



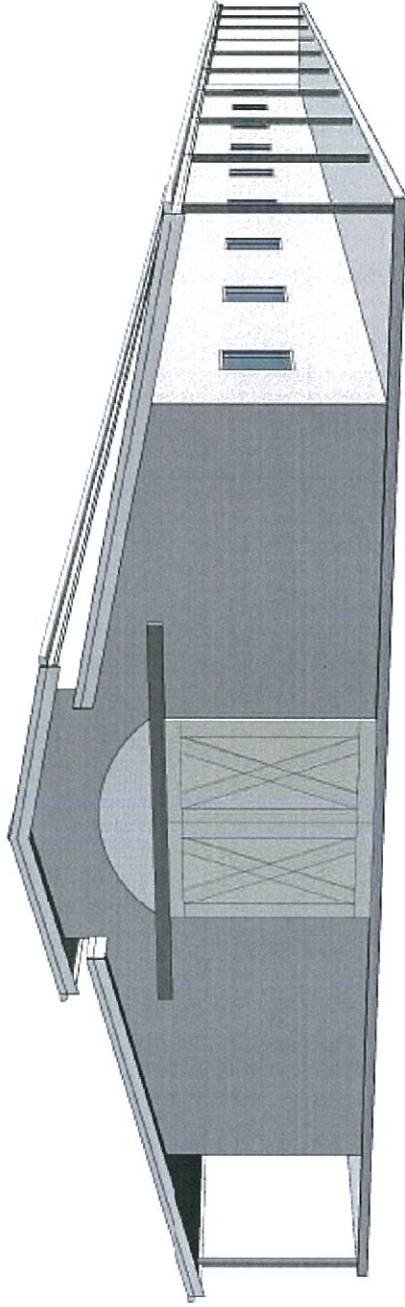
23 JULY 2014

ATTACHMENT

6.2.1

DA0389/2014 – Proposed Construction of Horse Stables Building, Lot 1 DP 1062660, 25A Robert Hoddle Grove, Bombira





PROPOSED STABLES | 25A ROBERT HODDLE GROVE, MUDGEES, NSW

GENERAL NOTES:

1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL & OTHER CONSULTANT DRAWINGS & SPECIFICATIONS & WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ALL DIMENSIONS SHALL REFER TO DIMENSIONS P.T.I. LTD FOR A DECISION BEFORE PROCEEDING WITH THE WORK.
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3. WORKMANSHIP & MATERIALS ARE TO BE IN ACCORDANCE WITH THE RELEVANT CURRENT S.A.A CODES INCLUDING ALL APPLICABLES, THE BUILDING CODE OF AUSTRALIA - VOLUME 2, 2012, POLICY REQUIREMENTS OF THE WESTERN REGIONAL SHIRE (WDRS).
4. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE & LEVELS ARE EXPRESSED IN METRES.
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6. THE RELEVANT STATUTORY AUTHORITIES SHALL BE NOTIFIED IN ADVANCE & THEIR APPROVALS OR SERVICES, IF NECESSARY SHALL BE OBTAINED.

DRAWING SCHEDULE

- 2101-A01 3D PERSPECTIVE & NOTES
- 2101-A02 LOCALITY & SITE PLAN
- 2101-A03 GROUND FLOOR LAYOUT
- 2101-A04 SECTION
- 2101-A05 SECTION

Drawing Status
PRELIMINARY DRAWINGS

Certification
Sheet 1 of 5
Drawing Number
21304-A01
Revision
A

Design: GO
Drawn: GO
Check: LM
Rev Date: 28/05/18
Amendment: PRELIMINARY DRAWINGS

Drawing Title
PERSPECTIVE & NOTES

Client: MAX WALKER

Project:
PROPOSED STABLES AT
25A ROBERT HODDLE GROVE,
MUDGEES



Offices Located
Dubbo, Mudgee, Parkes & Bathurst
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Drawing Sheet
A1 - Original Size - Scales as noted
A3 - Minimization - Not to scale
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1 LOCALITY PLAN
SCALE: 1:250



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Client: MAX WALKER
Project: PROPOSED STABLES AT 25A ROBERT HODDLE GROVE, MUDGEE

Drawing Title:
LOCALITY & SITE PLAN

| Design | Drawn | Rev | Date | Amendment | Certification |
|--------|-------|-----|--------|----------------------|-----------------------------|
| GO | GO | A | 2023/4 | PRELIMINARY DRAWINGS | Sheet 2 of 5 |
| LM | LM | | | | Drawing Number 21304-A02 |
| | | | | | Revision A |

2 SITE PLAN
SCALE: 1:100



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Drawing Status
PRELIMINARY DRAWINGS

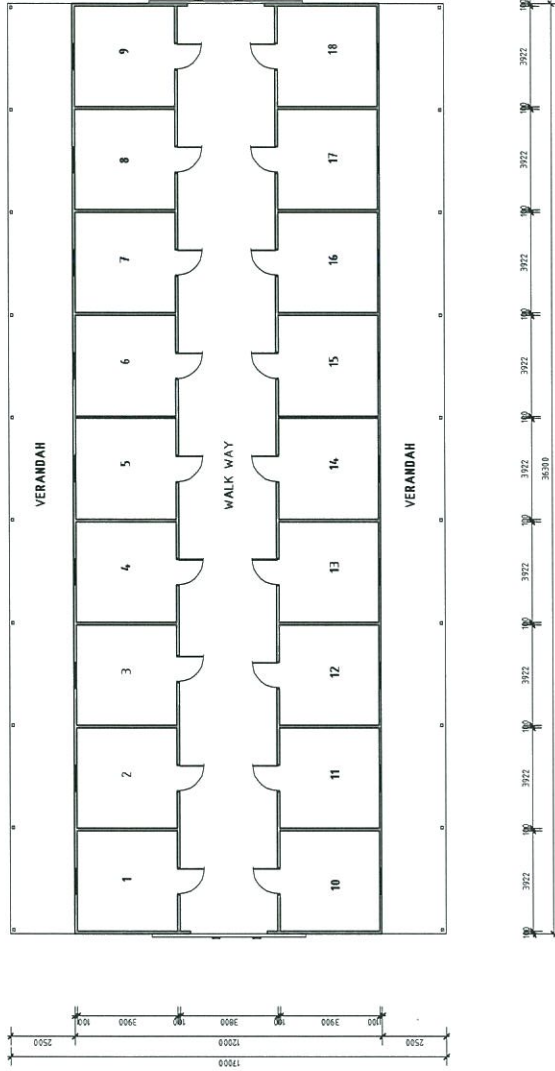


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5. ALL LEVELS, DIMENSIONS, SITE CONDITIONS & SERVICES, TO BE CHECKED & CONFIRMED ON SITE & WITH RELEVANT SERVICE AUTHORITIES, PRIOR TO CONSTRUCTION.
6. REGION A, TERRAIN CATEGORY 2.5, WIND CLASSIFICATION IN (W30M).
7. DURING THE CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STRUCTURE IN A STABLE CONDITION. ANY PART SHALL BE OBTAINING UNDER CONSTRUCTION ACTIVITIES.
8. ROOF & SURFACE WATER TO NEW ADDITIONS TO BE CONNECTED TO EXISTING STORMWATER SYSTEM.

AREAS:

| | |
|--------------------------------|-----------------------------|
| INTERNAL OF STABLES | - 43560m ² |
| EXTERNAL OF STABLES (VERANDAH) | - 78150m ² |
| TOTAL AREA | - 61710m² |



Drawing Status
PRELIMINARY DRAWINGS

Certification
Sheet 3 of 5

Drawing Number
21304-A03

Revision
A

| Design | Drawn | Rev | Date | Amendment |
|--------|-------|-----|----------|----------------------|
| GO | GO | A | 28/05/14 | PRELIMINARY DRAWINGS |
| LM | QA | | | |
| | LM | | | |

Drawing Sheet
A1 - Original Size - Scales as noted
A3 - Minimization - Not to scale

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Client: MAX WALKER

Project:
**PROPOSED STABLES AT
25A ROBERT HODDLE GROVE,
MUDGEE**

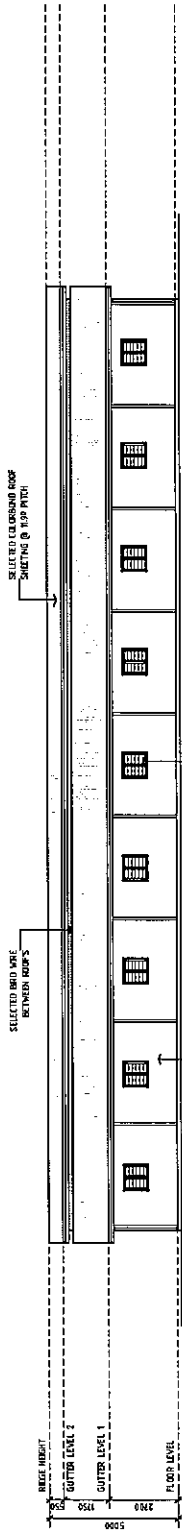
Drawing Title:
FLOOR LAYOUT



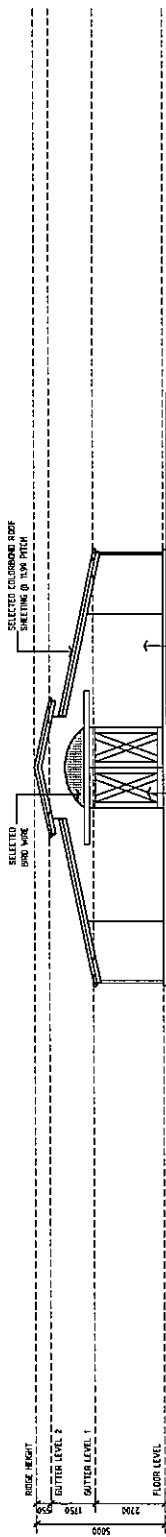
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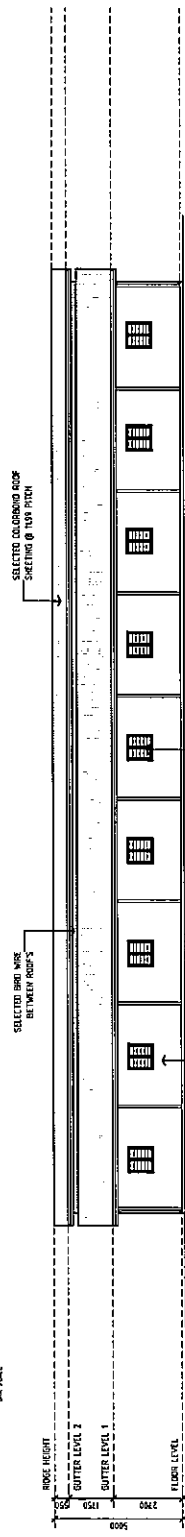




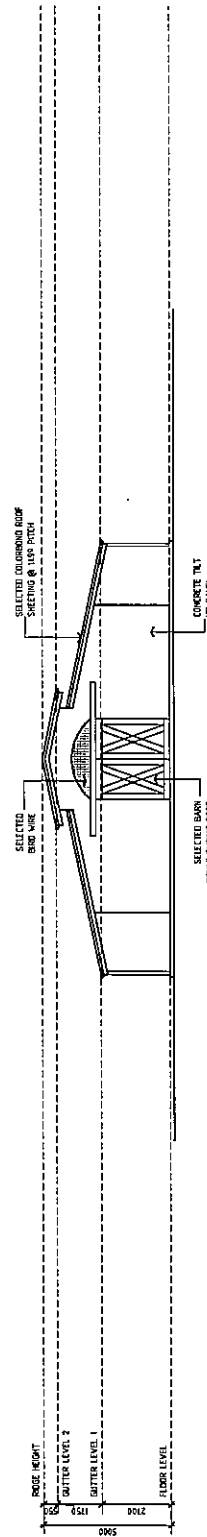
1 | FRONT ELEVATION
SCALE: 1:100
DATE: 2014



2 | LEFT ELEVATION
SCALE: 1:100
DATE: 2014



3 | REAR ELEVATION
SCALE: 1:100
DATE: 2014



4 | RIGHT ELEVATION
SCALE: 1:100
DATE: 2014

Drawing Status
PRELIMINARY DRAWINGS

Certification
Sheet 4 of 5
Drawing Number
21304-A04

Revision
A

Design: GO GO
Check: LX LX
Drawn: A 28/04
QA: LX
Rev Date: A 28/04
Amendment: PRELIMINARY DRAWING

Drawn by: LX
Checked by: LX
Approved by: LX
Date: 28/04/14

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Client: **MAX WALKER**

Project: **PROPOSED STABLES AT 25A ROBERT HODDLE GROVE, MUDGEE**

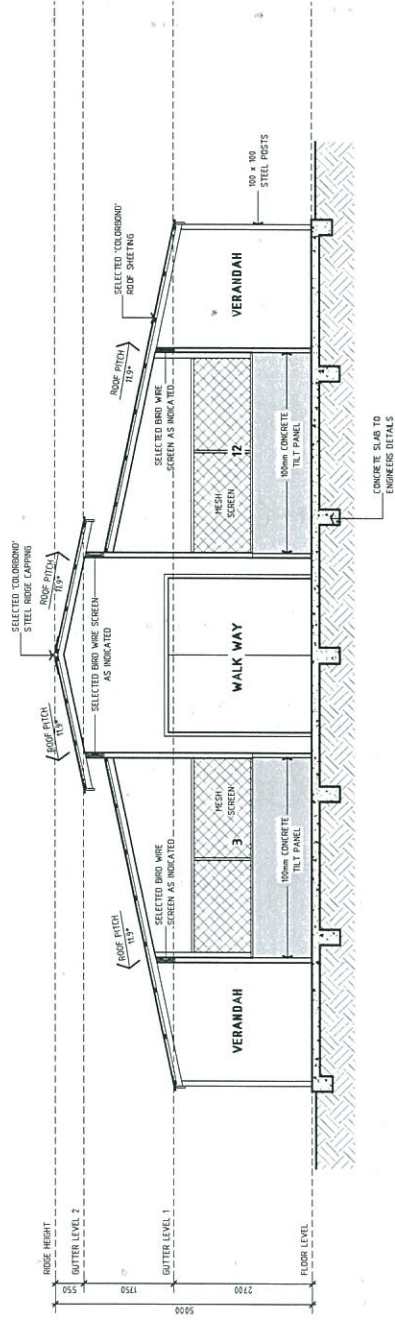
Drawing Title: **ELEVATIONS**



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1 | SECTION A-A
SCALE: 1:50



Drawing Status:
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Certification
Sheet 5 of 5
Drawing Number
21304-A05
Revision
A

Design: GO
Check: LM
Drawn: GO
QA: LM
Date: 26/05/14
Amendment: PRELIMINARY DRAWINGS

Drawing Sheet
All-Original Size - Scales as noted
A3 - Minimization - Not to scale
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Drawing Title
SECTION

Client: MAX WALKER
Project: PROPOSED STABLES AT 25A ROBERT HODDLE GROVE, MUDGEE



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7 Robert Hoddle Grove,

Mudgee

NSW

2850

29th June 2014

The General Manager,
Mid Western Regional Council,
P.O. Box 156,
Mudgee
NSW
2850

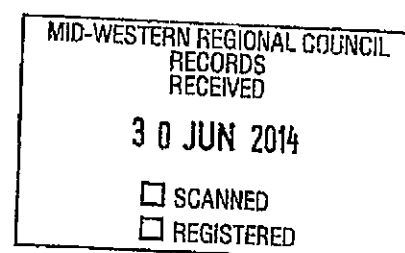
Dear Sir,

**DEVELOPMENT APPLICATION DAO389/2014 – PROPOSED ANIMAL
ESTABLISHMENT – HORSE STABLES – BONNY VIEW 25A ROBERT HODDLE
GROVE BOMBIRA NSW 2850 LOT 1 DP 1062660**

In relation to the above development application we would like to lodge an objection to using Robert Hoddle Grove as access to the proposed animal establishment /horse stables on the following grounds :

The turnoff from Ulan road into Moggs Lane is a dangerous one and should not be subject to any more traffic than is presently experienced.

Robert Hoddle Grove itself is not a properly constructed road and there is no place for pedestrians to step aside for approaching horse floats or for normal Robert Hoddle traffic to allow safe passing of horse floats. Vehicles pulling over will cause damage to residents property.



Based on this we believe access should be gained from the Lue road OR via the existing stables/racecourse.

Yours faithfully,

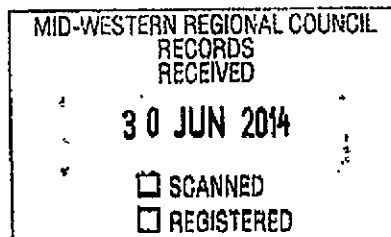
A stylized handwritten signature consisting of a large, sweeping loop that starts from the left, goes up and over, then down and back to the left, ending in a small flourish.

I.F. Livingstone-Blevins (Mr)

A handwritten signature in cursive script that reads "M. Livingstone-Blevins".

M.E. Livingstone-Blevins (Mrs)

1 Bombira Avenue,
Mudgee
29th June 2014.



The General Manager
Mid- Western Regional Council
PO Box 156
Mudgee NSW 2850.

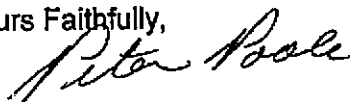
Dear Sir.

**Re Development Application DA0389/2014- Proposed Animal Establishment-
Horse Stables-Bonny View 25A Robert Hoddle Grove Bombira NSW 2850 lot 1
DP 1062660**

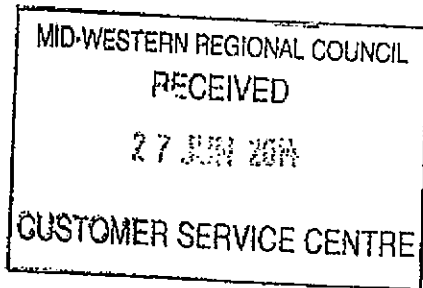
I am a resident at the above address which is situated on the corner of Bombira Avenue and Moggs Lane. I note that if this development is allowed to proceed these stables will be serviced by traffic proceeding along Moggs Lane and Robert Hoddle Grove.. This traffic would include heavy duty noisy horse floats, lorries conveying supplies to the stables and lighter vehicles transporting personnel to the stables. I would ask council if it allows this development to proceed to Bonny View that all vehicles servicing these stables access them from the Lue Road. My reasons for this request is as follows:

- 1 The Bombira area is a residential area not suited to commercial traffic when there is an alternative. access.
- 2 In the Bombira residential area there seventy four residences or residences under construction causing an existing heavy traffic flow.
- 3 Moggs Lane has an existing poor access from the busy Ulan road which should not be compounded by unnecessary heavy traffic servicing stables that could be easily reached from the Lue Road.
- 4 Moggs Lane and Robert Hoddle Grove are narrow twenty metre roadways,unsuitable for large heavy vehicles..These roadways do not have adjacent pedestrian footpaths to accommodate an ever increasing number of pedestrians in this area.
- 5 Moggs Lane and Robert Hoddle Grove are on a school bus route which services an ever increasing number of school children. Trucks servicing these stables would be an added danger to these children.
- 6 George Campbell Park and childrens' playground is situated in the Bombira area and extra heavy commercial traffic would be an added danger to children using this facility.

Yours Faithfully,



Peter Poole



39 Robert Hoddle Grove,
Mudgee. 2850

26 June, 2014

General Manager,
Mid Western Regional Council,
Market street,
Mudgee. NSW 2850

Dear Sir,

Re; Max Walker, Development Application Lot 1 DP1062660
25A Robert Hoddle Grove, Mudgee.

I wish to comment on the above proposal, a copy of which has just been received by me.

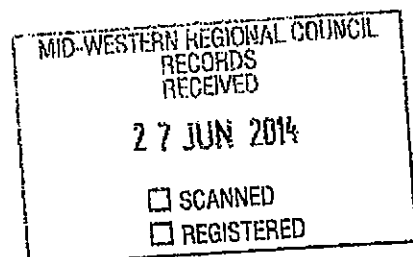
The proposal to construct horse stables on the property, 25A Robert Hoddle Grove, Bombira as submitted by the proposed developer, "Barnson" while addressing most issues does not address the issue of increased traffic flow to and from the stables, i.e. volume and time of day. This cannot be overlooked and the potentially significant impact on the residents of Robert Hoddle Grove.

It is noted that access to the property and stables is via Robert Hoddle Grove with secondary access from Lue road. Why? Surely it would make more sense to use Lue Road for what is essentially a business enterprise, thus avoiding Robert Hoddle Grove, which is a residential neighbourhood as recognised in the Barnson submission.

I have no objection to the construction of the stables which is the subject of the application but the traffic implication has been somewhat overlooked or whitewashed.

More details are required i.e.

1. Specific traffic flow details covering volume,
2. time of day,
3. vehicle size,



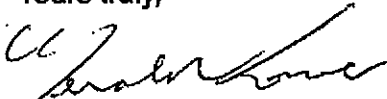
4. supply of feed etc.
5. why any associated traffic should not be routed via Lue Road.

Robert Hoddle Grove due to its topography is not suitable for heavy traffic flow or any large vehicles. There is no pavement for pedestrian use which means that all pedestrian activity i.e. exercise activities (considerable), children activities (considerable) are on the road and vulnerable to traffic.

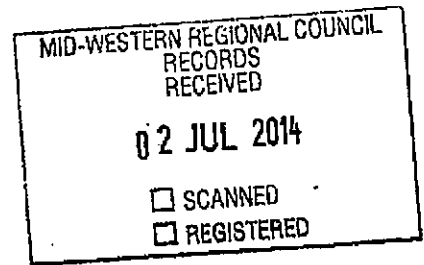
In summary I have no problem with construction of the stables as proposed but, I do object to the routing of traffic via Robert Hoddle Grove rather than Lue Road. Should Lue Road not be utilised then I strongly object to the overall proposal.

I look forward to you reply.

Yours truly,



Gerald M. Rowe




The Mayor,
Mid Western Regional Council,
Mudgee.

**REPRESENTATION TO THE CONSTRUCTION OF HORSE STABLES BUILDING AT
LOT 1 DP 1062660, 25A ROBERT HODDLE GROVE, BOMBIRA.**

I wish to make representation in respect to the abovementioned development proposal.

- 1. It would appear that the distance from the proposed stables building is significantly further away from the applicant's residence than that of the residences to the north, on Robert Hoddle Grove.
Should the development receive approval, the distance between the existing residential development and the proposed stables should be significantly increased.*
- 2. The property on which the stable building is proposed has a narrow access from Robert Hoddle Grove as well as a wide frontage to the Lue Road.
Should the development be approved, access to the stables development and associated activities should be accessed from Lue Road. Access from Lue Road being more in keeping with the rural type activities associated with stables.*
- 3. It would appear that the area of the proposed stables development is in excess of the 200m² standard identified in the State Environmental Planning Policy. Should the development be approved the development should be required to comply with the development standards required by the State Environmental Planning Policy.*
- 4. The amenity of the existing area will be affected by an 18 bays stable on property with a narrow access to Robert Hoddle Grove. Should the development receive approval, the impact of the development in relation to access and traffic movement needs to be anticipated.*

Yours Sincerely.


Lance Bowden

41 Robert Hoddle Grove

1 July, 2014.

07 0389/2014

17 Robert Hoddle Grove
Mudgee NSW 2850
30th June 2014

Mr. Brad Cam
General Manager
Mid- Western Regional Council
PO Box 156
Mudgee NSW 2850

| |
|---|
| MID-WESTERN REGIONAL COUNCIL RECORDS RECEIVED 03 JUL 2014 <input type="checkbox"/> SCANNED <input type="checkbox"/> REGISTERED |
|---|

Dear Mr. Cam

Thank you for the opportunity to comment on:

DA0389/2014
Proposed Animal Establishment- Horse Stables
Bonny View
25A Robert Hoddle Grove
Bombira NSW 2850

This DA was brought to our attention via a letter we received from Gary Bruce Manager Statutory Planning Development and Community Services, Mid- Western Regional Council dated 17th June 2014.

While agreeing in principle that this development is appropriate on this Lot 1DP 1062660 land zoned RU4 – Primary Production Small Lots, we do have major concern with the following issues that council made available to us including:
Barnson's Statement of Environmental Effects 4th March 2014
Construction of a horse stables building
LOT 1 DP1062660,
25A Robert Hoddle Grove, Bombira

3:8 Access & Traffic

There are two entry/egress points for the site from Robert Hoddle Grove via an all weather driveway, with secondary farm access from Lue Road.....allowing for safe egress/exit.

Our Comment:

There would be a high risk of increased traffic accident if this proposed Horse Stables business had access via 25A Robert Hoddle Grove as:

- It would mix heavy commercial with residential traffic right through the heart of our Bombira neighbourhood on both Moggs Lane and Robert Hoddle Grove.
- It would mix heavy commercial traffic with pedestrians. There are not any formed footpaths within the Bombira locality making it necessary for neighbourhood and visiting pedestrians and bike riding traffic of all ages to use both Robert Hoddle Grove and Moggs Lane roadways.
- There are an increasing number of families with young children moving into this area with future expansion of the Bombira neighbourhood more than likely.
- The road turnoff from Ulan/Cassilis Road into Moggs Lane to access Robert Hoddle Grove is extremely dangerous with impeded sight distance which would increase the risk of traffic accident if the heavy commercial traffic associated with this proposed business was allowed access through Robert Hoddle Grove.

We also object to access for this business' traffic through Robert Hoddle Grove as it would potentially be very noisy and odours /waste may be generated from horse floats as they drove through the Bombira neighbourhood.

3:6 Visual Amenity

Potential Impacts

The building may be clearly visible from varying vantage points of neighbouring houses to the north, affecting the undeveloped rural setting of their outlook.

Our Comment

As we have received verbal reports that the final positioning of the proposed stables on Lot 1 DP 1062660 may not concur with both the Locality and Site Plan within Barnson's 4th March 2014 report, we request the opportunity to comment further if the final stables' positioning is altered from the plans made available to us.

As the Locality and Site Plans for this proposal have not included details on road access plans from the entrance of the property to the stables complex we request the opportunity to comment further if this infrastructure has a negative visual/noise impact on the neighbourhood.

We are aware that at approximately 600 square metres (36.3m length x 17m wide x 5m high) this is a very large stables construction requiring DA as State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 2.32 Development Standards (1) (b) (ii)specifies that development of a farm building be 200 square metres on a lot of 2ha or more.

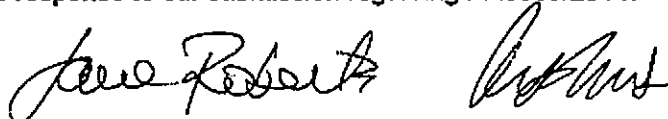
However, we appreciate the developer's effort to minimise the visual impact of these large stables on the neighbourhood and urge council to ensure that the developer adheres strictly to the following **3.6 Visual Impact Mitigation** measures as stated in Barnson 4th June 2014 report:

- Construction of tilt up concrete panels in a recessive natural colour such as an olive green with matching coloured non reflective roofing.
- Positioning of the stables northern wall at 60m from northern neighbourhood fence boundary and at least 90m from neighbourhood dwellings.
- Aligning the stables so that its shorter walls (17m) make up the north/south walls and the longer walls (36.3m) make up the east/west walls of the complex.... So as *'not to block broader views...'*
- We also urge council to ensure that the developer cuts the northern end of the stables into the site's topography which falls slightly to the south to create a flattened building envelope for the stables which will help to minimise visual impact on the neighbourhood by lowering the roof line. (3.1 Topography, Soils and Geology)

We strongly urge council to add further **3.6 Visual impact** and **3.4 Air Quality mitigation** measures to this proposal that ensure the parking of all associated stables machinery and vehicles and the positioning of storage pits/bins holding manure and waste from the stables be positioned to the south of the stables complex.

We look forward to council's response to our submission regarding DA0389/2014.

Yours faithfully,
Jane and Peter Roberts

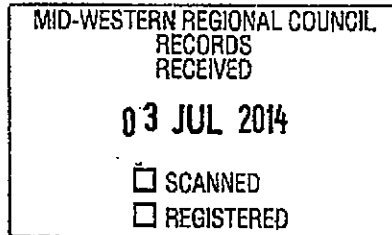


Cc: Mr. Gary Bruce Manager Statutory Planning Development and Community Services

2nd July 2014

Mrs Vivien Rooke
14 Robert Hoddle Grove
MUDGEES NSW 2850

Mr Brad Cam
General Manager
Midwestern Regional Council
MUDGEES NSW 2850



Dear Brad,

Re: Public Comment – Lot 1 DP1062660 (25A Robert Hoddle Grove, Bombira)
DA for Construction of Horse Stables Building

I refer to the above Development Application for the construction of horse stables at 25A Robert Hoddle Grove and wish to submit my comments to Council for consideration in relation to this Application.

I have no objection to the establishment of an 'animal boarding or training establishment' at the proposed site and believe this to be an appropriate use of the land nestled so closely to the Mudgee township and large lot residential housing on the outskirts of town.

I do, however, most strongly object to the primary access to the facility being established via Robert Hoddle Grove for the following reasons:

1. Safety

Due to the quality/range of the homes on Robert Hoddle Grove and the care taken by the residents to present well, a considerable amount of sight-seeing traffic already exists on the 'Robert Hoddle circuit'.

Those sightseeing by car tend to drive slowly, paying more attention to viewing the homes than observing the traffic. As a result drivers inadvertently, but regularly, swerve to the wrong side of the road which is narrow and not well suited to dual carriage for cars, let alone large horse transportation and commercial vehicles.

An increase in commercial traffic unfamiliar with this driving hazard will considerably increase the risk of accident.

2. Foot/Cycling Traffic

Due to its close proximity to town and the existing walking/cycling track which services the Bombira precinct, Robert Hoddle Grove also experiences high volumes of people walking/cycling early in the morning, throughout the day and after office hours (often when visibility is poor).

As there is no footpath on Robert Hoddle Grove, walkers/cyclists must share the road with all traffic and to an unsuspecting horse carrier, who may be potentially nearing the end of a long drive and/or delivering at odd hours, this will cause a significant safety hazard.

3. School Bus

My child catches the bus to school daily. The bus stops in several locations along Robert Hoddle Grove with children alighting and crossing the road to reach their homes. I would not like to see large horse transportation vehicles using the same road as the bus for obvious safety reasons.

4. Access Via Moggs Lane

The turn off into Moggs Lane from the Ulan Road is dangerous and busy. With the high volume of, often fast moving, mine related traffic (particularly at the change of shift), this corner is potentially lethal.

By increasing the number of large commercial vehicles coming in and out of Moggs Lane, the increased chance of serious accident is significant.

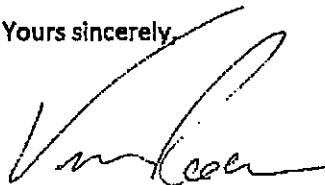
5. Residential Area

Finally, all residents of Robert Hoddle Grove have outlaid considerable money to enjoy a large lot holding in a quiet 'residential' area. An increase in large horse carrying and commercial vehicles using the street as the main access to the Stables will significantly impact on the desirability to live in the area and could affect the saleability and value of surrounding properties.

I would appreciate a response from Council explaining why the primary access cannot be established off Lue Road where there would be minimal effect on surrounding landholders and residents?

For 10 years we have enjoyed living in Mudgee, the last 5 years in Robert Hoddle Grove. I sincerely hope that Council will take my comments on board and make the decision to amend the access requirements to the proposed horse training facility and thus preserve the safety of the locals who utilise the area and the quality of life we enjoy in such beautiful surrounds.

Yours sincerely,



Viv Rooke
0412 430 773

FRANCES A. BEH

Saturday, 28 June 2014

The General Manager,
Mid Western Regional council,
Market Street
MUDGEE NSW 2850

Re: Proposed Development Lot 1 DP1062660 – Owner Max Walker

25A Robert Hoddle Grove, Mudgee.

I would like to add my comments to the proposed development on the above property in Robert Hoddle Grove, Mudgee.

The proposal sets out the construction of a stables building housing up to 18 horses on the aforesaid property. This proposal does not address the ongoing issue of current and future access by traffic associated with this project. Not only in the construction stage but the ongoing issue once construction has been completed. While this development is for one building only at this time, there is no indication that this will be the only construction of this type on this site. Once implied vehicle access is given via Robert Hoddle Grove to this site does this mean, should Mr Walker want to build a number of such buildings, that all access is via RHG? What we, as residents of RHG, are extremely concerned with is the increased traffic flow, both in volume and in size. What Council should consider is the future problems arising from this development on the existing residential area. There is NO indication that this will be the only building of this type on this site, and, therefore access to this site from Robert Hoddle Grove MUST be addressed now not sometime in the future when a more structures are proposed.

While it is mentioned in the proposal that this property will not be used for agistment purposes there is nothing in the proposal to say that this use is prohibited. *Once the door is open it will be very difficult to close.*

38 Robert Hoddle Grove, Mudgee, NSW 2850
Mobile: 0418 288 999

FRANCES A. BEH

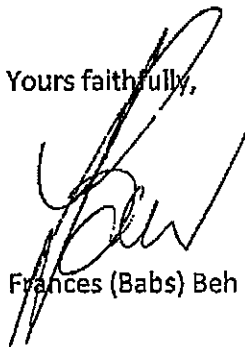
As a resident of Robert Hoddle Grove I am strongly against any such access to the stabling area via Robert Hoddle Grove. This area is a residential area as pointed out in the document prepared by Barnson's. Any movement of heavy vehicles to and from this site will have serious adverse effect on this quiet and friendly neighbourhood – especially traffic such as horse floats, feed trucks and other various oversize vehicles servicing the stables.

Robert Hoddle Grove was not built to take a high volume of large and heavy vehicles. It would be far more sensible and practical for the property in question to use their Lue Road entrance. Or, even for that matter, get access through the race course adjoining the property.

In conclusion, the issue of traffic access is of paramount importance and must be addressed specifically and not just brushed over with the thought that it will go away. It won't and it must be addressed now while the proposal is in the development stage.

I strongly object to this proposal should the traffic issue not be sorted out now.

Yours faithfully,



Frances (Babs) Beh

48 Denison Street, Mudgee, N.S.W. 2850, Australia

T: (+61) 02 6372 1213 M: (+61) 0431 690 084

Attention: Mr Gary Bruce
Manager Statutory Planning
Development and community Services
Mid-Western Regional Council
86 Market Street
Mudgee
NSW 2850

30 June, 2014

Dear Mr Bruce

**Re: DEVELOPMENT APPLICATION DA0389/2014 – PROPOSED ANIMAL
ESTABLISHMENT – HORSE STABLES – BONNY VIEW 25A ROBERT HODDLE GROVE
BOMBIRA NSW 2850 LOT 1DP 1062660**

The plans for the new stable block have been viewed at the Council Chambers and if, as it is understood, the building will be built into the slope to minimise the amount of impact such a large building will have on the residents in Robert Hoddle Grove it is acceptable but with concerns that the STANDARD codes of the development are strictly adhered to and that there will be fly control, no build-up of 'muck' from the stables and noise from staff working with the horses is kept controlled.

**OBJECTION –
ACCESS & TRAFFIC**

The objection is to the number of vehicles that will be servicing the Horse Stables using the narrow road through the residential area of Moggs Lane, Robert Hoddle Grove and the laneway to the farm;

Horse Boxes

Feed Supply trucks

'Muck' trucks

Bedding Hay Supply truck

Grooms & work riders who will be using the road very early in the morning.

email: robbyerw@bigpond.com

48 Denison Street, Mudgee, N.S.W. 2850, Australia

T: (+61) 02 6372 1213 M: (+61) 0431 690 084

Veterinary Service vehicles and other sundry cars and trucks.
In addition, all the building materials deliveries and construction workers.

All of the above will have particular impact on our block No. 25, Lot 6 DP 1074415 located on the corner of Robert Hoddle Grove and adjacent to the laneway that has been nominated as the primary access the Horse Stables.

When we purchased the land we were advised that this was ONLY an easement to the electric pole with a transformer box on it and that it would not be used otherwise. We purchased the land believing this and are currently building a house designed to maximise the views and peace of the agricultural land to the south and east.

We are now being threatened with this laneway becoming a busy thoroughfare for heavy vehicles.

For the amount of money being invested on our retirement home this is a devastating blow. The house build has started and if we had known that we were going to be compromised in this fashion we would not be building.

We note that there is a **second access**, this being from the Lue Road in a quiet agricultural area where no residents will be affected and request that consideration be given to nominating this as the primary entry to the Horse Establishment and Farm.

From a very unhappy future resident of Robert Hoddle Grove.

Yours sincerely

Robyn Williamson

email: robbiepw@bigpond.com

Krystie Baker

From: Cherie Edwards [cedwards45@bigpond.com]
Sent: Tuesday, 1 July 2014 9:52 AM
To: Council
Subject: Development Application Lot 1 DP1062660

The Manager,
Mid Western Regional Council,
Market Street,
Mudgee 2850

Dear Sir,

Re: Development Application Lot 1 DP 1062660 – 25a Robert Hoddle Grove

I am writing to lodge a concern I have with this development. I do not have a problem with the Stables that are proposed for construction but I am very concerned with the traffic which it will involve. Our area is a residential zone which the Barnson report acknowledges and we have many families living in this area who have children. Many of us in this area walk the road on a regular basis as do many people from in town. The road around Robert Hoddle has no footpath and no centre line for any vehicle to follow. My point is that we do not want big horsefloats and trucks regularly using our road as it has not been developed for a commercial business. There is another entrance to this property from the Lue Road and I would like to suggest that this could be used for this purpose.
I await your reply on this matter.

Yours sincerely

Cherie Edwards
37 Robert Hoddle Grove
Mudgee

This e-mail has been scanned for viruses by MCI's Internet Managed Scanning Services - powered by MessageLabs. For further information visit <http://www.mci.com> or contact Information Technology Business Unit - Mid-Western Regional Council

30th June 2014
Anthony and Beth Ellen Egan
12 Robert Hoddle Grove
Lot 16 DP 747912
Bombira 2850

Mid-Western Regional Council
DA 0389/2014

Dear Sir/ Madam,

We have been residents of Robert Hoddle Grove for twenty-one years and have seen many changes to Bombira. Recently it has been brought to our attention that stables are to be built nearby and an access road will be in our street at 25A. We would like to voice a strong objection to this access.

Robert Hoddle Grove is a narrow road with just enough room for two cars to pass in opposite directions safely. There is no footpath for pedestrians, and walkers with their dogs and young families have to use this road. This is a popular walking circuit that links with the path from town past the entrance to the racecourse. It can also be difficult to see ahead when driving in Robert Hoddle Grove due to street tree plantings that can obscure traffic and pedestrians on the bend in the road. To think that both car and pedestrian traffic would have to cope with horse floats and large trucks is a dangerous proposition.

The turn off from the Ulan Road into Moggs Lane has to contend with traffic to and from town travelling at 80 km per hour, and there is a succession from before dawn to the late hours due to the large number of mine vehicles that travel on the Ulan Road. As such this would be a difficult and dangerous turn for slow moving vehicles. I note that Council upheld this objection in the past when an access road to the racecourse was considered off Robert Hoddle Grove - this was prior even to the increased number of mine vehicles using the road.

We would suggest that any access road to the proposed stables be from the Lue Road only.

Yours faithfully,
Anthony and Beth Ellen Egan

QATAR ARMED FORCES SHOW-JUMPING TEAM

P O Box 8731, Doha, Qatar

Tel: + 974 66 92 97 48

Attention: Mr Gary Bruce, Manager, Statutory Planning
Development and Community Services
Mid-Western Regional Council
86 Market Street, Mudgee, NSW 2850

30 June, 2014

**Re: DEVELOPMENT APPLICATION DA0389/2014 – PROPOSED ANIMAL
ESTABLISHMENT – HORSE STABLES – BONNY VIEW 25A ROBERT HODDLE
GROVE BOMBIRA NSW 2850 LOT 1DP 1062660**

Dear Mr Bruce

My wife and I are currently building a home to retire to in Mudgee, on Building Block No25, Lot 6 DP074415, Robert Hoddle Grove.

I have no objection to the horse stables being built on the Bonny View block indicated above, since it is in a current agricultural area, below residential blocks and local traffic routes, plus being immediately adjacent to the Mudgee Racecourse.

However, I regard it as completely inappropriate to have access for vehicles related to a horse training establishment, travelling to and from the proposed stables, along the narrow, barely accessible laneway adjacent to our block - and then on through a quiet residential area, Heavy and usually long Trucks; with horses, stable refuse, bedding, feed and hay requirements, plus early morning comings and goings of stable staff.

In my opinion, with much more direct and suitable alternatives readily available, access of such horse elated traffic, plus for other goods and services, through a residential area is not logical, It is understood that there is **direct access** from the stables to **Lue Road**. Such vehicular and personnel access via that route, or alternatively, through the closely adjacent equine orientated Racetrack, would be the more logical choice.

Having been a Vet in the horse business for 50 years I do know something about vehicle and personnel movement in and out of stable areas

And also, I have been involved with some of the world's leading Equine and Equestrian Architects on stable facility design and lay-out, for many international equine/equestrian developments.

An essential requirement in all such project developments, has been the separation of residential and horse areas and related traffic,

One would anticipate that the same rules would apply in Mudgee

Yours sincerely,

Dr Ross Williamson

R J L Williamson BVSc(Syd) MRCVS

Qatar Armed Forces - Equine Veterinary Consultant

P O Box 8731, Doha, Qatar

Qatar Mobile: + 974 66 92 97 48

e-m: rossvet@superonline.com & rossvet@hotmail.com

43 Robert Hoddle Grove

Mudgee NSW 2850

02 63729341

Planning & Development Department

Midwestern Regional Council

86 Market St

Mudgee NSW 2850

To whom it may concern

RE: DA0389/2014. Lot 1 DP1062660 25A Robert Hoddle Grove, Bombira

Following review of statement of environmental effects for Lot 1 DP1062660 25A Robert Hoddle Grove, Bombira, we feel compelled to respond with strong objection to section 3.8 Access and Traffic.

We believe objection to the proposal for the primary entry point to be through Robert Hoddle Grove is justified due to the significant impact this traffic will have on this quiet residential area. The estate is a picturesque location on the outskirts of Mudgee and presence of the proposed animal establishment access would introduce horse/cattle transport vehicles to the area. Our concern is that this will disrupt the landscape and ambiance the local residents have chosen to reside in. The current road throughout Robert Hoddle Grove is by no means suitable for such large vehicles to be utilising particularly due to the width of the road and the absence of a centre line. The width of the road in particular would create significant risk should a normal vehicle and large transport vehicle meet specifically in areas with limited vision over the hill. The absence of a centre line allows these vehicles to divert into the centre of the road and make it difficult for residents cars to pass safely. There is also the risk of vehicle height and the effect they will have on the trees within the estate. These beautiful trees are a feature of this estate and damage to them would be very disappointing. Should a vehicle come into contact with the low lying tree line there is a significant potential for branches to injure residents. There are a number of small children that live in the area and as the parents of two young children, these risks raise great concern for our family and our main concern is their ability to remain safe from harm.

We feel that the Lue Road entrance is a far more suitable option for access as it is already a frequently utilised main road for all modes of transport including horse/cattle transport vehicles.

We thank you for your consideration in this matter

Kind Regards

Clint and Jennifer Ramien

19 Robert Hoddle Grove
MUDGEE NSW 2850
P: 6372 1848
E: jphickey@aapt.net.au

2nd July 2014

Mr Gary Bruce
Manager Statutory Planning
Development and Community Services
Mid-Western Regional Council
PO Box 156
MUDGEE NSW 2850

Dear Sir,

We refer to Development Application DA0389/2014 – Proposed Animal Establishment – Horse Stables – Bonny View 25A Robert Hoddle Grove Bombira NSW 2850 Lot 1 DP 1062560 and wish to lodge an objection on the following grounds:

1. Access and Traffic – objection to use of Robert Hoddle Grove as primary access on the following grounds :
 - a. It will introduce an increase in the flow of trucks, horse trailers and the like related to the proposed commercial business which is inappropriate in this residential area and is especially dangerous due to the narrow nature of the street
 - b. There are no footpaths so residents regularly use the road or the grass verge when walking within the area and the introduction of rural vehicles for a commercial business will pose an increased risk to pedestrians, joggers and young children
 - c. There is a twice a day school bus run along Robert Hoddle Grove with several set down and pick up places
 - d. There is a secondary access point at Lue Road that is appropriate for conducting a commercial business given it is already utilised for a wide range of passenger and farming vehicles and the line of sight to vehicles entering and exiting the proposed development site is clear for a greater distance.

2. Visual Amenity
 - a. We note the proposed finishes to reduce visual impact on the view from residences to the north of the development that include painting walls a recessive natural colour, non reflective roofing, tree and shrub planting around the perimeter of the building, and a separation of at least 90 metres from each neighbouring house.
 - b. We request that a condition of the proposed development include a stipulation that any trees planted do not exceed the same visual height as the ridge of the proposed stable

- c. We also request that a condition of the development include a provision for machinery, horse floats, waste from stables and the like be located on the southern side of the development or suitable other position on the property where impact on neighbouring homes is removed.

Yours sincerely

Judy and James Hickey

13 ROBERT HODDLE GROVE
MUDGEES NSW 2850
robertpisto@bigpond.com

GARY BRUCE
MANAGER STATUARY PLANNING
DEVELOPMENT AND COMMUNITY SERVICES
Mid- Western Regional Council
86 Market Street
MUDGEES NSW 2850

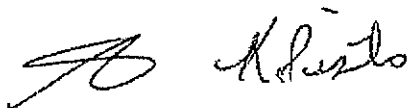
Dear Mr Bruce,

DEVELOPMENT APPLICATION DA0389/2014 – PROPOSED ANIMAL ESTABLISHMENT – HORSE STABLES – BONNY VIEW 25A ROBERT HODDLE GROVE BOMBIRA NSW LOT 1 DP 1062660,

We have viewed the application mentioned above and would like you to consider our concern regarding the primary access at 25A Robert Hoddle Grove.

- Moggs Lane and Robert Hoddle grove are rather narrow roads; with extra horse traffic this will make the road more dangerous. Particularly before and after school when my children are on and off the school bus.
- There is also no footpath along Robert Hoddle Grove thus making it more dangerous for pedestrians with increased traffic.
- The traffic on the Ulan road has already increased dramatically with the expansion of the mines. Having large horse floats turning in at the junction of Moggs Lane and Ulan Road could create a traffic hazard.

Kind regards,



Robert & Katherine Pisto.



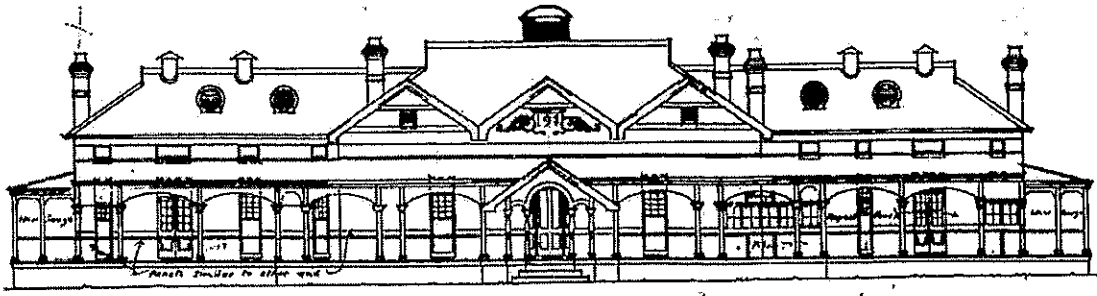
23 JULY 2014

ATTACHMENT

6.2.2

DA0331/2014 – Proposed Demolition of the Old
Gulgong Hospital – Lots 195 and 196 DP755434,
34 Goolma Road Gulgong





"Old Yarrawong"

Home Rule 2850
18th June, 2014.

Acting C. Manager, MWAC.
Mr Brad Carr.

URGENT.
MATTER.

Dear Brad, DA NO 0331/2014 has been lodged by Health Infrastructure (as its Consenting Authority) to demolish our 1901 Heritage Old Hospital's "core building."

Because of advice given to us by Dept of Lands, Dubbo, we came to know that Health Infrastructure has no power to lodge a DA on our building that has been closed for almost 4 years (AUG 2010). Dept of Lands contacted your Planning Dept alerting them to this improper action and that the usual procedure would be for Health to revoke the DA and offer the building back to the Crown for "revocation of dedication and repositioning." [see included email from Jody Burgess to Percy Thompson and CMP P 211 which are included in the "pack" of supporting papers for your information and to "back-up" Cullgong's position - delivered to you to day from the Cullgong Branch office.] In Health's DA 0331/2014 they state it is redundant to needs. Perhaps MWAC needs to seek legal advice on a DA lodged under a flawed procedure!

John Currey, Dept of Lands, Dubbo informed me today that his Dept has co-signed the DA after a request from MWAC Planning Dept "based on the information given to him", but that it ~~has~~ no way means they

(2)

agree with a demolition solution.

Perhaps this DA should be stopped to allow for "transparency" and another submission period gone through, as we as the community concerned have no idea how the DA now reads?

Certainly DA 0313/2012 should be revoked by MWRC as it was lodged without the correct (ie illegal?) Consenting Authority (for the 2nd [demolition] part, and MWRC illegally accepted it, reported on it, sent a report off to the Joint Regional Planning Panel and finally allowed demolition of part of Cullgoon's heritage to go ahead &

Especially we would like MWRC to revoke the DA ~~2012~~ 2012's permission to demolish G.01 and G.02. (see map) which hasn't been carried out yet, as these 2 rooms (no asbestos in roof at all!) added to the "core building will make a wing" (lock-off-able from the rest of the building) for a hydrotherapy pool / gym business or other community use, eg local art gallery (see Community Usage Plan to sent WNSW LHD, but not accepted. Other health related services [which were lost to Cullgoon when the Hospital closed, and NOT provided for in the MPS], could be housed as individual businesses, leasing space and providing a yearly income. (See Community Plan)

We as a community would like to save our 1901 Heritage Building "at all costs" hence our efforts to get an almost 700 signature petition and 58 individual letter submissions to MWRC, against this DA.

(3)

If our building is "repurposed" it can be put up for adaptive-reuse by 1) another State Dept.
2) local council
3) individuals.

[See supporting information pack - email to Percy Thompson from DEPT LAND DUBBO, and Health's own CMP P 208-211 that this is the usual procedure, & doesn't waste \$106,000 of valuable taxpayers money for demolition.]

Dr Hussein Alsened, our local CMP, has approached WNSW with re interest to buy the building, but in light of recent knowledge it is debatable if they have the authority to sell it. IF any sale does take place it seems the Crown will organise it!

Culgong has been told so many "inaccuracies" over the past 4 years (a polite term), we as a community are looking for some solid support from our MWAC staff and all councillors. Culgong ~~is~~ relies heavily on tourism from Heritage and you will see that of the petition signatures a good percentage are from tourists (gathered at our Culgong Markets) who want to see the building retained and restored.

Recent contact with the Heritage Office of NSW emphasises that 1) ~~is~~ its a building of rare heritage significance now in the STATE (only 3 left) ^{and 2)} that under the MWAC LEP ITEM 2071312 schedule 5 we should be expecting its protection, by Council.

Kind regards -

Joan Tamburini

for "Save the Old Culgong
Hospital Building Committee"

cc all councillors.

4

THOMSON & DIAMANTE

STONE CONSULTANTS

MARBLE – GRANITE SANDSTONE & FIXING

To Whom It May Concern.

My name is Laurence Thomson, I am A qualified Stonemason and have been requested to give an appraisal of the Gulgong Hospital.

1. The hospital is of stone and brick construction with a corrugated iron roof.
2. The base footing is of stone and is at least 400ml thick. There are no cracks and or rising damp in the stone and or in the brick works.
3. The brick work is constructed of stretcher and header bond at 300ml thick. There are no cracks in the outer walls of the building.
4. The corrugated iron roofing line is very straight and shows no sagging and it is in good condition.
5. In my opinion the building is still a very solid structure and would benefit greatly from a quality restoration, as buildings of this period, size and nature are hard to find. The building is also in keeping with the age and appearance of other buildings in the town.

Kind Regards
Laurence Thomson

Laurence Thomson

Stonemason

159 Streeon Drive Stirling ACT 2611

Ph (02) 62887161

E-mail diamondjim@bigpond.com

CC all councillors

1

SUBMISSION TO SAVE OLD GULGONG HOSPITAL BUILDING.

57 Submissions

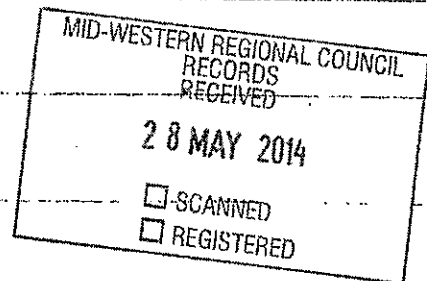
WE, THE UNDERSIGNED WISH TO OBJECT TO THE DEVELOPMENT APPLICATION DAO33/2014 TO DEMOLISH THE OLD GULGONG HOSPITAL BUILDING BY HEALTH INFRASTRUCTURE ON THE FOLLOWING GROUNDS;

- 1) THE 1901 BUILDINGS: CORE STRUCTURE IS STILL SOLID AND TYPICAL OF ITS FEDERATION COTTAGE HOSPITAL STYLE AND ALSO TYPICAL OF MARK COOPER DAYS WORK. HE WAS A PROMINENT ARCHITECT OF THE FEDERATION.
- 2) GULGONG IS A TOWN RENOWNED FOR ITS OLD BUILDINGS AND WINDING NARROW STREETS. WE NEED TO PRESERVE THIS BUILDING FOR ITS HISTORICAL SIGNIFICANCE.
- 3) GULGONGS OLD HOSPITAL IS INTERTWINED WITH THE PEOPLES LIVES AND THEREFORE HAS SOCIAL SIGNIFICANCE.
- 4) WITH RESTORATION AND RENOVATION GULGONG WILL HAVE A WELLNESS CENTRE TO COMPLIMENT THE MPS AND PROVIDE "LOST" SERVICES AND NEW LOCAL HEALTH AND COMMUNITY SERVICES.
- 5) TO REPLACE THIS BUILDING IN FUTURE YEARS WOULD BE A LOT MORE EXPENSIVE OPTION.

PRINT NAME

ADDRESS

SIGNATURE



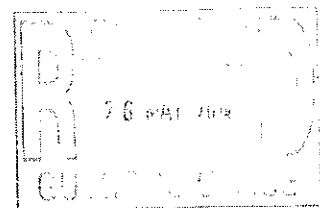
GULGONG MARKETS,
CORONATION PARK,
GULGONG. N.S.W. 2852

24th. MAY, 2014.

THE OLD GULGONG HOSPITAL BUILDING,
A 1901 FEDERATION HERITAGE BUILDING
ON THE MID WESTERN REGIONAL COUNCILS
LOCAL ENVIRONMENT PLAN NO.2070312,
IS OLDER THAN 85% OF THE BUILDINGS IN
THE TOWN-CENTRE CONSERVATION ZONE.

I THEREFORE OBJECT TO ITS
DEMOLITION BECAUSE OF ITS HISTORICAL
SIGNIFICANCE.

Signi - Walby
Address - Lahoma
Denmore 2328



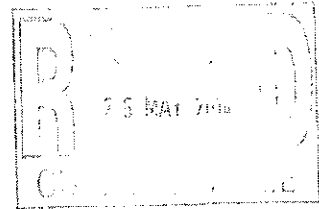
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I THEREFORE OBJECT TO ITS
DEMOLITION BECAUSE OF ITS HISTORICAL
SIGNIFICANCE.

Asgn. J. Allen
*Address - PO Box 3311,
Asquith, NSW, 2077.*



GULGONG MARKETS,
CORONATION PARK,
GULGONG. N.S.W. 2852

24th. MAY, 2014.

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I THEREFORE OBJECT TO ITS
DEMOLITION BECAUSE OF ITS HISTORICAL
SIGNIFICANCE.

Sign: Ann Verma
Address - 3/12, Willbetree st, Gulgong.

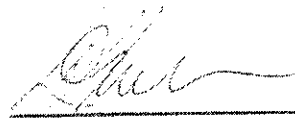


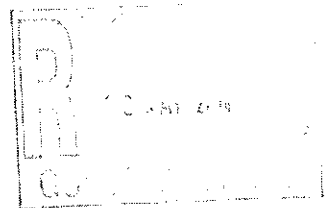
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I THEREFORE OBJECT TO ITS
DEMOLITION BECAUSE OF ITS HISTORICAL
SIGNIFICANCE.


13 Shelton St
Gulgong.



GULGONG MARKETS,
CORONATION PARK,
GULGONG. N.S.W. 2852

24th. MAY, 2014.

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I THEREFORE OBJECT TO ITS
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SIGNIFICANCE.

Luyn M. Woods

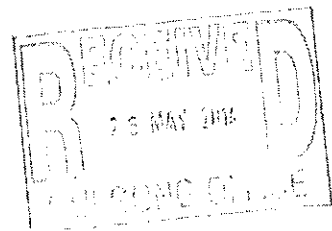
Address - 34 Bingham Rd

Beechcroft

Sydney

NSW

2119.




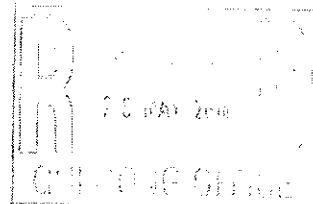
GULGONG MARKETS,
CORONATION PARK,
GULGONG. N.S.W. 2852

24th. MAY, 2014.

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ON THE MID WESTERN REGIONAL COUNCILS
LOCAL ENVIRONMENT PLAN NO.2070312,
IS OLDER THAN 85% OF THE BUILDINGS IN
THE TOWN-CENTRE CONSERVATION ZONE.

I THEREFORE OBJECT TO ITS
DEMOLITION BECAUSE OF ITS HISTORICAL
SIGNIFICANCE.

Sign - 
Address - B. Mc GREGOR
57, GULGAN ROAD
GULGONG NSW 2852

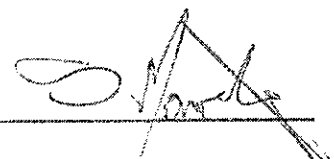


GULGONG MARKETS,
CORONATION PARK,
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I THEREFORE OBJECT TO ITS
DEMOLITION BECAUSE OF ITS HISTORICAL
SIGNIFICANCE.

Sign 
Address - 149 MAYNE ST
GULGONG. 2852.
NSW.



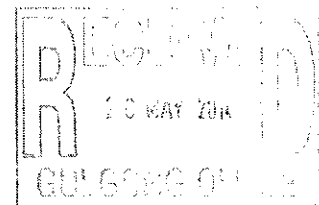
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THE OLD GULGONG HOSPITAL BUILDING,
A 1901 FEDERATION HERITAGE BUILDING
ON THE MID WESTERN REGIONAL COUNCILS
LOCAL ENVIRONMENT PLAN NO.2070312,
IS OLDER THAN 85% OF THE BUILDINGS IN
THE TOWN-CENTRE CONSERVATION ZONE.

I THEREFORE OBJECT TO ITS
DEMOLITION BECAUSE OF ITS HISTORICAL
SIGNIFICANCE.

Sign L Bryson
Address 63 Clifford St
Panama 2013



GULGONG MARKETS,
CORONATION PARK,
GULGONG. N.S.W. 2852

24th. MAY, 2014.

THE OLD GULGONG HOSPITAL BUILDING,
A 1901 FEDERATION HERITAGE BUILDING
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I THEREFORE OBJECT TO ITS
DEMOLITION BECAUSE OF ITS HISTORICAL
SIGNIFICANCE.

Sign: [Signature]
Address - "Narramore"
Elong Hwy NSW 2831



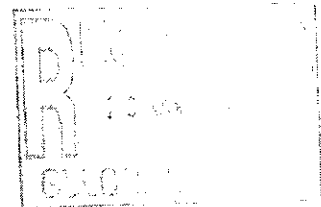
GULGONG MARKETS,
CORONATION PARK.
GULGONG. N.S.W. 2852.

24th. MAY, 2014.

THE SITE OF THE OLD GULGONG HOSPITAL
BUILDING, NOW EMPTY AND UNUSED (SINCE 29/8/2010,
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AND "IF A SECTION" IS NO LONGER REQUIRED FOR
HOSPITAL SERVICES THE LEGISLATIVE REQUIREMENT
IS FOR THE LAND TO BE HANDED BACK TO THE CROWN
FOR "REVOCATION OF THE DEDICATION AND REPURPOSING.
(DEPT. OF LANDS ADVICE).

I THEREFORE OBJECT TO THIS DEVELOPMENT
APPLICATION UNTIL THE TRUE LEGAL POSITION OF THE
BUILDING AND THE SITE IS WORKED OUT.

Sign - Ruth Thompson
Address - 7 Owens Pl
57 June 2015



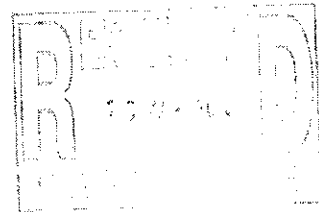
GULGONG MARKETS,
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GULGONG. N.S.W. 2852.

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BUILDING AND THE SITE IS WORKED OUT.

Sign: [Handwritten Signature]
Address - 'ULTIMO'
EUWALCERIE 2831



GULGONG MARKETS,
CORONATION PARK.
GULGONG. N.S.W. 2852.

24th. MAY, 2014.

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Sign Francis Jones
Address
26 George Street
Mudgee 2850

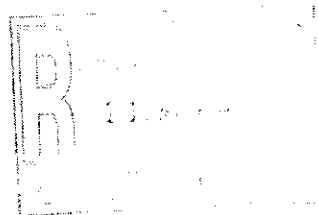


GULGONG MARKETS,
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GULGONG. N.S.W. 2852.
24th. MAY, 2014.

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Sign Chris Adams
Address Elong Elong 2831



GULGONG MARKETS,
CORONATION PARK.
GULGONG. N.S.W. 2852.

24th. MAY, 2014.

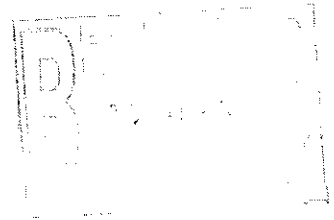
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Signi Blun

Address 67 Mayne St

Gulgong



GULGONG MARKETS,
CORONATION PARK.
GULGONG. N.S.W. 2852.

24th. MAY, 2014.

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Sign _____
Address
3484 YLAN RD YLAN



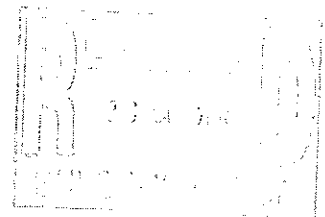
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Sign DJW

Address 92 Pine Close
Yarrawang



GULGONG MARKETS,
CORONATION PARK.
GULGONG. N.S.W. 2852.

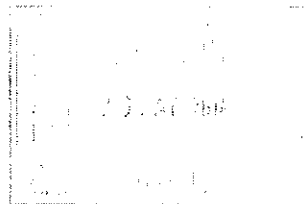
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BUILDING AND THE SITE IS WORKED OUT.

Sign - JJ

*Address - Janine Young
71 Back Creek Rd
Glasshouse Mt, QLD
4518*



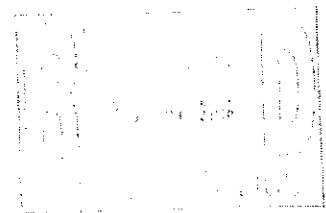
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BUILDING AND THE SITE IS WORKED OUT.

Sign. G. H. Hardy
Address - 2 LAKEBA ST
BELMORE 2192
NSW

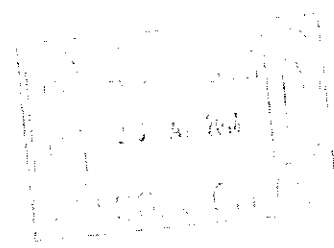


GULGONG MARKETS,
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GULGONG. N.S.W. 2852.
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I THEREFORE OBJECT TO THIS DEVELOPMENT
APPLICATION UNTIL THE TRUE LEGAL POSITION OF THE
BUILDING AND THE SITE IS WORKED OUT.

Sign: Tom Tamburini
Address "Old 'Tamburini'"
Home Rule
Via Mudgee
2850



GULGONG MARKETS,
CORONATION PARK.
GULGONG. N.S.W. 2852.

24th. MAY, 2014.

I OBJECT TO THE DEVELOPMENT APPLICATION 0331/214
DEMOLITION OF THE OLD GULGONG HOSPITAL BUILDING ON
THE GROUNDS THE SITE IS VESTED IN THE CROWN ESTATE
AND THE HEALTH DEPT. (WESTERN N.S.W. LOCAL HEALTH
DISTRICT) DOES NOT APPEAR TO HAVE TRUSTEESHIP OF
THE BUILDING.

THEREFORE OWNERS CONSENT HAS NOT BEEN GIVEN
FOR THE DEVELOPMENT APPLICATION.

Sign: [Signature]
*Address - 63 Clifford St
Parramatta 2213*

[Faint, illegible stamp or text]

GULGONG MARKETS,
CORONATION PARK.
GULGONG. N.S.W. 2852.

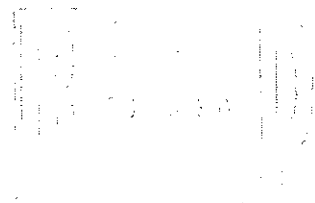
24th. MAY, 2014.

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FOR THE DEVELOPMENT APPLICATION.



Hillside
118 Hillside Ln
Gulgong 2852



GULGONG MARKETS,
CORONATION PARK.
GULGONG. N.S.W. 2852.

24th. MAY, 2014.

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THE BUILDING.

THEREFORE OWNERS CONSENT HAS NOT BEEN GIVEN
FOR THE DEVELOPMENT APPLICATION.

Rhannon Cheesewright

Sign: _____
Address- 5 Anderson Street
Gulgong NSW 2852



GULGONG MARKETS,
CORONATION PARK.
GULGONG. N.S.W. 2852.

24th. MAY, 2014.

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THEREFORE OWNERS CONSENT HAS NOT BEEN GIVEN
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Sign: Lane Hillman
Address -
2/226
Church street
Mudgee

GULGONG MARKETS,
CORONATION PARK.
GULGONG. N.S.W. 2852.

24th. MAY, 2014.

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DISTRICT) DOES NOT APPEAR TO HAVE TRUSTEESHIP OF
THE BUILDING.

THEREFORE OWNERS CONSENT HAS NOT BEEN GIVEN
FOR THE DEVELOPMENT APPLICATION.

Sign - [Handwritten Signature]
Address - 8 NABIKA PLACE
MIDDLE PARK
QLD 4074



GULGONG MARKETS,
CORONATION PARK.
GULGONG. N.S.W. 2852.

24th. MAY, 2014.

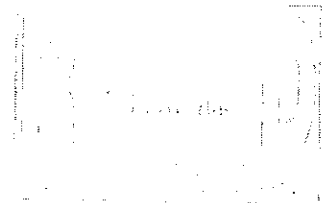
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THEREFORE OWNERS CONSENT HAS NOT BEEN GIVEN
FOR THE DEVELOPMENT APPLICATION.

Sign: J. Bowman
Address-

34 Pike St

Dulwich Hill NSW 2203



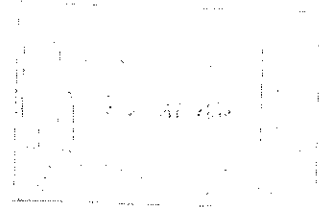
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THE BUILDING.

THEREFORE OWNERS CONSENT HAS NOT BEEN GIVEN
FOR THE DEVELOPMENT APPLICATION.

Sign: [Handwritten Signature]
Adolobson. *Presently closed*
4th Dec 2015.




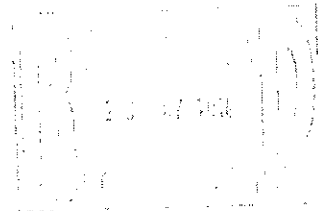
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Sign 
Arlo Jones Turramurra
Sydney



GULGONG MARKETS,
CORONATION PARK,
GULGONG. N.S.W. 2852.

24th. MAY, 2014.

THE OLD GULGONG HOSPITAL, BUILT IN
1901 THE YEAR FEDERATION, STANDS ON CROWN
LAND AT ONE OF THE MAIN ENTRANCEWAYS TO THE
HERITAGE GOLD RUSH TOWN OF GULGONG. ITS "CORE
BUILDING" IS ALL THAT IS LEFT AFTER RECENT
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THE YEARS. WITH REINSTATEMENT OF THE OLD
VERANDAH (ORIGINAL DRAWINGS AND PHOTOGRAPHIC
EVIDENCE AVAILABLE) AND RESTORATION AND
REFURBISHMENT OF THE CORE BUILDING IT CAN BE
AN IMPORTANT REMINDER OF THE GOLD RUSH PERIOD.

I OBJECT TO ITS DEMOLITION ON HISTORICAL,
CULTURAL AND SOCIAL GROUNDS.

Sign - Alfred Day
Address - 32 Medley St
Gulgong



GULGONG MARKETS,
CORONATION PARK,
GULGONG. N.S.W. 2852.

24th. MAY, 2014.

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CULTURAL AND SOCIAL GROUNDS.

Sign - I. E. Stokin
Address - 1640 Pokura Road
Two Mile Flat.

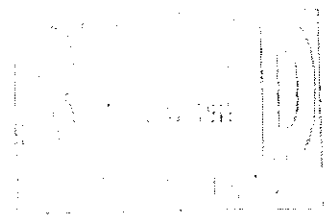
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Sign Adam
Address 1053 Spring Creek
RD Yarramongah.



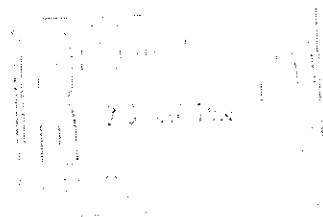
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CULTURAL AND SOCIAL GROUNDS.

Sign R. T. L.
Address 11 LINDSAY GORDON PL
HEATHCOTE. NSW 2233



GULGONG MARKETS,
CORONATION PARK,
GULGONG. N.S.W. 2852.

24th. MAY, 2014.

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CULTURAL AND SOCIAL GROUNDS.

Sign: M. F. Blofeld
Address M.F. BLOFELD
11 LINDSAY GORDON PLACE
HEATHCOTE N.S.W 2233

GULGONG MARKETS,
CORCORATION PARK,
GULGONG. N.S.W. 2852.

24th. MAY, 2014.

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Sign: [Signature]
Address: 43 DEWHURST DR
MUDGEE

GULGONG MARKETS,
CORCORATION PARK,
GULGONG. N.S.W. 2852.

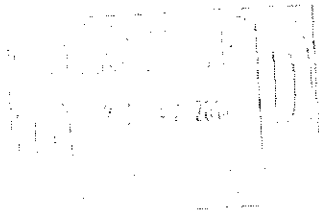
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Sign: Alfred

*Address - 39 FORSYTH STREET,
GLEBE, SYDNEY,
NSW 2037*



GULGONG MARKETS,
CORCORATION PARK,
GULGONG. N.S.W. 2852.

24th. MAY, 2014.

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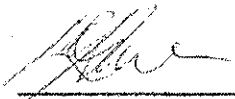
*Sign: Dyan Hewitt
Address PO Box 10
GRAFTON
NSW 2462*

GULGONG MARKETS,
CORONATION PARK,
GULGONG. N.S.W. 2852.

