

5 August 2020

Michael Rodger  
Urbanco  
Suite 3.03, 55 Miller Street  
Pyrmont NSW 2009

Attention: Mr. Michael Rodger

Dear Sir,

## **CLEVELAND ROAD NORTH – DAA LAND HOLDING, FLOOD ANALYSIS**

### **Background**

Indesco has been engaged by DAA to undertake a flood impact assessment to determine the development potential of lot 401 and lot 402 DP1254873 which are located north of Cleveland Road and adjacent to Fairwater Drive within the West Dapto urban release area. The preferred concept development is shown on Urbanco drawing 031.CL.016 and is the subject of a current planning proposal.

Rienco has prepared a flood study for the planning proposal which covers a number of lots north of Cleveland Road. The Rienco study includes lots 401 and 402 however it is understood that only limited investigation has been undertaken into the development potential of these lots to date. The Rienco flood model was made available to Indesco for the purpose of this investigation with the scope broadly being:

- Adopt Rienco flood model for analysis
- Incorporate design surface of Urban Co proposal into Rienco flood model
- Review flood planning levels, floodplain storage and impacts
- Provide summary of analysis and results
- Provide preliminary design surface for lots 401 and 402 for the purpose of incorporation into the Rienco rezoning flood study

### **Analysis and Findings**

Indesco has prepared a preliminary design surface of the preferred concept development plan based on providing lots above the flood planning level. The volume of floodplain fill was then calculated and compensatory floodplain excavation was designed to match this volume within the areas marked on the Urbanco plan. The excavation areas have been designed to grade out to surrounding low points with a minimum 1.5% fall and maximum batters of 1v:4h.

Following a number of iterations, Indesco has found that there is sufficient compensatory cut area on the Urbanco plan to offset the proposed floodplain fill and these cut areas can be designed to sufficiently minimise the impacts to flood levels. It is noted that the impacts assessed are the combined impact of the Urbanco layout along with the rezoning proposal as it currently stands in the Rienco model for the remainder of the rezoning area.

### **Impacts of the Proposal**

Flood maps attached to this letter show that the combined effect of the Urbanco layout and the current rezoning proposal is a reduction in 100 year ARI flood levels within the Council owned and private property adjacent to the rezoning area. The reductions in flood levels are primarily due to the works proposed within the floodplain upstream of lot 402 along with the floodplain excavation designed with lots 401 and 402.

In the Probable Maximum Flood (PMF) flood levels within the adjacent residential area are not impacted, however, an increase in flood levels is predicted on Fairwater Drive as a result of the development. At

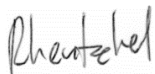
this location, the maximum depth of flooding on the road is predicted to increase by 30mm from 1.01m to 1.04m. Indesco has reviewed the temporal results of the flood modelling and found that the duration that the road is trafficable is not decreased in the PMF event. This means that the useability of the road for evacuation and emergency access is not reduced so the changes to flooding on Fairwater Drive are not considered adverse.

### **Floodplain Storage**

We have found that the proposed development, represented by the preliminary Indesco design surface results in a 25,000m<sup>3</sup> loss of flood storage in the 100 year ARI event. The design within the compensatory cut areas provides up to 26,000m<sup>3</sup> of cut which offsets the loss of floodplain storage in the 100 year ARI event. It is noted that there is further loss of floodplain storage in the PMF event however Council has recently revised their DCP to state that filling in the floodplain above the 100 year ARI event may be permitted if it can be demonstrated that there are no adverse impacts in a rare event. We consider the impacts of the proposal to not be adverse in the PMF event so are of the view that fill beyond the 100 year ARI extent aligns with the guidelines provided in the Wollongong City Council DCP.

Please contact me should you require further advice of information on this flood analysis.

