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BUSHFIRE HAZARD ASSESSMENT

PROPOSED 9 LOT SUBDIVISION
LOTS 109-110 CHURCH LANE, CRANE BROOK

DECEMBER 2013

PREPARED BY:

cityscape planning + projects

abn: 37 089 650 386

phone: 4739 3374

fax: 4739 3408

mobile: 0408 866913

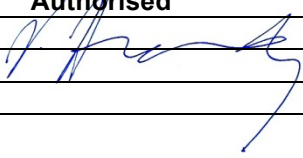
email: cityscape@cityscape.net.au

www.cityscape.net.au

post: PO Box 127

Glenbrook NSW 2773

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Version	Date	Prepared By:	Authorised
Draft	10/12/13	Vince Hardy	



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DISCLAIMER

This report is provided to accompany a Development Application to be lodged on the subject land and is to be used for that purpose solely and for the client exclusively. No liability is extended for any other use or to any other party. Whilst the report is derived in part from our knowledge and expertise, it is based on the conditions prevailing at the time of the Report and upon the information provided by the client.

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1.0 INTRODUCTION

This report represents a Bushfire Assessment to accompany a Development Application for the proposed subdivision of the Penrith subject site.

The report and assessment has been undertaken in a manner consistent with that identified in the relevant sections of ***Planning for Bushfire protection 2006***, and has been compiled through research, discussions with Council officers and on-site inspections.

2.0 SUBJECT SITE

2.1 LOCATION AND CONTEXT

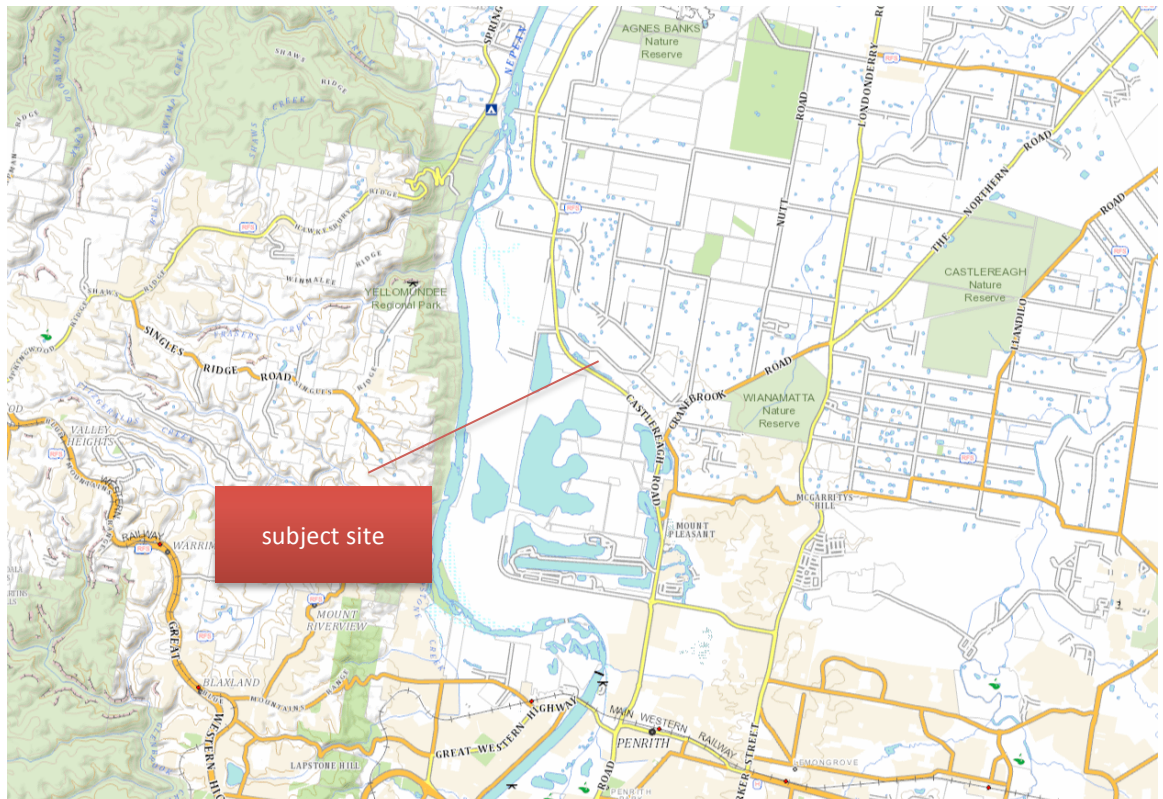
The subject site is a large irregular shaped parcel of land located on the southern side of Church Lane, with a second frontage to Castlereagh Rd to the south. A plan showing the locality of the site is provided at Figure 1.

The site forms part of the Penrith Lakes Scheme and actually represents the northern section of lots that straddle Castlereagh Rd and is comprised of two lots with the following real property description:

Lots: 109,110 **DP:** 1143931

The location of the site is demonstrated at Figure 1 with a cadastral plan provided at Figure 2 and an aerial photo of the broader Penrith Lake Scheme site provided at Figure 3.