24th. MAY, 2014.

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BUILDING" IS ALL THAT IS LEFT AFTER RECENT
DEMOLITION TO REMOVE ADDITIONS PUT ON OVER
THE YEARS. WITH REINSTATEMENT OF THE OLD
VERANDAH (ORIGINAL DRAWINGS AND PHOTOGRAPHIC
EVIDENCE AVAILABLE) AND RESTORATION AND
REFURBISHMENT OF THE CORE BUILDING IT CAN BE
AN IMPORTANT REMINDER OF THE GOLD RUSH PERIOD.

I OBJECT TO ITS DEMOLITION ON HISTORICAL,
CULTURAL AND SOCIAL GROUNDS.


13 Station St
Gulgong



GULGONG MARKETS,
CORONATION PARK,
GULGONG. N.S.W. 2852.

24th. MAY, 2014.

THE OLD GULGONG HOSPITAL BUILDING
MUST BE RETAINED AS AN EXAMPLE OF 1901
FEDERATION HOSPITAL STYLE WHEN HEALTH
SERVICES BECAME IMPORTANT ACROSS THE STATE
TO COMBAT CONTAGIOUS DISEASES (IN THIS CASE
SMALLPOX 1901). THERE ARE ONLY 3 OF THIS
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- 1) GRENFELL, WHERE IT IS PART OF THEIR
MULTI PURPOSE SERVICES.
- 2) PEAK HILL, WHERE IT IS STILL BEING USED
AS A HOSPITAL AND WHEN THEIR MULTI
PURPOSE SERVICES FINISHES IN 2015 WILL
BECOME A COMMUNITY WELLNESS CENTRE.
- 3) GULGONGS BUILDING WITH DEVELOPMENT
APPLICATION 0331/2014 PROPOSING ITS
DEMOLITION.

I OBJECT TO THIS DEVELOPMENT APPLICATION
ON THE GROUNDS IT CAN BECOME A VALUABLE
COMMUNITY BUILDING WHEN RETURNED TO THE DEPT.
OF LANDS AND THE CROWN ESTATE FOR "REPURPOSING".

Sign - A. Hopper
Address - 53 Dargy St,
Gulgong

9

GULGONG MARKETS,
CORONATION PARK,
GULGONG. N.S.W. 2852.

24th. MAY, 2014.

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Gabe Mayhew
40 URALBA LANE
FROG ROCK. (MUDGEE) 2850

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CORONATION PARK,
GULGONG. N.S.W. 2852.

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Sign John Halloran
Address - 162 Solopis Creek Rd
Gulgong NSW 2852

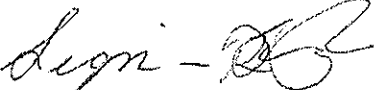
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Sign - 
Address - 3 White St Gulgong

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GULGONG. N.S.W. 2852.

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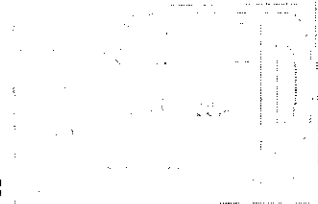
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OF LANDS AND THE CROWN ESTATE FOR "REPURPOSING".

Signature
Address CHRISTINE M'GEEVER
57 GOLLAN RD, GOOLMA
NSW 2852

GULGONG MARKETS,
CORONATION PARK,
GULGONG. N.S.W. 2852.

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Sign - [Signature]
Address - 5/170 CHURCH S
MUDGEE

GULGONG MARKETS,
CORONATION PARK,
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Sign - [Signature]
*Address - 108 Redley St
Gulgong NSW 2852.*


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CORONATION PARK,
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Address 35 Normurra Ave,
North Turramurra

GULGONG MARKETS,
CORONATION PARK,
GULGONG. N.S.W. 2852.

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Sign Trish Willoughby
Address 61 Chesterfield Rd
Epping 2121

GULGONG MARKETS,
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GULGONG. N.S.W. 2852.

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Just W Yearan
18 Station St Gulgong
28

GULGONG MARKETS,
CORONATION PARK,
GULGONG. N.S.W. 2852

24th. MAY, 2014.



THE OLD GULGONG HOSPITAL BUILDING
WAS BUILT IN 1901 ON CROWN LAND ADJACENT
TO ADAMS LEAD GOLD MINING LEASE, THE
FIRST ALLUVIAL GOLD AREA IN GULGONG AFTER
RED HILL IN THE 1870s.

I OBJECT TO ITS DEMOLITION ON THE
GROUNDS THAT IN FUTURE YEARS ITS ARCHAEOLOGICAL
SITE IMPORTANCE WILL ADD IMPORTANT KNOWLEDGE
ABOUT THE GOLD RUSH PERIOD IN GULGONG.

Sign L.H. Jenkins
Address 59 Belmore St Gulgong

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CORONATION PARK,
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Sign - [Signature]
*Address - 64 Medley St
Gulgong*

GULGONG MARKETS,
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GULGONG. N.S.W. 2852

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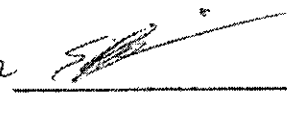
Sign - [Signature]
*Address - e. Raek
Mudgee.*

GULGONG MARKETS,
CORONATION PARK,
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Sign 
Address 40 URALBA LN.
MUDGEE

GULGONG MARKETS,
CORONATION PARK,
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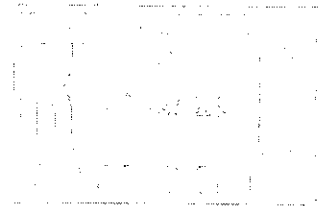
Sign - LK
IAN RINDFLEISH
Address -

"KENILWORTH"
COONAMBLE
2829

GULGONG MARKETS,
CORONATION PARK,
GULGONG. N.S.W. 2852

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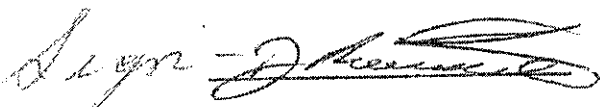
Sign Colin Bailey
Address - 6 FITZROY ST
GULGONG NSW 2852

GULGONG MARKETS,
CORONATION PARK,
GULGONG. N.S.W. 2852

24th. MAY, 2014.

THE OLD GULGONG HOSPITAL BUILDING,
A 1901 FEDERATION HERITAGE BUILDING
ON THE MID WESTERN REGIONAL COUNCILS
LOCAL ENVIRONMENT PLAN NO.2070312,
IS OLDER THAN 85% OF THE BUILDINGS IN
THE TOWN-CENTRE CONSERVATION ZONE.

I THEREFORE OBJECT TO ITS
DEMOLITION BECAUSE OF ITS HISTORICAL
SIGNIFICANCE.


Address - Damien Cheesewright
11 TAIHAWANG . R.D

GULGONG MARKETS,
CORONATION PARK,
GULGONG. N.S.W. 2852

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Signatures Ryan
Address
15 Perseverance Lane
Gulgong

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Sign: *Obadiah*
Address - Ten Dollar Town Motel
134 Mayne St
Gulgong 2852.

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Sign: Shursey
Address - Wodanara, Dunedoo
2844.

408 signatures on petitions

WE, THE UNDERSIGNED WISH TO OBJECT TO THE DEVELOPMENT APPLICATION DAO33/2014 TO DEMOLISH THE OLD GULGONG HOSPITAL BUILDING BY HEALTH INFRASTRUCTURE ON THE FOLLOWING GROUNDS;

- 1) THE 1901 BUILDINGS CORE STRUCTURE IS STILL SOLID AND TYPICAL OF ITS FEDERATION COTTAGE HOSPITAL STYLE AND ALSO TYPICAL OF MARK COOPER DAYS WORK. HE WAS A PROMINENT ARCHITECT OF THE FEDERATION.
- 2) GULGONG IS A TOWN RENOWNED FOR ITS OLD BUILDINGS AND WINDING NARROW STREETS. WE NEED TO PRESERVE THIS BUILDING FOR ITS HISTORICAL SIGNIFICANCE.
- 3) GULGONGS OLD HOSPITAL IS INTERTWINED WITH THE PEOPLES LIVES AND THEREFORE HAS SOCIAL SIGNIFICANCE.
- 4) WITH RESTORATION AND RENOVATION GULGONG WILL HAVE A WELLNESS CENTRE TO COMPLIMENT THE MPS AND PROVIDE "LOST" SERVICES AND NEW LOCAL HEALTH AND COMMUNITY SERVICES.
- 5) TO REPLACE THIS BUILDING IN FUTURE YEARS WOULD BE A LOT MORE EXPENSIVE OPTION.

PRINT NAME

ADDRESS

SIGNATURE



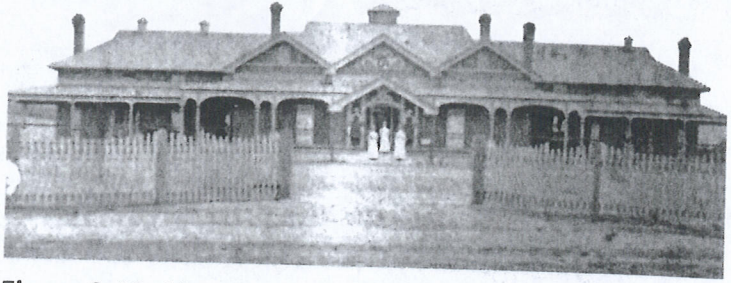


Figure 3.10 Very early photo of the 1901 hospital building¹⁰³

Branch Office,
Culgong.

Thursday
17th June.

Dear Brad.

Supplementary documents to
letter coming by email tomorrow (18th) to
give information about "Save the Old.

Culgong^{ts} Hospital Committee's efforts so far.

I'd appreciate if they could be
photos copied if needed, and these
originals sent back to the Culgong
Branch Office.

Thanking you

Joan Tamburini

MID-WESTERN REGIONAL COUNCIL
RECORDS
RECEIVED

20 JUN 2014

SCANNED
 REGISTERED

Old Gulgong Hospital

Subject: Old Gulgong Hospital

From: Jody Burgess <Jody.Burgess@lands.nsw.gov.au>

Date: 2/05/2014 11:51 AM

To: "thompsondm1@bigpond.com" <thompsondm1@bigpond.com>

Hi Percy,

Further to our telephone conversation earlier this week I can advise that the hospital site is a dedication for hospital, and if a section is no longer required for hospital services the legislative requirement may be for the land to be handed back to the crown for revocation of the dedication and repurposing.

I am not aware of any vesting act which may have removed the land from the crown estate, though the Dept of Health may have taken independent action to gazette a vesting.

The land in question appears to be in the trusteeship of "The Gulgong District Hospital" you may need to make enquiries as to whether this is actually a legal entity. *BOARD ?*

It is also uncertain whether the appropriate Owner's Consent to the Development application has been provided, either by "The Gulgong District Hospital" or the Crown. I have lodged an enquiry regarding this with Council and am awaiting a response. *****

Please advise whether you have filed any legal action such as an application for an injunction to stop demolition, as the Crown may need to be briefed on such action.

MURR

6/7th MAY

to

MARK

AMONDS

Secretary?























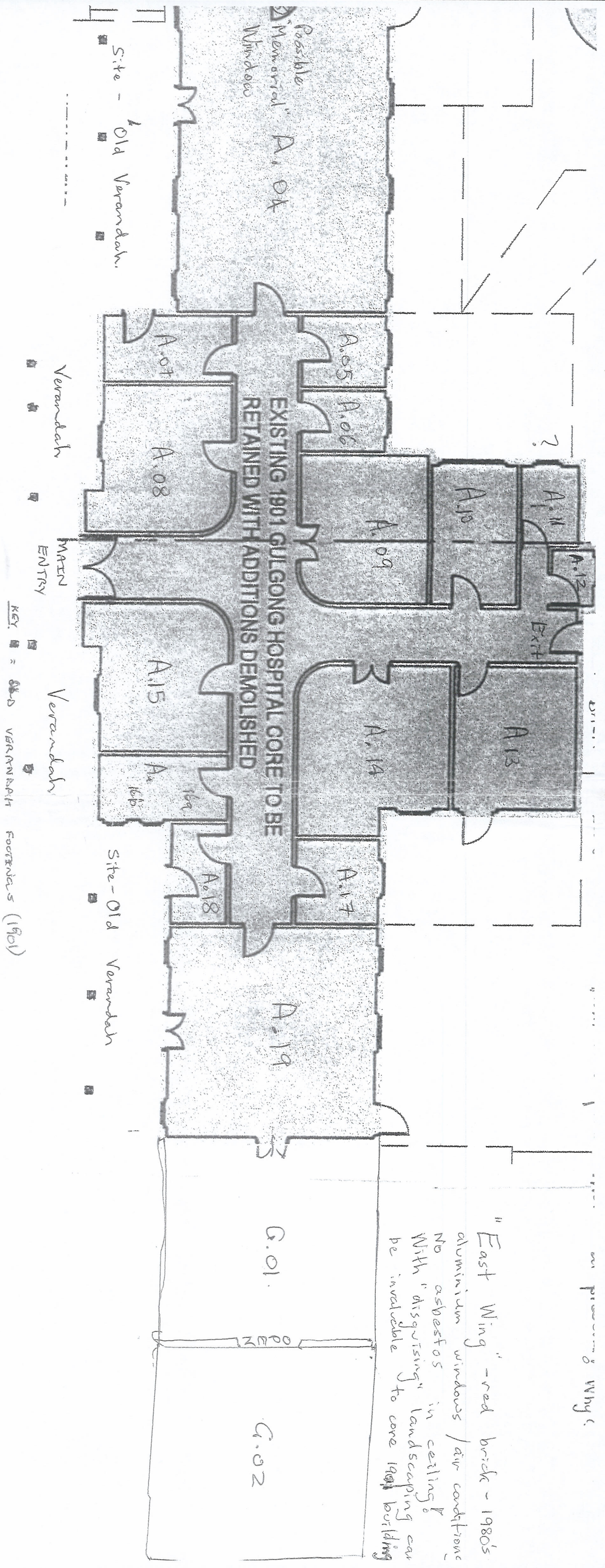
THE
GOLF
COURSE
CLUBHOUSE
IS
OPEN
FROM
8:00
AM
TO
5:00
PM
DAILY
EXCEPT
ON
SUNDAYS
AND
PUBLIC
HOLIDAYS
FOR
RESERVATIONS
CALL
781-234-1234











Suggested Plan of Clinical Services for "adaptive-reuse" of Old Gulgong Hospital.

- A.04. Day Care / Respite Centre / Large Activity Room for Tai Chi
 - and other community / health uses eg Qivaffe and Heart Moves, with access to restored verandah.
 - Possible Memorial Window at *
 - A.05 & A.06 Mens and Womens Toilets and showers
 - A.07 and A.08 'Pink lady' run Tea / Coffee shop with seating area and access to restored verandah.
 - *A.10. Dental Clinic
 - *A.10g Dental Waiting Room
 - *A.13 X-ray Dept.
 - *A.14 X-ray Waiting Room.
 - A.15. Optometrist Consulting Room.
 - A.17. Mens & Womens Toilets and Showers
 - A.19. Change Rooms and possible gym/activity area.
 - G.01 to G.02 Hydro-Therapy Pool.
- Other suggestions from Committee:
- * Visiting consulting Rooms (A.08)?
 - * VMO flat or Interns (as Wedge)
 - * Consulting Room - changed "Hot Spot"
- NB KEY: * Denotes area of possible lease/reverse for Western Health / or investor.

"East Wing" - red brick - 1980's aluminium windows / air conditioner No asbestos in ceiling With "disguising" landscaping can be invaluable to core 1901 building

Why?

GULGONG DISTRICT HOSPITAL CONSERVATION MANAGEMENT PLAN



prepared by John Blackwood Architects
for the Western NSW Local Health District

FINAL ISSUE
NOVEMBER 2011

re: Significance (P139-153)

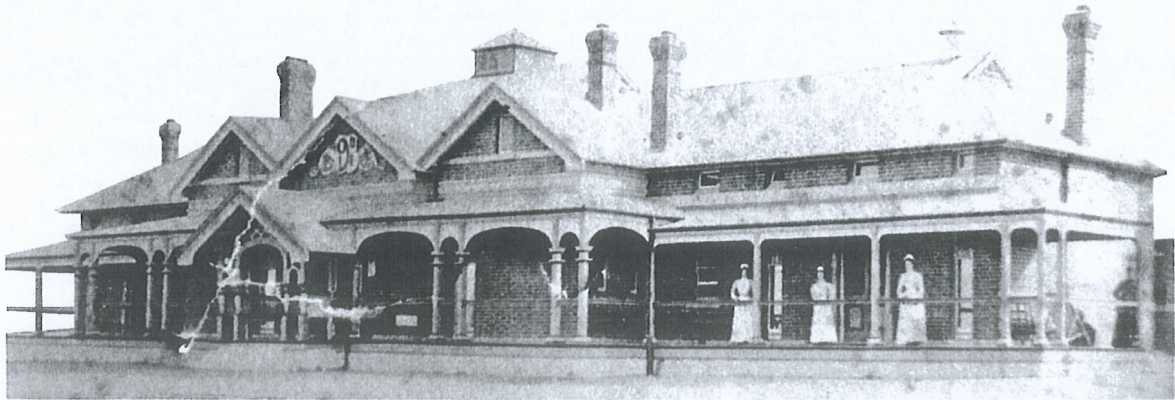


Figure 3.11 An oblique view of the 1901 building¹⁰⁴

The original details of the front door are fairly clear in one photo with the best resolution, this time with a posed horse and buggy in the foreground. On close inspection the original door, sidelights and multi-paned transomlight sash can be made out, sufficiently for reconstruction, should that ever be possible. The demolished joinery of the front porch is also clearly evident.



The original drawings have not been located but the drawings that are available appear to be the original with only minor edits done in 1927. It is likely that this is the drawing in the original hand, with some elements scratched out.



Figure 3.12 Horse and buggy outside the original entrance¹⁰⁵

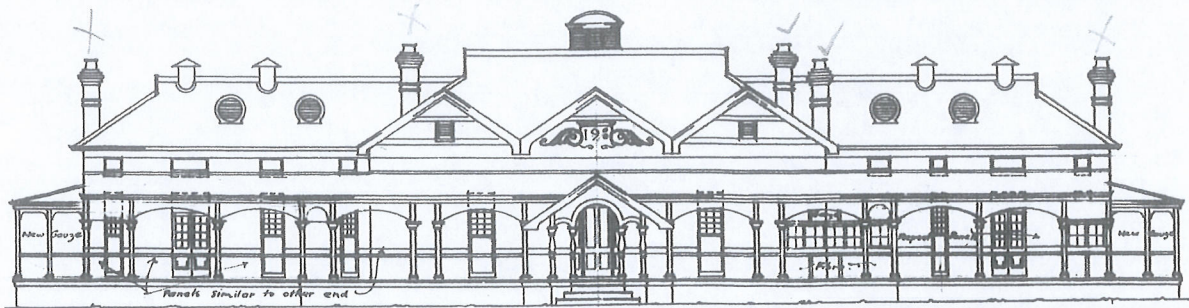


Figure 3.13 Drawing of front elevation showing proposed changes to front verandah – drawing dated 1927¹⁰⁶

The 1927 plans and elevations are almost identical to the original, only the front verandah was to be modified. However, various hand written notes show that the room designations were always fluid, even at this early stage of the building. As originally planned, however, the building is a

Key ✓ = chimney still existing

¹⁰⁴ ibid

¹⁰⁵ ibid

¹⁰⁶ Drawings provided from site archives

CAR PARK:
When did
the change
to
in front of
the "core"
building
take
place?

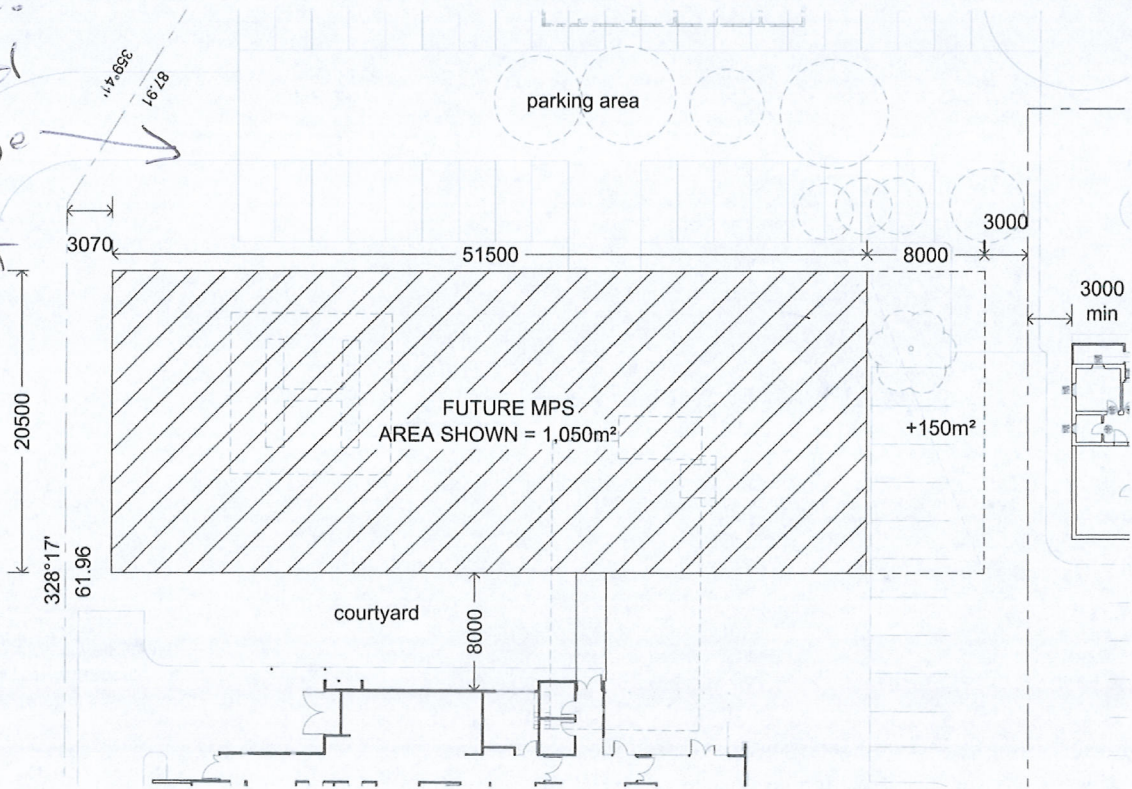


Figure 6.2 A detailed look at the area for an MPS

The available site area is about 1,050m² if the new carpark is retained, and 1,200m² if it is partly incorporated into the building. We understand these areas will still be considered very tight for an MPS, and that the required area could be considerably larger depending on the facilities introduced. A further 120m² could be gained if the new building sensitively abutted the old building, but the old building's floor levels may be significantly higher, so no effective connection could be made without a lift.

A creative solution working sensitively with the curtilage with a design that does not unduly impact upon significant fabric would be required.

After excavation the floor levels of the MPS and old building are now even greater.

- CCTV monitored carpark

The latter two issues are to be provided in the new Health One building. This only leaves the following issues to address.

- Asbestos
- Better paths

The paths may be able to wait under a new use, and the asbestos issue may not be as expensive as initially reported. In Parliament, on 29 October 2010 Ms Katrina Hodgkinson asked the Minister for Health about the reports, and made note that an accredited asbestos contractor had indicated that the actual cost of removing the asbestos from the hospital building was closer to \$400,000.⁴ We address the asbestos report in detail under section 6.4 below.

Impact of a vacant hospital building

The action that will involve minimal capital costs is to leave the building vacant. The asbestos does not need to be addressed if the building is not occupied.

moth-balling idea by BARBARA HICKSON.

This action will have a detrimental impact upon the heritage significance of the building, but that impact will accrue over a number of years. In time this will become a serious issue. Empty buildings do tend to break down and have greater maintenance costs simply because they aren't being used.

That said, under the NSW Heritage Act, even a building listed on the State Heritage Register is only required to be maintained to the Minimum Standards of Maintenance and Repair in order to avoid prosecution.

Minimum Standards only!

These minimum standards include ensuring the building is weatherproof, that adequate fire protection has been installed, that the building is properly secured against vandalism, and essential maintenance. These four points have been covered by existing works and procedures.

In time however it will become clear that maintaining a large building that delivers no functional benefits is not a cost effective option. It will become a drain on public finances, whereas it should be seen as a resource that

⁴ Legislative Assembly Questions and Answers 29.10.2010 – 11861
Gulgong hospital

can be put to a new utility. Two choices will present themselves; either make use of the building, or demolish it.

The need for a compatible use

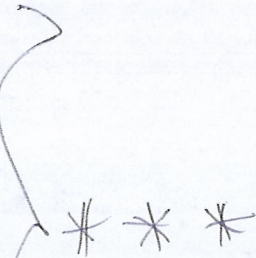
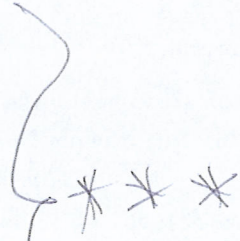
While the building no longer functions as an effective hospital building, it has by no means reached the end of its useful life. There are many purposes to which it could be put, and some of these uses will be viable even with the remediation costs required to achieve them. Further, as a heritage building it will be of particular value to a significant section of the community who value heritage buildings, and there will be incentives to highlight its heritage features to appeal to that section of the community. This is particularly valuable in a town that already has a significant heritage tourism industry.

Demolition of the structure would remove an important element in the cultural development of the local area, which would be a significant loss to the community. The Heritage Act has been designed to protect these buildings from demolition once they have lost their initial usefulness and to encourage adaptive reuse of old structures. This often requires creativity and a willingness to value the community asset of these structures.

There are of course many other arguments against demolition including economic arguments and environmental sustainability arguments that centre on the reuse of an existing structure being a better option than its demolition. This CMP focuses only on the heritage impact.

6.3.1 Adaptive Reuse of the old buildings

The original building was a "cottage hospital", which has grown into a much larger institutional complex. For this reason, there are a large range of possible uses that will fit the old building, depending on what level of intervention is appropriate. That said there are some uses that are more feasible and compatible than others.



So the question is raised, "Is the current owner in a position to preserve the significance of the heritage building, or would the building be best served under a different owner?"

* **

Some of the adaptive reuse options above would work with the Department retaining ownership of the site; some would work better with a different owner. Some will require a different owner, particularly if the occupier must meet the cost of remediation works.

* ** *

Other State owned heritage items transferred to new owners

The author of this CMP, while working with a different firm, was involved in the process of reviewing and reassessing the Section 170 Register of the NSW Department of Planning some years ago. Part of that process was making recommendations and being part of the process of finding new owners for heritage buildings on the register where the government was no longer in the best position to manage the heritage sites. In the 1960s the former State Planning Authority sought to take ownership of heritage buildings following the English Heritage model, but this model was not followed through and now many of these buildings have been transferred to new owners.

A number of very fine and very important buildings were handed over to various local Councils. Ownership by local Councils at a time when the State government is delegating much of its heritage role to local government is a sensible outcome. The information about the examples below is all in the public domain.

A very good example of this was the transfer of the 1840s Glenalvon cottage from the NSW Department of Planning to Campbelltown City Council. The Council subsequently leased the building to the Campbelltown and Airds Historical Society, who have moved their museum into the building. This was a relatively simple transfer because the building was in excellent condition and was ready for occupancy.

NSW Department of Planning also suggested a transfer of the 1829 Bonnyrigg House to Fairfield City Council. In this case the Council staff objected to being made responsible for a building that had no readily obvious

COPY PASTE

CAMPBELL TOWN CITY COUNCIL
FAIRFIELD CITY COUNCIL

NB ***

???
"HANDLED OVER"
to LOCAL COUNCIL
WHY NOT OFFERED
to MWRC already?
SENSIBLE OUTCOME!

Has happened x2 in
Dubbo says Jody Burgess
Dept. of Lands.
With Dubbo council
taking ownership for
adaptive re-use!

Each of these also has significant risks for the heritage fabric.

6.3.2 Ownership

Having looked at the options for adaptive reuse of the old buildings, and the possibilities surrounding any MPS for the site, it is important to identify the issues and opportunities of the site ownership.

SITE OWNERSHIP!

The NSW Department of Health has an obligation to the heritage buildings it owns under the Section 170 requirements. This is why it is important that the old Gulgong Hospital building be included in that list. It is expected that the Department of Health has part of its budget allocated to the maintenance and upkeep of its heritage buildings. In addition the Department must also abide by the heritage listing under the LEP.

SECTION 170 ✓

LEGAL
OBLIGATIONS
They got this wrong!

*** NB
"GULGONG DISTRICT HOSPITAL"
MWRC LEP ITEM NO 2070312
SCHEDULE 5
2008

It is Section 170 listed.

However this building is now a redundant building, and maintaining it is no longer central to the Department of Health's primary objective of providing health care to the people of NSW, as would be the case in a working heritage hospital. A conservative response to the present situation is that the building, simply by its current circumstances, must be considered under some level of threat to its long term preservation, as long as no viable use has been found.

*** NB
to NSW Health for NSW!
BUT NOT to Gulgong community!

*

Further, this building does not just need maintenance; it requires some level of remediation. At present the asbestos problem appears to be confined to the roof space (see section 6.4 below) and from our assessment of the asbestos report, the building can be safely occupied as all the asbestos in the public domain is well bonded and in a safe sheet form. The asbestos in the roof is unsafe but, as the roof space is sealed and warning signs are in place, this should not present a public risk. It must be noted that no air monitoring has been carried out within the hospital building to determine if these areas are safe for occupation. However it has been publicly announced that the building has been closed due to asbestos problems, and so those problems need to be resolved before anyone will be willing to occupy the building. That is now a matter of perception.

see The "SAVE the OLD GULGONG HOSPITAL PLAN'S" suggestions
*** remediation!

*** NO PUBLIC RISK FROM ASBESTOS PRESENCE IN ROOF!
NEEDS AIR MONITORING!

public use, and which they identified as a long term maintenance problem. This was also a building that was in relatively good condition, but its small size meant that it was limited to being leased as a residence, with poor return and management costs associated with the lease.

The Mid-Western Regional Council is the most obvious candidate for a transfer of ownership, as they have the responsibility to protect the historic building under the LEP. There are many issues that are involved in such a decision. This report can only suggest options that can be followed up if they appear suitable.

NB

STATE HERITAGE REGISTER

A different option is a transfer from public to private ownership, as exemplified by the Glenfield transfer. In this case the NSW Department of Planning transferred ownership of the property to the NSW Historic Houses Trust, which is a Trust established to look after a large property portfolio of heritage residential buildings in government ownership. The NSW HHT used their heritage and conservation expertise to undertake works on the building, and once complete they offered the property for private sale. This ensured the heritage values of the building were in good condition at the point of sale. However there remains the issue of how to ensure that the heritage value of the site will be preserved once in private hands.

*** NB

NSW Dept of Planning transfer ownership of the property to the NSW Historic Houses TRUST, who then used their heritage and conservation expertise before point of sale.

There are many examples of using a listing on the State Heritage Register (SHR) as a means to protect a heritage building once it has been transferred from public to private hands. Many post offices had a permanent conservation order (PCO) placed on them at the point of sale, and these were all transferred to the SHR when it was introduced in 1999. The NSW Office of Environment and Heritage would need to be consulted in this eventuality.

NB. MWRG refuse demolition
↓
NSW Dept of PLANNING.
transfers ownership to NSW Historic Houses Trust.
↓
undertake work on building ↓ this completed

Another option is an Heritage Agreement, which becomes part of the contract of sale. These can be far more effective than a listing on the SHR and are legally binding documents that constrain a private owner to ensure the preservation of the heritage values of the site through a report such as this CMP. Once again the NSW Office of Environment and Heritage would need to be consulted in this eventuality.



HERITAGE AGREEMENT in contract of sale.

OFFER FOR SALE
STATE HERITAGE REGISTER (SHR) means protection for heritage value will be preserved in public hands.

Summary of Ownership

As the building has been a hospital since its inception, the Department of Health is the preferred owner in order to maintain the historic continuity of the site. However, if the Department are not in a position to preserve the significance of the site and to find a compatible use for the building, then other options for ownership should be considered. These might include a long term lease while still under government ownership, a transfer to another more suitable authority or department, or even to a local government authority, or private ownership. Some means to ensure that any new owner would be constrained to preserve the significance of the site is necessary in these cases.

"historic continuity"

↑ lease transfer to other agencies eg MWRC or private ownership *

(also helipad) "lost" services.

- day care centre
- X-RAY SERVICE

"needed" services.

- Dental facility.
- larger activity area than allowed for in HEALTH ONE building where

"MEETING ROOM" on plan is used for activities by community nursing staff plus physiotherapist

(1x day per week at present - likely to be 3x days on completion of MPS)

Recommended additional policies related to ownership

1. Where the current ownership of the site may threaten the preservation of the significance of the site because it is a redundant structure, or where the building's security or maintenance cannot be assured, then the transfer or sale of the site to another more suitable NSW Government Department or Agency, Local Government Authority, or a private or community owner who will preserve the significance of the site is acceptable.
2. Any proposed contract of sale of the property must have provisions for the ongoing preservation of the heritage fabric identified in this CMP. This can be in the form of a State Heritage Register listing or other controls deemed suitable by the NSW Office of Environment and Heritage.

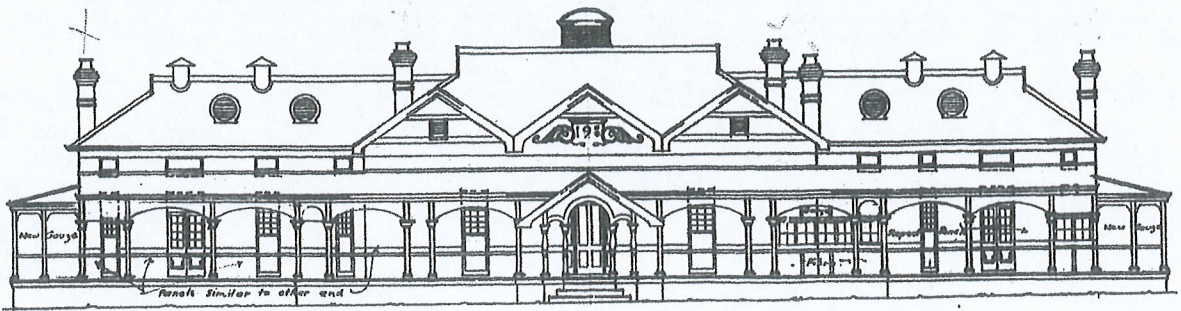
see DA P

* see Jody Burgess email to Percy

NOTE

X-ray & dental services could bring in RENTAL money. Room for HOSPITAL AUX. Coffee/Tea (& Gifts) room could also bring in money to WEST/HEALTH. due to voluntary nature of workers.

Copy



Mr W. Bennett,
The General Manager,
Mid Western Regional Council.

Old Yarrawonga,
Home Rule 2850.
17th Feb, 2014.

Dear Mr Bennett,

I was unable to attend the last Mudgee Public Forum session to explain Cullgong's predicament of the Old Hospital's demolition-proposal by Western Area Health and their "outrageous" suggestion that the community develop a Business Plan for clinical services for its "adaptive-reuse", plus "find" funding for its restoration and renovation of \$2 million and \$190,000 annually maintenance, so I've decided to write to you and all councillors for support.

In Nov, 2013 Cullgong's Health Council held a Public Meeting to explain the above situation to the community and form a "Save the Old Cullgong Hospital Committee." After many meetings by these volunteers (and 1 interested councillor) and in consultation with our local member, Andrew Cree, we managed to present a Plan ("after a fashion") on Feb 7th, but we've heard back, it's not acceptable and a Dev. Application to MWRC will go ahead.

We made much use of Health's Comprehensive Management Plan, required by Council with the Development Application for the MPS, about the building's significance (especially pages 139 to 153 attached) & which confirms MWRC's decision to recognise the Old Hospital as an Individual Building Item No 2070312 in the LEP.

The CMP suggests the building is NOT on Health's List of Section 170 Historical Buildings, due to the fact that its significantly historical features are largely concealed (P141), internally, by painting and boarding over them and outwardly by the removal of the 1901 original verandah. Council's help to get onto this list would be greatly appreciated by the Cullgoong community, as would a letter of support for the Committee's proposals (below) to the Health Minister.

We have suggested that the \$300,000 of the MAs contract NOT be used for demolition, as it's a negative use of public money. A beautiful piece of Cullgoong's heritage gone and an expensive bare-dirt area in its place! We suggested the money be more profitably used ~~by~~ in the short term:

- 1) to make the building weatherproof and secure
- 2) to retain the building's structural integrity by reinstating the original 1901 decorative verandah (CMP P43) and give "street-appeal." Attached is a photo ^{copy} from the Cullgoong Crossip's Nov. 2012 cover, to show how Health Infrastructure left the building (deliberately?) to make it look unworthy to keep.

We are willing to wait for further funding, if necessary, until the restoration and renovation work can be "budgeted" for by the Health Dept.

- 3) to provide a retainer for Barbara Hickson, Mudgee architect and mwarc's adviser, to use her expertise to supervise the short term (and longer term) plans for the building's restoration and renovation. We note in mwarc's Community News, MAY 2012 (attached) that Barbara Hickson recommended the main "core" of the Old Hospital be retained and further that (in the Mudgee Guardian in 2013) it could be "moth-balled" until funds become available. Hence our suggestions 1) and 2) above and they have been relayed in-person by Andrew Cree, and by letter, with accompanying plans and information from the Committee, to the Health Minister.

3)

The letter also pointed out, Health's own CMP states the building is solid and worthy of retention, with less asbestos problems, than was originally mentioned by Work Cover, due to their "misunderstandings" about additions to the core-1901 building. (P 234/235 CMP and FINLAY.B ASBESTOS AUDIT P 6 for the CULGONGA HEALTH SERVICE 2007.)

We request help from MURC staff and all councillors to achieve our goals:

- 1) to save our 1901 Federation "cottage hospital" core building a rarity now in NSW, [and older than only 15% of the Conservation Zone for the Culgong township,] and designed by MARK COOPER DAY, a renowned architect for his day, who has many other buildings still standing in NSW. (CMP 148/149)
- 2) to spend public money wisely, for the Culgong community and to support the Culgong Health Council who have requested (the plans attached) the clinical services outlined (for the MPS) over a period of over 10 years only to be ignored, as well as the recently emerging "need" for a hydrotherapy wing to allow all year round use, which could service the whole Western Health area surrounding it. Our nearest Hydrotherapy pools are PCYC in MUDGEE, privately owned, and LOURDES HOSPITAL, DUBBO. and distance for our aging and disabled residents will mean they can't access either of these.

The opening of the MPS in March will not be "lucky" for Culgong residents at all, as stated by Mayor Kennedy recently in local TV news. He failed to mention the "gaps" to services and those services which we already had, but "lost", when the Old Hospital was closed, and NOT fitted into the MPS.

Many in Culgong and surrounds won't be ~~able~~ able to afford and have access to, health services only available in MUDGEE or DUBBO. The Community Transport system as it now exists, is discriminatory and disadvantages Culgong's aged residents. They must pay for transport from MUDGEE to collect them for their appointments in MUDGEE, return them home, then pay to return the transport to MUDGEE! This situation needs MURC'S

attention, as it is one of their services, (3) If they can still drive, Culgong residents over 75 years will only be able (with new RMS licensing changes) to drive to their nearest centre. We do NOT all want to live in the "hub" of Mudgee, to have the same rights as MUDGEE residents!

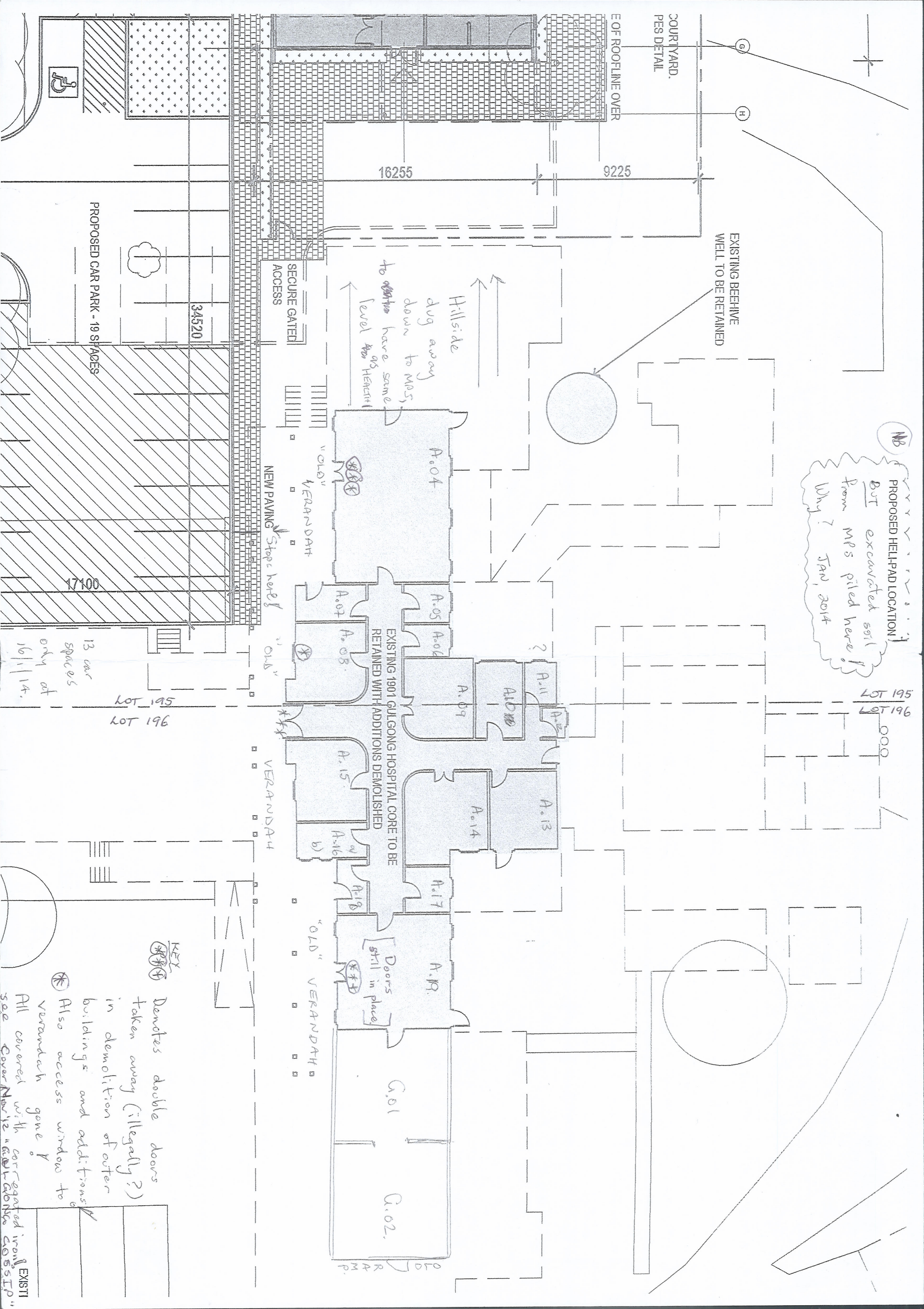
We ask that the MWRRC sections of planning and Economic Development to please help the "Save the Culgong Hospital Committee" to a successful outcome, as it is CULGONG that will be the most affected part of our Region if the Cobbyra Mine is sold, and privately-owned, with extra traffic and increased railway-crossing interruptions.

We ask also that MWRRC's application to the COBBORA TRANSITION FUNDING be modified to reflect the most affected part of the Regions needs, ie CULGONG! Funding for "Mudgee Town" seems to figure disproportionately in the present MWRRC application. I fail to understand how much of the "wish-list", actually follows the guide lines to Councils to use this FUND for the parts of their Regions most affected by the Cobbyra Mine. The only mention for Culgong and surrounding residents is the COPE RD, and what percentage of residents use that road? We do know that mines staff and heavy vehicles do, but this is only a very small part of our residential population.

This has become a rather lengthy letter, but as Culgong only gets 1 Public Forum opportunity per year, I hope you will be patient and understand that it is not always possible for outlying elderly residents to drive to MUDGEE, especially at night, to express their concerns and requests for help from Council.

From Joan Tamburini
for "Save the Old Culgong Hospital
Committee."

- cc - all councillors
- cc Elizabeth Stoner - Planning Section
- cc Julie Robinson - Economic Development Dept.



NB PROPOSED HELI-PAD LOCATION!
 BUT excavated soil from MFS piled here!
 Why? Jan, 2014

Hillside dug away down to MGS
 to ~~start~~ have same level as HERE!!

EXISTING BEEHIVE WELL TO BE RETAINED

EXISTING 1901 GILGONG HOSPITAL CORE TO BE RETAINED WITH ADDITIONS DEMOLISHED

13 car spaces only at 16' x 14'

LOT 195
 961 LOT

LOT 195
 LOT 196

KEY

Denotes double doors taken away (illegally?) in demolition of outer buildings and additions

Also access window to verandah gone

All covered with corrugated iron EXISTING
 See Cover Note "EXISTING CORRUGATED IRON ROOFING"

DR MARY FOLEY
DIRECTOR GENERAL/HEALTH

11

"OLD YARRAWONGA"
HOME ROLE via MUDGEEE
2850

Tuesday 3rd June, 2014

Dear Dr Foley,

URGENT
MATTER

I am writing to you because I could not be put through to your office by phone last week - the advice being "contact Western NSW District Health" about any inquiry. As the office in Dubbo is the inquiry and they tend to "lose" emails and the Minister for Health's department doesn't even acknowledge receipts, I thought a letter might "get through".

My letter is on behalf of the Culgong community and the "Save the Old Culgong Hospital" Building ^{Comm} which was set up in NOV '13 at a public meeting. We took the task imposed on Culgong to come up with a business plan to fund our 1901 Heritage building's renovation and restoration (\$2 million+) and the ongoing maintenance costs (\$190,000 annually) seriously, but to no avail, (see plan of community (called health) usage). This task was imposed on us by WNSWHD CEO, Scott McLaughlin. He has just put out a document "Living Well Together" and stating to Culgong Health Council members that there is now a "whole systems approach". He states that the moneys required by Health Dept to do the above funding for Culgong, would be better spent elsewhere in the State. YARRAWONGA HAS A CASE FOR DISCRIMINATION AND INEQUALITY!

I have been a volunteer for 14 years on the GHC and I have seen an ever increasing worsening prospect for health services for Culgong. I have seen AWAS morph into WNSWLHD and 4 ceo's come and go! Since the closure of our Hospital on 29/8/2010 we have

[2]

have had very limited services and now 3 HSM's that have had MUDGEE HOSPITAL and our HEALTH ONE under their care!

I am giving you; this background information on myself and the Cuslang Health Council position, so you can see there is NO "Living Well Together" for us.

The major reason for contacting you / your staff is that Health Infrastructure has again put in a DA for DEMOLITION with Mid-Western Regional Council's submissions, for objection closing on 24th May '14. They were refused permission for total demolition in their first DA in 2012 and are again wasting scant Western Division funds. (That is 2x consultants fees for 2 DAs and a very expensive Comprehensive Management Plan cost \$30,000 + which doesn't anywhere mention demolition.)

It is our belief (after advice from Dept Lands, Dubbo (email supplied to our Chairman, Councillor MWRC Percy Thompson) (attached) that Health Infrastructure is NOT the "consenting authority" for this DA (nor the last one in 2012) and nor is WNSW LHD the "vested legal entity" now the building has been closed for 4 years on Crown LAND and the "dedication" is for hospital use. The DA says it is "redundant." Could you please confirm for us if the site and building, now it is no longer a "hospital," should have been "handed back" to Dept of Lands / Crown for "redirection" and "repurposing"?

We are asking if you can have your Minister and her staff comply with known procedures.

I am enclosing BARBARA HICKSON's (local architect and heritage advisor for MWRC) HIS (and all the

documentary proof) so you can see our Committee is expecting that the crown be given the chance to "hand-over" to 1) state depts 2) local council 3) individuals the use of the building so that there will be no need for demolition (and therefore another saving of \$106,000).

Health Infrastructure has tried to do a "snow job" on the Cullgong community saying the Old Hospital Building would impede future MPS extension. We waited 14 years to get this MPS and Scott McLaughlin tells us that Health Budgets are decided 7 years ahead. The DA states that the "core" building will only be demolished to floor level and filled in with sand and the Beehive well retained, therefore the MPS cannot extend where they are telling us it "might". (see plan)

We have also had false information "fed" to us on the use of the building, ^{that it} must be health related; now its ok for it to be "sold", but under many conditions re-evaluation / boundary changes etc (see to local law firm ^{letter} attached as well as other letters that might help to sought out the conflicting stories we have been told over 4 years.

If WNSWLHD is not the consenting authority for the DA, then they probably also had no authority to "scuttle" our community submission for funds from the COBBORA TRANSITION FUND, in early 2014. On Jenny Davis's advice) [because WNSWLHD would not co-sign the submission] it was not even put in the "consideration" list. We were very upset by this and all the other lack of community consultation in the past 14 years.

We would like to keep our Old Building for its heritage / social / cultural significance, clearly set

out in Health's own CMA, (available mwrac)

4

If Peak Hill can keep their 1904 building and have it built into the MAS plans for completion in 2018, we are mystified as to why our heritage building must be demolished. Minister Skinner was to have visited Cullgong (for $\frac{1}{2}$ an hour) on her recent trip to Peak Hill, (attached photos and plan to support claims) but "somehow" we couldn't be fitted in. Could it be she didn't want to discuss our Old Hospital?

Dr Foley this has become a "long cry for help," but Cullgong deserves better; at the moment we are being discriminated against, so that WNSWLHD's budget can fund other communities. We have stated all along that we are willing to wait, as long as the building is made safe and weatherproof and with the verandah restored.

We await your response to our enquiries. Our chairman can be reached at:

thompsondm1@bigpond.com.

Your sincerely
Joan Tamburini.

For the "SAVE THE OLD

CULLGONG HOSPITAL
BUILDING COMMITTEE".

[Skip to content >>](#)

Western NSW, Living Well Together

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Building Projects

[Dubbo Hospital Redevelopment](#)[Lachlan Health Service Project](#)[Peak Hill Multi-Purpose Service...](#)[Gulgong Multi-Purpose Service Project](#)

Contact Us

Emergency Health

Emergency Numbers

Employment

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Health Services

Key Functions

Media & Communications

Right to Information

Peak Hill Multi-Purpose Service (MPS) Project

Welcome to the web page for the Peak Hill Multi-Purpose Service (MPS) Project.

The MPS will play an important role in providing health services for the community of Peak Hill. It will act as a coordination point for the community in relation to a range of health and aged care services. Improved service integration will provide significantly more accessible services and improved health outcomes for residents across the rural and remote communities around the township of Peak Hill.

Significant progress has been made on site since construction began in mid-2013.

On 20 March 2014, the main works contract was awarded to Zauner Construction and work is expected to commence soon. [View media release.](#)

In December 2013, early works construction was completed and main works scheduled to commence at the beginning of 2014.

The NSW Budget has confirmed funding for the \$12 million Peak Hill MPS. The Australian Government provided a commitment of \$6 million through the Health & Hospitals Fund (HHF) for the construction of Peak Hill MPS, this will be complemented by \$6 million from the NSW Government.

The Peak Hill MPS will include:

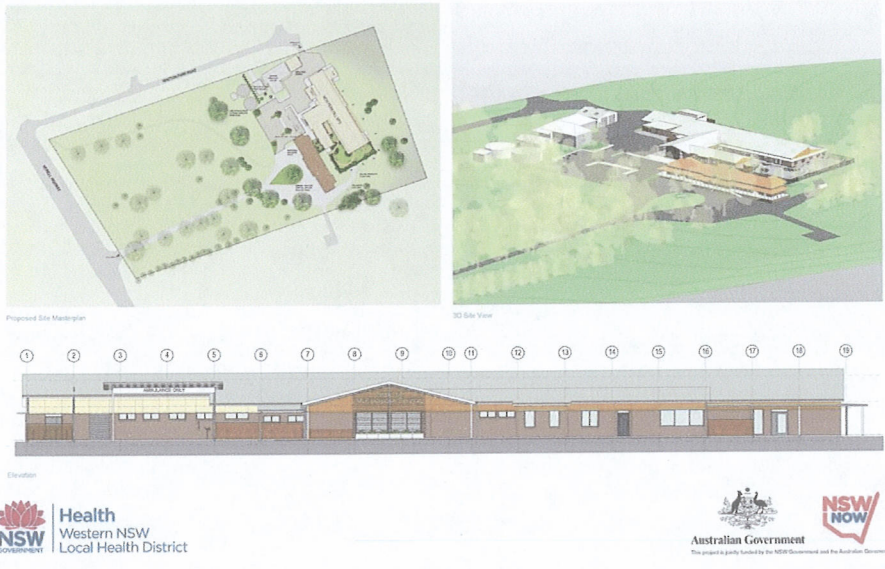
- 4 sub-acute beds including respite and palliative care;
- Rural Emergency Care Service;
- A wide range of community-based services;
- 10 high care residential aged care beds flexible in usage to accommodate residents with low level dementia;
- Respite care;
- Dementia specific services;
- Diversional therapy;
- General Practitioner services;
- Clinical and operational support services;
- Chronic Disease Management programs and clinics;
- Ambulatory and community acute/ post-acute services;
- Capacity for a facility based self-care renal dialysis space; and
- Refurbishment of existing staff accommodation.

(L to R) NSW Member for Dubbo, Troy Grant MP, Minister for Health, The Hon. Jillian Skinner MP and Federal Member for Calare, The Hon. John Cobb MP turn the first sod at Peak Hill MPS project.



Construction is scheduled for completion in early 2015.





If you require further information about this exciting project please contact Belinda Berryman: berrymanbelinda@gmail.com.

MONDAY, DEC 2, 2013.

"MUDGEES GUARDIAN"

opinion

EDITORIAL:

Hospital could have new life

Following calls from some members of the Gulgong community for the old Gulgong Hospital to be retained for community use rather than being demolished, the Western NSW Local Health District has hit the ball back into Gulgong's court, asking the town to come up with alternative uses for the building and proposals for how it would be funded.

It's clear historical or architectural value, let alone sentimental attachment to a local landmark, are unlikely to sway the decision. Coming up with a workable plan for the building which would fill a community need, is likely to be supporters' best chance of saving it.

So far, however, those who have spoken out in support of the building have not suggested how it might be used if it were saved.

Some possible uses of the building could be:

- * A hub for seniors' services, including day respite care, meeting and activities rooms for seniors' groups; and offices for services catering for seniors;

- * A health, sport and recreation centre, including a multi-purpose indoor court, a community gym, and meeting rooms for community and sporting groups;

- * Consulting rooms for visiting specialists;

- * A youth cafe, with room for DVD nights and games, and a rehearsal room/ performance space for young musicians, actors or dancers.

- * A public arts centre with studio space and an exhibition area.

Dunedoo residents, when discussing how the Cobbora Transition Fund might be used in their community, quickly identified possible reuse of their old hospital as an option for funding. This is an option that Gulgong residents could also explore.

These are only a few suggestions: Gulgong residents know best what their town needs and no doubt would have their own ideas.

The Mudgee Guardian would love to hear what they are.

YOUR SAY:

Mothball hospital, don't demolish it

A few years ago a parish in Bathurst asked for permission to demolish a little church.

We talked with them and the decision was made to 'moth-ball' the building, which they did.

A few years later and the church had a new use - was fitted out and is an important part of its community again.

Why not use the 'demolition' money to mothball Gulgong's old hospital - and repair the front entrance of the building.

A suitable use will surely turn up.

Barbara Hickson

DEAR LONERAGAN & HOGAN

Principal

Allan L. Hogan, B. Ec., Dip. Ed., B.Leg.S., Notary Public

Associates

Menaka Wickramasinghe LL.B

Sally K. Callander B.A., LL.B.

Consultants

John F. Loneragan, B.Ec., B.Leg.S.

Geoffrey K. Dear, B.A., LL.B

Gail A. Francis, LLB(Hons)

Dip. LP (Scotland) Dip Law

Our Ref: JFL:CCG:130543

Reply to: Mudgee

30 April 2014

Mrs J Tambarini

^ Old Yarrabonga ^

Home Rude NSW 2850

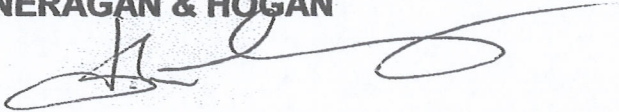
Dear Joan

RE: SAVE THE OLD GULGONG HOSPITAL

Please find enclosed copy of our letter to the Department of Health 23 April 2013 and their reply.

Yours faithfully

DEAR LONERAGAN & HOGAN



0059336

DEAR LONERAGAN & HOGAN

ABN 96 687 342 130 003

MUDGE 70 Market Street Mudgee NSW 2850 PO Box 5 Mudgee 2850 DX 6502 Mudgee

GULGONG 91A Herbert Street Gulgong NSW 2852 PO Box 15 Gulgong NSW 2852

RYLSTONE 26 Louee Street Rylstone NSW 2849

Email: admin@dlhmudgee.com.au

Tel: (02) 6372 1099 Fax: (02) 6372 2736

Tel: (02) 6374 1301 Fax: (02) 6374 2235

Tel: (02) 6379 1105 Fax: (02) 6379 1204



DEAR LONERAGAN & HOGAN

Principal

Allan L. Hogan, B. Ec., Dip. Ed., B.Leg.S., Notary Public

Associates

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Geoffrey K. Dear, B.A., LL.B

Gail A. Francis, LLB(Hons)

Dip. LP (Scotland) Dip Law

Our Ref: JFL::120935

Reply to: Mudgee

URGENT

23 April 2014

FAXED

Scott McLachlan
Chief Executive
Western NSW Local Health District
41 Bultje Street
Dubbo 2830

Dear Sir

RE: SAVE THE OLD GULGONG HOSPITAL

On 24 February 2014 at a meeting with members of the Gulgong Health Council and the Save the Old Gulgong Health Committee at the Gulgong MPS, you announced that the Old Hospital is now available for sale or lease.

We have two interested parties to buy the building, awaiting a valuation. Hugh Bateman of The Property Shop, Mudgee has agreed to do the valuation, but he needs access to the interior to do a valuation, according to Real Estate guidelines.

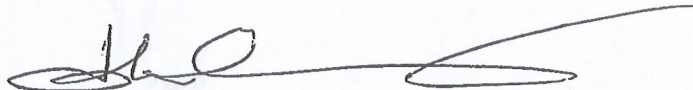
Secretary Ann Doran of Save the Old Gulgong Hospital Committee has sent three (3) emails over the past few weeks to you, (Scott McLachlan), but she has not received a reply.

At the same meeting Jeff Morrissey, Health Infrastructure, Bathurst, announced a "boundary change" has taken place to ensure that Old Hospital is now on one title as Lot 196 DP755434, instead of both Lots 195 and 196. We would appreciate details as to when the change took place and the exact details for the Old Hospital now.

Hugh Bateman can be emailed directly at hugh@thepropertyshop.com.au.

Yours faithfully

DEAR LONERAGAN & HOGAN



0059206

DEAR LONERAGAN & HOGAN

MUDGE 70 Market Street Mudgee NSW 2850 PO Box 5 Mudgee 2850 DX 6502 Mudgee
GULGONG 91A Herbert Street Gulgong NSW 2852 PO Box 15 Gulgong NSW 2852
RYLSTONE 26 Louce Street Rylstone NSW 2849

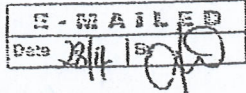
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Tel: (02) 6372 1099 Fax: (02) 6372 2736

Tel: (02) 6374 1301 Fax: (02) 6374 2235

Tel: (02) 6379 1105 Fax: (02) 6379 1204



Health
Western NSW
Local Health District

Trim: D14/3851 Your Ref: JFL::120935

Dear Loneragan & Hogan
70 Market Street
Mudgee NSW 2850

Dear Mr Loneragan

Re: Save the Old Gulgong Hospital

Thank you for your correspondence dated 23rd April 2014 in relation to the Old Gulgong Hospital site.

On 24 February 2014 the Chief Executive of Western NSW Local Health District (LHD), Scott McLachlan met with members of the Gulgong Health Advisory Council and the Save the Old Gulgong Hospital Committee at the Gulgong Multi-Purpose Service (MPS) site to discuss the future of the old facility. At that meeting Mr McLachlan advised that if either Committee is aware of a party interested in the purchase of the building, Western NSW Local Health District (WNSWLHD) would consider their proposal. To this date no formal interest has been provided to WNSWLHD.

A summary for divestment of a Health Administration Corporation owned assets was discussed at the meeting advising both Committees on how a valuation would be done if an interested party expressed interest in the purchase of the old facility. Should there be interested parties the LHD would be required to follow State guidelines for the sale of Crown Land which would involve State Valuation Office & Ministry of Health Properties Branch. We appreciate the interest of Mr Bateman of The Property Shop Mudgee and his offer to undertake a valuation. The LHD would, however need to follow State Procurement Guidelines.

At the meeting held 24 February 2014, Mr Jeff Morrissey, WNSWLHD Director Corporate Services advised the Committees that the previous Lots 195 & 196 across which the Old Hospital sat were realigned during the MPS planning stages in 2012. The Old Hospital remains on the same single Lot Number as the MPS. Mid-Western Regional Council processed the Development Application for this project. Information regarding the date of the change and any further details are readily available to the public from the Department of Lands.

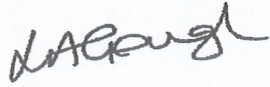
Ms Tamburini telephoned my office on Thursday 24 April 2014 to raise concerns. An email reply was sent addressing those concerns. I have requested that Ms Tamburini provides copies of the emails to Mr McLachlan to which responses have not been received as following a review of our systems, there is no record of any correspondence received by the LHD since 4th February 2014 regarding a draft Business plan which was responded to on 17 February to Ann Doran. In addition further correspondence has been provided to Ann and Peter Doran by Mr McLachlan on 17 March 2014.

Western NSW Local Health District
ABN 50 629 556 404
Chief Executive's Unit
PO Box 406 123 Hawthorn Street
Dubbo NSW 2830
Tel: 02 6841 2217 Fax 02 6841 2236
Website: www.wnswlhd.health.nsw.gov.au

NOT
TRUE

If you wish to discuss this matter further, please do not hesitate to contact Mr Jeff Morrissey
Director Corporate Services on (02) 6369 8161.

Yours sincerely



Lindsey Gough
Acting Chief Executive

28 April, 2014



Our ref: D13/12332

Mr Peter Doran
Chair, Gulgong Local Health Council

peter.doran@bigpond.com

At (PPT)
Project Planning
Team meetings

LHC reps are volunteers

Dear Mr Doran

Re: Old Gulgong Hospital Building

Thank you for your email dated 25 September, 2013 relating to the above matter. I have looked into this further and take seriously the concerns of the Gulgong Local Health Council. Mr Mark Lamond from Health Infrastructure advises that he did receive a call from you but also reflects that you were aware of the proposed application process as you had read the minutes of the Project Planning Team (PPT) meeting from the previous week. The Local Health Council (LHC) has two representatives which unfortunately were not present at that time.

To date, Health Infrastructure has not been advised of any LHC plans for the future use of the facility. At a recent meeting where Mr Lamond presented the options, the LHC did not advise of their preference. The Chairman did not call a vote or a motion in Mr Lamond's presence.

AFTERWARDS - [3] unanimous vote to retain OLD HOSPITAL BUILDING.

Health Infrastructure also advises that during the Site Options Study the expansion of the current MPS facility was discussed. It was advised at that meeting that any substantial expansion would require the demolition of the 1901 building. The LHC had several representatives at that meeting and the LHC concurred with the selected option.

Mr Lamond believes that he had previously indicated that the issue needed to be resolved by the completion of construction. Judith Ford, (Health Services Manager for Mudgee and Gulgong) was present and confirmed the demolition of the building would be included in the total cost of the project.

Community consultation has occurred with this issue being discussed at the very early options study. A two day public exhibition was held with written comments received. There were no comments received seeking to retain the 1901 building. Some comments made by community attendees suggested that the entire building be demolished. Health Infrastructure feel that they have communicated and been open and willing to receive community expressions relating to this matter, however the LHC has not always been present at the primary communication meeting, the PPT.

A representative of the LHC called Mr Lamond in February 2013 to discuss the possible retention of the building. Mr Lamond advised that the LHD would want to see a cost

FEB 2013

Handwritten notes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

Handwritten notes: WHO, Peter, Mike, SITE OPTIONS STUDY, who was present from LHC

What about
GRENFELL &
PEAK HILL?

6

neutral position at worst, and that the income stream would need to be secure. There was no further comment from the LHC at the recent meeting and they have not advised of an identified source of income or capital.

see plan and COBBARA SUBMISSION

Health Infrastructure confirms the approximate cost of renovating / refurbishing would be in the vicinity of \$2M. Confirmed by Phillip Fuller (Builder)

see plan

I am concerned that there is no proposed use for the building that would cover the operational and recurrent costs for the longer term maintenance.

THIS WITH IT'S NECESSARY?

The Local Health District has a significant financial sustainability challenge and our priority is to provide high quality clinical services. Should this facility be maintained and add a cost burden to the LHD, this will require a reduction to the services available to Gulgong community. I am sure you would agree that this is not an outcome that is both responsible or acceptable to the community.

1

There needs to be a decision made in the near future to ensure demolition or refurbishment is undertaken within the capital project. The District understands the issue of the limitation in skill and time to work up options and is willing to assist with assessing ideas. Although with a brand new facility next door, there is no potential health service delivery purpose that I can immediately see that would provide an income to cover costs.

- 1) helipont
- 2) day care room
- 3) X Ray service
- 4) proposed dental unit.
- 5) optomistric rooms.

! LOST? - CLINICAL SERVICES

As a matter of interest, Health Infrastructure has a valid consent to demolish the eastern additions to the 1901 building.

If you wish to discuss this matter further, please contact Jeff Morrissey, Director Corporate Services on 02 6363 8161 or via email jeff.morrissey@gwahs.health.nsw.gov.au

Yours sincerely

Scott McLachlan
Chief Executive

2] "capital project" completed - "handed over" MPS to LHD already.

17 October 2013

Don Campbell's comments

Philosophical Questions:

Should all health services be "cost neutral" or do some get paid for by the STATE for all state residents

LHD's "significant financial sustainability challenge" does NOT have to be borne by GULGONG RESIDENTS ALONE!

brand new facility next door does NOT cover all potential health services [dental + x ray asked for at early MPS stage and refused] would provide income to cover costs.

"lost" services day care room + helipad paid for & built by locals NOT even considered.

see DA Attachment 1

see above.

X

michael mcgregor

From: Lauren Nott [Lauren.Nott@health.nsw.gov.au] on behalf of Julie Dunn [Julie.Dunn@health.nsw.gov.au]
Sent: Wednesday, April 23, 2014 7:05 PM
To: mac408@tadaust.org.au
Subject: {Disarmed} Private and Confidential - for the attention of Ms Tamburini
Importance: High * * *

Dear Ms Tamburini

Thank you for your communication earlier today. A letter was received in the Chief Executive's Office yesterday (23 April at 15.37) from the Office of Dear Loneragan and Hogan. The Local Health District (LHD) will provide a formal response to this letter early next week. In the interim can you please confirm the name of the Solicitor at Dear Loneragan and Hogan along with who he or she is representing? John

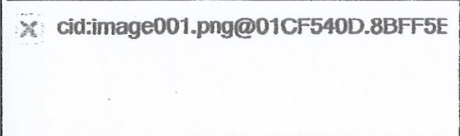
In terms of the three emails that you inform us have been sent to Mr McLachlan and not responded to; our systems have been thoroughly reviewed and there is no record of any correspondence received by the LHD since the 4th February 2014 regarding a draft Business Plan to which a reply was sent (to Ann Doran) on 17 February 2014. In addition, further correspondence has been provided to Ann and Peter Doran by the CEO, Mr McLachlan on 11 March 2104. I would be grateful if you provide copies of the emails that you refer to and for which you have received no response. Save the Old Gulgong Hospital Building Committee Loneragan

I understand that at the meeting on 24 February 2014, The Save The Old Gulgong Hospital Committee were advised to refer parties interested in the purchase of the old facility to the LHD. To date no information has been received. However, should there be interested parties the LHD would still be required to follow the State Guidelines for the sale of Crown Land. In relation to valuation of the facility and land the LHD would need to follow NSW Health process. NSW Health work with the State Valuation Office for such purposes. Secretary ANN DORAN looking into

In relation to the facility being consolidated from 2 lots to 1 lot, this change occurred during the planning process for the MPS. Information regarding the date of the change and any further details are readily available to the public from the Department of Lands. NB

I hope that this addresses your concerns. Please contact us if you have any further queries.

Regards
Lindsey Gough



Lindsey Gough

Acting Chief Executive
 23 Hawthorn Street, Dubbo NSW 2830
 Tel (02) 6841 2256 | lindsey.gough@health.nsw.gov.au

MailScanner has detected a possible fraud attempt from "http" claiming to be
<http://www.wnswlhd.health.nsw.gov.au>

ENQUIRE:

Who is our "representative" on
 WNSW Local Health District Board?

4/24/2014
 Was the Board advised about our
 re-adaptive plan for the building?

Letter to Health Min.
 • Interested party x2
 • NSW Health / State Valuation Office
 • State guidelines for sale of Crown Land
 NB (maybe not owned by wnswlhd)

Dept of Lands
 Search boundary changes have occurred.
 Lot 195 / Lot 196 combined? / When? / by who?
 None done! Quote Dept of Lands Dubbo (Early May 2014)



Our ref: D14/1112

Ann Doran
The Secretary
Old Gulgong Hospital Building Committee
84 Medley St
Gulgong NSW 2850

Dear Ann

Thank you for taking the time to prepare the Draft Business Plan dated 7 February 2014, which was requested by the Western NSW Local Health District in response to a proposal to retain the old hospital building. Upon consideration of the draft plan the District remains supportive of the Development Application to demolish the remains of the existing Gulgong Hospital building.

While the draft business plan confirms the estimated cost of renovating the old hospital building and identifies possible services that it could contain the proposal does not adequately confirm funding sources for the retention, renovation and ongoing costs associated with maintaining the old building.

What does this mean? of a community. Surely Health Workers are paid to do just this!

The NSW Government has committed \$7 million to build the new Gulgong Multipurpose Service (MPS) which when completed will allow for better integration of services for the local community while also providing capacity for high care residential aged care services. *Federal Funded!*

The demolition of the existing old hospital building is funded by the Gulgong MPS project during the construction period of the new hospital, which is due for completion by the end of March 2014. The funding set aside for the demolition of the building is only for the scope of the MPS project and is not transferrable.

*** An independent capital cost report confirmed that demolishing the building would cost significantly less than refurbishing the building. The Local Health District is not in a position to fund the renovation nor does it have capacity to support its recurrent costs. *We are willing to wait for a new budget!*

The Development Application seeks approval to create a memorial wall using parts of the existing building in front of the HealthOne and I put to the Committee that this memorial wall would help retain the history of Gulgong Hospital. I understand that Health Infrastructure will facilitate access to the old building for the recovery of building remnants for this purpose. *which remnants would be suitable in a "wall"?*

Historical items have already gone to Gulgong Museum + Photos!

