



STRATEGIC BUSHFIRE THREAT ASSESSMENT FOR A PLANNING PROPOSAL AT No. 792 SEAHAM ROAD SEAHAM

Prepared by:

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Prepared for:	Le Mottee Group Pty Ltd
Reference No.	Seaham – Le Mottee
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Disclaimer

Notwithstanding the precautions adopted within this report, it should always be remembered that bushfires burn under a wide range of conditions. An element of risk, no matter how small always remains, and although the standard is designed to improve the performance of such buildings, there can be no guarantee, because of the variable nature of bushfires, that any one building will withstand bushfire attack on every occasion.



Executive Summary

Firebird ecoSultants Pty Ltd has been engaged by Le Mottee Group Pty Ltd to provide a Strategic Bushfire Report for No. 792 Seaham Road, Seaham (Lot 100 DP 1064980) (hereafter referred to as 'the site'). Gateway approval for a rezoning of RU1 to R5 has been received and as part of the gateway approval the following information is to be provided:

Preparation of a Bushfire Assessment Report and consultation with the Rural Fire Service to address the proposals inconsistency with section 9.1 Direction 4.4 Planning for Bushfire Protection

Provided the recommendations stated within this report are implemented in full then Firebird ecoSultants Pty Ltd is of the opinion that the proposed rezoning is able to meet the aims and objectives of PBP (RFS, 2019).

Yours faithfully

Firebird ecoSultants



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Terms & Abbreviations

Abbreviation	Meaning
APZ	Asset Protection Zone
AS2419-2017	Australian Standard – Fire Hydrant Installations
AS3959-2018	Australian Standard – Construction of Buildings in Bush Fire Prone Areas
BAL	Bushfire Attack Level
BCA	Building Code of Australia
BFPL	Bush Fire Prone Land (Also Bushfire Prone Area)
BFPL Map	Bush Fire Prone Land Map
BPMs	Bush Fire Protection Measures
<i>EPA Act</i>	<i>NSW Environmental Planning and Assessment Act 1979</i>
FDI	Fire Danger Index
FMP	Fuel Management Plan
ha	hectare
IPA	Inner Protection Area
LGA	Local Government Area
PTS	Port Stephens Council
LHLEP	Lower Hunter Local Environmental Plan
OPA	Outer Protection Area
PBP 2019	Planning for Bushfire Protection 2019
RF Act	Rural Fires Act 1997
RF Regulation	Rural Fires Regulation



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I INTRODUCTION

Firebird ecoSultants Pty Ltd has been engaged by Le Mottee Group to undertake a Strategic Bushfire Threat Assessment to support an amendment to the Port Stephens Local Environmental Plan 2013, specifically, to rezone a ~44 ha area of land at No. 792 Seaham Road, Seaham (Lot 100 DP 1064980), hereafter referred to as 'the site' (Figure 1-1).

The site is currently zoned RU1 Transition under the Port Stephens LEP 2013. The objective of the planning proposal is to rezone the site to allow for residential development to support population growth in the area. A Gateway Determination has been provided for the proposal by the NSW Government Department of Planning, Industry and Environment (DPIE, 2019) which requires a Bushfire Strategic Report to be provided in accordance with section 9.1 Direction 4.4 Planning for Bushfire Protection.

I.1 Site Particulars

Locality:	Lot 100 DP 1064980
LGA:	Port Stephens
Forest Danger Index:	100 FDI
Current Land Use:	Land zoned as RU1
Climate / Fire History:	The site lies within an area with a Fire Danger Index (FDI) rating of 100. Extreme bushfire weather is therefore associated with long periods of drought, high temperatures, low humidity and gusty often north-westerly winds.

I.2 Legislative Requirements


This BTA has been prepared using current legislative requirements and draft legislative requirements associated guidelines for assessment of bushfire protection, these being:

- Environmental Planning and Assessment Act 1979
- Rural Fires Act 1997
- Planning for Bush Fire Protection (RFS, 2019)

I.3 Description of the Proposal

Refer to Appendix A for proposal plans.

Legend

 Subject Site

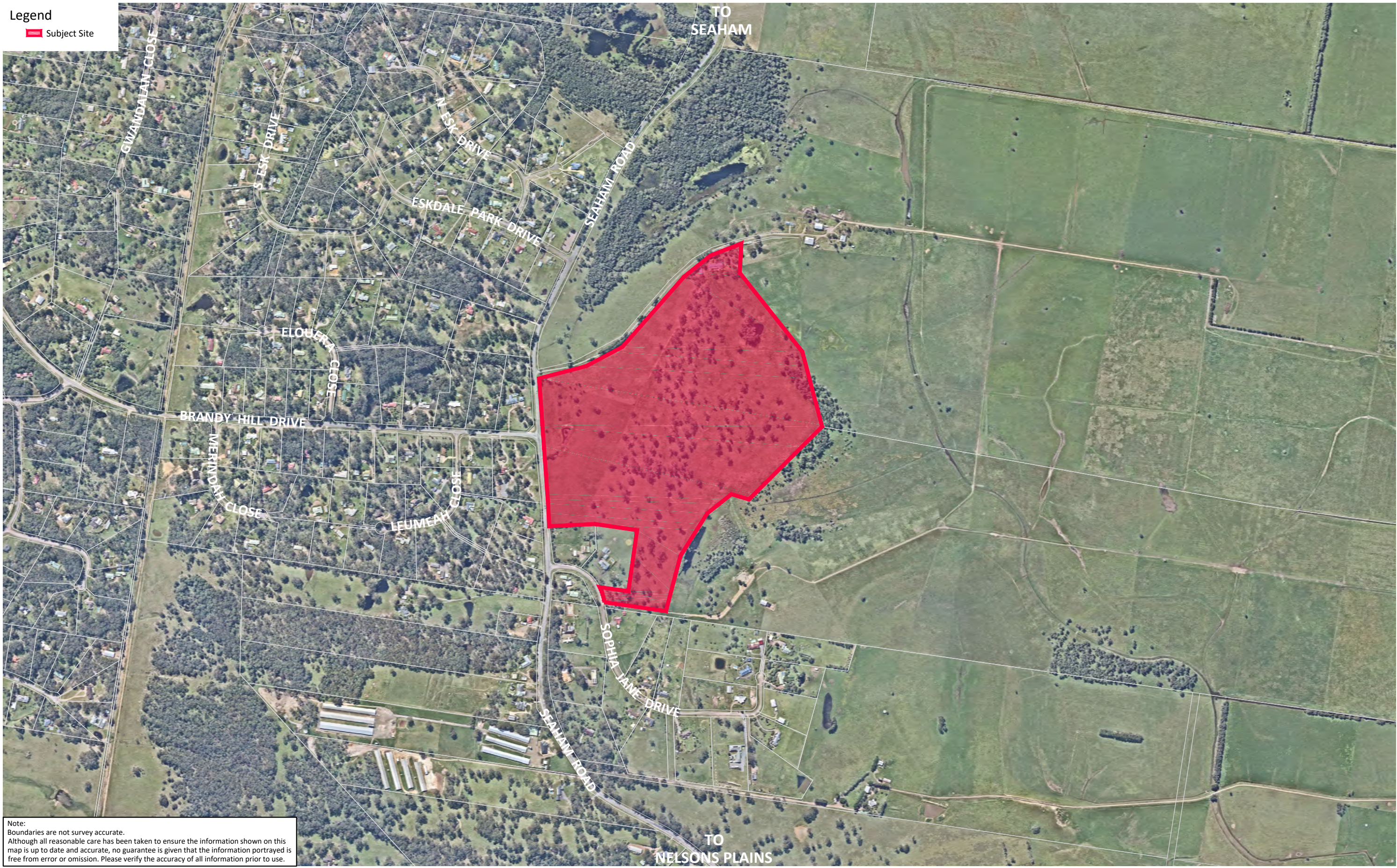
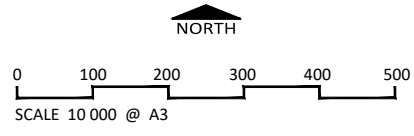


FIGURE 1-1: SITE LOCALITY MAP

CLIENT Client
SITE DETAILS No.792 Seaham Road Seaham
DATE 1 December 2020



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2 STRATEGIC STUDY

In accordance with section 4 of PBP 2019, strategic development proposals in bush fire prone areas require the preparation of a Strategic Bush Fire Study. A Strategic Bushfire Study aims to demonstrate how the proposal meets the strategic principles of PBP 2019 which are as follows;

- Ensuring land is suitable for development in the context of bush fire risk;
- Ensuring new development on BFPL will comply with PBP;
- Minimising reliance on performance-based solutions;
- Providing adequate infrastructure associated with emergency evacuation and firefighting operations; and
- Facilitating appropriate ongoing land management practices.

Section 2 of this report aims to demonstrate how the planning proposal complies with section 4 of PBP 2019, specifically how the proposal addresses the strategic issues outlined in Table 4.2.1 of PBP 2019.

2.1 Bush Fire Landscape Assessment

A bushfire landscape assessment considers the likelihood of a bush fire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape. Assessment considerations for this issue are as follows;

- The bush fire hazard in the surrounding area, including:
 - Vegetation
 - Topography
 - Weather
- The potential fire behaviour that might be generated based on the above;
- Any history of bush fire in the area;
- Potential fire runs into the site and the intensity of such fire runs; and
- The difficulty in accessing and suppressing a fire, the continuity of bush fire hazards or the fragmentation of landscape fuels and the complexity of the associated terrain.