subject site



subject site

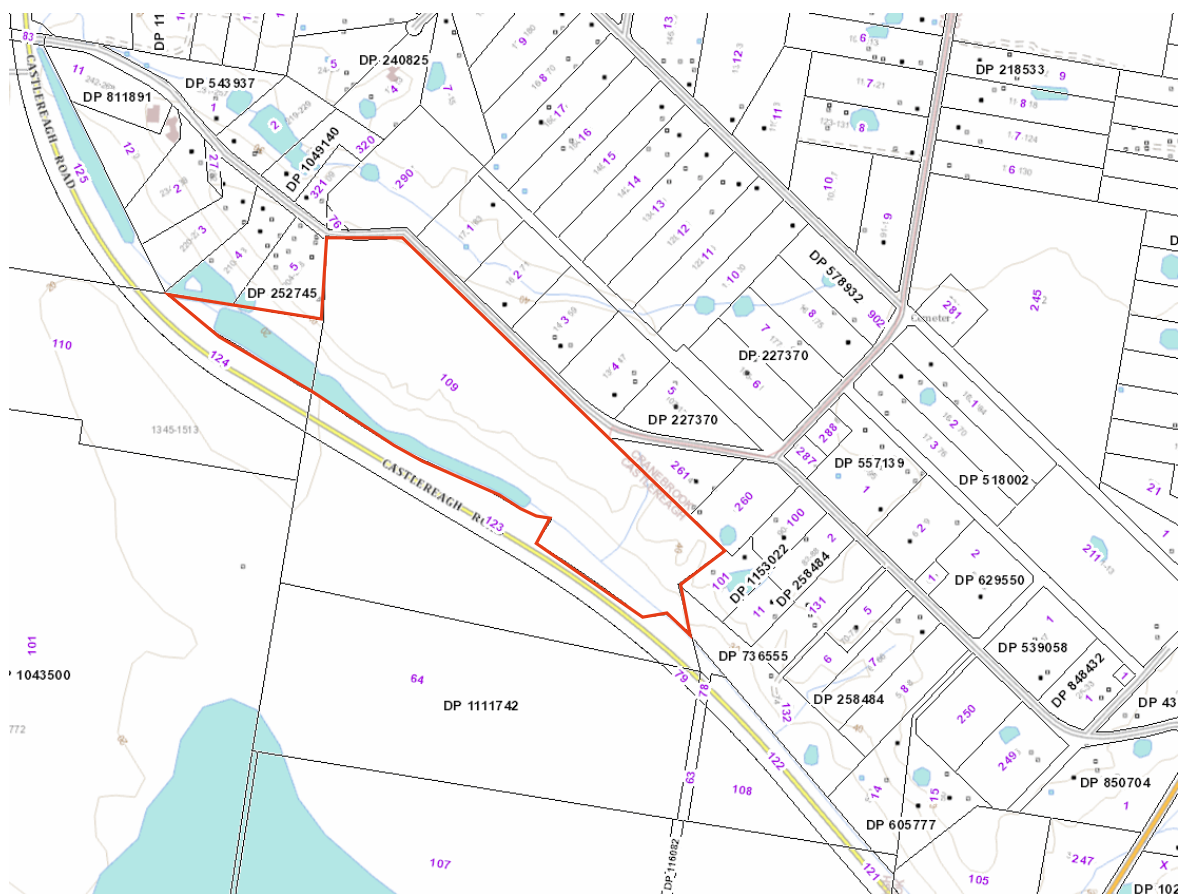


FIGURE 3: AERIAL IMAGE OF SITE



3.0 PROPOSED DEVELOPMENT

The application seeks Council consent for the subdivision of the subject site to create 9 (7 additional) allotments.

The dimension of each lot is represented in Table 1.

Vehicular access to each lot is to be provided via Church Lane. The subdivision plan includes designated building envelopes areas together with Asset Protection Zones (APZ) and waste-water disposal areas.

A detailed subdivision plan accompanies the Development Application however a representation of that plan is provided at Figure 4.

FIGURE 4: PROPOSED SUBDIVISION

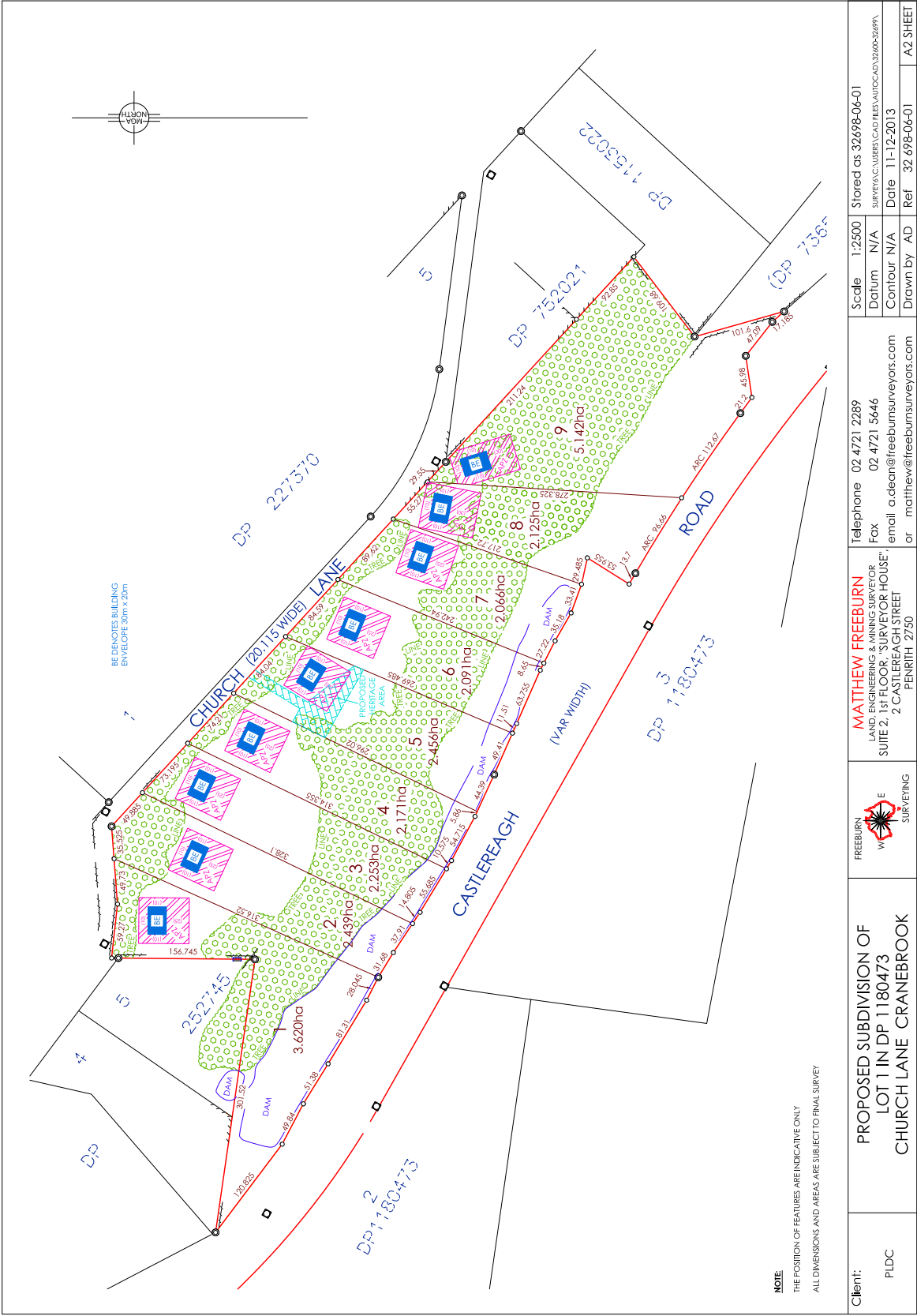


TABLE 1: PROPOSED LOT AREA

Proposed Lot	Area (hectares)	Lot Width (m) @ Church Lane	Comments
lot 1	3.63 ha	109m	
lot 2	2.43 ha	85.41m	
lot 3	2.25 ha	73.195m	
lot 4	2.17 ha	74.21m	
lot 5	2.46 ha	84.04m	Provides heritage curtilage for Mass Concrete Ruins
lot 6	2.09 ha	84.59m	
Lot 7	2.06 ha	89.62m	
Lot 8	2.09 ha	55.27m	
Lot 9	5.17 ha	333.64m	
Total	24.35 ha		

4.0 SITE ASSESSMENT

4.1 THE COUNCIL BUSHFIRE MAP

The subject site is identified as bushfire prone on the relevant bushfire prone land map held at the Penrith City Council offices.

Figure 5 provides an excerpt of that relevant Council map. The plan reveals that the central sections of the site are identified as *Bushfire Prone Land – Vegetation Category*, with the adjacent areas identified as *Buffer* areas.

