Figure 3: Visual Sensitivity Plan- Foreground and Middleground

WILSONS HILL ROAD
CALDER HIGHWAY
MARONG GOLF CLUB
MALONE PARK RECREATION RESERVE
WILSONS HILL NATURE CONSERVATION RESERVE
WILSONS HILL BUSHLAND RESERVE
500 M
1415 M
500M
BULLOCK CREEK
STERRY ROAD
BENDIGO REGIONAL PARK
DRY CREEK
WIMMERA HIGHWAY
500M
1645 M
1475 M
WILSONS HILL CHANNEL
1475 M
CEMETERY ROAD
500M
OSULLIVANS ROAD
MARONG CEMETERY
CALDER ALTERNATIVE HIGHWAY
MCKENZIE ROAD

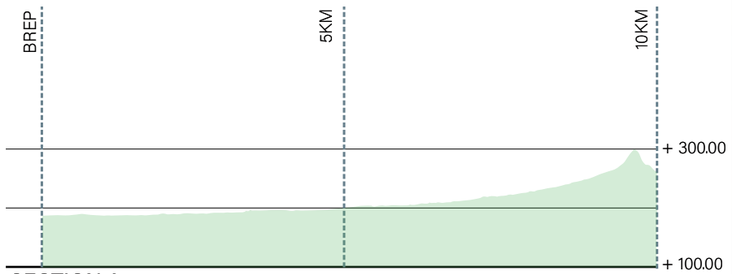
LEGEND

- Precinct Boundary
- Marong Township Boundary
- Parcel
- Watercourse
- Water Area
- Open Spaces
- Cluster of Existing Remnant / Road side Vegetation
- Low Priority for Visual Sensitivity
- Mid Priority for Visual Sensitivity
- High Priority for Visual Sensitivity
- Significant or High Value Vegetation
- Significant Places

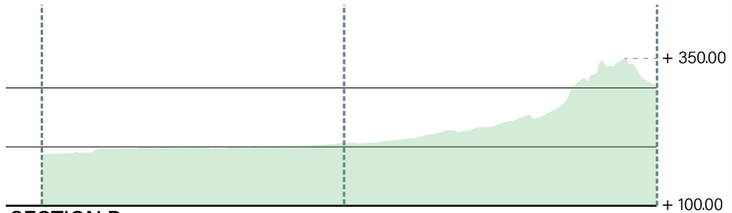
BENDIGO REGIONAL EMPLOYMENT PRECINCT

0 150 300 450 600 750m

spiire



SECTION A



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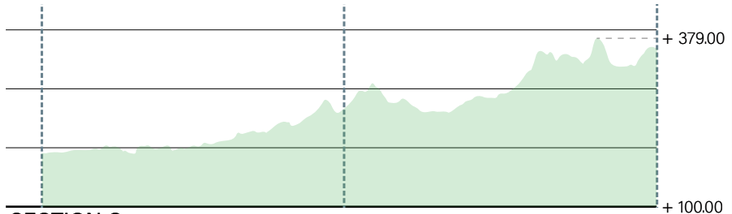

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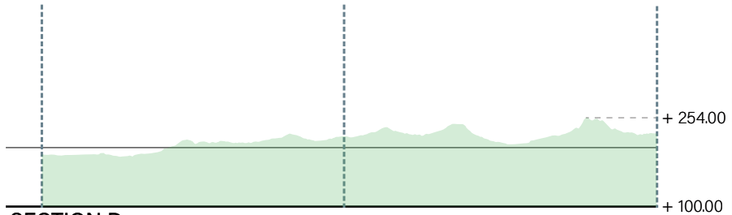

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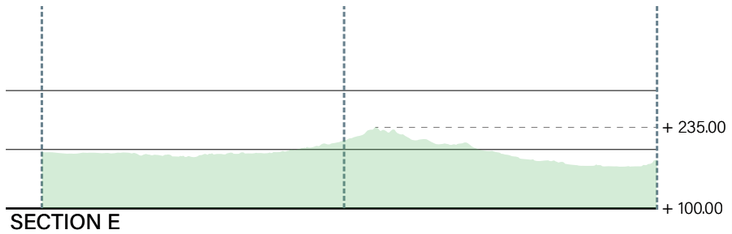


SECTION E

LEGEND

- Precinct Boundary
- Water Area
- Open Spaces
- Train Corridor

Roads

- Highway and Freeway
- Road
- Street

Figure 4: Visual Sensitivity Plan- Background

LEICHARDT NATURE CONSERVATION RESERVE
GREATER BENDIGO NATIONAL PARK
10KM
LEICHARDT
CALDER HIGHWAY
5KM
EAGLEHAWK
MARONG
CALDER HIGHWAY
WIMMERA HIGHWAY
BREP
BENDIGO
E
D
C
CALDER ALTERNATIVE HIGHWAY
KANGAROO FLAT
SHELBOURNE NATURE CONSERVATION RESERVE
A
B
BIG HILL
MANDURANG
LOCKWOOD STATE FOREST
LOCKWOOD
MOUNT HERBERT

BENDIGO REGIONAL EMPLOYMENT PRECINCT

0 1000 2000 3000 4000 5000m

spiire

4- STUDY CONTEXT

NATURAL ELEMENTS:

4-1-4 Vegetation

Within the activity area, two distinct pre-1750 bioregions exist: Victorian Riverina (EVC 803, plains woodland) and Goldfields (EVC 175, grassy woodland).

The existing vegetation of the site is mostly established, scattered indigenous trees within the road reserves, including remnant trees, as well as patches of remnant trees within the site.

An arboricultural assessment (ENSPEC, 29/03/2023) was undertaken which provides a good understanding of value of the existing vegetation across the study site.

A total of 3392 trees have been assessed out of which approximately 68% have high retention values and 6.5% have been assessed as critical retention value. As mentioned in the report these are remnant indigenous trees. *Eucalyptus microcarpa* covered 42% of the trees of the site.

A group of mature trees are located along the north-south axis of O' Sullivans Road, creating a great ecological corridor within the site with consistent spacing. 383 trees were assessed in this corridor with 88% described as critical and high retention value. The majority of these are *Eucalyptus microcarpa* and *Eucalyptus albens*.

This mature vegetation corridor is filtering views from east to west and vice versa with 12m the average height for the trees on this road. The youngest trees are 5-6m high and mature ones have maximum 21m height.

Along the east-west Cemetery Road, 940 out of 950 trees were assessed as critical and high retention value. The main species in this corridor is *Eucalyptus microcarpa* with *Eucalyptus melliodora* the second major species.

The vegetation along this road is not as consistent as O' Sullivans Road but have an average of 13m height and creates a vegetation buffer between BREP and the land to the south.

P10- O' Sullivan Road Vegetation Corridor View to South

P11- O' Sullivan Road Vegetation Corridor View to North

P12- High Value Vegetation Patch #1

P13- High Value Vegetation Patch #1

P14- High Value Vegetation Patch #2

P15- High Value Vegetation Patch #2

4- STUDY CONTEXT

NATURAL ELEMENTS:

4-1-4 Vegetation

Similarly with Calder Alternative Highway, the eastern boundary, a total 690 trees were identified, with 476 of these trees marked as critical and high retention value which indicate near 70% of the trees are worthy of retention. The average height of trees along this road is 13m and the majority of them are mature trees.

There have been 197 trees identified on Wimmera Highway roadside which forms the northern boundary of the site and continues and bends to form the western boundary, 133 of those trees have critical and high retention value.

Other than roadside trees that have most of the tree coverage on site and have a very high ecological value, two patches have the highest habitat values on the site and provide the most concentrated group of trees. The first patch is located on lot 1 Calder Alternative Highway (1\TP583727) with approximately 1.8ha area containing a mix of indigenous trees; *Eucalyptus albens, Eucalyptus microcarpa, Eucalyptus leucoxylon ssp. Pruinosa* and few *Eucalyptus melliodora.* A Wedge-tailed eagle nest was identified in one of these trees.

