BREP: VPA Infrastructure Strategy

Bendigo Regional Employment Precinct ('BREP')

Prepared for:

Development Victoria

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Stantec Australia Pty Ltd

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Acknowledgement of Country

Marong is on Dja Dja Wurrung Country.

Stantec, in conjunction with Development Victoria and City of Greater Bendigo, would like to acknowledge and extend appreciation of the Dja Dja Wurrung People, the Traditional Owners of the land where Marong is today.

Today, we pay our respects to leaders and Elders past, present and emerging for they hold the memories, the traditions, the culture and the hopes of all Dja Dja Wurrung Peoples.

We express our gratitude in the sharing of this land, our sorrow for the personal, spiritual and cultural costs of that sharing and our hope that we may walk forward together in harmony and in the spirit of healing.

"Stantec's Reconciliation Journey"

by Chern'ee Sutton

The conclusions in the Report titled BREP: Infrastructure Strategy are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

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Reference Documents

2002 (Bioregional)	One Planet Living Framework
2014 (Djaara)	Dhelkunya Dja (Dja Dja Wurrung Country Plan: 2014-2034)
2015 (Aug 26: CoGB)	Integrated Transport and Land Use Strategy (ITLUS)
2016 (Sept: GBCA)	Green Star – Communities v1.1
2017 (DELWP)	Plan Melbourne 2017-2050
2019 (Jan 21: REMPLAN)	Bendigo Industrial Land Review: Strategic Economic Inputs
2019 (Jun: CharterKC)	Bendigo Industrial Strategy: Industrial Land Search and Evaluation
2019 (Aug: 2019)	Coliban Water Sustainability Strategy
2020 (Feb: RMCG)	Industrial Land Infrastructure Assessment
2019 (Aug: RDA/RPLC)	Loddon Campaspe Economic Growth Strategy
2020 (CoGB)	CoGB: Economic Development Strategy 2020-2030
2020 (CoGB)	CoGB: Greening Greater Bendigo 2020-2070
2021 (CoGB)	Climate Change and Environment Strategy 2021-2026
2022 (March: DJPR)	Loddon Campaspe Regional Economic Development Strategy
2022 (Nov: CASBE)	Sustainable Subdivisions Framework Applicant Kit: Medium - V2
2023 (Feb 23: SGS)	Review of Future Industrial Land Supply in Bendigo
2023 (June: Aurecon & Lifecycles)	Circular Central Victoria – a regional circular opportunity scan
2023 (Oct: DV)	N0.1 Sustainability Strategy (Integrated Sustainability Principles)
2024 (Feb: CoGB)	Greater Bendigo Industrial Land Development Strategy (‘GBILDS’)
2024 (March 14: PPV)	Panel Report: C263gben – Marong Township Structure Plan
2024 (June: CoGB)	Greater Bendigo Industrial Development Guidelines
2024 (June: CoGB)	Marong Township Structure Plan
CoGB	Greater Bendigo Planning Scheme
(GBCA)	Green Star – Communities v2 (Consultation – Summary paper)

Key Project Background Documents

2020 (May 11: NAVIRE)	Bendigo Business Park Funding Model Assessment
2021 (July: RMCG)	Potable & Wastewater Demand and Sensitivity Analysis (BREP)
2021 (July 30: NAVIRE)	BREP: Market Sounding
2021 (Sept: REMPLAN)	Industrial Land Site Assessment: Economic Impact Analysis (BREP)
2021 (Oct 8: GHD)	BREP Impact Assessment Report (Water Infrastructure)
2021 (Nov: REMPLAN)	Industrial Land Site Assessment: Economic Impact Analysis (155ha)
2022 (Aug: NAVIRE)	BREP: Infrastructure Funding Prospectus
2023 (Feb: VPA)	BREP: Project Charter & Governance Plan
2023 (March: VPA)	BREP: Pitching Sessions - Summary Report
2023 (July: VPA)	BREP: Vision & Purpose – Workshop Summary
2023 (July 17: Heritage Insight)	BREP: Historical Heritage Assessment
2023 (Oct 2: ENSPEC)	BREP: Arboriculture Assessment
2023 (Oct: E&H Partners)	BREP: Biodiversity Assessment & Targeted Flora & Fauna Surveys
2023 (Nov: spiire)	BREP: Landscape & Visual Assessment
2024 (March 23: HIP v HYPE)	BREP: Sustainable Development Opportunities Report
2024 (April: WSP)	BREP: Land Capability Assessment (LCA)

1.

Executive Summary.

1 Executive Summary

The *Greater Bendigo Industrial Land Development Strategy – June 2024 ('GBILDS')* identified the need to plan for a pipeline of at least an additional 170-270 hectares of unconstrained, well serviced industrial land supply in Greater Bendigo over the next 30 years.

The cost of upfront regional and site-specific trunk infrastructure makes private sector led industrial development extremely challenging.

Without strategic infrastructure investment from Government to facilitate the delivery of new industrial land, Greater Bendigo risks becoming uncompetitive and losing businesses and employers to other regional centres.

In response to these challenges, the Bendigo Regional Employment Precinct ('BREP') presents a unique opportunity to respond to dwindling industrial land supply by delivering a new industrial/employment precinct in Greater Bendigo.

BREP is situated 15km west of Bendigo's CBD (south-west of Marong). The proposed 294ha site has direct access opportunities to the Wimmera Highway to the north and west, and Calder Alternative Highway to the east – a High Productivity Freight Vehicle ('HPFV') network.

In November 2021, City of Greater Bendigo ('CoGB') purchased 155ha of land within the 294ha BREP site; a visionary decision to assist in facilitating a national exemplar in a sustainable, commercially successful regional industrial development at scale.

In November 2022, $6 million in funding over 2 years was announced by the Hon. Jacinta Allan MP (now Premier) to plan key enabling infrastructure for BREP.

Enabling infrastructure including transportation networks, intersections, landscaping, electricity, public lighting, water and sewerage, telecommunications, site remediation and other onsite linking infrastructure that will be required to facilitate any development of BREP.

The Precinct is intended to be developed in stages, to provide for industrial lots that will vary in size to meet market expectations.

Development Victoria ('DV') has been engaged by CoGB as a delivery agent to prepare an Infrastructure Strategy, to include a Concept Infrastructure Plan and a strategy for enabling and site-specific staged infrastructure works.

This Infrastructure Strategy is the pre-cursor to the preparation of a Development Strategy and Business Case for BREP. It informs decisions around infrastructure and servicing requirements.

This Infrastructure Strategy has been prepared by Stantec in conjunction with DV, and a number of supporting specialist consultants and key stakeholders. In particular, Stantec acknowledges the key stakeholder inputs from *CoGB, DV, Regional Development Victoria ('RDV'), Victorian Planning Authority ('VPA'), Department of Transport and Planning ('DTP'), Coliban Water, Djaara*, and the specialist consultants' inputs from *Watson Young, Ethos Urban, Colliers and McKinna et al* during the preparation of this Infrastructure Strategy.

This Infrastructure Strategy has involved a review of Background Site Analysis reports to understand the opportunities and constraints associated with BREP, to provide a holistic, comprehensive understanding of the key infrastructure and servicing context associated with BREP.

Through key findings and project workshops, underpinned by climate resilience, nature, energy and circular economy sustainability priorities, this Infrastructure Strategy provides commentary on servicing and infrastructure options, in particular utility, landscape, stormwater, transport and earthworks considerations.

The provision of potable water, telecommunication and road infrastructure to the site is relatively uncomplicated and economical.

Stormwater can be detained to pre-developed flow rates incorporate Water Sensitive Urban Design (WSUD) to achieve Best Practice Environmental Management (BPEM) targets. A low flow outflow pipe to Bullock Creek has been incorporated into the design with conceptual support from the North Central Catchment Management Authority (NCCMA) greatly reducing the total earthworks required on site.

Sewer servicing of BREP has not been allowed for in Coliban Water's capital works program, and which is not being reviewed until 2028. Significant pipe and pump investment is needed to provide sewer connection, as well as significant upgrades at the Bendigo Water Reclamation Plant in Epsom.

Limited power is available in the Marong area. Extension of 66kV sub-transmission lines to the site and construction of a zone substation, the third for Bendigo, will be required if BREP attracts a moderate proportion of manufacturing or high energy users. The site presents an innovative opportunity to reduce grid reliance with a private energy network with onsite renewable generation.

An informed BREP Concept Infrastructure Plan and Infrastructure Servicing Layout Plan are presented in this Infrastructure Strategy.

The BREP Concept Infrastructure Plan incorporates the following 'key moves':

- Preserve & enhance existing significant vegetation
- Integrate water within the landscape
- Retain & promote biodiversity
- Provide transport connectivity
- Plan for flexibility

This Infrastructure Strategy concludes with recommendations regarding staging and infrastructure triggers, and flexible delivery.

It is recommended that Stage 1 of BREP be located in the north-east corner of the Council land. The recommended area of Stage 1 of 28 ha is below the trigger for the extension of the sub-transmission power infrastructure to the site.

The construction of the ultimate sewer outfall works will be required for Stage 1.

2.

Introduction.

2 Introduction

2.1 Background to Bendigo Regional Employment Precinct: BREP

The Bendigo Regional Employment Precinct ('BREP') is a significant strategic project for both CoGB and RDV. It presents a unique opportunity to lead the delivery of a new, large scale industrial/employment precinct.

The Greater Bendigo Industrial Land Development Strategy – June 2024 ('GBILDS') has identified the need to plan for a pipeline of at least an additional 170-270 hectares of industrial land supply over the next 30 years over and above the current supply of less than 100 hectares. Market sounding within the industrial development sector suggests there is an unmet need for large, well located, serviced sites in Greater Bendigo that are not constrained by growing residential and other sensitive land uses. The City's remaining zoned industrial land in Greater Bendigo provides less than 5 years of viable/serviced industrial zoned land and does largely not meet these characteristics.

The upfront regional and site-specific trunk infrastructure costs make private sector led development challenging. These include connection and long-term supply of potable water, sewage, power and delivery of major road, intersection and drainage works.

Without strategic infrastructure investment from Government to help facilitate the delivery of new industrial land, Greater Bendigo risks becoming uncompetitive and losing businesses and employers to other Victorian regional centres. This will also significantly impede economic activity and population growth across Greater Bendigo and northern Victoria.

The attributes and advantages of the proposed BREP location include:

- High quality access to arterial roads with frontages to two main highways and national freight routes, plus proximity to the planned Marong Western Freight Corridor ('MWFC') investigations.
- Located near existing settlement without currently abutting existing residentially zoned land.
- Gross developable area is approximately 294ha, meeting long-term industrial land supply needs of the region (including long-term expansion opportunities).
- Relatively flat, clear of vegetation, suitable for delivery of flexible, large, serviced development sites with relatively low impact on the environment.
- The geography allows for onsite detention and treatment of stormwater to best practice, as is the opportunity to promote sustainable, best practice industrial development.

2.2 Purpose of this Infrastructure Strategy Report

Stantec has been engaged by DV, on behalf of CoGB, to prepare an Infrastructure Strategy for enabling and infrastructure works to service staged industrial land release, and 'unlock' BREP.

The purpose of this Infrastructure Strategy report is to facilitate decisions around infrastructure and servicing requirements.

2.3 Key Stakeholders

There are a large number of key stakeholders who assisted in the preparation of this Infrastructure Strategy Report, including representatives from site and surrounding landholdings, state and local government agencies, community groups, private landowners and developers, and infrastructure providers. These included the following entities:

We cannot emphasise enough the importance of working collaboratively with stakeholders from the outset to achieve full buy-in and cooperation in the delivery of strategic major projects such as BREP. This is critical to fulfilling the potential of the BREP project in the immediate and longer terms.

2.4 Report Methodology

In the pursuit of data to inform our Infrastructure Strategy Report, a number of Stantec's consulting disciplines investigated the site with respect to infrastructure considerations, including town planning, environmental and geotechnical engineering, landscape & ecology, stormwater, transport, earthworks, sustainability and utility services.

A series of background site analyses, including desktop investigations, research, site walks and collaboration with key stakeholders and specialist consultants were carried out by appropriately qualified consultants to identify BREP's opportunities and constraints. The outcomes of these

considerations inform infrastructure considerations (both potential and practical) and associated sustainable opportunities and initiatives and a Concept Infrastructure Plan for BREP.

In turn, Stantec has prepared an Infrastructure Servicing Layout Plan, and provided suggested staging of the development of BREP.

2.5 Sustainability

The *Sustainable Development Opportunities Report (HIP v HYPE: March 2024*) ('HvH') investigates sustainable development opportunities for BREP.

HvH's four (4) focus areas were identified as critical in ensuring an ambitious and meaningful sustainability vision is developed for the precinct:

- net zero carbon
- climate resilience
- circular economy
- leadership and governance

BREP is a strategic opportunity to position CoGB and DV as leaders in driving forward innovative resilient solutions that prioritise both people and the planet. Sustainable practices are critical to ensure BREP operates efficiently while minimising its environmental impact. By incorporating, renewable energy, climate resilient design, circular economy initiatives – alongside leadership and governance - BREP can significantly reduce its carbon footprint and improve resource efficiency.

Strategic thinking associated with infrastructure design and delivery has had these 4 sustainability focus areas at its forefront. Our sustainability approach for BREP, in conjunction with key stakeholders, re-priorities these focus areas following consolidated background analysis and key findings. In turn, sustainability opportunities, initiatives and actions are provided as part of this Infrastructure Strategy.

3.

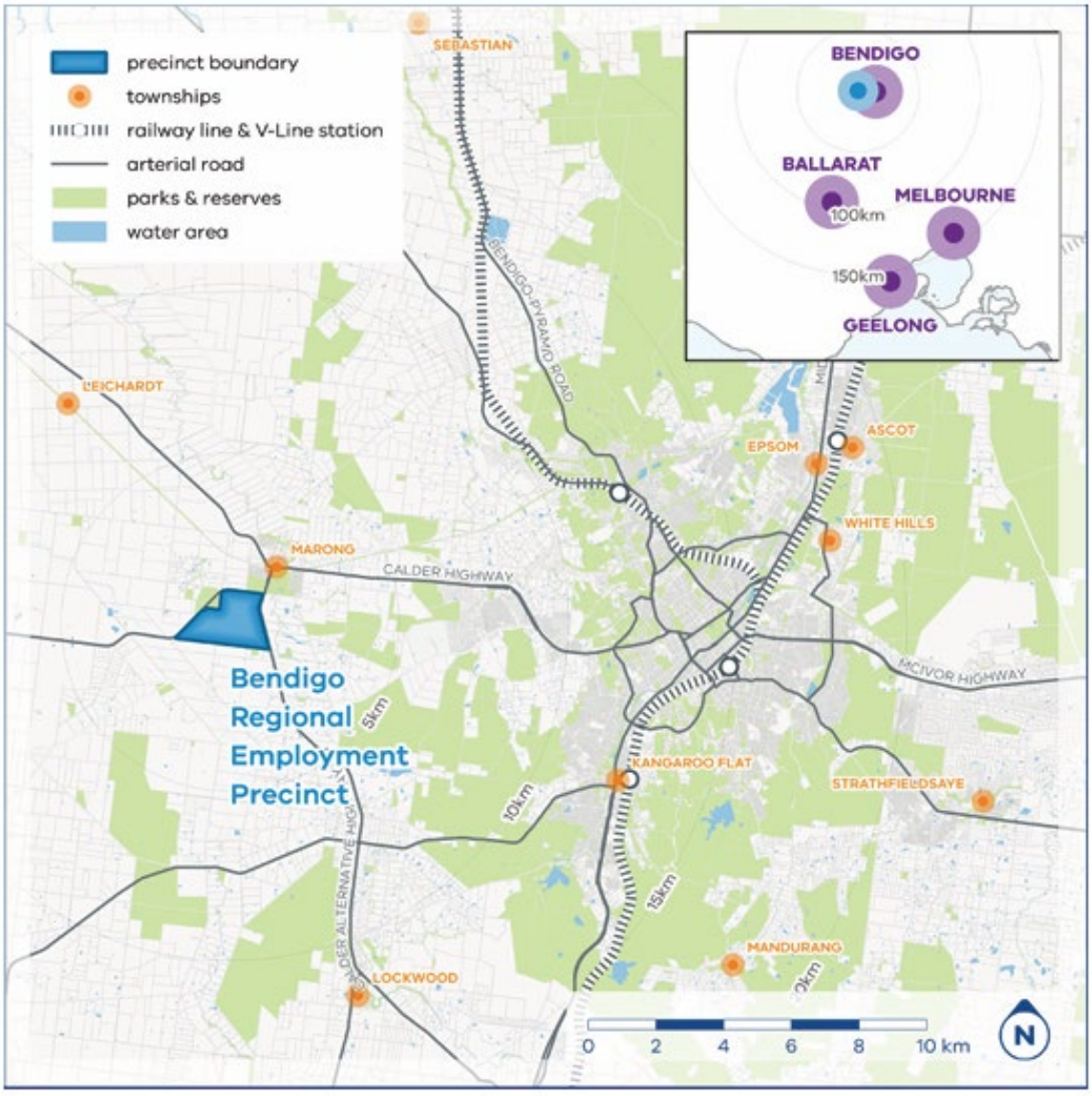
BREP: The Site and Surrounds.

3 BREP Site & Surrounds

3.1 Site

BREP is approximately 294ha in area, approximately 15km west of Bendigo city centre, and some 150km northwest of Melbourne. ***(refer to Figure 1)***

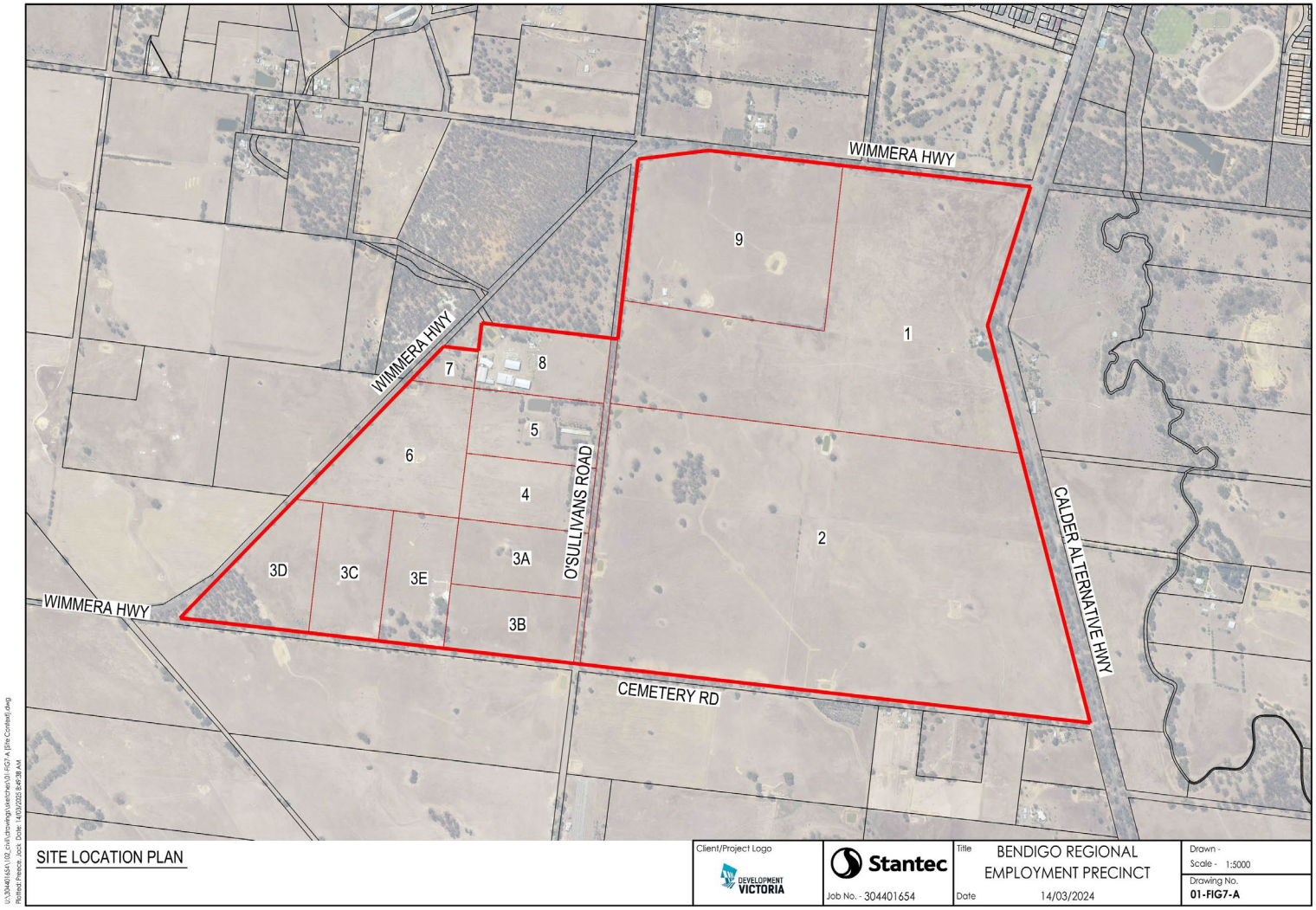
Figure 1: Regional Context Plan (VPA Pitching Sessions Summary Report – March 2023)



The site is south-west of Marong and is bound by Wimmera Highway to the north and Calder Alternative Highway to the east, Wimmera Highway to the west, and Cemetery Road to the south.

O'Sullivans Road, a local unsealed road, traverses the precinct north-south. ***(refer to Figure 2)***

Figure 2: Site Location Plan / BREP Property Identification Plan



The site comprises 13 titles as identified at ***Table 1*** and ***Figure 2*** above:

The City of Greater Bendigo is the largest landowner in the precinct, holding six titles (Property Nos. 2 & 3) that total 155 hectares, and which represents 53% of the area.

There are no identified title restrictions that would prevent the proposed development of these lots for industrial / commercial use and development into the future.

Table 1: BREP Property Identification

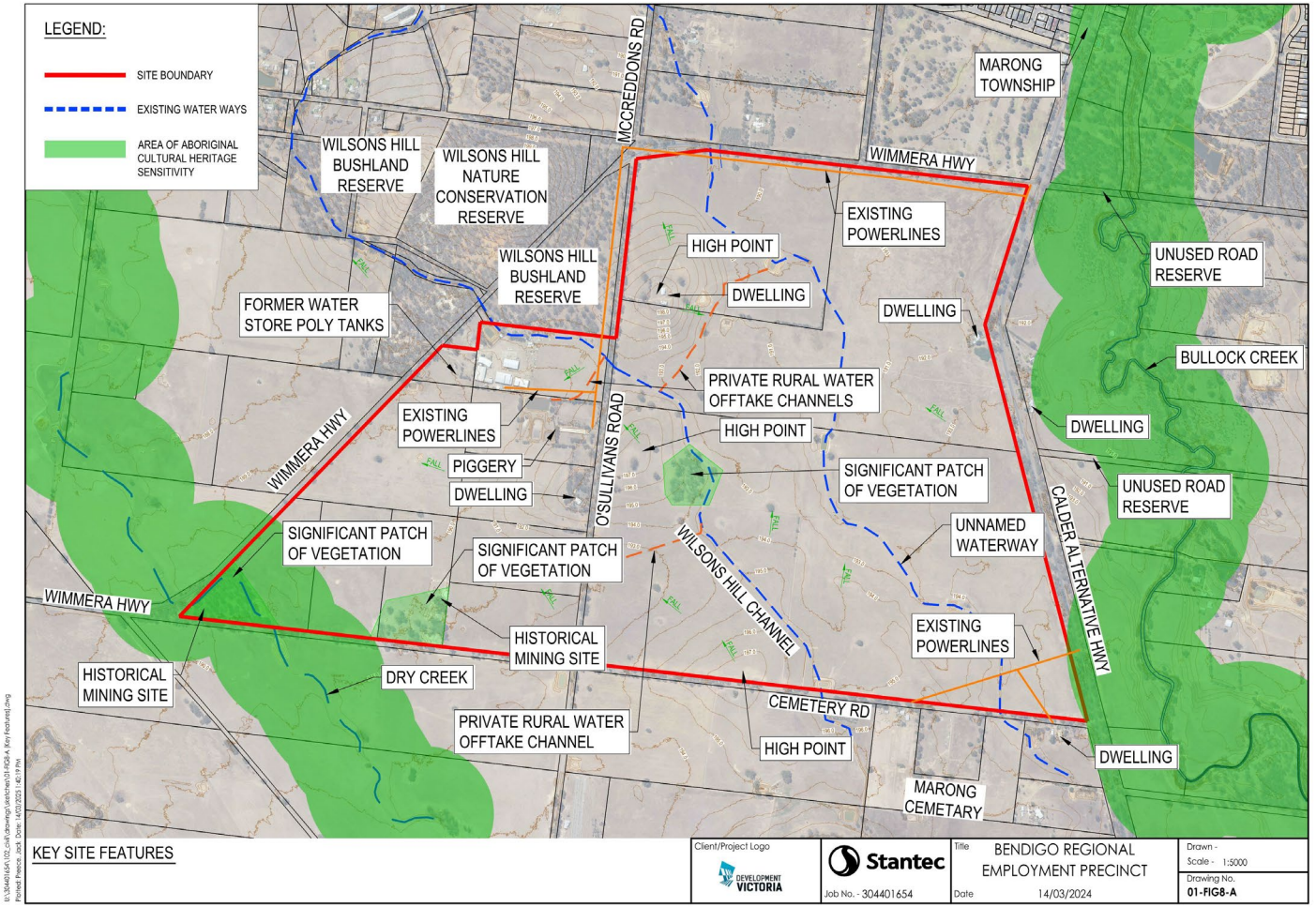
No.	Property Identification	Lot/Plan No.
1	(PART OF) 1880 CALDER ALTERNATIVE HIGHWAY MARONG 3515	(Part of) Lot 1 TP123242
2	CALDER ALTERNATIVE HIGHWAY MARONG 3515	Lot 1 TP583727
3 A-E	OSULLIVANS ROAD MARONG 3515	A – Lot 5 TP381572 B – Lot 6 TP381572 C – Lot 7 TP381572 D – Lot 10 TP381572 E – Allot. 5C Sec. 5 PARISH OF MARONG
4	106 OSULLIVANS ROAD MARONG 3515	Allot. 6B Sec. 5 PARISH OF MARONG
5	OSULLIVANS ROAD MARONG 3515	Allot. 6A Sec. 5 PARISH OF MARONG
6	BENDIGO-ST ARNAUD ROAD MARONG 3515	Lot 8 TP381572
7	BENDIGO-ST ARNAUD ROAD MARONG 3515	Allot. 7C Sec. 5 PARISH OF MARONG
8	211 BENDIGO-ST ARNAUD ROAD MARONG 3515	Allot. 7A Sec. 5 PARISH OF MARONG
9	41 OSULLIVANS ROAD MARONG 3515	Lot 1 TP13152

3.1.1 Key Site Features

(***refer to Figure 3***)

- A small number of existing businesses, including a piggery (Property No. 5) and a poly water tank manufacturer (Properties 7 & 8 - recently closed in 2024) to the west of O'Sullivans Road, and dwellings associated with low intensity agriculturally based activities such as grazing (Properties 4 & 9).
- A gently undulating landscape with scattered trees and extensive roadside vegetation. The land slopes to the north and west with a ridgeline traversing the site in a north-south direction to the east of O'Sullivans Road.
- An Area of Aboriginal Cultural Heritage Sensitivity within the south-west corner associated with Dry Creek alignment.
- High quality access to arterial roads with frontages to two main highways and national freight routes.
- Native vegetation and potential habitat for native species listed for protection under State and Federal legislation.
- Existing 22kV distribution and 12.7kV supply power lines.

