Nick Griggs & Co.
Land Surveyors, 295 Elizabeth Street, North Hobart 7000
Phone: 6234 5022 Fax: 6231 2412

PLAN OF SUBDIVISION

OWNER: AMNS PTY LTD

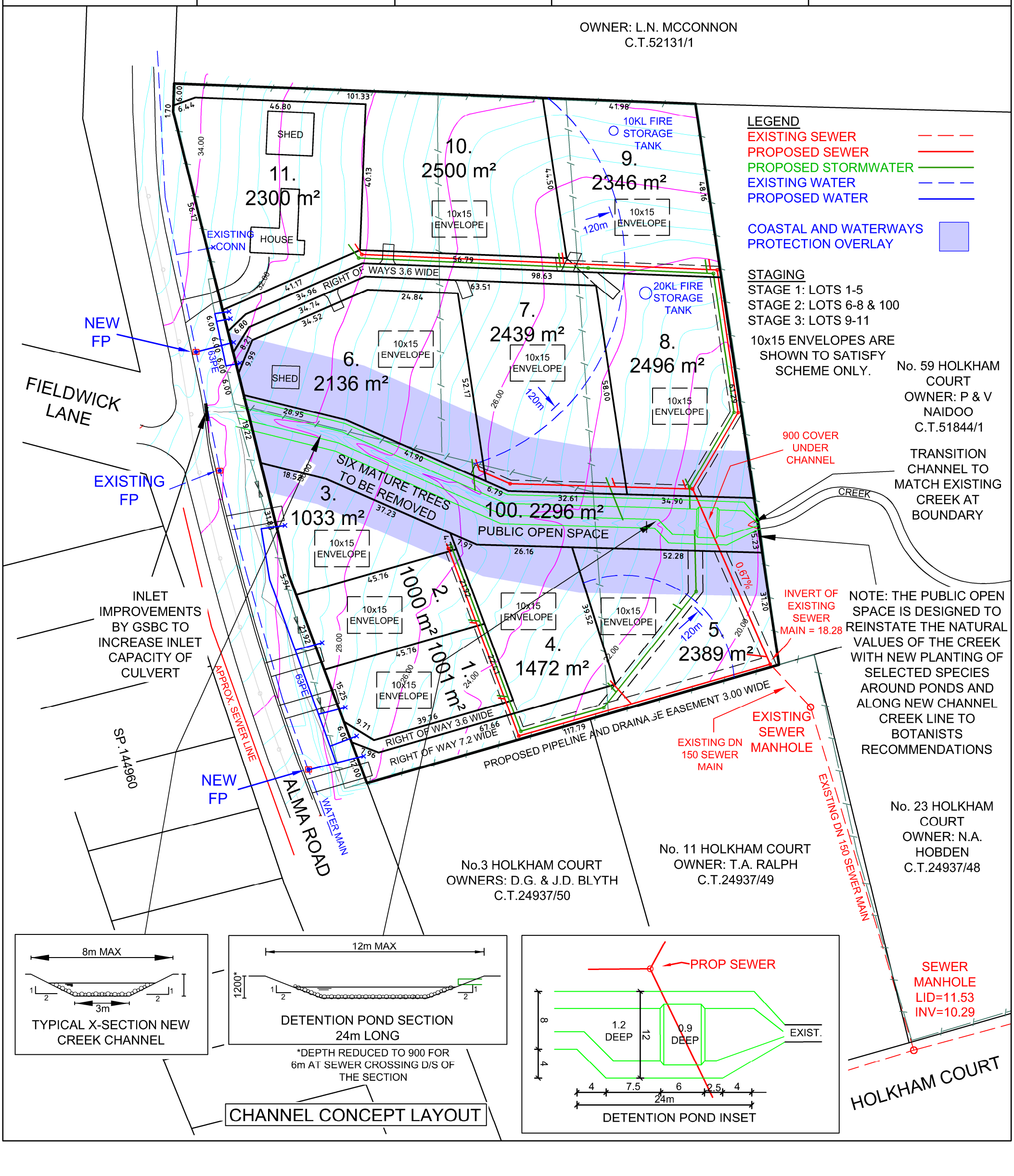
LOCATION: 66 ALMA RD ORFORD TAS 7190

MUNICIPALITY: Parish of TRIABUNNA, Land District of PEMBROKE

Important Note:
This plan was prepared as a proposed subdivision to accompany a subdivision application to Glamorgan-Spring Bay Council and should not be used for any other purpose. The dimensions, areas and total number of lots shown hereon are subject to field survey and also to the requirements of Council and any other authority which may have requirements under any relevant legislation. In particular, no reliance should be for any financial dealings involving the land. This note is an integral part of this plan.

MEASUREMENTS ARE IN METRES AND SUBJECT TO FINAL SURVEY

SCALE: 1:1000 @ A3	CONTOUR INT: 0.5m	DATE: 24/07/2020	REF. No: C.T. 35054/1	File No: 375713



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Bushfire Hazard Report (v2)

Proposed Subdivision, 66 Alma Rd Orford

Jim Mulcahy (BSc, GradDipEnvStud; Accreditation BFP - 159)

30 June 2020

Disclaimer

All reasonable steps have been taken to ensure that the information and advice contained in this report is an accurate reflection of the fire hazard affecting the proposed development at the time of the assessment and the hazard management measures necessary to meet the standards prescribed in *E1.0 Bushfire Prone Areas Code* of the *Glamorgan Spring Bay Interim Planning Scheme 2015* and *Australian Standard AS 3959-2009*.

The prescribed hazard management measures are designed to reduce bushfire risk to any dwelling(s) constructed on the site. The effectiveness of these measures relies on their implementation in full and their maintenance for the life of the development. No liability can be accepted for actions by landowners or third parties that undermine or compromise the integrity of prescriptions and recommendations contained in this report.

Due to the unpredictable nature of bushfires, particularly under extreme weather conditions, landowners should be aware that implementation and maintenance of the hazard management measures outlined in this report cannot guarantee that a building will survive a bushfire event.

Australian Standards

AS3959 – 2009 Construction of Buildings in Bushfire-Prone Areas has recently been superseded by *AS3959:2018*.

AS3959 2009 remains relevant for this report and will remain relevant until *E1.0 Bushfire Prone Areas Code* of the various *Interim Planning Schemes* has been updated to reference the new standard.

In respect of *Bushfire Attack Level* (BAL) determinations based on vegetation type and slope, the content of Table 2.4.4 in AS3959-2009 is the same as Table 2.6 in AS3959:2018. The new standard does include some changes to the description of *Low threat vegetation* and the *Classification of Vegetation*, but these changes do not materially affect the analysis contained in this report. As a result, to the best of the author's knowledge and understanding, the conclusions and prescribed separation distances contained in this report and the attached *Bushfire Hazard Management Plan* are consistent with the provisions of both AS3959-2009 and AS3959:2018.

Executive Summary

Owners	AMNS P/L
Applicant	PDA Surveyors (on behalf of owner)

Title references	FR 35054/1
PIDs	7637944
Address	66 Alma Rd Orford
Land size	2.325ha

Municipality	Glamorgan Spring Bay
Planning Scheme	*Glamorgan Spring Bay Interim Planning Scheme 2015*
Zoning	*12.0 Low Density Residential*

Proposed development	11 lot staged subdivision
Date of site assessment	3 June 2020
Bushfire Assessment	Existing and future dwellings are capable of meeting the requirements of BAL-19 in respect of hazard management areas, access for fire-fighting and water supplies for fire-fighting
Conclusion	Compliant development

The proposed subdivision occurs in a *bushfire prone area* pursuant to *E1.0 Bushfire Prone Areas Code* of the *Glamorgan Spring Bay Interim Planning Scheme 2015* (the Scheme). The Scheme requires that the bushfire risk to the development and appropriate hazard management responses to those risks be considered during the planning process. The proposed subdivision has been assessed against the requirements of *E1.0 Bushfire Prone Areas Code* and *AS 3959-2009 Construction of Buildings in Bushfire Prone Areas* (*AS 3959*).

A *Bushfire Hazard Management Plan* has been prepared, showing *Indicative Building Areas* for new lots and *Hazard Management Areas* which demonstrate the potential for existing and future dwellings to achieve a *Bushfire Attack Level* (BAL) rating of BAL-19 under Table 2.4.4 of *AS 3959*.

The *Bushfire Hazard Management Plan* demonstrates compliance with the acceptable solutions for subdivision under the Code and has been submitted to the Tasmania Fire Service (TFS) for endorsement. A certified version of the plan will accompany the final version of this report and will be provided to Glamorgan Spring Bay Council as part of a development application for the proposed subdivision.

Figure 1. Location of the subject land

1.0 Introduction

This report has been prepared by Mr Jim Mulcahy, *Provisionally Accredited Person* under Section 60B of the *Fire Service Act 1979* (Accreditation No. BFP-159, provisional for 3C). The report has been prepared in support of a development application for an eleven lot staged subdivision at 66 Alma Rd Orford (see Figure 2).

1.1 Purpose

The planning system in Tasmania aims for an integrated approach to development in bushfire prone areas between subdivision and the future construction of dwellings. The detailed planning requirements aimed at delivering this integrated approach have been codified under *Planning Directive 5.1 - Bushfire-Prone Areas Code* (Tasmanian Planning Commission, 2017), which has in turn been reproduced in the *Glamorgan Spring Bay Interim Planning Scheme 2015* (the Scheme) as *E1.0 Bushfire Prone Areas Code* (the Code).

The purpose of the Code is "*to ensure that use and development is appropriately designed, located, serviced, and constructed, to reduce the risk to human life and property, and the cost to the community, caused by bushfires*".

The purpose of this report is to demonstrate that the proposed development complies with the relevant provisions of the Code and *AS 3959-2009 Construction of Buildings in Bushfire Prone Areas* (AS 3959).

1.2 Scope

This report considers the bush-fire prone vegetation in the vicinity of the proposed subdivision, assesses the bushfire threat to existing and future dwellings and outlines appropriate bushfire hazard management measures in respect of:

- minimum separation distances required for existing and future dwellings to achieve BAL-19 under table 2.4.4 of *AS 3959*;
- provision of *Hazard Management Areas* which deliver the required separation distances to achieve BAL-19 under table 2.4.4 of *AS 3959*;
- requirements and recommendations for establishment and maintenance of *Hazard Management Areas*;
- provision of compliant access for fire-fighting; and
- provision of compliant water supplies for fire-fighting.

1.3 Limitations

Statutory requirements

This report only deals with the potential bushfire risk to the proposed subdivision development. Other statutory requirements relating to the development are generally outside the scope of the report, although planning issues which intersect with bushfire hazard management needs are referenced as appropriate.

Changing circumstances over time

The recommendations in this report are based on the surrounding vegetation at the time of the site inspection and the author's professional assessment of the fire

hazard posed by that vegetation. It is not possible, however, to accurately predict environmental changes over time and the impacts of those changes on the future bushfire hazard at the site, particularly where those outcomes are dependent on land management decisions on adjoining properties.

Limitations of scope

The attached *Bushfire Hazard Management Plan* defines '*Indicative Building Areas*' based on the provisions of the *Low Density Residential Zone* and meeting the acceptable solutions under the Code. In light of this limited scope, the following issue is worth noting.

Section 11F (2) (a) of the *Tasmanian Building Act 2016 – Building Amendment (Bushfire-Prone Areas) Regulations 2016*, incorporating the *Director's Determination for Building in Bushfire-Prone Areas*, provides that a *Bushfire Hazard Management Plan* undertaken for the purposes of a subdivision approval can be utilised to satisfy the bushfire planning requirements of a subsequent application to build on a lot arising from that subdivision, *"unless that bushfire hazard management plan is more than 6 years old."*

2.0 Site description

2.1 The subject land

The subject land is comprised of a single title 2.325ha in size, located on the outskirts of the settled areas of Orford, approximately 1.3km north of the Orford Post Office.

The property has a south-easterly aspect, descending from a maximum height of ~35m above sea level (asl) in the north-western corner to approximately 19m asl in the south-eastern corner. It contains an existing dwelling and several outbuildings in the north-west corner and has over 300m frontage to Alma Rd along its western boundary.

Vegetation on the subject land is comprised almost entirely of pasture, along with a small cluster of trees along a drainage line passing from west to east through the centre of the land and some plantings of trees and shrubs along the boundary to the west and north of the existing dwelling.

2.2 Context (see Figure 2)

The subject land is zoned *Low Density Residential* under the Scheme and the drainage line passing from west to east through the centre of the land is affected by the *Waterway and Coastal Protection Area* overlay (extending for 20m either side of the drainage line).

The property is bounded to the west by Alma Rd. Beyond the road lie *General Residential* properties which are mostly developed, with established dwellings and gardens. Beyond these residential blocks lie some larger forested properties on the lower slopes of Rudds Hill. To the north of the property are *Rural Living* lots which have vegetation cover comprised predominantly of pasture. To the east and south of the property lie *Low Density Residential* lots, which are mostly developed and have vegetation cover comprised predominantly of pasture.

3.0 Development proposal

An eleven lot staged subdivision is proposed (see Figure 3). The subdivision proposal includes the following features relevant to an assessment of bushfire hazard.

- Not all lots can support *Building Areas* with separation distances from the lot boundaries that are sufficient for *Hazard Management Areas* (at BAL-19) to be accommodated entirely within the lot boundaries. As a result, Part 5 Agreements under the *Land Use Planning and Approvals Act 1993* (LUPAA) will be required to secure the required hazard management outcomes.
- Most lots do not require a property access to access a fire-fighting water point. The two lots which cannot be serviced by hydrants (Lots 8 & 9) are capable of supporting property accesses suitable for access by fire-fighting appliances and compliant with the Code.

  If no new hydrants are installed then compliant access for fire-fighting will also be required to service Lots 5, 7 & 10.
- Most lots can be serviced by existing or proposed new water hydrants along Alma Rd. The two lots which cannot be serviced by hydrants (Lots 8 & 9) are capable of supporting compliant static water supplies dedicated to fire-fighting.

  If no new hydrants are installed then compliant static water supplies for fire-fighting will also be required to service Lots 5, 7 & 10.

4.0 Bushfire Threat Assessment

4.1 General

Fire Danger Index: FDI 50 (this index applies across Tasmania).

Bushfire History: the *Fire History* layer of the *Land Information System Tasmania* (LIST) shows that forest on the lower slopes of Rudds Hill to the west of the subject land was impacted by bushfire in 2017/2018.

Under ember attack and extreme conditions, existing and future dwellings could potentially be subject to bushfire attack from any direction. In terms of the probability of extreme fire weather conditions the main hazard is from the north. In terms of vegetation the main hazard is from the west, although the fact that the forest on Rudds Hill is upslope of the site does mitigate risk from this direction to some extent.

With appropriate management, existing and future dwellings are unlikely to be subject to a head-fire attack, but the site is at risk from bushfire. The potential impacts of forest fires in the broader landscape should not be underestimated in terms of their potential to create ember, smoke and radiant heat attack on existing and future dwellings and to spark spot fires in the surrounding landscape.

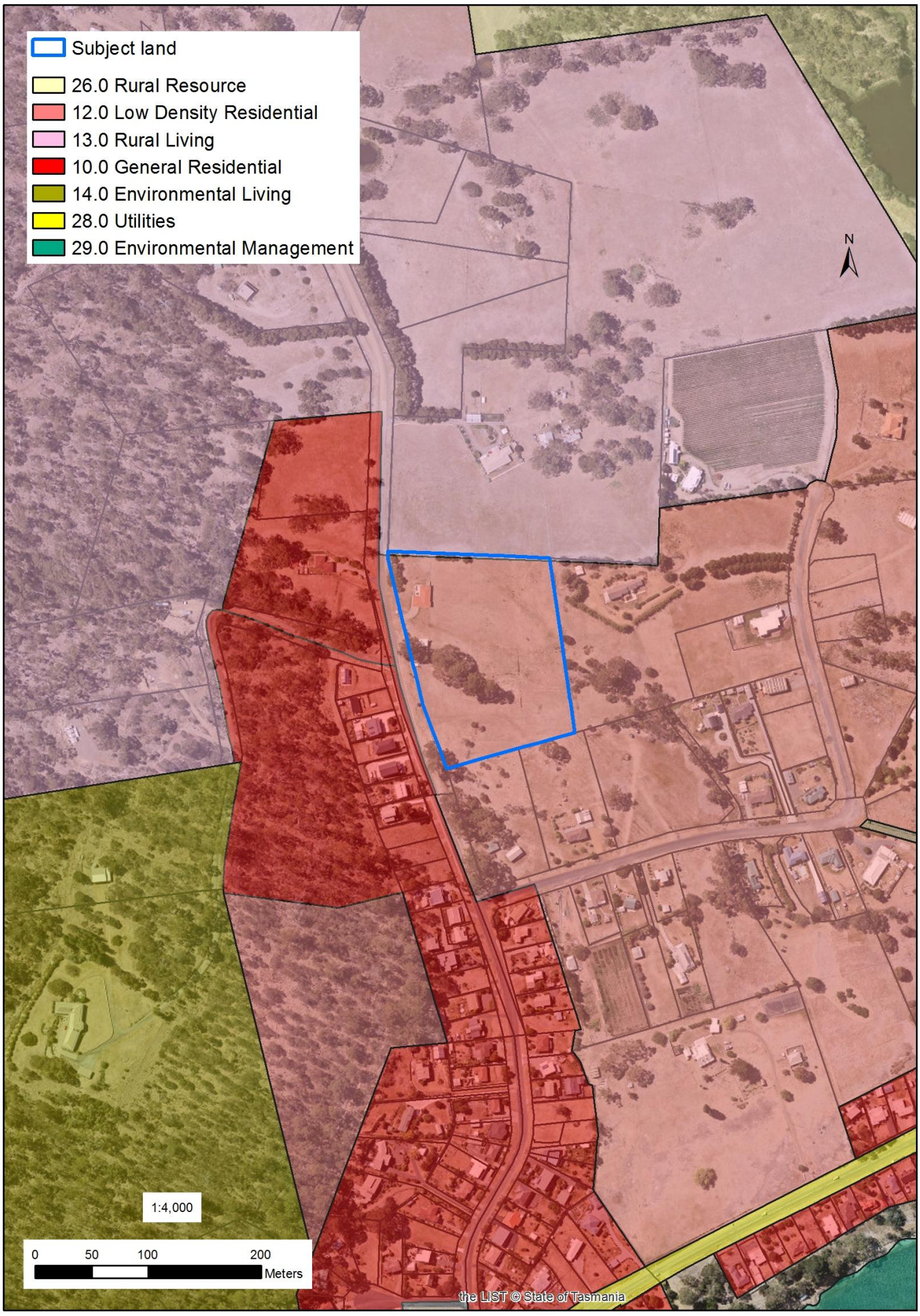


Figure 2. Zoning and context

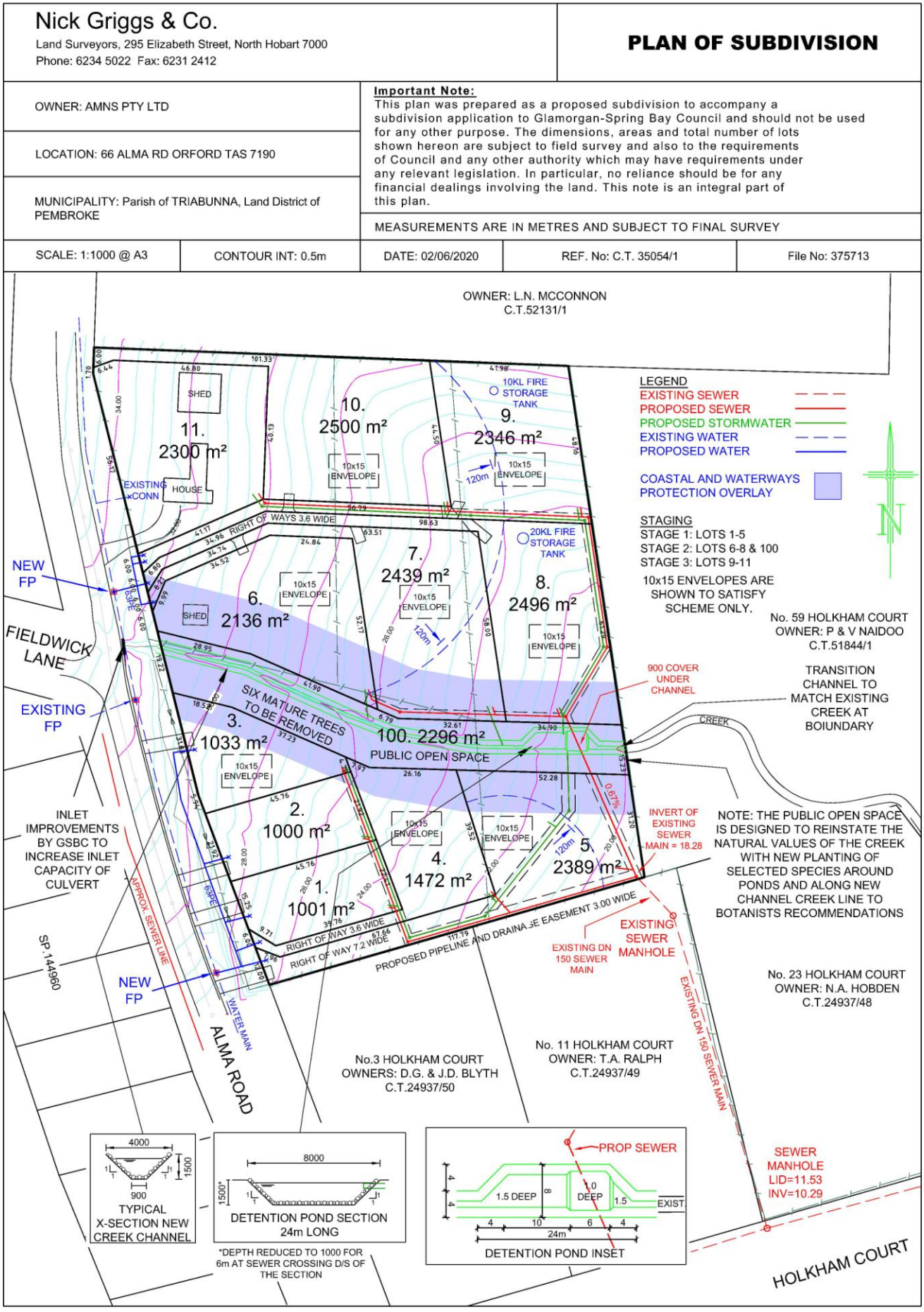


Figure 3. Subdivision proposal

4.2 Hazard Assessment

The subject land and surrounds were surveyed by the author on 3 June 2020 with reference to the draft subdivision layout. Information and images were collected which allowed assessment of *Bushfire Attack Level* (BAL) using *Method 1 (Simplified Procedure)* of *AS3959*.

Vegetation and slope were considered across the subject land and on adjoining properties for context. Vegetation and slope were then assessed in detail within 100m in every direction from the subject land. Minimum separation distances required for existing and future dwellings to meet the requirements of BAL-19 under Table 2.4.4 of *AS3959* were calculated for each combination of vegetation and slope and the separation distances overlaid to determine the 'primary hazard' and the effective slope.

The current bushfire attack level (BAL) was then calculated for the existing dwelling and the *Indicative Building Areas* to determine the separation distances and *Hazard Management Areas* required to meet the requirements of BAL-19 under Table 2.4.4 of *AS3959* (see Figure 4 and Tables 1-4). This assessment was used to prepare the *Bushfire Hazard Management Plan* (BHMP) at Attachment A.

4.2 Bushfire-prone vegetation (see Figure 4)

The following bushfire-prone vegetation occurs within 100m of the existing dwelling and the *Indicative Building Areas* (pursuant to vegetation classification under AS3959 Table 2.3 and Figures 2.4 A-G).

1. Pasture (FAG) occurs on the subject land and on adjoining properties to the north, east and south. For the purposes of this report this pasture has been classified as *G(i) Grassland.*
2. White peppermint/ white gum/ blue-gum dry forest (DPU) occurs to the west of the subject land within 90-100m of the site (*A. Forest*).
3. There is a strip of riparian vegetation associated with the drainage line that runs east from Rudds Hill through the neighbouring property to the west and then through the centre of the subject land. This riparian strip is contiguous with large areas of DPU forest on the slopes of Rudds Hill to the west. The riparian vegetation on the neighbouring property to the west has an established shrubby understorey and has been classified as *A. Forest.*
4. On the subject land, riparian vegetation associated with the drainage line is either purely pasture (eastern end) or is limited to a few trees over pasture (western end). In its current condition this vegetation would be classified as *G(i) Grassland.*

   It is proposed that the riparian strip through the subject land be part of a *Public Open Space* lot (Lot 100), which is to be revegetated with native species to reinstate the natural values of the creek-line. As a result, there is the potential for an increase in bushfire hazard associated with the riparian strip. Any tree planting will only create a linear strip and not represent potential future forest, but shrub plantings would create potential for succession to vegetation meeting the definition of *D. Scrub*.

Illustrative photos of bush-fire-prone vegetation can be found at Appendix A.

