# Lot 7 Forrest Beach Road Wonnerup Structure Plan (WAPC Ref SPN 2231)

This structure plan is prepared under the provisions of the City of Busselton Local Planning Scheme 21.

IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:

9 September 2020

Signed for and on behalf of the Western Australian Planning Commission: An officer of the Commission duly authorised by the Commission pursuant to section 16 of the Planning and Development Act 2005 for that purpose, in the presence of: Aloaper ----- Witness 9 September 2020 ----- Date 9 September 2030 Date Expiry

### Table of Amendments

Amendment No.	Summary Amendment	of	the	Amendment Type	Date approved by the WAPC

## **EXECUTIVE SUMMARY**

This Structure Plan relates to Lot 7 (86) Forrest Beach Road, Wonnerup.

The subject land currently accommodates one dwelling and two outbuildings and consists of just over 56 hectares in total area. The land is mainly utilised for cattle grazing purposes by the current owners.

Lot 7 abuts the Wonnerup Estuary along its southern and western boundaries. This estuary forms a series of coastal wetlands of local, regional and international significance with a large portion of these wetlands being listed under the Ramsar Convention.

Lot 7 is also located within boundaries of the Western Australian Planning Commission Busselton Wetlands Conservation Strategy (BWCS) which essentially highlights the significance of these wetlands and also offers incentives aimed at the preservation of these areas, including additional lots.

This Structure Plan has been prepared and submitted based upon a subdivision incentive available via the BWCS whereby subdivision of one additional lot per 20 ha of land area is possible subject to certain criteria.

This criteria will be explained in more detail later in this report, however in this case, an additional 3 lots is being sought (4 in total). An additional 100 m<sup>2</sup> lot also needs to be created to accommodate a 50,000 litre strategic fire-fighting tank which will be transferred to the City of Busselton.

As part of the BWCS process, the subject land also needs to be rezoned with, in this case, land essentially abutting the Wonnerup Estuary to be ceded as a reserve for conservation, landscape and foreshore protection purposes with the zoning of that area changing from the current "Rural" zone to "Reserve for Recreation". The remaining land will be rezoned from "Rural" to "Conservation" except for a 100 m<sup>2</sup> lot which will be zoned "Reserve for Public Purpose (Water Tank)". This separate but associated process forms Amendment 37 to the City of Busselton Local Planning Scheme 21 (LPS 21).

#### Summary of Key Statistics

Item	Data
Total area covered by the Structure Plan	56ha
Area of Reserve for Environmental Conservation	13.5ha
Area of Reserve for Public Purpose	100m <sup>2</sup>

Following the formal advertising period, further consideration of effluent disposal types and coastal inundation processes was undertaken with key agencies, which resulted in the following requirements:

- a) The provision of alternative on-site effluent disposal systems with secondary treatment systems with minimum depth to groundwater of 1.5m; and
- b) Due regard be given to the State Coastal Planning Policy (SPP 2.6) to assess coastal processes, hazards and risk.

Structure Plan Report Lot 7 (86) Forrest Beach Road, Wonnerup (WAPC Ref SPN 2231)

A coastal inundation risk assessment report (Seashore Engineering April 2020) was prepared and has recommended that habitable buildings achieve a 3.8 metre AHD finished floor level to flood proof development against extreme coastal inundation events, including a 500 year ARI tropical cyclone occurring towards the end of the 100 year planning period for sea level rise.

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Appendix Four – Coastal Inundation Assessment Report (Seashore Engineering April 2020)

## PART ONE: IMPLEMENTATION

## 1.1 Structure Plan Area

This Structure Plan applies to the land known as Lot 7 (86) Forrest Beach Road, Wonnerup. The Structure Plan Map identifies the subject land at Figure 1.

## 1.2 Operation

The Structure Plan comes into effect on the date it is approved by the Western Australian Planning Commission and the duration of the approval is 10 years or as consistent with Part 4, Schedule 2 of the *Deemed Provisions of the Planning and Development (Local Planning Schemes) Regulations 2015.* 

## **1.3 Subdivision and Development Requirements**

### 1.3.1 Land Use

The Structure Plan Map (Figure 1) identifies the following land use classifications applicable to the relevant lots:

- Conservation
- Recreation
- Public Purposes Water Tank

Land Use permissibility within the structure plan area shall accord with the land use permissibility of the corresponding zone or reserve under the City of Busselton Local Planning Scheme No.21.

### 1.3.2 Subdivision

- 1.3.2.1 Subdivision of land shall be in accordance with the Structure Plan Map.
- 1.3.2.2 Prior to the lodgement of an application for subdivision with the Western Australian Planning Commission, the following is to occur in relation to the subject land:
  - a. The proposed lots are rezoned to 'Conservation';
  - b. Include in the City's local planning scheme a requirement for a minimum finished floor level of 3.8 AHD for habitable development;
  - c. Include in the City's local planning scheme a requirement for the installation of alternative on-site effluent disposal systems, which achieve a minimum 1.5 metre vertical separation to the highest winter groundwater level.
- 1.3.2.3 The following matters will be addressed as conditions of subdivision:
  - a. A portion of each building envelope will be required to be filled to accommodate envisaged future development, to the satisfaction of the City, to achieve the following:

- i. A minimum 3.7 metres AHD ground level to facilitate a finished floor level of 3.8 m AHD;
- ii. A minimum 1.5 metre vertical separation between the highest winter groundwater level and the envisaged discharge point of the future on-site effluent disposal system;
- iii. A suitable land application area consistent with the requirements of the Government Sewerage Policy for on-site effluent disposal purposes.
- b. The preparation of a Foreshore Management Plan for the reserve land (to be ceded) adjoining the Wonnerup Estuary. The subdivider is to fence the new reserve boundary and establish an access/maintenance track for Department of Biodiversity, Conservation and Attractions (DBCA). Revegetation works within the reserve will be the responsibility of the DBCA;
- c. The preparation and implementation of a Nutrient Management Plan for the large Conservation lot adjoining the Wonnerup Estuary Foreshore Reserve, to manage stocking rates and to ensure revegetation and/or other works protect the water quality within the estuary;
- d. The ceding of the Wonnerup Estuary Foreshore Reserve to the Crown free of cost and without payment of compensation (for addition to Reserve 44838) for flora and fauna conservation purposes;
- e. The preparation and implementation of an updated Bushfire Management Plan, modified to include any additional landscaping or planting areas;
- f. The implementation of screening vegetation to assist in screening future development sites whilst maintaining any significant views across the site from Forrest Beach Rd;
- g. Appropriate notifications on title warning of risks or factors or off-site impacts posed to property, life and/or amenity associated with inundation/flooding, bushfire prone land, agricultural activity and mosquito borne disease; and
- h. Any measures necessary to avoid/protect Western Ringtail Possum habitat as a result of site works.

### 1.3.3 Development

1.3.3.1 In addition to the Scheme provisions applicable to development on the Conservation lots, the following will also apply:

i) Minimum finished floor levels of 3.8 m AHD;

ii) The requirement for effluent disposal to be via ATU's with secondary treatment systems; and

iii) A 1.5m minimum depth to groundwater for the waste water disposal areas.



## PART TWO: EXPLANATORY REPORT

## **1 PLANNING BACKGROUND**

## **1.1 Introduction and Purpose**

This Structure Plan has been prepared in accordance with the obligations set out under Part 4 – Structure Plans of Schedule 2 – Deemed Provisions of the *Planning and Development* (Local Planning Schemes) Regulations 2015.

## **1.2 Land Description**

### 1.2.1 Location

The land is located at Lot 7 (86) Forrest each Road, Wonnerup.

### 1.2.2 Area and land use

The subject land is currently utilised for cattle grazing. The land area is 56 hectares.

### 1.2.3 Legal description and ownership

The land is legally described as Lot 7 Forrest Beach Road, Wonnerup. The Certificate of Title is included at Appendix One. The land is owned by Mark and Sandra Sims.

## **1.3 Planning Framework**

### 1.3.1 Zoning and reservations

The subject area is zoned "Rural".

### **1.3.2 Planning Strategies**

### Western Australian Planning Commission Busselton Wetlands Conservation Strategy.

This Structure Plan and the associated Amendment 37 to LPS 21 have been prepared in accordance with the opportunities provided for by this Strategy.

The BWCS is a Western Australian Planning Commission document which is essentially aimed at guiding land use planning and management to maintain and improve the conservation values of the Strategy area. The Strategy area extends approximately 25 kilometres and includes a chain of coastal wetlands of various significance including a large portion being listed under the Ramsar Convention.

The purpose of the BWCS reads as follows:

#### "Purpose

The purpose of this Strategy is to provide a framework to guide sustainable land use and wise management of the biodiversity and environmental values of the Busselton Wetlands area. The Strategy will also guide management planning for publically owned wetlands area to be vested in the Conservation Commission."

This Structure Plan and the associated Scheme Amendment processes are based upon the aims, objectives and incentive opportunities provided for by this Strategy and in particular Part 2.3.2 Agricultural Land.

Under this section, the Strategy "supports limited rural clustered subdivision of agricultural land where suitable land can be set aside for reserves for conservation, landscape and foreshore protection, subject to proposals meeting certain criteria set out in the General Strategies listed below."

The General Strategies as they relate to subdivision and development of the subject land are discussed below.

For lots 20 ha or greater, subdivision based upon one additional lot per 20 hectares up to a maximum of 5 additional lots can be considered subject to the following criteria:

"- subdivision should be in clustered form – unless based on existing dwellings;"

Response:

Complied with. All proposed additional lots are adjacent to the existing dwelling, along Forrest Beach Road and away from the wetland.

With the overall lot size of 56 hectares, an additional 2.8 lots is possible under the Strategy. An additional 3 lots is being requested in this case because this represents a minor discrepancy and because of the excellent environmental outcome in that only 9.9 hectares of reserve land technically needs to be created in accordance with the requirements of the BWCS however 13.5 hectares is proposed adjacent to the Wonnerup Estuary. Also, as the purpose of the Strategy suggests, the Strategy is a guide to land use and there has been circumstances in the past where authorities have been prepared to vary standards, including in one instance where several additional lots beyond normally permitted by the Strategy were offered in exchanged for additional reserve land. Therefore, in this case an additional 3.6 hectares of reserve land is considered to be a fair and reasonable exchange of 0.2 discrepancy in lot calculation.