The committee's draft plan suggests a number of services which could have been delivered from the old building. I sincerely believe that we can find practical solutions to providing some of these services out of the Gulgong HealthOne, the new MPS or in the community through partnership with the Western Medicare Local and other private providers. *****

I would like to meet with the OGHB committee and the Gulgong Health Council to better understand these service gaps and to share with you some of the solutions I have in mind for delivering some of these to the Gulgong community.

Therefore I invite the OGHB Committee and Health Council to meet with me and members of the District's leadership team at 6.00pm on 24 February 2014 at the Gulgong MPS.

I look forward to working with the committee and the Health Council to improve health outcomes for the people of Gulgong.

Yours sincerely

[Signature]
Scott McLachlan
Chief Executive
17 February 2014

What happened to Health Council's Idea of a memorial garden for doctors and staff after the 110 years!

*Spoke to Rosie today in Andrew Ayle's office about meeting.
6362 5199.*

Western NSW Local Health District
ABN 50 629 556 404
Chief Executive Unit
PO Box 4061 23 Hawthorn Street
Dubbo NSW 2830
Tel (02) 6841 2217 Fax (02) 6841 2236
Website: www.wnswlhd.health.nsw.gov.au

*TEL: 6841 2217
FAX: (02) 6841 2217*

Attachment

*
*



Health
Western NSW
Local Health District

Ann Doran
The Secretary
Old Gulgong Hospital Building Committee
84 Medley St
Gulgong NSW 2850

Save the

Dear Ann

I wish to advise the Old Gulgong Hospital Building Committee that the Western NSW Local Health District Board has endorsed a decision by the District to proceed with a Development Application (D/A) to demolish the old Gulgong Hospital building.

The Committee must be commended for its efforts in compiling the draft business plan and for showing initiative to seek funding from the Cobbora Transition grant fund which unfortunately has not been successful. As was discussed when I met with the Committee and the Gulgong Health Council on 24 February 2014 the demolition of the old building is part of the scope of the MPS project and we have a finite window of opportunity to complete the works.

I completely understand the historical significance of the old building and the importance of retaining the history of the old hospital where many Gulgong residents have very strong ties and memories.

We have ensured that the D/A for the demolition of the old building seeks approval to create a memorial wall commemorating the hospital by using parts of the old building and I am keen to support the local community in ensuring the history of the hospital is remembered. I understand that some community representatives have already met with Mark Lamond from Health Infrastructure and inspected the site to determine what remnants from the building can be retained for this purpose.

I am pleased to advise that the new \$7M Gulgong MPS has now been officially handed over to the Duran Local Health District and will be open for business before the end of April. The new MPS will allow for greater integration of services for the local community, while also providing high care residential aged care services. Not to Gulgong Health Council's knowledge.

When we met we discussed a number of solutions for additional primary healthcare services that could be delivered from the MPS and Gulgong HealthOne and I can report that progress is being made with regard to the future delivery of a dental service. I will happily keep you briefed on progress as more information is available. Asked for in the planning stage of MPS and refused then!

I look forward to continuing to work with the committee and the Health Council to improve health outcomes for the people of Gulgong.

Yours sincerely

Scott McLachlan
Chief Executive

11 March 2014

TUES.

24th FEB -> SCOTT
(for sale or lease)
BOARD MET?
DETAILS? and community adaptive re-use plan discussed?

Western NSW Local Health District
ABN 50 629 556 494

Chief Executive Unit
FO Box 4061 23 Hawthorn Street
Dubbo NSW 2830

Tel (02) 6841 2217 Fax (02) 6841 2236
Website: www.wnswlhd.health.nsw.gov.au

(NB) Please note for background information on our Committee's position my letter to Council of 17/2/2014 with attached maps, community suggested adaptive-reuse plan.

(NB) Also Please note on 24/2/2014 (*) Scott McLachlan announced that the Old Gulgong Hospital could be bought or leased. This was a complete refusal to previous information. He makes no reference to this in the letter and we have 2 buyers lined-up!

Why?
scuttled by?
Quote this
Which part of the local community?

Why?

(Sec)

? *

? *

Peter Doran

From: "Peter Doran" <peter.doran@bigpond.com>
Date: Wednesday, 11 December 2013 11:43 PM
To: <northshore@parliament.nsw.gov.au>
Cc: <dubbo@parliament.nsw.gov.au>
Subject: Old Gulgong Hospital Building

The Hon.J.Skinner MP. Minister for Health & Medical Research.

Dear Mrs Skinner

At the Gulgong Public Meeting held on Tuesday 26th November 2013 to inform the Gulgong Community of Western NSW LHD's intention to lodge an application for demolition of the Old Gulgong Hospital Building, WNSW LHD advised the Gulgong Community to meet certain criteria if they wanted to retain the Old Hospital Building. A Committee was to be formed to present a Business Plan demonstrating how they could raise \$2.2million to renovate the Old Hospital Building, and suggest a viable Health use providing an annual income of \$190,00 for WNSW LHD. This plan has to be presented to WNSW LHD by 31 December 2013. Initially the date was when the new Gulgong MPS was completed in 2014. Two days before the Public Meeting it was the 31st January 2014, then it became the 31st December 2013 one day before the Public Meeting. A Committee has been formed and is developing the Plan requested by WNSW LHD. The Committee requested an extension on the deadline date but this was declined. The Committee requests your support in extending the deadline date to 28th February 2014 and a hold on the demolition of the Old Hospital Building. The Committee also requests that the money allocated for the demolition of the Old Hospital Building be retained for its preservation. The Committee wondered if the Old Hospital Building was available for Sale for Private Enterprise? Attached is an independent Builder's Report on the condition of the Old Gulgong Hospital Building.

Thank-you

Yours Sincerely

Ann Doran

Secretary

Old Gulgong Hospital Community Committee

[No answer received]

NSW Health submits DA to create Gulgong MPS

A Development Application from NSW Health Infrastructure proposed this month extending the HealthOne building nearing completion at Gulgong to create a new Multi Purpose Service (MPS) health facility on the site of the town's hospital, which was closed in 2010, and to retain the historic core of the old hospital which was built in 1901.

The MPS would provide four sub-acute beds, including one for respite/palliative care; six high care residential aged care beds with flexibility to accommodate residents with low level dementia, clinical and operational support services, and therapeutic care in addition to the primary, emergency and community care services of the HealthOne.

Expanding the HealthOne into an MPS will provide Gulgong a "one stop shop" with improved health care services, improved economic viability and improved community participation in the planning of local health and aged care services, said the DA, which was filed with Council.

"This will promote sustainability, integra-

tion of health services and provide capacity for high care residential aged care services," it said. "Health services will be housed in a building designed to meet the challenges of contemporary health care."

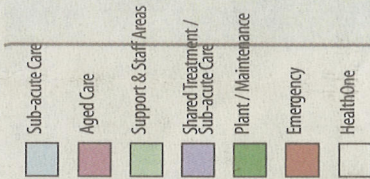
The MPS including the HealthOne would occupy a 1,400m² building, compared to 465m² in the HealthOne alone which is due for completion in April. The building would be located on the 20,638m² site of the old hospital and its grounds on the southwestern outskirts of Gulgong.

The old hospital was closed after a WorkCover inspection in May 2010 discovered asbestos in many parts of the structure, the proposal said. It said the layout of the old hospital was unsuited for the management of aged or acute patients and required inefficient levels of staffing.

The DA accepted a recommendation by heritage architect Barbara Hickson that the main core of the old hospital, constructed in 1901 and situated outside the footprint of the proposed MPS, be retained.

Extensions to the hospital that were add-

'ONE STOP SHOP': Floor plan of MPS health facility proposed to replace Gulgong Hospital. Old hospital building is just to right of the proposed MPS site.



ed over the years would be stripped away, revealing the shape of the original structure. A beehive well outside the hospital building would also be retained, but a number of out-buildings including a 1936 nurses' residence would be removed.

Council has worked hard with the

Gulgong community to get a modern re-placement for the old hospital, partly to help ease the pressure on health and aged care facilities in the area and partly because Gulgong is the closest location able to offer emergency care for workers at a number of the Region's coal mines.



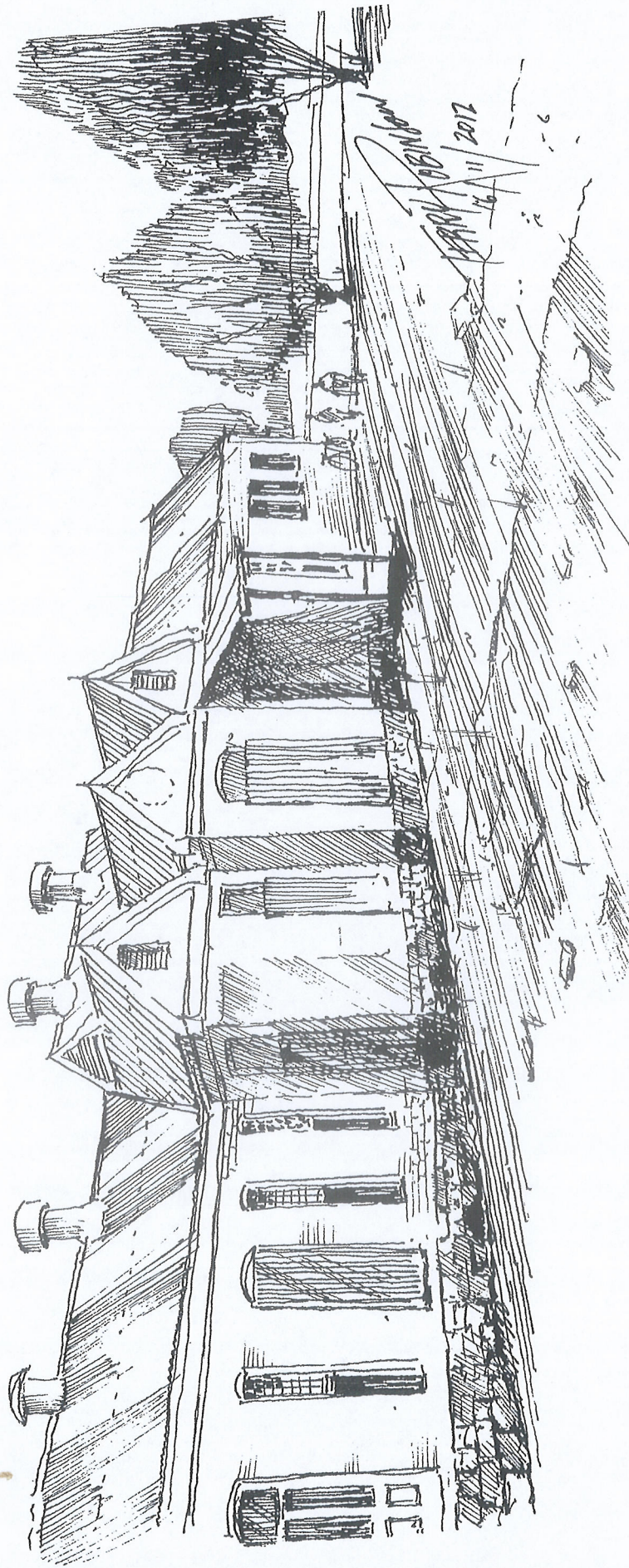
Gulgong Gossip



Greetings from Gulgong.



Distributed free each month to 2,300 homes, farms and businesses in Gulgong and surrounding areas.



Takes more than a bandage to fix the Old Hospital.

GULGONG NSW



Could look like this...Gulgong Hospital

GULGONG NSW

NB PROPOSED HELIPAD LOCATION



Attachment #

BUT Soil from MPS excavation piled here!

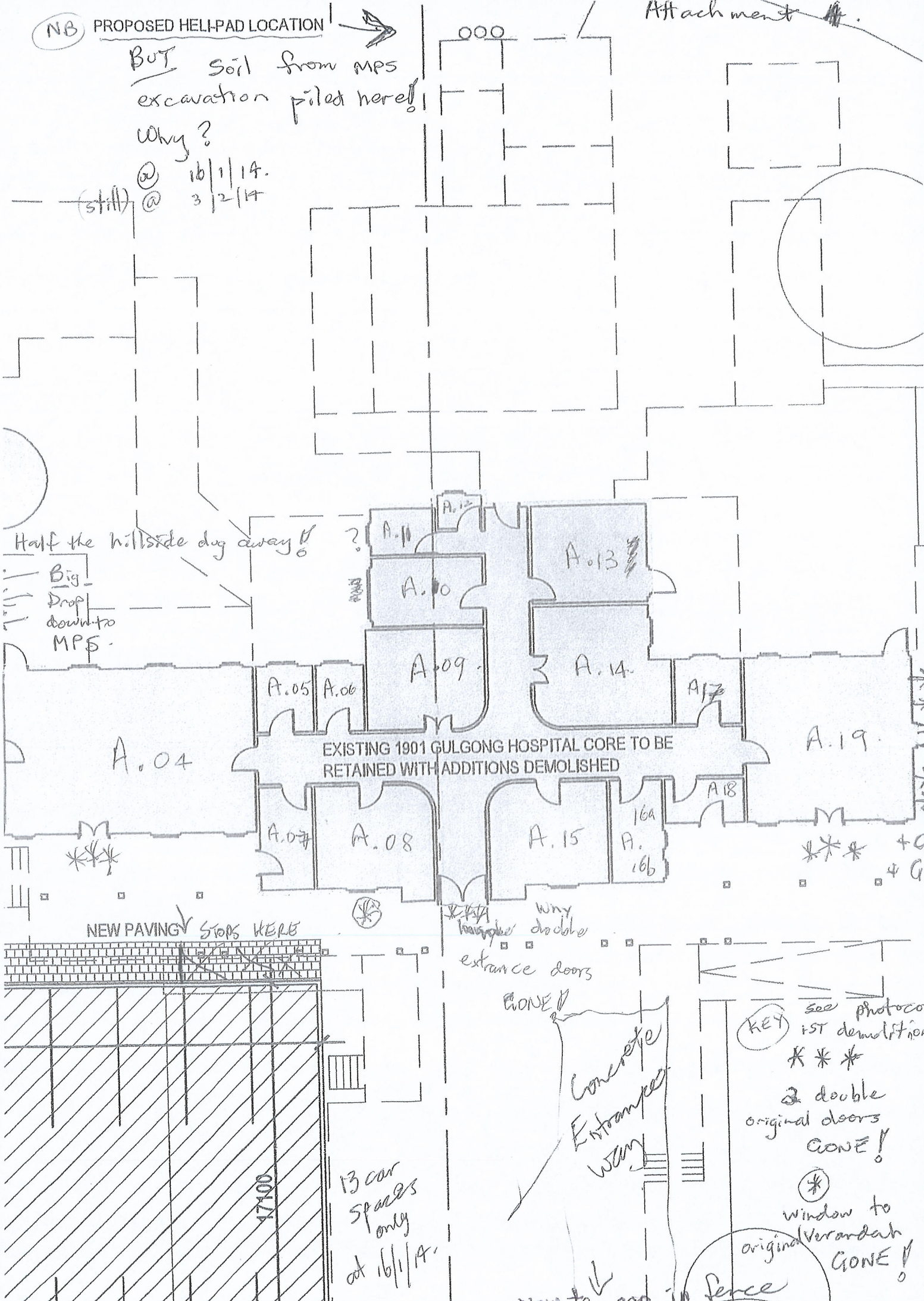
Why?

@ 16/1/14.

(still) @ 3/2/14

Half the hillside dug away!

Big Drop down to MPS.



EXISTING 1901 GULGONG HOSPITAL CORE TO BE RETAINED WITH ADDITIONS DEMOLISHED

NEW PAVING STOPS HERE

Concrete Entrance way

13 car spaces only at 16/1/14.

Why hanging double entrance doors

KEY see photos 1st demolition *** & double original doors GONE! * window to original verandah GONE!

Now to gap in fence

Hospital decision nears

By SAM PAINE

Gulgong residents are working to preserve the former Gulgong Hospital building, as the deadline for its demolition nears.

"Time is running out for us to prove it is a viable option to save it and also to prove it will be a useful and profitable asset for the community of Gulgong," said Julie Halloran, one member of the committee formed to save the building.

The group came together after hearing the old hospital was to be demolished as part of the construction of Gulgong's HealthOne and MPS.

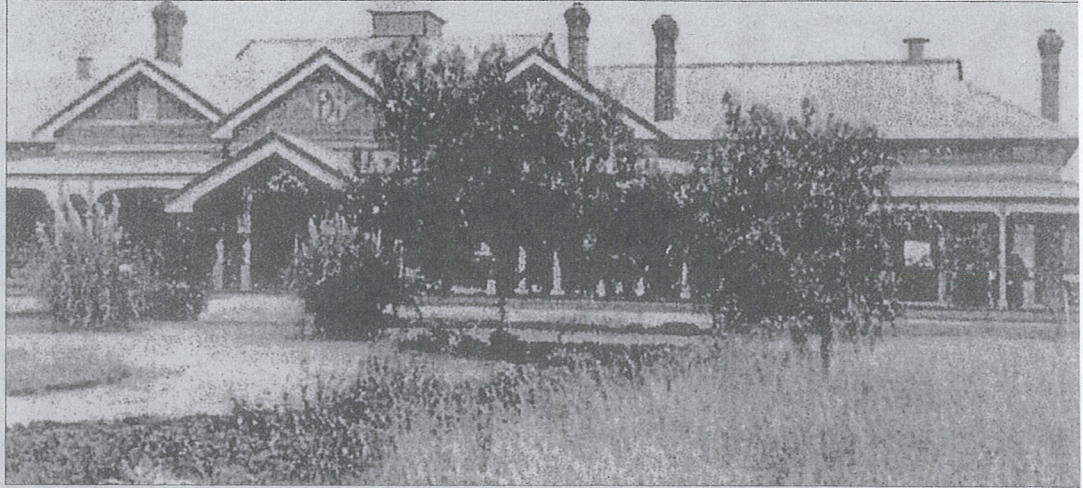
A meeting in Wellington with Member for Orange Andrew Gee secured an extension of the building's demolition date until mid-February, giving the group time to raise community support.

Ms Halloran said the 113-year-old building had been inspected and found to be structurally sound, giving it value as additional space for the hospital.

The group has suggested the building could be used for x-ray facilities, dental rooms, emergency accommodation, quarters for visiting medical staff, day care, respite, or a café.

"Another option, if enough money is not forthcoming soon, is to tidy up the deliberately unappealing façade with a copy of the original verandah in place and mothball the building for the future," Ms Halloran said.

The committee said anyone interested in seeing the old Gulgong hospital preserved should write to Gillian Skinner, Minister for Health, care of the NSW Parliamentary Building.



Gulgong hospital in its intact state.

160214/BH GULGONG HOSPITAL/OLD PIC



Gulgong hospital as it stands today, boarded up and stripped of its verandah.

160214/BH GULGONG HOSPITAL/25

Sam
Paine
MUDGEE
GUARDIAN.
63 72 1455 (Ben Harris)

YOUR SAY:

New plans for old hospital

Regarding the old Gulgong Hospital (*Mudgee Guardian*, February 17), the present situation is a grant submission has been forwarded to the Cobbora Transition Fund in order to upgrade the present building to provide ancillary health services namely dental/X-ray/mental health/ possibly a hydrotherapy pool plus various office spaces related to health services.

These services would be provided on a fee-for-services as the building would be on a 10x10 year lease to a professional health services group.

The committee is hopeful that an agreement would be reached with Western Area

Health should we be successful with our grant as they would have no financial input.

Looking towards the future should the Mac Group development materialize and with the expansion of the mines these services would be welcomed by families moving into the area plus the large proportion of elderly residents who reside in Gulgong.

We wait in anticipation of our submission.

**Rick McGregor,
Chairman,
Save The Old Gulgong
Hospital Committee**

ALDI customers help Barnardos

ALDI would like to thank all

residents who helped donate funds to Barnardos Australia by purchasing a CD from ALDI's Christmas range last year.

Together, ALDI shoppers have helped us to successfully raise over \$140,000 which will help Barnardos to find real and permanent solutions for Australian children in desperate need.

Barnardos has over 100 programs and one of the programs that the donation might be used is towards the Indigenous Learning Centre in Waterloo called Yurungai. The Barnardos Yurungai Learning Centre provides after-school educational support to 40 highly vulnerable children aged 5-12 years, in the inner Sydney area.

By providing high quality

educational services which employ Indigenous staff who can be role models to the children, Barnardos works towards improving children's retention rate and experiences of educational success. Although they are centred around education, they also incorporate nutritional education, social wellbeing, physical fitness, leadership skills and building self-esteem.

By purchasing the ALDI Christmas CDs, shoppers helped us go above and beyond. We were able to join forces to raise money and help fight the disadvantages that these children are suffering from, and we couldn't have done it without the help of the local community.

Thanks,
ALDI Australia

Whatever you did (not do) for one of the least of these

**PASTOR SIMON CHEN,
NARROMINE BAPTIST CHURCH**

More drama with boat people! What is really going on? Getting a clear picture can be quite a challenge these days.

will) to make good and right choices.

As Christians, we should be concerned about the refugee situation. And it is neither because of public opinion nor because it is the fashionable sentiment of the day. Rather, as followers of Jesus, we

**Eternity
Matters**



...55.3%
...18.4%
...26.3%

t



23 JULY 2014

ATTACHMENT

6.2.5

Planning Proposal General Amendments –
Consideration of Submissions
and Public Hearing



Planning Proposal

Revised for Public Exhibition

General Amendments to Mid-Western Regional LEP 2012

To facilitate a number of general amendments to Mid-Western Regional Local Environmental Plan 2012

Mid-Western Regional Council



September 2013

Amended February 2014 for
Public Exhibition in accordance with
the DOPI Gateway Determination

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Overview

This planning proposal has been prepared by Mid-Western Regional Council in accordance with section 55 of the Environmental Planning and Assessment Act and the relevant Department of Planning and Infrastructure Guidelines.

The planning proposal relates to an amendment to the Mid-Western Regional Local Environmental Plan 2012 for the following:

- (a) Clarify dwelling provisions as they relate to split parcels on the Rylstone Lot Size Map ,
- (b) Insert a Farm Adjustment Clause ,
- (c) Clarification of clause 4.2 A – dwellings on rural land,
- (d) Subdivision of land below MLS for a non-agricultural purpose,
- (e) Clarification of the 2 ha minimum lot size on Lot 1 DP 1166658,
- (f) Reclassify drainage reserves and surplus land from Community to Operational Land,
- (g) Rezoning land from R1 General Residential to B4 Mixed Use in Inglis St Mudgee,
- (h) Rezoning land from IN2 Light Industrial to B4 Mixed Use on Lots 1 & 2 Section 49 DP 758721
Inglis St Mudgee,

Mid-Western Regional LEP 2012 was published in August 2012. There were a number of matters that were raised during the course of the public exhibition which were considered outside the delegation of Council to amend without the need for additional consultation and re-exhibition. Further, there are matters that have arisen since and have been included in this general amendment.

Part 1 Objectives or Intended Outcomes

As there are a number of matters to be addressed and a range of issues within items, each item has been explored individually for the purpose of the planning proposal.

The following table provides an outline of the objectives for each of the individual amendments.

| Amendment | Objective/Outcome |
|---|---|
| <ul style="list-style-type: none"> • Clarify dwelling provisions as they relate to split parcels on the Rylstone Lot Size Map | Certainty as to the erection of a dwelling on a split zoned parcel |
| <ul style="list-style-type: none"> • Dwellings on rural land - Clarification of clause 4.2 A | Remove uncertainty in interpretation of the clause |
| <ul style="list-style-type: none"> • Insert a Farm Adjustment Clause | Provisions that will provide flexibility in the subdivision of rural land |
| <ul style="list-style-type: none"> • Subdivision of land below MLS for a non-agricultural purpose, | Provide flexibility in use of rural land |
| <ul style="list-style-type: none"> • Clarification of the 2 ha minimum lot size on Lot 1 DP 1166658, | Facilitate development for subdivision for the purpose of aero-related development |
| <ul style="list-style-type: none"> • Reclassify drainage reserves and surplus land from Community to Operational Land | Enable better management of drainage reserves and land reclassification |
| <ul style="list-style-type: none"> • Rezoning land from R1 General Residential to B4 Mixed Use in Inglis St Mudgee, | Rezone land to better reflect the current and potential use of the land |
| <ul style="list-style-type: none"> • Rezoning land from IN2 Light Industrial to B4 Mixed Use on Lots 1 & 2 Section 49 DP 758721 Inglis St Mudgee, | Rezone land to better reflect the current and potential use of the land, in particular as it relates to the permissibility of dwellings |

Part 2 Explanation of Provisions

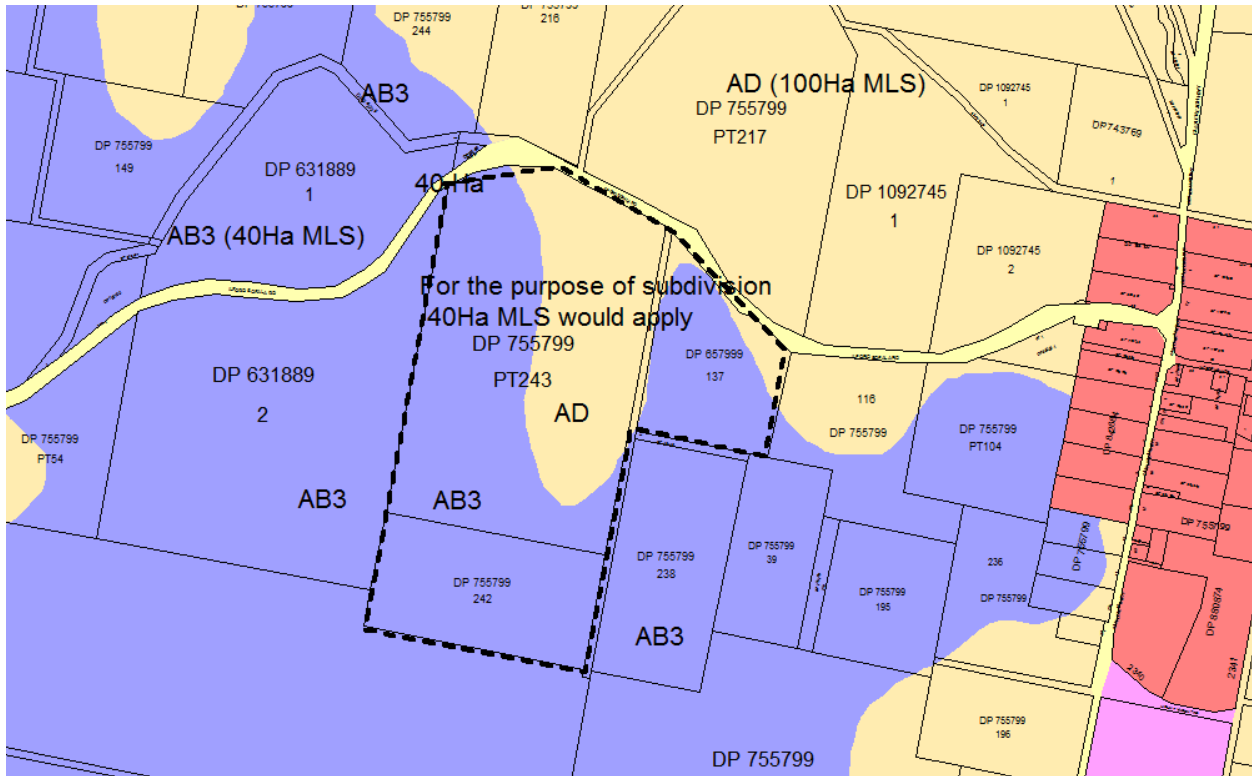
It is intended that the objectives and intended outcomes described in Part 1 will be achieved in the form of controls on development in an amending LEP. The individual provisions or mechanism for achieving the objective outcomes are explained as follows:

(a) Split parcels on the Rylstone Lot Size Map

Clause 4.1 as it relates to Rylstone minimum lot size where the land is subject to two minimum lot sizes. Flexibility is considered to be warranted here because of the scale and accuracy of the baseline mapping and current ability to refute this. It is considered that such flexibility is consistent with the intention of Council to “maintain the status quo” in relation to existing subdivision and minimum lot size provisions. Under the previous planning instrument the Council could resolve, on the advice of an agronomist that land was not prime crop and pasture land and therefore could be subdivided for the erection of a dwelling to 40ha.

The intention of the amendment is to provide clarification as to which of the two minimum lot sizes applies to the land. For the purposes of a majority rule approach, 50% is considered reasonable. This is the approach currently taken.

The amendment will not result in the creation of additional dwelling or fragmentation beyond that which is currently the case in the LEP. The amendment will provide clarity in the way that the LEP is currently interpreted and make it clear to land holders.



There is also some confusion as to the circumstances in which a dwelling is permissible on a split zoned lot.

Clause 4.2A(3) (a) provides for the erection of a dwelling on a lot “*that is at least the minimum lot size shown on the Lot Size Map in relation to that land*”. In circumstances where it is a split minimum lot size reference has to be made to a previous planning instrument under clause 4.2A(3) (b).

In order to simplify this, and importantly to avoid the need to reference a previous planning instrument for a straight forward enquiry, it is proposed to insert an additional sub-clause from the former Rylstone LEP that identifies the Former LEP Boundaries Map and allows dwellings on land having an area not less than 40ha.

The inclusion of this clause will reduce both complexity and confusion surrounding the erection of dwellings on existing lots regardless of the MLS shown on the LSM.

(b) Dwellings on Rural Land

4.2A Erection of dwelling houses and dual occupancies on land in certain zones

There are additional issues with the manner in which clause 4.3A operates and is interpreted and the intention of various sub-clauses which need to be addressed. The provisions of clause 4.2A were specifically drafted to enact the outcomes of the Mid-Western Regional Comprehensive Land Use Study (CLUS) in relation to dwelling rights, expanded largely as a result of the threat to increase minimum rural lot sizes from 100Ha to 400Ha (this did not eventuate). In this regard CLUS recommends the preservation or where necessary, the reanimation of any dwelling right that land has or may have had.

Clause 4.2A(3)(b) refers to a lot “created”. The intention of this provision is to ensure that those lots or holdings that existed immediately prior to the commencement of the plan retain their entitlements. In the recent past, the erection of a dwelling was based on a minimum land area (lot or holding) under a particular ownership that met the minimum area attached to a particular zone. Council regularly provided advice which stated that provided the land holding was, for example 100ha, a dwelling could be erected. Typically a plan of consolidation was only prepared as a condition of consent for the dwelling. Therefore, and following on from this, sub-clause (3)(b) endeavoured to retain entitlement for those lots (or holdings).

It is proposed to amend the wording of the sub-clause to include “or holding” after “lot” and omit “created” and insert “existed” as a means of clarification. There is a common view that the term created can be read widely to mean “created by a subdivision approved by Council” and this is not the intention.

Clause 4.2A(3)(f) came about as a result of the merging of two sub-clauses that should have remained separate. The exhibition of the Draft LEP represented the provisions as follows:

(e) in the case of a land within the R5 Large Lot Residential Zone;

(i) on a lot that has an area not less than 5ha, or

(ii) on an existing holding that has an area not less than 2ha and has all weather vehicle access, if Council is satisfied adequate public utility services are available to the lot and the land is suitable for on-site disposal of domestic wastewater, or

This subclause has been retained for public exhibition purposes only. Council has prepared an Explanatory Note outlining the intent of this subclause to seek public comment.

(f) on an existing lot located partly or wholly within 500m of a RU5 Village Zone that has an area of not less than 5ha, and provision is made for the lot to have a tar sealed road frontage and that the lot is connected to the sealed road network, or

This subclause has been retained for public exhibition purposes only. Council has prepared an Explanatory Note outlining the intent of this subclause to seek public comment.

The former (e) relates to a provision in Mudgee LEP 1998 and carried through to MWRC Interim LEP 2008. The clause gives those existing lots within the R5 zone an entitlement provided they

meet the MLS criteria of 5ha. The intention was NOT to relate these entitlements to connection to the sealed road network.

Sub-clause (f) as exhibited is a new provision which came about as a mechanism to provide additional dwelling opportunities to land adjacent to or adjoining a Village zone. The intention of sub-clause (f) is to introduce a new provision which facilitates the growth of Villages by extending entitlements beyond the boundary BUT ONLY WHERE the proponent provides a sealed road connection. The Villages in the LGA have sealed main streets, however, often gravel beyond that. They also have existing lots at the fringe which are undersize for the RU1 zone which applies. This clause recognises the opportunity for a dwelling on an existing lot in close proximity to the Village, without the need for a subdivision and on which a dwelling would not otherwise be permissible. However, the dwelling is conditional on the proponent sealing the road (if it is not already sealed). While this involves a cost to the proponent, there is a significant benefit of a dwelling entitlement which otherwise would not exist.

It is proposed to reinstate the sub-clauses as they appeared in the public exhibition version of the draft LEP.

Clause 4.2A(3)(g)

Extract

a lot on which a dwelling house would have been permissible under an environmental planning instrument prior to the making of Mudgee Local Environmental Plan 1998 and Merriwa Local Environmental Plan 1992, and in the case of land within Zone RU1 Primary Production, has an area of not less than 40 hectares.

The function of clause 4.2A(3)(g) is to preserve dwelling rights where there have been changes in zoning and or minimum lot sizes over time that affect dwelling rights. Its secondary function is to reinstate dwelling rights for allotments, parcels or portions of land within the RU1 – Primary Production zone, which have an area of 40Ha or more.

The minimum rural lot size was initially 100Ha but was amended to 40Ha in 1975 which carried through until 1985 when Council adopted an LEP (LEP 15) that set the minimum lot size for rural subdivision and or the erection of dwellings at 100Ha.

LEP 15 had a clause that was in effect a savings provision whereby any existing allotment of 40Ha or more that was separately owned from any surrounding land retained a dwelling right in spite of the 100Ha minimum lot size. The purpose of drafting the clause in this fashion is to preserve dwelling rights while preventing the break-up of larger holding into 40Ha parcels or amalgamation of smaller parcels into a 40Ha lot which would defeat the purpose of having a 100Ha minimum lots size.

Mudgee Local Environmental Plan 1998 momentarily preserved the dwelling rights of the existing 40Ha lots however, a sunset clause in MLEP 1998 terminated the clause three years after the commencement of that LEP and the subsequent Interim LEP 2008 did not contain any 40Ha provisions.

Since the commencement of LEP 2012 Council has assessed a number of development applications for dwellings or staged dwellings which rely on the provisions of 4.2A(3)(g) and this has revealed that the clause works as designed in relation to the preservation of rights affected over time by zone changes and the like but is not sufficiently clear in relation to which instruments should be referred to or that there are limitations on 40Ha parcels ie the parcel had to be separately owned at 11 February 1985. This has led to a number of attempts at creating a defacto 40Ha subdivision and associated dwelling entitlement.

It is recommended that the clause be amended to reflect that the instruments of reference are those in force immediately prior to MLEP 1998 and Merriwa LEP 1992 in addition to the following, in relation to land marked “Mudgee” on the [Former LEP Boundaries Map](#) on an allotment that has an area of not less than 40 hectares and that was in existence as a separate lot, portion or parcel of land as at 11 February 1985, and was separately owned from any adjoining or adjacent lands as at that date.

(c) Farm Adjustment Clause

This was an issue that was included in the report to Council on 7th December 2011 which considered the Draft LEP and submissions. The following paragraphs have been lifted from that report and remain valid.

The inclusion of this clause has been an on-going issue for Council throughout the negotiations with the DOPI leading to the exhibition and remains unresolved in terms of both clarifying the mechanism for facilitating farm adjustments both with and without exiting dwellings and between rural zones.

The clause does not create the opportunity of additional dwellings.

The intent of the clause is to provide the opportunity for land that is underutilised or not required on one property to be transferred to a productive holding. This is supported by the first aim of the Rural Lands SEPP which says:

The aims of this Policy are as follows:

(a) to facilitate the orderly and economic use and development of rural lands for rural and related purposes,

Further, like the clause proposed by Council, the Rural SEPP provides the opportunity for subdivision for agricultural purposes as follows:

9 Rural subdivision for agricultural purposes

(1) The objective of this clause is to provide flexibility in the application of standards for subdivision in rural zones to allow land owners a greater chance to achieve the objectives for development in the relevant zone.

(2) Land in a rural zone may, with consent, be subdivided for the purpose of primary production to create a lot of a size that is less than the minimum size otherwise permitted for that land.

(3) However, such a lot cannot be created if an existing dwelling would, as the result of the subdivision, be situated on the lot.

(4) A dwelling cannot be erected on such a lot.

(5) State Environmental Planning Policy No 1—Development Standards does not apply to a development standard under this clause.

By way of interpretation, a subdivision under this provision cannot occur if it will result in a dwelling being situated on a lot that is under the minimum lot size for a dwelling in that particular zone even though the dwelling already exists and the creation of the agricultural lot will facilitate a desirable outcome in term of the on-going management and productivity of the rural land. Further, there is no mechanism at all for a boundary adjustment between two already undersized lots both which have

existing dwellings if the adjustment will result in a variation to either lot size by more than 10%. Again, this is not conducive to creating the opportunities for optimum use of agricultural land.

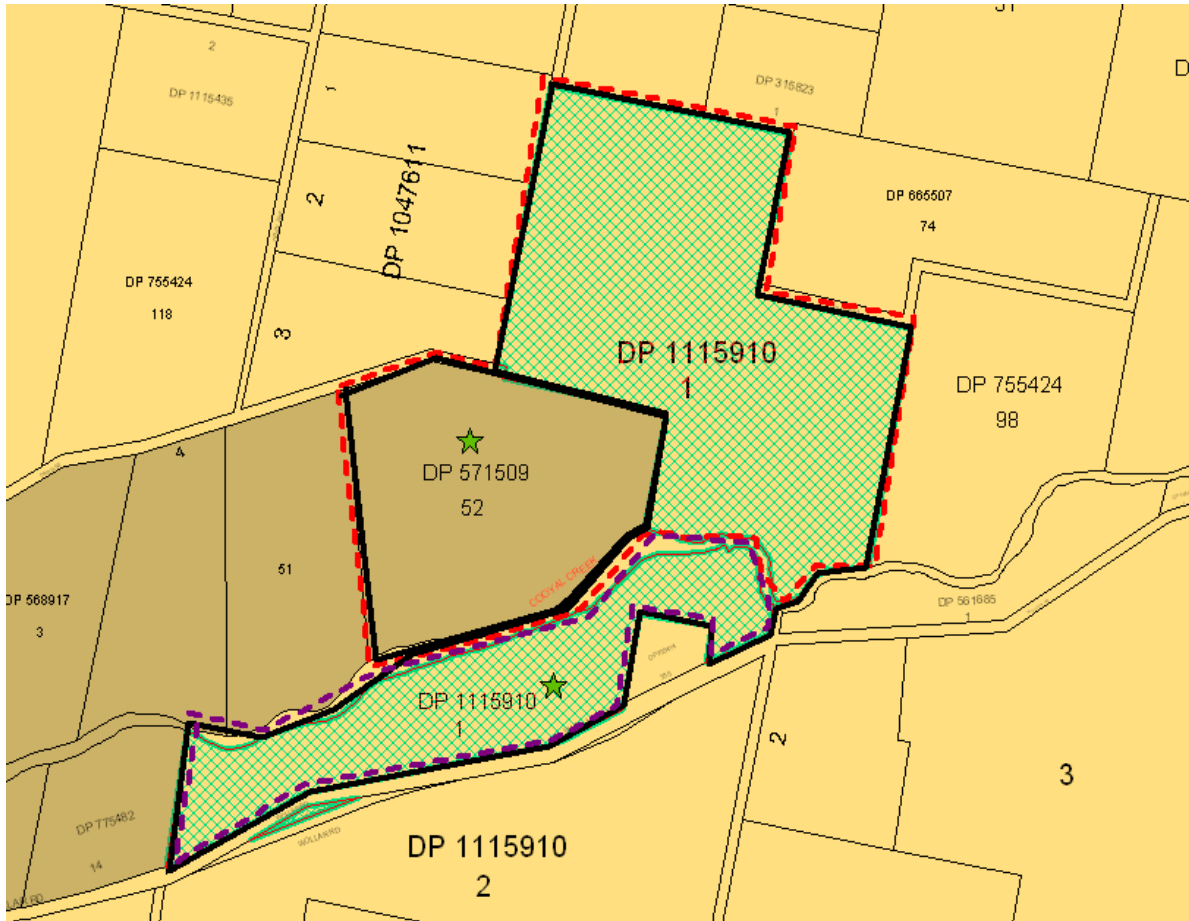
The clause as proposed does not increase the net number of dwellings or opportunity for dwellings. However, what it will do is assist in the consolidation of operating rural enterprises and provide an opportunity for an increase in holding sizes.

In the application of this clause a resolution needs to be made in terms of the most appropriate minimum lot size for these lots. An existing dwelling still needs to be buffered from the operation of a neighbouring farm to reduce the potential for land use conflict and have regard to the protection of natural resources. At this stage the minimum lot size for a holding in the rural context is 12ha in the R5 Large Lot Residential zone and this could be adopted in the farm adjustment provisions for both the RU1 Primary Production and RU4 Primary Production Small Lots zones. In terms of the R5 zone, the minimum lot size for a dwelling on existing lots is 5ha (Clause 48 (2) in the Interim LEP 2008) and provided no net increase in dwellings this could be adopted as the minimum lot size in the R5 zone.

The Farm adjustment would include that following elements:

- Applicable to rural and R5 zones
- Not result in an increase in the net number of dwellings or opportunity for additional dwellings
- Provide a minimum lot size of 12ha in the RU1 and RU4 zones consistent with the MLS for the erection of a dwelling currently in the R5 zone
- Provide a minimum lot size of 5ha in the R5 zone consistent with the MLS for the erection of a dwelling currently in the R5 zone where there is an existing lot.

Example of how the clause would work.



Lot 1 DP 1115910 – Zoned Agriculture, has an existing dwelling. Lot size 50.06ha (undersized lot in the Agriculture Zone).

Lot 52 DP 571509 – Zoned Rural Small Holdings, has an existing dwelling. Lot size 20.23 ha.

The owner of Lot 1 is seeking a boundary adjustment with the owner of Lot 52 for the area of Lot 1 that is north of Cooyal Creek. The proposal would not result in an increase in the net number of dwellings or create the opportunity for additional dwellings on either lot. The proposal will result in the better utilisation and efficient management of agricultural land.

As both lots have existing dwellings and the adjustment (based on the area) is not “minor”, there is no mechanism within the current planning framework to facilitate that proposal. The farm adjustment clause would facilitate this subdivision.

(d) Subdivision of land below MLS for a non-agricultural purpose

There were provisions in the Interim LEP 2008 which allowed subdivision below the minimum lot size for a purpose other than agriculture or a dwelling. Council has a current example of infrastructure associated with the rail loop at Bylong whereby a lot cannot be created for the purpose of a refuelling facility which requires only 2Ha of land.

These provisions are not contrary to the Rural SEPP rather provide flexibility within the zone to accommodate the development other than agriculture and dwellings in accordance with the land use table.

The clause in LEP 2008 was as follows:

39 Subdivision of land within Intensive Agriculture Zone for purposes other than agriculture, intensive plant agriculture, aquaculture or dwellings

- (1) This clause applies to a subdivision of land within the Intensive Agriculture Zone where, in the opinion of the consent authority, it is intended that no allotments created by the subdivision will be used for the purpose of agriculture, intensive plant agriculture, aquaculture or any dwelling.
- (2) Clause 19 (Minimum subdivision lot size) does not apply to a subdivision to which this clause applies.
- (3) The consent authority, before granting consent to a subdivision to which this clause applies, must:
 - (a) be satisfied that:
 - (i) the size of the proposed allotment and its future use will be consistent with the objectives of the zone, and
 - (ii) the level of demand for any goods and services that are to be supplied from the allotment, and for any activities that are to be carried out on the allotment, and the extent to which the allotment is proposed to be used to meet that demand, justify the creation of the allotment, and
 - (iii) the creation of the allotment is unlikely to adversely affect the existing and potential capability of the adjoining and adjacent land to be used for other permissible land uses in that zone, and
 - (iv) the allotment to be created and any subsequent development on the allotment is unlikely to have the effect of creating a demand for uneconomic provision of public infrastructure and utilities, and
 - (v) the allotment to be created is of an adequate area and has appropriate topography and geology to facilitate an on-site effluent disposal system, and
 - (vi) the future use of the allotment will not result in land use conflict or degradation of natural resources, including water resources, and

- (b) consider:
- (i) the effect of the subdivision on the existing and potential capability of the land and adjacent land to produce food or fibre or to be used for agricultural purposes, and
 - (ii) whether legal and practical access to any proposed lot can be provided to an existing dedicated road reserve, and
 - (iii) the effect of the proposed use on adjoining existing development, and
 - (iv) the effect of the proposed use on the natural environment, including water resources, and
 - (v) the effect of the proposed development on vegetation, timber production, land capability (including soil resources and soil stability) and water resources (including the availability, quality and stability of watercourses and ground water storage and riparian rights), and
 - (vi) the protection of areas of significance for nature conservation or of high scenic or recreational value, and
 - (vii) the potential for rural land use conflict with adjoining uses where the new allotments, and any resulting potential future development, are likely to inhibit or give rise to complaints about normal farming practice (such as pesticide spraying, noxious weeds and feral animal control, bush fire hazard reduction work, noise, separation from noxious odours and the like).

A local clause in the LEP 2012 would have a similar intent and will catch those uses that are permissible but which do not necessarily require 100ha of land.

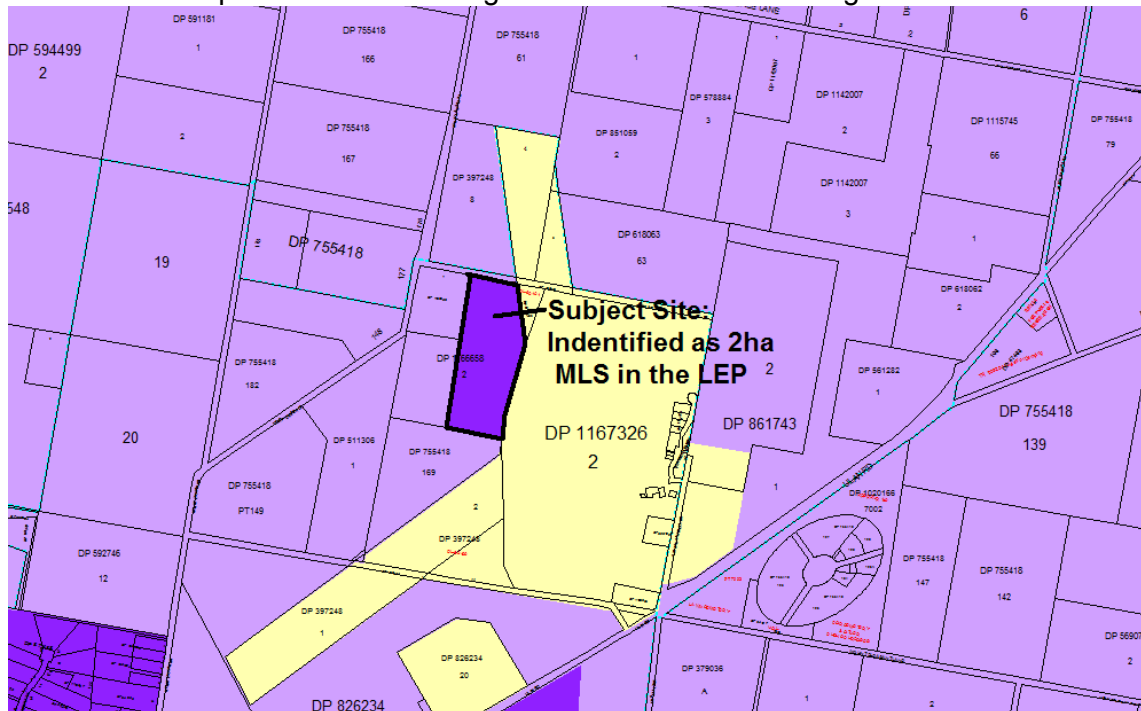
(e) Clarification of the 2 ha minimum lot size at the airport

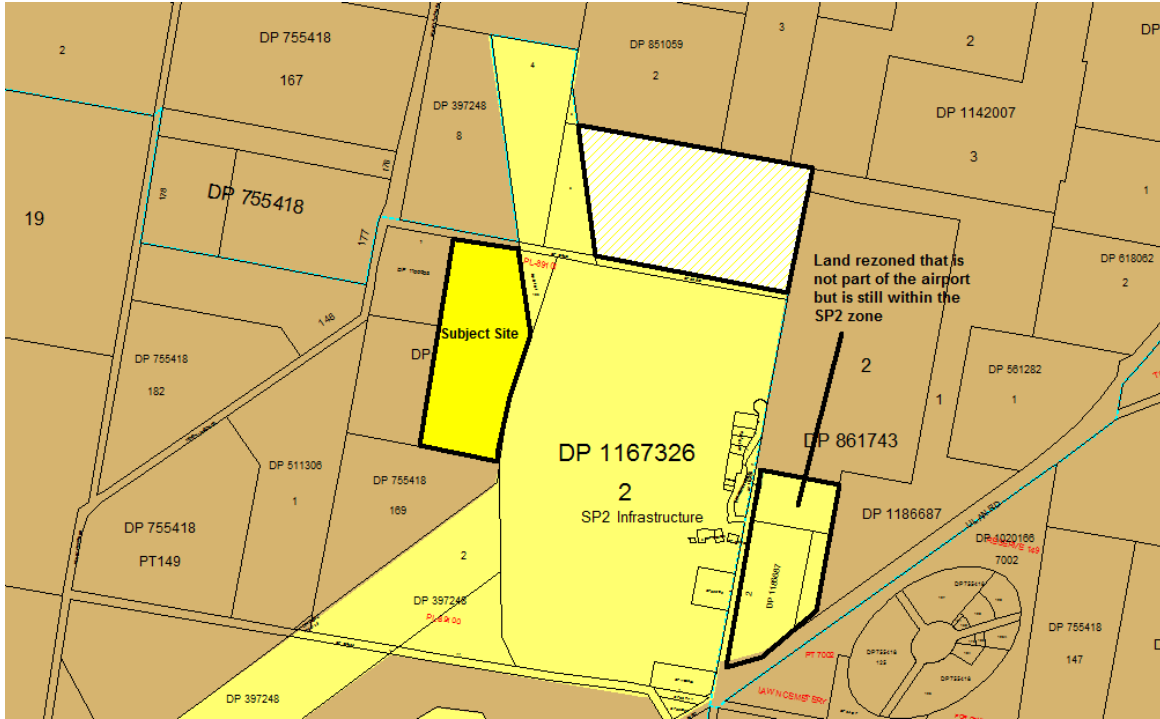
In the review of public submissions to the Draft LEP 2012 on December 7, 2011, Council resolved to include part of Lot 1 DP 1166658 in the SP1 Special Purposes Airport related facilities zone. The Department of Planning vetoed the inclusion of the land in the SP1 zone, however, permitted an amendment to the Lot Size Map to show the site as having a 2ha minimum lot size. The RU4 Primary Production Small Lots zone was retained. This creates an anomaly in so far as while the lot size map permits the land to be subdivided to 2ha, clause 4.2B requires that the proponent must demonstrate an intensive agricultural use.

The intention of the site was to provide freehold hanger development and an associated dwelling. This can be achieved but for clause 4.2B. In order to overcome this, Council initially proposed to insert into Schedule 1 an additional permitted use in accordance with clause 2.5 of the LEP which deals specifically with this site adjoining the airport. Council held the view that, under the circumstances this provides the most transparent result.

An alternative option would be a Special Purposes SP zone over the site. This is the preferred mechanism of the Department of Infrastructure and Planning and recommended in the Gateway Determination.

The uses Council considers suitable for this site are limited the use consistent with a aerodrome or airport and include hangers and associated dwellings.





Subject Site – Special Purposes Zone

(f) Reclassify drainage reserves and surplus land

In the course of subdivision development, Council has acquired via dedication a number of drainage reserves. These are operational in nature and should be classified as such to allow Council to continue to manage and maintain them effectively and the avoid having to prepare Plans of Management of each individual reserve. The LEP 2012 will need to be amended to include the re-classification of this land from Community Land to Operational Land. The following properties are included:

| Asset No | Description | Prop no | Notes |
|---|--|----------------|--|
| 140758 - Defined as Drainage Reserve | Drainage Reserve 44A Mortimer Street MUDGEE Lot A DP 408150 | 1827 | Plan dated 1957 doesn't specifically dedicate reserve for drainage |
| 140799 - Defined as Drainage Reserve | Collyer Park Public Reserve 16A Lisbon Road MUDGEE Lot 2 DP 802143 | 9150 | Lot 2 had been listed as a Drainage Reserve but was dedicated as Public Reserve on Plan dated 2/7/1990. Note that there is an Easement to Drain Water over Lot 2. There is a retention basin for drainage on Lot 2. |
| 140833 - Defined as Drainage Reserve | Public Reserve 18A Macquarie Drive MUDGEE Lot 47 DP 862452 | 11219 | Lot 47 had been listed as a Drainage Reserve but was dedicated as Public Reserve on Plan dated 17/9/1996. Note that there is an Easement to Drain Water over Lot 47. |
| 140853 - Defined as Drainage Reserve | Drainage Reserve 76A Bellevue Road MUDGEE Lot 19 DP 1020110 | 12635 | Lot 19 is dedicated as a Drainage Reserve on Plan dated 6/12/2000. Note that there is an Easement to Drain Water over Lot 19. |

Planning Proposal – General Amendments

| Asset No | Description | Prop no | Notes |
|--------------------------------------|--|----------------|---|
| 140858 - Defined as Drainage Reserve | Drainage Reserve 15 White Circle MUDGEE Lot 49 DP 1062044 | 13436 | Lot 49 is dedicated as a Drainage Reserve on Plan dated 28/11/2003. |
| 140895 - Defined as Drainage Reserve | Drainage Reserve 2A Banjo Paterson Avenue MUDGEE Lot 157 DP 1082615 | 18549 | Lot 157 is dedicated as a Drainage Reserve on Plan dated 7/6/2005. |
| 140897 - Defined as Drainage Reserve | Drainage Reserve 30 Vera Court MUDGEE Lot 33 DP 1087576 | 18613 | Lot 33 is dedicated as a Drainage Reserve on Plan dated 26/9/2005. |
| 140902 - Defined as Drainage Reserve | Drainage Reserve 152 Robertson Street MUDGEE Lot 18 DP 1110787 | 19250 | Lot 18 was dedicated as a Drainage Reserve on Plan dated 30/4/2007. |
| 140908 - Defined as Drainage Reserve | Drainage Reserve 72 White Circle MUDGEE Lot 227 DP 1119919 | 19621 | Lot 227 was dedicated as a Drainage Reserve on Plan dated 10/12/2007. |
| 140922- Defined as Drainage Reserve | Public Reserve 29 Woodside Close MUDGEE Lot 29 DP 871844 | 20174 | Lot 29 had been listed as an Access to Drainage Reserve but was dedicated as a Public Reserve on Plan dated 3/11/1997. Lot 29 includes an area for drainage ie it is just not for access. |
| 140798 - Defined as Drainage Reserve | Collyer Park Drainage Reserve 14 Lisbon Road MUDGEE Lot 18 DP 788035 | 8928 | Lot 18 was dedicated as a Drainage Reserve on Plan dated 6/4/1989. |
| 140814 - Defined as Drainage Reserve | Walkers Oval Public Reserve 3 Court Street MUDGEE Lot 23 DP 816236 | 9772 | Lot 23 had been listed as a Drainage Reserve but was dedicated as Public Reserve on Plan dated 22/4/1992. Note that there is an Easement to Drain |

| Asset No | Description | Prop no | Notes |
|---|---|----------------|---|
| | | | Water over Lot 23. Reserve is predominately for drainage. |
| - Defined as Drainage Reserve | Drainage Reserve 3A Banjo Paterson Avenue MUDGEE Lot 158 DP 1082615 | 18550 | Lot 158 is dedicated as a Drainage Reserve on Plan dated 7/6/2005. |
| 140899 - Defined as Drainage Reserve | Public Reserve 65A White Circle MUDGEE Lot 199 DP 1089672 | 18866 | Lot 199 was dedicated as Public Reserve on Plan dated 12/12/2005. Reserve contains a retention basin. |
| 136570/136571 - Defined as Drainage Reserve | Public Reserve 85-95 White Circle MUDGEE Lot 228 DP 1119919 | 19614 | Lot 228 was dedicated as Public Reserve on Plan dated 10/12/2007. Reserve contains a retention basin |
| | Drainage Reserve - 69 Banjo Paterson Avenue MUDGEE Lot 271 DP 1175650 | 21766 | Lot 271 was dedicated as a Drainage Reserve on plan dated 16 March 2012 |
| Drainage Reserve | 11 Doug Gudgeon Dr Lot 1 DP 1182613 | 22167 | Lot 1 was dedicated as a Drainage Reserve on plan dated 12/6/2013 |
| Drainage Reserve | 49A White Circle Lot 2 DP 1182624 | 22064 | 1.599ha. Land purchased by Council 24/4/2013 for construction of a retention basin |
| Drainage Reserve | 40-48 Bellevue Road Lot 14 DP 1184367 | 22209 | Lot 1 was dedicated as a Drainage Reserve on plan dated 28/6/13 |

LEP Practice Note PN 09-003 Classification and reclassification of public land through a local environmental plan

Attachment 2 to the Practice note outlines the items for which Council must provide a statement for the public exhibition of a planning proposal which deals with reclassification of land.

Reasons why the plan is being prepared – The parcels subject to reclassification as outlined above are considered to perform purely as property assets of Council in one form or another, predominantly drainage reserves. The reclassification will remove the burden on Council to maintain land that is not suitable for use as public open space and enable the sale of surplus land.

Classification – All of the properties above are currently community land and it is proposed to re-classify them all to operational land.

Reasons for the reclassification – The land is being reclassified to enable more efficient and flexible management of the drainage reserves and assets. The other sites will be reviewed site by site with the view of offering surplus land for private sale.

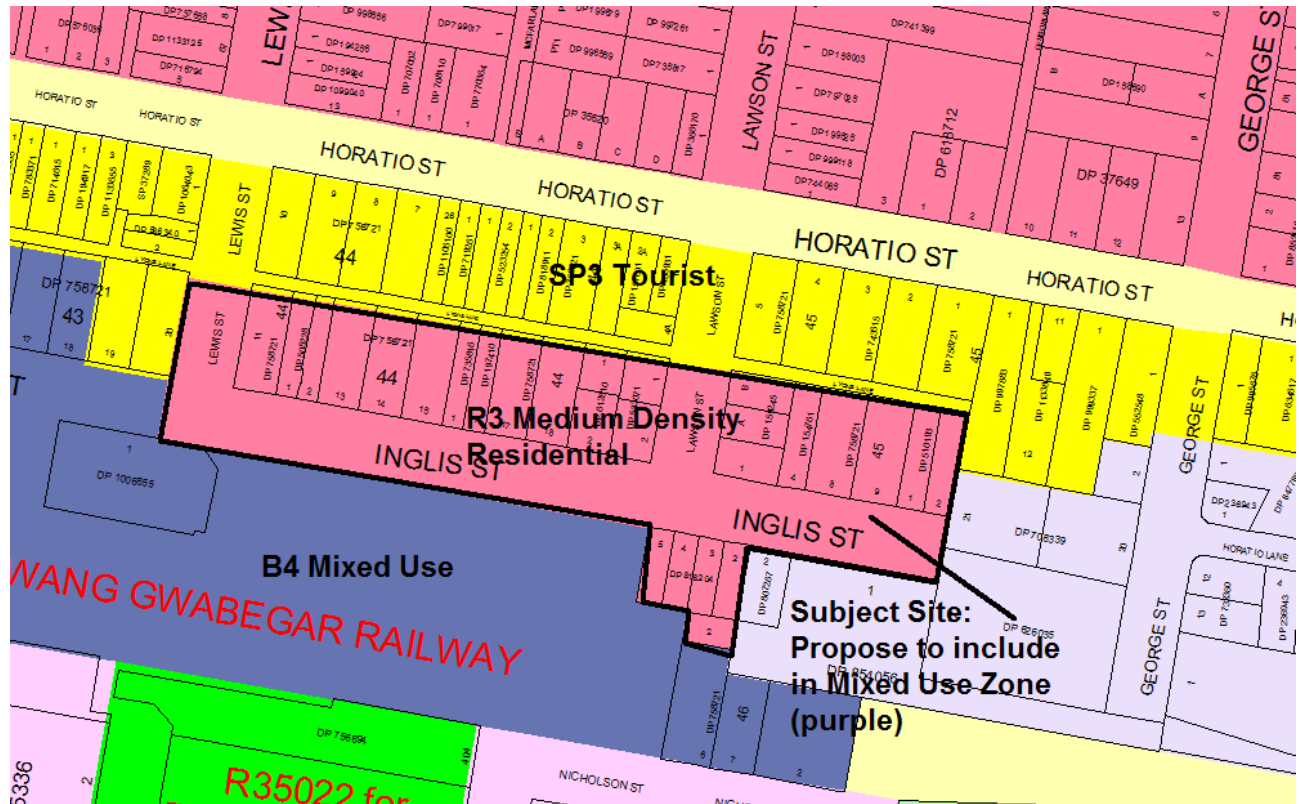
Council's interest in the land – refer to the table above.

Financial Loss or Gain – There is to be no gain due to rezoning as it is not proposed to alter the current zoning of the land. Financial gain may result from the disposal of the lands in Gulgong after reclassification has occurred. An estimate of the gain from proposal sales of lands totals \$70,000.

Asset Management Objectives - On 7 February 2007 Council resolved to dispose of land surplus to its needs, on a case by case basis. This Proposal seeks to address the first component of Council's discussion to reclassify the subject land from Community to Operational in order to facilitate disposal.

A copy of the Practice Note is attached as Appendix 2 to this Planning Proposal.

(g) Rezoning land from R1 General Residential to B4 Mixed Use in Inglis St Mudgee



The LEP 2012 introduced a number of new zones including an SP3 Tourist zone and B4 Mixed Use zone. The application of these zones either side of Inglis St in Mudgee has resulted in a small area of R3 Medium Density residential in isolation from other residential land. Further, there are a number of large garages and storage sheds, some of a commercial nature fronting the rear lane between Inglis St and Horatio Street. Given that the land is zoned R3, the legal commercial use of this land is limited. There is an opportunity to consider expanding the Mixed Use zone like that which occurs in the western end of Inglis Street and in Church Street opposite the tennis courts.

In addition to the uses already permissible in the R3 zone the B4 zone would allow:

Business, Office and Retail Premises, Vets, Wholesale supplies, water supply systems, car parks, passenger transport facilities, hotel or motel accommodation, camping grounds, caravan parks, emergency services facilities, public administration buildings, major recreation facilities, exhibition villages, helipad and mortuaries.

The proposal would require targeted consultation with land owners in Inglis Street and this can be undertaken in parallel with the planning proposal.

up the LEP. The amendments reflect the need for local provisions to deal with specific issues and circumstances within the region.

Mid-Western Regional Draft Comprehensive Land Use Strategy

The Mid-Western Regional Council has prepared the *Mid-Western Regional Comprehensive Land Use Strategy*. The Strategy provides clear direction for future growth and land-use change in the area for the next 15 to 20 years. The proposed amendments are generally consistent with the strategic direction established in the Strategy.

State and Regional Policies

Whilst there is no specific State or Regional Environmental Plan that addresses future development in Mudgee or that has relevance to the LGA, there are a number of significant challenges common to strategic planning in inland and regional areas of NSW. These are to:

- Support sustainable agriculture
- Conserve valuable environmental assets
- Minimise land use conflict.

At a general policy level, the proposed amendment will facilitate the more efficient use of land and provide clarity in an otherwise complex planning document.

Q2 Is the planning proposal the best means of achieving the objectives or outcomes or is there a better way?

The Planning Proposal is the best means of achieving the outcomes explicit to the Planning Proposal.

Section B – Relationship to strategic planning framework

Q3: Is the planning proposal consistent with the application regional or sub-regional strategy?

There are no regional strategies in place.

Q4: Is the proposal consistent with Council's Community Strategic Plan or other local strategic plan?

Yes. Refer to Q1

Q5: Is the planning proposal consistent with applicable state environmental planning policies?

Yes. An analysis of the applicable State Environmental Planning Policies (SEPP's) is included in the following table. The proposal is either consistent with or not offensive to any applicable SEPP's.

Planning Proposal – General Amendments

| SEPP | Consistency / Response |
|--|------------------------|
| 1 – DEVELOPMENT STANDARDS | Not relevant |
| 4 – DEVELOPMENT WITHOUT CONSENT | Not relevant |
| 6 – NUMBER OF STOREYS | Not relevant |
| 10 – RETENTION OF LOW COST RENTAL ACCOMMODATION | Not relevant |
| 14 – COASTAL WETLANDS | Not relevant |
| 19 – BUSHLAND IN URBAN AREAS | Not relevant |
| 21 – CARAVAN PARKS | Not relevant |
| 22 – SHOPS AND COMMERCIAL PURPOSES | Not relevant |
| 26 – LITTORAL RAINFORESTS | Not relevant |
| 29 – WESTERN SYDNEY RECREATION AREA | Not relevant |
| 30 – INTENSIVE AGRICULTURE | Not relevant |
| 32 – URBAN CONSOLIDATION (Redevelopment of Urban Land) | Not relevant |
| 33 – HAZARDOUS AND OFFENSIVE DEVELOPMENT | Not relevant |
| 36 – MANUFACTURED HOME ESTATES | Not relevant |
| 39 – SPIT ISLAND BIRD HABITAT | Not relevant |
| 41 – CASINO ENTERTAINMENT COMPLEX | Not relevant |
| 44 – KOALA HABITAT PROTECTION | Not relevant |
| 47 – MOORE PARK SHOWGROUND | Not relevant |
| 50 – CANAL ESTATE DEVELOPMENT | Not relevant |
| 52 – FARM DAMS AND OTHER WORKS IN LAND AND WATER MANAGEMENT PLAN AREAS | Not relevant |
| 53 – METROPOLITAN RESIDENTIAL DEVELOPMENT | Not relevant |
| 55 – REMEDIATION OF LAND | Not relevant |
| 59 – CENTRAL WESTERN SYDNEY ECONOMIC AND EMPLOYMENT AREA | Not relevant |
| 60 – EXEMPT AND COMPLYING DEVELOPMENT | Not relevant |
| 62 – SUSTAINABLE AQUACULTURE | Not relevant |

Planning Proposal – General Amendments

| SEPP | Consistency / Response |
|--|---|
| 64 – ADVERTISING AND SIGNAGE | Not relevant |
| 65 – DESIGN QUALITY OF RESIDENTIAL FLAT DEVELOPMENT | Not relevant |
| 70 – AFFORDABLE HOUSING | Not relevant |
| 71 - COASTAL PROTECTION | Not relevant |
| BASIX 2004 | Not relevant |
| EXEMPT AND COMPLYING DEVELOPMENT CODES 2008 | Not relevant |
| HOUSING FOR SENIORS OR PEOPLE WITH A DISABILITY 2009 | Not relevant |
| INFRASTRUCTURE 2007 | Not relevant |
| KOSCIUSZKO NATIONAL PARK - ALPINE RESORTS 2007 | Not relevant |
| MAJOR DEVELOPMENT 2005 | Not relevant |
| SYDNEY REGION GROWTH CENTRES 2006 | Not relevant |
| MINING, PETROLEUM PRODUCTION AND EXTRACTIVE INDUSTRIES 2007 | Not relevant |
| TEMPORARY STRUCTURES AND PLACES OF PUBLIC ENTERTAINMENT 2007 | Not relevant |
| RURAL LANDS 2008 | The aim of this SEPP is to facilitate the orderly and economic use and development of rural lands for rural and related purposes. Council is of the view that the provisions within the Planning Proposal are consistent with the intent of the Rural Lands SEPP. |
| EXEMPT AND COMPLYING DEVELOPMENT CODES 2008 | Not relevant |
| WESTERN SYDNEY EMPLOYMENT AREA 2009 | Not relevant |
| WESTERN SYDNEY PARKLANDS 2009 | Not relevant |
| AFFORDABLE RENTAL HOUSING | Not relevant |

There are no relevant Deemed SEPPs.

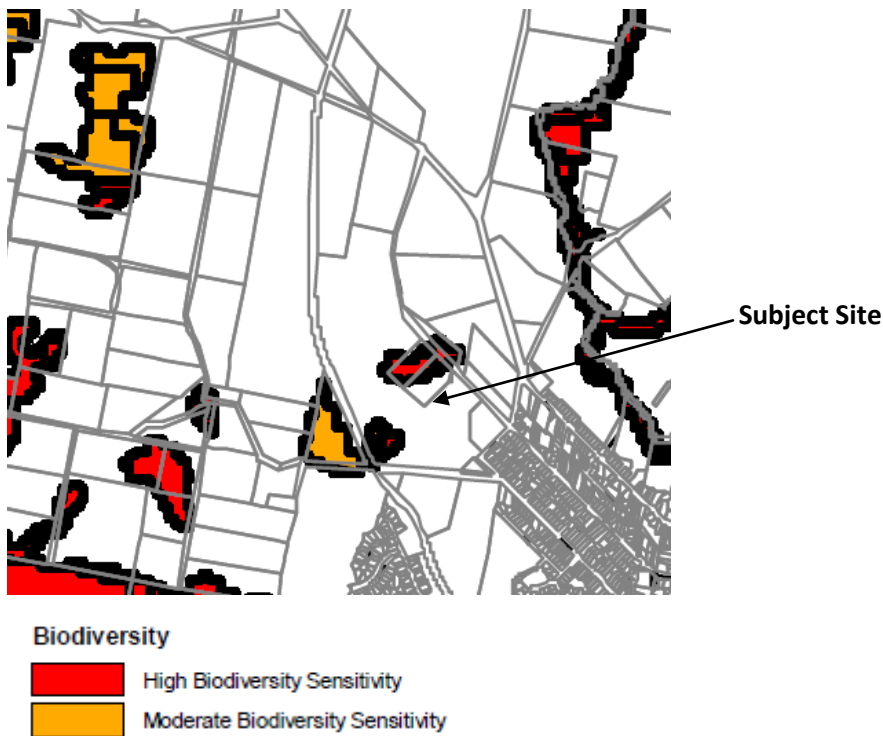
Q6: Is the planning proposal consistent with applicable Ministerial Directions (s.117 directions)?

The relevant section 117 Directions are addressed in Appendix 2. The proposal is consistent with those 117 Directions that are relevant to the site.

Section C – Environmental, social and economic impact

Q8: Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

Small pockets of land within the subject site are identified as having biodiversity values under Council’s Draft LEP mapping (see Figure 6). Further ecological and biodiversity studies can be carried out as the planning proposal progresses through the Gateway Process should it be considered necessary, to understand the extent of the biodiversity value of the land, and ensure the planning proposal will not cause any detrimental impact on critical habitat or threatened species, populations or ecological communities.



Q9: Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?

As set out in *A Guide to Preparing Planning Proposals*, the purpose of this question is to ascertain the likely environmental effects that may be relevant. It states that technical investigations to address an identified environmental issue should be undertaken following the initial Gateway determination.

Technical studies, together with community and public authority consultation, will investigate the potential for other likely environmental effects arising from the planning proposal and explore options for the mitigation and management of any environmental effects.