Figure 3: Key Site Features Plan



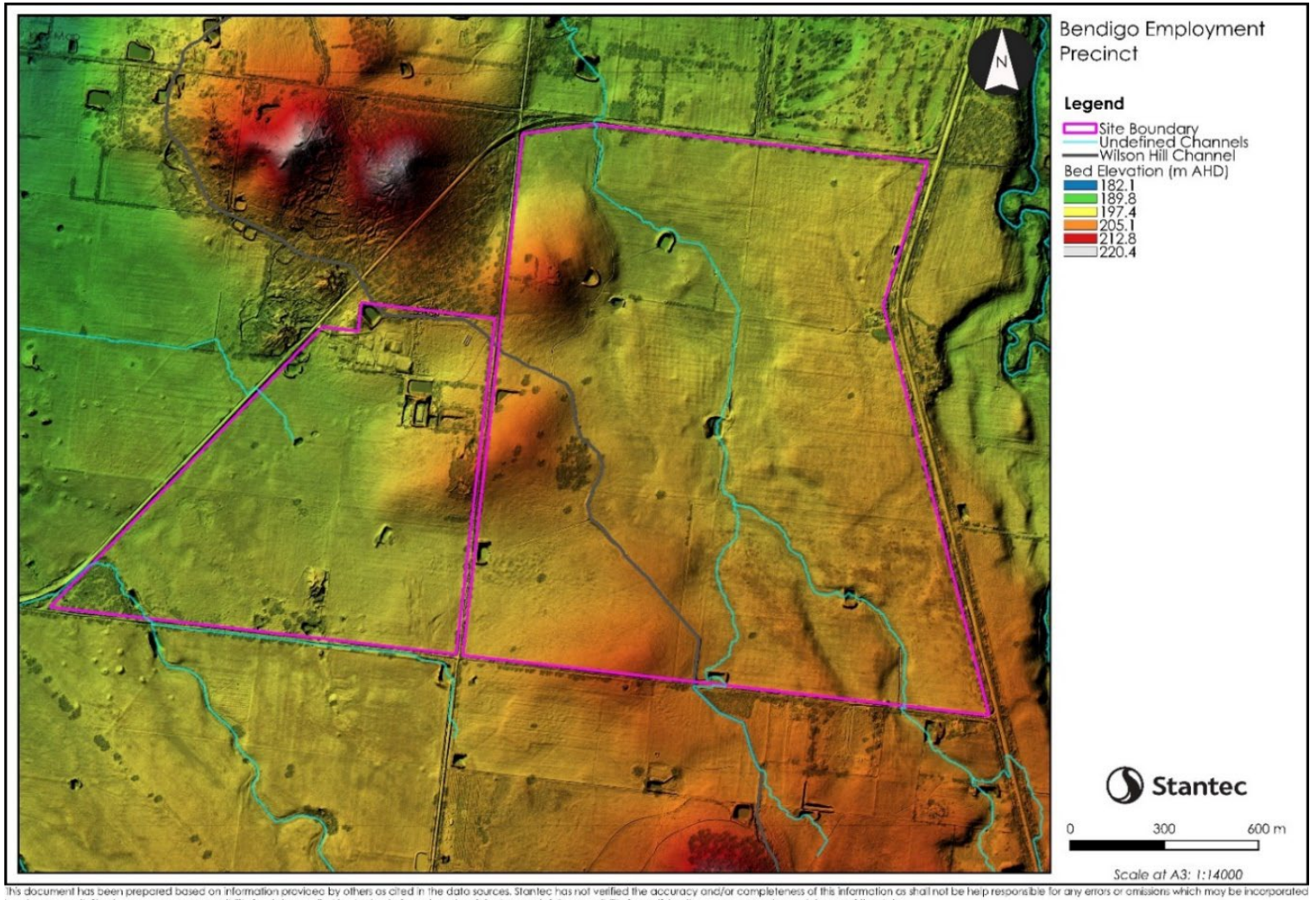
3.1.2 Topography

Stantec has:

- reviewed existing available information and data,
- obtained LiDAR data available (March 2020) within the subject site area (contour resolution 1m; vertical tolerance 0.1m, horizontal tolerance 0.3m), and
- obtained Digital Cadastral map data of the parcels with the subject area.

The precinct topography consists of large areas of very flat land, grading generally southeast to north northwest at an average slope of less than 0.3% or 1 in 330. The eastern part of the site grades to north and the western part to the west. The variation in height across the site ranges from 188m AHD-198m AHD. ***(see Figure 4)***

Figure 4: BREP Topography Map



3.2 Key Surrounding Features

A Key Surrounding Features plan has been prepared at ***Figure 5.***

North

- The Marong Golf Course is located immediately to the north-east.
- There is proposed future residential land directly to the north and west of the golf course as identified in the Marong Township Structure Plan, and existing agricultural land (including a broiler farm) to the north-west, beyond the Wimmera Highway.
- A designated waterway traverses the Wimmera Highway from the site.
- A section of the Wimmera Highway abutting the northern boundary, and a section of Calder Alternative Highway abutting the eastern boundary of the site running parallel to the current preferred Marong Western Freight Corridor ('MWFC'), also known as the Marong Bypass.

West

- Wilsons Hill Bushland Reserve.
- Wilsons Hill Channel that traverses the Wimmera Highway and into the site.
- Agricultural land beyond the Wimmera Highway to the west.
- Dry Creek, that runs through the south-west corner of the site.

South

- A small number of dwellings south of Cemetery Road.
- The Marong Cemetery.

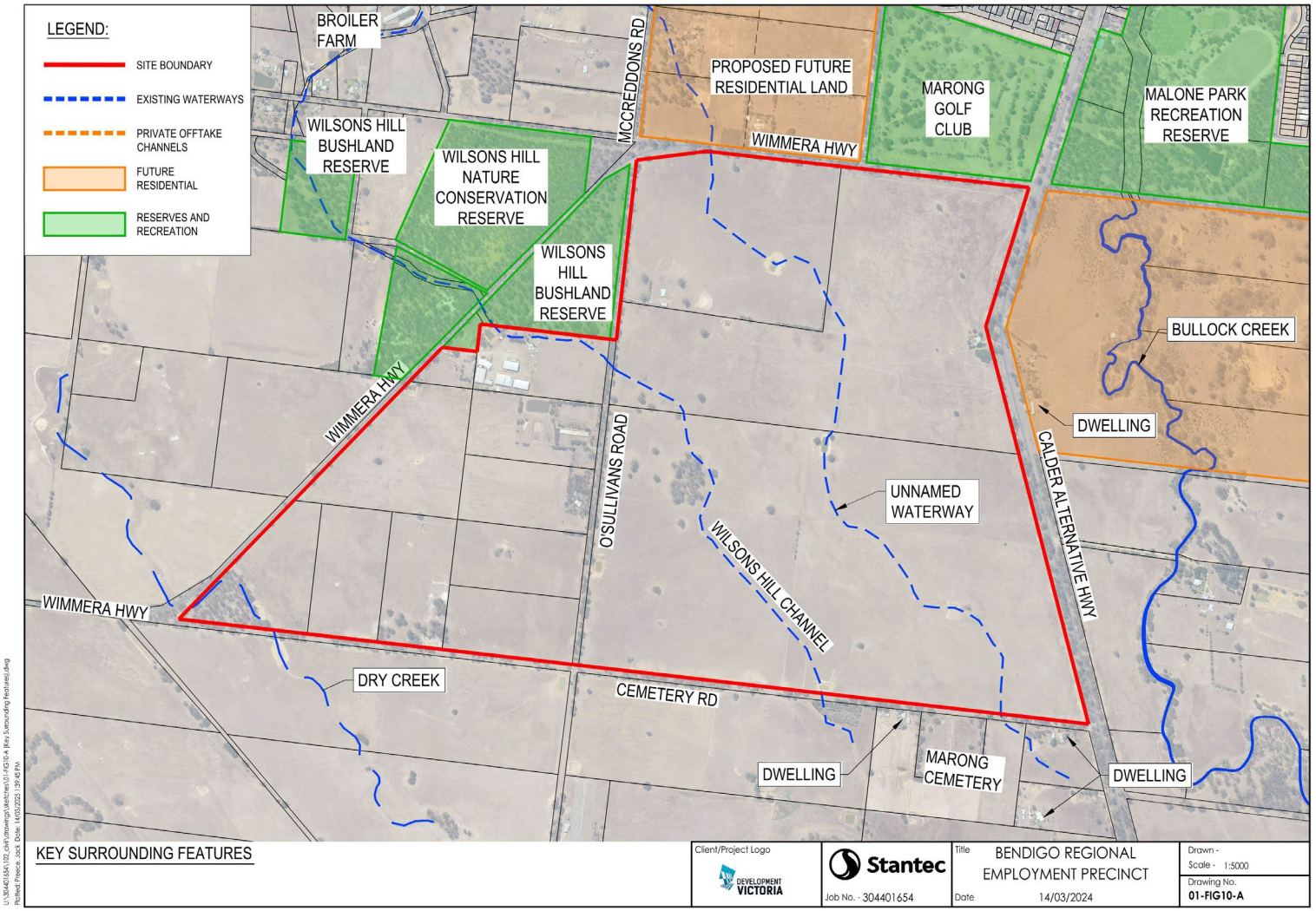
East

- Bullock Creek to the east of and running parallel to the Calder Alternative Highway.
- A small number of dwellings immediately east of the Calder Alternative Highway.
- There is proposed future residential land directly to the east of the Calder Alternative Hwy as identified in the Marong Township Structure Plan, and existing agricultural land to the southeast

BREP is framed by a consistent ring of mature roadside vegetation including significant trees and some scattered patches of native vegetation within the site. Views from beyond the site looking towards BREP are largely obstructed, filtered or encumbered through existing vegetation surrounding the boundaries of the site.

This roadside vegetation provides additional ecological and biodiversity values.

Figure 5: Key Surrounding Features



4.

Background Site Analysis.

4 Background Site Analysis

Stantec has prepared a comprehensive Background Site Analysis report.

Section 4 of this Infrastructure Strategy summaries the scope / methodology and key findings associated with the BREP site's existing conditions and immediate surrounds, from Town Planning, Environmental Engineering, Geotechnical Engineering, Landscape, Stormwater and Transport perspectives

Commentary regarding existing Utility servicing is embedded into Section 6: Infrastructure Optioneering.

4.1 Town Planning Summary

Table 2: Town Planning Background Summary

Tasks	Analysis
Scope / Methodology	Stantec reviewed key documents, including the Greater Bendigo Planning Scheme ('GBPS') and the Marong Township Structure Plan ('MTSP'), to assess the suitability of BREP for development.
Key Findings	
Marong Township Structure Plan	The MTSP envisions Marong as a satellite township for 8,000 people, focusing on a vibrant community centre and public spaces. It aims to create 2,000-3,000 new jobs and accommodate a mix of industrial land uses. The MTSP states that BREP *'should be subject to a detailed investigation regarding its future use as an industrial employment precinct'* through a Planning Scheme Amendment that considers application of an appropriate planning overlay to protect existing significant vegetation, and the Development Contributions Plan Overlay to facilitate critical infrastructure funding (if applicable).
Greater Bendigo Industrial Land Development Strategy	Amendment C282 to the GBPS has been prepared to partially implement the Greater Bendigo Industrial Land Development Strategy 2024 (GBILDS) and to introduce the Greater Bendigo Industrial Development Guidelines 2024.
Threshold Distances	Threshold distances for futures uses and activities with potential adverse impacts should be considered, including the introduction of Industrial 3 Zone (IN3Z) or application of a Buffer Area Overlay (BAO).
Design Considerations	Sensitive design responses are needed in areas interfacing with highways and the potential Marong Western Freight Corridor ('MWFC') to ensure a smooth transition from rural to urban character. Consider the introduction of a Design & Development Overlay to implement the Greater Bendigo Industrial Development Guidelines 2024.
Greater Bendigo Planning Scheme	The GBPS currently zones the entire site as Farming Zone ('FZ1') and is partly affected by the Bushfire Management Overlay ('BMO') to enhance community safety against bushfire risks. BMOs aims to protect human life, identify bushfire hazards, and ensure development minimizes risks to life and property.
Permit Requirements	Planning permits are necessary for access alterations and land subdivision adjacent to Transport Zone 2 (TRZ2). Additionally, planning consent is required for the removal of native vegetation under Clause 52.17 of the GBPS.
Aboriginal Cultural Heritage Considerations	Areas of Aboriginal Cultural Heritage Sensitivity ('AACHS'), both within and adjoining the site, require Cultural Heritage Management Plans for any significant ground disturbance affecting these areas.
Environmental Approvals	Environmental approvals for buildings and works, including native vegetation removal are required under various acts, including the Flora & Fauna Guarantee Act and the Environment Protection and Biodiversity Act, to ensure compliance with environmental regulations.

4.2 Environmental Engineering Summary

Figure 6: Contamination Zone A, subzone boundaries

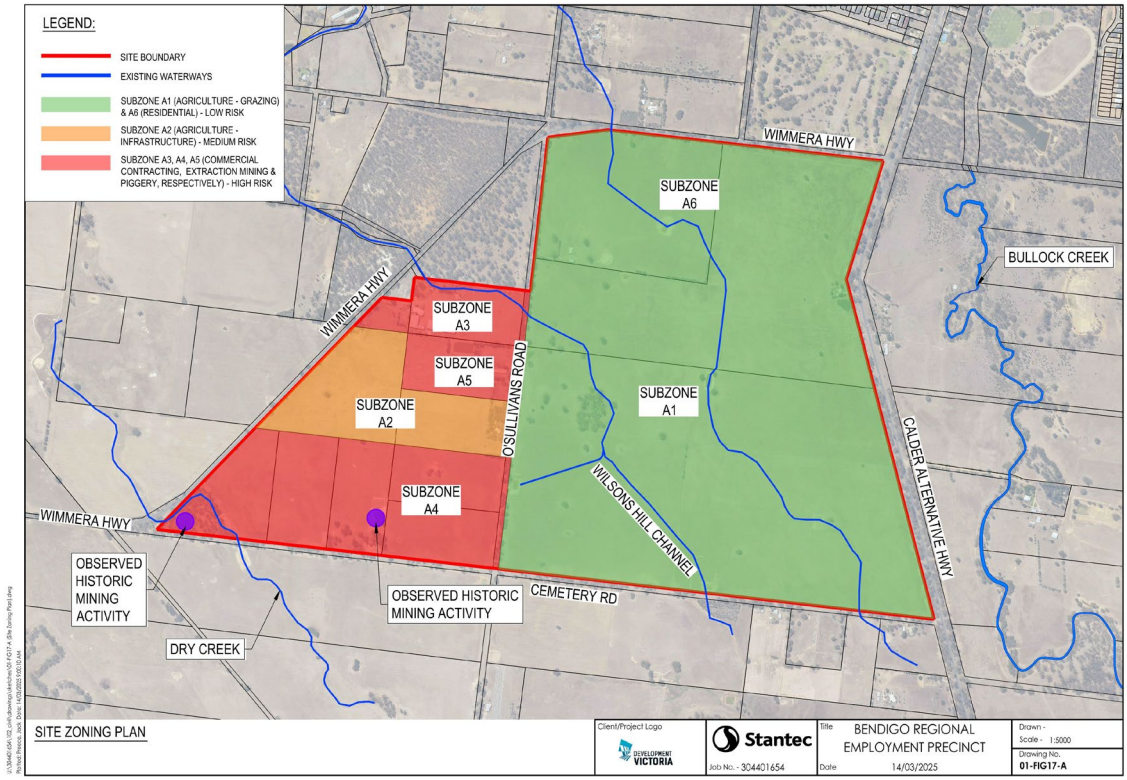


Table 3: Environmental Engineering Background Summary

Tasks	Analysis
Scope / Methodology	Stantec assessed the suitability of BREP for commercial/industrial development, analysed the identified risk levels for various sub-zones in the *Land Capability Assessment (WSP: 2024) ('LCA')*. Key activities included desktop reviews, contamination assessments, and discussions with local authorities.
Key Findings	
Sub-Zones A1 & A6	(Agriculture (Grazing)) & (Residential) respectively – **Low Risk** confirmed.
Sub-Zone A2	(Agriculture (Infrastructure)) – **Medium Risk** confirmed. Planning Authority or Responsible Authority are to document consideration of potential for contamination to impact on the proposal.
Sub-Zones A3, A4 & A5	(Commercial contracting), (Extractive Mining) & (Piggery) respectively – **High Risk** confirmed. A Preliminary Site Investigation ('PSI') to inform the need for an Environmental Audit is recommended.

4.3 Geotechnical Engineering

Table 4: Geotechnical Engineering Background Summary

Tasks	Analysis
Scope / Methodology	Stantec conducted a comprehensive review, including publicly available geological maps and the Visualising Victoria's Groundwater website ('VVG'), aerial images, geotechnical investigation reports, & undertook site inspections (noting access to Subzone Lots 4, 5, 6, and 8 was restricted). Key reports reviewed included: LCA and Historical Heritage Assessment: Heritage Insight (July 2023) ('HHA'). Assessed historical sites, their significance, and mining history in the region. Findings indicated potential geotechnical concerns related to past mining activities, including tailing mounds and mining sludge.
Key Findings	
Mining Activity	Gold mining occurred in the 1860s, with small-scale operations until 1912. Mining byproducts are present in the area, particularly north of Cemetery Road and east of Wimmera Highway.
Drainage and Flooding	The Wilsons Hill Channel, constructed in the late 1800s, serves historical mining and agricultural needs. Evidence of mining activities, such as cyanide vats and filled-in mineshafts, are present.
Acid Sulfate Soils	Low probability of acid sulfate soils ('ASS') affecting excavation or development.
Sodic/Dispersive Soils	Presence of sodic soil indicated by data from Victorian Resources Online.
Earthquake Risk	No significant earthquake risk identified; however, building designs should comply with AS 1170.4 standards. Bendigo has a 'Z' value' of 0.09, indicating low risk. Additional testing is recommended.
Geology	The site is underlain by Quaternary Coonambidgal Alluvium, Colluvium & Gully Alluvium, Shepparton Formation, and Ordovician Castlemaine Group, with historical mining activities impacting the area.
Site suitability	Generally suitable for development, but further investigation is needed. Risks include variable subsurface profiles, expansive clay-rich soils, and potential erosion from sodic soils.
Construction Considerations	Quaternary soils may pose risks to deep excavations, requiring careful design to mitigate differential settlement and structural damage.
Groundwater	The data obtained from VVG suggests that the majority of BREP site has a depth to groundwater of less than 5m below ground level ('bgl'). However, some areas north of the site may encounter groundwater at depths ranging from 5m to 10m bgl.

4.4 Landscape

Table 5: Landscape Background Summary

Tasks	Analysis
Scope / Methodology	Stantec aimed to identify landscape and visual characteristics within the site to preserve its visual appeal and identity.
Key Findings	
Key Visual Values	The site features low-lying topography with two high points near Wilson Hill (198m and 197m AHD). A gentle ridgeline runs north - southeast of O'Sullivans Road, enhancing views from Calder Alternative Highway and Wimmera Highway. Mature tree plantings along O'Sullivan Road, Cemetery Road, Calder Alternative Highway, and Wimmera Highway provide visual enclosure and mitigate potential negative impacts from industrial development.
Key Landscape Values	Wilson Hill Nature Conservation Reserve, at over 204m AHD, is significant for visual and landscape value, serving as a green link. Additionally, the site is surrounded by other open spaces, providing opportunities to create multi-modal movement and green corridors through the site. ***(refer to Figure 7)*** Two waterway channels traverse the site: • Waterway 1 (WW1) - Wilson Hill Channel ('WHC') • Waterway 2 (WW2) - designated waterway east of WHC Three high-value vegetation and ecological areas ('HVE') identified, including HVE1, which contains a nest of the EPBC Act protected Wedgetail Eagle. ***(refer to Figure 8)*** Existing mature tree plantings provide ecological links to surrounding open spaces Potential presence of Grey Box Grassy Woodland and Derived Native Grasslands within vegetation patches PW4, PW8, and PW9, each over 0.5 hectares ***(refer to Figure 9)*** Cultural and heritage values include historic gold mining activities and an AACHS associated with Dry Creek.

Figure 7: Extract from Landscape and Visual Assessment (Spiire, Nov 2023) illustrating surrounding open space network near or adjacent to the Site

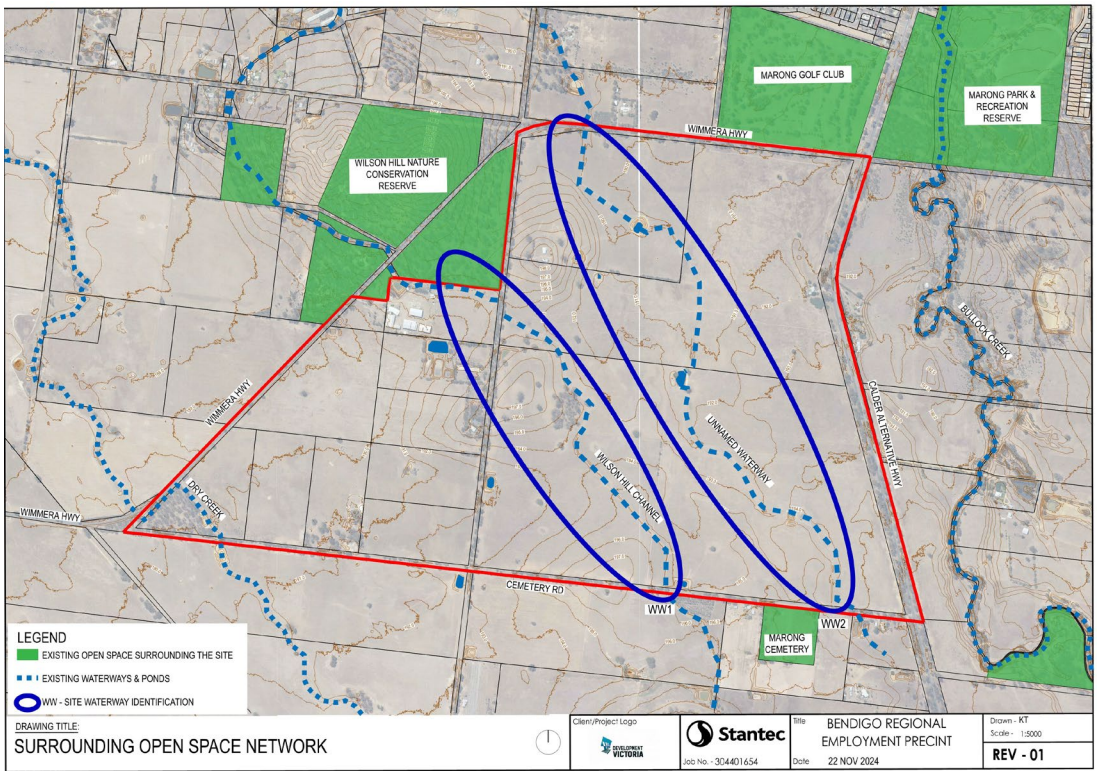


Figure 8: Extract from Arboriculture Assessment (Enspec Oct 2023) illustrating existing local road reserve mature tree plantings and high value ecological patches within the Site

