



Breen Resources Pty Ltd

Breen Resources Facility EIS Bush Fire Assessment Report

April 2021

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1. Introduction

1.1 Background

Breen Resources Pty Ltd (Breen) owns and operates the Existing Breen Resource Facility at 330 Captain Cook Drive, Kurnell comprising:

- Lot 1122 DP794114 (Lot 1122)
- Lot 1123 DP794114 (Lot 1123)
- Lot 5 DP1158627 (Lot 5) and
- Lot 6 DP1158627 (Lot 6).

The Existing Breen Resources Facility currently receives excavated materials and selected construction and demolition (C&D) waste, and carries out site restoration by application of these materials to land.

Parts of the Existing Breen Resources Facility (Lot 1122 and Lot 1123, and Lot 6) are also subject to a Voluntary Planning Agreement (VPA) which requires the future provision of regional recreation facilities and parklands (named by Sutherland Shire Council as the Embellished Marang Parklands).

The existing recycling infrastructure is located on land that will become the Embellished Marang Parklands. To deliver the Embellished Marang Parklands on Lots 1122 and 1123 and Lot 6, this existing infrastructure needs to be demolished and/or relocated.

Breen is therefore proposing to construct and operate a new integrated resource management facility to consolidate all functional recycling activities within the eastern part of the Proposal Site. This will allow Breen to deliver the recreational space and other publicly accessible parklands in the western part of the Proposal Site to the community. It will also provide improved recycling capability in line with NSW Government priorities and targets to increase resource recovery from the C&D and C&I sectors.

The Proposal is comprised of the delivery of the Embellished Marang Parklands, the continuation of landfilling on the residual parts of Lot 5 and the construction of the New Resource Recovery Facility.

1.2 Purpose of this report

Ethos Urban has been engaged by Breen to author an Environmental Impact Statement (EIS) to support a development application for approval of the Proposal under Part 4 of the New South Wales (NSW) *Environmental Planning and Assessment Act 1979* (the EP&A Act). The EIS is being prepared in accordance with the provisions of the EP&A Act.

This report has been prepared by GHD to provide an assessment of bushfire risks as an input to the EIS. This report has been prepared to form part of the EIS being prepared by Ethos Urban and may be used and distributed for that purpose. This report addresses the Secretary of the NSW Department of Planning and Environment's Environmental Assessment Requirements (SSD-10412) dated 14 February 2020.

1.3 The Proposal Site

1.3.1 Location

The Proposal Site is located within the Sutherland Shire Local Government Area, approximately 12 kilometres south of the Sydney Kingsford Smith Airport. The Proposal Site is situated on the Kurnell Peninsula, positioned between Quibray Bay (within Botany Bay) to the north and Bate Bay (being Cronulla and Wanda beaches) to the south. It is currently accessible from Captain Cook Drive and Lindum Road.

Figure 1 shows the location of the Proposal Site.