2.1.1 Vegetation & Topography

In accordance with PBP (RFS 2019), an assessment of the vegetation over a distance of 140m in all directions from the site was undertaken. Vegetation that may be considered a bushfire hazard was identified in all directions from the site. This assessment is depicted in Table 2-1 and Figure 3-1 that shows the vegetation post development.



In accordance with PBP (RFS 2019), an assessment of the slope that the vegetation considered a bushfire hazard was undertaken and the results are presented in Table 2.1 below.

Table 2-1: Vegetation & Slope Assessment

Direction	Vegetation Type	Slope
North	Access road followed by Forest*	Downslope >0-5 degrees
East	Forest*	Downslope >0-5 degrees
South	Managed land – Sophia Jane Drive and residential development	N/A
West	Forest*	Downslope >0-5 degrees

*Although surrounding vegetation is not currently in a state that would normally be considered forest and is far from the proposed setback, this report assumes the worse case scenario under revegetation works to be undertaken on site. As such, all vegetation and areas to be revegetated are treated as potentially forest vegetation blocks in this report.

2.1.2 Weather

The typical / average climate in the Port Stephens area is warm subtropical and the bush fire season generally runs from October to March. Prevailing weather conditions associated with the bush fire season in the Port Stephens area are north-westerly winds accompanied by high day-time temperatures and low relative humidity (LHBFMC, 2009).

For all developments requiring an APZ, the relevant FFDI (Forest Fire Danger Index) must be identified. The FFDI measures the degree of danger of fire in Australian vegetation. For the purposes of PBP, the FFDI required to be used for development assessment purposes is based on local government boundaries. The 1:50 year fire weather scenario for most of the state was determined as FFDI 80, however, a number of areas including the Greater Sydney, Greater Hunter, Illawarra, Far South Coast and Southern Ranges Fire Areas have higher FFDIs which are set at 100. Port Stephens is within the Greater Hunter area and has an FFDI of 100.

2.1.3 Local Bush Fire History

The Lower Hunter area has on average 200 per year, of which 3 on average can be considered to be major fires (LHBFMC, 2009).

There have been no significant fires on site within recent history.

Table 2-2 below shows the approximate length (m) of potential fire runs into the development area.



Table 2-2: Potential Fire Runs

Direction	Vegetation Class	Slope	Fire Run (m)	APZ to be provided	Radiant Heat (kW/m ²)
North	Hunter-Macleay Dry Sclerophyll Forests	Downslope 0-5 degrees	~900 m	29 m	
East	Hunter-Macleay Dry Sclerophyll Forests	Downslope >0-5 degrees	~250 m	29 m	N/A
South	Managed Land	N/A	N/A	N/A	N/A
West	Hunter-Macleay Dry Sclerophyll Forests	Downslope >0-5 degrees	~150 m	29 m	

2.1.4 Bush Fire Landscape Assessment

The development site sits along a small rise immediately surrounded by floodplain areas. The predominate bushfire threat to the development site, albeit minor, comes from the north and south where longer fire runs occur through vegetation classified Hunter-Macleay Dry Sclerophyll Forests. The vegetation to the north and south occurs over cross-slope of gentle (<5°) downslope. As such it is considered that any fire moving toward the site from the south and north would move at a relatively slow rate.

The prevailing winds associated with the bush fire season in the Port Stephens area are north-westerly winds. The vegetation to the north-west consists of scattered pockets of vegetation among residential development. The north-west of the site is shielded by the Brandy Hill area.

Overall, it is considered that the bushfire landscape is relatively favourable for the proposal due to the few areas of threatening vegetation, adequate area for APZs, shortened fire runs due to the surrounding floodplains occurring near the development area and the proposal providing sufficient access to the bushfire threat.

2.2 Land Use Assessment

The land use assessment will identify the most appropriate locations within the site layout for the proposed land uses. The following have been considered in the land use assessment;

- **The risk profile of different areas of the development layout based on the above landscape study;**
- **The proposed land use zones and permitted uses;**



- **The most appropriate siting of different land uses based on risk profiles within the site (i.e. not locating development on ridge tops, SFPP development to be located in lower risk areas of the site); and**
- **The impact of the siting of these uses on APZ provision**

The objective of the proposal is to rezone the site from RU1 to R5. There will be no Special Fire Protection Purpose (SFPP) developments as part of this planning proposal.

The chosen area of development has avoided large ridgelines and areas with steep slopes. The development site sits on a shallow rise with floodplain/grassland vegetation occurring downslope away from the development to the north, east and part of the western elevation. The southern and remaining area to the west of the site is residential development (as discussed in previous section 2.1.5 of this report). This area of the site is considered the lowest risk area for development in regards to bushfire planning.

The APZs for proposal are not considered to be too constrictive since the gradient of the land on which the bushfire hazards occur is either flat or downslope >0-5 degrees at most. As such, the APZs for the proposal can be contained wholly within the development area within the setbacks of the residential lots.

2.3 Access and Egress

A study of the existing and proposed road networks both within and external to the masterplan area or site layout has been undertaken. The following have been considered in this assessment;

- **The capacity for the proposed road network to deal with evacuating residents and responding emergency services, based on the existing and proposed community profile;**
- **The location of key access routes and direction of travel; and**
- **The potential for development to be isolated in the event of a bush fire**

Due to the location of the site, access is only available via Sophia Jane Drive to the site's south. The design of the proposal connects all lots by a main loop road.

The main loop road will provide relatively fast access to the development site and will connect directly to Sophia Jane Drive. The main access point at Sophia Jane Drive and Seaham Road provides egress to Seaham to the north, and Raymond Terrace to the South.



The capacity for the road network to deal with evacuating residents and responding emergency services, based on the existing and proposed community profile can be accommodated for the potential increased traffic flow.

2.4 Emergency Services

An assessment of the future impact of new development on emergency services has been undertaken. The following have been considered in this assessment;

- **Consideration of the increase in demand for emergency services responding to a bush fire emergency including the need for new stations/brigades; and**
- **Impact on the ability of emergency services to carry out fire suppression in a bush fire emergency**

The site has access points, a main loop road and a perimeter road around the entire development. The access throughout the site is considered sufficient for emergency services to carry out fire suppression in a bush fire emergency.

2.5 Infrastructure

An assessment of the issues associated with infrastructure and utilities has been undertaken. The following have been considered in this assessment;

- **The ability of the reticulated water system to deal with a major bush fire event in terms of pressures, flows, and spacing of hydrants; and**
- **Life safety issues associated with fire and proximity to high voltage power lines, natural gas supply lines etc**

Infrastructure and utilities are to comply with the requirements of PBP 2019. The following outlines the acceptable solutions for water supplies, electricity services and gas services in accordance with Table 5.3c of PBP 2019:

Water Supplies

- reticulated water is to be provided to the development where available;
- a static water and hydrant supply is provided for non-reticulated developments or where reticulated water supply cannot be guaranteed;
- static water supplies shall comply with Table 5.3d of PBP 2019;



- fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2017;
- hydrants are not located within any road carriageway;
- reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads;
- fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2017;
- 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.

Electricity Services

- where practicable, electrical transmission lines are underground;
- where overhead, electrical transmission lines are proposed as follows:
 - lines are installed with short pole spacing of 30m, unless crossing gullies, gorges or riparian areas; and
 - no part of a tree is closer to a power line than the distance set out in ISSC3 *Guideline for Managing Vegetation Near Power Lines*.

Gas Services

- 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 10m and shielded on the hazard side;
- connections to and from gas cylinders are metal;
- polymer-sheathed flexible gas supply lines are not used; and
- above-ground gas service pipes are metal, including and up to any outlets.

2.6 Adjoining Land

The impact of new development on adjoining landowners and their ability to undertake bush fire management.



-
- **Consideration of the implications of a change in land use on adjoining land including increased pressure on BPMs through the implementation of Bush Fire Management Plans**

The proposed development would provide a slightly positive outcome for the nearby brandy hill area as the development would provide a managed area that would act as a buffer from any potential grassfire developing in the floodplain area.



3 METHODOLOGY

3.1 Vegetation Assessment

Vegetation surveys and vegetation mapping carried out on the site has been undertaken as follows:

- Aerial Photograph Interpretation to map vegetation cover and extent.
- Site Inspection

3.2 Slope Assessment

Slope assessment has been undertaken as follows:

- Aerial Photograph Interpretation in conjunction with analysis of electronic contour maps with a contour interval of 10m.
- Site Inspection



4 SITE ASSESSMENT

4.1 Vegetation Assessment

In accordance with PBP 2006, PBP 2019 and Australian Standards AS3959-2018 an assessment of the vegetation over a distance of 140m in all directions from the site was undertaken.

Vegetation that may be considered a bushfire hazard was identified in all directions from the site. Due to the size of the site the below vegetation assessment and direction is in reference to each allocated mapped area of the site (Figures 4-1) and are presented and depicted in Tables 4-1.

Note: Land to be rezoned for environmental conservation and the drainage lines have been as assessed as Forest due to the likelihood of revegetation/regeneration.

4.2 Effective Slope Assessment

In accordance with PBP (RFS 2019), an assessment of the slope affecting the bushfire behaviour was undertaken for a distance of 100m from the edge of the lot boundaries in the direction of the bushfire hazard.

The slopes leading away from the site have been evaluated to identify both the average slope and by identifying the maximum slope present. These values help determine the level of gradient which will most significantly influence the fire behaviour of the site. Refer to Tables 4-1 Vegetation and Slope Assessment.