Figure 4. Bushfire Hazard Assessment Map

Table 1. Separation distance calculations for the *Existing Dwelling* (pursuant to Balance lot at Stages 1 & 2 and Lot 11 at Stage 3)

Direction	Vegetation Classification[#]	Effective Slope under vegetation	Approx. distance from IBA (m)	Current BAL rating	Separation distance for BAL-19 (m)	Prescribed minimum hazard management area
North	Low threat (lawn & garden)*	-	0-28	-	-	Whole area of fenced paddock/yard
	G (i). Grassland	+/- flat to upslope	28-100	BAL-12.5	-	
North East	Low threat (lawn & garden)*	-	0-3	-	-	-
	G (i). Grassland	+/- flat across slope	3-100	BAL-FZ	10-<14	10m
East	Low threat (lawn & garden)*	-	0-2	-	-	-
	G (i). Grassland	Downslope 4^0	2-100	BAL-FZ	11-<16	11m
South East	G (i). Grassland	Downslope 4^0	0-100	BAL-FZ	11-<16	11m
South	Low threat & non-veg. (lawn & shed)*	-	0-41	-	-	Whole area of fenced paddock/yard
	D. Scrub (potential)	+/- flat across slope	41-59	BAL-12.5	-	
	G (i). Grassland	+/- flat across slope	59-100	-	-	
South West	Low threat & non-veg. (lawn, road & verge)*	-	0-39	-	-	Whole area of fenced paddock/yard
	A. Forest	Upslope	39-66	BAL-12.5	-	
	Non-veg. (road)	-	66-72	-	-	
	G (i). Grassland	Upslope	72-100	-	-	
West	Low threat & non-veg. (lawn, road & verge)*	-	0-33	-	-	Whole area of fenced paddock/yard
	G (i). Grassland	Upslope	33-92	BAL-12.5	-	
	A. Forest	Upslope	92-100	-	-	
North West	Low threat & non-veg. (lawn, road & verge)*	-	0-65	-	-	Whole area of fenced paddock/yard
	G (i). Grassland	Upslope	65-100	-	-	

* Exclusion under AS3959-2009 2.2.3.2 [#] Classification as per AS3959-2009 amendment 3, Table 2.3 and Figures 2.4(A)-2.4(G)

Table 2. Separation distance calculations for *Indicative Building Area* on Lot 1 (Stage 1)

Direction	Vegetation Classification[#]	Effective Slope under vegetation	Approx. distance from IBA (m)	Current BAL rating	Separation distance for BAL-19 (m)	Prescribed hazard management area
North	G (i). Grassland	+/- flat across slope	0-35	BAL-FZ	10-<14	Whole area of Lots 1-5 in Stage 1 to be established & maintained as HMA
	D. Scrub (potential)	+/- flat across slope	35-54	BAL-12.5	-	
	G (i). Grassland	+/- flat to upslope	54-100	-	-	
North East	G (i). Grassland	+/- flat across slope	0-41	BAL-FZ	10-<14	Whole area of Lots 1-5
	D. Scrub (potential)	+/- flat across slope	41-60	BAL-12.5	-	
	G (i). Grassland	+/- flat to upslope	60-100	-	-	
East	G (i). Grassland	Downslope 4^0	0-100	BAL-FZ	11-<16	Whole area of Lots 1-5
South East	G (i). Grassland	Downslope 4^0	0-100	BAL-FZ	11-<16	Whole area of Lots 1-5
South	G (i). Grassland	+/- flat across slope	0-76	BAL-FZ	10-<14	Whole area of Lots 1-5
	Low threat & non-veg. (road & verge)*	-	76-100	-	-	
South West	G (i). Grassland	Upslope	0-17	BAL-FZ	10-<14	Whole area of Lots 1-5
	Low threat & non-veg. (road, verge & residential areas)*	Upslope	17-100	-	-	
West	G (i). Grassland	Upslope	0-17	BAL-FZ	10-<14	Whole area of Lots 1-5
	Low threat & non-veg. (road, verge & residential areas)*	Upslope	17-95	-	-	
	G (i). Grassland	Upslope	95-100	-	-	
North West	G (i). Grassland	Upslope	0-38	BAL-FZ	10-<14	Whole area of Lots 1-5
	Low threat & non-veg. (road, verge & residential areas)*	Upslope	38-100	-	-	

* Exclusion under AS3959-2009 2.2.3.2 [#] Classification as per AS3959-2009 amendment 3, Table 2.3 and Figures 2.4(A)-2.4(G)

Table 3. Separation distance calculations for *Indicative Building Area* on Lot 2 (Stage 1)

Direction	Vegetation Classification[#]	Effective Slope under vegetation	Approx. distance from IBA (m)	Current BAL rating	Separation distance for BAL-19 (m)	Prescribed hazard management area
North	G (i). Grassland	+/- flat across slope	0-18	BAL-FZ	10-<14	Whole area of Lots 1-5 in Stage 1 to be established & maintained as HMA; 19m+ to the north
	D. Scrub (potential)	+/- flat across slope	18-37	BAL-29	19-<27	
	G (i). Grassland	+/- flat to upslope	37-100	-	-	
North East	G (i). Grassland	+/- flat across slope	0-19	BAL-FZ	10-<14	Whole area of Lots 1-5; 19m+ to the north-east
	D. Scrub (potential)	+/- flat across slope	19-41	BAL-19	19-<27	
	G (i). Grassland	+/- flat to upslope	41-100	-	-	
East	G (i). Grassland	Downslope 4^0	0-100	BAL-FZ	11-<16	Whole area of Lots 1-5
South East	G (i). Grassland	Downslope 4^0	0-100	BAL-FZ	11-<16	Whole area of Lots 1-5
South	G (i). Grassland	+/- flat across slope	0-91	BAL-FZ	10-<14	Whole area of Lots 1-5
	Low threat & non-veg. (road & verge)*	-	91-100	-	-	
South West	G (i). Grassland	Upslope	0-17	BAL-FZ	10-<14	Whole area of Lots 1-5
	Low threat & non-veg. (road, verge & residential areas)*	Upslope	17-100	-	-	
West	G (i). Grassland	Upslope	0-18	BAL-FZ	10-<14	Whole area of Lots 1-5
	Low threat & non-veg. (road, verge & residential areas)*	Upslope	18-94	-	-	
	G (i). Grassland	Upslope	94-100	-	-	
North West	G (i). Grassland	Upslope	0-33	BAL-FZ	10-<14	Whole area of Lots 1-5
	Low threat & non-veg. (road, verge & residential areas)*	Upslope	33-77	-	-	
	A. Forest	Upslope	77-100	BAL-12.5	-	

* Exclusion under AS3959-2009 2.2.3.2

[#] Classification as per AS3959-2009 amendment 3, Table 2.3 and Figures 2.4(A)-2.4(G)

Table 4. Separation distance calculations for *Indicative Building Area* on Lot 3 (Stage 1)

Direction	Vegetation Classification[#]	Effective Slope under vegetation	Approx. distance from IBA (m)	Current BAL rating	Separation distance for BAL-19 (m)	Prescribed hazard management area
North	G (i). Grassland	+/- flat across slope	0-12	BAL-FZ	10-<14	Whole area of Lots 1-5 in Stage 1 to be established & maintained as HMA; 19m+ to the north
	D. Scrub (potential)	+/- flat across slope	12-30	BAL-40	19-<27	
	G (i). Grassland	+/- flat to upslope	30-100	BAL-12.5	-	
North East	G (i). Grassland	+/- flat across slope	0-13	BAL-FZ	10-<14	Whole area of Lots 1-5; 19m+ to the north-east
	D. Scrub (potential)	+/- flat across slope	13-31	BAL-29	19-<27	
	G (i). Grassland	+/- flat to upslope	31-100	-	-	
East	G (i). Grassland	Downslope 4^0	0-29	BAL-FZ	11-<16	Whole area of Lots 1-5
	D. Scrub (potential)	Downslope 4^0	29-100	BAL-19	22-<31	
South East	G (i). Grassland	Downslope 4^0	0-100	BAL-FZ	11-<16	Whole area of Lots 1-5
South	G (i). Grassland	+/- flat across slope	0-44	BAL-FZ	10-<14	Whole area of Lots 1-5
	Low threat & non-veg. (road & verge)*	-	44-100	-	-	
South West	G (i). Grassland	Upslope	0-13	BAL-FZ	10-<14	Whole area of Lots 1-5
	Low threat & non-veg. (road, verge & residential areas)*	Upslope	13-100	-	-	
West	G (i). Grassland	Upslope	0-4	BAL-FZ	10-<14	Whole area of Lots 1-5
	Low threat & non-veg. (road, verge & residential areas)*	Upslope	4-94	-	-	
	G (i). Grassland	Upslope	94-100	-	-	
North West	G (i). Grassland	Upslope	0-17	BAL-FZ	10-<14	Whole area of Lots 1-5
	Low threat & non-veg. (road, verge & residential areas)*	Upslope	17-57	-	-	
	A. Forest	Upslope	57-100	BAL-12.5	-	

* Exclusion under AS3959-2009 2.2.3.2 [#] Classification as per AS3959-2009 amendment 3, Table 2.3 and Figures 2.4(A)-2.4(G)

Table 5. Separation distance calculations for *Indicative Building Area* on Lot 4 (Stage 1)

Direction	Vegetation Classification[#]	Effective Slope under vegetation	Approx. distance from IBA (m)	Current BAL rating	Separation distance for BAL-19 (m)	Prescribed hazard management area
North	G (i). Grassland	+/- flat across slope	0-13	BAL-FZ	10-<14	Whole area of Lots 1-5 in Stage 1 to be established & maintained as HMA; 19m+ to the north.
	D. Scrub (potential)	+/- flat across slope	13-28	BAL-29	19-<27	
	G (i). Grassland	+/- flat to upslope	28-100	-	-	
North East	G (i). Grassland	+/- flat across slope	0-20	BAL-FZ	10-<14	Whole area of Lots 1-5; 19m+ to the north east.
	D. Scrub (potential)	+/- flat across slope	20-46	BAL-19	19-<27	
	G (i). Grassland	+/- flat to upslope	46-100	-	-	
East	G (i). Grassland	Downslope 4^0	0-100	BAL-FZ	11-<16	Whole area of Lots 1-5
South East	G (i). Grassland	Downslope 4^0	0-100	BAL-FZ	11-<16	Whole area of Lots 1-5
South	G (i). Grassland	+/- flat across slope	0-100	BAL-FZ	10-<14	Whole area of Lots 1-5
South West	G (i). Grassland	Upslope	0-57	BAL-FZ	10-<14	Whole area of Lots 1-5
	Low threat & non-veg. (road, verge & residential areas)*	Upslope	57-100	-	-	
West	G (i). Grassland	Upslope	0-54	BAL-FZ	10-<14	Whole area of Lots 1-5
	Low threat & non-veg. (road, verge & residential areas)*	Upslope	54-100	-	-	
North West	G (i). Grassland	Upslope	0-31	BAL-FZ	10-<14	Whole area of Lots 1-5
	D. Scrub (potential)	Upslope	31-74	BAL-12.5	-	
	Low threat & non-veg. (road, verge & residential areas)*	Upslope	74-100	-	-	

* Exclusion under AS3959-2009 2.2.3.2

[#] Classification as per AS3959-2009 amendment 3, Table 2.3 and Figures 2.4(A)-2.4(G)

Table 6. Separation distance calculations for *Indicative Building Area* on Lot 5 (Stage 1)

Direction	Vegetation Classification[#]	Effective Slope under vegetation	Approx. distance from IBA (m)	Current BAL rating	Separation distance for BAL-19 (m)	Prescribed hazard management area
North	G (i). Grassland	+/- flat across slope	0-13	BAL-FZ	10-<14	Whole area of Lots 1-5 in Stage 1 to be established & maintained as HMA; 19m+ to the north.
	D. Scrub (potential)	+/- flat across slope	13-28	BAL-29	19-<27	
	G (i). Grassland	+/- flat to upslope	28-100	-	-	
North East	G (i). Grassland	+/- flat across slope	0-18	BAL-FZ	10-<14	Whole area of Lots 1-5; 19m+ to the north east.
	D. Scrub (potential)	+/- flat across slope	18-37	BAL-29	19-<27	
	G (i). Grassland	+/- flat to upslope	37-100	BAL-12.5	-	
East	G (i). Grassland	Downslope 4^0	0-100	BAL-FZ	11-<16	Whole area of Lots 1-5
South East	G (i). Grassland	Downslope 4^0	0-100	BAL-FZ	11-<16	Whole area of Lots 1-5
South	G (i). Grassland	+/- flat to downslope 2^0	0-100	BAL-FZ	10-<14	Whole area of Lots 1-5
South West	G (i). Grassland	Upslope	0-82	BAL-FZ	10-<14	Whole area of Lots 1-5
	Low threat & non-veg. (road, verge & residential areas)*	Upslope	82-100	-	-	
West	G (i). Grassland	Upslope	0-81	BAL-FZ	10-<14	Whole area of Lots 1-5
	Low threat & non-veg. (road, verge & residential areas)*	Upslope	81-100	-	-	
North West	G (i). Grassland	Upslope	0-20	BAL-FZ	10-<14	Whole area of Lots 1-5; 19m+ to the north west.
	D. Scrub (potential)	Upslope	20-40	BAL-19	19-<27	
	Low threat & non-veg. (road, verge & residential areas)*	Upslope	40-100	-	-	

* Exclusion under AS3959-2009 2.2.3.2

[#] Classification as per AS3959-2009 amendment 3, Table 2.3 and Figures 2.4(A)-2.4(G)

Table 7. Separation distance calculations for *Indicative Building Area* on Lot 6 (Stage 2)

Direction	Vegetation Classification[#]	Effective Slope under vegetation	Approx. distance from IBA (m)	Current BAL rating	Separation distance for BAL-19 (m)	Prescribed hazard management area
North	G (i). Grassland	Upslope	0-100	BAL-FZ	10-<14	Whole area of Lots 6-8 in Stage 2 to be established & maintained as HMA
North East	G (i). Grassland	+/- flat to upslope	0-100	BAL-FZ	10-<14	Whole area of Lots 6-8
East	G (i). Grassland	Downslope 4^0	0-100	BAL-FZ	11-<16	Whole area of Lots 6-8
South East	G (i). Grassland	Downslope 4^0	0-53	BAL-FZ	11-<16	Whole area of Lots 6-8
	D. Scrub (potential)	Downslope 4^0	53-74	BAL-12.5	-	
	G (i). Grassland	Downslope 4^0	74-100	-	-	
South	G (i). Grassland	+/- flat across slope	0-21	BAL-FZ	11-<16	Whole area of Lots 6-8; 19m+ to the south
	D. Scrub (potential)	+/- flat across slope	21-40	BAL-19	19-<27	
	G (i). Grassland	+/- flat across slope	40-100	-	-	
South West	G (i). Grassland	Upslope	0-22	BAL-FZ	10<14	Whole area of Lots 6-8; 19m+ to the south west
	D. Scrub (potential)	Upslope	22-41	BAL-19	19-<27	
	Low threat & non-veg. (road, verge & residential areas)*	Upslope	41-100	-	-	
West	G (i). Grassland	Upslope	0-17	BAL-FZ	10-<14	Whole area of Lots 6-8
	Low threat & non-veg. (lawn, road & verge)*	Upslope	17-59	-	-	
	A. Forest	Upslope	59-100	BAL-12.5	-	
North West	G (i). Grassland	Upslope	0-21	BAL-FZ	10-<14	Whole area of Lots 6-8
	Low threat & non-veg. (dwelling, lawn, road & verge)*	Upslope	21-100	-	-	

* Exclusion under AS3959-2009 2.2.3.2

[#] Classification as per AS3959-2009 amendment 3, Table 2.3 and Figures 2.4(A)-2.4(G)

Table 8. Separation distance calculations for *Indicative Building Area* on Lot 7 (Stage 2)

Direction	Vegetation Classification[#]	Effective Slope under vegetation	Approx. distance from IBA (m)	Current BAL rating	Separation distance for BAL-19 (m)	Prescribed hazard management area
North	G (i). Grassland	+/- flat to upslope	0-100	BAL-FZ	10-<14	Whole area of Lots 6-8 in Stage 2 to be established & maintained as HMA
North East	G (i). Grassland	+/- flat to upslope	0-100	BAL-FZ	10-<14	Whole area of Lots 6-8
East	G (i). Grassland	Downslope 4^0	0-100	BAL-FZ	11-<16	Whole area of Lots 6-8
South East	G (i). Grassland	Downslope 4^0	0-40	BAL-FZ	11-<16	Whole area of Lots 6-8
	D. Scrub (potential)	Downslope 4^0	40-62	BAL-12.5	-	
	G (i). Grassland	Downslope 4^0	62-100	-	-	
South	G (i). Grassland	+/- flat across slope	0-30	BAL-FZ	11-<16	Whole area of Lots 6-8
	D. Scrub (potential)	+/- flat across slope	30-45	BAL-12.5	-	
	G (i). Grassland	+/- flat across slope	45-100	-	-	
South West	G (i). Grassland	Upslope	0-28	BAL-FZ	10<14	Whole area of Lots 6-8
	D. Scrub (potential)	Upslope	28-47	BAL-19	19-<27	
	G (i). Grassland	Upslope	47-84	BAL-12.5	-	
	Low threat & non-veg. (road, verge & residential areas)*	Upslope	84-100	-	-	
West	G (i). Grassland	Upslope	0-57	BAL-FZ	10-<14	Whole area of Lots 6-8
	Low threat & non-veg. (lawn, road & verge)*	Upslope	57-100	-	-	
North West	G (i). Grassland	Upslope	0-77	BAL-FZ	10-<14	Whole area of Lots 6-8
	Low threat & non-veg. (lawn)*	Upslope	77-100	-	-	

* Exclusion under AS3959-2009 2.2.3.2 [#] Classification as per AS3959-2009 amendment 3, Table 2.3 and Figures 2.4(A)-2.4(G)

Table 9. Separation distance calculations for *Indicative Building Area* on Lot 8 (Stage 2)

Direction	Vegetation Classification[#]	Effective Slope under vegetation	Approx. distance from IBA (m)	Current BAL rating	Separation distance for BAL-19 (m)	Prescribed hazard management area
North	G (i). Grassland	+/- flat to upslope	0-100	BAL-FZ	10-<14	Whole area of Lots 6-8 in Stage 2 to be established & maintained as HMA
North East	G (i). Grassland	+/- flat to upslope	0-46	BAL-FZ	10-<14	Whole area of Lots 6-8
	Low threat (garden)*	Upslope	46-100	-	-	
East	G (i). Grassland	+/- flat to upslope	0-100	BAL-FZ	10-<14	Whole area of Lots 6-8
South East	G (i). Grassland	Downslope 4^0	0-100	BAL-FZ	11-<16	Whole area of Lots 6-8
South	G (i). Grassland	+/- flat across slope	0-19	BAL-FZ	11-<16	Whole area of Lots 6-8; 19m+ to the south
	D. Scrub (potential)	+/- flat across slope	19-34	BAL-19	19-<27	
	G (i). Grassland	+/- flat across slope	34-100	-	-	
South West	G (i). Grassland	Upslope	0-24	BAL-FZ	10<14	Whole area of Lots 6-8
	D. Scrub (potential)	Upslope	24-44	BAL-19	19-<27	
	G (i). Grassland	Upslope	44-100	BAL-12.5	-	
West	G (i). Grassland	Upslope	0-78	BAL-FZ	10-<14	Whole area of Lots 6-8
	D. Scrub (potential)	Upslope	78-100	BAL-12.5	-	
North West	G (i). Grassland	Upslope	0-100	BAL-FZ	10-<14	Whole area of Lots 6-8

* Exclusion under AS3959-2009 2.2.3.2

[#] Classification as per AS3959-2009 amendment 3, Table 2.3 and Figures 2.4(A)-2.4(G)

Table 10. Separation distance calculations for *Indicative Building Area* on Lot 9 (Stage 3)

Direction	Vegetation Classification[#]	Effective Slope under vegetation	Approx. distance from IBA (m)	Current BAL rating	Separation distance for BAL-19 (m)	Prescribed hazard management area
North	G (i). Grassland	Upslope	0-100	BAL-FZ	10-<14	Whole area of Lots 9 & 10 in Stage 3 to be established & maintained as HMA
North East	G (i). Grassland	Upslope	0-100	BAL-FZ	10-<14	Whole area of Lots 9 & 10
East	G (i). Grassland	+/- flat across slope	0-37	BAL-FZ	10-<14	Whole area of Lots 9 & 10
	Low threat & non-veg. (garden, lawn & dwelling)*	+/- flat across slope	37-100	-	-	
South East	G (i). Grassland	Downslope 4^0	0-100	BAL-FZ	11-<16	Whole area of Lots 9 & 10
South	G (i). Grassland	+/- flat across slope	0-72	BAL-FZ	11-<16	Whole area of Lots 9 & 10
	D. Scrub (potential)	+/- flat across slope	72-87	BAL-12.5	-	
	G (i). Grassland	+/- flat across slope	87-100	-	-	
South West	G (i). Grassland	Upslope	0-81	BAL-FZ	10<14	Whole area of Lots 9 & 10
	D. Scrub (potential)	Upslope	81-99	BAL-12.5	-	
	G (i). Grassland	Upslope	99-100	BAL-12.5	-	
West	G (i). Grassland	Upslope	0-86	BAL-FZ	10-<14	Whole area of Lots 9 & 10
	Low threat & non-veg. (dwelling & lawn)*	Upslope	86-100	-	-	
North West	G (i). Grassland	Upslope	0-100	BAL-FZ	10-<14	Whole area of Lots 9 & 10

* Exclusion under AS3959-2009 2.2.3.2

[#] Classification as per AS3959-2009 amendment 3, Table 2.3 and Figures 2.4(A)-2.4(G)

Table 11. Separation distance calculations for *Indicative Building Area* on Lot 10 (Stage 3)

Direction	Vegetation Classification[#]	Effective Slope under vegetation	Approx. distance from IBA (m)	Current BAL rating	Separation distance for BAL-19 (m)	Prescribed hazard management area
North	G (i). Grassland	Upslope	0-100	BAL-FZ	10-<14	Whole area of Lots 9 & 10 in Stage 3 to be established & maintained as HMA
North East	G (i). Grassland	Upslope	0-100	BAL-FZ	10-<14	Whole area of Lots 9 & 10
East	G (i). Grassland	+/- flat across slope	0-87	BAL-FZ	10-<14	Whole area of Lots 9 & 10
	Low threat & non-veg. (garden & lawn)*	+/- flat across slope	87-100	-	-	
South East	G (i). Grassland	Downslope 4^0	0-100	BAL-FZ	11-<16	Whole area of Lots 9 & 10
South	G (i). Grassland	+/- flat across slope	0-66	BAL-FZ	11-<16	Whole area of Lots 9 & 10
	D. Scrub (potential)	+/- flat across slope	66-85	BAL-12.5	-	
	G (i). Grassland	+/- flat across slope	85-100	-	-	
South West	G (i). Grassland	Upslope	0-49	BAL-FZ	10<14	Whole area of Lots 9 & 10
	Low threat & non-veg. (lawn, road & verge)*	Upslope	49-100	-	-	
West	G (i). Grassland	Upslope	0-33	BAL-FZ	10-<14	Whole area of Lots 9 & 10
	Low threat & non-veg. (dwelling, lawn, road & verge)*	Upslope	33-86	-	-	
	G (i). Grassland	Upslope	86-100	BAL-12.5	-	
North West	G (i). Grassland	Upslope	0-93	BAL-FZ	10-<14	Whole area of Lots 9 & 10
	Low threat & non-veg. (road & verge)*	Upslope	93-100	-	-	

* Exclusion under AS3959-2009 2.2.3.2 [#] Classification as per AS3959-2009 amendment 3, Table 2.3 and Figures 2.4(A)-2.4(G)

5.0 Bushfire Protection Measures

5.1 Limitations on hazard management

There is no threatened vegetation, threatened species habitat or other site constraint that would limit hazard management works. There are several large blue gums on the subject land and in the adjoining road reserve that provide potential foraging habitat for the endangered Swift Parrot (*Lathamus discolor*), but no trees need to be removed for hazard management purposes.

5.2 Hazard Management Areas

The objectives of providing *Hazard Management Areas* are:

- to facilitate an integrated approach between subdivision and subsequent building on a lot; and
- to provide for sufficient separation of building areas from bushfire-prone vegetation to reduce radiant heat levels, direct flame attack and ember attack at the building area.

5.2.1 Code provisions

The requirements for *Hazard Management Areas* within a subdivision are detailed in E1.6.1 of the Code.

The acceptable solutions under E1.6.1 A1 of the Code require that:

(b) The proposed plan of subdivision: …

(iii) shows hazard management areas between bushfire-prone vegetation and each building area that have dimensions equal to, or greater than, the separation distances required for BAL 19 in Table 2.4.4 of AS3959; …

5.2.2 Compliance

The bushfire hazard assessment (see Figure 4 & Tables 1-11) indicates that all lots require *Hazard Management Areas* to provide separation distances that will allow existing and future dwellings to meet the requirements of BAL-19 under Table 2.4.4 of *AS3959*.

The *Bushfire Hazard Management Plan* at Attachment A shows *Indicative Building Areas* for Lots 1-10 and defines *Hazard Management Areas* for all lots with sufficient separation distances from bushfire prone vegetation to allow existing and future dwellings to meet the requirements of BAL-19.

Most lots cannot support *Building Areas* with separation distances from the lot boundaries that are sufficient for *Hazard Management Areas* meeting the requirements of BAL-19 to be accommodated entirely within the lot boundaries. As a result, a *Part V Agreement* under the *Land Use Planning and Approvals Act 1993* will be required to secure hazard management outcomes across property boundaries within the subdivision. This agreement will need to include the proposed *Public Open*

Space lot (Lot 100), which needs to provide hazard management areas for Lots 1, 2, 4 & 5.

To simplify the *Part V Agreement* and to cater for future owners choosing to build at locations other than the *Indicative Building Areas* shown on the *Bushfire Hazard Management Plan* at Attachment A, it is recommended that the agreement apply to all lots, with the general requirement that:

> *"owners agree to manage the entirety of their lot as '*low threat vegetation' *and/or '*non-vegetated land' *(as defined by Clause 2.2.3.2 of AS3959-2009) in order to provide bushfire hazard management areas for dwellings on adjoining lots."*

5.2.3 Establishment and maintenance of Hazard Management Areas

Hazard Management Areas for each stage must be established at the time of development and maintained for the life of the development.

In order to minimise bushfire hazard to existing and future dwellings, *Hazard Management Areas* must be maintained as *low threat vegetation* and/or *non-vegetated land* (as defined by Clause 2.2.3.2 of AS3959-2009). Landscaping choices and the planting of gardens associated with residential occupation and use of the lots must take into account the need to maintain effective *Hazard Management Areas* into the future.

General management guidelines for establishment and maintenance of *Hazard Management Areas* can be found in Schedule 1 of this report and the *Bushfire Hazard Management Plan* at Attachment A.

5.3 Fire-fighting access

The objectives for roads, property access and fire trails within a subdivision are:

- to allow safe access and egress for residents, fire fighters and emergency services personnel;
- to provide access to the bushfire-prone vegetation that allows both property to be defended when under bushfire attack and for hazard management works to be undertaken;
- to provide access to water supplies for fire appliances;
- that design and construction allow for fire appliances to be manoeuvred; and
- that design allows connectivity, and where needed, offers multiple evacuation points.

5.3.1 Code provisions for access

No new roads are proposed as part of the subdivision and only Lots 8 & 9 depend upon property access to access a fire-fighting water point.

The requirements for property access within a subdivision are detailed in E1.6.2 and Table E2 of the Code. The content of Table E2 has been reproduced in Schedule 2 of this report. The acceptable solutions under E1.6.2 A1 require that:

(b) A proposed plan of subdivision showing ... the location of property access to building areas is included in a bushfire hazard management plan that:

(i) *demonstrates ... proposed private accesses will comply with Table E2 ...; and*

(ii) *is certified by the TFS or accredited person.*

5.3.2 Existing and proposed access for fire-fighting

All lots will be provided with at least 6m frontage to Alma Rd, which can provide fire-fighting access for Lots 1-7 & 10-11.

Lots 6-10 will share access from Alma Rd through *Rights of Way*, which are shown as 3.6m wide on the Proposal Plan. *Indicative Property Accesses* to service Lots 8 & 9 are shown on the *Bushfire Hazard Management Plan* at Attachment A. The indicative accesses are 5m wide and approximately 150m long. The 5m width provides demonstrates a corridor compliant with the Code (a 4m wide carriageway, with an additional 0.5m clearance width to either side). The exact length of property accesses will ultimately depend on where future buildings are located within the lots, but accesses will be less than 200m in length.

5.3.3 Compliance – fire-fighting access

Alma Rd is a sealed, Council-maintained road with a formation 7m wide along the frontage to the subject land and is compliant with the Code as a fire-fighting access.

The *Property Access* provisions shown on the *Bushfire Hazard Management Plan* at Attachment A demonstrate that:

- property access for both lots can be appropriately maintained/constructed to provide access for fire-fighting appliances; and
- the proposed lot sizes and configuration can accommodate the required carriageway widths, horizontal clearances and turning areas for access by fire-fighting appliances.

To ensure that compliant property accesses can be provided to Lots 8 & 9, the proposed *Rights of Way* for shared access to Lots 6-10 will need to be expanded from the proposed 3.6m width to a 5m width.

The exact location, alignment and engineering design for property access to Lots 8 & 9 will be detailed as part of any future development applications for construction of buildings. The developers, consultants and contractors must ensure at this time that design and construction of the property accesses complies in all respects with the detailed standards outlined in Schedule 3 of this report.

Note: *if no new hydrants are installed then compliant property access for fire-fighting will also be required to service Lots 5, 7 & 10.*

5.4 Provision of water supplies for fire-fighting purposes

The objective in provision of water supply for fire-fighting purposes is that:

- adequate, accessible and reliable water supply for the purposes of fire-fighting can be demonstrated at the subdivision stage and allow for the protection of life and property associated with the subsequent use and development of bush fire-prone areas.

5.4.1 Code provisions

The development occurs in an area serviced with reticulated water supply and all lots except Lots 8 & 9 can be serviced by existing or proposed hydrants along the frontage to Alma Rd.

The requirements for provision of reticulated water supplies for fire-fighting purposes are detailed in E1.6.3 A1 and Table E4 of the Code. The content of Table E4 has been reproduced in Schedule 4 of this report.

The acceptable solutions under E1.6.3 A1 of the Code require that:

(b) a proposed plan of subdivision showing the location of fire hydrants, and building areas, is included in a bushfire hazard management plan approved by the TFS or accredited person as being compliant with Table E4.

The requirements for provision of static water supplies for fire-fighting purposes are detailed in E1.6.3 A2 and Table E5 of the Code. The content of Table E5 has been reproduced in Schedule 3 of this report. The acceptable solutions under E1.6.3 A2 require that:

(b) the TFS or accredited person certifies that a proposed plan of subdivision demonstrates that a static water supply, dedicated to fire-fighting, will be provided and located compliant with Table E5.

5.4.2 Existing and proposed water supplies for fire-fighting

There are two existing, compliant hydrants along the frontage to Alma Rd and two new hydrants are proposed as part of the development (see Figure 3 and *Bushfire Hazard Management Plan* at Attachment A). These hydrants will provide fire-fighting water supplies to service Lots 1-7 and Lots 10-11.

For the purposes of this report, the establishment of compliant static water supplies dedicated to fire-fighting, in the form of a water tank or tanks, is proposed to service Lots 8 & 9.

5.4.3 Compliance

The *Bushfire Hazard Management Plan* at Attachment A shows the location of existing and proposed hydrants (100mm fire plugs) which can service Lots 1-7 and Lots 10-11. No part of the affected *Indicative Building Areas* or the *Existing Dwelling* is more than 120m hose lay from a hydrant. At the time of construction, the developer, consultants and contractors must ensure that the final location, design and construction of new water hydrants complies in all respects with the detailed standards outlined in Schedule 3 of this report.