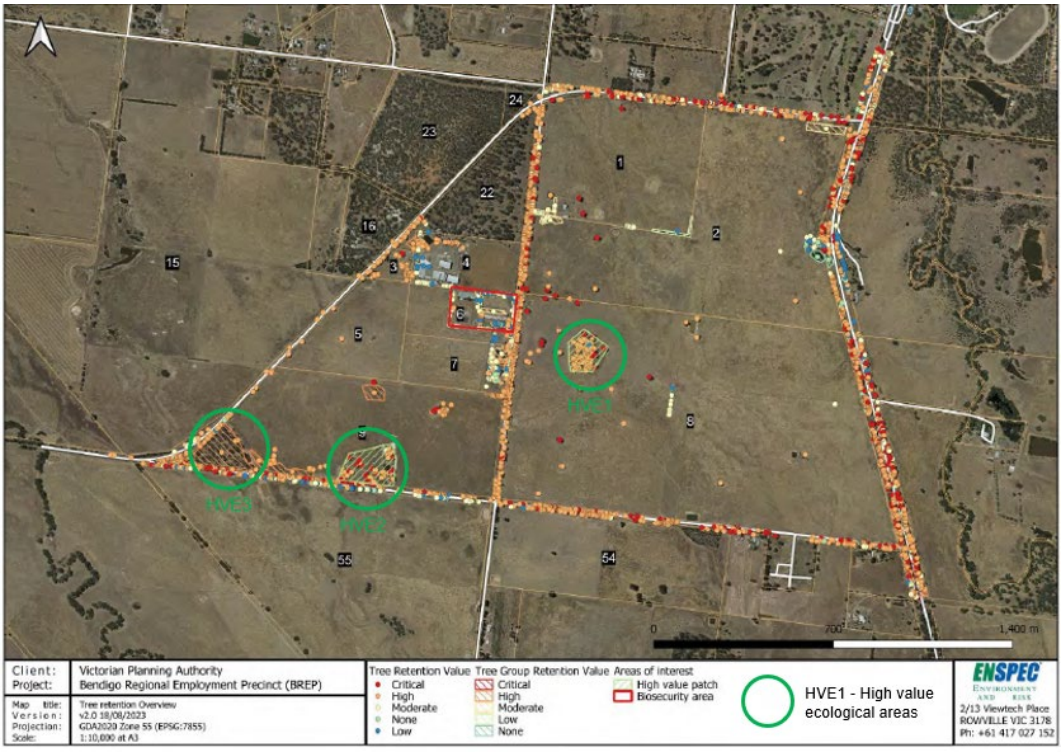
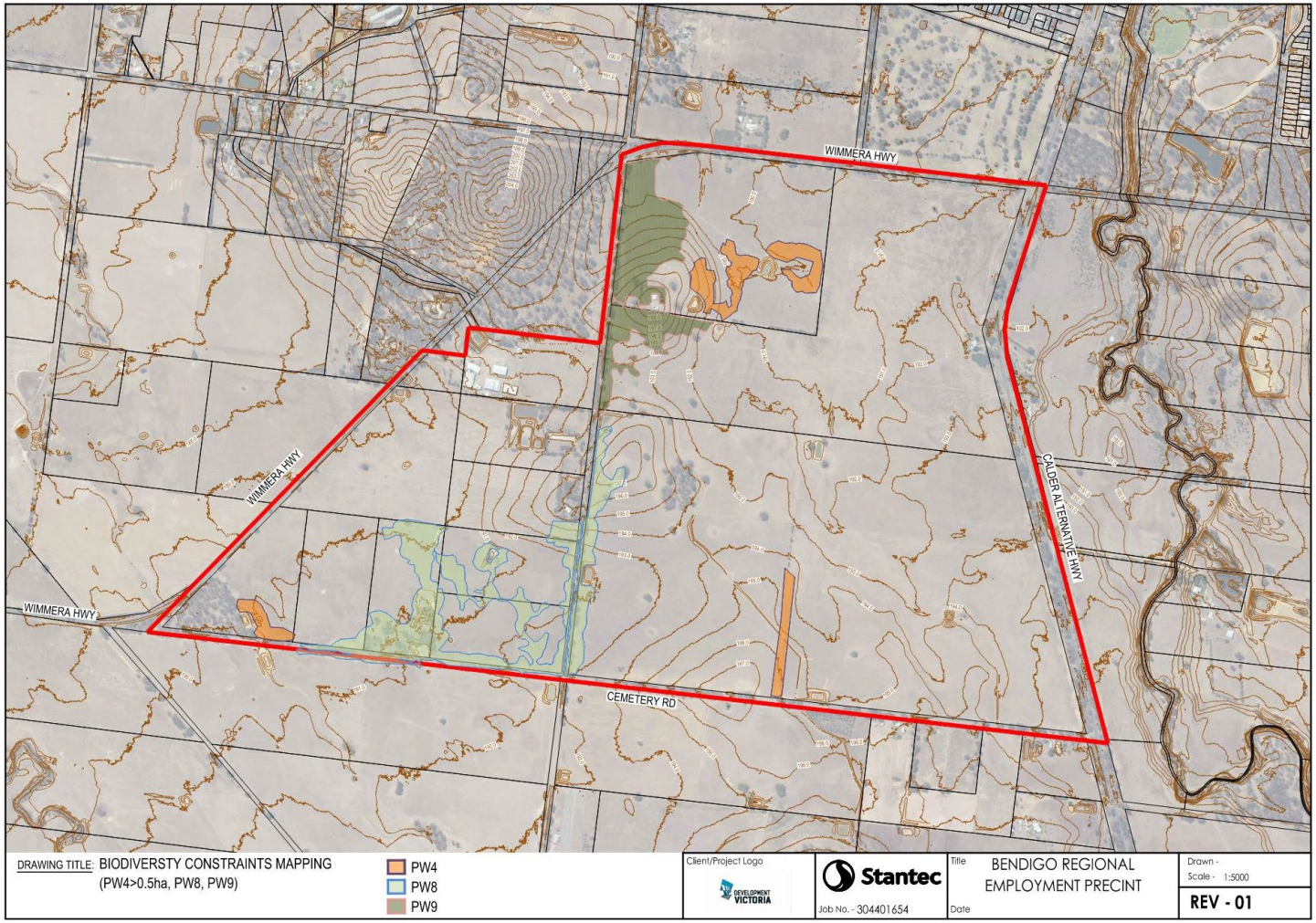


Figure 9: Mapping of vegetation patches PW4, PW8 and PW9 from BREP Biodiversity Assessment Report (Ecology and Heritage Partners, Oct 2023)



4.5 Stormwater

Table 6: Stormwater Background Summary

Tasks	Analysis
Scope / Methodology	Stantec assessed infrastructure needs to comply with Best Practice Environmental Management Guidelines ('BPEMG') for stormwater.
Key Findings	
Existing conditions	The site is predominantly flat, with a slight gradient (average slope < 0.3%). The site comprises two major stormwater catchments, separated by a ridge line running approximately along the alignment of the Wilson's Hill channel. The eastern catchment falls gently to the north with the western catchment falling gently to the west. The site consists of 3 distinct high points on Cemetery Road, adjacent the piggery and adjacent Wilson's Hill Bushland reserve where an existing dwelling is located. (***refer to Figure 4: BREP Topography Map***) Key features include: • Wilsons Hill Channel, a constructed water supply swale. • An unnamed tributary of Bullock Creek, receiving flows from BREP. • Dry Creek, an ephemeral tributary, draining the southwestern area. • 2 primary catchments and 1 minor catchment ***(Figure 10)*** Detailed Flood mapping of Bullock creek conducted in the Marong Flood Study indicates that the 1% AEP flood extent does not affect BREP. Detailed flood mapping of the BREP site has not been undertaken ***(refer to* Figure 11*)***
Strategic Context	CoGB requires Stormwater Management associated with new industrial developments to be managed in according Council's Engineering Requirements and the Infrastructure Design Manual (IDM). Integrated water management objectives in Marong are set out in MTSP including stormwater quality requirements. Development staging must provide for the delivery of the ultimate waterway and drainage infrastructure network, including stormwater quality treatment. Where this is not possible, development proponents must demonstrate how any interim solution adequately manages and treats stormwater generated from the development and how this will enable delivery of an ultimate drainage solution, all to the satisfaction of the responsible authority".

Figure 10: Catchment Plan

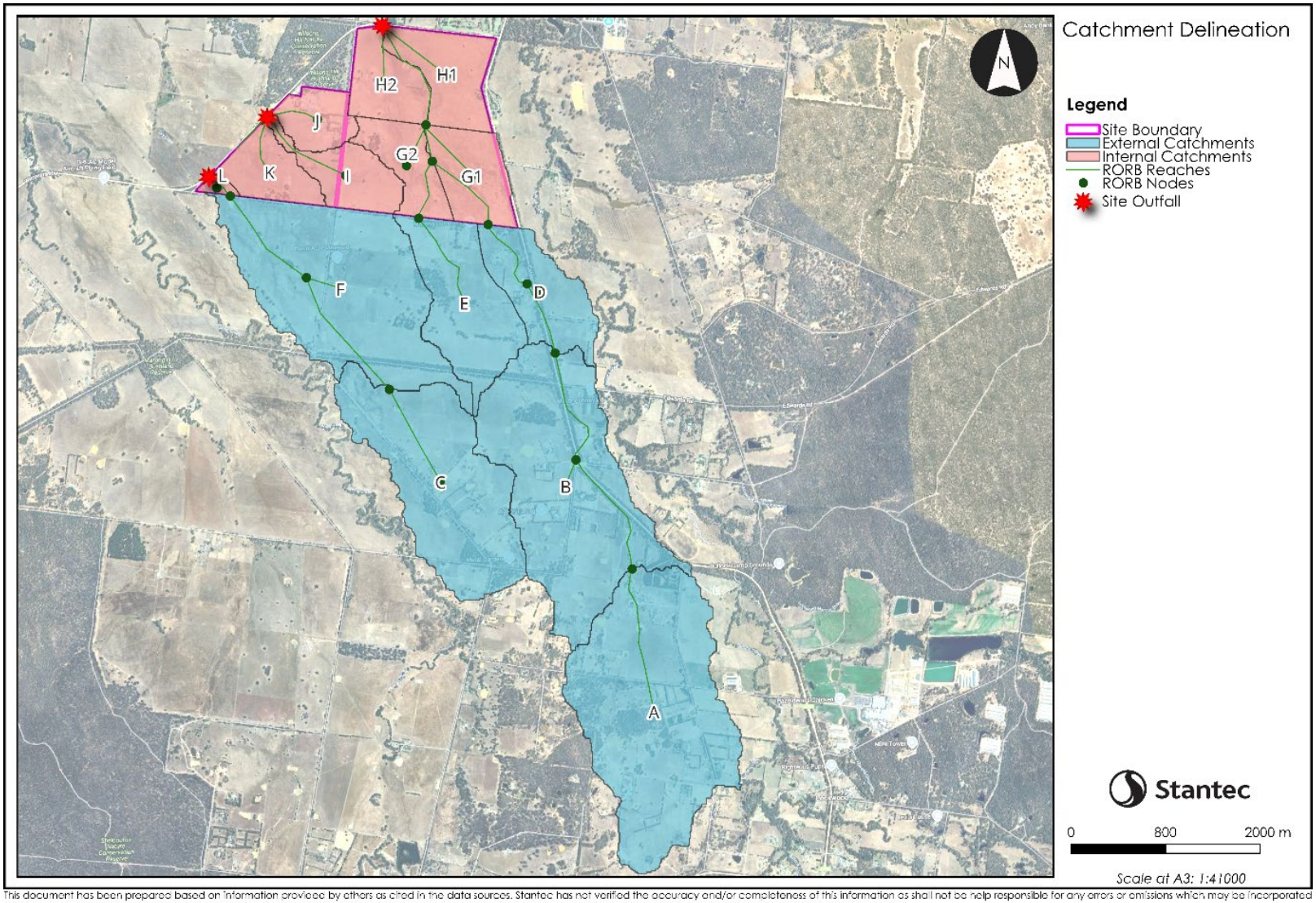
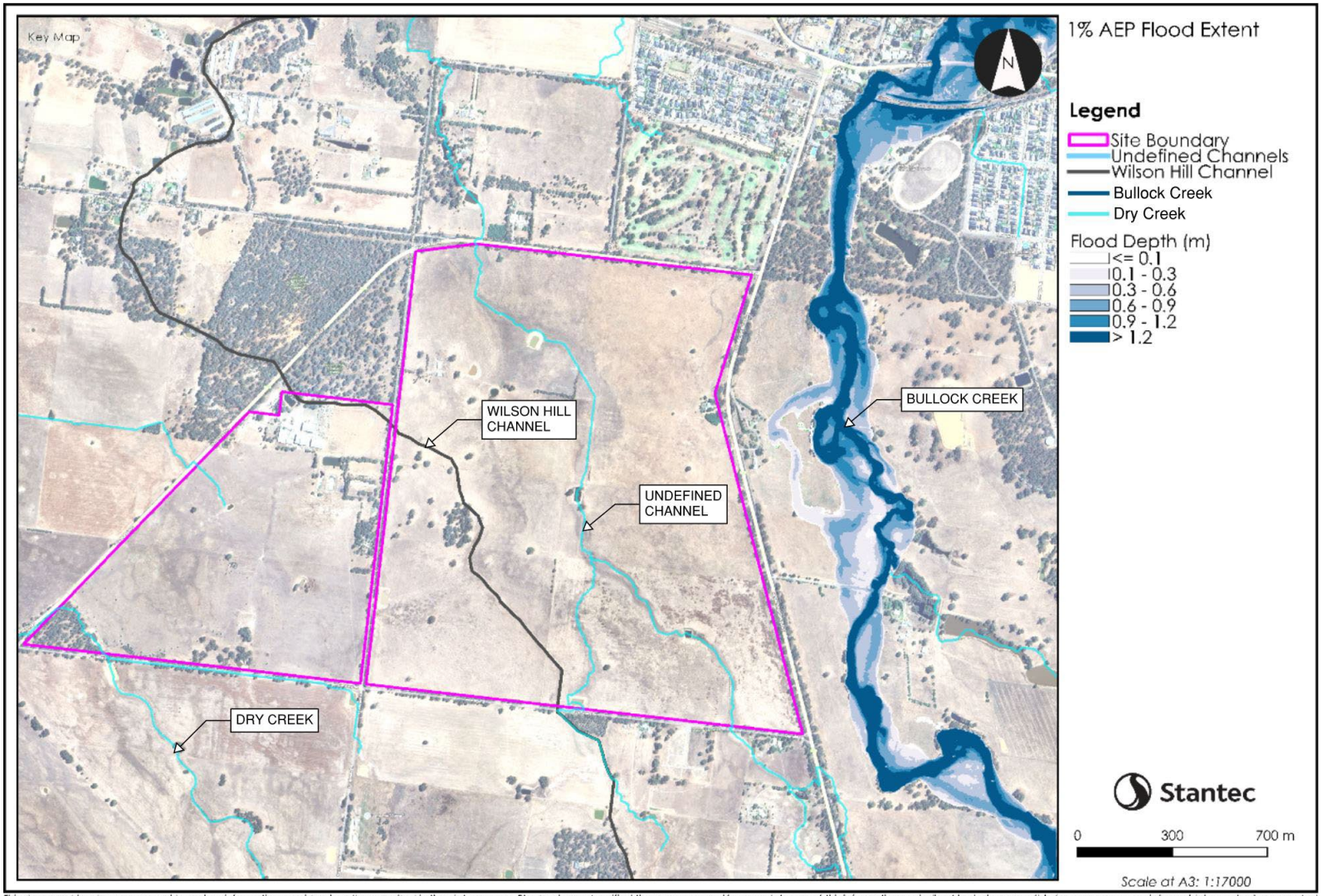


Figure 11: Flood Mapping of Bullock Creek in proximity to BREP (NCCMA)



4.6 Transport

Table 7: Transport Background Summary

Tasks	Analysis
Scope / Methodology	Stantec has conducted a Traffic Impact Assessment ('TIA') to assess transport infrastructure needs and internal arrangements for BREP. This TIA reviews the future movement and access approach as identified in the MTSP, and implications associated with the proposed Marong Western Freight Corridor ('MWFC') – also known as the Marong Bypass.
Key Findings	
Road Network	The area features two main arterial roads (Calder Alternative Highway and Wimmera Highway) forming part of the High Productivity Freight Vehicle ('HPFV') network, and several unsealed local roads. Calder Alternative Highway: Highway, DTP, Heavy Vehicle Classifications ('HVC'): Performance Based Standard ('PBS')-3 A-Triple, 10.2 m width, 56 m reserve. Wimmera Highway: Highway, DTP, HVC: PBS-3 A-Triple, 6.2 m width, 22 m reserve. Various unsealed roads with (carriageway) widths ranging from 3 m to 22 m.
Key Intersections	Notable intersections include Calder Alternative Highway/Wimmera Highway (unsignalised T-intersection), and Wimmera Highway/O'Sullivans Rd (unsignalised X-intersection).
Freight Network	AB Triple vehicle combinations are permitted on adjacent arterial roads. ***Refer Figure 12***
Traffic Volumes	Traffic surveys conducted in November 2023 recorded AM and PM peak hour volumes at the Calder Alternative Highway/Wimmera Highway intersection. ***Refer Figure 13 and Figure 14***
Active Transport	No current pedestrian or bicycle facilities; nearest public transport is a bus stop 800m away at the Calder Highway / Calder Alternative Highway intersection.
Bus Routes	No current bus services access the BREP. There are limited bus services connecting to Marong, with routes to Bendigo and Southern Cross Railway Station.
Crash Statistics	Three crashes recorded (2018-2023): 1 fatality, 2 serious injuries.
Movement and Place (M&P)	The M&P framework classifies roads for movement and place functions, indicating low classifications for most roads, with high freight classifications on adjacent arterial road network.

Figure 12: Heavy Vehicle Network Map (Source: Victoria's PBS Level 3A AB-Triple General Freight Network for Reference Vehicle 1)

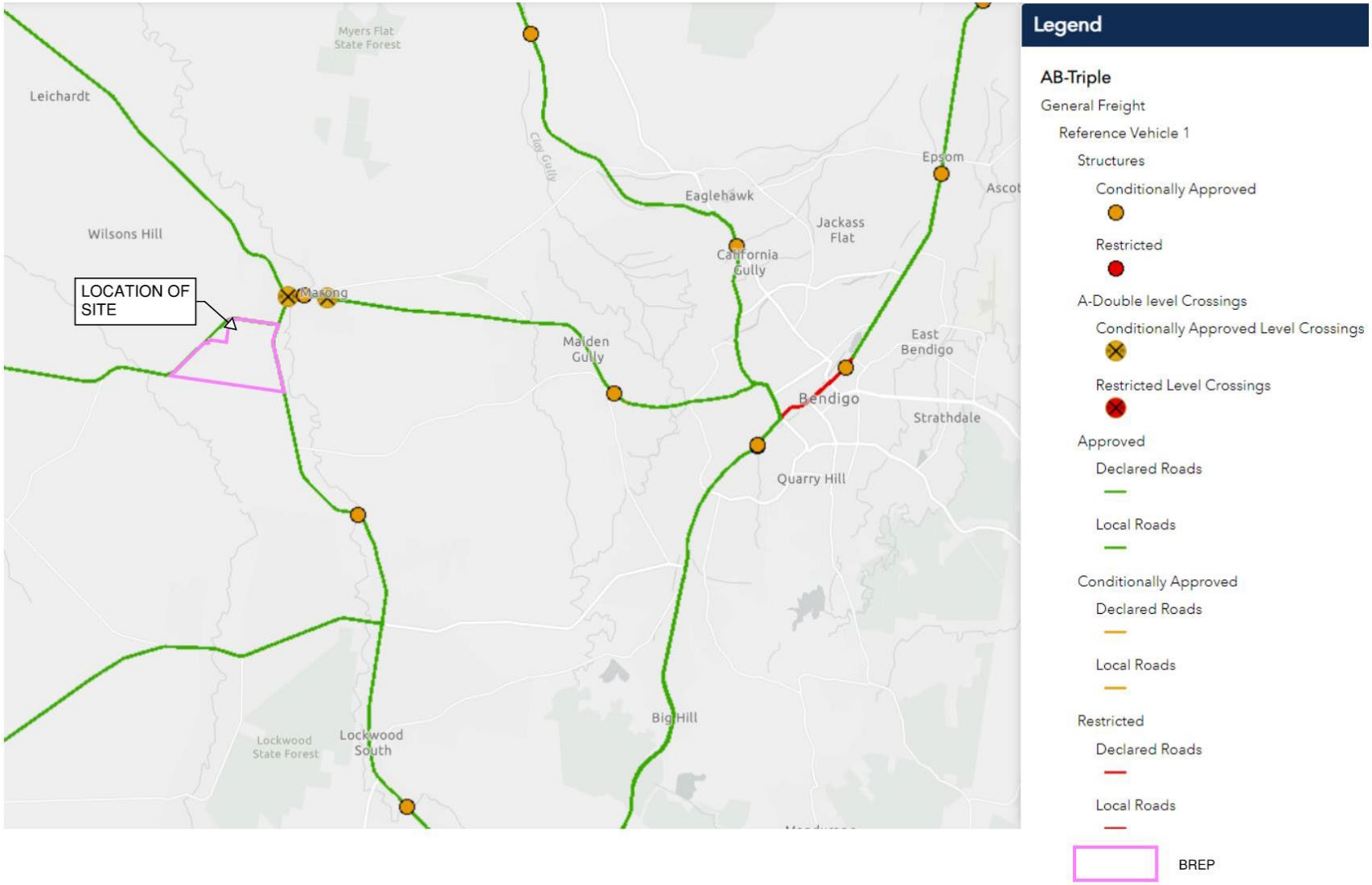


Figure 13: AM Peak hour traffic volumes

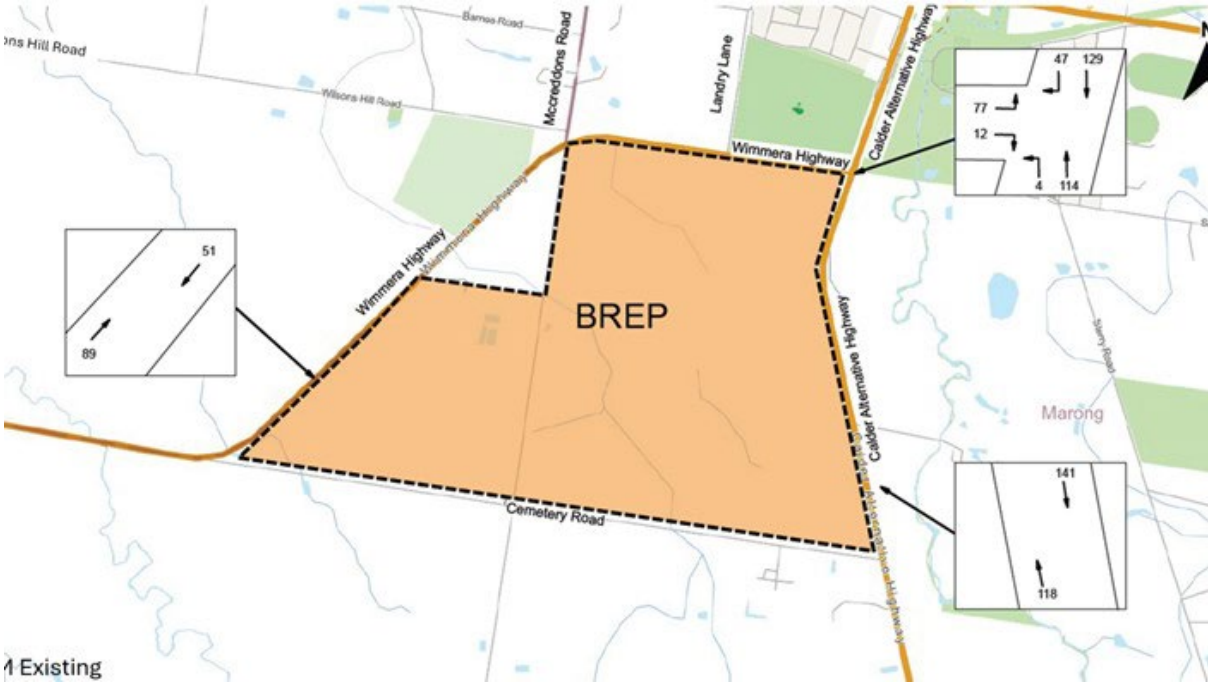
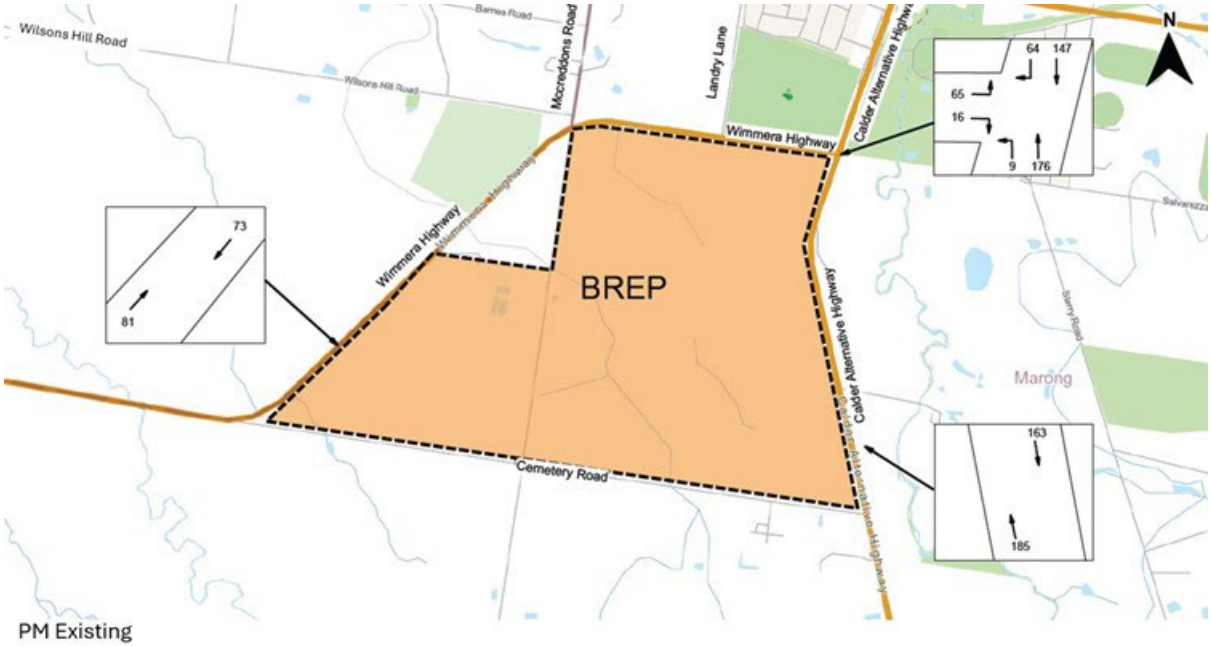


Figure 14: PM Peak hour traffic volumes



5.

Sustainability Approach.