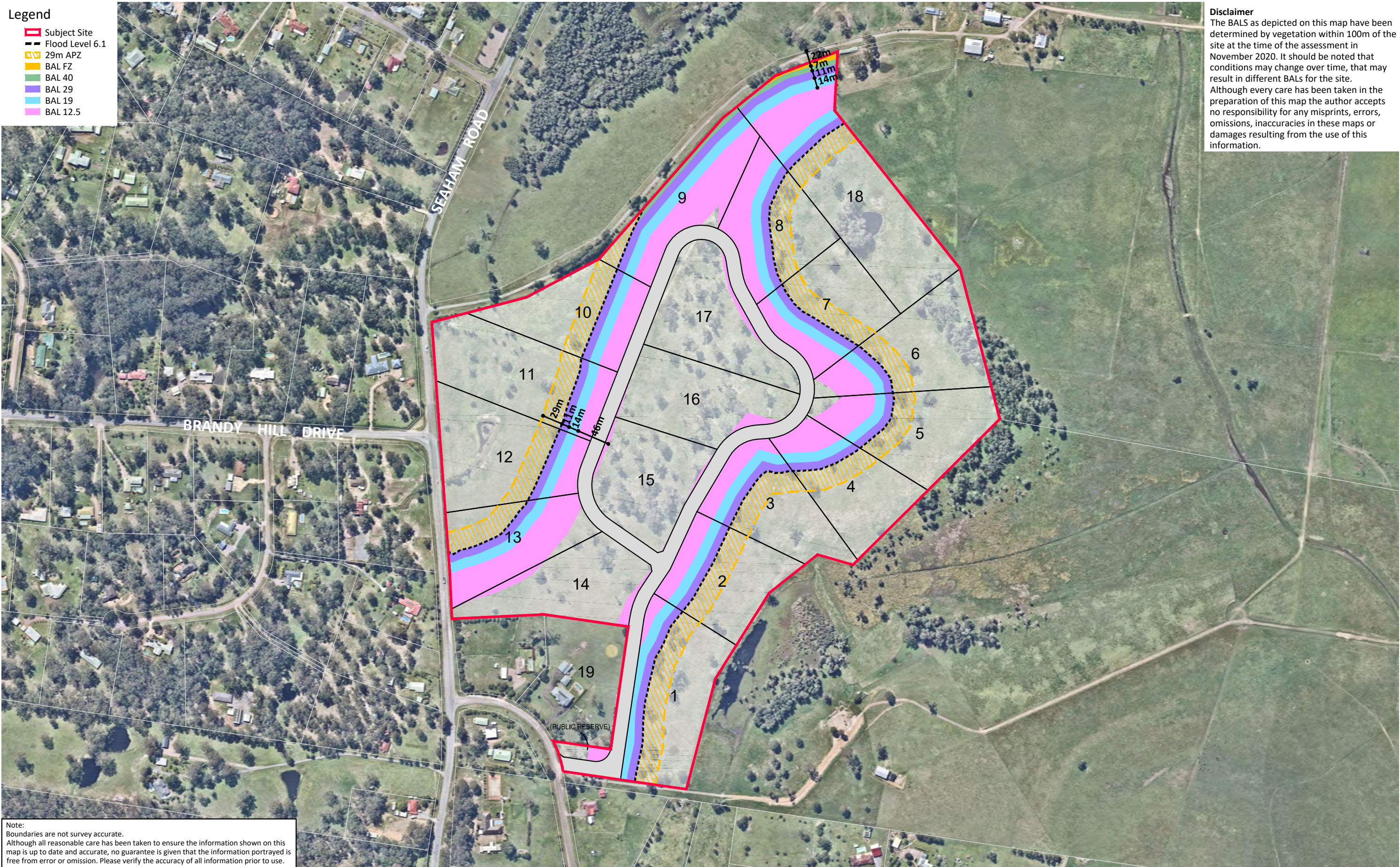


Table 4-1: Vegetation & Slope Classification

Direction	Vegetation Type	Distance from Site Boundary	Slope Vegetation occurs on
North	Hunter-Macleay Dry Sclerophyll Forests	Within	Downslope >0-5 degrees
East	Hunter-Macleay Dry Sclerophyll Forests	Within	Downslope >0-5 degrees
South	Managed Land - Residential Development	N/A	N/A
West	Hunter-Macleay Dry Sclerophyll Forests	Within	Downslope >0-5 degrees

- Legend**
- Subject Site
 - Flood Level 6.1
 - 29m APZ
 - BAL FZ
 - BAL 40
 - BAL 29
 - BAL 19
 - BAL 12.5

Disclaimer
 The BALS as depicted on this map have been determined by vegetation within 100m of the site at the time of the assessment in November 2020. It should be noted that conditions may change over time, that may result in different BALS for the site. Although every care has been taken in the preparation of this map the author accepts no responsibility for any misprints, errors, omissions, inaccuracies in these maps or damages resulting from the use of this information.

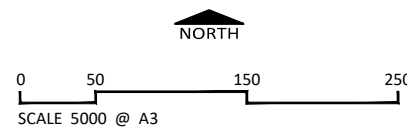


Note:
 Boundaries are not survey accurate.
 Although all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

FIGURE 4-1: BAL & APZ MAP

CLIENT
 SITE DETAILS
 DATE

Client
 No.792 Seaham Road Seaham
 1 December 2020



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5 BUSHFIRE ATTACK ASSESSMENT

5.1 Bushfire Attack Assessment for Residential & Urban Rural Residential Lots

The site lies within the Port Stephens Local Government Area (LGA), this area is assessed under an FDI rating of 100. Using the results from the Site Assessment outlined in Section 4.1 of this report, with Table A1.12.2, the deemed to satisfy APZ requirements for future proposed urban rural lots and any bushfire hazard is detailed in Table 4-1. Refer to Figure 4-1 for APZs.

Table 5-1 Bushfire Attack Assessment for the Residential & Urban Rural Lots

Direction	Vegetation classification within 140m	Effective Slope (within 100m)	APZ in accordance with PBP 2019 (m)
North	Hunter-Macleay Dry Sclerophyll Forests	Downslope >0-5 degrees	29
East	Hunter-Macleay Dry Sclerophyll Forests	Downslope >0-5 degrees	29
South	Managed Land	N/A	N/A
West	Hunter-Macleay Dry Sclerophyll Forests	Downslope >0-5 degrees	29

The subject land is surrounded by rural residential properties managed using various practices, resulting in a discontinuous canopy and generally managed understory.



6 BUSHFIRE ATTACK LEVELS (BALS)

Building design and the materials used for construction of future dwellings should be chosen based on the information contained within AS3959-2018, and accordingly the designer / architect should be made aware of this recommendation. It may be necessary to have dwelling plans checked by the architect involved to ensure that the proposed dwellings meet the relevant Bushfire Attack Level (BAL) as detailed in AS3959-2018.

The determinations of the appropriate BAL are based upon parameters such as weather modelling, fire-line intensity, flame length calculations, as well as vegetation and fuel load analysis. The determination of the construction level is derived by assessing the:

- Relevant FDI = 100
- Flame temperature
- Slope
- Vegetation classification; and
- Building location.

The following BAL, based on heat flux exposure thresholds, are used in the standard:

(a) **BAL – LOW** The risk is considered to be **VERY LOW**
There is insufficient risk to warrant any specific construction requirements but there are still some risks.

(b) **BAL – 12.5** The risk is considered to be **LOW**
There is a risk of ember attack.

The construction elements are expected to be exposed to a heat flux not greater than 12.5 kJ/m².

(c) **BAL – 19** The risk is considered to be **MODERATE**
There is a risk of ember attack and burning debris ignited by wind borne embers and a likelihood of exposure to radiant heat.

The construction elements are expected to be exposed to a heat flux not greater than 19 kW/m².

(d) **BAL-29** The risk is considered to be **HIGH**
There is an increased risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to an increased level of radiant heat.

The construction elements are expected to be exposed to a heat flux no greater than 29 kW/m².

(e) **BAL-40** The risk is considered to be **VERY HIGH**



There is much increased risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to a high level of radiant heat and some likelihood of direct exposure to flames from the fire front.

The construction elements are expected to be exposed to a heat flux no greater than 40 kW/m².

(f) **BAL-FZ** The risk is considered to be **EXTREME**

There is an extremely high risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to an extreme level of radiant heat and direct exposure to flames from the fire front.

The construction elements are expected to be exposed to a heat flux greater than 40 kW/m².

6.1 Determination of Bushfire Attack Levels

Using a FDI of 100, the information relating to vegetation, slope and according to Table A1.12.5 PBP 2019 the required Bushfire Attack Levels (BALs) have been determined. Table 5-1 illustrates the required BALs for future residential and urban rural residential dwellings within the site.



Table 6-1: Determination of BALs for Future Residential Dwellings within the Site

Vegetation Type and Slope	Separation Distance in accordance with,		Bushfire Attack Level (BAL)
	PBP 2019	AS3959 2018	
	29-<40m	32-<43m	BAL-29
	40-<54m	43-<57m	BAL- 19
	54-<100m	57-<100m	BAL-12.5
	>100m		BAL-LOW
Forest occurs over downslope >0-5, to the East	<22m	<24m	BAL-FZ
	22-<29m	24 - <32m	BAL-40
	29-<40m	32-<43m	BAL-29
	40-<54m	43-<57m	BAL- 19
	54-<100m	57-<100m	BAL-12.5
	>100m		BAL-LOW
Forest occurs over downslope >0-5, to the East	<22m	<24m	BAL-FZ
	22-<29m	24 - <32m	BAL-40
	29-<40m	32-<43m	BAL-29
	40-<54m	43-<57m	BAL- 19
	54-<100m	57-<100m	BAL-12.5
	>100m		BAL-LOW
Forest occurs over downslope >0-5, to the West	<22m	<24m	BAL-FZ
	22-<29m	24 - <32m	BAL-40
	29-<40m	32-<43m	BAL-29
	40-<54m	43-<57m	BAL- 19
	54-<100m	57-<100m	BAL-12.5
	>100m		BAL-LOW

Any future dwellings within the site will need to be assessed under Section 4.14 of the EP&A Act which requires assessment in accordance with AS3959 or PBP.