"- the rural clustered lots should be within the range 1 to 2 hectares in area, however there may be circumstances where lots below 1 hectare are justified and result in a more desirable outcome for the Busselton Wetlands;"

Response:

Complied with. All 3 proposed additional lots are 2 hectares in area.

"- ceding free of cost land adjacent to the Busselton Wetlands, as reserve for conservation, landscape and foreshore protection purposes. The width of the reserve should be at least 30 metres from the Quindalup Very Wet Saline Flats. Additionally, land retained in private ownership should be protected by conservation covenants to guarantee the perpetual maintenance of conservation and landscape values;"

#### Response:

Onshore Environmental determined an alignment of the Quindalup Very Wet Saline Flats (QVWSF) and a line 30 metres beyond that alignment into the subject property.

Preliminary discussions have also occurred with the Department of Biodiversity, Conservation and Attractions (DBCA) regarding various aspects of this proposal, including the preferred alignment of land to be reserved.

Firstly, the DBCA acknowledge that there is a strip of QVWSF soils that run along the Forrest Beach frontage of the property however DBCA advice is that this land, essentially because of its location and characteristics, is unlikely to be set aside as wetland reserve, but would remain freehold with other protections outlined in the BWCS. Based upon this preliminary advice, this Structure Plan has identified this portion of the subject land as accommodating the additional lots as from a land use point of view this is considered the best location from a servicing point of view, including the area having direct vehicular access to Forrest Beach Road.

In the vicinity of the existing dwelling/outbuildings, the Onshore Environmental assessment identifies the 30 metre setback line from the QVWSF as encroaching over one of the outbuildings and also within very close proximity to all buildings in this location. Preliminary DBCA mapping in this vicinity identifies an alignment that does not encroach and provides a better and more usable setback area to buildings. Given the circumstances, the BDCA alignment has been selected for the proposed reserve boundary in this vicinity and is it represents a more practical outcome.

The DBCA has also requested additional land not mapped as QVWSF. This land is in the south east and south west portions of the site. In regard to this matter, Onshore Environmental has calculated an area 30 metres beyond the QVWSF (excluding the small portion of land identified above near the existing buildings) of 9.9 hectares with the DBCA preferred alignment consisting of 13.5 hectares, a difference of an additional 3.6 hectares of land to be reserved. This owners of the property have accepted this increase in land for reserve purposes in exchange for 3 additional lots.

*"- rezoning of the proposed rural clustered lots and the balance of the land being to "Conservation "zone;"* 

Response:

Complied with. The associated Scheme Amendment 37 aims to achieve this outcome.

*"- the proposed rural clustered lots not being located within the "Rural and Wetland Amenity Area", where possible;"* 

#### Response:

This entire property is identified as Rural and Wetland Amenity Area. In this case however all proposed lots are situated on grazing land and at similar ground level to the existing dwelling. There are no conservation values in this part of the site. This, along with the fact that 13.5 hectares of land will be created as reserve adjacent to the Wonnerup Estuary is considered to warrant flexibility with this specific standard. Furthermore, preliminary discussions with the DBCA indicates support for this proposal.

*"- revegetation (with local native species) and enhancing appropriate locations adjoining wetlands. Plantings in suitable areas should reduce run-off, revegetate degraded areas and maintain or enhance vegetation and landscape linkages;"* 

#### Response:

Any requirements in this regard is normally enforced through the associated and subsequent subdivision process.

"- being unlikely to have a significant detrimental impact on wildlife;"

#### Response;

Complied with. This Structure Plan process will have a positive effect in this regard as it will effectively be creating 13.5 hectares of reserve land adjacent to the Wonnerup Estuary which is currently used for cattle grazing. This reserve land will be required to be fenced by the owner through these various planning processes and rehabilitation of this area is likely to occur. Most of the remainder of the land will be rezoned to "Conservation" which significantly reduces potential use of the land for other purposes. A nutrient management plan will also be required.

*"- not detracting from the ongoing viability of the balance of the lot for long-term agricultural land use;"* 

#### Response:

Complied with. Although being rezoned from "Rural" to "Conservation" as part of the associated Scheme Amendment process, one larger lot of 37.58 hectares in area will continue to be utilised for agricultural purposes, in this case cattle grazing.

*"- not detracting from the important education, scientific and ecotourism values and opportunities;"* 

#### Response:

Complied with. None of these values will be adversely affected, in fact they all should be enhanced by this proposal.

"- not detracting from the visual quality of the landscape;"

#### Response:

Complied with. This Structure Plan will introduce additional buildings on the land but they will not have a significant effect as for instance a second and even more dwellings could be applied for currently under LPS21 and under the current zoning as well as additional outbuildings. Regardless, because of the proposed lots sizes and configuration and distribution of building envelopes view scapes to the wetland will remain when travelling along Forrest Beach Road.

Furthermore, the visual landscape should in fact be enhanced by the creation of 13.5 hectares of reserved land adjacent to an important wetland.

*"- Ensuring the provision of adequate measures for fencing, emergency access and bushfire protection without burdening the values and management of the wetlands."* 

Response:

Complied with.

The reserve area to be created as part of this Structure Plan will be required to be fenced at full cost of the land owner via a condition of any future subdivision approval.

As Forrest Beach Road is a two way road no alterative on site emergency access ways will be required from a bushfire management point of view. A bushfire management plan has been prepared by Ecosystem Solutions (see Appendix Two).

Vehicle access for DBCA to land created as reserve as part of the Amendment process will be directly from Forrest Beach Road as already acknowledged by the DBCA.

### 1.3.3 Planning Policies

### State Planning Policy 3.7 Planning in Bushfire Prone Areas

This policy document essentially directs how land use should address bushfire risk management in Western Australia. It applies to all land which has been designated bushfire prone by the Fire and Emergency Services Commissioner as highlighted on the Map of Bushfire Prone Areas. The subject land is identified as bushfire prone and in accordance with this policy a bushfire management plan has been prepared by Ecosystem Solutions as part of the Structure Plan process confirming compliance.

#### 1.3.4 Other approvals and decisions

As stated, the BWCS also requires the land to be rezoned and this is being carried out by a separate concurrent process via Amendment 37 to LPS21.

### 1.3.5 Pre lodgement consultation

The proposed Structure Plan and associated Scheme Amendment have been discussed with the City of Busselton and the Department of Conservation, Biodiversity and Attractions.

## **1.4 Site Conditions and Constraints**

### 1.4.1 Biodiversity and natural assets

The portion of the subject land with the highest level of biodiversity and natural assets is the area adjacent to the Wonnerup Estuary. As part of this Structure Plan, the associated Scheme Amendment and subsequent subdivision processes, this area will be created as a reserve, it will be fenced from livestock and it will be ceded free of charge to the Crown.

#### 1.4.2 Landform, soils and ground water/surface water

The subject land is generally flat with loamy soils and wetter areas being closer to the Wonnerup Estuary. There is a man-made lake closer to Forrest Beach Road.

The previous landowner created this lake to essentially provide water for stock. The current owner has installed water troughs for this purpose. Following problems with mosquito breeding within the man-made lake area and following advice from authorities the owner commenced filling this area.

Although low lying, the remainder of the property is generally not subject to inundation with relatively well draining soils as well as natural drainage channels installed by previous owners. This property was once also used for horticultural purposes which required good drainage.

#### 1.4.3 Bushfire hazard

As stated, this area is identified as being bushfire prone. A BMP plan has been prepared in this regard confirming compliance with relevant statutory/policy positions.

## 1.5 Other Considerations

#### 1.5.1 Servicing

This is essentially a rural area and therefore reticulated services are limited.

There is a Western Power aboveground power line running east west through the property near Forrest Beach Road which is identified on the attached Structure Plan. Western Power will require this line to be relocated and most likely replaced with an underground system should this Structure Plan and associated Scheme Amendment be successful and via a condition at the next subdivision stage.

Any proposed effluent disposal will need to be via approved on site systems with these details normally resolved at any building licence stage.

Provision of a potable water supply is also a matter controlled at any building licence stage with Clause 4.11 of LPS21 requiring dwellings be provided with a potable tank water supply of a minimum capacity of 135,000 litres with a minimum roof catchment of 150 m<sup>2</sup>.

The BMP requires a water tank with a capacity of 50,000 litres for fire-fighting purposes which will be provided via a condition of any associated subdivision approval process.

#### 1.5.2 Landscape Value Area

The subject land is included within the Landscape Value Area pursuant to LPS21. The intent of this clause, as the title suggests, is to maintain any landscape features of a particular property in relation to any future development or clearing. It also includes maintaining wildlife refuges, significant wetland and other important features.

This clause also discusses building materials suggesting the use of dark tones or dark colouring.

The main purpose of this Structure Plan and associated Scheme Amendment is not just to maintain but to enhance and maintain the conservation values of the property as encouraged via the BWCS. This will be achieved by creating extra reserve land adjacent to the Wonnerup

Estuary, fencing that area and also controlling continuing farming activities on the remaining subject land.

### 1.5.3 Wetland Area

There is a portion of the subject site identified as Wetland Area. This area is essentially located along the boundary of the property adjacent to the Wonnerup Estuary and is along a similar alignment of the Quindalup Very Wet Saline Flat soils and the 30 metre setback to these soils as required by the BWCS and as identified by Onshore Environmental.

In regard to the Wetland Area designation, LPS21 essentially discourages development within this area and that all proposed lots containing buildings be outside the Wetland Area. These two standards are complied with in relation to this Structure Plan.

This section of LPS21 also discusses processes whereby development can be considered contrary to this preferred standard which is not relevant in the case of this Structure Plan.

### 1.5.4 Floodway Area and Other Flood Prone Land

A portion of the subject site is identified a Floodway Area. This alignment is similar to the Wetland Area alignment except for including additional land along the subject land's eastern boundary. Some of this land has been included within the proposed reserve area at the request of the DBCA and it is in addition to land normally required as reserve under the BWCS.