4.2 VEGETATION

4.2.1 VEGETATION TYPES

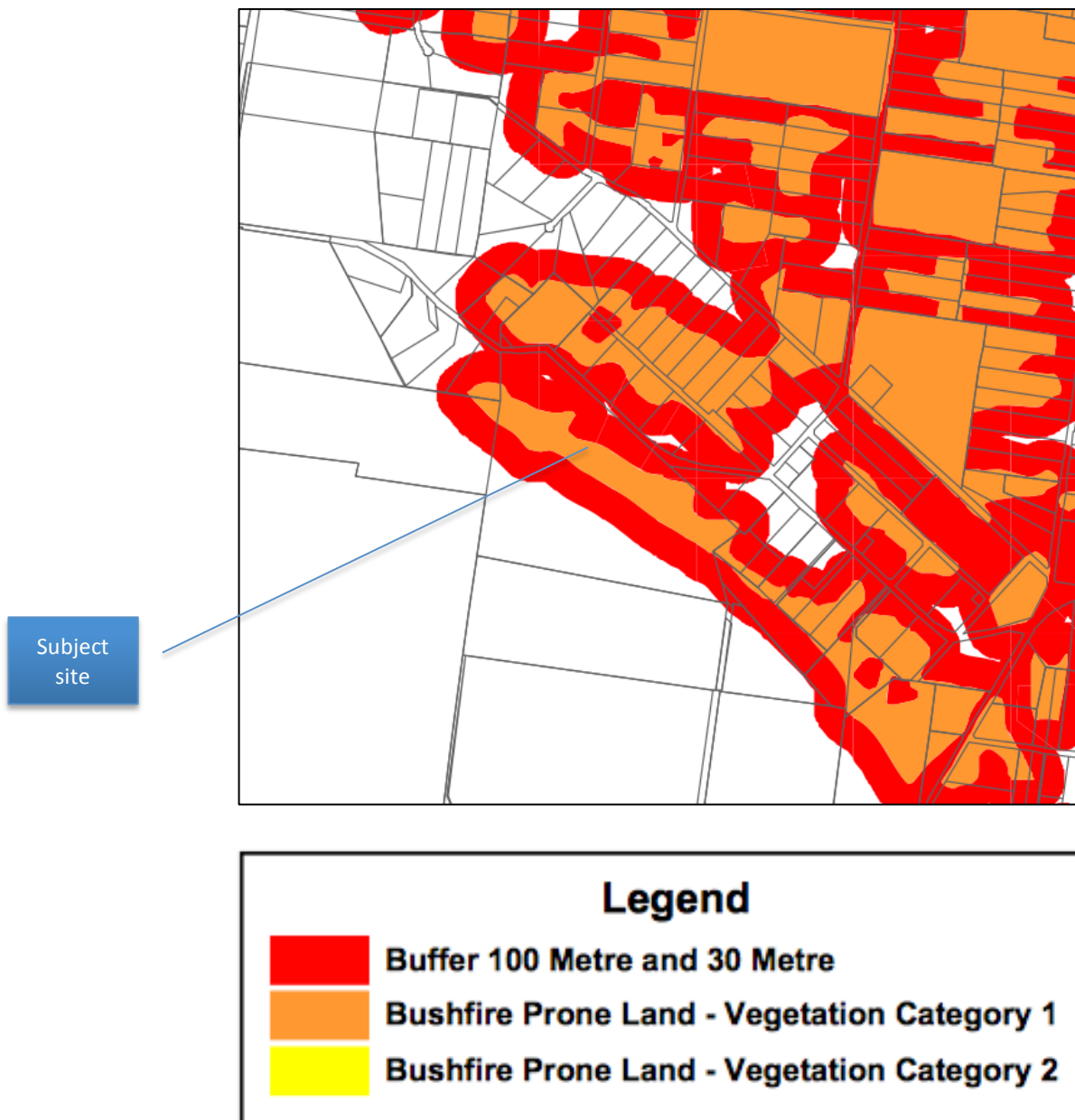
The broader Penrith Lakes has been highly modified by quarrying activities and other forms of development over many decades. This quarrying activity however has only been undertaken at the southern or lower sections of the subject site.

The upper areas of the site have been cleared as part of previous framing activity, however the central sections of the site provide

contiguous stands of bushland and the upper areas still provide scattered stands of bushland.

Study of the site by *Biosis Research* in 2007 has identified that this part of the site areas containing two native plant communities. i.e. Cumberland Plain Woodland and River-flat Eucalypt Forest. A copy of that report is provided at Annexure A.

FIG 5: **COUNCIL BUSHFIRE MAP**



The *Biosis* study stated that the River-flat Eucalypt Forest was restricted to the banks of the Nepean River, whilst the Cumberland Plain Woodland was recorded in the escarpment area and was considered to be in moderate condition, with a relatively intact tree canopy and weed management reducing the dominance of exotic species.

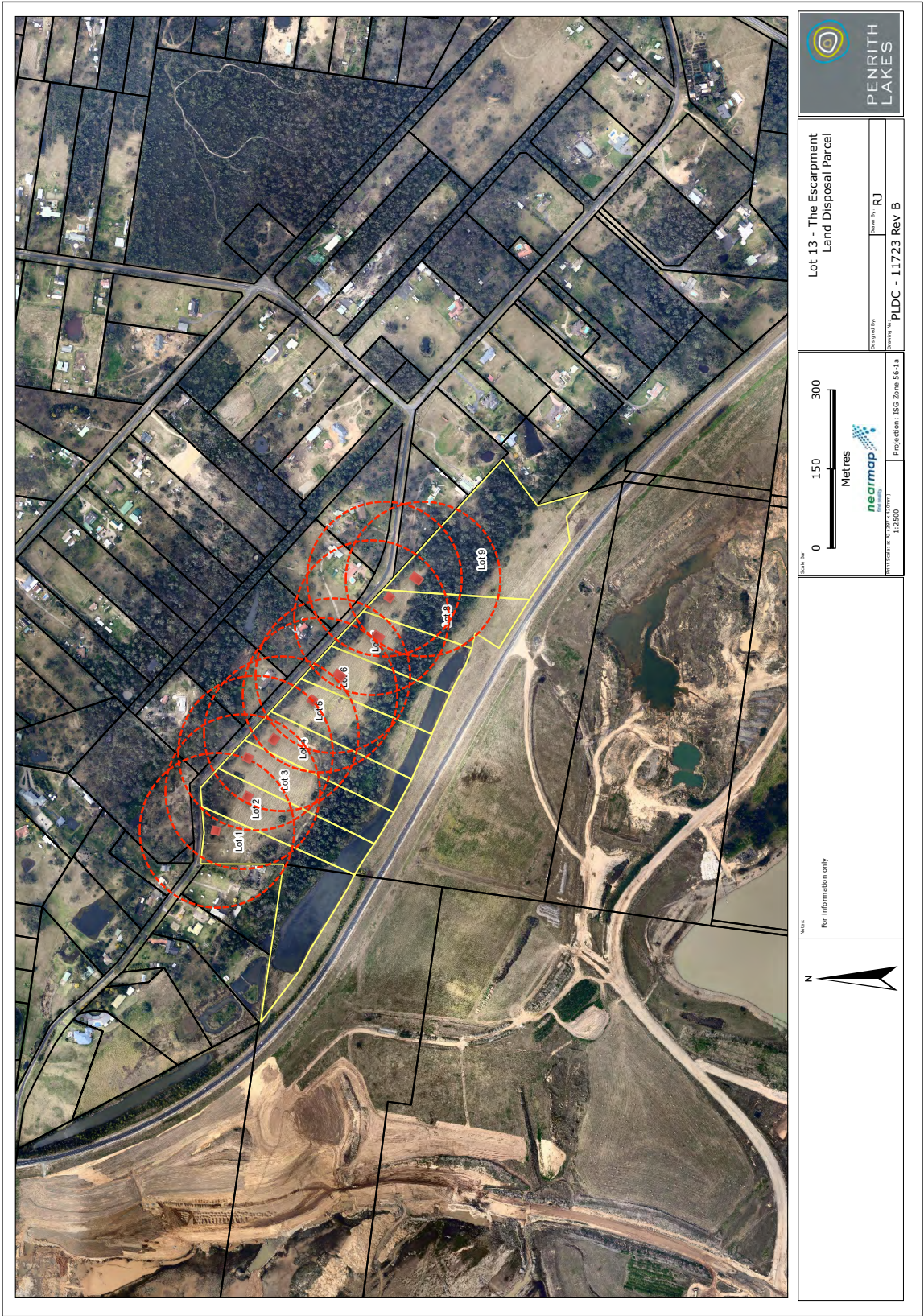
This study is consistent with mapping undertaken by *NSW National Parks and Wildlife Service in 2001*. An extract of that mapping is provided at Figure 7. Photos of the on site vegetation are provided at Figure 8-11.