7 ACCESS

7.1 Public Roads for Large Lot Residential

All future lots as a result of the rezoning will have direct access to the public road system. This ensuring that all residents evacuating the area can do in a safe manner in the opposite direction of any bushfire hazard and allow for emergency personnel to safely access areas requiring assistance. Refer to Appendix A for proposal plans.

The proposal's roads have been assessed against the acceptable solution and performance-based assessment for Access for Residential - Table 5.3b of PBP (2019). The roads compliance with PBP 2019 is outlined in Table 7-1 below:



Table 7-1: Performance Criteria and Acceptable Solutions - Access for Residential (PBP, 2019)

Access (General Requirements)		
<ul style="list-style-type: none"> › property access roads are two-wheel drive, all-weather roads; › perimeter roads are provided for residential subdivisions of three or more allotments; › subdivisions of three or more allotments have more than one access in and out of the development; › traffic management devices are constructed to not prohibit access by emergency services vehicles; › maximum grades for sealed 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; › all roads are through roads; › dead end roads are not recommended, but if unavoidable, are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end; › where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road; 	<p>firefighting vehicles are provided with safe, all-weather access to structures.</p>	<p>Complies with Performance based –</p> <p>The proposed access road within the site is designed to meet the requirements of the acceptable solution, with the exception of no perimeter roads and the road it is not a through. In this case the lots are large rural allotments that allow for access by firefighters. This allow firefighting vehicles are provided with safe, all-weather access to structures.</p>



<p>› where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system; and</p> <p>one way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.</p>		
<p>› the capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/</p> <p>causeways are to clearly indicate load rating.</p>	<p>the capacity of access roads is adequate for firefighting vehicles.</p>	<p>Complies with Acceptable Solution – All roads within the site will be designed to meet the requirements of the acceptable solution.</p>
<p>› hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression;</p> <p>› hydrants are provided in accordance with the relevant clauses of AS 2419.1:2017 - Fire hydrant installations System design, installation and commissioning; and</p> <p>there is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.</p>	<p>there is appropriate access to water supply.</p>	<p>Complies with Acceptable Solution – Hydrants are to be positions appropriately across the site.</p>



Perimeter Roads		
<ul style="list-style-type: none"> › are two-way sealed roads; › minimum 8m carriageway width kerb to kerb; › parking is provided outside of the carriageway width; › hydrants are located clear of parking areas; › are through roads, and these are linked to the internal road system at an interval of no greater than 500m; › curves of roads have a minimum inner radius of 6m; › the maximum grade road is 15 degrees and average grade of not more than 10 degrees; › the road crossfall does not exceed 3 degrees; and <p style="margin-left: 40px;">a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.</p>	<p>access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.</p>	<p>Can Comply with Acceptable Solution – All access roads to the site are designed to meet the requirements of the acceptable solution.</p>
Non-Perimeter Roads		
<ul style="list-style-type: none"> › minimum 5.5m carriageway width kerb to kerb; › parking is provided outside of the carriageway width; 	<p>access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.</p>	<p>Complies with Acceptable Solution – Roads meet all requirements</p>



<ul style="list-style-type: none"> › hydrants are located clear of parking areas; › roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m; › curves of roads have a minimum inner radius of 6m; › the road crossfall does not exceed 3 degrees; and <p style="padding-left: 40px;">a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.</p>		
Property Access		
<ul style="list-style-type: none"> › There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles. <p>In circumstances where this cannot occur, the following requirements apply:</p> <ul style="list-style-type: none"> › minimum 4m carriageway width; › in forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, 	<p>firefighting vehicles can access the dwelling and exit the property safely.</p>	<p>Complies with Acceptable Solution – All future lots are to be connected to a public road by a driveway <70m</p>



<p>making a minimum trafficable width of 6m at the passing bay;</p> <ul style="list-style-type: none">› a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches;› provide a suitable turning area in accordance with Appendix 3;› curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress;› the minimum distance between inner and outer curves is 6m;› the crossfall is not more than 10 degrees;› maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and› a development comprising more than three dwellings has access by dedication of a road and not by right of way. <p>Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development</p>		
--	--	--



property access roads in addition to the above.		
---	--	--



Table 7-2: Compliance with Access (1) - Public Roads in accordance with PBP (2019)

Performance Criteria	Acceptable Solutions	Compliance
The intent may be achieved where		
<ul style="list-style-type: none"> fire-fighters are provided with safe all-weather access to structures (thus allowing more efficient use of fire fighting resources) 	<ul style="list-style-type: none"> public roads are two-wheel drive, all weather roads 	Capable of achievement under proposal as submitted. Detailed compliance can be assessed at DA stage
<ul style="list-style-type: none"> public road widths and design that allow safe access for fire-fighters while residents are evacuating an area. 	<ul style="list-style-type: none"> urban perimeter roads are two-way, that is, at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb), allowing traffic to pass in opposite directions. Non perimeter roads comply with Table 4.1 – Road widths for Category 1 Tanker (Medium Rigid Vehicle). the perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas. traffic management devices are constructed to facilitate access by emergency services vehicles. public roads have a cross fall not exceeding 3 degrees. all roads are through roads. Dead end roads are not recommended, but if unavoidable, dead ends are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end and direct traffic away from the hazard. curves of roads (other than perimeter roads) are a minimum inner radius of six metres and minimal in number, to allow for rapid access and egress. the minimum distance between inner and outer curves is six metres. maximum grades for sealed 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. there is a minimum vertical clearance to a height of four metres above the road at all times. 	Capable of achievement under proposal as submitted. Detailed compliance can be assessed at DA stage.



Performance Criteria	Acceptable Solutions	Compliance
<ul style="list-style-type: none"> the capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles. 	<ul style="list-style-type: none"> the capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles (approximately 15 tonnes for areas with reticulated water, 28 tonnes or 9 tonnes per axle for all other areas). Bridges clearly indicate load rating. 	Capable of achievement under proposal as submitted. Detailed compliance can be assessed at DA stage
<ul style="list-style-type: none"> roads that are clearly sign- posted (with easily distinguishable names) and buildings/properties that are clearly numbered. 	<ul style="list-style-type: none"> public roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression. public roads between 6.5 metres and 8 metres wide are No Parking on one side with the services (hydrants) located on this side to ensure accessibility to reticulated water for fire suppression. 	Capable of achievement under proposal as submitted. Detailed compliance can be assessed at DA stage
<ul style="list-style-type: none"> there is clear access to reticulated water supply 	<ul style="list-style-type: none"> public roads up to 6.5 metres wide provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression. one way only public access roads are no less than 3.5 metres wide and provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression. 	Capable of achievement under proposal as submitted. Detailed compliance can be assessed at DA stage
<ul style="list-style-type: none"> parking does not obstruct the minimum paved width 	<ul style="list-style-type: none"> parking bays are a minimum of 2.6 metres wide from kerb edge to road pavement. No services or hydrants are located within the parking bays. public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road. 	Capable of achievement under proposal as submitted. Detailed compliance can be assessed at DA stage



8 EMERGENCY SERVICES

The following is recommended for strategic land use planning to achieve the objectives and strategic planning principles of PBP 2019 relating to emergency management. Strategic emergency management planning is undertaken in collaboration with emergency service organisations within the strategic land use planning process, to establish preferred future outcomes (i.e. emergency evacuation) that have implications for land use planning, including:

- a. Emergency evacuation planning; and
- b. Evacuation adequacy assessment.

There are several RFS brigades within close proximity, which include:

- Seaham Rural Fire Brigade to the north;

The proximity of emergency services to the precinct are considered adequate, provided emergency management and planning fosters a leave early approach.



9 CONCLUSION & RECOMMENDATIONS

This strategic bushfire study has assessed the bushfire risk to the Planning Proposal, the appropriateness of the proposed land uses and the ability for appropriate bushfire protection measures to be provided.

It has been found that the Planning Proposal meets the aim and objectives of PBP and can achieve required APZs and other bushfire mitigation measures and does not impose additional mitigation actions on adjoining land. At the detailed design phase, lot design / APZ provision, infrastructure, access and construction plans are required to meet the specifications outlined in PBP 2019. However, the assessment of the Planning Proposal in this Strategic Bushfire Study identifies that the orderly provision of bushfire protection measures to satisfy standards prescribed within PBP is achievable.

- The location and type of land uses included in the Planning Proposal are considered appropriate for the site, given: the level of bushfire landscape risk; the nature of the subject land; the characteristics of the land uses proposed; and the ability for bushfire protection measures to be provided. It is assumed that more detailed design work will be undertaken should the Planning Proposal be supported, to ensure appropriate micro siting and design, in order to meet or exceed the requirements of PBP.
- Based on the landscape assessment of vegetation and slope, preliminary Asset Protection Zones (APZ) have been determined to indicate the separation distance required between a structure and the vegetation hazard. This analysis considers the existing vegetation within and adjoining the site. APZ dimensions are provided in Table 4-1 and Figure 4-1 and represent the required setback detailed in PBP (2019) and AS3959. Indicative APZs identified in Figure 4-1 are for a scenario of residential development only. Final APZ dimensions should be determined based on the final design, vegetation configuration and topography.
- The PBP acceptable solution requirements for water is achievable
- Underground electricity supply to the subject land is compliant with PBP. If the electrical transmission line to the subject land is above ground, no part of a tree is to be closer than 0.5 m to the powerline conductors.