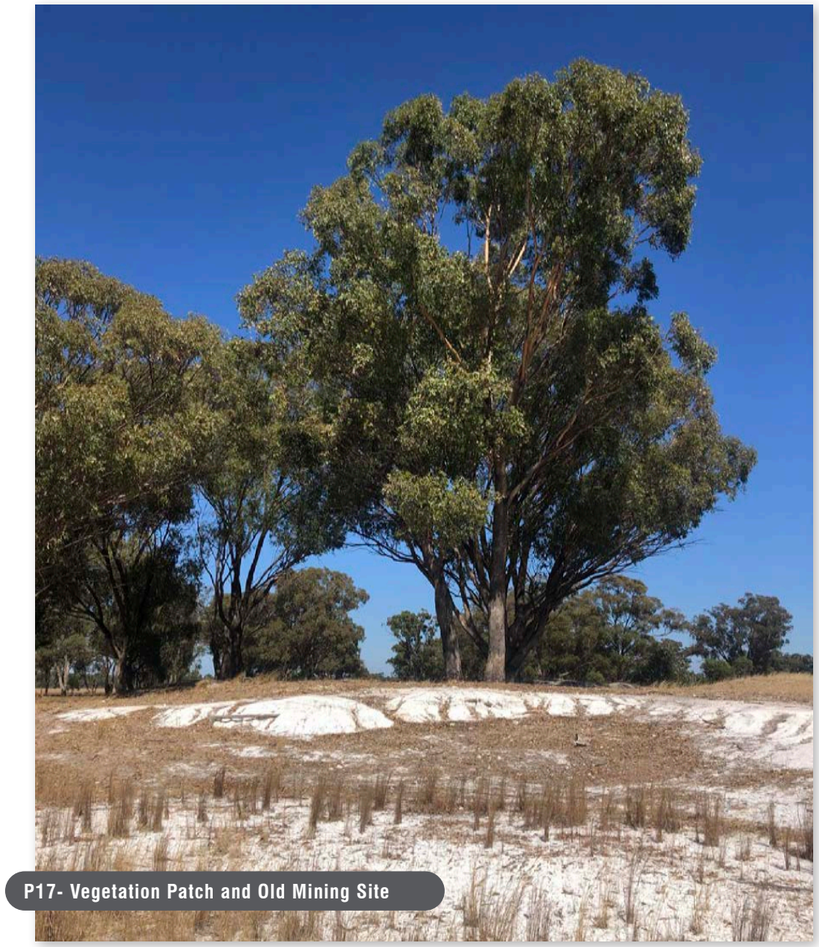
To the south, along Cemetery Road, the second patch of all indigenous trees is 2.7ha in size and mostly containing *Eucalyptus microcarpa* and *Eucalyptus melliodora.* This patch is located on the area that is identified as an old mining site.

There is a large population of mature indigenous trees near a watercourse located in the corner of Cemetery Road and Wimmera Highway; *Eucalyptus microcarpa* is the main species in this group. There are some established trees scattered in the vicinity of same group of trees that have been marked as high retention value.

There are also mature individual large trees with high and critical retention value which are spread across the site.

A cluster of exotic species are mainly found around the residential properties along Calder alternative Highway that has low to medium retention value is considered as having low landscape character value.

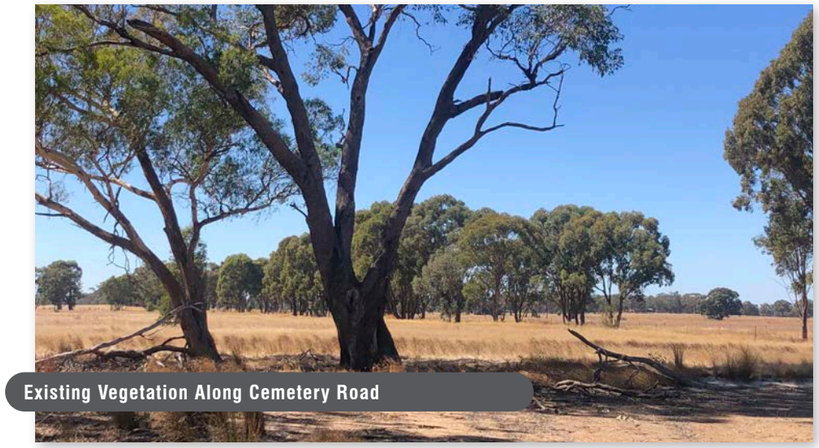
P16- Vegetation Patch and Old Mining Site



P17- Vegetation Patch and Old Mining Site

P18- High Value Vegetation Patch next to Old Mining Site

P19-Existing Young Vegetation Patch



Existing Vegetation Along Cemetery Road

Figure 5: Significant Vegetation and Heritage Plan

WILSONS HILL ROAD
WILSONS HILL NATURE CONSERVATION RESERVE
WILSONS HILL BUSHLAND RESERVE
MARONG GOLF CLUB
MALONE PARK RECREATION RESERVE
CALDER HIGHWAY
BULLOCK CREEK
STERRY ROAD
BENDIGO REGIONAL PARK
DRY CREEK
WIMMERA HIGHWAY
CLUSTER NO.1
WILSONS HILL CHANNEL
OBSERVED HISTORIC MINE ACTIVITY
CLUSTER NO.2
OBSERVED HISTORIC MINE ACTIVITY
CEMETERY ROAD
OSULLIVANS ROAD
MARONG CEMETERY
CALDER ALTERNATIVE HIGHWAY
MCKENZIE ROAD

LEGEND

- Precinct Boundary
- Marong Township Boundary
- Parcel
- Watercourse
- Water Area
- Open Spaces
- Cluster of Existing Remnant / Road side Vegetation Group
- Significant or High Value Vegetation
- Significant Places
- Observed Historic Mine Activity
- High Value Patch
- Area of Cultural Sensitivity

Tree Retention Value

- Critical Tree Retention Value
- High Tree Retention Value
- Medium Tree Retention Value
- Low Tree Retention Value

0 150 300 450 600 750m

spiire

4- STUDY CONTEXT

NATURAL ELEMENTS:

4-1-5 Water Form/ Hydrology

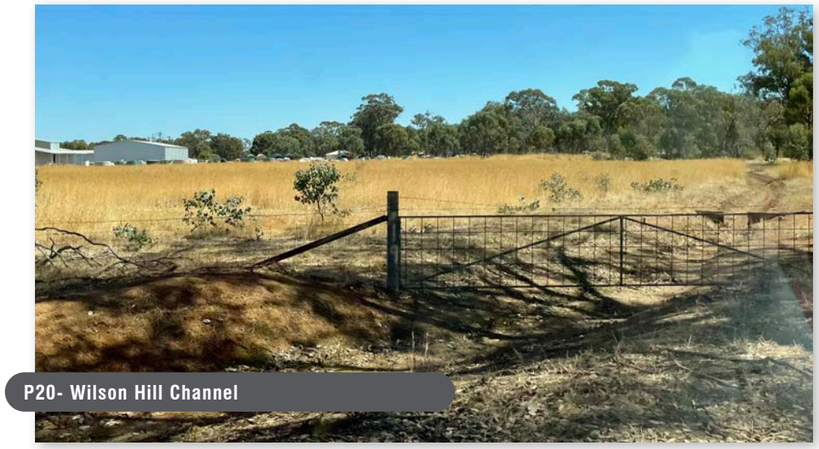
There is a man-made channel and 11 large dams formed on the properties for drainage and irrigation. The largest water bodies are found in Lot 6A-5\PP3068 next to the piggery. (Image P24)

Wilson Hill channel is a continuous depression from north-west corner to south-east, with one dam on the north-west corner; the WaterStore Poly Tanks property, and the other one at the end of the depression line on the south-eastern side.

The Wilson Hill channel is a narrow man-made channel with lowest point not exceeding 500mm in depth. Although this channel is running within the site, it is not considered as a one of the character values of the site.

Several dams across the site have been formed for their private use and have low character value. The other water course is an extension of Dry Creek entering to the south-west corner of the site, where a big concentration of trees is developed, and connects to the adjoining land to the south-west. A dam is constructed as part of the Dry Creek corridor (Image P23) and the other section of that is located on the other side of Cemetery Road. This permanent waterbody feels more natural due to the fact that is surrounded by vegetation and therefore adds to the landscape character value.

There is also a small waterbody near the high ecological value patch in the southern boundary along the Cemetery Road, which enhanced the quality of vegetation. This is the most natural looking waterbody and can be considered as a high value asset which should be retained to both enhance the ecology of the indigenous vegetation and preserve the heritage of the mining site. (Image P25)

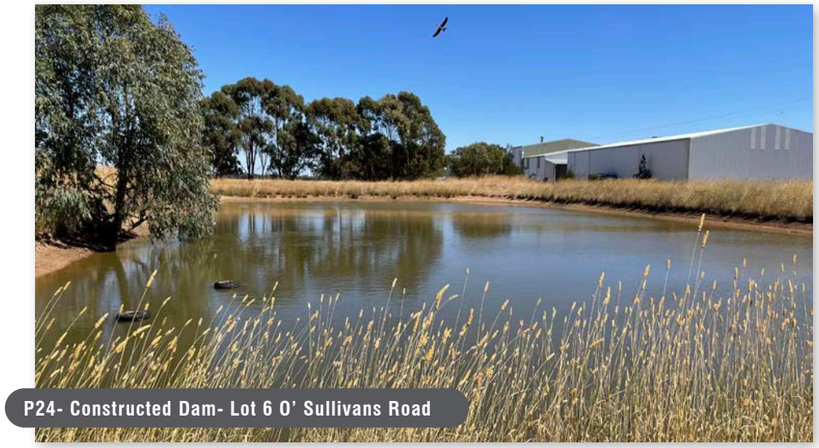


P20- Wilson Hill Channel

P21- Wilson Hill Channel next to Vegetation Patch

P22- Wilson Hill Channel

P23- Constructed Dam- Dry Creek



P24- Constructed Dam- Lot 6 O' Sullivans Road

P25- Constructed Dam within Vegetation Patch

4- STUDY CONTEXT

4-1 Existing Conditions:

4-1-6 Constructed Features

Light overhead power lines are placed on the northern boundary along Wimmera Highway and continuing to the north-eastern boundary. There is an overhead power line crossing the Calder Alternative Highway from south-eastern section of site and continuing to the south edge along Cemetery Road.