The *Indicative Water Tanks for Fire-fighting* and the *Indicative Property Access* provisions shown on the *Bushfire Hazard Management Plan* at Attachment A demonstrate the capacity for Lots 8 & 9 to accommodate static water supplies compliant with the Code.

The actual location and specifications of tanks for fire-fighting to service Lots 8 & 9 will be detailed as part of any future development applications for construction of dwellings. If the developers choose not to locate tanks at the locations shown on the *Bushfire Hazard Management Plan*, they must ensure that the design and installation

of tanks for fire-fighting purposes complies in all respects with the detailed standards outlined in Schedule 4 of this report.

Note: *if no new hydrants are installed then compliant static water supplies for fire-fighting will also be required to service Lots 5, 7 & 10.*

6.0 Conclusions

The *Bushfire Hazard Management Plan* at Attachment A demonstrates the capacity of the subdivision to comply with the Code and AS3959 in respect of *Indicative Building Areas*, *Provision of hazard management areas*, *Public and fire-fighting access* and *Provision of water supply for fire-fighting purposes.* As a result, the *Bushfire Hazard Management Plan* has been certified.

8.0 References

Standards Australia Limited (2009). AS3959-2009 *Construction of buildings in bushfire prone areas* (incorporating amendments 1, 2 & 3). Standards Australia, Sydney.

Standards Australia Limited (2018). AS3959:2018 *Construction of buildings in bushfire prone areas*. Standards Australia, Sydney.

Tasmanian Planning Commission (2017). *Planning Directive No.5.1 – Bushfire prone Areas Code*. Tasmanian Planning Commission, Hobart.

Tasmanian Planning Commission (2019). *Glamorgan Spring Bay Interim Planning Scheme 2015.* Retrieved from iplan: http://www.iplan.tas.gov.au.

The Bushfire Planning Group (2005). *Guidelines for development in bushfire prone areas of Tasmania – Living with fire in Tasmania,* Tasmania Fire Service, Hobart.

Appendix A. Illustrative photos of access & vegetation

Image 1 Existing Dwelling and associated access

Image 2 Proposed access point from Alma Rd for shared access to Lots 6-10 (approximate location of new hydrant at right)

Image 3 Proposed alignment of shared access to Lots 6-10

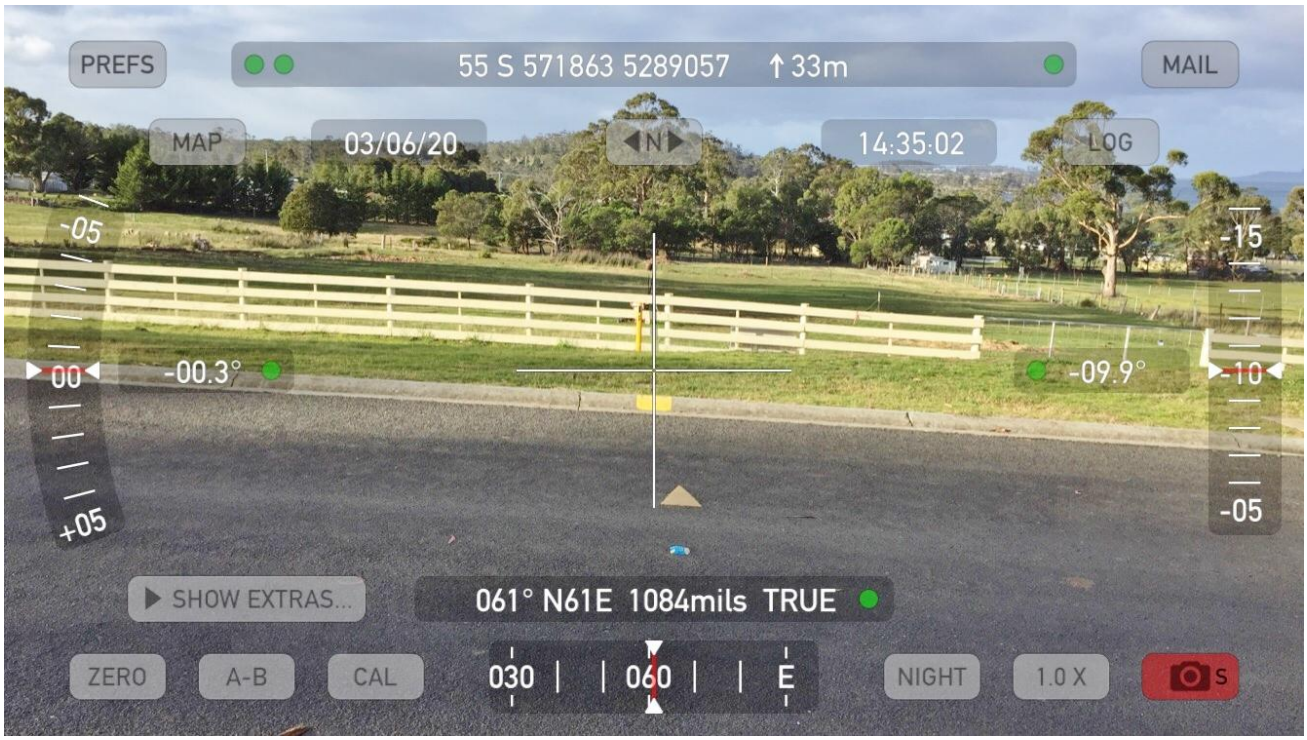


Image 4 Hydrant on frontage to Lot 1 (A)

Image 5 Hydrant on frontage to Lot 1 (B)

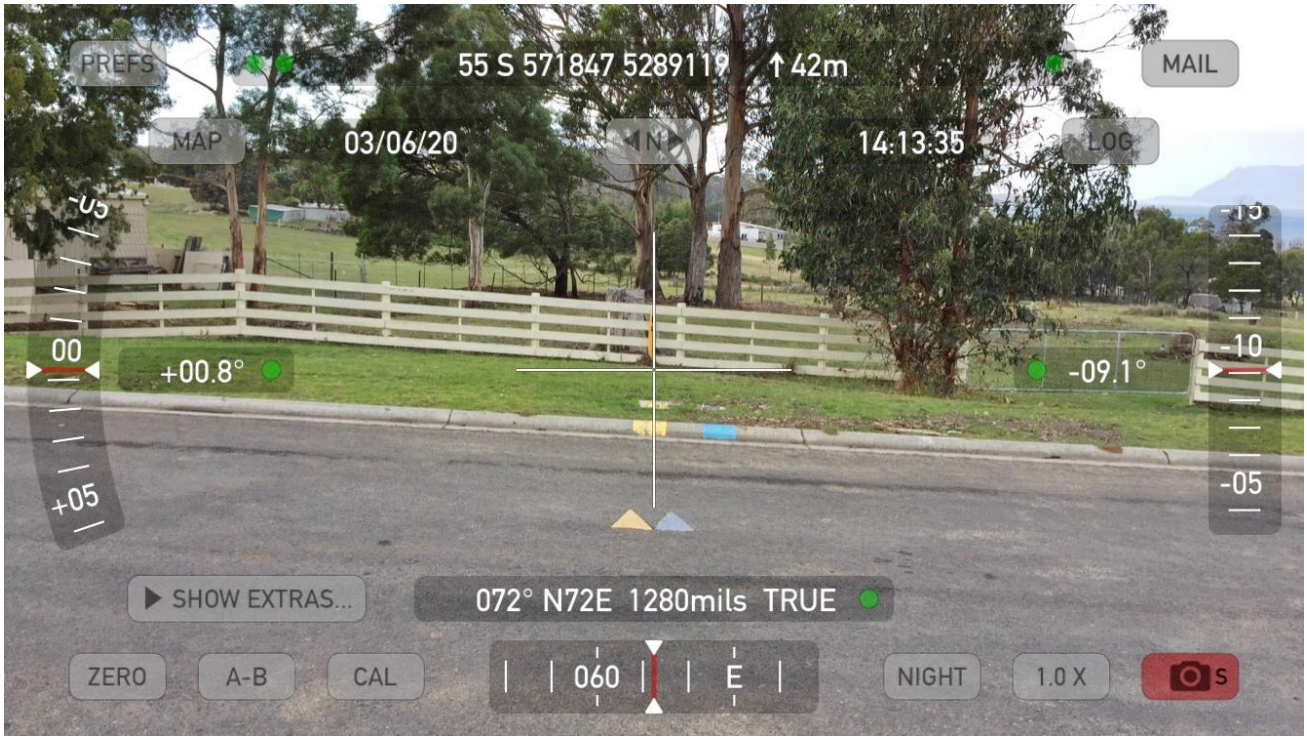


Image 6 Hydrant on frontage to Lot 3 (A)

Image 7 Hydrant on frontage to Lot 3 (B)

Image 8 Image 2 Proposed access point from Alma Rd for shared access to Lots 4 & 5 (approximate location of new hydrant at left)

Image 9 Individual trees within proposed Public Open Space lot (Lot 100)

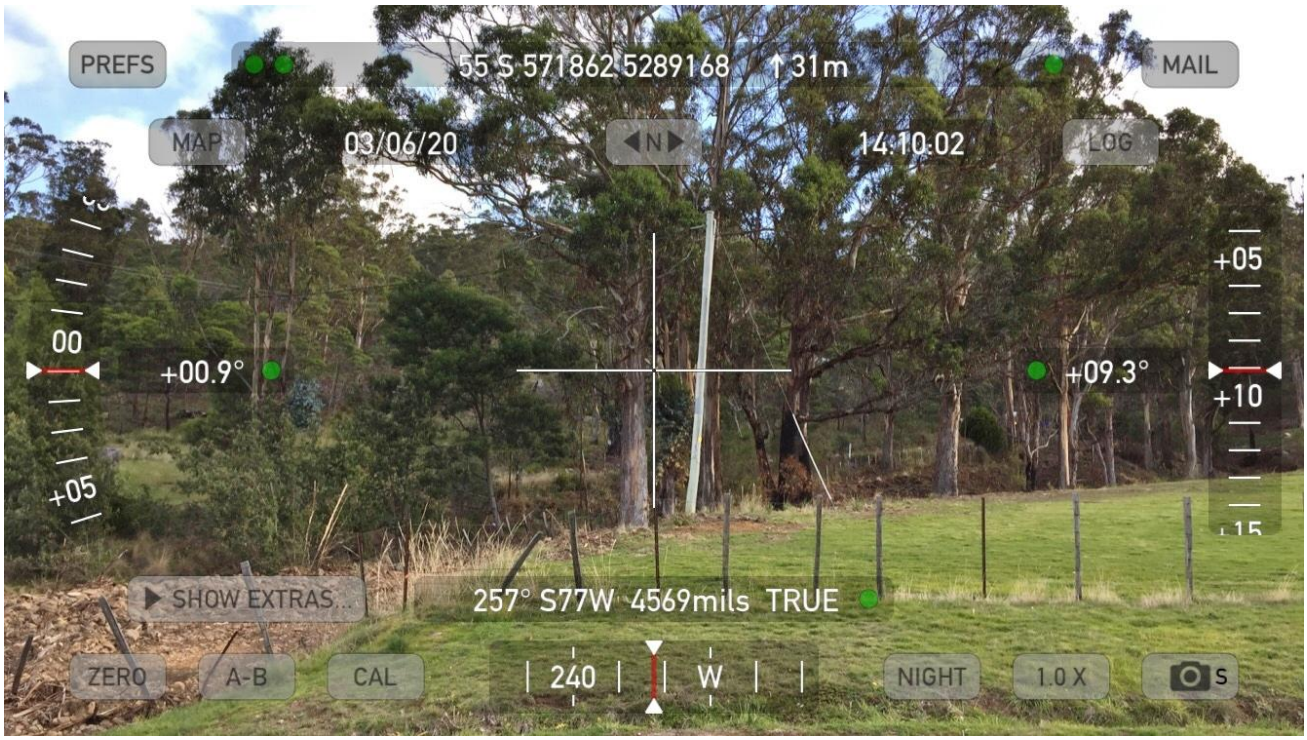


Image 10 Riparian vegetation (A. forest) and pasture (Gi Grassland) west of Alma Rd roughly adjacent to Existing Dwelling

Image 11 Pasture (Gi Grassland) south of Lots 3 & 4

Image 12 Pasture (Gi Grassland) south of Lot 5

Image 13 Pasture (Gi Grassland) east of Lot 5

Image 14 Pasture (Gi Grassland) east of Lot 8

Image 15 Pasture (Gi Grassland) east of Lot 9

Image 16 Pasture (Gi Grassland) north of Lot 9

Image 17 Pasture (Gi Grassland) north of Lots 10& 11

Image 18 Pasture (Gi Grassland) on subject land viewed from northern boundary

Schedule 1. Guidelines for establishment and maintenance of *Hazard Management Areas*

Hazard Management Areas

Where not explicit, the following general advice should be applied to management of both existing vegetation and the design and establishment of new plantings. More detailed advice about the principles and practices involved with bushfire hazard management can be found in *Guidelines for Development in Bushfire-Prone Areas of Tasmania* (Tasmania Fire Service, 2005).

1. An annual inspection and maintenance of *Hazard Management Areas* should be conducted prior to summer or any other identified period of high fire risk.
2. Hazard management does not require the removal of all standing vegetation. Strategically retained or established areas of trees and shrubs can assist in mitigating bushfire risk by acting as an ember screen and wind break, particularly if comprised of relatively low flammability species.
3. To reduce the overall density of vegetation available to fuel a fire and to minimise potential for transmission of fire, areas of trees and shrubs should be thinned or separated to create discontinuous 'clumps' and a minimum 20m separation should be maintained between any retained or planted clumps of vegetation.
4. Flammable vegetation should not be retained or planted directly adjacent to dwellings or in corridors which can form a 'wick' to the vicinity of dwellings.
5. A minimum 2m horizontal separation should be maintained between the canopies of any retained or planted trees and low branches should be removed to create a minimum 2m vertical separation between the tree canopy and underlying shrubs or ground cover.
6. No trees should overhang dwellings and retained or planted trees should ideally be sited a minimum distance of 1.5 times their mature height from dwellings.
7. Grassland, pasture and lawn must be kept short (<100mm) to act as 'low threat vegetation'.
8. Fine fuels such as leaves, bark and twigs should be removed from the ground periodically, particularly leading into summer or any other identified period of high fire risk.
9. Landscaping choices and management of flammable materials in the area immediately adjacent to dwellings is particularly important to minimise bushfire risk, particularly directly adjacent to flammable building elements (eg wooden decks and cladding) and glazed elements (eg windows and sliding glass doors).

   It is recommended that non-combustible elements such as paths, paving and inorganic mulch (eg gravel or pebbles) are employed under and directly adjacent to dwellings and decks, with only minimal planting of relatively low-flammability vegetation (preferably low-growing shrubs and ground-cover).

   Other appropriate landscaping choices in the vicinity of dwellings may include maintained lawn, swimming pools, ornamental gardens comprised of recognised 'low flammability' species, vegetable gardens and orchards.
10. Flammable materials such as stored fuel (including gas cylinders), firewood, building materials and organic mulch (eg wood chips or bark) should not be stored under or directly adjacent to dwellings and decks

Schedule 2. Requirements for property access in the subdivision to comply with *E1.0 Bushfire Prone Areas Code*

Property access for fire-fighting

Property access is required for a fire appliance to access fire-fighting water points on Lots 8 & 9.

All property access required for a fire appliance to access fire-fighting water points will need to meet the following standards to comply with the Code:

(a) all-weather construction;

(b) load capacity of at least 20 tonnes, including for bridges and culverts;

(c) minimum carriageway width of 4 metres;

(d) minimum vertical clearance of 4 metres;

(e) minimum horizontal clearance of 0.5 metres from the edge of the carriageway;

(f) cross falls of less than 3 degrees (1:20 or 5%);

(g) dips less than 7 degrees (1:8 or 12.5%) entry and exit angle;

(h) curves with a minimum inner radius of 10 metres;

(i) maximum gradient of 15 degrees (1:3.5 or 28%) for sealed roads, and 10 degrees (1:5.5 or 18%) for unsealed roads; and

(j) terminate with a turning area for fire appliances provided by one of the following:

  (i) a turning circle with a minimum inner radius of 10 metres;

  (ii) a property access encircling the building; or

  (iii) a hammerhead “T” or “Y” turning head 4 metres wide and 8 metres long.

Because the property access to both lots is greater than 200m in length, they will also require:

(k) passing bays of 2m additional carriageway width and 20m length every 200m.

Schedule 3. Requirements for reticulated water supplies for fire-fighting to comply with *E1.0 Bushfire Prone Areas Code*

Provision of reticulated water supplies for fire-fighting purposes

Two new hydrants are proposed to service the subdivision.

Reticulated water supply servicing the subdivision needs to meet the following standards to comply with the Code.

A. Distance between building area to be protected and water supply

The following requirements apply:

a) the building area to be protected must be located within 120m of a fire hydrant; and

b) the distance must be measured as a hose lay, between the fire fighting water point and the furthest part of the building area.

B. Design criteria for fire hydrants

The following requirements apply:

a) fire hydrant system must be designed and constructed in accordance with *TasWater Supplement to Water Supply Code of Australia WSA 03 – 2011-3.1 MRWA 2nd Edition*; and

b) fire hydrants are not installed in parking areas.

C. Hardstand

A hardstand area for fire appliances must be:

a) no more than 3m from the hydrant, measured as a hose lay;

b) no closer than 6m from the building area to be protected;

c) a minimum width of 3m constructed to the same standard as the carriageway; and

d) connected to the property access by a carriageway equivalent to the standard of the property access.

Schedule 4. Requirements for static water supply for fire-fighting to comply with *E1.0 Bushfire Prone Areas Code*

Provision of static water supplies for fire-fighting purposes

Static water supplies dedicated for fire-fighting purposes are required to service Lots 8 & 9.

All static water supplies for fire-fighting purposes need to meet the following standards to comply with the Code.

A. Distance between building area to be protected and water supply

The following requirements apply:

a) the building area to be protected must be located within 90m of the fire-fighting water point of a static water supply; and

b) the distance must be measured as a hose lay, between the fire-fighting water point and the furthest part of the building area.

B. Static Water Supplies

A static water supply:

a) may have a remotely located off-take connected to the static water supply;

b) may be a supply for combined use (fire-fighting and other uses) but the specified minimum quantity of fire-fighting water must be available at all times;

c) must be a minimum of 10,000l per building area to be protected; this volume of water must not be used for any other purpose including fire-fighting sprinklers and spray systems;

d) must be metal, concrete or lagged by non-combustible materials if above ground; and

e) if a tank can be located so it is shielded in all directions in compliance with section 3.5 of *Australian Standards AA3959-2009 Construction of buildings in bushfire-prone areas*, the tank may be constructed of any material, provided that the lowest 400mm of the tank is protected by:
(i) metal;
(ii) non-combustible material; or
(iii) fibre-cement a minimum of 6mm thickness.

C. Fittings, pipework and accessories (including stands and tank supports)

Fittings and pipework associated with a fire-fighting water point for a static water supply must:

a) have a minimum nominal internal diameter of 50mm;

b) be fitted with a valve with a minimum nominal internal diameter of 50mm;

c) be metal or lagged by non-combustible materials if above ground;

d) if buried, have a minimum depth of 300mm (compliant with *AS/NZS 160-19600.1-2003 clause 5.23*);

e) provide a DIN or NEN standard forged Storz 65mm coupling fitted with a suction washer for connection to fire-fighting equipment;

f) ensure the coupling is accessible and available for connection at all times;

g) ensure the coupling is fitted with a blank cap and securing chain (minimum 220mm length);

h) ensure underground tanks have either an opening at the top of not less than 250mm diameter or a coupling compliant with this Table; and

i) if a remote offtake is installed, ensure the offtake is in a position that is:

(i) visible;

(ii) accessible to allow connection by fire-fighting equipment;

(iii) at a working height of 450-600mm above ground level; and

(iv) protected from possible damage, including damage by vehicles.

D. Signage for static water connections

The fire-fighting water point for a static water supply must be identified by a sign permanently fixed to the exterior of the assembly in a visible location. The sign must:

a) comply with water tank signage requirements within *Australian Standard AS2304-2011 Water storage tanks for fire protection systems*; or

b) comply with the Tasmania Fire Service Guideline:

(i) marked with the letter 'W' contained within a circle, with the letter in upper case and not less than 100mmm in height;

(ii) marked in fade-resistant material with white reflective lettering and circle on a red background;

(iii) located within 1m of the water connection point in a situation which will not impede access or operation; and

(iv) no less than 400mm above ground.

E. Hardstand

A hardstand area for fire appliances must be:

a) no more than 3m from the fire-fighting water point, measured as a hose lay (including the minimum water level in dams, swimming pools and the like);

b) no closer than 6m from the building area to be protected;

c) a minimum width of 3m constructed to the same standard as the carriageway; and

d) connected to the property access by a carriageway equivalent to the standard of the property access.

ATTACHMENT A. *Bushfire Hazard Management Plan*

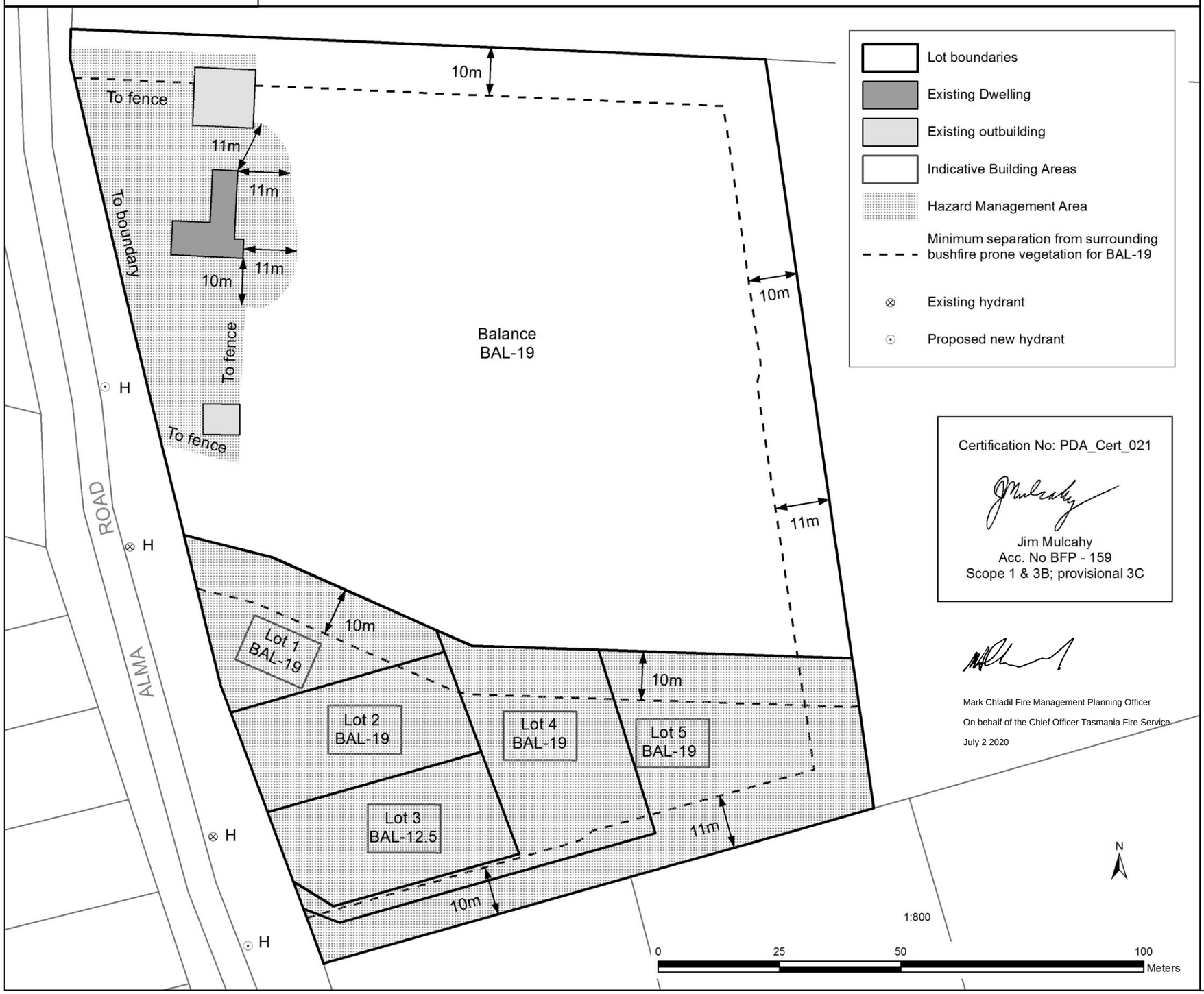
Address: 66 Alma Rd Orford
Title(s): FR 35054/1
Scheme: Glamorgan Spring Bay Interim Planning Scheme 2015

BUSHFIRE HAZARD MANAGEMENT PLAN STAGE 1

PDA Surveyors Incorporating WALTER SURVEYS
Surveying, Engineering & Planning
ABN 71 217 806 325

Date: 30 June 2020
PDA Reference: 45593CT
Map Reference: 45593CT_BHMP_A_v2

This plan has been prepared for the purpose of obtaining subdivision approval from Glamorgan Spring Bay Council. It should be read in conjunction with 45593CT_Bushfire Hazard Report_v2 (PDA, 30 June 2020). All relevant consultants and contractors should be provided with a full A3 copy of this plan. Dimensions and areas are subject to final survey. Some details are indicative only to demonstrate the capacity for compliance.



Certification No: PDA_Cert_021

Jim Mulcahy
Acc. No BFP - 159
Scope 1 & 3B; provisional 3C

Mark Chladil Fire Management Planning Officer
On behalf of the Chief Officer Tasmania Fire Service
July 2 2020

1. Hazard Management Areas

a. Hazard Management Areas must be established at the time of development and maintained as 'low threat vegetation' and/ or 'non- vegetated land' (as defined by Clause 2.2.3.2 of AS3959-2009) for the life of the development.

b. A Part V Agreement under the Land Use Planning and Approvals Act 1993 will be required to secure hazard management outcomes across lot boundaries within the subdivision.

c. No trees should overhang dwellings and retained or planted trees should ideally be sited a minimum distance of 1.5 times their mature height away from buildings.

d. Trees and shrubs should be thinned or separated to create discontinuous 'clumps' and a minimum 20m separation should be maintained between retained or planted clumps.

e. A minimum 2m horizontal separation should be maintained between the canopies of any retained or planted trees and low branches should be removed to create a minimum 2m vertical separation between the tree canopy and underlying shrubs or ground cover.

f. Grassland, pasture & lawn must be kept short (<100mm).

g. Fine fuels such as leaves, bark and twigs should be removed from the ground periodically, particularly leading into summer or any other identified period of high fire risk.

h. Flammable vegetation should not be retained or planted under or directly adjacent to dwellings (particularly decks, flammable cladding and glazed elements) or in corridors which can act as a 'wick' to channel fire to dwellings.

i. Flammable materials such as firewood, building materials, organic mulch and fuel should not be stored under decks or dwellings nor directly adjacent to dwellings.

2. Fire-fighting Access

a. Alma Rd is compliant with the provisions of Table E1 of the Bushfire Prone Areas Code of the Planning Scheme (the Code).

b. No new road is proposed and property access is not required to access a fire-fighting water point.

Note: if no new hydrants are installed, a compliant property access for fire-fighting will be required to service Lot 5.

3. Water Supplies for Fire-fighting

a. Reticulated water supply is available to the site.

b. This plan shows existing compliant hydrants and proposed new hydrants along the frontage to Alma Rd.

c. No part of the Indicative Building Areas for Lots 1-5 or the Existing Dwelling on the Balance is more than 120m hose lay from a hydrant.

c. At the time of installation, proposed new hydrants must comply with E1.6.3 & Table E4 of the Code.

Note: if no new hydrants are installed, a compliant static water supply for fire-fighting will be required to service Lot 5.

4. Construction of future dwellings

a. This plan only certifies that future dwellings constructed within Indicative Building Areas can achieve the separation distances required to allow construction to BAL-19 or BAL-12.5

b. Dwellings constructed to BAL-19 may be constructed outside Indicative Building Areas provided minimum separation distances for BAL-19 are maintained.