LPS21 establishes certain criteria for consideration of any potential development within such an area. No development is proposed within the Floodway Area via this Structure Plan process.

#### **1.5.5 Developer Contribution Areas**

Clause 5.12 of LPS21 reads as follows:

"The purpose of having development contribution areas is to –

(a) provide for equitable sharing of the costs of infrastructure and administrative costs between owners;

(b) ensure that cost contributions are reasonably required as a result of the subdivision and development of land in the development contribution area;

(c) coordinate the timely provision of infrastructure."

The subject site is within the LPS21 Development Contribution Plan Area (DCA 1) – 'Rural Remainder'. The policy was originally gazetted in 2013 and carried over into the existing Planning Scheme. In accordance with Local Planning Policy 6 - *Development Contribution Policy* (2010), the subject land will require a "per lot/unit monetary contribution" for local and district level community facilities.

This contribution is imposed as a condition of planning consent (paid prior to issue of an associated building licence) or as a condition of subdivision approval (paid at the time of clearance of conditions). Appropriate conditions in this regard will be imposed at any such future relevant stage(s).

## **APPENDIX ONE – CERTIFICATE OF TITLE**

Structure Plan Report Lot 7 (86) Forrest Beach Road, Wonnerup (WAPC Ref SPN 2231)

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ESTERN	院	AUSTRALIA	DUPLICATE EDITION 1	DATE DUPL <b>9/3/</b>
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561

#### **RECORD OF CERTIFICATE OF TITLE** UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

W



**REGISTRAR OF TITLES** 

LAND DESCRIPTION:

LOT 7 ON PLAN 3280

#### **REGISTERED PROPRIETOR:** (FIRST SCHEDULE)

MARK LESLIE SIMS SANDRA MARGARET SIMS BOTH OF LOT 7 FORREST BEACH ROAD, WONNERUP AS JOINT TENANTS

(T J644452) REGISTERED 2/3/2006

#### LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS: (SECOND SCHEDULE)

1. THE LAND THE SUBJECT OF THIS CERTIFICATE OF TITLE EXCLUDES ALL PORTIONS OF THE LOT DESCRIBED ABOVE EXCEPT THAT PORTION SHOWN IN THE SKETCH OF THE SUPERSEDED PAPER VERSION OF THIS TITLE. VOL 1976 FOL 561.

J644453 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA REGISTERED 2/3/2006. 2.

A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Warning: \* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title. Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

#### STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: PREVIOUS TITLE: PROPERTY STREET ADDRESS: LOCAL GOVERNMENT AUTHORITY: 1976-561 (7/P3280) 1827-563 86 FORREST BEACH RD, WONNERUP. CITY OF BUSSELTON



## APPENDIX TWO – BUSHFIRE MANAGEMENT PLAN (Prepared by Ecosystem Solutions)





## **Bushfire Management Plan Coversheet**

This Coversheet and accompanying Bushfire Management Plan has been prepared and issued by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme.

Bushfire Management Plan and Site Details					
Site Address / Plan Reference: Lot 7 Forrest Beach Road					
Suburb: Wonnerup		State:	WA	P/code: 6	280
Local government area: City of Busselton					
Description of the planning proposal: Subdivision of existing lot into	o six				
BMP Plan / Reference Number: 18552	Version: Rev C		Date of Issue:	23/11/20	18
Client / Business Name: Mark & Sandra Simms (C/- Tim Koroveshi	Town Planning Consultant)				

Reason for referral to DFES	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?		Ŋ
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the BPC elements)?		Ø
Is the proposal any of the following special development types (see SPP 3.7 for definitions)?		
Unavoidable development (in BAL-40 or BAL-FZ)		M
Strategic planning proposal (including rezoning applications)		M
Minor development (in BAL-40 or BAL-FZ)		M
High risk land-use		M
Vulnerable land-use		M

If the development is a special development type as listed above, explain why the proposal is considered to be one of the above listed classifications (E.g. considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

Note: The decision maker (e.g. local government or the WAPC) should only refer the proposal to DFES for comment if one (or more) of the above answers are ticked "Yes".

BPAD Accredited Practitioner Details and Declaration					
Name Gary McMahon	Accreditation Level Level 3	Accreditation No. 35078	Accreditation Expiry 11/2019		
Company Ecosystem Solutions		<b>Contact No.</b> (08) 9759 1960			

I declare that the information provided within this bushfire management plan is to the best of my knowledge true and correct

Date 23/11/2018

Signature of Practitioner



DUNSBOROUGH WA 6281 Ph: +61 8 9759 1960 Fax: +61 8 9759 1920 Mobile: 0427 591 960 info@ecosystemsolutions.com.au www.ecosystemsolutions.com.au

# **Bushfire Management Plan**

## Lot 7 (86) Forrest Beach Road, Wonnerup

23 November 2018

Prepared for: Mark & Sandra Sims C/- Tim Koroveshi Town Planning Consultant Att: Tim Koroveshi



# **Limitations Statement**

This report has been solely prepared for Mark & Sandra Sims(C/- Tim Koroveshi Town Planning Consultant, Att: Tim Koroveshi). No express or implied warranties are made by Ecosystem Solutions Pty Ltd regarding the findings and data contained in this report. No new research or field studies were conducted other than those specifically outlined in this report. All of the information details included in this report are based upon the research provided and obtained at the time Ecosystem Solutions Pty Ltd conducted its analysis.

In undertaking this work the authors have made every effort to ensure the accuracy of the information used. Any conclusions drawn or recommendations made in the report are done in good faith and the consultants take no responsibility for how this information and the report are used subsequently by others.

Please note that the contents in this report may not be directly applicable towards another organisation's needs. Ecosystem Solutions Pty Ltd accepts no liability whatsoever for a third party's use of, or reliance upon, this specific report.

STATEMENT OF CONFORMITY - PLANNING AND DEVELOPMENT ACT 2005



Gary McMahon B.Sc. M. Env Mgmt. PG Dip Bushfire Protection. C.EnvP, BPAD Level 3 (35078)

The signatory declares that this Bushfire Management Plan meets the requirements of State Planning Policy 3.7.

# **Document Control**

Client - Mark & Sandra Sims

Site - Lot 7 (86) Forrest Beach Road, Wonnerup

Version	Revision	Purpose	Author	Reviewer	Sut	omitted
					Form	Date
Report	Rev A	Initial Report	DP	KP	Electronic (email)	24/07/2018
Report	Rev B	Comments from TK	KP	DC	Electronic (email)	24/07/2018
Report	Rev C	Updated Lot 1 Boundary	DP	KP	Electronic (email)	23/11/2018

Filename: \\ECONAS\Data\PROJECTS\18552 Lot 7 (86) Forrest Beach Road, Wonnerup BMP\Reports\Lot 7 (86) Forrest Beach Road Wonnerup BMP RevC.docx

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City of Busselton Firebreak & Fuel Hazard Reduction Notice

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Table 6	City of Busselton Responsibilities	30

# 1 Proposal

This Bushfire Management Plan (BMP) has been prepared for Lot 7 (86) Forrest Beach Road, Wonnerup (hereafter referred to as the 'Site') by Danae Plowman (B.Sc. Env Sc. PG Dip Energy Env.) and Gary McMahon (B.Sc. M. Env Mgmt. PG Dip Bushfire Protection. C. EnvP, BPAD Level 3) from Ecosystem Solutions.

The proposal is to subdivide the existing Lot into six (Figure 1) with all lots being accessed from Forrest Beach Road:

- Lot 1 37.58 ha to retain the purpose of Agriculture; and
- Lot 2 to Lot 4 2.0 ha each for rural residential;
- Lot 5 10 m<sup>2</sup> for a strategic water tank vested to the City of Busselton; and
- Conservation Reserve 13.5 ha for environmental conservation.

The Site is located within a bushfire prone area, as declared by State Planning Policy 3.7: Planning in Bushfire Prone Areas (Figure 2).

The purpose of this BMP is to detail the fire management methods and requirements that will be implemented within and around the Site to reduce the threat to residents and fire fighters in the event of a fire.



Figure 1 Proposed Subdivision Plan



Figure 2 Map of Bushfire Prone Areas for the Site (within yellow square)

# 2 Bushfire Assessment Results

## 2.1 Assessment Inputs

The assessment of the Site was undertaken on 8 June 2018 by a BPAD Accredited Practitioner for the purpose of determining the Bushfire Attack Level in accordance with AS 3959 - 2009 Simplified Procedure (Method 1).

All vegetation within 150 m of the Site was classified in accordance with Clause 2.2.3 of AS 3959-2009, shown in the photos below with map provided in Figure 3.



Photo ID: 1

Description / Justification for Classification

 
 DIRECTION 279 deg(T)
 33.61723\*5 115.42912\*E
 ACCURACY 5 m DATUM WGS84

 Lot 7 (86) Forrest Beach Road, Wonnerup
 2018-06-08 13:29:26+08:00

B Woodland Downslope >0-5°









Description / Justification for Classification

Shrub vegetation less than two metres high consisting of *Lepidosperma sp* and Samphire. Photo 6 shows the boundary into Plot 4, A Forest.



Description / Justification for Classification

Canopy of Agonis flexuosa over Hibbertia cuneiformis, Spyridium globulosum, Acacia cochlearis. Foliage cover in the range of 30-70%.



Lot 7 (86) Forrest

Photo ID: 9

Description / Justification for Classification

Photo ID: 10 Open woodland with a canopy of introduced Eucalyptus sp. and Melaleuca sp. with an understorey of introduced grasses.



Photo ID: 19 Description / Justification for Classification

G Grassland Upslope / Flat

Grassland used for agriculture purposes.



Photo ID: 13 Description / Justification for Classification

*Photo ID: 14* Grassland used for agriculture purposes.



excluded under S 2.2.3.2 (f). Photo 11 and 12 include areas within the proposed lots which will be maintained in a low fuel state in perpetuity as a requirement of this Bushfire Management Plan and is enforceable s33 of the Bush Fires Act 1954 as the City of Busselton Firebreak and Fuel Hazard Reduction Notice states "A Fire Management Plan is a comprehensive Plan for the prevention and control of bushfire which may apply to individual land holdings. The Landowner must comply with the Fire Management Plan."