4.2.2 VEGETATION DISTANCES

Planning for Bushfire Protection 2006 requires that an assessment be made of the different vegetation communities within 140m of the subject site.

The 140m radius is therefore plotted around the building envelope which is identified for each proposed lot as demonstrated at Figure 6. This figure reveals that the major vegetation units within that radius are the vegetation on the central sections of the site and vegetation to the north of Church Lane at the rear of those lots opposite.

FIG 6: 140 METRE RADIUS



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FIG 7: NPWS VEGETATION MAP

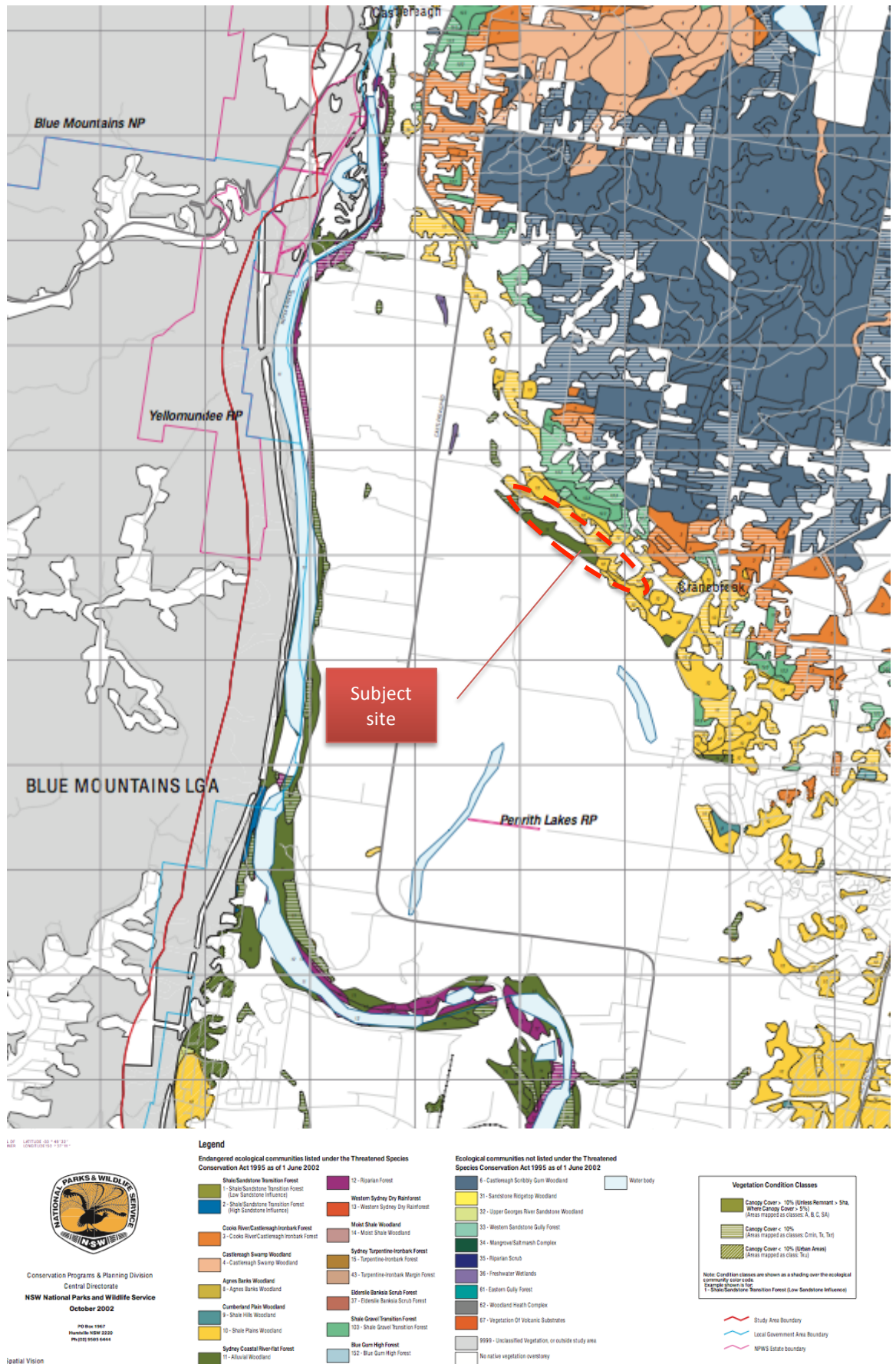


FIG 8: VEGETATION @ CHURCH LANE FRONTAGE



FIG 9: CLEARED OPEN AREA @ UPPER SECTION OF SITE



FIGURE 10-11: ESCARPMENT VEGETATION



4.2.3 VEGETATION CLASSIFICATION

Analysis of this vegetation reveals that the eastern escarpment area provides an open layer (>30% foliage cover) of eucalypts trees typically 15-35m high together with diverse ground covers and a sparsely distributed shrub layer.

Pursuant to the classifications provides as part of *Planning for Bushfire Protection 2006* this vegetation can be classified as Grassy Woodlands (woodlands), which has an assessed fuel load of 20-25 tonnes per ha.

For the purposes of this assessment this vegetation type is identified as the predominant class for those relevant lots.

