Montrose Quarry
End Use Concept Master Plan

Prepared for Boral

Acknowledgement of Country

We pay our respects to the Traditional Custodians of Country throughout Australia, their Elders and ancestors, recognising their rich heritage and enduring connection to Country and acknowledging the ongoing sovereignty of all Aboriginal and Torres Strait Islander Nations.

We recognise the profound connection to land, waters, sky and community of the First Nations peoples, with continuing cultures that are among the oldest in human history. We recognise that they are skilled land shapers and place makers, with a deep and rich knowledge of this land which they have cared for, protected and balanced for millennia.

Our Country, 2022
88 x 119 cm Acrylic on canvas
Original artwork by
Alfred Carter
Gunaikurnai

Quality Assurance

Montrose Quarry End Use Master Plan

Prepared for
Boral

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02	18 May 2023	Victorian Common Funding Agreement Submission	TM & SM	MR	MR

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Contents

1 Introduction

1.1 Background

Boral has engaged Tract to develop an End Use Master Plan for their quarry site located in Montrose, Victoria. Montrose Quarry is currently operational and shares the site with Boral's concrete and asphalt batching plants. Under the current approved work authority, extraction will likely cease in early 2024. However, pending the approval of a Work Plan Variation, Boral is looking to extend the existing extraction boundary to the south and east to increase the life of the quarry by approximately 40 years.

Tract has undertaken a process of research and design to assist Boral in developing a plan for the eventual rehabilitation of Montrose Quarry to enable optimum value outcomes for Boral, its stakeholders and the community. This report lays the foundation for the End Use Master Plan by presenting a landscape site analysis, and overview of the quarry's current conditions and operation, a review of its planning background, and an evaluation of relevant benchmark projects. This research is then applied in the End Use Concept Master Plan by exploring three options for rehabilitation; the approved rehabilitation plan for the existing work authority, and two alternative rehabilitation concepts based on an expanded work authority and extraction boundary.

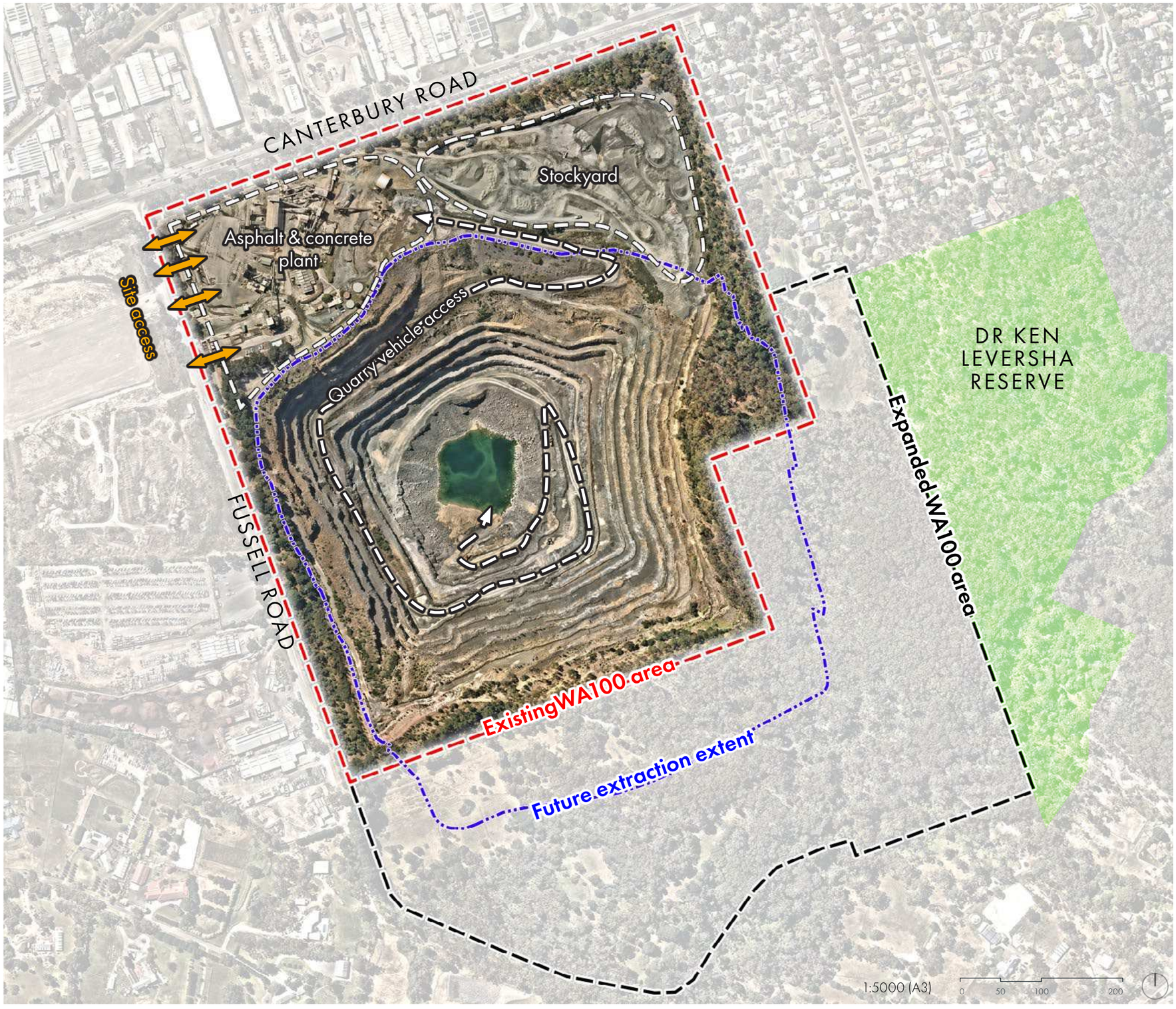
1.2 Quarry and Operations

The current quarry operations occupies 57.5ha out of Boral's 77.4ha landholding and supplies concrete aggregates for projects across the greater metropolitan Melbourne area. The current quarry depth is 180m below crest level, however quarrying operations are deepening the existing pit and trimming the batters to maximise extraction. All materials transported to primary crusher for processing within the plant.

The quarry and plant are currently accessed via Fussell Road, with no access to the site via Canterbury Road.

Boral intends to continue the operation of the asphalt and concrete plants following the completion of quarrying operations due to their strategic location for major infrastrtucre works. Therefore, the existing area occupied by these plants is excluded from the Master Plan.

The stockyard currently stores piles of quarried material for processing. Following the end of extraction at Montrose, it is likely a significant area of the stockyard may no longer be required in the ongoing operation of the adjacent plants and therefore could be transitioned to alternative uses.



2 Landscape Site Analysis

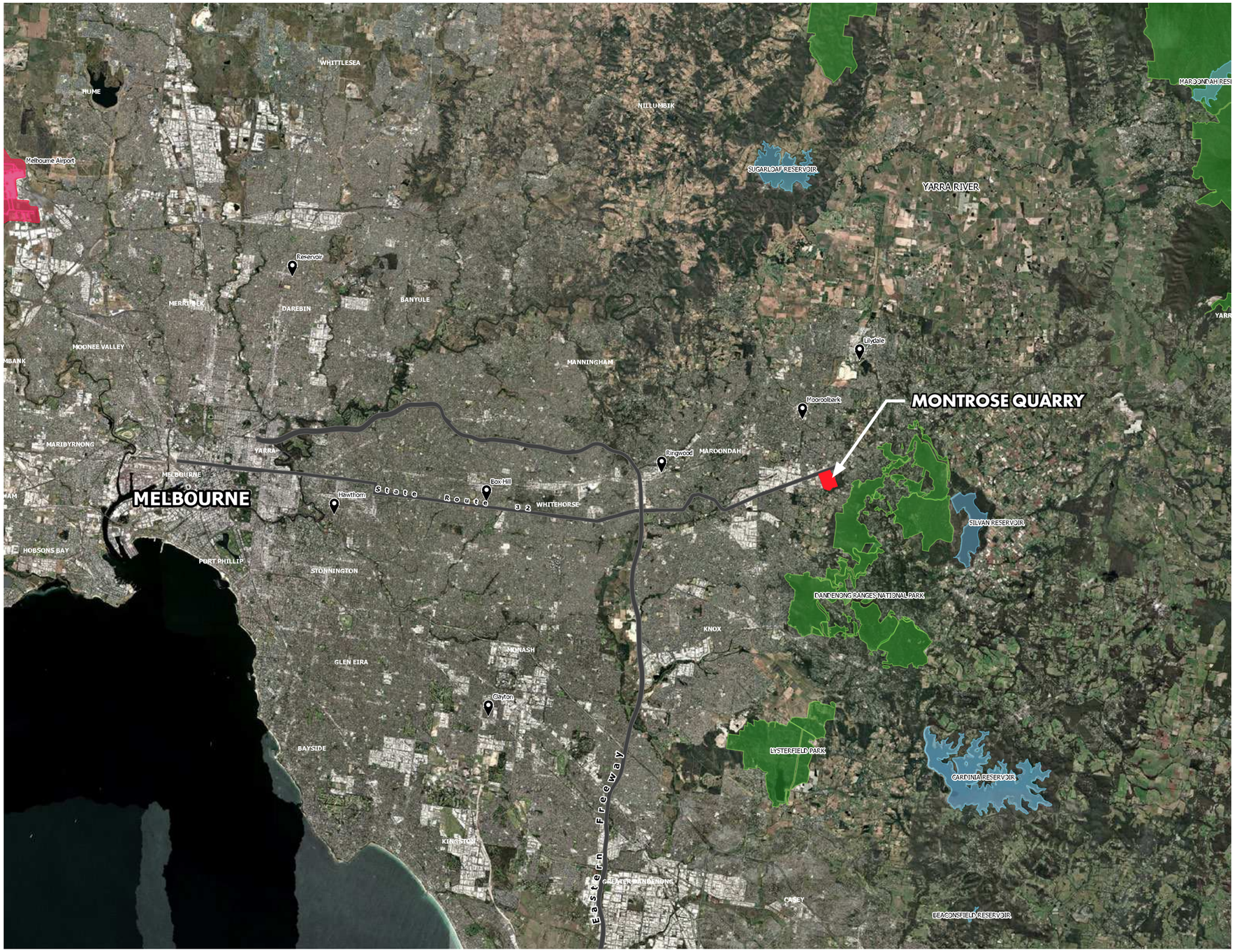
2.1 Regional Context

The quarry site is located in Montrose, 33km east of Melbourne's CBD and at the foothills of Mount Dandenong. The site sits within the Yarra Ranges Shire, which also encompasses the Dandenong Ranges, Lilydale, Kilsyth and Mooroolbark.

The formally recognised Traditional Owners for this area are the Wurundjeri People, and the site is positioned within Wurundjeri land.

The Dandenong Ranges National Park is a popular destination for nature tourism. The temperate rainforest is rich with wildlife and vegetation. Visitors typically travel from Melbourne for a day-trip or longer stays to partake in scenic drives, picnics, walking and hiking.

Mount Dandenong is a 50 minute drive from the Melbourne CBD, with the most direct routes passing through Montrose via Canterbury Road or Mount Dandenong Road.



2.2 Local Context

Montrose Quarry is located south of Canterbury Road on the edge of Montrose where it borders with Kilsyth. The site interfaces with industrial use areas to the north and west. The east edge of the site borders with a residential area and the Dr Ken Leversha Reserve. Bungalook Cree runs along the site's southern boundary, passing through land managed by Melbourne Water containing draingage infrastructure.

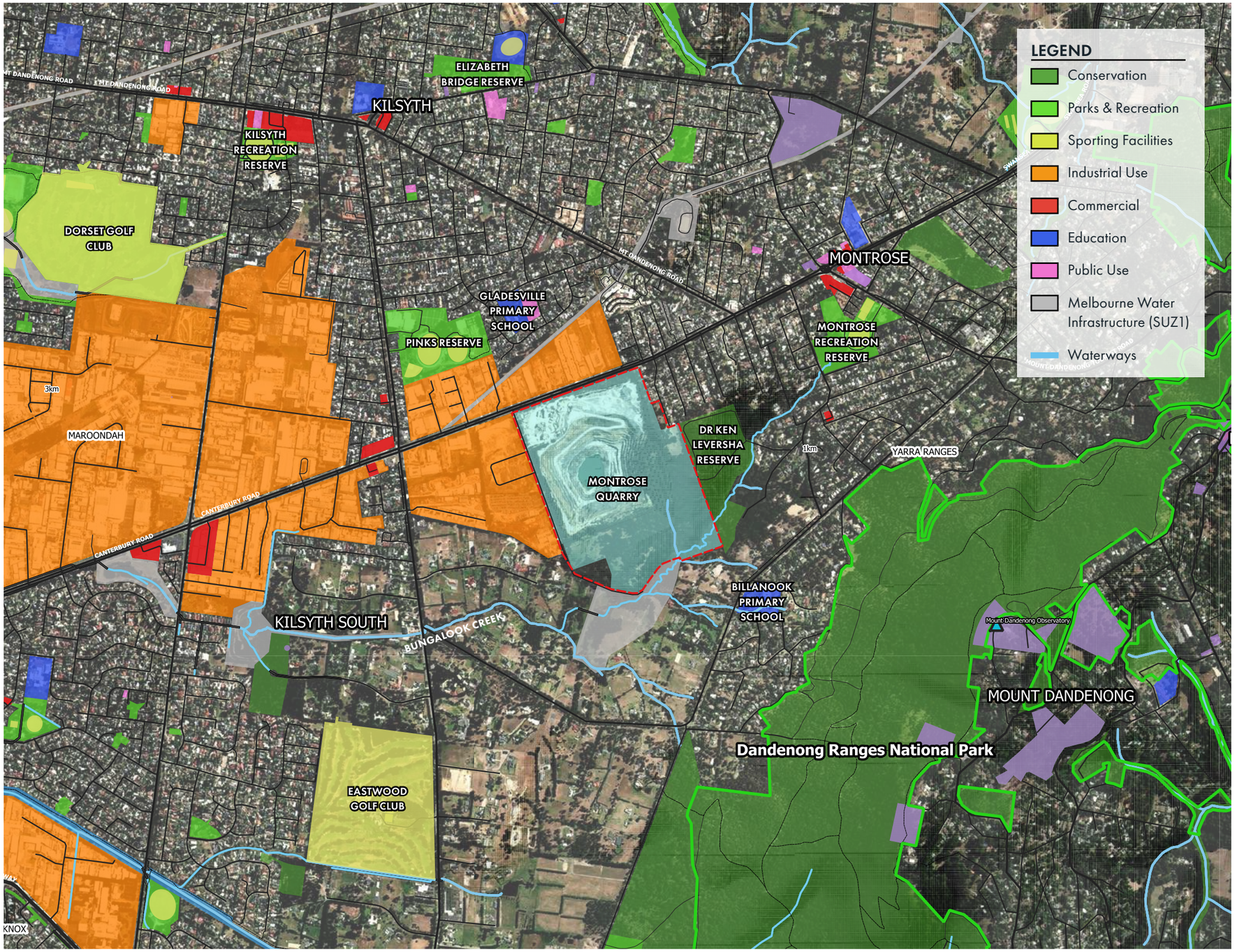
The local area surrounding the site is dominated by industrial use and residences. Pinks Reserve and the Montrose Recreation Reserve provide recreational space to the local community, offering sporting facilities (football, cricket, netball, tennis) and children's playgrounds.

The quarry is withing 1km of Gladesville and Billanook primary schools, however private industrial and residential land are barriers to access.

There is currently minimal commercial centres in close proximity to the site. Montrose's commercial centre is located further along Canterbury Road, where it intersects with Mount Dandenong Tourist Road.

Dr Ken Leversha Reserve.

Image sourced from 'Montrose, Victoria, Past & Present, 3765' Facebook page



3 Vegetation & Ecological Vegetation Classes

End Use rehabilitation using native planting should be informed by the original and surrounding vegetation to maximise ecological value and survival. However Montrose Quarry is a developed site, and therefore any replanting should also be appropriate to its modified landform and soil.

Montrose Quarry sits at the base of the Dandenong Ranges, placing it on the border of the Southern Fall Highlands and Gippsland Plain bioregions. Before colonisation the site would have likely contained a combination of Ecological Vegetation Classes (EVCs), specfically herb-rich foothill forest, valley heathy forest and grassy forest. The remanent vegetation to the south-east of the site (including Dr Ken Leversha Reserve) is still comprised of this mix of vegetation.