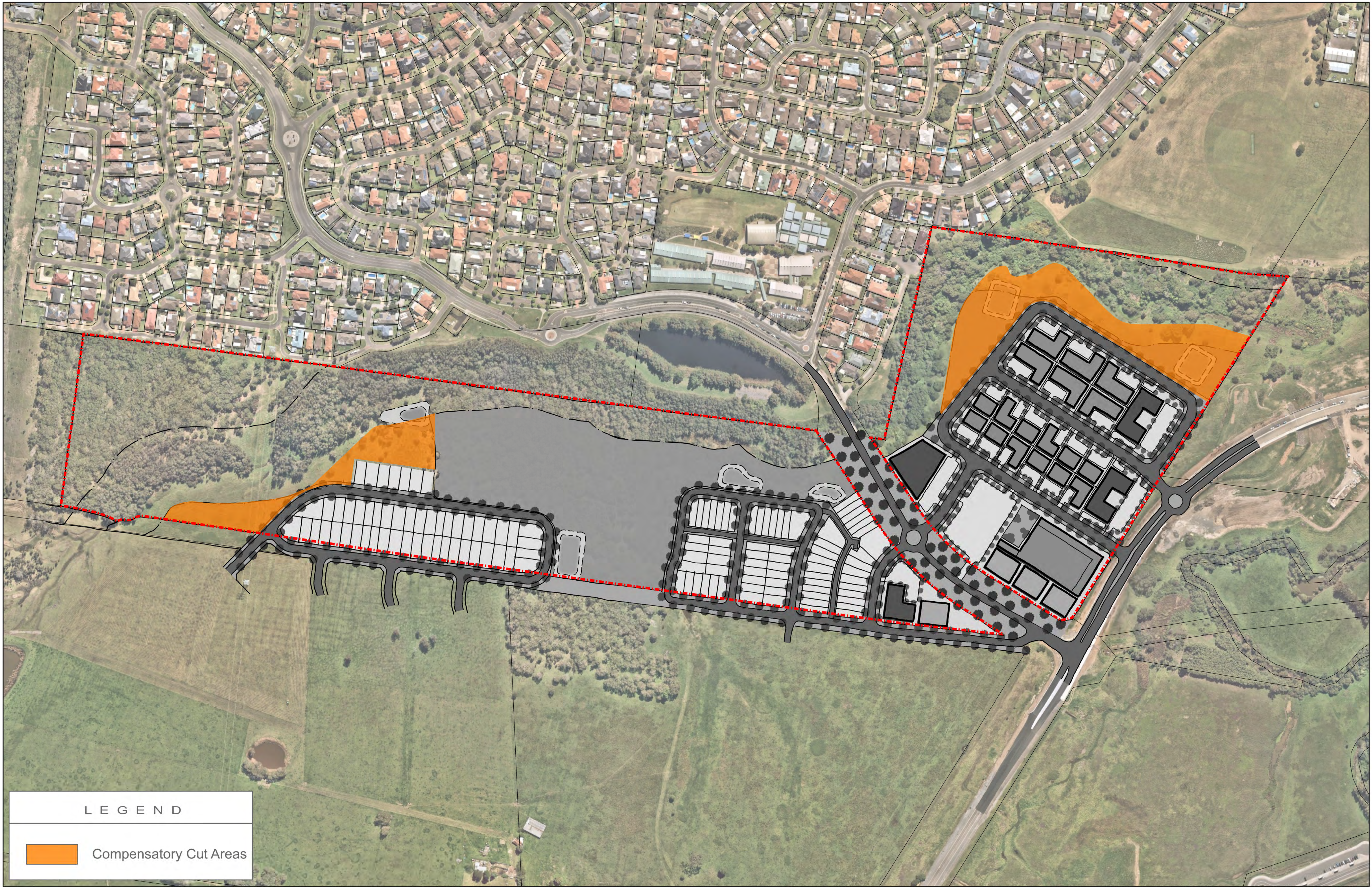
Yours faithfully,  
Indesco Pty Limited.