4.3 SLOPE

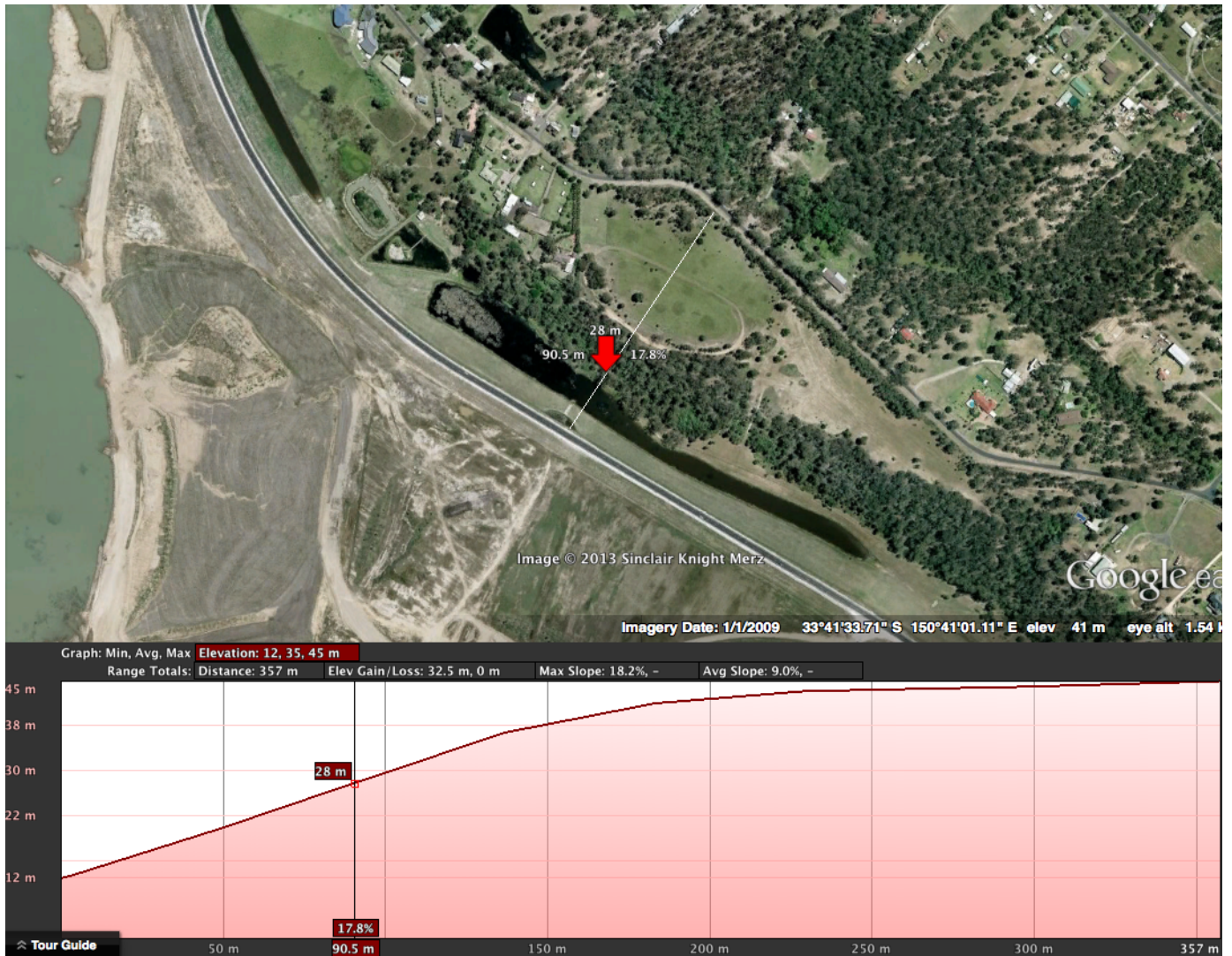
The lower sections of the site provides a floodplain type environment that has limited relief, however the areas that accommodate the bushfire lands are typically associated with steeper river-bank and escarpment lands.

Slope profiles of each of the relevant development lots are provided at Figures 12-15 and demonstrate the 'effective slope' for each site.

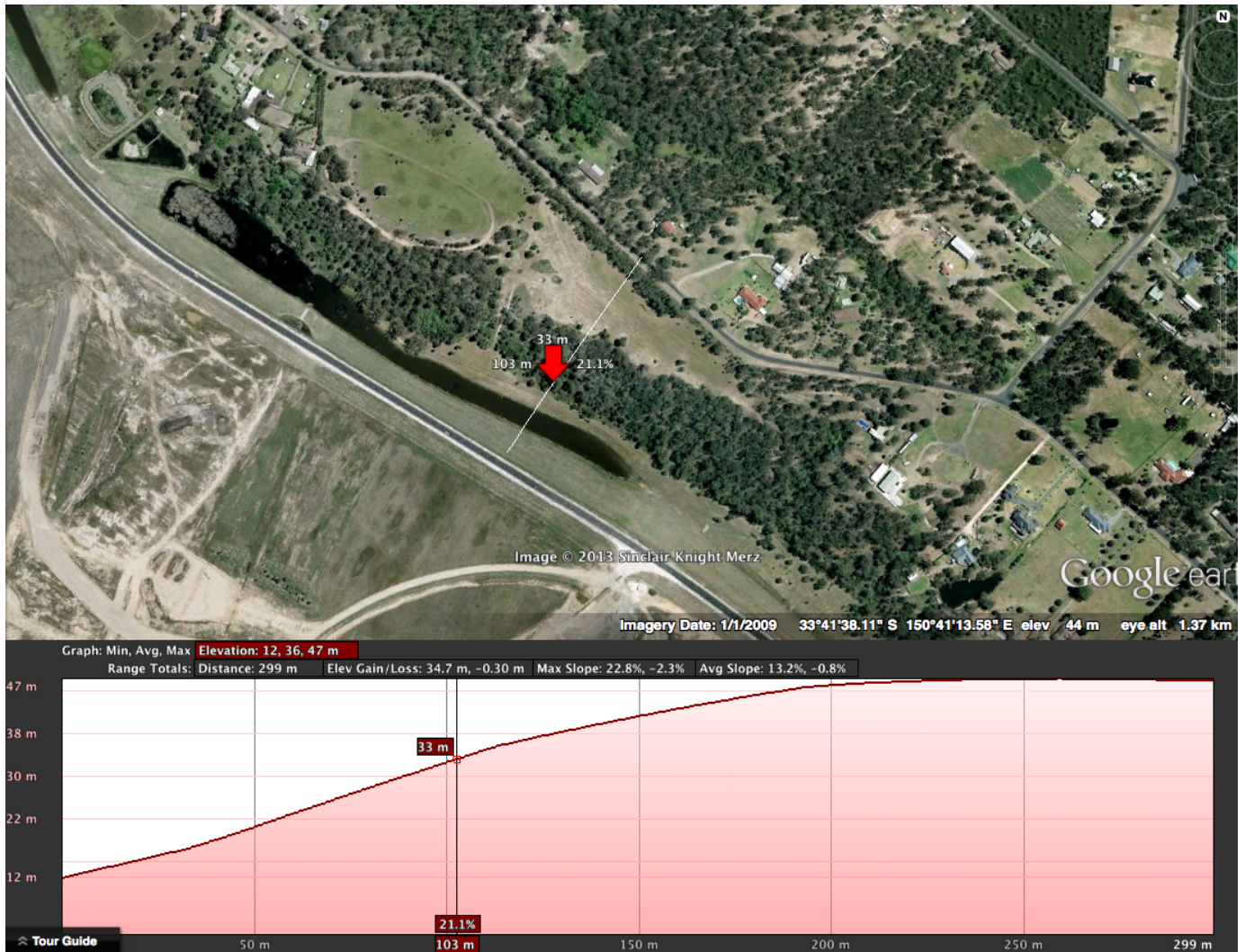
The effective slope is that slope within the hazard, which most significantly affects fire behaviour of the site having regard to the vegetation class found.

Detailed analysis of the sites effective slopes is also provided at the Table to Figures 20-22.