Within the study area, there are two residential farmhouses and one piggery site. The first farmhouse, located at 6B-5\TP381572, is owned by the family who also own the piggery site at 6A-5\PP3068. The second residential farmhouse, situated at 1\TP13152, is positioned atop the northern mound.

All of the constructed features are typical of rural agricultural landscape but don't have a strong character worthy of retention.

Piggery site 6A-5\PP3068

Residential at 1\TP13152

Waterstore Poly Tank- Industrial site at 7A-5\PP3068

4- STUDY CONTEXT

4-1 Existing Conditions:

4-1-7 Cultural and Heritage Elements:

BREP lies on the traditional lands of the Dja Dja Wurrung, with neighbouring Wergaia and Barababaraba language groups.

This area does not contain previously identified Aboriginal places directly within the activity area, but there are 17 such places located within a 5km buffer (Geographic Region). The closest Aboriginal place, a scarred tree, is situated approximately 220m to the north of the activity area. (Djandak, BREP Aboriginal Cultural Heritage Impact Assessment- ACHIA- 18/04/2023)

Although the land has undergone significant clearing, aerial imagery reveals pockets of dense trees and vegetation. A predictive model suggests a moderate to high archaeological value for the area, with a high point containing mature trees being the most archaeologically sensitive. (Djandak, 18/04/2023) (Vegetation Cluster #1- Refer figure 5)

Based on the Djandak report (07/06/2023), a Wedge-tailed Eagle nest, one of the current identified fauna, was captured on the site. Wedge-tailed Eagles hold significant cultural importance to the Dja Dja Wurrung community.

Threats known to the Wedge-tailed Eagle are lack of nesting sites due to clearing of land.

ACHIA desktop assessment highlights two other areas of mapped sensitivity: the eastern road reserve and the southwest corner, both in proximity to waterways. The eastern border, near Bullock Creek, features sizable native vegetation but no identified scarring. The southwest area around Dry Creek, despite initially suspected native vegetation suitable for cultural scarring, is heavily disturbed and contains sparse, young trees. (Djandak, 18/04/2023)

Based on the ACHIA report, no Aboriginal cultural heritage sites or places were found during the survey. Given the extensive historical land use and clearance, the likelihood of identifying culturally scarred trees within the activity area was lowered. The majority of the remaining activity area is considered to have moderate cultural heritage sensitivity.

4- STUDY CONTEXT

4-1 Existing Conditions:

4-1-7 Cultural and Heritage Elements:

Immediately Northwest of the site, the Wilsons Hill area contains several historic mining shafts and remnant cyanide processing works. The mining lease encompassing the Wilsons Hill area also extends into the north-western portion of the proposed site. This mining lease, MIN4273, owned by GBM Wilson Hill Ltd was surrendered in 2008 (GSV).

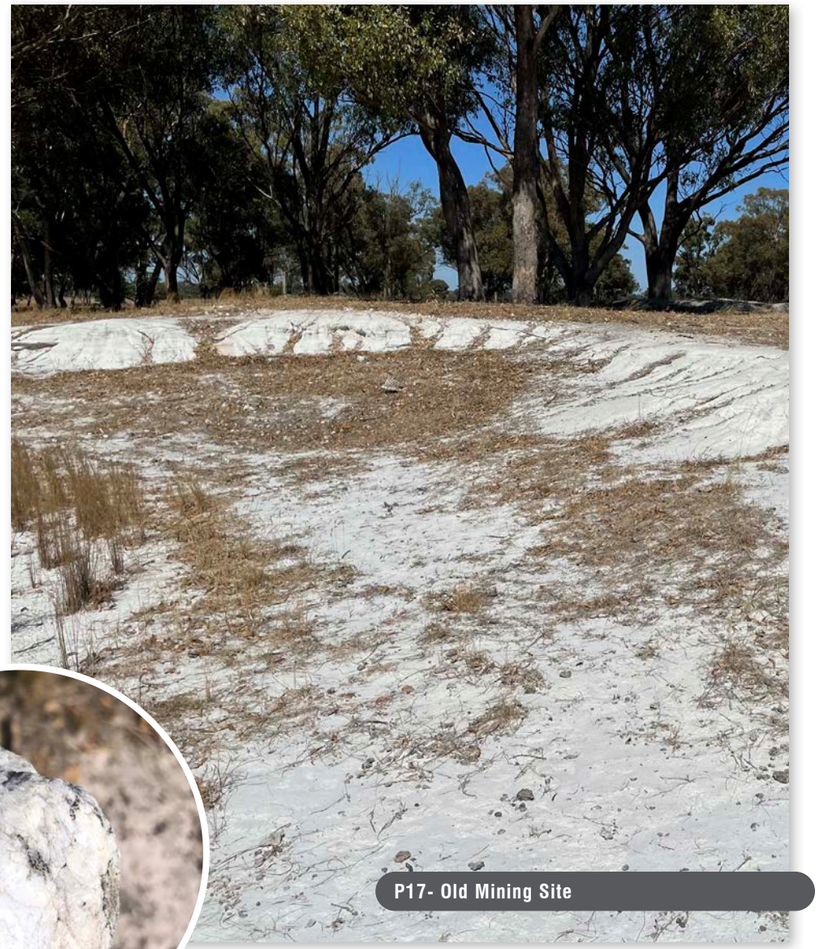
Signs of historical mining operations were noted in the southwestern area of the site. Piles of crushed quartz rock and nearby soils that seemed to have been leached, potentially resulting from gold processing activities. Based on the Land Capability Assessment (LCA) report (WSP, July 2023) observed features may be connected to the past mining operations.

Based on the previous activities on the site, potential contamination resulting from land use activities has been assessed in the LCA report as low, medium and high risk.

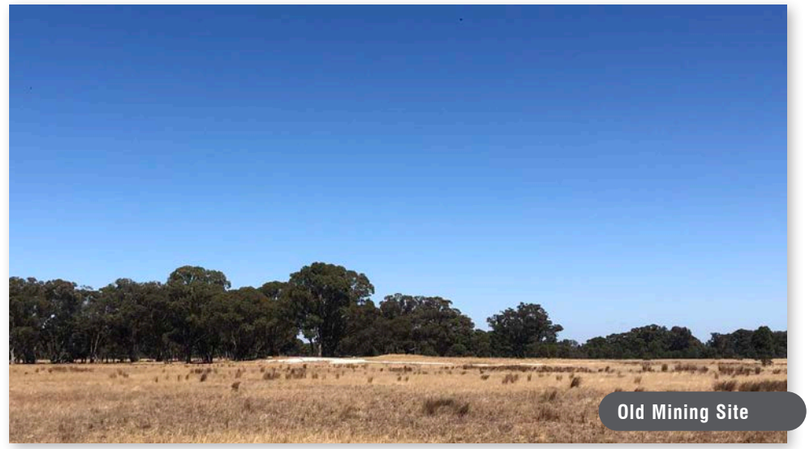
Zones identified as historical mining fall within the high contamination category.

Additionally, the Waterstore Poly Tank and the Piggery site are among the high-contamination sites listed as development constraints in the BREP. (WSP, July 2023)

Figure 5 captures the areas of historical mining, while Figure 6 displays the high-contamination zones.