Rory Hentschel  
Senior Water Engineer

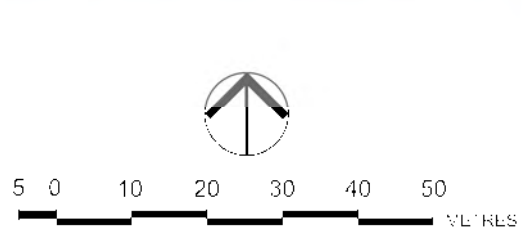
Encl. Concept Plan, Flood Maps





CONCEPT DEVELOPMENT PLAN - COMPENSATORY CUT AREAS  
LOT 401 & 402 FAIRWATER DRIVE  
CLEVELAND

NOTES  
Base data supplied by NSW LPI  
Projection MGR Zone 56  
Areas and dimensions shown are subject to final survey conditions  
All color highways are shown for illustrative purposes only and are subject to  
final engineering design  
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CLIENT : DAA  
SCALE : A1 @ 1:2,000  
DATE : 17/07/2020  
PLAN No : 031.CL.016  
REVISION : 02





PROPOSED

LOT BOUNDARY

ROAD CENTERLINE AND CHAINAGE

7.0

CONTOURS (0.5m)

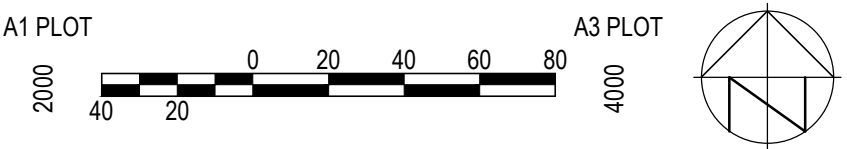
EXISTING

LOT BOUNDARY

EASEMENT

7.0

CONTOURS (1.0m)



No.	AMENDMENT	APPROVED	DATE	AUTHORIZED BY
1	ISSUED AS PRELIMINARY	RJH	05.08.2020	SSJ

PRELIMINARY  
NOT FOR CONSTRUCTION

DAA

WOLLONGONG | CANBERRA | SYDNEY

www.indesco.com.au

APPROVED	RJH	DATE	05.08.2020
CHECKED		DATE	
DESIGNED BY	SSJ		
DRAWN BY	SSJ		
CAD FILE	G:\ISC00292\Lot 402 Cleveland Road\Acad\Civil\00 - Subarea\ISC00292-00-SK01.dwg		
SCALE	1:2000	ORIGINAL SIZE	A1

PROJECT

LOT 401 AND 402 OF  
DP1254873  
PROPOSED SUBDIVISION

DRAWING TITLE

CONCEPTUAL EARTHWORKS DESIGN

PROJECT No.