3.1 EVC 23: Herb-rich Foothill Forest

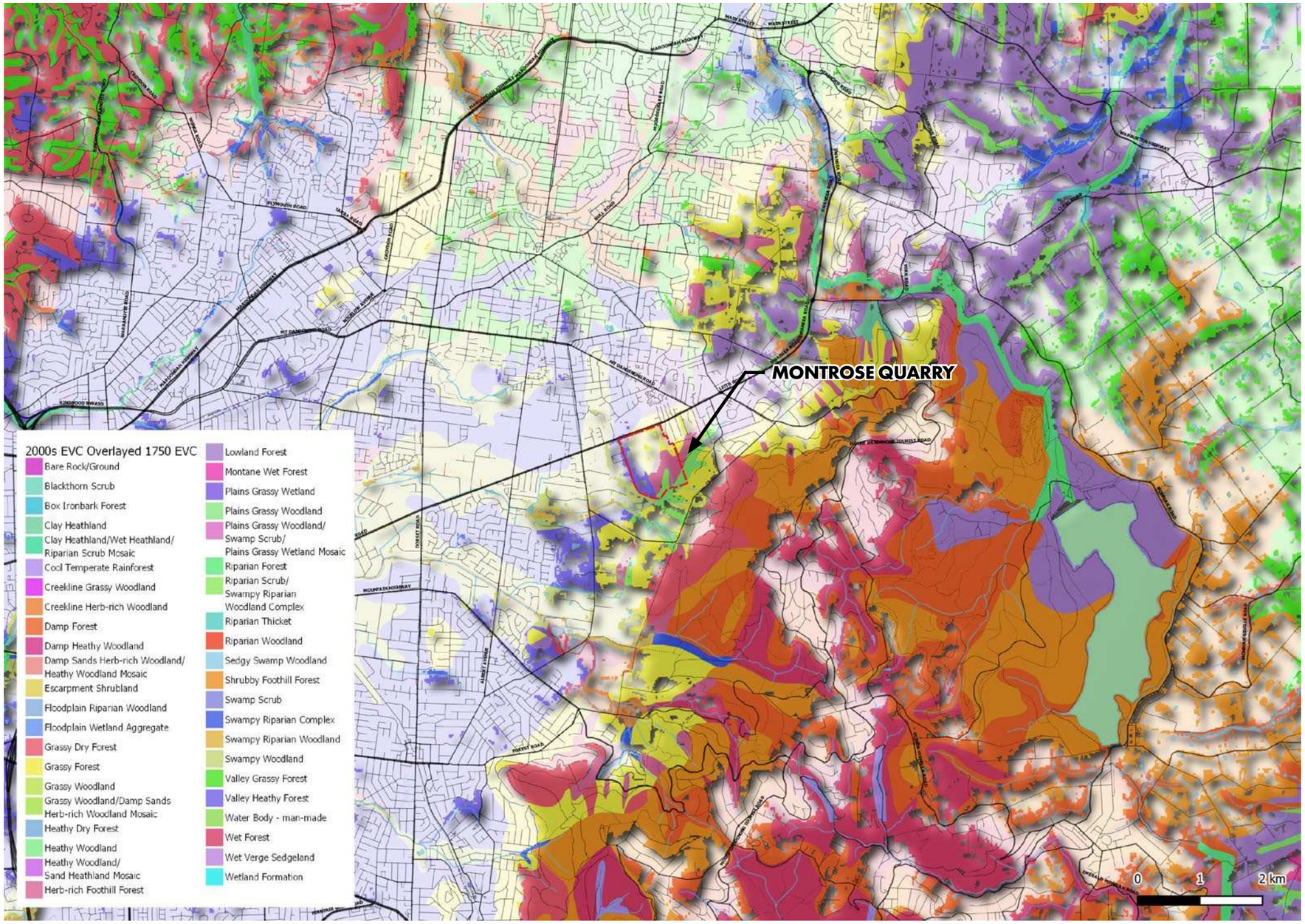
Occurs on relatively fertile, moderately well-drained soils on an extremely wide range of geological types and in areas of moderate to high rainfall. Occupies easterly and southerly aspects mainly on lower slopes and in gullies. A medium to tall open forest to 25 m tall with a large shrub or understorey tree layer over a sparse to dense medium shrub layer. A high cover and diversity of herbs and grasses in the ground layer which characterises this EVC.

3.2 EVC 127: Valley Heathy Forest

A low, open forest to 15 m tall with a sedgy/grassy understorey with a component of small ericoid shrubs and grass-trees. Soil and moisture factors are critical in delimiting the vegetation.

3.3 EVC 128: Grassy Forest

Low growing forest to 20 m tall with an understorey of small and medium shrubs and a rich diversity of herbs. Large shrubs and understorey trees may also be conspicuous. Often grows in areas transitional between drier box stringybark forests and taller, herb-rich forests typical of more favourable environments.



4 Planning Context

4.1 Uses Permitted by Current Zoning

The Montrose Quarry site is subject to the:

- Special Use Zone - Schedules 1 and 6 (SUZ1 and SUZ6)
- Green Wedge A Zone – Schedule 1 (GWAZ1)
- Neighbourhood Residential Zone – Schedule 3

Refer to Figure 1 – Zone Plan.

Under these zone controls, a limited number of uses are currently allowed as of right or with a planning permit. These are summarised below for each zone, limited to uses considered relevant to the Site.

It is also noted that each zone stipulates a range of uses that are prohibited. These would require a planning scheme amendment, which is discussed in more detail in section 4.2.

4.1.1 SUZ1 & SUZ6

Under these provisions, use of the site for leisure and recreation is permitted. Ferntree Gully Quarry Reserve provides a useful benchmark case, which incorporates a range of recreational facilities such as shelter, boardwalk, seating, bushwalking trails, picnic areas, lake swimming, fishing etc.

Pursuant to SUZ1 and SUZ6, the Site could also be used for agriculture, other industry, manufacturing sales and a place of assembly (e.g., function centre, exhibition centre).

It is noted, use of the Site for a floating solar farm would be permissible under current planning controls.

4.1.2 GWAZ1

In addition to the aforementioned uses, GWAZ1 permits more commercial uses of the Site such as accommodation (including a bed and breakfast, camping and caravan park, dwellings and residential buildings in association with agricultural or recreation uses) as well as further recreational uses such as indoor recreation centre with function centre and major sports facility.

4.1.3 NRZ3

The relatively small portion of the Site that is subject to the NRZ3 could be used for accommodation (including residential subdivision), food and drink premises and a store.

4.1.4 PUZ1 Interface

The southern boundary of the site interfaces with a PUZ1 zone. The purpose of PUZ1 is to:

- To recognise public land use for public utility and community services and facilities.
- To provide for associated uses that are consistent with the intent of the public land reservation or purpose.

4.2 Potential uses that would require planning scheme amendment

As aforementioned, the current planning controls prohibit many uses of the site. To use the site for a hotel (e.g., Intercontinental Shanghai Wonderland) or other more commercial uses would require a planning scheme amendment to change the zoning of the site.

In summary, this process would involve requesting the planning authority (either the Yarra Ranges Council or Minister for Planning) to pursue the amendment – there is no formal process for external parties. If the amendment was not on Council's agenda and is seen as mainly facilitating the development of the Site, Council would be more likely to request the proponent prepare background material and amendment documentation.

The starting point for any amendment is establishing the strategic justification for the proposed change to the scheme. The Planning and Environment Act 1987 provides very broad guidance at section 12(2).

The Municipal Planning Strategy and Planning Policy Framework of the Yarra Ranges Planning Scheme partly informs how Council see the strategic development of the Site and surrounding area.

The land to the north of the Site has been identified as an 'Incremental Growth Area' (see plan at Clause 02.04-4). Pursuant to Clause 16.01-1L, additional housing is supported in such areas where it is consistent with the existing character of the neighbourhood in areas with access to services. Therefore, it is foreseeable that residential growth will occur around the quarry, which may support recreational, commercial, and residential uses of the site.

It is noted, while the residential lots to the south of the site could hypothetically be subdivided under current planning controls, the GWAZ1 imposes significant restrictions on residential growth given the overarching purpose of the GWAZ is for agriculture and conservation purposes.

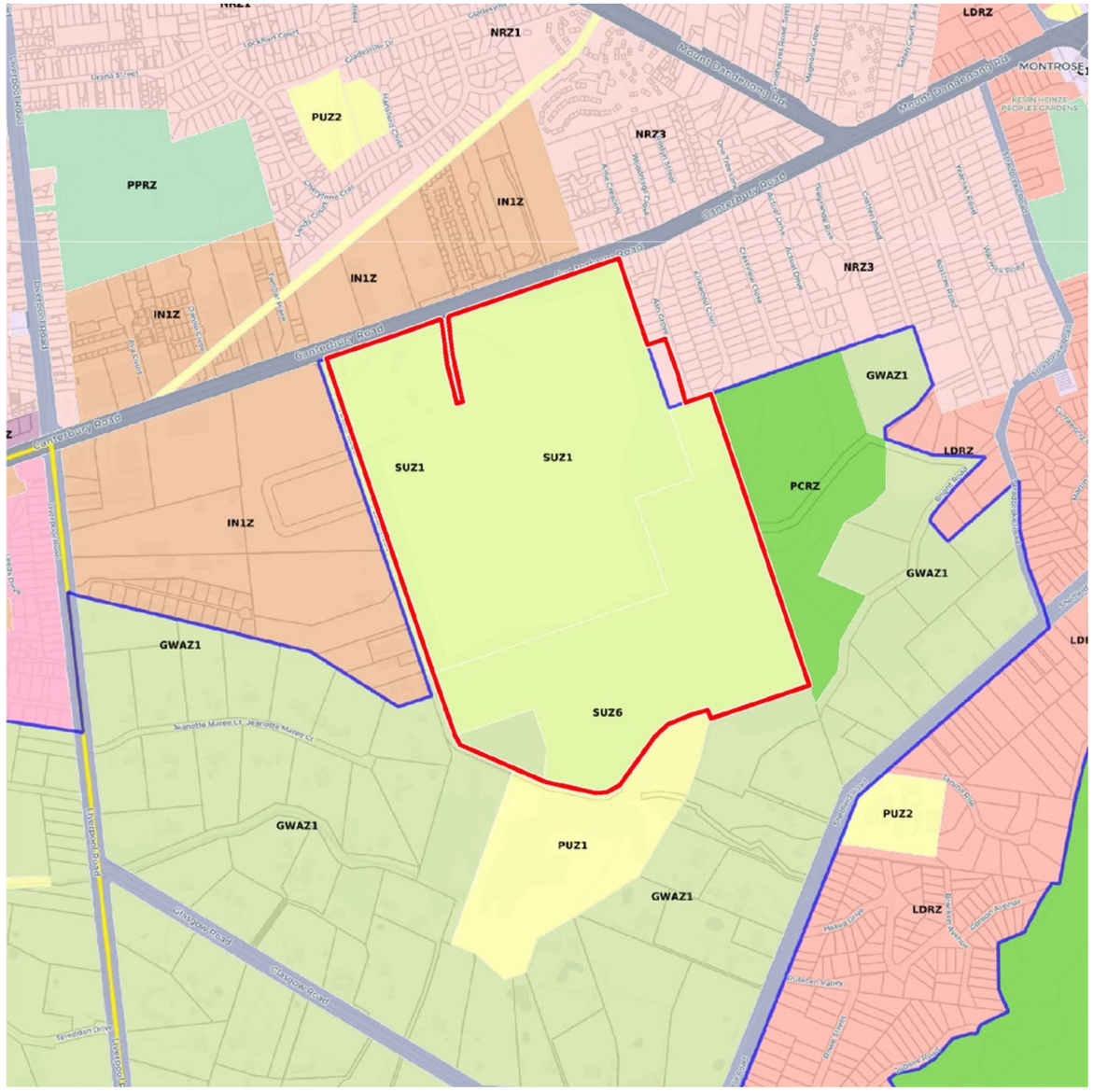


Figure 1 Zone Plan

5 Strategic Context

5.1 Recreation & Open Space Plan (2013-2023)

The Yarra Ranges Council's Recreation and Open Space Plan outlines the council's guiding policy and framework for creating active spaces for its communities.

The Precinct E: Kilsyth and Montrose action sheets specifically detail the recreation and open space strategic context for the area surrounding Montrose Quarry. The document explains the current relevant issues relating to open space as:

> *"There is a need to improve the quality of existing open space in the Kilsyth and Montrose precinct to* ***provide more diverse recreation opportunities****. Different experiences should be provided at local social recreation parks.*
>
> *"Distribution of off-road trail and footpaths connecting open spaces, retail and commercial centres and education precincts needs to be improved to connect these with where people live.*
>
> *"The major road arterials of* ***Canterbury Road and Mt Dandenong Road are considered barriers to accessing open spaces****. Connections to open space within this local community are important via off-road trails and road crossings."*

Furthermore, general planned actions include:

- Social recreation parks: improvement of quality and diversity of recreation opportunities.
- Parks Victoria and other open space managers: exploration of partnerships to investigate nature-based tourism in the precinct.

5.2 Relevance for End Use Master Plan

5.2.1 Provide Alternative Recreation

The Montrose Quarry End Use Master Plan can seek to provide value for the local community by offering alternative recreational uses compared to other local sports and recreation facilities.

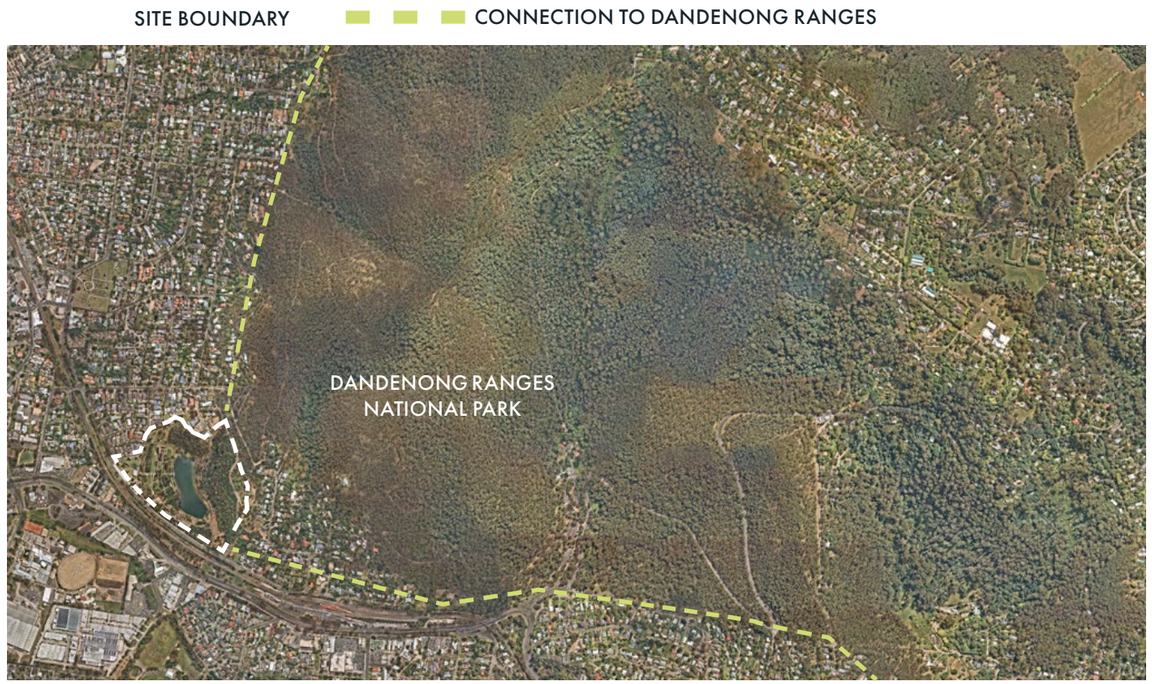
5.2.2 Increase Access

The site's location on the edge of Canterbury Road means that it will provide open space to residents to the south of the major road. Access via trails should be considered.

5.2.3 Nature-based Tourism

Montrose Quarry can also provide a site for nature-based tourism in the precinct. Its interface with Dr Ken Leversha Reserve allows for the creation of a large-scale green space.

6 Benchmarking



6.1 Ferntree Gully Quarry

Site Area: 15.1 Ha

Site use: Public Park, Conservation / Ecology

Date of Completion: 2020 and ongoing

Features Include:

- Lake
- Over water fishing platforms and board walk
- Shelter
- Fishing
- Birdwatching
- BBQ area
- Nature Playground

Context / Location / Surroundings

- Eastern edge borders the Dandenong Ranges National Park.
- Site surrounded by private residences and functions as a local park
- Tourism destination differentiated from neighbouring national park through recreation & dramatic rock face.
- Large exposed rock feature wall referencing history as basalt quarry

Quarry Depth and Fill

- Quarry has been partially filled to increase site accessibility with the western side manipulated to create easier access to the bottom.
- The filling allows for amenities that enable recreation and picnic spaces, playground, and walking trails.

Accessibility

- Only accessible from one edge, which is near housing & major road
- Multiple trails through the site that meander to the bottom
- More direct paths provide more physical challenge.
- Boundary loop path provides dramatic views.

Trails and Rec / Assets

- Boundary loop path connects walkers to the national park.
- The national park hills to forms a visual backdrop and adds value to a very small site
- Partial fill has allowed for a playground, shelters, and picnic areas.
- Board walk enables visitors to get close to water & fish

Use

- Recreational value for local residents of Ferntree Gully
- Tourism value provided by rock face and fishing

Nature and Conservation

- Minimal conservation focus due to small size and differentiation from neighbouring national park.

Findings

Landuse: Passive recreation & conservation

Key design factors:

- Proximity to national park - The site was not an important asset for nature conservation due to its relatively small footprint compared to the neighbouring Dandenong ranges national park. However, this location also created an opportunity for the site to offer active recreational use not possible in national park.
- Residential/major road interface - the quarry site was well-positioned to provide value to the local community. This interface also provided a clear need for the slope to be angled towards the west to provide access.
- Size - Small quarry and site area made sporting use unfeasible. Partial fill was able to make the quarry easily accessible

SURROUNDING NATURE RESERVE / PARKLANDS

SITE BOUNDARY

6.2 Plenty Gorge, Blue Lake, South Morang

Site Area: 18.8 Ha

Site use: Natural Parklands

Date of Completion: 1999 and ongoing

Features Include:

- Swimming
- Walking trails
- Views
- Lake
- Wildlife (Bird watching)
- BBQ's

Context / Location / Surroundings

- The Blue Lake is positioned in the base of an old Boral operated quarry located in South Morang and part of the Plenty Gorge network of parklands. Quarrying ceased in 1970s.
- Primarily residential area surrounding the Blue Lake, with a large number of parks with trails and wildlife.
- Blue Lake seems to have undergone minimum post extraction rehabilitation. There has been no fill and the water level has been allowed to reach groundwater level. This is largely due to the accessibility of the site and its location within Plenty Gorge.

Quarry Depth and Fill

- There is no evidence of filling of the small-scale quarry. Leaving it in its natural condition provided that biggest asset for visitors and the landscape.

Accessibility

- Due to the undisturbed landscape, the path network is limited around Blue Lake and Plenty Gorge. There is one path loop circulating the Lake with one marked trail down the water's surface. From the car park to the East to the site is roughly a 300m walk and a 500+m walk from the entrance on the west of the Gorge.
- Accessibility is limited due to the location of the site in relation to the populated areas of Plenty.