A review of biodiversity, site contamination and soil salinity should be undertaken prior to development of the site and can be done either post gateway or as a requirements through provisions in the amended instrument.

Q10: How has the planning proposal adequately addressed any social and economic effects?

The proposal will facilitate the development of much needed residential land. Mudgee is currently experiencing a housing crisis with upward pressure being placed on rent through demand for housing from those working in the mining industry. The Department of Planning and Infrastructure with Council have commissioned a Local Services Assessment to investigate the impact of the resources boom on the region. Although it is yet to be finalise, indications are that the planning proposal would be consistent with the outcomes of the assessment in terms of the need for additional residential land.

Section D – State and Commonwealth interests

Q11: Is there adequate public infrastructure for the planning proposal?

The assessment of public infrastructure is a relevant matter. At this stage the following infrastructure has been considered:

Utilities

Essential Energy has advised that there is capacity currently available for the proposal. Taking into account the planned future upgrade of the existing Water Supply System, there is capacity in system to provide potable water supply to cater to the proposal.

Further consultation will occur with telecommunication authorities to confirm the availability of utilities.

Sewer

A new Sewerage Augmentation system to service Mudgee township is currently under construction, consisting of a Sewage Treatment Plant, Pump Station and associated rising main. The plant is being sized to accommodate the planned growth in Mudgee therefore will have capacity to service the proposal.

Roads

There is currently good road access available in the surrounding road and traffic network to service the proposal. More detailed traffic investigations will be undertaken as the planning proposal progresses through the Gateway process.

Waste Management

The existing Waste Management Facility located west of the subject land will have capacity to service the proposal.

It is anticipated that enabling development on the subject land will increase demand on public infrastructure in the area. Consultation will be required on this matter with the appropriate public authorities who will be identified through the initial gateway determination.

Q12: What are the views of State and Commonwealth public authorities consulted in accordance with the gateway determination?

N/A at this stage

Part 4 – Community Consultation

The proposal deals with an issue that is currently generating significant community interest and it is considered appropriate to apply the recommended community consultation for ‘All other planning proposals’ which would include the following:

- An exhibition period of 28 days commencing on the date that a notice of exhibition is printed in the local news press
- Advertising in the local newspaper at the start of the exhibition period
- Advertising on Council’s website for the duration of the exhibition period

Consultation was undertaken as required by the Gateway Determination issue by the DOPI on 25 October 2013. The Gateway Determination is Attached as Appendix 3.

- Essential Energy
- NSW Office of Environment and Heritage
- Department of Primary Industries - Agriculture
- NSW Rural Fire Service
- Civil Aviation Safety Authority

Submission were received from DPI Agriculture, OEH and CASA none of whom have any comments or raised concerns in respect to the Planning Proposal.

Part 5 – Project Timeline

| Milestone | Date |
|--|---|
| Gateway Determination | Received 30 October 2013 |
| Completion of Technical Information | February 2014 |
| Agency Consultation | Commenced Dec 2013 Concluded February 2013 |
| Public Exhibition | Commence 7 th March 2014 |
| Public Hearing | Mid April 2014 |
| Consideration of Submissions | April 2014 |
| Report to Council | May 2014 |
| Submission back to the Department | May 2014 |

Appendix 1

117 Directions

Appendix 1 Section 117 Directions

1.1 Business and Industrial Zones

Objectives

- (1) The objectives of this direction are to:
 - (a) encourage employment growth in suitable locations,
 - (b) protect employment land in business and industrial zones, and
 - (c) support the viability of identified strategic centres.

Where this direction applies

- (2) This direction applies to all relevant planning authorities.

When this direction applies

- (3) This direction applies when a relevant planning authority prepares a planning proposal that will affect land within an existing or proposed business or industrial zone (including the alteration of any existing business or industrial zone boundary).

What a relevant planning authority must do if this direction applies

- (4) A planning proposal must:
 - (a) give effect to the objectives of this direction,
 - (b) retain the areas and locations of existing business and industrial zones,
 - (c) not reduce the total potential floor space area for employment uses and related public services in business zones,
 - (d) not reduce the total potential floor space area for industrial uses in industrial zones, and
 - (e) ensure that proposed new employment areas are in accordance with a strategy that is approved by the Director-General of the Department of Planning.

Consistency

- (5) A planning proposal may be inconsistent with the terms of this direction only if the relevant planning authority can satisfy the Director-General of the Department of Planning (or an officer of the Department nominated by the Director-General) that the provisions of the planning proposal that are inconsistent are:
 - (a) justified by a strategy which:
 - (i) gives consideration to the objective of this direction, and
 - (ii) identifies the land which is the subject of the planning proposal (if the planning proposal relates to a particular site or sites), and
 - (iii) is approved by the Director-General of the Department of Planning, or
 - (b) justified by a study (prepared in support of the planning proposal) which gives consideration to the objective of this direction, or
 - (c) in accordance with the relevant Regional Strategy or Sub-Regional Strategy prepared by the Department of Planning which gives consideration to the objective of this direction, or

(d) of minor significance.

Note: In this direction, “identified strategic centre” means a centre that has been identified as a strategic centre in a regional strategy, sub-regional strategy, or another strategy approved by the Director General.

| Section 117 Direction | | Applicable (PP) | Consistent | Remarks |
|-----------------------------------|--|-----------------|------------|--|
| 1 Employment and Resources | | | | |
| 1.1 | Business and Industrial Zones | Yes | No | The PP includes amendments to the Industrial zone in Inglis Street in Mudgee, however, it is considered of minor significance given that the amendment involves a change from Light Industry to Mixed Use and arguably providing additional opportunities for development within this precinct. The amendment is consistent with the objectives of the direction. The Mixed Use zone is also more aligned with the current land use structure of the area. The re-zoning will be undertaken in consultation with individual landowners and has been at the request of same to better accommodate the current mix of commercial and residential land use. |
| 1.2 | Rural Zones | Yes | N/A | |
| 1.3 | Mining, Petroleum Production and Extractive Industries | Yes | N/A | |
| 1.4 | Oyster Aquaculture | No | N/A | |
| 1.5 | Rural Lands | Yes | Yes | See Detail below. |
| 2 Environment and Heritage | | | | |
| 2.1 | Environment Protection Zones | Yes | N/A | |
| 2.2 | Coastal Protection | No | N/A | |
| 2.3 | Heritage Conservation | Yes | N/A | There are no known Aboriginal items at the site identified within any planning instruments. However, an Aboriginal Heritage can be undertaken post- |

Planning Proposal – General Amendments

| | | | | |
|--|---|-----|-----|---|
| | | | | gateway as required to determine that there is no potential impact on items of heritage significance. |
| 2.4 | Recreation Vehicle Areas | Yes | N/A | |
| 3 Housing, Infrastructure and Urban Development | | | | |
| 3.1 | Residential Zones | Yes | N/A | <p>This direction seeks <i>'To encourage a variety and choice of housing types to provide for existing and future housing needs; to make efficient use of existing infrastructure and services and ensure that new housing has appropriate access to infrastructure and services; and to minimise the impact of residential development on the environment and resource lands'</i>.</p> <p>The planning proposal is consistent with this objective and will provide for a range of dwelling types that will support the supply of residential development in the Mudgee region.</p> |
| 3.2 | Caravan Parks and Manufactured Home Estates | No | N/A | |
| 3.3 | Home Occupations | Yes | N/A | |
| 3.4 | Integrating Land Use and Transport | Yes | N/A | |
| 3.5 | Development Near Licensed Aerodromes | No | N/A | The land has previously been identified by council as land for future residential urban release, taking into account the location of Mudgee airport. |
| 4 Hazard and Risk | | | | |
| 4.1 | Acid Sulfate Soils | No | N/A | |
| 4.2 | Mine Subsidence and Unstable Land | No | N/A | |
| 4.3 | Flood Prone Land | No | N/A | |
| 4.4 | Planning for Bushfire Protection | Yes | TBA | Further assessment will be required in addition to consultation with the Commissioner of the NSW Rural Fire Service after the gateway determination and prior to community consultation. |
| 5 Regional Planning | | | | |

| | | | | |
|--------------------------------|---|---------|-----|--|
| 5.1 | Implementation of Regional Strategies | No | N/A | |
| 5.2 | Sydney Drinking Water Catchments | No | N/A | |
| 5.3 | Farmland of State and Regional Significance on the NSW Far North Coast | No | N/A | |
| 5.4 | Commercial and Retail Development along the Pacific Highway, North Coast | No | N/A | |
| 5.5 | Development in the vicinity of Ellalong, Paxton and Millfield (Cessnock LGA) | revoked | | |
| 5.6 | Sydney to Canberra Corridor (Revoked 10 July 2008. See amended Direction 5.1) | | | |
| 5.7 | Central Coast (Revoked 10 July 2008. See amended Direction 5.1) | | | |
| 5.8 | Second Sydney Airport: Badgerys Creek | No | N/A | |
| 6 Local Plan Making | | | | |
| 6.1 | Approval and Referral Requirements | Yes | Yes | Is consistent with Ministerial Direction |
| 6.2 | Reserving Land for Public Purposes | No | N/A | |
| 6.3 | Site Specific Provisions | Yes | N/A | |
| 7 Metropolitan Planning | | | | |
| 7.1 | Implementation of the Metropolitan Strategy | No | N/A | |

117(s) Directions

1.5 Rural Lands

Objectives

- (6) The objectives of this direction are to:

- (a) protect the agricultural production value of rural land,
- (b) facilitate the orderly and economic development of rural lands for rural and related purposes.

Where this direction applies

- (2) (a) This direction applies to all planning proposals to which *State Environmental Planning Policy (Rural Lands) 2008* applies, which includes all local government areas in the State other than the following local government areas:

| | | |
|----------------|----------------|-------------|
| Ashfield | Holroyd | Penrith |
| Auburn | Hornsby | Pittwater |
| Bankstown | Hunters Hill | Randwick |
| Baulkham Hills | Hurstville | Rockdale |
| Blacktown | Kogarah | Ryde |
| Blue Mountains | Ku-ring-gai | Strathfield |
| Botany Bay | Lake Macquarie | Sutherland |
| Burwood | Lane Cove | Warringah |
| Camden | Leichhardt | Waverley |
| Campbelltown | Liverpool | Willoughby |
| Canada Bay | Manly | Wollondilly |
| Canterbury | Marrickville | Woollahra |
| City of Sydney | Mosman | Wollongong |
| Fairfield | Newcastle | Wyong |
| Gosford | North Sydney | |
| Hawkesbury | Parramatta | |

When this direction applies

- (8) This direction applies when:
 - (a) a relevant planning authority prepares a planning proposal that will affect land within an existing or proposed rural or environment protection zone (including the alteration of any existing rural or environment protection zone boundary) or
 - (b) a relevant planning authority prepares a planning proposal that changes the existing minimum lot size on land within a rural or environment protection zone.

What a relevant planning authority must do if this direction applies

- (4) A planning proposal to which clauses 3(a) or 3(b) apply must be consistent with the Rural Planning Principles listed in *State Environmental Planning Policy (Rural Lands) 2008*.
- (5) A planning proposal to which clause 3(b) applies must be consistent with the Rural Subdivision Principles listed in *State Environmental Planning Policy (Rural Lands) 2008*.

Note: *State Environmental Planning Policy (Rural Lands) 2008* does not require a relevant planning authority to review or change its minimum lot size(s) in an existing LEP. A relevant planning authority can transfer the existing minimum lot size(s) into a new LEP. However, where a relevant planning authority seeks to vary an existing minimum lot size in an LEP, it must do so in accordance with the Rural Subdivision Principles listed in *State Environmental Planning Policy (Rural Lands) 2008*.

Consistency

- (6) A planning proposal may be inconsistent with the terms of this direction only if the relevant planning authority can satisfy the Director-General of the Department of Planning (or an officer of the Department nominated by the Director-General) that the provisions of the planning proposal that are inconsistent are:
- (a) justified by a strategy which:
 - i. gives consideration to the objectives of this direction,
 - ii. identifies the land which is the subject of the planning proposal (if the planning proposal relates to a particular site or sites, and
 - iii. is approved by the Director-General of the Department of Planning and is in force, or
 - (b) is of minor significance.

Comment

Both clauses 4(a) and 4(b) apply in that the Planning Proposal affects rural land and changes the lot size of land within a rural zone, therefore triggering consistency with either/or the Rural Planning and Subdivision Principles of the SEPP (Rural Lands) 2008, extracted below.

7 Rural Planning Principles

The Rural Planning Principles are as follows:

- (a) the promotion and protection of opportunities for current and potential productive and sustainable economic activities in rural areas,
- (b) recognition of the importance of rural lands and agriculture and the changing nature of agriculture and of trends, demands and issues in agriculture in the area, region or State,
- (c) recognition of the significance of rural land uses to the State and rural communities, including the social and economic benefits of rural land use and development,
- (d) in planning for rural lands, to balance the social, economic and environmental interests of the community,
- (e) the identification and protection of natural resources, having regard to maintaining biodiversity, the protection of native vegetation, the importance of water resources and avoiding constrained land,
- (f) the provision of opportunities for rural lifestyle, settlement and housing that contribute to the social and economic welfare of rural communities,

- (g) the consideration of impacts on services and infrastructure and appropriate location when providing for rural housing,
- (h) ensuring consistency with any applicable regional strategy of the Department of Planning or any applicable local strategy endorsed by the Director-General.

The SEPP (Rural Lands) 2008 also includes a number of subdivision principles;

8 Rural Subdivision Principles

The Rural Subdivision Principles are as follows:

- (a) the minimisation of rural land fragmentation,
- (b) the minimisation of rural land use conflicts, particularly between residential land uses and other rural land uses,
- (c) the consideration of the nature of existing agricultural holdings and the existing and planned future supply of rural residential land when considering lot sizes for rural lands,
- (d) the consideration of the natural and physical constraints and opportunities of land,
- (e) ensuring that planning for dwelling opportunities takes account of those constraints.

In order to address this direction the table of amendments covered by this planning proposal has been altered and a comment as to the justification for the inconsistency has been inserted.

| Amendment | Objective/Outcome | Comment |
|---|---|---|
| (a) Clarify dwelling provisions as they relate to split parcels on the Rylstone Lot Size Map | Certainty as to the erection of a dwelling on a split zoned parcel | The inclusion of a clause clarifying how the minimum lot size is applied when land has a split lot size is not inconsistent with the SEPP (Rural Lands) 2008. |
| (b) Dwellings on rural land - Clarification of clause 4.2 A | Remove uncertainty in interpretation of the clause | As Above, the amendment goes to clarification of the provisions |
| (c) Insert a Farm Adjustment Clause | Provisions that will provide flexibility in the subdivision of rural land | The inclusion of this clause will facilitate better rural land management. The consistency with the SEPP is addressed in the body of the PP refer p6 |

| | | |
|---|---|--|
| (d) Subdivision of land below MLS for a non-agricultural purpose, | Provide flexibility in use of rural land | This is a provisions that has existing in previous planning instruments. The Rural SEPP is |
| (e) Clarification of the 2 ha minimum lot size on Lot 1 DP 1166658, | Facilitate development for subdivision for the purpose of aero-related development | While the minimum lot size provides for a 2 ha lot, clause 4.2B requires that the proponent demonstrate an intensive agricultural use. Addressing this anomaly in the LEP is not considered inconsistent with the direction or the SEPP. |
| (f) Reclassify drainage reserves and surplus land from Community to Operational Land | Enable better management of drainage reserves and land reclassification | N/A |
| (g) Rezoning land from R1 General Residential to B4 Mixed Use in Inglis St Mudgee, | Rezone land to better reflect the current and potential use of the land | N/A |
| (h) Rezoning land from IN2 Light Industrial to B4 Mixed Use on Lots 1 & 2 Section 49 DP 758721 Inglis St Mudgee, | Rezone land to better reflect the current and potential use of the land, in particular as it relates to the permissibility of dwellings | N/A |

Appendix 2

LEP Practice Note Land Classification

Appendix 3

Gateway Determination

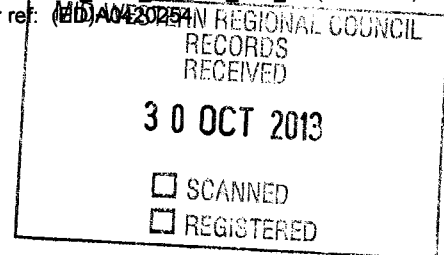


Planning & Infrastructure

Contact: Louise Starkey
 Phone: (02) 6841 2180
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 Email: Louise.Starkey@planning.nsw.gov.au
 Postal: PO Box 58, Dubbo NSW 2830

Mr Warwick Bennett
 General Manager
 Mid-Western Regional Council
 PO Box 156
 MUDGEE NSW 2850

Our ref: PP 2013 MIDWR 006_00 (13/16407)
 Your ref: (13) AW 20294



Warwick
 Dear Mr Bennett,

Planning proposal to amend Mid-Western Regional Local Environmental Plan 2012

I am writing in response to your Council's letter dated 19 September 2013 requesting a Gateway determination under section 56 of the Environmental Planning and Assessment Act 1979 ("EP&A Act") in respect of the planning proposal for various amendments including: item (a) clarifying subdivision and dwelling provisions on certain land subject to two minimum lot sizes; item (b) clarifying clause 4.2A relating to provisions for dwellings on rural land; items (c and d) inserting a new clause to facilitate farm adjustment and a new clause to allow subdivision of rural land below the minimum lot size, in certain circumstances; item (e) permitting certain development and subdivision as additional permitted uses on land adjoining the Mudgee Airport; item (f) reclassifying certain land from 'community' to 'operational' land; and items (g and h) rezoning certain land at Inglis Street, Mudgee to B4 Mixed Use.

As delegate of the Minister for Planning and Infrastructure, I have now determined the planning proposal should proceed subject to the conditions in the attached Gateway determination.

While I support the intended outcome of the planning proposal, Council's proposed provision to include private aircraft hangers, associated dwellings and permit subdivision for purposes other than intensive agriculture as additional permitted uses on land adjoining the Mudgee Airport is not supported as a means of achieving the intended outcome. Council is to consider zoning the land appropriately to reflect the intended land uses, such as zoning the land to an appropriate special purpose zone. Council is to amend the planning proposal to reflect the above approach, prior to undertaking public exhibition.

I have also agreed the planning proposal's inconsistencies with S117 Directions 1.1 Business and Industrial Zones, 1.2 Rural Zones and 1.5 Rural Lands (in regards to item (c) and item (e)) are of minor significance. No further approval is required in relation to these Directions.

Council is reminded of its obligations for undertaking a public hearing and providing adequate information regarding the discharge of any interests in relation to the proposed reclassification of land in accordance with the department's practice note *PN09-003, Classification and reclassification of public land through a local environmental plan*.

The Minister delegated his plan making powers to councils in October 2012. It is noted that Council has now accepted this delegation. I have considered Council's planning proposal and have decided not to issue an authorisation for Council to exercise delegation because Council has not confirmed that the Governor's approval is not required for the reclassification of land. Reclassification proposals where the Governor's approval is required cannot be delegated back to councils. Should Council demonstrate that it does not require the Governor's approval for the reclassification, it should contact the relevant regional office as soon as practicable.

The amending LEP is to be finalised within 12 months of the week following the date of the Gateway determination. Council should aim to commence the exhibition of the planning proposal as soon as possible. Council's request for the department to draft and finalise the LEP should be made 6 weeks prior to the projected publication date.

The State Government is committed to reducing the time taken to complete LEPs by tailoring the steps in the process to the complexity of the proposal, and by providing clear and publicly available justification for each plan at an early stage. In order to meet these commitments, the Minister may take action under section 54(2)(d) of the EP&A Act if the time frames outlined in this determination are not met.

Should you have any queries in regard to this matter, please contact Louise Starkey of the regional office of the department on 02 6841 2180.

Yours sincerely,


25.10.13
Neil McGaffin
Acting Deputy Director General
Planning Operations & Regional Delivery

Encl: Gateway determination

Gateway Determination

Planning proposal (Department Ref: PP_2013_MIDWR_006_00): to make various amendments to the Mid-Western Regional LEP 2012.

I, the Acting Deputy Director General, Planning Operations and Regional Delivery at the Department of Planning and Infrastructure as delegate of the Minister for Planning and Infrastructure, have determined under section 56(2) of the EP&A Act that an amendment to the Mid-Western Regional Local Environmental Plan (LEP) 2012 for various amendments including: item (a) clarifying subdivision and dwelling provisions on certain land subject to two minimum lot sizes; item (b) clarifying clause 4.2A relating to provisions for dwellings on rural land; items (c and d) inserting a new clause to facilitate farm adjustment and a new clause to allow subdivision of rural land below the minimum lot size, in certain circumstances; item (e) permitting certain development and subdivision as additional permitted uses on land adjoining the Mudgee Airport; item (f) reclassifying certain land from 'community' to 'operational' land; and items (g and h) rezoning certain land at Inglis Street, Mudgee to B4 Mixed Use should proceed subject to the following conditions:

1. Council's proposed provision to include private aircraft hangers, associated dwellings and permit subdivision for purposes other than intensive agriculture as additional permitted uses on land adjoining the Mudgee Airport is not supported and should be removed from the planning proposal. Council is to consider zoning the subject land appropriately to reflect the intended land uses. Council is to amend the planning proposal to reflect the above approach and to provide further clarification and justification regarding land uses proposed on the subject land. This is to be done prior to undertaking public exhibition.
2. Prior to undertaking public exhibition, Council is to update the planning proposal to:
 - a) include additional information regarding the potential impact and fragmentation of rural land as a result of item (a). Council is to identify the affected land, assess the impacts of the potential additional dwellings and potential impacts of the proposal on surrounding land and justify why a 50% threshold has been chosen for land with a minimum lot size of 40ha, or justify another percentage;
 - b) remove the draft clauses for items (a), (b), (c) and (d) from the 'explanation of provisions' within the planning proposal and instead provide a plain English explanation of the intention of the proposed provisions;
 - c) include a project timeline, consistent with Section 2.6 Part 6 of the *A Guide to Preparing Planning Proposals*.
 - d) address the Director-General's requirements relating to the reclassification of public land consistent with section 5.5.4 of *A Guide to Preparing LEPs*, which includes advising whether the planning proposal extinguishes any interests.
 - e) include existing and proposed land zoning and other applicable maps, which are at an appropriate scale and clearly identify the subject lands. Council is to prepare mapping consistent with the Standard technical requirements for LEP maps when it makes a request for the department to finalise the LEP.
3. Council is to update the planning proposal to include sufficient additional information to adequately demonstrate consistency or justify any inconsistency with the below S117 Directions:
 - 1.5 Rural Lands (item (a))
 - 3.5 Development Near Licensed Aerodromes (item (e))
 - 4.4 Planning for Bushfire Protection
 - 6.2 Reserving Land for Public Purposes (item (f))



Planning & Infrastructure

4. Community consultation is required under sections 56(2)(c) and 57 of the Environmental Planning and Assessment Act 1979 ("EP&A Act") as follows:
 - (a) the planning proposal must be made publicly available for a minimum of **28 days**; and
 - (b) the relevant planning authority must comply with the notice requirements for public exhibition of planning proposals and the specifications for material that must be made publicly available along with planning proposals as identified in section 5.5.2 of *A Guide to Preparing LEPs (Department of Planning & Infrastructure 2013)*.

5. Consultation is required with the following public authorities under section 56(2)(d) of the EP&A Act and/or to comply with the requirements of relevant S117 Directions:
 - Essential Energy
 - Department of Primary Industries – Agriculture
 - Office of Environment and Heritage
 - NSW Rural Fire Service (S117 Direction 4.4 Planning for Bushfire Protection)
 - Civil Aviation Safety Authority (S117 Direction 3.5 Development Near Licensed Aerodromes)

Each public authority is to be provided with a copy of the planning proposal and any relevant supporting material, and given at least 21 days to comment on the proposal.

6. A public hearing is not required to be held into the matter under section 56(2)(e) of the EP&A Act. However, a public hearing is required to be held into the matter in accordance with the department's practice note PN09-003, as the planning proposal involves a reclassification of land from community to operational.

7. The timeframe for completing the LEP is to be **12 months** from the week following the date of the Gateway determination.

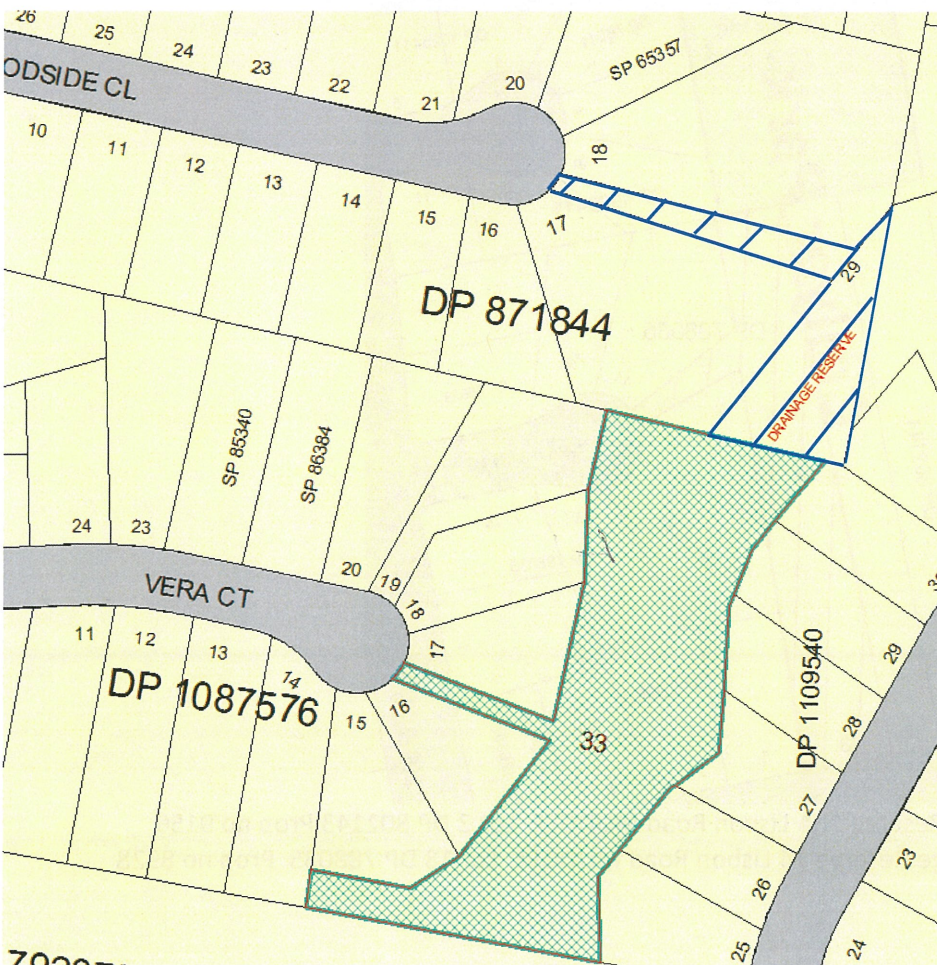
Dated *25th* day of *October* 2013.

Neil McGaffin
Acting Deputy Director General
Planning Operations & Regional Delivery
Department of Planning & Infrastructure

Delegate of the Minister for Planning & Infrastructure

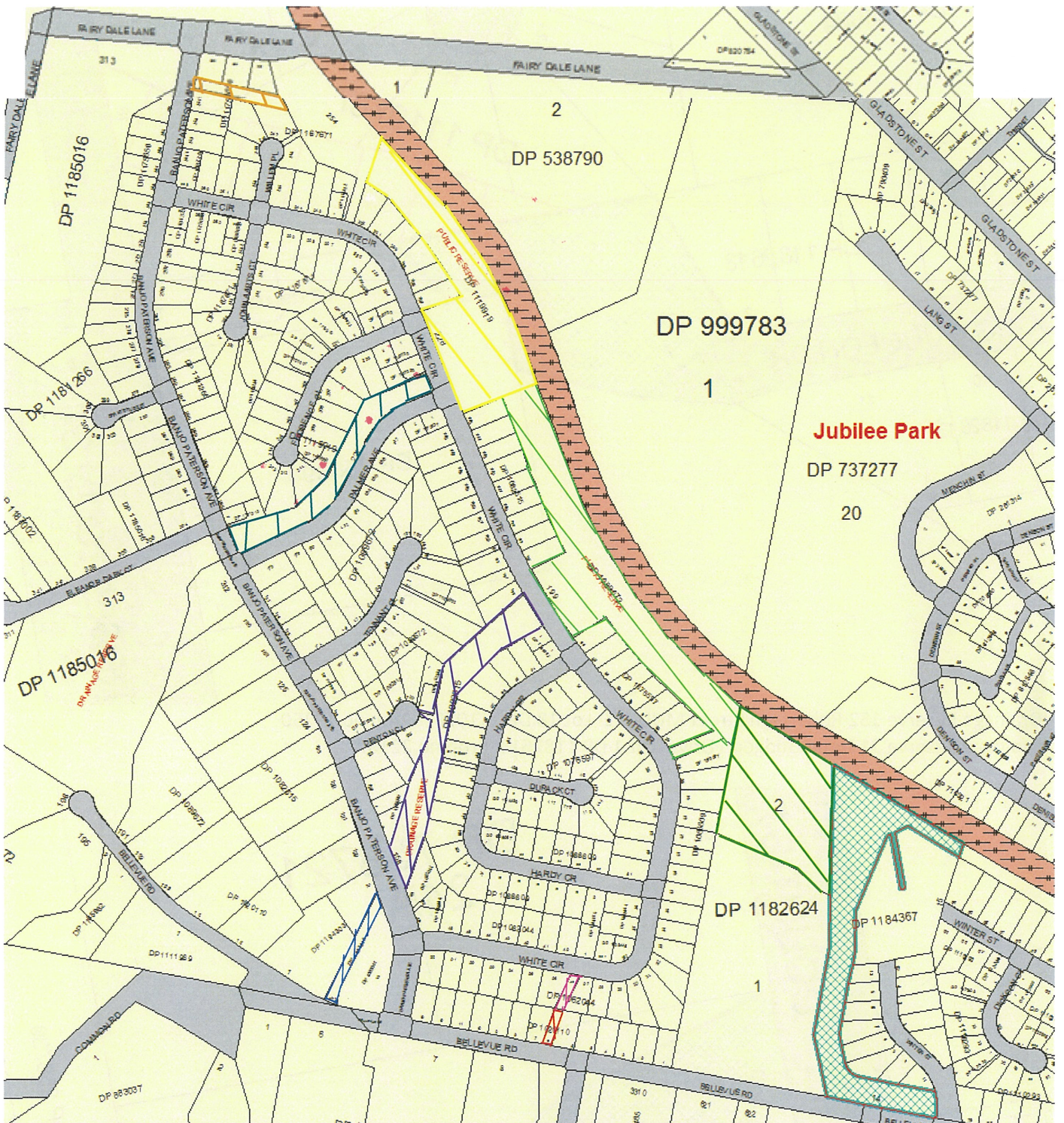


#Drainage Reserve Public Reserve 18A Macquarie Drive MUDGEE Lot 47 DP 862452 Prop no 11219

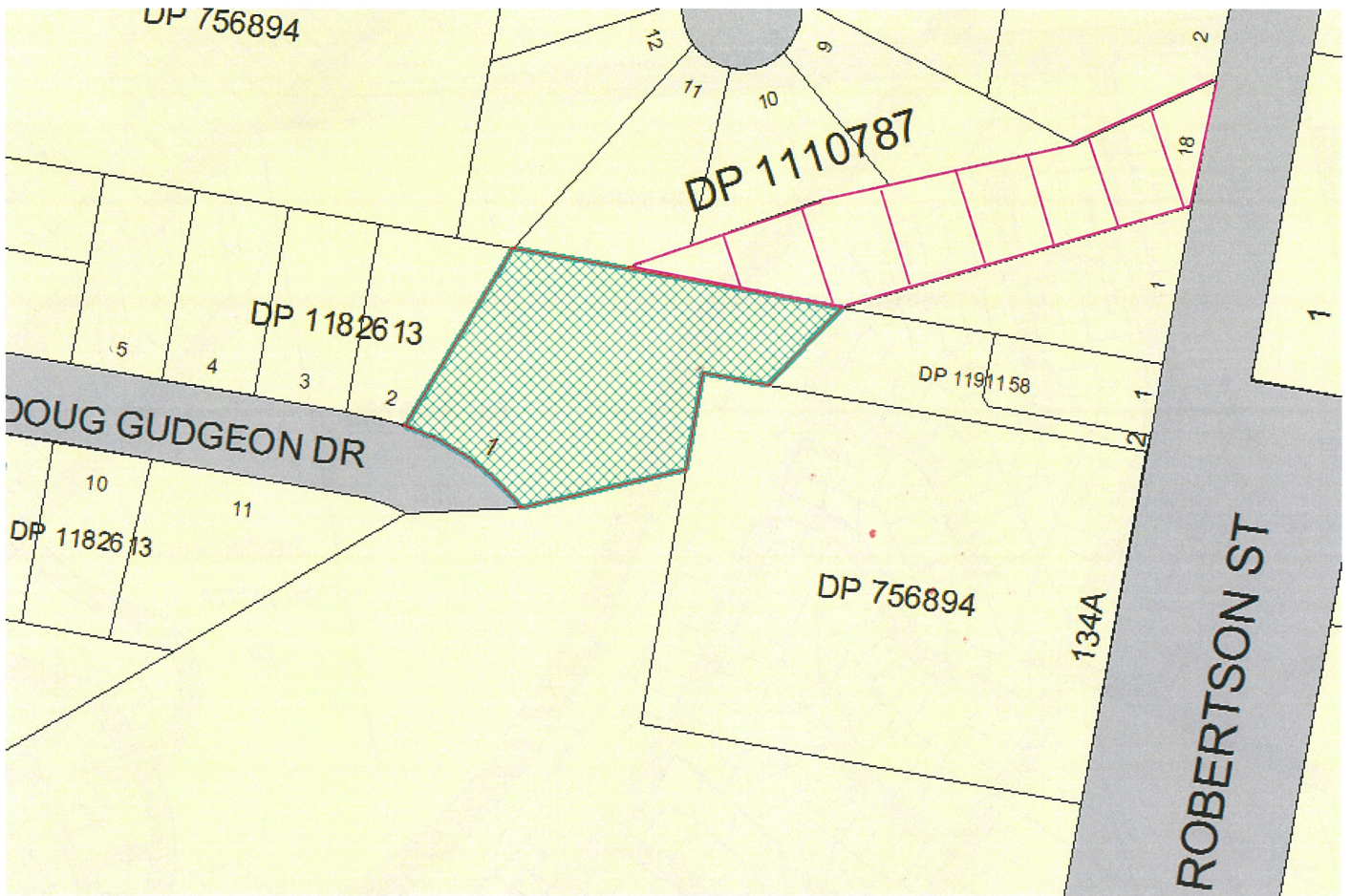


#Drainage Reserve 30 Vera Court MUDGEE Lot 33 DP 1087576 Prop no 18613

#Drainage Reserve Public Reserve 29 Woodside Close MUDGEE Lot 29 DP 871844 Prop no 20174



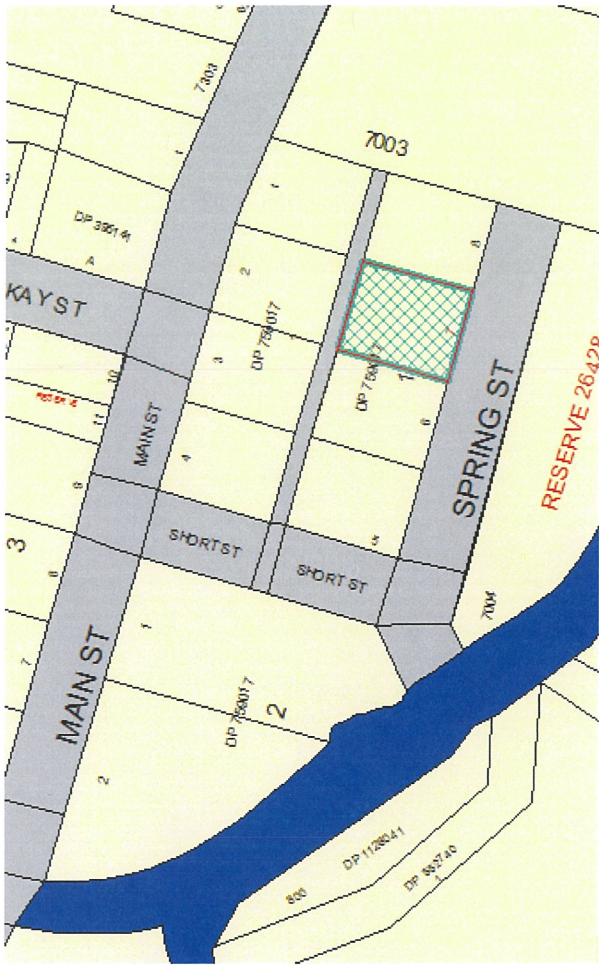
- #Drainage Reserve 40-48 Bellevue Road MUDGEE Lot 14 DP 1184367 Prop no 22209
- # Drainage Reserve 49A White Circle MUDGEE Lot 2 DP 1182624 Prop no 22064
- #Drainage Reserve Public Reserve 65A White Circle MUDGEE Lot 199 DP 1089672 Prop no 18866
- #Drainage Reserve Public Reserve 85-95 White Circle MUDGEE Lot 228 DP 1119919 Prop no 19614
- # Drainage Reserve 69 Banjo Paterson Avenue MUDGEE Lot 271 DP 1175650 Prop no 21766
- #Drainage Reserve 72 White Circle MUDGEE Lot 227 DP 1119919 Prop no 19621 Prop no 19621
- #Drainage Reserve 3A Banjo Paterson Avenue MUDGEE Lot 158 DP 1082615 Prop no 18550
- #Drainage Reserve 2A Banjo Paterson Avenue MUDGEE Lot 157 DP 1082615 Prop no 18549
- #Drainage Reserve 15 White Circle MUDGEE Lot 49 DP 1062044 Prop no 13436
- #Drainage Reserve 76A Bellevue Road MUDGEE Lot 19 DP 1020110 Prop no 12635



#Drainage Reserve 152 Robertson Street MUDGE E Lot 18 DP 1110787 Prop no 19250
 #Drainage Reserve 11 Doug Gudgeon Drive Lot 1 DP 1182613 Prop no 22167



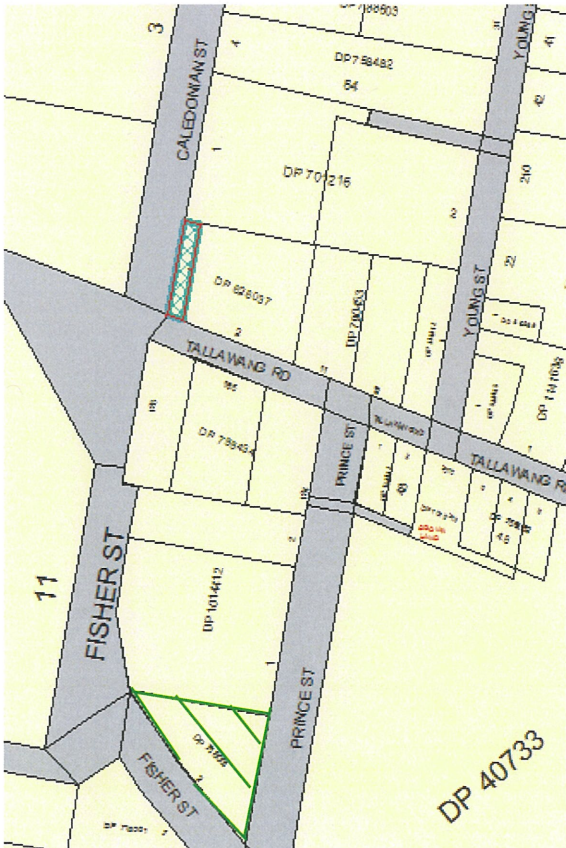
#Drainage Reserve Walkers Oval Public Reserve 3 Court Street MUDGE E Lot 23 DP 816236 Prop no 9772



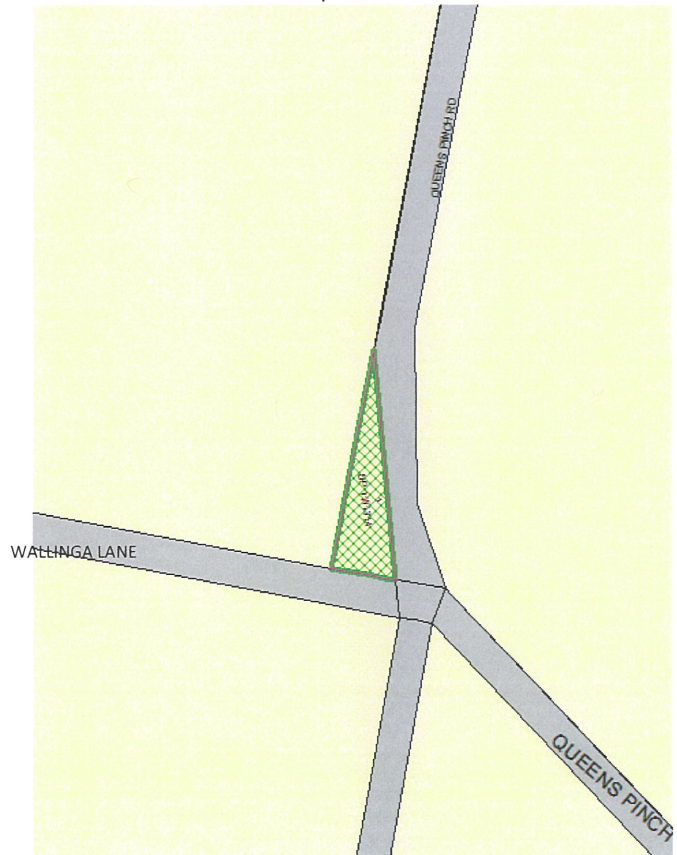
#Vacant Land 15 Spring Street ULAN
 Lot 7 Sec 1 DP 759017 Prop no 13933



Former Closed Council Road 3A Industrial Ave MUDGEE
 Lot 82 DP 1127630 Prop no 19941



#Public Reserve 20 Tallowang Road GULGONG
 Lot 3 DP 626037 Prop no 11104
 # Public Reserve 40 Fisher Street GULGONG
 Lot 2 DP 718061 Prop no 11128



#Queens Pinch Waste Transfer Station
 147 Wallinga Lane SPRING FLAT Lot 1 DP 1181314
 Prop no 21856

Mid-Western Regional Council

86 Market Street

MUDGEES NSW 2850

26th March 2014

Dear Sir/Madam

**RE: Planning Proposal – Rezoning Land from R3 Medium Density Residential to B4
Mixed use in Inglis Street Mudgee**

We are opposed to the abovementioned planning proposal.

My husband and I live in Inglis Street Mudgee, which is a residential street, and enjoy the peace and quiet and privacy of our home. We are aware of the current surrounding businesses, and feel that they are adequate for this small area of Mudgee. The R3 Medium Density is already enough for our "Local Environment" and any further change to a B4 Mixed Use area would ruin the environment and disturb the residents, who live in the proposed area.

Mudgee has two industrial areas already. I fail to see the benefit or necessity for more, especially within our residential area. It will eventually turn our peaceful "Residential Zone", to primarily a noisier "Higher Density Mixed Zone", that will only be of benefit to those who seek it for its commercial use.

We feel you have disregarded the opinions of the residents of the proposed area for rezoning, namely Inglis Street. The lifestyles, health & safety & value of the residents properties, will all be affected by your planning proposal.

We wish to remain "R3 Medium Density Residential" and highly object to be rezoned to "B4 Mixed".

We wait to hear your response to our letter of oppose.

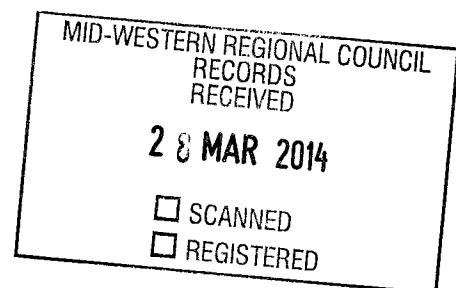
Yours faithfully

W. Roberts

Wayne & Toni Roberts

14 Inglis Street

MUDGEES NSW 2850





Flood Study for Kandos and Rylstone

FLOOD STUDY REPORT

- FINAL
- November 2013



Flood Study for Kandos and Rylstone

FLOOD STUDY REPORT

- FINAL
- November 2013

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LIMITATION: The sole purpose of this report and the associated services performed by Sinclair Knight Merz Pty Ltd (SKM) is to UNDERTAKE A FLOOD STUDY in accordance with the scope of services set out in the contract between SKM and Mid-Western Regional Council. That scope of services, as described in this report, was developed with Mid-Western Regional Council.

In preparing this report, SKM has relied upon, and presumed accurate, certain information (or absence thereof) provided by the Client and other sources. Except as otherwise stated in the report, SKM has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

SKM derived the data in this report from a variety of sources. The sources are identified at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. SKM has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose of the project and by reference to applicable standards, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report.

This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by SKM for use of any part of this report in any other context.

This report has been prepared on behalf of, and for the exclusive use of, Mid-Western Regional Council and is subject to, and issued in connection with, the provisions of the agreement between SKM and Mid-Western Regional Council. SKM accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.



FOREWORD

The primary objective of the New South Wales Government's Flood Prone Land Policy is to reduce the impact of flooding and flood liability on individual owners and occupiers of flood prone property, and to reduce private and public losses resulting from floods, utilising ecologically positive methods, wherever possible. Under the Policy, the management of flood prone land remains the responsibility of local government.

The policy provides for a floodplain management system comprising the following five sequential stages:

- 1. Data Collection** Involves compilation of existing data and collection of additional data
- 2. Flood Study** Determines the nature and extent of the flood problem
- 3. Floodplain Risk Management Study** Evaluates management options in consideration of social, ecological and economic factors relating to flood risk with respect to both existing and future development
- 4. Floodplain Risk Management Plan** Involves formal adoption by Council of a plan of management for the floodplain
- 5. Implementation of the Plan** Implementation of flood, response and property modification measures (including mitigation works, planning controls, flood warnings, flood preparedness, environmental rehabilitation, ongoing data collection and monitoring by Council

Mid-Western Regional Council (Council) is responsible for local planning and land management in its Local Government Area (LGA), including the management of flood prone areas in the townships of Kandos and Rylstone. Through its Floodplain Risk Management Committee, Council proposes to prepare a comprehensive Floodplain Risk Management Plan for Kandos and Rylstone in accordance with the New South Wales Government's 2005 Floodplain Development Manual.

This report represents the first and the second stages of the management process and has been prepared for Council by Sinclair Knight Merz. It documents the nature and extents of flooding throughout Kandos and Rylstone and is an essential resource for the subsequent stages of the floodplain risk management process.



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1. Introduction

1.1. Background

Mid-Western Regional Council (MWRC) is responsible for local planning and land management in the towns of Kandos and Rylstone. Council is currently reviewing its Local Environment Plan (LEP) and preparing a Development Control Plan (DCP). Council has no formal floodplain risk management strategies in place to provide an appropriate level of protection for the Kandos and Rylstone communities. Further, Council has no formal emergency management strategies to effectively manage the continuing flood problems for the two towns. Hence, Council proposes to develop floodplain risk management plans for both Kandos and Rylstone in phases, in accordance with the NSW Government's (2005) Floodplain Development Manual. Initial investigations (including data collection and review of all relevant data) and a flood study, are included in the first phase (Phase 1). For both towns, a Floodplain Risk Management Study (the Study) and Plan (the Plan) will be developed in the second phase (Phase 2), with the Plan being implemented in the third phase (Phase 3).

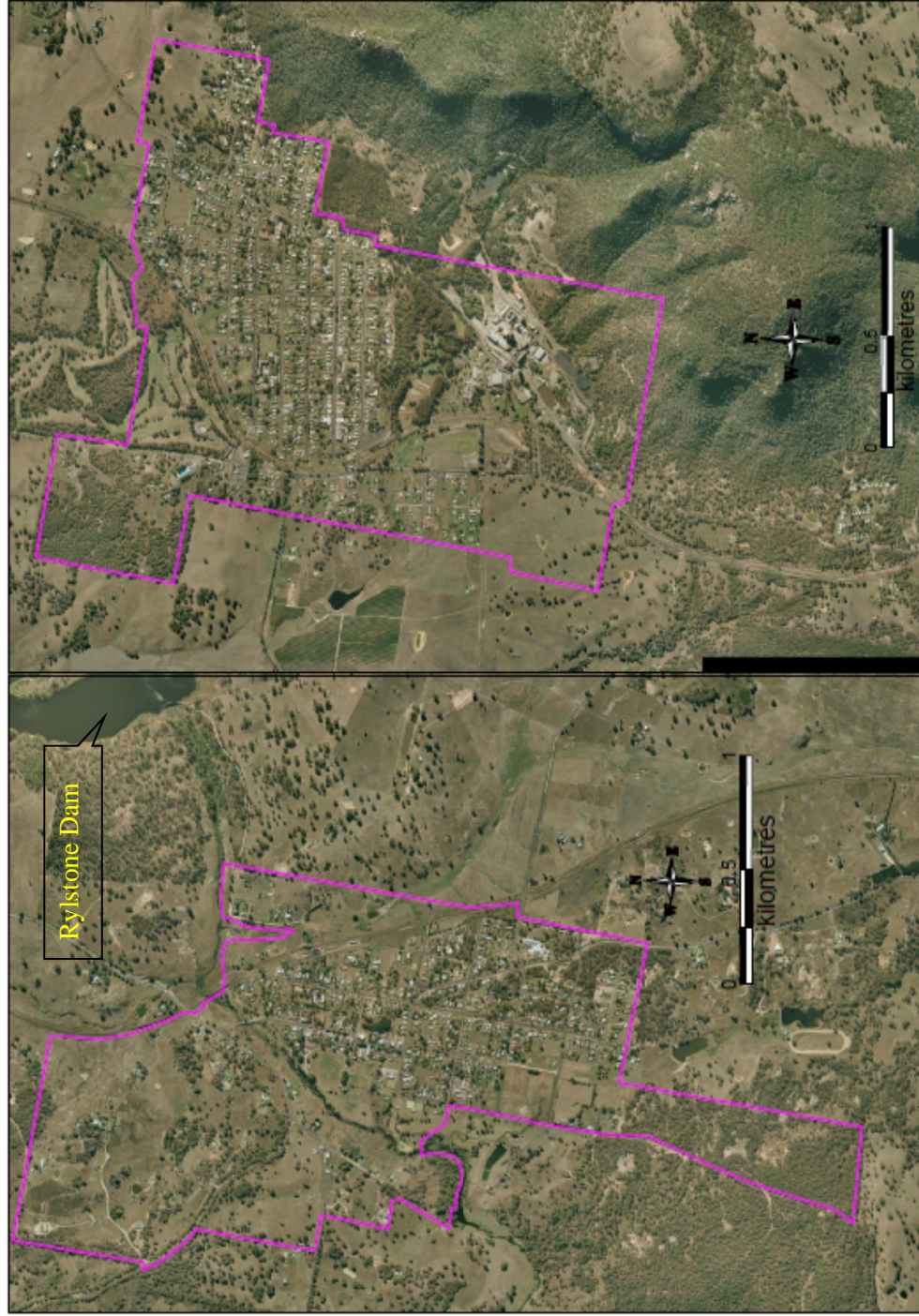
Sinclair Knight Merz (SKM) was engaged by Council in June 2011 to develop a Floodplain Risk Management Plan for Kandos and Rylstone encompassing all activities in Phase 1 and Phase 2. This report details outcomes from Phase 1 of the project.

1.2. Study Areas

1.2.1. Kandos

The study area for Kandos is shown in **Figure 1-1**. Kandos (population approximately 1,440) is located in the Central Tablelands of NSW. The town is located on the headwaters of Cumber Melon Creek, which is a tributary of the Cudgegong River. Kandos has a history of overland flooding and in recent times, Kandos experienced minor overland flooding in 2010 and 2012. Minor development has modified overland flow paths to some extent and future development has the potential to aggravate overland flooding further. Council is reviewing its LEP and also preparing a DCP, in order to guide the expansion of the township, and Council needs to assess the impact of future urbanisation on the catchment.

■ **Figure 1-1 Study Areas**



Rylstone

Kandos



1.2.2. Rylstone

The study area for Rylstone is shown in **Figure 1-1**. Rylstone (population approximately 730) is located in the upper Cudgegong River catchment and has a history of both overland flooding and, to a much lesser extent, riverine flooding from the Cudgegong River. The town experienced several major floods in the 1950s due to flooding in the Cudgegong River and in recent times significant overland flooding problems were experienced in some parts of the town in 2010 and 2012.

Rylstone Dam, which provides water supply for Rylstone and Kandos, is located on the Cudgegong River approximately 1 km upstream of Rylstone. Failure of Rylstone Dam (catchment area 535 km² and a storage capacity of 3,038 ML) has the potential to impact on flooding in Rylstone.

1.3. Overall Objective

Council needs to develop a Floodplain Risk Management Plan (FRMP) for Kandos and Rylstone, to address the existing, future and continuing flood problems, in accordance with the NSW Floodplain Development Manual (2005). To meet the requirements of the Manual, Council needs a FRMP in order to:

- Reduce the flood hazard and risk to people and property in the existing community;
- Provide valuable flood intelligence to assist State Emergency Service (SES) in updating Local Flood Plans for the townships;
- Protect, maintain and, where possible, enhance the river and floodplain environment, and
- Ensure flood management decisions integrate the social, economic and environmental considerations.

The study is being undertaken in three phases. Major activities undertaken in each phase are provided below:

- **Phase 1**
 - **Initial Investigations**
 - A site inspection;
 - Data collection and review of all relevant documents, data and reports;
 - Consultation with the community and stakeholders; and
 - Identification of additional data needs to undertake the study.
 - **Flood Study**
 - Review of existing hydrologic and hydraulic models for the Cudgegong River catchment at Rylstone and defining flood behaviour for 0.5%, 1%, 2%, 5%, 10%,



- 20% Annual Exceedance Probability (AEP) events and the Probable Maximum Flood (PMF) event;
- Investigations of overland flooding for both Kandos and Rylstone under the existing catchment and floodplain conditions for the full range of flood events including 0.5%, 1%, 2%, 5%, 10%, 20% AEP events and the PMF event;
- Identification of flooding issues within the catchments and an assessment of the existing stormwater drainage network in both Kandos and Rylstone; and
- Preparation of provisional flood mapping for both Kandos and Rylstone for the PMF, 1% AEP, 1% AEP +0.5m and 20% AEP events.
- Climate variability was not part of this study.
- **Phase 2 Floodplain Risk Management Study and Draft Plan**
 - An assessment of potential flood management and mitigation measures in order to achieve improvements necessary to meet the required service levels. Such measures may include improved drainage works within both Kandos and Rylstone, levees, bypass floodways, culvert amplification, house floor raising, construction of flood retarding basins, flood warning and public education, zoning and development control, voluntary purchase etc;
 - Estimation of flood damages and annual average damages and their net present worth;
 - An economic assessment of the floodplain management measures based on life cycle cost and benefits;
 - Prioritisation of improved drainage measures and estimate the cost thereof; and
 - Final flood mapping.
- **Phase 3 Floodplain Risk Management Plan Implementation**

1.4. Structure of the Report

This report describes the Data Collection (Stage 1) and Flood Study (Stage 2) aspects as defined in Section 1.3. The outcome of the Floodplain Risk Management Study and draft Plan (Stage 3) will be produced in a separate report.

The report has been divided into the following sections:

- **Section 1:** introduces the study
- **Section 2:** provides details on the initial investigations undertaken for the study including review of the available data and community consultation
- **Section 3:** details riverine flooding assessment for the Cudgegong River in Rylstone, including a dambreak assessment for Rylstone Dam



- **Section 4:** details stormwater capacity assessment for both Kandos and Rylstone townships
- **Section 5:** assesses local overland flooding for both Kandos and Rylstone township
- **Section 6:** acknowledges input provided by others in completing the study
- **Section 7:** provides conclusions on the study
- **Appendix A:** Questionnaire sent to residents
- **Appendix B:** Additional topographic data
- **Appendix C:** Flood modelling for Cudgegong River
- **Appendix D:** Input data used and results obtained from the stormwater capacity assessment for both towns
- **Appendix E:** Details on local overland flood assessment for both Kandos and Rylstone
- **Appendix F:** Combined flood maps for Rylstone due to flooding in the Cudgegong River and local overland flooding

This report contains the most up-to-date information on flooding for both Rylstone and Kandos, which was estimated on the basis of available historical flood data, detailed topographic data and review of catchment hydrology. Outcomes from the study will be used in the development of a Floodplain Risk Management Plan and information presented in this report will be useful to SES in updating the Local Flood Plans for Rylstone and Kandos. In addition, the information on dambreak modelling for Rylstone Dam can be utilised to update its Dam Safety Emergency Plan (DSEP).



2. Initial Investigations

2.1. Site Inspection

A site inspection was carried out on 7 and 8 June 2011 to:

- Gain an appreciation of the catchment characteristics, Rylstone Dam, potential flooding problem areas and stormwater systems; and
- Estimate Manning's roughness coefficients for the floodplains.

2.2. Review of Relevant Reports

Mid-Western Regional Council Local Flood Plan (July 2007)

SES prepared the Local Flood Plan for the Council area, which includes the townships of Rylstone and Kandos. The Plan identifies the effects of flooding on the community in the townships, rural areas, road closures and utilities and infrastructure. Implications of failure of Rylstone Dam on Rylstone are also discussed in the Plan.

Integrated Water Cycle Modelling (August 2002)

Hunter Water Australia (HWA) prepared the report for Rylstone Shire Council to document outcomes from the integrated water cycle modelling. HWA developed the following quantitative models of the various components of the water cycle:

- Catchment modelling using XP-RAFTS;
- Floodplain modelling using MIKE11;
- Water system modelling using PIPES⁺⁺;
- Wastewater system modelling using MOUSE; and
- Effluent modelling as part of a sustainable effluent management plan.

The report details the above models developed by HWA and, where appropriate, provides recommendations for future work, which could be undertaken to improve the models. Both XP-RAFTS and MIKE11 models developed in the 2002 study were available to this study.

Windamere Dam PMP Design Flood and Spillway Adequacy Study (1999)

The report was prepared by SMEC Australia for the then NSW Department of Land and Water Conservation. A hydrologic model using XP-RAFTS was developed for the catchment area (1,088km²) of Windamere Dam. The XP-RAFTS model was calibrated against recorded streamflow data for three storm events (1971, 1973 and 1976) and the model was verified against recorded streamflow data for four storm events (1956, 1986, July 1990 and August 1990). The verified model was used to define inflow and outflow frequency curves for Windamere Dam for storm events between 5% and 0.0001% AEP. Inflows to Windamere Dam for the 5%, 2% and 1%



AEP events were estimated at 430 m³/s, 607m³/s and 768m³/s, respectively. The XP-RAFTS model used in the 1999 study was not available to this study.

Rylstone Flood Study Report (June 1987)

This reconnaissance flood study report was prepared by the Department of Water Resources to define flood behaviour for the town of Rylstone under the current conditions. The report details the results of flood investigations based on the historical flood of February 1955, which was considered as the highest flood recorded in the last century. The elevation of the 1955 flood is equivalent to a gauge height of 4m at Rylstone Bridge gauge (GS 421038). No residential or industrial properties were affected by the 1955 flood and, hence, no flood marks were recorded on buildings or other structures. The Department obtained three flood marks of the 1955 flood, which allowed an estimate of the 1955 profile in the town to be made. Estimated 1955 flood levels at the Filtration Plant, Louee Street Bridge, Dabee Street and Cudgegone Street were 570.5, 570.0, 569.5 and 568.5 mAHD, respectively.

Report on Stormwater Drainage for the Towns of Kandos & Rylstone (July 1975)

The report was prepared by Sinclair Knight & Partners for Rylstone Shire Council as an outcome of a study on the overall drainage systems of Kandos and Rylstone. The following tasks were undertaken as part of the study:

- Delineation of stormwater catchment boundaries;
- Calculation of discharge rates in the 20% AEP storm event;
- Comparison of the capacity of the existing structures with calculated discharge rates; and
- Recommendations for various works.

While the calculation methods were not stated in the report, it is likely that the flows and pipe capacities were estimated based on Rational Method flow calculations and Manning's n capacity calculations.

Studies Relating to Rylstone Dam

Council provided over a dozen reports on Rylstone Dam addressing spillway hydrology, dam break study, structural review, geotechnical investigation, dam surveillance, dam safety emergency plan, portfolio risk assessment, review of environmental factors, flood security upgrade, survey of reservoir etc. The following reports of relevance to this study were reviewed and key outcomes from the review are summarised below:

- **Dam Safety Emergency Plan for Rylstone Dam (February 2010)** - A Dam Safety Emergency Plan (DSEP) for Rylstone Dam was prepared by NSW Public Works for Council to address preparedness in relation to the occurrence of an emergency condition at Rylstone Dam resulting from flooding, earthquake and other emergency situations. The report provides



information necessary for emergency agencies to manage a downstream evacuation in the unlikely event of a dam failure. The study used flooding conditions downstream of the Rylstone Dam based on a Base Safety Conditions (BSC) Study undertaken by Public Works Department in 2001 (PWD 2001). Inundation maps were produced as part of the DSEP using 16 surveyed cross sections from the 2001 BSC along Cudgegong River covering a distance of 3.1km downstream of the Dam. Flood inundation maps were used to estimate the number of houses inundated by the various flood cases. The PMF for Rylstone Dam adopted in the study was approximately 6,100 m³/s. The study recommended updating the BCS Study based on the 2003 PMF Study for Rylstone Dam, which determined the peak inflow to be 14,700 m³/s.

- **Rylstone Dam Survey prepared by GHD Pty Ltd (2009)** – company ‘Whelans Insites’ undertook a topographic and bathymetric survey over the catchment area of the Rylstone Dam extending to RL 580.5 mAHD on 6 and 13 November 2008. The storage volumes at the Dam were calculated for various depths from 568.0 to 580.5 mAHD.
- **Rylstone Dam Probable Maximum Flood Study (August 2003)** - The report was prepared by NSW Department of Commerce for Rylstone Shire Council to assist in the preparation of a dam safety emergency plan for Rylstone Dam. A hydrological model using RORB was developed for the catchment area and model parameter values were estimated using recommended regional relationships. The Bureau of Meteorology's Bulletin 53, as amended in December 1996, was used to estimate the probable maximum precipitation for the catchment area. Estimated peak outflows from the Dam for the PMF event varied between 5,455 m³/s and 13,350 m³/s depending on the value of k_c (a parameter of the RORB model). Hydrographs based on three values of k_c (14.32, 21.91 and 42.62) are presented in the report. A k_c value of 14.32 provides the upper bound flood estimate while a k_c value of 42.62 provides the lower bound flood estimate for the PMF event. The study estimated the peak inflow to be approximately 14,700 m³/s. Details of the RORB model set up are not available in the report and the RORB model was not available to this study.
- **Rylstone Dam, Dambreak Study for Rylstone Shire Council (January 1993)** - NSW Public Works undertook the dambreak study for a 3 km reach of the Cudgegong River using the BOSS DAMBRK model which included 16 cross sections. Cross sections were obtained from Council's on-site physical survey, after confirmation of locations by a combined PWD/Council site inspection. A preliminary estimate on the PMF (peak inflow of 6,077 m³/s) was derived from the 6 hour Probable Maximum Precipitation (PMP) event. Three hypothetical dambreak scenarios were investigated in the study including a Sunny Day Failure (SDF) and Imminent Failure Flood (IFF) with and without dam failure. The number of dwellings located within the flood inundation zones for the SDF event, IFF without dam failure and IFF with dam failure were estimated at 2, 3 and 11, respectively.



2.3. Review of Available Data

2.3.1. Rainfall Data

The Bureau of Meteorology's website was searched to locate rainfall stations in the close proximity of both townships. Location of daily read rain gauges in the vicinity of the study area is shown in **Figure 2-1** and details on the gauges are provided in **Table 2-1**.

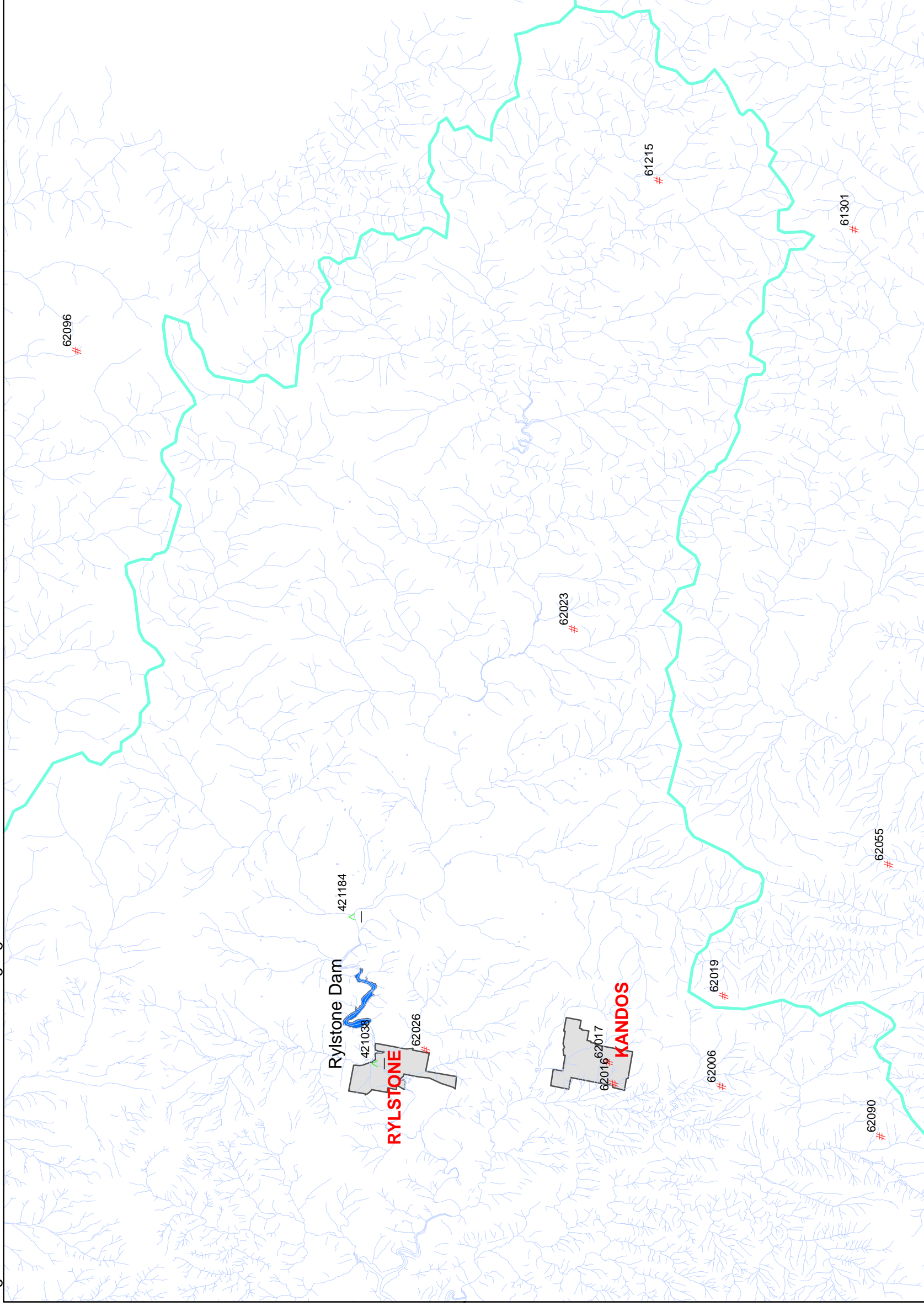
■ Table 2-1 Rain Gauge Details

| Station No. | Station Name | Latitude (degree) | Longitude (degree) | Year Opened | Year Closed |
|-------------|----------------------------------|-------------------|--------------------|-------------|-------------|
| 61215 | Rylstone (Kelgoola) | -32.872 | 150.299 | 1962 | |
| 61301 | The Nile | -32.933 | 150.283 | 1930 | 1954 |
| 62006 | Charbon Standard Portland Cement | -32.900 | 149.967 | 1929 | 1978 |
| 62016 | Kandos | -32.867 | 149.967 | 1938 | 1967 |
| 62017 | Kandos Cement Works | -32.865 | 149.975 | 1951 | |
| 62023 | Springdale | -32.850 | 150.133 | 1898 | 1967 |
| 62026 | Rylstone (Ilford Rd) | -32.808 | 149.977 | 1881 | |
| 62055 | Marsden Forest | -32.950 | 150.050 | 1948 | 1984 |
| 62090 | Edenvale | -32.950 | 149.950 | 1973 | 1977 |
| 62096 | Rylstone (Yoothamurra) | -32.693 | 150.230 | 1981 | 1998 |

Table 2-1 shows that there are three rain gauges which are currently in operation and the remaining gauges are no longer in operation. The rain gauge (No. 62026) located at Rylstone (Ilford Road) is the closest rain gauge to both Kandos and Rylstone. The gauge was opened in 1881 and is still in operation. Twenty (20) highest 1-day (9 AM to 9 AM) rainfall events recorded at the gauge are shown in **Figure 2-2**.

The Bureau of Meteorology's web site (www.bom.gov.au) indicates that two pluviographs are located within 50km of Rylstone. One pluviograph (62100 Nullo Mountain Aws) became operational in February 2010 and the other pluviograph (62101 Mudgee Airport Aws) commenced operation in September 2011.

Figure 2-1 Rainfall and Streamflow Gauging Stations



LEGEND

- Study Area
- Catchment
- Drainage Line
- # Rain Gauge
- ▲ Stream Gauge

Sinclair Knight Merz does not warrant that this document is definitive nor free of error and does not accept liability for any loss caused or arising from reliance upon information provided herein.

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■ **Figure 2-2 Recorded 1-day Peak Rainfall in Rylstone (Ilford Road) Gauge**

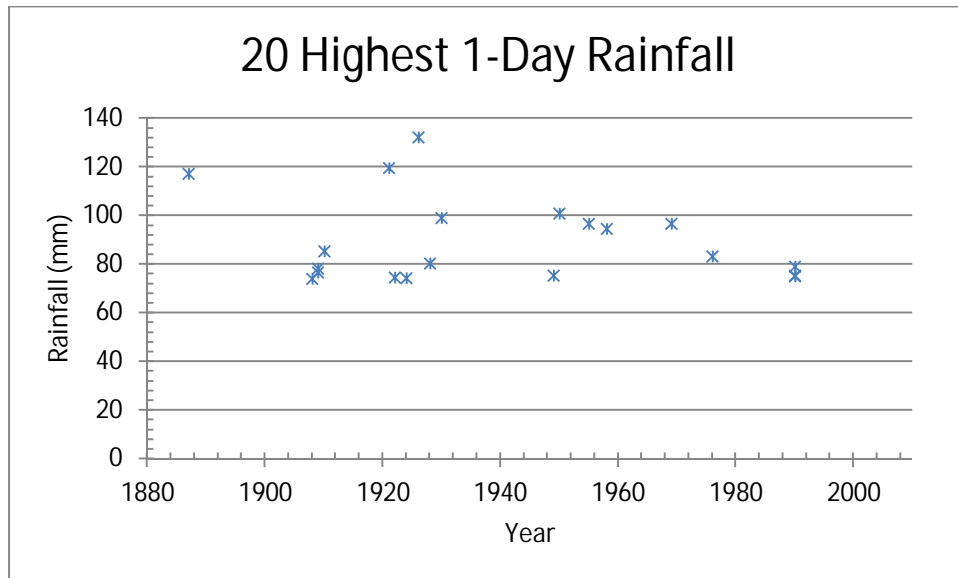


Figure 2-2 shows that the maximum 1-day rainfall recorded at the gauge was 132mm, which occurred in 1926, and since 1980 the recorded 1-day peak rainfall is lower than 80mm.