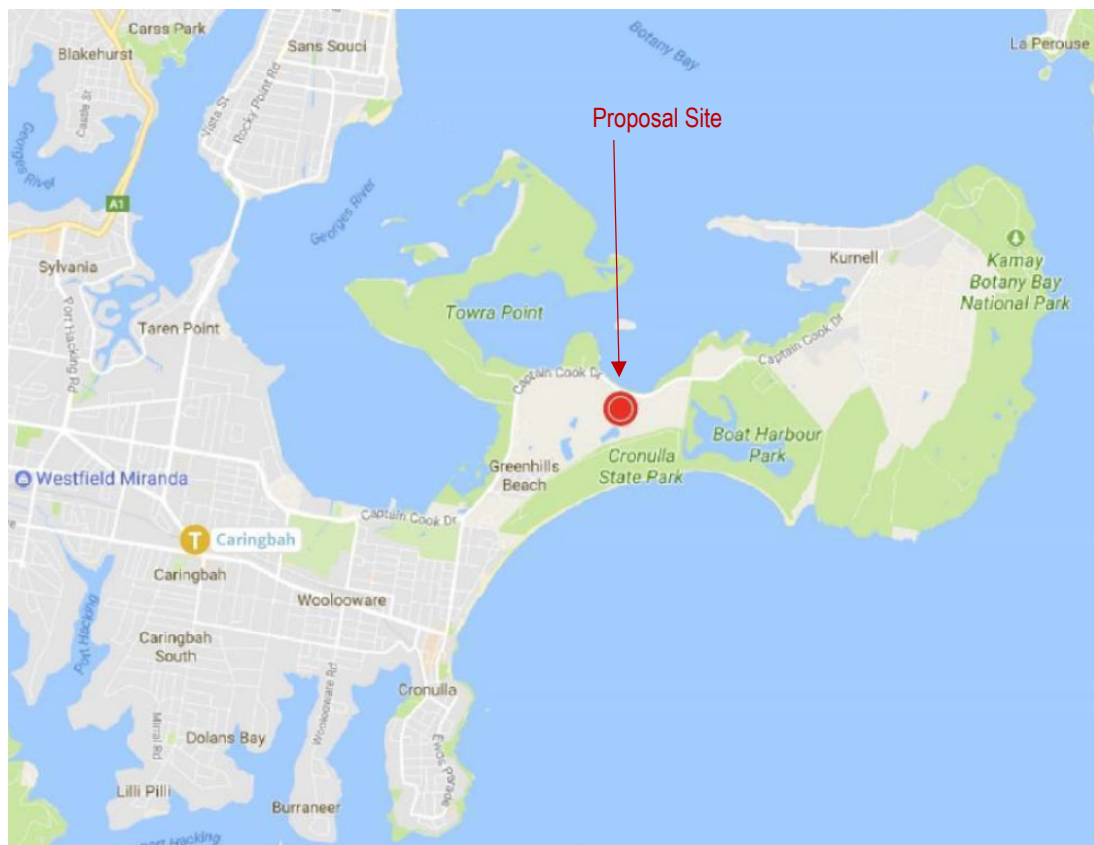


Figure 1 Proposal Site location

1.3.2 Site context

The Proposal Site is generally bounded to the north by Captain Cook Drive, which provides access from North Cronulla through to the village of Kurnell, as well as the main access to the Existing Breen Resources Facility. Further to the north of Captain Cook Drive are the foreshores and waters of Botany Bay, including the Towra Point Nature Reserve.

Near the eastern end of the Proposal Site, Sporting Field No. 1 and the Skate Park have recently been constructed on Lot 1 DP 1101922 and are now operational. This new recreational area represents the closest existing sensitive receptor to the eastern part of the Proposal Site, where the resource recovery facility is proposed to be located.

An electricity transmission line easement runs along this boundary, between the Proposal Site and the Sporting Field No. 1 and Skate Park recreational area. The easement contains Ausgrid 132kV overhead electricity transmission lines. Further to the west, Hockey Fields No. 2 and No. 3 have also already been constructed on Lot 111 DP777967 and part of Lot 1123, and are now operational.

To the south, the Proposal Site adjoins the Heritage Sand Dune and Cronulla State Park, which leads to Wanda Beach, fronting onto Bate Bay.

To the east, the Proposal Site is bounded by an unconstructed extension of Lindum Road, within which a pedestrian footpath has been constructed for beach and foreshore access. Beyond the Lindum Road road reserve is a sand mining site that is being progressively mined for construction sand and backfilled with virgin excavated natural materials.

To the west, the Proposal Site adjoins Charlotte Breen Memorial Reserve and Sydney Water's Cronulla wastewater treatment plant. Beyond Charlotte Breen Memorial Reserve to the south west is the new residential suburb of Greenhills Beach, comprising low density residential housing.

1.4 Proposal overview

The Proposal is comprised of the delivery of the Embellished Marang Parklands, the continuation of landfilling on the residual parts of Lot 5 and the construction of the New Resource Recovery Facility.

Specifically, the Proposal involves the following key integrated components:

- Construction and operation of a resource management facility, comprising:
 - A New Resource Recovery Facility on the eastern part of the Proposal Site (Lot 5), including consolidation of existing waste management activities within this part of the Proposal Site.
 - A waste disposal facility, being the continuation of current land restoration, landfilling and contouring operations at the Proposal Site by permanent application of some of the residual waste materials from the New Resource Recovery Facility to land on Lot 5.
- Use of suitable material processed by the New Resource Recovery Facility to cap, contour and re-profile areas of the Proposal Site and to construct the Embellished Marang Parklands on Lots 1122, 1123 and Lot 6.
- Re-profiling of parts of the Proposal Site within Lots 1122, 1123 and 6, with some existing waste materials from those lots.
- Delivery of an activated and integrated community space in the form of the Embellished Marang Parklands on Lots 1122, 1123 and Lot 6, to provide a superior parkland to that proposed under the VPA as detailed in Section 4.4.3 of the EIS (referred to as the Embellished Marang Parklands). This would include, among other things, integrated water usage and management and utilising personnel, plant, material and infrastructure across the whole of the Site.

To enable the above Proposal, the Existing Breen Resources Facility on Lots 1122, 1123 and 6 (this includes those parts of Lots 1122, 1123 and 6 that will comprise the Playing Fields) will be demolished and/or relocated (as required) to Lot 5.

These are shown on Figure 2.



Figure 2 Proposal – key components

1.5 Definitions

The following terms are used within this report:

- The ‘Proposal Site’ refers to the land the subject of the SSDA, which also reflects the entirety of the Existing Breen Resources Facility, being Lot 1122 and Lot 1123, and Lot 5 and Lot 6.
- Embellished Marang Parklands refers to the regional recreation facilities and parklands proposed under the VPA
- The VPA refers to The Voluntary Planning Agreement entered into between Breen Holdings Pty Ltd (subsequently novated to Breen Property), Australand Kurnell Pty Ltd (now renamed Frasers Property Australia Limited) and Sutherland Shire Council in June 2010 which requires:
 - A staged transfer of 91 ha of land to public ownership for the purpose of environmental conservation and public open space.
 - Construction of regional recreation facilities, including 10 playing fields, a skate park, 3 amenities buildings, walking and cycling tracks, picnic facilities and associated parking for over 400 cars.
 - Rehabilitation and landscaping of degraded land previously dredged for sand mining to support an ecological ‘green corridor’ stretching from the Towra Point Nature Reserve to the ocean at Wanda Beach.

1.6 Secretary Environmental Assessment Requirements and agency requirements

The specific SEARs and agency requirements addressed in this report are summarised in Table 1.