It is concluded that the Planning Proposal is consistent with Ministerial Direction 4.4 (Planning for Bushfire Protection) issued under section 9.1(2) of the EP&A Act and the requirements of PBP.



I0 BIBLIOGRAPHY

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Rural Fires and Environmental Assessment Legislation Amendment Act 2002.

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APPENDIX A PROPOSED REZONING PLANS

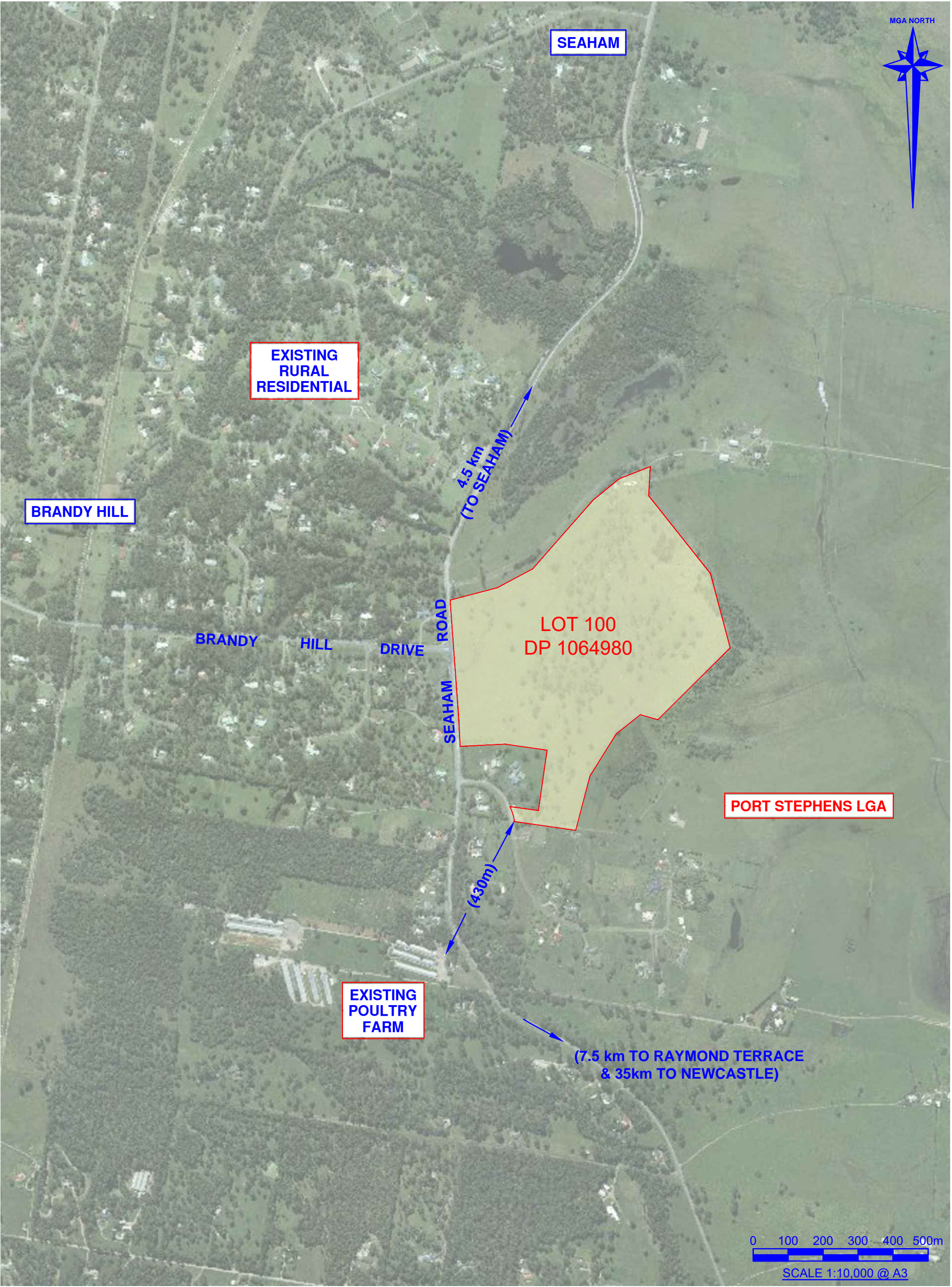
PROPOSED REZONING

LOT 100 DP 1064980

No.792 SEAHAM ROAD, SEAHAM

SHEET SCHEDULE

1. SITE ANALYSIS - LOCALITY PLAN
2. SITE ANALYSIS - SUBJECT LAND & ZONING
3. SITE ANALYSIS - WETLANDS & ACID SULPHATE
4. SITE ANALYSIS - BUSHFIRE & FLOOD PRONE LAND
5. SITE ANALYSIS - KOALA HABITAT & BUFFER ZONES
6. SITE ANALYSIS - CONSTRAINTS & OPPORTUNITIES
7. PROPOSED LOT LAYOUT (WITH AERIAL UNDERLAY)
8. PROPOSED LOT LAYOUT



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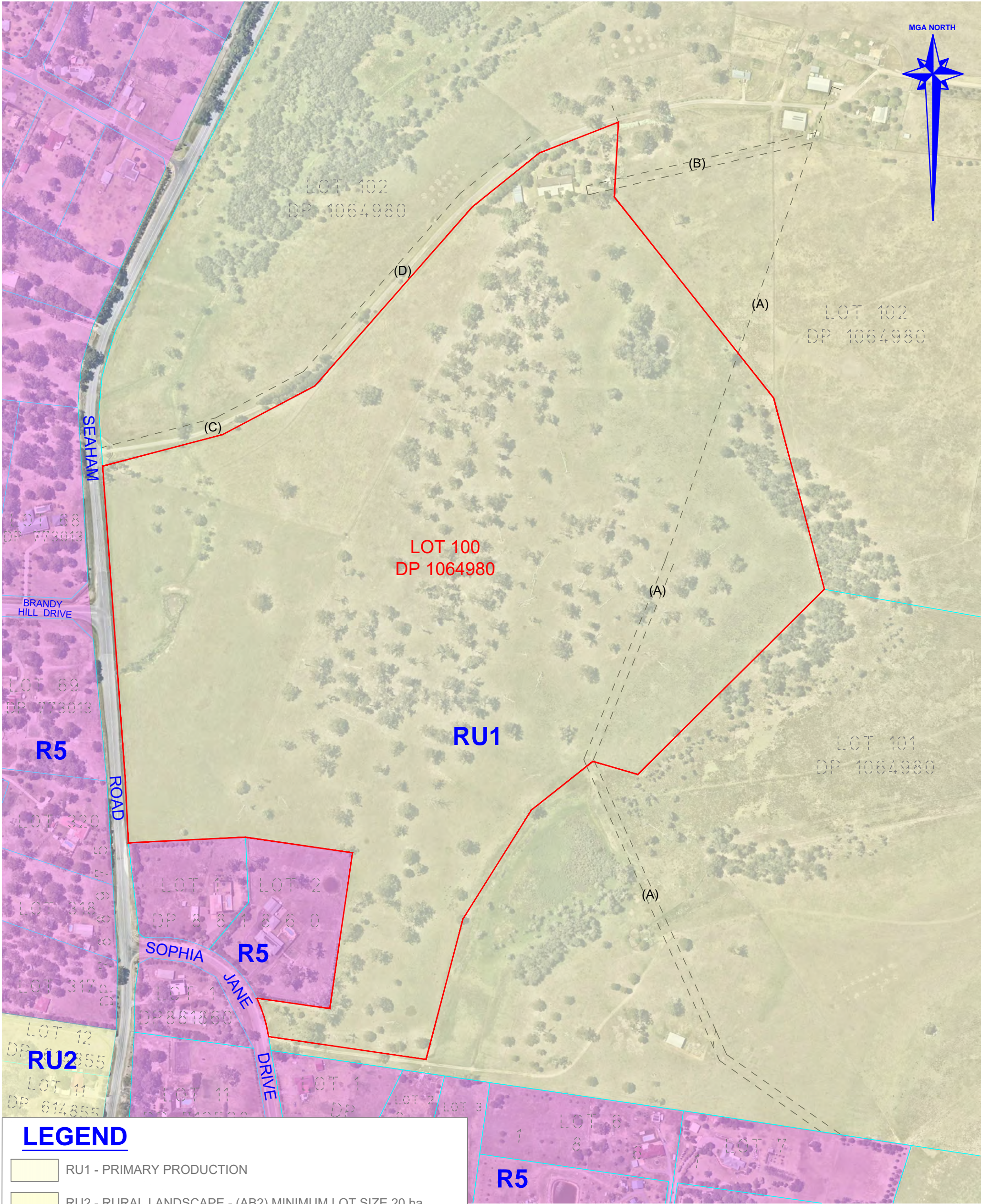
Site

Locality

SEAHAM

**SITE ANALYSIS
LOCALITY PLAN**
STATHAM
Lot 100 DP 1064980 - No. 792 SEAHAM ROAD
LGA PORT STEPHENS

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6182 REZ-V1
Sheet No.
1 of 8
Original Size
A3