P17- Old Mining Site

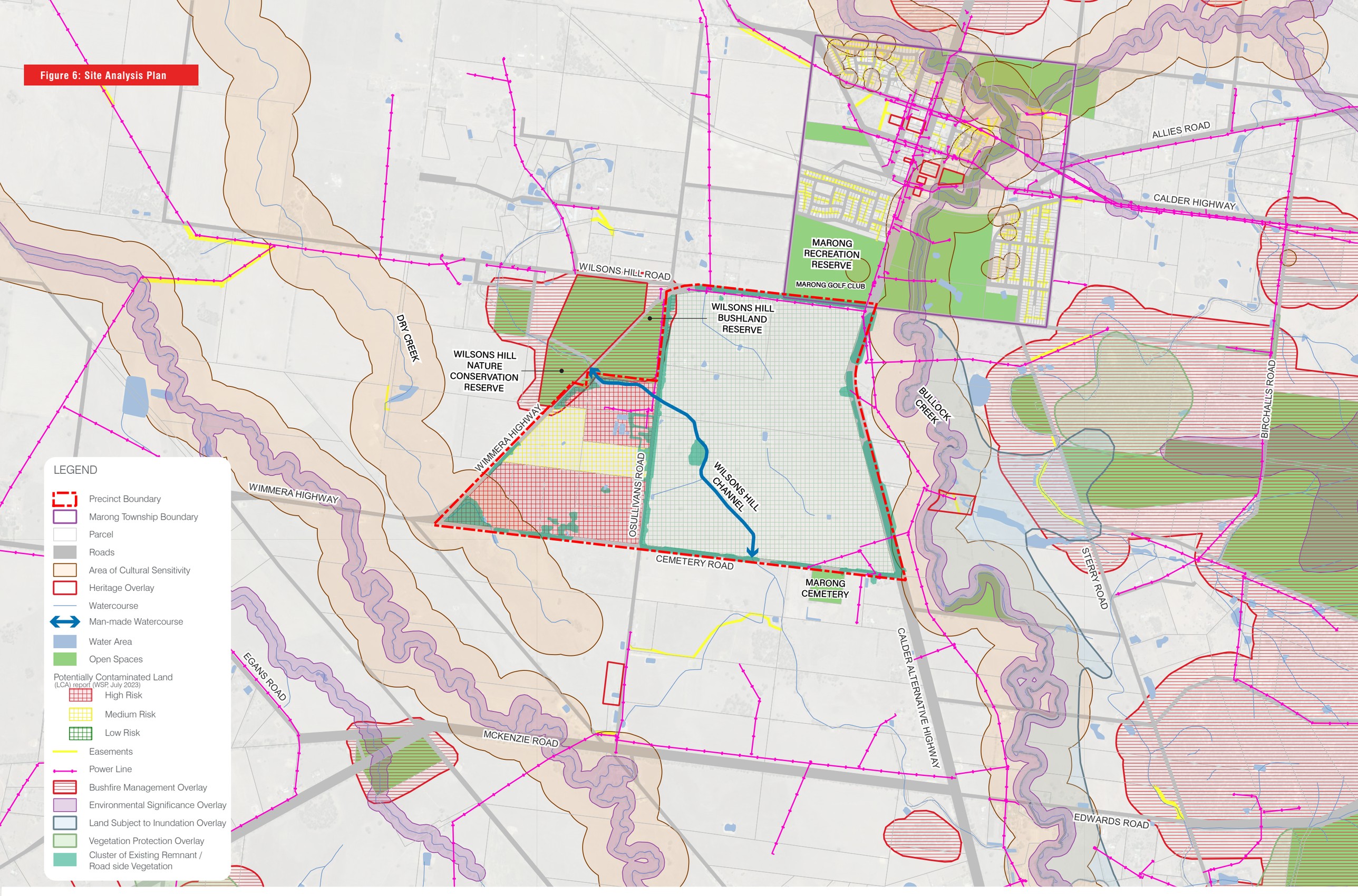


Old Mining Site

Quartz Rock

Piggery site 6A-5\PP3068

Figure 6: Site Analysis Plan



BENDIGO REGIONAL EMPLOYMENT PRECINCT

0 200 400 600 800 1000m

spiire

Figure 7: Existing Land Use Plan

MARONG TOWNSHIP
MARONG GOLF CLUB
MALONE PARK RECREATION RESERVE
WILSONS HILL NATURE CONSERVATION RESERVE
WILSONS HILL BUSHLAND RESERVE
BENDIGO REGIONAL PARK
MARONG CEMETERY
ALLIES ROAD
CALDER HIGHWAY
WILSONS HILL ROAD
WIMMERA HIGHWAY
DRY CREEK
BULLOCK CREEK
BIRCHALLS ROAD
WILSONS HILL CHANNEL
CEMETERY ROAD
OSULLIVANS ROAD
STERRY ROAD
CALDER ALTERNATIVE HIGHWAY
EGANS ROAD
MCKENZIE ROAD
EDWARDS ROAD

LEGEND

- Precinct Boundary
- Marong Township Boundary
- Parcel
- Watercourse
- Water Area
- Open Spaces
- Commercial
- Farming
- Industrial
- Public Use Open Space
- Residential
- Township
- Cluster of Existing Remnant / Road side Vegetation

BENDIGO REGIONAL EMPLOYMENT PRECINCT

0 200 400 600 800 1000m

spiire

4- STUDY CONTEXT

4-1 Existing Conditions

4-1-8 Edge Conditions

BREP is bounded by highways and roads to almost all corners. The only edge that is not defined by road is the southern boundary of Willsons Hill Bushland Reserve with the northern boundary of the existing industrial site; 'Waterstore Poly Tanks'.

The majority of the edges have significant mature vegetation cover. Calder Alternative Highway, two bond asphalt road to the east with a relatively consistent tree coverage along the road formed a great canopy cover except where the only residential lot exists. The eastern boundary mostly comprises farmland with just one residence facing the highway. Vegetation along Calder Highway has less understorey vegetation so the subject is more visible from the road.

Farmlands also front the Wimmera Highway on the northern boundary, with open recreational reserve (Golf Club) on the adjoining land to the north. Wimmera Highway also has a two-bond asphalt finish and continues and bends to the western boundary with the same width and finish. Vegetation cover in this road is not as dense and consistent as Calder Alternative Highway but provides a good tree canopy along the road.

Wimmera Highway continues to the west boundary and sporadically has vegetation cover. The southern section of road and northern section where adjoining the Willsons Hill Bushland Reserve have mature dense vegetation cover and provide a great vegetation buffer that is on a bushfire management overlay and screens the industrial site located on the southern boundary of Willsons Hill Bushland Reserve. The vegetation on the Wimmera Highway at the Wilson's Hill site contains more understorey species making views into the site less open.

The top section of O' Sullivans Road, the unsealed road, forms a section of the western boundary which is rich in vegetation and has a mature tree coverage adjoining to Willsons Hill Bushland Reserve.

Cemetery Road another unsealed road on the southern edge has a relatively consistent vegetation cover. There are also two significant vegetation patches along the road mainly on the western section of the road which added a great ecological value to this site. Farmlands mainly covered either side of the road and Marong cemetery, a public use zone, to the southern boundary.

P26- O'Sullivans Road

P27- Wimmera Highway- North

P28- Cemetery Road

P29- Calder Alternative Highway

Figure 8: Edge and Interface Conditions Plan

WILSONS HILL ROAD
CALDER HIGHWAY
WIMMERA HIGHWAY
CEMETERY ROAD
OSULLIVANS ROAD
MCKENZIE ROAD
CALDER ALTERNATIVE HIGHWAY
STERRY ROAD
DRY CREEK
BULLOCK CREEK
WILSONS HILL CHANNEL

WILSONS HILL NATURE CONSERVATION RESERVE
WILSONS HILL BUSHLAND RESERVE
MARONG GOLF CLUB
MALONE PARK RECREATION RESERVE
MARONG CEMETERY
BENDIGO REGIONAL PARK

190
195
200

LEGEND

- Precinct Boundary
- Marong Township Boundary
- Local Road (unpaved)
- Highway
- Parcel
- Watercourse
- Water Area
- Open Spaces
- Cluster of Existing Remnant / Road side Vegetation
- Visual Connection
- High Visibility with Partial/ Obstructed View
- Low Visibility to No Visibility

BENDIGO REGIONAL EMPLOYMENT PRECINCT

0 150 300 450 600 750m

spiire

5- BREP LANDSCAPE CHARACTER

The BREP site comprises of two different character areas.

Character Type A: Open Vista Agricultural Zone

The majority of the site is considered agricultural with a flat topography, and minor undulating surfaces with high visibility across the site. This character type is common within the state of Victoria.

Character Type B: Roadside Canopy

The Roadside Canopy character of the site has been formed by the existing mature indigenous trees on the roadsides with significant patches merging with the roadside vegetation of Cemetery Road on the south-west corner and two individual high value vegetation patches forming a great natural amenity on site.