Significant flooding was experienced in Rylstone and Kandos in December 2010. A review of rainfall data for November and December 2010 indicates that a number of storm events were recorded at the gauge indicating wet catchment conditions during both months. The recorded rainfall for November 2010 (142.7mm) was more than double the mean monthly rainfall for November and the rainfall recorded in December 2010 (184mm), was almost three times the mean monthly rainfall for December. However, the 1-day maximum rainfall in both November and December 2010 were less than 40mm. Wet catchment conditions coupled with additional rainfalls from other storm events resulted in flooding in parts on the catchment in December 2010.



2.3.2. Streamflow Data

A review of PINNEENA version 9.3 (a surface water database released by NSW Office of Water) shows that there are two streamflow gauging sites on the Cudgegong River in Rylstone. Details on the gauges are provided below and location of the streamflow gauges is shown in **Figure 2-1**:

- Cudgegong River at Upstream Rylstone (GS 421184) - This site commenced in June 2009 and water level records for two months are available in PINNEENA.
- Cudgegong River at Rylstone Bridge (GS 421038) – The Bridge is located on the Cudgegong River at Bridge Street. This gauge was commissioned in 1957 and was discontinued in 1980. Monthly flow volumes are available in PINNEENA for this site. SES holds a flood intelligence card for this gauge (SES 2007), however, no flood classifications are available from SES for this gauge.

Council provided information on flooding in the Cudgegong River for the flood events of 2010 and 2012. The information provided was limited to photographs captured during the floods. The photographs were captured from the ground and the flood was confined within the main channel of the Cudgegong River for both events. The flood event of 2012 was smaller than the 2010 flood.

2.3.3. Data Provided by Council

Council provided the following data including: topographic data, aerial photography, GIS layers and modelling data:

- Airborne Laser Survey (ALS) with a vertical accuracy 63% within +/- 0.15m
- 0.5m contours based on ALS data
- Corrected Cadastre accurate to 0.15m
- Layout plan of the existing drainage system in MapInfo
- Imagery for the study areas
- Natural drainage layer in MapInfo
- Zoning maps in MapInfo
- Hydrologic and hydraulic modelling data from the Integrated Water Cycle Modelling Study (August 2002).

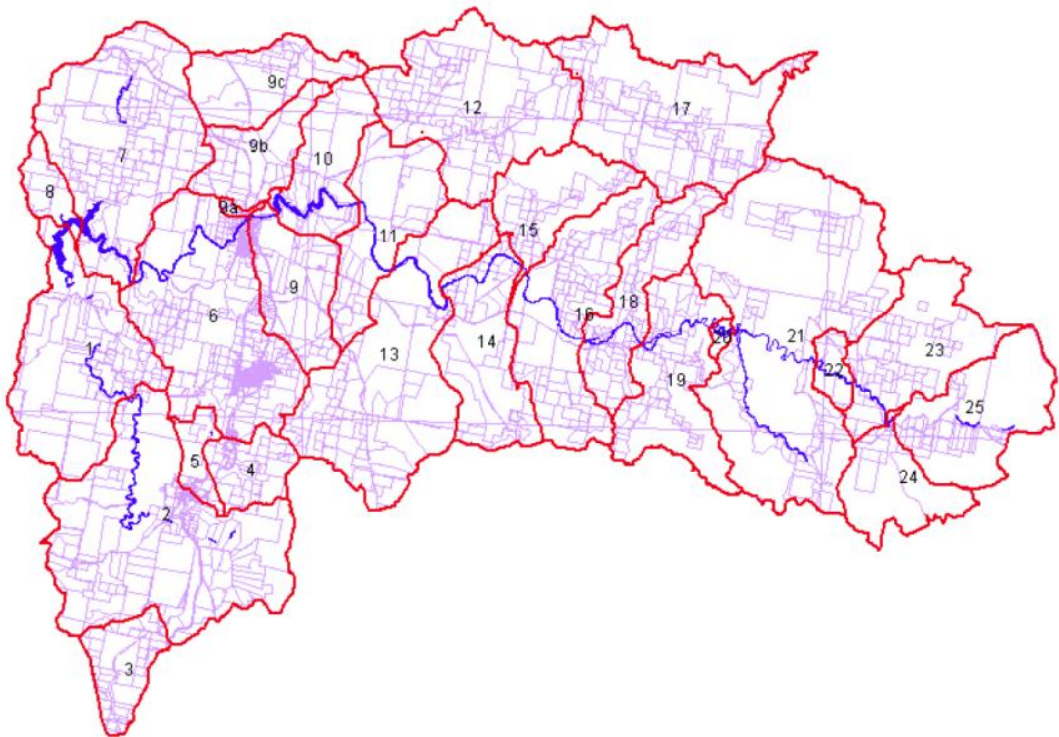


2.4. Review of the Available Computer Models

2.4.1. Hydrologic Model

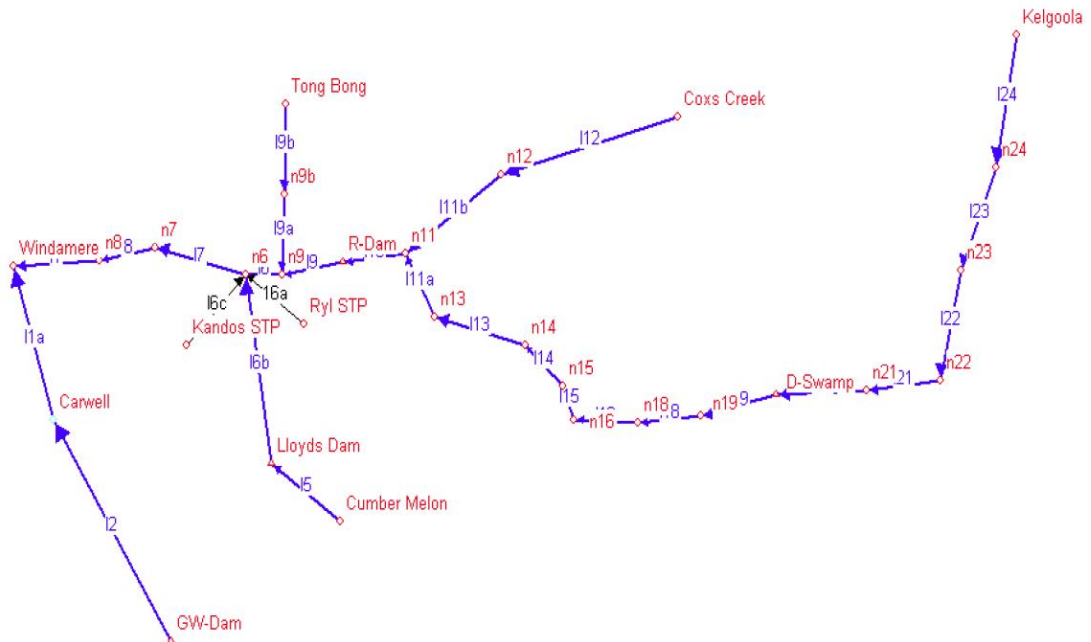
The XP-RAFTS hydrologic model used in the Rylstone Integrated Water Cycle Modelling Study (HWA 2002) was provided by Council for use in this study. Sub-catchments of the XP-RAFTS model are shown **Figure 2-3** and a schematic of the XP-RAFTS model is shown in **Figure 2-4**.

- **Figure 2-3 XP-RAFTS Sub-catchments (HWA 2002)**





■ **Figure 2-4 Schematic of XP-RAFTS Model (HWA 2002)**



A review was undertaken of the XP-RAFTS hydrologic model (HWA 2002) prior to using the model in this study. Outcomes from the review are provided below:

- **Catchment Area** - The total catchment area of the Cudgegong River represented in the XP-RAFTS model is 862 km², which is 226 km² smaller than the catchment area of Windamere Dam. The catchment area represented in the model at Rylstone Dam is 533 km², which is similar to the catchment area for Rylstone Dam reported elsewhere.
- **Impervious Areas** - A 32.7 ha area is included in the XP-RAFTS model to represent impervious areas in Rylstone. This is considered a reasonable estimate.
- **Rylstone Dam** - The storage capacity of Rylstone Dam at the full supply level (FSL) of 580.03 mAHD, is 3,320 ML according to the flood study undertaken in 2003 (DoC 2003). However, a storage volume of 13,012 ML is represented in the XP-RAFTS model (HWA 2002) at FSL, which is almost four times the actual storage capacity of Rylstone Dam at FSL. The spillway discharge is calculated in the model using a 140m long broad crested weir (crest at FSL) with a coefficient of discharge value of 2.1. A 260 m long fuse plug at dam crest is also defined in the model. The report (HWA 2002) does not clarify why a stage-discharge table was not used to define the capacity of the spillway. Hence, appropriate storage and spillway capacities for Rylstone Dam need to be used in the updated XP-RAFTS model.
- **Model calibration and verification** - The report (HWA 2002) does not indicate that the XP-RAFTS model was calibrated or validated. Consequently, calibration of the XP-RAFTS model was outside the scope of this flood study.



- Although the catchment area is located in “Zone 2” as defined in Australian Rainfall Runoff, rainfall temporal patterns for "Zone 1" were adopted in the XP-RAFTS HWA 2002 study. The updated XP-RAFTS model needs to use rainfall temporal patterns for “Zone 2”.
- Rainfall losses - An initial rainfall loss of 20mm and a continuing rainfall loss of 2.3mm/hour were used for both pervious and impervious areas for all storm events up to and including the 1% AEP event. The adopted rainfall losses for pervious areas are considered reasonable, however, it is considered appropriate to use 1mm initial loss and zero continuing loss for impervious areas.
- Comparison of design peak discharge - The XP-RAFTS model (HWA 2002) was used to simulate design discharges for the 100%, 50%, 20%, 10%, 5%, 2% and 1% AEP events. A comparison of estimated peak discharges for the 5%, 2% and 1% AEP events for the Cudgegong River is shown in **Table 2-2**, which shows that design discharges estimated in the XP-RAFTS model HWA 2002 study are significantly higher than that estimated in the Windamere Dam SMEC 1999 study. It is to be noted that the hydrologic model used in this latter study was calibrated and verified against recorded streamflow data, and hence, design discharges estimated in the 1999 SMEC study are considered more robust than that estimated in the 2002 HWA study.

■ **Table 2-2 Comparison of Peak Design Discharges (m³/s)**

| Flood Event (AEP) | Cudgegong River and Carwell Creek Junction (Catchment area = 862 km²)¹ | Inflow to Windamere Dam (Catchment area = 1,070 km²)² |
|--------------------------|---|--|
| 5% | 492 | 430 |
| 2% | 662 | 607 |
| 1% | 832 | 768 |

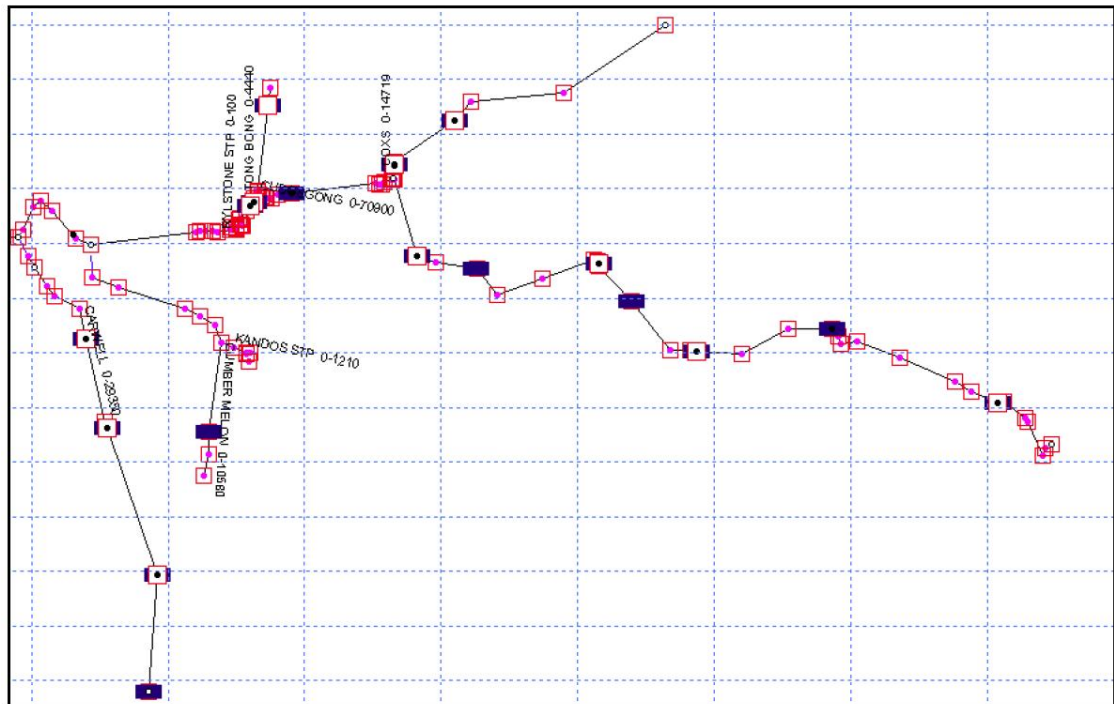
¹HWA XP-RAFTS model 2002; ² Windamere Dam study, SMEC 1999

The HWA (2002) study overestimated peak discharges due to a number of reasons including the adoption of inappropriate temporal patterns, storage and spillway rating curves for Rylstone Dam, rainfall losses for impervious areas, etc. and hence it was recommended that the HWA XP-RAFTS model for the Cudgegong River be updated as part of this study.

2.4.2. Hydraulic Model

A MIKE11 hydraulic model used in the Rylstone Integrated Water Cycle Modelling Study (HWA 2002) was provided by Council for use in this study. A schematic of the MIKE11 model is presented in **Figure 2-5**.

■ **Figure 2-5 MIKE11 Model Schematic (HWA 2002)**



A review was undertaken on the MIKE11 hydraulic model prior to using the model in this study. Outcomes from the review are provided below:

- **Model extent** – The following flow paths were represented in the MIKE11 model:
 - Cudgegong River (70.9 km) including a 51.6 km reach of Cudgegong River upstream of Rylstone Dam;
 - Cumber Melon Creek (10.6 km) which is located outside the area of interest to this study;
 - Carwell Creek (29.4 km) which is located outside the study area for this study;
 - Coxs Creek (14.7 km) which is located upstream of Rylstone Dam; and
 - A 4.44 km reach of Tong Bong Creek.
- **Channel network** - The Cudgegong River and its associated floodplain is represented as a single flowpath within the study area for Rylstone. The model includes additional flow paths that are located outside the study area for this study, which could be excluded from the model configuration.
- **Cross Sections** - The report (HWA 2002) shows that 18 cross sections used in the MIKE11 model are surveyed cross sections. Insufficient information was available on location of cross sections and generally cross sections were extrapolated to represent the floodplain in the model. Cross sections for Cudgegong River used in the model further downstream of Rylstone Sewage Treatment Works were possibly sourced from the available topographic mapping. A



comparison of three surveyed cross sections with the corresponding cross sections extracted from the ALS data showed a reasonable agreement between the two sets of data. Hence, additional cross sections need to be extracted from the ALS data for a better representation of the terrain in the MIKE11 model.

- Waterway Crossings - Bridges, weirs etc. represented in the model, need to be updated using “work as executed” drawings and field survey.
- Manning's n values - Manning's n values used in the model are generally considered reasonable estimates.
- Downstream boundary condition - The model uses a fixed water level at Lake Windamere. It is considered appropriate to use a stage-discharge rating curve as the downstream boundary of the model. A stage-discharge rating curve will be developed for use in the model.



2.5. Community Consultation

2.5.1. Flood Questionnaire

A community consultation process was initiated to obtain flood information for past events. This involved sending a newsletter and a questionnaire (included in **Appendix A**) to residents and landowners within the study areas in Kandos and Rylstone. The newsletter introduced the floodplain management process to the residents of the areas, described the purpose of the questionnaire and provided the residents with contacts for their responses. The questionnaire was prepared in consultation with Council to help identify flood and drainage issues in the study areas and to provide reliable flood information to assist in the validation of the hydrologic and hydraulic computer models. An electronic copy of the newsletter and questionnaire was provided to Council and Council distributed printed copies of the newsletter and questionnaire within the community in July 2011.

The flood information that was requested included:

- General information such as:
 - Residents from the Study Area
 - Ownership of the residence
 - How long residents lived at the property
- Specific flood information such as:
 - Experience on flooding in residence and/or at work
 - Location and depth of flood water in the worst flood experienced
 - Duration of flooding
 - Flood damages to residence and business
 - Disruption to vehicular access to residence during flooding
 - Identify information (eg. flood photographs, newspaper clippings, flood marks etc) that can be provided to Consultants
 - Flooding to residence made worse by works on other properties or by construction of roads or other structures
 - Any comments on any other issues associated with this study.

The responses to the community survey were thoroughly reviewed for information of major flooding effects that could be useful for validation of the hydrologic and hydraulic computer models.

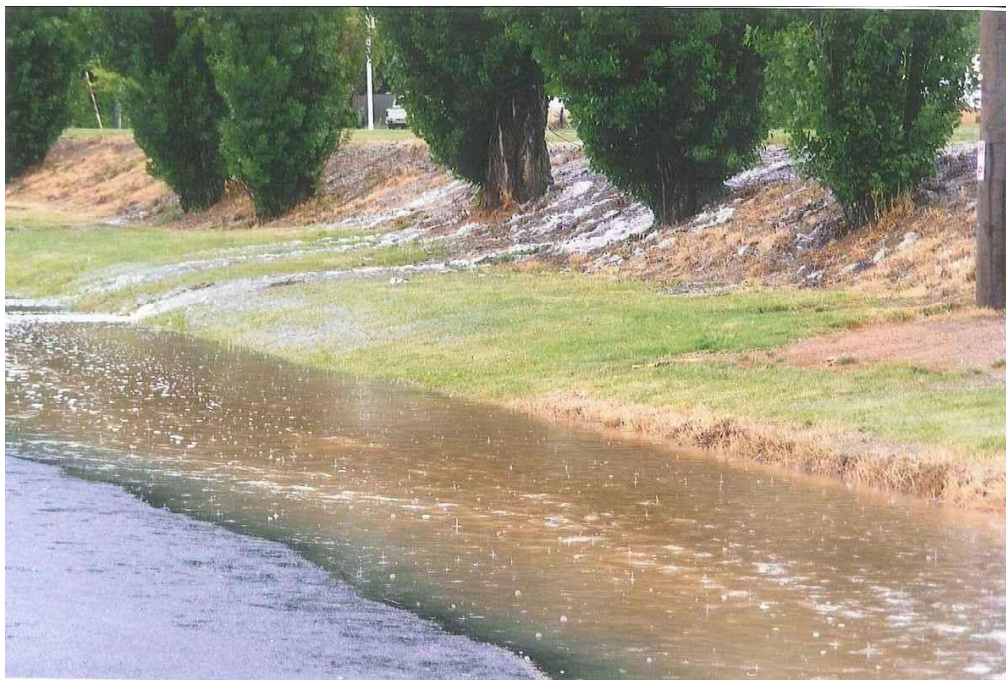


2.5.2. Summary of Responses to Flood Questionnaire

In total six (6) responses were received from the community to the questionnaire. Three (3) respondents are residents of Rylstone; one respondent is a resident of Kandos; one respondent lives in Clandulla (which is located outside the study area) who identified a flooding problem area in Rylstone, which is also located outside the study area; and one respondent intends to live in Rylstone and identified benefits of flooding on the re-vegetation of the riparian area of the Cudgegong River through Rylstone. A summary of information provided by respondents is provided below.

Kandos

The owner has been living in the dwelling on 15 George Street, Kandos for the last 30 years. A storm event in 2010 resulted in a 0.4m depth of flooding in the garage and washed out the driveway. Photographs (refer to **Figure 2-6** to **Figure 2-8**) provided by the owner indicate that stormwater from Darton Park (located at the corner of George and Mason Street) runs along both George Street and Mason Street, which is obstructed by the culvert under the driveway of the property on 15 George Street. The obstruction at the driveway culvert caused stormwater to run along the driveway in a northerly direction.



■ **Figure 2-6 Stormwater from Darton Park moving along George Street**



■ **Figure 2-7 Stormwater impeded by culvert under the Driveway of 15 George Street**



■ **Figure 2-8 Stormwater running along the Driveway of 15 George Street**



Rylstone

Information provided by respondents relating to flooding issues in Rylstone is discussed below:

- Blockage of pipe culvert under driveway of 42 Carwell Street, Rylstone - A pipe culvert (approximately 900mm diameter) under the driveway is approximately 75% blocked with silt, gravel and rocks. Stormwater from the adjoining Council yard and Piper Street is drained through the pipe culvert under the driveway, and hence, clearing this culvert is desirable.
- Flooding on 2571 Bylong Valley Way, Rylstone - Two respondents identified flooding on this property. Following further discussion with the owner of the property it is understood that the backyard was flooded during a storm event about ten (10) years ago.
- Re-vegetation and Rylstone Weir - The respondent (who lives outside the study area) highlighted the importance of re-vegetation along the Cudgegong River in mitigating bank erosion. The respondent was involved in re-vegetation of a 450m reach along the Cudgegong River upstream of Rylstone. The respondent believes that removal of the weir will have a positive impact on flooding in Rylstone and movement of fish and platypus.
- Access to Rylstone Cemetery cut-off - The respondent (who lives outside the study area) identified flooded sections of Glen Alice Road, Brown Lane and Narrango Road, which cut off access to the cemetery. In 2010, Narrango Road was impassable for a week due to one storm event. However, Council clarified that access to the cemetery was restricted for a day due to flooding on the causeway on Fitzgerald Street and an alternative access to the cemetery via Glen Alice Road was open. Council further clarified that Narrango Road was not impassable for a week.

2.6. Additional Topographic Survey

Collection of stormwater details by Council was included as part of the study. Survey of additional waterway crossings (eg. bridges, culverts, weirs etc) was included in the scope of the additional topographic survey. Council engaged Whelans Insites to undertake the additional survey and this topographic data is included in **Appendix B**. Council provided additional data on culverts in May 2013 and this is also included in **Appendix B**.



3. Cudgegong River Catchment Flooding - Rylstone

3.1. Background

Cudgegong River drains a catchment area of approximately 590 square kilometres at the southern boundary of Rylstone, near the sewage treatment works (STW). Rylstone Dam (catchment area 535 square kilometres) is located on Cudgegong River approximately 1.5 kilometres north-east of Rylstone. The dam (15m high, a crest length of 143m and a storage capacity of 3,320 ML at FSL) comprises of a concrete arch section with earthfill embankments at both ends.

Cudgegong River flows in a westerly direction through a well-defined valley for approximately 1 kilometre downstream of Rylstone Dam. An unnamed creek joins the River from the south beside the water treatment plant (WTP). Tongbong Creek joins the River from the north approximately 200 metres downstream of the WTP. The Wallerawang-Gwabegar Railway line crosses Cudgegong River downstream of its junction with Tongbong Creek. Bylong Valley Way crosses the River downstream of the Railway crossing. The River then flows along the western edge of the township into open undulating country before flowing into Windamere Dam reservoir located 15 kilometres downstream.

Except for the urban area of the township, the dominant land use within the catchment is forest and there are significant rural areas within the catchment. Urban development in Rylstone extends to the edge of the narrow floodplain of the Cudgegong River with the only developments on the floodplain being playing fields and associated buildings.

3.1.1. Updating of the Hydrologic Model

The hydrologic model used in the Integrated Water Cycle Modelling (HWA 2002) was updated to reconcile estimates of design discharges with SMEC 1999 study. The following updates were made to the XP-RAFTS hydrologic model:

- Details on the storage capacity of Rylstone Dam and the spillway rating curve adopted in this study are presented **Appendix C**;
- An initial rainfall loss of 1mm and a continuing rainfall loss rate of 0 mm/hour were assigned to represent losses for the impervious area;
- Rainfall temporal pattern were set to "Zone 2" instead of "Zone 1" as defined in the HWA 2002 study; and
- Areal reduction factors (ARF) were calculated based on Australian Rainfall & Runoff (Engineers Australia, April 2013).



The updated XP-RAFTS model was run for the 30 hour storm (which produced peak discharges in Rylstone) for all design flood events. A comparison of peak discharge between the updated XP-RAFTS model and SMEC 1999 study, are shown in **Table 3-1**, which shows that discharges estimated for Windamere Dam catchment (area 1070 km²) are consistently higher than the corresponding discharges adopted in this study.

■ **Table 3-1 Comparison of Peak Design Discharges (m³/s)**

| Flood Event (AEP) | Cudgegong River and Carwell Creek Junction (Catchment area = 862 km ²) ¹ | Inflow to Windamere Dam (Catchment area = 1,070 km ²) ² |
|-------------------|---|--|
| 5% | 354 | 430 |
| 2% | 469 | 607 |
| 1% | 605 | 768 |

¹this study; ² SMEC 1999

Peak discharges estimated for the full range of flood events between 20% AEP and 0.5% AEP events are shown in **Table 3-2**. It is to be noted that design rainfall intensity-frequency-duration data for all events were calculated in XP-RAFTS and Rylstone Dam was assumed to be at full supply level prior to commencement of the storm event. **Table 3-2** also shows peak inflows and outflows for Rylstone Dam, which indicates almost no attenuation of peak discharge due to Rylstone Dam.

Table 3-2 Estimated Peak Design Discharges (m³/s) for 30 Hour Storm

| Flood Event (AEP) | Rylstone Dam (node* 'R-Dam') | | Tong Bong Creek (node 'n9b') | Town Catchment (node 'n9' -local) | Tong Bong/ Cudgegong River (node 'n9' - total) |
|-------------------|------------------------------|---------|------------------------------|-----------------------------------|--|
| | Inflow | Outflow | | | |
| 20% | 130 | 129 | 20 | 15 | 132 |
| 10% | 182 | 180 | 26 | 19 | 187 |
| 5% | 265 | 263 | 36 | 26 | 274 |
| 2% | 347 | 345 | 45 | 32 | 360 |
| 1% | 445 | 442 | 56 | 40 | 462 |
| 0.5% | 548 | 546 | 67 | 48 | 573 |

* XP-RAFTS node (refer to **Figure 2-4**)

The inflow hydrograph for the PMF event adopted in this study was sourced from the DoC's 2003 report, which produced a peak inflow of 14,700 m³/s from Rylstone Dam for the 4 hour PMP event.



3.1.2. Updating of the Hydraulic Model

A review of the MIKE11 hydraulic model developed in the Integrated Water Cycle Modelling (HWA 2002) project was undertaken as part of the study. Outcomes from the review are provided in Section 2.4.2. The following updates were made to the MIKE11 model:

- All flow paths located outside Rylstone were removed from the model set up which included Cumber Melon Creek, Carwell Creek and Cox's Creek;
- Reduced lengths of Cudgegong River (between Chainage 51630m to 56140m) and Tong Bong Creek (between 3400m to 4440m) were included in the model due to the availability of ALS data for the study area within Rylstone;
- An additional flow path was included in the MIKE11 model to represent the elevation-lake area relationship and spillway capacity for Rylstone Dam;
- In total twenty eight (28) cross sections were used in the MIKE11 model to represent Cudgegong River of which 9 cross sections were sourced from the HWA 2002 study and the remaining 19 cross sections were extracted from the ALS data;
- All nine (9) cross sections used to represent Tong Bong Creek were extracted from the ALS data;
- A global Manning's n value of 0.033 was adopted in the MIKE11 model. Relative resistance values were assigned based on site reconnaissance and aerial imagery to vary Manning's n along each cross section;
- A tailwater rating curve was used to define the downstream boundary of the model in the Cudgegong River; and
- The foot bridge over Cudgegong River was included in the model. However, Rylstone Weir could not be included in the model as the weir crest was located above the invert of cross sections extracted from the ALS data.

Details on the MIKE11 model set up are provided in **Appendix C**.

3.1.3. Model Calibration

The flood event of February 1955 is considered to be a major event in Rylstone, no residential or industrial properties were affected by 1955 flood, and as a result no flood marks were recorded on buildings or other structures (DWR 1987). In addition, no recorded flood levels are available for the recent flood events of 2010 and 2012 and flood events that occurred between 1955 and 2010. Hence, in the absence of recorded data it was not possible to calibrate the hydrologic and hydraulic models for the Cudgegong River.



3.2. Flood Behaviour for the Existing Condition

3.2.1. Flood Behaviour

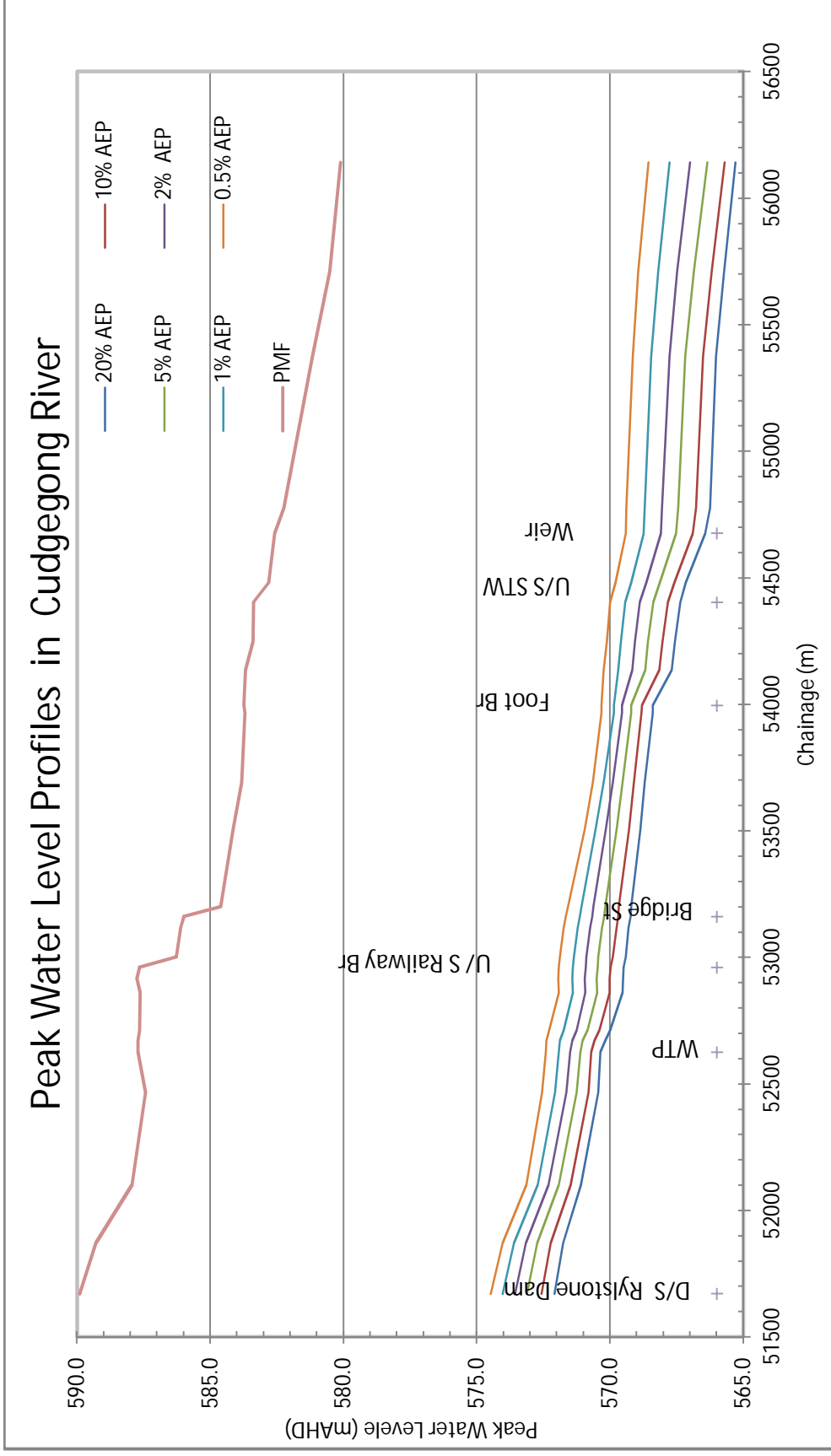
The updated MIKE11 model was run for the 0.5%, 1%, 2%, 5%, 10%, and 20% AEP events and the PMF event. Peak water levels, discharge, velocities and times to reach peak water levels for all modelled events are presented in **Appendix C**. Rylstone Dam was assumed to be at FSL prior to occurrence of all modelled flood events. Peak water level profiles and peak velocity profiles in Cudgegong River downstream of Rylstone Dam are shown in **Figure 3-1** and **Figure 3-2**.

Following observations can be made from **Figure 3-1** and **Figure 3-2**:

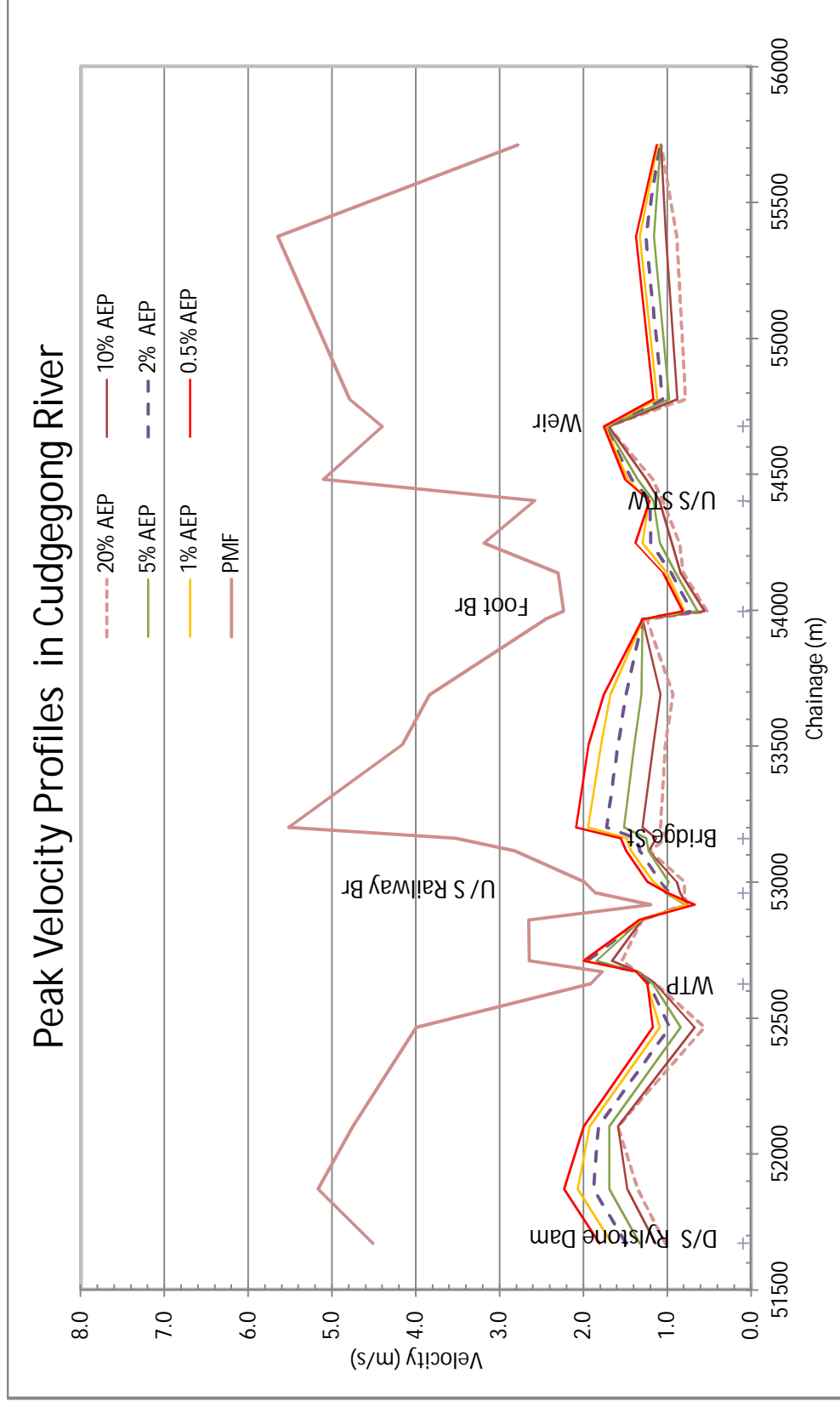
- Variation in peak water level profiles for all flood events between 0.5% AEP and 20% AEP is consistent;
- Peak water levels in Cudgegong River for the 0.5% AEP and 20% AEP events vary between 2m to 3.5m. The range of variation for the two events is the smallest in the vicinity of the foot bridge and largest downstream of the Weir; and
- The flood profile for the PMF event is, at least, 10m above the flood profile for the 0.5% AEP event and the afflux at the Railway Bridge and Bridge Street are very pronounced.

Peak velocities in Cudgegong River for the 20% AEP to 0.5% AEP events vary between 0.5m/s to 2.5m/s as shown in **Figure 3-2**. However, velocities can be as high as 6m/s in the case of the PMF event.

■ **Figure 3-1 Peak Water Level Profiles in Cudgegong River**



■ **Figure 3-2 Peak Velocity Profiles in Cudgegong River**





3.2.2. Comparison of Peak Water Level Profiles

Peak water levels in Cudgong River for the 1% AEP event estimated in the HWA 2002 study were provided by Council. A comparison of peak water level profiles between this study and the HWA 2002 study is shown in **Figure 3-3**.

■ **Figure 3-3 Comparison of 1% AEP Peak Water Levels in Cudgong River**

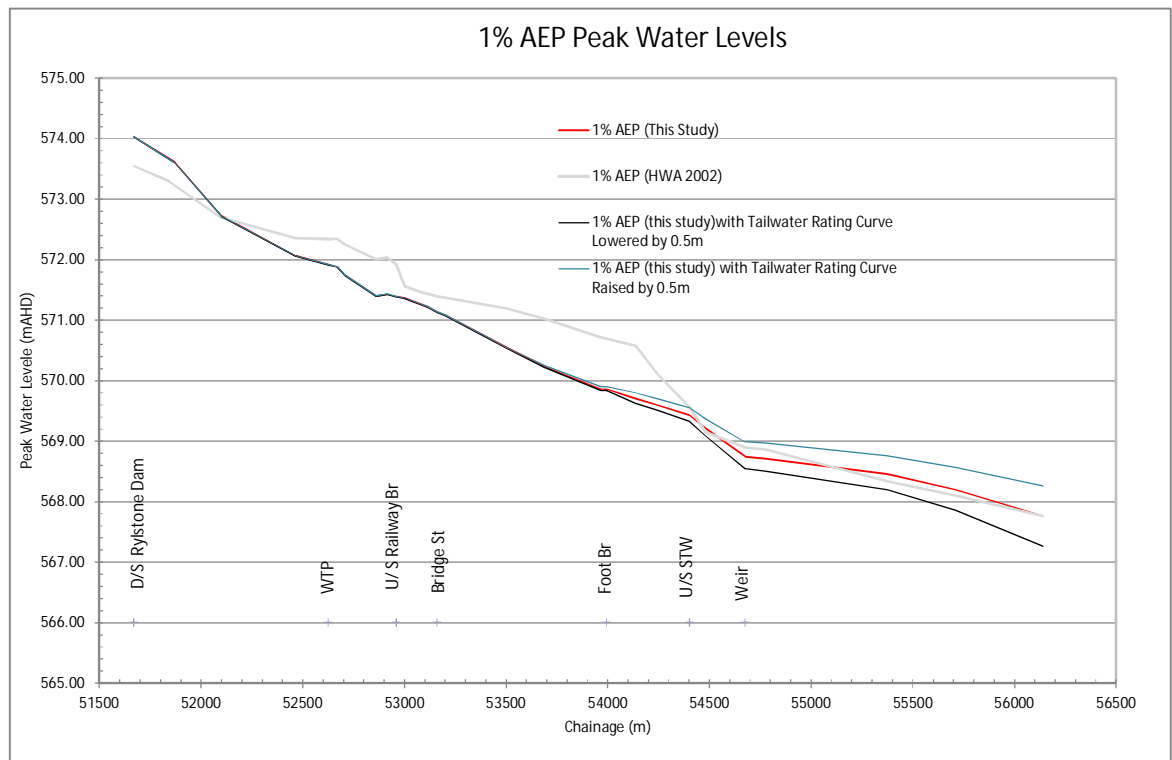


Figure 3-3 shows that peak water levels estimated in the 2002 study between Bridge Street and the Foot Bridge are up to 0.8m higher than this study. Downstream of STW, peak water levels estimated in this study are in close agreement with those estimated in the 2002 study.

3.2.3. Sensitivity Analysis

The sensitivity of the 1% AEP peak water level profile on the adopted downstream boundary condition was assessed by lowering and raising the downstream boundary condition by 0.5m. The resulting 1% AEP peak water level profiles are also shown in **Figure 3-3**, which indicates that peak water levels upstream of the Foot Bridge are almost insensitive to a 0.5m variation in the adopted tailwater boundary condition. In the vicinity of the Weir, located downstream of the study area boundary, the 1% AEP flood level is changed by approximately 0.2m due to 0.5m changes in the downstream boundary conditions. A 0.2m variation in flood levels is considered reasonable.



It is to be noted that the most downstream cross section of the Cudgegong River (chainage 56140m) used in the MIKE11 model is located at the extremity of the ALS survey. Moreover, cross sections used in the HWA 2002 study downstream of cross section 56140m were estimated based on the available topographic maps. Considering a reasonable change (0.2m) in 1% AEP flood level at the downstream boundary of the study area and due to the unavailability of reliable topographic data, in consultation with Council, the MIKE11 model was not extended farther downstream.

It is to be noted that a sensitivity analysis due to climate change was outside the scope of the study.

3.2.4. Flood Mapping

Modelled peak water levels for the following events were used in ArcMap to delineate flood extents which are shown in **Figure 3-4**.

- 20% AEP;
- 1% AEP;
- 1% AEP + 0.5m (ie. the Flood Planning Level(FPL)); and
- PMF.

Figure 3-4 shows that the flood extent for the 20% AEP event is limited within the bank of Cudgegong River and flood extents for the 1% AEP event and 1% AEP event plus 0.5m freeboard are very similar. The PMF event causes extensive inundation in Rylstone and the majority of the township area is inundated by the PMF event.

A flood hazard map was prepared for the Flood Planning Level (FPL) using the flood extent for the FPL event and peak velocities for the 1% AEP event. High hazard and low hazard areas were identified for the FPL using the criteria adopted in the NSW Government's Floodplain Development Manual (2005), and are shown in **Figure 3-5**.

The delineation of hydraulic categories is important with the adoption of merit based flood policy. This is because the NSW Government's Floodplain Development Manual (2005) recognises three hydraulic categories of flood prone land (floodway, flood fringe and flood storage). Definition of floodways, flood storage and flood fringe, as given in the Manual, are presented below:

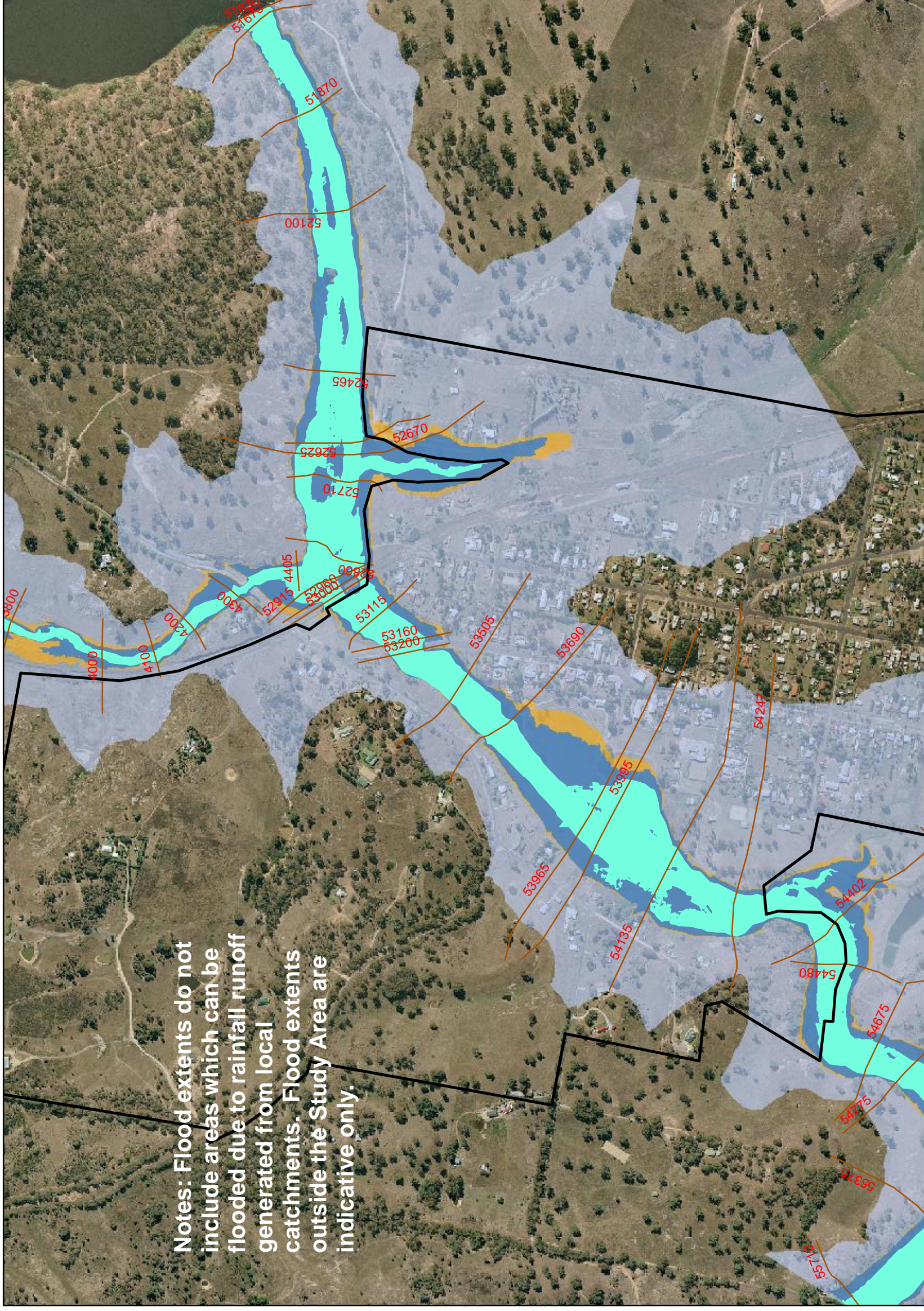
- Floodways are those areas where a significant volume of water flows during floods and are often aligned with obvious natural channels. They are areas that, even if only partially blocked, would cause a significant increase in flood levels and/or a significant redistribution of flood flow, which may in turn adversely affect other areas. They are often, but not necessarily, areas with deeper flows or areas where higher velocities occur.



- Flood Storage areas are those parts of the floodplain that are important for the temporary storage of floodwaters during the passage of a flood.
- Flood fringe is the remaining area of land affected by flooding, after floodway and flood storage areas have been defined. Development in flood fringe areas would not have any significant effect on the pattern of flood flows and/or flood levels.

After reviewing the nature of riverine flooding in Rylstone and considering the fact that the low flow channel of the Cudgegong River is poorly represented in the ALS data, it is recommended that the flood extent for the 20% AEP event be classified provisionally as floodway and the remaining areas would be classified as flood fringe. It is further recommended that the provisional hazard categories be based on hazard categories shown in **Figure 3-5**.

Figure 3-4 Extent of Flood Inundation in Rylstone due to Flooding in Cudgong River under the Existing Conditions



Notes: Flood extents do not include areas which can be flooded due to rainfall runoff generated from local catchments. Flood extents outside the Study Area are indicative only.

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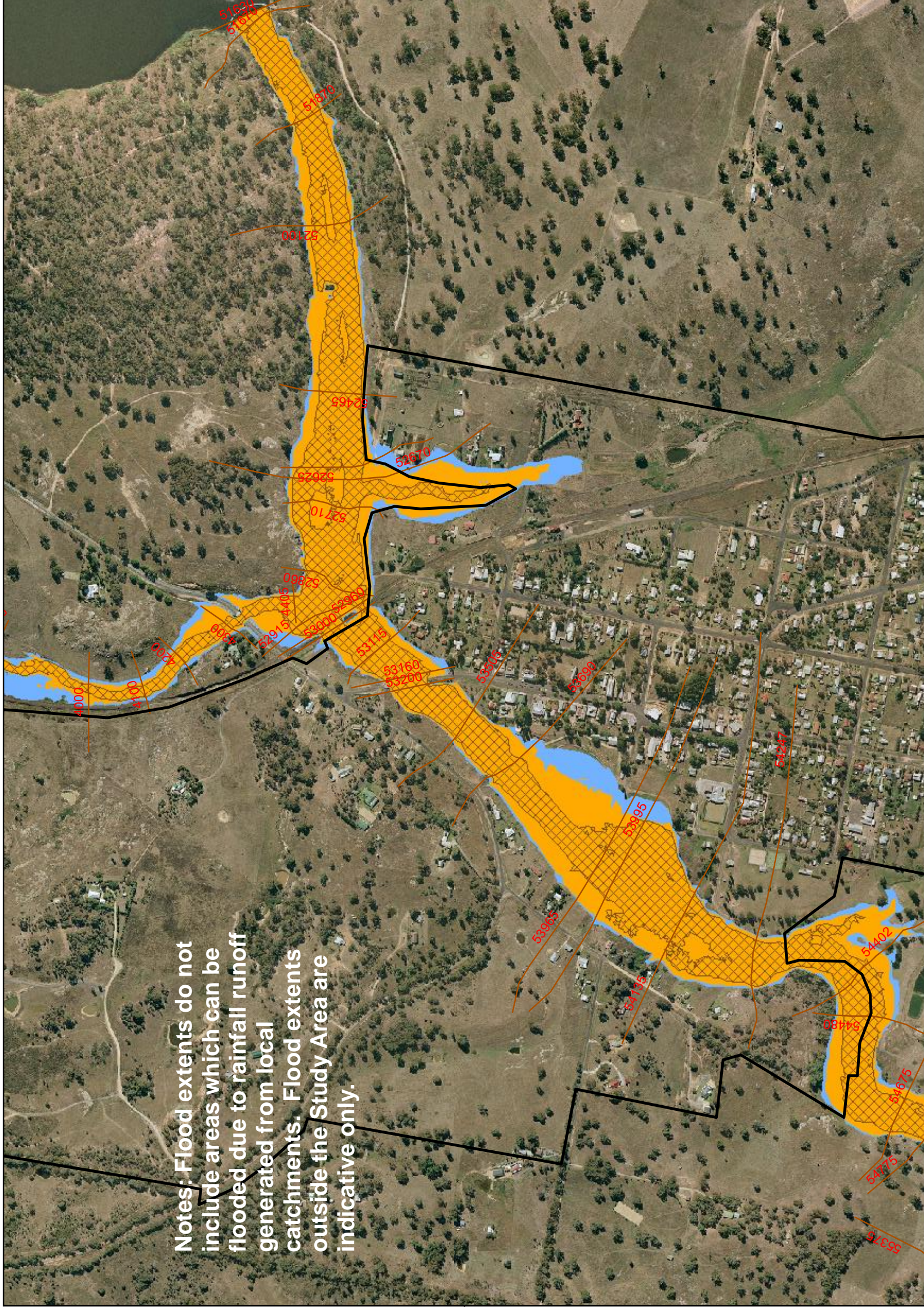
- MIKE11 Cross Section
- Study Area
- 20% AEP Flood Extent
- 1% AEP Flood Extent
- Provisional Flood Planning Level
- PMF Extent

The flood inundation map is based on the available data and the assumptions made in the flood study. Hence, the flood study report must be read to draw any conclusion on the basis of the flood inundation map.






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0 0.3
Kilometres

Figure 3-5 Provisional Flood Categorisation for Rylstone due to Flooding in Cudgegong River



LEGEND

-  Study Area
-  MIKE11 Cross Section
- Hazard Category:**
-  Low Hazard
-  High Hazard
-  Floodway

The flood inundation map is based on the available data and the assumptions made in the flood study. Hence, the flood study report must be read to draw any conclusion on the basis of the flood inundation map.

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3.3. Flood Behaviour with Potential Failure of Rylstone Dam

Failure of Rylstone Dam has the potential to impact on flooding in Rylstone. Hence, an assessment was made to quantify potential impact on flood behaviour in Rylstone.

3.3.1. Dam Break Scenarios

Scenarios investigated in this study included the following:

- A Sunny Day Failure (SDF) of Rylstone Dam;
- A Dam Crest Flood (DCF) with and without failure of Rylstone Dam; and
- A PMF event with and without failure of Rylstone Dam.

For all scenarios, it was assumed that the reservoir was at FSL. This assumption is consistent with the previous dambreak study for Rylstone Dam undertaken by Public Works (PWD 1993). The discharge hydrographs (with a peak inflow of 14,700 m³/s) generated by a 4 hour PMP was sourced from the DPWS 2003. The DCF was estimated to be about 0.37 PMF. A 1% AEP flood was assumed downstream of the Dam for all flood scenarios and a small release was assumed for the Sunny Day Failure scenario.

3.3.2. Failure Mechanism

Rylstone Dam consists of a central concrete arch with embankment sections on both ends. The failure mechanism due to overtopping can be rapid due to sudden failure of the concrete section or slow due to erosion failure of the embankment sections. Based on the outcomes from the sensitivity undertaken by PWD (1993), a failure of the concrete section was investigated in this study. A failure time of 5 minutes and vertical side slopes with a breach width of 50m were adopted for the failure of the concrete section for all dam break scenarios. The failure mechanism was represented in the MIKE11 model for the investigated scenarios.

3.3.3. Modelling Results

Modelling results for the dam break scenarios in terms of peak water levels, discharges, velocities and times to peak water levels are presented in **Appendix C**. Peak water level, peak velocity and time to peak water level profiles along Cudgegong River downstream of Rylstone Dam are presented in **Figure 3-6**, **Figure 3-7** and **Figure 3-8**, respectively. **Figure 3-6** and **Figure 3-7** show that both peak water levels and peak velocities in Cudgegong River for the flood scenarios with and without dam failure remain almost unchanged, indicating the capacity of the storage is too small to dominate flooding conditions downstream. However, **Figure 3-8** shows that times to peak water levels are slightly shorter for flood scenarios with dam break.

■ **Figure 3-6 Peak Water Level Profiles in Cudgegong River for Dam Break Scenarios**

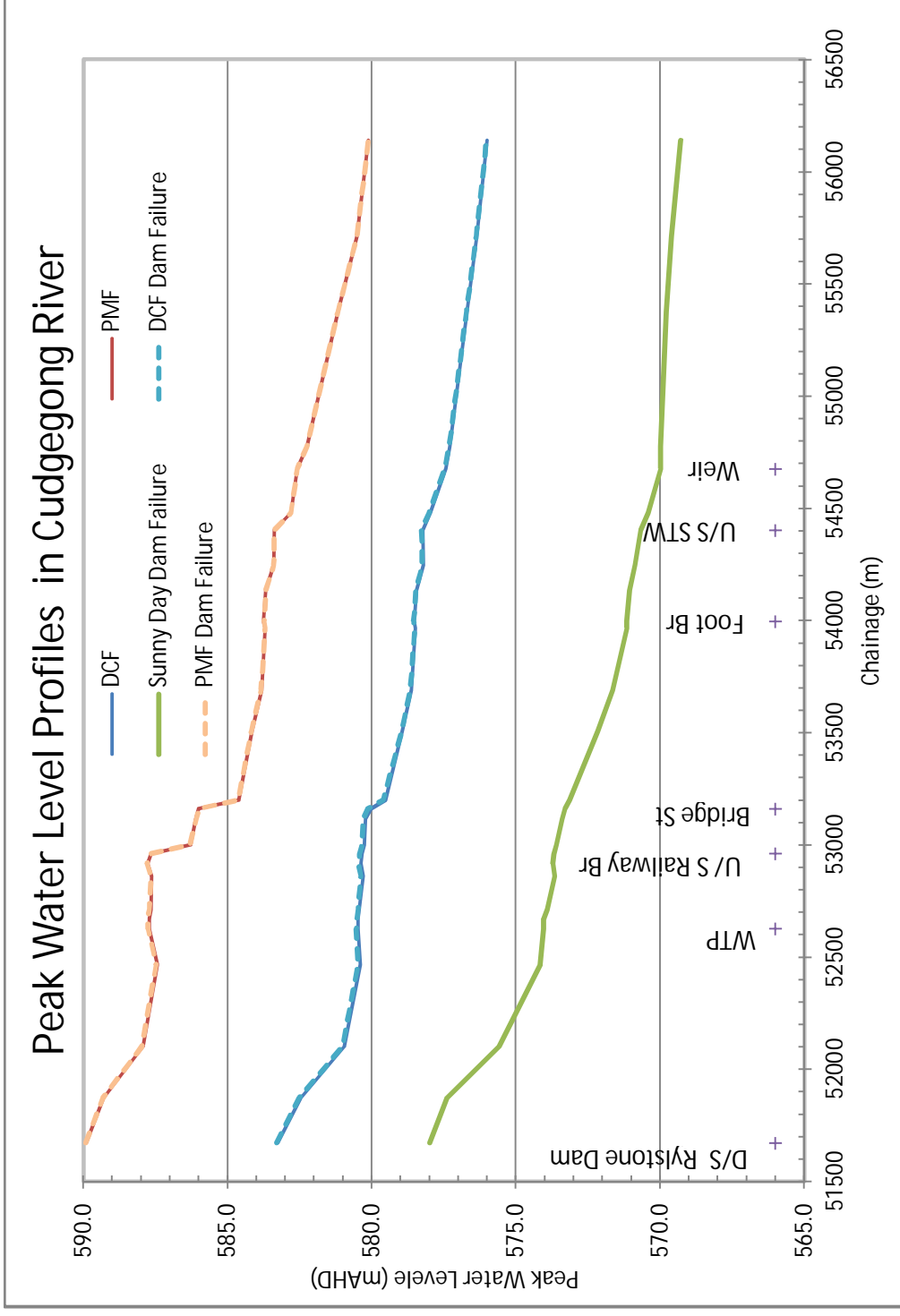
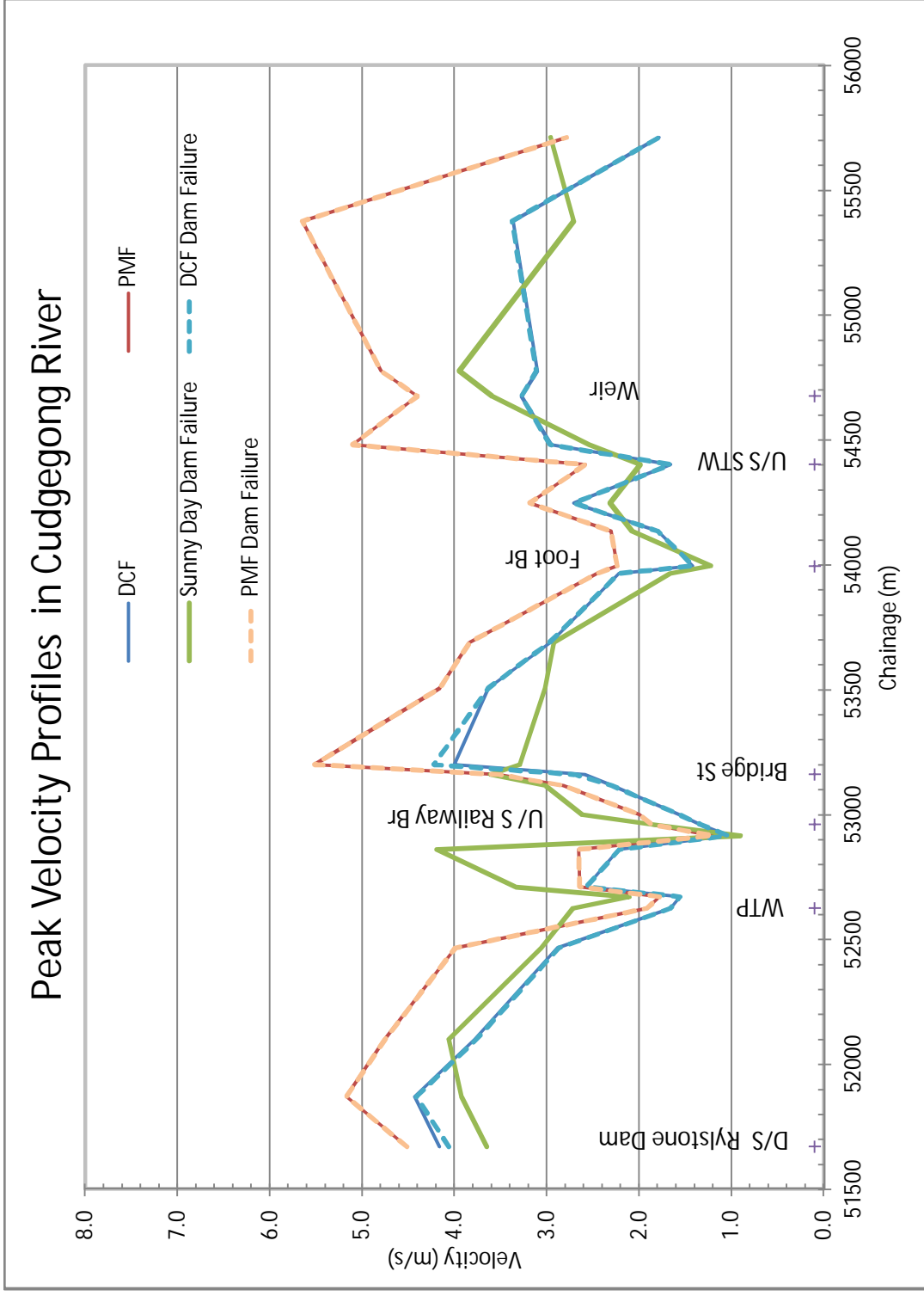
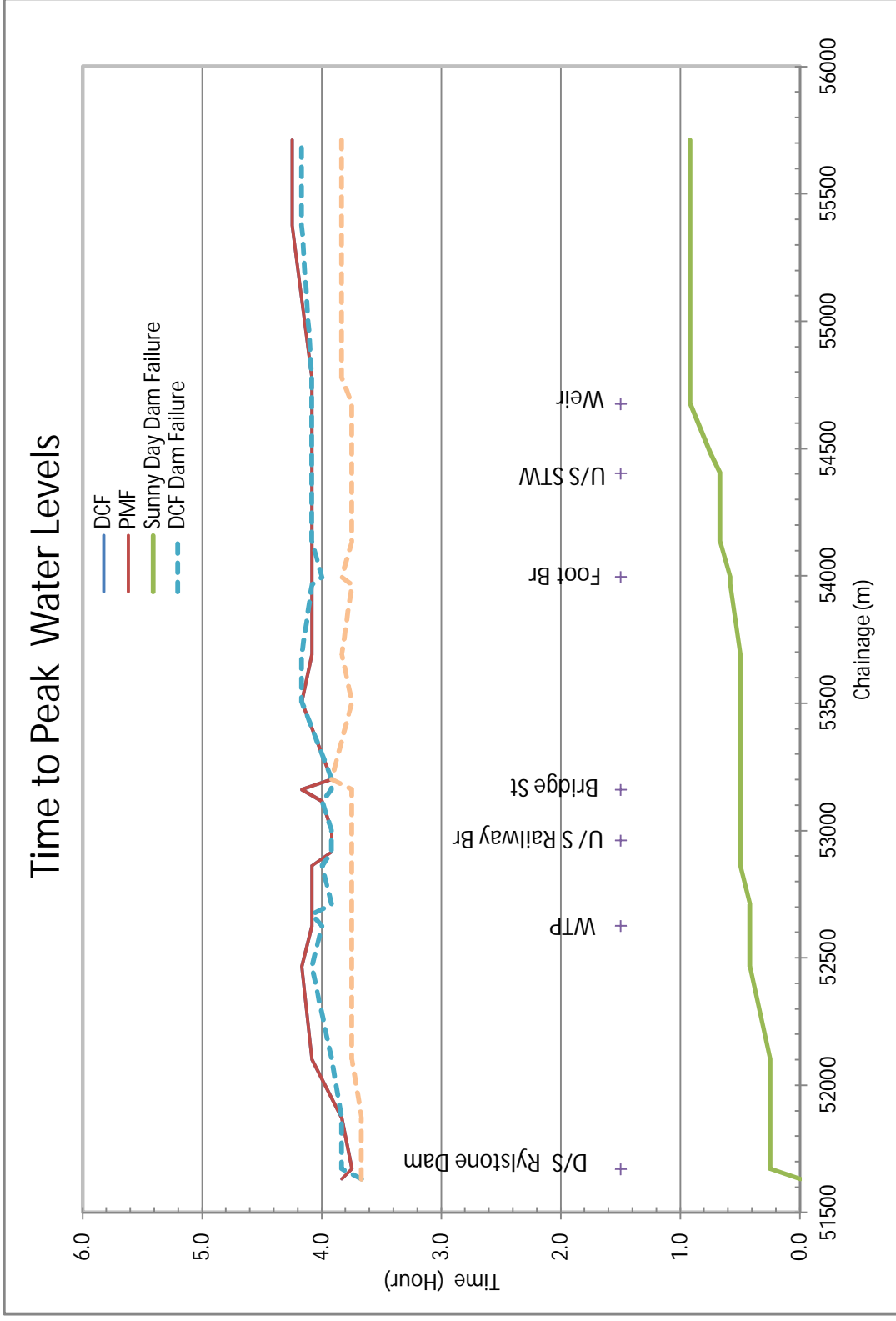


Figure 3-7 Peak Velocity Profiles in Cudgong River for Dam Break Scenarios



■ **Figure 3-8 Time to Peak Water Level Profiles in Cudgegong River for Dam Break Scenarios**





In the case of the Sunny Day Dam Failure, peak water levels in Cudgegong River upstream of the STW are higher than the 0.5% AEP event. The difference in peak water level between Sunny Day Dam Failure and 0.5% AEP event gradually increases upstream of the STW and the increment is up to a maximum of 3m at the toe of the Dam. Peak velocities in Cudgegong River for the Sunny Day Dam Failure vary between 1m/s to 4 m/s. Times to reach peak water levels for the Sunny Day Failure scenario vary from 0.25 hour at the toe of the dam to 0.67 hour upstream of the STW. In the case of the other dambreak scenarios, times to reach peak water levels vary between 3.6 hour at the Dam and 4.4 hour upstream of the STW.

Previous dambreak studies for Rylstone Dam were undertaken using limited topographic data and different estimates of PMF and hence a comparison dambreak modelling results between this study and the previous studies was not undertaken.



4. Stormwater Capacity Assessment

4.1. Background

Computer models were set up in the DRAINS program to assess the capacity of the existing drainage systems for both Kandos and Rylstone. DRAINS simulates the rainfall-runoff process on natural and developed catchments, developing flow hydrographs at each entry point in the drainage system and then routing and combining flows through the drainage network. DRAINS is capable of modelling multiple storm patterns, pit bypass flows and overland flows.

4.2. Approach

4.2.1. Modelling Program

The computer program that was selected for use in this study was DRAINS (O'Loughlin and Stack, 2003). DRAINS is a comprehensive program for designing and analysing urban stormwater drainage systems. DRAINS is an updated version of the ILSAX (O'Loughlin, 1993) program. DRAINS includes additional functionality compared to the ILSAX program and allows more detailed and accurate modelling of drainage systems including overland flowpaths.

DRAINS can model drainage systems of all scales, from very large to very small. The program converts rainfall patterns to stormwater runoff hydrographs and routes these through a network of pipes, channels and streams. DRAINS carries out the hydrological modelling using ILSAX, the Rational Method and storage routing models, together with hydraulic modelling of pipes and open channels and automatic design procedures for piped drainage systems. The version of the DRAINS program used in this study was version 2012.04 – 12 March 2012.

4.2.2. Setting Up DRAINS Models

The DRAINS models were configured based on pit and pipe survey collected for Council for this study. The survey data was comprised of an MS Excel spreadsheet with the following details:

- Pits: Easting, Northing, pit inlet type and dimensions, depth of pit, comments.
- Pipes: Conduit type (pipe or box culvert), dimensions, invert levels, Easting and Northing of surveyed point (typically one point per pipe), number of cells, comments.
- Bridges in the study area were also surveyed but not included in the DRAINS models.

The drainage features included in the DRAINS models are pits, pipes and overflow routes. The pit and pipe survey data was plotted in MapInfo as point data, to define their location. Pipe lines were then digitised manually, based on CAD data accompanying the survey table data and the aerial photography, to link up the pits and headwall inlets and outlets on each stormwater branch.

For the purposes of this study, it was assumed that all pits were of unlimited capacity; hence, the drainage system capacity is defined by pipe capacity.



Overflow routes were then manually digitised to define the surface flow routes between pits, headwall inlets/outlets and for other flow paths. The overflow routes were defined typically as following the surface contours and natural overland flow paths, rather than the street drainage, which is a more realistic representation for overland flow patterns in larger magnitude events. This approach in configuration results in overland flows often bypassing stormwater pits, and hence the drainage network cannot intercept these flows.

Catchment SIM was used to automatically generate a sub-catchment at each pit and to produce a GIS sub-catchment layer. Impervious fractions and travel times were estimated from aerial photography and ALS by overlaying the sub-catchment layer onto land-use GIS layers. An impervious fraction value, visually estimated from the aerial photography, was adopted for each land-use type. The impervious fractions are tabulated in **Table 4-1**.

■ **Table 4-1 DRAINS Sub-Catchment Land-Use Impervious Fractions**

| Land Use | Fraction Impervious |
|-------------------------|---------------------|
| Open Space | 0.05 |
| Commercial | 0.50 |
| Railway | 0.20 |
| Road | 0.70 |
| Rural/Rural Residential | 0.10 |
| Urban/Residential | 0.30 |
| Quarry | 0.80 |

Overland flowpaths, destinations and travel times were determined from the ALS and aerial photography data. Sub-catchments were typically assigned to a pit or headwall at its outlet where appropriate; otherwise, a simple node was digitised at the sub-catchment outlet and linked to the downstream drainage network with an overflow route.

Significant storages upstream of overland flow paths were modelled as detention basins. Only one significant storage was identified in the study area, that being the storage upstream of the Railway embankment on the flow path to the north of Kandos Quarry, with a storage depth of approximately 6m before it overflows over the railway embankment, and a storage volume of approximately 25,000m³. Other minor storages were identified upstream of the Railway embankment, to the north of Kandos Railway Station. However, these storages are unlikely to significantly attenuate flood flows, and hence were excluded from the DRAINS model. This is considered a conservative assumption.

Input data used in the DRAINS models for both Kandos and Rylstone are included in **Appendix D**.