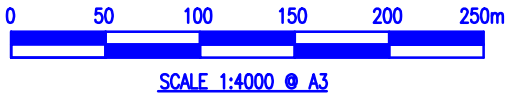
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- RU1 - PRIMARY PRODUCTION
- RU2 - RURAL LANDSCAPE - (AB2) MINIMUM LOT SIZE 20 ha
- R5 - RESIDENTIAL - LARGE LOT

- (A) EASEMENT FOR TRANSMISSION LINE 10 WIDE (DP 810145)
- (B) EASEMENT FOR ELECTRICITY PURPOSES 10 WIDE (DP 1064980)
- (C) RIGHT OF CARRIAGEWAY 20 WIDE (DP 1064980)
- (D) POSITIVE COVENANT (DP 1064980)

NOTES - GENERAL

1. Maps obtained from Port Stephens Shire Council LEP 2013, and are indicative only



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Locality

SEAHAM

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SUBJECT LAND & ZONING
STATHAM

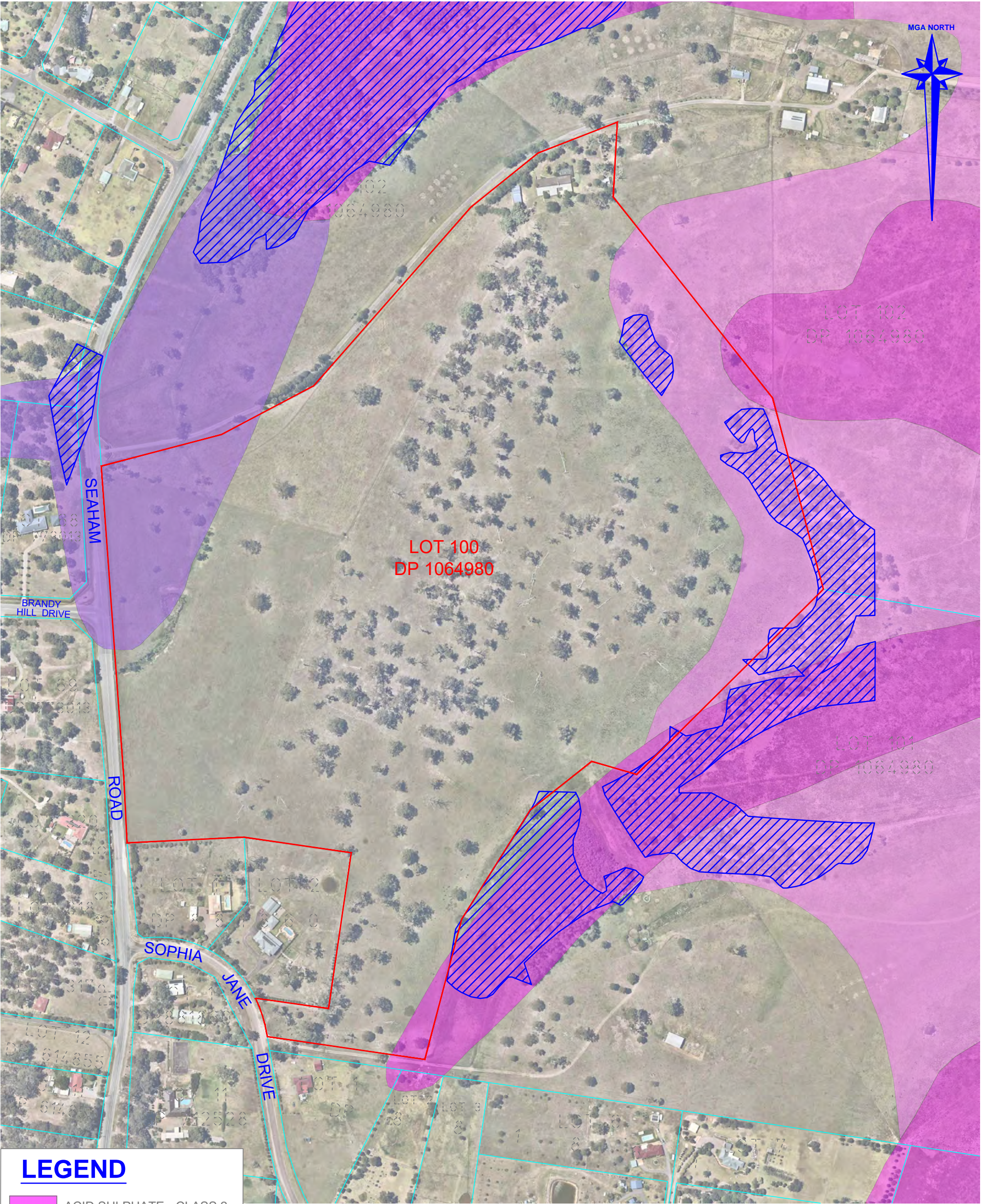
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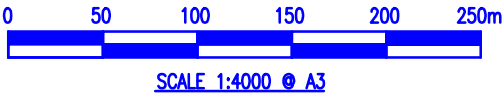


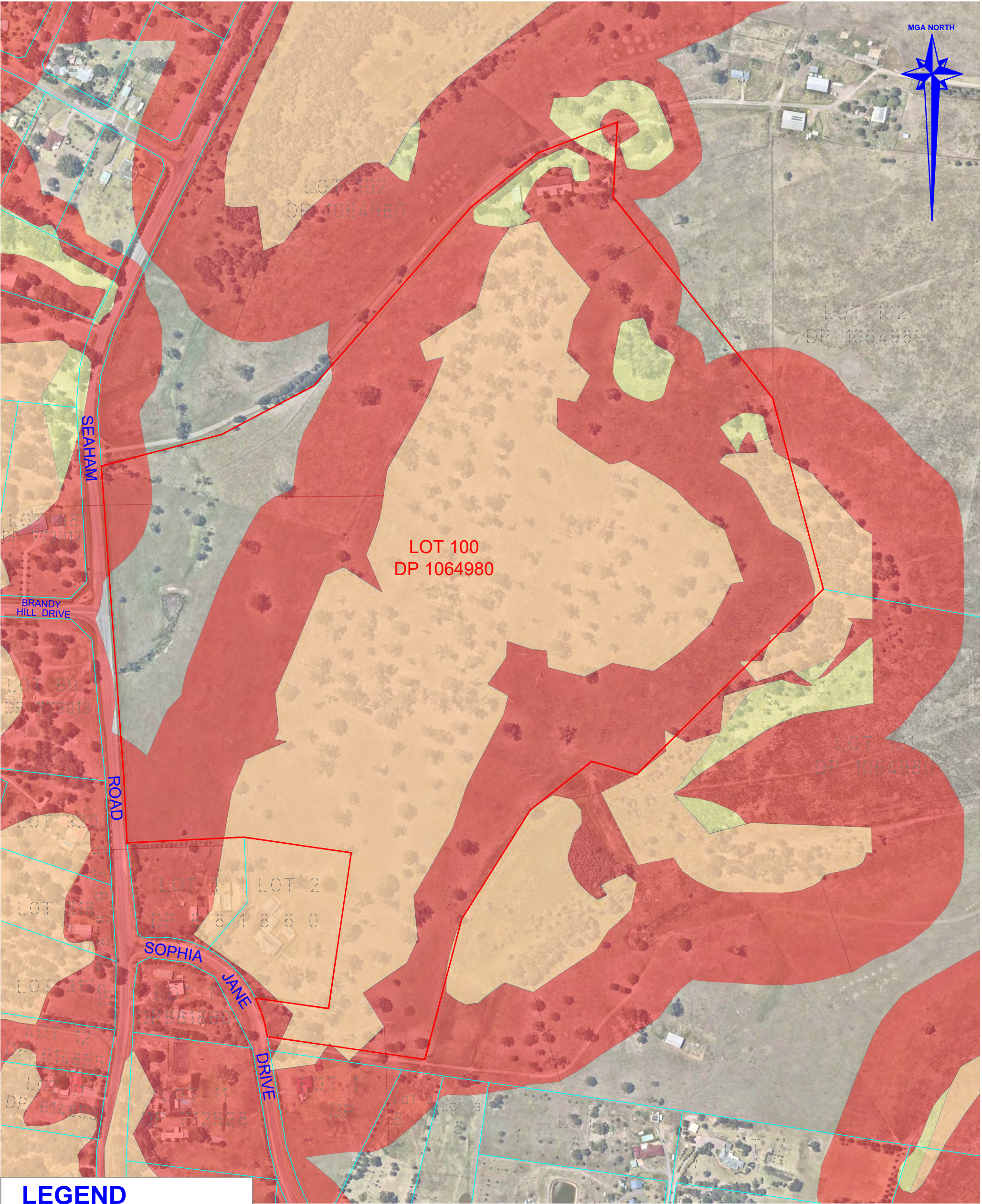
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- ACID SULPHATE - CLASS 2
- ACID SULPHATE - CLASS 3
- ACID SULPHATE - CLASS 4
- WETLANDS