## 2.2 Assessment Outputs

The results from the Site assessment are provided in Table 1. The Determined Bushfire Attack Level (highest BAL) for the Site has been determined in accordance with clause 2.2.6 of AS 3959-2009 with map provided in Figure 4.

#### Table 1Site Assessment Results

Meth	Method 1 BAL Determination					
Fire [	Danger Index - 80 (AS3959-2009 Tabl	e 2.1)				
Plot	Vegetation Classification	Effective Slope Under the Classified Vegetation (degrees)	Separation Distance to the Classification Vegetation (metres)	Bushfire Attack Level		
1	B Woodland	Downslope >0-5°	>100 m	BAL-LOW		
2	C Shrubland	Downslope >0-5°	>100 m	BAL-LOW		
3	C Shrubland	Upslope / Flat	Min 53 m	BAL-12.5		
4	A Forest	Upslope / Flat	Min 30 m	BAL-29		
5	B Woodland	Upslope / Flat	Min 34 m	BAL-19		
6	G Grassland	Upslope / Flat	Min 35 m	BAL-12.5		
7	G Grassland	Downslope >0-5°	Min 34 m	BAL-12.5		
8	Excluded Clause 2.2.3.2 (e) & (f)	NA	NA	BAL-LOW		
9	Excluded Clause 2.2.3.2 (f)	NA	NA	BAL-LOW		

#### Determined Bushfire Attack Level

BAL-29\*

\* A lower BAL rating can be achieved based on an increased separation distance from the classified vegetation, given there is adequate area cleared within the proposed lots.



Figure 4 Map of Bushfire Attack Level Assessment

# 3 Environmental Considerations

## 3.1 Native Vegetation - modification and clearing

Lot 7 (86) Forrest Beach Road contains grassland used for agriculture with small pockets of vegetation and windbreaks. There is no modification required to any vegetation. A conservation reserve is being created where the site abuts the Wonnerup wetland.

The area has been assessed for environmental values using a simple desktop review (Table 2). The Lot is classified as Agriculture and borders Wonnerup wetland and a Threatened Ecological Community (TEC). There is no proposed impact to the wetland or TEC as a result of this proposal.

#### Table 2Proposed native vegetation clearing within environmental valued areas

Environmental Value	Yes or No	If Yes - describe
Conservation Covenants	No	Not applicable
Bushfire Forever Sites	No	Not applicable
Conservation Category Wetlands and Buffer	Yes	Wonnerup wetland neighbours the Site to the south and west, which is a RAMSAR listed wetland. There is no proposed impact to this area as a result of this proposal.
Threatened Ecological Communities (TECs)	Yes	A TEC has been identified north of Site, within the assessment area, according to SLIP public data. There is no proposed impact to this area as a result of this proposal.
Declared Rare Flora (DRF)	No	Not applicable
Significant through Local Planning or Biodiversity Strategy	No	Not applicable

## 3.2 Re-vegetation / Landscape Plans

No active revegetation is required.

# 4 Identification of Bushfire Hazard Issues

Bushfire behaviour is significantly affected by weather conditions. Bushfires will burn more aggressively when high temperatures combine with low humidity and strong winds. Generally, the greatest fire risk occurs from summer through to autumn, when the moisture levels in the soil and vegetation are low.

The majority of the area within the Site is grassland used for agriculture purposes with small pockets of native vegetation, posing a Moderate bushfire risk. The managed grassland/gardens within the Site pose a Low bushfire hazard due to the lack of remaining vegetation.

The overall fire risk to people and property within the Site is considered Moderate due to the extent of remnant native vegetation in proximity to the Site. By complying with the requirements of this BMP, this risk can be appropriately managed.

# 5 Assessment Against the Bushfire Protection Criteria

### 5.1 Compliance with the Acceptable Solutions for each Element

#### Bushfire Protection Criteria - Element 1 - Location

**Intent:** To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure.

**Performance Principle P1:** The intent may be achieved where the strategic planning proposal, subdivision or development application is located in an area where the bushfire hazard assessment is or will, on completion, be moderate or low OR a BAL-29 or below applies AND the risk can be managed. For unavoidable development in areas where BAL-40 or BAL-FZ applies, demonstrating that the risk can be managed to the satisfaction of DFES and the decision-maker.

Acceptable Solution	Compliance	Assessment Statements
A1.1 Development location The strategic planning proposal, subdivision and development	Compliance with this element is achieved.	The building envelopes for Lots 1, 2, 3 and 4 achieve BAL-29 as shown in Figure 4.
application is located in an area that is or will, on completion, be subject to either a moderate or low bushfire hazard level, or BAL-29 or below.		Lot 1 includes an existing building, located within an area of BAL-29 or below. If additions or alterations are planned, a setback of 21 metres from any Class A - Forest upslope vegetation and 9 m from any Class G Grassland downslope >0- 5° will be required to achieve a BAL-29 rating.

#### Bushfire Protection Criteria - Element 2 - Siting and Design

Intent: To ensure that the siting and design of development minimises the level of bushfire impact.

**Performance Principle P2:** The siting and design of the strategic planning proposal, subdivision or development application, including roads, paths and landscaping, is appropriate to the level of bushfire threat that applies to the site. That it incorporates a defendable space and significantly reduces the heat intensities at the building surface thereby minimising the bushfire risk to people, property and infrastructure, including compliance with AS 3959 if appropriate.

Acceptable Solution	Compliance	Assessment Statements
A2.1 Asset Protection Zone (APZ) Every habitable building is surrounded by, and every proposed lot can achieve, an APZ depicted on submitted plans, which meets the following requirements:	Compliance with this element is achieved.	Figure 5 demonstrates that Asset Protection Zones, to achieve a BAL- 29 or lower rating will be achieved with Lots 2, 3 and 4 and the northern portion of Lot 1 being managed in a low fuel state in perpetuity, by the respective Landowners, which is also in
<ul> <li>Width: Measured from any external wall or supporting post or column of the proposed building, and of</li> </ul>		compliance with the City of Busselton Firebreak and Fuel Hazard Reduction Notice as grass must be maintained under 10 cm.
sufficient size to ensure the potential radiant heat impact of a bushfire does not exceed 29kW/m <sup>2</sup> (BAL-29) in all circumstances.		The requirement to manage the Lots in a low fuel state is a condition of this Bushfire Management Plan and is enforceable s33 of the Bush Fires Act 1954 as the City of
<ul> <li>Location: the APZ should be contained solely within the boundaries of the lot on which the building is situated, except in instances where the neighbouring lot or lots will be managed in a low-fuel state on an ongoing basis, in perpetuity (see explanatory</li> </ul>		Busselton Firebreak and Fuel Hazard Reduction Notice states "A Fire Management Plan is a comprehensive Plan for the prevention and control of bushfire which may apply to individual land holdings. The Landowner must comply with the Fire Management Plan."
<ul> <li>Management: the APZ is managed in accordance with the requirements of 'Standards for Asset Protection Zones'. (see Schedule 1).</li> </ul>		A 25 m Building Protection Zone is also required around any dwelling within the Site, managed according to the standard in the City of Busselton Firebreak and Fuel Hazard Reduction Notice.

#### Bushfire Protection Criteria - Element 3 - Vehicular Access

**Intent:** To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event.

**Performance Principle P3:** The internal layout, design and construction of public and private vehicular access and egress in the subdivision/ development allow emergency and other vehicles to move through it easily and safely at all times.

Acceptable Solution	Compliance	Assessment Statements
A3.1 Two Access Routes Two different vehicular access routes are provided, both of which connect to the public road network, provide safe access and egress to two different destinations and are available to all residents/the public at all times and under all weather conditions.	Compliance with this element is achieved.	All proposed lots will be accessed from Forrest Beach Road. Forrest Beach Road can be taken south west to Layman Road. Layman Road can be taken north west or south east via Bussell Highway to Busselton town centre. Forrest Beach Road can also be taken north east to Capel town centre via Ludlow Road North, Stirling Road and Bussell Highway.
<b>A3.2 Public Road</b> A public road is to meet the requirements in Table 6, Column 1.	Compliance with this element is achieved.	No new roads are proposed as part of this development. All roads listed above are well built public roads.
<ul> <li>A3.3 Cul-de-sac (including a dead-end road)</li> <li>Where no alternative exists (i.e. the lot layout already exists, demonstration required):</li> <li>Requirements in Table 6, Column 2;</li> <li>Maximum length: 200 m (if public emergency access is provided between cul-de-sac heads maximum length can be increased to 600 m provided no more than eight lots are serviced and the emergency access way is no more than 600 m); and</li> </ul>	Not applicable to this Site.	
<ul> <li>Turn-around area requirements, including a minimum 17.5 metre diameter head.</li> </ul>		

A3. Whe (der	4 Battle-axe ere no alternative exists, monstration required): Requirements in Table 6, Column 3; Maximum length: 600 m; and	Not appli	icable to this Site.	
A3.	5 Private driveway >50m	Compliar	nce with this element is	The location of buildings within
•	Requirements in Table 6, Column 3;	acmeved		driveway greater than 50 m. Any driveway over 50 m will comply
•	Required where a house site is more than 50 m from a public road;			with the requirements in the Guidelines.
•	Passing bays: every 200 m with a minimum length of 20 m and a minimum width of 2 m;			
•	Turn-around areas designed to accommodate type 3.4 fire appliances and to enable them to turn around safely every 500 m (i.e. kerb to kerb 17.5 m) and within 50 m of a house;			
•	Any bridges or culverts are able to support a minimum weight capacity of 15 t; and			
•	All-weather surface (i.e. compacted gravel, limestone or sealed).			