4.2.3. Parameter Values Used in DRAINS

The following modelling approach and assumptions have been adopted in the DRAINS modelling:

- Unlimited pit inlet capacity was assumed and hence pit inlet blockage factors were zero (unblocked). DRAINS models would estimate capacity of stormwater pipes. Pit inlet blockage factors will be considered in the assessment of drainage improvement strategies in the floodplain risk management study.
- A pit hydraulic loss coefficient (K_u) value of 1.5 was adopted for the purposes of this study. For part-full flows, K_u values were set to 35 mm;
- Sag pits were defined with a typical sag storage volume of 10m^3 and a depth of 0.5m based on a review of ALS data at major sags;
- Headwall inlets were assumed to have a K_u value of 0.5;
- It was assumed that all impervious areas are directly connected, i.e. that supplementary areas = 0. This provides a conservative estimate as it assumes runoff from paved areas flows out of each subcatchment without lagging from flow over grassed areas.
- The pipe roughness was kept at the default Colebrook-White roughness coefficient value of 0.3mm; and
- Travel times for sub-catchments and overflow routes were based on the longest flow path determined in Catchment SIM and flow velocities of 0.7 m/s for paved areas and 0.5 m/s for grassed areas. This is consistent with kinematic wave equation with typical catchment slope of 5%.

4.2.4. Estimation of Design Rainfall and Runoff

An ILSAX hydrological model was adopted for the DRAINS modelling with the following parameters used:

- An Antecedent Moisture Condition “AMC” of 3 (“Rather Wet” soil moisture condition) for storm events up to and including the 1% AEP event. An AMC of 4 (“Totally Saturated” soil moisture condition) was adopted for the 0.5% AEP and PMF events;
- A soil type of 3 (slow infiltration rates which may have layers that impede downward movement of water);
- Paved area depression storage of 1 mm and grassed area depression storage of 5 mm.

Design rainfall intensities for the 20%, 10%, 5%, 2%, 1% and 0.5% AEP events were estimated based on Intensity-Frequency-Duration (IFD) parameter values from the Bureau of Meteorology online IFD calculator for both Kandos and Rylstone. Temporal patterns for AR&R Zone 2 (Murray-Darling Basin) were assumed. The DRAINS models were run for the 10, 15, 20, 25, 30, 45, 60, 90, 120 and 180 minutes duration events for these design AEP events.



Intensities for the PMP events were calculated based on the Generalised Short Duration Method (GSDM) (BOM, 2003). Design temporal patterns from GSDM were adopted. A constant rainfall depth across each catchment was assumed. The PMP storm was also run for the 15, 30, 45 and 60 minute storm durations.

4.3. Stormwater Capacities for Rylstone

DRAINS model results for are presented in **Appendix D** and model results for Rylstone were analysed to determine the design capacity for each pipe, which is mapped in **Figure 4-1**. The pipes with a 1% AEP capacity are typically located in the upper sections of the drainage network or on minor branches, where there is typically a number of overflow routes bypassing this section of the network. These overflow routes tend to converge on the lower sections of the drainage network, hence the flows intercepted by the network are relatively larger and the pipe event AEP tends to be smaller. Often adjoining pipes with the same size have different capacities which result from different pipe slopes.

4.4. Stormwater Capacities for Kandos

The DRAINS model results (presented in **Appendix D**) for Kandos were analysed to determine the design AEP capacity event for each pipe, which is mapped in **Figure 4-2**. The estimated pipe capacities range from less than the 20% AEP event to greater than the 1% AEP event. The pipes with a 1% AEP capacity are typically located in the upper sections of the drainage network or on minor branches, where there is typically a number of overflow routes bypassing this section of the network. These overflow routes tend to converge on the lower sections of the drainage network, hence the flows intercepted by the network are relatively larger and the pipe event AEP tends to be smaller. Often adjoining pipes with the same size have different capacities which result from different pipe slopes.

The majority of pipes in Kandos have adequate capacities for events up to 20% AEP. The main stormwater system starting at Buchanan Street and crossing Angus Avenue, Rodgers Street, Dangar Street, Fleming Street and finally discharging on Dunn Street, have capacities less than 20% AEP in the section between Buchanan Street and Fleming Street, which run through private properties.

Note that there is uncertainty in the pipe network configuration upstream of pipe ST00520 (corner of George Street and Bent Street, Kandos). It was difficult to determine the exact configuration from the available survey, Council GIS layers, aerial photography and DEM due to incomplete and conflicting information. There is therefore likely to be some inaccuracy in the pipe hydraulic conditions at this location, though overland flows are likely to be estimated satisfactorily.

Figure 4-1 Stormwater Pipe Capacity - Rylstone



LEGEND

- Stormwater Pit
- Stormwater Pipe Capacity
 - Adequate for less than 20% AEP
 - Adequate for less than 10% AEP
 - Adequate for less than 5% AEP
 - Adequate for less than 2% AEP
 - Adequate for less than 1% AEP
 - Adequate for more than 1% AEP
- Cadastral
- ▭ Study Area

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0 0.3 Kilometres



5. Local Overland Flooding – Kandos & Rylstone

5.1. General

Stormwater drainage, which surcharges the piped drainage system, is likely to be conveyed along the street system and natural flow paths in the towns, and/or rural areas bordering the towns. Hydraulic modelling was undertaken to estimate flooding conditions in major overland flow paths including depths, velocities and flood hazard category of flow in the street and other overland flow paths. Hydraulic models for the main flow paths in the two towns were set up using HEC-RAS.

A Digital Elevation Model (DEM) was created using the ALS data for each town. The DEM was used to cut adequate cross sections for the selected overland flow paths to be represented in the HEC-RAS models. Major hydraulic structures and obstructions to flow and bed resistances were defined in the HEC-RAS model. The flows applied to the HEC-RAS models were computed from the DRAINS modelling and represented discharges surcharging or not captured by the existing piped system.

5.2. Approach

5.2.1. HEC-RAS Model Development

HEC-RAS (US Army Corps of Engineers, 2003) program was used to undertake hydraulic modelling of the main overland flow paths in and around both Kandos and Rylstone. Main flow paths modelled using HEC-RAS were selected on the basis of the following considerations:

- Location: flow paths that run through a number of properties; and
- Peak discharge: those flow paths carrying a relatively high discharge are more likely to present a flood risk.

Cross-sections, which were extracted from the ALS data, were used to set up the HEC-RAS models. The ALS data represented the existing topographic conditions. The cross-sections were located at more frequent intervals in potential flooding problem areas, in order to define flood levels and velocities in more detail at these locations. It was assumed in the HEC-RAS model that existing fencing would fail and would allow floodwater to move freely from one property to another without forming a solid obstruction. A high Manning's n value of 0.1 was used in HEC-RAS models to represent friction losses through properties. Recent aerial photography of the area and a site reconnaissance were used to assign Manning's n values to model cross sections.

The HEC-RAS models were set up to include the overland flow paths connected to, and including a section of, the downstream main waterways. This was done to ensure that realistic tailwater conditions were applied to the local overland flow paths affecting both Kandos and Rylstone townships. In the case of the HEC-RAS model for Rylstone, a peak discharge of 100 m³/s was



used just downstream of Rylstone Dam for all modelled events to represent minor flooding in the Cudgegong River. The adopted peak discharge (ie. $100 \text{ m}^3/\text{s}$) represents a flood event smaller than the 20% AEP event in the Cudgegong River.

All HEC-RAS models were run for steady-state solutions for the mixed flow regimes, which were considered suitable for the level of detail required in this study. Normal flood depths were used to define both upstream and downstream boundary conditions for running the models for the mixed flow regimes.

All HEC-RAS models were run for 20%, 10%, 5%, 2%, 1%, 0.5% AEP and PMF events under the existing conditions.

5.2.2. Flood Behaviour

A set of flood surfaces was created using the HEC-RAS modelling results for the 20% AEP, 1% AEP, 1% AEP + 0.5m freeboard (ie. FPL) events and the PMF. The modelling results were imported into the GIS, where each cross-section was attributed with the flood level results. This allowed the creation of flood surface data. The intersection between the DTM (created using ALS data) and the flood surfaces was calculated, which defined the extent of flooding. This allowed flood prone areas to be accurately defined. Flood maps were produced from the GIS, showing inundation extents for each flood event. All analysis and mapping was undertaken using ArcMap. A flood hazard map was prepared for the Flood Planning Level (FPL) using flood extent for the FPL and peak velocities for the 1% AEP event. High hazard and low hazard areas were identified for the FPL using the criteria adopted in the NSW Government's Floodplain Development Manual (2005).

5.3. Local Overland Flood Behaviour for Rylstone

Detailed HEC-RAS modelling results in terms of peak water levels, discharges and velocities for all modelled events are given in **Appendix E**. Flood extents for the four selected flood events for Rylstone are presented in



Figure 5-1 which shows the following:

- A number of properties are impacted by local overland flooding in a 20% AEP event. These properties are located on the southern end of Louee Street between Dawson Street and Melon Street; Cudgegong Road between Dawson Street and Piper Road; Dawson Street; Short Street; and Coomers Street.
- The extent of inundation in a 1% AEP event is slightly more extensive than the 20% AEP extent.
- The FPL covers more area than the PMF, indicating that the FPL is higher than PMF levels in some areas.

Flood hazards for the FPL for Rylstone are shown in **Figure 5-2**. This shows that most areas are low hazard with some isolated areas being high hazard. Flood hazard on sections of Tongbong Road, Short Street and Main Street are high for the FPL.







5.4. Combined Flood Behaviour

The flood behaviour in Rylstone due to flooding in the Cudgegong River is discussed in Section 3 of this report and the overland flood behaviour in Rylstone is discussed in Section 5.3. A combined flood extent map for Rylstone is included in **Appendix F** which shows flood extents for the 20% AEP, 1% AEP and the PMF events. The extent of the FPL is also shown on the same map. A combined provisional flood hazard map for Rylstone is also included in **Appendix F**.

Figure 5-1 Extent of Flood Inundation in Rylstone due to Rainfall Runoff Generated from Local Catchments



LEGEND

-  Study Area
-  HEC-RAS Cross Section
-  20% AEP Flood Extent
-  1% AEP Flood Extent
-  Provisional Flood Planning Level
-  PMF Extent

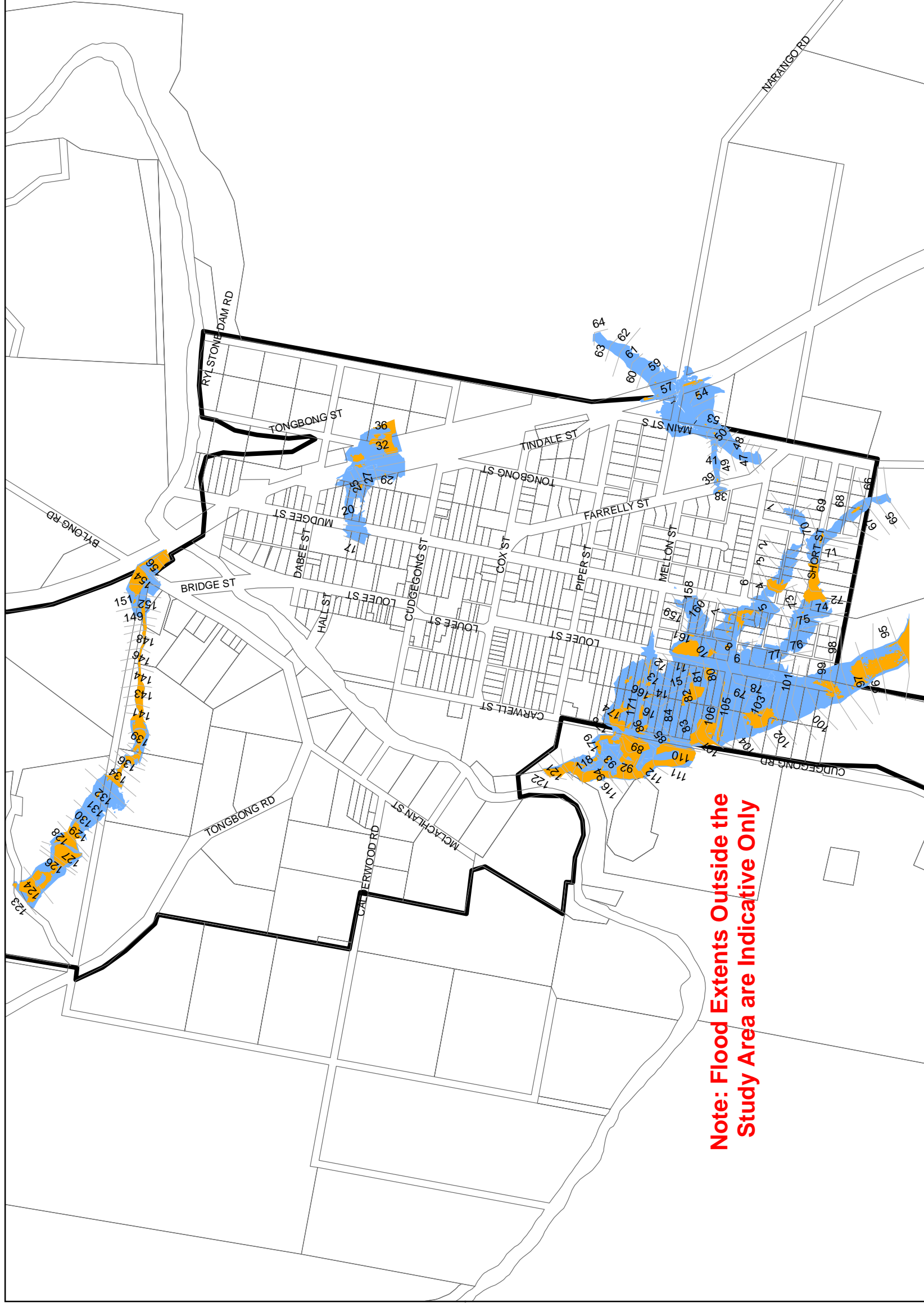
The flood inundation map is based on the available data and the assumptions made in the flood study. Hence, the flood study report must be read to draw any conclusion on the basis of the flood inundation map.

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Figure 5-2 Provisional Flood Hazard Categorisation for Rylstone due to Rainfall Runoff Generated from Local Catchments





5.5. Local Overland Flood Behaviour for Kandos

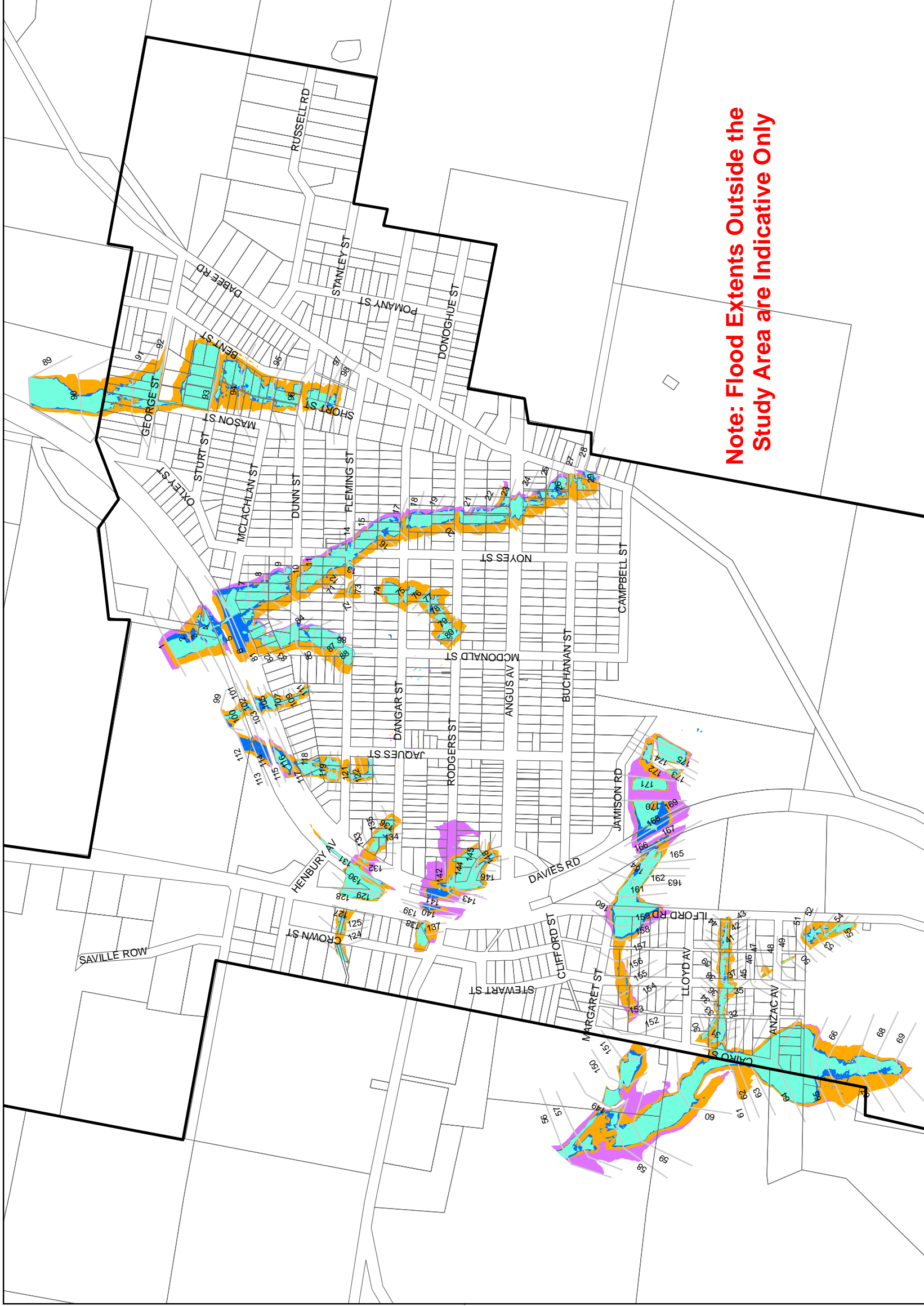
Detailed HEC-RAS modelling results in terms of peak water levels, discharges and velocities for all modelled events are presented in **Appendix E**. Flood extents in Kandos for the selected flood events are presented in **Figure 5-3** which shows significant flooding in Kandos for the 20% AEP event. Overflows associated with the main stormwater system crossing the Railway at the corner of Davies Road and McLachlan Street result in flooding of adjoining properties located along its overland flow paths. Properties along the overland flow path for the stormwater system crossing Georges Street are impacted by overflows in the 20% AEP event. A number of properties on Davies Road are also impacted due to the 20% AEP event. An overland flow path runs east to west between Lloyd Avenue and Anzac Avenue, which impacts of a number of properties in the 20% AEP event.

The flood extent for the 1% AEP event is slightly more extensive than the 20% AEP flood extent. In some areas, the PMF is less than 0.5m higher than the 1% AEP event and in some areas the PMF is higher than the FPL.

Flood hazards for the FPL are shown in **Figure 5-4** which indicates the following:

- Flood hazard is generally low in the majority of the flooded areas; and
- Areas with high flood hazard are present on overland flow paths between Dangar Street and Dunn Street; Whites Crescent, Davies Road; Ilford Road; Cario Street and Anzac Avenue.

Figure 5-3 Extent of Flood Inundation in Kandos due to Rainfall Runoff Generated from Local Catchments under the Existing Conditions



- LEGEND**
- Study Area
 - HEC-RAS Cross Section
 - 20% AEP Extent
 - 1% AEP Extent
 - Provisional Flood Planning Level
 - PMF Extent

The flood inundation map is based on the available data and the assumptions made in the flood study. Hence, the flood study report must be read to draw any conclusion on the basis of the flood inundation map.

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0 0.3 Kilometres



6. Acknowledgements

The study was carried out by Sinclair Knight Merz with funding provided from Mid-Western Regional Council and the Commonwealth and NSW Governments, through the Office of Environment and Heritage.

A number of organisations and individuals have contributed both time and valuable information to this study. The assistance of the following in providing data and/or guidance to the study is gratefully acknowledged:

- Residents of Kandos and Rylstone;
- Councillors and Council staff from Mid-Western Regional Council;
- Office of Environment and Heritage; and
- Roads and Maritime Services.



7. Conclusions

In accordance with NSW Government Policy, Mid-Western Regional Council is committed to preparing a Floodplain Risk Management Plan for the townships of Kandos and Rylstone. This report documents the first two stages of the process of preparing the Plan – that is, the preparation of a flood study report.

The study area included the townships of Kandos and Rylstone. The township of Kandos is located in the upper catchment areas of Cumber Melon Creek and hence is not subject to riverine flooding. However, isolated areas within the township have experienced local overland flooding due to limited stormwater capacity. The township of Rylstone is located on the left bank (looking downstream) of the Cudgegong River, which has a very narrow floodplain consisting of a series of river flats. Rylstone Dam is located one (1) kilometre upstream of the town. Rylstone experienced local overland flooding in recent years due to limited stormwater capacity. However, both residential and commercial/industrial properties within the township are yet to be impacted by riverine flooding in recent memory.

A community consultation process was undertaken to collect information on flooding from the community. Information provided by the community indicated no major flooding issues in Kandos and Rylstone.

Hydrologic and hydraulic computer models for Cudgegong River used in a previous study were updated to define riverine flood behaviour for Rylstone. A range of flood events between the 20% AEP and PMF events was investigated and flood extents and provisional flood hazard mapping were undertaken to define flood behaviour in Rylstone. Flood behaviour due to potential failure of Rylstone Dam was also assessed.

The capacity of the stormwater systems for both Kandos and Rylstone was assessed through the development of computer based hydrologic model DRAINS. Hydraulic modelling was undertaken using HEC-RAS hydraulic models to define local overland flood behaviour for both towns. Results from HEC-RAS models were used to map flood extents and hazards on local overland flow paths.

Detailed hydrologic and hydraulic modelling undertaken in this study provide a sound platform for the flood modelling tasks that will be undertaken during preparation of the Floodplain Risk Management Study and Plan for Kandos and Rylstone.



8. References

Bureau of Meteorology (2003) *The Estimation of Probable Maximum Precipitation in Australia: Generalised Short Duration Method*

Danish Hydraulic Institute (2011) MIKE11 User's Guide

DWR (1987) Rylstone Flood Study Report

Engineers Australia (2013) Australian Rainfall & Runoff Revision Projects, Project 2, Spatial Patterns of Design Rainfall, Collation and Review of Areal Reduction factors from Applications of the CRC-Forge Method in Australia, Final Report Institution of Engineers Australia (2001) *Australian Rainfall and Runoff –Volume 1*

GHD (2009) Rylstone Dam Survey

HWA (2002) Integrated Water Cycle Modelling, report prepared for Rylstone Shire Council

NSW Department of Commerce (2003) Rylstone Dam Probable Maximum Flood Study

NSW Government (2005) *Floodplain Development Manual*, Department of Infrastructure, Planning and Natural Resources

NSW Public Works (1993) Rylstone Dam, Dambreak Study for Rylstone Shire Council

NSW Public Works (2010) Dam Safety Emergency Plan for Rylstone Dam, February 2010

SES (2007) Mid-Western Regional Council Local Flood Plan, July 2007 Edition

SKP (1975) Report on Stormwater Drainage for the Towns of Kandos & Rylstone

SMEC (1999) Windamere Dam PMP Design Flood and Spillway Adequacy Study

US Army Corps of Engineers (2010) HEC-RAS River Analysis System, User's Manual

Watercom (2012) *DRAINS User Manual*



9. Glossary

| | |
|-------------------------------------|---|
| Annual Exceedence Probability (AEP) | The chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage. |
| Australian Height Datum (AHD) | A common national surface level datum approximately corresponding to mean sea level. |
| Average Annual Damage (AAD) | Depending on its size (or severity), each flood will cause a different amount of flood damage to a flood prone area. AAD is the average damage per year that would occur in a nominated development situation from flooding over a very long period of time. |
| Average Recurrence Interval (ARI) | The long-term average number of years between the occurrences of a flood as big as or larger than the selected event. For example, floods with a discharge as great as or greater than the 20 year ARI flood event will occur on average once every 20 years. ARI is another way of expressing the likelihood of occurrence of a flood event. |
| Catchment | The land area draining through the main stream, as well as tributary streams, to a particular site. It always relates to an area above a specific location. |
| Development | <p>Is defined in Part 4 of the EP&A Act</p> <p><u>In fill development</u>: refers to the development of vacant blocks of land that are generally surrounded by developed properties and is permissible under the current zoning of the land. Conditions such as minimum floor levels may be imposed on infill development.</p> <p>New development: refers to development of a completely different nature to that associated with the former land use. Eg. The urban subdivision of an area previously used for rural purposes. New developments involve re-zoning and typically require major extensions of exiting urban services, such as roads, water supply, sewerage and electric power.</p> <p>Redevelopment: refers to rebuilding in an area. Eg. As urban areas age, it may become necessary to demolish and reconstruct buildings on a relatively large scale. Redevelopment generally does not require either re-zoning or major extensions to urban services.</p> |
| Effective Warning Time | The time available after receiving advise of an impending flood and before the floodwaters prevent appropriate flood |



response actions being undertaken. The effective warning time is typically used to move farm equipment, move stock, raise furniture, evacuate people and transport their possessions.

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| Flood | Relatively high stream flow which overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam, and/or local overland flooding associated with major drainage before entering a watercourse, and/or coastal inundation resulting from super-elevated sea levels and/or waves overtopping coastline defences excluding tsunami. |
| Flood fringe areas | The remaining area of flood prone land after floodway and flood storage areas have been defined. |
| Flood liable land | Is synonymous with flood prone land (i.e.) land susceptibility to flooding by the PMF event. Note that the term flooding liable land covers the whole floodplain, not just that part below the FPL (see flood planning area) |
| Floodplain | Area of land which is subject to inundation by floods up to and including the probable maximum flood event, that is flood prone land. |
| Floodplain risk management options | The measures that might be feasible for the management of particular area of the floodplain. Preparation of a floodplain risk management plan requires a detailed evaluation of floodplain risk management options. |
| Floodplain risk management plan | A management plan developed in accordance with the principles and guidelines in this manual. Usually include both written and diagrammatic information describing how particular areas of flood prone land are to be used and managed to achieve defines objectives. |
| Flood plan (local) | A sub-plan of a disaster plan that deals specifically with flooding. They can exist at state, division and local levels. Local flood plans are prepared under the leadership of the SES. |
| Flood planning levels (FPLs) | Are the combination of flood levels (derived from significant historical flood events or floods of specific AEPs) and freeboards selected for floodplain risk management purposes, as determined in management studies and incorporated in management plans. FPLs supersede the "designated flood" or the "flood standard" used in earlier studies. |



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| Flood proofing | A combination of measures incorporated in the design, construction and alteration of individual buildings and structures subject to flooding, to reduce or eliminate flood damages. |
| Flood readiness | Readiness is an ability to react within the effective warning time. |
| Flood risk | <p>Potential danger to personal safety and potential damage to property resulting from flooding. The degree of risk varies with circumstances across the full range of floods. Flood risk in this manual is divided into 3 types, existing, future and continuing risks. They are described below.</p> <p><u>Existing flood risk</u>: the risk a community is exposed to as a result of its location on the floodplain.</p> <p><u>Future flood risk</u>: the risk a community may be exposed to as a result of new development on the floodplain.</p> <p><u>Continuing flood risk</u>: the risk a community is exposed to after floodplain risk management measures have been implemented. For a town protected by levees, the continuing flood risk is the consequences of the levees being overtopped. For an area without any floodplain risk management measures, the continuing flood risk is simply the existence of its flood exposure.</p> |
| Flood storage areas | Those parts of the floodplain that are important for the temporary storage of floodwaters during passage of a flood. The extent and behaviour of flood storage areas may change with flood severity, and loss of flood storage can increase the severity of flood impacts by reducing natural flood attenuation. Hence, it is necessary to investigate a range of flood sizes before defining flood storage areas |
| Floodway areas | Those areas of the floodplain where a significant discharge of water occurs during floods. They are often aligned with naturally defined channels. Floodways are areas that, even if only partially blocked, would cause a significant redistribution of flood flow, or a significant increase in flood levels. |
| Freeboard | Provides reasonable certainty that the risk exposure selected in deciding on a particular flood chosen as the basis for the FPL is actually provided. It is a factor of safety typically used in relation to the setting of floor levels, levee crest levels, etc. Freeboard is included in the flood planning level. |



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| Hazard | A source of potential harm or situation with a potential to cause loss. In relation to this manual the hazard is flooding which has the potential to cause damage to the community. |
| Local overland flooding | Inundation by local runoff rather than overbank discharge from a stream, river, estuary, lake or dam. |
| m AHD | Metres Australian Height Datum (AHD) |
| m/s | Metres per second. Unit used to describe the velocity of floodwaters. |
| m ³ /s | Cubic metres per second or "cusecs". A unit of measurement of creek or river flows or discharges. It is the rate of flow of water measured in terms of volume per unit time. |
| Mainstream flooding | Inundation of normally dry land occurring when water overflows the natural or artificial banks of a stream, river, estuary, lake or dam. |
| MIKE11 | A computer program used for analysing behaviour of unsteady flow in open channels and floodplains. |
| Modification measures | Measures that modify either the flood, the property or the response to flooding. |
| Overland flowpath | The path that floodwaters can follow as they are conveyed towards the main flow channel or if they leave the confines of the main flow channel. Overland flowpaths can occur through private property or along roads. |
| PIPE ⁺⁺ | A computer program for analysing water supply systems. |
| Probable Maximum Flood (PMF) | The largest flood that could conceivably occur at a particular location, usually estimated from probable maximum precipitation coupled with the worst flood producing catchment conditions. Generally, it is not physically or economically possible to provide complete protection against this event. The PMF defines the extent of flood prone land, that is, the floodplain. |
| Risk | Chance of something happening that will have an impact. It is measured in terms of consequences and likelihood. In the context of the manual it is the likelihood of consequences arising from the interaction of floods, communities and the environment. |
| Runoff | The amount of rainfall which actually ends up as a streamflow, also known as rainfall excess. |
| Stage | The amount of rainfall which actually ends up as streamflow, also known as rainfall excess. |



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| SES | State Emergency Service of New South Wales. |
| Stage hydrograph | A graph that shows how the water level at particular location changes with time during a flood. It must be referenced to a particular datum. |
| XP-RAFTS | A computer program used in the estimation of rainfall runoff |



Appendix A Questionnaire

Mid-Western Regional Council is overseeing the “Kandos and Rylstone Flood Study”. Council has contracted the Consultant, Sinclair Knight Merz (SKM), to undertake the study. The study is aimed at addressing the stormwater flooding issues within Kandos and both stormwater and riverine flooding issues within Rylstone. The Consultant would like to receive feedback from the community on a number of issues and topics already highlighted by the Council with regard to stormwater/ riverine flooding in the townships of Kandos and Rylstone.

If you cannot answer any question, or do not wish to answer a question, then leave it unanswered and proceed to the next question. **Your input to this important study will be greatly appreciated.** If you need additional space, please add sheets.

If you would prefer to provide a letter with your comments or send your response to this questionnaire directly to the consultant, this would also be welcomed. Contact details of the Consultant's Project Manager are provided below:

Akhter Hossain
P O Box 164
St Leonards, NSW 1590
email: ahossain@globalskm.com

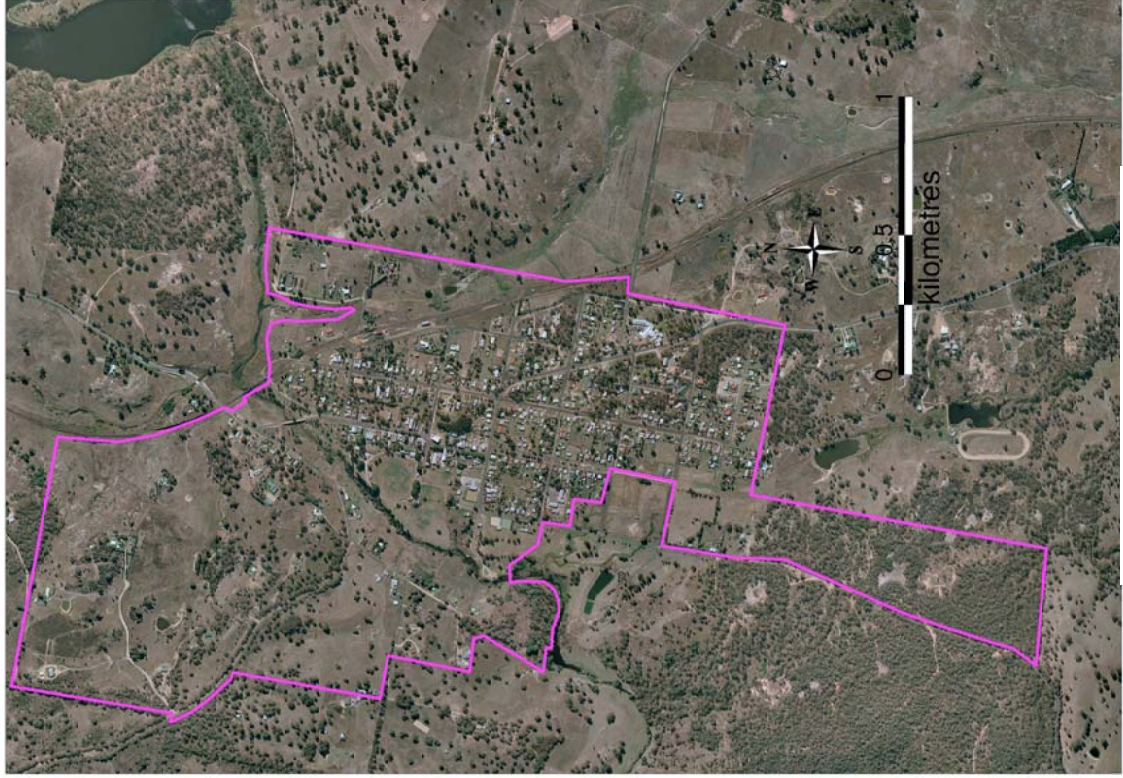
Place a tick or write a number in the relevant box as per instruction or write answers.

| Question No. | Question and Answer |
|--------------|---|
| 1. | <p>Do you live (reside) or have lived in the study area shown on the attached plan?</p> <p><input type="checkbox"/> Yes (Please provide your address)</p> <p style="text-align: right;">.....</p> <p><input type="checkbox"/> No (Go to Question 3)</p> |
| 2. | <p>Do you own or rent your residence in the study area (Kandos and Rylstone)?</p> <p><input type="checkbox"/> Own</p> <p><input type="checkbox"/> Rent</p> <p>How long have you lived in the study area? (Please write number of years).....</p> |
| 3. | <p>Do you own or manage a business in the study area?</p> <p><input type="checkbox"/> Yes, For how many years?</p> <p><input type="checkbox"/> No (go to Question 5)</p> |
| 4. | <p>What kind of business?</p> <p><input type="checkbox"/> Home based business</p> <p><input type="checkbox"/> Shop/commercial premises</p> <p><input type="checkbox"/> Light industrial</p> <p><input type="checkbox"/> Heavy industry</p> <p><input type="checkbox"/> Others, please write type of business</p> |

| Question No. | Question and Answer |
|--------------|---|
| 5. | <p>Have you had any experience of flooding (due to storm events as well) in and around where you live or work?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No (Go to Question 14)</p> |
| 6. | <p>How deep was the floodwater (from storm water as well) in the worst flood/ storm event that you experienced?</p> <p>Please estimate the depth</p> <p>What was the year of this flood?.....</p> <p>Where was this flood?</p> <p><input type="checkbox"/> At your house?</p> <p><input type="checkbox"/> At work?</p> <p><input type="checkbox"/> Elsewhere?</p> <p>Please provide the street address for this flood?</p> |
| 7. | <p>How long did the floodwaters stay up?</p> <p><input type="checkbox"/> Few minutes</p> <p><input type="checkbox"/> Less than one hour</p> <p><input type="checkbox"/> More than one hour</p> |
| 8. | <p>What damage resulted from this flood in your residence? (Please indicate either "none", "minor", "moderate" or "major".)</p> <p><input type="checkbox"/> Damage to garden, lawns or backyard</p> <p><input type="checkbox"/> Damage to external house walls</p> <p><input type="checkbox"/> Damage to internal parts of house (floor, doors, walls etc)</p> <p><input type="checkbox"/> Damage to possessions (fridge, television etc)</p> <p><input type="checkbox"/> Damage to car</p> <p><input type="checkbox"/> Damage to garage</p> <p><input type="checkbox"/> Other damage, please list.....</p> <p><input type="checkbox"/> What was the cost of the repairs, if any?.....</p> |
| 9. | <p>What damage resulted from this flood in your business? (Please indicate either "none", "minor", "moderate" or "major".)</p> <p><input type="checkbox"/> Damage to surroundings</p> <p><input type="checkbox"/> Damage to building</p> <p><input type="checkbox"/> Damage to stock</p> <p><input type="checkbox"/> Other damages, please list.....</p> <p><input type="checkbox"/> What was the cost of the repairs, if any?.....</p> |
| 10. | <p>Was vehicle access to/from your property disrupted due to floodwaters during the worst flooding/ storm event?</p> <p><input type="checkbox"/> Not affected</p> <p><input type="checkbox"/> Minor disruption (roads flooded but still driveable)</p> <p><input type="checkbox"/> Access cut off</p> |
| 11. | <p>What information can you provide on past floods/ storm events that created flooding? (You can tick more than one box). Please write any descriptions at the end of the questionnaire</p> <p><input type="checkbox"/> No information</p> <p><input type="checkbox"/> Information on extent or depth of floodwater at particular locations, newspaper clippings or other images on the past floods</p> <p><input type="checkbox"/> Any permanent marks indicating maximum flood level for particular floods</p> <p><input type="checkbox"/> Memory of flow directions, depth or velocities</p> |

| Question No. | Question and Answer |
|--------------|---|
| 12. | <p>Do you consider that flooding of your property has been made worse by works on other properties, or by the construction of roads or other structures?</p> <p><input type="checkbox"/> Yes (please provide further details. Attach extra page if necessary. Provide sketch if possible.)</p> <p><input type="checkbox"/> Unsure</p> <p><input type="checkbox"/> No</p> |
| 13. | <p>Do you have any photographs of past floods that would be useful for the consultant to help him understand the area flooded or other flood effects? If possible please attach the photographs (with dates and location) which will be copied and returned.</p> <p><input type="checkbox"/> Yes (either attach or the consultant will contact you to arrange for a copy to be made and returned)</p> <p><input type="checkbox"/> No</p> |
| 14. | <p>Do you wish to comment on any other issues associated with this study? Please add comments at the end of the questionnaire Or please indicate your willingness to answer questions over the phone?.</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> |
| 15. | <p>Do you wish to remain on the mailing list for further details, Newsletters etc?</p> <p><input type="checkbox"/> Yes (please provide contact details, see next question)</p> <p><input type="checkbox"/> No</p> |
| 16. | <p>If you would like, please provide details of where you live and how we can contact you if we need to follow up on some details or seek additional comment.</p> <p>Name: _____</p> <p>Address: _____</p> <p>_____</p> <p>Telephone:</p> <p>Fax:</p> <p>Email:.....</p> |
| | <p>Space for additional comments</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> |

Study Areas



Rylstone



Kandos



Appendix B Additional Topographic Data

Table B.1. Additional Topographic Data

- mMGA to be used for Existing and Northings, elevations and invert levels.
- Sizes in mm, lengths in m.
- Digital photographs required for each asset.
- Bridge general arrangement sketches to include: piers (location, size and shape); abutments (shape and elevation); deck (elevation mAHd and thickness); railing; height; and width of the deck.



| Asset ID | GENERAL | | | | Type | Location of Additional Assets | Digital Photos | PITS | | | PIPES / CULVERTS | | | | BRIDGES | | Notes |
|----------|---------|----------------|--------|-------|------|-------------------------------|----------------|-----------|---------------|------------|------------------|----------|-----------------|---------|----------|---------|---|
| | Pit | Culvert / Pipe | Bridge | Other | | | | Type | Size of Limit | Grate Size | Depth | Type | Diameter / Size | Length | Material | # Cells | |
| | | | | | | | | | | | | | | | | | |
| 1 | X | | | | | 7843.257 | 6367419.401 | 1 | KIP | 1000 | 900x550 | 760 | | | | | |
| 2 | X | | | | | 7843.515 | 6367419.324 | 2 | KIP | 1000 | 900x550 | 600 | | | | | |
| 8 | X | | | | | 78304.648 | 6367570.682 | 8 | KIP | 760x150 | 0 | 670 | | | | | |
| 9 | X | | | | | 78296.451 | 6367567.471 | 9 | KIP | 1800 | 800x400 | 1040 | | | | | |
| 10 | X | | | | | 78253.300 | 6367489.363 | 10 | GIP | 0 | 900x600 | 570 | | | | | |
| 11 | X | | | | | 78252.852 | 6367500.194 | 11 | GIP | 0 | 900x600 | 540 | | | | | |
| 12 | X | | | | | 78252.852 | 6367500.194 | 12 | GIP | 1800 | 800x400 | 1280 | | | | | |
| 13 | X | | | | | 78268.455 | 6367593.673 | | GIP | 2400 | 900x450 | 570 | | | | | |
| 14 | X | | | | | 78263.676 | 6367261.318 | 13 | GIP | 0 | 900x450 | 770 | | | | | |
| 15 | X | | | | | 78269.807 | 6367252.457 | 14 | GIP | 0 | 900x450 | 770 | | | | | |
| 16 | X | | | | | 78170.767 | 6367233.464 | 15 | GIP | 0 | 580x450 | 520 | | | | | |
| 17 | X | | | | | 78192.959 | 6367252.593 | 16 | GIP | 0 | 450x450 | 790 | | | | | |
| 18 | X | | | | | 78171.621 | 6367239.265 | 17 | GIP | 450x150 | 0 | 850 | | | | | |
| 19 | X | | | | | 78169.781 | 6367038.914 | 18 | GIP | LETTERBOX | 0 | 500 | | | | | |
| 20 | X | | | | | 78196.926 | 6367048.998 | 19 | GIP | 1000 | 900x450 | 800 | | | | | |
| 21 | X | | | | | 78170.812 | 6367071.214 | | GIP | 1800 | 900x450 | 580 | | | | | |
| 22 | X | | | | | 78200.749 | 6367095.687 | 21 | GIP | 1800 | 900x450 | 900 | | | | | |
| 23 | X | | | | | 78183.775 | 6367095.326 | 22 | GIP | 0 | 450x450 | 460 | | | | | |
| 24 | X | | | | | 78171.771 | 6367034.567 | | GIP | 1000 | 900x450 | 460 | | | | | |
| 25 | X | | | | | 77981.478 | 6367073.017 | 24 | KERB OUTLET | | | | | | | | |
| 26 | X | | | | | 77973.460 | 6367090.971 | 26 | GIP | 1800 | 900x450 | 1150 | | | | | |
| 27 | X | | | | | 77832.655 | 636796.733 | 27 | GIP | 600 | 900x450 | 420 | | | | | LETTERBOX PIT |
| 28 | X | | | | | 78331.696 | 636796.759 | 28 | GIP | 600 | 900x450 | 520 | | | | | |
| 29 | X | | | | | 78325.320 | 6366785.876 | 29 | KIP | 600 | 900x450 | 300 | | | | | |
| 30 | X | | | | | 78160.268 | 6366828.825 | 30 | GIP | 2000 | 900x450 | 1120 | | | | | |
| 31 | X | | | | | 78156.495 | 6366833.836 | 31 | GIP | 0 | 900x450 | 1430 | | | | | |
| 32 | X | | | | | 78145.752 | 6366836.115 | 32 | GIP | 0 | 900x450 | 1000 | | | | | |
| 33 | X | | | | | 77934.278 | 6366870.992 | 33 | GIP | 0 | 900x450 | 760 | | | | | |
| 34 | X | | | | | 77940.823 | 6366861.023 | 34 | GIP | 1800 | 800x400 | 720 | | | | | |
| 35 | X | | | | | 78238.994 | 636574.764 | 35 | LETTERBOX | 400x200 | 0 | 750 | | | | | |
| 36 | X | | | | | 78294.864 | 6365656.650 | 36 | GIP | 2400 | 800x400 | 700 | | | | | |
| 37 | X | | | | | 78209.632 | 6365833.503 | 37 | GIP | 2400 | 800x400 | 1650 | | | | | |
| 38 | X | | | | | 78120.035 | 6366600.545 | 38 | GIP | 2000 | 800x400 | 1900 | | | | | |
| 39 | X | | | | | 78373.238 | 6366336.618 | 39 | GIP | 900 | 900x450 | 1450 | | | | | |
| 40 | X | | | | | 78359.677 | 6366328.871 | 40 | GIP | 900 | 900x450 | 1260 | | | | | |
| 41 | X | | | | | 78247.539 | 6366366.334 | 41 | GIP | 900 | 900x400 | 660 | | | | | |
| 42 | X | | | | | 78232.389 | 6366366.678 | 42 | GIP | 900 | 900x450 | 900 | | | | | |
| 43 | X | | | | | 78250.622 | 6366395.579 | 43 | GIP | 850 | 900x450 | 1200 | | | | | |
| 44 | X | | | | | 78240.989 | 6366329.069 | 44 | GIP | 900 | 900x450 | 710 | | | | | |
| 45 | X | | | | | 78410.710 | 6366147.683 | 45 | GIP | 2400 | 800x400 | 1260 | | | | | |
| 46 | X | | | | | 78301.280 | 6366168.697 | 46 | GIP | 2400 | 800x400 | 1270 | | | | | |
| 47 | X | | | | | 78222.958 | 6366183.691 | 47 | GIP | 2400 | 800x400 | 1130 | | | | | |
| 48 | X | | | | | 78214.824 | 6366196.035 | 48 | GIP | 2400 | 800x400 | 1130 | | | | | |
| 50 | X | | | | | 78127.946 | 6366823.714 | 50 | JUNCTION PIT | 1000 | 900x450 | 890 | | | | | LEVELS NOT OBTAINED - BORED PIT |
| 51 | X | | | | | 78196.292 | 6366188.763 | 51 | CULVERT INLET | | | | | | | | |
| 52 | X | | | | | 78197.527 | 6366200.140 | 52 | JUNCTION PIT | | | | | | | | |
| ST00001 | X | | | | | 78722.505 | 6366752.991 | ST00001 | | | | | | | | | |
| ST00002 | X | | | | | | | | | | | | | | | | UNABLE TO FIND START OF PIPE NUMBER ST00002 |
| ST00003 | X | | | | | 778735.05 | 6366707.237 | ST00076 A | | | | | | | | | PIPE FOUND TO BE 375, NOT 450 |
| ST00004 | X | | | | | | | ST00004 | | | | | | | | | PIPE FOUND TO BE 375, NOT 450 |
| ST00005 | X | | | | | 778715.502 | 6366560.854 | ST00005 | | | | | | | | | |
| ST00006 | X | | | | | 778715.322 | 6366544.715 | ST00006 | | | | | | | | | |
| ST00007 | X | | | | | 778694.198 | 6366426.691 | ST00007 | | | | | | | | | |
| ST00008 | X | | | | | 778613.157 | 6367178.562 | ST00008 | | | | | | | | | |
| ST00009 | X | | | | | 778580.760 | 6366965.196 | ST00009 | | | | | | | | | |
| ST00010 | X | | | | | 778489.888 | 6366668.151 | ST00010 | | | | | | | | | |
| ST00011 | X | | | | | 778548.198 | 6366418.527 | ST00081 A | | | | | | | | | |
| ST00012 | X | | | | | 778540.503 | 6366420.463 | ST00081 E | | | | | | | | | |
| ST00013 | X | | | | | 778636.694 | 6366245.307 | ST00012 | | | | | | | | | |
| ST00014 | X | | | | | 77857.700 | 6366285.166 | ST00013 | | | | | | | | | PIPE FOUND TO BE 600, NOT 450 |
| ST00015 | X | | | | | 778433.515 | 6367419.324 | ST00014 | | | | | | | | | |
| ST00016 | X | | | | | 77847.675 | 6367416.915 | ST00015 | | | | | | | | | |
| ST00017 | X | | | | | 778326.056 | 6367684.996 | ST00016 | | | | | | | | | |
| ST00018 | X | | | | | 778097.116 | 6366511.199 | ST00017 | | | | | | | | | |
| ST00019 | X | | | | | 778304.648 | 6367570.682 | 8 | Pipe | 375 | 5 | CONCRETE | 1 | 574.753 | 574.645 | | |
| ST00020 | X | | | | | 778296.54 | 6367568.136 | 9 | Pipe | 600 | 30 | CONCRETE | 1 | 574.645 | 574.136 | | |
| ST00021 | X | | | | | 77823.312 | 6367631.737 | ST00020 | | | | | | | | | |
| ST00022 | X | | | | | 778253.3 | 6367489.363 | 10 | Pipe | 600 | 75 | CONCRETE | 1 | 574.126 | 566.125 | | |
| ST00023 | X | | | | | 778209.807 | 6367252.457 | 13 | Pipe | 450 | 15 | CONCRETE | 1 | 583.095 | 582.000 | | |
| ST00024 | X | | | | | 778217.238 | 6367255.45 | 15 | Pipe | 600 | 20 | CONCRETE | 1 | 580.141 | 579.518 | | |
| ST00025 | X | | | | | 778109.835 | 6367285.918 | ST00024 | | | | | | | | | |
| ST00026 | X | | | | | 778348.727 | 6367020.529 | ST00025 | | | | | | | | | |
| ST00027 | X | | | | | 778170.812 | 6367071.214 | 20 | Pipe | 450 | 25 | CONCRETE | 1 | 594.015 | 592.160 | | |
| ST00028 | X | | | | | 778170.812 | 6367071.214 | 24 | Pipe | 450 | 27 | CONCRETE | 1 | 581.561 | 580.256 | | |
| ST00029 | X | | | | | 778200.945 | 6367095.762 | 21 | Pipe | 450 | 5 | CONCRETE | 1 | 582.229 | 582.229 | | |
| ST00030 | X | | | | | 778171.476 | 6367034.603 | | Pipe | 450 | 5 | CONCRETE | 1 | 582.032 | 582.032 | | |
| ST00031 | X | | | | | 778113.936 | 6367051.826 | 24 | Pipe | 450 | 20 | CONCRETE | 1 | 582.032 | 580.256 | | |
| ST00032 | X | | | | | 778117.004 | 6367051.222 | | Pipe | 450 | 137 | CONCRETE | 1 | 580.256 | 576.736 | | |

DRAINAGE STRUCTURES IN CARWELL, MELLON, LOUFE AND COOMBER STREETS, RYLSTONE

| ID NO | DRAIN TYPE | NO OF BARRELS | LENGTH (M) | UPSTREAM INV | DOWNSTREAM INV | PHOTO NOS |
|-------|---|---------------|------------|-----------------------------------|----------------|-----------------------|
| 1 | 750MM DIA PIPE & HEADWALL | 1 | 13.7 | 574.42 | 574.09 | 1-U,1A-U,1-D,1A-D |
| 2 | 1050MM DIA PIPE & HEADWALL | 1 | 10.05 | 571.35 | 571.04 | 2-U,2A-U,2-D,2A-D |
| 3 | 600MM DIA PIPES & HEADWALL | 2 | 10.15 | 572.73 | 572.56 | 3-U,3A-U,3-D,3A-D |
| 4 | 450MM DIA PIPES & HEADWALL | 2 | 10.25 | 573.88 | 573.78 | 4-U,4A-U,4-D,4A-D |
| 5 | 450MM DIA PIPE (HEADWALL UPSTREAM) | 1 | 10.1 | 573.99 | 573.95 | 5-U,5A-U,5-D,5A-D |
| 6 | 450MM DIA PIPE (HWALL DSTREAM, KERB INLET PIT UPSTREAM) | 1 | 34.6 | 576.74 | 575.65 | 6-U,6A-U,6-D,6A-D |
| 7 | 450MM DIA PIPES & HEADWALLS | 2 | 23.6 | NTH PIPE=575.4 STH PIPE=575.35 | 575.17 | 7-U,7A-U,7-D,7A-D |
| 8 | 450MM DIA PIPES & HEADWALLS | 1 | 7.45 | 576.13 | 575.94 | 8-U,8A-U,8-D,8A-D |
| 9 | 900MM DIA PIPES & ROCK HEADWALLS | 2 | 8.8 | 574.06 | 573.83 | 9-U,9A-U,9-D,9A-D |
| 10 | CULVERT-CENTRE SUPPORT 0.2 WIDE NTH CHAMBER=1.52 HIGHx1.83 WIDEx7.6 LONG STH CHAMBER=1.52 HIGHx1.73 WIDEx7.6 LONG | 2 | 7.6 | 573.23 | 573.22 | 10-U,10A-U,10-D,10A-D |



Appendix C Cudgegong River Flood Modelling

Figure C-1 MIKE11 Model Layout for Rylstone



LEGEND

-  Study Area
-  MIKE11 Cross Section
-  Creek/ Overland Flowpath

The flood inundation map is based on the available data and the assumptions made in the flood study. Hence, the flood study report must be read to draw any conclusion on the basis of the flood inundation map.

Sinclair Knight Merz does not warrant that this document is definitive nor free of error and does not accept liability for any loss caused or arising from reliance upon information provided herein.

○ [GDA1994 MGA ZONE 55]
A3 1:11,691





■ **Table C-9-1 Storage Capacity of Rylstone Dam**

| Elevation (mAHD) | Surface Area (m ²) | Storage Volume (m ³) |
|------------------|--------------------------------|----------------------------------|
| 568.00 | 0 | 0 |
| 568.50 | 388 | 53 |
| 569.00 | 1,245 | 443 |
| 569.50 | 4,759 | 1,801 |
| 570.00 | 10,476 | 5,425 |
| 570.50 | 19,799 | 12,799 |
| 571.00 | 29,493 | 25,046 |
| 571.50 | 39,653 | 42,313 |
| 572.00 | 52,885 | 65,423 |
| 572.50 | 71,657 | 96,290 |
| 573.00 | 100,226 | 138,572 |
| 573.50 | 136,738 | 197,436 |
| 574.00 | 178,168 | 276,290 |
| 574.50 | 226,218 | 377,906 |
| 575.00 | 231,218 | 499,616 |
| 575.50 | 296,785 | 639,813 |
| 576.00 | 332,580 | 796,815 |
| 576.50 | 376,008 | 974,398 |
| 577.00 | 420,811 | 1,172,714 |
| 577.50 | 477,474 | 1,397,862 |
| 578.00 | 535,103 | 1,650,846 |
| 578.50 | 588,195 | 1,931,731 |
| 579.00 | 645,967 | 2,240,165 |
| 579.50 | 715,730 | 2,579,806 |
| 580.00 | 772,240 | 2,952,943 |
| 580.11 | 779,334 | 3,038,275 |
| 580.50 | 817,667 | 3,349,211 |

Source: Council; GHD (2009)



■ **Table C-9-2 Adopted Spillway Rating for Rylstone Dam**

| Elevation (mAHD) | Discharge (m ³ /s) |
|---------------------|----------------------------------|
| 580.11 | 0 |
| 580.41 | 23 |
| 581.08 | 211 |
| 581.58 | 439 |
| 581.59 | 444 |
| 582.08 | 751 |
| 583.08 | 1,602 |
| 583.41 | 1,929 |
| 583.42 | 1,939 |
| 584.08 | 2,679 |
| 585.08 | 3,982 |
| 586.08 | 5,390 |
| 586.46 | 5,962 |
| 586.47 | 5,977 |
| 587.08 | 6,935 |
| 588.08 | 8,607 |
| 589.08 | 10,395 |
| 590.08 | 12,294 |
| 591.08 | 14,296 |
| 591.58 | 15,334 |
| 592.08 | 16,396 |

Source: NSW Department of Commerce (2003); GHD (2009)

■ **Table C-9-3 Modelled Peak Water Levels (mAHD)**

| Flowpath | Chainage | 20% AEP | 10% AEP | 5% AEP | 2% AEP | 1% AEP | 0.5% AEP | DCF | PMF | Sunny Day DB | DCF DB | PMF DB | Remarks |
|-----------|----------|---------|---------|--------|--------|--------|----------|--------|--------|--------------|--------|--------|------------------|
| CUDGEGONG | 51630 | 580.21 | 580.24 | 580.30 | 580.36 | 580.44 | 580.53 | 583.41 | 589.95 | 580.11 | 583.42 | 589.96 | U/S Rylstone Dam |
| CUDGEGONG | 51670 | 572.10 | 572.57 | 573.12 | 573.57 | 574.03 | 574.48 | 583.26 | 589.90 | 578.00 | 583.31 | 589.92 | Rylstone Dam Toe |
| CUDGEGONG | 51870 | 571.77 | 572.22 | 572.74 | 573.17 | 573.61 | 574.04 | 582.47 | 589.31 | 577.40 | 582.52 | 589.32 | |
| CUDGEGONG | 52100 | 571.09 | 571.48 | 571.93 | 572.31 | 572.72 | 573.15 | 580.96 | 587.93 | 575.58 | 581.00 | 587.96 | |
| CUDGEGONG | 52465 | 570.45 | 570.82 | 571.26 | 571.63 | 572.07 | 572.55 | 580.40 | 587.43 | 574.15 | 580.48 | 587.47 | |
| CUDGEGONG | 52625 | 570.36 | 570.71 | 571.12 | 571.49 | 571.92 | 572.42 | 580.48 | 587.72 | 574.03 | 580.54 | 587.76 | WTP |
| CUDGEGONG | 52670 | 570.18 | 570.58 | 571.03 | 571.43 | 571.88 | 572.40 | 580.48 | 587.72 | 574.03 | 580.53 | 587.77 | |
| CUDGEGONG | 52710 | 569.99 | 570.40 | 570.86 | 571.27 | 571.74 | 572.29 | 580.43 | 587.66 | 573.92 | 580.47 | 587.71 | |
| CUDGEGONG | 52860 | 569.53 | 570.01 | 570.49 | 570.93 | 571.40 | 571.92 | 580.30 | 587.63 | 573.65 | 580.39 | 587.66 | |
| CUDGEGONG | 52915 | 569.52 | 570.02 | 570.50 | 570.95 | 571.43 | 571.95 | 580.39 | 587.77 | 573.72 | 580.45 | 587.80 | |
| CUDGEGONG | 52960 | 569.49 | 569.99 | 570.47 | 570.92 | 571.39 | 571.92 | 580.33 | 587.65 | 573.68 | 580.41 | 587.68 | U/S Railway Br |
| CUDGEGONG | 53000 | 569.41 | 569.91 | 570.44 | 570.90 | 571.37 | 571.88 | 580.25 | 586.29 | 573.59 | 580.33 | 586.30 | |
| CUDGEGONG | 53115 | 569.31 | 569.76 | 570.30 | 570.75 | 571.22 | 571.73 | 580.22 | 586.11 | 573.39 | 580.29 | 586.09 | |
| CUDGEGONG | 53160 | 569.24 | 569.69 | 570.23 | 570.68 | 571.14 | 571.66 | 580.03 | 586.00 | 573.30 | 580.15 | 585.99 | U/S Bridge St |
| CUDGEGONG | 53200 | 569.22 | 569.67 | 570.19 | 570.63 | 571.08 | 571.58 | 579.52 | 584.62 | 573.14 | 579.60 | 584.62 | |
| CUDGEGONG | 53505 | 568.87 | 569.30 | 569.77 | 570.16 | 570.54 | 570.96 | 578.94 | 584.16 | 572.16 | 578.96 | 584.17 | |
| CUDGEGONG | 53690 | 568.69 | 569.11 | 569.53 | 569.89 | 570.23 | 570.65 | 578.62 | 583.82 | 571.65 | 578.66 | 583.83 | |
| CUDGEGONG | 53965 | 568.41 | 568.82 | 569.21 | 569.55 | 569.86 | 570.32 | 578.50 | 583.71 | 571.14 | 578.52 | 583.70 | |
| CUDGEGONG | 53995 | 568.40 | 568.81 | 569.20 | 569.55 | 569.86 | 570.33 | 578.52 | 583.75 | 571.15 | 578.55 | 583.74 | Foot Bridge |
| CUDGEGONG | 54135 | 567.69 | 568.15 | 568.69 | 569.18 | 569.71 | 570.24 | 578.45 | 583.69 | 571.05 | 578.47 | 583.68 | |
| CUDGEGONG | 54247 | 567.58 | 568.03 | 568.58 | 569.07 | 569.60 | 570.13 | 578.22 | 583.39 | 570.87 | 578.24 | 583.39 | |
| CUDGEGONG | 54402 | 567.36 | 567.83 | 568.38 | 568.88 | 569.43 | 569.99 | 578.23 | 583.37 | 570.67 | 578.26 | 583.37 | U/S STW |
| CUDGEGONG | 54480 | 567.16 | 567.59 | 568.14 | 568.64 | 569.21 | 569.80 | 577.98 | 582.81 | 570.41 | 578.01 | 582.81 | |
| CUDGEGONG | 54675 | 566.43 | 566.90 | 567.52 | 568.10 | 568.74 | 569.41 | 577.44 | 582.58 | 569.97 | 577.46 | 582.58 | Weir |
| CUDGEGONG | 54775 | 566.25 | 566.78 | 567.45 | 568.05 | 568.71 | 569.39 | 577.29 | 582.25 | 569.97 | 577.31 | 582.25 | |
| CUDGEGONG | 55375 | 566.03 | 566.52 | 567.17 | 567.78 | 568.46 | 569.16 | 576.70 | 581.17 | 569.77 | 576.73 | 581.16 | |
| CUDGEGONG | 55710 | 565.72 | 566.20 | 566.86 | 567.48 | 568.20 | 568.94 | 576.37 | 580.52 | 569.60 | 576.39 | 580.52 | |
| CUDGEGONG | 56140 | 565.29 | 565.71 | 566.35 | 567.00 | 567.77 | 568.57 | 576.00 | 580.13 | 569.28 | 576.02 | 580.13 | |
| TONG_BONG | 3400 | 575.13 | 575.36 | 575.66 | 575.88 | 576.12 | 576.35 | 580.40 | 587.79 | 573.86 | 580.47 | 587.79 | |
| TONG_BONG | 3600 | 574.15 | 574.36 | 574.64 | 574.85 | 575.07 | 575.28 | 580.40 | 587.78 | 573.83 | 580.43 | 587.79 | |
| TONG_BONG | 3800 | 572.88 | 573.07 | 573.33 | 573.51 | 573.68 | 573.82 | 580.41 | 587.77 | 573.78 | 580.45 | 587.79 | |
| TONG_BONG | 4000 | 571.78 | 571.96 | 572.25 | 572.41 | 572.55 | 572.67 | 580.39 | 587.78 | 573.73 | 580.44 | 587.79 | |
| TONG_BONG | 4100 | 571.15 | 571.35 | 571.58 | 571.74 | 571.90 | 572.05 | 580.40 | 587.78 | 573.71 | 580.46 | 587.79 | |
| TONG_BONG | 4200 | 570.90 | 571.06 | 571.26 | 571.41 | 571.55 | 571.96 | 580.42 | 587.77 | 573.72 | 580.45 | 587.80 | |
| TONG_BONG | 4300 | 569.98 | 570.22 | 570.51 | 570.96 | 571.43 | 571.95 | 580.42 | 587.78 | 573.72 | 580.48 | 587.80 | |
| TONG_BONG | 4405 | 569.52 | 570.02 | 570.50 | 570.95 | 571.43 | 571.95 | 580.40 | 587.77 | 573.71 | 580.46 | 587.80 | |
| TONG_BONG | 4440 | 569.52 | 570.02 | 570.50 | 570.95 | 571.43 | 571.95 | 580.39 | 587.77 | 573.72 | 580.45 | 587.80 | Cudgegong River |

DB - Dambreak

■ **Table C-9-4 Modelled Peak Discharges (m³/s)**

| Flowpath | Chainage (m) | 20% AEP | 10% AEP | 5% AEP | 2% AEP | 1% AEP | 0.5% AEP | DCF | PMF | Sunny Day/DB | DCF DB | PMF DB | Remarks |
|-----------|--------------|---------|---------|--------|--------|--------|----------|------|--------|--------------|--------|--------|--------------------|
| CUDGEGONG | 51650 | 130 | 182 | 265 | 347 | 445 | 548 | 5586 | 14,513 | 0 | 0 | 0 | Rylstone Dam |
| CUDGEGONG | 51770 | 130 | 182 | 265 | 347 | 445 | 548 | 5304 | 14,507 | 2,013 | 5,324 | 14,512 | |
| CUDGEGONG | 51985 | 130 | 182 | 265 | 347 | 445 | 548 | 5287 | 14,498 | 2,047 | 5,318 | 14,506 | |
| CUDGEGONG | 52282.5 | 130 | 182 | 265 | 347 | 445 | 548 | 5280 | 14,474 | 2,034 | 5,305 | 14,495 | |
| CUDGEGONG | 52545 | 130 | 182 | 265 | 347 | 445 | 548 | 5287 | 14,500 | 1,913 | 5,359 | 14,495 | |
| CUDGEGONG | 52647.5 | 130 | 182 | 265 | 347 | 445 | 548 | 5279 | 14,476 | 1,782 | 5,345 | 14,482 | |
| CUDGEGONG | 52690 | 130 | 182 | 265 | 347 | 445 | 548 | 5273 | 14,464 | 1,704 | 5,323 | 14,476 | WTP |
| CUDGEGONG | 52785 | 130 | 182 | 265 | 348 | 446 | 548 | 5275 | 14,451 | 1,584 | 5,447 | 14,463 | |
| CUDGEGONG | 52887.5 | 130 | 182 | 265 | 348 | 447 | 554 | 5249 | 14,460 | 1,542 | 5,651 | 14,452 | |
| CUDGEGONG | 52937.5 | 133 | 187 | 273 | 359 | 463 | 571 | 5329 | 14,493 | 1,237 | 5,344 | 14,440 | |
| CUDGEGONG | 52980 | 133 | 187 | 273 | 359 | 462 | 571 | 5347 | 14,480 | 1,218 | 5,366 | 14,439 | U/S Railway Bridge |
| CUDGEGONG | 53057.5 | 133 | 187 | 273 | 360 | 462 | 570 | 5456 | 14,560 | 1,196 | 5,538 | 14,477 | |
| CUDGEGONG | 53137.5 | 133 | 188 | 273 | 360 | 462 | 569 | 5651 | 14,624 | 1,201 | 5,979 | 14,449 | |
| CUDGEGONG | 53180 | 133 | 200 | 273 | 360 | 462 | 569 | 5803 | 15,070 | 1,120 | 5,957 | 15,114 | Bridge Street |
| CUDGEGONG | 53352.5 | 133 | 188 | 274 | 360 | 463 | 570 | 5257 | 14,481 | 1,160 | 5,320 | 14,429 | |
| CUDGEGONG | 53597.5 | 133 | 188 | 274 | 361 | 464 | 571 | 5247 | 14,464 | 1,160 | 5,294 | 14,438 | |
| CUDGEGONG | 53827.5 | 133 | 188 | 274 | 362 | 465 | 572 | 5252 | 14,490 | 1,154 | 5,268 | 14,436 | |
| CUDGEGONG | 53980 | 133 | 188 | 275 | 362 | 465 | 573 | 5251 | 14,461 | 1,138 | 5,266 | 14,456 | Foot Bridge |
| CUDGEGONG | 54005 | 133 | 189 | 275 | 362 | 465 | 573 | 5330 | 14,502 | 1,136 | 5,138 | 14,579 | |
| CUDGEGONG | 54191 | 133 | 189 | 275 | 363 | 466 | 574 | 5241 | 14,467 | 1,075 | 5,268 | 14,450 | |
| CUDGEGONG | 54324.5 | 133 | 189 | 275 | 363 | 466 | 574 | 5237 | 14,456 | 1,057 | 5,266 | 14,451 | |
| CUDGEGONG | 54441 | 133 | 189 | 275 | 363 | 466 | 575 | 5236 | 14,450 | 1,043 | 5,272 | 14,453 | STW |
| CUDGEGONG | 54577.5 | 133 | 189 | 276 | 363 | 467 | 575 | 5239 | 14,454 | 1,030 | 5,279 | 14,455 | |
| CUDGEGONG | 54725 | 134 | 189 | 276 | 364 | 467 | 576 | 5240 | 14,454 | 1,002 | 5,276 | 14,457 | D/S Weir |
| CUDGEGONG | 55075 | 134 | 189 | 276 | 364 | 467 | 575 | 5238 | 14,464 | 906 | 5,257 | 14,456 | |
| CUDGEGONG | 55542.5 | 134 | 189 | 276 | 363 | 467 | 575 | 5236 | 14,468 | 814 | 5,259 | 14,456 | |
| CUDGEGONG | 55925 | 134 | 189 | 276 | 363 | 467 | 575 | 5230 | 14,469 | 677 | 5,255 | 14,455 | |
| TONG_BONG | 3500 | 20 | 26 | 36 | 45 | 56 | 67 | 56 | 70 | 1 | 56 | 73 | |
| TONG_BONG | 3700 | 20 | 26 | 36 | 45 | 56 | 67 | 87 | 135 | 3 | 80 | 101 | |
| TONG_BONG | 3900 | 20 | 26 | 36 | 45 | 56 | 67 | 141 | 234 | 11 | 108 | 179 | |
| TONG_BONG | 4050 | 20 | 26 | 36 | 45 | 56 | 67 | 165 | 277 | 19 | 123 | 225 | |
| TONG_BONG | 4150 | 20 | 26 | 36 | 45 | 56 | 67 | 172 | 298 | 26 | 130 | 241 | |
| TONG_BONG | 4250 | 20 | 26 | 36 | 45 | 56 | 67 | 182 | 323 | 33 | 138 | 257 | |
| TONG_BONG | 4352.5 | 20 | 26 | 36 | 45 | 56 | 67 | 197 | 349 | 48 | 146 | 273 | |
| TONG_BONG | 4422.5 | 20 | 26 | 36 | 45 | 56 | 67 | 215 | 361 | 53 | 191 | 287 | Cudgegong River |
| DAM | 30 | | | | | | | | | 1,984 | 2,178 | 2,767 | Dambreak Outflows |