ISC00292-00

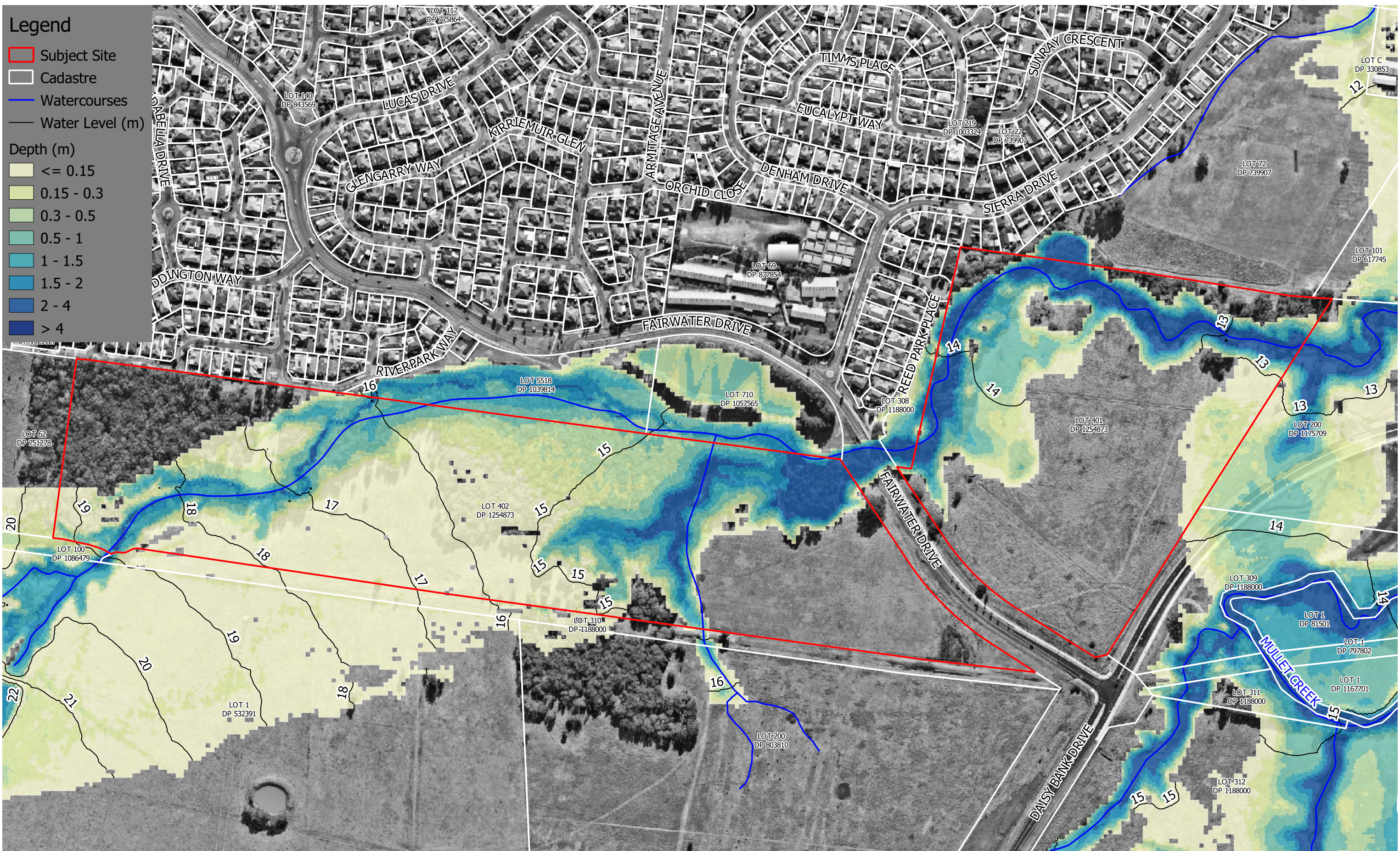
DRAWING No.