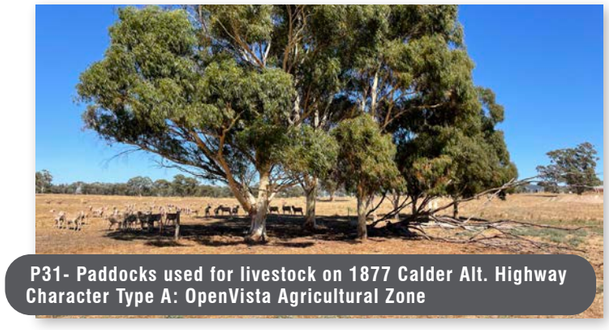
The average height of the significant ecology patch on Lot 1 Calder Alternative Highway is 13m and 17m is the average height of the high value vegetation patch along Cemetery Road on the southern boundary.

The overall vegetation height on the roadside is also near 12m which can be seen from any corner. As the topography of the site is relatively flat, these vegetation patches are the bold natural features of the site. These patches also characterise the indigenous landscape prior to settlement and given how much of the site has been cleared for farming, are precious remnants providing vital habitat for native fauna.

The specific species identified along with the associated fauna relying on them contribute to the bio-diversity, character and identity of the Bendigo region and Victoria at large.

The combination of agricultural land mixed with native vegetation is a strong character type that is recognisable in regional Victoria however, it is more so the native vegetation that provides the connection to place, than the cleared pasture land and thus this is the significant character type to retain.

P30- Livestock on 41 O'Sullivans
Character Type A: OpenVista Agricultural Zone



P31- Paddocks used for livestock on 1877 Calder Alt. Highway
Character Type A: OpenVista Agricultural Zone

P34- Windmill in the boundary of Lot 1

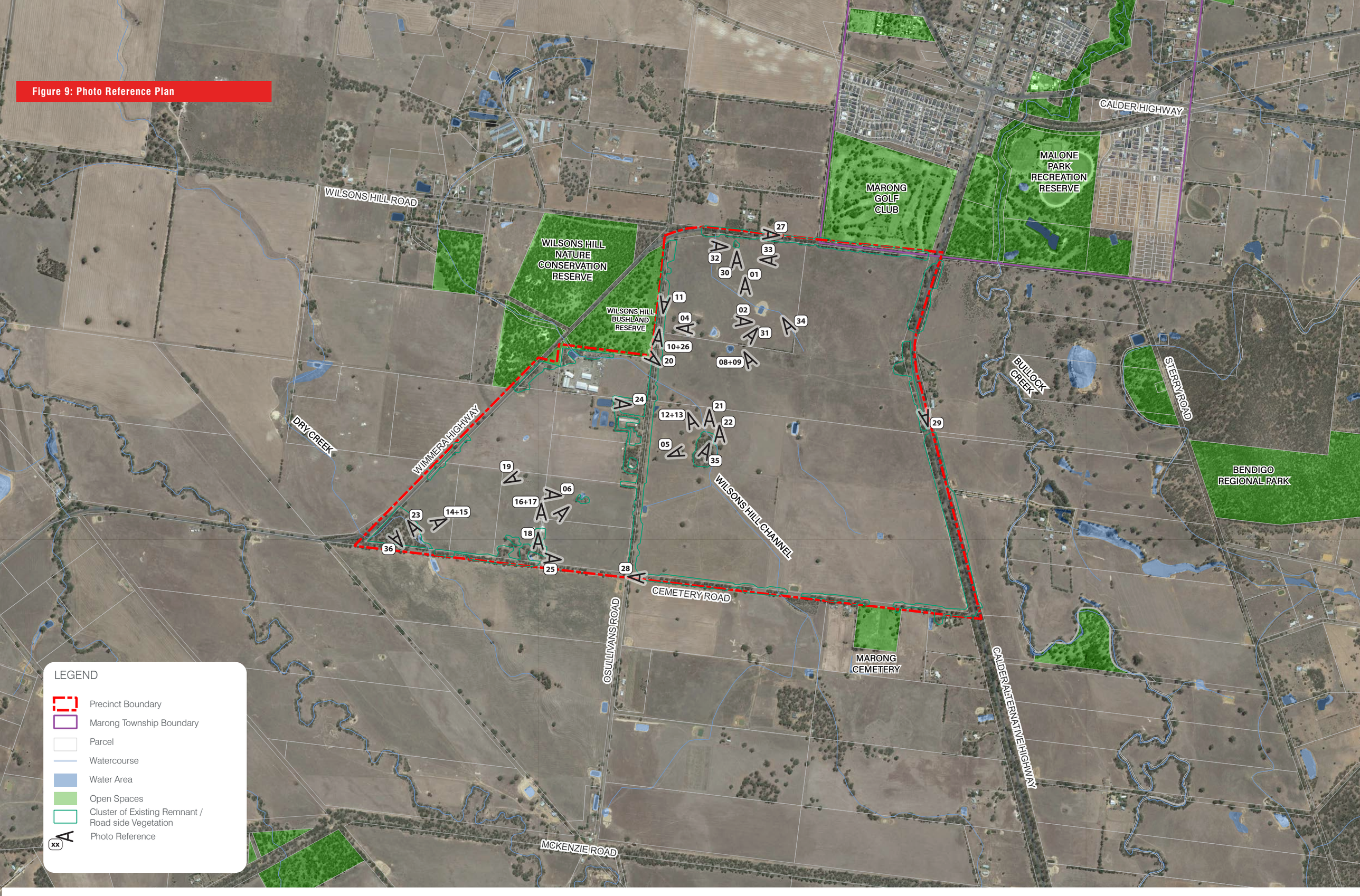
P32- Consistent ring of trees around the boundary of the site
Character Type B: Roadside Canopy

P35- Existing High Value Vegetation

P33- Tree along Calder Alternative Highway
Character Type B: Roadside Canopy

P36- High Value Vegetation Patch

Figure 9: Photo Reference Plan



LEGEND

- Precinct Boundary
- Marong Township Boundary
- Parcel
- Watercourse
- Water Area
- Open Spaces
- Cluster of Existing Remnant / Road side Vegetation
- Photo Reference (xx)

BENDIGO REGIONAL EMPLOYMENT PRECINCT

0 150 300 450 600 750m

spiire

6- PLANNING CONTEXT

6-1 Marong Township Structure Plan (September 2020)

6-1-1 Future Planning for BREP

Based on the Marong Township Structure Plan, there are two significant assets planned within the BREP site. There is a major drainage asset proposed along the northern section of Wimmera highway which is subject to investigation. And next to that a neighbourhood park has been identified. Also within the site boundary is land under investigation for use including the western freight corridor

The key township entrances are also proposed on the boundaries of BREP. There is one on the northwest corner along the Wimmera Highway and the other one at the Calder Alternative Highway.

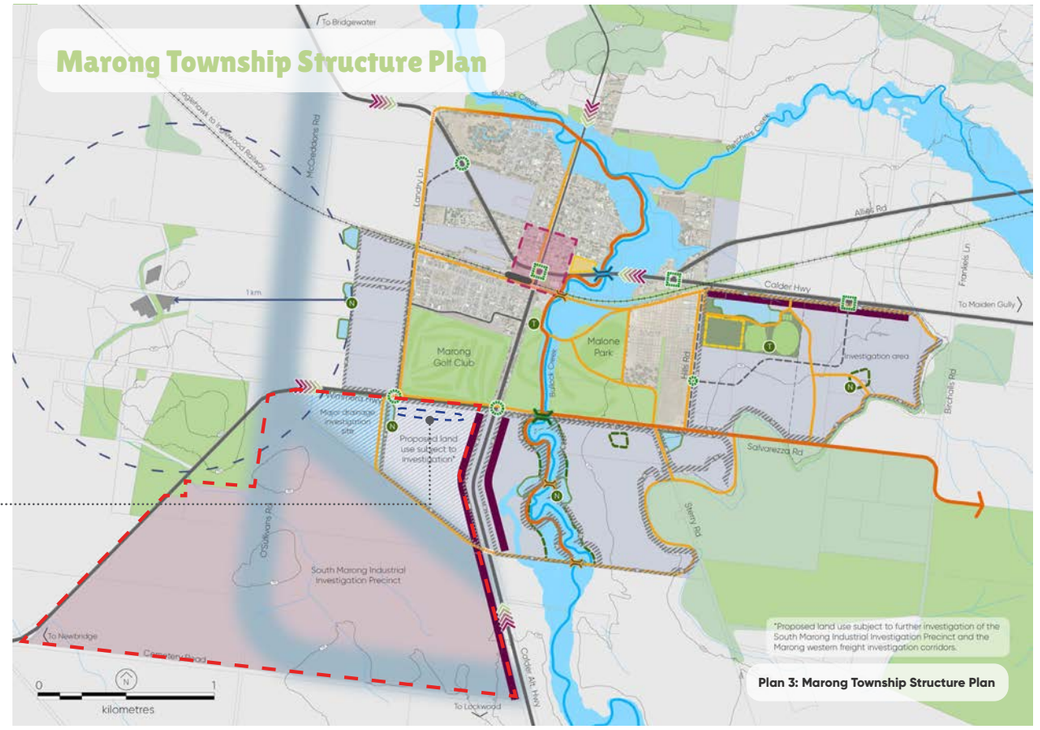
Significant roadside vegetation is notably present along the northern stretch of O'Sullivans Road. Additionally, two areas of heritage significance are identified: one on the eastern side of the Calder Highway, adjacent to BREP, and the other within the Wilsons Hill Natural Conservation Reserve, both of which lie outside the boundaries of BREP. The Western side of Calder Alternative Highway within BREP and the northern section of the eastern verge is designated as a key interface with the rural highway.