Table 1 Secretary's Environmental Assessment Requirements and agency requirements (extract)

Assessment requirements	Where addressed in report
SEARs	
Fire and Incident Management detailed information relating to the proposed structures addressing relevant levels of compliance with Volume One of the National Construction Code (NCC).	Assessment of compliance requirements with the NCC in respect of requirements for bush fire protection is provided in Section 6.2. Compliance with the NCC with respect to other requirements is addressed by others.
Sutherland Shire Council	
As the site is identified as Bush fire Prone Land, a bush fire hazard risk assessment is required	Chapters 3 and 5

1.7 Scope and structure of the report

1.7.1 Scope of report

This report:

- Identifies site assessment details in relation to bush fire hazard and bush fire attack levels for the Proposal
- Addresses the relevant requirements of 'Planning for Bush Fire Protection: A guide for councils, planners, fire authorities and developers 2019' (NSW Rural Fire Service (RFS), 2019) (PBP 2019)
- Identifies if the Proposal complies with the aims and objectives of PBP 2019, and
- Supplies the relevant information to determine the Asset Protection Zones and Bush Fire Attack Level in relation to the Proposal.

1.7.2 Structure of report

This report is structured as follows:

- Chapter 1 – Introduction – this chapter introduces the Proposal and describes the Proposal Site
- Chapter 2 – The Proposal – this chapter describes the planning and legal context and provides details of the Proposal components
- Chapter 3 – Method – this chapter provides an outline of the method of assessment
- Chapter 4 – Bush fire assessment – this chapter provides an assessment of bush fire hazard and attack levels
- Chapter 5 – Compliance with Planning for Bush Fire Protection – this chapter provides an assessment of the Proposal with respect to the requirements of PBP 2019
- Chapter 6 – Conclusions – this chapter outlines the conclusions of the assessment and identifies recommendations for compliance with the Performance Criteria for PBP 2019
- Chapter 7 – References

1.8 Scope and limitations

This report: has been prepared by GHD for Breen Resources Pty Ltd and may only be used and relied on by Breen Resources Pty Ltd for the purpose agreed between GHD and the Breen

Resources Pty Ltd as set out in sections 1.2 and 1.7 of this report. The Services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report and directions and instructions as provided by Breen Resources Pty Ltd whilst GHD prepared this report. The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report and in consultation with Breen Resources Pty Ltd.

GHD has prepared this report on the basis of information provided by Breen Resources Pty Ltd and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report. Site conditions may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

2. The Proposal

2.1 Site and planning context

The Proposal Site is located in Sutherland Shire Council (Council) local government area in the south-east of Sydney. The Proposal Site is zoned under the *State Environmental Planning Policy (Kurnell Peninsula) 1989* NSW) as 7(b) Special Development.

2.2 Legal framework

The *Environmental Planning and Assessment Act 1979* (EP&A Act) applies to all development in NSW and sets out the procedures and objects for all development.

Development in bush fire prone areas (as determined and mapped by the NSW Rural Fire Service in consultation with Local Government) must comply with PBP 2019. Accordingly, a development application must demonstrate how the development complies with the PBP 2019.

Further to this, building work on bush fire prone land must comply with the requirements of the National Construction Code (NCC). Under the Deemed to Satisfy provisions of the NCC building work on bush fire prone land must comply with AS3959:2018 Construction of buildings in bush fire-prone areas (AS3959) or the National Association of Steel Framed Housing (2014) Steel Framed Construction in Bush Fire Areas (NASH Standard).

2.3 Proposal details

The existing recycling infrastructure is located on land that will become the Embellished Marang Parklands. To deliver the Embellished Marang Parklands on Lots 1122 and 1123 and Lot 6, this existing infrastructure needs to be demolished and/or relocated.

Breen is therefore proposing to construct and operate a new integrated resource management facility to consolidate all functional recycling activities within the eastern part of the Proposal Site. This will allow Breen to deliver the recreational space and other publicly accessible parklands in the western part of the Proposal Site to the community. It will also provide improved recycling capability in line with NSW Government priorities and targets to increase resource recovery from the C&D and C&I sectors.

The Proposal is comprised of the delivery of the Embellished Marang Parklands, the continuation of landfilling on the residual parts of Lot 5 and the construction of the New Resource Recovery Facility.

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- Construction and operation of a resource management facility, comprising:
 - A New Resource Recovery Facility on the eastern part of the Proposal Site (Lot 5), including consolidation of existing waste management activities within this part of the Proposal Site.
 - A waste disposal facility, being the continuation of current land restoration, landfilling and contouring operations at the Proposal Site by permanent application of some of the residual waste materials from the New Resource Recovery Facility to land on Lot 5.
- Use of suitable material processed by the New Resource Recovery Facility to cap, contour and re-profile areas of the Proposal Site and to construct the Embellished Marang Parklands on Lots 1122, 1123 and Lot 6.

- Re-profiling of parts of the Proposal Site within Lots 1122, 1123 and 6, with some existing waste materials from those lots.
- Delivery of an activated and integrated community space in the form of the Embellished Marang Parklands on Lots 1122, 1123 and Lot 6, to provide a superior parkland to that proposed under the VPA as detailed in **Section 4.4.3** of this EIS (referred to as the **Embellished Marang Parklands**). This will include, among other things, integrated water usage and management and utilising personnel, plant, material and infrastructure across the whole of the Site.