Trails and Rec / Assets

- Yellow gum recreation area used by hikers, trail walkers, campers, and swimmers
- Due to the rehabilitated state the quarry, people come to see the site to view the landscape and wildlife.

Use:

- Hikers & Walkers
- Swimmers
- Bird/Nature watchers

Nature and Conservation

- The post extraction plan for Blue Lake and Plenty gorge was to preserve the landform and allow both native vegetation and animals to flourish. Because of the surrounding parklands, vegetation and wildlife has been reintroduced easily
- Plenty gorge is now a wildlife hub with over 200 bird species and 265 animal species. Several of the old Quarry digs in plenty gorge have filled with water creating wetland habitats and with that promoting wetland wildlife and vegetation.

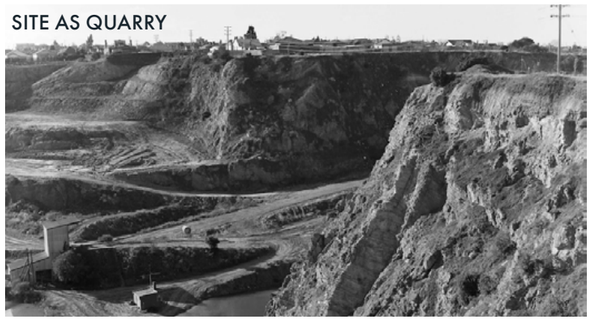
Findings

Landuse: Conservation

Key design factors:

- Parkland context - the quarry was able to transition into a nature reserve with minimal modification due to sitting within the Plenty Gorge parkland. The isolated nature of the quarry pit means that fill and accessibility were not prioritised, which has resulted in land the provides minimal value to the local community.
- Lack of major residential interface - the nearby residential area does not directly border the site and there is no direct access via a major road. This precluded the site from transitioning into recreational space and gave it no commercial value.

ENTRY POINTS PATHS SITE BOUNDARY



6.3 All Nations Park, Northcote

Site Area: 13 Ha

Site use: Park & Public Gathering Hub

Date of Completion: 2002

Features

- Outdoor Fitness equipment
- Views from Hilltop
- Large open space for picnic and kick about
- Veterans Walk
- The Olive Grove
- Lake
- Playground, skate park, basketball

Context / Location / Surroundings

- Located in Northcote, the old clay and brick quarry/ Rubbish tip has turned large scale, multi-use park and reserve with ANZAC memorial wall.
- There are minimal parks and large open gathering spaces in proximity to All nations park, the closest open space/ walking parkland is the Merri Park and Wetland just under 2km away. The decision to become a gathering hub/park allows residents to have a place of rest and a space for general play.
- Surrounding All Nations Park is primarily residential and retail use. High Street 300m to the West and The Northcote Plaza situated directly across the road, provide heavy foot traffic through the park. Because of the position of the park in a busy pedestrian and residential area, there was a need for the quarry to be refurnished into the park it is today.
- Housing was built before the tip was filled, so residents may have pushed for the development of the park.

Quarry Depth and Fill

- Due to the context and surroundings, once a park was the desired outcome, extreme filling was undertaken to flatten the quarry. The earlier use as a rubbish tip means the filling of the quarry was done so with a variety of materials, from the existing rubbish to natural materials from other sites.
- Areas of the park are elevated and provide a viewpoint looking over the entire park.
- Higher surface levels increasing the usable surface area, the range of uses and activation and visual connection to surroundings.

Accessibility

- Accessibility is a key feature of the site with 19 entrances into the park and a network of internal paths that connect the whole site.
- The large car park at the Northcote Plaza provides both Northcote shoppers and residents with easy access to the park.
- Because of the Great accessibility of the site, the decision to create the Park was a logical one. Great foot traffic, parking, high interaction with the local community.

Trails and Rec / Assets

- The value of filling the quarry – Providing a space for activities, picnics, remembrance, and rest.
- ANZAC war memorial has been situated on site. Interesting that a high order civic use such as a war memorial would be placed here. It goes to the elevated importance of the place and potentially the lack of alternatives.
- Since the site was re-opened residential developments have consistently been increasing both high rise and story housing. The park is a hub for gathering and an attractive asset for the city of Northcote, increasing the liveability of the suburb.

Use

- Residents, Shoppers and people paying respects to the ANZACS.

Nature and Conservation

- There has been no preservation of the previous site, the tip and quarry barely recognizable.
- Because of this they have been able to create a successful flat accessible park. It may have not been possible to keep some representation of the existing quarry, because of the area and situation of the site. The demands of the location have triumphed here, as they have led to a park that is accessible for residents and shoppers and has multiple feature elements that will attract people from outside of Northcote.

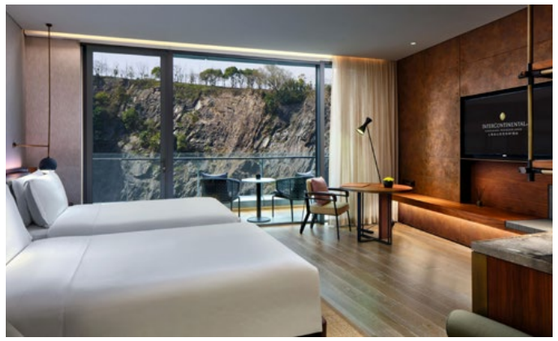
Findings

Landuse: Civic and recreational space

Key design factors:

- Site footprint - the site has an elongated footprint, therefore the site has an increased boundary length in relative to area. This means the All Nations Park has been designed to have activated edges with increased points of access. Multiple can also be placed adjacent to each other along the site.
- Lack of civic & recreational space - the quarry's highly urbanised location & Northcote's lack of public open space meant the site could provide high value as a civic and recreational space.
- Fill - the site has been completely filled to maximise useable space and access.
- Past use - the site's history as a rubbish tip also necessitated a high amount of fill to cap the waste.

SITE BOUNDARY



6.4 Intercontinental Shanghai Wonderland

Site Area: 88m Depth

Site use: Hotel

Date of Completion: 2018

Features Include:

- 4-star hotel
- Glass walk over cliff face
- Underwater Rooms
- Lighting placed throughout the Quarry walls.

Context / Location / Surroundings

- Located just out of Shanghai, the Intercontinental Hotel is the first ever hotel built in an old stone quarry, providing guest with unique views of the stone walls from their rooms and underwater. The exposed rock walls of the quarry give visitors a breath-taking experience and creates a unique atmosphere.
- The quarry hotel is surrounded by agricultural and industrial landuse. In immediate proximity to the site is a variety of farms and commercial sites. There is also a large space dedicated to densely planted parkland. The planting looks consistent with the planting of the quarry and golf course to the west of the site.
- There is a large river that surrounds the quarry, which has enabled the construction of a man-made waterfall. The waterfall fills the Quarry's Lake below and adds to the theatrical 'fantasy' theme of the hotel and experience.

Quarry Depth and Fill

- 88m deep
- Appears to have had no environmental rehabilitation, rather it is left in its post-quarrying condition which has supplied the framework for the hotel and the aesthetic vision.
- The depth of the quarry gives the hotel views of the exposed rock from the rooms and the walking trails above.

Accessibility

- The entrance is above on the level surface with the hotel complex bellow in the quarry.
- Accessibility down into the quarry is minimal as you must go through the hotel. The quarry is owned and maintained by the hotel.
- The path above the quarry is accessible and can be walked by anyone. The walk is very scenic as the decision to leave the quarry in its post-extraction state that showcases the exposed rock walls.

Trails and Rec / Assets

- The view of the exposed rock are the major asset of the Hotel and Quarry. The depth of the quarry adds value to the walking paths above, with extreme views of the rock and the unique hotel.
- The depth and height of the quarry has provided an opportunity to interact with the rock as a walk descends into and follows the walls. The walk consists of only glass therefore the guest can see down bellow their feet as they walk.
- Guests of the quarry hotel have the unique experience of the views and atmosphere.
- The hotel interacts with the lake as well, as floors continue under the waters surface.

Use

- Access to the Quarry is limited to the residents of the Hotel.

Nature and Conservation

- The quarry has been left in its post-extraction state, keeping the steep walls of the quarry. The landscape follows suit with the existing parkland's and planting of the golf course to the west.
- Minimal changes to the site post extraction may promote wildlife to the site, there are parks to the southwest, perhaps the re population of native species of animals is also a large asset and perk of the Hotel.

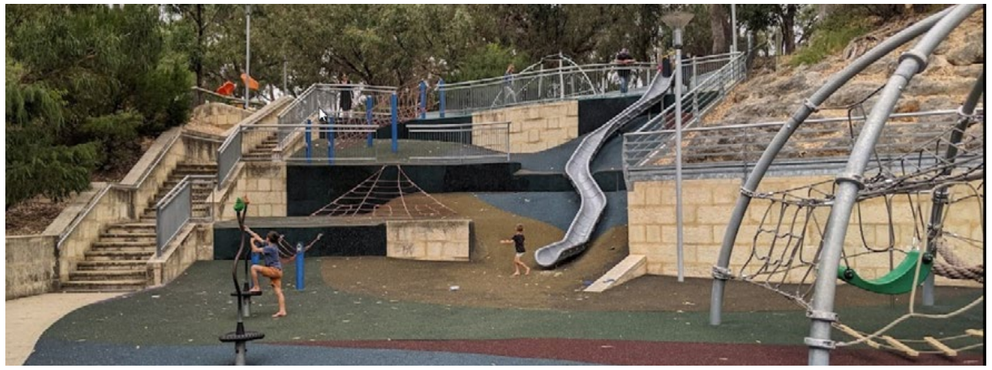
Findings

Landuse: Commercial (Hotel)

Key design factors:

- Local population - The Intercontinental Hotel's proximity to Shanghai's large population and the international airport means it has a strong customer base of wealthy visitors looking for a novel experience.
- Neighbouring landuses - The site's interface with agriculture, residences and golf course makes it an attractive location for a self-contained hotel experience. Interfacing with industrial land would make the site less desirable for a hotel.
- Point of difference - The quarry site offered a dramatic setting for a unique visual amentity, hotel design, and visitor experience. The design used the existing site in a creative way to maximise value, rather than trying to provide value following rehabilitation.

SITE BOUNDARY



6.5 Meadow Springs, WA

Site Area: 4 Ha (1.6Ha Usable open space)

Site use: Quarry Park (Mirvac)

Date of Completion: 2016 Meadow park (residential estate is not yet complete)

Features Include:

- 4 hectares of open space
- Terraced Limestone Amphitheatre
- Viewing platforms
- Toddler's play zone
- Adventure playground
- Community facilities
- BBQ areas

Context / Location / Surroundings

- The small quarry now has been converted to a reserve, playground and amphitheatre in a residential area in WA.
- Now a major play space for the City of Mandurah, it is recognised as one of the city's most successful community facilities. Nestled within the new community of Meadow Springs, the Quarry Park has fast become a key play destination in Mandurah, with people travelling on weekends to spend the day.
- Surrounded by housing, and between a golf course and main highway. Amenities provide the park with enough value for people to travel to the park. Includes, BBQs, Picnic area, large playgrounds, and amphitheatre all are unique to the park.

Quarry Depth and Fill

- The quarry has been partially filled to make the south of the park more usable. A slope has is used for an amphitheatre and playground
- The opposite side of the quarry is left exposed, providing a backdrop for the amphitheatre/playground.

Accessibility

- The site is easily accessible due to partial fill.
- The site spans 4ha however only the space subject to filling is usable.
- There are multiple entrances and paths on the south eastern side of the site. Entrances are positioned on the flat side of the quarry. There are multiple paths that connect through the site as well as a scenic route that goes across the top of the quarry.

Trails and Rec / Assets

- Orientation of all the amenities in the park such as, amphitheatre, picnic areas and playground all face down the slope of the quarry. This provides these features with a backdrop of the exposed rock face.
- Events and weddings are regular occurrences at the park, people making the most of the scenic positioning of the amphitheatre. Large open space supplies enough room for a family gathering, which is found around the BBQ area.

Use

- Residents use the space recreation
- People from outside the community visit for events and dramatic scenery.

Nature and Conservation

- More than half the quarry has been left in its post-extraction state. The base of the quarry has also been filled in to allow for a consistent planting height of the bellow level trees.
- Minimal changes to the site post-extraction enhances the aesthetic appeal of the site as the exposed rock creates a unique atmosphere.

Findings

Landuse: Recreation & civil space

Key design factors:

- Residential context - the quarry is surrounded by residences, and therefore is able to provide high value as a local park with recreation and event space
- Multiple/Shared use - The site design has created a flexible community space that can be used for events space and recreation by including an open grassed lawn.
- Size - the small site precluded it from becoming value wildlife habitat.

SITE BOUNDARY → FALL LINES

2023 CONTEXT

6.6 Quarry Park, Footscray

Site Area: 18.5

Site use: Sporting Reserves and Parkland

Date of Completion: 2016 and ongoing

Features Include:

- Mountain Bike Trails x4
- Sporting Ovals
- Open lawned areas
- Shelters
- Play space and Nature Play
- Lookout
- Sporting Facilities/Pavilion
- Public Art / Memorial
- Picnic Space
- Rain garden

Context / Location / Surroundings

- Situated in the busy suburb of Footscray, Quarry Park is a hub for the community, housing local sporting clubs and large open space for public leisure. The Footscray Quarry Park has 4 Mountain bike riding tracks to the north of the site.
- Located in a residential area, the park is a major hub for sporting activities and leisure. There are other parks that border the river, however they do not have sporting or bike riding amenities.

Quarry Depth and Fill

- Entirely filled to match the existing topography. The result is a flat surface to the east of the park where majority of the sporting facilities and park amenities are found. There is then a large open space in the centre of the park that begins to climb in elevation, once at the top of the hill there is another flattening of the land where another sporting oval is positioned.

Accessibility

- Multiple entrances and carpark add to the high accessibility of the site. However, the slope is walkable so park goers can move through the site as they wish and don't have to stick to the provided singular path.

Trails and Rec / Assets

- Following the natural topography of the existing land has provided opportunity to the site. The addition of 4 mountain bike trails is unique and works perfectly with the existing elevations of the new park. The existing landscape also has provided park goers with incredible views of the city and the outer suburbs of Melbourne.

Use

- Recreational use for local residents
- Sporting clubs and spectators
- Mountain Bike riders

Nature and Conservation

- The park has been filled and manipulated to be a fun experience with many recreational activities to keep park goers entertained. The overall slope of the site matches the surrounding topography.

Findings

Landuse: Active recreation space

Key design factors:

- Site footprint - Footscray quarry park is also a linear site, therefore multiple recreational precincts were able to situated along the site. The moderate size of the site also allowed for multiple sports reserves
- Residential context - Quarry Park is surrounded by residences with major road access, therefore it was completely filled to maximise recreational space and access. The slope of the site & surrounding topography created an opportunity for mountain biking.
- City views - the elevated site provides clear views into the city, which has become a key point of difference for the park and therefore a marketable quality for visitors and adjacent land.

SITE BOUNDARY

6.7 Wilson Botanic Garden

Site Area - 39 Ha

Site use - Botanic Garden

Date of Completion - 1992

Features Include

- Tower lookouts
- Shelter
- Large amphitheatre
- Cafe
- Playground, sensory Garden
- Fitness events
- Walking trails
- Visitors Centre
- BBQ
- Toilet facilities
- Lakes

Context / Location / Surroundings

- Located in Berwick, the park was originally a basalt/ bluestone quarry that was donated to the city of Casey for public use.
- The park is in a residential area surrounded by houses, with some backing onto the park.
- The park connects with major roads and the Princess Highway (where the major entrance is found and largest carpark). The placement of the main entrance is decided on the point of highest traffic, thus having access form this major road brings in more people who might want a rest from driving or want to have a quick look at the gardens.

Quarry Depth and Fill

- Evidence of the old quarry still exists in the walls of the lake. Some filling and excavation have been undertaken to manipulate the landscape into the current state. This manipulation provides more accessible areas and adds to the theme/aesthetic of the park.
- The cut and fill have created a botanic garden that is divided by the twists and turns, hills, and slopes of the landscape.

Accessibility

- There is a path network that connects the entire site. There are many twists and turns and the path meanders to account for safe descent though the park. The paths navigate the hilly landscape and provide visitors with options/choices in what direction to go down.
- Two other entrances exist, one to the northwest and one to the east of the park. All entrances have car parks.
- There is a looping path around the top the lake that supplies scenic views of the water and gardens.

Trails and Rec / Assets

- The variety of gardens and amenities create a park that takes time to explore the entirety of the site.
- Wilson Botanic Garden offers the community free events and shows, free fun runs around the gardens every Saturday morning and hosts weddings and other private events. There are thirteen different feature gardens with unique planting, and a sensory garden.

Use

- Residents use the park however it is also a tourist destination. The larger scale and variety of different gardens provide people with a full day of activities.

Nature and Conservation

- They park is dedicated to the protection and display of native Australian plants.

Findings

Principles: Botanic Garden, Conservation

Key design factors:

- Residential context - Wilson Botanic Garden is surrounded by residences on all sides, therefore it was a valuable site for community use & amenity. The quarry also required a high level of fill to maximise accessibility.
- Community need - there are already multiple sporting grounds close to Wilson Botanic Garden, therefore parkland focused on leisure and community events provides more value to the community.
- Quarry scale - the original bluestone quarry was only a small percentage of the site, and therefore the two pits were able to be rehabilited into the two lakes with miminal fill.
- Point of difference - The park's botanical nature draws in more visitors from surrounding suburbs than a typical park design. The high visitation rate facilitates the operation of a cafe and visitor centre.

6.8 Quarry Park Adventures, CA, Sacramento

Site Area -4 Ha - 20m Deep

Site use - Tourist attraction, Adventure Play

Features Include

- Rappel
- Zip Line
- Via Ferrata
- Free Fall
- Rock climbing
- Amphitheatre
- Paddle boats
- Kids zone
- Aerial Adventure

Context / Location / Surroundings

- Located in Rocklin California USA. The quarry has been transformed into a popular tourist adventure destination.
- Quarry Park is in a residential and retail district of Rocklin. Surrounded by other parks, the reformed quarry had to be different and unique to add value to the community. They have done so by creating an adventure park consisting of rock climbing, zip lining, paddle boarding and kayaking.