#### Bushfire Protection Criteria - Element 3 - Vehicular Access

#### A3.6 Emergency Access Way Not applicable to this Site.

Where no alternative exists (demonstration required), an emergency access way is to be provided as an alternative link to a public road during emergencies:

- Requirements in Table 6, Column 4;
- No further than 600 m from a public road;
- Provided as right of way or public access easement in gross to ensure accessibility to the public and fire services during an emergency; and
- Must be signposted

#### **Bushfire Protection Criteria - Element 3 - Vehicular Access**

#### **A3.7 Fire Service Access** Routes (perimeter roads)

Not applicable to this Site.

To provide access within and around the edge of the subdivision and related development to provide direct access to bushfire prone areas for fire fighters and link between public road networks for firefighting purposes:

- Requirements Table 6, Column • 5;
- Provided as right of ways or public access easements in gross to ensure accessibility to the public and fire services during an emergency;
- Surface: all-weather (i.e. compacted gravel, limestone or sealed);
- Dead end roads are not • permitted;
- Turn-around areas designed to accommodate type 3.4 appliances and to enable them to turn around safely every 500 m (i.e. kerb to kerb 17.5 m);
- No further than 600 m from a • public road;
- Allow for two-way traffic; and •
- Must be signposted. •

#### 1 147 161

A3.8 Firebreak Width Lots greater than 0.5 ha must have an internal perimeter firebreak of a minimum width of 3 m or to the level as prescribed in the local firebreak notice issued by the local government.	Compliance with this element is achieved.	The lots are classified Category 1, Rural (Lot 1) and Category 6, Rural Residential (Lots 2, 3 and 4) on the City of Busselton Firebreak and Fuel Hazard Reduction Notice (Appendix A). This requires minimum 2 m (Rural) and 3m (Rural Residential) wide internal firebreaks immediately inside all boundaries of the lots. (Refer to Figure 5).
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#### Bushfire Protection Criteria - Element 4 - Water

**Intent:** To ensure that water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.

**Performance Principle P4:** The subdivision, development or land use is provided with a permanent and secure water supply that is sufficient for fire fighting purposes.

Ac	ceptable Solution	Compliance	Assessment Statements
A4 Th lai re ac sp wa De En	<b>I.1 Reticulated Areas</b> the subdivision, development or and use is provided with a ticulated water supply in cordance with the ecifications of the relevant ater supply authority and epartment of Fire and mergency Services.	Not applicable to this Site.	
A4 Wa pu sta	<b>I.2 Non-reticulated Areas</b> ater tanks for fire fighting rposes with a hydrant or andpipe are provided:	Not applicable to this Site.	A 50,000 L water tank will be installed with hardstand and turn-around area suitable for a type 3.4 fire appliance (Figure 5) This water tank will be
•	Volume: minimum 50,000 L per tank;		located in Lot 5 with the Lot vested to the City of Busselton.
•	Ratio of tanks to lots: minimum one tank per 25 lots (or part thereof);		
•	Tank location: no more than 2 km to the further most house site within the residential development to allow a 2.4 fire appliance to achieve a 20 minute turnaround time at legal road speeds;		
•	Hardstand and turn-around areas suitable for a type 3.4 fire appliance (i.e. kerb to kerb 17.5 m) are provided within 3 m of each water tank; and		
•	Water tanks and associated facilities are vested in the relevant local government.		

#### Bushfire Protection Criteria - Element 4 - Water

A4.3 Individual lots within nonreticulated areas (only for 1 additional lot) Single lots above 500 m<sup>2</sup> need a dedicated static water supply on

dedicated static water supply on the lot that has the effective capacity of 10,000 L.

## 5.2 Performance Based Solutions

The Site assessment was conducted in accordance with AS 3959-2009 Simplified Procedure (Method 1). The Proposal meets all the compliance requirements for the four Bushfire Protection Criteria Elements. There are no performance-based solutions proposed.

### 5.3 Summary of the Assessment Outcomes

This plan provides acceptable solutions and responses to the performance criteria outlined in the Guidelines for Planning in Bushfire Prone Areas (WAPC, Dec 2017).

The layout and design of the development is such that no structure will be required to be exposed to a radiant heat flux in excess of 29kW/m<sup>2</sup> (BAL-29) provided the management as outlined in the plan is adopted.

Any class 1,2, 3 or associated 10a structure that are to be constructed, or additions planned to existing dwellings shall be designed and built to conform with Australian Standards AS3959-2009:

- BAL-29: sections 3 & 7;
- BAL-19 sections 3 & 6; and
- BAL 12.5 sections 3 & 5.

A summary of the Bushfire Management Strategies to be implemented is provided in Figure 5.

### Spatial representation of the proposed risk management measures



### LEGEND



#### **PROPERTY / ASSESSMENT DETAILS**

Owner	n: E Hannaford
Proper	rty Address: 77 Johnson Road, Wilyabrup
Projec	t No: 18566
Prepar	red by: K Paterson
Accred	ditation Level: Level 2
Accred	ditation Number: 38253
Accred	ditation Expiry Date: 02/19

0 2550 100 150 200

Meters



#### Figure 5 Map of Bushfire Management Strategies

### NOTES

The minimum width for the Asset Protection (APZ) for this Site is the distance required to meet the BAL-29 setback. The Area within Lots 2, 3 and 4 and the northern portion of Lot 1 will be maintained as an APZ. Vegetation within the APZ is to comply with Schedule 1 Element 2 of the Guidelines noting that: - Trees >5m in height are to be setback a minimum distance of 6m from the building with no branches overhanging the roof. - Shrubs >5m in height are to be setback a minimum distance of 3m from the building, and not planted in clumps greater than 5 sqm - Grass is to be maintained at less than 100mm in height.

All dwellings within the Site, including the existing dwelling, require a 25 m Building Protection Zone around the perimeter of the dwelling, managed according to the City of Busselton Firebreak and Fuel Hazard Reduction Notice.

A 50,000 L water tank dedicated for fire fighting, with a 50 mm male coupling and hardstand suitable for a type 3.4 fire appliance, will be installed and vested to the City of Busselton.

Any driveway longer than 50 m will comply with the requirements of the Guidelines (A3.5). Any gates along the driveway will have a minimum width of 3.6m.

Internal perimeter firebreaks are required within the Lots, and will be managed in accordance with the City of Busselton Firebreak and Fuel Hazard Reduction Notice.

Installation and upkeep of the APZ, BPZ, firebreaks and the driveway are the responsibility of the landowner. The installation of the water tank is the responsibility of the Developer, and will then become the responsibility of City of Busselton once vested. The measures listed above shall be implemented prior to the occupation of the dwelling and shall continue to be maintained in perpetuity.

# 6 Responsibilities for Implementation and Management of the Required Bushfire Measures

The responsibilities for the Developer, Builder, Landowner/Occupier and Local Government are outlined in Table 3, Table 4, Table 5 and Table 6 respectively.

#### Table 3Developer Responsibilities

Number	Action	Due	Completed
1	Establish the Building Envelopes within Lots 2, 3 and 4 to the dimensions and standard stated in the Bushfire Management Plan.	Post planning approval and prior to lot sale	
2	Install a 50,000 L water tank with hardstand suitable for a type 3.4 fire appliance.	Post planning approval and prior to lot sale	
3	Vest the 50,000 L water tank to the City of Busselton.	Post planning approval and prior to lot sale	
4	Provide a copy and obtain endorsement of this Bushfire Management Plan by those with responsibility under this plan including Builders, Landowners/Occupiers and City of Busselton.	Post planning approval and prior to lot sale	

#### Table 4 Builder Responsibilities

Action	Action	Due	Completed
1	Be aware of the existence of any BMP that refers to the Site	Prior to any building work.	
2	Ensure the building or incidental structure to which a building permit applies is compliant on completion with the bushfire provisions of the Building Code of Australia (BCA) as it applies in WA.	Prior to any building work.	

#### Table 5 Landowner / Occupier Responsibilities

Number	Action	Due
1	Install driveways and buildings incompliance to the dimensions and standard stated in the Bushfire Management Plan.	Prior to occupancy
2	Maintain the Asset Protection Zone (APZ), Building Protection Zone (BPZ) and low fuel state areas to the dimensions and standard stated in the Bushfire Management Plan.	Ongoing

Number	Action	Due
3	Maintain existing Firebreaks and install required Firebreaks within each Lot to comply with this Bushfire Management Plan.	Ongoing
4	Comply with the relevant local government annual firebreak notice issued under s33 of the <i>Bush Fires Act 1954</i> .	Ongoing
5	Maintain vehicular access routes within the lot to the required surface condition and clearances.	Ongoing
6	Ensure that any builders (of future structures on the Lot) are aware of the existence of this Bushfire Management Plan and the responsibilities it contains regarding the application of construction standards corresponding to the determined BAL rating.	Ongoing
7	<ul><li>Ensure all future buildings the landowner has responsibility for, are designed and constructed in full compliance with:</li><li>(a) the requirements of the WA Building Act 2011 and the bushfire provisions of the Building Code of Australia (BCA) as applicable to WA; and</li><li>(b) with any identified additional requirements established by this BMP or the relevant local government.</li></ul>	Ongoing
8	Updating the Bushfire Management Plan may be required to ensure that the bushfire risk management measures remain effective. Bushfire plans do not expire and are a 'living document'. Updating is required in certain circumstances, including (but not limited to) if site conditions change, if further details are required at subsequent development stages or to reflect new technologies or methodologies in best practice bushfire risk management ('Guidelines' s4.6.4 and s4.6.5).	Ongoing

### Table 6City of Busselton Responsibilities

Number	Action	Due
1	Maintain the water tank and associated area in good working condition.	Ongoing
2	Monitor landowner compliance with the annual firebreak notice.	Ongoing
3	Develop and maintain district bushfire fighting services and facilities.	Ongoing
4	Promote education and awareness of bushfire prevention and preparation measures though the community.	Ongoing
5	Administer the requirements of the Bush Fire Act 1954, Planning and Development Act 2005 and the Building Act 2011.	Ongoing

## Appendix A City of Busselton Firebreak & Fuel Hazard Reduction Notice

#### BUSH FIRES ACT 1954 PROPERTY COMPLIANCE REQUIREMENTS

Compliance inspections of land will be carried out from 16 November 2017, to assess landowner(s) or occupier(s) of land compliance with the City of Busselton Firebreak and Fuel Hazard Reduction Notice.