To enable the above Proposal, the Existing Breen Resources Facility on Lots 1122, 1123 and 6 (this includes those parts of Lots 1122, 1123 and 6 that will comprise the Playing Fields) will be demolished and/or relocated (as required) to Lot 5.

The proposed Embellished Marang Parklands include the following improvements and benefits to the community over and above those contemplated by the 2010 VPA:

- A cleared 'Village Green' area in the middle of the parklands with amphitheatre, providing a place for the community to hold events and celebrations in a semi natural setting
- Associated picnic areas for all members of the local and wider community to use and enjoy
- A playground
- A network of accessible paths, including key pedestrian and cycle links between Quibray Bay and Cronulla Beach, to allow visitors to easily access the parklands for pedestrians and cycling, reinforcing the Sydney Green Grid
- An elevated landscape, including a panoramic look out in the western part of the parklands, that offers spectacular all-round regional views that will assist in a better understanding of the varied landscapes of this part of Sydney

The key components of the Proposal are shown in Figure 2.

2.3.1 New Resource Recovery Facility

The New Resource Recovery Facility would include the following:

- A waste processing building for the recycling plant and light residual waste processing
- A concrete processing building
- A soil processing building
- Public/light vehicle drop-off area
- Three weighbridges (2 in and 1 out) to ensure secure access to the New Resource Recovery Facility and Landfill for all commercial vehicles and public drop-off/small vehicles bringing material to the New Resource Recovery Facility and Landfill or taking material off site
- A separate internal weighing zone for tracking internal movements
- Site office and administration building and workshop
- Stockpiles and storage areas for stockpiling of recovered materials and temporary storage of skip bins
- Associated facilities including a parking area, wheel washes, recovered water basins for management of stormwater and to allow for water recovery and reuse, internal roadways, fencing, visual screening and other facilities ancillary to the operations.

The key infrastructure and works associated with the New Resource Recovery Facility, to be located at the eastern part of the Proposal Site, are shown indicatively in Figure 3.