5 Sustainability Approach

5.1 Background Analysis

The VPA conducted a 'Vision & Purpose Workshop' with key stakeholders, where one of five emerging themes was consideration of a Sustainable Development Framework.

The future vision element for the Sustainable Development Framework positioned BREP as:

> **"Creating a sustainable and climate-resilient precinct, encouraging adoption of best practice environmental design and circular economy outcomes that can be measured and monitored to ensure continual adherence and improvement**
>
> ***Bendigo Regional Employment Precinct – Vision & Purpose Workshop Summary: VPA (July 2023)***

In response to the Sustainable Development Framework emerging theme, VPA, in partnership with CoGB, engaged HIP v HYPE Sustainability to prepare a *Sustainable Development Opportunities Report (March 2024: HIP v HYPE) ('HvH'),* which provides a roadmap to the successful delivery of sustainable ambitions for BREP, including:

- Confirming key sustainability targets, strategies, initiatives and partnerships identified as being critical to its development.
- Detailing key implementation considerations, mechanisms, stages, and delivery roles and partnerships for the VPA and CoGB to consider and take forward as the project progresses.

HvH provided the following 'Precinct Sustainability Vision' for BREP:

> **"By 2050, BREP has become a national exemplar in sustainable, commercially successful regional industrial development at scale. Through strong leadership and robust governance structures, the original project goals of zero carbon, climate resilience and circular economy focused have remained strong and continued to be delivered through the operational phase.**
>
> **The construction of buildings and other infrastructure have minimised embodied carbon emissions, The precinct is fully renewable, transport is active and zero emissions and all waste from business is captured and converted to a higher and better use. It is a key gateway to north-western Victoria, and key stop for low emissions long-range transport heading to Mildura, Swan Hill or beyond.**
>
> **Tenants are connected to each other and their businesses are climate-ready. Tenants, workers and precinct visitors experience a high quality, green and well-connected public realm and participate in a broad range of thriving commercial and related activity.**
>
> **Known as a circular economy centre of excellence, tenants continue to optimise their operational performance and adapt to low emission and circular economy markets and supply chains as they evolve. This has translated into strong partnerships with local and regional businesses and a thriving industrial ecology within the precinct and the greater region"**
>
> ***Precinct Sustainability Vision - Sustainable Development Opportunities Report (March 2024: HIP v HYPE)***

5.2 Government Policies & Strategic Frameworks

Our Sustainability Approach is supported by existing policy, strategy documents and industry best practice.

Several documents, such as the *Bendigo Zero Carbon Emissions Plan 2023-2030* and *Greater Bendigo 2030 Zero Emissions Roadmap*, outline the City's ambitious goals to reduce carbon emissions through innovative energy strategies and improved urban planning. These plans emphasise the reduction of embodied carbon in construction, efficient energy use, and the integration of renewable energy sources.

The *Green Star Communities v2* and other associated draft 'framework' documents provide invaluable guidelines for achieving sustainable community development. They cover diverse categories such as nature, health, leadership, resilience, and responsible resource management, emphasising the importance of integrating cultural practices, community engagement, and inclusive design into urban planning. Such frameworks advocate for the protection of biodiversity, the promotion of social equity, and the reduction of waste and resource consumption.

Complementing this, plans such as the *Dhelkunya Dja Country Plan 2014* demonstrate the critical role that Indigenous knowledge has to play in land and water management, aligning sustainability efforts with cultural preservation. Overall, the documents reflect a holistic approach to urban and regional development, focusing on long-term ecological health, community well-being, and climate resilience.

5.3 BREP Climate Risks

Stantec has undertaken an infrastructure-specific Climate Risk Assessment, to validate the Sustainability Priorities for BREP.

A summary of this infrastructure-specific Climate Risk Assessment is tabulated below:

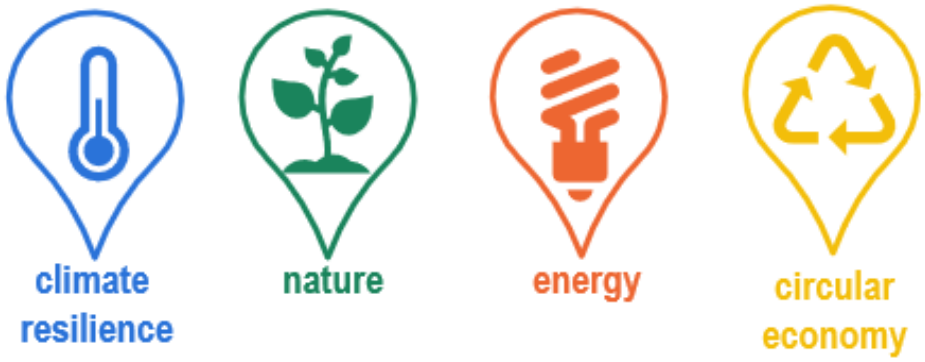
Table 8: Summary of identified BREP Climate Risks

Discipline	Risk	Commentary
Civil	Flooding. Natural Disasters. Drainage. Breakdown of Stormwater detention. Heat Island effect. Water shortage. Reserves/Walk/Bike paths. Road Safety. Road closures.	Emergency access/egress considerations. Climate change may exceed 1% AEP design flow rate. Flooding in extreme rainfall events. Sedimentation. Bushfires. Soil cracking.
Landscape	Reduced Amenity. Visual Amenity. Water shortage. Increased fuel for bushfire risk. Biodiversity loss	Death of flora / plant damage. Bushfire management.
Utilities	Power Outages. Sewer disruptions.	Flooding in extreme rainfall events. Health risks. Emergency energy generation.

5.4 BREP's Sustainability Priorities

These identified Climate Risks have been presented to DV, and following further discussions, workshop and the key findings from the Background Site Analysis, the four sustainability focus areas previously identified by HvH have been re-prioritised as BREP's four (4) 'Sustainability Priorities' below:

Figure 15: BREP's Four (4) Sustainability Priorities



As climate change continues to pose significant challenges, the City Of Greater Bendigo sets ambitious goals to reduce carbon emissions, enhance energy efficiency, and shift to 100% renewable energy sources by 2030. The project is designed to lead the way in fostering a carbon-neutral future by implementing electrification across all developments, phasing out fossil fuels, and integrating renewable energy systems.

Beyond energy, the project also emphasises a holistic approach to environmental sustainability through climate planning, circular economy principles, and biodiversity conservation. Water-Sensitive Urban Design (WSUD), along with the establishment of green infrastructure, will help manage stormwater, reduce urban heat islands, and increase urban biodiversity.

Climate Resilience Planning

Climate adaptation and planning are essential strategies that prepare communities, infrastructure, and ecosystems to withstand the impacts of climate change.

BREP also presents opportunities to strengthen the development through a collaboration of conventional design and indigenous knowledge, involving meaningful engagement and sharing of sustainable expertise.

A Sustainable Certification pathway (such as *Green Star Communities v2*) should be implemented.

Consider the preparation of a Climate Adaption Plan, Climate Resilience Plan & Community Development Plan, and establish monitoring programs.

Nature Positive Planning

Nature Positive Planning is a strategy that focuses on reversing biodiversity loss and enhancing ecosystems and is a key component of the sustainability initiatives for BREP. This plan both promotes sustainable development and ensures that human activities, including urban planning and infrastructure development, contribute positively to nature. Establishing a baseline allows an understanding of the current state of biodiversity, ecosystem health, and natural resource use within the precinct. This baseline data acts as a reference point from which progress can be measured, ensuring that future development leads to a net positive outcome for nature. The community plays a significant role in this plan, actively involved in conserving existing biodiversity, restoring damaged ecosystems, and creating opportunities for nature to thrive alongside human activity.

Renewable Energy & Electrification

The transition to renewable energy is not only a global imperative but also a strategic opportunity for this regional development precinct. The urgent need to address climate change makes the decarbonisation of CoGB's operations inevitable. However, this transition is not just a necessity, but also a strategic opportunity that can lead to growth and development.

Integrating renewable energy at BREP offers multiple significant benefits. Firstly, it aligns with the growing demand for sustainable products and services, attracting businesses and talent to the region. Secondly, renewable energy infrastructure can create new installation, maintenance, and research jobs, boosting local economies. Thirdly, by reducing reliance on fossil fuels, precincts can mitigate climate change risks and improve air quality, enhancing the region's long-term sustainability.

Circular Economy & Waste Minimisation

Circular economy and waste minimisation focuses on transforming the traditional linear economy (take, make, waste) into a circular model where resources are continuously reused, recycled, and regenerated to minimise waste, and reduce environmental impacts. The key principles include designing out waste, keeping materials in use & regenerating natural systems.

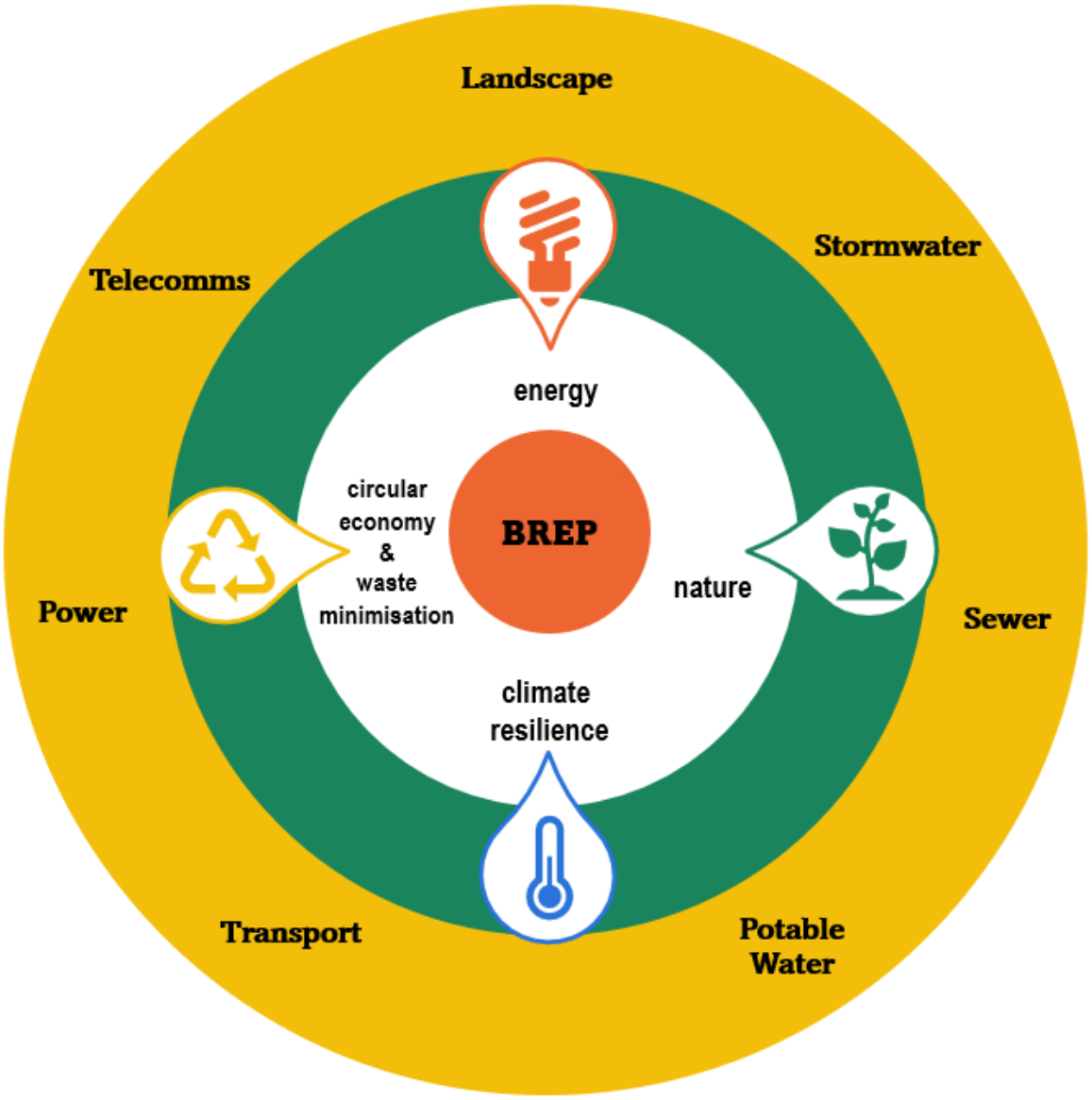
At the municipal level, waste minimisation involves setting ambitious targets, such as diverting a significant portion of waste from landfills, promoting local circular industries, and educating communities on reducing consumption.

5.5 Sustainability Scope / Methodology

As part of this Infrastructure Strategy, Sustainability specialists have been working closely with discipline specialists, DV and key stakeholders to:

- Identify the Sustainability Opportunities and Initiatives that should be considered as part of BREP, and
- Integrate initiatives which add genuine value to BREP's infrastructure in terms of the four identified Sustainability Priorities.

Figure 16: Sustainability integration into BREP



6.

Infrastructure Optioneering.

6 Infrastructure Optioneering

6.1 Utility Services Strategy

In order to inform this Infrastructure Strategy from a Utility Services perspective, Stantec has:

- reviewed existing topographical information and consulted with the relevant authorities – Coliban Water and CoGB - to provide advice on outlet locations for sewer and drainage,
- liaised with the relevant Distribution and Communication Authorities (Powercor, Ausnet and NBN Co.) to advise on connection points for all other services, and
- introduced Sustainability Opportunities & Initiatives for each discipline's infrastructure optioneering.

We understand that the COGB is commissioning an Integrated Water Management Strategy ('IWMS') for the Bendigo Western Growth Corridor ('BWGC') for early 2025, which includes Marong and its surrounds. Coliban Water will be a key stakeholder to this strategy. The outcomes of this report may alter BREP's water infrastructure strategy. Where possible this report has allowed for flexibility to integrate possible outcomes from the IWMS and assumptions of probable outcomes have been made where appropriate. Recommendations regarding water infrastructure are based on the best current available information.

6.1.1 Potable Water Supply

Coliban Water is the authority for Potable Water (and Sewer and Rural Water) within the Greater Bendigo Region. Stantec has engaged with Coliban Water on an ongoing basis during the development of this Infrastructure Strategy.

6.1.1.1 Existing Potable Water Supply

Marong forms the western edge of the existing Coliban Water network that supplies Bendigo, Raywood, and Axedale via the Sandhurst (Bendigo) Treatment Plant. Marong has experienced rapid residential growth over the past 10 years, and this has put supply pressure on the existing systems. With current planned future residential growth, the existing potable water system has reached its capacity based on the existing infrastructure.

Currently Marong is fed via an existing 150mm water main extending from the Specimen Hill storage tank via Maiden Gully to a newly constructed 3ML storage tank and booster pump in Sterry Road, approx. 1.2km east of BREP site. Works are currently underway to augment the existing supply to Marong with a second pipeline, via Maiden Gully to the existing 3.2ML Marong Storage tank. This augmentation was initially planned to supply the current and proposed future residential growth areas only as identified in the Marong Township Structure Plan ('MTSP').

As part of this upgrade, Council as the majority landowner in BREP, negotiated upsizing of this new main with Coliban water to provide additional capacity for the development of BREP. The upsizing allows for an additional 2ML /day to be supplied. The basis behind the flow rate of 2ML/day is

unknown as the agreement date between CoGB and Coliban Water for this amount (Dec 2022) pre-dates the production of this report. However in a letter from the former CEO of CoGB to Coliban Water dated 16th December 2022 "*The City has completed an internal assessment and confirms that a 2ML/day water servicing strategy for BREP is appropriate (noting this is for the full precinct and not just the City's 155ha*)".

The existing reticulated watermain infrastructure extends to the northern boundary of the golf course, 450m north of the boundary of BREP, with the exception of a 180mm watermain feed to a standpipe on the Calder Alternative Highway 180m northeast of the intersection with the Wimmera Highway. There are no watermains located within BREP site itself.

Below is a copy of the Coliban Water augmentation plan for the current 2023-28 capital works program**. *(refer to Figure 17)***

Figure 17: Coliban Water Potable Water Augmentation Plan for the Current 2023-28 Capital Works Program

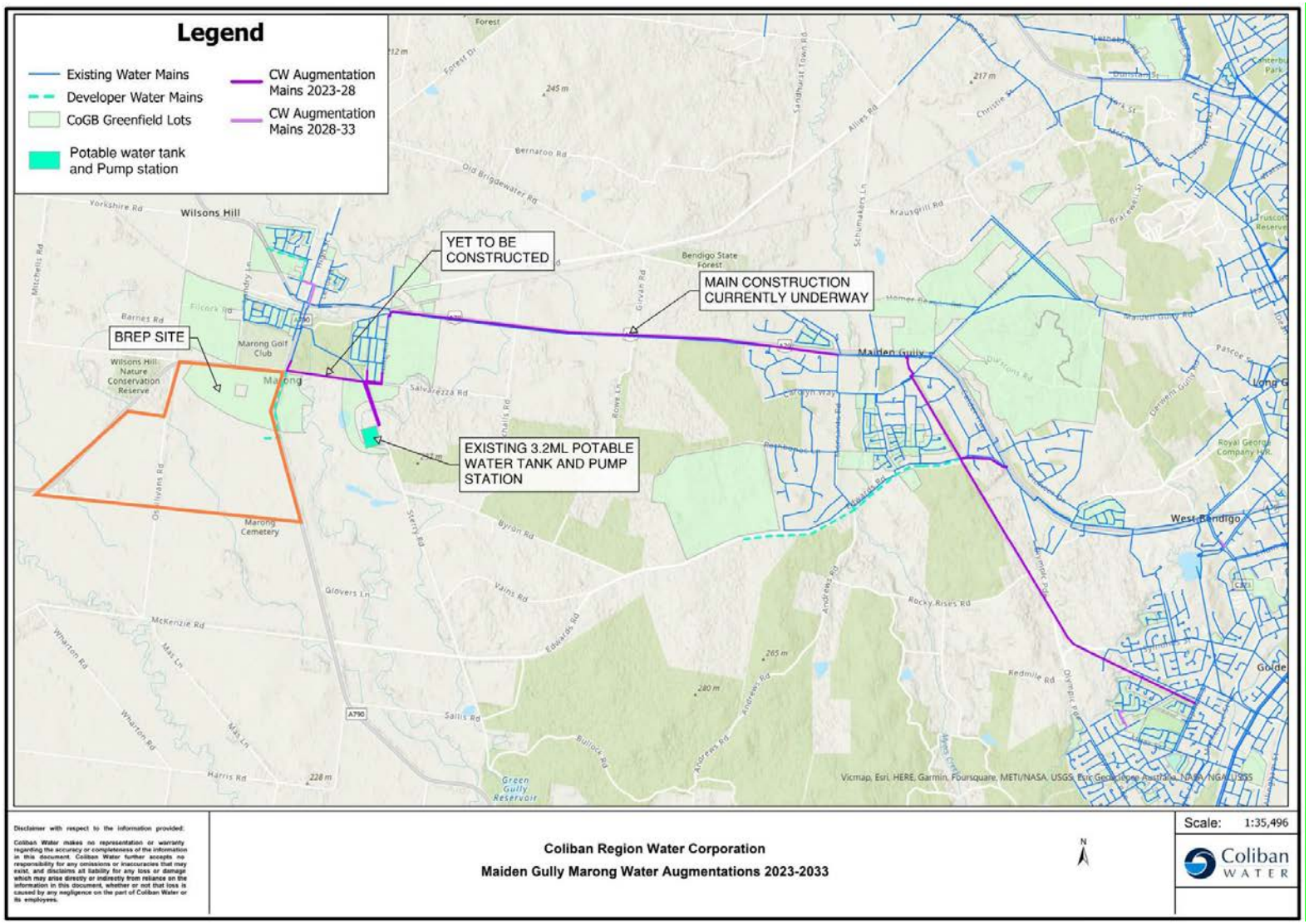


Table 9: Potable Water Existing Services Summary

Potable Water Item	Summary
Existing Services	150mm water main from Specimen Hill tank to a 3ML storage tank and booster pump on Sterry Road.
Existing Capacity	Current system capacity has been reached due to rapid residential growth.
Upgrades currently underway	Construction of a second pipeline from Specimen Hill to the 3.2ML Marong storage tank.
Forecasted capacity increase	Additional 2ML per day from the main under construction to support future development in BREP area.

6.1.1.2 Stakeholder Engagement

Coliban Water has indicated that an additional **2ML storage tank** is necessary to serve BREP based upon a 2ML/day demand. To facilitate the township development this tank may increase in size with 2ML allocated to the BREP. They advised that this new tank should be located near the existing Sterry Road tank. Coliban Water has undertaken preliminary discussions with the adjacent landowners regarding the potential site for the tank. Should a more committed time frame for the BREP be confirmed, interim water supply may be available to facilitate the delivering of early development of the BREP prior to construction of the 2ML storage tank.

With the completion of the pipeline works and the new tank, 2ML/day would be available for BREP. The supply of water from the storage tanks to BREP requires a new 375mm diameter watermain to be provided from the storage tanks to the site. The current Coliban Water capital works program includes construction of a new watermain from Sterry Road to the Calder Alternative Highway via a new main running along the southern boundary of the recreation reserve and golf course, It is likely that upsizing/ augmentation to this main (with a contribution by BREP) could provide the required capacity. BREP would then be required to deliver the main from the new point of connection near the intersection of the Wimmera Hwy/ Calder Alternative Hwy to the site.

Coliban Water are also providing guidance to the City of Greater Bendigo's Integrated Water Management Strategy which is expected to be completed in mid-2025. This will incorporate water management in Marong and subject to its outcomes, other potential sources of water may be available to BREP for use where potable water standard is not required, e.g. manufacturing.

6.1.1.3 Potable Water Sustainability Opportunities & Initiatives

Table 10: Potable Water Sustainability Opportunities & BREP Initiatives

Sustainability Priority	Sustainability Opportunities	Considerations	BREP Initiatives
	Provisions of Recycled Water if determined in the IWMS. Options include stormwater harvesting and recycled wastewater via provisions of a local treatment plant.	Reduced reliance on the potable water supply for non-essential tasks such as truck washing - Suring up supply of potable water in periods of drought. The IWMS is expected to be delivered in mid-2025. Stormwater harvesting and recycled wastewater will require a significant local treatment facility. Coliban Water have confirmed that recycled water cannot be supplied from any of their existing facilities.	Allowance for additional water services should be made available within the road reserves such as a recycled water 'purple pipe'.
	Passive watering with road stormwater reducing reliance on potable water. Recycled water can be used for watering street trees and landscaped areas.	Greening Greater Bendigo.	Proposed road cross sections should allow for passive stormwater systems that funnel road water directly to street trees.
	Potable water will likely require booster pumps to maintain pressure. Renewable energy should be considered in the planning of any proposed water treatment plant.	Coliban Water assets located outside BREP will require collaboration to provide renewable energy solutions. Coliban Water has a net zero carbon target of 2030. Water treatment plants are energy intensive.	Booster pumps should be powered using renewable energy.
	Potable Water pipes to be made from recycled materials.	Potable water pipes are generally PVC and PE which are both thermoplastics which can be readily manufactured from recycled materials. Many products exist in the market today. At end of life the pipes can be recycled again.	Detailed design should specify use of recycled pipes.

6.1.1.4 Potable Water Supply Strategy

The supply strategy for potable water to the site is heavily dependent on the demand requirements from future businesses. Forecasting if the 2ML/day is sufficient for BREP is difficult. Water demand can differ by orders of magnitude e.g. between dry industries such as warehousing and logistics compared to food manufacturing.

The Water Services Association of Australia ('WSAA') code does not provide anticipated demand rates for non-residential areas and suggests that usage and demand rates for non-residential areas can vary widely.

Low demand users will enable large parts of BREP to be developed without impact on the availability of supply. Conversely in the event of a high-water demand user establishing onsite, this 2ML/day capacity may be reached early in the life of the development. The *BREP Industry Engagement Study (Mckinna: October 2024)* provides an indication of likely industry interest in BREP. Although there is potential for some high-water users such as food manufacturers the general mix of probable industries are predominantly low water users such as warehousing and logistics.

In the *Potable & Wastewater Demand and Sensitivity Analysis (BREP) (RMCG: July 2021)* prepared for CoGB, based on primarily of existing industries in the Bendigo region, the users were identified as not being significant water users. If this trend was to be continued at BREP, the 2ML/day supply could be adequate for the whole project. This is considered the most likely scenario.

Should higher water demand users occupy the site, the 2 ML/day supply could be reached prior to the complete build-out of BREP, at which point additional network augmentation would be required. This will be reviewed every five years as part of the Coliban Water Plan (2028, 2033…). Adopting a conservative development rate of 10 hectares per year, as calculated in the *Greater Bendigo Industrial Land Development Strategy,* it is anticipated that approximately 35% of BREP will be developed by the 2033. It is considered unlikely that the 2 ML/day supply will be exceeded prior to this date.

Coliban Water does not guarantee fire-fighting supply to properties within their supply area. Developments occurring on the created lots onsite in BREP will be required to provide for their own fire-fighting storage, booster assemblies, etc. as part of their works to the relevant codes.

Coliban Water have indicated that standard New Customer Charges ('NCCs') for potable water would likely apply to the development on the basis of the demand not exceeding the expected 2ML/day requirements. The Potable Water Supply Plan is shown in ***Figure 18***.

6.1.1.5 Potable Water Infrastructure Works

The required infrastructure works required to service potable water to Stage 1 of BREP are summarised below in ***Table 11*** and visualised in ***Figure 18***.