DB - Dambreak

SINCLAIR KNIGHT MERZ

■ **Table C-9-5 Modelled Peak Velocities (m/s)**

| Flowpath | Chainage | 20% AEP | 10% AEP | 5% AEP | 2% AEP | 1% AEP | 0.5% AEP | DCF | PMF | Sunny Day DB | DCF DB | PMF DB | Remarks |
|-----------|----------|---------|---------|--------|--------|--------|----------|------|------|--------------|--------|--------|------------------|
| CUDGEGONG | 51630 | 0.15 | 0.21 | 0.31 | 0.40 | 0.51 | 0.62 | 4.19 | 0.00 | 0.00 | 4.05 | 0.00 | U/S Rylstone Dam |
| CUDGEGONG | 51670 | 1.02 | 1.14 | 1.33 | 1.49 | 1.66 | 1.81 | 4.16 | 4.52 | 3.65 | 4.06 | 4.52 | Rylstone Dam Toe |
| CUDGEGONG | 51870 | 1.35 | 1.48 | 1.70 | 1.88 | 2.07 | 2.23 | 4.43 | 5.17 | 3.93 | 4.41 | 5.17 | |
| CUDGEGONG | 52100 | 1.59 | 1.59 | 1.70 | 1.82 | 1.93 | 2.00 | 3.78 | 4.75 | 4.06 | 3.76 | 4.75 | |
| CUDGEGONG | 52465 | 0.56 | 0.68 | 0.84 | 0.97 | 1.09 | 1.17 | 2.89 | 3.99 | 3.06 | 2.87 | 3.99 | |
| CUDGEGONG | 52625 | 1.14 | 1.14 | 1.17 | 1.22 | 1.24 | 1.24 | 1.66 | 1.92 | 2.71 | 1.66 | 1.92 | WTP |
| CUDGEGONG | 52670 | 1.36 | 1.36 | 1.37 | 1.37 | 1.37 | 1.37 | 1.56 | 1.78 | 2.11 | 1.56 | 1.78 | |
| CUDGEGONG | 52710 | 1.55 | 1.66 | 1.85 | 1.95 | 2.00 | 2.00 | 2.57 | 2.65 | 3.34 | 2.57 | 2.65 | |
| CUDGEGONG | 52860 | 1.30 | 1.31 | 1.32 | 1.32 | 1.32 | 1.33 | 2.22 | 2.66 | 4.20 | 2.21 | 2.66 | |
| CUDGEGONG | 52915 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.67 | 1.04 | 1.20 | 0.90 | 1.04 | 1.20 | |
| CUDGEGONG | 52960 | 0.80 | 0.85 | 1.03 | 0.98 | 1.00 | 1.00 | 1.34 | 1.86 | 1.84 | 1.33 | 1.86 | U/S Railway Br |
| CUDGEGONG | 53000 | 0.80 | 0.89 | 0.98 | 1.08 | 1.17 | 1.24 | 1.56 | 1.99 | 2.61 | 1.57 | 1.99 | |
| CUDGEGONG | 53115 | 1.21 | 1.22 | 1.23 | 1.33 | 1.43 | 1.49 | 2.29 | 2.82 | 3.01 | 2.30 | 2.82 | |
| CUDGEGONG | 53160 | 1.01 | 1.13 | 1.25 | 1.37 | 1.49 | 1.56 | 2.59 | 3.52 | 3.61 | 2.70 | 3.52 | U/S Bridge St |
| CUDGEGONG | 53200 | 1.09 | 1.30 | 1.52 | 1.73 | 1.95 | 2.09 | 4.00 | 5.52 | 3.29 | 4.22 | 5.52 | |
| CUDGEGONG | 53505 | 1.02 | 1.17 | 1.39 | 1.59 | 1.79 | 1.94 | 3.63 | 4.16 | 3.02 | 3.63 | 4.16 | |
| CUDGEGONG | 53690 | 0.93 | 1.08 | 1.31 | 1.49 | 1.68 | 1.76 | 2.96 | 3.84 | 2.92 | 2.97 | 3.84 | |
| CUDGEGONG | 53965 | 1.25 | 1.29 | 1.30 | 1.30 | 1.29 | 1.29 | 2.22 | 2.46 | 1.66 | 2.22 | 2.46 | |
| CUDGEGONG | 53995 | 0.53 | 0.55 | 0.64 | 0.71 | 0.80 | 0.81 | 1.42 | 2.24 | 1.22 | 1.42 | 2.24 | Foot Bridge |
| CUDGEGONG | 54135 | 0.81 | 0.84 | 0.90 | 0.95 | 1.00 | 1.05 | 1.79 | 2.30 | 2.08 | 1.80 | 2.30 | |
| CUDGEGONG | 54247 | 0.85 | 0.95 | 1.09 | 1.20 | 1.30 | 1.38 | 2.71 | 3.19 | 2.31 | 2.71 | 3.19 | |
| CUDGEGONG | 54402 | 1.06 | 1.09 | 1.17 | 1.20 | 1.22 | 1.21 | 1.66 | 2.58 | 1.99 | 1.66 | 2.58 | U/S STW |
| CUDGEGONG | 54480 | 1.17 | 1.25 | 1.36 | 1.43 | 1.48 | 1.50 | 2.96 | 5.11 | 2.54 | 2.96 | 5.11 | |
| CUDGEGONG | 54675 | 1.70 | 1.70 | 1.72 | 1.74 | 1.75 | 1.76 | 3.27 | 4.40 | 3.59 | 3.28 | 4.40 | Weir |
| CUDGEGONG | 54775 | 0.78 | 0.88 | 0.98 | 1.06 | 1.12 | 1.17 | 3.10 | 4.79 | 3.95 | 3.12 | 4.79 | |
| CUDGEGONG | 55375 | 0.89 | 1.02 | 1.16 | 1.26 | 1.33 | 1.38 | 3.37 | 5.65 | 2.71 | 3.38 | 5.65 | |
| CUDGEGONG | 55710 | 1.08 | 1.08 | 1.09 | 1.10 | 1.11 | 1.13 | 1.78 | 2.79 | 2.96 | 1.78 | 2.79 | |
| CUDGEGONG | 56140 | 1.08 | 1.08 | 1.09 | 1.10 | 1.11 | 1.13 | 1.78 | 2.79 | 2.96 | 1.78 | 2.79 | |
| TONG_BONG | 3400 | 1.10 | 1.19 | 1.32 | 1.40 | 1.50 | 1.57 | 1.49 | 1.41 | 0.44 | 1.49 | 1.41 | |
| TONG_BONG | 3600 | 1.20 | 1.32 | 1.47 | 1.58 | 1.70 | 1.80 | 1.70 | 1.58 | 0.67 | 1.69 | 1.58 | |
| TONG_BONG | 3800 | 0.94 | 1.02 | 1.12 | 1.21 | 1.30 | 1.36 | 1.30 | 1.20 | 0.41 | 1.30 | 1.20 | |
| TONG_BONG | 4000 | 1.52 | 1.59 | 1.61 | 1.61 | 1.60 | 1.60 | 1.60 | 1.60 | 0.80 | 1.60 | 1.60 | |
| TONG_BONG | 4100 | 0.84 | 0.90 | 1.00 | 1.07 | 1.15 | 1.21 | 1.05 | 1.00 | 0.45 | 1.05 | 1.00 | |
| TONG_BONG | 4200 | 0.86 | 0.91 | 1.01 | 1.08 | 1.17 | 1.26 | 1.05 | 1.00 | 0.47 | 1.05 | 1.00 | |
| TONG_BONG | 4300 | 1.36 | 1.35 | 1.37 | 1.37 | 1.39 | 1.44 | 1.36 | 1.31 | 0.61 | 1.36 | 1.31 | |
| TONG_BONG | 4405 | 1.67 | 1.72 | 1.80 | 1.84 | 1.89 | 1.93 | 1.58 | 1.29 | 0.50 | 1.59 | 1.29 | |
| TONG_BONG | 4440 | 2.92 | 2.93 | 2.94 | 2.96 | 2.97 | 3.00 | 3.16 | 2.40 | 1.18 | 3.17 | 2.40 | Cudgegong River |

DB - Dambreak

■ **Table C-9-6 Modelled Time to Peak Water Level (Hour)**

| Flowpath | Chainage | 20% AEP | 10% AEP | 5% AEP | 2% AEP | 1% AEP | 0.5% AEP | DCF | PMF | Sunny Day DB | DCF DB | PMF DB | Remarks |
|-----------|----------|---------|---------|--------|--------|--------|----------|------|------|--------------|--------|--------|------------------|
| CUDGEGONG | 51630 | 26.00 | 22.50 | 20.75 | 19.75 | 19.00 | 18.25 | 3.83 | 3.83 | 0.00 | 3.67 | 3.67 | U/S Rylstone Dam |
| CUDGEGONG | 51670 | 26.25 | 22.50 | 20.75 | 19.75 | 19.00 | 18.25 | 3.75 | 3.75 | 0.25 | 3.83 | 3.83 | Rylstone Dam Toe |
| CUDGEGONG | 51870 | 26.25 | 22.75 | 20.75 | 19.75 | 19.00 | 18.25 | 3.83 | 3.83 | 0.25 | 3.83 | 3.67 | |
| CUDGEGONG | 52100 | 26.25 | 22.75 | 20.75 | 19.75 | 19.00 | 18.25 | 4.08 | 4.08 | 0.25 | 3.92 | 3.75 | |
| CUDGEGONG | 52465 | 26.25 | 22.75 | 20.75 | 19.75 | 19.00 | 18.50 | 4.17 | 4.17 | 0.42 | 4.08 | 3.75 | |
| CUDGEGONG | 52625 | 26.25 | 22.75 | 20.75 | 19.75 | 19.00 | 18.50 | 4.08 | 4.08 | 0.42 | 4.00 | 3.75 | WTP |
| CUDGEGONG | 52670 | 26.25 | 22.75 | 20.75 | 19.75 | 19.00 | 18.50 | 4.08 | 4.08 | 0.42 | 4.08 | 3.75 | |
| CUDGEGONG | 52710 | 26.25 | 22.75 | 20.75 | 19.75 | 19.00 | 18.50 | 4.08 | 4.08 | 0.42 | 3.92 | 3.75 | |
| CUDGEGONG | 52860 | 26.25 | 22.50 | 20.75 | 19.75 | 19.00 | 18.75 | 4.08 | 4.08 | 0.50 | 4.00 | 3.75 | |
| CUDGEGONG | 52915 | 26.25 | 22.50 | 20.75 | 19.75 | 19.00 | 18.50 | 3.92 | 3.92 | 0.50 | 3.92 | 3.75 | U/S Railway Br |
| CUDGEGONG | 52960 | 26.25 | 22.50 | 20.75 | 19.75 | 19.00 | 18.25 | 3.92 | 3.92 | 0.50 | 3.92 | 3.75 | |
| CUDGEGONG | 53000 | 26.25 | 22.50 | 20.75 | 19.75 | 19.00 | 18.50 | 4.00 | 4.00 | 0.50 | 4.00 | 3.75 | |
| CUDGEGONG | 53115 | 26.25 | 22.50 | 20.75 | 19.75 | 19.00 | 18.50 | 4.17 | 4.17 | 0.50 | 3.92 | 3.75 | U/S Bridge St |
| CUDGEGONG | 53160 | 26.25 | 22.50 | 20.75 | 19.75 | 19.00 | 18.50 | 3.92 | 3.92 | 0.50 | 3.92 | 3.92 | |
| CUDGEGONG | 53200 | 26.25 | 22.50 | 20.75 | 19.75 | 19.00 | 18.50 | 4.17 | 4.17 | 0.50 | 4.17 | 3.75 | |
| CUDGEGONG | 53505 | 26.25 | 22.75 | 20.75 | 19.75 | 19.00 | 18.50 | 4.17 | 4.17 | 0.50 | 4.17 | 3.75 | |
| CUDGEGONG | 53690 | 26.25 | 22.75 | 20.75 | 19.75 | 19.00 | 18.50 | 4.08 | 4.08 | 0.50 | 4.17 | 3.83 | |
| CUDGEGONG | 53965 | 26.25 | 22.75 | 20.75 | 19.75 | 19.00 | 18.75 | 4.08 | 4.08 | 0.58 | 4.08 | 3.75 | |
| CUDGEGONG | 53995 | 26.50 | 22.75 | 20.75 | 19.75 | 19.00 | 18.75 | 4.08 | 4.08 | 0.58 | 4.00 | 3.83 | Foot Bridge |
| CUDGEGONG | 54135 | 26.50 | 22.75 | 21.00 | 19.75 | 19.25 | 18.75 | 4.08 | 4.08 | 0.67 | 4.08 | 3.75 | |
| CUDGEGONG | 54247 | 26.50 | 22.75 | 21.00 | 19.75 | 19.25 | 18.75 | 4.08 | 4.08 | 0.67 | 4.08 | 3.75 | |
| CUDGEGONG | 54402 | 26.50 | 22.75 | 21.00 | 20.00 | 19.25 | 18.75 | 4.08 | 4.08 | 0.67 | 4.08 | 3.75 | U/S STW |
| CUDGEGONG | 54480 | 26.50 | 22.75 | 21.00 | 20.00 | 19.25 | 18.75 | 4.08 | 4.08 | 0.75 | 4.08 | 3.75 | |
| CUDGEGONG | 54675 | 26.50 | 23.00 | 21.00 | 20.00 | 19.25 | 18.75 | 4.08 | 4.08 | 0.92 | 4.08 | 3.75 | Weir |
| CUDGEGONG | 54775 | 26.75 | 23.00 | 21.00 | 20.00 | 19.25 | 18.75 | 4.08 | 4.08 | 0.92 | 4.08 | 3.83 | |
| CUDGEGONG | 55375 | 26.75 | 23.00 | 21.00 | 20.00 | 19.25 | 18.75 | 4.25 | 4.25 | 0.92 | 4.17 | 3.83 | |
| CUDGEGONG | 55710 | 26.75 | 23.00 | 21.25 | 20.00 | 19.50 | 18.75 | 4.25 | 4.25 | 0.92 | 4.17 | 3.83 | |
| CUDGEGONG | 56140 | 26.75 | 23.00 | 21.25 | 20.00 | 19.50 | 19.00 | 4.25 | 4.25 | 0.92 | 4.08 | 3.83 | |
| TONG_BONG | 3400 | 8.00 | 8.00 | 7.75 | 8.00 | 7.75 | 7.25 | 4.08 | 4.08 | 0.50 | 4.00 | 3.75 | |
| TONG_BONG | 3600 | 8.00 | 8.00 | 8.00 | 8.00 | 7.75 | 7.25 | 4.00 | 4.00 | 0.42 | 4.00 | 3.75 | |
| TONG_BONG | 3800 | 8.25 | 8.00 | 8.00 | 8.00 | 7.75 | 7.25 | 4.00 | 4.00 | 0.42 | 4.00 | 3.75 | |
| TONG_BONG | 4000 | 8.25 | 8.00 | 8.00 | 8.00 | 7.75 | 7.50 | 4.17 | 4.17 | 0.42 | 4.00 | 3.75 | |
| TONG_BONG | 4100 | 8.25 | 8.25 | 8.00 | 8.00 | 8.00 | 7.50 | 4.00 | 4.00 | 0.42 | 4.00 | 3.75 | |
| TONG_BONG | 4200 | 8.25 | 8.50 | 8.00 | 8.00 | 8.00 | 18.25 | 4.08 | 4.08 | 0.50 | 3.92 | 3.75 | |
| TONG_BONG | 4300 | 8.25 | 8.75 | 20.50 | 19.50 | 19.00 | 18.50 | 4.08 | 4.08 | 0.50 | 4.00 | 3.75 | |
| TONG_BONG | 4405 | 26.25 | 22.50 | 20.75 | 19.75 | 19.00 | 18.50 | 3.92 | 3.92 | 0.50 | 3.92 | 3.75 | |
| TONG_BONG | 4440 | 26.25 | 22.50 | 20.75 | 19.75 | 19.00 | 18.50 | 3.92 | 3.92 | 0.50 | 3.92 | 3.75 | Cudgegong River |

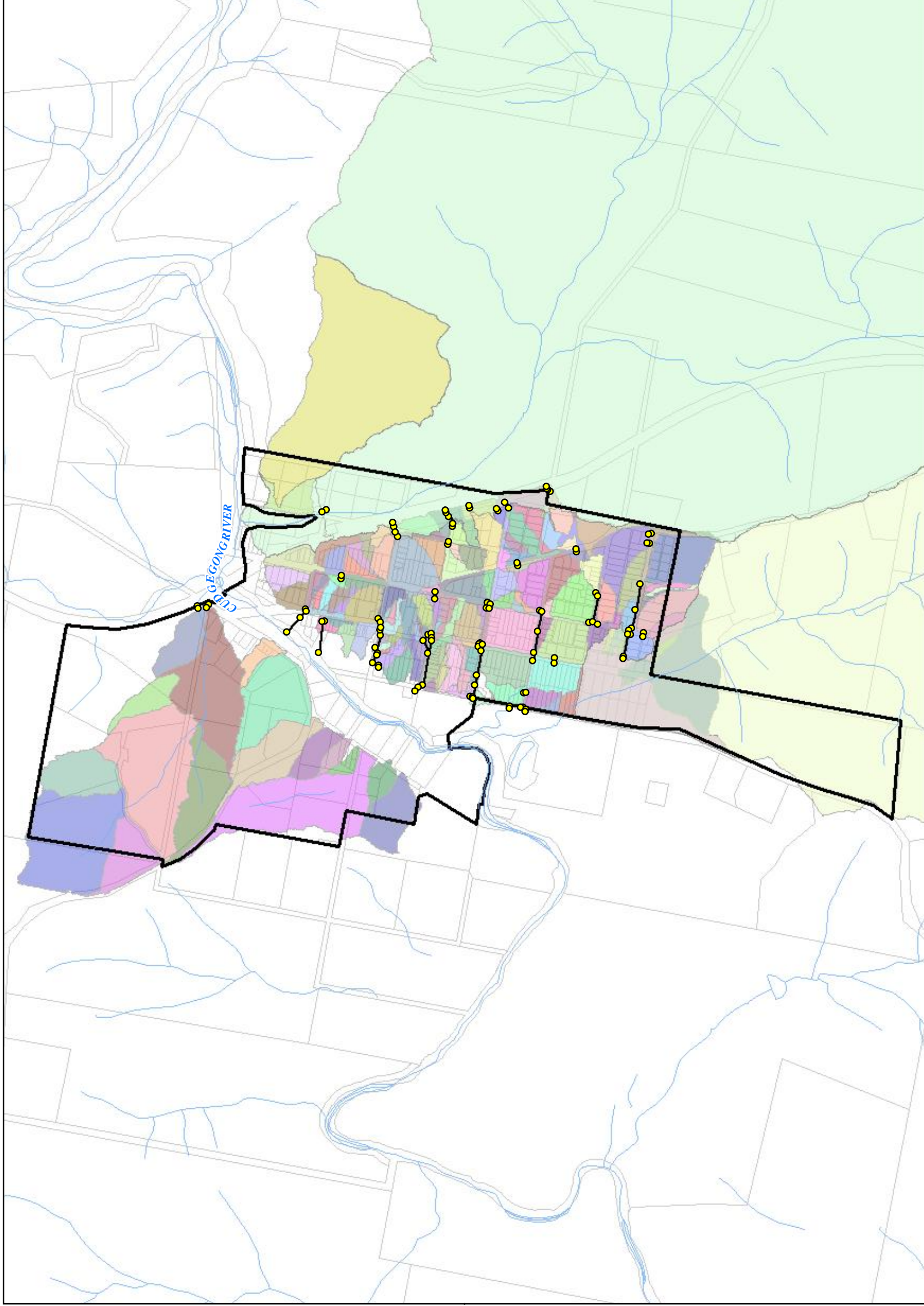
DB - Dambreak

SINCLAIR KNIGHT MERZ








Appendix D DRAINS Modelling Input and Output


Figure D1-1 Rylstone Subcatchments



LEGEND

-  Catchment based on LIDAR
-  Stormwater Pit
-  Stormwater Network
-  Cadastre
-  Study Area

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Table D1-1:Rylstone subcatchments data

| Catchment draining to pit | Total area (ha) | Paved area (%) | Grass area (%) |
|---------------------------|-----------------|----------------|----------------|
| N_HW2 | 0.37 | 45.4 | 54.6 |
| N_R024 | 1.83 | 41.6 | 58.4 |
| Pit01 | 0.17 | 0.1 | 99.9 |
| 34 | 0.09 | 60.8 | 39.2 |
| RYLSTONE6 | 0.15 | 36.4 | 63.6 |
| RYLSTONE1 | 0.58 | 31.1 | 68.9 |
| ST00081 | 0.4 | 49.1 | 50.9 |
| ST00079 | 0.41 | 54.2 | 45.8 |
| ST00080 | 0.07 | 70 | 30 |
| Pit3 | 1.3 | 41.9 | 58.1 |
| 41 | 2.89 | 38.7 | 61.3 |
| 39 | 0.98 | 36.2 | 63.8 |
| 40 | 0.06 | 69.9 | 30.1 |
| 43 | 0.13 | 64.4 | 35.6 |
| 35 | 2.1716 | 38 | 62 |
| 36 | 1.86 | 42.2 | 57.8 |
| 38 | 0.59 | 43.6 | 56.4 |
| 30 | 0.38 | 48.4 | 51.6 |
| 29 | 1.04 | 39.1 | 60.9 |
| N_R010 | 0.49 | 45.9 | 54.1 |
| 27 | 0.47 | 71.5 | 28.5 |
| N_R009 | 1.53 | 40 | 60 |
| 21 | 0.48 | 54.4 | 45.6 |
| 22 | 0.13 | 38.1 | 61.9 |
| 23 | 0.89 | 41.7 | 58.3 |
| 24 | 0.43 | 51.1 | 48.9 |
| 19 | 0.86 | 35.2 | 64.8 |
| 20 | 0.18 | 45.2 | 54.8 |
| 13 | 0.14 | 63.9 | 36.1 |
| 14 | 0.73 | 43.8 | 56.2 |
| 10 | 0.29 | 55.6 | 44.4 |
| 11 | 0.39 | 41.6 | 58.4 |
| 8 | 0.48 | 47.8 | 52.2 |
| 9 | 0.44 | 51.8 | 48.2 |
| 1 | 0.3 | 26.5 | 73.5 |
| N_R027 | 0.74 | 56.6 | 43.4 |
| N_R185 | 2.01 | 33.8 | 66.2 |
| N_R183 | 0.32 | 60.4 | 39.6 |
| N_R180 | 0.39 | 17.5 | 82.5 |
| N_R179 | 0.73 | 21.9 | 78.1 |
| N_R178 | 0.73 | 16.7 | 83.3 |
| N_R176 | 0.25 | 53.9 | 46.1 |
| N_R173 | 0.54 | 51.8 | 48.2 |
| N_R172 | 4.92 | 18.8 | 81.2 |
| N_R171 | 0.38 | 23.4 | 76.6 |
| N_R170 | 0.31 | 17.9 | 82.1 |
| N_R169 | 0.22 | 25.3 | 74.7 |

| | | | |
|----------|-------|------|------|
| N_R168 | 0.6 | 37.3 | 62.7 |
| N_R167 | 0.24 | 52.4 | 47.6 |
| N_R165 | 3.65 | 26.2 | 73.8 |
| N_R162 | 0.39 | 36.9 | 63.1 |
| N_R161 | 0.25 | 45.1 | 54.9 |
| N_R160 | 1.08 | 31.7 | 68.3 |
| N_R159 | 0.27 | 45.2 | 54.8 |
| N_R158 | 1.63 | 35.4 | 64.6 |
| N_R157 | 1.4 | 20.2 | 79.8 |
| N_R156 | 0.33 | 50.8 | 49.2 |
| N_R155 | 0.43 | 28.8 | 71.2 |
| N_R151 | 10.75 | 7.7 | 92.3 |
| N_R150 | 2.82 | 15.6 | 84.4 |
| N_R147 | 0.79 | 50.6 | 49.4 |
| N_R145 | 0.27 | 50.1 | 49.9 |
| N_R144 | 0.27 | 46.2 | 53.8 |
| N_R143 | 0.25 | 59.6 | 40.4 |
| N_R142 | 3.07 | 33.4 | 66.6 |
| N_R141 | 3.62 | 36.5 | 63.5 |
| N_R140 | 1.12 | 43.1 | 56.9 |
| N_R136 | 1.6 | 39.4 | 60.6 |
| N_R133 | 0.24 | 50.8 | 49.2 |
| N_R132 | 0.16 | 34.2 | 65.8 |
| N_R131 | 0.23 | 33.2 | 66.8 |
| N_R130 | 0.46 | 45.5 | 54.5 |
| N_R128 | 1.51 | 32.9 | 67.1 |
| N_R127 | 0.14 | 70 | 30 |
| N_R125 | 0.67 | 41.9 | 58.1 |
| N_R124 | 0.07 | 31.1 | 68.9 |
| N_R123 | 0.79 | 35.8 | 64.2 |
| N_R122 | 0.55 | 21.2 | 78.8 |
| N_R121 | 0.95 | 35.6 | 64.4 |
| N_R120 | 1.05 | 57.8 | 42.2 |
| N_R119 | 2.15 | 37.8 | 62.2 |
| N_R118 | 0.64 | 35.7 | 64.3 |
| N_R116 | 0.13 | 50.6 | 49.4 |
| N_R114 | 0.12 | 32.7 | 67.3 |
| N_R113 | 0.35 | 49.8 | 50.2 |
| N_R112 | 1.12 | 31.2 | 68.8 |
| N_R111 | 0.47 | 37.3 | 62.7 |
| N_R110 | 0.24 | 45.9 | 54.1 |
| N_R109 | 0.93 | 37.7 | 62.3 |
| N_R107 | 0.18 | 38.4 | 61.6 |
| N_R106 | 0.71 | 33.7 | 66.3 |
| N_R105 | 0.44 | 49 | 51 |
| N_R103 | 0.27 | 4.3 | 95.7 |
| N_R102 | 1.07 | 25 | 75 |
| N_R101 | 0.98 | 32.8 | 67.2 |
| N_R100 | 3.76 | 27.1 | 72.9 |
| N_R099 | 1.03 | 19.1 | 80.9 |
| R_18_out | 1.28 | 24.7 | 75.3 |

| | | | |
|---------|--------|------|------|
| N_R095 | 0.24 | 30.3 | 69.7 |
| N_R094 | 0.54 | 34.9 | 65.1 |
| N_R092 | 0.18 | 33.5 | 66.5 |
| N_R090 | 0.23 | 51.3 | 48.7 |
| N_R089 | 0.54 | 17.5 | 82.5 |
| N_R088 | 0.51 | 14.1 | 85.9 |
| N_R087 | 0.71 | 18.5 | 81.5 |
| N_R086 | 0.91 | 24.4 | 75.6 |
| N_R084 | 0.72 | 31.5 | 68.5 |
| N_R083 | 0.92 | 31.2 | 68.8 |
| N_R081 | 1.03 | 33.9 | 66.1 |
| N_R080 | 0.71 | 25.9 | 74.1 |
| N_R079 | 0.31 | 30.1 | 69.9 |
| N_R078 | 0.55 | 40.3 | 59.7 |
| N_R077 | 0.46 | 30.1 | 69.9 |
| N_R076 | 0.26 | 30 | 70 |
| N_R075 | 0.28 | 33.9 | 66.1 |
| R17_out | 1.13 | 24.1 | 75.9 |
| N_R074 | 2.84 | 40.7 | 59.3 |
| N_R070 | 2.61 | 5.4 | 94.6 |
| N_R069 | 6.81 | 11.7 | 88.3 |
| N_R068 | 16.12 | 13.3 | 86.7 |
| N_R065 | 5.34 | 6.4 | 93.6 |
| N_R064 | 14.87 | 6 | 94 |
| N_R063 | 4.71 | 17.5 | 82.5 |
| R16_out | 4.72 | 7.4 | 92.6 |
| R15_out | 2.47 | 6.2 | 93.8 |
| R14_out | 1.35 | 20.3 | 79.7 |
| N_R049 | 1.28 | 21.5 | 78.5 |
| N_R050 | 0.05 | 63.7 | 36.3 |
| N_R051 | 0.81 | 47.4 | 52.6 |
| N_R061 | 0.04 | 53.4 | 46.6 |
| N_R060 | 0.15 | 66.6 | 33.4 |
| R8_out | 1.57 | 12.6 | 87.4 |
| R7_out | 14.96 | 10.4 | 89.6 |
| R6_out | 0.76 | 16 | 84 |
| R5_out | 0.96 | 9.3 | 90.7 |
| R4_out | 6.26 | 22.6 | 77.4 |
| R3_out | 8.31 | 10.7 | 89.3 |
| N_R018 | 0.2 | 63.4 | 36.6 |
| N_R020 | 0.85 | 27.1 | 72.9 |
| N_R019 | 10.63 | 16.4 | 83.6 |
| N_R012 | 0.04 | 39.5 | 60.5 |
| ST00116 | 0.4 | 49 | 51 |
| N_R146 | 3.26 | 30.6 | 69.4 |
| N_R072 | 11.58 | 10.1 | 89.9 |
| N_R071 | 3.31 | 10.4 | 89.6 |
| N_R046 | 0.4 | 42.3 | 57.7 |
| N_R043 | 1.05 | 23.8 | 76.2 |
| N_R034 | 325.68 | 8.1 | 91.9 |
| N_R054 | 1.41 | 28.2 | 71.8 |

| | | | |
|---------|------|------|------|
| N_R040A | 0.27 | 38.4 | 61.6 |
| N_R038 | 0.16 | 20.3 | 79.7 |
| N_R036 | 0.18 | 55.9 | 44.1 |
| N_R021 | 0.28 | 70 | 30 |
| HW7 | 2.47 | 17.2 | 82.8 |
| HW6 | 0.48 | 31.9 | 68.1 |
| HW3 | 1.24 | 20.8 | 79.2 |
| HW8 | 0.18 | 57.9 | 42.1 |
| HW1 | 0.74 | 19.7 | 80.3 |
| 15 | 0.27 | 42.5 | 57.5 |
| 51 | 0.13 | 69 | 31 |

Table D1-2: Rylstone peak pipe flow results

| Pipe ID | Peak pipe flows (m ³ /s) | | | | | | |
|--------------|-------------------------------------|---------|--------|--------|--------|----------|------|
| | 20% AEP | 10% AEP | 5% AEP | 2% AEP | 1% AEP | 0.5% AEP | PMF |
| ST00489 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| P_50 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 |
| P_RYLSTONE9 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 |
| P_RYLSTONE10 | 0.34 | 0.34 | 0.33 | 0.33 | 0.33 | 0.33 | 0.34 |
| P_34 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 |
| Rylstone5 | 0.04 | 0.04 | 0.05 | 0.06 | 0.07 | 0.09 | 0.27 |
| RYLSTONE3 | 0.34 | 0.43 | 0.52 | 0.55 | 0.57 | 0.59 | 0.60 |
| RYLSTONE4 | 0.34 | 0.43 | 0.54 | 0.63 | 0.73 | 0.82 | 0.83 |
| ST00010 | 0.10 | 0.12 | 0.15 | 0.17 | 0.19 | 0.24 | 0.43 |
| ST00009 | 0.10 | 0.12 | 0.15 | 0.17 | 0.20 | 0.24 | 0.44 |
| ST00003 | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 |
| ST00062 | 0.07 | 0.08 | 0.10 | 0.11 | 0.13 | 0.16 | 0.52 |
| ST00063 | 0.07 | 0.08 | 0.10 | 0.11 | 0.13 | 0.16 | 0.53 |
| ST00065 | 0.07 | 0.08 | 0.10 | 0.11 | 0.13 | 0.16 | 0.41 |
| ST00066 | 0.07 | 0.08 | 0.10 | 0.11 | 0.13 | 0.16 | 0.29 |
| P_52 | 0.41 | 0.44 | 0.46 | 0.49 | 0.50 | 0.50 | 0.50 |
| A30 | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 0.77 |
| ST00056 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 |
| ST00057 | 0.20 | 0.26 | 0.32 | 0.36 | 0.41 | 0.42 | 0.43 |
| ST00054 | 0.22 | 0.28 | 0.35 | 0.39 | 0.45 | 0.58 | 0.59 |
| ST00055 | 0.25 | 0.32 | 0.39 | 0.42 | 0.42 | 0.46 | 0.47 |
| ST00044 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.28 |
| ST00045 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 |
| ST00046 | 0.40 | 0.41 | 0.43 | 0.42 | 0.43 | 0.48 | 0.50 |
| ST00047 | 0.44 | 0.44 | 0.44 | 0.44 | 0.45 | 0.45 | 0.45 |
| ST00043 | 0.16 | 0.20 | 0.22 | 0.23 | 0.23 | 0.23 | 0.25 |
| ST00039 | 0.45 | 0.51 | 0.51 | 0.52 | 0.52 | 0.52 | 0.52 |
| ST00040 | 0.41 | 0.41 | 0.41 | 0.41 | 0.41 | 0.41 | 0.46 |
| ST00041 | 0.31 | 0.31 | 0.31 | 0.30 | 0.30 | 0.33 | 0.32 |
| ST00038 | 0.22 | 0.29 | 0.35 | 0.39 | 0.47 | 0.50 | 0.50 |
| ST00036 | 0.12 | 0.15 | 0.17 | 0.20 | 0.23 | 0.27 | 0.27 |
| ST00037 | 0.12 | 0.15 | 0.17 | 0.20 | 0.23 | 0.28 | 0.36 |
| ST00029 | 0.30 | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 |
| ST00030 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 |
| ST00031 | 0.32 | 0.32 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 |
| ST00032 | 0.44 | 0.47 | 0.47 | 0.49 | 0.49 | 0.49 | 0.49 |
| ST00033 | 0.46 | 0.46 | 0.46 | 0.46 | 0.47 | 0.47 | 0.47 |
| ST00034 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 |
| ST00027 | 0.17 | 0.23 | 0.28 | 0.31 | 0.36 | 0.36 | 0.36 |
| ST00028 | 0.24 | 0.31 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 |
| ST00022 | 0.04 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.39 |
| ST00023 | 0.17 | 0.21 | 0.27 | 0.31 | 0.36 | 0.46 | 0.89 |
| ST00024 | 0.17 | 0.22 | 0.27 | 0.31 | 0.36 | 0.46 | 0.81 |
| ST00021 | 0.07 | 0.09 | 0.11 | 0.12 | 0.14 | 0.17 | 0.28 |
| ST00021B | 0.17 | 0.20 | 0.24 | 0.28 | 0.33 | 0.37 | 0.38 |
| ST00018 | 0.16 | 0.19 | 0.20 | 0.21 | 0.22 | 0.22 | 0.22 |
| ST00019 | 0.70 | 0.70 | 0.73 | 0.74 | 0.74 | 0.74 | 0.76 |

| Pipe ID | Peak pipe flows (m ³ /s) | | | | | | |
|-------------|-------------------------------------|---------|--------|--------|--------|----------|------|
| | 20% AEP | 10% AEP | 5% AEP | 2% AEP | 1% AEP | 0.5% AEP | PMF |
| ST00020 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 |
| ST00014 | 0.07 | 0.09 | 0.10 | 0.12 | 0.14 | 0.18 | 0.37 |
| ST00017 | 0.96 | 1.00 | 1.04 | 1.07 | 1.10 | 1.16 | 1.16 |
| ST00075 | 0.34 | 0.36 | 0.37 | 0.38 | 0.39 | 0.42 | 1.73 |
| RYLSTONE14 | 0.32 | 0.43 | 0.56 | 0.71 | 0.85 | 1.21 | 1.47 |
| A26 | 0.81 | 1.08 | 1.19 | 1.24 | 1.28 | 1.36 | 1.36 |
| ST00001 | 0.43 | 0.47 | 0.48 | 0.49 | 0.49 | 0.50 | 1.09 |
| A22 | 0.12 | 0.15 | 0.18 | 0.21 | 0.24 | 0.32 | 0.42 |
| A20 | 0.34 | 0.43 | 0.54 | 0.63 | 0.66 | 0.69 | 0.96 |
| A13 | 0.18 | 0.19 | 0.21 | 0.23 | 0.25 | 0.29 | 0.93 |
| RYLSTONE 12 | 0.31 | 0.32 | 0.33 | 0.34 | 0.35 | 0.37 | 0.37 |
| ST00008 | 0.07 | 0.08 | 0.10 | 0.11 | 0.13 | 0.16 | 0.58 |
| A19 | 1.44 | 1.93 | 2.49 | 2.93 | 3.49 | 4.97 | 9.80 |
| ST00007 | 0.48 | 0.49 | 0.50 | 0.51 | 0.52 | 0.54 | 0.90 |
| A17 | 0.70 | 0.94 | 1.20 | 1.43 | 1.50 | 1.56 | 2.01 |
| ST00061 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 |
| ST00060 | 0.07 | 0.08 | 0.10 | 0.11 | 0.13 | 0.16 | 0.29 |
| P_HW7 | 0.28 | 0.30 | 0.31 | 0.32 | 0.32 | 0.34 | 0.37 |
| ST00051 | 1.59 | 1.66 | 1.74 | 1.80 | 1.86 | 1.98 | 1.98 |
| ST00050 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.59 |
| ST00048 | 0.52 | 0.55 | 0.59 | 0.62 | 0.66 | 0.73 | 0.90 |
| ST00049 | 0.35 | 0.37 | 0.38 | 0.40 | 0.41 | 0.44 | 0.56 |
| ST00026 | 0.25 | 0.26 | 0.27 | 0.28 | 0.28 | 0.29 | 0.56 |
| P_HW1 | 0.27 | 0.27 | 0.28 | 0.28 | 0.28 | 0.29 | 0.60 |
| ST00490 | 0.34 | 0.36 | 0.37 | 0.38 | 0.40 | 0.42 | 0.40 |

Table D1-3: Rylstone peak overland flow results

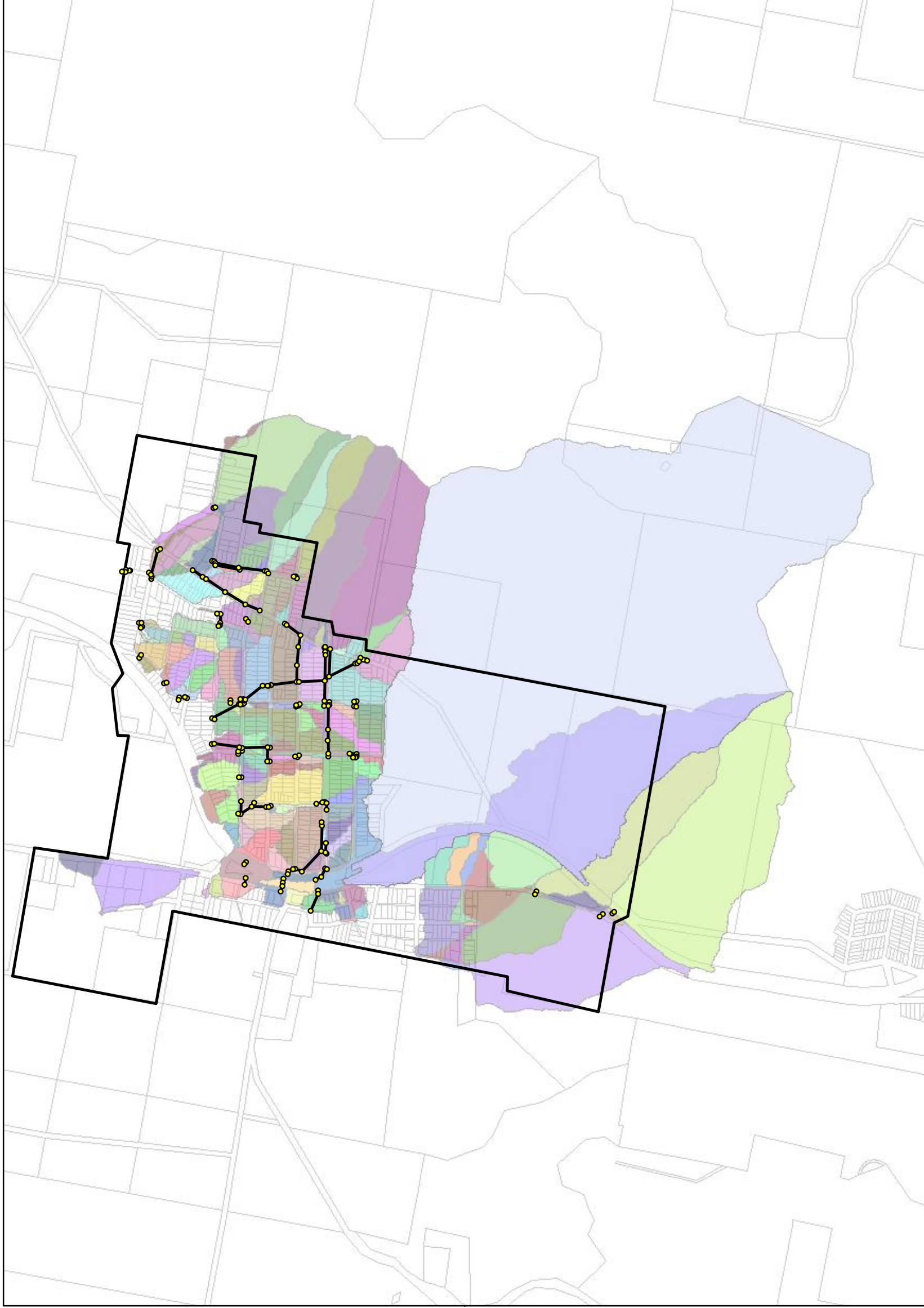
| Overland flowpath ID | from | to | Peak overland flows (m ³ /s) | | | | | | |
|----------------------|------------|------------|---|---------|--------|--------|--------|----------|--------|
| | | | 20% AEP | 10% AEP | 5% AEP | 2% AEP | 1% AEP | 0.5% AEP | PMF |
| O_8 | 8 | 9 | 0.014 | 0.038 | 0.085 | 0.116 | 0.169 | 0.261 | 1.785 |
| O_9 | 9 | 12 | 0.199 | 0.477 | 0.754 | 0.965 | 1.237 | 1.825 | 10.633 |
| O_12 | 12 | R1_out | 0.089 | 0.341 | 0.619 | 0.83 | 1.103 | 1.692 | 10.501 |
| O_10 | 10 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0.509 |
| O_11 | 1 | N_R002 | 0 | 0 | 0 | 0 | 0 | 0.032 | 1.476 |
| O_RYLSTONE6 | RYLSTONE6 | N_R004 | 0 | 0 | 0 | 0 | 0 | 0 | 0.148 |
| O_HW1 | HW1 | N_R005 | 0.027 | 0.109 | 0.197 | 0.264 | 0.35 | 0.542 | 2.391 |
| O_21 | 21 | 22 | 0.153 | 0.278 | 0.433 | 0.581 | 0.74 | 1.065 | 6.148 |
| O_22 | 22 | 23 | 0.224 | 0.351 | 0.508 | 0.662 | 0.823 | 1.155 | 6.352 |
| O_25 | 25 | 26 | 0.842 | 1.171 | 1.556 | 1.907 | 2.298 | 3.081 | 14.596 |
| O_26 | 26 | N_R007 | 1.045 | 1.415 | 1.909 | 2.351 | 2.843 | 3.911 | 19.74 |
| O_N_R007 | N_R007 | N_R008 | 1.516 | 1.886 | 2.38 | 2.822 | 3.313 | 4.382 | 20.21 |
| O_28 | 28 | N_R009 | 0 | 0 | 0 | 0 | 0 | 0 | 0.917 |
| O_N_R009 | N_R009 | 30 | 0.402 | 0.513 | 0.644 | 0.732 | 0.841 | 1.074 | 5.059 |
| O_N_R010 | N_R010 | Pit01 | 0.336 | 0.429 | 0.521 | 0.587 | 0.697 | 0.867 | 3.971 |
| O_30 | 30 | 31 | 0 | 0.058 | 0.2 | 0.312 | 0.439 | 0.717 | 5.253 |
| O_31 | 31 | 32 | 0.043 | 0.163 | 0.306 | 0.408 | 0.538 | 0.816 | 5.352 |
| O_50 | 50 | RYLSTONE9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| O_RYLSTONE9 | RYLSTONE9 | RYLSTONE10 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 |
| O_RYLSTONE10 | RYLSTONE10 | 34 | 0.152 | 0.152 | 0.152 | 0.152 | 0.152 | 0.152 | 0.152 |
| O_33 | 33 | 34 | 0.381 | 0.566 | 0.776 | 1.05 | 1.304 | 1.818 | 9.933 |
| O_34 | 34 | N_R011 | 0.531 | 0.732 | 0.939 | 1.233 | 1.489 | 2.006 | 10.138 |
| O_N_R011 | N_R011 | HW2 | 0.961 | 1.162 | 1.369 | 1.663 | 1.919 | 2.436 | 10.569 |
| O_N_R012 | N_R012 | HW3 | 0.965 | 1.175 | 1.387 | 1.665 | 1.925 | 2.461 | 10.596 |
| O_HW3 | HW3 | N_R013 | 1.871 | 2.402 | 2.998 | 3.627 | 4.279 | 5.829 | 26.78 |
| O_N_R015 | N_R015 | HW3 | 0 | 0 | 0 | 0 | 0 | 0 | 0.404 |
| O_HW4 | HW4 | HW5 | 0 | 0 | 0 | 0 | 0 | 0 | 1.099 |
| O_37 | 37 | 38 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| O_38 | 38 | N_R017 | 0.078 | 0.116 | 0.15 | 0.179 | 0.218 | 0.288 | 1.557 |
| O_N_R017 | N_R017 | HW4 | 0.515 | 0.554 | 0.588 | 0.616 | 0.656 | 0.726 | 1.995 |
| O_HW8 | HW8 | N_R006 | 0.155 | 0.264 | 0.398 | 0.516 | 0.638 | 0.897 | 5.205 |
| O_29 | 29 | N_R010 | 0 | 0 | 0 | 0 | 0 | 0.093 | 2.221 |
| O_45 | 45 | 46 | 0 | 0 | 0 | 0 | 0 | 0 | 0.194 |
| O_46 | 46 | 47 | 0 | 0 | 0 | 0 | 0 | 0 | 0.19 |
| O_47 | 47 | 52 | 0 | 0 | 0 | 0 | 0 | 0 | 0.314 |
| O_48 | 48 | 52 | 0 | 0 | 0 | 0 | 0 | 0 | 0.166 |
| O_39 | 39 | 40 | 0 | 0 | 0 | 0 | 0.047 | 0.241 | 2.236 |
| O_40 | 40 | 43 | 0 | 0 | 0 | 0 | 0 | 0.012 | 2.106 |
| O_41 | 41 | 42 | 0.229 | 0.375 | 0.553 | 0.709 | 0.876 | 1.217 | 6.753 |
| O_52 | 52 | Pit3 | 0 | 0 | 0 | 0.003 | 0.031 | 0.072 | 0.432 |
| O_43 | 43 | 42 | 0 | 0 | 0 | 0.016 | 0.08 | 0.192 | 2.499 |
| O_44 | 44 | pit1 | 0.688 | 0.819 | 0.961 | 1.051 | 1.114 | 1.276 | 3.379 |
| O_27 | 27 | 28 | 0 | 0 | 0 | 0 | 0 | 0.009 | 1.145 |
| O_N_R019 | N_R019 | N_R020 | 2.822 | 3.696 | 4.847 | 6.113 | 7.285 | 10.971 | 50.164 |
| O_N_R021 | N_R021 | N_R022 | 0 | 0 | 0 | 0 | 0 | 0 | 0.14 |
| O_N_R023 | N_R023 | N_R186 | 0.066 | 0.081 | 0.099 | 0.109 | 0.128 | 0.159 | 0.577 |
| O_N_R186 | N_R186 | 45 | 0.066 | 0.081 | 0.099 | 0.109 | 0.128 | 0.159 | 0.717 |
| O_51 | 51 | Pit3 | 0.72 | 1.079 | 1.505 | 1.915 | 2.343 | 3.416 | 5.191 |
| O_HW7 | HW7 | N_R025 | 0 | 0.077 | 0.189 | 0.314 | 0.447 | 0.758 | 4.893 |
| O_1 | 1 | N_R027 | 0 | 0 | 0 | 0 | 0 | 0 | 0.499 |
| O_N_R036 | N_R036 | N_R037 | 0.426 | 0.703 | 1.046 | 1.38 | 1.767 | 2.525 | 13.988 |
| O_N_R037 | N_R037 | N_R038 | 0.906 | 1.194 | 1.547 | 1.891 | 2.288 | 3.063 | 14.488 |
| O_N_R038 | N_R038 | N_R039 | 0 | 0 | 0 | 0 | 0 | 0 | 18.857 |
| O_N_R039 | N_R039 | R18_out | 1.927 | 2.559 | 3.31 | 4.053 | 4.902 | 6.516 | 30.654 |
| O_N_R029 | N_R029 | N_R039 | 0.703 | 0.939 | 1.199 | 1.428 | 1.502 | 1.562 | 2.009 |
| O_HW6 | HW6 | N_R016 | 0.746 | 1.439 | 2.318 | 3.256 | 4.102 | 6.222 | 38.246 |
| O_N_R061 | N_R061 | N_R054 | 0.535 | 0.705 | 0.873 | 0.978 | 1.161 | 1.501 | 7.198 |
| O_ST00081 | ST00081 | N_R059 | 0 | 0 | 0 | 0 | 0 | 0 | 0.727 |

| | | | | | | | | | |
|-------------|-----------|-----------|-------|-------|-------|--------|--------|--------|--------|
| O_N_R040A | N_R040A | N_R040B | 0 | 0 | 0 | 0 | 0 | 0 | 0.32 |
| O_RYLSTONE1 | RYLSTONE1 | RYLSTONE2 | 0 | 0 | 0.023 | 0.076 | 0.169 | 0.505 | 4.03 |
| O_RYLSTONE2 | RYLSTONE2 | N_R041 | 0 | 0 | 0 | 0 | 0 | 0.144 | 3.67 |
| O_N_R041 | N_R041 | N_R042 | 0.339 | 0.431 | 0.542 | 0.626 | 0.732 | 0.959 | 4.486 |
| O_N_R042 | N_R042 | N_R043 | 0 | 0 | 0 | 0 | 0.077 | 0.267 | 3.527 |
| O_N_R044 | N_R044 | N_R045 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| O_N_R046 | N_R046 | N_R047 | 0 | 0.067 | 0.185 | 0.324 | 0.466 | 0.722 | 5.17 |
| O_N_R047 | N_R047 | N_R048 | 0.425 | 0.537 | 0.663 | 0.808 | 0.956 | 1.222 | 5.67 |
| O_N_R062 | N_R062 | N_R048 | 0.444 | 0.566 | 0.714 | 0.844 | 1.011 | 1.335 | 6.187 |
| O_N_R051 | N_R051 | N_R054 | 0.158 | 0.201 | 0.255 | 0.292 | 0.335 | 0.428 | 2.022 |
| O_N_R054 | N_R054 | N_R053 | 0.509 | 0.767 | 1.017 | 1.271 | 1.583 | 2.172 | 11.847 |
| O_N_R057 | N_R057 | N_R058 | 0 | 0 | 0.158 | 0.373 | 0.648 | 1.18 | 11.713 |
| O_N_R034 | N_R034 | N_R035 | 3.816 | 5.454 | 7.668 | 10.464 | 12.867 | 20.797 | 102.01 |
| O_N_R063 | N_R063 | N_R066 | 0.453 | 0.611 | 0.805 | 1.009 | 1.202 | 1.758 | 8.242 |
| O_N_R064 | N_R064 | N_R066 | 0.989 | 1.383 | 1.912 | 2.524 | 3.039 | 4.695 | 22.226 |
| O_N_R066 | N_R066 | N_R067 | 1.414 | 1.924 | 2.57 | 3.318 | 3.986 | 6.186 | 28.976 |
| O_N_R065 | N_R065 | N_R067 | 0.528 | 0.695 | 0.912 | 1.16 | 1.406 | 2.087 | 9.818 |
| O_N_R067 | N_R067 | N_R068 | 1.879 | 2.515 | 3.334 | 4.227 | 5.043 | 7.803 | 36.252 |
| O_N_R074 | N_R074 | N_R026 | 0.406 | 0.514 | 0.646 | 0.789 | 0.942 | 1.248 | 5.765 |
| O_N_R027 | N_R027 | N_R083 | 0.241 | 0.3 | 0.364 | 0.41 | 0.483 | 0.605 | 2.685 |
| O_N_R084 | N_R084 | N_R085 | 0.128 | 0.17 | 0.221 | 0.251 | 0.29 | 0.381 | 1.813 |
| O_N_R083 | N_R083 | N_R085 | 0.379 | 0.475 | 0.585 | 0.692 | 0.816 | 1.058 | 4.929 |
| O_N_R086 | N_R086 | N_R028 | 0.129 | 0.173 | 0.226 | 0.278 | 0.339 | 0.451 | 2.146 |
| O_N_R085 | N_R085 | N_R087 | 0.496 | 0.643 | 0.805 | 0.926 | 1.102 | 1.431 | 6.742 |
| O_N_R087 | N_R087 | N_R028 | 0.586 | 0.773 | 0.977 | 1.149 | 1.371 | 1.786 | 8.437 |
| O_N_R028 | N_R028 | N_R088 | 0 | 0 | 0 | 0 | 0.205 | 0.673 | 11.219 |
| O_N_R088 | N_R088 | N_R089 | 0.107 | 0.137 | 0.167 | 0.191 | 0.339 | 0.859 | 11.219 |
| O_16 | 16 | N_R090 | 0 | 0 | 0 | 0 | 0 | 0 | 0.086 |
| O_15 | 15 | N_R090 | 0.067 | 0.08 | 0.096 | 0.111 | 0.129 | 0.161 | 0.75 |
| O_N_R092 | N_R092 | N_R093 | 0.344 | 0.43 | 0.528 | 0.597 | 0.695 | 0.894 | 5.06 |
| O_14 | 14 | N_R095 | 0 | 0 | 0 | 0 | 0 | 0 | 1.268 |
| O_N_R094 | N_R094 | N_R090 | 0.152 | 0.194 | 0.245 | 0.279 | 0.322 | 0.424 | 3.096 |
| O_N_R095 | N_R095 | N_R094 | 0.058 | 0.069 | 0.084 | 0.096 | 0.112 | 0.143 | 1.778 |
| O_N_R100 | N_R100 | N_R036 | 0.531 | 0.704 | 0.915 | 1.118 | 1.359 | 1.838 | 8.634 |
| O_N_R101 | N_R101 | R_17_out | 0.166 | 0.219 | 0.283 | 0.336 | 0.389 | 0.506 | 2.418 |
| O_N_R102 | N_R102 | N_R104 | 0.355 | 0.456 | 0.564 | 0.698 | 0.823 | 1.067 | 5.005 |
| O_N_R103 | N_R103 | N_R104 | 0.06 | 0.073 | 0.089 | 0.103 | 0.121 | 0.159 | 0.741 |
| O_N_R104 | N_R104 | N_R036 | 0.381 | 0.493 | 0.63 | 0.77 | 0.909 | 1.184 | 5.591 |
| O_N_R107 | N_R107 | N_R108 | 0.044 | 0.053 | 0.064 | 0.073 | 0.085 | 0.107 | 0.496 |
| O_20 | 20 | N_R108 | 0 | 0 | 0.06 | 0.1 | 0.168 | 0.307 | 2.607 |
| O_N_R108 | N_R108 | N_R105 | 0.044 | 0.053 | 0.123 | 0.17 | 0.253 | 0.408 | 3.04 |
| O_N_R106 | N_R106 | N_R105 | 0.107 | 0.139 | 0.179 | 0.215 | 0.26 | 0.348 | 1.62 |
| O_N_R105 | N_R105 | 26 | 0.216 | 0.284 | 0.362 | 0.488 | 0.643 | 0.922 | 5.464 |
| O_N_R110 | N_R110 | 25 | 0.298 | 0.39 | 0.5 | 0.59 | 0.69 | 0.912 | 4.282 |
| O_N_R109 | N_R109 | 25 | 0.173 | 0.226 | 0.291 | 0.33 | 0.38 | 0.496 | 2.342 |
| O_19 | 19 | N_R115 | 0 | 0 | 0 | 0 | 0.008 | 0.119 | 1.858 |
| O_N_R114 | N_R114 | N_R115 | 0.029 | 0.035 | 0.042 | 0.048 | 0.056 | 0.071 | 0.336 |
| O_N_R115 | N_R115 | 20 | 0.029 | 0.035 | 0.042 | 0.048 | 0.06 | 0.184 | 2.149 |
| O_N_R111 | N_R111 | N_R110 | 0.272 | 0.359 | 0.461 | 0.541 | 0.63 | 0.823 | 3.854 |
| O_23 | 23 | 18 | 0.262 | 0.412 | 0.603 | 0.798 | 1.009 | 1.439 | 7.86 |
| O_18 | 18 | 24 | 0.262 | 0.412 | 0.603 | 0.798 | 1.009 | 1.439 | 7.86 |
| O_N_R116 | N_R116 | N_R117 | 0.033 | 0.039 | 0.047 | 0.054 | 0.063 | 0.078 | 0.361 |
| O_N_R006 | N_R006 | N_R117 | 0.404 | 0.521 | 0.664 | 0.788 | 0.916 | 1.187 | 5.612 |
| O_N_R117 | N_R117 | 21 | 0.416 | 0.536 | 0.682 | 0.812 | 0.947 | 1.231 | 5.825 |
| O_N_R118 | N_R118 | 24 | 0.117 | 0.154 | 0.199 | 0.226 | 0.26 | 0.34 | 1.612 |
| O_N_R119 | N_R119 | HW8 | 0.371 | 0.482 | 0.617 | 0.735 | 0.854 | 1.108 | 5.249 |
| O_N_R120 | N_R120 | N_R102 | 0.212 | 0.264 | 0.327 | 0.378 | 0.437 | 0.551 | 2.551 |
| O_N_121 | N_R121 | RYLSTONE1 | 0.192 | 0.253 | 0.313 | 0.348 | 0.415 | 0.533 | 2.464 |
| O_32 | 32 | N_R126 | 0.399 | 0.58 | 0.784 | 1.02 | 1.264 | 1.726 | 8.948 |
| O_N_R128 | N_R128 | 32 | 0.243 | 0.319 | 0.412 | 0.495 | 0.59 | 0.769 | 3.655 |
| O_N_R127 | N_R127 | N_R126 | 0.037 | 0.044 | 0.053 | 0.06 | 0.07 | 0.084 | 0.399 |
| O_N_R126 | N_R126 | N_R125 | 0.405 | 0.589 | 0.796 | 1.06 | 1.311 | 1.784 | 9.187 |
| O_N_R125 | N_R125 | 34 | 0.444 | 0.646 | 0.865 | 1.16 | 1.434 | 1.948 | 10.064 |

| | | | | | | | | | |
|------------|----------|---------|-------|-------|-------|-------|-------|-------|--------|
| O_N_R124 | N_R124 | N_R129 | 0.017 | 0.02 | 0.024 | 0.028 | 0.033 | 0.042 | 0.198 |
| O_N_R123 | N_R123 | N_R129 | 0.122 | 0.158 | 0.202 | 0.241 | 0.291 | 0.387 | 1.801 |
| O_N_R129 | N_R129 | N_R113 | 0.139 | 0.178 | 0.226 | 0.267 | 0.316 | 0.427 | 1.943 |
| O_HW2 | HW2 | N_R012 | 0.965 | 1.174 | 1.386 | 1.665 | 1.925 | 2.461 | 10.596 |
| O_N_R130 | N_R130 | N_R139 | 0.203 | 0.254 | 0.312 | 0.35 | 0.407 | 0.518 | 2.387 |
| O_N_R131 | N_R131 | N_R135 | 0.056 | 0.067 | 0.081 | 0.093 | 0.108 | 0.137 | 0.636 |
| O_N_R132 | N_R132 | N_R134 | 0.039 | 0.047 | 0.056 | 0.065 | 0.075 | 0.095 | 0.445 |
| O_N_R136 | N_R136 | ST00076 | 0.241 | 0.308 | 0.389 | 0.47 | 0.563 | 0.754 | 3.434 |
| O_ST00073 | ST00076 | N_R062 | 0.126 | 0.247 | 0.395 | 0.525 | 0.693 | 1.017 | 5.869 |
| O_ST00116 | ST00116 | N_R139 | 0.101 | 0.121 | 0.144 | 0.166 | 0.193 | 0.239 | 1.1 |
| O_N_R139 | N_R139 | N_R135 | 0.304 | 0.374 | 0.457 | 0.512 | 0.599 | 0.757 | 3.374 |
| O_N_R135 | N_R135 | N_R134 | 0.349 | 0.428 | 0.522 | 0.592 | 0.692 | 0.876 | 3.944 |
| O_N_R134 | N_R134 | N_R133 | 0.376 | 0.464 | 0.565 | 0.642 | 0.751 | 0.952 | 4.331 |
| O_N_R133 | N_R133 | N_R046 | 0.406 | 0.507 | 0.618 | 0.708 | 0.828 | 1.048 | 4.872 |
| O_N_R050 | N_R050 | N_R140 | 0.013 | 0.016 | 0.019 | 0.021 | 0.025 | 0.03 | 0.147 |
| O_N_R040 | N_R140 | ST00076 | 0.204 | 0.26 | 0.327 | 0.385 | 0.453 | 0.593 | 2.753 |
| O_Pit01 | Pit01 | N_R141 | 0.124 | 0.225 | 0.329 | 0.404 | 0.521 | 0.71 | 4.125 |
| O_N_R141 | N_R141 | N_R142 | 0.588 | 0.76 | 0.971 | 1.286 | 1.592 | 2.192 | 11.145 |
| O_N_R142 | N_R142 | N_R148 | 0.973 | 1.28 | 1.615 | 1.93 | 2.308 | 3.241 | 15.007 |
| O_N_R014 | N_R014 | N_R148 | 0.515 | 0.554 | 0.588 | 0.617 | 0.656 | 0.725 | 0.896 |
| O_N_R148 | N_R148 | HW3 | 1.481 | 1.825 | 2.197 | 2.529 | 2.949 | 3.948 | 15.883 |
| O_N_R145 | N_R145 | N_R146 | 0.453 | 0.694 | 0.969 | 1.155 | 1.408 | 1.955 | 10.346 |
| O_HW5 | HW5 | N_R149 | 0 | 0 | 0 | 0 | 0 | 0 | 0.693 |
| O_N_R146B | N_R146B | N_R150 | 2.268 | 3.058 | 3.98 | 4.85 | 5.769 | 7.763 | 37.556 |
| O_N_R150 | N_R150 | HW6 | 2.315 | 3.097 | 4.05 | 5.041 | 5.946 | 8.163 | 38.748 |
| O_pit1 | pit1 | N_R147 | 0.688 | 0.819 | 0.961 | 1.051 | 1.114 | 1.276 | 3.379 |
| O_N_R147 | N_R147 | N_R146 | 1.564 | 2.037 | 2.588 | 3.087 | 3.623 | 4.829 | 22.063 |
| O_Pit3_out | Pit3_out | N_R152 | 1.291 | 1.693 | 2.189 | 2.712 | 3.228 | 4.487 | 21.203 |
| O_N_R151 | N_R151 | N_R152 | 0.809 | 1.089 | 1.468 | 1.904 | 2.294 | 3.683 | 17.394 |
| O_ST00080 | ST00080 | N_R153 | 0.117 | 0.144 | 0.172 | 0.198 | 0.229 | 0.282 | 1.279 |
| O_N_R153 | N_R153 | N_R130 | 0.117 | 0.144 | 0.172 | 0.198 | 0.229 | 0.282 | 1.279 |
| O_N_R143 | N_R143 | N_R141 | 0.062 | 0.076 | 0.09 | 0.104 | 0.12 | 0.148 | 0.674 |
| O_N_R144 | N_R144 | N_R154 | 0.065 | 0.08 | 0.096 | 0.11 | 0.128 | 0.159 | 0.73 |
| O_35 | 35 | N_R154 | 0.169 | 0.304 | 0.446 | 0.528 | 0.666 | 0.944 | 5.326 |
| O_36 | 36 | N_R054 | 0.182 | 0.265 | 0.371 | 0.46 | 0.573 | 0.799 | 4.077 |
| O_N_R154 | N_R154 | N_R145 | 0.414 | 0.646 | 0.911 | 1.087 | 1.327 | 1.849 | 9.782 |
| O_N_R059 | N_R059 | N_R156 | 0.101 | 0.121 | 0.145 | 0.166 | 0.193 | 0.239 | 1.151 |
| O_N_R156 | N_R156 | N_R155 | 0.185 | 0.22 | 0.264 | 0.303 | 0.352 | 0.437 | 2.058 |
| O_N_R155 | N_R155 | N_R061 | 0.269 | 0.33 | 0.396 | 0.456 | 0.531 | 0.669 | 3.197 |
| O_N_R157 | N_R157 | N_R061 | 0.268 | 0.368 | 0.472 | 0.532 | 0.633 | 0.828 | 3.995 |
| O_N_R159 | N_R159 | N_R147 | 0.702 | 0.906 | 1.156 | 1.438 | 1.736 | 2.375 | 11.167 |
| O_N_R160 | N_R160 | 44 | 0.178 | 0.234 | 0.304 | 0.365 | 0.426 | 0.554 | 2.646 |
| O_N_R161 | N_R161 | N_R164 | 0.063 | 0.075 | 0.09 | 0.103 | 0.12 | 0.149 | 0.689 |
| O_N_R163 | N_R163 | N_R164 | 2.196 | 2.863 | 3.737 | 4.659 | 5.543 | 8.24 | 37.903 |
| O_N_R152 | N_R152 | N_R163 | 2.17 | 2.831 | 3.697 | 4.609 | 5.51 | 8.155 | 37.424 |
| O_N_R162 | N_R162 | N_R163 | 0.085 | 0.11 | 0.132 | 0.152 | 0.177 | 0.224 | 1.03 |
| O_N_R164 | N_R164 | N_R019 | 2.214 | 2.885 | 3.764 | 4.693 | 5.583 | 8.294 | 38.209 |
| O_N_R165 | N_R165 | N_R166 | 0.468 | 0.608 | 0.771 | 0.977 | 1.181 | 1.622 | 7.562 |
| O_N_R158 | N_R158 | N_R166 | 0.235 | 0.303 | 0.385 | 0.469 | 0.564 | 0.763 | 3.479 |
| O_N_R166 | N_R166 | N_R159 | 0.668 | 0.865 | 1.111 | 1.41 | 1.707 | 2.321 | 10.94 |
| O_N_R060 | N_R060 | N_R157 | 0.04 | 0.047 | 0.056 | 0.064 | 0.074 | 0.09 | 0.42 |
| O_N_168 | N_R168 | N_R167 | 0.132 | 0.169 | 0.204 | 0.234 | 0.273 | 0.345 | 1.589 |
| O_N_R022 | N_R022 | N_R173 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| O_N_R172 | N_R172 | N_R173 | 0.542 | 0.731 | 0.961 | 1.217 | 1.485 | 2.095 | 9.86 |
| O_N_R173 | N_R173 | N_R174 | 0.646 | 0.862 | 1.126 | 1.387 | 1.683 | 2.344 | 10.795 |
| O_N_R171 | N_R171 | N_R174 | 0.065 | 0.089 | 0.117 | 0.131 | 0.153 | 0.205 | 0.965 |
| O_N_R174 | N_R174 | N_R175 | 0.708 | 0.947 | 1.23 | 1.486 | 1.799 | 2.5 | 11.488 |
| O_N_R170 | N_R170 | N_R175 | 0.046 | 0.064 | 0.085 | 0.102 | 0.121 | 0.16 | 0.77 |
| O_N_R175 | N_R175 | N_R176 | 0.752 | 1.009 | 1.308 | 1.571 | 1.891 | 2.641 | 12.054 |
| O_N_R176 | N_R176 | N_R177 | 0.771 | 1.032 | 1.337 | 1.61 | 1.927 | 2.702 | 12.315 |
| O_N_R169 | N_R169 | N_R177 | 0.035 | 0.048 | 0.063 | 0.074 | 0.087 | 0.113 | 0.546 |
| O_N_R177 | N_R177 | 51 | 0.8 | 1.069 | 1.382 | 1.665 | 1.976 | 2.787 | 12.669 |
| O_N_R187 | N_R025 | N_R182 | 0.277 | 0.375 | 0.497 | 0.63 | 0.77 | 1.095 | 5.178 |

| | | | | | | | | | |
|------------|----------|-----------|-------|-------|-------|-------|-------|-------|--------|
| O_N_R178 | N_R178 | N_R182 | 0.128 | 0.178 | 0.225 | 0.253 | 0.299 | 0.398 | 1.883 |
| O_N_R182 | N_R182 | Pit3 | 0.128 | 0.178 | 0.225 | 0.253 | 0.299 | 0.398 | 1.883 |
| O_N_R179 | N_R179 | N_R181 | 0.104 | 0.141 | 0.186 | 0.228 | 0.28 | 0.367 | 1.762 |
| O_N_R180 | N_R180 | N_R181 | 0.068 | 0.094 | 0.12 | 0.135 | 0.159 | 0.212 | 1.003 |
| O_N_R181 | N_R181 | N_R151 | 0.169 | 0.232 | 0.303 | 0.36 | 0.427 | 0.567 | 2.731 |
| O_N_R018 | N_R018 | N_R184 | 0.053 | 0.062 | 0.074 | 0.085 | 0.099 | 0.12 | 0.562 |
| O_N_R183 | N_R183 | N_R184 | 0.065 | 0.08 | 0.098 | 0.113 | 0.132 | 0.166 | 0.769 |
| O_N_R184 | N_R184 | N_R165 | 0.109 | 0.133 | 0.161 | 0.183 | 0.212 | 0.27 | 1.196 |
| O_ST00079 | ST00079 | ST00080 | 0 | 0 | 0 | 0 | 0 | 0 | 0.657 |
| O_N_R167 | N_R167 | N_R152 | 0.156 | 0.203 | 0.251 | 0.292 | 0.349 | 0.449 | 2.141 |
| O_N_R185 | N_R185 | N_R079 | 0.333 | 0.436 | 0.563 | 0.674 | 0.791 | 1.03 | 4.898 |
| O_N_R079 | N_R079 | N_R078 | 0.395 | 0.517 | 0.661 | 0.784 | 0.915 | 1.195 | 5.614 |
| O_N_R078 | N_R078 | N_R077 | 0.515 | 0.662 | 0.835 | 0.979 | 1.144 | 1.489 | 6.822 |
| O_N_R077 | N_R077 | N_R076 | 0.605 | 0.775 | 0.971 | 1.132 | 1.326 | 1.73 | 7.837 |
| O_N_R076 | N_R_076 | 9 | 0.655 | 0.838 | 1.048 | 1.218 | 1.428 | 1.866 | 8.427 |
| O_13 | 13 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| O_N_R090 | N_R090 | N_R092 | 0.269 | 0.336 | 0.415 | 0.471 | 0.547 | 0.706 | 4.296 |
| O_N_R075 | N_R075 | 8 | 0.655 | 0.838 | 1.048 | 1.218 | 1.428 | 1.866 | 8.427 |
| O_N_R093 | N_R093 | N_R081 | 0.344 | 0.43 | 0.528 | 0.597 | 0.695 | 0.894 | 5.06 |
| O_N_R004 | N_R004 | N_R092 | 0.037 | 0.044 | 0.053 | 0.061 | 0.071 | 0.09 | 0.413 |
| O_N_R003 | N_R003 | HW1 | 0.17 | 0.215 | 0.268 | 0.313 | 0.364 | 0.462 | 0.807 |
| O_N_R005 | N_R005 | R_17_out | 0.294 | 0.381 | 0.474 | 0.544 | 0.634 | 0.831 | 2.72 |
| O_N_R112 | N_R112 | N_R111 | 0.181 | 0.239 | 0.31 | 0.373 | 0.439 | 0.572 | 2.731 |
| O_N_R113 | N_R113 | N_R008 | 0.204 | 0.258 | 0.322 | 0.377 | 0.442 | 0.59 | 2.656 |
| O_R_18_out | R_18_out | N_R089 | 0.213 | 0.288 | 0.379 | 0.437 | 0.511 | 0.667 | 3.218 |
| O_N_R089 | N_R089 | N_R038 | 0.384 | 0.52 | 0.684 | 0.781 | 0.927 | 1.466 | 12.426 |
| O_N_R099 | N_R099 | N_R038 | 0.172 | 0.238 | 0.313 | 0.352 | 0.414 | 0.553 | 2.621 |
| O_N_R122 | N_R122 | N_R044 | 0.117 | 0.15 | 0.182 | 0.209 | 0.245 | 0.317 | 1.473 |
| O_N_R053 | N_R053 | N_R057 | 0.814 | 1.084 | 1.345 | 1.608 | 1.931 | 2.537 | 12.213 |
| O_42 | 42 | N_R147 | 0.229 | 0.375 | 0.553 | 0.719 | 0.941 | 1.385 | 9.178 |
| O_N_R071 | N_R071 | R10_out | 0 | 0 | 0 | 0 | 0 | 0.061 | 4.235 |
| O_N_R146 | N_R146 | N_R146B | 1.309 | 2.06 | 2.943 | 3.78 | 4.667 | 6.599 | 37.056 |
| O_Pit3 | Pit3 | Pit3_out | 0.548 | 0.952 | 1.449 | 1.973 | 2.487 | 3.74 | 20.458 |
| O_N_R040B | N_R040B | RYLSTONE1 | 0.067 | 0.08 | 0.096 | 0.11 | 0.128 | 0.161 | 0.739 |
| O_24 | 24 | 25 | 0.488 | 0.729 | 1.019 | 1.275 | 1.535 | 2.068 | 10.015 |
| O_N_R072 | N_R072 | R9_out | 0.324 | 0.583 | 0.888 | 1.3 | 1.644 | 2.791 | 15.53 |