The activities at the quarry all directly interact with the quarry walks as minimal site filling or manipulation has been conducted.

Quarry Depth and Fill

- The Quarry is largely untouched, the entry roads into the quarry remain the mint entry point into the quarry. The absence of filling has left 20+ meter exposed rock walls that are integrated into the play elements of the adventure park.
- The only filling that seems to be involved in the site is for safety and structural purposes beneath the play structure, however this is minimal.

Accessibility

- Accessibility is unique as other than the main entrance road down to the quarry, the only other means of movement through the site is via zip line or abseiling down the quarry wall.

Trails and Rec / Assets

- The dramatic topography and unique activities is what brings people to the site. It is a novel experience to climb the exposed walls of the old quarry or walk through the aerial course suspending above the quarry floor. The masterplan of the site caters for a big target audience, including the extreme activities, such as rock climbing and zip lining, and more family and youth friendly activities such as paddle boating, and a suspended kid's zone.
- Because of the depth, a park wasn't feasible unless significant filling was conducted. Instead the extreme height and dramatic walls became an opportunity for adventure recreation.

Use:

- Largely a tourist destination, the park attracts visitors from afar. People come to visit the site because of the unique experience they get when they are interacting with the quarry.

Nature and Conservation

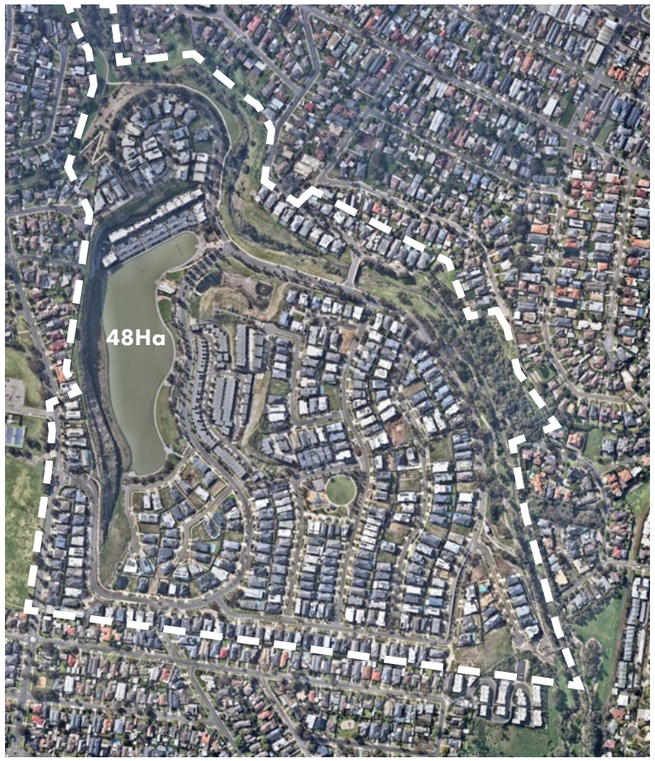
- There is no focus on nature or wildlife.

Findings

Landuse: Active recreation & commercial opportunity

Key design factors:

- Toursim/commercial use - Quarry Park Adventures was a public and private development that was part of a push by the city to revitalise the area through entertainment and commerical activity. The City of Rocklin intended for the adventure park to bring customers to other local businesses.
- Quarry area & depth - the original granite quarry had a relatively small footprint however was quite deep with sheer faces. This shape suited an adventure park, as the end-use did not need to utilise a large are but the depth provided a dramatic and unique site.



SITE BOUNDARY

6.9 Valley Lake, Niddrie

Site Area: 48Ha

Site use: Residential, 30% open space

Date of Completion: 2022

Features Include:

- Lake
- Integrated sustainable urban architecture and design
- Cliff-top and lake side board walks
- Amphitheatre
- Public artwork
- Park, Playground, Basketball court
- Extensive network of recreation trails

Context / Location / Surroundings

- Residential development 10km from Melbourne CBD, set within the steep escarpment of the Duke Street Quarry. The design incorporates the existing terracing of the quarry and terraces the streets and 2-3 Storey Town homes to provide uninterrupted views over roof tops to the central
- The existing topography is the main design driver for the projects as placement of lots, roads, community hubs like play and gathering spaces are all done so in compliance with the retained rock.

Quarry Depth and Fill

- Cut and Filling has occurred to create more areas and housing lots. However, the filling has been selective and minimal and a significant portion of the overall estate has been left as open space. The decision to keep the topography of the quarry and not fill visually enhances the quality of the lots.

Accessibility

- The site is accessible via car and walking due to the gradual terracing of the site.

Trails and Rec / Assets

- The developments views and topography are the major assets. There are multiple exposed rock faces that support housing on top of the cliff faces and bellow providing two unique perspectives of the quarry.
- The 30m Cliff faces and Lookout provide visitors and residents stunning views of lake Niddrie
- Lake side board walk, seating, shelter
- Public art throughout the development

Use

- Residential
- Leisure / Walking

Nature and Conservation

- Home to a pair of peregrine falcons and among some 30 native bird species. To improve their environment, students from nearby Essendon Keilor Secondary College were undertaking tree-planting at Valley Lake in early 2007.

Findings

Principles – Residential

Key design factors:

- Quarry area & depth - Duke Street Quarry was a relatively shallow quarry over a large area. Therefore, the gradual terracing allowed for an upmarket residential development with minimal fill.
- Unique site features - the quarry landform became a key selling point for the residential development. The cliffs and lake aesthetically differentiate the development and facilitated the construction of more expensive and ‘architectural’ dwellings.

6.11 Benchmarking Conclusion

Following a review of benchmark quarry redevelopments, the most common factors that that influenced the designed outcome were:

6.11.1 Location and Surroundings

Considerations included whether the site was surrounded by residences, nature reserves, or other landuses. This context informed the designs by indicating who would utilise the site and how it would be accessed. However, context can also provide direct additional value to the site through things like access connections (trails), conservation links or views ('borrowed' landscape).

6.11.2 Community Need & Council Strategy

Benchmark quarries that were redeveloped into recreational and leisure space responded to the needs of the local community, typically indicated through the council's strategic documents. This determines whether the site would provide the most value to the community as sporting facilities, alternative sports (such as mountain biking) or passive recreation (such as trail walking).

6.11.3 Fill

The amount of fill recieved by each site determined the possible end-uses. The common driver behind the decision for filling is community and accessibility. Complete fill maximises recreational area, partial fill allows for access to the bottom of the pit (typically a lake), and projects left in their post-extraction condition were done so for unconventional recreation, tourism or nature conservation.

6.11.4 Point of Difference

Majority of the projects display some resemblance of the former quarry landform, predominantly through exposed rock faces. Sites that have not been completely filled can use the quarry landform to differentiate themselves from similar recreational and commercial offerings. Assets such as zip lining, dramatic, Residencies, adventure playgrounds, amphitheatres and mountain bike trails all possible due the unique form of the quarries and become a key selling point.

6.11.5 Depth

The finished depth and area of the quarries informed design possibilities. The steeper quarries, such as the Shanghai Continental Hotel and the Adventure Park in Sacramento, use the existing walls of the quarry as both a visual asset and an opportunity for dramatic activity. The steepness creates views, cliff face walks, and adventure play opportunities.

6.11.6 Area

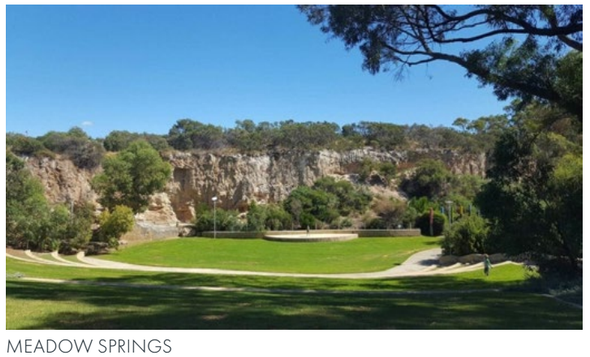
Quarries with a larger area facilitated more landuses, with elongated sites able to accomodate multiple diverse site uses situated side-by-side and rounder sites more suited for a dominant landuse with complimentary landuses scattered throughout.

FERNTREE GULLY QUARRY

PLENTY GORGE 'BLUE LAKE'

ALL NATIONS PARK

INTERCONTINENTAL SHANGHAI WONDERLAND



MEADOW SPRINGS

QUARRY PARK FOOTSCRAY

WILSON BOTANIC PARK

QUARRY PARK ADVENTURE

VALLEY LAKE NIDDRIE

7 Montrose Quarry Landuse Decision Matrix

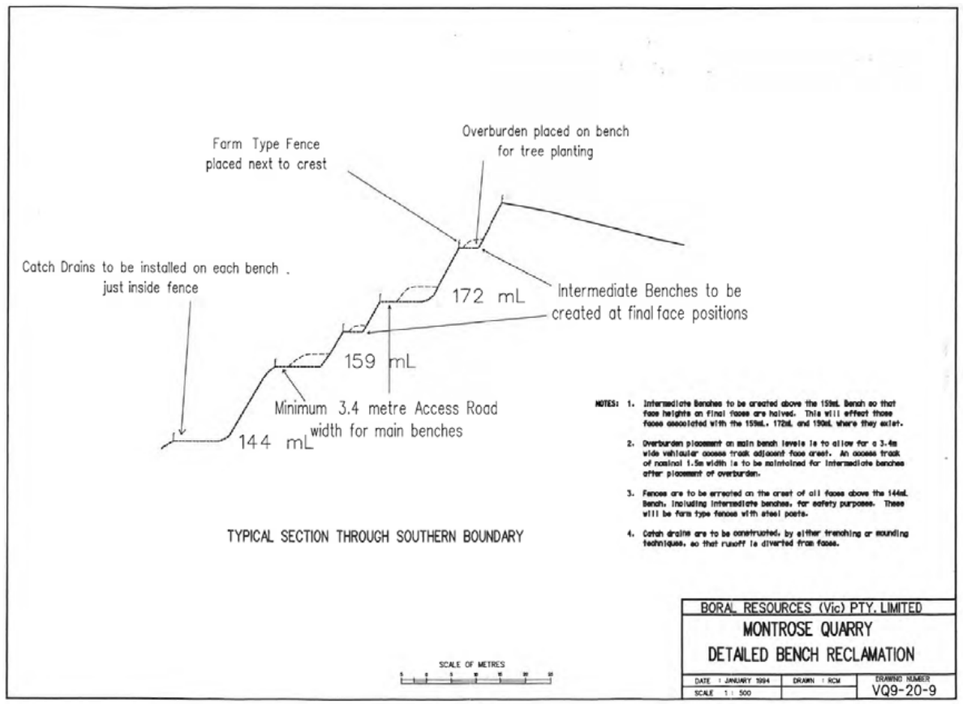
Landuse	Zoning allowance?	Appropriate site area?	Appropriate context?	Necessary Access?	High community value & aligns with council strategy?	Utilises unique site /point of difference?	Fill required	Required land area	Evaluation of land use
Nature Conservation	✓	✓	✓ Dr Ken Leversha Reserve	✓	✓ Meets need for increased nature tourism	✓	Moderate fill for access	Dominant land use	✓ Ideal as dominant landuse due to interface with Dr Ken Leversha Reserve increasing habitat potential
Passive Recreation	✓	✓	✓ Neighbouring residences	✓	✓ Meets need for diverse recreation	✓	Moderate fill for access	Complimentary to other land uses	✓ Passive recreation should be incorporated into site design to provide value to community
Sports	✓	✓	✓ Neighbouring residences	✗ Requires multiple points of exit	✗ Existing sports facilities nearby	✗	Maximum fill	Dominant land use	✗ Sporting needs are already met in the community
Gathering/ Events	✓	✓	✓ Neighbouring residences	✗ Typically multiple points of exit	-	✓	Moderate fill for access	Complimentary to other land uses	✓ Passive recreation space can also be used for events, as seen in benchmarks
Adventure Play	✓	✓	✓ Existing tourism & residential area	✓	✓ Meets need for diverse recreation	✓	Minimum fill	Complimentary to other land uses	✓ Draws visitors to the site and provides a unique form of recreation to the community
Industrial Use	✓	✓	✓ Existing industry	✓	-	✗	Best suited for edge of quarry	Can utilise site edge	✓ Industrial use can provide a buffer between existing plant and community use
Floating Solar Farm	✓	✓	✓ Neighbouring residences	✓	✗ Microgrid renewable energy not priority in urban areas	✗	Minimum fill	Dominant land use	✗ Although a solar farm is a viable end-use, we believe it does not maximise community benefit on the site compared to other uses, as solar is equally viable on surrounding land.
Agriculture	✓	✗ Site is too small	✗ Poor location due to industry & residences	✓	-	✗	Maximum fill	Dominant land use	✗ Not appropriate given context and fill required
Hotel	✗ Scheme amendment required	✓	✗ Poor location for luxury hotel	✗ No main road frontage	-	✓	Minimum fill	Dominant land use	✗ The quarry's industrial context and distance from major infrastucutre make it a poor site for a hotel
Commercial Use	✗ Scheme amendment required	✓	No other nearby business, would require visitor draw	✗ No main road frontage	-	✓	Best suited for edge of quarry	Complimentary to other land uses	✓ A hospitality business can capitalise on existing visitor draw from passive recreation & adventure playground

Approved Rehabilitation Plan

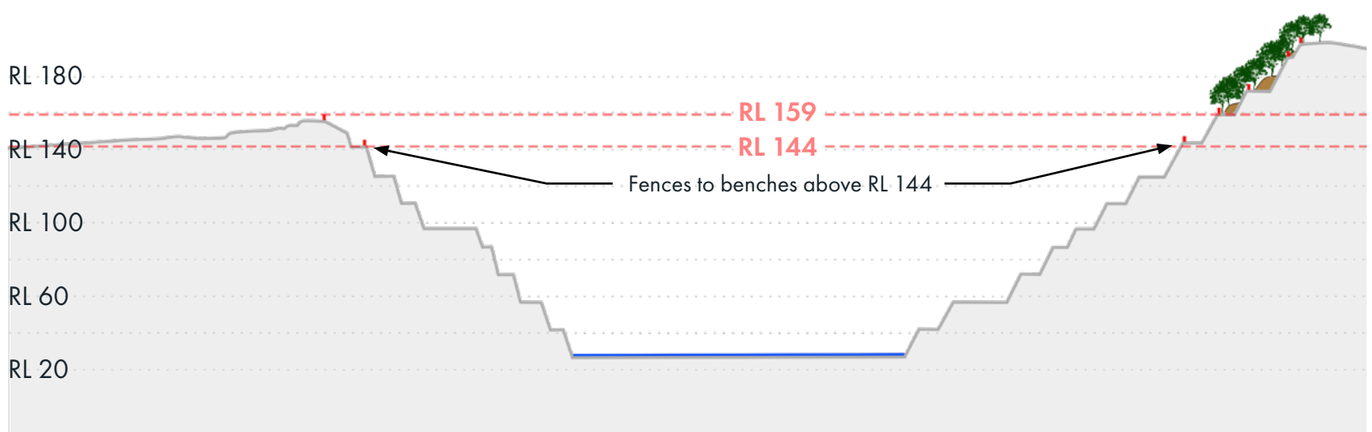
8 Approved Rehabilitation Plan (Baseline Option)

The rehabilitation plan for Montrose Quarry's current existing extraction area was approved by the Extractive Industries Board on 9th June 1994. The reclamation plan outlines that benches above RL 159 will have tree planting following the placement of overburden to minimise visual impact. All benches below RL 159 will remain in their post-extraction condition. Additionally, 'farm style' fences with catch drains will be installed next to the crest on benches above RL 144. The pit base sits below the current groundwater level (RL 28), therefore a small waterbody filled by groundwater and surface runoff will naturally form.

Under the current work authority, Montrose Quarry will likely conclude extraction in early 2024 and the existing reclamation plan will be enacted. Boral intends to continue to operate the concrete and asphalt plants on the site. The overbuden retained in the north-east stockyard can be utilised for the quarry reclamation, therefore allowing for potential subdivision and development of this site area. Industrial landuse is appropriate given the site's location within a greater industrial precinct and the continued operation of the adjacent concrete and asphalt plants. Furthermore, industrial use is currently permissible under the existing planning scheme.



Montrose Quarry Detailed Bench Reclamation from 1994 Approved Development Plan. Obtained from Boral.



8.1 Outcomes of Approved Rehabilitation Plan

1 Improved safety & minimum visual impact

The approved rehabilitation plan for the quarry under the existing work authority primarily ensures the site is safe and not visible to the local community. The installation of fences to benches above RL 144 minimise the risk of accidental injury from falling into the pit. Constructing intermediate benches and planting trees on benches above RL 159 minimises the post-extraction quarry's visibility from outside of the site.

2 Interface with surrounding landuses

The approved rehabilitation plan for the quarry under the existing work authority only applies to the upper south-east benches, allowing the existing overburden stockyard to transition to an alternative landuse. Industrial landuse is the appropriate given the site's location within a greater industrial precinct and the continued operation of the adjacent concrete and asphalt plants. Furthermore, industrial use is currently permissible under the existing planning scheme.

3 Re-vegetated ecological system

Introducing planting to the upper south-east benches is an opportunity for re-establishing the local ecosystem on the site following the end of quarrying operations. Planting trees contained within EVC 23: Herb-rich Foothill Forest will provide adequate visual screening and provide habitat value within the local ecosystem.

End Use Concept Master Plan Development for Proposed Expanded Work Authority

9 End Use Concept Master Plan for Proposed Expanded Work Authority

9.1 The role of the end use Concept Master Plans

The role of this end use Concept Master Plan is to investigate innovative end land uses for Montrose Quarry that are beneficial to the local community if it were to recieve an approved Work Plan Variation.