Rural Residential, Urban and Industrial Land requirements must be compliant by 16 November 2017

Rural Land requirements must be compliant by <u>15 December 2017</u>

Local Government may serve a notice pursuant to Section 33 of the Bush Fire Act 1954, requiring the property owner to undertake any extra work to reduce the impact of a fire

Rural Residential, Urban and Rural Land requirements must be maintained in accordance with the table overleaf until 12 May 2018 or a later date if the compliance period is extended, in which case a notice will be placed in the local newspaper

#### FIRE PERMITS

Permits to burn are required for the whole of the restricted periods and can only be obtained from the Fire Control Officer for your area

Permits are to be obtained before burning commences (the permit holder must be in possession of the permit during the burn)

#### FIRE PERMIT APPLICATION

Before you call a Fire Control Officer ensure you have the following information

- Who will be the three able bodied persons in attendance at all times whilst the fire is alight including contact phone number?
- What is the address of the property for which the permit applies?
- What fire fighting equipment and resources will you have at the fire front and is it in good working order?
- What is the size of burn to take place?
- Are there firebreaks installed and can a fire unit get access to the area?
- What material are you burning? Is it dry? Are there any plastics, tyres, treated posts or woods in the piles or area to be burnt? If so, remove them to a safe place.
- Ensure you give 72 hours notice to the Fire Control Officer first; and
- Ensure you notify neighbours 72 hours prior to commencing your burn

For further advice, contact your local Fire Control Officer, as advertised in the City of Busselton's Community Directory or on the City of Busselton website www.busselton.wa.gov.au

#### GENERAL REQUIREMENTS

- Garden Refuse Urban Areas (Town sites): No garden refuse is permitted to be burnt on the ground, in the open air or in an outdoor incinerator within the urban areas of Busselton and Dunsborough town sites at any time of the year
- Graden Refuse Rural Residential Areas (non-Town sites): The burning of garden refuse is prohibited from 14 December to 28 february. During the restricted burning period, 2 November to 14 December and 1 March to 12 May each year, permits are required to be obtained from the Fire Control Officer in your area for the burning of any garden refuse
- 8 Burning of toxic materials and rubbish is prohibited at all times
- Camp fires are prohibited within the City during the restricted and prohibited burning period
- Wood and coal fuelled barbecues, including wood fired pizza ovens and chimineas are banned during a total fire ban or in any period when the fire danger forecast is 'Very Hinh' or above
- Wood fired pizza ovens must have a spark arrestor fitted
- Warning: The use of electric fences during periods of 'Very High' or above may cause fire
- Owners of tractors with down swept exhaust systems are encouraged to have an approved spark arrestor fitted as provided in the Bush Fires Act 1954 Regulations
- Idding, Cutting and Grinding Equipment: A person shall not operate this equipment during the restricted/prohibited burning times on lond which is under crop, pasture, stubble and bush unless one working fire extinguisher is provided, work area is clear of flammable materials and there is compliance with any other controls required by a fire Control Officer.
- Welding, cutting and grinding equipment is not permitted to be used anywhere within the City of Busselton when the fire index is 'extreme' or above

#### FIRE DANGER RATING

For the current fire danger rating visit Department of Fire & Emergency Services (DFES) website <u>www.dfes.wa.gov.au</u> or Bureau of Meteorology (BOM) website <u>www.bom.gov.au</u>

#### CONTRACTORS

Please be advised, if you engage a contractor to gain compliance with this notice II is the property owner, not the contractor, who is responsible for the standard and quality of the fire prevention work undertaken and required to be compliant by 15November (or 15 December I/ Rural Land) each year and maintained as per this notice throughout whole the fire season.

#### CONTACT US

For further fire safety information visit the City of Busselton website <u>www.busselton.wa.gov.au</u> or Department of Fire & Emergency Services (DFES) website <u>www.dfes.wa.gov.au</u> IMPORTANT DATES The below dates may change due to seasonal fire conditions in which case details will be published in the local newspaper.

#### RESTRICTED BURNING PERMITS ARE REQUIRED FROM

2 November 2017 to 14 December 2017 inclusive and 1 March 2018 to 12 May 2018 inclusive

BURNING PROHIBITED 15 December 2017 to 28 February 2018 inclusive (ALL FIRES PROHIBITED)

#### COMPLIANCE DATE

Completion of firebreaks/fuel hazard reduction on all rural residential, urban and industrial land is required to be completed by 16 November 2017 and must be maintained until 12 May 2018

Completion of firebreaks/fuel hazard reduction on all rural land is required to be completed by 15 December 2017 and must be maintained until 12 May 2018

T Burning on Sundays and public holidays during the restricted fire season is prohibited

Applications for a variation of this the Firebreak and Fuel Hazard Reduction Notice, where ground considerations or environmental concerns prevent compliance with the requirements of this Notice, must be lodged in writing together with a Firebreak and Fuel Hazard Reduction Notice Variation form, prior to 31 October 2017.

#### The hardest aspect of fire prevention is explaining to your family why you didn't undertake any!



#### Actions speak louder than words and actions save lives

Should you require further clarification of the information contained in this notice please do not hesitate to contact the Clty's Ranger and Emergency Services Department on (08) 9781 0444.



### FIREBREAK AND FUEL HAZARD REDUCTION NOTICE



#### 2017/2018 BUSH FIRE SEASON FIRST AND FINAL NOTICE

#### Bush Fires Act 1954 Take notice that pursuant to Part 3 Division 6 Section 33 of the Bush Fires Act 1954, landowner(s) or occupier(s) of land shall construct firebreaks and carry out fire prevention work in accordance with the City of Busetton Firebreak and Fuel Hazard Reduction Notice.