ATTACHMENT A. *Bushfire Hazard Management Plan*

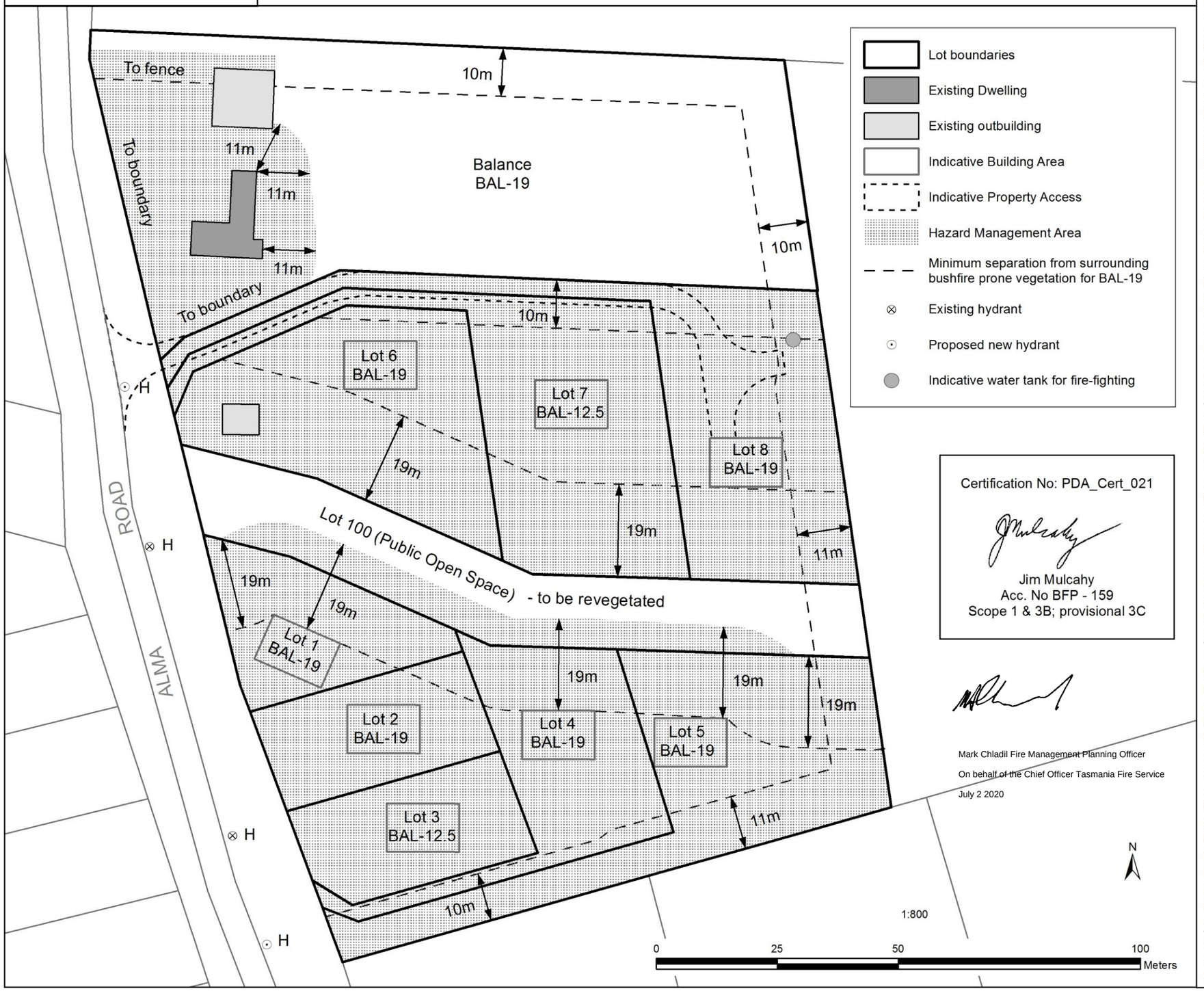
Address: 66 Alma Rd Orford
Title(s): FR 35054/1
Scheme: Glamorgan Spring Bay Interim Planning Scheme 2015

BUSHFIRE HAZARD MANAGEMENT PLAN STAGE 2

PDA Surveyors Incorporating WALTER SURVEYS
Surveying, Engineering & Planning
ABN 71 217 806 325

Date: 30 June 2020
PDA Reference: 45593CT
Map Reference: 45593CT_BHMP_B_v2

This plan has been prepared for the purpose of obtaining subdivision approval from Glamorgan Spring Bay Council. It should be read in conjunction with 45593CT_Bushfire Hazard Report_v2 (PDA, 30 June 2020). All relevant consultants and contractors should be provided with a full A3 copy of this plan. Dimensions and areas are subject to final survey. Some details are indicative only to demonstrate the capacity for compliance.



Certification No: PDA_Cert_021

Jim Mulcahy
Acc. No BFP - 159
Scope 1 & 3B; provisional 3C

Mark Chladil Fire Management Planning Officer
On behalf of the Chief Officer Tasmania Fire Service
July 2 2020

1. Hazard Management Areas

a. Hazard Management Areas must be established at the time of development and maintained as 'low threat vegetation' and/ or 'non- vegetated land' (as defined by Clause 2.2.3.2 of AS3959-2009) for the life of the development.

b. A Part V Agreement under the Land Use Planning and Approvals Act 1993 will be required to secure hazard management outcomes across lot boundaries within the subdivision.

c. No trees should overhang dwellings and retained or planted trees should ideally be sited a minimum distance of 1.5 times their mature height away from buildings.

d. Trees and shrubs should be thinned or separated to create discontinuous 'clumps' and a minimum 20m separation should be maintained between retained or planted clumps.

e. A minimum 2m horizontal separation should be maintained between the canopies of any retained or planted trees and low branches should be removed to create a minimum 2m vertical separation between the tree canopy and underlying shrubs or ground cover.

f. Grassland, pasture & lawn must be kept short (<100mm).

g. Fine fuels such as leaves, bark and twigs should be removed from the ground periodically, particularly leading into summer or any other identified period of high fire risk.

h. Flammable vegetation should not be retained or planted under or directly adjacent to dwellings (particularly decks, flammable cladding and glazed elements) or in corridors which can act as a 'wick' to channel fire to dwellings.

i. Flammable materials such as firewood, building materials, organic mulch and fuel should not be stored under decks or dwellings nor directly adjacent to dwellings.

2. Fire-fighting Access

a. Alma Rd is compliant with the provisions of Table E1 of the Bushfire Prone Areas Code of the Planning Scheme (the Code).

b. Property access is only required to access a fire-fighting water point on Lot 8.

c. This plan shows a compliant 'Indicative Property Access' to service Lot 8 which is 5m wide & approximately 150m long.

d. The plan shows a compliant turning head which provides a hardstand within 3m of the 'Indicative Water Tank for Fire-Fighting' and more than 6m from the 'Indicative Building Area'.

e. At the time of construction, property access must comply with E1.6.2 & Table E2 of the Code.

Note: if no new hydrants are installed, compliant property access for fire-fighting will also be required to service Lots 5 & 7.

3. Water Supplies for Fire-fighting

a. Reticulated water supply is available to the site.

b. This plan shows existing compliant hydrants and proposed new hydrants along the frontage to Alma Rd.

c. No part of the Indicative Building Areas for Lots 1-7 or the Existing Dwelling on the Balance is more than 120m hose lay from a hydrant.

d. At the time of installation, proposed new hydrants must comply with E1.6.3 & Table E4 of the Code.

e. This plan shows an Indicative Water Tank for Fire-fighting to service Lot 8 which is located within 3m of a hardstand and within 90m hose-lay of the furthest part of the Indicative Building Area.

f. At the time of installation, static water supplies for fire-fighting must comply with E1.6.3 & Table E5 of the Code.

Note: if no new hydrants are installed, compliant water tanks for fire-fighting will also be required to service Lots 5 & 7.

4. Construction of future dwellings

a. This plan only certifies that future dwellings constructed within Indicative Building Areas can achieve the separation distances required to allow construction to BAL-19 or BAL-12.5.

ATTACHMENT A. *Bushfire Hazard Management Plan*

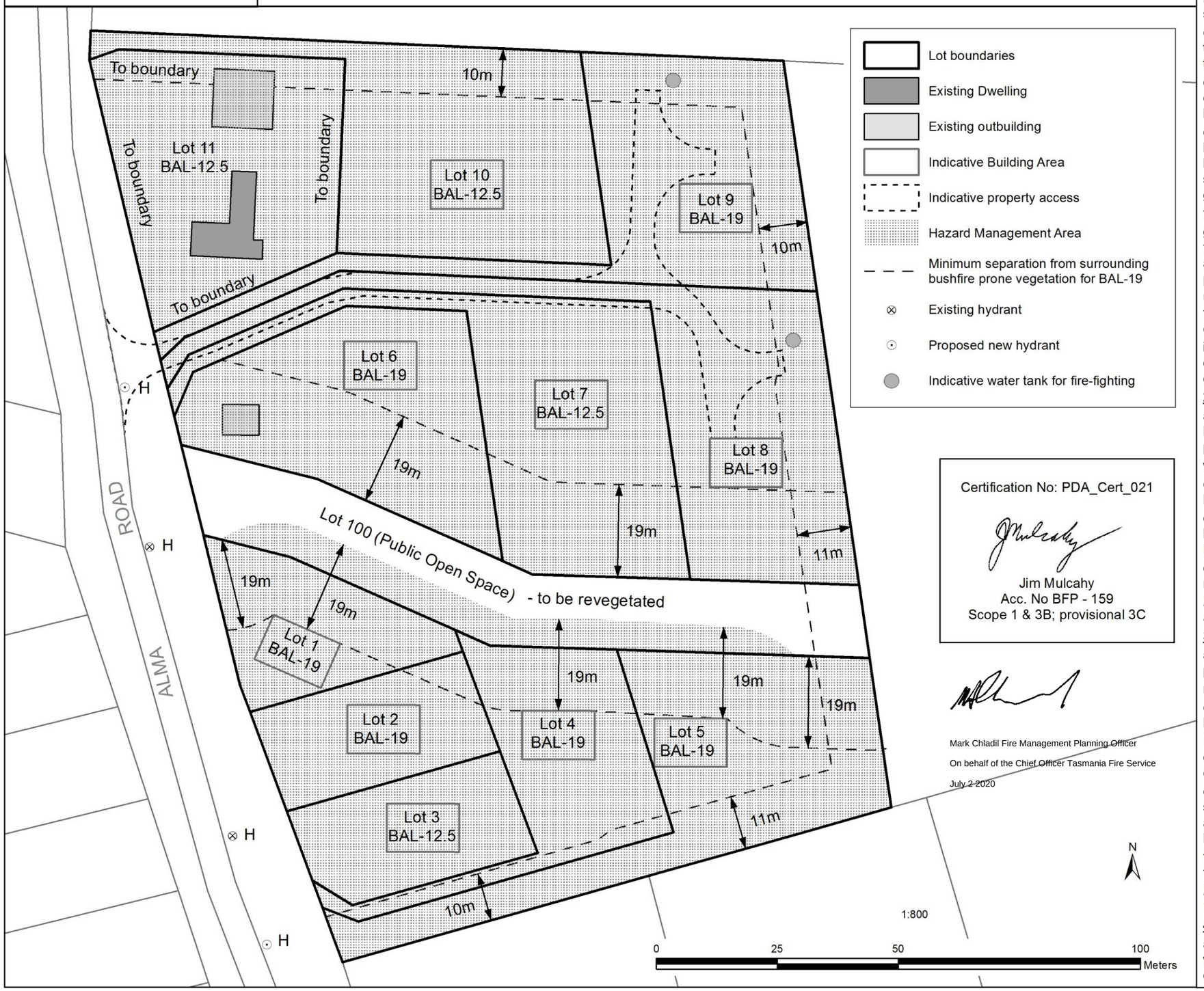
Address: 66 Alma Rd Orford
Title(s): FR 35054/1
Scheme: Glamorgan Spring Bay Interim Planning Scheme 2015

BUSHFIRE HAZARD MANAGEMENT PLAN STAGE 3

PDA Surveyors Incorporating WALTER SURVEYS
Surveying, Engineering & Planning
ABN 71 217 806 325

Date: 30 June 2020
PDA Reference: 45593CT
Map Reference: 45593CT_BHMP_C_v2

This plan has been prepared for the purpose of obtaining subdivision approval from Glamorgan Spring Bay Council. It should be read in conjunction with 45593CT_Bushfire Hazard Report_v2 (PDA, 30 June 2020). All relevant consultants and contractors should be provided with a full A3 copy of this plan. Dimensions and areas are subject to final survey. Some details are indicative only to demonstrate the capacity for compliance.



- Lot boundaries
- Existing Dwelling
- Existing outbuilding
- Indicative Building Area
- Indicative property access
- Hazard Management Area
- Minimum separation from surrounding bushfire prone vegetation for BAL-19
- Existing hydrant
- Proposed new hydrant
- Indicative water tank for fire-fighting

Certification No: PDA_Cert_021

Jim Mulcahy
Acc. No BFP - 159
Scope 1 & 3B; provisional 3C

Mark Chladil Fire Management Planning Officer
On behalf of the Chief Officer Tasmania Fire Service
July 2 2020

1. Hazard Management Areas

a. Hazard Management Areas must be established at the time of development and maintained as 'low threat vegetation' and/ or 'non- vegetated land' (as defined by Clause 2.2.3.2 of AS3959-2009) for the life of the development.

b. A Part V Agreement under the Land Use Planning and Approvals Act 1993 will be required to secure hazard management outcomes across lot boundaries within the subdivision.

c. No trees should overhang dwellings and retained or planted trees should ideally be sited a minimum distance of 1.5 times their mature height away from buildings.

d. Trees and shrubs should be thinned or separated to create discontinuous 'clumps' and a minimum 20m separation should be maintained between retained or planted clumps.

e. A minimum 2m horizontal separation should be maintained between the canopies of any retained or planted trees and low branches should be removed to create a minimum 2m vertical separation between the tree canopy and underlying shrubs or ground cover.

f. Grassland, pasture & lawn must be kept short (<100mm).

g. Fine fuels such as leaves, bark and twigs should be removed from the ground periodically, particularly leading into summer or any other identified period of high fire risk.

h. Flammable vegetation should not be retained or planted under or directly adjacent to dwellings (particularly decks, flammable cladding and glazed elements) or in corridors which can act as a 'wick' to channel fire to dwellings.

i. Flammable materials such as firewood, building materials, organic mulch and fuel should not be stored under decks or dwellings nor directly adjacent to dwellings.

2. Fire-fighting Access

a. Alma Rd is compliant with the provisions of Table E1 of the Bushfire Prone Areas Code of the Planning Scheme (the Code).

b. Property access is only required to access a fire-fighting water point on Lots 8 & 9.

c. This plan shows compliant 'Indicative Property Access' for Lots 8 & 9 which is 5m wide & approximately 150m long.

d. The plan shows compliant turning heads which provide hardstands within 3m of the 'Indicative Water Tanks for Fire-Fighting' and more than 6m from the 'Indicative Building Areas'.

e. At the time of construction, property access to Lots 8 & 9 must comply with E1.6.2 & Table E2 of the Code.

Note: if no new hydrants are installed, compliant property access will also be required to service Lots 5, 7 & 10.

3. Water Supplies for Fire-fighting

a. Reticulated water supply is available to the site.

b. This plan shows existing compliant hydrants and proposed new hydrants along the frontage to Alma Rd.

c. No part of the Indicative Building Areas for Lots 1-7 and Lot 10 & no part of the Existing Dwelling on Lot 11 is more than 120m hose lay from a hydrant.

d. At the time of installation, proposed new hydrants must comply with E1.6.3 & Table E4 of the Code.

e. This plan shows Indicative Water Tanks for Fire-fighting to service Lots 8 & 9 which are located within 3m of hardstands and within 90m hose-lay of the furthest parts of the Indicative Building Areas.

f. At the time of installation, static water supplies for fire-fighting must comply with E1.6.3 & Table E5 of the Code.

Note: if no new hydrants are installed, compliant water tanks will also be required to service Lots 5, 7 & 10.

4. Construction of future dwellings

a. This plan only certifies that future dwellings constructed within Indicative Building Areas can achieve the separation distances required to allow construction to BAL-19 or BAL 12.5.

BUSHFIRE-PRONE AREAS CODE

CERTIFICATE[1] UNDER S51(2)(d) *LAND USE PLANNING AND APPROVALS ACT 1993*

1. Land to which certificate applies[2]

Land that is the Use or Development Site that is relied upon for bushfire hazard management or protection.

Name of planning scheme or instrument:	Glamorgan Spring Bay Interim Planning Scheme 2015
Street address:	66 Alma Rd Orford 7150
Certificate of Title / PID:	FR 35054/1

Land that is not the Use or Development Site that is relied upon for bushfire hazard management or protection.

Street address:	
Certificate of Title / PID:	

2. Proposed Use or Development

Description of Use or Development:

Eleven lot staged sub-division

Code Clauses:

- ❑ **E1.4 Exempt Development**
- ❑ **E1.5.1 Vulnerable Use**
- ❑ **E1.5.2 Hazardous Use**
- ☒ **E1.6.1 Subdivision**

[1] This document is the approved form of certification for this purpose, and must not be altered from its original form.

[2] If the certificate relates to bushfire management or protection measures that rely on land that is not in the same lot as the site for the use or development described, the details of all of the applicable land must be provided.

3. Documents relied upon

Documents, Plans and/or Specifications

Title:	PLAN OF SUBDIVISION (Nick Griggs & Co. File No. 375713)		
Author:	Nick Griggs & Co		
Date:	2 June 2020	**Version:**	-

Bushfire Hazard Report

Title:	45593CT _Bushfire Hazard Report_v2		
Author:	Jim Mulcahy		
Date:	30 June 2020	**Version:**	2

Bushfire Hazard Management Plan

Title:	45593CT_BHMP_A_v2; 45593CT_BHMP_B_v2; 45593CT_BHMP_C_v2		
Author:	Jim Mulcahy		
Date:	30 June 2020	**Version:**	2

Other Documents

Title:			
Author:			
Date:		**Version:**	

4. Nature of Certificate[3]

❑	**E1.4 – Use or development exempt from this code**		
	Assessment Criteria	**Compliance Requirement**	**Reference to Applicable Document(s)**
❑	E1.4 (a)	Insufficient increase in risk	

❑	**E1.5.1 – Vulnerable Uses**		
	Assessment Criteria	**Compliance Requirement**	**Reference to Applicable Document(s)**
❑	E1.5.1 P1	Residual risk is tolerable	
❑	E1.5.1 A2	Emergency management strategy	
❑	E1.5.1 A3	Bushfire hazard management plan	

❑	**E1.5.2 – Hazardous Uses**		
	Assessment Criteria	**Compliance Requirement**	**Reference to Applicable Document(s)**
❑	E1.5.2 P1	Residual risk is tolerable	
❑	E1.5.2 A2	Emergency management strategy	
❑	E1.5.2 A3	Bushfire hazard management plan	

☒	**E1.6 – Development standards for subdivision**		
	E1.6.1 Subdivision: Provision of hazard management areas		
	Assessment Criteria	**Compliance Requirement**	**Reference to Applicable Document(s)**
❑	E1.6.1 P1	Hazard Management Areas are sufficient to achieve tolerable risk	
❑	E1.6.1 A1 (a)	Insufficient increase in risk	
☒	E1.6.1 A1 (b)	Provides BAL 19 or BAL 12.5 for all lots	45593CT_Bushfire Hazard Report_v2 45593CT_BHMP_A_v2 45593CT_BHMP_B_v2 45593CT_BHMP_C_v2

❑	E1.6.1 A1 (c)	Consent for Part 5 Agreement	

	E1.6.2 Subdivision: Public and fire-fighting access		
	Assessment Criteria	**Compliance Requirement**	**Reference to Applicable Document(s)**
❑	E1.6.2 P1	Access is sufficient to mitigate risk	
❑	E1.6.2 A1 (a)	Insufficient increase in risk	
☒	E1.6.2 A1 (b)	Access complies with Tables E1, E2 & E3	45593CT_Bushfire Hazard Report_v2 45593CT_BHMP_A_v2 45593CT_BHMP_B_v2 45593CT_BHMP_C_v2

	E1.6.3 Subdivision: Provision of water supply for fire-fighting purposes		
	Assessment Criteria	**Compliance Requirement**	**Reference to Applicable Document(s)**
❑	E1.6.3 A1 (a)	Insufficient increase in risk	
☒	E1.6.3 A1 (b)	Reticulated water supply complies with Table E4	45593CT_Bushfire Hazard Report_v2 45593CT_BHMP_A_v2 45593CT_BHMP_B_v2 45593CT_BHMP_C_v2
❑	E1.6.3 A1 (c)	Water supply consistent with the objective	
❑	E1.6.3 A2 (a)	Insufficient increase in risk	
☒	E1.6.3 A2 (b)	Static water supply complies with Table E5	45593CT_Bushfire Hazard Report_v2 45593CT_BHMP_A_v2 45593CT_BHMP_B_v2 45593CT_BHMP_C_v2
❑	E1.6.3 A2 (c)	Static water supply is consistent with the objective	

5. Bushfire Hazard Practitioner[4]

Name:	Jim Mulcahy	**Phone No:**	6234 3217
Address:	PDA Surveyors	**Fax No:**	
	127 Bathurst St	**Email Address:**	Jim.Mulcahy@pda.com.au
	Hobart 7000		
Accreditation No:	BFP – 159	**Scope:**	1 and 3B; provisional 3C

6. Certification

I, certify that in accordance with the authority given under Part 4A of the Fire Service Act 1979 –

The use or development described in this certificate is exempt from application of Code E1 – Bushfire-Prone Areas in accordance with Clause E1.4 (a) because there is an insufficient increase in risk to the use or development from bushfire to warrant any specific bushfire protection measure in order to be consistent with the objectives for all the applicable standards identified in Section 4 of this Certificate.	❑

or

There is an insufficient increase in risk from bushfire to warrant the provision of specific measures for bushfire hazard management and/or bushfire protection in order for the use or development described to be consistent with the objective for each of the applicable standards identified in Section 4 of this Certificate.	❑

and/or

The Bushfire Hazard Management Plan/s identified in Section 4 of this certificate is/are in accordance with the Chief Officer's requirements and can deliver an outcome for the use or development described that is consistent with the objective and the relevant compliance test for each of the applicable standards identified in Section 4 of this Certificate.	☒

Signed: *certifier*

Date: 30 June 2020 **Certificate No:** PDA_Cert_021

Mark Chladil Fire Management Planning Officer

On behalf of the Chief Officer Tasmania Fire Service

July 2 2020

[4] A Bushfire Hazard Practitioner is a person accredited by the Chief Officer of the Tasmania Fire Service under Part IVA of *Fire Service Act 1979.* The list of practitioners and scope of work is found at www.fire.tas.gov.au.

ROSS CUMMING ENGINEERING

ABN 30 619 277 446
32 SUMMERHILL ROAD
WEST HOBART
TASMANIA 7000
grc@netspace.net.au
PHONE: 0407 870 015
(0362 345 398)
REF: Alma Rd REV 2
DATE: 27 JULY 2020
ISSUE: REVISION 3

THE GENERAL MANAGER
GLAMORGAN SPRING BAY COUNCIL
PO BOX 6
TRIABUNNA TAS 7190

ATTENTION: Council Planner

66 ALMA ROAD, ORFORD SUBDIVISION APPLICATION SA 2020/009 STORMWATER MANAGEMENT DESIGN REPORT

1. INTRODUCTION

Ross Cumming Engineering (RCE) undertook preliminary design of the subdivision services layout including stormwater management for AMNS Pty Ltd. The subdivision comprises 11 lots all accessed from Alma Road. This report summarizes the design of stormwater aspects at the Permit application stage of the project.

The reference drawing for the proposed layout was the Plan of Subdivision prepared by surveyor Nick Griggs & Co. File No. 375713 dated 24/07/2020. This has been annotated to show proposed services including stormwater management features. A copy of this plan is included in this report as Attachment A.

2. EXISTING STORMWATER ARRANGEMENT

The proposed subdivision is approximately 2.4Ha in area and is contained within a 100Ha hillside catchment that terminates approximately 700m further downstream at the Tasman Highway at Raspins Beach.

The lower point of the 2.4Ha subdivision catchment is contained within a 30Ha catchment that extends upstream into the steep hills to the west.

The catchment includes a single ephemeral creek that passes through the property from east to west for an overall length of approximately 150m. It is a well-defined channel through the uppermost 80m of the proposed subdivision but is undefined in the lower 70m where it has likely been filled in in the past. The stormwater catchment plan is attached to this report as Attachment B.

The creek profile for the 80m uppermost section was for many years typically, approximately 700mm deep, 1.2m wide at the surface and with a floor width of 600mm. That profile indicates a full flow capacity of the channel of approximately 2.5 to 3.0 cumec.

Recently, on 02/04/2020 during a major storm event the profile on the historical alignment was in part, for the 80m uppermost section, severely eroded from a depth of 700mm to a depth of 1.5m and an overall width of 1.7m. The storm event transported rocks and sand from the upper section of the creek channel and deposited the debris at the lower section of the creek where there was no existing formed channel. The channel erosion also severely undercut two large eucalypt trees that were growing at the edge of the channel, making them a potential safety hazard.

The flow from the storm event can be estimated from the channel characteristics to have been between 4 and 7 cumec. A copy of the channel capacity calculations is included as Attachment C.

There are no nearby piped Council stormwater systems other than the existing piped culvert with a 750mm diameter pipe where it crosses Alma Road to the west of the proposed subdivision.

3. PROPOSED LOT ACCESSES & STORMWATER CONTROL

3.1 ACCESSES

The subdivision proposes 11 lots varying between 1,000m2 and 2,496m2 in area. Lots would be accessed off Alma Road with no new public roads. Five lots are to the south of the creek and six lots are to the north of the creek.

There are two internal lots to the south of the creek and four internal lots to the north of the creek each with combined private ROW access arrangements.

The combined accesses can drain via swale drains, then by piped discharge into the creek channel.

3.2 STORMWATER

The proposal for control of stormwater is as follows:

1) The creek channel profile is to be formalized as a trapezoidal rock-lined channel with a depth of 1.2m, a floor width of 3m and a maximum top width at natural ground surface level of 7.8m. This cross-section will provide flow capacity of 9m3/sec at a flow depth of 550mm with 650mm vertical (1.35m horizontal) freeboard that can be grassed and vegetated.
2) Lots and driveways are to be provided with a DN150 to DN300mm piped connections for at least the AEP 5% storm event and there will be two DN225/300 outfalls to a 27m3 detention pond incorporated into the new creek channel.
3) The on-stream detention storage/infiltration pond will be created by increasing the channel from 7.8m to 11.8m wide over a distance of 10m. The detention volume will be created by shallowing the channel depth from 1.2m to 900mm over a distance of 6m and this will create a detention volume of between 27m3 at spill depth and up to 46m3 during discharge. Surface area will be approx. 100m2.
4) The nature of the ground at the creek is compacted dolerite rock wash bound in a sandy/silty fine-grained matrix. This has medium to high permeability (20mm to 50mm/hr) and will facilitate infiltration of detention runoff from the ponds and achieve WSUD principles. The ponds will function as infiltration basins for low level flows less than AEP20% (Q5) that don't spill due to the medium/high permeability.

5) Two lots will discharge directly to the new channel upstream from the detention storage.

The channel design is preliminary only to provide a workable concept design. The final design will consider ways to reduce the channel depth and width whilst maintaining public safety, provision for in excess of recently occurring flood flows and for ease of Council ongoing maintenance.

By adopting the above approach to stormwater control and because the area modified by the subdivision only amounts to 2.4Ha of the total 30Ha upstream catchment and the provision of detention storage there will be no change to the peak runoff flows from this catchment.

4. HYDROLOGY & STORMWATER DRAINAGE DESIGN

4.1 General

Design is in accordance with Australian Rainfall & Runoff (ARR) procedures with rainfall data extracted from BOM in accordance with latest 2016 data. Attachment D shows the Intensity/Frequency /Duration (IFD) data from BOM applicable to this stormwater catchment.

Analysis of the catchment was undertaken to determine peak storm flows for design of:

(a) The creek system based on providing a formalised rock-lined channel for the AEP1% (plus allowance for climate change) for the "through-flow" from the upstream catchment. This system has a peak flow arising from an approximate 30minute rainfall event and there is no change to the creek runoff due to the creation of the subdivision.