SK01

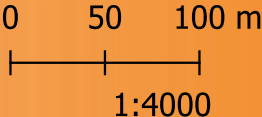
AMDT

1





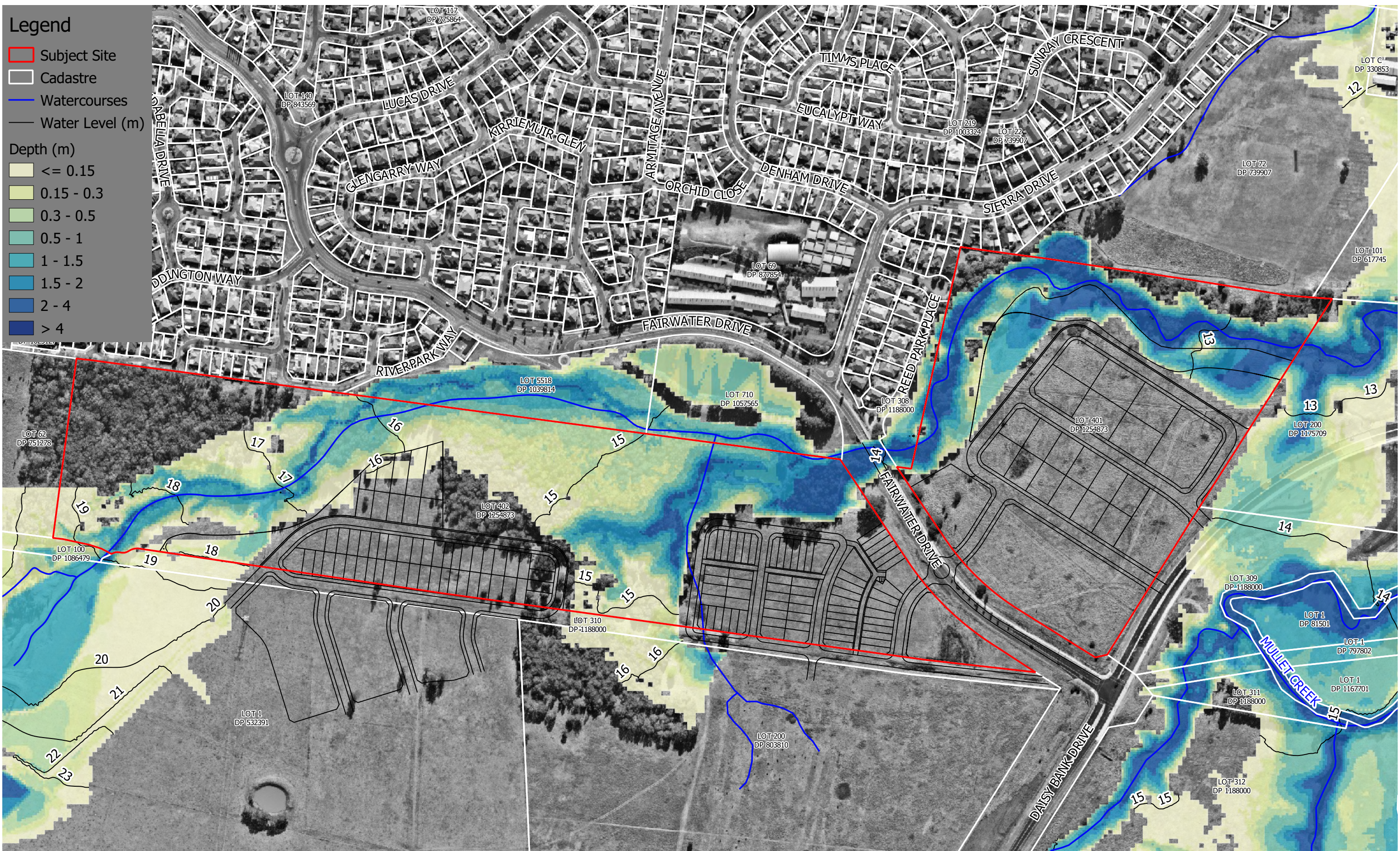
Cleveland Rd North - DAA  
Existing 100 year ARI Flood Extent