Figure 18: Potable Water Supply Plan

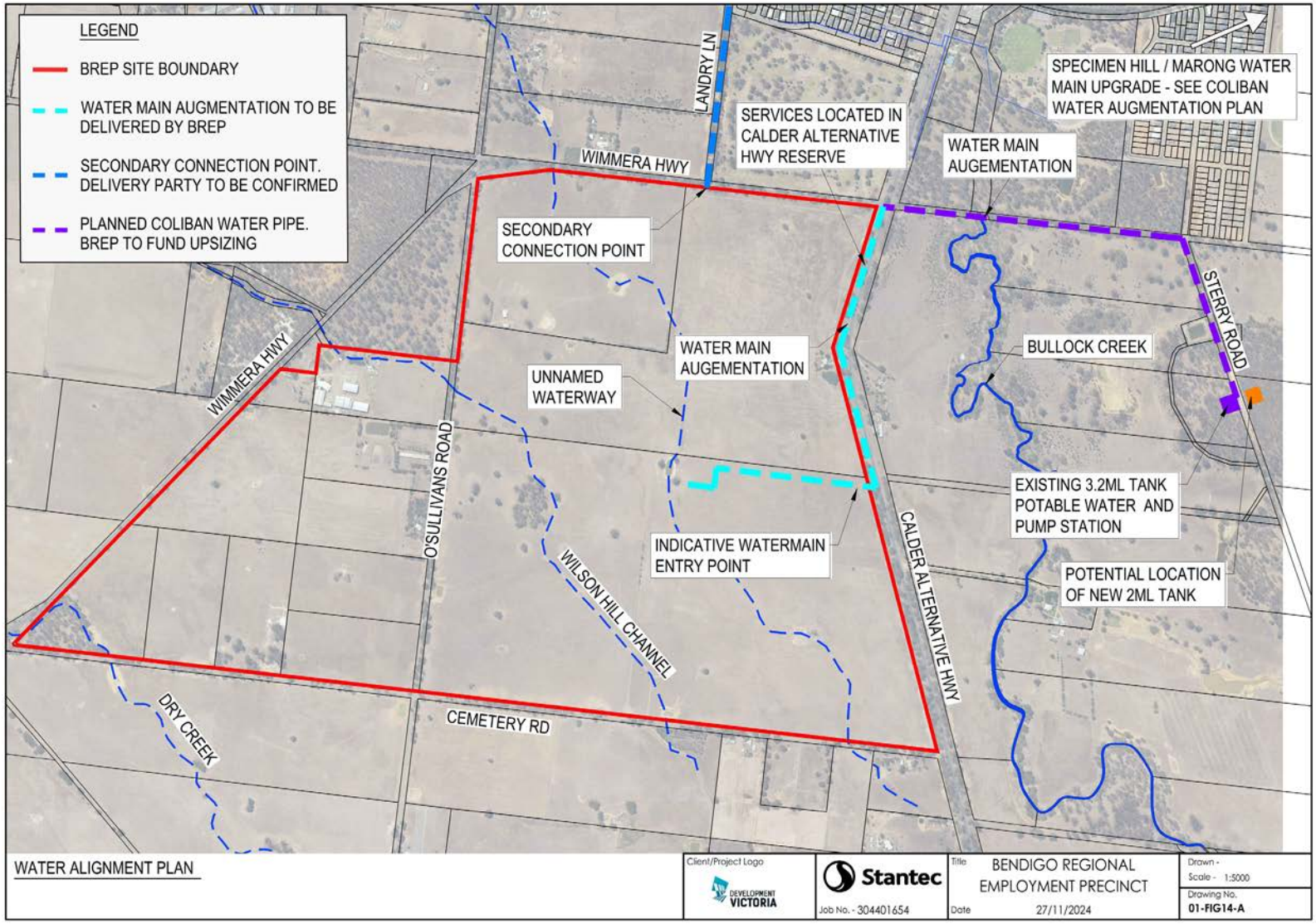


Table 11: Potable Water Infrastructure Works

Item	Action	Delivery Party	Funding
1.	Construction of new watermain from Specimen Hill to Sterry Road, Marong	Coliban Water	Project is already funded and construction has commenced
2.	Construction of a new 2ML tank on Sterry Road, Marong	TBC, likely Coliban Water	BREP Developer funded or proportional to use if a bigger tank is constructed
3.	Construction of water main from Sterry Road to the Corner of Calder Alternative Hwy and Wimmera Hwy. Watermain is in the existing CW capital works program to service the township however BREP will need negotiate upsizing to accommodate the BREP	Coliban Water.	BREP Developer to fund relative proportion
4.	Construction of Main from the Corner of Calder Alternative Hwy and Wimmera Hwy to proposed Stage 1.	Stage 1 Developer	BREP Developer Funded
5.	Construction of a backup water supply connecting at Evermore Drive and Landry Lane	TBC	TBC

Existing Coliban Water capital works will deliver the upgraded main from Specimen Hill to Sterry Road. Following that, the proposed 2ML tank will need to be constructed.

Coliban Water has advised that a 375 mm diameter main needs to be constructed from the existing 400mm main on Sterry Road to BREP. A 400mm pipe is already planned in the existing Coliban water capital works plan from Sterry Road to the NW Corner of BREP Site. ***(See Figure 17)*** This pipe can be upgraded to accommodate BREP with a contribution from BREP.

A secondary feed for supply security during maintenance shutdowns can be established from the 225mm stub at Evermore Drive and Landry Lane. It may extend south along Landry Lane to the Wimmera Highway, connecting directly to the development or running west to O'Sullivans Road. It is not anticipated that this will be required immediately for BREP

6.1.2 Sewerage Supply

Coliban Water is the authority for Sewer within the Greater Bendigo Region. Stantec has engaged with Coliban Water on an ongoing basis during the development of this Infrastructure Strategy.

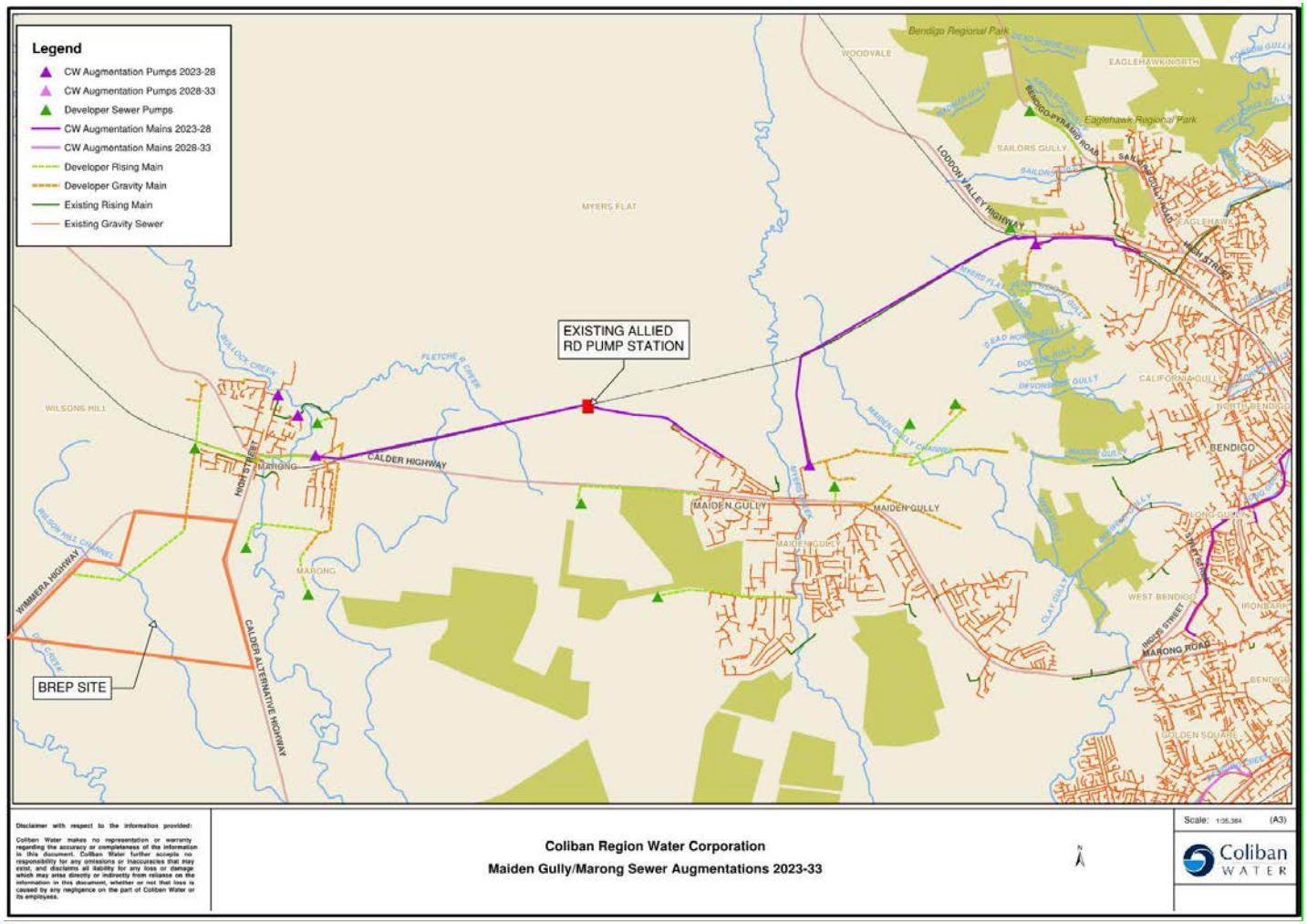
6.1.2.1 Existing Sewerage Supply

The existing sewerage system in Marong is constrained due to recent residential growth. Sewerage from Marong is currently reticulated via gravity mains and pump stations within the town, to a Sewerage Pump Station ('SPS') located near the intersection of Allies Road and the Calder Highway on the eastern edge of Marong. The sewerage is then pumped via a 100mm rising main along the existing VicTrack rail alignment, to the northern end of Hermitage Road, where it falls via gravity into

the Maiden Gully gravity system. This, in turn, is pumped via Schumakers Lane towards Eaglehawk, and ultimately the Bendigo Water Reclamation Plant ('BWRP') in Epsom.

Coliban Water is undertaking upgrades and augmentation of the existing sewer outfall from Marong as part of their capital works program, to allow for the planned future residential growth. This augmentation plan is provided below at ***Figure 19***.

Figure 19: Coliban Water sewer augmentation plan for the current 2023-28 capital works program



Coliban Water has confirmed that currently planned sewer network upgrades do not have surplus capacity for BREP.

Existing dwellings within the BREP site currently rely on septic systems, as no sewerage infrastructure is in place.

Table 12: Existing Sewer Summary

Sewer Item	Summary
Existing services	Marong's sewerage system operates via gravity mains and pump stations to an SPS near Allies Road and Calder Highway, pumping sewage to Epsom via Maiden Gully and Schumakers Lane. BREP site relies on septic systems, with no sewerage infrastructure present.
Existing capacity	The current system is constrained by recent residential growth and does not have surplus capacity for BREP.
Forecasted capacity increase	By 2028, up to 200 kL/day of interim capacity may be available for BREP, subject to Marong's residential development rate, but this capacity is not guaranteed.
Upgrades currently underway	Coliban Water's 2023–28 capital works include upgrades to Marong's sewer outfall to support residential growth but do not allow for BREP. Dedicated network upgrades will be required for BREP.

6.1.2.2 Stakeholder Engagement

A number of previous reports prepared, notably the *BREP Impact Assessment (GHD:2021)*, have identified significant constraints on the provision of sewerage to BREP and Marong area. Clarification was sought from Coliban Water on the currency of these reports, most notably a previously identified option for the establishment of a western treatment plant located near Marong that would benefit not just BREP, but the greater Marong township, including its identified growth areas. An IWMS investigation is ongoing. Therefore, it is currently assumed all discharges are likely to ultimately be transferred to the existing BWRP in Epsom.

Coliban Water has advised that, following completion of the current capital works program for sewerage upgrades in Marong (currently in design phase), up to 200 kL/day of sewer capacity allocated for the Marong Township may temporarily be available for BREP site until a dedicated BREP sewer outfall is provided. This capacity is not guaranteed and depends on the rate of residential development in Marong.

In order to use this interim 200 kL/day capacity, sewerage from the BREP site will need to be pumped approximately 2.5 km via a new dedicated rising main, constructed and funded by the developer, directly to the Calder Hwy SPS. As advised by Coliban Water, it cannot be discharged into the existing reticulation network within the residential area north of the Golf Course. Commitment to a dedicated BREP outfall would be required to ensure sufficient capacity is available for the township.

Coliban Water has advised that the ultimate solution would consist of a BREP specific standalone outfall pipe from the site extending to the BWRP in Epsom approximately 17km to the north-east of BREP. A dedicated outfall is required because of the following reasons:

- Coliban Water capital works upgrade program does not accommodate the BREP development.
- The current system relies on multiple individual pump stations to transfer waste to Epsom, whereas a single larger pump station would improve efficiency, reduce operational costs, and simplify maintenance.
- A larger upsized rising main sized for both BREP and residential loads would be underutilized during the build out phase of BREP (a period of potentially 20+ years), leading to septicity and odour issues until full sewerage flow from BREP is realised in the outfall.

6.1.2.3 Sewer Sustainability Opportunities & Initiatives

Table 13: Sewer Sustainability Opportunities & BREP Initiatives

Sustainability Priority	Sustainability Opportunities	Considerations	BREP Initiatives
climate resilience	The IWMS may include a local sewage treatment plant. The plant would produce recycled water which could be reused within BREP. Recycled water can be used for local agriculture, commercial processes within the BREP and other instances where potable water is not required.	A local sewage treatment plant would reduce reliance on the potable water supply for non-essential tasks such as truck washing. This would assist in reducing significant network upgrades. The IWMS is expected to be delivered in mid-2025. Legislation does not currently allow for the use of recycled sewage in potable water systems.	Spatial allowance for additional water services should be made available for services within the road reserves such as a recycled water 'purple pipe'.
nature	Recycled water from sewage can be used for watering street trees and landscaped areas.		
energy	Renewable energy should be considered in the planning of any proposed water treatment plant.	Coliban water assets located outside BREP require collaboration to provide renewable energy solutions. The sewage system will require pumps. These can be powered using renewable energy.	Minimise/ reduce the number of sewerage pump stations required onsite to reduce energy/ maintenance costs. Investigate the use of deeper sewerage networks (or merging of catchments) to take advantage of better efficiencies in energy costs of a single larger Pump Station vs multiple individual Pump

		Water treatment plants are energy intensive.	Stations, including maintenance/ operational costs.
	Sewage pipes to be made from recycled materials.	Potable water pipes are generally PVC and PE which are both thermoplastics which can be readily manufactured from recycled materials. Many products exist in the market today. At end of life the pipes can be recycled again.	Detailed design to specify use of recycled pipes.

6.1.2.4 Sewer Supply Strategy

Initial calculations, based on WSAA demand rates suggest that the 200kL/day interim limit would be reached with the development of the first 7ha, (subject to the final customer demand requirements), which represents only a small portion of the site. We note the WSAA demand calculations are generally conservative until actual lot users are identified.

Utilisation of the 200kl/day interim capacity has the following constraints:

- Provides limited developable area 7Ha (approx. 3.5% of the total BREP developable area).
- Provision of this capacity is subject to residential development rates within Marong and not guaranteed by Coliban Water.
- Requires the construction of approximately 2.5km of the ultimate outfall to the Calder Highway Rd Pump Station as indicated by Coliban Water. (See ***Figure 20*** for location)

With these constraints, both in terms of the interim solution being made available, and a limited lifespan, the ultimate outfall to Epsom will be required early in the development. For these reasons it is recommended the interim is utilised as a ‘stop gap’ during the planning, design and construction phase of the ultimate outfall, which is expected to be lengthy, due to the distance of the main involved (some 15km), authority approvals required (inclusive of VicTrack), interfacing with existing infrastructure and surfaces through Eaglehawk and native vegetation removal (where required).

Development within BREP will be required to contribute to the brought forward costs for upgrade works at the Epsom BRWP, which will be calculated as a site-specific New Customer Contribution (‘NCC’) for the area. As the NCCs fall outside of the current capital works program, the calculation of the NCC and any reviews of the charges to account for actual demand requirements and rate of development would need to be by agreement between the Developer(s) and Coliban Water.

Internally, the development will have a conventional sewer design. In order to minimise the need for multiple sewer pump stations (SPS), it is anticipated that some of the sewers will be installed at depth to ensure that the maximum sewer catchment can flow via gravity to the pump stations. At this time, it is envisaged that a primary pump station which will convey the waste to Epsom would be located within the CoGB land purely for ease of design/ ownership considerations, however it would be ideally located at the lowest point, being along the Wimmera Hwy frontage. This would be subject to negotiations with the other landowners within BREP. This pump station within COGB land may be

decommissioned as the ultimate sewer pump station comes online at the northern end of the BREP site.

An existing ridge generally follows the Wilsons Hill channel. The western catchment (proposed Stages 4-6) will require at least one SPS to collect sewerage from the western half of the site, pumped over the ridge and connecting into the gravity system to be served by the primary SPS.

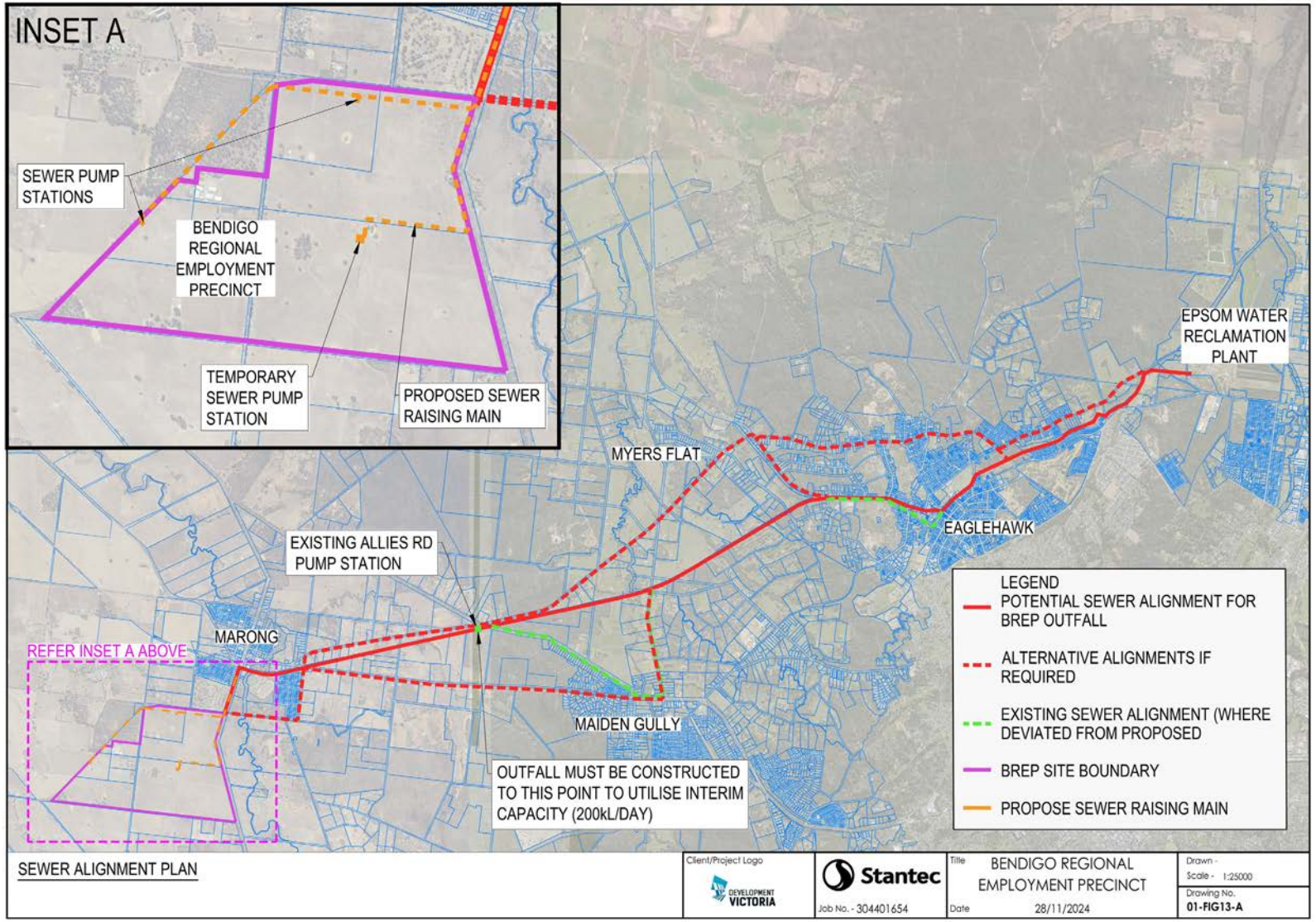
6.1.2.5 Sewer Network Infrastructure Works

The required infrastructure actions required to provide sewer service to BREP are summarised below in ***Table 14*** and visualised in ***Figure 20***

Table 14: Sewer Infrastructure Works Sequence

Sequence	Action	Responsible Party	Funding
1.	Confirm 200kl/day of interim sewer capacity can be allocated to BREP	Coliban Water / Developer	NA
2.	Commence planning and design of the ultimate sewer outfall.	Coliban Water / Developer	BREP Developer
3.	Construct outfall to the Calder Hwy Rd Pump Station to enable the	Developer Coliban Water have indicated they would not have inhouse capacity to project manage this.	BREP Developer
4.	Construct outfall to the Epsom Water Reclamation Plant.	Developer Coliban Water have indicated they would not have inhouse capacity to project manage this.	BREP Developer

Figure 20: Sewer Supply Alignment Plan



6.1.3 Rural Water Supply

Coliban Water is the authority for Rural Water within the Greater Bendigo Region. Stantec has engaged with Coliban Water on an ongoing basis during the development of this Infrastructure Strategy.

The rural water network provides agricultural water to water rights holders within the network. Water rights are held in perpetuity and are traded on an open market between parties.

6.1.3.1 Existing Rural Water Supply

The BREP site is bisected by the Wilsons Hill rural water supply channel which is fed from the south of the site. The channel runs from Cemetery Road approximately midway between O'Sullivans Road and the Calder Alternative Highway, generally in a northwest direction, crossing under O'Sullivans Road just to the south of the Wilsons Hill Bushland Reserve, continuing northwest crossing the Wimmera Highway, and continuing to customers downstream north and west of the site. The channel comprises a triangular earthen channel following the contours of the site, with an average grade of approximately 1 in 700 ***(Refer to Figure 5 for a plan of the channel).***

Private offtakes from the channel feed three dams within the BREP site. These private channels cross property boundaries and are maintained by informal agreements between landowners.

Figure 21: Wilson Hill Channel heading north (at its intersection of Cemetery Road), September 2024.

Table 15: Existing Rural Water Summary

Rural Water Item	Summary
Existing services	Coliban Water manages rural water within the Greater Bendigo Region. The network provides agricultural water to water rights holders, with water rights held in perpetuity and traded on an open market. The BREP site is bisected by the Wilsons Hill rural water supply channel, which feeds three dams within the site.
Existing capacity	The channel is a triangular earthen structure with an average grade of approximately 1 in 700. Peak demand on this channel is 40ML/day during peak periods, equating to approximately 7.7L/s on average. The expected peak flow rate is less than 20L/s, supported by the channel's physical properties and road culvert crossing.
Forecasted capacity increase	No forecasted capacity increases.
Upgrades currently underway	Coliban Water is undertaking a rural water efficiency project aimed at reducing losses in the network. The project is currently in the planning phases, and no specific plans for the Rural Water Channel are available at this time.

6.1.3.2 Stakeholder Engagement

Coliban Water has advised there is a peak demand by downstream customers on this channel of 40ML/day which, if it is considered to occur over a 3-month (summer/ dry) period when required, equates to approx. 7.7L/s on average. With adjustments to allow for variability of flows, it could be expected that the peak flowrate would be less than 20L/s. This is supported by the channel's physical properties and road culvert crossing, which support an indicative flow rate in this order of magnitude.

Coliban Water confirmed the following:

- Water from the channel is fully allocated to existing rights holders.
- The channel can be re-routed and piped where feasible.
- The channel must be placed in a reserve 30m wide from the top of bank in each direction. The reserve will vest with Coliban Water.
- Piped sections of the pipe must remain in a 10m wide easement in favour of Coliban Water.
- The channel cannot be utilised for environmental improvement, such as "naturalisation" of the channel.

6.1.3.3 Rural Water Supply Strategy

Given the water cannot be utilised by the development and the channel reserve cannot be landscaped, it is not considered of significant value to the development (and should be piped where possible). Due to the topography, this is only feasible for the first 530 metres of the channel from Cemetery Road. It is not anticipated that public access will be given to the channel reserve. The remainder of the channel will be placed into a reserve. As the channel is effectively a pass-through asset, there are no sustainability opportunities. Given the water is fully allocated it is considered unlikely that significant volumes could be utilised by businesses within BREP for non-potable applications.