(b) The reticulated local system based on providing piped control of flood flows at the Annual Exceedance Probability (AEP) 5% level (ie the 1 in 20 year probability) and attenuation of flows by the provision of a detention pond within the creek channel. This system has peak flows arising from an approximate 10minute rainfall event and any increase in peak flow is reduced back to pre-development levels by the action of the detention ponds.

Note that the creek channel is not necessarily in flood when the peak flow for condition (b) occurs. If it is not in flood then the detention pond functions to attenuate the peak runoff in the channel for the short period local catchment flood event (10minute event).

If the creek is in flood then the detention pond still provides some limited benefit for the longer term 30 minute total catchment event.

The total catchment of the subdivision to the lowest, eastern boundary including the upstream area of the hillside above it to the west, is approximately 30ha.

Attachment E shows the calculation summary for the peak design flows for the catchment. The AEP 5% design flow is estimated at 2.9cumec and the AEP 1% at 4.5cumec. This is before any additional allowance is made for the future effects of climate change.

4.2 Drainage System Main Creek Channel & Detention storage

The main creek channel is designed as a trapezoidal rock lined channel with 120mm graded rock lining. Side slopes are 1V:2H with a total channel depth of 1.2m. This results in a channel width at the surface of 7.8m (say 8m). Attachment F shows the channel capacity chart.

At the calculated 1% AEP flood flow of 4.5cumec the 8m wide channel will flow at a depth of 350mm. With an allowance of +33% for future climate change (ie. 6cumec) the flow depth will be 400mm. The capacity of the channel at 600mm depth is 12cumec. This provides ample allowance for climate change increase and will provide full control in a repeat of the recent flood event estimated at between 4 & 7cumec. Where the channel reduces in depth to 900mm to provide detention storage, the extra width of the channel (12m) will maintain the capacity for the above flood flows.

Widening of the channel to 12m will require the removal of the four large eucalypt trees located along the creek line. As mentioned in Sect 2, two of these trees will need removal, irrespective of the proposed subdivision and there is an opportunity to replant selected species adjacent to and clear of the proposed new creek channel. Selected species would also enhance the detention pond area and vegetation can also be established on the upper 600mm (vertical) of the channel side embankments.

The flow into the subdivision comes from the outfall of the existing DN750mm culvert under Alma Road at Fieldwick Lane. Observations by the writer of inlet flow conditions and blockage during the flood event of 02 April 2020 indicated that improvements can be made to the inlet channel(s) to improve the entrance conditions to the culvert and reduce the flooding over Alma Road. With improvements, the existing culvert has the capacity to convey an AEP 5% (Q20) flood without overflow. It is noted that the hierarchy of Alma Rd would not normally require a flood capacity of more that AEP 5% (Q20) as it would for instance, Tasman Highway where DSG warrants would be for AEP 1% (Q100) capacity. The flooding on 2 April demonstrated that the flow flooding over Alma Road re-converged rapidly at the main channel in the proposed subdivision. Some rock armouring work is required at the D/S culvert end-wall in Alma Road to preserve and support the integrity of the edge of the road formation.

4.3 Roof and Lot Access Drainage

To prevent local flash flooding due to peak storm runoff from roofs and accesses of individual houses it is proposed to reticulate these two local catchments within the subdivision.

There are 6 lots on the northern side of the creek and 5 lots on the southern side – each side will have separate reticulation pipes discharging to the detention pond. AEP 5% flow is 110L/sec. and AEP 1% is 164L/sec. The detention pond will attenuate these flows to 45L/sec and 78L/sec respectively.

For the undeveloped (comparison) catchment the AEP 5% flow is 41L/sec and the AEP 1% flow is 61L/sec.

Attachment G shows the calculation summary for the peak design flows for the 11 lots and Attachment H shows the calculation summary for the detention storage provided.

5. WATER SENSITIVE URBAN DESIGN (WSUD)

WSUD elements included in the design for this this subdivision are:

- Swale drains to collect runoff from lot accesses and avoid flow concentration and to allow for infiltration and groundwater re-charge
- Rock floored channel & detention pond allowing for silt collection, detention and groundwater re-charge.

Assessment of the WSUD effectiveness using MUSIC software indicates that performance exceeds the requirements of the Tasmania State Stormwater Strategy. A summary of the WSUD modeling showing the effectiveness of the treatment is included under Attachment I.

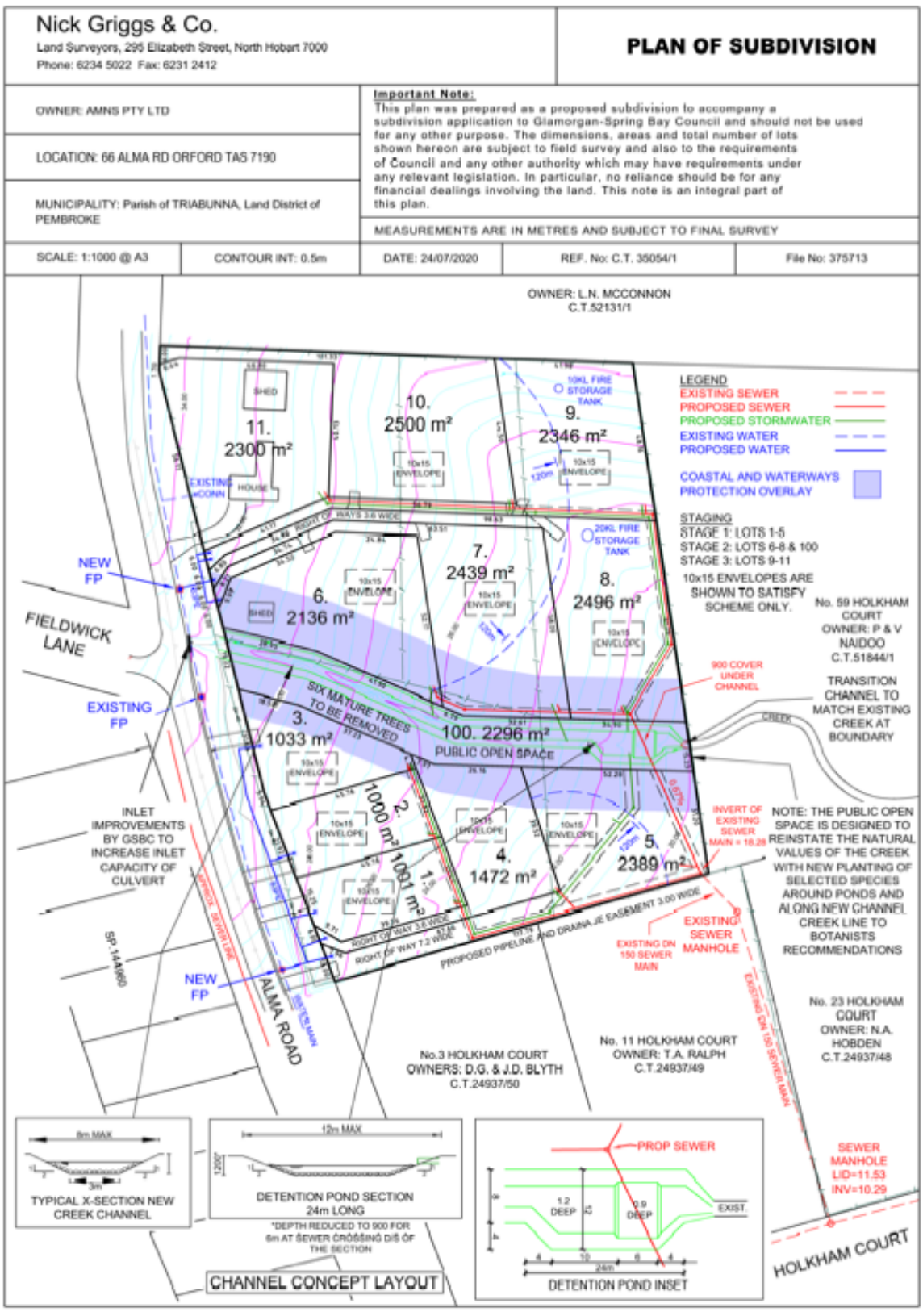
6. ATTACHMENTS

The following attachments are included with this report as follows:

A. Subdivision layout with concept services shown
B. Stormwater catchment plan for total catchment including the subdivision catchment
C. Existing creek channel capacity chart
D. IFD chart for Orford per ARR 2016 rainfall data
E. Summary calculations for total peak catchment design flows at the lower extremity of the subdivision catchment.
F. Proposed new creek channel capacity chart
G. Summary calculations for local lot catchment design flows from hard surfaces.
H. Summary calculations for detention pond for peak AEP 5% flow from hard surfaces
I. WSUD model output summary of treatment train effectiveness (ponds & swales)

Yours faithfully,

Ross Cumming
BEng, FIEAust, CPEng, IPWEA, AWA 27/07/2020

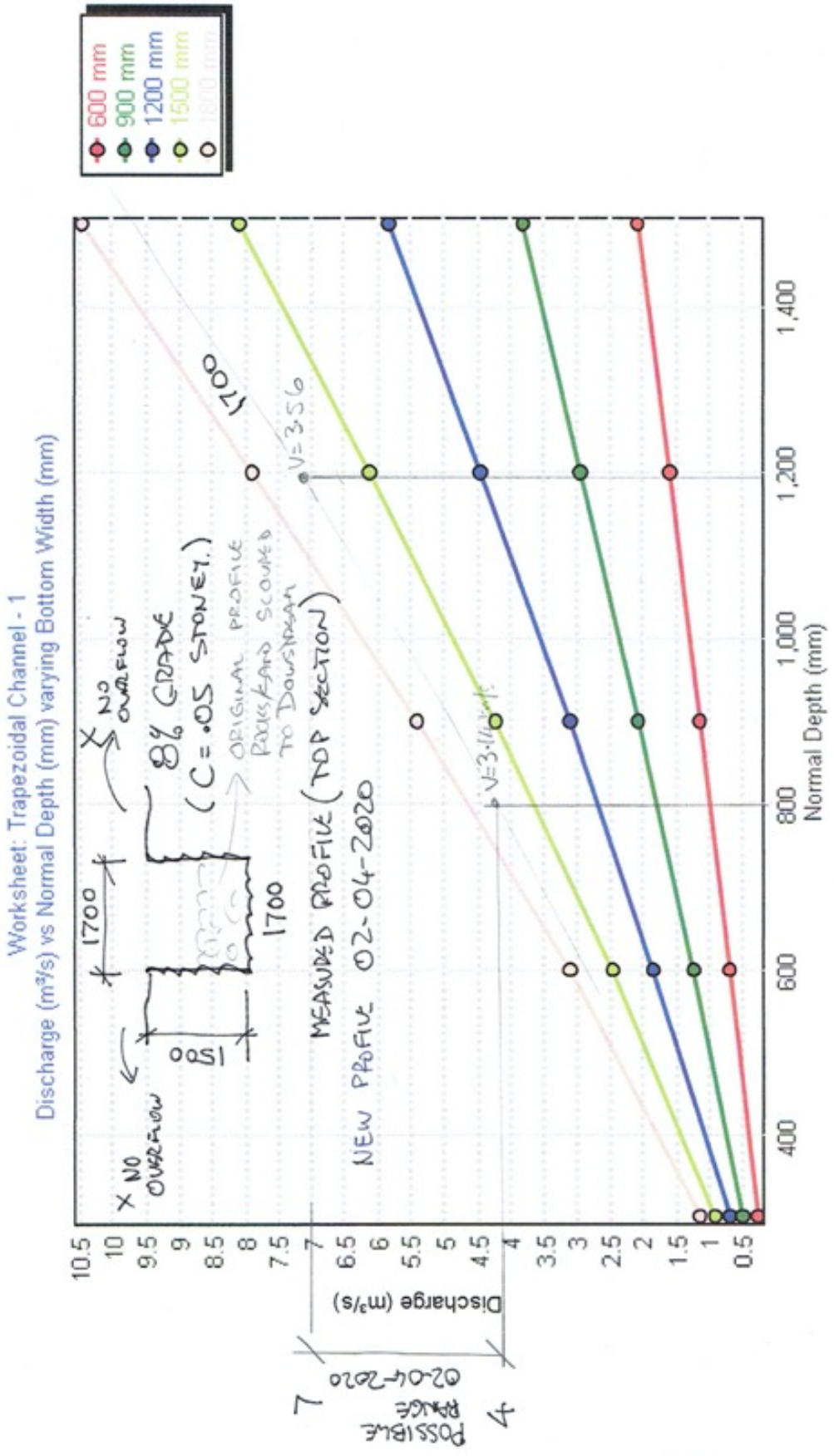

Nick Griggs & Co.
Land Surveyors, 295 Elizabeth Street, North Hobart 7000
Phone: 6234 5022 Fax: 6231 2412
PLAN OF SUBDIVISION
OWNER: AMNS PTY LTD
LOCATION: 66 ALMA RD ORFORD TAS 7190
MUNICIPALITY: Parish of TRIABUNNA, Land District of PEMBROKE
Important Note:
This plan was prepared as a proposed subdivision to accompany a subdivision application to Glamorgan-Spring Bay Council and should not be used for any other purpose. The dimensions, areas and total number of lots shown hereon are subject to field survey and also to the requirements of Council and any other authority which may have requirements under any relevant legislation. In particular, no reliance should be for any financial dealings involving the land. This note is an integral part of this plan.
MEASUREMENTS ARE IN METRES AND SUBJECT TO FINAL SURVEY
SCALE: 1:1000 @ A3
CONTOUR INT: 0.5m
DATE: 24/07/2020
REF. No: C.T. 35054/1
File No: 375713
OWNER: L.N. MCCONNON
C.T.52131/1
LEGEND
EXISTING SEWER
PROPOSED SEWER
PROPOSED STORMWATER
EXISTING WATER
PROPOSED WATER
COASTAL AND WATERWAYS PROTECTION OVERLAY
STAGING
STAGE 1: LOTS 1-5
STAGE 2: LOTS 6-8 & 100
STAGE 3: LOTS 9-11
10x15 ENVELOPES ARE SHOWN TO SATISFY SCHEME ONLY.
10. 2500 m²
9. 2346 m²
11. 2300 m²
7. 2439 m²
8. 2496 m²
6. 2136 m²
3. 1033 m²
100. 2296 m²
PUBLIC OPEN SPACE
2. 1000 m²
1. 1091 m²
4. 1472 m²
5. 2389 m²
10KL FIRE STORAGE TANK
20KL FIRE STORAGE TANK
NEW FP
EXISTING FP
FIELDWICK LANE
ALMA ROAD
SIX MATURE TREES TO BE REMOVED
INLET IMPROVEMENTS BY GSBC TO INCREASE INLET CAPACITY OF CULVERT
900 COVER UNDER CHANNEL
TRANSITION CHANNEL TO MATCH EXISTING CREEK AT BOUNDARY
INVERT OF EXISTING SEWER MAIN = 18.28
NOTE: THE PUBLIC OPEN SPACE IS DESIGNED TO REINSTATE THE NATURAL VALUES OF THE CREEK WITH NEW PLANTING OF SELECTED SPECIES AROUND PONDS AND ALONG NEW CHANNEL CREEK LINE TO BOTANISTS RECOMMENDATIONS
EXISTING SEWER MANHOLE
EXISTING DN 150 SEWER MAIN
PROPOSED PIPELINE AND DRAINAGE EASEMENT 3.00 WIDE
RIGHT OF WAY 7.2 WIDE
RIGHT OF WAYS 3.6 WIDE
No. 59 HOLKHAM COURT
OWNER: P & V NAIDOO
C.T.51844/1
No. 23 HOLKHAM COURT
OWNER: N.A. HOBDEN
C.T.24937/48
No. 11 HOLKHAM COURT
OWNER: T.A. RALPH
C.T.24937/49
No.3 HOLKHAM COURT
OWNERS: D.G. & J.D. BLYTH
C.T.24937/50
SEWER MANHOLE
LID=11.53
INV=10.29
HOLKHAM COURT
TYPICAL X-SECTION NEW CREEK CHANNEL
DETENTION POND SECTION
24m LONG
*DEPTH REDUCED TO 900 FOR 6m AT SEWER CROSSING D/S OF THE SECTION
PROP SEWER
EXIST.
DETENTION POND INSET
CHANNEL CONCEPT LAYOUT

A

200m/40m
0 170
300 100
550 50
750 30
900 20
1450 10
1550 5
B
A
Contrib. Area at (A) = 30ha
Subdivision Area = 24ha.
at (B) = 100 ha
basemaps
GDA94 MGA55 : 5710226E, 5269781N 1:6,771

A

B


Worksheet: Trapezoidal Channel - 1
Discharge (m³/s) vs Normal Depth (mm) varying Bottom Width (mm)
600 mm
900 mm
1200 mm
1500 mm
1800 mm
Discharge (m³/s)
Normal Depth (mm)
10.5
10
9.5
9
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
400
600
800
1,000
1,200
1,400
X NO OVERFLOW
1700
8% GRADE
(C=.05 STONEY.)
X NO OVERFLOW
1700
1700
V=3.56
V=3.1(approx)
MEASURED PROFILE (TOP SECTION)
NEW PROFILE 02-04-2020
ORIGINAL PROFILE PASSED AND SCOURED TO DOWNSTREAM
POSSIBLE RANGE 02-04-2020
7
4

C

PROJECT: STORMWATER RUNOFF TO ARR 2016 REF: 2/4/19

RAINFALL INTENSITIES & POLYNOMIAL COEFFICIENTS PER AUSTRALIAN RAINFALL & RUNOFF, 2016 VERSION

LOCATION: ALMA RD ORFORD
LATITUDE: 42.5375 S LONG 147.8625 E

INTENSITY/FREQUENCY/DURATION (IFD) CHART I mm/hr (d/60T)

DURATION HR	0.083	0.100	0.167	0.333	0.500	1	2	3	6	12	24	48	72
MIN	5	6	10	20	30	60	120	180	360	720	1440	2880	4320
AEP %													
63.2%	44.7	41.5	32.7	22.7	18.1	12.3	8.57	7.00	5.00	3.51	2.33	1.43	1.03
50%	50	46.8	37.0	25.6	20.4	13.9	9.67	7.92	5.70	4.04	2.71	1.66	1.20
20%	69	65	52	35.7	28.2	19.0	13.1	10.8	7.84	5.67	3.88	2.40	1.73
10%	83	78	63	43.2	34.0	22.6	15.5	12.7	9.24	6.76	4.68	2.91	2.09
5%	97	92	74	51	40.1	26.3	17.8	14.5	10.6	7.79	5.45	3.41	2.44
2%	117	111	91	63	48.8	31.3	20.8	16.9	12.3	9.18	6.51	4.10	2.93
1%	133	127	105	73	56	35.3	23.1	18.6	13.6	10.2	7.33	4.64	3.31

INTENSITY/FREQUENCY/DURATION (IFD) CHART d mm

DURATION HR	0.083	0.100	0.167	0.333	0.500	1	2	3	6	12	24	48	72
T MINUTES	5	6	10	20	30	60	120	180	360	720	1440	2880	4320
AEP %													
63.2%	3.72	4.15	5.46	7.57	9.05	12.3	17.1	21.0	30.0	42.1	56	69	74
50%	4.20	4.68	6.17	8.55	10.2	13.9	19.3	23.8	34.2	48.5	65	80	86
20%	5.78	6.47	8.60	11.9	14.1	19.0	26.2	32.3	47.0	68	93	115	124
10%	6.92	7.78	10.4	14.4	17.0	22.6	30.9	38.0	55	81	112	140	150
5%	8.11	9.15	12.4	17.1	20.1	26.3	35.5	43.5	63	94	131	164	176
2%	9.77	11.1	15.2	20.9	24.4	31.3	41.6	51	74	110	156	197	211
1%	11.1	12.7	17.5	24.2	28.0	35.3	46.3	56	82	123	176	223	238

TRANSPOSE IMPORT FROM BOM POLYNOMIAL COEFFICIENTS FOR AEP 63.2% to 1% (ARI= 1.6 to 100 YEARS)

YR	Coefficient	C0	C1	C2	C3	C4	C5	C6
1.58	63.2%	.17197	.73590	.07342	-.08566	.02222	-.00232	.00009
2	50%	.29333	.70980	.10664	-.10075	.02529	-.00260	.00010
5	20%	.61910	.60128	.23654	-.15587	.03576	-.00351	.00012
10	10%	.80660	.51480	.33723	-.19718	.04332	-.00415	.00014
20	5%	.97147	.42491	.44097	-.23923	.05091	-.00477	.00016
50	2%	1.16836	.27874	.61035	-.30848	.06357	-.00584	.00020
100	1%	1.30618	.16575	.74089	-.36161	.07324	-.00665	.00022

NOTE: AR&R recommends that I values be rounded for use as follows:
<= 9.99 mm/hr : 2 decimal places
10.0 to 49.9 mm/hr : 1 " "
=> 50 mm/hr : 0 " "

d=e^(C0+C1*ln(T) + C2*ln(T)^2 + C3*ln(T)^3 + C4*ln(T)^4 + C5*ln(T)^5 + C6*ln(T)^6) : I mm/hr & t hours

IMPORT FROM BOM

IFD Design Rainfall Coefficients
Issued: 26-Mar-19
Location Label:
Requested coo Latitude -42.5375 Longitude 147.8625
Nearest grid ce Latitude 42.5375 (S) Longitude 147.8625 (E)

Coefficient	63.20%	50%	20%	10%	5%	2%	1%
C0	0.17197143	0.29332954	0.61910266	0.80659729	0.97147101	1.1683599	1.3061836
C1	0.7359035	0.70980126	0.60127753	0.51480162	0.4249053	0.27874008	0.16574723
C2	0.073420458	0.10664487	0.23653907	0.33723161	0.44096848	0.61035287	0.74088943
C3	-0.085659325	-0.10075426	-0.15587334	-0.19717614	-0.2392342	-0.3084799	-0.3616099
C4	0.022223786	0.025294175	0.035764489	0.043318667	0.05090604	0.06357256	0.07323756
C5	-0.002322788	-0.002604623	-0.00351259	-0.004145351	-0.0047726	-0.0058403	-0.0066506
C6	8.55E-05	9.51E-05	0.000124378	0.00014418	0.00016357	0.00019743	0.00022298

HYDROLOGICAL REPORT - ALMA RD PRE D'MT TOTAL CATCHMENT TO POINT A

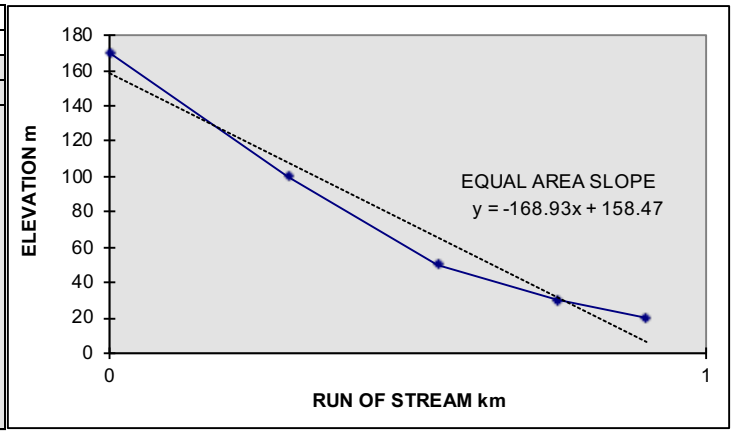
LOCATION REF: **USING BRANSBY WILLIAMS METHOD**

A1. For a stream flow, use BRANSBY WILLIAMS formula to estimate the Time of Concentration.

tc= (58*L)/(A^0.1*Se^0.2)= **29** minutes incl + t_0 — REF: ARR 1992-IV-3 FORMULA 1.3

L=	0.90	km	Mainstream length
Se=	168.9	m/km	Equal area slope

AREA SLOPE SECTION	
distance	elevation
km	m
0.000	170
0.300	100
0.550	50
0.750	30
0.900	20



A2. For overland flow use Kinemetic Wave Equation for Time of Concentration.

tc = 6.94*(L*n)^0.6/(I $_{y,tc}$^0.4*Se^0.3) +t $_o$ minutes — REF: ARR 1992-VIII-12 FORMULA 1.2

L=	200	m	Overland flow path length
Se=	0.20	m/m	Slope
n=	0.10	friction coeff: conc/HM=.01 gravel=.02 grass=.10 lawn=.3	
t_o=	8.0	minutes	To run overland 200m into creek

B. Use RATIONAL METHOD to estimate the 1% to 100% AEP (100 to 1 yr ARI) floods

Qy= 0.278*Cy*I $_{y,tc}$*A — REF: ARR 1992 VIII-15

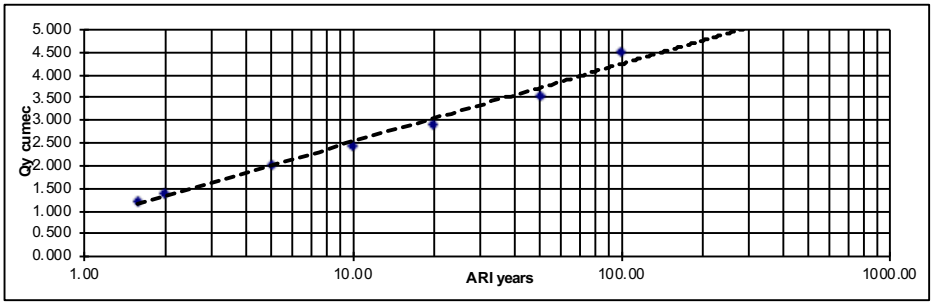
Cy= $(C_I+C_{catch})/100$ C_{catch}= 0.7 Runoff Coef — REF: ARR 1987 Table 5.7

$I_{y,tc}$= mm/hr Rainfall intensity — REF: IFD 2016 Coeffs

A= 0.3 km2 Area — REF: LIST MAP

30 ha

ARI YR	AEP %	tc minutes	Qy,tc cumec	$I_{y,tc}$ mm/hr	Cy C_I+C_{catch}	Runoff Volume m3	I for C_I mm/hr	C_I=
1.58	63.2%	29	1.229	18.4	0.80	2,144	0	0
2	20%	29	1.386	20.8	0.80	2,419	12	10
5	50%	29	2.037	28.7	0.85	3,555	25	15
10	10%	29	2.456	34.6	0.85	4,286	50	25
20	5%	29	2.896	40.9	0.85	5,054	75	30
50	2%	29	3.527	49.7	0.85	6,154	100	35
100	1%	29	4.524	57.1	0.95	7,895	500	35