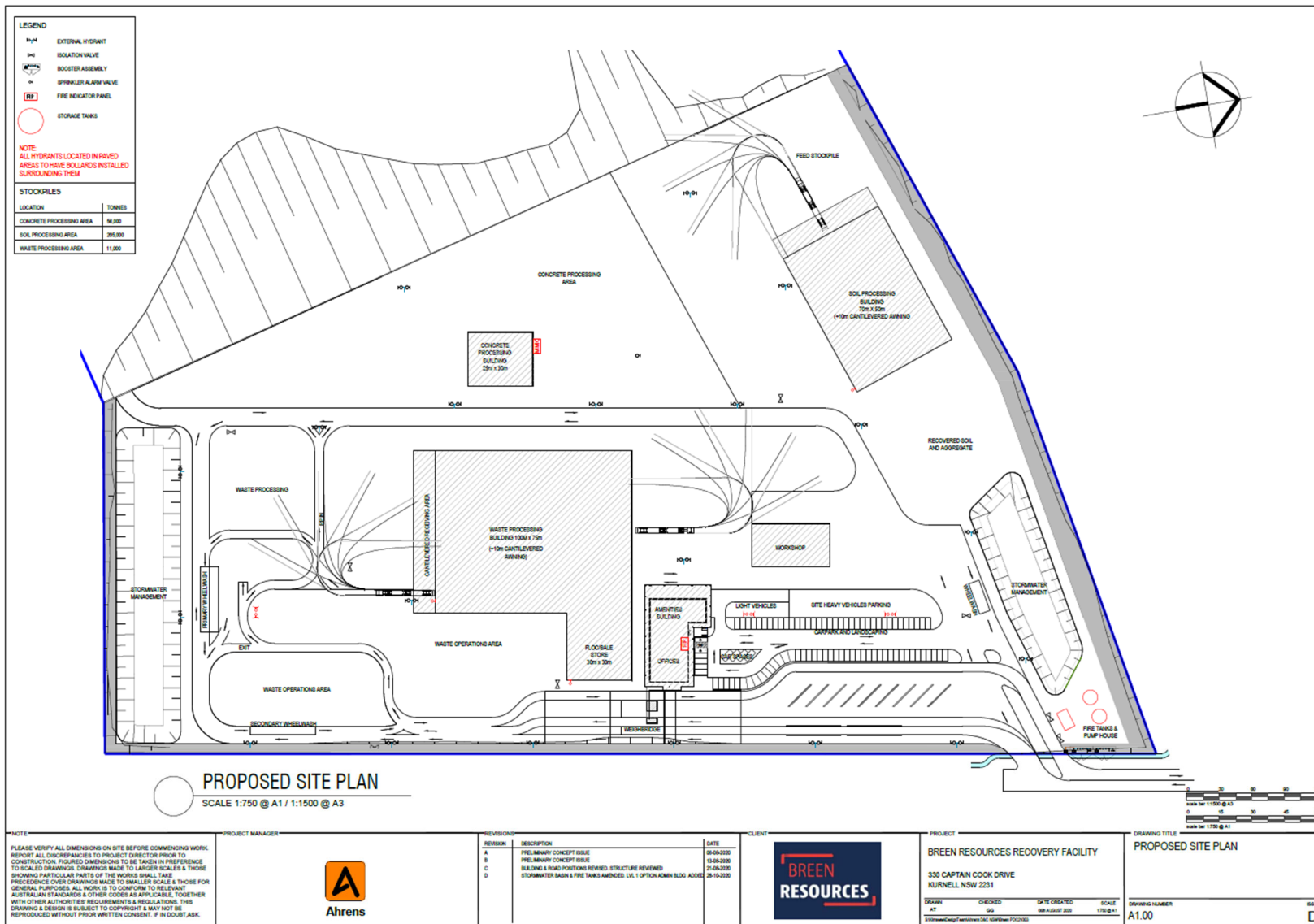


Figure 3 New Resource Recovery Facility plan



LEGEND

- Project Boundary
- - - Landscape Boundary

- Landform contours
- Shared pathways
- Recycled sculptures/ Interpretative trail
- Kurnell Dune Forest
- Coastal Dune Heath
- Modified Kurnell Dune Heath (Low Heath)

- Informal native grass (Indicative Area)
- Managed native grass (Indicative Area)
- Trees
- Picnic shelters (x3)
- Picnic tables (x11)

KEY

- 1. Amphitheatre
- 2. Potential Installation Art
- 3. Village green
- 4. Drop off, turn around area & coach parking
- 5. Disabled parking
- 6. Pedestrian entry zone
- 7. Main plaza
- 8. Panoramic lookout
- 9. Stabilised embankment
- 10. Slide
- 11. Lookout/ peak
- 12. General carparking
- 13. Open grassed picnic area
- 14. Nature play/trail connection
- 15. Playground
- 16. Vehicular access point
- 17. Pedestrian access points
- 18. Picnic facilities
- 19. Future amenities block
- 20. Existing amenities block
- 21. Infiltration area

Figure 4 Embellished Marang Parklands plan

3. Methodology

GHD was commissioned by Breen Resources Pty Ltd to provide a bush fire assessment for the Proposal. The methodology GHD has applied to completing the bush fire assessment is in conformance with Appendix 1 of PBP 2019. In summary the methodology entails:

- Desktop assessment of bush fire prone land mapping pertaining to the Proposal Site
- Bush fire hazard assessment including classification of vegetation category and type within and adjacent to the Proposal Site
- Topography assessment including assessment of slope categories under classifiable vegetation
- Assessment of access and egress for emergency services and site occupants/visitors

This desktop assessment provided the initial analysis of potential acceptable solutions and performance requirements for bush fire management in the development and layout of the Proposal Site.

No field assessment was undertaken as desktop assessment confirmed that field assessment was not necessary and relevant data for bush fire assessment data was available from existing sources of site knowledge from non-bush fire work disciplines.

4. Bush fire assessment

4.1 Bush fire prone land classification

The Proposal Site is classified as bush fire prone land due to the presence within parts of the Proposal Site of bush fire-prone Vegetation Category 2, and also the proximity of the Proposal Site to bush fire-prone Vegetation Category 2 on adjacent land. Bush fire prone land mapping for the Proposal Site (accessed via ePlanning Spatial Viewer, 2020), is depicted at Figure 5.

In Figure 5, it can be seen that bush fire prone vegetation within the Proposal Site is largely restricted to Vegetation Category 2 in the western part of the Proposal Site on Lot 1122 and Lot 1123, near the southern boundary of Lot 6, and near the northern boundary of Lot 5. Vegetation Buffers applying to Vegetation Category 2 on adjacent land also extend within all Lots.

Vegetation Category 2 is considered to be a lower bush fire risk, being lower than both Category 1 and Category 3. It is represented as light orange on a bush fire prone land map and has been given a 30 metre buffer. This vegetation category includes patches of remnant vegetation which have lower combustibility and/or limited potential fire size due to the vegetation area shape and size.