6.1.4 Electrical Supply

6.1.4.1 Existing Electrical Supply

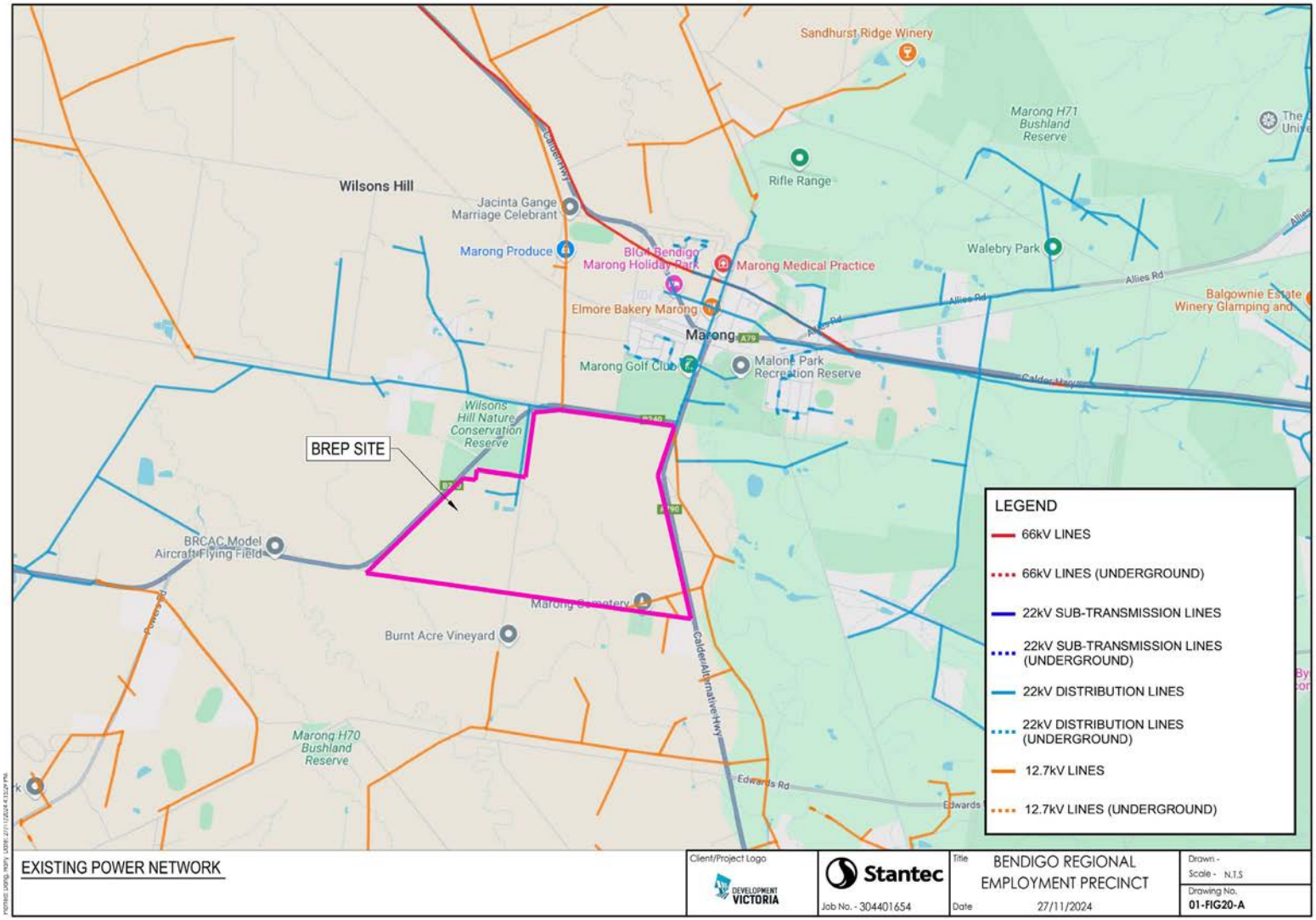
An existing 22kV overhead distribution line runs parallel to the northern boundary of BREP adjacent to the Wimmera Highway, prior to continuing along Wilsons Hill Road. A connecting branch line heads south from the intersection of the Wimmera Highway and O'Sullivans Road - on the western side of O'Sullivans Road - supplying the former Water Storage Poly Tanks site (Parcels 7 & 8) and the Piggery (Parcel 5).

An overhead 12.5kV Single Wire Earth Return ('SWER') line is also located in the southeast corner of the site, cutting across from the Calder Alternative Highway, through the existing paddock to immediately west of the Marong Cemetery - with a spur line servicing the house east of the cemetery. ***See Figure 22.***

Table 16: Existing Electrical Supply summary

Electrical Item	Summary
Existing services	An existing 22kV distribution line runs along the northern boundary of BREP, with a branch line supplying nearby sites. Additionally, a 12.5kV SWER line crosses the northeast corner of the site.
Existing capacity	Less than 1MW
Forecasted capacity increase	Nil
Upgrades currently underway	Nil

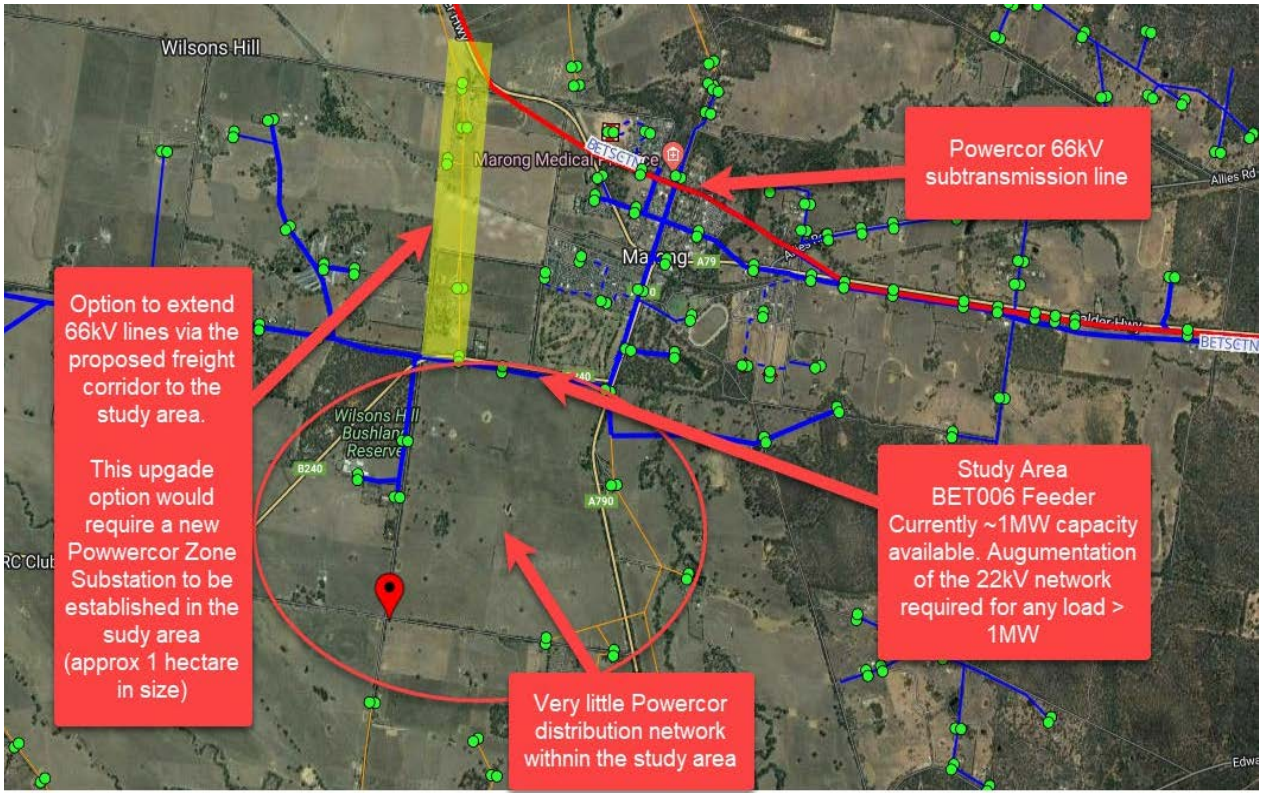
Figure 22: Existing electrical network



6.1.4.2 Stakeholder Engagement

Stantec engaged with Powercor to provide high level non-binding servicing advice to the BREP precinct. Powercor provided initial advice on the existing network in the vicinity of the site as represented at ***Figure 23***.

Figure 23: Existing Power Network Source: Powercor



Powercor has advised that based on the current infrastructure, network augmentation works will be required to serve the BREP site.

Powercor advised that power could be supplied in the following tiers:

Table 17: Power Availability Tiers

Tier	Power Available	Network Augmentation
1	0-1MW	Currently Available at the site.
2	1-5MW	Upgrades are required to the existing 22kv network.
3	>5MW	Extensions of the 66kV sub transmission line to BREP site from along McCreddons Road and installation of a Zone Substation.

We note that throughout our engagement with Powercor the available power within each upgrade tier has fluctuated and is likely to continue to fluctuate depending on changes within the grid.

6.1.4.3 Electrical Sustainability Opportunities & Initiatives

Table 18: Electrical Sustainability Opportunities & BREP Initiatives

Sustainability Priority	Sustainability Opportunities	Considerations	BREP Initiatives
	Private energy network to with onsite renewable generation to reduce reliance on the grid.	Increased heat will increase reliance on air conditioning and internal power demand. Increased heat and severe weather events may reduce the reliability of the grid.	Road cross sections should have allowance for additional conduits which could be utilised in a private network.
	Undergrounding of power network.	Overhead power cables require vegetation trimming which often disfigures trees.	The energy network should be undergrounded where possible. Where assets travel through existing vegetated areas they should be bored/micro-tunnelled to reduce impact to vegetation.
	Privatised Network. Utilising onsite generation and storage and electricity. Electrification of transport.	The traditional power network will need significant upgrades to accommodate BREP power demands. Electric Vehicle charging needs to be considered in the overall power network design.	Consider a Microgrid or Embedded Network arrangement to allow up-take of de-centralised embedded generation specific for powering BREP.

6.1.4.4 Renewable Electrical Supply Strategy

A Privatised Network could be established within BREP to support energy demand via embedded renewable energy sources. A private network electricity provider could replace the traditional supply authority - owning the precinct's electrical infrastructure and acting as the network operator. This would reduce reliance on the main grid and potentially avoid significant network augmentation.

Installing distributed Energy Resources ('DERs') e.g. solar PV, wind turbines, and battery storage would be installed to share generation across the precinct. Providing shared benefits in terms of power cost and stability.

The network could operate as either a microgrid or an embedded network:

1. **Microgrid**: Aims to operates independently of the main grid, highly resilient to outages, primarily relies on on-site renewable energy sources, and managed by its own control systems. The connection to the grid provides redundancy and it is anticipated the network augmentation could be limited to the 5MW power supply tier (provided the base-load energy demand at BREP can be supported).
2. **Embedded Network**: Aims to operate as a local energy system that remains connected to the main grid, primarily relies on the grid for power however can supplement demand with on-site generation, and follows main grid regulations. This arrangement to the grid is expected require network augmentation that may exceed the 5MW tier therefore triggering a significant network augmentation.

Both options support the renewable energy goals of CoGB and reduce reliance on the main grid, reducing emissions and supporting the greater energy transition.

Establishing a privatised network from the start encourages lot owners to conform to the arrangements and attracts environmentally conscious businesses.

Benefits of a privatised network:

- Reduces reliance on the main grid and carbon footprint.
- Promotes shared utilisation of DER generation.
- Engages a third-party service provider for infrastructure management, maintenance, and billing.
- This strategy offers a sustainable selling point for the precinct and supports the transition to renewable energy.

Estimated Power Demand

Power Demand was estimated for the site utilising *Table C3 of AS/NZS 3000* which considers building floor space. Based on similar typical industrial developments it is estimated that approximately 40% of the net saleable Lot area would be built on. This percentage has been considered higher in other sections of this report, given the inherent conservatism of the power calculations we believe this is a reasonable assumption. A load of 60 W/m2 of building space was estimated based on assumed lighting, venting, aircon and equipment loads. Based on this estimation a power demand of 180kW was assumed per HA of saleable lot area.

On-site Generation

A preliminary assessment of the potential onsite solar generation to achieve 100% off-grid reliance has been calculated as per below:

Table 19: Onsite Renewable Generation

Estimated Annual Electricity Usage	Estimate Annual Solar PV Generation	Estimate Solar PV Array Capacity	Estimate Solar PV Area Requirement	Estimate % of BREP Net Developable Lot Area
52,200 MWh	52,200 MWh	47.70 MWp	477,000 m2	26%

BREP has an estimated total building footprint area of 560,000 m^2 making roof mounted solar as the primary energy source feasible. A ground mounted solar farm could be placed on or near the BREP site to supplement the rooftop solar and an onsite battery energy storage system could be provided to capture excess generation.

Pairing solar PV with battery storage is essential in a microgrid to ensure continuous energy availability and supporting uninterrupted operations. This approach also helps meet daytime loads and avoids costly infrastructure upgrades - enhancing microgrid efficiency. Battery systems are modular and can be expanded to the needs of the development.

Challenges to Implement a Private Network:

Implementing a private network into an industrial subdivision presents the following challenges:

- The private grid needs to be owned and operated by a provider. Currently authorities such as Powercor are not willing to operate private networks therefore an independent private operator is required or community owners corporation. Further feasibility assessment and engagement with private network operators is required to determine if a BREP private network is a feasible investment.
- Private networks reduce reliance on the grid and therefore reducing Powercor's expected revenue. Therefore, Powercor may contribute less to network augmentation costs to service BREP in periods where self-generated power is not available.

The neighbouring city of Ballarat's Energy Network Vision ('BEN') is conducting an assessment using the industrial subdivision Ballarat West Employment Zone ('BWEZ') as a test case. The BWEZ precinct serves as a suitable analogue for BREP and will offer valuable insights for further investigation of BREP private network. The goal of this study is to establish Australia's first community-owned energy network, capable of powering a regional city of over 100,000 people with 100% locally generated renewable energy.

Further work is required to determine the complete feasibility and cost of a private network.

6.1.4.5 Traditional Electrical Supply Strategy

Augmentation of the existing power network must be undertaken using an 'Option 1' Powercor Non-contestable works agreement whereby Powercor design and construct the network. Works within the subdivision for new electrical network can be undertaken by VESI accredited consultants and contractors.

The Existing 22kV distribution assets are located on the site along the northern boundary of BREP. For initial loads generated by BREP, up to 5MW would be available via augmentation of this 22kV network with new or augmented feed connection to Stage 1 of BREP via the existing road network.

For increased power demands above 5MW a new Powercor Zone Substation will be required onsite, fed from the existing 66kV transmission line that runs along the Calder Hwy approx. 2 km to the north. Powercor have indicated that 1Ha of land would be required for the Zone substation. The Zone substation is shown indicatively below in ***Figure 24.*** However further consideration with stakeholders is required to determine the final location.

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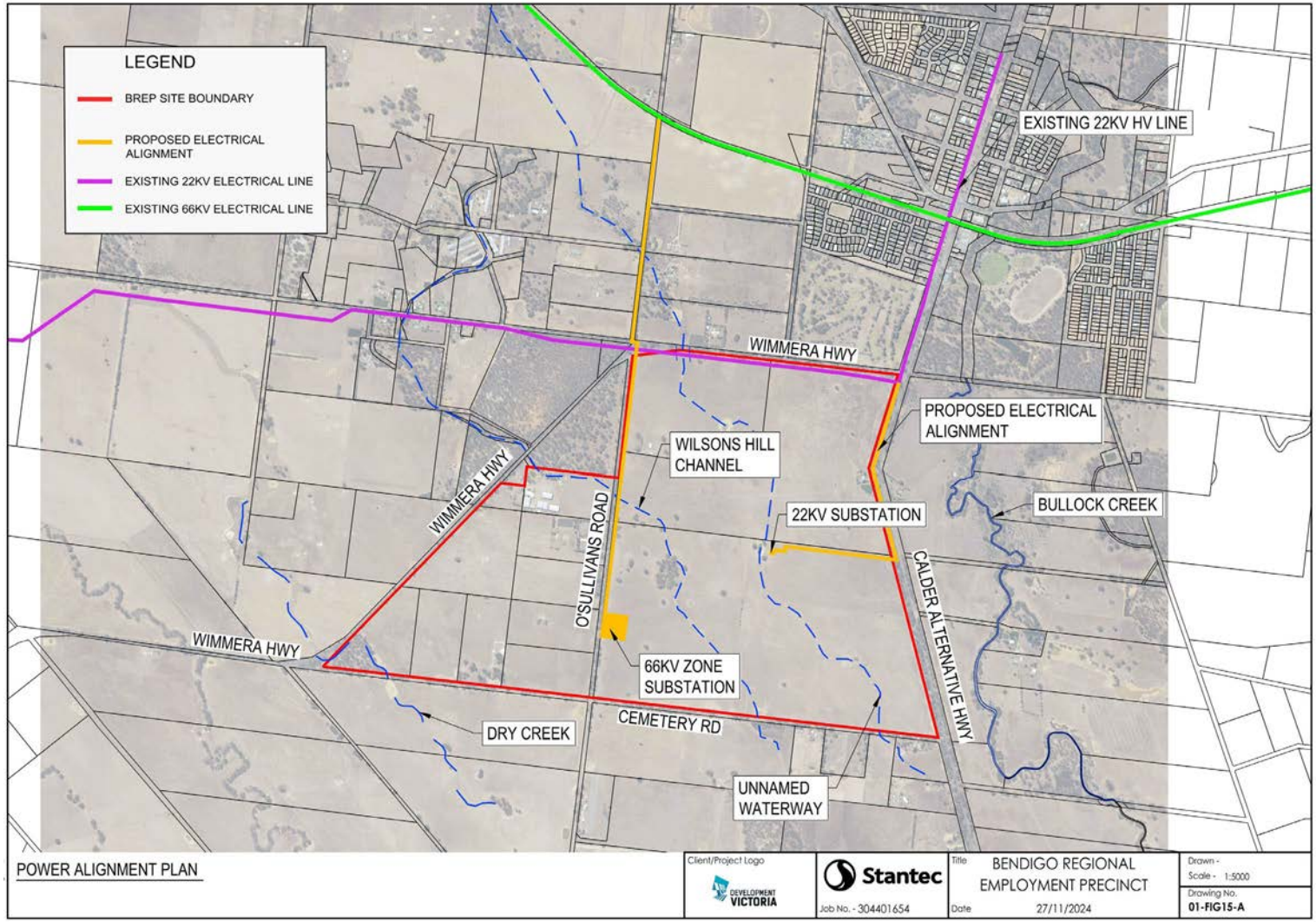
Figure 24: Power Supply Plan



As outlined in ***Section 6.1.4.4***, Stantec has proposed a Private Electric Network harnessing Distributed Energy Resources to provide onsite generation for power supply of BREP, in alignment with the sustainability goals of the project. The proposed private network is expected to be grid tied to allow the supply of grid power in case of power shortfalls and conversely to sell excess power back to the grid. Should a private network be adopted reliance on the grid will be reduced and it anticipated augmentation could be limited to 5 MW.

6.1.4.6 Electrical Infrastructure Works

With an assumed total saleable lot area of 187Ha for BREP, this equates to a total demand of **34MW.** Based on these assumptions developable land for each power tier is as shown in ***Table 20.***

Table 20: Power Upgrade Tiers

Tier	Power Available	Developable land
1	0-1MW	6Ha
2	1-5MW	28Ha
3	>5MW	187Ha (Total estimate saleable lots)

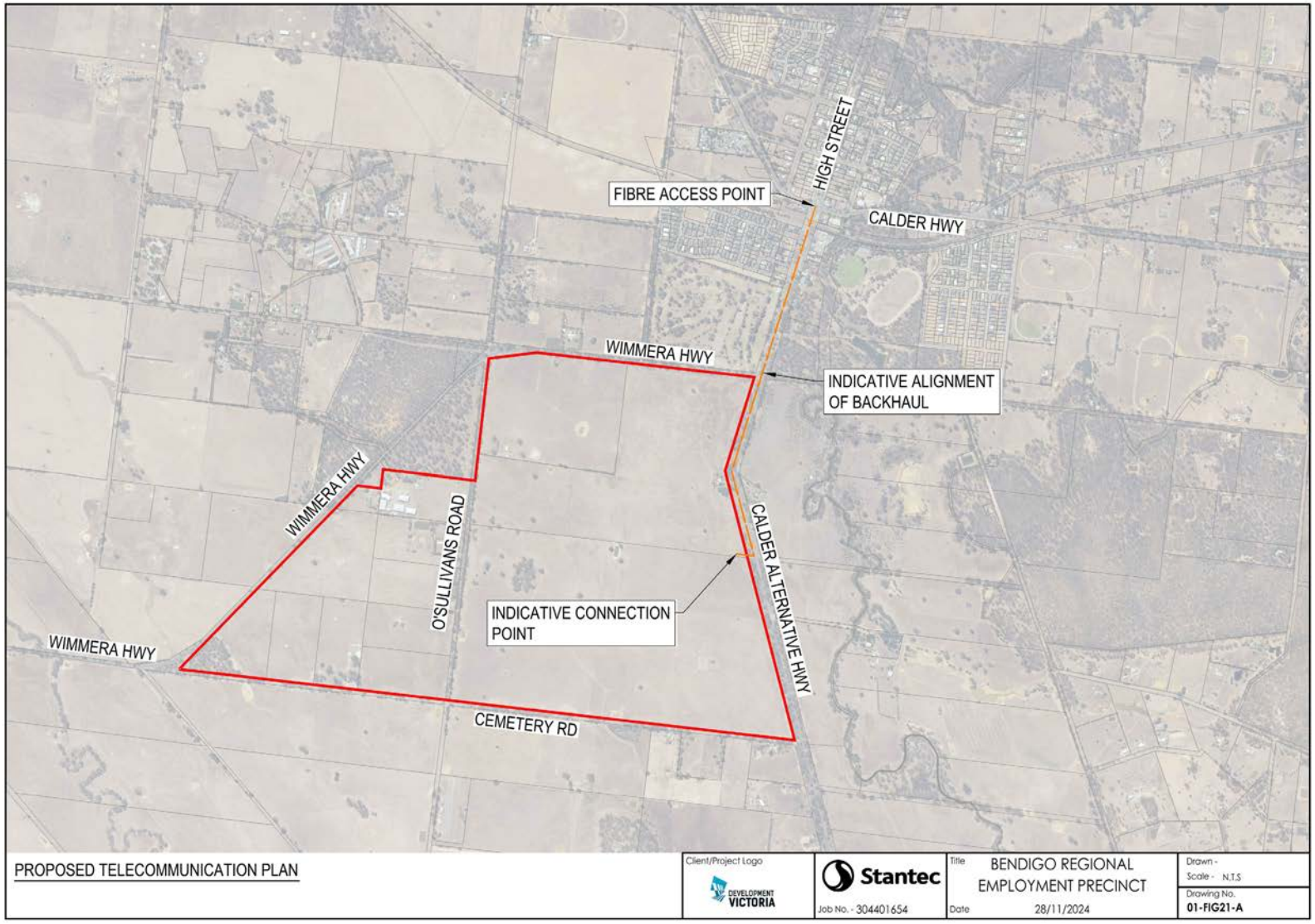
6.1.5 Telecommunications Supply

Currently the site is only served with conventional bundled wire telephone lines owned by Telstra and NBN Fixed Wireless service. These services are obsolete with the use of fibre optics. The site is located approximately 1.3km outside the fixed line footprint for NBN services, however the area has sufficient capacity to provide service to BREP. Existing Telstra cables are located along Cemetery Road, Wimmera Highway and Calder Alternative Highway, running the entire length of the site, plus O'Sullivans Road at the southern end.

The nearest fibre access point ('FAP') is located at the existing Marong Exchange at the intersection of Calder Highway and High Street (approx. 2.1km from BREP). As development progresses, there may be a need for a 5G tower to be provided to provide additional capacity within the development. The siting of this would be subject to standard conditions and agreements with landowners. As access to both fibre and the electrical grid will be available to the site, no further servicing consideration is made on the provision of mobile services, apart from noting these towers are typically located at the high points in an area or on taller buildings.

Connection to the FAP is located approx. 2.1km from the northern edge of the BREP site near the intersection of Calder Highway and High Street in Marong as noted in ***Figure 25*** below.

Figure 25: Nearest FAP to BREP



6.1.6 Gas Supply

The provision of natural gas, a fossil fuel, is in conflict with the sustainability objectives of stakeholders within BREP. Victoria's Gas Substitution Roadmap outlines government strategies to reduce reliance on gas. According to AEMO and the Australian Competition and Consumer Commission (ACCC), natural gas reserves in traditional fields, such as those off the Gippsland coast, are projected to deplete rapidly over the next decade. This depletion is expected to outpace the anticipated decline in demand for fossil gas.

The *BREP Industry Engagement Study (McKinna, October 2024)* highlights that the absence of piped natural gas is a "deal breaker" for most potential food industry tenants. AEMO also notes that around half of Victoria's large commercial and industrial gas consumption cannot realistically be electrified. As such, alternative energy sources such as hydrogen or biogas are likely to be necessary to replace natural gas in these sectors.

Should the development not provide gas supply, businesses that require gas may opt to construct their own supply by augmenting the network or via a trucked in tanked system.

Noting the above this report outlines the requirements for supplying natural gas to BREP for further consideration by BREP stakeholders.

6.1.6.1 Existing Gas Supply

Marong township has a reticulated gas supply recently constructed to provide connection for residential areas. This network is supplied via a "daughter" supply tank under an exclusive supply arrangement with TasGas, and in its current arrangement is unlikely to provide sufficient demand capacity for large industrial users.

Table 21: Existing Gas Summary

Gas Item	Summary
Existing Service	Independent tanked system
Existing capacity	None
Forecasted capacity increase	None
Upgrades currently underway	None

6.1.6.2 Stakeholder Engagement

Stantec has engaged with Downer who manage the gas distribution network on behalf of AusNet.

Downer has provided two connection alignments (three capacity) options for the supply of natural gas from the state piped gas network:

1. Option 1 is a 7.5km route (7.8km to NE corner of CoGB land) with a 125mm PE (polyethylene) main easterly via the Calder Hwy, connecting within the Maiden Gully Township at the Monsants Rd Intersection, connecting to an existing 110mm main with a 350m3/h capacity.

2. Option 2a is a 7.2km route (6.5km to SE corner of CoGB land) with a 125mm PE gas main southerly along the Calder Alternative Hwy to Linder Lane, to an existing 180mm main which currently supplies Hazeldenes Chicken. This would provide approximately 650m3/h capacity.
3. Option 2b upsize option 2a to a 180mm main. This would provide approximately 900m3/h capacity.