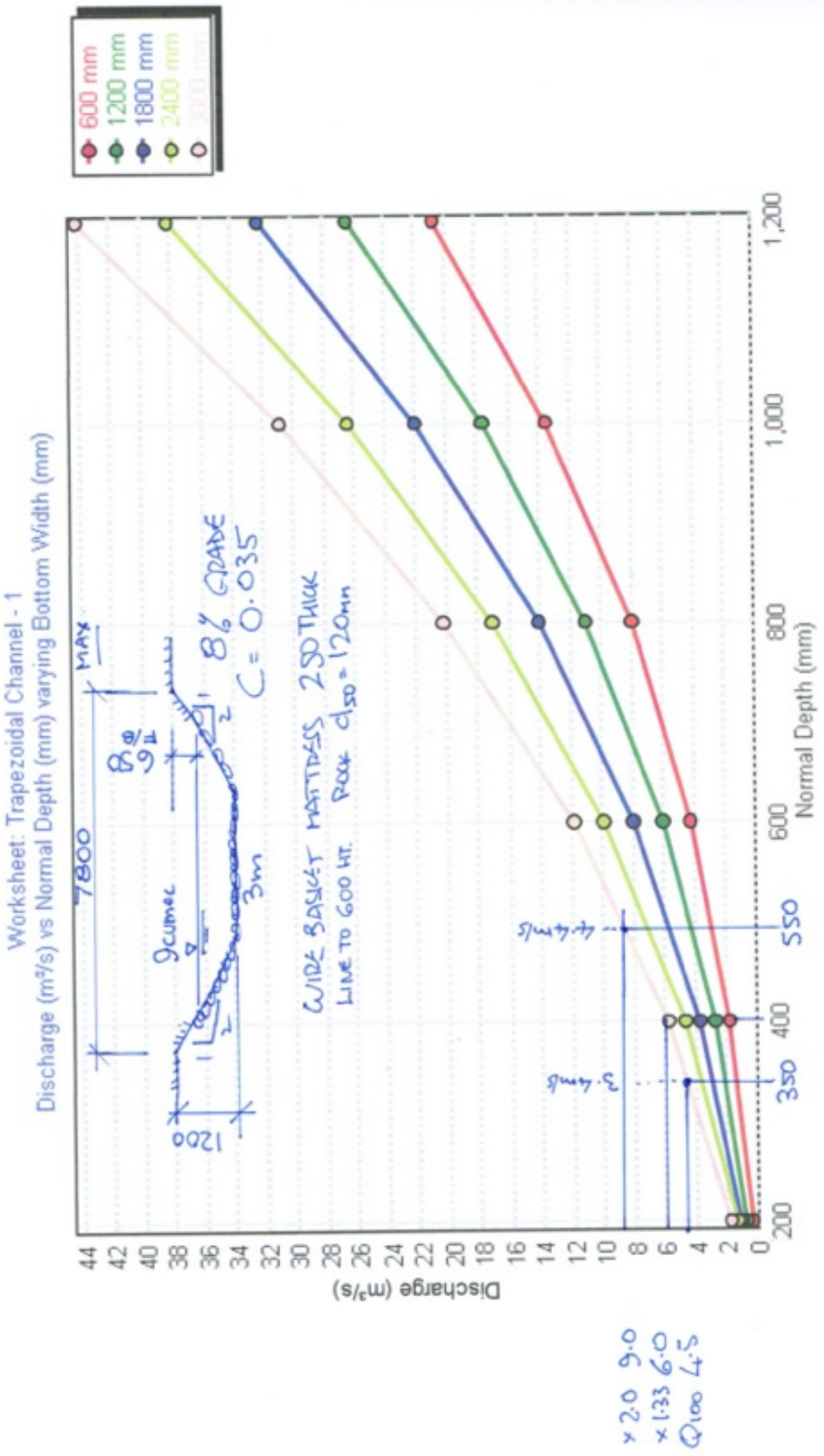


C. ADOPT DESIGN FLOOD

Q1.5	1,250 L/s
Q20	2,900 L/s
Q100	4,500 L/s

Flood ARR 2016 ALMA AT A PRE_POST.xlsx PRINTED: 15/4/20

E


600 mm
1200 mm
1800 mm
2400 mm
3000 mm
Worksheet: Trapezoidal Channel - 1
Discharge (m³/s) vs Normal Depth (mm) varying Bottom Width (mm)
Discharge (m³/s)
Normal Depth (mm)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
200
400
600
800
1,000
1,200
7800
MAX
8%
9cumec
1200
3m
8% GRADE
C = 0.035
WIDE BASKET MATTRESS 250 THICK
LINE TO 600 HT. MAX d50 = 120mm
350
550
x 2.0 9.0
x 1.33 6.0
Q100 4.5

F

HYDROLOGICAL REPORT -

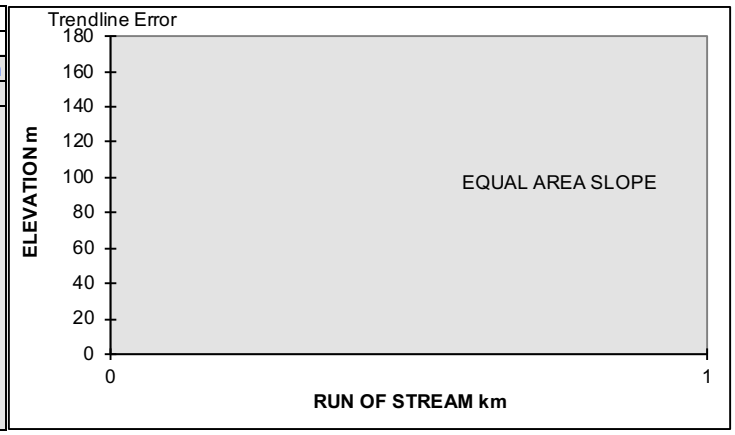
LOCATION REF:

LOT SCALE RUNOFF FROM 11 LOTS ea 500m2
USING OVERLAND FLOW METHOD

A1. For a stream flow, use BRANSBY WILLIAMS formula to estimate the Time of Concentration.

tc= (58*L)/(A^0.1*Se^0.2)=		**N/A**	minutes incl + t_0	REF: ARR 1992-IV-3 FORMULA 1.3
L=	0.00	km	Mainstream length	
Se=	N/A	m/km	Equal area slope	

AREA SLOPE SECTION	
distance	elevation
km	m



A2. For overland flow use Kinemetic Wave Equation for Time of Concentration.

tc = 6.94*(L*n)^0.6/(I $_{y,tc}$^0.4*Se^0.3) +t $_o$		minutes		REF: ARR 1992-VIII-12 FORMULA 1.2
L=	10	m	Overland flow path length	
Se=	0.10	m/m	Slope	
n=	0.01	friction coeff: conc/HM=.01 gravel=.02 grass=.10 lawn=.3		
t_o=	9.0	minutes		

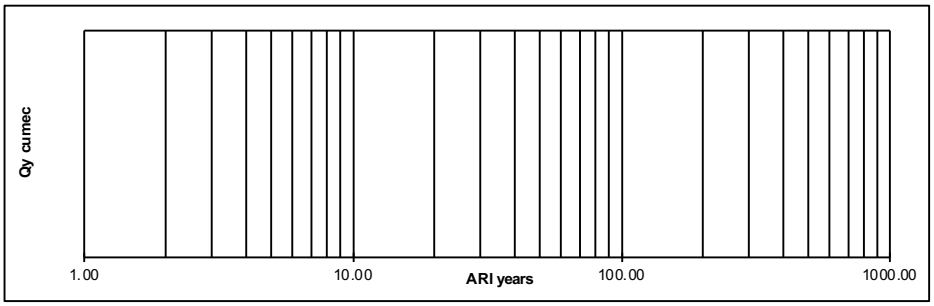
B. Use RATIONAL METHOD to estimate the 1% to 100% AEP (100 to 1 yr ARI) floods

Qy= 0.278*Cy*I $_{y,tc}$*A

Cy=	(C_l+C_{catch})/100	C_{catch}=	0.65	Runoff Coef
$I_{y,tc}$=		mm/hr	Rainfall intensity	
A=	0.0055	km2	Area	
	0.55	ha	(300m2)	

REF: ARR 1992 VIII-15
REF: ARR 1987 Table 5.7
REF: IFD 2016 Coeffs
REF: LIST MAP

ARI YR	AEP %	tc minutes	Qy,tc cumec	$I_{y,tc}$ mm/hr	Cy C_l +C_{catch}	Runoff Volume m3	I for C_l mm/hr	C_l=
1.58	63.2%	10	0.0403	33.0	0.80	23.8	0	0
2	50%	10	0.0457	37.4	0.80	26.9	12	10
5	20%	10	0.0720	52.3	0.90	41.9	25	15
10	10%	10	0.0875	63.6	0.90	50.7	50	25
20	5%	10	0.1096	75.5	0.95	63.2	75	30
50	2%	10	0.1419	92.8	1.00	81.4	100	35
100	1%	10	0.1640	107.3	1.00	93.8	500	35



C. ADOPT DESIGN FLOOD

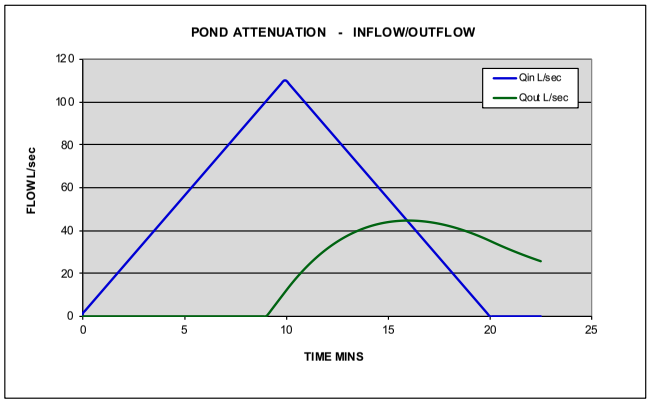
Q1.5	40L/sec	
Q20	110L/sec	Flow for pre-development is 110x0.37 = 41L/sec
Q100	164L/sec	(for runoff factor 35% cf 95% for roof & drive)

Flood ARR 2016 11 LOTS ROOF & DRIVE.xlsx PRINTED: 24/7/20

G

POND HYDRAULIC ATTENUATION PERFORMANCE
ALMA RD ALL 11 LOTS CATCHMENT

ROSS CUMMING ENGINEERING



INPUT DATA		Pond m2	RL/IL m	DIA mm	No.
SPILL	TWL	98	0.300		
IL #3		93	0.200	0	1
IL #2		89	0.100	0	1
IL #1 &	LWL	84	0.000	0	1
	Silt storage	-	0.000		

AREA	TOTAL CATCHMENT 00L/sec UNDERFLOW		
Qi max L/sec	Q20	110	Peaks at 10
Time step min		0.125	

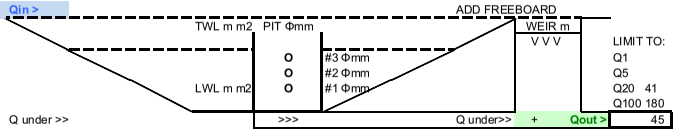
START WITH POND DEPTH AT RL:	-	m
START WITH POND AREA AT:	84	m2
PIT SPILL	-	DIA mm
WEIR SPILL	4.200	m
BYPASS FLOW UNDER POND	0	L/sec

FLOW CONDITION Q20 TOTAL CATCHMENT 00L/sec UNDERFLOW

START CONDITION LEVEL	0.000	m
POND SPILL RL	0.300	m
POND SURFACE AREA AT SPILL	98.0	m2
POND VOLUME AT SPILL	27.3	m3
MAX DEPTH IN POND	0.519	m
MAX SPILL DEPTH	0.219	m
MAX SPILL FLOW	0.045	cumec
MINIMUM DETENTION TIME	#DIV/0!	hrs

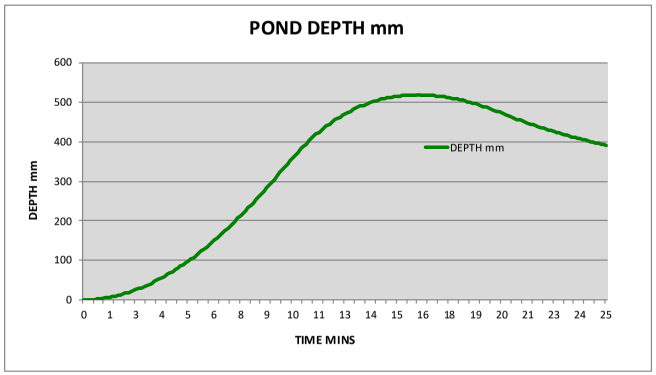
SIDE SLOPE (H:V): 16.50

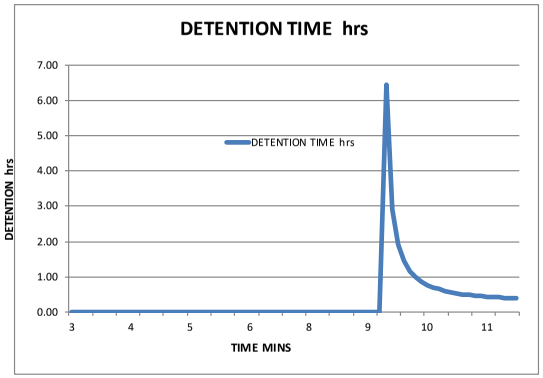
110 Qin >

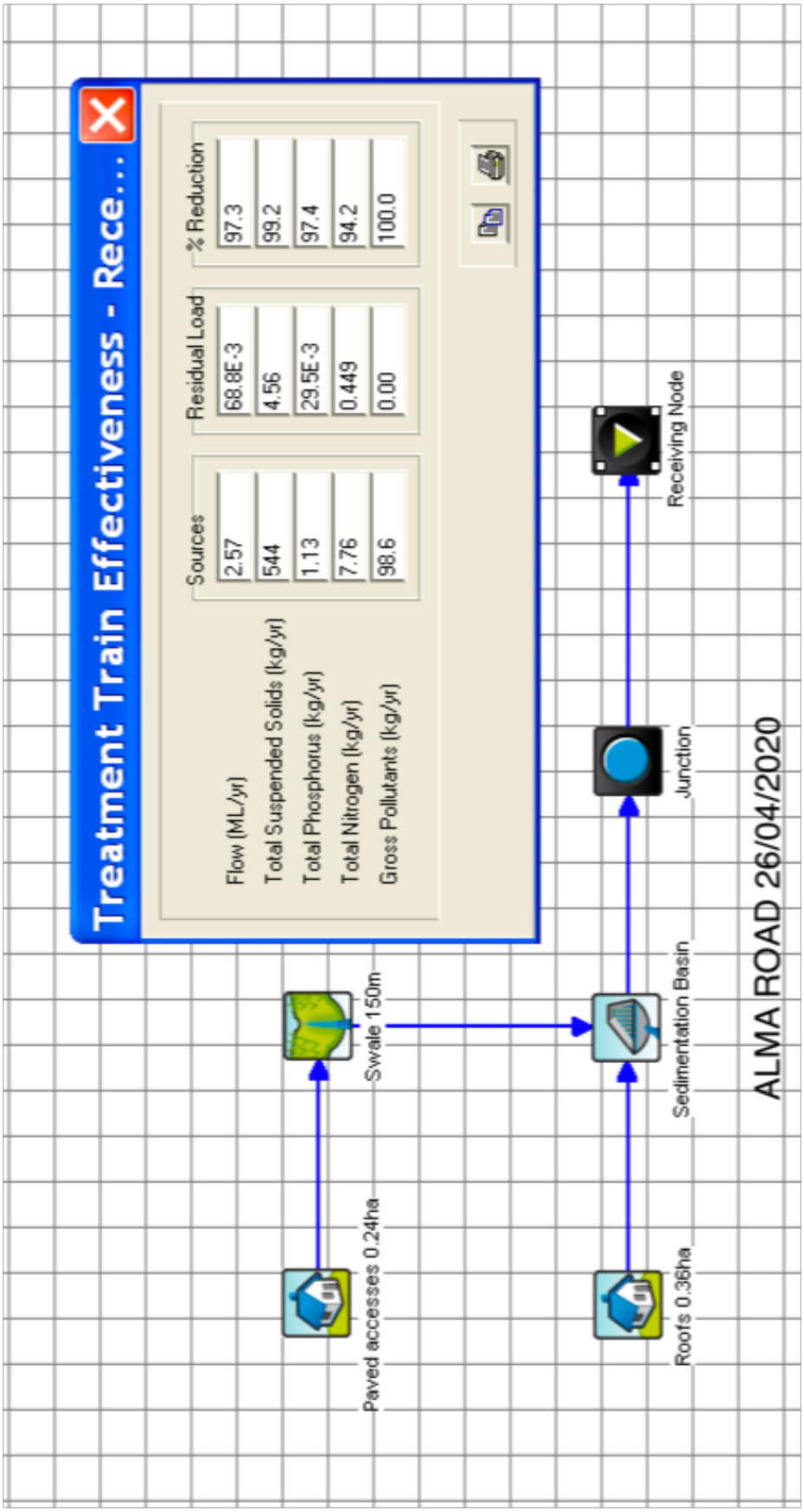


- Q under >>

0






Treatment Train Effectiveness - Rece...
Sources
Residual Load
% Reduction
Flow (ML/yr)
2.57
68.8E-3
97.3
Total Suspended Solids (kg/yr)
544
4.56
99.2
Total Phosphorus (kg/yr)
1.13
29.5E-3
97.4
Total Nitrogen (kg/yr)
7.76
0.449
94.2
Gross Pollutants (kg/yr)
98.6
0.00
100.0
Receiving Node
Junction
Sedimentation Basin
Swale 150m
Paved accesses 0.24ha
Roofs 0.36ha
ALMA ROAD 26/04/2020

Tasflora

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NATURAL VALUES ASSESSMENT

Proposed subdivision:
66 Alma Road, Orford

Advice prepared by Tasflora
for Tony McCullogh
April 2020

CONTENTS

1 EXECUTIVE SUMMARY

A subdivision to create eleven lots is proposed at 66 Alma Road, Orford. A natural values assessment of the eleven lots and proposed area of public open space was undertaken in April 2020.

No native vegetation communities of conservation significance or otherwise were observed in the survey area, which is dominated by pasture grasses and herbs (refer Figure 2) and classified as agricultural land (TASVEG code FAG).

No threatened flora or fauna species listed under the Tasmanian *Threatened Species Protection Act 1995* (the TSP Act) or Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) were observed when undertaking the survey.

Several mature remnant *Eucalyptus globulus* and *E. pulchella* trees were recorded along the creek line which runs through the centre of the property. These were assessed as having the potential to provide nesting and/or foraging habitat for two threatened bird species: *Lathamus discolor* (swift parrot; listed as endangered under the TSP and critically endangered under the EPBC Act) and *Tyto novaehollandiae* subsp. *castanops* (Tasmanian masked owl; listed as endangered under the TSP Act and vulnerable under the EPBC Act). These trees occur within the area of public open space proposed along the existing creek line.

The survey area contains a Waterway and Coastal Protection Area, which occurs as a buffer along the length of the creek line which passes through the property. No natural values of conservation significance were observed along the creek line, and the impact of the proposed subdivision on the natural values of the creek is considered to be low provided disturbance in the area of proposed public open space is minimised.

Small populations of the declared weeds gorse and horehound were present within the survey area. It is recommended that these be controlled prior to any on ground work occurring within the subdivision area. Weed hygiene measures should also be implemented when undertaking any development on the lots.

2 BACKGROUND

A subdivision to create 11 lots is proposed at 66 Alma Road, Orford as illustrated in Figure 1.

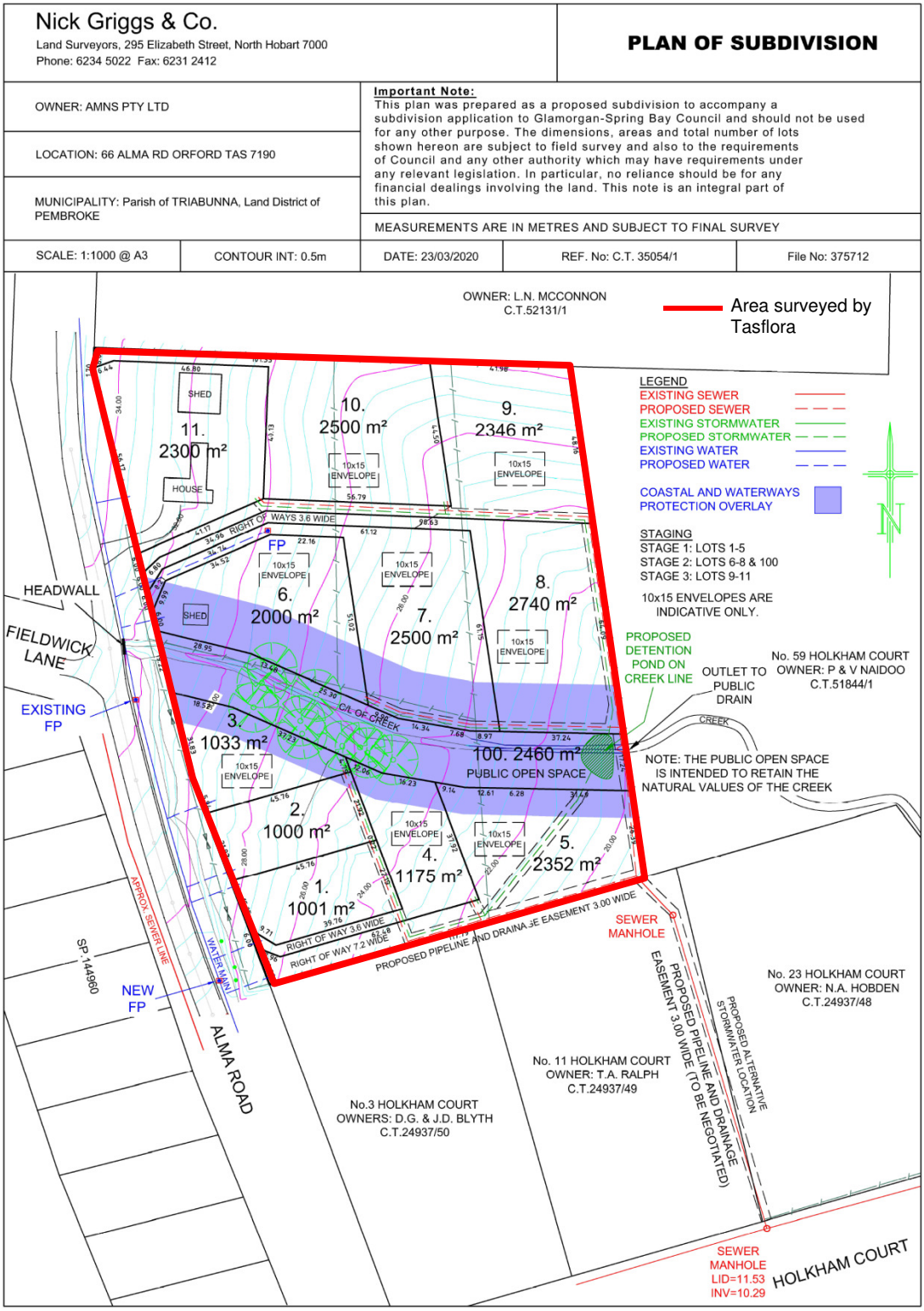

Figure 1: Proposed subdivision at 66 Alma Road, Orford.[1]

[1] Base map provided by Nick Griggs & Co. Land Surveyors.

Tasflora has been engaged by Tony McCullogh to undertake a natural values assessment of the proposed subdivision area to:

- determine whether any threatened vegetation communities listed under the Tasmanian *Nature Conservation Act 2002* (the Nature Conservation Act) will be impacted by the proposed development;

- determine whether any native flora or fauna species listed under the Tasmanian *Threatened Species Protection Act 1995* (the TSP Act) or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) will be impacted by the proposed development;

- identify any weed species present, including those that are listed as declared weeds under the Tasmanian *Weed Management Act 1999* (the Weed Management Act); and

- assess the potential impact of the proposed development on the natural values of the site and the surrounding area.

3 SURVEY METHOD

A vegetation survey and habitat assessment of the subdivision area was undertaken by Tasflora on 7 April 2020. The area surveyed is illustrated in Figure 1.

The random meander technique was used across the entire survey area when undertaking the vegetation survey. Vegetation communities were identified and attributed to TASVEG mapping units as described by Harris and Kitchener (2013). All native species encountered were recorded, as well as declared and environmental weeds. A large portion of the survey area is rural land dominated by pasture grasses and herbs, and a full list of exotic grasses and herbs encountered in pasture areas has not been included in this report. Nomenclature for flora was guided by de Salas and Baker (2019), with common names following Wapstra et al. (2005).

Every effort was made to accurately record flora species present within the survey area. However, due to varying flowering times and annual cycles it is possible that some species were not encountered when undertaking the survey and that some species (e.g. annuals, orchid species) may have been missed because they were not able to be identified (i.e. no flowers or seed heads present) or their annual cycle had already finished and the plants had died back.

The fauna assessment was limited to on ground habitat assessment for fauna species identified in database searches. No systemic fauna surveys were undertaken.

A desktop assessment was undertaken in addition to the field visit to assist in assessing the flora, fauna and natural values of the area. This assessment included a review of a number of publicly available information sources, including the Department of Primary Industries, Parks, Water and

Environment (DPIPWE) Natural Values Atlas and the Land Information System Tasmania (LIST).

4 NATURAL VALUES

4.1 Vegetation communities of conservation significance

No vegetation communities of conservation significance or otherwise were observed in the survey area, which is dominated by pasture grasses and herbs (refer Figure 2) and classified as agricultural land (TASVEG code FAG).

While six mature *Eucalyptus globulus* and two mature *E. pulchella* trees were recorded along the creek line which runs through the centre of the property (refer Figure 3), these remnant individuals do not form a native vegetation community.

4.2 Flora species of conservation significance

A full flora species list for the area surveyed is provided at Appendix 1.

No threatened species listed under the TSP Act or the EPBC Act were recorded when undertaking the survey, and none have been previously recorded within 500m of the survey area (DPIPWE 2020).

According to the Natural Values Atlas maintained by DPIPWE, a number of flora species listed under the TSP Act and/or the EPBC Act have been previously recorded within 5km of the survey area (DPIPWE 2020). A full list of these species, and an assessment of the likelihood of them occurring within the survey area, is provided at Appendix 2.

Two species endemic to Tasmania were recorded within the survey area: *Eucalyptus pulchella* (white peppermint) and *Clematis gentianoides* (ground clematis).

4.3 Fauna species of conservation significance

No fauna species listed under the TSP or EPBC Acts were observed when undertaking the survey, and none have been previously recorded within the survey area.

According to DPIPWE's Natural Values Atlas, a number of threatened fauna species have been previously recorded (or range boundaries indicate that they could occur) within 5km of the survey area (DPIPWE 2020). A full list of these species, and an assessment of the likelihood of them occurring within the survey area, is provided at Appendix 3.

Based on this assessment, the survey area is considered to contain potential habitat for two threatened bird species.

- *Lathamus discolor* (swift parrot) – listed as endangered under the TSP Act and critically endangered under the EPBC Act. This species forages in mature *Eucalyptus globulus* (blue gum) and *E. ovata* (black gum) trees, and nests in hollows in mature eucalypts across a range of species with stem diameter greater than 70cm at breast height. The property contains

Figure 2: Typical agricultural land occurring on the property.

Figure 3: Remnant *Eucalyptus globulus* and *E. pulchella* trees occurring along the creek within the survey area.

six mature blue gum trees which could provide a food source and nesting habitat for this species.

- *Tyto novaehollandiae* subsp. *castanops* (Tasmanian masked owl) - listed as endangered under the TSP Act and vulnerable under the EPBC Act. This species inhabits dry eucalypt forest and woodland, and its nesting habitat is old growth eucalypts containing hollows. Limited suitable nesting habitat may exist in some mature *Eucalyptus* trees within the survey area.

4.4 Geoconservation sites

No geoconservation sites have been previously recorded within or near the survey area.

5 THREATS

5.1 Weeds

Two species listed as declared weeds under the Weed Management Act were recorded during the survey: *Ulex europaeus* (gorse) and *Marrubium vulgare* (horehound). Gorse is also classified as a Weed of National Significance (WONS). The approximate location of these weeds is illustrated in Figure 4.

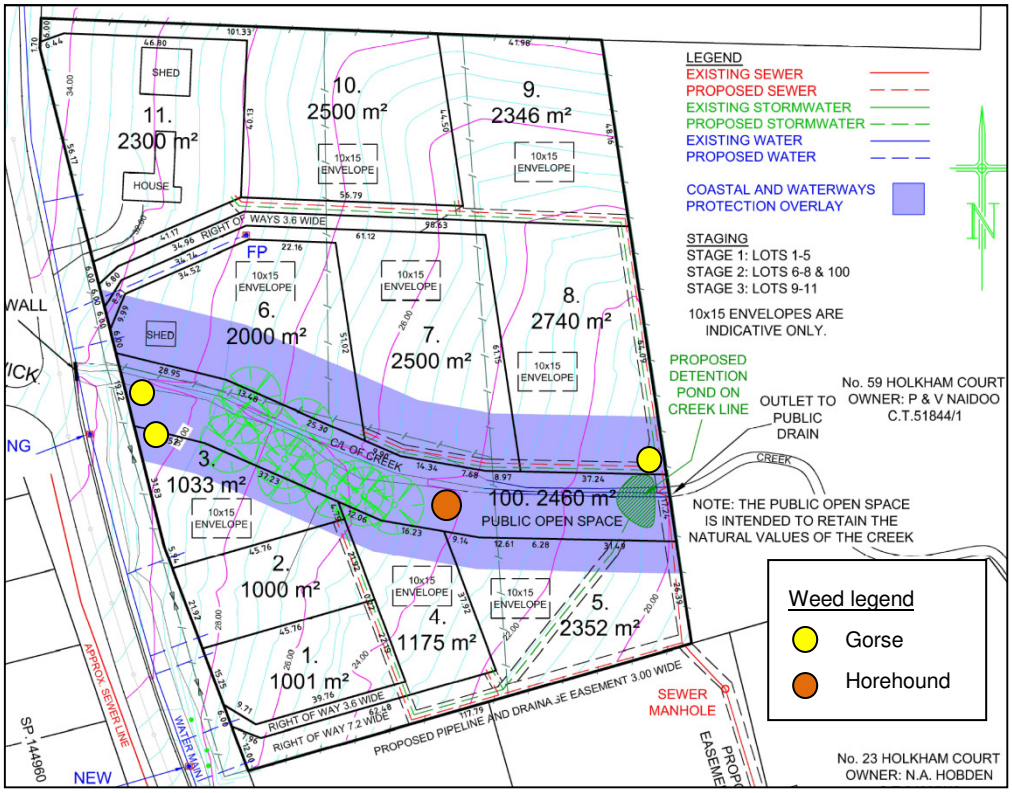

Figure 4: Approximate location of declared weeds recorded within the survey area.