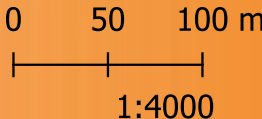




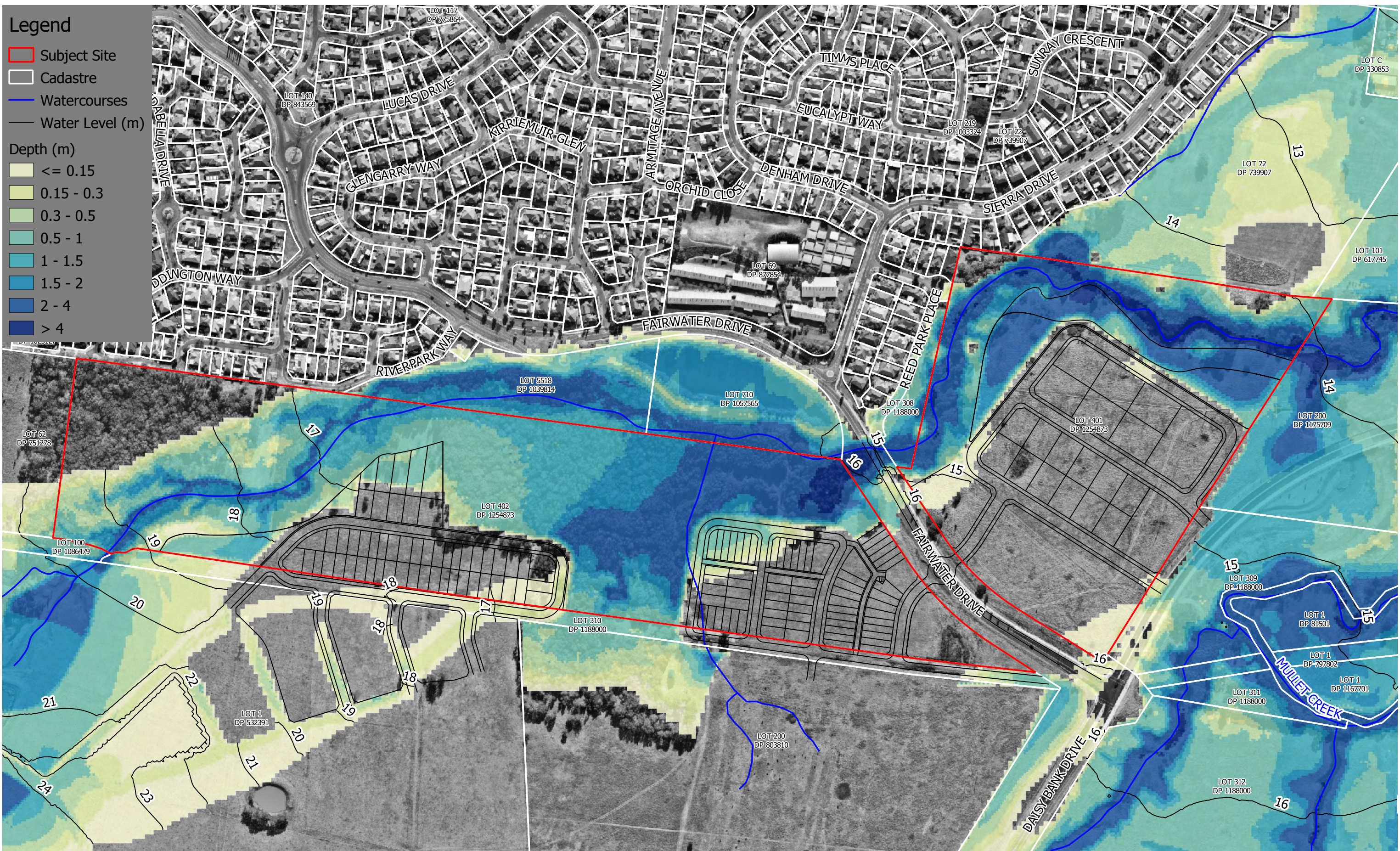




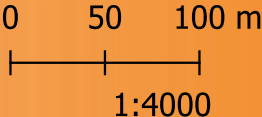
Cleveland Rd North - DAA  
Proposed 100 year ARI Flood Extent