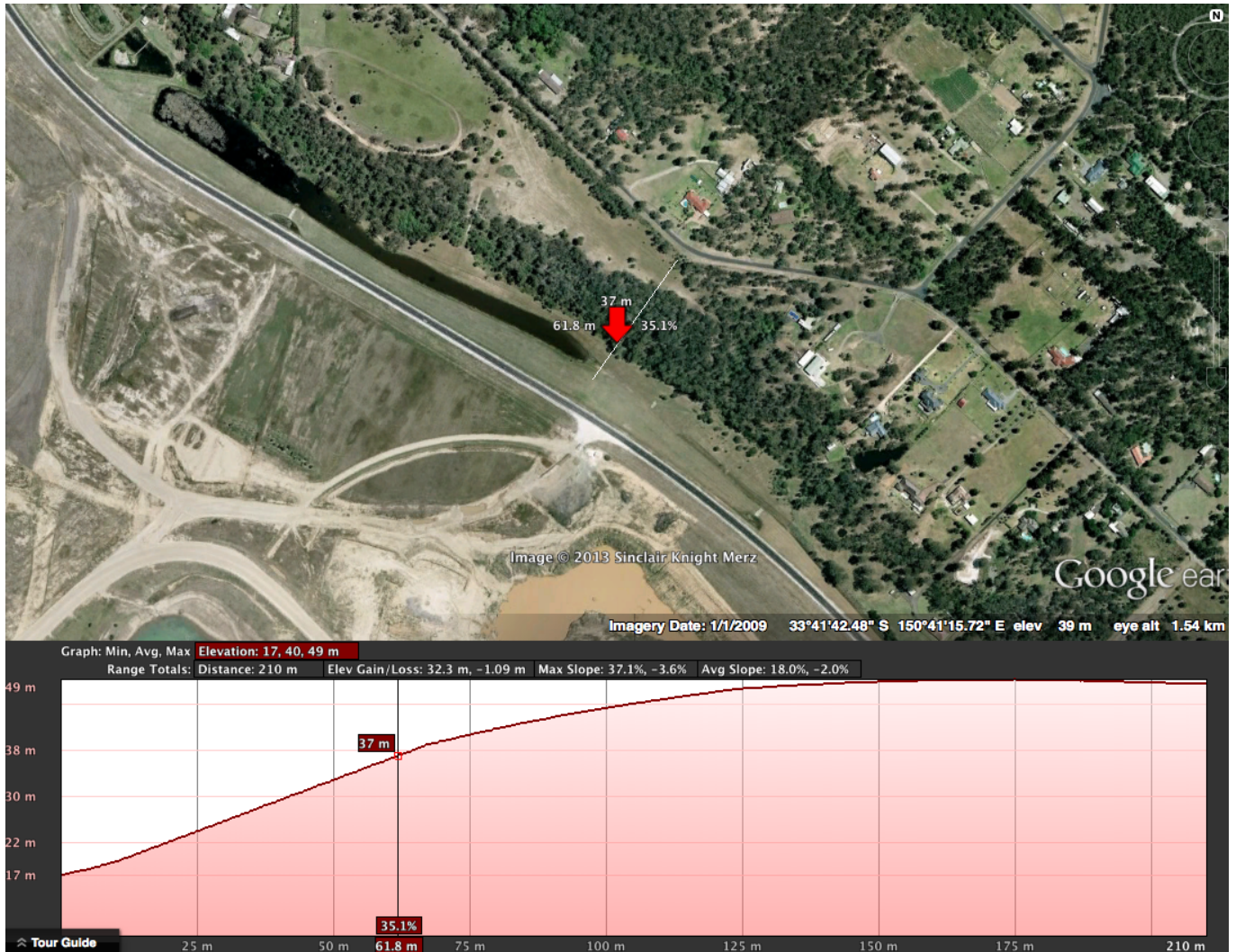
FIGURES 12: PROPOSED LOTS 1-3 SLOPE ANALYSIS



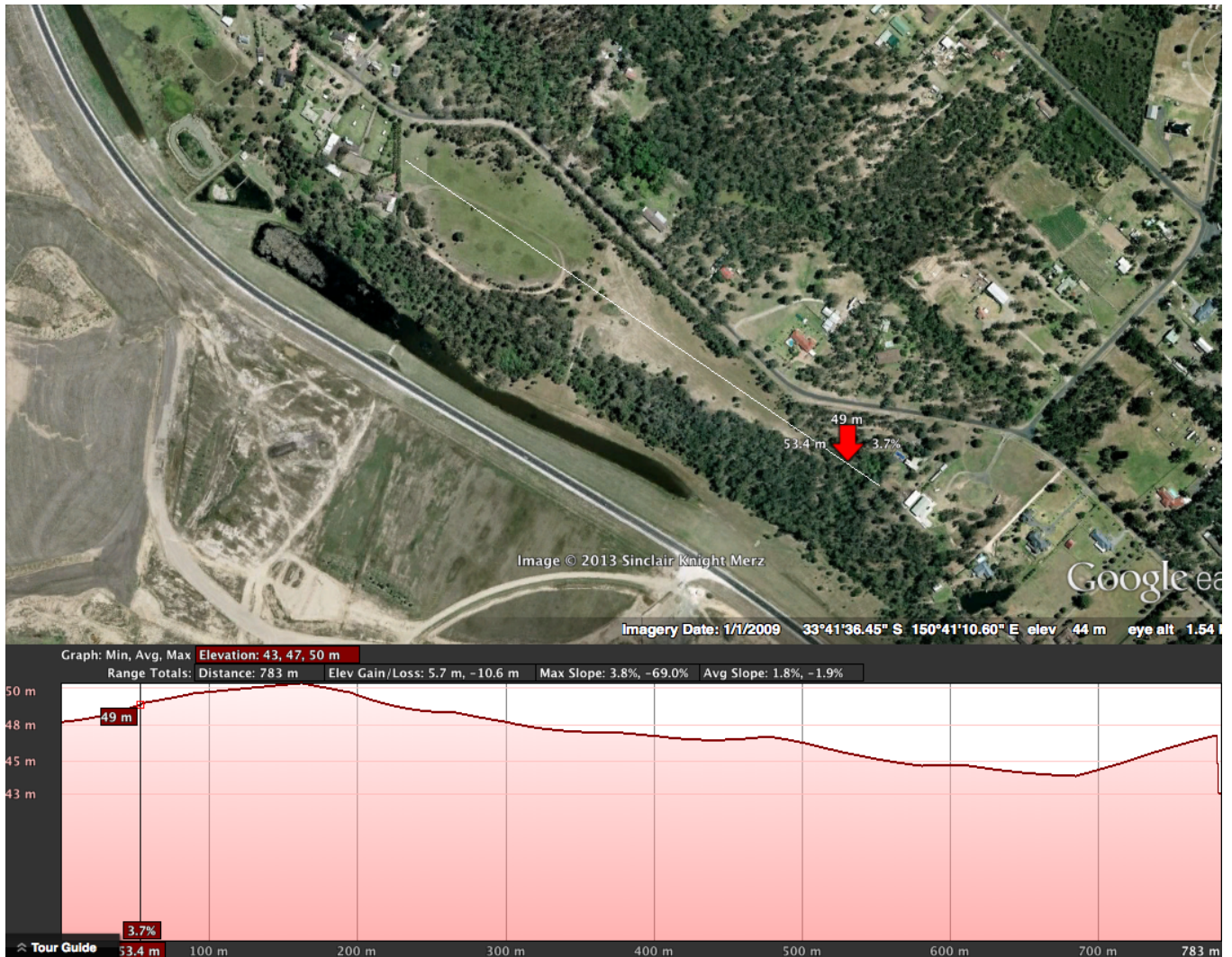
FIGURES 13: PROPOSED LOTS 4-7 SLOPE ANALYSIS



FIGURES 14: LOTS 8-9 SLOPE ANALYSIS



FIGURES 15: CROSS SLOPE ANALYSIS



4.4 FIRE WEATHER AREA

The site is located within the Penrith LGA and therefore is determined as having a Fire Danger Index of 100.

4.5 REQUIRED ASSET PROTECTION ZONES

When this vegetation classification is considered in conjunction with the identified slope and FDI rating then Table A2.4 to *Planning for Bushfire Protection* identifies the relevant minimum Asset Protection Zone (APZ) in all directions. This is analysed in the tables provided at Figures 20-22.

5.0 RECENT FIRE EVENT

The Penrith Lakes Scheme was impacted upon by recent fire events in Western Sydney and The Blue Mountains and this provides further relevant contextual information to the subject development.