Recognising this, the Master Plan approach will be based on key principles that allow flexibility in the lead up until the quarries end use. There is an understanding that the site context and Yarra Ranges Council strategy will change between now and when the quarry would cease extraction. Therefore, a flexible framework has been established ensuring a sound foundation for the sites rehabilitation, whilst providing options for the future that will benefit the Montrose community and surrounding region.

9.2 Guiding principles

The following provides an overview of the major design drivers that have shaped the end use Master Plan. These principles are derived from the benchmarking study and their implementation is informed by the context study.

1) Interface with immediate landuses

2) Maximise community benefit

3) Offer a point of difference

4) Re-establish site ecological systems

5) Improve community access

1 Interface with surrounding landuses

The framework guiding all end use options for the Montrose Quarry is derived from the site's immediate context. Each end-use option must respond to the adjacent concrete & asphalt plants and Canterbury Road as key site considerations. Additionally, the site's performance can be increased by interfacing with the existing Dr Ken Leversha Reserve and residential lots to the east.

Furthermore, there is a preference placed on future landuses that are currently permissible under the existing planning schemes that apply to the site. However, landuses that would require an amendment to the planning schemes will still be considered where they strongly align with the Master Plan's guiding principles.

2 Maximise Community Benefit

Montrose Quarry's possible future landuses have been evaluated based on the benefit they will provide for the local Montrose community. The needs and values of the community have been established through the Yarra Ranges Council's strategic documents and comparison with the communities associated with each benchmark study. The landuse decision matrix demonstrates that a range of different landuses would provide a degree of benefit to the community, however designing with landuses that maximise community benefit will result in increased council and community support.

3 Offer a point of difference

The unique characteristics of the Montrose Quarry present a different landscape within the Yarra Ranges which should be celebrated within the site end-use outcomes. Retaining and designing around post-extraction features of the quarry, such as viewlines, exposed rock walls and industrial infrastructure, is an opportunity to differentiate the site from other spaces in the region.

As demonstrated through the benchmarking projects, providing a point of difference encourages community use and facilitates tourism, which allows for a wider range of landuses across the site. Furthermore, retaining elements of the quarry can reduce the fill volume and time required before handover and benefits surrounding land holders.

4 Re-establish site ecological systems

Ecological systems across the site will be restored and reconnected to provide a sustainable ecological framework for the future of the site. Effectively re-establishing the local ecology achieves valuable environmental outcomes, increases the success rate of planting and provides community amenity This principle will influence the Master Plan development through plant species selection, the design of waterbodies, and the rehabilitated site landform.

5 Improve community access

The existing site has been deliberately designed to restrict access due to potentially dangerous quarrying operations. Therefore, improving access is a essential focus of the Master Plan development to ensure the site can be used and maintained once separated from the operational asphalt and concrete plants. Key access points have been developed to provide entries from Canterbury Road, nearby residential areas, and via Dr Ken Leversha Reserve.

Accessibility is also an essential consideration for developing the rehabilitated landform. As demonstrated through the benchmarking studies, the amount of fill and its distribution influences the accessibility of the lowest points of the rehabilitated landscape.

9.3 Vegetation / Planting Palette

Re-vegetation is a guiding principle for the reclamation of the Montrose Quarry extension, therefore native planting is a key consideration for successful rehabilitation. The species selected for planting within the re-vegetated areas within the Concept Master Plan options should be based on the original ecological vegetation classes (EVCs) that existed on the site to maximise ecological value. Selecting species based on the original EVCs re-establishes the local ecosystem, increases the resiliency of planting and maximises the habitat value provided.

The list below outlines key plant species for rehabilitation within the Concept Master Plan. These species have been selected based on their inclusion within the original EVCs that existed on the site before quarrying (EVC 17, 23, 127 & 128), as well as continuing to grow in the adjacent Dr Ken Leversha Reserve. Both rehabilitated options for the Concept Master Plan have a waterbody within the site, therefore species growing along Bungalook creek (EVC 17: Riparian Scrub) have been included for planting on the edge of the waterbody.

Trees

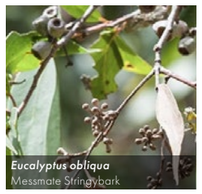

Eucalyptus radiata
Narrow-leaf Peppermint


Eucalyptus goniocalyx
Bundy


Eucalyptus macrorhyncha
Red Stringybark


Eucalyptus dives
Broad-leaved Peppermint


Eucalyptus cypellocarpa
Mountain Grey-gum


Eucalyptus obliqua
Messmate Stringybark


Melaleuca squarrosa
Scented Paperbark


Leptospermnum continentale
Prickly Tea-tree

Shrubs

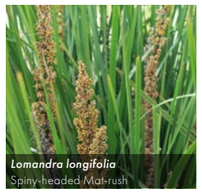

Acacia melanoxylon
Blackwood


Cassinia aculeata
Common Cassinia


Epacris impressa
Common Heath

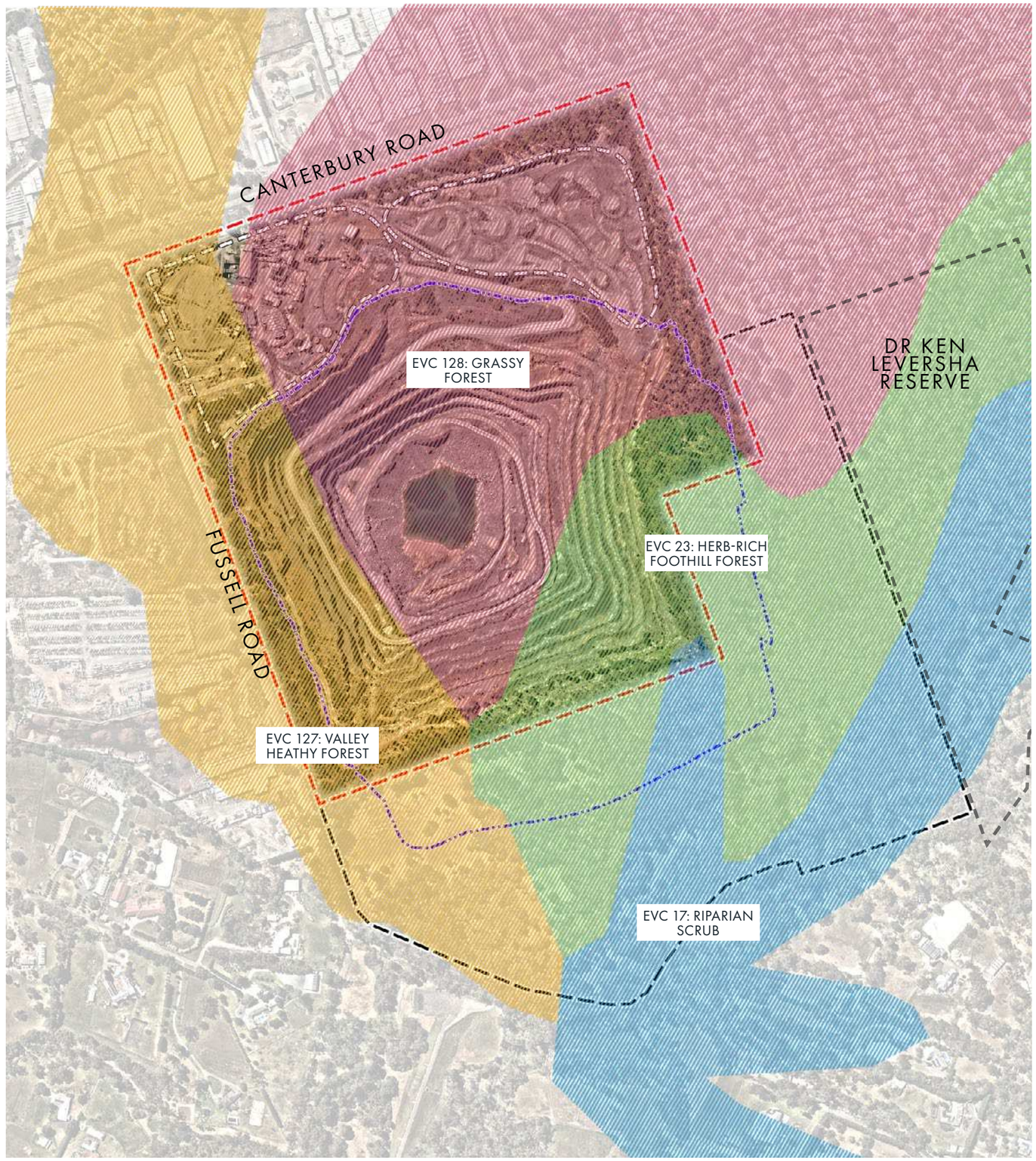

Themeda triandra
kangaroo Grass


Acacia mearnsii
Black Wattle


Lomandra longifolia
Spiny-headed Mat-rush


Dianella tasmanica
Tasman Flax-lily


Microlaena stipoides var. stipoides
Weeping Grass



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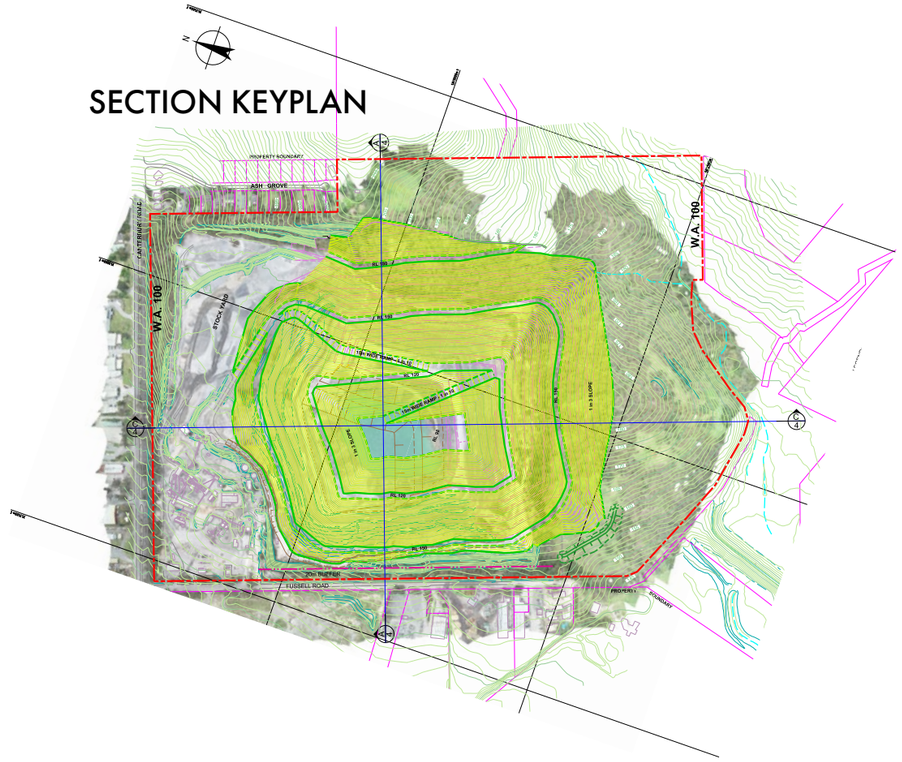
11 Evaluating Fill Scenarios

As part of the *Boral Montrose Staging Plan and Rehabilitation Concept* report (21 October 2022), GHD outlines hypothetical fill scenarios following the final stage of expanded extraction and their associated end-use possibilities. The following analysis explains the advantages and disadvantages contained within each fill scenario, particularly their required fill and community value. It is demonstrated that each of the fill scenarios partially meet the established guiding principles, including the current rehabilitation concept. However, potential alternative landforms are proposed for Concept Master Plan optimised option 2 & 3 to maximise community amenity and minimise fill time.



Option 1 Rehabilitated Landform
Fill to RL 98, 1:3 slopes
13,700,000m³ fill required
56 years to fill

Option 2 Rehabilitated Landform
Fill to RL 112
12,000,000m³ fill required
50 years to fill

Option 3 Rehabilitated Landfrom
Fill to RL 88
6,000,000m³ fill required
25 years to fill

RL 250
RL 200
RL 150
RL 100
RL 50
RL 0

END OF WA100

END OF WA100

Groundwater (RL 28)

Current Quarry Landform
as of May 2022

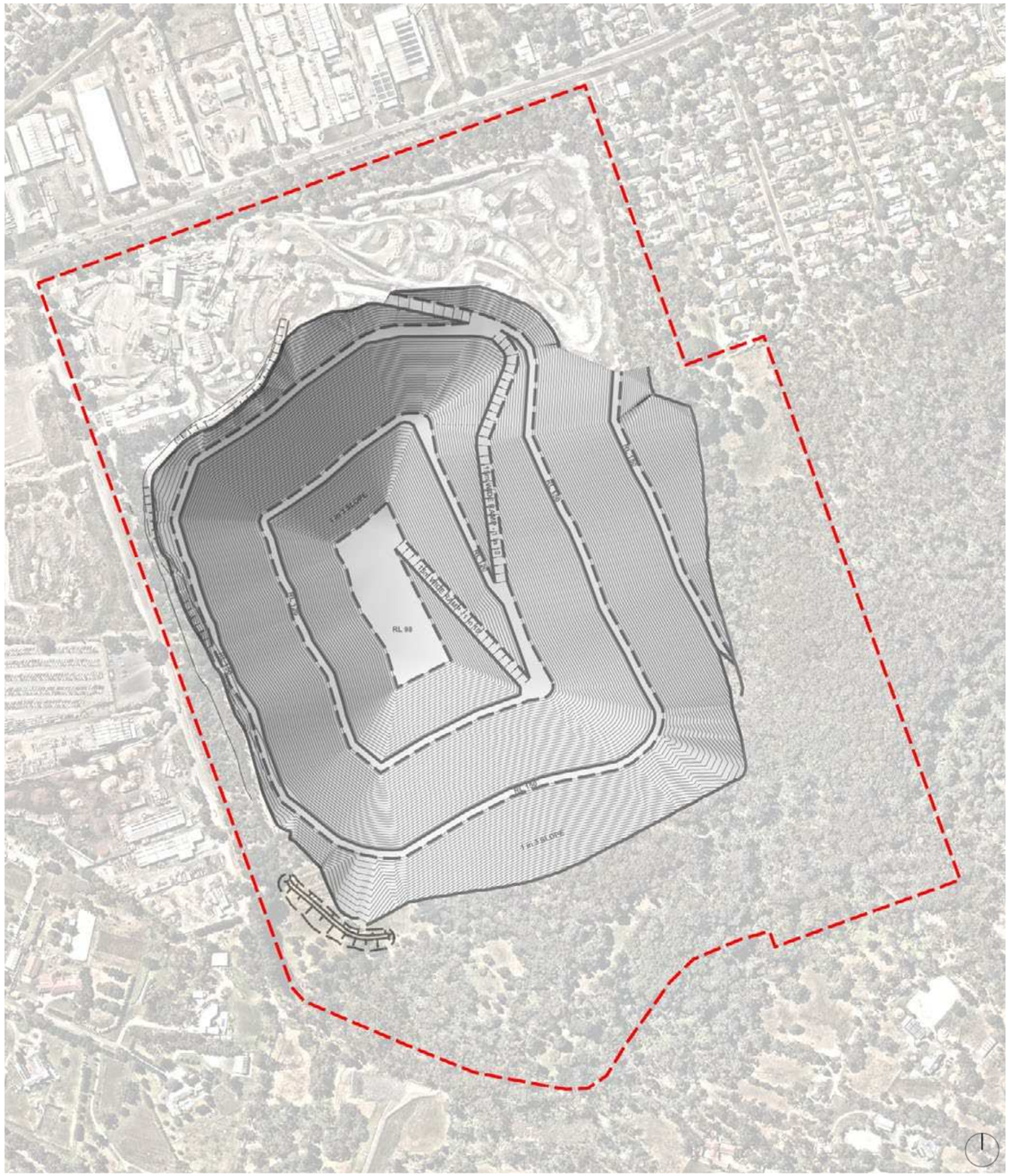
Expanded Quarry Landform

SECTION C-C

0 30 60 150m

11.1 Fill to RL 98 & 1:3 Slopes (Option 1)

- ✓ Improved pit access
- ✘ Removes quarry feature walls that act as point of difference
- ✘ Minimal flat area for recreational landuses
- ✘ Typically only viable for re-vegetation & conservation