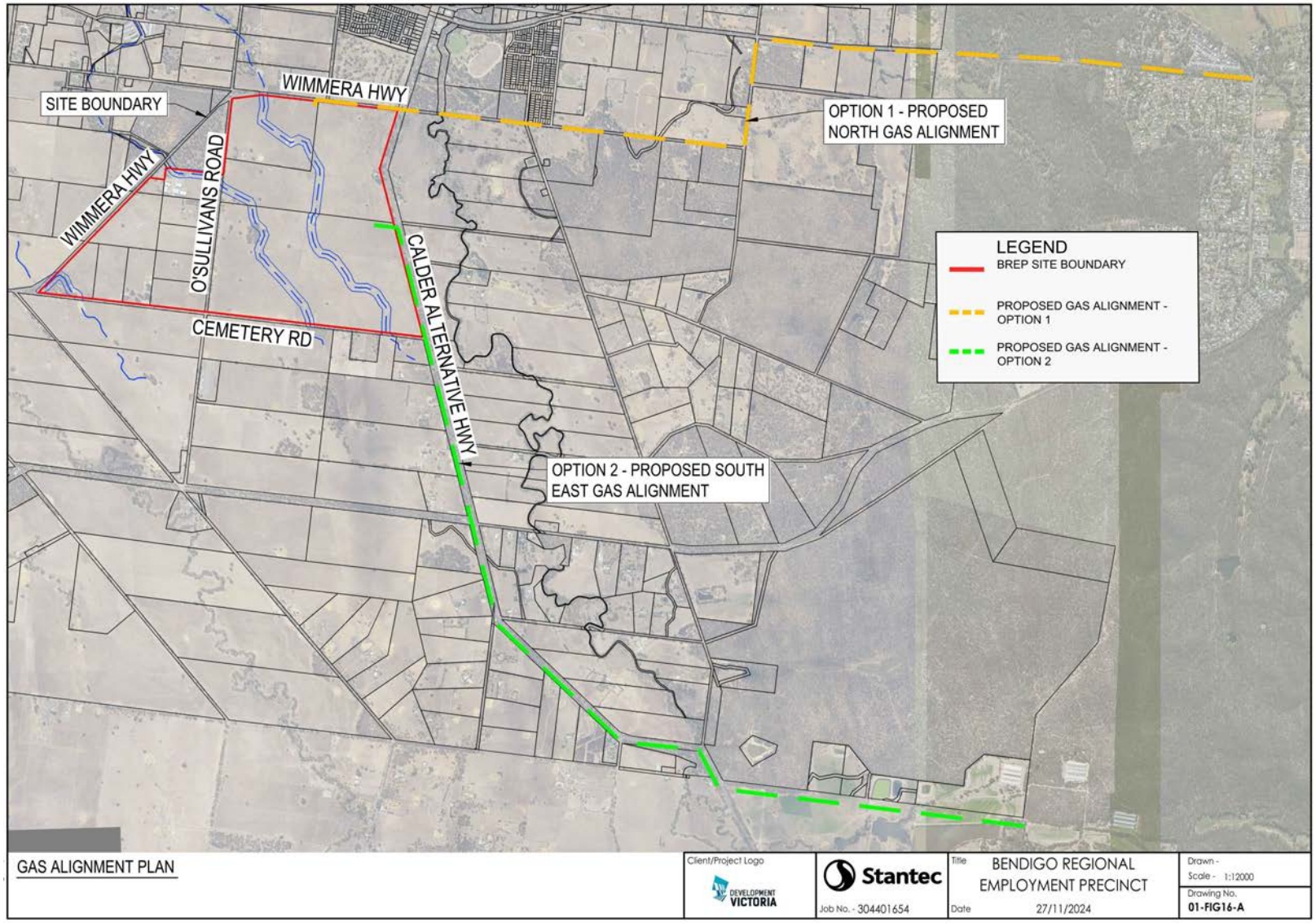
6.1.6.3 Gas Supply Strategy

Demand requirements cannot be easily determined without further engagement with potential tenants of the sites.

Both route options present similar distances along heavily vegetated road reserves. **Option 2** provides the most supply capacity, albeit with the most difficulties to overcome in reaching the site, given it is supplied from south of the BREP site, with no ability to share trenching, etc. with other services.

Option 1 generally follows the same route as the sewer outfall upgrades and current potable water upgrades proposed by Coliban Water for the Marong Township. Ideally the gas main would share a trench with potable water. However, given the difference in works timing between the two services (the water main is designed and ready for construction while the gas only has a potential alignment at this time), it is unlikely that any benefit can be obtained from co-location of the services. There may be some benefit as several existing vegetation, cultural heritage studies, etc. may be used for the gas pipeline. ***Refer to Figure 26*** for the alignments.

Figure 26: Gas Supply Plan



7.

Infrastructure Servicing & Staging

7 Infrastructure Servicing & Staging

7.1 Key Moves

Five ‘key moves’ for the precinct have been developed to help inform and guide BREP”s Concept Infrastructure Plan.

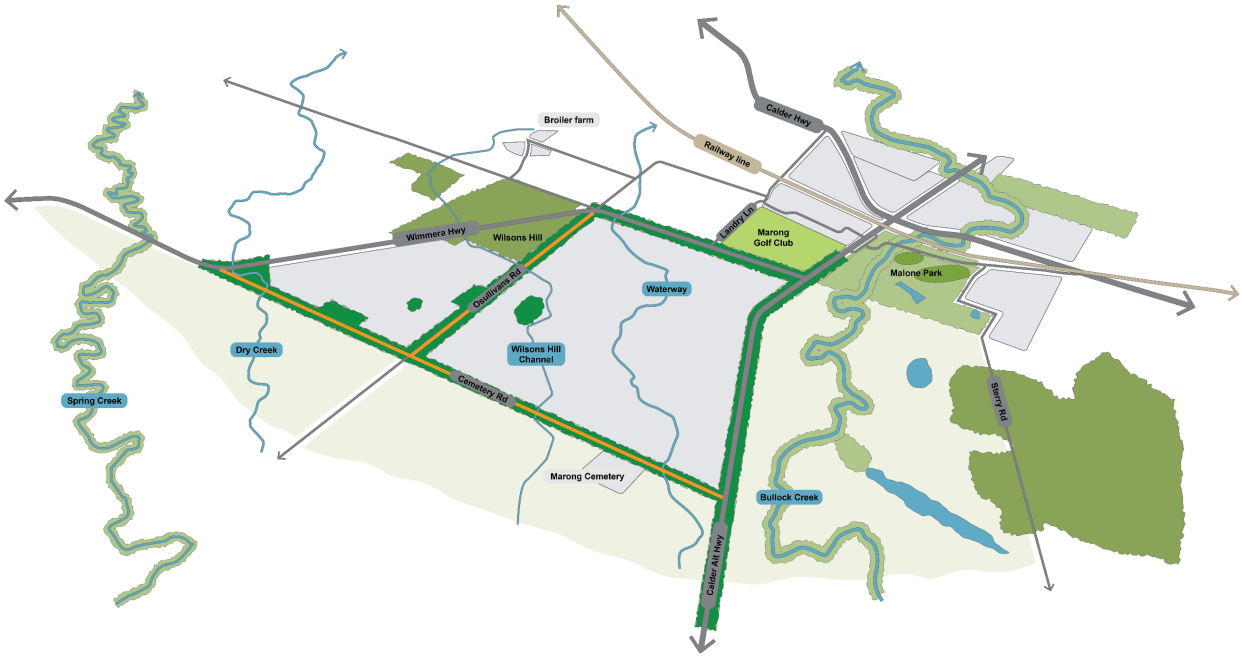
The key moves are focused on providing maximum flexibility, ensuring BREP offers a range of different lots (including large sites of 1ha or more) to the market to help meet long-term industry needs.

These key moves provide a framework that responds positively to the surrounding environment by enhancing areas of biodiversity and creating valuable areas of open space with an integrated approach to stormwater and walking and cycling routes, as well as exploring other precinct-wide sustainability initiatives such as utilising the potential for significant solar energy generation on-site.

7.1.1 Key Move 1: Grow and enhance what's there

- The outstanding biodiversity and landscape values provided by the existing indigenous trees (around 80% of all trees within the precinct) – trying to preserve and enhance as many critical and high value trees as possible.
- Protecting the greatest value concentrated in the roadside vegetation – these are of high value as they contain a mix of ages and natural recruitment is occurring spontaneously.
- Ensuring O'Sullivans Road and Cemetery Road are downgraded to local access/active transport with no truck access to help support the significant trees along these routes.
- Incorporating three high value patches of trees within the landscape strategy for the site.

Figure 40: Key Move 1

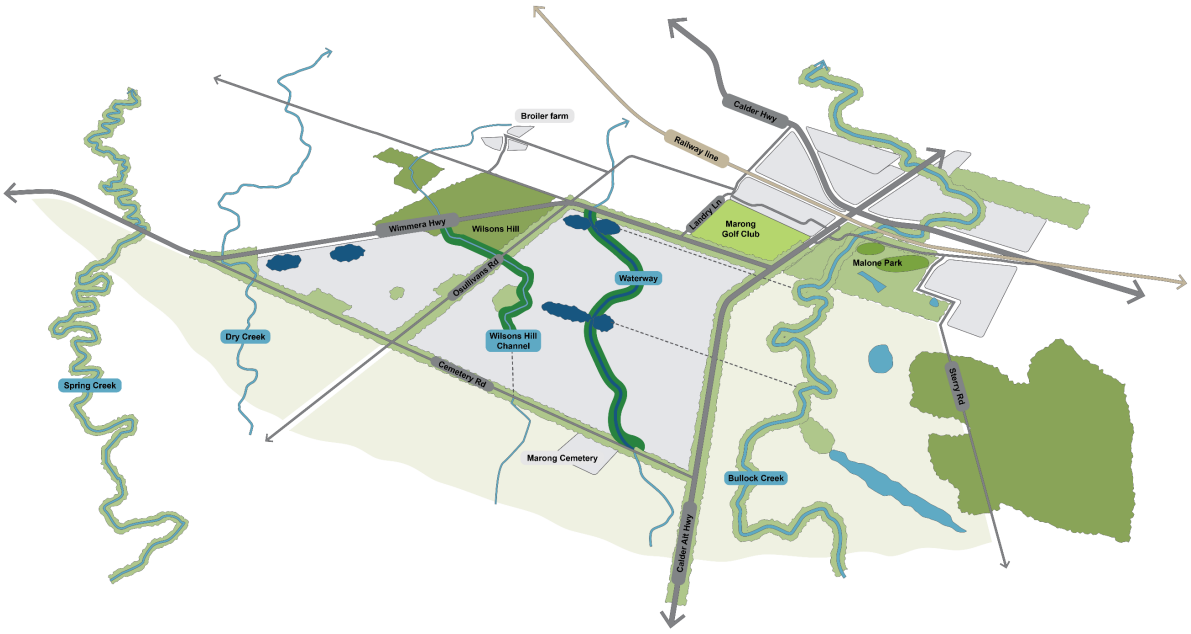


7.1.2 Key Move 2: Integrate water within the landscape

This key move is about:

- Retaining and enhancing the existing waterway within a green, landscaped 60m reserve that connects to the proposed areas of open space and biodiversity corridors.
- Retaining stormwater on site through landscaped retarding basins with constructed wetlands of densely-planted ponds that help filter and clean the water prior to being discharged.
- Providing low flow piped outlets to Bullock Creek to help reduce the costs and environmental impacts of significant earthworks.
- Incorporating Wilsons Hill irrigation channel as an integral part of the landscaping and acting as a biodiversity corridor connected with Wilson Hill Nature Conservation Area.

Figure 41: Key Move 2

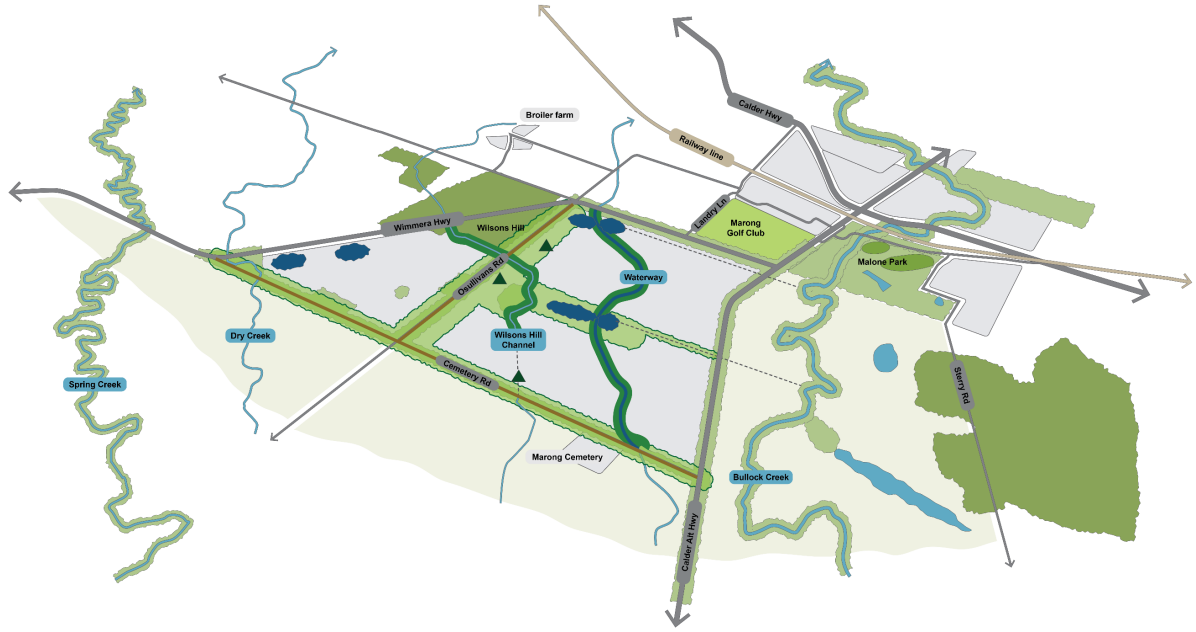


7.1.3 Key Move 3: Retain and promote biodiversity

This key move is about:

- Providing a variety of flora and fauna habitats to promote and retain biodiversity.
- Creating biodiversity corridors along O'Sullivan's Road linking Wilsons Hill Nature Conservation Reserve and Bushland Reserve, and Cemetery Road - incorporating areas of Plains Woodland, significant trees and homes of the Swift Parrot, Squirrel Glider and Brushtail Phascogale.
- Undertake habitat creation by creating connected, linear habitat corridors along the waterways, retarding basins and other required easements.

Figure 42: Key Move 3

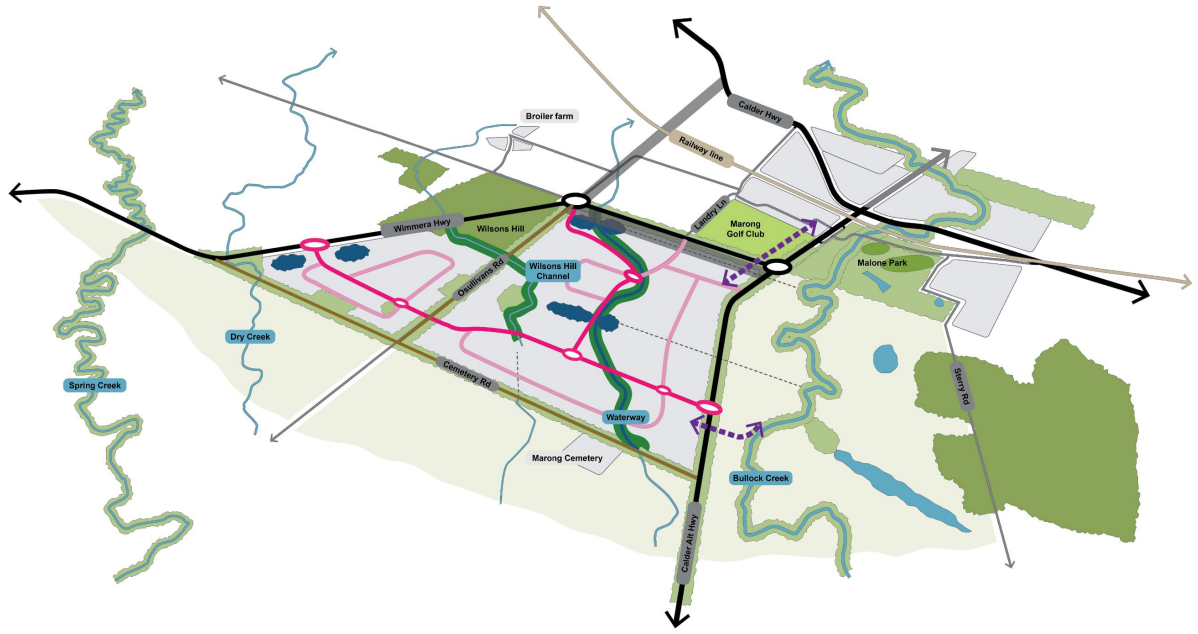


7.1.4 Key Move 4: Connect the precinct, strategically and locally

This key move is about:

- Providing two key primary connector roads through the site - connecting with the Calder Alt Hwy and Wimmerra Hwy, the Principal Freight Network and Marong Western Freight Corridor.
- Connector roads of 26m that allows for wide planting strips, off-road cycle lanes and be bus capable for future bus routes.
- Local roads (22m) coming off the Connector Roads to provide lot access to each of the larger parcels with 3m wide shared path on one side and space for tree planting.
- Additional green walking and cycling routes along key landscape and waterway corridors and along Osullivan's Road and Cemetery Road.
- Providing safe crossing facilities to the Marong township to help support active travel.

Figure 43: Key Move 4

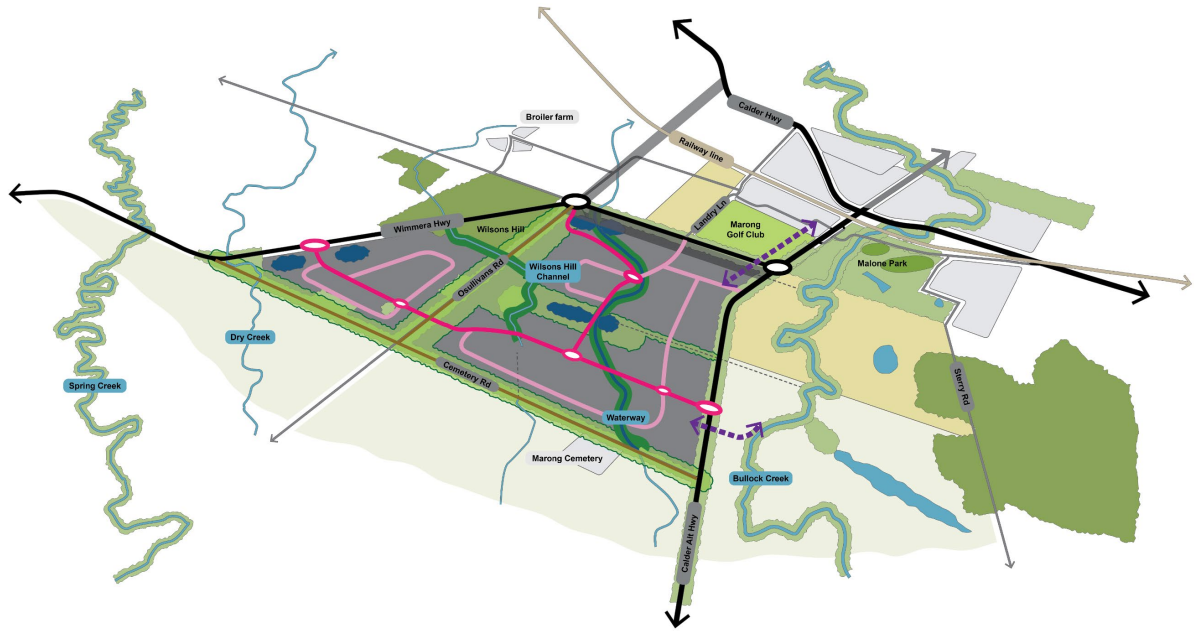


7.1.5 Key Move 5: Plan for flexibility

This key move is about:

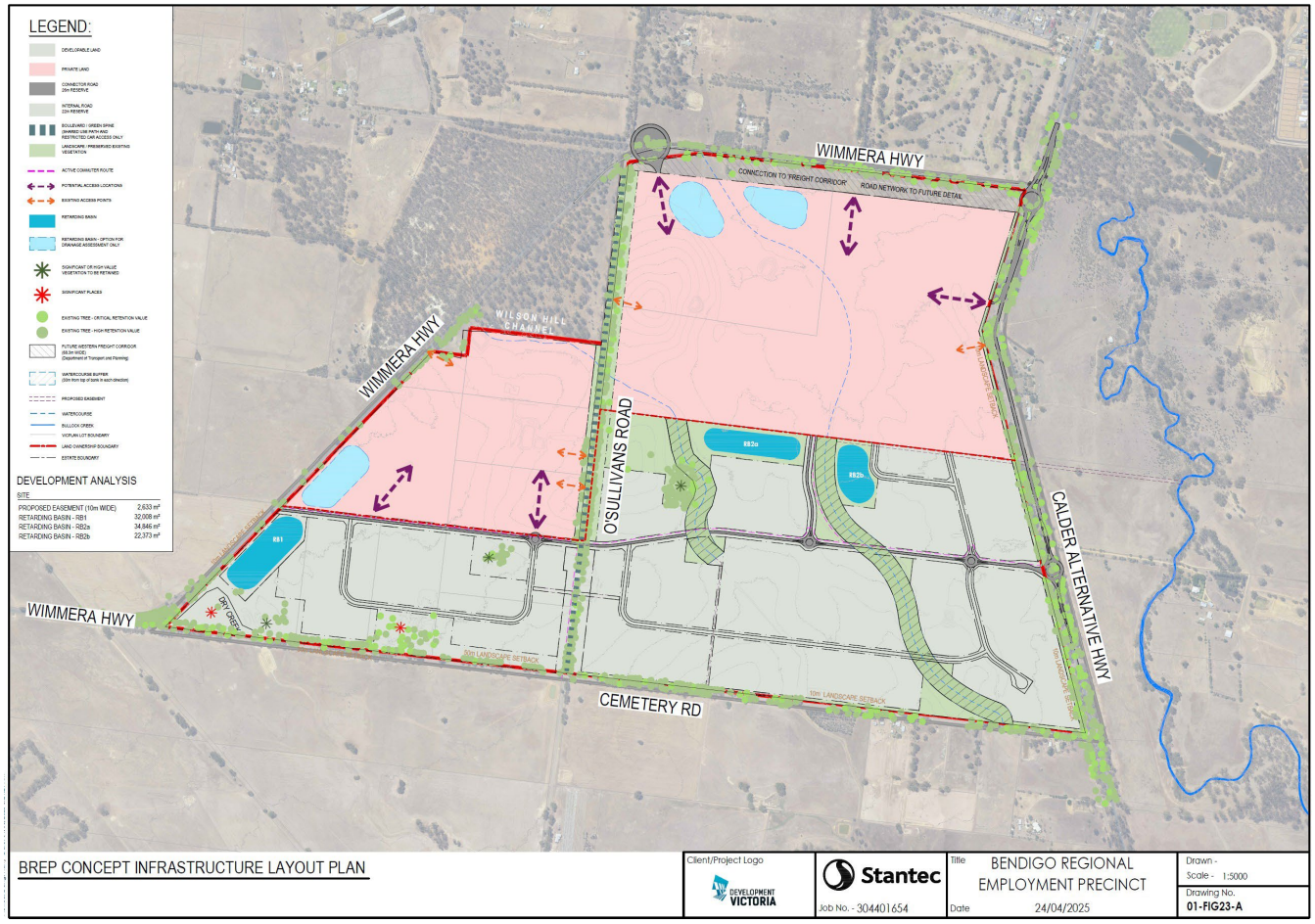
- Providing a plan that provides a flexible overarching framework which considers the likely staging and infrastructure requirements of the whole precinct over time (20+ years)
- Ensuring the proposed key connector roads provide access to all areas within the precinct.
- Allowing for flexibility for the local roads to respond to each stage accordingly, including the potential to provide greater frontage to the Calder Alternative Highway if required and is viable in future stages.

Figure 44: Key Move 5



7.2 BREP's Concept Infrastructure Plan

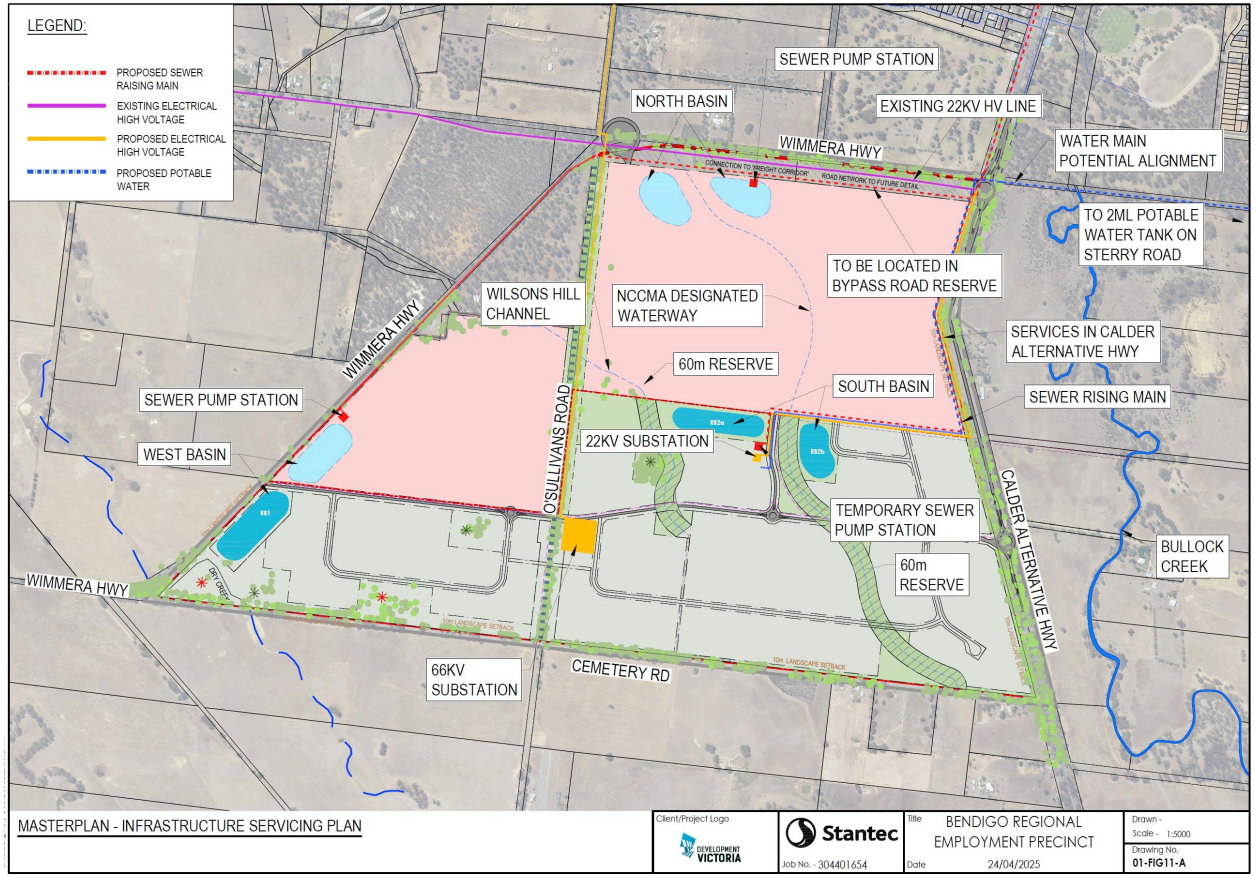
Figure 45: Concept Infrastructure Plan



7.3 Infrastructure Servicing Layout

The following Infrastructure Servicing Layout plan demonstrates the proposed trunk infrastructure.