On 17, October 2013 a bushfire event that initiated in the Linksvie Rd, Springwood, travelled east through Winmalee and Yellow Rock, before moving down the eastern escarpment of the Blue Mountains and ultimately jumping across the Nepean River and burning vegetation on the eastern bank of the Nepean River, within the Penrith Lakes Scheme. The extent of that fire is evident at Figures 15-16.

It is estimated approximately 35ha of the Lakes Scheme site was impacted by this fire event. The area impacted is shown at Figure 16-17 with photos of the area impacted provided at Figures 18-19. Importantly, this fire event is over 2km from any of the new bushfire prone building envelopes identified as part of this assessment.

FIGURE 16: NSW RFS MAP OF RECENT FIRE EVENT



FIGURE 17: AREA IMPACTED BY RECENT FIRE EVENT



FIGURE 18: PHOTOS OF AREA IMPACTED BY RECENT FIRE EVENT



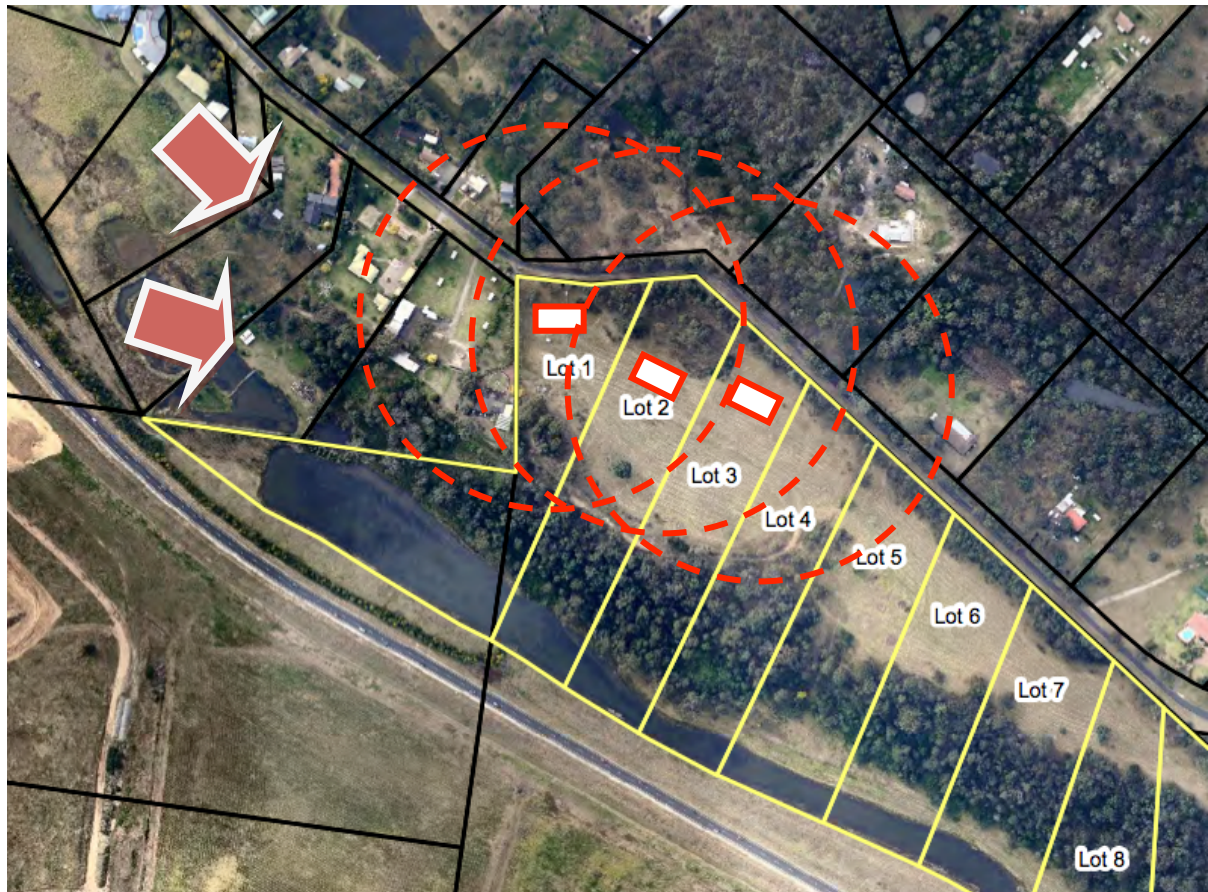
FIGURE 19: AREA IMPACTED BY RECENT FIRE EVENT






6.0 APZ ASSESSMENT

6.1 PROPOSED LOTS 1-3

FIGURE 20: AERIAL PHOTO OF SITE & SURROUNDS






Aspect		Vegetation	Effective Slope			REQUIRED APZ
	Type	Distance (m)	Angle		Slope	
South	Managed properties	0-110	4.3%	2.5 ⁰	Downslope	Nil
South	Woodland	110-140	17.8%	10.1 ⁰	Downslope	25m
West	Managed properties	0-140	3.2%	1.8 ⁰	Upslope	Nil
North	Managed properties	0-140	6.5%	3.7 ⁰	Upslope	Nil
East	Managed properties	0-140	2.3%	1.3 ⁰	Upslope	Nil
		Building envelope				
		140 metre radius of proposed dwelling				
		Prevailing winds in typical bushfire Conditions				

6.2 PROPOSED LOT 4-7

FIGURE 21: AERIAL PHOTO OF SITE & SURROUNDS






Aspect	Vegetation		Effective Slope			REQUIRED APZ
	Type	Distance (m)	Angle		Slope	
South	Managed properties	0-50	11.5%	6.6 ⁰	Downslope	Nil
South	Woodland	50-140	21.2%	11.9 ⁰	Downslope	25m
West	Managed properties	0-140	2.5%	1.4 ⁰	Upslope	Nil
North	Managed properties	0-140	9.3%	5.3 ⁰	Upslope	Nil
East	Managed properties	0-140	3.5%	2.0 ⁰	Upslope	Nil
		Building envelope				
		140 metre radius of proposed dwelling				
		Prevailing winds in typical bushfire Conditions				

6.3 PROPOSED LOT 8-9

FIGURE 22: AERIAL PHOTO OF SITE & SURROUNDS



Aspect	Vegetation		Effective Slope			REQUIRED APZ
	Type	Distance (m)	Angle		Slope	
South	Managed properties	0-20	3.8%	2.2 ⁰	Downslope	Nil
South	Woodland	20-85	24.9%	13.9 ⁰	Downslope	25m
	Woodland	85-140	35.1%	19.3 ⁰	Downslope	30m
West	Managed properties	0-140	3.5%	2 ⁰	Upslope	Nil
North	Managed properties	0-140	9.3%	5.3 ⁰	Upslope	Nil
East	Woodland	0-140	3.7%	2.1 ⁰	Downslope	15m
		Proposed building envelope				
		140 metre radius of proposed dwelling				
		Prevailing winds in typical bushfire Conditions				

7.0 PERFORMANCE BASED CONTROLS

The following assessment is undertaken against Performance Based Controls identified in chapter 4 of *Planning for Bushfire Protection 2006*.