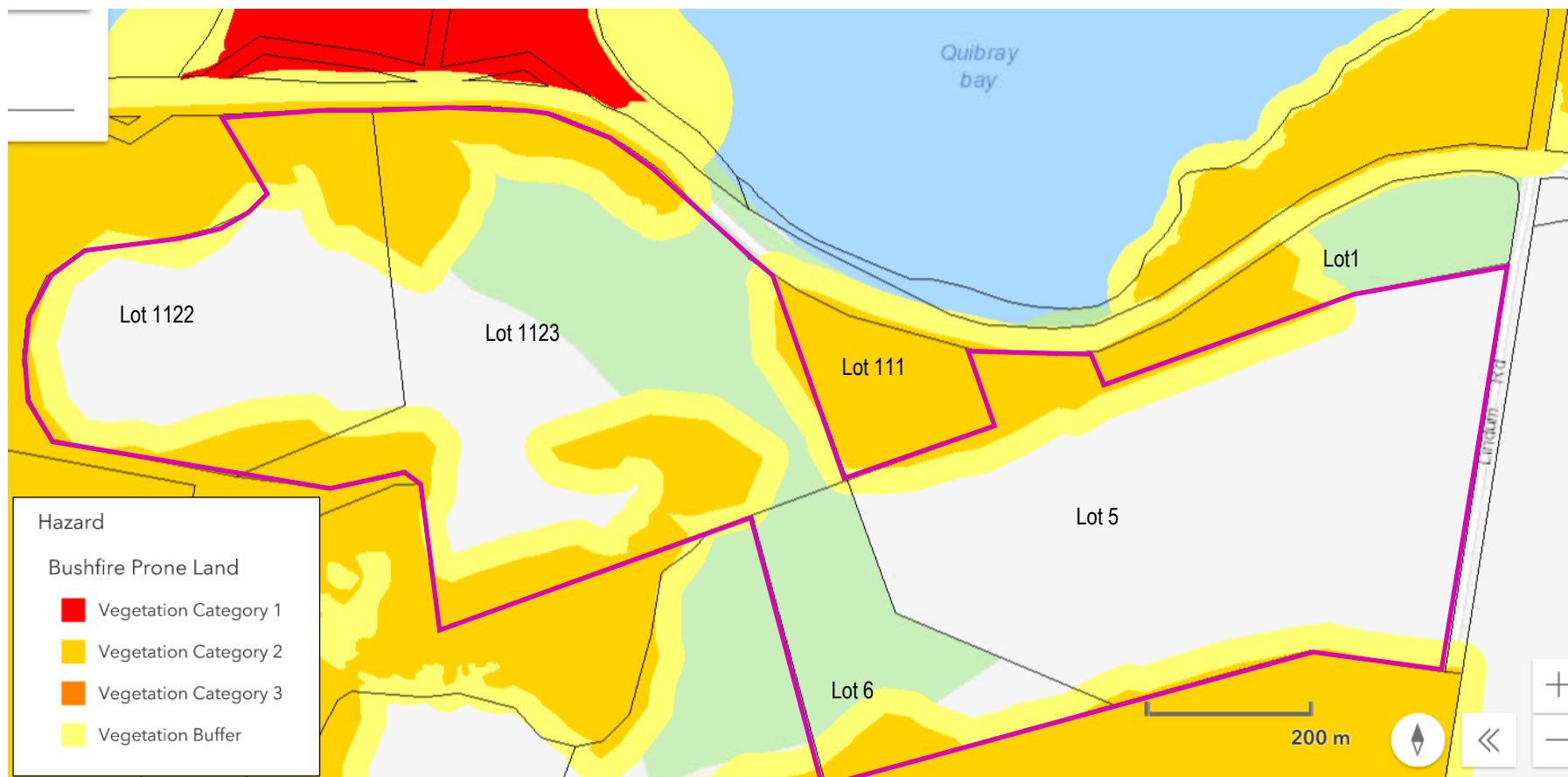


Figure 5 Bush fire prone land mapping (ePlanning Spatial Viewer, 2020)

4.1.1 Bush fire prone vegetation clearance

Since the bush fire prone land mapping at Figure 5 was undertaken, further changes to vegetation cover have occurred on and around the Proposal Site, and further clearance of degraded vegetation is planned pursuant to the Proposal:

- All the Category 2 vegetation in Lot 111 DP777967 (outside of the Proposal Site) has been cleared previously to make way for the Greenhills Hockey Centre which is already in place.
- There is no classifiable bush fire prone vegetation within Lot 5. Vegetation strips adjacent to the northern boundary of Lot 5 are excludable from classification due to being less than 20 m wide (noting also that a cleared, actively managed High Voltage Transmission Line easement occupies land immediately adjacent to the northern boundary of Lot 5).
- All Category 2 vegetation within Lot 1123 (except along the southern boundary of Lot 1123) is to be cleared, reprofiled and landscaped as part of the Proposal to provide clear open maintained lawn areas containing an amphitheatre, village green, picnic and barbeque facilities and playground.

4.2 Fire weather

The Proposal Site falls within the Sutherland Shire Council Local Government Area within the Sydney region, for which Fire Danger Index (FDI) of 100 is applicable for bush fire assessment (NSW RFS, 2019).

4.3 Vegetation

The Proposal Site has been extensively cleared of native vegetation with only a very small proportion of the Proposal Site occupied by remnant or regenerating vegetation.



Figure 6 Vegetation clearance extent within the Proposal Site

Remnant vegetation patches immediately adjacent to the Proposal Site (to the west and south) are comprised principally of coastal heathland vegetation on dunes and revegetating on land previously the subject of sand mining. Much of the remnant coastal heathland is in a degraded condition, colonised by numerous weed species. Under PBP 2019, the vegetation is classifiable as Tall Heath vegetation (and some is Low Heath potentially in transition to Tall Heath).

4.4 Effective slope

Effective slope was assessed using contour mapping from Nearmaps (Table 2). The Proposal Site can be characterised as low lying level land, having historically been the subject of sand mining.

Table 2 Effective slope

Lot/DP	Slope class
Lot 1122 DP794114	Upslope/Flat
Lot 1123 DP794114	Upslope/Flat
Lot 6 DP1158627	Flat
Lot 5 DP1158627	Flat

4.5 Bush fire Attack Level (BAL) assessment

To achieve deemed-to-satisfy acceptable solutions for Asset Protection zones and building construction, buildings within the development are to be positioned such that building can achieve a radiant heat exposure not exceeding 29 kW/m² (NSW RFS 2019).

All proposed buildings within the New Resource Recovery Facility are not within the bush fire prone area of Lot 5.

No amenities buildings for the Embellished Marang Parklands are proposed.