A 20-meter bushfire setback is assigned to the northern segment of the Calder Highway and the northeastern portion of the Wimmera Highway. Adjacent to the northern side of the Wimmera Highway, there is an allocation for future residential development, also incorporating a 20-meter bushfire setback. Furthermore, within the southern section of the Marong Golf Club area, there is a proposal for suitable locations for medium-density residential development.

Within the northern part of BREP, a secondary public space network (local) has been planned, featuring a 19-meter bushfire setback along its western and southern sections. This network is designed to create a loop connecting the Wimmera Highway to the Calder Alternative Highway.

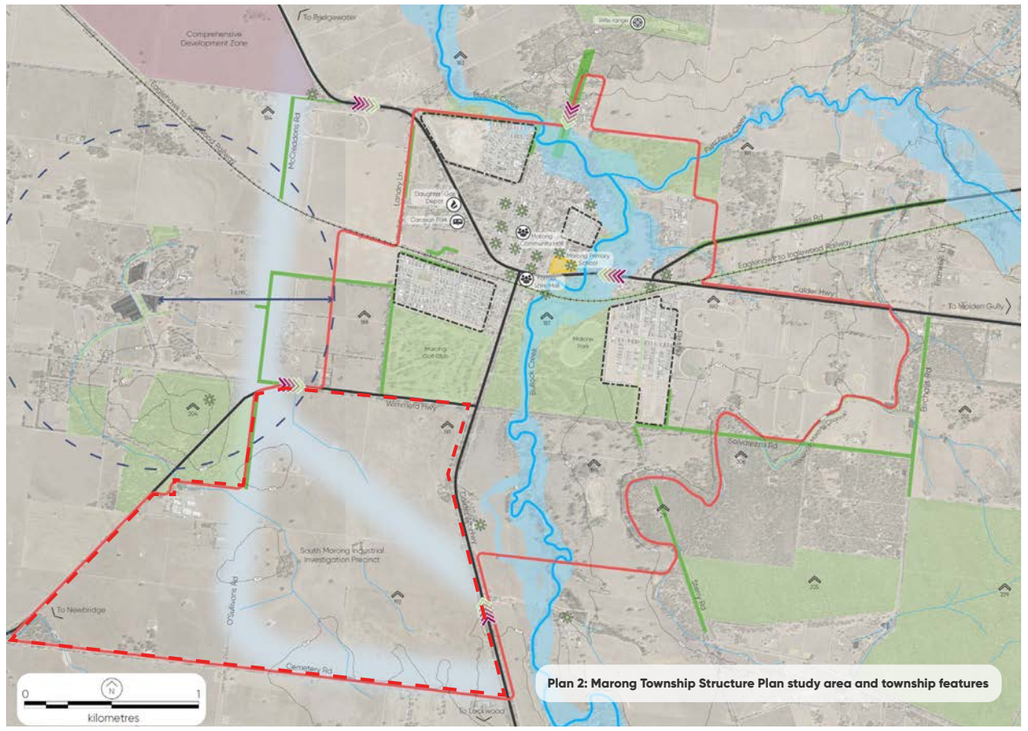
The Marong Western Freight Investigation Corridor has also been planned to intersect with BREP along O'Sullivans Road and continue on to Cemetery Road, potentially resulting in significant consequences for the existing roadside vegetation and the valuable ecological patch #1.

Areas appropriate for medium density residential development



Marong Township Structure Plan Legend

- Future residential development areas
- Required bushfire setback and distance in metres
- Town centre
- Private forest
- Crown land
- Encumbered land to be used as open space
- Potential site for new government school and sports fields
- Indication of potential school size
- Existing Marong Primary School
- South Marong Industrial Investigation Precinct
- Neighbourhood and township parks
- 1% AEP (1 in 100 year flood event)
- No land use changes proposed
- Key township entrances
- Intersection upgrade - traffic signals
- Intersection upgrade - roundabout
- Key interface with rural highway
- Rail
- Marong western freight investigation corridors
- Existing arterial and sub-arterial road
- Existing collector road
- Proposed collector road
- Proposed railway station
- Primary public space network (district)
- Secondary public space network (local)
- Creeks
- Proposed retarding basin
- Major drainage investigation site
- 1km buffer from broiler farm
- 195 and 200 metre contour lines
- BREP Boundary



Study Area and Township Features Legend

- Marong Township Structure Plan study area
- Main roads
- Creeks
- Other waterway
- 1% AEP (1 in 100 year flood event)
- Rail
- Crown land
- 195 and 200 metre contour lines
- Elevation reference points (in metres)
- Significant roadside vegetation
- Places of heritage significance
- Marong western freight investigation corridors
- Key township entrances
- Existing Marong Primary School
- Places of heritage significance
- Recently constructed and/or approved residential development
- 1km buffer from broiler farm
- BREP Boundary

6- PLANNING CONTEXT

6-2 Planning Considerations for the Future Development

6-2-1 Municipal Planning Strategy

The following section summarises the key planning policies and controls which are of relevance to this report.

Clause 02.03 Strategic Directinos	
Clause 02.03-1 Settlement	- Support rehabilitation of former mining land for development, including residential development. - Avoid development in bushfire and flood prone areas, unless risk can be managed. - Protect agricultural land and high value environmental areas from development.
Clause 02.03-2 Environment and landscape values	Environment and landscape features in Greater Bendigo include: - Areas of native vegetation on roadsides, waterways and gullies that create habitat and wildlife corridors surrounding Bendigo. - Large old trees and an undisturbed ground layer.
	The strategic directions for environment and landscape values are: - Enhance the sense of the Bendigo urban area being 'A City in Forest' that is created by extensive forest areas and roadside vegetation. - Develop biolinks and habitat corridors to connect areas of environmental significance. - Improve the health of streams and watercourses and land adjacent to develop their role as important community assets. - Protect gullies as an important part of the waterway network in providing habitat for flora and fauna
Clause 02.03-3 Natural environmental risks	Former mine sites have left a legacy of contaminated land across Bendigo. It is a challenge to remediate this land to be suitable for other uses, particularly residential development. The strategic directions for natural environmental risks are: - Ensure new development manages the risks from legacy mining contamination.
Clause 02.03-5 Built environment and heritage	The key built environment and heritage issues for Greater Bendigo are: - Creating healthy environments. - Protecting neighbourhood character and heritage assets while encouraging infill development. - Supporting environmentally sustainable development.
	The strategic directions for heritage are: - Protect the city's valuable sites, places and features of natural, archaeological, and cultural heritage significance. - Protect sites of heritage and cultural significance to the Dja Dja Wurrung and Taungurung people.
Clause 02.03-7 Economic Development	The strategic directions for economic development are: - Plan for the future growth of the industrial sector by providing zoned land in appropriate locations and lot configurations.

7- RELEVANT CASE STUDIES

1. Western Sydney Employment Area (WSEA)

The WSEA is located in the western suburbs of Sydney, New South Wales, and it represents a significant industrial precinct development project that aimed to balance economic development with environmental conservation.

Project Overview:

Location: Western Sydney, New South Wales, Australia.

Background: The Western Sydney region experienced rapid urban and industrial growth. To accommodate this growth, the New South Wales Government identified the need for additional employment land. However, this area also contains important ecological communities and remnant vegetation.

Key Features:

Environmental Considerations: The project planners recognised the significance of the Cumberland Plain Woodland, an endangered ecological community, which includes remnant vegetation. Protecting this vegetation was a priority to maintain biodiversity and ecological values.

Balancing Development and Conservation: The project aimed to strike a balance between industrial development and environmental conservation. Special environmental zones and offset programs were established to protect and enhance the local environment. This included the preservation of critical remnant vegetation areas.