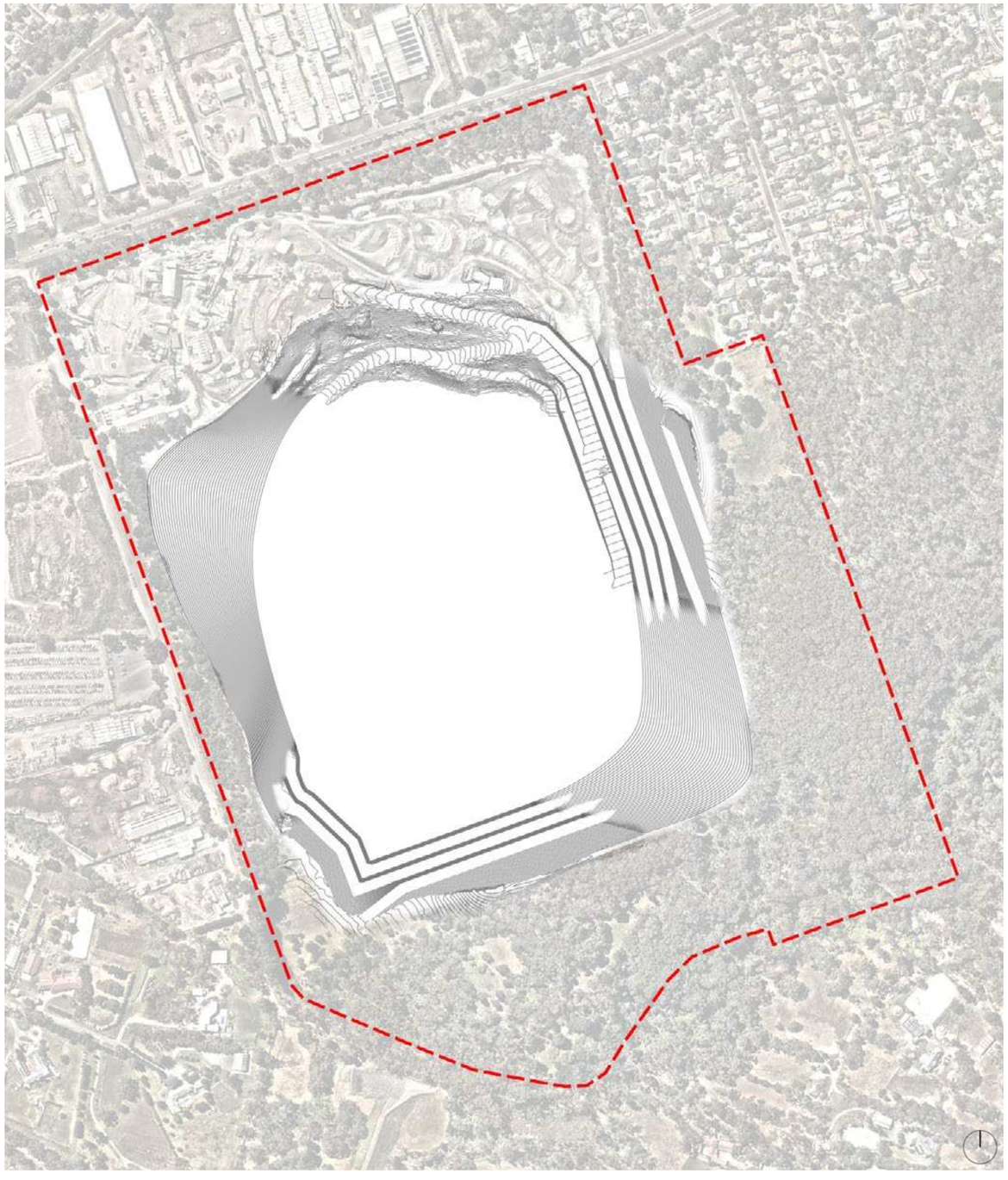


11.2 Fill to RL 112

- ✓ Maximum flat ground for recreational use
- ✓ Dramatic feature walls as point of difference
- \- Requires further fill to allow multiple access points
- \- Older quarry walls may require reinforcement

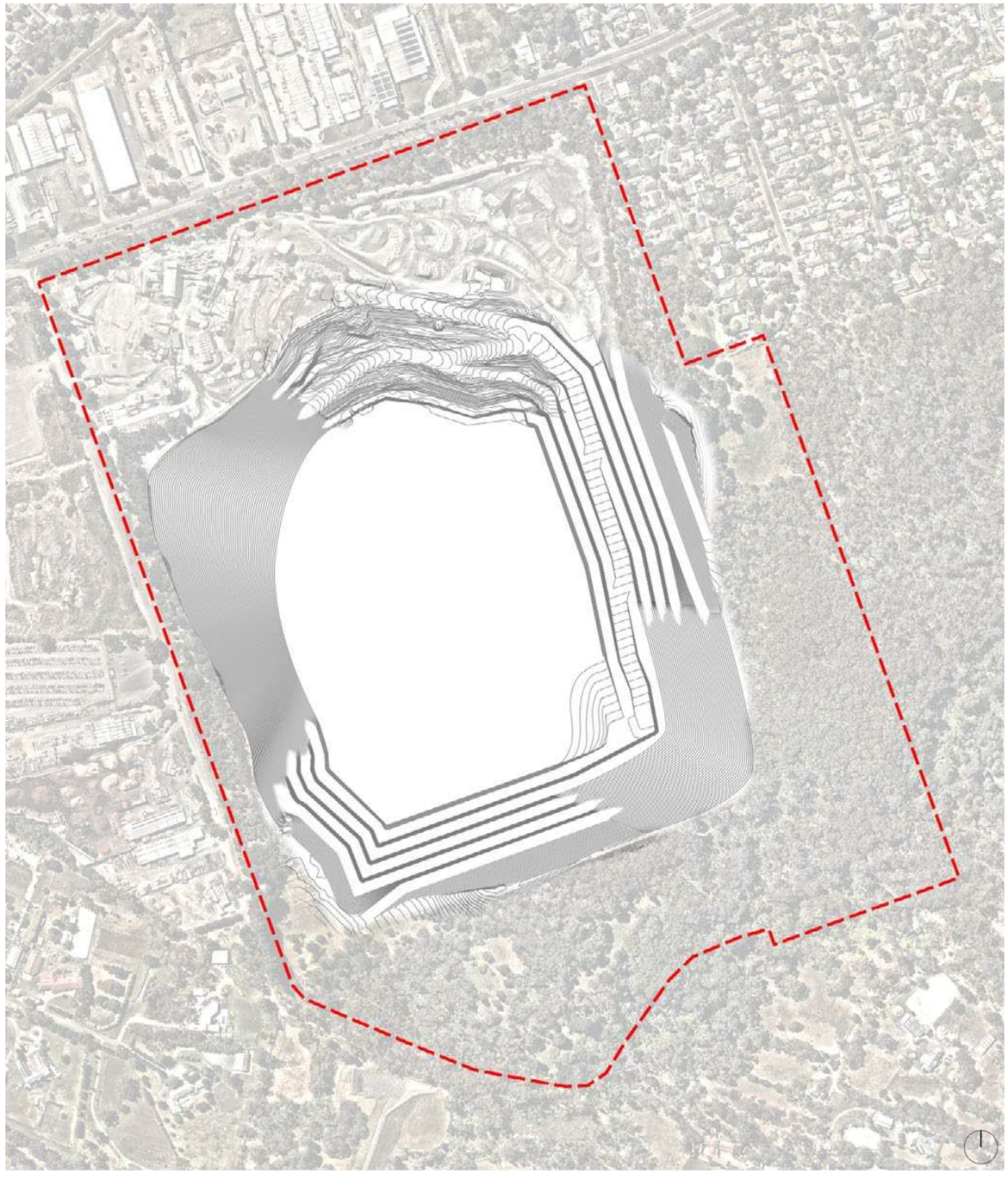
11.4 Fill to RL 112 with Sloped Edges (Option 2)

- ✓ Maximum flat ground for recreational use
- ✓ Maximises site access
- ✓ Sloping edges provide topographic variation and improve access



11.3 Fill to RL 88 with Sloped Edges (Option 3)

- ✓ Maximum flat ground for recreational use
- ✓ Maximises site access
- ✓ Slope edges provide variation & improve access
- ✓ Minimal fill duration (Approx 25 Years)



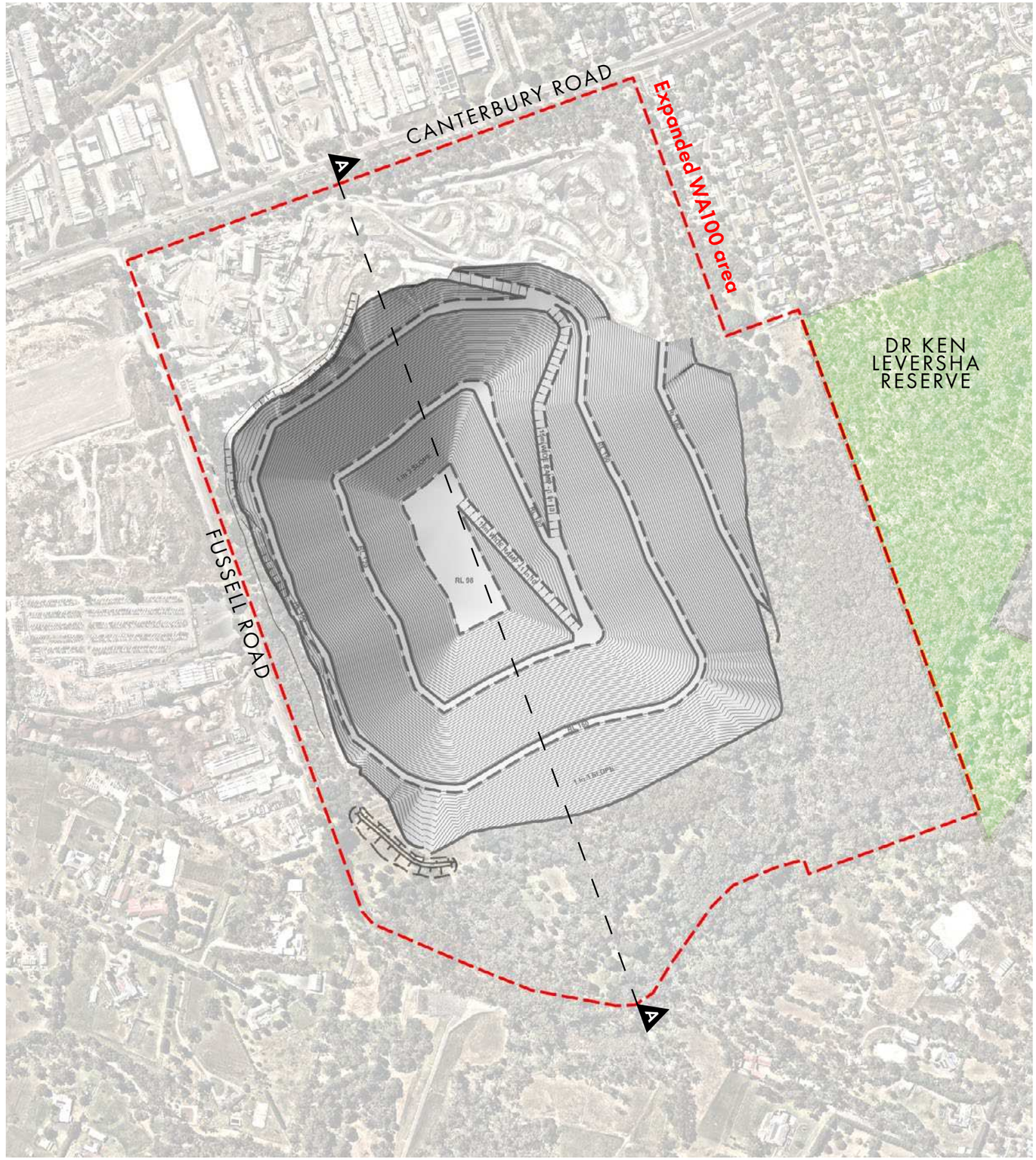
12 Option 1 - Fill to RL 98 & 1:3 Slopes

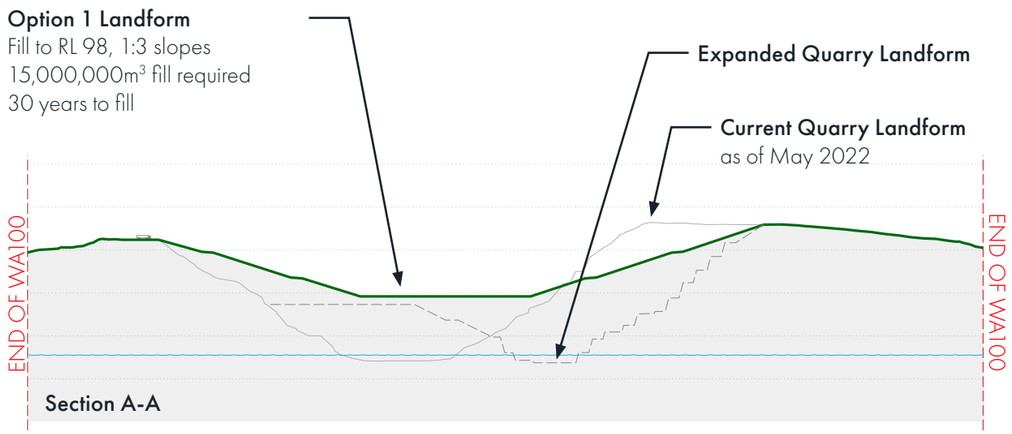
12.1 End use landform / topography

Optimised option 1 of the Concept Master Plan uses the rehabilitation concept landform for the Montrose Quarry extension as proposed by GHD (*Boral Montrose Staging Plan and Rehabilitation Concept,* 21 October 2022, Appendix E). This landform buries the quarried batters under 1:3 slopes to maximise stability, safety and access. It is estimated that this landform requires 15,000,000m^3 of clean fill, predominantly externally sourced over a 56 year period. The base of the pit sits at RL 98 and is 70m above the current groundwater level (RL 28). A small waterbody can be expected to naturally form at the landform's lowest point from surface runoff, with its depth dependent on rainfall, catchment area and the rate of absorption.

The lowest point of the landform is accessed via a 1:10 graded road, which is generally appropriate for vehicle and pedestrian access. Typically, a 1:10 slope grade is not considered wheelchair accessible, however could be navigated with assistance. Intermittent benches at every 30m of elevation gain provide flat space for potential trail loops. This landform provides minimal area for typical active recreation uses, however the sloping edges facilitate re-vegetation, passive recreation (walking, picnicking, wildlife observation etc) and downhill mountain bike riding.

Following rehabilitation, the existing overburden stockyard could undergo potential subdivision and development. Industrial landuse is appropriate given the site's location within a greater industrial precinct and the continued operation of the adjacent concrete and asphalt plants. Furthermore, industrial use is currently permissible under the existing planning scheme.





12.2 Access

As a community parkland, the optimised option 1 end use plan is focused on improving site access from multiple directions of travel. Consideration has also been given to the surrounding context to maximise the community value of the space by interfacing with other public land. The site will be primarily navigated by visitors on foot, however parking allowances are required to minimise the impact of visitation on adjacent residences.

1 Canterbury Road Entry

As a major route of transport, Canterbury Road is the primary entrance point for visitors travelling by car and public transport. The access point has been positioned at the northeast corner of the site to maintain a buffer between park visitors and industrial landuse, with a smaller buffer maintained to the east between the access point and residences. A small car park will be necessary to allow visitors to leave their car and travel through the site on foot. Other amenities, such as toilets or major signage should also be positioned at this entrance.

2 Interface with Dr Ken Leversha Reserve

The existing Dr Ken Leversha Reserve loop trail offers an opportunity for extending the trail network of the rehabilitated quarry. Linking to the north-west corner of the Dr Ken Leversha Reserve loop provides access to Kirkwood Court through the existing reserve entrance, and Ruby Road and Bright Road via the reserve trail.

3 Fussell Road Retarding Basin

Fussell Road Retarding Basin is publicly accessible land managed by Melbourne Water that limits the flow of Bungalook Creek to prevent flooding. A trail connection between the rehabilitated quarry and the basin extends the walking network, provides access to Bungalook Creek and Fussell Road.

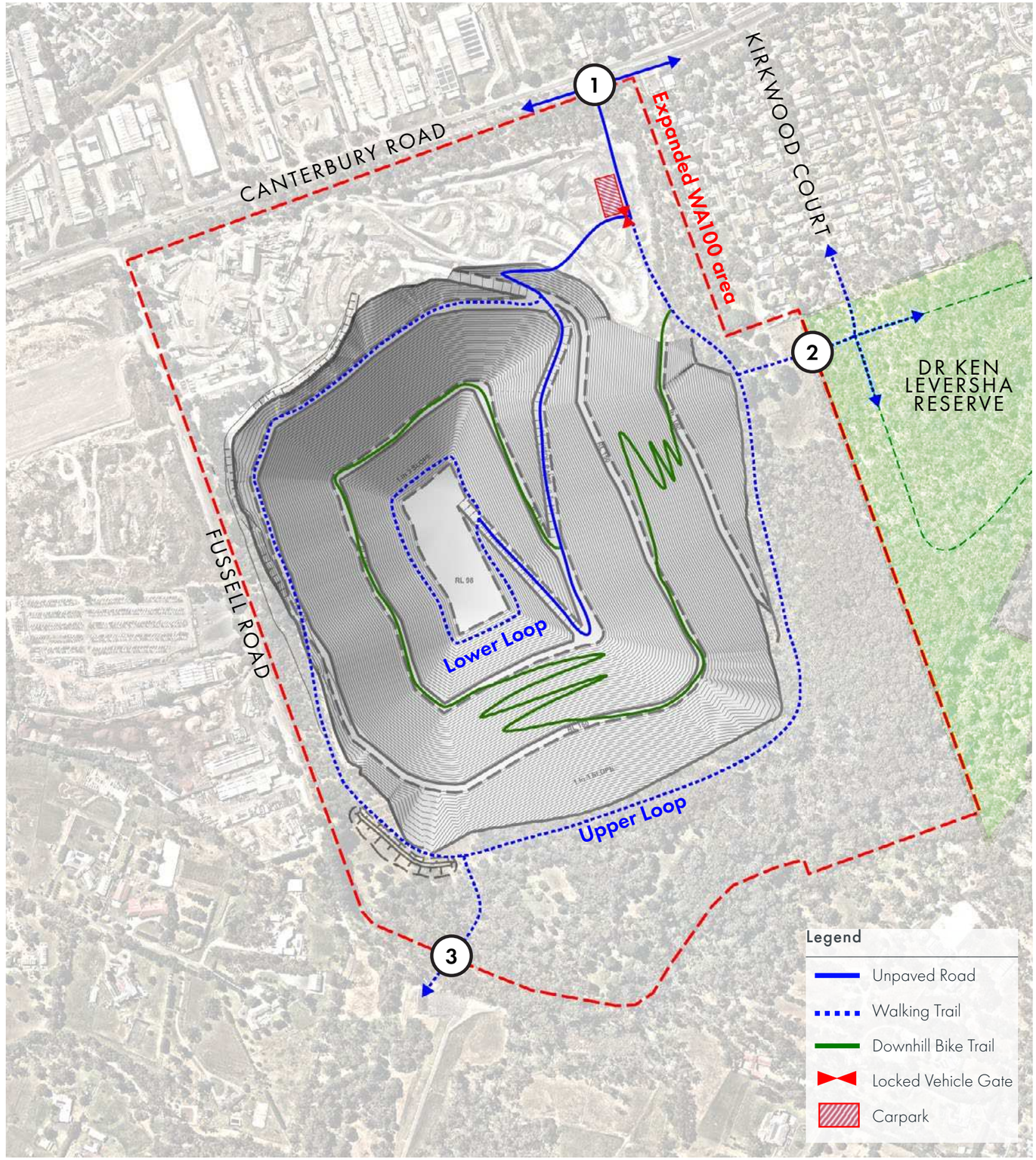
12.3 Circulation

Pedestrian

The site is primarily navigated by foot, with two loops facilitating passive recreation. An upper loop trail follows the perimeter of the rehabilitated pit with view-lines into the constructed basin. The trail remains separated from the concrete and asphalt plants by diverting along the highest rehabilitated bench in the northwest corner of the site. A lower loop access by a 1:10 unpaved vehicle access track allows visitors to get close to the feature lake.