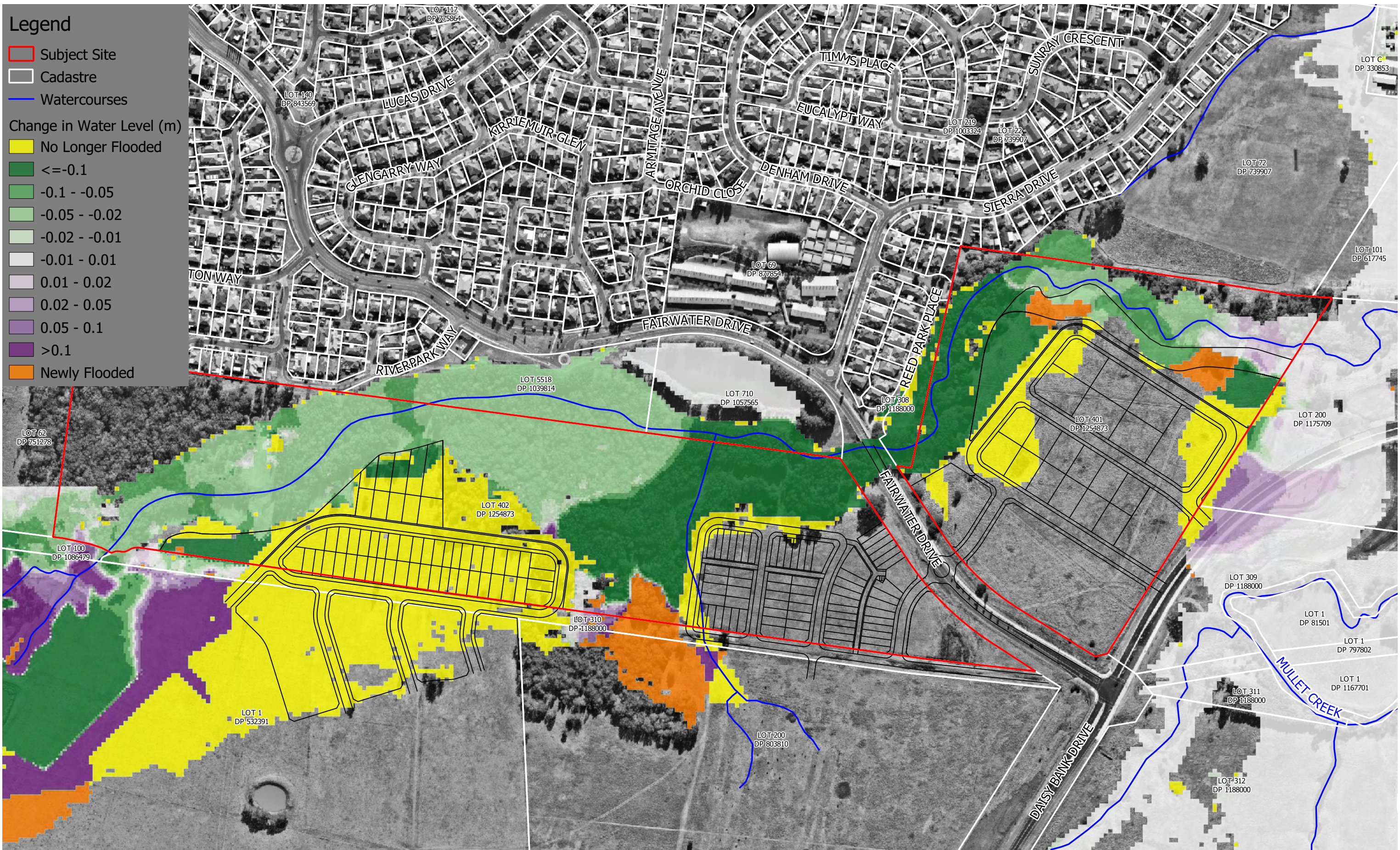




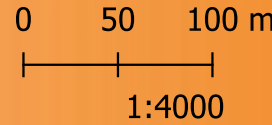
Cleveland Rd North - DAA  
Proposed PMF Extent