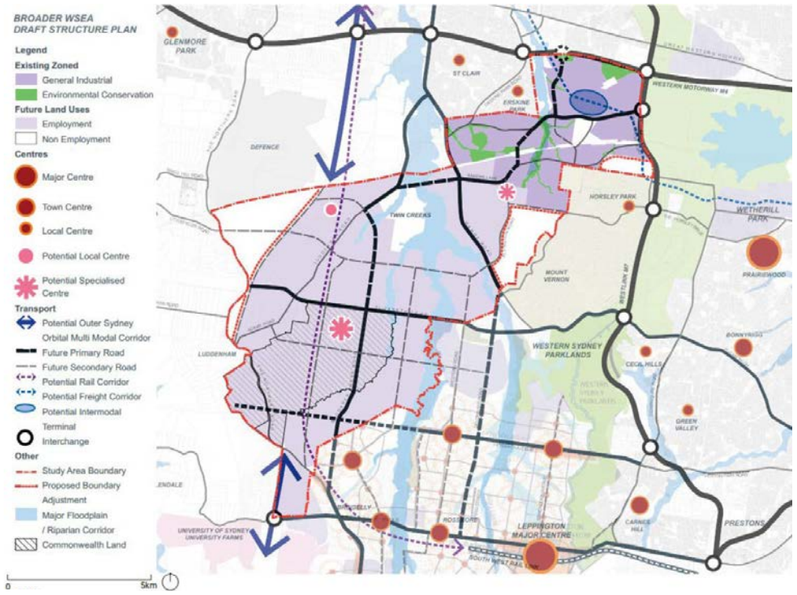
Sustainable Practices: The development incorporated sustainable design and building practices to minimise the impact on the environment. This included water-sensitive urban design, energy-efficient infrastructure, and green building techniques.

Infrastructure: Adequate infrastructure, such as roads and utilities, was developed to support industrial activities in the area.

Employment Opportunities: The project aimed to create significant job opportunities in the region, promoting economic growth.

Outcome:

The Western Sydney Employment Area successfully accommodated industrial development while conserving remnant vegetation and important ecological communities. This project serves as an example of how industrial development and environmental conservation can coexist through careful planning and sustainable practices.



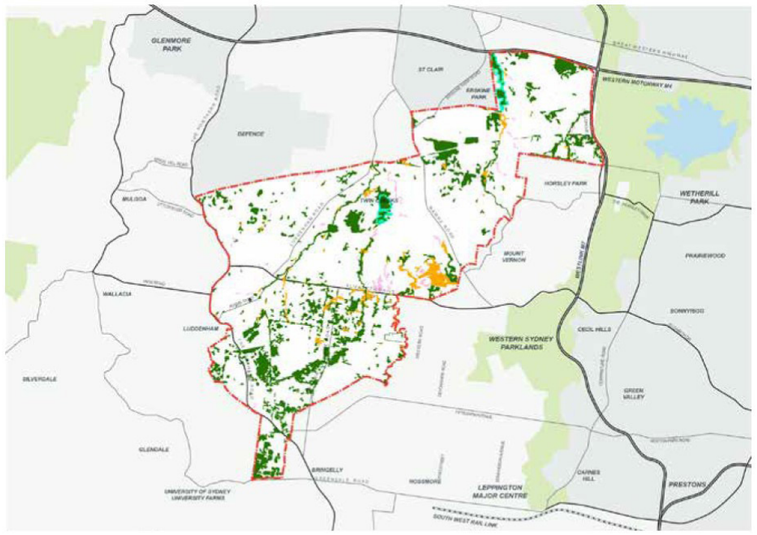


Figure 14 Conservation Significance

Broader Western Sydney Employment Area (WSEA)

Cumberland Plain Priority Conservation Lands

Conservation Significance status

Core

Support for Core

Urban Remnant Trees

Other remnant vegetation

Source: Broader Western Sydney Employment Area- Draft Structure Plan- June 2013

7- RELEVANT CASE STUDIES

2. Eastern Creek Business Park, New South Wales

The Eastern Creek Business Park is an industrial and logistics hub located in Western Sydney, New South Wales. It is a prime example of sustainable industrial development within an area that includes existing vegetation.

Project Overview:

Location: Eastern Creek, New South Wales, Australia.
Project Scope: Development of an extensive industrial estate.
Existing Vegetation: The site contained pockets of remnant vegetation, including native grasslands and scattered trees.

The Eastern Creek Business Park project aimed to transform a large parcel of land into a modern industrial estate while preserving and enhancing existing remnant vegetation. The development was strategically planned to minimise its environmental impact and promote sustainability.

Environmental Conservation Measures:

Vegetation Preservation: Portions of the site's native grasslands and individual trees of ecological significance were identified and preserved.

Landscaping and Buffer Zones: The development incorporated extensive landscaping and buffer zones to protect and integrate the existing vegetation into the estate.

Stormwater Management: Sustainable stormwater management practices were implemented to prevent contamination of water bodies near the site and protect the natural environment.

Biodiversity Enhancement: The project included initiatives to enhance local biodiversity through planting native species and creating wildlife corridors.

Benefits:

Economic Growth: The Eastern Creek Business Park has contributed to economic growth in the region by attracting businesses, creating jobs, and supporting the logistics and warehousing industry.

Environmental Conservation: The project showcased how industrial development could coexist with remnant vegetation, preserving local ecosystems and biodiversity.

Sustainability: Sustainable practices within the park, including energy-efficient buildings and stormwater management, set an example for environmentally responsible industrial development.

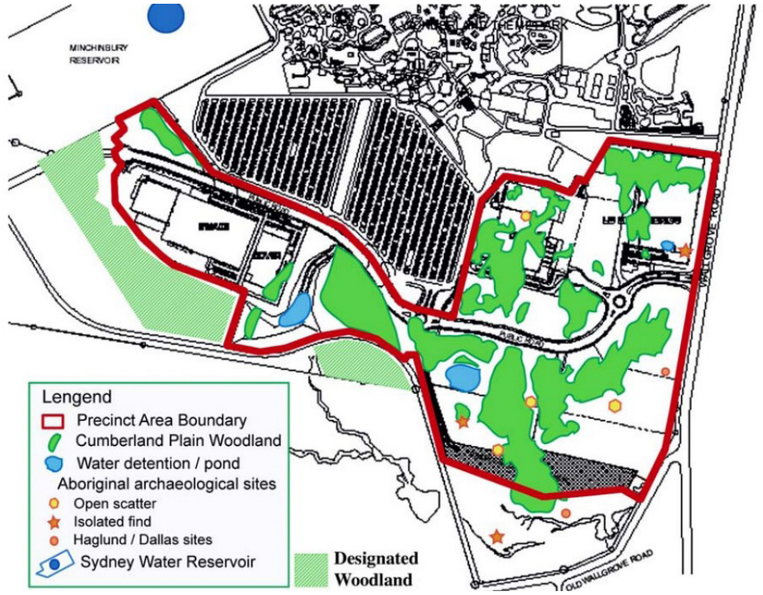
Challenges:

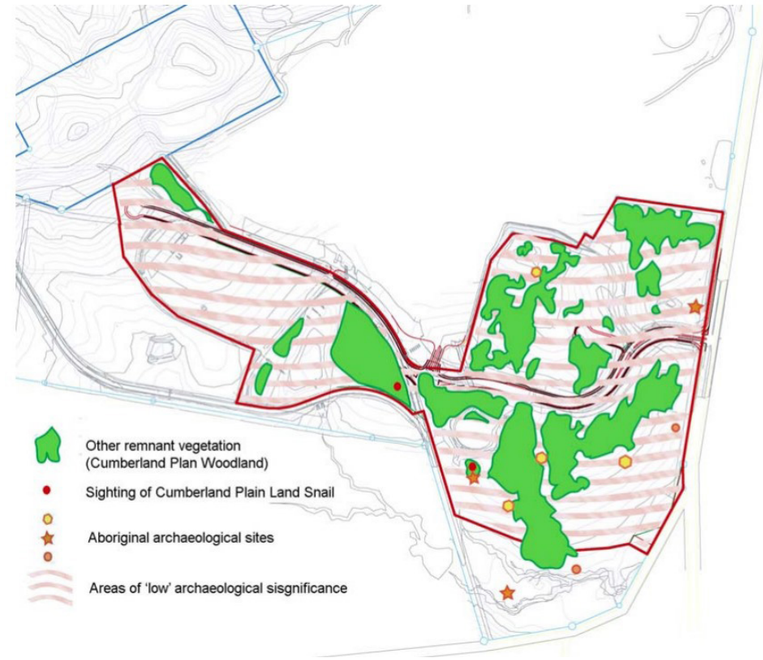
Balancing Development with Conservation: One of the key challenges was finding a balance between industrial development and the preservation of existing vegetation.