NOTES - GENERAL

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LEGEND

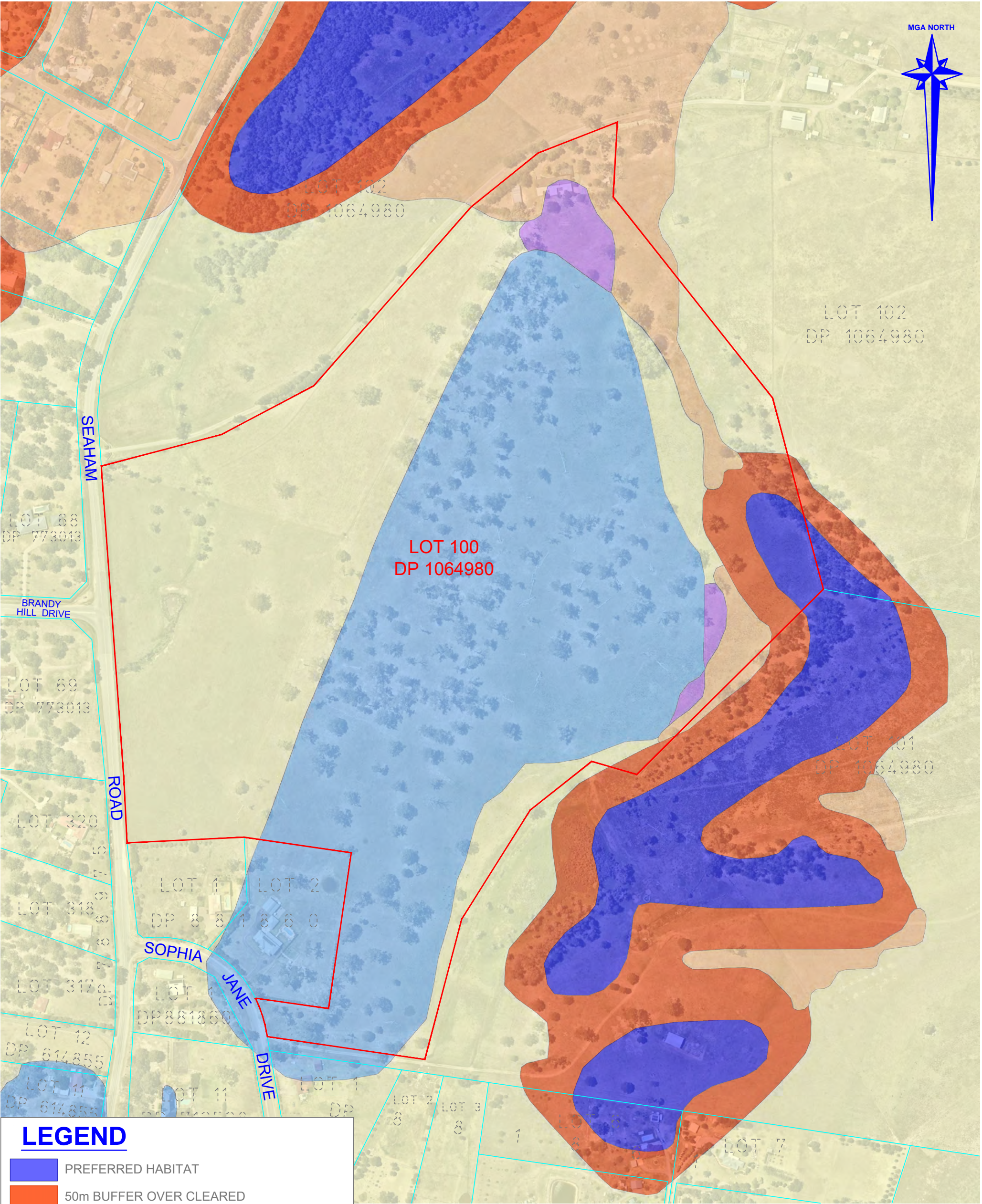
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- BUSHFIRE PRONE LAND - VEGETATION CATEGORY 2
- BUSHFIRE PRONE LAND - VEGETATION BUFFER (100m & 30m)

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SCALE 1:4000 @ A3

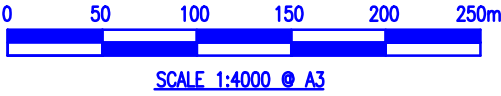


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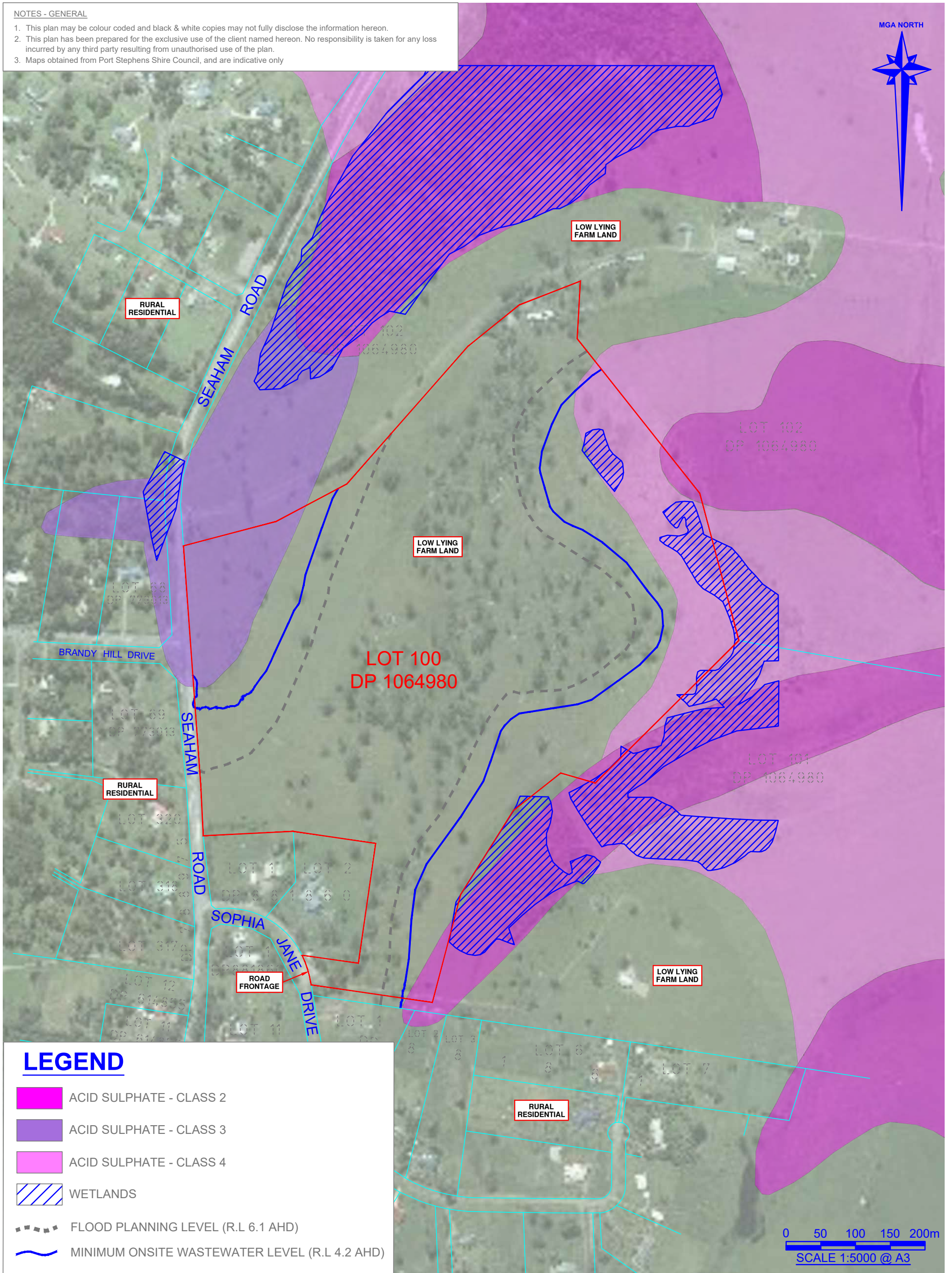
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- 50m BUFFER OVER CLEARED
- LINK OVER CLEARED LAND
- MAINLY CLEARED
- MARGINAL KOALA HABITAT
- PREFERRED LINK OVER MARGINAL HABITAT

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LEGEND

-  ACID SULPHATE - CLASS 2
 ACID SULPHATE - CLASS 3
 ACID SULPHATE - CLASS 4
 WETLANDS
 FLOOD PLANNING LEVEL (R.L 6.1 AHD)
 MINIMUM ONSITE WASTEWATER LEVEL (R.L 4.2 AHD)