Vehicle

Vehicle access is via the Canterbury Road entry point. Visitors leave their vehicle at the northeast and continue to navigate the site on foot. A 1:10 unpaved vehicle track enables maintenance and emergency vehicles to access the base of the rehabilitated pit and feature lake.



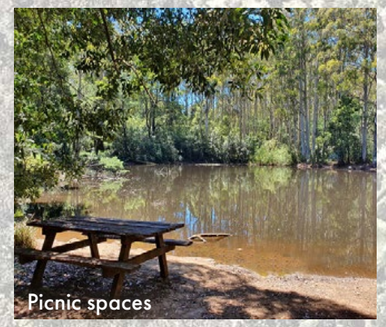
12.4 Option 1 Illustrative Plan


Natural reserve & walking trails


Viewpoints


Boardwalk/fishing


Downhill mountain biking


Picnic spaces

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0 50 100 200

1 Interfaces with surrounding landuses

Optimised option 1 primarily interfaces with its context through expanding Montrose's trail system. The rehabilitated quarry's trail network interconnects with Dr Ken Leversha Reserve and the retarding basin to maximise community walkability and extend the possible hiking distance within native forest.

Furthermore, the existing overburden stockyard can transition to an alternative landuse following rehabilitation. Industrial landuse is the appropriate given the site's location within a greater industrial precinct and the continued operation of the adjacent concrete and asphalt plants. Industrial use is currently permissible under the existing planning scheme.

2 Provides Community Benefit

Under the expanded work authority, option 1 for the rehabilitated quarry creates accessible greenspace that provides benefit to the local community. This design is aligns with the Yarra Range's current open space strategy by developing natural tourism and providing diverse recreational space. The community is also indirectly benefited through the expansion of native forest which provides valuable habitat and ecosystem services.

3 Re-establishes site ecological systems

Optimised option 1 proposes re-vegetating most of the quarried land with native forest. Re-introducing species that were originally on the site and remain within Dr Ken Leversha Reserve will strengthen the local ecology and provide valuable habitat. Furthermore, a central waterbody reduces strain on the surrounding stormwater infrastructure and creates aquatic habitat.

4 Improves community access

Key entry points have been developed to provide entries from Canterbury Road, Dr Ken Leversha Reserve, nearby residences (via the reserve) and the Fussell Road (via the retarding basin). This ensures the community has access to the reclaimed site and benefit from its amenity.

The sloping rehabilitated landfrom also maximises the accessibility of the landform and allows pedestrians and vehicles to access the lowest point in the landscape. This ensures the parkland can be used and maintained once separated from the operational asphalt and concrete plants.

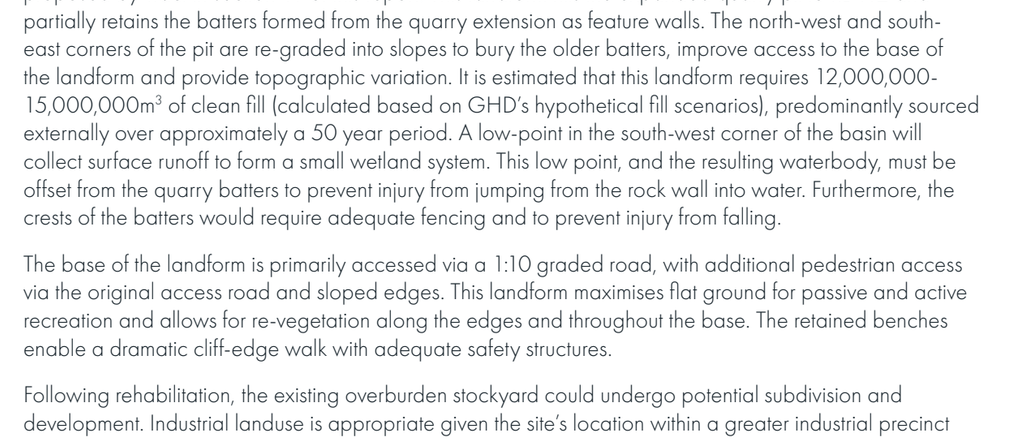
13 Optimised Option 2 - Fill to RL 112 with Sloped Edges

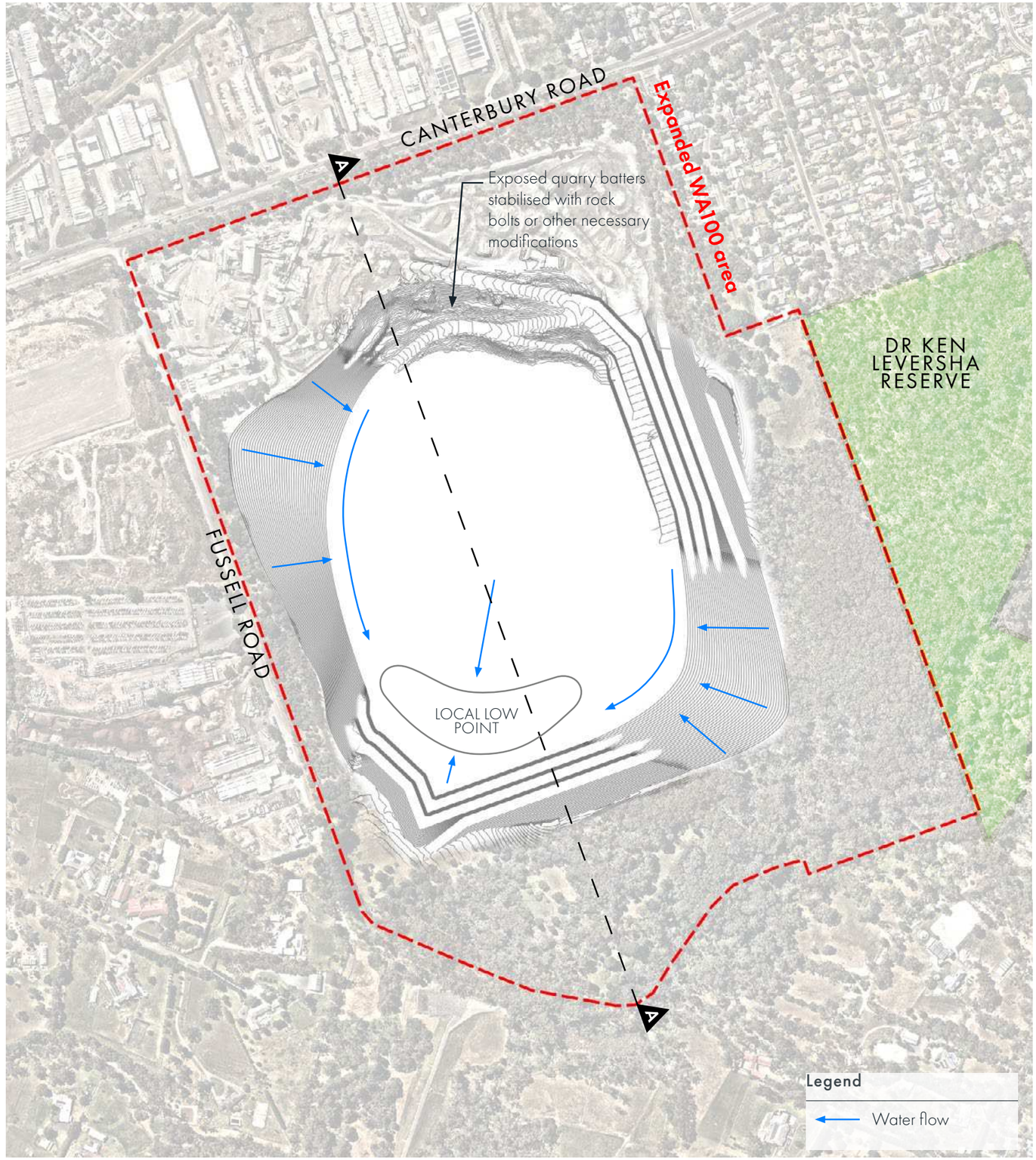
13.1 End use landform / topography

Optimised option 2 of the Concept Master Plan uses an alternative rehabilitation concept landform proposed by Tract in section 11 of this report. This landform fills the expanded quarry pit to RL 112 and partially retains the batters formed from the quarry extension as feature walls. The north-west and south-east corners of the pit are re-graded into slopes to bury the older batters, improve access to the base of the landform and provide topographic variation. It is estimated that this landform requires 12,000,000-15,000,000m^3 of clean fill (calculated based on GHD's hypothetical fill scenarios), predominantly sourced externally over approximately a 50 year period. A low-point in the south-west corner of the basin will collect surface runoff to form a small wetland system. This low point, and the resulting waterbody, must be offset from the quarry batters to prevent injury from jumping from the rock wall into water. Furthermore, the crests of the batters would require adequate fencing and to prevent injury from falling.

The base of the landform is primarily accessed via a 1:10 graded road, with additional pedestrian access via the original access road and sloped edges. This landform maximises flat ground for passive and active recreation and allows for re-vegetation along the edges and throughout the base. The retained benches enable a dramatic cliff-edge walk with adequate safety structures.

Following rehabilitation, the existing overburden stockyard could undergo potential subdivision and development. Industrial landuse is appropriate given the site's location within a greater industrial precinct and the continued operation of the adjacent concrete and asphalt plants. Furthermore, industrial use is currently permissible under the existing planning scheme.





13.2 Access

As an active community space, the optimised option 2 End Use Plan is focused on improving site access from multiple directions of travel. Consideration has also been given to the surrounding context to maximise the community value of the space by interfacing with other public land. The base of the rehabilitated landform can be accessed by vehicles and extensive pedestrian trails maximise site amenity.

1 Canterbury Road Entry

As a major route of transport, Canterbury Road is the primary entrance point for visitors travelling by car and public transport. The access point has been positioned at the north-east corner of the site to align with the ramp into the basin and provide shared use to the adjacent industrial land, with a smaller buffer maintained to the east between the access point and residences. A carpark allows visitors to visit a commercial space and access the rehabilitated quarry via walking, however vehicles can continue to drive into the basin closer to the park facilities and features.

2 Interface with Dr Ken Leversha Reserve

The existing Dr Ken Leversha Reserve loop trail offers an opportunity for extending the trail network of the rehabilitated quarry. Linking to the north-west corner of the Dr Ken Leversha Reserve loop provides pedestrian access to Kirkwood Court through the existing reserve entrance, and Ruby Road and Bright Road via the reserve trail.

3 Fussell Road Retarding Basin

Fussell Road Retarding Basin is publicly accessible land managed by Melbourne Water that limits the flow of Bungalook Creek to prevent flooding. A trail connection between the rehabilitated quarry and the basin extends the walking network, provides access to Bungalook Creek and Fussell Road.

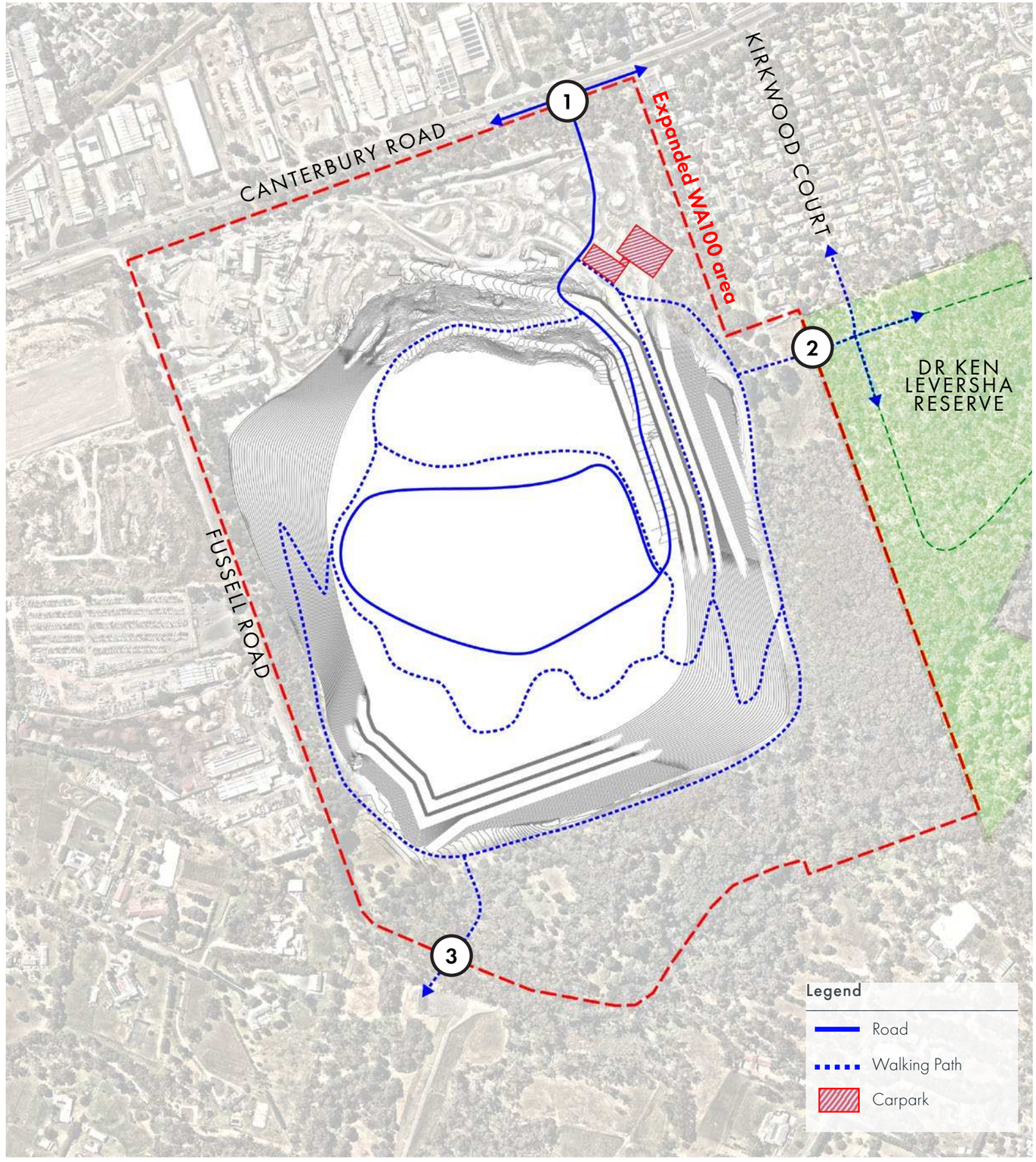
13.3 Circulation

Pedestrian

A pedestrian path network across the site maximises areas accessible for recreational use and provides multiple trail options. Pedestrians can access the bottom of the topographic depression via the original quarry haul road, which contextualises the site's history. A central loop allows pedestrians to walk between spaces within the park. An outer loop follows the vegetated edge of the rehabilitated quarry and provides views into the park. This trail interfaces with surrounding trail networks and avoids the operational plants in the north-west corner of the site. A feature walkway follows a retained bench on the eastern edge and terminates at the commercial space.

Vehicle

Vehicle access is via the Canterbury Road entry point. Visitors can park at the commercial space or continue into the park basin. A vehicle loop with scattered road-side parking allows visitors to travel to desired destinations.



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0 50 100 200

13.4 Optimised Option 2 Illustrative Plan

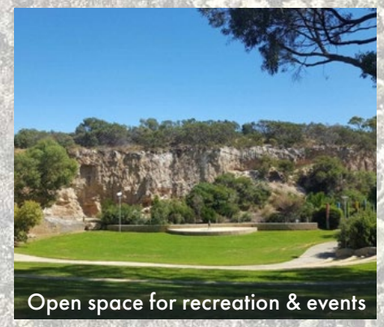

Adventure playground


Dramatic hospitality space


Feature quarry wall


Quarry edge walk


Natural reserve & walking trails


Open space for recreation & events


Wetland boardwalk


Picnic spaces

1:5000 (A3)

0 50 100 200

1 Interfaces with surrounding landuses

Optimised option 2 interfaces with its context through creating an expanded trail system throughout Montrose and extending the network of active recreation spaces. The rehabilitated quarry's trail network connects with Dr Ken Leversha Reserve and the retarding basin to maximise community walkability and extend the possible hiking distance within native forest.

Furthermore, the existing overburden stockyard can transition to an alternative landuse following rehabilitation. Industrial landuse is the appropriate given the site's location within a greater industrial precinct and the continued operation of the adjacent concrete and asphalt plants. Industrial use is currently permissible under the existing planning scheme.

2 Maximises Community Benefit

Optimised option 2 creates active and passive recreational space tailored to meet the needs of the Montrose community. An adventure playground and a large open space aligns with the Yarra Range's Open Space Strategy though providing diverse recreational offerings. Additionally, the trail network and feature rock walls increase the local natural tourism offering. Increased vehicle access and an open event space also ensures the park can facilitate outdoor community events.

3 Offers a point of difference

This rehabititation option provides a community space with unique qualities which differentiate it from other parkland. Retaining and designing with elements of the post-extraction features of the quarry creates interest, tourism potential, and acknowledges the landscape's history. These outcomes result in economic opportunity and the potential for more diverse landuse options, such as the adventure playground, without requiring a lengthy fill time to maximise the usability of the space.