Failure to comply with this notice may result

in a \$5,000 FINE



#### RING 000 FOR ALL FIRES

Mark & Sandra Sims | Bushfire Management Plan

CATEGORY					FIREBREAK CATEGORY CODE AND SUMMARY OF REQUIREMENTS
It is the land owner's responsibility to identify the category that relates to their	A	в	c	D	ALL REQUIREMENTS IN THIS NOTICE ARE TO BE MAINTAINED THROUGHOUT THE ENTIRE DURATION OF THE FIRE SEASON (1 DECEMBER TO 12 MAY EACH YEAR). FAILURE TO COMPLY MAY RESULT IN A 55,000 FINE
property and to ensure the necessary pre- prevention works are completed on time. Please contact the City if you are unsure of your category.					PLEASE BE ADVISED THAT YOUR PROPERTY MUST COMPLY WITH CATEGORY REQUIREMENTS AS NOTED BY A TICK IN COLUMN A, B, C OR D
CATEGORY 1 UNAL Skorp diantions and vineyards for fourist cholets, refer to Estate Fire Management land or individual Fire Vanagement Plan) ections A, C and D apply to this category.	-		1	-	A - Firebreak – The term firebreak includes a mineral earth firebreak. A mineral earth firebreak means a 3 metre wide area of the owner(s)/occupiers(s) land, cleared and maintained totally clear of all vegetation material (living or dead) s there is only mineral earth life. Any overhanging trees and other vegetation must be pruned to a height of 5 metres above the ground level of a mineral earth firebreak. Category 1 – Naral: A mineral earth Firebreak shall be constructed 3 metres wide, except in partice or orgo areas where a FIREBREAK shall be 2 metres wide. FIREBREAK shall be located adjacent to all external boundaries of the land. Where the lans area exceeds 120 hectares, an additional FIREBREAK must divide the land into areas of not more than 120 hearts or the earth category 1 – Metres Metres All be 2 metres wide. FIREBREAK shall be constructed and metres wide land within 6 metres of the land. Where the lans area exceeds 120 hectares, an additional FIREBREAK must divide the land into areas of not more than 120 hearts with each part completely surrounded by a FIREBREAK. Category 1 – Uthan Residential on Industrial-Commercial: Where the area of land exceeds 1202an? (% area) a mineral earth FIREBREAK shall be category 4 metres wide and within 6 metres of the land, where the areas of land is 2024m? (% area) on line exceeds 120 hectares with each part completely surrounded by a FIREBREAK. Category 2 - Uthan Residential (Industrial: A metres wide a land exceeds 1202an? (% area) a mineral earth FIREBREAK shall be constructed and metres wide and within 6 metres of the inside of all externs boundaries of the land. Where the area of land is 2024m? (% area) or interview of an accordance with section 8 - File Reduction (filer to 83). Category 5 - Potres Reduction (filer to 83).
ATEGORY 2 IRBAN RESIDENTIAL & INDUSTRIAL - OMMERCIAL ections A, B, D and E1 Trees, apply to this category. eff to section E - Interpretation and Additional equirements (E1 Trees).	~	~		-	Category 6 and 7 - Rural Residential: A mineral earth FIREBREAK shall be constructed 3 metres wide. On Category 6 Rural Residential land with pasture or crop, a FIREBREAK shall be 2 metres wide and located within 6 metres of all external boundaries of the land. For Category 7 Rural Residential land, free access along a Strategic FIREBREAK shall be constructed 3 metres wide. On Category 6 Rural Residential and with pasture or crop, a FIREBREAK shall be 2 metres wide and located within 6 metres of all external boundaries of the land. For Category 7 Rural Residential land, free access along a Strategic FIREBREAK shall be constructed 3 metres and including acress the boundary of a lot, by means of a 3.5 metres wide field gate in the edjoining lot boundary fence. 8 - Yeal Residential and industrial-Commercial: Where the area of land is 2024m <sup>2</sup> (% acre) or less, ALI HAZARDOUS MATERIAL must be removed from the whole of the land except living trees, in the area remaining, vegetation is to be maintained to a height of no greater than 10 continenters; this includes pills of timber, branches, and other vegetation. Trees shall be private france with section and Additional Requirements (refor to S1). 2 Category 5 - Protes Plantations/Vineyards: A 5 metre low field area is to be maintained between the 3 metre FIREBREAK and the plantation/vineyard area. In this area, vegetation is to be maintained to a height of no greater than 10 centimetres; this includes pills of intoger section and additional Requirements (refor to S1).
ATEGORY 3 & 4 LANTATIONS Ire Management Plan applies	N/A	N/A	N/A	N/A	3) Category 6, 7 and 8 - Rural Residential: Parkinal clearing must be carried out in all open paddocks and along the boundary of the property. Clearing means that all dead vegetation and dry grasses (excluding approved crops, pasture areas and livit trees/shrubs) including piles of timber and disued materials must be maintained to a height of no greater than 10 centimetres. C - Building Protection Zones (BPZ) - This is a modified area of reduced fuel immediately surrounding a building BP2's starve the fire by reducing the fuel levels around your house. These requirements are designed to reduce the fire's intensity and minimise the likelihood of flame contact with buildings. The BP2 gives more protection for fire fighters and property owners who may decide to stay with their property. A BP2 shall be provided for buildings in bush fire prone areas. The surroundings of building must be maintained to a height of no reduce the fire's intensity and minimise the likelihood of flame contact with buildings. The BP2 gives more protection for fire fighters and property owners who may decide to stay with their property.
ATEGORY 5 NOTEA PLANTATIONS / VINEYARDS or tourist challers, refer to Estate free Management an or individual free Management Plan) inflams A., B., C and D apply to this category.	-	-	-	-	The BPZ for existing buildings must be at least 20 metres from any external wall of the building unless varied under an approved Fire Management Plan (FMP) in accordance with section E - Interpretation and Additional Requirements (refer to E4).     The minimum BPZ for buildings constructed after 1 Novement PC101, and Lacas shall be 25 metres.     The BPZ must be located within the boundary of the lot that the building is situated on.     Haradroux/flammable materials must not exceed the maximum fuel load specified in Point's below with grass areas not exceeding a height greater than 10 cm,     Feel loads must be reduced and maintained at 2 tonne per frectare.     Isolated trees and shulls may be retained to a height of no greater than 500 millimetres.     Resculated gardens in the BPZ shall be maintained to a height of no greater than 500 millimetres.     Hore on the V of the PID on events the it and to a height of mogreater than 500 millimetres.
ATEGORY 6 URAL RESIDENTIAL - LOTS WITH INDIVIDUAL WINERAL EARTH BOUNDARY BREAKS sections A, B, C and D apply to this category unless e property is subject to Estate Fire Management an or Individual Fire Management Plan	-	~	-	-	9) Trees in the BP2 must comply with section E - Interpretation and Additional Requirements (refer to E1). 10) Where the land has an approved RMP, compliance must be achieved in accordance with the FMP. The FMP may vary the above BP2 requirements. 11) A Hazard Separation Zone (F42) is also recommended in the absence of a Fire Management Plan. Section E - Interpretation and Additional Requirements (refer to E3).  D - Fuel Storage & Haystack Protection Zones A 3 metre mineral earth firebreak shall be located within 6 metres of fuel storage tanks, sheds, gas cylinders and haystacks. The mineral earth firebreak shall be maintained so that it is totally clear of all material (living or dead).
ATEGORY 7 URAL RESIDENTIAL - LOTS WITH A STRATEGIC REBEAK ON ONE OR MORE BOUNDARIES Incline A, B, C and D apply to this category unless is properly is subject to State First Management an or Individual Fire Management Plan	-	~	-	-	E – Interpretation and Additional Requirements  1) Trees On Urban, Industrial, Rural, and Rural Residential land, all tree branches must be removed or pruned to ensure a clear separation of at least 3 metres back from the eaves of all buildings and 5 metres above the top of the roof. Branches th may fail on the house must also be removed. In the BP2 the following is "recommended"; the spacing of individual or groups of trees should be 15 metres apart to provide for a 5 metres separation between tree crowns. There is also a requirement 2.5 metres between trees and power lines so they do not come into contact and start a fire or bring down a power line. 2.1 <u>Harardoust and Fianmable Materials</u> means the accumulation of fuel (ling) or dead) such as leaf litter, twigt, trash, bush, dead trees and scrub capable of carrying a running fire, but excludes standing living trees and isolated shrubs. NOTE: All remaining vegetation, piles of timber, branches and other living vegetation must be maintained to a height of no greater than 10 centimetres. To measure and determine fuel loads use DFES's <i>Visual Fuel Load Guide</i> <u>http://www.fesw.aproc.us/astervinformations.assysters</u> and select <i>Visual Fuel Load Guide Shart</i> Costal (Pari 1 & 2). Surface bush fire fuels should be kept low to the ground.
ATEGORY 8 URAL RESIDENTIAL - LOTS WITHIN A STRATEGIC REBREAK AREA WITH NO STRATEGIC REBREAKS ON THE LOT BOUNDARIES		1	1	-	3) Hazard Separation Zones (HSZ) A HSZ is a modified area of reduced fuel load outside of the BPZ and is recommended to assist in reducing the fires intensity when flames are approaching buildings. BHSZ are the BPZ and the HSZ are essential strategy for the protection of buildings. A HSZ is a modified area of reduced fuel load outside of the BPZ and is recommended to assist in reducing the fires intensity when flames are approaching buildings. Beth the BPZ and the HSZ are essential strategy for the protection of buildings. A HSZ to vers the area 75 metres outside the BPZ. The HSZ should be modified to have a maximum fiel load of 66 stones per hectare. This can be implemented by fuel reduction methods such as burning, moving and slashing to remove the hazard. This should not require the removal of living trees shrubs. REMEMBER: reduce the fuel level of the first to lower the intensity of the blace. Further information on fuel loading can be found in the <i>Visual Fuel Coad Guide</i> available by calling DES or via their website at <u>www.des.vau</u> 40 is an expected on the dividual land before the intensity of the blace. Further information on fuel loading can be found in the <i>Visual Fuel Coad Guide</i> available by calling DES or via their website at <u>www.des.vau</u> 40 is an expected on the standard and the
the property is subject to Estate Fire Management Plan Plan or Individual Fire Management Plan CATEGORY B RURAL RESIDENTIAL - LOTS WITHIN A STRATEGYC PREBREAKS AREA WITH NO STRATEGYC PREBREAKS ON THE LOT BOUNDARIES Sections U, C and D apply to This category unless the poperty is subject to Estate Fire Management Plan Despress Plan Burget to		•	-	*	2) <u>Hzardous and Flammable Materials</u> means the accumulation of fuel (living or dead) such as tell inter, twigs, trash, buik, dead trees and scrub capable of carrying a running fire, but excludes standing living trees and lookad drubs. NOTE: All remaining vegetation, giles of timber, branches and other living vegetation must be maintained to a height of no greater than 10 centimeters. To measure and determine fuel loads used EFES' Must fuel Load <u>Inter/Jowe disks ago, au/safety/information/line/bushfre/Jagety/builcation.aspads</u> and select Youw <i>Hel Load Guide Swan Costal (Part 3 &amp; J</i> ). Standing the Load Suited and the Load Guide Swan Costal (Part 3 & J). Standing the Load Suited and the Load Guide Swan Costal (Part 3 & J). Standing and perception of the BPZ and the HSZ are essential for the protection of buildings. A HSZ covers the area 35 metres outside the BPZ. The HSZ bould be modified area of reduced fuel cado: Carlo de BPZ and is recommended to assist. In reducing the hore many metric de load Guide and Bell of Standing to the tensity of the BPZ and the HSZ are essential for the protection of buildings. A HSZ covers the area 35 metres outside the BPZ. The HSZ bould be modified to have a maximum fuel load of 64 tonne per hectare. This can be limplemented by fuel reduction methods such as burning, moving and slashing to remove the hazard. This should not require the removal of livin shouts. REMEMBER: reduce the fuel level of the first control with minimum fuel load Guide available by calling DFS or via their website at <u>www discus yawa available</u> . J Fire Management Plan (FMP) A RMP is a comprehensive plan for the prevention and control of bushfires which may apply to individual land holdings. An other the tract to the removal and invince the under the relation of tell doad divides to reduce the accordance with a Austanda Si as amended) may be pla Certificate(s) of Title of the land for medium to long term fire maxing and otherms of accommendation, as well as additions to estimation buildings. An other web

## APPENDIX THREE – DETERMINATION OF WETLAND BOUNDARIES (Prepared by Onshore Environmental)



Onshore Environmental Consultants Pty Ltd PO Box 227, Yallingup, WA 6282 0427 339 842 Tel/Fax: 08 9756 6206 ABN 41 095 837 120

Tim Koroveshi Town Planning Consultant 64 Espinos Road Busselton WA 6280

6th June 2018

#### Determination of Wetland Boundaries at Lot 7 Forrest Beach Road, Wonnerup

Dear Tim

Thank you for your recent enquiry regarding definition of wetland boundaries at Lot 7 Forrest Beach Road, Wonnerup, on behalf of the private landholder Mr and Mrs Mark and Sandra Sims. As you are aware, Onshore Environmental has worked on similar projects at a number of sites fringing the Vasse Wonnerup Estuary and surrounds. This work has involved defining riparian zones, undertaking baseline flora and vegetation surveys, and planning and implementing native revegetation programs.

The wetland at Lot 7 Forrest Beach Road has been defined using the following combination of layers: 1) High resolution aerial photography at 1:5,000 scale was utilised to define the boundary of hydric soils. The hydric soils are easily identified by the darker, smoother shading pattern resulting from seasonal inundation and the typical samphire vegetation layer; and

2) Mapping the 'Quindalup Very Wet Saline Flats (Qwy)' layer as defined by Tille and Lantzke (1990). The Qwy unit occurs in low-lying depressions which are seasonally inundated during winter months and saline in summer.

The above layers corresponded accurately along the majority of the wetland with a maximum differentiation of ±30 metres. The wetland area within Lot 7 Forrest Beach Road has been mapped (green solid line in attached Figure 1) and a 30 metre buffer applied to either side of the wetland (dotted green line in attached Figure 1). This boundary has then been compared with the wetland boundary proposed by the Department of Biodiversity Conservation and Attractions (DBCA) (grey dotted line in attached Figure 1). The Qwy unit with a 30 metre buffer covers 10.64 hectares. The area delineated by DBCA covers 13.48 hectares, which includes a large proportion of the 'Quindalup Wet Flats (Qw)' land unit defined by Tille and Lantzke (1990).