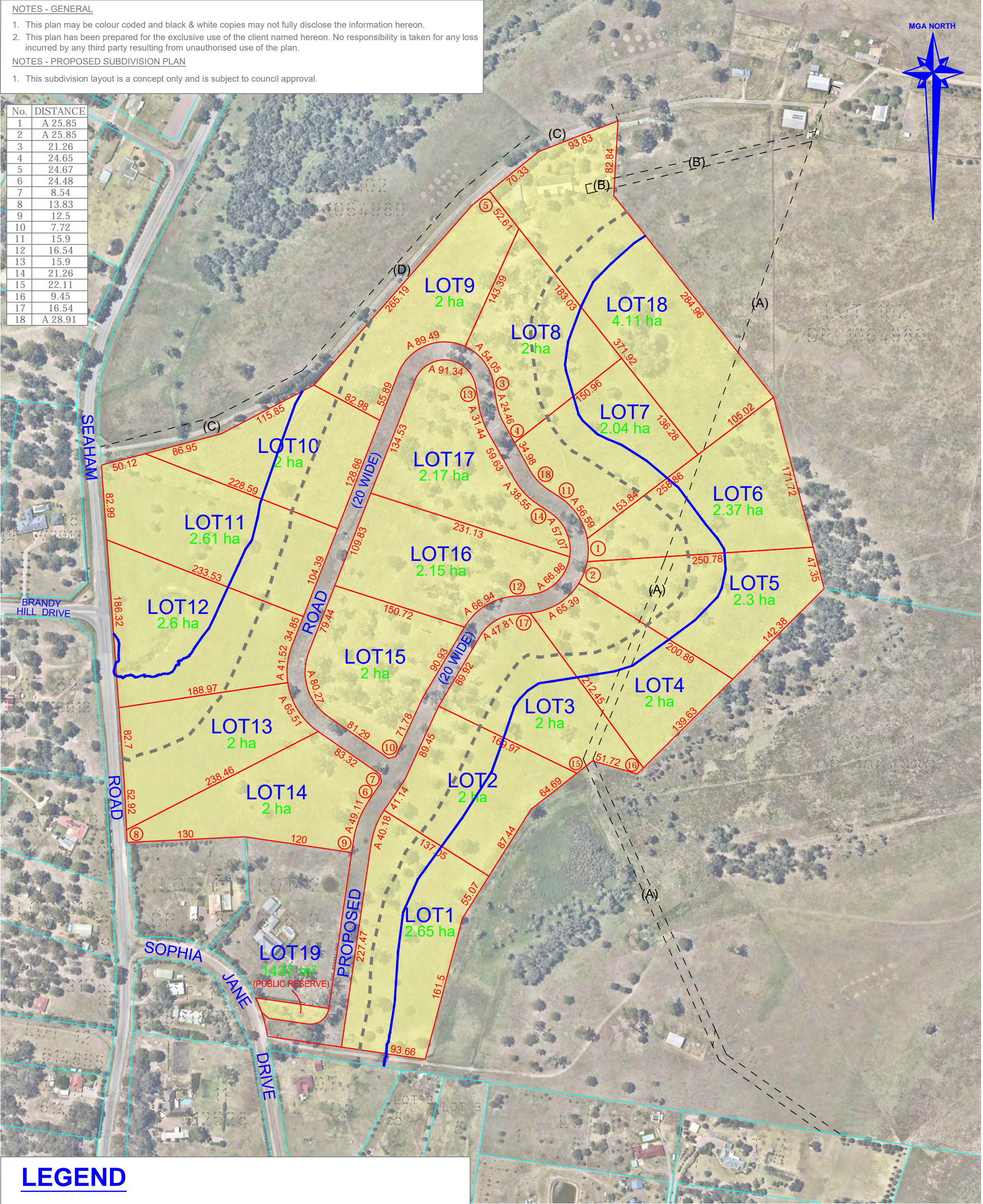
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NOTES - PROPOSED SUBDIVISION PLAN

1. This subdivision layout is a concept only and is subject to council approval.

No.	DISTANCE
1	A 25.85
2	A 25.85
3	21.26
4	24.65
5	24.67
6	24.48
7	8.54
8	13.83
9	12.5
10	7.72
11	15.9
12	16.54
13	15.9
14	21.26
15	22.11
16	9.45
17	16.54
18	A 28.91



MGA NORTH



LEGEND

--- FLOOD PLANNING LEVEL (R.L. 6.1 AHD)

~ MINIMUM ONSITE WASTEWATER LEVEL (R.L. 4.2 AHD)

- (A) EASEMENT FOR TRANSMISSION LINE 10 WIDE (DP 810145)
(B) EASEMENT FOR ELECTRICITY PURPOSES 10 WIDE (DP 1064980)
(C) RIGHT OF CARRIAGEWAY 20 WIDE (DP 1064980)
(D) POSITIVE COVENANT (DP 1064980)



SCALE 1:4000 @ A3



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Site

Locality

PROPOSED LOT LAYOUT
(OVERLAID ON SITE AERIAL)
STATHAM
Lot 100 DP 1064980 - No. 792 SEAHAM ROAD
SEAHAM
LGA PORT STEPHENS

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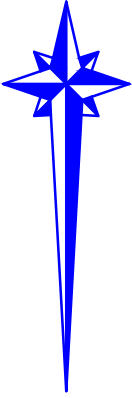
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12	16.54
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17	16.54
18	A 28.91

MGA NORTH



SEAHAM

BRANDY HILL DRIVE

ROAD

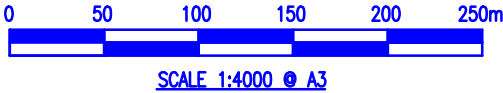
SOPHIA

JANE DRIVE

PROPOSED

LEGEND

- FLOOD PLANNING LEVEL (R.L 6.1 AHD)
~ MINIMUM ONSITE WASTEWATER LEVEL (R.L 4.2 AHD)
(A) EASEMENT FOR TRANSMISSION LINE 10 WIDE (DP 810145)
(B) EASEMENT FOR ELECTRICITY PURPOSES 10 WIDE (DP 1064980)
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Title

Client

Site
Lot 100 DP 1064980 - No. 792 SEAHAM ROAD

Locality
SEAHAM
LGA
PORT STEPHENS

PROPOSED LOT LAYOUT

STATHAM

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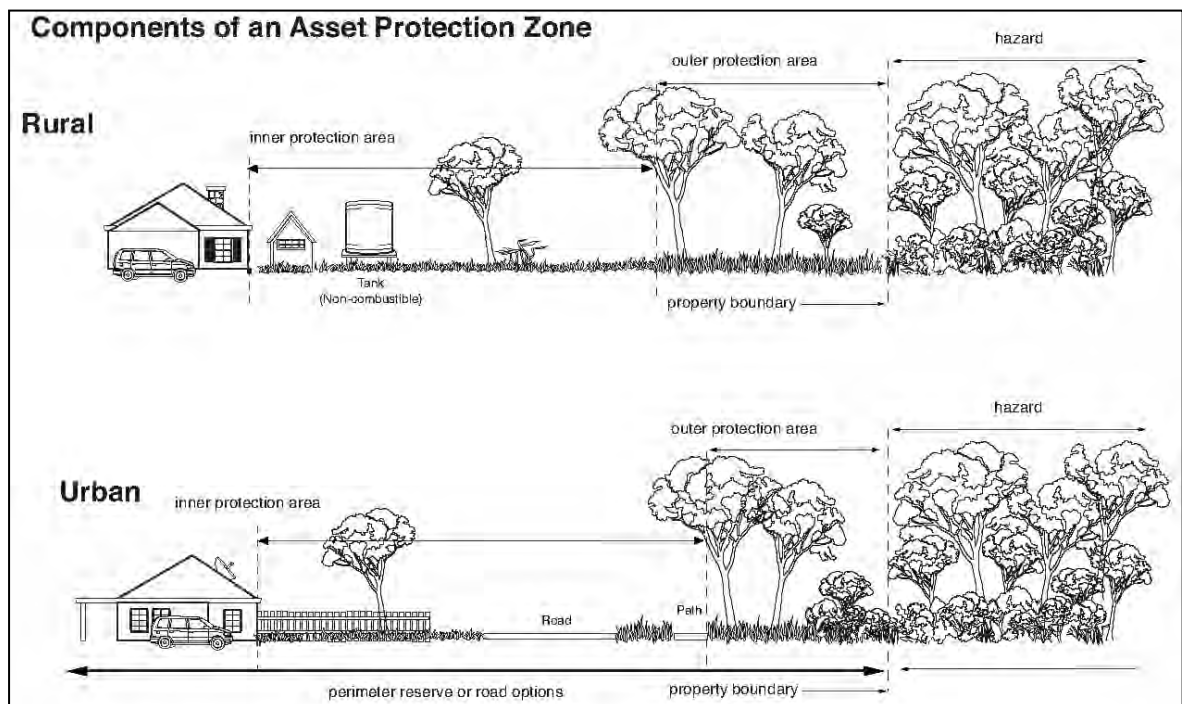
APPENDIX B ASSET PROTECTION ZONES

ASSET PROTECTION ZONES

An Asset Protection Zone (APZ) is an area surrounding a development that is managed to reduce the bushfire hazard to an acceptable level to mitigate the risk to life and property (refer to Figure B-1 below). The required width of the APZ varies with slope and the type of hazard. An APZ can consist of both an Inner Protection Area (IPA) and an Outer Protection Area (OPA). The respective IPA and OPA widths for the required APZs are as detailed in Table 5-1. An APZ can include the following:

- Lawns;
- Discontinuous gardens;
- Swimming pools;
- Driveways;
- Unattached non-combustible garages with suitable separation from the dwelling;
- Open space / parkland; and
- Car parking.

Figure 1: Components of an APZ (PBO 2006)





INNER PROTECTION AREA

The Inner Protection Area (IPA) extends from the edge of the OPA to the development. The IPA aims to ensure that the presence of fuels which could contribute to a fire event / intensity, are minimised close to the development. The performance of the IPA must be such that:

- There is minimal fine fuel at ground level which could be set alight by a bushfire; and
- Any vegetation in the IPA does not provide a path for the transfer of fire to the development – that is, the fuels are discontinuous.

The presence of a few shrubs or trees in the IPA is acceptable provided that they:

- Do not touch or overhang any buildings;
- Are well spread out and do not form a continuous canopy;
- Are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and
- Are located far enough away from any dwelling so that they will not ignite the dwelling by direct flame contact or radiant heat emission.

Woodpiles, wooden sheds, combustible material storage areas, large areas / quantities of garden mulch, stacked flammable building materials etc are not permitted in the IPA

OUTER PROTECTION AREA

The Outer Protection Area (OPA) is located adjacent to the hazard. Within the OPA any trees and shrubs should be maintained in a manner such that the vegetation is not continuous. Fine fuel loadings should be kept to a level where the fire intensity expected will not impact on adjacent developments.