Figure 46: Draft Infrastructure Servicing Layout plan



7.4 Staging Considerations & Recommendations

7.4.1 Landowner Engagement

City of Greater Bendigo own Parcels 2 and 3A-E ***(Figure 2)*** and whom have commissioned this report with the intention to develop BREP.

The landowners of the remaining parcels 4, 5, 6, 7 and 8 have not been engaged with.

Discussions with Private Landowner representatives and other factors such as contamination, distance to the infrastructure connection points and stormwater influenced the staging recommendations.

7.4.2 Infrastructure Considerations to Project Staging

Table 30: Infrastructure Considerations to Project Staging

Item	Staging Implications
Site Access	Stage 1 will require access from one of the four proposed connection points, as detailed in ***Section 6.4.*** The Calder Alternative Hwy is the busiest boundary road and provides the best access to the predominant traffic flow towards Marong Township.
Potable Water	The proposed potable water main will connect to BREP at the intersection of the Wimmera Hwy and Calder Alternative Hwy. Construction of the potable water network augmentation will be required prior to Stage 1, extending via road reserves to the site.
Sewer	The proposed sewer outfall pipe will connect to BREP at the intersection of the Wimmera Hwy and Calder Alternative Hwy, with network augmentation required prior to Stage 1. Stage 1 will need a sewer pump station and gravity pipe, or a temporary pump station if permanent locations are unavailable.
Power	Power supply will be extended from the existing 22kV line parallel to the Wimmera Hwy or from McCreddons Rd for long-term capacity. Supply to Stage 1 will be extended via road reserves, subject to the adoption of a private power network with on-site generation.
Telecommunications	Telecommunications will connect to BREP at the intersection of the Wimmera Hwy and Calder Alternative Hwy, extending to Stage 1 via road reserves.
Gas	If gas is required, a new gas main will be constructed from Landry Lane beyond the southeast corner of BREP. From this point, an internal gas reticulation network or a direct connection to industries requiring dedicated service can be provided.
Stormwater	The site is divided into two main catchments: Eastern (draining north) and Western (draining northwest). Stage 1 will require a completed drainage basin for its catchment before compliance. The Eastern Catchment will include southern and northern basins for development flexibility.

7.4.3 Infrastructure Triggers

Table 31: Infrastructure Considerations to Project Staging

Developable land	Required infrastructure
0–7 Ha	The following Infrastructure items are required for Stage 1: • Site access including the construction of an external intersection. For Stage 1 this is recommended to be the proposed Calder Alternative roundabout. • Stormwater for Stage 1 will require a wetland retarding basin and outfall pipe to Bullock Creek as detailed in ***Section 6.3***. Our Stormwater Strategy allows for 6 basins which can be constructed independently. Stage 1 will only require 1 of these basins to service the Stage. • Sewer outfall will be required for Stage 1. This will require connection to a permanent (or temporary pump station if the permanent is not feasible due to access to other landowners) within BREP. Coliban Water has indicated the interim connection point is approximately 2.5km away from BREP at the Calder Hwy SPS. This rising main will have to be constructed to utilise the initial 200kL/day available sewer capacity, and its suitability is dependent on industry users onsite and timing of the residential growth. • Potable Water supply requires the construction of a new 2MLwater tank on Sterry Road 1.4km east of the site and corresponding connection main. • Telecommunications fibre backhaul of 1.7km will be required. • Power - the currently available power of 1MW is not considered sufficient to commence industrial development. Augmentation of the network to provide up to 5MW will be required.
7–28 Ha	Using the WSAA demand rates for industrial (which are conservative), the ultimate sewer outfall would be required after 7 hectares of development, based on predicted sewer consumption rates. If all the industries onsite were all "dry" industries with low sewer demands, potentially 15ha (or more) could be serviced via the interim connection up until the capacity was needed by residential users. However, this would not be known until purchasers of the land are known and flows monitored.
Greater than 28 Ha	Our power demand calculations indicate that the available 5MW capacity is sufficient to support up to 28 hectares of development. Beyond this, augmentation of the 66kV network and the construction of a new zone substation will be required to provide power exceeding 5MW. Implementing a private energy network, as outlined in ***Section 6.1.4.4*** of this report, could reduce reliance on the grid and potentially mitigate the need for grid power exceeding 5MW.

7.4.4 Other Staging Considerations

An additional environmental contamination assessment is recommended as part of the Environmental Engineering Section of this report for high-risk Sub-Zones A3, A4 and A5 - which corresponds to Parcels 3A-3E, 5, 7 & 8 on the Site Location Plan ***(Figure 2).*** Further investigations may lead to the need for further testing and analysis as well as remediation. However, this has had little impact on the project staging or delivery strategy.

Consultation is required with Heritage Victoria regarding 2 listed sites within Property 9 as detailed in ***Section 4.***

7.4.5 Staging Recommendations

The proposed Staging is shown below in ***Figure 47.*** Initial development is proposed in the north-east corner of Council's land due to Council's appetite to provide external infrastructure to the BREP and provide industrial land supply to Bendigo. Council is also the majority landowner in the precinct.

Figure 47: BREP Staging Plan

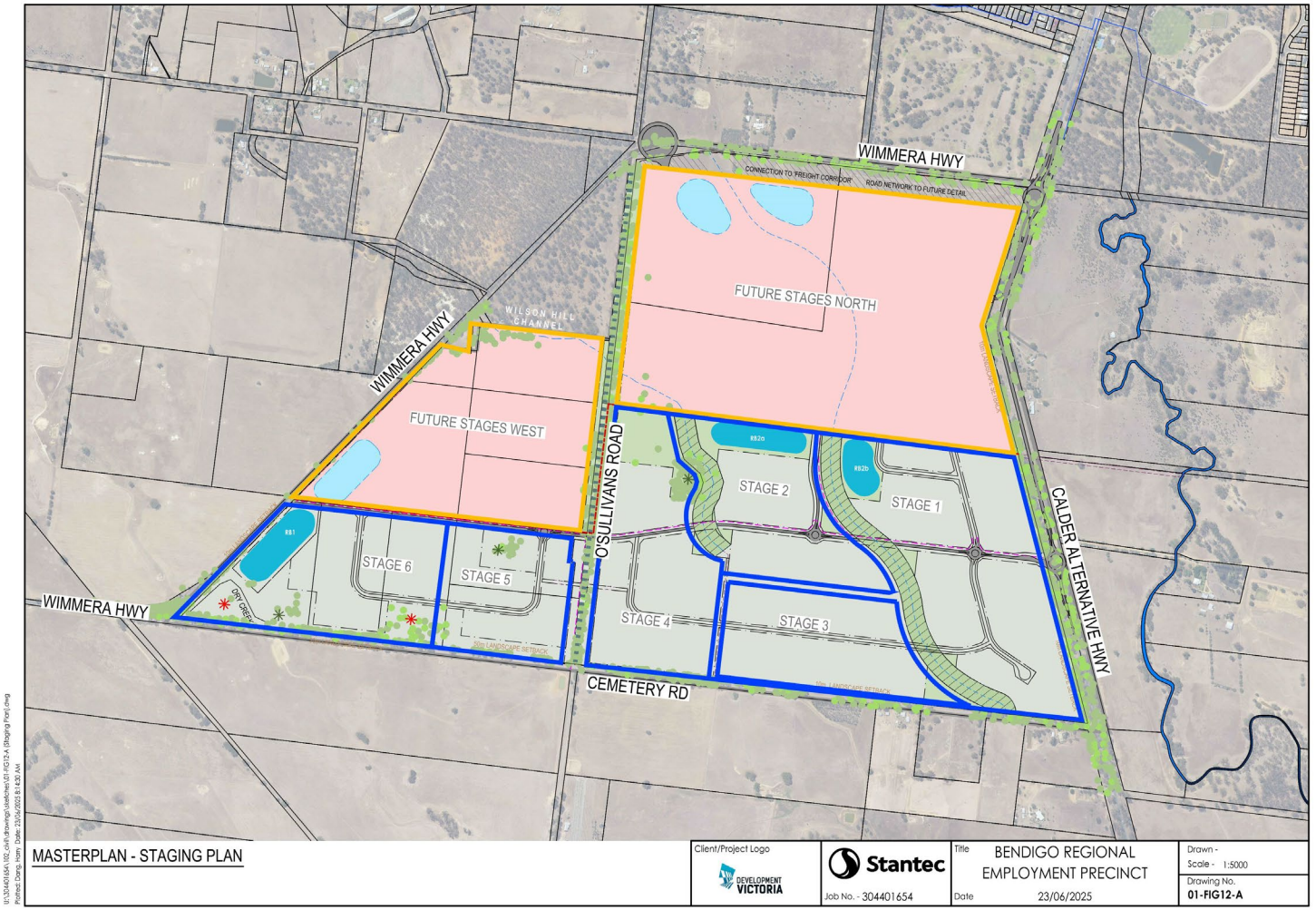


Table 32: Staging Recommendations

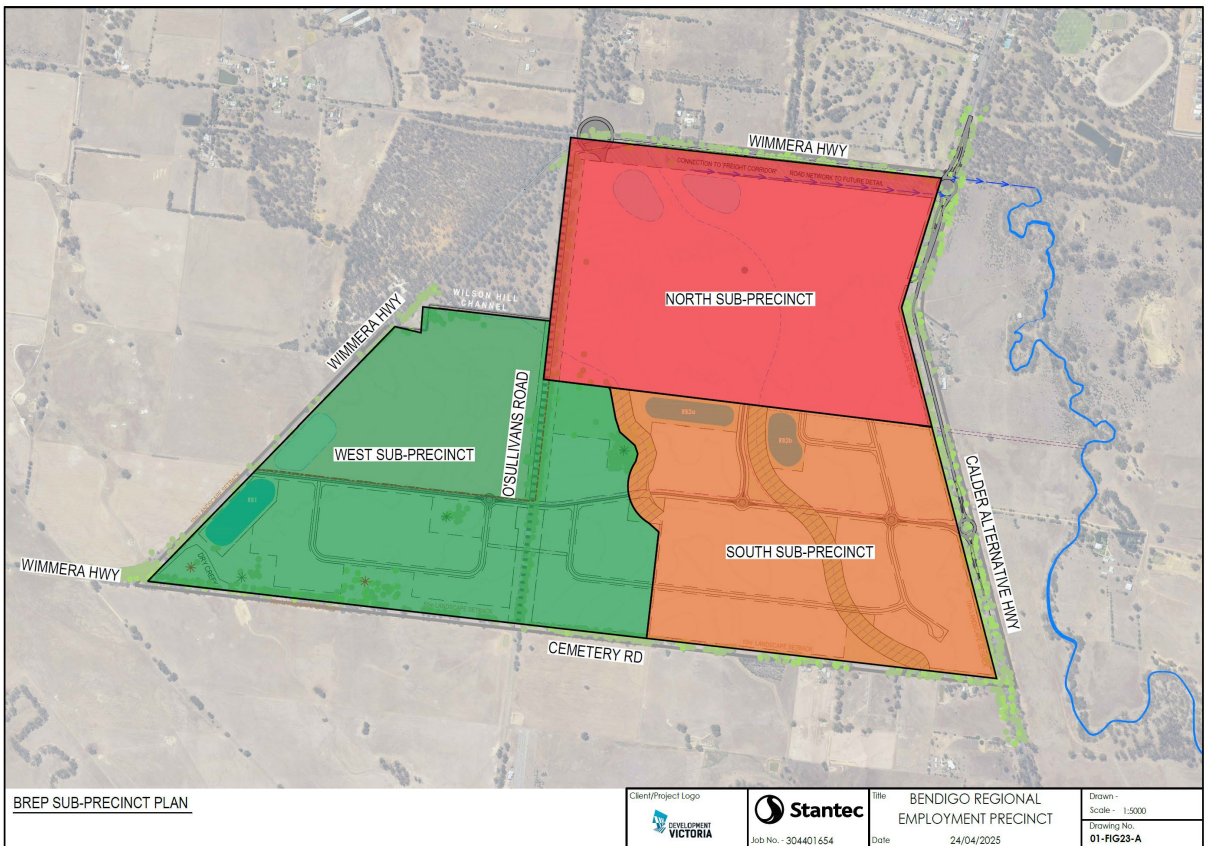
Stage	Area (Ha)	Recommendations
Stage 1	**29.65**	Stage 1 has been situated as shown in ***Figure 47*** for the following reasons: • The landowner, CoGB, has advised they intend to develop the site as soon as possible to meet demand for industrial land. • This land is close to external services at the north and north-eastern corners of BREP, which can be extended via the Calder Alternative Hwy or *YourLand* site (subject to negotiation). • This proposed stage is adjacent to the Calder Alternative Hwy - a high-traffic road providing good access to Marong Township. • It's next to a wetland retarding basin (RB2b) to manage stormwater runoff and the proposed low flow outlet pipe to Bullock Creek. • Providing infrastructure to Stage 1 in its proposed location provides for straightforward development of subsequent stages with minimal additional infrastructure. • It has a Low environmental contamination risk. • There are no known significant heritage, landscape, or ecological issues requiring further investigation. • It is anticipated landscaping and full realignment of the unnamed waterway can be deferred to Stages 2 and 3. Stage 1 will require the re-alignment and landscaping of the unnamed waterway
Stage 2	**14.95**	The land to the west of Stage 1 is the logical progression of the development. West of the unnamed channel will require the construction of Retarding Basin (RB2a). Development will progress from the bottom of the catchment. Stage 2 will require the partial or complete realignment of the Wilson's Hill channel. The developer may opt to complete the whole Wilson's Hill channel realignment during Stage 2 for efficiency.
Stage 3	**16.67**	Stage 3 is the logical progression upstream of the RB2a catchment. Construction of the unnamed waterway and landscaping of the unnamed waterway adjacent to the stage will be required.
Stage 4	**16.10**	The initial stage in the western catchment, requiring the construction of Retarding Basin RB3B. Despite changing catchments, staging should progress west to continue internal services.
Stage 5	**10.02**	This stage will require the closure of O'Sullivan's Road to the edge of Parcel 3, to facilitate the development of the road network. Access to remaining undeveloped lots to the north will be provided via O'Sullivan's Road accessed from the north.
Stage 6	**16.60**	This stage will complete the development of the CoGB land from east to west. This will trigger the completion of the Wimmera Hwy – Internal Road intersection.

7.4.6 Sub Precincts

Given the site constraints and considerations detailed in this section including, stormwater and sewer catchments, site features, physical constraints and tittle boundaries, the site logically falls into three sub-precincts, as shown below in ***Figure 48: Sub-Precincts.***

A self-contained drainage strategy for each of the sub-precincts is feasible.

Figure 48: Sub-Precincts



7.4.7 Staging Flexibility

Subject to rezoning, any landowner could feasibly commence works first provided they were able to provide Power, Water, Sewer to their site and were able to provide stormwater retention and treatment for their catchment. Additionally, multiple landowners may develop concurrently. Therefore, the staging proposed in this report are recommendations only. Should parcel's 1 or 9 opt to develop first, the internal routing of trunk infrastructure may be altered through detailed design for more efficient routes through developed parcels.

Once trunk infrastructure is brought to the site, development within future stages north and future stages west could commence concurrently. The provision of external infrastructure will promote concurrent development from private landowners.

7.5 Recommended Sustainability Actions

Table 33: Recommended Sustainability Actions

Sustainability Priority	Discipline	Recommended Sustainability Actions
 climate resilience	**Utilities**	Implement outcomes of the IWMS to reduce reliance on potable water. Undertake a feasibility study for provision of a private energy network powered by onsite generation. Allow for recycled water 'purple pipe' within the road reserve. Road cross sections to allow for additional conduits which could be utilised in a private energy network.
	Landscape	Include 4.5m wide planting strips on both sides of connector streets. Include 3.5m wide planting strips on both sides of local streets. Create 10m wide planted buffers along Calder Alternative Highway and Wimmera Highway. Implement passive tree watering in design.
	Stormwater	Stormwater modelling to be undertaken using ARR 2024 Climate Change factors. Retarding basins proposed to have 300mm freeboard above the 1% AEP + Climate Change ('CC') flood levels. Roadway gap flow contingencies implemented to take climate change escalated flow rates, to ensure safe access and egress. Implement stormwater harvesting in design.
	Transport	BREP cross-sections to include walking and cycling facilities separate from the road carriageway, with the traffic lanes being suitably wide to support bus services. Advocate for public transport services that align with BREP commuter travel times. Design guidelines to be consistent with the Sustainability Subdivisions Framework.
	Overall	Undertake a Sustainable Certification pathway *(such as Green Star A Communities v2).* Prepare Climate Adaption Plan, Climate Resilience Plan & Community Development Plan.
 nature	**Utilities**	Proposed road cross sections to allow for passive stormwater systems that funnel road water directly to street trees. IWMS to investigate recycled water options for non-potable water applications. Services to be undergrounded where practical to reduce vegetation impact. Where assets are to travel through existing vegetated areas they are to be bored/micro-tunnelled to reduce impact to vegetation.
	Landscape	Create 10m wide planted buffers along Calder Alternative Highway and Wimmera Highway to allow for succession planting. Provide extensive landscape buffers, approximately 20-30m in width, around existing significant landscape areas to be retained within the development. Convert O'Sullivans Road into a central green spine incorporating non-vehicular modes of transport. Retain Cemetery Road in its current form. Road cross sections to provide for passive stormwater systems that funnel road water directly to street trees. Establish habitat corridors through the site incorporating existing high valued ecological patches and trees. Develop partnerships with other land managers to establish ecological corridors that support species movement and connect fragmented habitats.

Sustainability Priority	Discipline	Recommended Sustainability Actions
		Develop a ten-year action plan, including monitoring regime, for management of wildlife corridors and ecological communities. Artificial shelters installed to compensate for any removal of hollow-bearing trees and to promote suitable habitat for species.
	Stormwater	Provide provisions for stormwater harvesting to landscape watering.
	Transport	Use permeable pavements for roads and internal hardstand areas where practical. Nature strips prioritised in road cross section by removing on-street parking.
	Earthworks	Filling to be minimised throughout the site to reduce impact to existing landscape and existing vegetation.
	Overall	Prepare a Native Vegetation Precinct Plan.
	Utilities	Promote water network pumps to be powered using renewable energy. Private energy network with onsite renewable energy generation strategy.
	Landscape	Use solar lighting for public open spaces.
	Stormwater	Stormwater to be designed as a passive system with no energy usage.
	Transport	Private energy network with onsite renewable energy generation strategy to facilitate green charging of private and commercial electric vehicles. Best practise active transport network is implemented to promote pedestrian, cycling and e-micromobility Mandate 20% of car parking spaces within developed land parcels to have electric vehicle charging facilities in place and the ability to increase to 100% of car spaces as the general vehicle fleet makes this transition over the coming decades. Truck vehicle charging facilities to be provided, noting the likely speed of fleet transition and types, e.g. battery electric and hydrogen fuel cells.
	Overall	Undertake a feasibility study for a Private Energy Network.
	Utilities	All reinforcing steel, asphalt, and concrete used in site-works must be sourced from facilities that have ISO 14001 accreditation. All PVC pipes, conduits, and cable insulation must comply with the PVC Best Practice Guidelines, or alternatives to PVC must be used, ensuring a lower environmental impact. Detailed design to specify use of recycled Poly Ethelyne pipes.
	Landscape	At least 95% (by cost) of all timber used in the construction works must be certified by a forest certification scheme, or from a reused source.
	Stormwater	Utilise recycled polyethylene pipework were practicable.
	Transport	Pavements to the use the maximum allowable proportion of recycled materials defined by Vic Roads TN 107
	Earthworks	Minimise the import of offset fill. Utilised crushed concrete, glass and bricks in placed of crushed rock applications like trench backfill.
	Overall	Prepare a Circular Economy Management Plan. Partner with CoGB to develop circular economy schemes for BREP.

8.

Conclusions & Recommendations.

8 Conclusions and Recommendations

BREP can be serviced by infrastructure to support the industrial development of the site.

Table 34: Infrastructure Conclusions

Item	Conclusion
Transport	• Access provided via new intersections on Calder Hwy Alternative & Wimmera Hwy. • Internal network and streetscape designed to provide best practice active transport. • Internal network design to facilitate A-triples capitalising on the site's situation on freight network, and integration with the proposed Marong Freight Bypass Corridor network.
Potable Water	• Duplication of trunk water main from Bendigo system to existing Marong storage tank underway with capacity for BREP. • Additional storage tank and new water main extension to BREP required. • Marong IWMS to consider provision of recycled water.
Sewer	• Limited existing system capacity available for initial development. • 2.5 km of new sewer outfall required for initial connection to existing sewer system east of Marong. • Remainder of new sewer outfall to Epsom Sewer Treatment Plant required after existing capacity is utilised plus major plant upgrades. • Marong IWMS may consider new local Reclaimed Water Plant as an alternative to connection to Bendigo system.
Power	• Existing system capacity insufficient for initial development. • Upgrade of existing 22 kV feeder network required to provide 5MW of power. • Following the initial stage of development the ultimate development requires extension of 66 kV sub transmission line to a new zone substation on site. • Opportunity for development of a private network with onsite renewable generation which can reduce reliance on the grid network and potentially delay / reduce grid upgrades.
Telecommunications	• Minor Backhaul required.
Gas	• Provision of natural gas conflicts with BREP sustainability objectives, but is essential for most food industry operations. Victorian Government is transitioning away from Gas within diminishing local supply. Gas dependent industries will need to transition to biogas or hydrogen. • Existing gas reticulation suitable to supply BREP is over 7km from site if required.
Stormwater	• Corridors for existing watercourses provided for conveyance of existing flows through the site. • Stormwater detention & water quality treatment facilities proposed to maintain existing flows & protect downstream environment.
Earthworks	• Generally flat grades are conducive to industrial development. • Shallow existing drainage outlets require the site to be filled. • Low flow outfall pipes to Bullock Creek proposed for east catchment to minimise filling of this catchment.
Landscape	• Retention and protection of significant vegetation in O'Sullivans & Cemetery Roads and within the site. • Green links to be provided connecting open space and significant landscapes. • Landscape and nature to be prioritised in streetscape.

The Infrastructure Strategy has been incorporated throughout our strategy to facilitate Climate Resilience planning, Nature Positive development, Renewable Energy, and Circular Economy and Waste Minimisation.

Development Staging

Initial development is proposed in the north-east corner of Council's land with Council driving BREP and other key landowners showing no intention to lead industrial development of the land. The primary impost of this location for Stage 1 is the need to extend utility services along the Calder Highway Alternative from the north-east corner of the site to the Council land to service Stage 1. This is not considered to be significant.

The key infrastructure triggers for staging are:

- **Outfall sewer** – existing system capacity is estimated to allow for 7ha of development, following which major sewer works are required to provide the ultimate outfall that will service the whole development.
- **Power** – the upgrade of existing 22 kV feeder network required for initial development is estimated to allow for 28ha of development, following which extension of 66kV sub-transmission line and establishment of a new zone substation on site are required.

The above estimates of developable areas are based on estimated utility services loads for industry. The actual utility loads of the users in BREP will impact on the area that can be developed, as will any Integrated Water Management initiatives and alternative power supply strategies.

Based on the above we make the following key recommendations:

- Stage 1 should be located in the north-east corner of the Council land nominally 28ha in developable area to maximise development before major power upgrades are required.
- Scoping of the ultimate outfall sewer required for this initial stage size be progressed to understand critical constraints and timing, and to refine estimates of costs. The delivery of these works is expected to be on the critical path for the development of Stage 1.
- The Marong Integrated Water Management Study be expedited to determine if there are feasible alternatives particularly for the provision of outfall sewer for BREP.
- Alternative power supply strategies be pursued to maximise development before 66KV extension and zone substation required

The *Greater Bendigo Industrial Land Development Strategy* highlights the exciting potential of BREP as a transformative project to address industrial land shortages and support sustainable economic growth.

The project is progressing toward creating a nationally exemplary industrial precinct. This visionary industrial/commercial precinct integrates strategic transport connectivity, environmental sustainability, and tailored infrastructure to attract diverse industries.

While challenges remain, particularly in sewer and power infrastructure, innovative solutions like onsite renewable energy offer promising opportunities.

With strategic investment and phased development, BREP represents the key enabler in growth of Greater Bendigo's industries - creating a competitive and sustainable regional hub for business and employment.

The following additional items of work are identified as to refine the Infrastructure Strategy:

- Site contamination investigations at locations A3, A4, and A5 to identify any remediation requirements.
- Further discussions with Powercor to clarify HV reimbursements.
- Development of an earthworks grading model and strategy to confirm earthworks volumes which are a large component of the internal estimated construction costs.
- Expansion of the private energy feasibility assessment, including engagement with private network operators and potential modelling work.
- Refinement of external intersection costs and confirmation of cost-sharing and planning mechanisms for development.
- Identification of target industries to refine service demand requirements and establish control mechanisms where service capacity is limited.

9.

Appendices.

Appendix A Stormwater Reporting

Appendix B Transport Reporting