5.2 Potential acid sulphate soils

No potential for acid sulphate soils has been identified within the survey area (DPIPWE 2020).

6 ECOLOGICAL ASSESSMENT OF PROPOSED DEVELOPMENT

The survey area is predominantly rural land dominated by pasture grasses and herbs, and the proposed subdivision will have no impact on threatened flora species or native vegetation communities of conservation significance.

Several mature eucalypts on the property were assessed as having the potential to provide nesting and/or foraging habitat for the threatened swift parrot and masked owl. These trees occur within the area of public open space proposed along the existing creek line. While there is substantial alternative foraging and nesting habitat on neighbouring Rudds Hill, these mature eucalypts can be protected within the public open space.

As depicted in Figure 1, the survey area contains a Waterway and Coastal Protection Area, which occurs as a buffer along the length of the creek line. The majority of this area, and in particular the creek line itself, occurs within the proposed area of public open space. No natural values of conservation significance were observed along the creek line, and the impact of the proposed subdivision on the natural values of the creek is considered to be low provided disturbance in this area is minimised.

Small populations of the declared weeds gorse and horehound were present within the survey area as depicted in Figure 4. It is recommended that these be controlled prior to any on ground work occurring within the subdivision area, and a discussion with the landowner has indicated his intent to do so.

There is also a risk that disturbance of the soil through future development activities may result in the germination of new declared and environmental weeds. It is recommended that weed hygiene measures be implemented when undertaking any development on the lots.

7 REFERENCES

Department of Primary Industries, Parks, Water and Environment (2020). *Natural Values Atlas report*. Unpublished report for Tasflora.

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de Salas, M.F. and Baker, M.L. (2019). *A census of the vascular plants of Tasmania, including Macquarie Island.* Tasmanian Herbarium, Tasmanian Museum and Art Gallery, Tasmania.

Wapstra, H., Wapstra, A., Wapstra, M. and Gilfedder, L. (2005). *The little book of common names for Tasmanian plants.* Department of Primary Industries, Water and Environment, Hobart.

APPENDIX 1: FLORA SPECIES RECORDED AT 66 ALMA ROAD, ORFORD

Recorder: A Woolford **Date:** 7 April 2020

e = endemic i = introduced d = declared weed

Note: exotic grasses and broadleaf weeds were present but not all were individually recorded

Family name	Species name	Common name
DICOTYLEDONAE		
ASTERACEAE		
i	*Arctotheca calendula*	capeweed
i	*Cirsium vulgare*	spear thistle
i	*Taraxacum officinale*	common dandelion
CHENOPODACEAE		
	Einadia nutans subsp. *nutans*	climbing saltbush
CONVULVULACEAE		
	Dichondra repens	kidneyweed
EPACRIDACEAE		
	Astroloma humifusum	native cranberry
	Lissanthe strigosa subsp. *strigosa*	peachberry heath
FABACEAE		
i,d	*Ulex europaeus*	gorse
GERANIACEAE		
	Geranium solanderi	southern cranesbill
LAMIACEAE		
i,d	*Marrubium vulgare*	horehound
MIMOSACEAE		
	Acacia mearnsii	black wattle
	Acacia melanoxylon	blackwood
MYRTACEAE		
	Eucalyptus globulus subsp. *globulus*	Tasmanian blue gum
e	*Eucalytpus pulchella*	white peppermint
OXALIDACEAE		
	Oxalis perennans	grassland woodsorrel
PITTOSPORACEAE		
	Bursaria spinosa	prickly box
RANUNCULACEAE		
e	*Clematis gentianoides*	ground clematis

ROSACEAE		
	Acaena novae-zelandiae	buzzy
i	*Sanguisorba minor* subsp.*muricata*	salad burnet
SANTALACEAE		
	Exocarpos cupressiformis	native cherry
SAPINDACEAE		
	Dodonaea viscosa subsp. *spatulata*	broadleaf hopbush
THYMELAEACEAE		
	Pimelea humilis	dwarf riceflower
MONOCOTYLEDONAE		
CYPERACEAE		
	Carex tasmanica	sedge
	Gahnia grandis	cutting grass
	Gahnia radula	thatch sawsedge
	Lepidosperma filiforme	common rapiersedge
	Lepidosperma laterale	variable swordsedge
JUNCACEAE		
	Juncus filicaulis	thread rush
	Juncus pallidus	pale rush
	Juncus pauciflorus	looseflower rush
LILIACEAE		
	Dianella revoluta	spreading flaxlily
POACEAE		
i	*Agrostis stolonifera*	creeping bent
i	*Anthoxanthum odoratum*	sweet vernalgrass
	Austrodanthonia caespitosa	common wallabygrass
	Austrostipa flavescens	yellow speargrass
	Austrostipa stipoides	coast speargrass
	Dichelachne crinita	longhair plumegrass
i	*Holcus lanatus*	Yorkshire fog
	Poa labillardierei	tussockgrass
	Poa rodwayi	velvet tussockgrass
	Themeda triandra	kangaroo grass
XANTHORRHOEACEAE		
	Lomandra longifolia	sagg

APPENDIX 2: FLORA SPECIES OF CONSERVATION SIGNIFICANCE RECORDED WITHIN 5KM OF THE SURVEY AREA[2]

Species	Common name	Conservation significance[3]	Radius at which recorded	Observed within survey area	Comment
Acacia ulicifolia	juniper wattle	rare	5km	No	Occurs in sandy coastal heaths, open forest and woodland. No suitable habitat within the survey area.
Asplenium hookerianum	maidenhair spleenwort	endangered VULNERABLE	5km	No	Occurs in heavily shaded fissures on watercourse margins within rainforest or in very sheltered gullies in drier forest types. No suitable habitat within the survey area.
Caladenia filamentosa	daddy longlegs	rare	5km	No	Occurs in heathy and sedgy open eucalypt forest and woodland on sandy soil. No suitable habitat within the survey area.
Carex longebrachiata	drooping sedge	rare	5km	No	Occurs along riverbanks, rough grassland and pastures. Suitable habitat exists however unlikely to have been overlooked.
Cyrtostylis robusta	large gnat-orchid	rare	5km	No	Occurs in coastal scrub and sheoak woodland on well-drained sandy or brown loams, oftern near dolerite outcrops. No suitable habitat within the survey area.
Eucalyptus barberi	barbers gum	rare	5km	No	Occurs on the edges of dolerite rock plates in dry sclerophyll forest and scrub. No suitable habitat within the survey area.
Glossostigma elatinoides	small mudmat	rare	5km	No	Aquatic plant that occurs submerged in shallow water and on the banks of streams. No suitable habitat within the survey area.

[2] Data obtained from DPIPWE (2020).
[3] lower case = TSP Act; UPPER CASE = EPBC Act.

Species	Common name	Conservation significance[3]	Radius at which recorded	Observed within survey area	Comment
Gyrostemon thesioides	broom wheelfruit	rare	5km	No	Occurs on dolerite in low forest or scrub dominated by *Allocasuarina verticillata*, and woodland dominated by 'half-barked' *Eucalyptus amygdalina*. No suitable habitat within the survey area.
Lepidium hyssopifolium	soft peppercress	endangered ENDANGERED	5km	No	Occurs in the growth suppression zone of large trees, and is associated with bare ground. Suitable habitat exists but unlikely to have been overlooked.
Limonium australe var. baudinii	tasmanian sea-lavender	vulnerable VUNERABLE	5km	No	Grows in saltmarshes in south east Tasmania. No suitable habitat within the survey area.
Melaleuca pustulata	warty paperbark	rare	5km	No	Occurs in a range of habitats including dry open woodland, grassland and scrub, riparian zones and stable dunes in sparse coastal shrubbery. No suitable habitat within the survey area.
Ozothamnus lycopodioides	clubmoss everlastingbush	rare	5km	No	Occurs on dolerite in dry sclerophyll forest near the East Coast and on rocky slopes along the Prosser River. No suitable habitat within the survey area.
Pimelea flava subsp. flava	yellow riceflower	rare	5km	No	Occurs on moderately fertile sites, often where *Eucalyptus amygdalina* is present. No suitable habitat within the survey area.
Pomaderris intermedia	lemon dogwood	rare	5km	No	Occurs in wet sclerophyll forest and shrubland. No suitable habitat within the survey area.

Species	Common name	Conservation significance[3]	Radius at which recorded	Observed within survey area	Comment
Pomaderris phylicifolia subsp. phylicifolia	narrowleaf dogwood	rare	5km	No	Occurs in a wide range of habitats, particularly flood-prone rocky and densely shrubby rivers but also across broader floodplains and gentle slopes into grassy/shrubby dry sclerophyll forest. No suitable habitat within the survey area.
Pterostylis squamata	ruddy greenhood	vulnerable	5km	No	Occurs in heathy and grassy open eucalypt forest, woodland and heathland on well drained sandy and loamy soils. No suitable habitat within the survey area.
Scaevola aemula	fairy fanflower	endangered	5km	No	Occurs in dry woodland/forest on dolerite dominated by *Allocasuarina verticillata* or 'halfbarked' *Eucalyptus amygdalina*, with *Callitris rhomboidea* also usually present. No suitable habitat within the survey area.
Scleranthus fasciculatus	spreading knawel	vulnerable	5km	No	Occurs in silver tussock grassland and grassy woodland. No suitable habitat within the survey area.
Senecio squarrosus	leafy fireweed	rare	5km	No	Occurs in dry sclerophyll forest. No suitable habitat within the survey area.
Stenanthemum pimeleoides	propeller plant	vulnerable VUNERABLE	5km	No	Grows in dry sclerophyll forest or woodland with an open heathy or shrubby understorey and dominated by either *Eucalyptus amygdalina* or *E.* aff. *pulchella*, with *Allocasuarina littoralis* and *E. viminalis* common co-dominants. No suitable habitat within the survey area.
Teucrium corymbosum	forest germander	rare	5km	No	Occurs in *Allocasuarina verticillata* woodland and *Eucalyptus viminalis* woodland and grasslands. No suitable habitat within the survey area.

Species	Common name	Conservation significance[3]	Radius at which recorded	Observed within survey area	Comment
Thryptomene micrantha	ribbed heathmyrtle	vulnerable	5km	No	Grows in near-coastal heathy woodlands on granite-derived sands. No suitable habitat within the survey area.

APPENDIX 3: FAUNA SPECIES OF CONSERVATION SIGNIFICANCE RECORDED WITHIN 5KM OF THE SURVEY AREA[4]

Species	Common name	Conservation significance[5]	Radius at which recorded	Observed within survey area	Comment
Accipter novaehollandiae	grey goshawk	endangered	500m[6]	No	Inhabits mature blackwood swamp forest, wet forest and mixed forest at lower altitudes. No nests observed within the survey area.
Antipodia chaostola	chaostola skipper	endangered ENDANGERED	500m[6]	No	Inhabits dry lowland vegetation communities with *Gahnia radula* and *G. microstachya* present. No suitable habitat within the survey area.
Aquila audax subsp. *fleayi*	wedge-tailed eagle (Tasmanian)	endangered ENDANGERED	5km	No	Prefers to nest in tall eucalypts in large areas of old growth or mixed eucalypt forest. No nests observed within the survey area.
Calidris ferruginea	curlew sandpiper	CRITICALLY ENDANGERED	5km	No	Inhabits coastal habitats. No suitable habitat within the survey area.
Dasyurus maculatus subsp. *maculatus*	spotted-tail quoll	rare VULNERABLE	5km	No	Inhabits mature wet forest. No suitable habitat within the survey area.
Dasyurus viverrinus	eastern quoll	ENDANGERED	500m	No	Found in a range of vegetation types including open grassland (including farmland), tussock grassland, grassy woodland, dry eucalypt forest, coastal scrub and alpine heathland. No suitable nesting habitat but may pass through. Previously recorded within 500m 18 years ago, so unlikely to be an accurate indicator of potential presence within the survey area.

[4] Data obtained from DPIPWE (2020).
[5] lower case = TSP Act; UPPER CASE = EPBC Act.
[6] Based on range boundaries.

Species	Common name	Conservation significance[5]	Radius at which recorded	Observed within survey area	Comment
Haliaeetus leucogaster	white-bellied sea-eagle	vulnerable	5km	No	Prefers to nest in mature forests within 5km of a large water body. No nests observed within the survey area.
Lathamus discolor	swift parrot	endangered CRITICALLY ENDANGERED	500m	No	Forages in mature *Eucalyptus globulus* and *E. ovata* trees, and nests in hollows in mature eucalypts across a range of species with stem diameter greater than 70cm at breast height. Suitable nesting and foraging habitat occur within the survey area.
Lissotes latidens	broad-toothed stag beetle	endangered ENDANGERED	5km	No	Occurs in wet eucalypt forest dominated by *Eucalyptus obliqua, E. regnans* and *E. globulus.* No suitable habitat within the survey area.
Litoria raniformis	green and golden frog	vulnerable VULNERABLE	500m[6]	No	Dependent upon permanent freshwater lagoons for breeding. No suitable habitat within the survey area.
Pardalotus quadragintus	forty-spotted pardalote	endangered ENDANGERED	500m[6]	No	Core habitat includes any *Eucalyptus viminalis* forest within 3 km of the east coast from St Helens to Southport. Forages in grassy *Eucalyptus viminalis* forest. No suitable habitat within the survey area.
Perameles gunnii	eastern barred bandicoot	VULNERABLE	5km	No	Inhabits grassy woodlands, native grasslands and mosaics of pasture and shrubby ground cover. May forage but no suitable nesting habitat.
Prototroctes maraena	Australian grayling	vulnerable VULNERABLE	5km	No	Inhabits coastal streams and rivers, and requires free movement between freshwater and marine habitats. No suitable habitat within the survey area.

Species	Common name	Conservation significance[5]	Radius at which recorded	Observed within survey area	Comment
Pseudomoia pagenstecheri	tussock skink	vulnerable	500m[6]	No	Inhabits lowland *Poa* tussock grassland and grassy woodland. No suitable habitat within the survey area.
Sarcophilus harrisii	Tasmanian devil	endangered ENDANGERED	5km	No	Nests in hollow logs, caves, dense vegetation, dens or burrows. No suitable nesting habitat within the survey area.
Sterna nereis subsp. *nereis*	fairy tern	vulnerable VULNERABLE	5km	No	Inhabits coastal habitats. No suitable habitat within the survey area.
Thinornis rubricollis	hooded plover	VULNERABLE	5km	No	This species mainly inhabits sandy ocean beaches and their adjacent dunes. No suitable habitat within the survey area.
Tyto novaehollandiae subsp. *castanops*	masked owl (Tasmanian)	endangered VULNERABLE	5km	No	Inhabits dry eucalypt forest and woodland. Nesting habitat is old growth eucalypts containing hollows. Limited potential nesting habitat observed within the survey area.

Nick Griggs & Co.

Land Surveyors, 295 Elizabeth Street, North Hobart 7000
Phone: 6234 5022 Fax: 6231 2412

TREE RETENTION PLAN

OWNER: AMNS PTY LTD

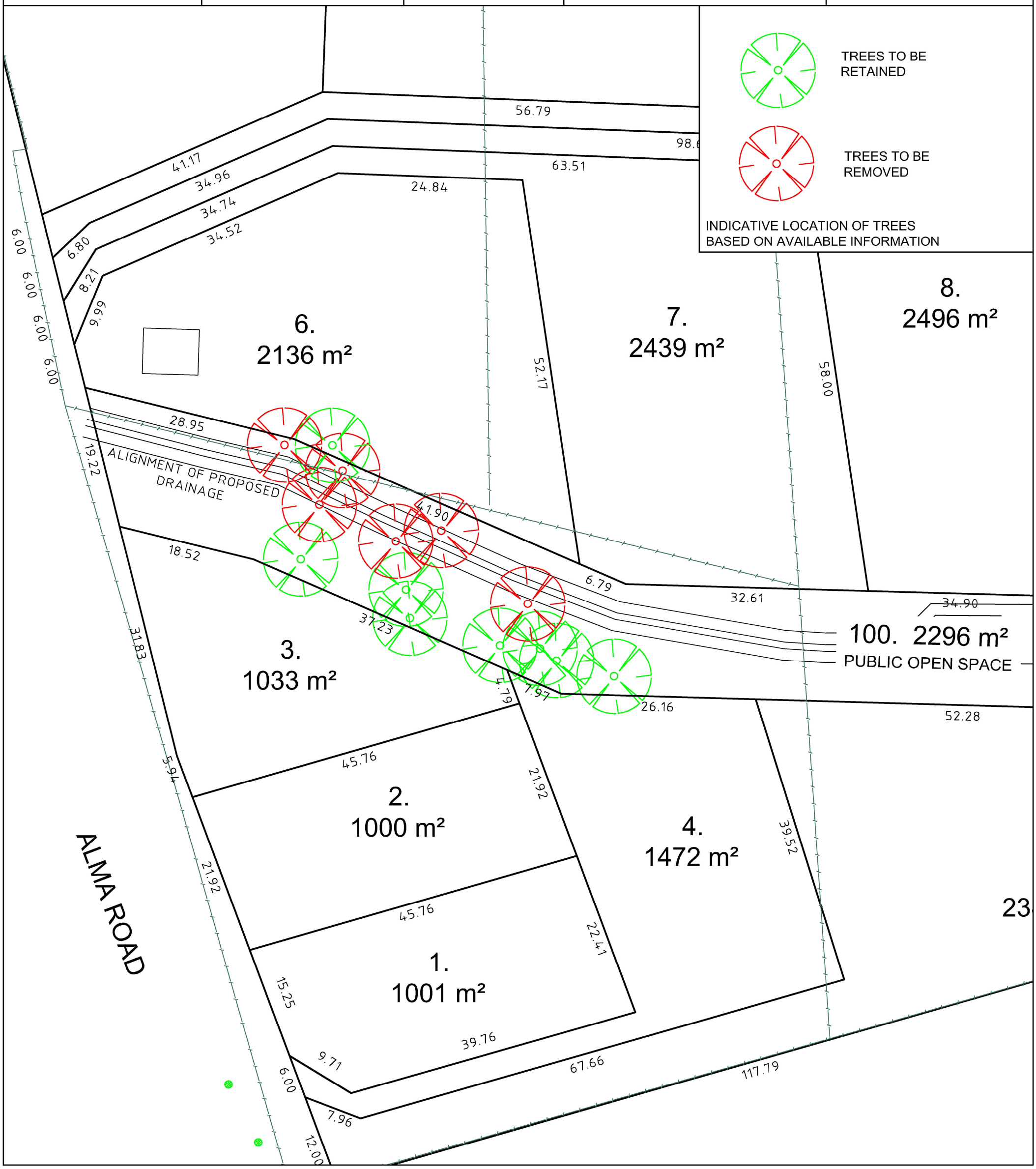
LOCATION: 66 ALMA RD ORFORD TAS 7190

MUNICIPALITY: Parish of TRIABUNNA, Land District of PEMBROKE

Important Note:
This plan was prepared as a proposed subdivision to accompany a subdivision application to Glamorgan-Spring Bay Council and should not be used for any other purpose. The dimensions, areas and total number of lots shown hereon are subject to field survey and also to the requirements of Council and any other authority which may have requirements under any relevant legislation. In particular, no reliance should be for any financial dealings involving the land. This note is an integral part of this plan.

MEASUREMENTS ARE IN METRES AND SUBJECT TO FINAL SURVEY

SCALE: 1:500 @ A3	CONTOUR INT: 0.5m	DATE: 10/06/2020	REF. No: C.T. 35054/1	File No: 375709



Tasflora

PO Box 420
Sandy Bay 7006
Mobile: 0438 391 121
Email: tasflora@bigpond.com

Mr Tony McCullogh
66 Alma Road
ORFORD TAS 7190

Dear Mr McCullogh

Re: Revegetation advice – 66 Alma Road, Orford

I am writing with regard to your request for revegetation advice pertaining to the public open space (POS) within the proposed subdivision at the above address.

Following the proposed creek remediation work along the creek line within the POS, which will require the removal of six mature *Eucalytpus globulus* (blue gum) trees, it is understood that there is a desire to reinstate the natural values of the creek with native planting along the new channel creek line and around the proposed detention ponds.

Where possible, natural regeneration of local grasses and shrubs should be encouraged at the site following creek remediation works. Tasflora also recommends revegetation with a mixture of native trees, understorey shrubs and grasses/reeds be undertaken at the following density:

- Trees – approximately 3m apart
- Understorey shrubs – minimum 2 m intervals
- Grasses/reeds – minimum 0.5 m intervals.

Recommended species and suggested quantities for each species are provided at Attachment A. Planting will be limited to the POS only and no closer than 2m from the 1.5m deep channel.

Prior to undertaking revegetation, the site should be prepared by removing all weed species. In order to maximise survival rates, planting should be undertaken in autumn or winter. Plants should be protected from animal browsing by securing tree guards around each plant (if planted individually around the property) or with rabbit proof fencing (if planted in groups, e.g. grasses/reeds).

Maintenance of all plants planted on the property is recommended for two years to maximise survival. This includes:

- watering as required to ensure establishment, particularly during extended dry periods;
- regular hand weeding around each plant for the first two years;

- removal of individual tree guards once trees have become established; and
- replacement of any plants that may die during this period.

Should you require any further information regarding this advice, please contact me on 0438 391121 or email tasflora@bigpond.com.

Yours sincerely

<<*Original signed*>>

Andrew Woolford
20 May 2020

ATTACHMENT 1 – RECOMMENDED SPECIES FOR REVEGETATION IN PUBLIC OPEN SPACE AT 66 ALMA ROAD, ORFORD

Stratum	Species	Common name	Suggested no. plants	Location	Recommended spacing
Trees	*Acacia mearnsii*	black wattle	10	Either side of creek batters	Approx. 3m apart
	Acacia melanoxylon	blackwood	10		
	Banksia marginata	silver banksia	10		
	Eucalyptus globulus	blue gum	10		
	Eucalyptus pulchella	white peppermint	10		
Understorey shrubs	*Bursaria spinosa*	prickly box	10	Either side of creek batters	Min. 2 m intervals
	Dodoaea viscosa	native hop	10		
	Leptospermum scoparium	common tea tree	10		
	Leptospermum lanigerum	woolly tea tree	5		
	Pultenaea daphnoides	large-leaved bush pea	5		
Grasses/reeds	*Dianella revoluta*	spreading flaxlily	20	Either side of creek batters	Min. 2 m intervals. These can be bought as small multi-celled plants to reduce cost.
	Lomandra longifolia	sagg	50		
	Poa labillardierei	tussockgrass	50		
	Carex tasmanica	curly topped sedge	20	Detention ponds	
	Ficinia nodosa	knobby club rush	50		
	Juncus pallidus	pale rush	50		

WOOLCOTT SURVEYS

PLANNING SUPPORTING REPORT

SUBDIVISION
66 ALMA ROAD, ORFORD

Prepared for Nick Griggs & Co Surveying

July 2020

Job Number: H200504
Prepared by: Shane Wells (shane@woolsurveys.com.au)
Senior Town Planner
Reviewed by: James Stewart (james@woolcottsurveys.com.au)
Senior Town Planner

Revision History			
Rev. no	Date	Revision Description	Prepared by
1	3 July 2020	Draft report	SW
2	6 July 2020	Quality Assurance Review	JS
3	6 July 2020	Client Review	

TABLE OF CONTENT

1. INTRODUCTION

This report has been prepared in support of a planning permit application under Section 57 of the *Land Use Planning and Approval Act 1993* ("**the Act**") for a subdivision to create 11 lots at 66 Alma Road, Orford ("**the Site**").

This application is to be read in conjunction with the following supporting documentation:

Document	Consultant
Plan of Subdivision, 2 June 2020	Nick Griggs and Co
Tree Retention Plan, 10 June 2020	Nick Griggs and Co
Bushfire Hazard Report, 30 June 2020	PDA Surveyors
Natural Values Assessment, April 2020	Tasflora
Revegetation advice, 20 May 2020	Tasflora
Stormwater Management Design Report, 4 June 2020	Ross Cumming Engineering
Certificate of titles	

1.1 APPLICATION SUMMARY

The following is a summary of the application information:

Address	66 Alma Road, Orford
Title	35054/1 (refer to Annexure 1 for detail)
Land area	2.35 ha
Special or significant features	A modified watercourse runs through the site
Current use	Dwelling and outbuildings
Proposed use	Nil
Proposed development	Subdivision
Planning Authority	Glamorgan Spring Bay Council ("**the Council**")
Zone	Lowl Residential Zone
Use status	NA
Covenants	Nil
Application status	Discretionary application

1.2 PLANNING HISTORY

A 15-lot subdivision of the site was refused by Council earlier this year. Clearly stated refusal reasons were not provided but relate to impact to waterway values and the construction of a cul-de-sac.

That application sought to construct a short cul-de-sac off Alma Road to service the land. The assessment of this in the report to Council stated the following:

> "A cul-de-sac is created. The cul-de-sac is the principal and only road. This cannot be seen as keeping to a minimum."

With respect to waterway values, the report noted that there was an absence of a natural values survey which it considered necessary although it did not request prior to making a decision, and nor did it report on any consultation with its natural resource management staff.

The subdivision layout has been modified in consultation with Council staff and it is understood that all issues have been resolved in this later design.

The absence of a cul-de-sac road necessitates a lesser lot yield and an increased use of internal lots from four to six internal lots.

1.3 THE PROPOSAL

Approval is sought for a subdivision to create 11 lots.

The subdivision layout provides a 2296m^2 public open space lot centred upon the existing watercourse. The current watercourse is heavily modified, and is filled for a 45m section in the eastern part of the lot. The lack of a complete channel through the site is a major source of flooding for downstream properties as it forces flows from upper sections of the catchment and flows from the rural living area to the north to sheet overland through the site and into adjoining land with effects exacerbated by substandard kerbing to Holkham Court. The watercourse will be reinstated, re-shaped and formed to convey stormwater and runoff from higher sections of the catchment through the site. Additional stormwater generated by the lots will be managed in stormwater detention basin within the public open space lot. Council also has a works external policy requiring a per lot charge for upgrades to downstream infrastructure.

Lots 1 to 5 are on the southern side of the public open space lot. Lots 1 to 3 have direct frontage to Alma Road and range from 1000m^2 to 1033m^2. Lots 4 and 5 are larger, internal lots. A piped stormwater system is proposed for all of these lots. A section of lot 5 that is below the stormwater line will require a Part 5 Agreement or other means to restrict future development. Lots 1 to 4 will be serviced via a new sewer line. Water connections will be provided from Alma Road.

Lots 6 to 11 are on the northern side of the public open space lot. Lots 7, 8, 9 and 10 are internal lots and all lots in this section are above 2000m^2. Lot 11 contains the existing dwelling and one of the existing outbuildings. A piped stormwater system is proposed for lots 8, 9, 10 and 11 with lots 6 and 7 connecting to the watercourse above the stormwater detention pond. Water will be provided from Alma Road. Two sewer pipes are proposed to service this section.

2. SUBJECT SITE

2.1 LOCATION

The Site is within a large area of Low Density Residential Zone at the northern extent of Orford. The land is serviced, and General Residential Zone land exists to the west on the opposite side of Alman Road. The current pattern of lots was formed under a former rural living type zone, but a number of low density sized lots have been created along Holkham Court, including the new Mace Court.

2.2 SITE CHARACTERISTICS

The site has a south-east aspect with a fall of approximately 1 in 13. An unnamed watercourse runs through the site with drains a catchment from Rudds Hill through to Raspins Beach. The watercourse is heavily modified and is filled within a section, which creates a flood risk to downstream properties. There is some retained native vegetation adjacent to a section of the watercourse.

2.3 EXISTING SERVICE INFRASTRUCTURE

Reticulated water is available in Alma Road. Reticulated sewerage is available via an existing connection in the south-east corner of the site.

The existing watercourse is part of the Council stormwater network, with the current house connected into this.

The site is connected to reticulated power and is within the fixed line NBN rollout.

2.4 ACCESS

The site has an existing access from Alma Road.