7.1 ASSET PROTECTION ZONES (APZ)

- *radiant heat levels at any point on a proposed building will not exceed 29 kW/m²*
- *APZs are managed and maintained to prevent the spread of a fire towards the building.*
- *APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is negated*

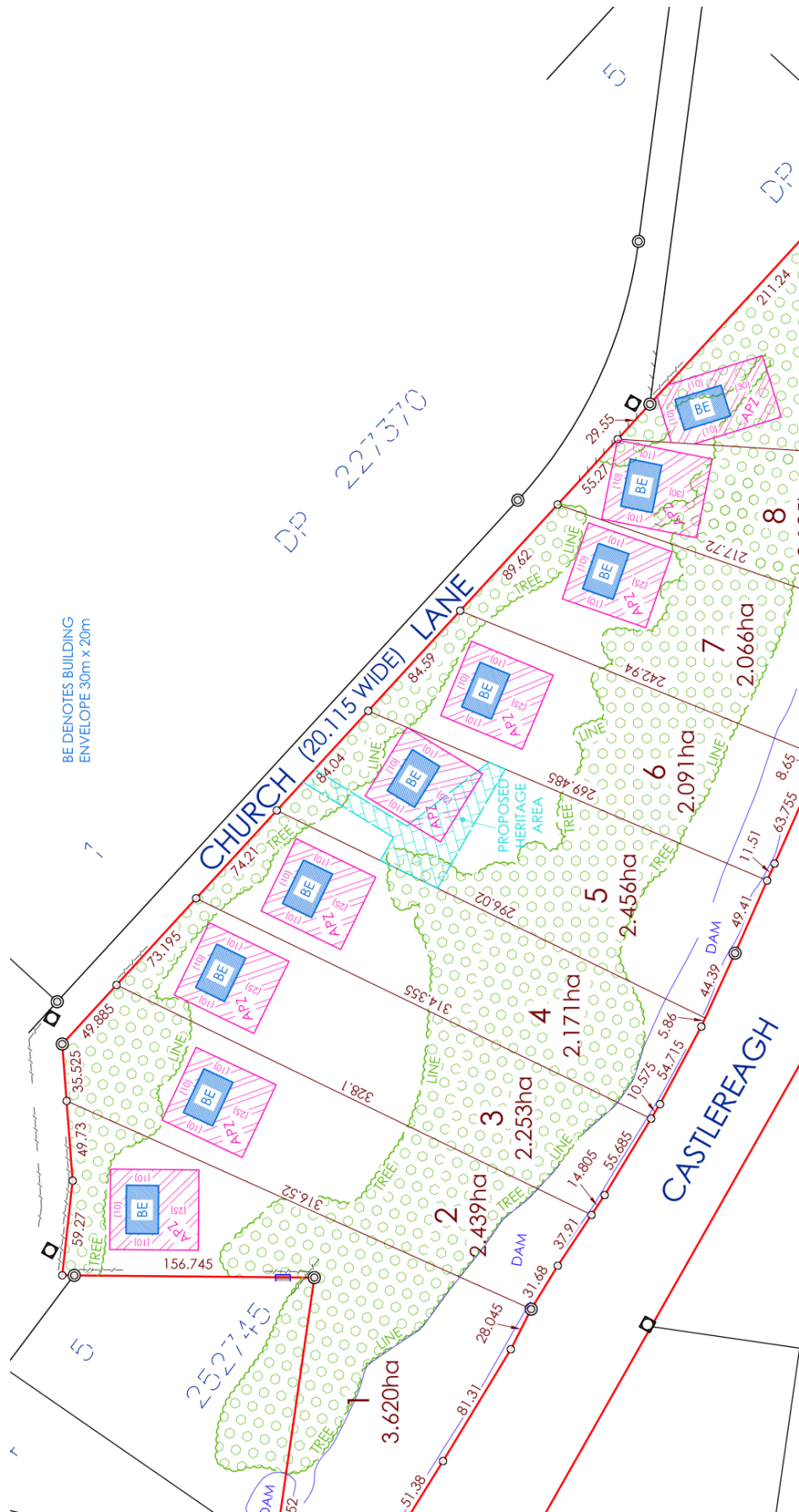
The subject development provides lots that can all provide a future dwelling opportunity that will readily achieve the required APZ's as identified at the tables to Figures 20-22. The APZ's are demonstrated in the subdivision plan that accompanies this subdivision plan. An extract of which is provided at Figure 23.

These APZ's will require no vegetation removal on lots 1-7 and only limited clearing on lots 8-9.

This APZ's will:

- Limit the opportunity for a crown fire to impact upon any future dwelling
- Provide a suitably scaled defensible space to prevent the spread of the fire towards the building
- Ensure any future dwelling will be able to achieve a BAL 29 rating under AS AS3959, 2009 – *Construction of Buildings in Bushfire Prone Areas*.

FIGURE 23: PROPOSED LOTS AND APZ's



7.2 ACCESS

- firefighters are provided with safe all weather access to structures (thus allowing more efficient use of firefighting resources)*
- public road widths and design that allow safe access for firefighters while residents are evacuating an area.*
- the capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles.*
- roads that are clearly sign- posted (with easily distinguishable names) and buildings/properties that are clearly numbered.*
- there is clear access to reticulated water supply*
- parking does not obstruct the minimum paved width*

The development does not provide any new public roads but instead will rely upon vehicular access from Church Lane. This is a full sealed road ensures suitable and appropriate vehicular access is provided for vehicles to the proposed lot in the manner as stipulated in the design criteria.

This includes the availability of access for fully loaded fire fighting vehicles and other fire fighting appliances.

There are no bridges, slope, curve or other slope access constraints in the vicinity of the site and the roads have a wide verge that allows for easy passing of heavy vehicles road side parking. These roads also provides for emergency egress in the event of a bushfire.

7.3 ACCESS (2) – PROPERTY ACCESS

- *access to properties is provided in recognition of the risk to fire fighters and/ or evacuating occupants.*
- *the capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles.*
- *all weather access is provided.*
- *road widths and design enable safe access for vehicles*

The new lots will enjoy direct vehicular access to existing roads. Any future dwelling will not be located more than 200m from those existing roads and Rd therefore alternative access requirements are not applicable.

7.4 ACCESS (3) – FIRE TRAILS

Not relevant as no fire trails are proposed or required as part of the development.

7.5 AVAILABILITY OF SERVICES

Reticulated water supplies

- *water supplies are easily accessible and located at regular intervals*

Each of the sites enjoys access to reticulated water supply by Sydney Water.

Table 4.2 of *Planning for Bushfire Protection 2006* should be used for determining dedicated static water supply requirements.

This table requires the provision of a 20,000 litre water supply for each of the dwellings. This can be readily provided for all lots as part of any future application for a dwelling.

Non-reticulated water supply areas

• for rural-residential and rural developments (or settlements) in bush fire prone areas, a water supply reserve dedicated to firefighting purposes is installed and maintained. The supply of water can be an amalgam of minimum quantities for each lot in the subdivision (community titled subdivisions), or held individually on each lot.

Not relevant.

Electricity Services

• location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings
• regular inspection of lines is undertaken to ensure they are not fouled by branches.

Gas services

• location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings

Electrical and other energy utility services can be provided from the roadway in accordance with the requirements of *Planning for Bushfire Protection 2006* as part of the service delivery of any approved subdivision.

8.0 CONCLUSION

The site is located within a small rural lot area that has been highly modified as part of previous quarrying and farming activity. Nevertheless, it provides some remnant bushland vegetation and is identified as being bushfire prone on the relevant map held at the Penrith City Council offices.

The development will generate 9 x new dwelling opportunities.

Future development of the new lots will be able to provide the required Asset Protection Zones for each lot. Good vehicle access is already readily available and all services are able to be provided in a suitable manner.

As such it is considered that the proposed development is considered to be consistent with *Planning for Bushfire Protection 2006*.

ANNEXURE A: FLORA + FAUNA ASSESSMENT