Cleveland Rd North - DAA  
Change in 100 year ARI Water Level



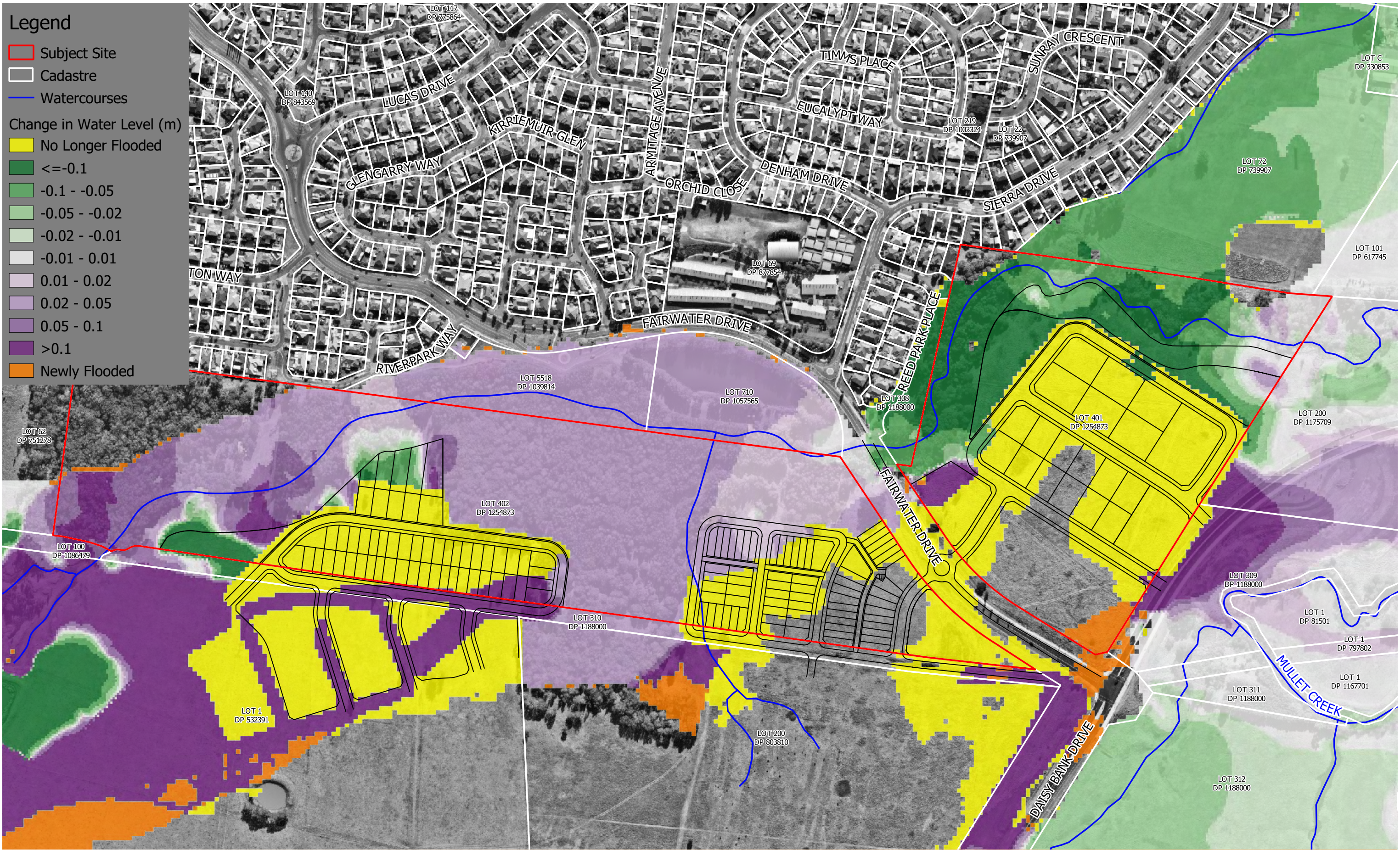


**Legend**

- Subject Site
- Cadastre
- Watercourses

**Change in Water Level (m)**

- No Longer Flooded
- <=-0.1
- 0.1 - -0.05
- 0.05 - -0.02
- 0.02 - -0.01
- 0.01 - 0.01
- 0.01 - 0.02
- 0.02 - 0.05
- 0.05 - 0.1
- >0.1
- Newly Flooded



Cleveland Rd North - DAA  
Change in PMF Level



0 50 100 m  
1:4000