If you require any further detail on points listed above, please do not hesitate to make contact at any time on 0427339842.

Yours sincerely

Darren Brearley Managing Director and Principal Botanist

#### References

Tille P.J. and Lantzke N.C. The Busselton-Margaret River-Augusta Land Capability Study, Land Resource Series No. 5 Western Australian Department of Agriculture, 1990.



## APPENDIX FOUR – COASTAL INUNDATION ASSESSMENT REPORT (Prepared by Seashore Engineering)

Our Ref: SE103\_01B Project: SE103 Your ref: email

07 April 2020

Tim Koroveshi c/Lot 7 Forrest Beach Rd Wonnerup City of Busselton

#### Lot 7 Forrest Beach Road – Coastal Inundation

#### 1. Background

There is a draft Structure Plan for Lot 7 (86) Forrest Beach Road, Wonnerup in the City of Busselton, that is currently with the Department Planning, Lands and Heritage (DPLH) for final endorsement. This Structure Plan has been developed by Tim Koroveshi on behalf of Mark and Sandra Sims, the landowners (Figure 1). Three additional 2 ha lots are proposed in return for creating 13.5 ha of reserve land adjacent to the Wonnerup Inlet, based upon the opportunities available under the Busselton Wetlands Conservation Strategy (Tim Koroveshi, email, 07/02/2020).

#### 2. Scope

Seashore Engineering inspected the site on 13/02/2020 and was engaged on 21/02/2020 to undertake a limited scope of work. This is the basis of this report and includes a brief review of plans provided to date, description of the site and surrounding area, risk mitigation associated with Finished Floor Levels (FFLs) of 3.8mAHD, scope for further modelling of inundation levels and general advice on drainage in terms of the wider hydraulics of the Wonnerup Inlet, rather than site stormwater drainage.



Figure 1 – Lot 7 (86) Forrest Beach Road – Structure Plan

#### 3. Site Inspection

The site was inspected briefly on 13 February and the following was noted in the context of the potential for storm surge inundation:

- There is a reasonably well developed coastal dune barrier immediately west of the site, with the eastern arm of the Wonnerup Inlet (the 'Deadwater') and Forrest Beach Road sited between Lot 7 and the coast.
- The Wonnerup Inlet provides a pathway for coastal flooding within the Inlet.
- The Wonnerup Surge barrier limits flooding of upstream areas (Wonnerup Estuary) and mitigates potential storm surge inundation of Lot 7 under operating conditions for the storm surge barrier.
- The site is developed agricultural land that is higher towards Forrest Beach Road, where the new lots are proposed, then falls away in elevation to the south.



Figure 2 - Site photos of Lot 7 from Forrest Beach Rd. Site is generally cleared agricultural land with Wonnerup Estuary in background.



Figure 3 – Surrounding Area including Wonnerup Inlet (upper), Wonnerup Surge Barrier on Forrest Beach Road (middle) and Wonnerup Estuary upstream of the surge barrier (right).

#### 4. Coastal Flooding – Risk Mitigation

#### 4.1 Water Levels

Development along the Geographe Bay foreshore is focussed on the low lying beach ridge between the sandy shoreline and the shore parallel estuaries and coastal lagoons. This beach ridge is geologically relatively stable but is subject to erosion and coastal flooding (storm surge inundation).

The highest ocean water level recorded in Geographe Bay was 1.76mAHD during Tropical Cyclone Alby in April-1978. This level is one meter above highest astronomic tide (HAT). The extent of storm surge inundation in Wonnerup was surveyed by Public Works follow the event, with levels of 1.8m to 2.1mAHD observed within Wonnerup Inlet, together with damage to the Wonnerup causeway (Figure 4).



Figure 4 - Wonnerup Post Tc Alby Survey (PWD 51019-8)

Non-cyclonic events can also cause significant storm surges. There have been at least 11 events recorded since 2002 with ocean water levels within 0.5m of the peak recorded at Busselton Jetty for TC Alby. This exposure to storm surges along Geographe Bay is associated with a relatively shallow bathymetry and north facing coastline.

Tidal planes for Busselton are summarised in Table 1. Extreme value analysis of 14 years of tide gauge data has been used to assess non-cyclonic high water levels, with the 100yrARI water level estimate in the order of 2.0mAHD (Table 2).

Tidal Level	LAT	MLLW	MHLW	AHD	MSL	MLHW	мннw	HAT
Water Level (mAHD)	-0.68	-0.23	-0.12	0.0	0.13	0.37	0.48	0.76
% Time Submerged	100	90	84	74	62	37	27	8

Table 1 Tidal Plane	s for Busselton	(mAHD) [1]
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TUDIE 2 NOIT-CYCIOTILE TIIGIT WULLET LEVET EXTLETTIES (THATD)[2]
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Average Return Interval (years)	1	10	25	50	100	200	500
Non-Cyclonic High Water Level (mAHD)	1.2	1.6	1.8	1.9	2.0	n/a	n/a

Note: Low confidence in 100yrARI estimate due to length of data record being limited to 14 years.

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Guidance is provided on preliminary design water levels for the southwest region in the absence of site specific tropical cyclone modelling (Table 3). The 500yrARI preliminary design water level for Busselton is 2.9mAHD. This includes wave set-up but not wave runup. It is noted that this is a conservative estimate for planning purposes, and is more than 1 meter higher than observed water levels during TC Alby.

Average Return Interval (years)	10	25	50	100	200	500
Preliminary Design Water Levels for Tropical Cyclones (mAHD)	1.4	1.7	2.0	2.3	2.5	2.9

Table 3 Preliminary Design Water Levels for Tropical Cyclones (mAHD) [3].

Guidance is provided by Department of Transport on allowances for sea level rise, with a 0.9m allowance mandated over a 100yr planning period [4]. Storm sure inundation levels for various return intervals and planning periods are shown schematically in Table 4.





#### 4.2 Vasse-Wonnerup Wetlands (Flooding and Drainage Pathways)

The Vasse Wonnerup wetlands are managed by a range of State Government agencies. Water Corporation manages the catchment's drainage network (known as the Busselton Drainage District) including the Vasse Estuary and Wonnerup Estuary surge barriers, to protect Busselton from storm surges and flooding. The surge barriers are operated following guidelines developed in 1990, which control water levels in the Vasse-Wonnerup wetlands for the protection of lands upstream of the surge barriers from storm surges, summer seawater inundations and winter flooding. These barriers

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prevent flooding of the surrounding agricultural land during high river flows in winter and sea water inundation [4].

There are three potential pathways for coastal inundation of Lot 7 (Figure 4):

- Inundation and deflation of coastal dunes infront of the Deadwater (wave attack)
- Coastal flooding through the Wonnerup Inlet entrance, across Forrest Beach Road and the north western boundary.
- Inundation of the Vasse Storm Surge Barrier and abutments, allowing water to flood the Vasse Estuary and across the south eastern boundary of Lot 7.

There are 200m wide dunes to 3.0mAHD between Geographe Bay and the Deadwater that protect Lot 7 from direct wave attack during storm surge events. Inundation through the entrance of Wonnerup Inlet is possible with the road level in the order of 2.0mAHD, nominally the 100yrARI event. Flooding in the Vasse Estuary is mitigated by the Vasse Storm Surge barrier, but could occur during extreme events.



*Figure 5 - Vasse Wonnerup Wetlands, Location of Lot 7 and Potential Coastal Flooding Pathways.* 

#### 5. Review of Structure Plan

The three proposed lots have existing elevations in the order of 1.5mAHD, with higher areas towards the road in the order of 2.0mAHD and areas below 1.0mAHD toward the south (Figure 5). The development of very low-lying areas to the south of Lot 7 is not proposed.

Finished floor levels for coastal properties along Geographe Bay are typically identified by the City of Busselton as being 3.0mAHD. The State Coastal Planning Policy requires a more conservative estimate of potential for a 500yrARI tropical cyclone (tracking to maximise storm surge) and 100yrARI sea level rise.

The proposed 3.8mAHD building pads for Lot 7 (86) Forrest Beach Rd allow for a conservative estimate of the 500yrARI tropical cyclone (2.9mAHD water level) occurring in 2120, towards the end of the 100year planning period (i.e. includes 0.9m SLR allowance) (Table 4). Nominally, this type of event has a 0.2% chance of occurrence each year.



Figure 5 – Detail of Lot 7 showing elevation of proposed lots.

The proposed building pad levels of 3.8mAHD meet the requirements for storm surge inundation under SPP2.6.

However, this approach requires filling of the building lots by more than 2.0m in places for a standard concrete slab. Alternatively, an FFL of 3.8mAHD could be achieved by building

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design' which could either allow for wet areas on the lower floor (e.g. garage) and raised living areas on the second floor, or raised flood levels (steel or timber frames construction).

The potential for a staged coastal adaptation approach could also be considered, whereby the initial dwelling constructed on the lot allows for 50 years sea level rise and the preliminary design level for a 500yrARI tropical cyclone (FFL of 3.2mAHD).

Numerical modelling of the design cyclone for Busselton may demonstrate a FFL in the order of 3.0mAHD to be acceptable over a 50 year planning period, provided it is acknowledged that future coastal adaptation is required beyond 50years.

Sincerely

Sten Ban

Stuart Barr Director, Seashore Engineering

#### References

- [1] Tidal Submergence Curve (2012)
- [2] Shore Coastal Busselton CMP Coastal Flooding, Risk Response and Mitigation
- [3] Seashore Design Cyclones
- [4] Vasse Wonnerup Operational Plan Guidance for Managers 2019.
- [5] SPP2.6. State Coastal Planning Policy.

#### **Limitations of this Report**

This report and the work undertaken for its preparation, is presented for the use of the client. The report may not contain sufficient or appropriate information to meet the purpose of other potential users. Seashore Engineering does not accept any responsibility for the use of the information in the report by other parties.