4 Re-establishes site ecological systems

Optimised option 2 proposes re-vegetating much of the quarried land with native forest. Re-introducing species that were originally on the site and remain within Dr Ken Leversha Reserve will strengthen the local ecology and provide valuable habitat. Furthermore, a constructed waterbody reduces strain on the surrounding stormwater infrastructure, creates aquatic habitat, and purifies surface runoff.

5 Improves community access

Key entry points have been developed to provide entries from Canterbury Road, Dr Ken Leversha Reserve, nearby residences (via the reserve) and the Fussell Road (via the retarding basin). This ensures the community has access to the reclaimed site and benefit from its amenity.

Extending vehicle access to the bottom of the basin facilitates more diverse uses allows for improved maintenance. The sloped edges of the proposed landform also increases the accessibility of the landform by further interconnecting the trail system and increases the passive recreation offering.

14 Optimised Option 3 - Fill to RL 88 with Sloped Edges

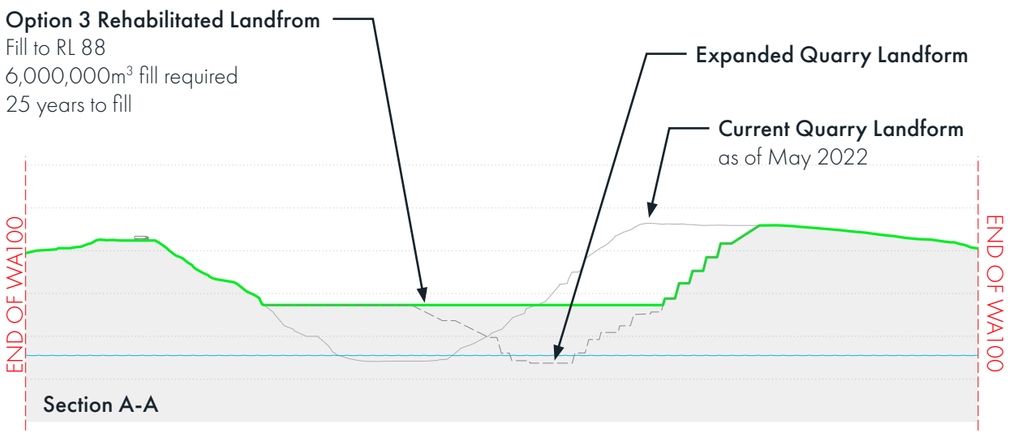
14.1 End use landform / topography

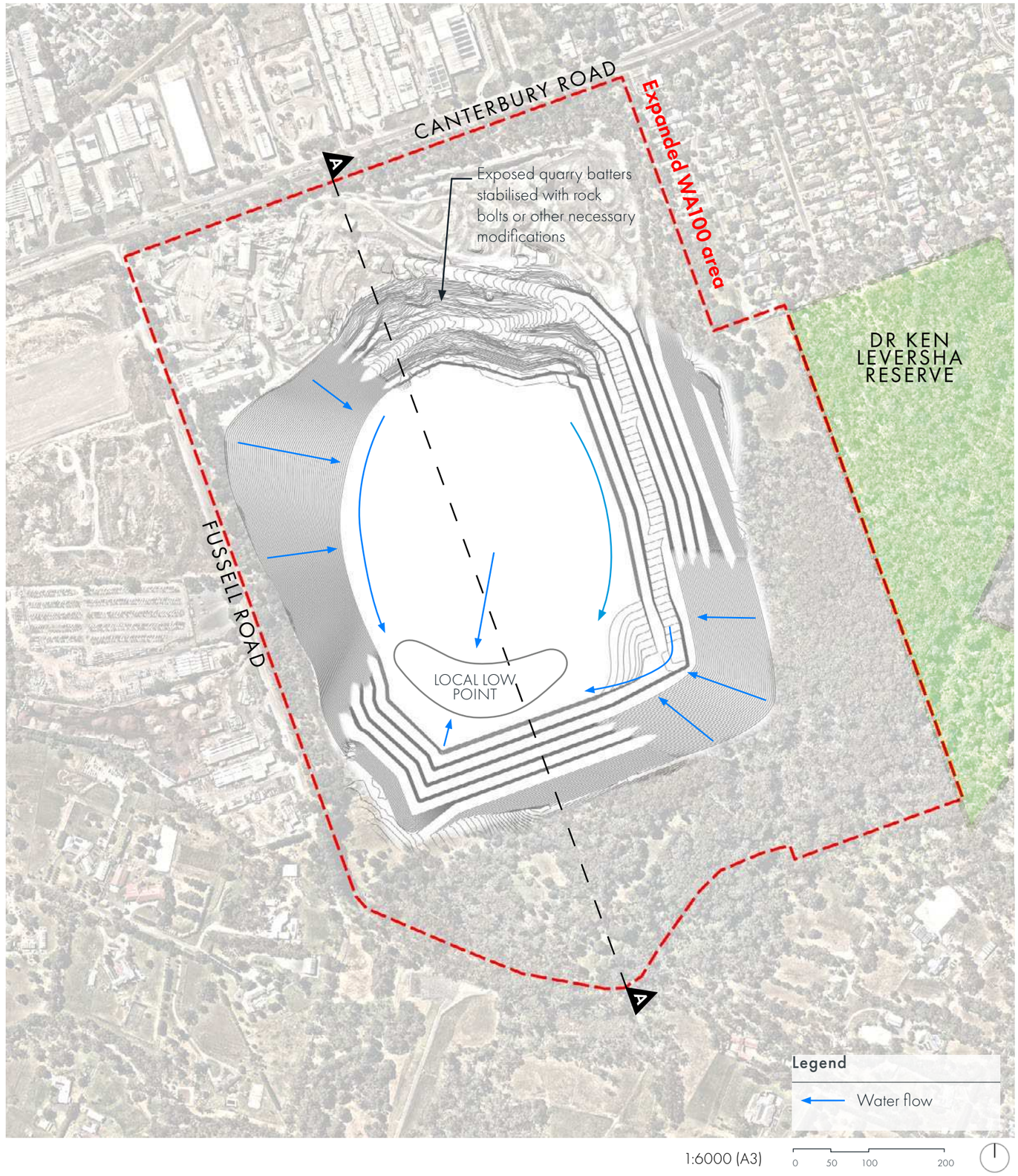
Optimised option 3 of the Concept Master Plan uses an alternative rehabilitation concept landform proposed by Tract in section 11 of this report. This landform requires less fill than Option 2, as the expanded quarry pit is filled to only RL 88. Similar to Option 2, the north-west and south-east corners of the pit are re-graded into slopes to bury the older batters, improve access to the base of the landform and provide topographic variation. The advantage of this landform is that it requires approximately 6,000,000m^3 of clean fill over a 25 year period, therefore minimising the time from final extraction to community parkland. This results in a more dramatic and deeper landform with a longer access ramp.

A low-point in the south-west corner of the basin will collect surface runoff to form a small wetland system. This low point, and the resulting waterbody, must be offset from the quarry batters to prevent injury from jumping from the rock wall into water. Furthermore, the crests of the batters would require adequate fencing and to prevent injury from falling.

The base of the landform is primarily accessed via a 1:10 graded road, with additional pedestrian access via the original access road and sloped edges. This landform maximises flat ground for passive and active recreation and allows for re-vegetation along the edges and throughout the base. The retained benches enable a dramatic cliff-edge walk with adequate safety structures.

Following rehabilitation, the existing overburden stockyard could undergo potential subdivision and development. Industrial landuse is appropriate given the site's location within a greater industrial precinct and the continued operation of the adjacent concrete and asphalt plants. Furthermore, industrial use is currently permissible under the existing planning scheme.





14.2 Access

As an active community space, the optimised option 3 End Use Plan is focused on improving site access from multiple directions of travel. Consideration has also been given to the surrounding context to maximise the community value of the space by interfacing with other public land. The base of the rehabilitated landform can be accessed by vehicles and extensive pedestrian trails maximise site amenity.

1 Canterbury Road Entry

As a major route of transport, Canterbury Road is the primary entrance point for visitors travelling by car and public transport. The access point has been positioned at the north-east corner of the site to align with the ramp into the basin and provide shared use to the adjacent industrial land, with a smaller buffer maintained to the east between the access point and residences. A carpark allows visitors to visit a commercial space and access the rehabilitated quarry via walking, however vehicles can continue to drive into the basin closer to the park facilities and features.

2 Interface with Dr Ken Leversha Reserve

The existing Dr Ken Leversha Reserve loop trail offers an opportunity for extending the trail network of the rehabilitated quarry. Linking to the north-west corner of the Dr Ken Leversha Reserve loop provides pedestrian access to Kirkwood Court through the existing reserve entrance, and Ruby Road and Bright Road via the reserve trail.

3 Fussell Road Retarding Basin

Fussell Road Retarding Basin is publicly accessible land managed by Melbourne Water that limits the flow of Bungalook Creek to prevent flooding. A trail connection between the rehabilitated quarry and the basin extends the walking network, provides access to Bungalook Creek and Fussell Road.

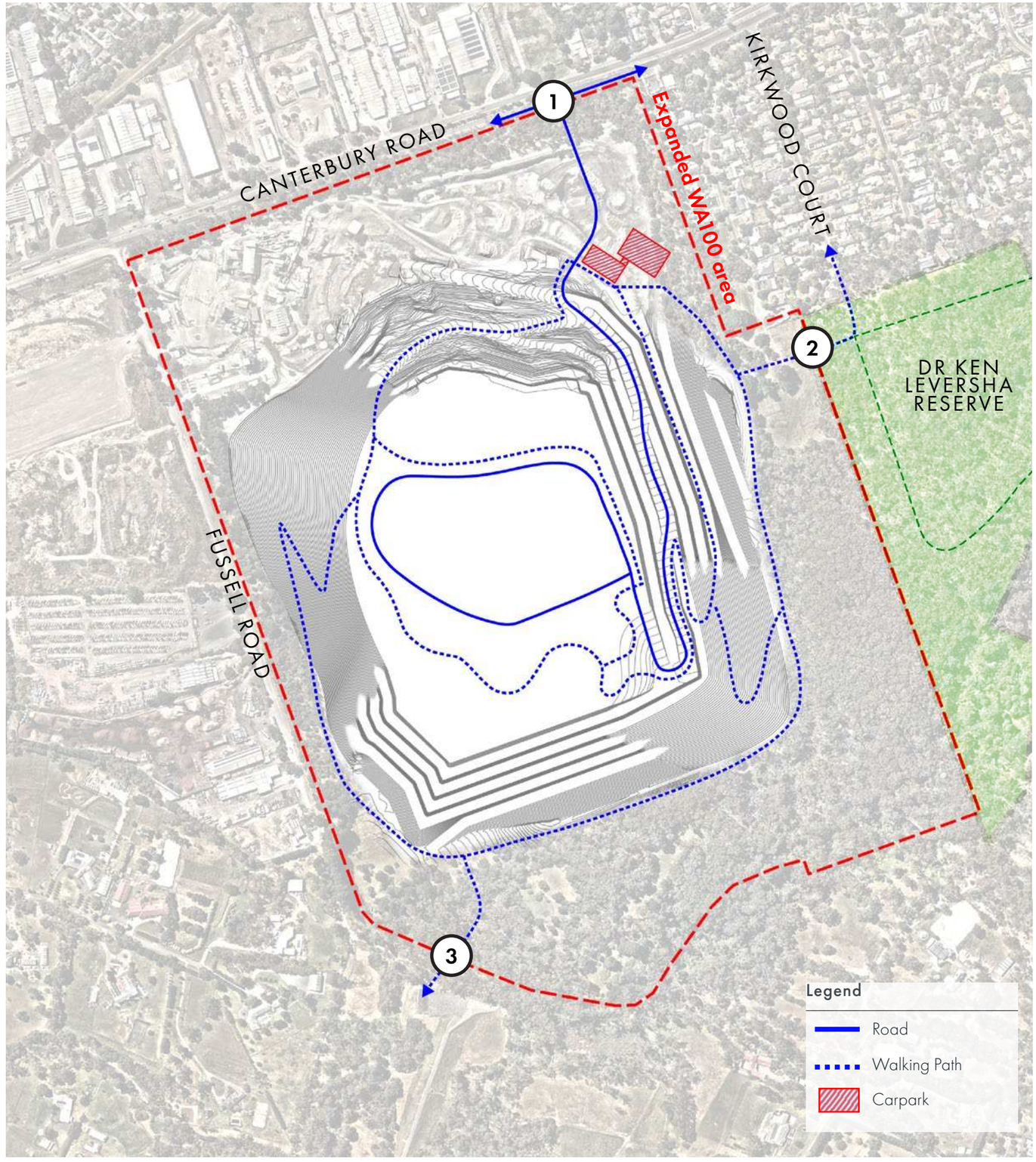
14.3 Circulation

Pedestrian

A pedestrian path network across the site maximises areas accessible for recreational use and provides multiple trail options. Pedestrians can access the bottom of the topographic depression via the original quarry haul road, which contextualises the site's history. A central loop allows pedestrians to walk between spaces within the park. An outer loop follows the vegetated edge of the rehabilitated quarry and provides views into the park. This trail interfaces with surrounding trail networks and avoids the operational plants in the north-west corner of the site. A feature walkway follows a retained bench on the eastern edge and terminates at the commercial space.

Vehicle

Vehicle access is via the Canterbury Road entry point. Visitors can park at the commercial space or continue into the park basin. A vehicle loop with scattered road-side parking allows visitors to travel to desired destinations.



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14.4 Optimised Option 3 Illustrative Plan


Adventure playground


Dramatic hospitality space


Feature quarry wall


Quarry edge walk

Natural reserve & walking trails

Open space for recreation & events

Wetland boardwalk

Picnic spaces

1:5000 (A3)

0 50 100 200

1 Interfaces with surrounding landuses

Optimised option 3 interfaces with its context through creating an expanded trail system throughout Montrose and extending the network of active recreation spaces. The rehabilitated quarry's trail network connects with Dr Ken Leversha Reserve and the retarding basin to maximise community walkability and extend the possible hiking distance within native forest.

Furthermore, the existing overburden stockyard can transition to an alternative landuse following rehabilitation. Industrial landuse is the appropriate given the site's location within a greater industrial precinct and the continued operation of the adjacent concrete and asphalt plants. Industrial use is currently permissible under the existing planning scheme.

2 Provides Community Benefit

Optimised option 3 creates active and passive recreational space tailored to meet the needs of the Montrose community. An adventure playground and a large open space aligns with the Yarra Range's Open Space Strategy though providing diverse recreational offerings. Additionally, the trail network and feature rock walls increase the local natural tourism offering. Increased vehicle access and an open event space also ensures the park can facilitate outdoor community events.

3 Offers a point of difference

This rehabititation option provides a community space with unique qualities which differentiate it from other parkland. Retaining and designing with elements of the post-extraction features of the quarry creates interest, tourism potential, and acknowledges the landscape's history. These outcomes result in economic opportunity and the potential for more diverse landuse options, such as the adventure playground, without requiring a lengthy fill time to maximise the usability of the space.

4 Re-establishes site ecological systems

Optimised option 3 proposes re-vegetating much of the quarried land with native forest. Re-introducing species that were originally on the site and remain within Dr Ken Leversha Reserve will strengthen the local ecology and provide valuable habitat. Furthermore, a constructed waterbody reduces strain on the surrounding stormwater infrastructure, creates aquatic habitat, and purifies surface runoff.

5 Improves community access

Key entry points have been developed to provide entries from Canterbury Road, Dr Ken Leversha Reserve, nearby residences (via the reserve) and the Fussell Road (via the retarding basin). This ensures the community has access to the reclaimed site and benefit from its amenity.

Extending vehicle access to the bottom of the basin facilitates more diverse uses allows for improved maintenance. The sloped edges of the proposed landform also increases the accessibility of the landform by further interconnecting the trail system and increases the passive recreation offering.

6 Minimal Fill Duration

Optimised Option 3 requires the least fill volume of the proposed landforms, therefore the time from final extraction to the delivery of community parkland is minimised. The fill period for Option 3 is estimated to be 25 years; half the duration of Option 2. A reduced fill volume results in more dominating slopes and batters on the site edges and a smaller internal flat space.

15 Evaluation of End Use Options

15.1 Approved Rehabilitation Plan (Baseline Option)

- ✓ Improved pit access
- ✗ Removes quarry feature walls that act as point of difference
- ✗ Minimal flat area for recreational landuses
- ✗ Typically only viable for revegetation & conservation

Outcomes

1) Improved safety and minimum visual impact
2) Interface with surrounding landuses
3) Re-vegetated ecological system

15.2 Rehabilitation Concept (Option 1)

- ✓ Improved pit access
- ✗ Removes quarry feature walls that act as point of difference
- ✗ Minimal flat area for recreational landuses
- ✗ Typically only viable for revegetation & conservation

Outcomes

1) Interfaces with surrounding landuses
2) Provides community benefit
3) Re-establishes site ecological systems
4) Improves community access

15.3 Activated Community Park Concept (Optimised Option 2)

- ✓ Maximum flat ground for recreational use
- ✓ Maximises site access
- ✓ Sloping edges provide topographic variation and improve access

Outcomes

1) Interfaces with surrounding landuses
2) Maximise community benefit
3) Offers a point of difference
4) Re-establishes site ecological systems
5) Maximises community access

15.4 Activated Community Park Concept (Optimised Option 3)

- ✓ Maximum flat ground for recreational use
- ✓ Maximises site access
- ✓ Sloping edges provide topographic variation and improve access
- ✓ Minimal fill duration (Approx 25 Years)

Outcomes

1) Interfaces with surrounding landuses
2) Provides community benefit
3) Offers a point of difference
4) Re-establishes site ecological systems
5) Maximises community access
6) Minimises fill time

Existing Dramatic Batters

Tract

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