FIGURE 1 – AERIAL VIEW OF THE SITE AND SURROUNDS, WITH WATER AND SEWER MAINS AND HYDROGRAPHIC LINE (SOURCE: LISTMAP).

3. PLANNING CONTROLS

3.1 PLANNING SCHEME

The subject site falls within the municipal area of Glamorgan Spring Bay Council. Therefore, the statutory planning control document is the *Glamorgan Spring Bay Interim Planning Scheme 2015* ("**the Scheme**").

3.2 ZONING

The site is within the Low Density Residential Zone of the Scheme, as is adjacent land to the south and east. Land to the north is within the Rural Living Zone.

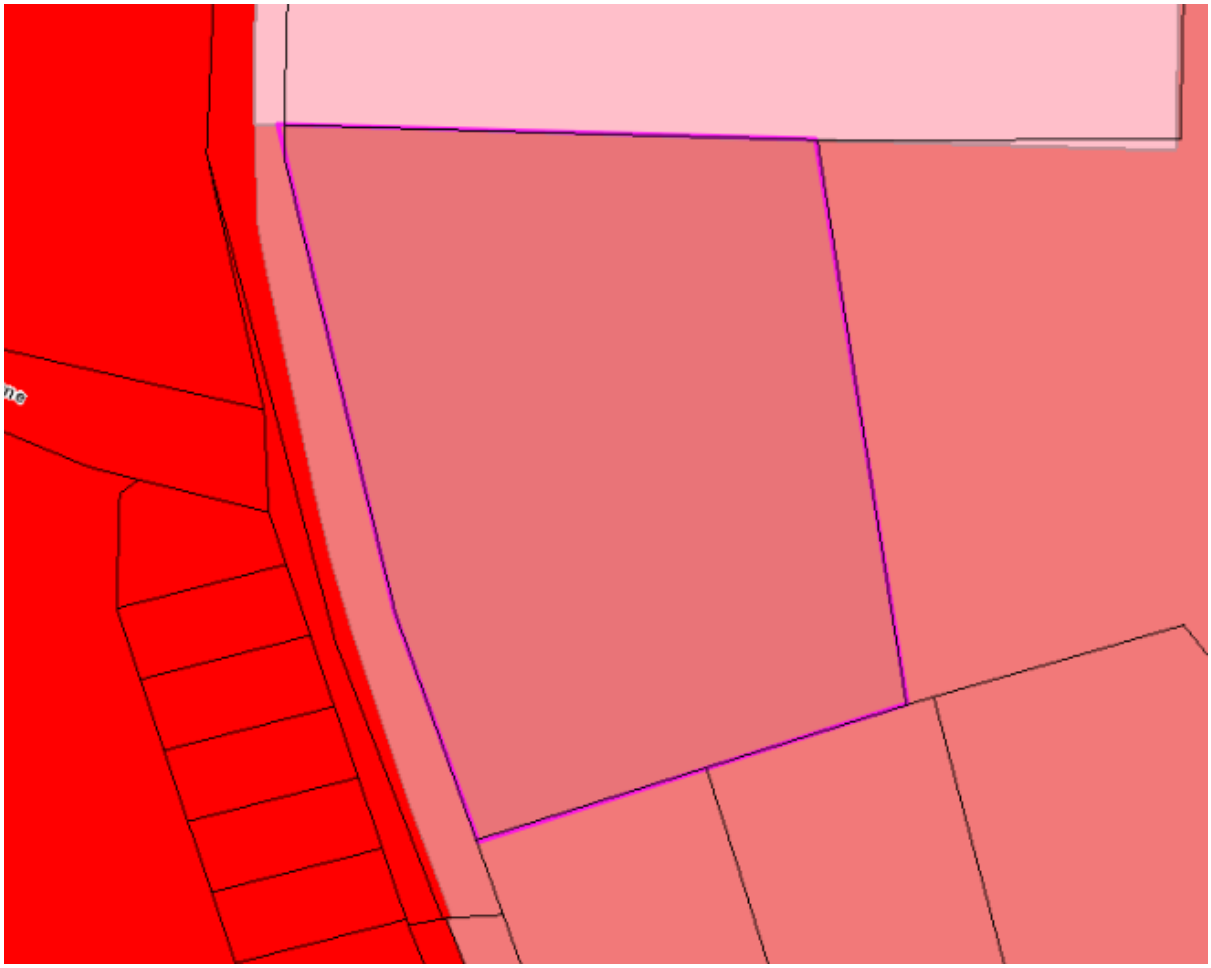


FIGURE 2 – ZONING; GENERAL RESIDENTIAL IN RED, LOW DENSITY RESIDENTIAL IN PINK (SOURCE: LISTMap)

3.3 OVERLAYS

A Waterway and Coastal Protection Area overlay runs through the site. There are no other overlays.

FIGURE 3 –OVERLAYS (SOURE: LISTMap).

4. PLANNING ASSESSMENT

4.1 Planning Scheme Zone Assessment

12.0 Low Density Residential Zone

12.1 Zone Purpose

12.1.1 Zone Purpose Statements

12.1.1.1	To provide for residential use or development on larger lots in residential areas where there are infrastructure or environmental constraints that limit development.
12.1.1.2	To provide for non-residential uses that are compatible with residential amenity.
12.1.1.3	To avoid land use conflict with adjacent Rural Resource or Significant Agricultural zoned land by providing for adequate buffer areas.

Response:

The subdivision provides larger lots within the urban environment of Orford in a manner than responses to the environmental and servicing constraints of the site. There is no adjacent rural land and no conflict with rural use.

12.2 Use Table

Not applicable.

12.3 Use Standards

Not applicable.

12.4 Development Standards for Buildings and Works

Not applicable.

12.5 Development Standards for Subdivision

12.5.1 Lot design

Objective	To provide for new lots that: (a) have appropriate area and dimensions to accommodate development consistent with the Zone Purpose and any relevant Local Area Objectives or Desired Future Character Statements; (b) contain building areas which are suitable for residential development, located to avoid hazards and values and will not lead to land use conflict and fettering of resource development use on adjoining rural land; (c) are not internal lots, except if the only reasonable way to provide for desired residential density.		
Acceptable solutions		**Performance criteria**	
A1	The size of each lot must be in accordance with the following, except if for public open space, a riparian or littoral reserve or utilities: no less than 1,000 m^2 and no more than 2,500 m^2 (except balance lot)	P1	No Performance Criteria.

Response:

A1 All lots are between 1000m^2 and 2500m^2.

Acceptable solutions		Performance criteria	
A2	The design of each lot must provide a minimum building area that is rectangular in shape and complies with all of the following, except if for public open space, a riparian or littoral reserve or utilities; (a) clear of the frontage, side and rear boundary setbacks; (b) not subject to any codes in this planning scheme; (c) clear of title restrictions such as easements and restrictive covenants; (d) has an average slope of no more than 1 in 5; (e) is a minimum of 10 m x 15 m in size.	P2	The design of each lot must contain a building area able to satisfy all of the following: (a) is reasonably capable of accommodating residential use and development; (b) meets any applicable standards in codes in this planning scheme; (c) enables future development to achieve reasonable solar access, given the slope and aspect of the land; (d) minimises the requirement for earth works, retaining walls, and cut & dill associated with future development;

Response:

P2 Lots 1 to 4 and 6 to 11 comply with the acceptable solution. The building area for lot 5 complies with the acceptable solution other than the setback to the side boundary with lot 4. The relevant side boundary setback is 4.5m and the area is shown with the corner of the building area set on the boundary.

There is a large area within lot 5 to accommodate future development. This includes the potential to develop within the waterway overlay given the section within the overlay:

- is pasture with no native vegetation;
- extensive re-vegetation is proposed to the public open space lot;
- the fall of the land to is to the south-east and away from the watercourse; and
- concentrated stormwater from buildings and driveways will be piped to the stormwater detention basin.

For lot 5, there is minimal need for cut and fill. Lot 5 also has good solar access with the east-west aligned building area having no features to the north that limit solar access.

Acceptable solutions		Performance criteria	
A3	The frontage for each lot must be no less than the following, except if for public open space, a riparian or littoral reserve or utilities and except if an internal lot: 30m.	P3	The frontage of each lot must provide opportunity for reasonable vehicular and pedestrian access and must be no less than: 6m.

Response:

P3 Lots 3 and 11 comply with the 30m frontage.

A 30m frontage with a 2.5 ratio of depth to frontage would be a 2625m^2 lot, which is in fact prohibited in the zone as it exceeds the maximum lot size. The 30m frontage is clearly an unreasonable standard.

Each lot has a 6m or greater frontage. Each internal lot will have practical access via a shared driveway and each will have reasonable vehicular and pedestrian access.

Acceptable solutions		Performance criteria	
A4	No lot is an internal lot.	P4	An internal lot must satisfy all of the following: (a) access is from a road existing prior to the planning scheme coming into effect, unless site constraints make an internal lot configuration the only reasonable option to efficiently utilise land; (b) it is not reasonably possible to provide a new road to create a standard frontage lot; (c) the lot constitutes the only reasonable way to subdivide the rear of an existing lot; (d) the lot will contribute to the more efficient utilisation of living land; (e) the amenity of neighbouring land is unlikely to be unreasonably affected by subsequent development and use; (f) the lot has access to a road via an access strip, which is part of the lot, or a right-of-way, with a width of no less than 3.6m; (g) passing bays are provided at appropriate distances along the access strip to service the likely future use of the lot; (h) the access strip is adjacent to or combined with no more than three other internal lot access strips and it is not appropriate to provide access via a public road; (i) a sealed driveway is provided on the access strip prior to the sealing of the final plan. (j) the lot addresses and provides for passive surveillance of public open space and public rights of way if it fronts such public spaces.

Response:

P4 The provision of a public open space lot to the watercourse necessitates a layout that incorporates internal lots, as there is no viable way to construct a public road network. With respect to each of the criteria, it is submitted that:

(a) Access is from an existing road and no new road is proposed.

(b) It is not reasonably possible to provide a new road. South of the public open space lot there are two internal lots only and road construction would be cost prohibitive and create an unreasonable maintenance obligation for the road authority. North of the public open space lot, a road to lots 8 and 9 would be approximately 115m in length for five lots. For comparison, the initial 115m length of Mace Court provides access for nine lots. A new road would be a significant construction and maintenance cost item and would add very little practical benefit over the proposed shared right of way. In any case, based on the earlier refusal, the Council would refusal any subdivision that included a cul-de-sac.

(c) For the above reasons, the proposed internal lots are the only reasonable way to access the land.

(d) The subdivision layout provides a more efficient use of urban land.

(e) The internal lots are unlikely to affected by vehicle movements along the shared accesses.
(f) Each lot has a direct frontage that is more than 3.6m.
(g) The Bushfire Hazard Report requires passing bays at a distance of every 200m. It is considered that passing bays at the frontage will be adequate.
(h) The access strips for lots 7 to 10 do not exceed the maximum of four of adjacent access strips.
(i) A sealed driveway can be constructed prior to sealing the final plan of survey.
(j) The lots retain the ability for passive surveillance over the public open space and the shared driveways.

Acceptable solutions		Performance criteria	
A5	Setback from a new boundary for an existing building must comply with the relevant Acceptable Solution for setback.	P3	Setback from a new boundary for an existing building must satisfy the relevant Performance Criteria for setback.

Response:

A5 The setback of all existing buildings is more than 1.5m and complies.

12.5.2 Roads

Objective: To ensure that the arrangement of new roads within a subdivision provides for all of the following:
(a) the provision of safe, convenient and efficient connections to assist accessibility and mobility of the community;
(b) the adequate accommodation of vehicular, pedestrian and cycling traffic;
(c) the efficient ultimate subdivision of the entirety of the land and of neighbouring land..

Acceptable solutions		Performance criteria	
A1	The subdivision includes no new road.	P1	The arrangement and construction of roads within a subdivision must satisfy all of the following: (a) the appropriate and reasonable future subdivision of the entirety of any balance lot is not compromised; (b) the route and standard of roads accords with any relevant road network plan adopted by the Planning Authority; (c) the subdivision of any neighbouring or nearby land with subdivision potential is facilitated through the provision of connector roads and pedestrian paths, where appropriate, to common boundaries; (d) an acceptable level of access, safety, convenience and legibility is provided through a consistent road function hierarchy; (e) cul-de-sac and other terminated roads are not created, or their use in road layout design is kept to an absolute minimum; (f) connectivity with the neighbourhood road network is maximised; (g) the travel distance between key destinations such as shops and services is minimised; (h) walking, cycling and the efficient movement of public transport is facilitated; (i) provision is made for bicycle infrastructure on new arterial and collector roads in accordance with Austroads Guide to Road Design Part 6A;

	(j) multiple escape routes are provided if in a bushfire prone area.

Response:

A1 No new roads are proposed.

12.5.3 Ways and Public Open Space

Objective: To ensure that the arrangement of ways and public open space provides for all of the following:
- (a) the provision of safe, convenient and efficient connections for accessibility, mobility and recreational opportunities for the community;
- (b) the adequate accommodation of pedestrian and cycling traffic;.

Acceptable solutions	Performance criteria
A1 No Acceptable Solution.	P1 The arrangement of ways and public open space within a subdivision must satisfy all of the following: (a) connections with any adjoining ways are provided through the provision of ways to the common boundary, as appropriate; (b) connections with any neighbouring land with subdivision potential is provided through the provision of ways to the common boundary, as appropriate; (c) connections with the neighbourhood road network are provided through the provision of ways to those roads, as appropriate; (d) new ways are designed so that adequate passive surveillance will be provided from development on neighbouring land and public roads as appropriate; (e) topographical and other physical conditions of the site are appropriately accommodated in the design; (f) the route of new ways has regard to any pedestrian & cycle way or public open space plan adopted by the Planning Authority; (g) new ways or extensions to existing ways must be designed to minimise opportunities for entrapment or other criminal behaviour including, but not limited to, having regard to the following: (i) the width of the way; (ii) the length of the way; (iii) landscaping within the way; (iv) lighting; (v) provision of opportunities for 'loitering'; (vi) the shape of the way (avoiding bends, corners or other opportunities for concealment).
A2 No Acceptable Solution.	P2 Public Open Space must be provided as land or cash in lieu, in accordance with the relevant Council policy.

Response:

P1/P2 The public open space lot would enable future connectivity by way of a pathway along the watercourse as adjoining land is subdivided. The public open space lot is large and wide and provides ample room for the watercourse, for revegetation and for public use such as future walkway if desired, with passive surveillance with no opportunities for entrapment. The public open space lot exceeds the 5% limitation at section 116 (1) of the *Local Government (Building and Miscellaneous Provisions Act) 1993* but compensation will not be sought.

12.5.4 Services

Objective: To ensure that the subdivision of land provides adequate services to meet the projected needs of future development.			
Acceptable solutions		**Performance criteria**	
A1	Each lot must be connected to a reticulated potable water supply where such a supply is available.	P1	No Performance Criteria.
A2	Each lot must be connected to a reticulated sewerage system where available	P2	Where a reticulated sewerage system is not available, each lot must be capable of accommodating an on-site wastewater treatment system adequate for the future use and development of the land.
A3	Each lot must be connected to a stormwater system able to service the building area by gravity	P3	Each lot must be capable of accommodating an on-site stormwater management system adequate for the likely future use and development of the land.
A4	The subdivision includes no new road.	P4	The subdivision provides for the installation of fibre ready facilities (pit and pipe that can hold optical fibre line) and the underground provision of electricity supply.

Response:

A1 Each lot is connected to reticulated water.

A2 Each lot is connected to reticulated sewer.

A3 Each lot is connected to a stormwater system that will service the building area of each lot by gravity.

A4 No new road is proposed.

4.2 Planning Scheme Code Assessment

The following Codes under the Scheme are considered applicable to this application.

CODE		COMMENTS
E1	Bushfire-prone Areas Code	Applicable.
E2	Potentially Contaminated Land Code	Not applicable – no known history of a relevant activity.
E3	Landslide Code	Not applicable.
E5	Road and Railway Assets Code	Applicable.
E6	Parking and Access Code	Applicable.
E7	Stormwater Management Code	Applicable.
E8	Electricity Transmission Infrastructure Protection Code	Not applicable.
E9	Attenuation Code	Not applicable.
E10	Biodiversity Code	Not applicable.
E11	Waterway and Coastal Protection Code	Applicable.
E13	Historic Heritage Code	Not applicable.
E14	Scenic Landscape Code	Not applicable.
E15	Inundation Prone Areas Code	Not applicable.
E16	Coastal Erosion Hazard Code	Not applicable.
E17	Signs Code	Not applicable.
E18	Wind and Solar Energy Code	Not applicable.
E19	Telecommunications Code	Not applicable.
E24	Coastal Development Code	Not applicable.

E1.0 Bushfire-Prone Areas Code

Compliance with this Code is demonstrated by the Bushfire Hazard Report.

Section 51(2)(d) of LUPPA states that a Planning Authority must accept:

> *(i) any relevant bushfire hazard management plan, or other prescribed management plan relating to environmental hazards or natural hazards, that has been certified as acceptable by an accredited person or a State Service Agency;*

E5.0 Road and Rail Code

This Code applies to all use and development.

E5.5 Use standards

E5.5.1 Existing road accesses and junctions

A1/P1 and A2/P2 are not relevant to this location

Objective:	To ensure that the safety and efficiency of roads is not reduced by increased use of existing accesses and junctions.		
Acceptable solutions		**Performance criteria**	
A3	The annual average daily traffic (AADT) of vehicle movements, to and from a site, using an existing access or junction, in an area subject to a speed limit of 60km/h or less, must not increase by more than 20% or 40 vehicle movements per day, whichever is the greater.	P3	Any increase in vehicle traffic at an existing access or junction in an area subject to a speed limit of 60km/h or less, must be safe and not unreasonably impact on the efficiency of the road, having regard to: (a) the increase in traffic caused by the use; (b) the nature of the traffic generated by the use; (c) the nature and efficiency of the access or the junction; (d) the nature and category of the road; (e) the speed limit and traffic flow of the road; (f) any alternative access to a road; (g) the need for the use; (h) any traffic impact assessment; and (i) any written advice received from the road authority.

Response:

A3 Traffic movements to and from the existing access will not change. This clause applies to existing accesses only.

For the subdivision, the traffic generation of 10 additional lots will equate to 74 additional daily vehicle trips using traffic generation rates from Road and Maritime Services NWS, Updated Traffic Surveys, 2013. The additional lots represent an approximate 10% increase in the number of residential and low density residential lots using Alma Road. The traffic movements will not cause an unreasonable impact to the efficiency or safety of the road.

E5.5.2 Existing level crossings

Not applicable.

E5.6 Development Standards

E5.6.1 Development adjacent to roads and railways

Not applicable.

E5.6.2 Road access and junctions

A1/P1 is not relevant to this location.

Objective:	To ensure that the safety and efficiency of roads is not reduced by the creation of new accesses and junctions.	
Acceptable solutions		**Performance criteria**
A2	No more than one access providing both entry and exit, or two accesses providing separate entry and exit, to roads in an area subject to a speed limit of 60km/h or less.	P2 For roads in an area subject to a speed limit of 60km/h or less, accesses and junctions must be safe and not unreasonably impact on the efficiency of the road, having regard to: (a) the nature and frequency of the traffic generated by the use; (b) the nature of the road; (c) the speed limit and traffic flow of the road; (d) any alternative access to a road; (e) the need for the access or junction; (f) any traffic impact assessment; and (g) any written advice received from the road authority.

Response:

A2 Each lot has a maximum of one access.

E5.6.3 New level crossings

Not applicable.

E5.6.4 Sight distance at accesses, junctions and level crossings

Objective:	To ensure that accesses, junctions and level crossings provide sufficient sight distance between vehicles and between vehicles and trains to enable safe movement of traffic.	
Acceptable solutions		**Performance criteria**
A1	Sight distances at: (a) an access or junction must comply with the Safe Intersection Sight Distance shown in Table E5.1; and (b) rail level crossings must comply with AS1742.7 Manual of uniform traffic control devices - Railway crossings, Standards Association of Australia.	P1 The design, layout and location of an access, junction or rail level crossing must provide adequate sight distances to ensure the safe movement of vehicles, having regard to: (a) the nature and frequency of the traffic generated by the use; (b) the frequency of use of the road or rail network; (c) any alternative access; (d) the need for the access, junction or level crossing; (e) any traffic impact assessment; (f) any measures to improve or maintain sight distance; and (g) any written advice received from the road or rail authority.

Table E5.1 Safe intersection sight distance

Vehicle Speed	Safe Intersection Sight Distance in metres, for speed limit of:	
km/h	60 km/h or less	Greater than 60 km/h
50	80	90

Response:

A1 The sight distance is more than 100m in both directions from each of the proposed access locations.

E6.0 Car Parking Code

E6.7 Development Standards

E6.7.1 Number of Vehicular Accesses

Objective: To ensure that:

(a) safe and efficient access is provided to all road network users, including, but not limited to: drivers, passengers, pedestrians, and cyclists, by minimising:
  (i) the number of vehicle access points; and
  (ii) loss of on-street car parking spaces;
(b) vehicle access points do not unreasonably detract from the amenity of adjoining land uses;
(c) vehicle access points do not have a dominating impact on local streetscape and character.

Acceptable Solutions	Performance Criteria
A1 The number of vehicle access points provided for each road frontage must be no more than 1 or the existing number of vehicle access points, whichever is the greater.	P1 The number of vehicle access points for each road frontage must be minimised, having regard to all of the following: (a) access points must be positioned to minimise the loss of on-street parking and provide, where possible, whole car parking spaces between access points; (b) whether the additional access points can be provided without compromising any of the following: (i) pedestrian safety, amenity and convenience; (ii) traffic safety; (iii) residential amenity on adjoining land; (iv) streetscape; (v) cultural heritage values if the site is subject to the Local Historic Heritage Code; (vi) the enjoyment of any 'al fresco' dining or other outdoor activity in the vicinity.

Response:

A1 The acceptable solution is complied with.

E6.7.2 Design of Vehicular Accesses

Objective: To ensure safe and efficient access for all users, including drivers, passengers, pedestrians and cyclists by locating, designing and constructing vehicle access points safely relative to the road network.	
Acceptable Solutions	**Performance Criteria**
A1 Design of vehicle access points must comply with all of the following: (a) in the case of non-commercial vehicle access; the location, sight distance, width and gradient of an access must be designed and constructed to comply with section 3 – "Access Facilities to Off-street Parking Areas and Queuing Areas" of AS/NZS 2890.1:2004 Parking Facilities Part 1: Off-street car parking; (b) in the case of commercial vehicle access; the location, sight distance, geometry and gradient of an access must be designed and constructed to comply with all access driveway provisions in section 3 "Access Driveways and Circulation Roadways" of AS2890.2 - 2002 Parking facilities Part 2: Off-street commercial vehicle facilities.	P1 Design of vehicle access points must be safe, efficient and convenient, having regard to all of the following: (a) avoidance of conflicts between users including vehicles, cyclists and pedestrians; (b) avoidance of unreasonable interference with the flow of traffic on adjoining roads; (c) suitability for the type and volume of traffic likely to be generated by the use or development; (d) ease of accessibility and recognition for users.

Response:

A1 Vehicle access points will comply with the acceptable solution.

E6.7.3 Vehicular Passing Areas Along an Accesses

Objective: To ensure that: (a) the design and location of access and parking areas creates a safe environment for users by minimising the potential for conflicts involving vehicles, pedestrians and cyclists; (b) use or development does not adversely impact on the safety or efficiency of the road network as a result of delayed turning movements into a site.	
Acceptable Solutions	**Performance Criteria**
A1 Vehicular passing areas must: (a) be provided if any of the following applies to an access: (i) it serves more than 5 car parking spaces; (ii) is more than 30 m long; (iii) it meets a road serving more than 6000 vehicles per day; (b) be 6 m long, 5.5 m wide, and taper to the width of the driveway; (c) have the first passing area constructed at the kerb; (d) be at intervals of no more than 30 m along the access.	P1 Vehicular passing areas must be provided in sufficient number, dimension and siting so that the access is safe, efficient and convenient, having regard to all of the following: (a) avoidance of conflicts between users including vehicles, cyclists and pedestrians; (b) avoidance of unreasonable interference with the flow of traffic on adjoining roads; (c) suitability for the type and volume of traffic likely to be generated by the use or development; (d) ease of accessibility and recognition for users.

Response:

P1 Passing bays at 30m intervals is unnecessary. One passing bay at the start of each shared driveways and passing opportunities along the northern shared access will provide safe, efficient and convenient access without conflict with other road users.

E6.7.14 Road Access

Objective: To ensure that access to the road network is provided appropriately.	
Acceptable Solutions	**Performance Criteria**
A1 Access to a road must be in accordance with the requirements of the road authority.	P1 No Performance Criteria.

Response:

A1 The acceptable solution is complied with. Access complies with the planning scheme and is therefore understood to comply with the requirements of the road authority.

E7.0 Stormwater Management Code

E7.7 Development Standards

E7.7.1 Stormwater Drainage and Disposal

Objective: To ensure that stormwater quality and quantity is managed appropriately.	
Acceptable Solutions	**Performance Criteria**
A1 Stormwater from new impervious surfaces must be disposed of by gravity to public stormwater infrastructure.	P1 Stormwater from new impervious surfaces must be managed by any of the following: (a) disposed of on-site with soakage devices having regard to the suitability of the site, the system design and water sensitive urban design principles (b) collected for re-use on the site; (c) disposed of to public stormwater infrastructure via a pump system which is designed, maintained and managed to minimise the risk of failure to the satisfaction of the Council.

Response:

A1 The acceptable solution is achieved by gravity connection to Councils system.

A2 A stormwater system for a new development must incorporate water sensitive urban design principles for the treatment and disposal of stormwater if any of the following apply: (a) the size of new impervious area is more than 600 m^2;	P2 A stormwater system for a new development must incorporate a stormwater drainage system of a size and design sufficient to achieve the stormwater quality and quantity targets in accordance with the State Stormwater Strategy 2010, as detailed in Table E7.1 unless it is not feasible to do so.

(b) new car parking is provided for more than 6 cars; (c) a subdivision is for more than 5 lots.	

Response:

A2 The stormwater system incorporates water sensitive urban design principles for the treatment and disposal of stormwater. The system proposed will re-established a clear channel through the land and will provide a detention pond for flow management. The subdivision is also subject to a works external policy in this location which requires a contribution to downstream infrastructure upgrades.

E11.0 Waterway and Coastal Protection Code

E11.7 Development Standards

E11.7.1 Buildings and Works

A2/P2 and A3/P3 are not relevant to this location

Objective: To ensure that buildings and works in proximity to a waterway, the coast, identified climate change refugia and potable water supply areas will not have an unnecessary or unacceptable impact on natural values.	
Acceptable Solutions	**Performance Criteria**
A1 Building and works within a Waterway and Coastal Protection Area must be within a building area on a plan of subdivision approved under this planning scheme.	P1 Building and works within a Waterway and Coastal Protection Area must satisfy all of the following: (a) avoid or mitigate impact on natural values; (b) mitigate and manage adverse erosion, sedimentation and runoff impacts on natural values; (c) avoid or mitigate impacts on riparian or littoral vegetation; (d) maintain natural streambank and streambed condition, (where it exists); (e) maintain in-stream natural habitat, such as fallen logs, bank overhangs, rocks and trailing vegetation; (f) avoid significantly impeding natural flow and drainage; (g) maintain fish passage (where applicable); (h) avoid landfilling of wetlands; (i) works are undertaken generally in accordance with 'Wetlands and Waterways Works Manual' (DPIWE, 2003) and “Tasmanian Coastal Works Manual” (DPIPWE, Page and Thorp, 2010), and the unnecessary use of machinery within watercourses or wetlands is avoided.

Response:

P1 The natural values of the waterway are identified in the natural values survey. The subdivision will require the removal of some existing trees. The public open space is proposed to be revegetated to reinstate the natural values of the watercourse. Weed

management will also occur, as recommended by the natural values survey. A soil and water management plan will be prepared as part of the engineering design stage which will mitigate potential erosion risk during the construction phase.

5. CONCLUSION

The proposed subdivision is consistent with the purpose of the Low Density Residential Zone and satisfies all applicable Standards for the zone and codes. Therefore, the Council's support of this development is sought.

Annexure 1 – Certificate of Title Plan and Folio Text

Annexure 2 – Plan of Subdivision

Annexure 3 – Tree Retention Plan

Annexure 4 – Bushfire Hazard Report

Annexure 5 – Natural Values Assessment

Annexure 6 – Revegetation advice

Annexure 7 – Stormwater Management Design Report