Table 3 Determination of BALs for proposed buildings

1. Buildings	2. Nearest BF prone Vegetation	3. Effective slope class	4. Distance from buildings to BF-prone vegetation	5. Likely worst-case BAL for all proposed buildings
New Resource Recovery Facility – soil processing building	Low heathland	Flat	65 m to Cat 2 vegetation in Lot1 DP1101922 Not on bush fire prone land	BAL LOW
New Resource Recovery Facility – all other buildings	Low heathland	Flat	>100 m in all directions Not on bush fire prone land	BAL LOW

6. Compliance with Planning for Bush Fire Protection

The bush fire assessment identifies that the Proposal can provide bush fire protection measures meeting the objectives of PBP 2019, and meeting all Acceptable Solutions.

6.1 Asset Protection Zones

Built assets requiring separation from bush fire prone vegetation have had Asset Protection Zone requirements determined below.

All proposed buildings within the New Resource Recovery Facility are not on bush fire-prone sections of the Proposal Site and therefore no requirement for an Asset Protection Zone is triggered.

All buildings except the Soil Processing Building in the northern part of the resource recovery facility (see Figure 3) are more than 100 metres from classifiable vegetation or bush fire prone buffers extending therefrom. Buildings more than 100 metres from classifiable vegetation are located outside of bush fire prone sections of the Proposal Site.

The Soil Processing Building is proposed near the northern boundary of Lot 5 within the Proposal Site. Although there is no classifiable vegetation within Lot 5, Category 2 vegetation is mapped as being present within Lot 1 DP1101922 (outside of the Proposal Site), between Captain Cook Drive and the New Resource Recovery Facility boundary. This patch of Category 2 vegetation ends at the edge of the High Voltage Transmission Line Easement which is maintained in a cleared and slashed state due to the presence of overhead transmission lines in that location.

Based on the observed footprint of bush fire prone vegetation in Lot 1, the required 30 metre bush fire prone buffer extending from the patch of Category 2 vegetation in Lot 1 does not extend as far as the planned location of the proposed Soil Processing Building (which is approximately 65 metres from the nearest point of the Category 2 vegetation patch). Therefore the Soil Processing Building is also not in a bush fire prone area, and thus no requirement for an Asset Protection Zone is triggered.

6.2 Construction requirements for buildings in bush fire prone areas

Building work on bush fire prone land must comply with the requirements of the National Construction Code (NCC). Under the Deemed to Satisfy provisions of the NCC building work on bush fire prone land must comply with AS3959:2018 *Construction of buildings in bushfire-prone areas* (AS3959) or the National Association of Steel Framed Housing (2014) *Steel Framed Construction in Bush Fire Areas* (NASH Standard).

None of the proposed buildings that form part of the New Resource Recovery Facility are in bush fire prone areas of the Proposal Site. Therefore compliance with AS3959 or the NASH standard is not required.

6.3 Access

In line with PBP 2019, any new development should design public roads and property access roads to ensure safe access, egress and defensible space for emergency services.

6.3.1 New Resource Recovery Facility

Proposed access to the New Resource Recovery Facility is from the eastern end of the Proposal Site off Lindum Road. By design, the New Resource Recovery Facility will be provided with access suitable for simultaneous access and egress by large articulated trucks bringing waste resources to the Proposal Site and departing the Proposal Site.

Road access to individual buildings within the New Resource Recovery Facility is designed to be accessible to articulated trucks and to cater for multiple simultaneous truck movements within Lot 5. Further, a large truck and trailer parking area is provided immediately inside the entrance.

Due to the requirements for site operation outlined above, site access requirements will greatly exceed the requirements of PBP 2019.

6.3.2 Embellished Marang Parklands

Proposed access to the Embellished Marang Parklands is from the northern side of the site off Captain Cook Drive. The internal road has two access/egress point onto Captain Cook Drive. It should also be noted that the majority of the internal access road network traverses non-bush fire prone land areas, providing access to sporting fields, and open recreation reserve areas. Sections of road providing access adjacent to bush fire prone vegetation are limited to carparking areas which are designed as loop access carparks providing through access via the loop configuration.

Internal site access roads will provide access to extensive car parking areas adjacent to the main recreation areas and fields within the Proposal Site. The Proposal Site is relatively level and open providing level access without steep grades or crossfalls and providing excellent line of sight to other traffic entering or egressing the site. The following performance criteria are considered applicable for the Embellished Marang Parklands access road network (RFS, 2019):

Main entrance road (not traversing bush fire prone areas)

- Two-way road
- Minimum 8 m carriageway width kerb to kerb; parking is provided outside of the carriageway width
- Hydrants located clear of parking areas
- Through road requirement not required as not in bush fire prone part of the site
- Curves of roads have a minimum inner radius of 6 m
- The maximum grade road is 15 degrees and average grade of not more than 10 degrees
- The road crossfall does not exceed 3 degrees
- A minimum vertical clearance of 4 m to any overhanging obstructions, including tree branches, is provided.

The current design of the main Embellished Marang Parkland access road allows for compliance with PBP 2019.

Internal Roads to carparking areas

Internal roads within the Embellished Marang Parkland include roads which link the main access road to the carparking areas within the site, providing access for firefighting services and egress for visitors. Internal roads should comply with the following (RFS, 2019):

- Minimum 5.5 m carriageway width kerb to kerb

- Parking is provided outside of the carriageway width
- Hydrants are located clear of parking areas
- Roads are through loop roads, and these are linked to the main access road
- Curves of roads have a minimum inner radius of 6 m
- The road crossfall does not exceed 3 degrees
- A minimum vertical clearance of 4 m to any overhanging obstructions, including tree branches, is provided.