Infrastructure and Traffic: Managing increased traffic and infrastructure demands in the area while minimizing environmental impact required careful planning.

Conclusion:

The Eastern Creek Business Park serves as a successful case study of industrial development within existing vegetation in Australia. It demonstrates that with careful planning, sustainable practices, and a commitment to environmental conservation, industrial estates can coexist harmoniously with natural environments.





Source: Eastern Creek Business Park- Precinct Plan- Blacktown City Council- June 2004

8- CONCLUSION AND RECOMMENDATIONS

The following chapter is derived from the analysis of the above-mentioned information. The recommendations are provided in line with the existing landscape character of the site and the arboricultural report.

Existing mature roadside vegetation provides a natural buffer that can mitigate the impact of the proposed future development. Given this is proposed industrial/employment, this buffer needs to be retained and protected to preserve the natural rural character of the area as best as possible and soften the interface between different land-uses i.e. between built-up industrial/commercial, unbuilt-up residential, recreational and conservation areas.

The development of the site should be sensitive to the remnant vegetation patches within the site and across the edges in a setting that built forms do not encroach to these areas so as to protect the ecological values.

A non-intrusive and neutral material palette can mitigate adverse impacts of industrial sites and can blend smoothly with the surrounding landscape character reducing the visual impact as a backdrop to the remnant tree rows.

8-1 Landscape Character

- Retain gentle undulating topography and enhance the ecology of existing vegetation patches that have been assessed and identified in the arboricultural report as critical and high retention value by aligning the urban design layout.
- Retain high visibility throughout the site by considering view lines in the design of the public realm where appropriate. i.e. Straight roads and consistent building setbacks help facilitate view lines.

8-2 Land Use

- As the vegetation on the north-south axis of O' Sullivans Road consists of mature tall trees, the precinct has been spatially and visually divided in to two separated zones. The vegetation on this axis creates a green filter in such that the visibility from east to west and vice versa is encumbered. This feature could separate different land use on eastern and western parcels.
- The eastern parcel is larger in size and its boundaries are defined mainly by sealed and unsealed roads and mature roadside vegetation. Adjacency to Calder Alternative Highway and northern Wimmera Highway as the main arterial road connecting BREP to the Marong township provides excellent access to the future employment precinct as oulined in the Marong Township Structure Plan as a Key Township Entrance.
- The western parcel has two main high value vegetation patches and also the Wilsons Hill Bushland Reserve adjoining its northern boundary. This provides a greater tree canopy coverage to the western portion. This spatial arrangement has formed an ideal site for smaller industrial sites which could allocate less landscape areas within their boundary.
- Retention of the historic mining/quarry site located within the high value vegetation patch along Cemetery Road. This will preserve potentially historically significant and ecologically important landscape. Provide pedestrian and visual connection where appropriate. This area can be protected for future open spaces.
- Development that is in harmony with the rural landscape of Marong is encouraged; providing wider road reserves and/or greater setbacks and indigenous species for front landscape can form this quality.
- Bushfire protection measures to be implemented along the Wimmera Highway on the western boundary; provide gravel verges and boulders in the nature strips fronting the Wilsons Hill Bushland Reserve. Bushfire management requiremnets to be informed by CFA advice.

8-3 Waterbodies

- It is highly recommended to extend and improve the water assets within the site, especially the two water assets located in the southern boundary of the western zone closer to Cemetery Road.
- It is highly recommended not changing the hydrology around the existing high value vegetation patches and trees.
- Development along water features should be faced toward them for passive surveillance. This also assists with activation of open space to maximise amenity value.

8-4 Landform

- Retain the undulating topography of the site to help with natural drainage and minimising any disruption on the landform and tree protection zones as some of the existing high value vegetation patches are formed around the undulating topography.
- Utilise high points as a platform to provide viewing and way finding opportunities
- Shape and position the road to align with the visual sightlines while ensuring that the existing vegetation and clusters of high-value vegetation remain undisturbed.
- Ensure Flora and Fauna Reserves or Vegetation Protection Overlays are adequately sized to ensure no earthworks impact the trees/ Tree Protection Zones.

8-5 Vegetation

- Retain and protect identified critical and high value trees along the roadsides and the patches within the site. Roadside vegetation creates an established green buffer to adjoining land and gives a defined boundary for the precinct whilst scattered trees or patches of trees provide opportunity for reserves and retaining the character within the site.
- Retain and protect the individual high value trees within the site where possible and connect them to create linear open space between eastern and western zones that can form biodiversity corridors to support native fauna.
- The green belt along the roadside could be considered as the landmark of this precinct and form the character of this site. It is highly recommended to plan BREP in a way to celebrate and improve the quality of this character.
- Form an ecology corridor on O' Sullivans Road and Cemetery Road to enhance the quality of mature indigenous trees.
- Provide a landscape buffer hierarchy (high, medium, and low planting) around the proposed ecology corridors for a smooth transition to adjoining lands and not be detrimental to the health of the existing trees.
- The current vegetation lining O'Sullivan Road presents an ideal opportunity for a pedestrian and cycling pathway. To maintain this unique character, it is recommended that the new road reserve be relocated away from the existing one.
- Create a landscape buffer or waterway corridor to the south of Wilsons Hill Bushland Reserve to boost the Wilson Hill Channel water asset and add to the ecology of the existing vegetation of Wilsons Hill Bushland Reserve as well as defining the boundary of site.
- Consider engaging an ecologist to assess landscape buffer requirements for retained landscape assets, with a particular focus on fauna habitat in Cluster 1.
- As industrial precincts typically have expansive areas of pavement and low vegetation and tree cover, by providing green links, corridors, reserves and increasing tree canopies within the eastern zone of the site, the Urban Heat Island (UHI) can be mitigated once the hardscapes and buildings are built on the site.
- Provide greater vegetation screening along Calder Alternative Highway and northern Wimmera Highway interface to mitigate views into the large industrial lots facing the Calder Alternative Highway.
- New plantings within the site both in Reserves and the private realm, should support native ecological and biodiversity values. Namely through the use of a predominantly indigenous planting palette with sufficient space to accommodate large indigenous trees.
- The large-scale warehouses synonymous with the proposed development would have high visual impact and change the skyline within the site, and surrounding area based on the existing landform. It will be critical to retain the scattered trees within the road reserves as these will help mitigate the visual impact of the development and visually integrate it with its surrounding context. Development setbacks should be implemented to ensure the Tree Protection Zones of the existing trees are outside of the developable land.

8-6 Built Form

- Considering the topography and the current vegetation heights, it is recommended that the height of built structures be kept under 10 meters when adjacent to sensitive residential interfaces. This is in recognition of the proximity to mature trees that reach a height of 12 meters
- Set out roads away from the existing mature vegetation on the roadsides in order to keep and enhance the character of the site and not undermine the existing ecology.
- BREP is less visible from long distances thanks to the dense vegetation bounding the site. Therefore, development would have less visual impact on the surroundings than if this vegetation did not exist or were to be compromised.
- BREP is assessed as having a limited visual exposure.
- By keeping a greater setback and providing the front landscape design for the industrial site, not only the character of site will be acknowledged but the pedestrian scale will be incorporated in the urban design arrangement for large scale industrial lots.
- It is advised that development be prohibited within the proposed ecological corridors, as illustrated in Figure 10.

Figure 10: Landscape Consideration for Future Development

WILSONS HILL ROAD
CALDER HIGHWAY
MARONG GOLF CLUB
MALONE PARK RECREATION RESERVE
WILSONS HILL NATURE CONSERVATION RESERVE
WILSONS HILL BUSHLAND RESERVE
BIG HILL
LOCKWOOD STATE FOREST
SHELBOURNE NATURE CONSERVATION RESERVE
BULLOCK CREEK
STERRY ROAD
DRY CREEK
WIMMERA HIGHWAY
CLUSTER NO.1
WILSONS HILL CHANNEL
BENDIGO REGIONAL PARK
OBSERVED HISTORIC MINE ACTIVITY
CLUSTER NO.2
OBSERVED HISTORIC MINE ACTIVITY
CEMETERY ROAD
OSULLIVANS ROAD
MARONG CEMETERY
CALDER ALTERNATIVE HIGHWAY
MCKENZIE ROAD
190
195
200

LEGEND

- Precinct Boundary
- Marong Township Boundary
- Parcel
- Watercourse
- Water Area
- Open Spaces
- Significant or High Value Vegetation
- Significant Places
- Potential Biodiversity Corridor (Exact offset to be confimed by ecologist)
- Potential Road Alignment / External Views
- Proposed Shared Path (Pedestrian and Cycling)
- Edge Road / Internal Views (To retained landscape asset)

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