6.4 Services

The following service requirements should be included in the development of the Proposal Site.

6.4.1 Water supply

The New Resource Recovery Facility is to be provided with reticulated water supply: Fire hydrant spacing sizing and pressures must comply with AS2419.1:2005. Hydrants must be accessible (i.e. outside parking bays or within the access road) and suitably spaced. Additionally, all above ground water service pipes external to buildings are to be metal, including taps.

The Water Supply Authority is required to provide a certification or test report in demonstration of that the requirements of AS2419.1:2005 can be achieved during a bush fire.

6.4.2 Electricity

It is recommended that electricity lines be underground. It is noted that the connection to the mains electricity supply could be via an overhead line.

6.4.3 Gas

In order to comply with the Rural Fires Regulation 2013, all gas supplies are to be installed and maintained in accordance with AS1596:2014. All fixed gas cylinders are to be kept clear of flammable materials, close to the buildings with release valves pointing away from the buildings.

7. Conclusions

The requirements of, and the acceptable solutions identified in, PBP 2019 in relation to asset protection zones, public roads and accessibility, provision of services can be met in full for the Proposal, with requirements summarised in Table 4.

A bush fire safety authority (BFSA) is not required from the NSW Rural Fire Service under *Rural Fires Act 1997* (NSW) (RF Act) s100b as the Proposal is neither a subdivision of bush fire prone land for a residential or rural residential purpose, nor a special fire protection purpose development under section 100B(6) of the *Rural Fires Act 1997* (NSW).

The aim of PBP 2019 in respect of development on bush fire prone land is “to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to the development potential, site characteristics and protection of the environment”.

The objectives of PBP 2019 as set out in PBP 2019 – Section 1.1 are:

- Afford buildings and their occupants protection from exposure to bush fire
- Provide for a defensible space to be located around buildings
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to the buildings
- Ensure that appropriate operational access and egress for emergency service personnel and occupants is available
- Provide for ongoing management and maintenance of bush fire prevention measures, and
- Ensure that utility services are adequate to meet the needs of firefighters.

The aims and objectives of PBP 2019 can be met for the Proposal.

7.1 Recommendations for compliance with Performance Criteria

The bush fire protection measures and standards identified in this report are aligned to the acceptable solutions for each performance measure within Chapter 5 of PBP 2019. These performance criteria are summarised in Table 4.

Table 4 Recommendations. Summary of Performance Criteria - PBP 2019

Measures	Performance Criteria
Asset Protection Zones (per Appendix 1 PBP 2019)	New Resource Recovery Facility Buildings No APZ required due to all proposed buildings not being situated on bush fire prone land
Construction requirements	New Resource Recovery Facility Buildings None of the proposed buildings in the New Resource Recovery Facility are in bush fire prone areas of the Proposal Site. Therefore compliance with AS3959 or the NASH standard is not required.
Access (per Appendix 3 PBP, 2019)	General: • All access roads are two-wheel drive, all-weather roads

Measures	Performance Criteria
	• Traffic management devices are constructed to not prohibit access by emergency services vehicles • Maximum grades for roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient • A through road is not necessary as the site entrance, main entrance road and the majority of the road network is not within bush fire prone sections of the site land, however, those sections of internal roads which access bush fire prone sections of the site are to be provided with loop road access providing two exit routes to the main access road <u>Adequacy of access roads for firefighting vehicles:</u> • The capacity of all road surfaces is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); there are no bridges or causeways <u>Adequacy of access to water for firefighting provisions:</u> • Hydrants for the New Resource Recovery Facility are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression • Hydrants provided in accordance with the relevant clauses of AS 2419.1:2005 - Fire hydrant installations System design, installation and commissioning <u>Main access roads:</u> • A two-way road • Minimum 8 m carriageway width kerb to kerb • Parking is provided outside of the carriageway width • Hydrants are located clear of parking areas • Curves of roads have a minimum inner radius of 6 m • Maximum grades are well within requirements noting the generally level nature of the site • The road crossfall does not exceed 3 degrees • A minimum vertical clearance of 4 m to any overhanging obstructions, including tree branches, is provided <u>Internal roads:</u> • Minimum 5.5 m carriageway width kerb to kerb • Parking is provided outside of the carriageway width • Hydrants are located clear of parking areas • Roads/carpark access are to be through loop design roads,

Measures	Performance Criteria
	• Curves of roads have a minimum inner radius of 6 m • The road crossfall does not exceed 3 degrees • A minimum vertical clearance of 4 m to any overhanging obstructions, including tree branches, is provided
Services – Water, Electricity and Gas	<u>Water:</u> • Reticulated water is to be provided to the New Resource Recovery Facility • Fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2005; hydrants are not located within any road carriageway • Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005 • All above-ground water service pipes are metal, including and up to any taps; and above-ground water storage tanks shall be of concrete or metal <u>Electricity:</u> • Electrical services lines are underground <u>Gas:</u> • Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 - The storage and handling of LP Gas, the requirements of relevant authorities, and metal piping is used • All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 m and shielded on the hazard side • Connections to and from gas cylinders are metal • Polymer-sheathed flexible gas supply lines are not used • Above-ground gas service pipes are metal, including and up to any outlets

8. References

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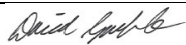
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