Figure D2-1. Kandos Subcatchments



- LEGEND**
- Catchment based on LIDAR
 - Stormwater Pit
 - Stormwater Network
 - 0.5m Contours
 - Cadastral
 - Study Area

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Kilometres

Table D2-1:Kandos subcatchments data

| Catchment draining to pit | Total area (ha) | Paved area (%) | Grass area (%) |
|---------------------------|-----------------|----------------|----------------|
| ST00297 | 0.17 | 67.5 | 32.5 |
| ST00298 | 0.91 | 38.5 | 61.5 |
| ST00299 | 0.33 | 43.4 | 56.6 |
| N_K005 | 0.32 | 48 | 52 |
| ST00304 | 0.15 | 68.7 | 31.3 |
| ST00306 | 0.46 | 51.6 | 48.4 |
| ST00308 | 1.09 | 35.7 | 64.3 |
| ST00309 | 0.96 | 46.8 | 53.2 |
| ST00301 | 0.67 | 47.3 | 52.8 |
| ST00300 | 0.09 | 63.5 | 36.5 |
| ST00302 | 0.19 | 67.7 | 32.3 |
| ST00310 | 0.07 | 69.9 | 30.1 |
| ST00311 | 2.91 | 38.1 | 61.9 |
| ST00312 | 2.25 | 41.7 | 58.3 |
| ST00313 | 0.46 | 49.8 | 50.2 |
| N_K052 | 0.09 | 48.2 | 51.8 |
| ST00315 | 0.01 | 70 | 30 |
| ST00318 | 1.9 | 36.5 | 63.5 |
| ST00319 | 0.74 | 49.8 | 50.2 |
| ST00316 | 1.61 | 41.2 | 58.8 |
| ST00317 | 0.84 | 53.4 | 46.6 |
| ST00320 | 0.42 | 44.7 | 55.3 |
| ST00322 | 0.64 | 51.3 | 48.7 |
| ST00323 | 0.09 | 64.9 | 35.1 |
| ST00324 | 1.99 | 33.8 | 66.2 |
| ST00325 | 0.26 | 41.5 | 58.5 |
| ST00328 | 0.16 | 53.1 | 46.9 |
| ST00501 | 0.03 | 65.9 | 34.1 |
| ST00327 | 1.15 | 39.5 | 60.5 |
| ST00326 | 0.14 | 50.3 | 49.7 |
| ST00329 | 0.17 | 40.8 | 59.3 |
| ST00330 | 0.71 | 33.3 | 66.8 |
| ST00332 | 2.54 | 37.7 | 62.3 |
| ST00331 | 0.02 | 70 | 30 |
| ST00335 | 0.1 | 43.1 | 56.9 |
| ST00337 | 0.22 | 65.6 | 34.4 |
| ST00338 | 0.67 | 43.8 | 56.2 |
| ST00340 | 1.56 | 33 | 67 |
| ST00341 | 0.24 | 55.5 | 44.5 |
| ST00342 | 0.51 | 42.8 | 57.2 |
| ST00345 | 0.52 | 43.9 | 56.1 |
| ST00346 | 0.03 | 70 | 30 |
| ST00348 | 1.69 | 36.2 | 63.8 |
| ST00347 | 0.25 | 55 | 45 |
| ST00350 | 1.15 | 40.9 | 59.1 |
| ST00349 | 0.33 | 42.7 | 57.3 |
| ST00351 | 0.54 | 41 | 59 |

| | | | |
|---------|-------|------|------|
| ST00354 | 0.18 | 50.7 | 49.3 |
| ST00360 | 0.12 | 56.6 | 43.4 |
| ST00361 | 2.4 | 21.8 | 78.2 |
| ST00370 | 10.59 | 7.7 | 92.3 |
| ST00375 | 0.43 | 38.1 | 61.9 |
| ST00372 | 1.46 | 39 | 61 |
| ST00377 | 0.58 | 38.1 | 61.9 |
| ST00376 | 0.12 | 67.6 | 32.4 |
| ST00380 | 0.3 | 52.9 | 47.1 |
| ST00367 | 0.26 | 49.1 | 50.9 |
| ST00384 | 0.01 | 61.8 | 38.2 |
| ST00383 | 4.78 | 14.1 | 85.9 |
| ST00381 | 5.09 | 12.9 | 87.1 |
| ST00366 | 0.09 | 67.2 | 32.8 |
| ST00365 | 5.95 | 19.5 | 80.5 |
| ST00379 | 0.18 | 37.4 | 62.6 |
| ST00388 | 1.51 | 40.2 | 59.8 |
| ST00387 | 6.22 | 9.9 | 90.1 |
| N_K060 | 0.03 | 59.9 | 40.1 |
| ST00389 | 0.15 | 45.2 | 54.8 |
| ST00390 | 0.33 | 50.2 | 49.8 |
| ST00392 | 11.6 | 7.5 | 92.5 |
| ST00393 | 0.06 | 69.6 | 30.4 |
| ST00394 | 0.3 | 51.4 | 48.6 |
| ST00401 | 0.14 | 56.2 | 43.8 |
| N_K043 | 4.82 | 39.1 | 60.9 |
| N_K046 | 2.84 | 37.1 | 62.9 |
| ST00397 | 0.21 | 53 | 47 |
| ST00396 | 0.36 | 42.6 | 57.4 |
| ST00403 | 0.28 | 70 | 30 |
| ST00402 | 2.59 | 35.7 | 64.3 |
| ST00398 | 17.83 | 10.3 | 89.8 |
| ST00404 | 4.43 | 40.2 | 59.8 |
| ST00410 | 0.03 | 66.3 | 33.7 |
| ST00510 | 0.01 | 70 | 30 |
| ST00411 | 0.43 | 37.4 | 62.6 |
| ST00412 | 1.83 | 38.4 | 61.6 |
| ST00413 | 0.26 | 67.5 | 32.5 |
| ST00415 | 0.63 | 38.4 | 61.6 |
| ST00416 | 0.29 | 46.5 | 53.5 |
| ST00418 | 0.02 | 63.6 | 36.4 |
| ST00420 | 0.17 | 60.8 | 39.2 |
| ST00421 | 0.1 | 66.9 | 33 |
| ST00424 | 0.05 | 70 | 30 |
| ST00425 | 0.36 | 30.4 | 69.6 |
| ST00427 | 0.02 | 70 | 30 |
| ST00430 | 3.56 | 39.4 | 60.6 |
| K5_out | 0.86 | 33.4 | 66.6 |
| ST00432 | 1.86 | 9.9 | 90.1 |
| ST00433 | 1.51 | 9.3 | 90.8 |
| ST00499 | 1.15 | 39 | 61 |

| | | | |
|---------|--------|------|------|
| N_K051 | 0.32 | 44.7 | 55.3 |
| ST00500 | 0.28 | 20.5 | 79.5 |
| ST00529 | 3.49 | 39.5 | 60.5 |
| K1_out | 1.3 | 29.2 | 70.8 |
| K2_out | 6.45 | 19.6 | 80.4 |
| K3_out | 0.99 | 31 | 68.9 |
| K4_out | 0.82 | 39.9 | 60.1 |
| HW1 | 0.58 | 25.7 | 74.3 |
| HW2 | 0.67 | 29.1 | 70.9 |
| HW3 | 0.88 | 41 | 59 |
| N_K007 | 0.9 | 32.4 | 67.6 |
| N_K008 | 0.43 | 32 | 68 |
| HW6 | 5.48 | 12.9 | 87.1 |
| N_K016 | 0.8 | 7.7 | 92.3 |
| N_K017 | 2.98 | 16.1 | 83.9 |
| N_K018 | 0.66 | 36.5 | 63.5 |
| K8_out | 4.25 | 20.5 | 79.5 |
| N_K020 | 0.96 | 28.4 | 71.6 |
| HW7 | 0.28 | 25.4 | 74.6 |
| K7_out | 0.23 | 32.8 | 67.2 |
| N_K024 | 0.25 | 29.4 | 70.6 |
| HW9 | 21.96 | 9.1 | 90.9 |
| HW8 | 44.79 | 7.4 | 92.6 |
| N_K026 | 1.16 | 33.9 | 66.1 |
| HW12 | 15.29 | 6.3 | 93.7 |
| HW10 | 99.74 | 21.4 | 78.6 |
| N_K032 | 151.85 | 8.9 | 91.1 |
| ST00303 | 0.81 | 44.6 | 55.4 |
| N_K035 | 0.78 | 37 | 63 |
| N_K038 | 0.74 | 43 | 57 |
| N_K040 | 1.27 | 14.7 | 85.3 |
| HW13 | 3.96 | 16 | 84 |
| N_K049 | 0.15 | 68 | 32 |
| N_K050 | 0.52 | 39.4 | 60.6 |
| N_K053 | 1.18 | 33.8 | 66.2 |
| K9_out | 1.01 | 36.7 | 63.3 |
| K10_out | 0.28 | 26.7 | 73.3 |
| K11_out | 4.87 | 36.7 | 63.3 |
| N_K055 | 0.99 | 37.9 | 62.1 |
| K12_out | 1.07 | 29.1 | 70.9 |
| N_K056 | 0.8 | 35.1 | 64.9 |
| K13_out | 0.99 | 36.2 | 63.8 |
| N_K057 | 0.58 | 43.5 | 56.5 |
| N_K058 | 0.05 | 62.5 | 37.5 |
| N_K059 | 1.27 | 36.5 | 63.5 |
| N_K061 | 0.03 | 56 | 44 |
| N_K062 | 0.76 | 13.1 | 86.9 |
| N_K063 | 1.06 | 18 | 82 |
| HW15 | 1.32 | 36.3 | 63.7 |
| N_K068 | 0.26 | 37.1 | 62.9 |
| N_K069 | 0.28 | 42.1 | 57.9 |

| | | | |
|---------|-------|------|------|
| N_K073 | 8.81 | 7.6 | 92.4 |
| N_K075 | 0.08 | 61.6 | 38.4 |
| N_K077 | 0.09 | 66.8 | 33.3 |
| N_K080 | 0.14 | 18.6 | 81.4 |
| N_K082 | 0.17 | 62.6 | 37.4 |
| N_K084 | 0.04 | 70 | 30 |
| HW17 | 1.46 | 38.6 | 61.4 |
| N_K089 | 0.97 | 40.8 | 59.2 |
| N_K090 | 0.44 | 30.9 | 69.2 |
| N_K093 | 0.07 | 55.8 | 44.2 |
| N_K094 | 0.22 | 45.9 | 54.1 |
| N_K095 | 0.21 | 35.2 | 64.8 |
| N_K096 | 0.65 | 38.9 | 61.1 |
| N_K098 | 0.73 | 35.4 | 64.6 |
| N_K099 | 0.59 | 43.3 | 56.7 |
| N_K101 | 0.15 | 39.8 | 60.2 |
| N_K103 | 0.15 | 55.7 | 44.3 |
| N_K104 | 0.05 | 70 | 30 |
| N_K106 | 1.06 | 39.7 | 60.3 |
| N_K109 | 0.07 | 70 | 30 |
| N_K110 | 0.25 | 41.9 | 58.1 |
| N_K112 | 1.27 | 36.1 | 63.9 |
| N_K113 | 1.86 | 44.3 | 55.7 |
| N_K114 | 3.99 | 35.5 | 64.6 |
| N_K115 | 2.19 | 40.9 | 59.1 |
| N_K116 | 0.12 | 56.8 | 43.2 |
| N_K117 | 0.17 | 33.4 | 66.6 |
| N_K120 | 0.17 | 63.4 | 36.6 |
| N_K121 | 1.54 | 37.6 | 62.4 |
| N_K122 | 0.51 | 30.1 | 69.9 |
| N_K123 | 0.09 | 65.3 | 34.7 |
| N_K125 | 0.03 | 69.3 | 30.8 |
| N_K127 | 24.39 | 5 | 95 |
| N_K128 | 2.13 | 34.6 | 65.4 |
| N_K129 | 0.4 | 30.7 | 69.3 |
| N_K130 | 0.11 | 67.6 | 32.4 |
| N_K132 | 3.36 | 38.9 | 61.1 |
| N_K133 | 0.04 | 69.6 | 30.4 |
| N_K134 | 0.75 | 43.7 | 56.3 |
| N_K135 | 0.2 | 32.2 | 67.8 |
| N_K136 | 0.28 | 44.5 | 55.5 |
| K14_out | 0.55 | 47.5 | 52.5 |
| N_K137 | 1.24 | 37.3 | 62.7 |
| N_K138 | 0.36 | 34.4 | 65.6 |
| N_K139 | 0.45 | 36.8 | 63.2 |
| N_K141 | 0.81 | 28 | 72 |
| N_K142 | 1.14 | 14.4 | 85.6 |
| N_K143 | 5.51 | 8.8 | 91.2 |
| N_K144 | 0.97 | 40.2 | 59.8 |
| ST00429 | 0.1 | 45.9 | 54.1 |
| ST00428 | 0.46 | 36.3 | 63.7 |

| | | | |
|----------|------|------|------|
| ST00356b | 0.27 | 56.8 | 43.2 |
|----------|------|------|------|

Table D.2.2: Kandos peak pipe flow results

| Pipe ID | Peak pipe flows (m ³ /s) | | | | | | |
|-----------|-------------------------------------|---------|--------|--------|--------|----------|-------|
| | 20% AEP | 10% AEP | 5% AEP | 2% AEP | 1% AEP | 0.5% AEP | PMF |
| ST00277 | 0.09 | 0.11 | 0.13 | 0.16 | 0.18 | 0.24 | 0.55 |
| A46 | 1.57 | 1.72 | 1.93 | 2.23 | 2.33 | 2.42 | 3.06 |
| ST00278 | 1.78 | 1.81 | 1.84 | 1.84 | 1.87 | 1.95 | 2.66 |
| ST00135 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.97 |
| ST00137 | 0.46 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.41 |
| ST00136 | 0.34 | 0.35 | 0.32 | 0.34 | 0.34 | 0.33 | 0.31 |
| ST00134 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 |
| ST00132 | 0.62 | 0.62 | 0.62 | 0.62 | 0.62 | 0.62 | 0.67 |
| P_ST00299 | 0.07 | 0.08 | 0.10 | 0.11 | 0.13 | 0.16 | 0.21 |
| ST00127 | 0.31 | 0.34 | 0.35 | 0.36 | 0.36 | 0.36 | 0.38 |
| ST00126 | 0.20 | 0.23 | 0.27 | 0.30 | 0.31 | 0.31 | 0.32 |
| ST00130 | 0.23 | 0.27 | 0.31 | 0.36 | 0.41 | 0.50 | 0.63 |
| ST00275 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 |
| P_ST00431 | 0.64 | 0.64 | 0.64 | 0.64 | 0.64 | 0.64 | 0.64 |
| A71 | 0.79 | 0.81 | 0.83 | 0.85 | 0.87 | 0.94 | 1.34 |
| A72 | 1.96 | 2.46 | 3.17 | 4.05 | 4.82 | 6.70 | 10.22 |
| A66 | 0.46 | 0.47 | 0.48 | 0.49 | 0.51 | 0.54 | 0.90 |
| KANDOS 21 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.14 |
| KANDOS 22 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 |
| ST00165 | 0.16 | 0.19 | 0.22 | 0.25 | 0.29 | 0.29 | 0.30 |
| ST00166 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 |
| ST00167 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 |
| ST00169 | 0.08 | 0.10 | 0.11 | 0.13 | 0.16 | 0.19 | 0.39 |
| ST00170 | 0.08 | 0.10 | 0.11 | 0.13 | 0.16 | 0.19 | 0.42 |
| ST00172 | 0.01 | 0.02 | 0.02 | 0.02 | 0.03 | 0.03 | 0.15 |
| ST00171 | 0.26 | 0.31 | 0.36 | 0.37 | 0.37 | 0.37 | 0.38 |
| ST00173 | 0.03 | 0.03 | 0.04 | 0.06 | 0.12 | 0.19 | 0.27 |
| ST00174 | 0.28 | 0.33 | 0.39 | 0.44 | 0.49 | 0.49 | 0.49 |
| ST00175 | 0.44 | 0.44 | 0.44 | 0.45 | 0.45 | 0.45 | 0.45 |
| ST00176 | 0.10 | 0.11 | 0.12 | 0.13 | 0.13 | 0.14 | 0.15 |
| ST00177 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 |
| ST00179 | 0.01 | 0.01 | 0.01 | 0.04 | 0.10 | 0.24 | 0.44 |
| ST00178 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.40 | 0.41 |
| P_ST00510 | 0.40 | 0.40 | 0.40 | 0.42 | 0.48 | 0.51 | 0.51 |
| ST00180 | 0.17 | 0.19 | 0.23 | 0.26 | 0.30 | 0.37 | 0.46 |
| ST00181 | 0.26 | 0.30 | 0.35 | 0.37 | 0.37 | 0.37 | 0.37 |
| KANDOS7 | 0.37 | 0.38 | 0.38 | 0.39 | 0.40 | 0.41 | 0.54 |
| C15 | 0.20 | 0.24 | 0.29 | 0.34 | 0.40 | 0.52 | 0.64 |
| C14 | 0.24 | 0.25 | 0.26 | 0.26 | 0.27 | 0.29 | 0.41 |
| ST00195 | 0.51 | 0.51 | 0.51 | 0.51 | 0.52 | 0.52 | 0.53 |
| ST00196 | 0.95 | 1.08 | 1.11 | 1.10 | 1.11 | 1.10 | 1.09 |
| ST00208 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 | 0.11 | 0.18 |
| ST00209 | 0.14 | 0.16 | 0.18 | 0.21 | 0.24 | 0.30 | 0.31 |
| ST00210 | 0.13 | 0.16 | 0.18 | 0.21 | 0.24 | 0.30 | 0.49 |
| ST00207 | 0.61 | 0.60 | 0.62 | 0.59 | 0.62 | 0.56 | 0.63 |
| ST00197 | 0.82 | 0.82 | 0.82 | 0.81 | 0.81 | 0.81 | 0.90 |

| Pipe ID | Peak pipe flows (m ³ /s) | | | | | | |
|-----------|-------------------------------------|---------|--------|--------|--------|----------|------|
| | 20% AEP | 10% AEP | 5% AEP | 2% AEP | 1% AEP | 0.5% AEP | PMF |
| ST00198 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.15 |
| ST00199 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 |
| ST00183 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 |
| P_ST00414 | 0.35 | 0.34 | 0.35 | 0.34 | 0.35 | 0.33 | 0.33 |
| ST00184 | 0.14 | 0.17 | 0.20 | 0.22 | 0.26 | 0.32 | 0.44 |
| ST00212 | 0.09 | 0.10 | 0.12 | 0.14 | 0.16 | 0.16 | 0.25 |
| ST00213 | 0.12 | 0.12 | 0.14 | 0.15 | 0.17 | 0.18 | 0.23 |
| ST00214 | 0.54 | 0.54 | 0.54 | 0.54 | 0.54 | 0.54 | 0.54 |
| ST00215 | 0.57 | 0.57 | 0.57 | 0.57 | 0.57 | 0.57 | 0.57 |
| ST00216 | 0.52 | 0.52 | 0.53 | 0.53 | 0.53 | 0.52 | 0.58 |
| ST00200 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| P_N_K043 | 0.54 | 0.54 | 0.54 | 0.54 | 0.54 | 0.55 | 0.56 |
| P_N_K044 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 |
| P_N_K045 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| ST00201 | 1.03 | 1.03 | 1.03 | 1.03 | 1.03 | 1.03 | 1.00 |
| P_N_K046 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.80 |
| ST00188 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 |
| ST00187 | 0.22 | 0.22 | 0.23 | 0.23 | 0.23 | 0.24 | 0.25 |
| C06 | 0.22 | 0.21 | 0.22 | 0.22 | 0.22 | 0.22 | 0.35 |
| ST00203 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.45 |
| ST00202 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 | 0.11 | 0.54 |
| ST00191 | 0.20 | 0.23 | 0.27 | 0.30 | 0.30 | 0.30 | 0.43 |
| P_ST00333 | 1.65 | 1.65 | 1.66 | 1.65 | 1.65 | 1.65 | 1.65 |
| ST00193 | 0.00 | 0.00 | 0.00 | 0.01 | 0.05 | 0.14 | 0.40 |
| ST00163 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.06 |
| ST00162 | 0.04 | 0.05 | 0.06 | 0.08 | 0.09 | 0.11 | 0.39 |
| ST00161 | 0.18 | 0.19 | 0.20 | 0.21 | 0.21 | 0.20 | 0.21 |
| ST00160 | 0.27 | 0.27 | 0.28 | 0.29 | 0.31 | 0.31 | 0.33 |
| ST00508 | 0.13 | 0.16 | 0.19 | 0.23 | 0.26 | 0.28 | 0.39 |
| ST00157 | 0.48 | 0.52 | 0.57 | 0.59 | 0.61 | 0.63 | 0.64 |
| ST00150 | 0.16 | 0.18 | 0.21 | 0.24 | 0.27 | 0.34 | 0.60 |
| C01 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.09 |
| P_ST00328 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 | 0.26 |
| ST00503 | 0.18 | 0.18 | 0.20 | 0.22 | 0.23 | 0.23 | 0.35 |
| ST00504 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.41 |
| ST00153 | 0.55 | 0.55 | 0.56 | 0.57 | 0.58 | 0.58 | 0.58 |
| ST00152 | 0.44 | 0.44 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 |
| ST00143 | 0.10 | 0.12 | 0.14 | 0.16 | 0.18 | 0.23 | 0.30 |
| ST00144 | 0.13 | 0.15 | 0.17 | 0.19 | 0.22 | 0.27 | 0.31 |
| ST00145 | 0.13 | 0.15 | 0.17 | 0.20 | 0.22 | 0.28 | 0.40 |
| ST00146 | 0.56 | 0.56 | 0.56 | 0.56 | 0.56 | 0.56 | 0.56 |
| P_ST00530 | 1.01 | 1.01 | 1.01 | 1.01 | 1.02 | 1.01 | 1.02 |
| ST00148 | 0.20 | 0.23 | 0.27 | 0.30 | 0.30 | 0.31 | 0.34 |
| P_ST00318 | 0.65 | 0.65 | 0.69 | 0.70 | 0.70 | 0.71 | 0.71 |
| ST00204 | 0.65 | 0.67 | 0.65 | 0.65 | 0.65 | 0.65 | 0.63 |
| ST00219 | 0.21 | 0.25 | 0.29 | 0.33 | 0.35 | 0.36 | 0.37 |
| ST00220 | 0.24 | 0.29 | 0.34 | 0.38 | 0.40 | 0.42 | 0.45 |
| ST00221 | 0.36 | 0.41 | 0.47 | 0.53 | 0.56 | 0.56 | 0.57 |

| Pipe ID | Peak pipe flows (m ³ /s) | | | | | | |
|-----------|-------------------------------------|---------|--------|--------|--------|----------|-------|
| | 20% AEP | 10% AEP | 5% AEP | 2% AEP | 1% AEP | 0.5% AEP | PMF |
| ST00222 | 0.33 | 0.39 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 |
| ST00225 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.44 |
| ST00256 | 0.22 | 0.22 | 0.21 | 0.22 | 0.22 | 0.20 | 0.20 |
| ST00526 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 |
| ST00258 | 0.30 | 0.30 | 0.28 | 0.28 | 0.28 | 0.28 | 0.29 |
| ST00259 | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.48 |
| ST00260 | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.47 | 0.49 |
| P_ST00380 | 0.07 | 0.08 | 0.09 | 0.10 | 0.12 | 0.15 | 0.53 |
| ST00263 | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 |
| ST00264 | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 |
| ST00265 | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 |
| ST00239 | 0.14 | 0.16 | 0.20 | 0.26 | 0.30 | 0.31 | 0.48 |
| ST00246 | 0.47 | 0.48 | 0.48 | 0.47 | 0.49 | 0.47 | 0.44 |
| ST00249 | 0.43 | 0.43 | 0.43 | 0.44 | 0.44 | 0.43 | 0.43 |
| ST00527 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 |
| ST00267 | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 | 0.49 |
| ST00253 | 0.03 | 0.04 | 0.04 | 0.06 | 0.06 | 0.07 | 0.33 |
| ST00243 | 0.09 | 0.11 | 0.14 | 0.17 | 0.20 | 0.29 | 0.54 |
| ST00520 | 0.53 | 0.53 | 0.54 | 0.54 | 0.54 | 0.54 | 0.54 |
| ST00242 | 0.22 | 0.23 | 0.25 | 0.26 | 0.27 | 0.27 | 0.31 |
| ST00241 | 0.17 | 0.17 | 0.18 | 0.19 | 0.19 | 0.19 | 0.23 |
| KANDOS 10 | 0.47 | 0.48 | 0.49 | 0.50 | 0.52 | 0.54 | 0.82 |
| C10 | 1.06 | 1.11 | 1.14 | 1.18 | 1.20 | 1.27 | 1.80 |
| C09 | 1.56 | 1.61 | 1.64 | 1.68 | 1.70 | 1.77 | 2.04 |
| ST00375 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.07 |
| ST00237 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.20 |
| C07 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.18 | 0.13 |
| ST00238 | 0.40 | 0.41 | 0.42 | 0.44 | 0.44 | 0.44 | 0.45 |
| ST00230 | 0.19 | 0.22 | 0.26 | 0.30 | 0.35 | 0.41 | 0.42 |
| ST00232 | 0.05 | 0.06 | 0.07 | 0.08 | 0.10 | 0.10 | 0.48 |
| A44 | 0.61 | 0.71 | 0.84 | 0.94 | 1.07 | 1.36 | 2.48 |
| ST00247 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 |
| ST00248 | 0.47 | 0.47 | 0.51 | 0.53 | 0.52 | 0.50 | 0.47 |
| ST00128 | 0.16 | 0.18 | 0.21 | 0.25 | 0.28 | 0.29 | 0.30 |
| ST00129 | 0.18 | 0.21 | 0.25 | 0.28 | 0.32 | 0.32 | 0.42 |
| A54 | 6.20 | 7.06 | 7.93 | 8.32 | 8.57 | 9.20 | 16.85 |

Table D.2.3: Kandos peak overland flow results

| Overland flowpath ID | from | to | Peak overland flows (m ³ /s) | | | | | | |
|----------------------|---------|---------|---|---------|--------|--------|--------|----------|--------|
| | | | 20% AEP | 10% AEP | 5% AEP | 2% AEP | 1% AEP | 0.5% AEP | PMF |
| O_N_K039 | N_K039 | ST00405 | 0.255 | 0.297 | 0.351 | 0.368 | 0.37 | 0.372 | 1.816 |
| O_ST00408 | ST00408 | ST00406 | 0.165 | 0.191 | 0.225 | 0.258 | 0.296 | 0.37 | 0.462 |
| O_HW8 | HW8 | N_K023 | 0 | 0 | 0 | 0 | 0 | 0.828 | 37.92 |
| O_N_K023 | N_K023 | N_K024 | 1.959 | 2.464 | 3.174 | 4.046 | 4.817 | 7.527 | 47.994 |
| O_HW9 | HW9 | N_K025 | 0.47 | 0.749 | 1.154 | 1.651 | 2.112 | 3.629 | 25.511 |
| O_N_K024 | N_K024 | N_K071 | 1.961 | 2.466 | 3.178 | 4.054 | 4.827 | 7.536 | 48.089 |
| O_N_K025 | N_K025 | N_K071 | 1.258 | 1.555 | 1.982 | 2.503 | 2.983 | 4.568 | 26.855 |
| O_N_K071 | N_K071 | N_K022 | 3.201 | 3.992 | 5.127 | 6.549 | 7.802 | 11.829 | 71.587 |
| O_N_K022 | N_K022 | K7_out | 3.201 | 3.992 | 5.127 | 6.549 | 7.802 | 11.829 | 71.587 |
| O_HW7 | HW7 | N_K021 | 0.238 | 0.278 | 0.328 | 0.375 | 0.431 | 0.552 | 2.893 |
| O_N_K026 | N_K026 | N_K072 | 2.761 | 3.271 | 3.926 | 4.492 | 5.214 | 7.043 | 37.946 |
| O_N_K027 | N_K027 | N_K072 | 2.305 | 2.803 | 3.445 | 3.999 | 4.708 | 6.507 | 37.074 |
| O_HW12 | HW12 | N_K027 | 2.999 | 3.547 | 4.253 | 4.85 | 5.636 | 7.594 | 40.836 |
| O_N_K072 | N_K072 | N_K073 | 3.704 | 4.425 | 5.344 | 6.169 | 7.116 | 9.732 | 52.665 |
| O_N_K073 | N_K073 | N_K074 | 3.704 | 4.425 | 5.344 | 6.169 | 7.116 | 9.732 | 52.665 |
| O_N_K074 | N_K074 | N_K020 | 3.712 | 4.434 | 5.354 | 6.208 | 7.164 | 9.807 | 52.893 |
| O_N_K020 | N_K020 | HW7 | 0.021 | 0.025 | 0.03 | 0.037 | 0.042 | 0.043 | 0.232 |
| O_N_K075 | N_K075 | N_K076 | 0.904 | 1.089 | 1.327 | 1.578 | 1.845 | 2.533 | 13.219 |
| O_N_K017 | N_K017 | N_K076 | 0.908 | 1.093 | 1.332 | 1.589 | 1.856 | 2.545 | 13.317 |
| O_N_K076 | N_K076 | N_K018 | 0.137 | 0.163 | 0.196 | 0.227 | 0.264 | 0.355 | 1.93 |
| O_N_K016 | N_K016 | N_K018 | 0.24 | 0.295 | 0.365 | 0.447 | 0.526 | 0.737 | 3.74 |
| O_ST00432 | ST00432 | N_K077 | 0.218 | 0.267 | 0.33 | 0.392 | 0.457 | 0.625 | 3.308 |
| O_ST00433 | ST00433 | N_K077 | 1.552 | 1.88 | 2.29 | 2.758 | 3.222 | 4.426 | 22.939 |
| O_N_K077 | N_K077 | K8_out | 1.096 | 1.321 | 1.606 | 1.919 | 2.24 | 3.064 | 16.07 |
| O_N_K018 | N_K018 | N_K077 | 0 | 0 | 1.097 | 4.624 | 7.753 | 17.785 | 81.352 |
| O_HW10 | HW10 | N_K028 | 6.203 | 7.058 | 9.031 | 12.939 | 16.32 | 26.984 | 98.197 |
| O_N_K028 | N_K028 | N_K029 | 6.203 | 7.058 | 9.031 | 12.939 | 16.32 | 26.984 | 98.197 |
| O_N_K029 | N_K029 | N_K030 | 6.203 | 7.058 | 9.031 | 12.939 | 16.32 | 26.984 | 98.197 |
| O_N_K030 | N_K030 | N_K013 | 6.203 | 7.058 | 9.031 | 12.939 | 16.32 | 26.984 | 98.197 |
| O_N_K013 | N_K013 | N_K012 | 6.203 | 7.058 | 9.031 | 12.939 | 16.32 | 26.984 | 98.197 |
| O_N_K012 | N_K012 | N_K011 | 6.23 | 7.094 | 9.078 | 13.007 | 16.421 | 27.158 | 98.197 |
| O_HW6 | HW6 | N_K011 | 6.23 | 7.094 | 9.078 | 13.007 | 16.421 | 27.158 | 98.197 |
| O_N_K011 | N_K011 | HW11 | 6.23 | 7.094 | 9.078 | 13.007 | 16.421 | 27.158 | 98.197 |
| O_HW11 | HW11 | N_K031 | 0.194 | 0.226 | 0.267 | 0.306 | 0.352 | 0.448 | 2.326 |
| O_N_K007 | N_K007 | N_K079 | 0.065 | 0.077 | 0.095 | 0.119 | 0.137 | 0.149 | 0.806 |
| O_ST00500 | ST00500 | N_K079 | 0.134 | 0.156 | 0.193 | 0.244 | 0.283 | 0.305 | 1.581 |
| O_N_K008 | N_K008 | N_K077 | 0.024 | 0.028 | 0.034 | 0.042 | 0.048 | 0.049 | 0.259 |
| O_N_K077 | N_K077 | K6_out | 0.032 | 0.039 | 0.047 | 0.059 | 0.069 | 0.075 | 0.407 |
| O_N_K080 | N_K080 | N_K008 | 0.387 | 0.529 | 0.681 | 0.789 | 0.956 | 1.317 | 10.123 |
| O_ST00430 | ST00430 | ST00431 | 5.413 | 6.774 | 8.719 | 10.962 | 13.091 | 20.261 | 124.46 |
| N_K032 | N_K032 | HW10 | 0 | 0 | 0 | 0 | 0.004 | 0.073 | 1.637 |
| O_ST00301 | ST00301 | ST00302 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| O_ST00300 | ST00300 | ST00302 | 0 | 0 | 0 | 0 | 0 | 0 | 1.918 |
| O_ST00302 | ST00302 | ST00430 | 0.044 | 0.05 | 0.059 | 0.077 | 0.089 | 0.092 | 0.47 |
| O_N_082 | N_K082 | N_K083 | 0.395 | 0.644 | 0.923 | 1.242 | 1.53 | 2.167 | 13.968 |
| O_ST00306 | ST00306 | N_K083 | 0.161 | 0.161 | 0.161 | 0.161 | 0.161 | 0.161 | 0.161 |
| O_ST00307 | ST00307 | ST00308 | 0.323 | 0.373 | 0.425 | 0.472 | 0.532 | 0.651 | 2.888 |
| O_ST00308 | ST00308 | ST00309 | 0.309 | 0.446 | 0.671 | 1.064 | 1.403 | 2.16 | 15.233 |
| O_ST00309 | ST00309 | N_K004 | 1.236 | 1.345 | 1.569 | 1.962 | 2.301 | 3.059 | 16.132 |
| O_N_K004 | N_K004 | HW2 | 0 | 0 | 0 | 0 | 0.256 | 1.058 | 14.201 |
| O_HW2 | HW2 | N_K002 | 1.565 | 1.72 | 1.93 | 2.232 | 2.582 | 3.476 | 17.255 |
| O_N_K002 | N_K002 | HW3 | 0.014 | 0.164 | 0.347 | 0.627 | 0.909 | 1.691 | 15.866 |
| O_HW3 | HW3 | N_K003 | 1.782 | 1.92 | 2.144 | 2.46 | 2.778 | 3.636 | 18.528 |
| O_N_K003 | N_K003 | K4_out | 0.402 | 0.652 | 0.939 | 1.263 | 1.556 | 2.201 | 14.127 |

| | | | | | | | | | |
|-----------|---------|---------|-------|-------|-------|-------|--------|--------|--------|
| O_N_K083 | N_K083 | ST00309 | 0.361 | 0.418 | 0.492 | 0.563 | 0.646 | 0.81 | 4.176 |
| O_ST00316 | ST00316 | HW17 | 0 | 0 | 0 | 0 | 0 | 0 | 4.57 |
| O_HW17 | HW17 | N_K070 | 0.606 | 0.708 | 0.84 | 0.938 | 1.068 | 1.364 | 7.05 |
| O_N_K070 | N_K070 | N_K084 | 0 | 0 | 0 | 0 | 0 | 0 | 0.664 |
| O_HW1 | HW1 | N_K001 | 0.09 | 0.11 | 0.133 | 0.158 | 0.182 | 0.242 | 1.217 |
| O_N_K001 | N_K001 | N_K085 | 0.625 | 0.731 | 0.867 | 0.968 | 1.103 | 1.406 | 7.277 |
| O_N_K084 | N_K084 | N_K085 | 0.711 | 0.833 | 0.989 | 1.11 | 1.273 | 1.641 | 8.48 |
| O_N_K085 | N_K085 | K3_out | 0 | 0 | 0 | 0.01 | 0.058 | 0.139 | 1.912 |
| O_ST00317 | ST00317 | ST00318 | 1.065 | 1.362 | 1.727 | 1.993 | 2.326 | 3.117 | 17.008 |
| O_ST00318 | ST00318 | ST00319 | 1.722 | 2.018 | 2.414 | 2.756 | 3.129 | 3.954 | 19.04 |
| O_ST00319 | ST00319 | N_K053 | 0 | 0 | 0 | 0 | 0 | 0 | 0.884 |
| O_ST00313 | ST00313 | N_K052 | 0 | 0 | 0 | 0 | 0 | 0.01 | 1.164 |
| O_N_K052 | N_K052 | ST00315 | 0 | 0 | 0 | 0 | 0 | 0 | 0.99 |
| O_ST00315 | ST00315 | ST00530 | 0.646 | 0.846 | 1.075 | 1.247 | 1.461 | 1.956 | 10.199 |
| O_ST00529 | ST00529 | ST00530 | 0.211 | 0.418 | 0.692 | 0.894 | 1.137 | 1.686 | 11.073 |
| O_ST00530 | ST00530 | ST00318 | 0.714 | 0.785 | 0.866 | 0.936 | 1.05 | 1.265 | 5.61 |
| O_N_K037 | N_K037 | ST00529 | 0 | 0 | 0 | 0 | 0 | 0 | 0.661 |
| O_ST00299 | ST00299 | N_K005 | 0.07 | 0.12 | 0.186 | 0.254 | 0.295 | 0.361 | 1.722 |
| O_N_K005 | N_K005 | N_K086 | 0.232 | 0.474 | 0.682 | 0.917 | 1.138 | 1.615 | 12.085 |
| O_ST00304 | ST00304 | N_K086 | 0.232 | 0.477 | 0.733 | 1.034 | 1.31 | 1.924 | 13.436 |
| O_N_K086 | N_K086 | ST00306 | 0 | 0 | 0 | 0 | 0.035 | 0.127 | 1.973 |
| O_ST00298 | ST00298 | ST00304 | 0.244 | 0.423 | 0.594 | 0.817 | 1.035 | 1.458 | 10.355 |
| O_ST00303 | ST00303 | ST00304 | 0 | 0 | 0 | 0 | 0 | 0.072 | 1.614 |
| O_N_K035 | N_K035 | N_K034 | 0.392 | 0.521 | 0.626 | 0.771 | 0.918 | 1.188 | 7.124 |
| O_ST00311 | ST00311 | N_K034 | 0.018 | 0.021 | 0.025 | 0.032 | 0.037 | 0.038 | 0.195 |
| O_ST00310 | ST00310 | N_K084 | 0.159 | 0.185 | 0.219 | 0.245 | 0.285 | 0.293 | 0.298 |
| O_N_K036 | N_K036 | N_K087 | 0.159 | 0.185 | 0.219 | 0.245 | 0.285 | 0.293 | 0.298 |
| O_N_K087 | N_K087 | ST00303 | 0.044 | 0.051 | 0.06 | 0.073 | 0.087 | 0.092 | 0.47 |
| O_ST00297 | ST00297 | ST00431 | 0 | 0 | 0 | 0 | 0 | 0 | 0.626 |
| O_ST00425 | ST00425 | ST00426 | 0 | 0 | 0 | 0 | 0 | 0 | 0.588 |
| O_ST00426 | ST00426 | ST00427 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| O_ST00424 | ST00424 | ST00423 | 0 | 0 | 0 | 0.044 | 0.103 | 0.231 | 2.786 |
| O_ST00427 | ST00427 | ST00421 | 0 | 0 | 0 | 0 | 0 | 0.07 | 2.848 |
| O_ST00421 | ST00421 | ST00420 | 0.207 | 0.24 | 0.283 | 0.324 | 0.372 | 0.469 | 2.438 |
| O_N_K089 | N_K089 | ST00417 | 0.036 | 0.113 | 0.211 | 0.336 | 0.388 | 0.586 | 2.7 |
| O_ST00417 | ST00417 | ST00412 | 0 | 0.017 | 0.047 | 0.064 | 0.084 | 0.133 | 1.059 |
| O_ST00411 | ST00411 | ST00412 | 0.43 | 0.532 | 0.731 | 0.931 | 1.137 | 1.486 | 7.841 |
| O_ST00412 | ST00412 | ST00413 | 0.535 | 0.651 | 0.844 | 1.051 | 1.275 | 1.679 | 8.502 |
| O_ST00413 | ST00413 | ST00416 | 0.1 | 0.117 | 0.137 | 0.158 | 0.182 | 0.23 | 1.175 |
| O_N_K090 | N_K090 | ST00416 | 0.28 | 0.41 | 0.668 | 0.882 | 1.099 | 1.547 | 9.443 |
| O_ST00416 | ST00416 | N_K092 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| O_ST00414 | ST00414 | N_K092 | 0 | 0 | 0 | 0 | 0 | 0 | 1.224 |
| O_ST00415 | ST00415 | N_K042 | 0.28 | 0.41 | 0.668 | 0.882 | 1.099 | 1.547 | 9.443 |
| O_N_K092 | N_K092 | N_K091 | 0.708 | 0.859 | 1.118 | 1.365 | 1.596 | 2.157 | 11.259 |
| O_N_K091 | N_K091 | N_K043 | 0.018 | 0.022 | 0.026 | 0.032 | 0.037 | 0.038 | 0.209 |
| O_N_K093 | N_K093 | N_K094 | 0.072 | 0.083 | 0.1 | 0.13 | 0.149 | 0.156 | 0.826 |
| O_N_K094 | N_K094 | N_K046 | 4.673 | 5.706 | 7.021 | 8.36 | 9.835 | 13.688 | 72.371 |
| O_ST00336 | ST00336 | N_K047 | 0 | 0 | 0 | 0 | 0 | 0 | 0.163 |
| O_ST00334 | ST00334 | N_K047 | 0 | 0 | 0 | 0 | 0 | 0 | 0.033 |
| O_ST00337 | ST00337 | ST00333 | 4.579 | 5.618 | 6.939 | 8.277 | 9.756 | 13.609 | 72.316 |
| O_N_K047 | N_K047 | ST00333 | 0 | 0 | 0 | 0.013 | 0.054 | 0.136 | 1.921 |
| O_ST00338 | ST00338 | ST00339 | 4.125 | 5.185 | 6.548 | 8.097 | 9.455 | 13.675 | 79.12 |
| O_ST00333 | ST00333 | N_K095 | 0.303 | 0.355 | 0.421 | 0.472 | 0.587 | 0.826 | 5.656 |
| O_ST00340 | ST00340 | N_K095 | 0 | 0 | 0 | 0 | 0 | 0 | 1.526 |
| O_ST00339 | ST00339 | ST00340 | 4.143 | 5.215 | 6.598 | 8.217 | 9.546 | 13.946 | 81.758 |
| O_N_K095 | N_K095 | ST00332 | 0.059 | 0.068 | 0.079 | 0.091 | 0.104 | 0.127 | 0.646 |
| O_ST00341 | ST00341 | ST00332 | 3.584 | 4.675 | 6.124 | 7.673 | 9.141 | 13.659 | 84.645 |
| O_ST00332 | ST00332 | ST00331 | 5.839 | 6.931 | 8.38 | 9.928 | 11.396 | 15.918 | 81.96 |
| O_ST00331 | ST00331 | N_K054 | 0.124 | 0.143 | 0.169 | 0.207 | 0.247 | 0.274 | 1.388 |

| | | | | | | | | | |
|-----------|---------|---------|-------|-------|-------|-------|--------|--------|--------|
| O_ST00342 | ST00342 | N_K054 | 5.859 | 6.956 | 8.411 | 9.947 | 11.441 | 15.982 | 82.426 |
| O_N_K054 | N_K054 | K11_out | 1.027 | 1.236 | 1.466 | 1.686 | 1.982 | 2.559 | 13.482 |
| O_ST00326 | ST00324 | K11_out | 0 | 0 | 0 | 0 | 0 | 0 | 1.218 |
| O_ST00322 | ST00322 | ST00323 | 0.178 | 0.205 | 0.24 | 0.275 | 0.315 | 0.385 | 1.946 |
| O_ST00323 | ST00323 | ST00324 | 0.564 | 0.656 | 0.774 | 0.871 | 1.001 | 1.277 | 6.8 |
| O_ST00324 | ST00324 | K10_out | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| O_ST00418 | ST00418 | N_K048 | 0 | 0 | 0 | 0 | 0 | 0 | 2.715 |
| O_ST00420 | ST00420 | N_K048 | 0.156 | 0.182 | 0.216 | 0.246 | 0.282 | 0.352 | 3.806 |
| O_N_K049 | N_K049 | ST00498 | 0 | 0.03 | 0.069 | 0.109 | 0.155 | 0.249 | 3.746 |
| O_ST00498 | ST00498 | ST00499 | 0.173 | 0.259 | 0.356 | 0.451 | 0.579 | 0.838 | 5.128 |
| O_ST00499 | ST00499 | N_K096 | 0.249 | 0.341 | 0.463 | 0.602 | 0.754 | 1.063 | 6.417 |
| O_N_K096 | N_K096 | ST00501 | 0 | 0 | 0 | 0 | 0 | 0 | 0.198 |
| O_ST00328 | ST00328 | ST00327 | 0.583 | 0.792 | 1.017 | 1.217 | 1.505 | 2.058 | 12.806 |
| O_ST00327 | ST00327 | ST00326 | 0 | 0 | 0 | 0 | 0 | 0.057 | 1.329 |
| O_N_K050 | N_K050 | N_K051 | 0 | 0 | 0 | 0 | 0 | 0 | 1.922 |
| O_N_K051 | N_K051 | ST00330 | 0 | 0.046 | 0.148 | 0.235 | 0.318 | 0.423 | 3.864 |
| O_ST00330 | ST00330 | ST00502 | 0.392 | 0.521 | 0.626 | 0.771 | 0.918 | 1.188 | 7.124 |
| O_ST00311 | ST00311 | ST00312 | 0.255 | 0.297 | 0.351 | 0.402 | 0.464 | 0.593 | 3.127 |
| O_N_K099 | N_K099 | ST00409 | 0 | 0 | 0 | 0 | 0 | 0.078 | 0.308 |
| O_ST00510 | ST00510 | ST00403 | 0 | 0 | 0 | 0 | 0 | 0 | 2.36 |
| O_ST00410 | ST00410 | ST00404 | 1.81 | 2.148 | 2.438 | 2.839 | 3.321 | 4.354 | 22.8 |
| O_ST00404 | ST00404 | ST00403 | 0.147 | 0.171 | 0.202 | 0.225 | 0.258 | 0.334 | 1.774 |
| O_N_K098 | N_K098 | N_K099 | 0 | 0 | 0 | 0 | 0 | 0 | 1.445 |
| O_N_K038 | N_K038 | N_K039 | 0 | 0 | 0 | 0.034 | 0.094 | 0.222 | 2.757 |
| O_ST00409 | ST00409 | ST00410 | 0.167 | 0.28 | 0.424 | 0.591 | 0.752 | 1.176 | 7.383 |
| O_HW13 | HW13 | N_K145 | 0 | 0 | 0 | 0 | 0 | 0.014 | 2.313 |
| O_N_K040 | N_K040 | N_K102 | 0.196 | 0.238 | 0.29 | 0.34 | 0.395 | 0.519 | 0.635 |
| O_N_K041 | N_K041 | N_K102 | 0.196 | 0.238 | 0.29 | 0.34 | 0.395 | 0.532 | 2.813 |
| O_N_K102 | N_K102 | N_K101 | 0.536 | 0.656 | 0.807 | 0.981 | 1.15 | 1.588 | 7.921 |
| O_N_K145 | N_K145 | HW14 | 0.294 | 0.407 | 0.552 | 0.719 | 0.881 | 1.304 | 7.509 |
| O_HW14 | HW14 | ST00406 | 0.184 | 0.331 | 0.507 | 0.717 | 0.92 | 1.436 | 7.888 |
| O_ST00406 | ST00406 | ST00405 | 0 | 0.063 | 0.342 | 0.584 | 0.79 | 1.307 | 9.036 |
| O_ST00405 | ST00405 | N_K101 | 0.215 | 0.28 | 0.607 | 0.936 | 1.199 | 1.865 | 11.983 |
| O_N_K101 | N_K101 | ST00404 | 0.038 | 0.043 | 0.053 | 0.068 | 0.078 | 0.081 | 0.415 |
| O_N_K103 | N_K103 | ST00404 | 0.763 | 1.068 | 1.5 | 1.997 | 2.441 | 3.799 | 24.415 |
| O_ST00398 | ST00398 | N_K104 | 0 | 0 | 0 | 0 | 0 | 0 | 0.437 |
| O_ST00397 | ST00397 | ST00400 | 0 | 0 | 0 | 0 | 0 | 0 | 1.088 |
| O_ST00400 | ST00404 | N_K104 | 0 | 0 | 0 | 0 | 0 | 0 | 0.832 |
| O_ST00396 | ST00396 | ST00400 | 0.765 | 1.07 | 1.503 | 2.001 | 2.445 | 3.806 | 24.589 |
| O_N_K104 | N_K104 | ST00403 | 2.192 | 2.754 | 3.329 | 4.169 | 5.032 | 7.056 | 39.132 |
| O_ST00403 | ST00403 | ST00402 | 3.119 | 3.735 | 4.353 | 5.217 | 6.093 | 8.322 | 42.553 |
| O_ST00402 | ST00402 | ST00401 | 3.576 | 4.411 | 5.253 | 6.342 | 7.474 | 10.421 | 58.333 |
| O_ST00401 | ST00401 | N_K043 | 0.403 | 0.55 | 0.788 | 1.038 | 1.331 | 2.274 | 16.072 |
| O_ST00392 | ST00392 | ST00393 | 0.38 | 0.549 | 0.792 | 1.023 | 1.321 | 2.262 | 16.074 |
| O_ST00393 | ST00393 | ST00394 | 0.463 | 0.629 | 0.874 | 1.113 | 1.396 | 2.352 | 16.296 |
| O_ST00394 | ST00394 | ST00401 | 0 | 0 | 0 | 0 | 0.019 | 0.039 | 0.883 |
| O_ST00390 | ST00390 | ST00391 | 0 | 0 | 0 | 0 | 0 | 0 | 0.707 |
| O_ST00391 | ST00391 | ST00392 | 5.113 | 6.108 | 7.366 | 8.658 | 10.082 | 13.783 | 69.74 |
| O_N_K043 | N_K043 | N_K044 | 4.952 | 5.946 | 7.204 | 8.496 | 9.92 | 13.621 | 69.578 |
| O_N_K044 | N_K044 | N_K045 | 4.756 | 5.747 | 7.004 | 8.298 | 9.723 | 13.425 | 69.518 |
| O_N_K045 | N_K045 | ST00513 | 4.46 | 5.451 | 6.708 | 8.002 | 9.426 | 13.129 | 69.228 |
| O_ST00513 | ST00513 | N_K046 | 0.037 | 0.044 | 0.054 | 0.067 | 0.077 | 0.081 | 0.421 |
| O_ST00389 | ST00389 | N_K105 | 0.105 | 0.155 | 0.216 | 0.264 | 0.386 | 0.533 | 3.433 |
| O_ST00388 | ST00388 | ST00387 | 0.212 | 0.368 | 0.569 | 0.777 | 1.059 | 1.667 | 10.926 |
| O_ST0387 | ST00387 | N_K060 | 0.781 | 0.974 | 1.167 | 1.387 | 1.668 | 2.292 | 12.389 |
| O_ST00384 | ST00384 | ST00385 | 0.781 | 0.974 | 1.167 | 1.387 | 1.668 | 2.292 | 12.389 |
| O_ST00385 | ST00385 | N_K105 | 0.805 | 1.072 | 1.367 | 1.708 | 2.101 | 3.199 | 19.216 |
| O_N_K105 | N_K105 | ST00386 | 0.379 | 0.677 | 0.965 | 1.312 | 1.714 | 2.822 | 18.967 |
| O_ST00379 | ST00379 | N_K106 | 0.605 | 0.827 | 1.211 | 1.654 | 2.065 | 3.35 | 20.477 |

| | | | | | | | | | |
|-----------|---------|---------|-------|-------|-------|-------|-------|-------|--------|
| O_N_K109 | N_K109 | N_K108 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| O_N_K107 | N_K107 | N_K112 | 0.237 | 0.28 | 0.332 | 0.374 | 0.43 | 0.554 | 2.921 |
| O_N_K112 | N_K112 | N_K111 | 0.034 | 0.033 | 0.035 | 0.034 | 0.035 | 0.036 | 0.035 |
| O_ST00368 | ST00368 | N_K111 | 0.211 | 0.245 | 0.289 | 0.33 | 0.38 | 0.481 | 2.502 |
| O_N_K055 | N_K055 | ST00343 | 0.03 | 0.037 | 0.044 | 0.055 | 0.063 | 0.065 | 0.34 |
| O_N_K116 | N_K116 | ST00344 | 0 | 0 | 0 | 0.028 | 0.091 | 0.191 | 2.214 |
| O_ST00343 | ST00343 | ST00344 | 0 | 0 | 0 | 0 | 0.083 | 0.199 | 2.511 |
| O_ST00344 | ST00344 | ST00345 | 0 | 0 | 0 | 0 | 0.061 | 0.215 | 3.442 |
| O_ST00345 | ST00345 | ST00346 | 0.363 | 0.416 | 0.474 | 0.538 | 0.631 | 0.789 | 4.066 |
| O_ST00346 | ST00346 | K11_out | 0 | 0 | 0.059 | 0.113 | 0.187 | 0.352 | 3.616 |
| O_ST00348 | ST00348 | ST00347 | 0.388 | 0.454 | 0.532 | 0.592 | 0.675 | 0.864 | 4.501 |
| O_ST00347 | ST00347 | K12_out | 0.003 | 0.068 | 0.155 | 0.24 | 0.341 | 0.541 | 4.764 |
| O_ST00350 | ST00350 | ST00349 | 0.505 | 0.581 | 0.685 | 0.787 | 0.904 | 1.136 | 5.999 |
| O_ST00349 | ST00349 | K13_out | 0.19 | 0.221 | 0.26 | 0.342 | 0.398 | 0.429 | 2.193 |
| O_N_K056 | N_K056 | ST00350 | 0.039 | 0.045 | 0.053 | 0.061 | 0.07 | 0.088 | 0.451 |
| O_N_K117 | N_K117 | N_K114 | 0 | 0 | 0 | 0 | 0 | 0.012 | 1.805 |
| O_ST00351 | ST00351 | ST00353 | 0.187 | 0.217 | 0.255 | 0.296 | 0.352 | 0.408 | 0.416 |
| O_ST00352 | ST00352 | ST00353 | 0 | 0 | 0 | 0 | 0 | 0 | 0.058 |
| O_ST00354 | ST00354 | ST00353 | 0.225 | 0.26 | 0.306 | 0.352 | 0.415 | 0.504 | 2.644 |
| O_ST00353 | ST00353 | N_K114 | 0.141 | 0.163 | 0.192 | 0.236 | 0.282 | 0.312 | 1.579 |
| O_N_K057 | N_K057 | N_K058 | 0.147 | 0.171 | 0.201 | 0.242 | 0.288 | 0.328 | 1.701 |
| O_N_K058 | N_K058 | N_K059 | 0.453 | 0.527 | 0.621 | 0.711 | 0.817 | 1.035 | 5.554 |
| O_N_K059 | N_K059 | N_K118 | 1.539 | 1.811 | 2.16 | 2.64 | 3.034 | 4.124 | 26.965 |
| O_N_K118 | N_K118 | N_K119 | 1.539 | 1.811 | 2.16 | 2.64 | 3.034 | 4.124 | 26.965 |
| O_N_K119 | N_K119 | N_K114 | 0.119 | 0.133 | 0.153 | 0.179 | 0.199 | 0.246 | 1.129 |
| O_ST00357 | ST00357 | ST00355 | 0.367 | 0.438 | 0.526 | 0.619 | 0.713 | 0.922 | 4.481 |
| O_ST00355 | ST00355 | N_K113 | 2.109 | 2.571 | 3.161 | 3.778 | 4.327 | 5.747 | 27.817 |
| O_ST00358 | ST00358 | ST00356 | 2.652 | 3.113 | 3.706 | 4.336 | 4.889 | 6.321 | 28.563 |
| O_ST00356 | ST00356 | HW15 | 2.242 | 2.666 | 3.257 | 3.929 | 4.495 | 5.967 | 82.839 |
| O_HW15 | HW15 | N_K064 | 2.71 | 3.144 | 3.748 | 4.434 | 5.01 | 6.506 | 83.586 |
| O_N_K064 | N_K064 | HW16 | 0 | 0.19 | 0.484 | 0.795 | 1.103 | 2.043 | 49.694 |
| O_HW16 | HW16 | N_K066 | 2.21 | 2.644 | 3.248 | 3.934 | 4.51 | 6.006 | 83.126 |
| O_N_K065 | N_K065 | N_K066 | 1.058 | 1.296 | 1.628 | 1.97 | 2.304 | 3.309 | 18.412 |
| O_N_K062 | N_K062 | HW16 | 0.555 | 0.784 | 1.103 | 1.429 | 1.755 | 2.775 | 17.218 |
| O_ST00370 | ST00370 | ST00369 | 1.028 | 1.257 | 1.575 | 1.901 | 2.227 | 3.247 | 17.691 |
| O_ST00369 | ST00369 | N_K062 | 0.085 | 0.103 | 0.128 | 0.158 | 0.186 | 0.268 | 1.513 |
| O_N_K063 | N_K063 | ST00359 | 0 | 0 | 0 | 0 | 0 | 0 | 0.031 |
| O_ST00360 | ST00360 | ST00359 | 0 | 0 | 0 | 0 | 0 | 0 | 1.115 |
| O_ST00359 | ST00359 | ST00358 | 0.294 | 0.347 | 0.41 | 0.459 | 0.534 | 0.693 | 3.491 |
| O_N_K111 | N_K111 | N_K120 | 0.317 | 0.373 | 0.441 | 0.496 | 0.571 | 0.746 | 3.762 |
| O_N_K120 | N_K120 | N_K124 | 2.135 | 2.427 | 2.821 | 3.213 | 3.581 | 4.583 | 20.066 |
| O_N_K121 | N_K121 | N_K124 | 2.32 | 2.695 | 3.169 | 3.638 | 4.068 | 5.184 | 22.618 |
| O_N_K124 | N_K124 | N_K123 | 0.108 | 0.126 | 0.149 | 0.17 | 0.196 | 0.25 | 1.307 |
| O_N_K122 | N_K122 | N_K123 | 0.309 | 0.377 | 0.463 | 0.561 | 0.656 | 0.9 | 4.482 |
| O_ST00361 | ST00361 | N_K123 | 0.107 | 0.145 | 0.177 | 0.212 | 0.246 | 0.285 | 1.238 |
| O_ST00375 | ST00375 | N_K125 | 0 | 0 | 0 | 0.004 | 0.087 | 0.232 | 3.179 |
| O_ST00372 | ST00372 | N_K125 | 0.602 | 0.824 | 1.206 | 1.649 | 2.058 | 3.342 | 20.439 |
| O_N_K067 | N_K067 | N_K109 | 0.371 | 0.637 | 0.931 | 1.273 | 1.666 | 2.764 | 18.78 |
| O_ST00386 | ST00386 | ST00379 | 0 | 0 | 0 | 0 | 0 | 0 | 1.136 |
| O_ST00377 | ST00377 | ST00376 | 0.171 | 0.197 | 0.247 | 0.314 | 0.362 | 0.377 | 1.947 |
| O_ST00376 | ST00376 | N_K125 | 0.058 | 0.146 | 0.271 | 0.414 | 0.543 | 0.913 | 6.672 |
| O_ST00383 | ST00383 | N_K105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| O_ST00382 | ST00382 | ST00381 | 0 | 0 | 0 | 0 | 0 | 0 | 0.25 |
| O_ST00380 | ST00380 | ST00367 | 0.164 | 0.261 | 0.393 | 0.541 | 0.676 | 1.076 | 7.173 |
| O_ST00381 | ST00381 | ST00366 | 0.13 | 0.15 | 0.176 | 0.201 | 0.231 | 0.285 | 1.297 |
| O_ST00367 | ST00367 | ST00363 | 0.058 | 0.067 | 0.079 | 0.09 | 0.104 | 0.129 | 0.661 |
| O_N_K110 | N_K110 | N_K111 | 0.396 | 0.494 | 0.628 | 0.777 | 0.914 | 1.318 | 7.493 |
| O_ST00366 | ST00366 | N_K061 | 0.666 | 0.814 | 1.003 | 1.222 | 1.432 | 1.988 | 10.214 |
| O_ST00365 | ST00365 | ST00364 | 1.137 | 1.286 | 1.474 | 1.693 | 1.903 | 2.459 | 10.685 |

| | | | | | | | | | |
|-----------|---------|---------|-------|-------|-------|-------|-------|--------|--------|
| O_ST00364 | ST00364 | N_K061 | 0.077 | 0.104 | 0.163 | 0.202 | 0.228 | 0.291 | 1.306 |
| O_ST00363 | ST00363 | ST00362 | 0.508 | 0.535 | 0.595 | 0.633 | 0.66 | 0.722 | 1.738 |
| O_ST00362 | ST00362 | N_K121 | 2.609 | 3.058 | 3.629 | 4.216 | 4.761 | 6.1 | 27.038 |
| O_N_K123 | N_K123 | ST00358 | 0.062 | 0.076 | 0.091 | 0.114 | 0.131 | 0.14 | 0.736 |
| O_N_K068 | N_K068 | N_K059 | 0.068 | 0.083 | 0.1 | 0.124 | 0.142 | 0.151 | 0.792 |
| O_N_K069 | N_K069 | ST00351 | 0.23 | 0.265 | 0.309 | 0.355 | 0.405 | 0.496 | 0.631 |
| O_N_K006 | N_K006 | HW2 | 0.255 | 0.388 | 0.491 | 0.64 | 0.783 | 1.123 | 8.543 |
| O_N_K034 | N_K034 | ST00303 | 0 | 0 | 0 | 0 | 0.001 | 0.093 | 0.223 |
| O_N_K126 | ST00422 | ST00417 | 1.583 | 1.987 | 2.558 | 3.233 | 3.814 | 5.658 | 33.141 |
| O_N_K127 | N_K127 | N_K032 | 0.063 | 0.073 | 0.09 | 0.115 | 0.132 | 0.14 | 0.718 |
| O_N_K128 | N_K128 | ST00357 | 1.901 | 2.167 | 2.675 | 3.058 | 3.476 | 4.4 | 21.307 |
| O_N_K129 | N_K129 | ST00357 | 1.474 | 1.69 | 1.979 | 2.328 | 2.652 | 3.524 | 16.607 |
| O_ST00325 | ST00325 | K11_out | 0.137 | 0.192 | 0.287 | 0.385 | 0.487 | 0.539 | 2.694 |
| O_N_K053 | N_K053 | K9_out | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| O_N_K061 | N_K061 | N_K121 | 0.164 | 0.22 | 0.321 | 0.428 | 0.532 | 0.599 | 2.987 |
| O_ST00374 | ST00374 | N_K130 | 0.361 | 0.528 | 0.712 | 0.874 | 1.088 | 1.451 | 7.043 |
| O_ST00373 | ST00373 | N_K130 | 0.303 | 0.343 | 0.356 | 0.371 | 0.388 | 0.401 | 0.786 |
| O_N_K130 | N_K130 | N_K125 | 0 | 0 | 0 | 0 | 0.073 | 0.196 | 3.989 |
| O_ST00501 | ST00501 | N_K131 | 0.361 | 0.528 | 0.712 | 0.874 | 1.088 | 1.529 | 10.363 |
| O_ST00329 | ST00329 | ST00330 | 0.763 | 0.885 | 1.042 | 1.194 | 1.37 | 1.719 | 8.812 |
| O_ST00502 | ST00502 | N_K131 | 0.011 | 0.013 | 0.015 | 0.019 | 0.021 | 0.022 | 0.119 |
| O_N_K131 | N_K131 | ST00327 | 0.764 | 0.921 | 1.122 | 1.33 | 1.612 | 2.22 | 11.51 |
| O_N_K132 | N_K132 | ST00333 | 0.866 | 1.04 | 1.264 | 1.479 | 1.762 | 2.39 | 12.451 |
| O_N_K133 | N_K133 | ST00530 | 0.134 | 0.155 | 0.182 | 0.234 | 0.272 | 0.296 | 3.692 |
| O_N_K060 | N_K060 | N_K134 | 0.047 | 0.057 | 0.069 | 0.087 | 0.1 | 0.107 | 0.562 |
| O_N_K134 | N_K134 | ST00385 | 0.481 | 0.495 | 0.521 | 0.551 | 0.583 | 0.648 | 1.979 |
| O_N_K048 | N_K048 | N_K049 | 0.506 | 0.544 | 0.589 | 0.622 | 0.67 | 0.758 | 2.622 |
| O_N_K135 | N_K135 | ST00498 | 0.261 | 0.303 | 0.358 | 0.409 | 0.47 | 0.597 | 3.115 |
| O_N_K042 | N_K042 | N_K136 | 0.195 | 0.346 | 0.522 | 0.652 | 0.843 | 1.262 | 11.21 |
| O_N_K136 | N_K136 | N_K091 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| O_N_K137 | N_K137 | ST00392 | 0.176 | 0.205 | 0.243 | 0.278 | 0.32 | 0.409 | 2.116 |
| O_N_K139 | N_K139 | K5_out | 0.216 | 0.255 | 0.304 | 0.347 | 0.402 | 0.534 | 2.852 |
| O_N_K140 | N_K140 | ST00300 | 0.422 | 0.524 | 0.666 | 0.824 | 0.967 | 1.407 | 7.975 |
| O_N_K141 | N_K141 | ST00427 | 0.234 | 0.271 | 0.335 | 0.427 | 0.491 | 0.521 | 2.678 |
| O_N_K142 | N_K142 | N_K017 | 0.086 | 0.099 | 0.117 | 0.153 | 0.179 | 0.193 | 0.987 |
| O_N_K143 | N_K143 | N_K017 | 0.275 | 0.319 | 0.376 | 0.388 | 0.397 | 0.4 | 0.528 |
| O_N_K144 | N_K144 | ST00374 | 0.101 | 0.246 | 0.404 | 0.518 | 0.691 | 1.064 | 10.278 |
| O_N_K138 | N_K138 | N_K048 | 0.4 | 0.699 | 0.997 | 1.39 | 1.803 | 2.985 | 19.998 |
| O_ST00423 | ST00423 | ST00422 | 0.427 | 0.547 | 0.712 | 0.886 | 1.089 | 1.463 | 8.913 |
| O_ST00431 | ST00431 | N_K139 | 1.03 | 1.197 | 1.412 | 1.754 | 2.179 | 3.558 | 23.07 |
| O_N_K106 | N_K106 | N_K067 | 0.299 | 0.359 | 0.436 | 0.524 | 0.608 | 0.792 | 4.038 |
| O_N_K125 | N_K125 | N_K108 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| O_N_K108 | N_K108 | N_K118 | 4.82 | 5.849 | 7.163 | 8.503 | 9.98 | 13.835 | 72.485 |
| O_N_K115 | N_K115 | N_K118 | 0 | 0 | 0 | 0 | 0 | 0 | 0.258 |



Appendix E Overland Flood Behaviour

Table E1 - HEC-RAS Model Results for Rylstone

| Cross Section ID* | River | Reach | River Station | 20% AEP | | | 10% AEP | | | 5% AEP | | | 2% AEP | | | 1% AEP | | | 0.5% AEP | | | PMF | | |
|-------------------|---------|-------|---------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|
| | | | | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) |
| 1 | trib 10 | 10 | 0.05 | 1.10 | 574.79 | 0.51 | 1.31 | 574.81 | 0.58 | 1.56 | 574.82 | 0.63 | 1.90 | 574.86 | 0.67 | 2.25 | 574.86 | 0.77 | 2.92 | 574.91 | 0.83 | 13.14 | 575.34 | 1.52 |
| 2 | trib 10 | 10 | 0.07 | 1.10 | 574.95 | 1.07 | 1.31 | 574.97 | 1.17 | 1.56 | 574.99 | 1.24 | 1.90 | 575.01 | 1.34 | 2.25 | 575.02 | 1.44 | 2.92 | 575.05 | 1.59 | 13.14 | 575.38 | 2.75 |
| 3 | trib 10 | 10 | 0.1 | 1.10 | 575.39 | 1.15 | 1.31 | 575.41 | 1.17 | 1.56 | 575.42 | 1.22 | 1.90 | 575.44 | 1.30 | 2.25 | 575.45 | 1.37 | 2.92 | 575.48 | 1.48 | 13.14 | 575.78 | 2.22 |
| 4 | trib 10 | 10 | 0.14 | 1.10 | 575.79 | 1.23 | 1.31 | 575.83 | 1.29 | 1.56 | 575.86 | 1.36 | 1.90 | 575.90 | 1.45 | 2.25 | 575.93 | 1.54 | 2.92 | 575.95 | 1.87 | 13.14 | 576.38 | 2.29 |
| 5 | trib 10 | 10 | 0.16 | 1.10 | 576.03 | 1.50 | 1.31 | 576.07 | 1.57 | 1.56 | 576.10 | 1.63 | 1.90 | 576.15 | 1.66 | 2.25 | 576.23 | 1.47 | 2.92 | 576.28 | 1.50 | 13.14 | 576.64 | 2.07 |
| 6 | trib 9 | 9b | 0.07 | 2.32 | 574.58 | 0.78 | 3.10 | 574.60 | 0.82 | 4.05 | 574.61 | 0.41 | 5.04 | 574.61 | 0.51 | 5.95 | 574.61 | 0.60 | 8.16 | 574.61 | 0.82 | 38.75 | 574.79 | 1.44 |
| 7 | trib 9 | 9b | 0.11 | 2.27 | 574.67 | 0.22 | 3.06 | 574.69 | 0.26 | 3.98 | 574.71 | 0.31 | 4.85 | 574.72 | 0.35 | 5.77 | 574.74 | 0.39 | 7.76 | 574.77 | 0.45 | 37.56 | 575.04 | 0.86 |
| 8 | trib 9 | 9b | 0.13 | 2.27 | 574.69 | 0.39 | 3.06 | 574.71 | 0.45 | 3.98 | 574.74 | 0.50 | 4.85 | 574.76 | 0.53 | 5.77 | 574.77 | 0.57 | 7.76 | 574.81 | 0.63 | 37.56 | 575.09 | 1.11 |
| 9 | trib 9 | 9b | 0.15 | 2.27 | 574.86 | 0.50 | 3.06 | 574.88 | 0.56 | 3.98 | 574.91 | 0.63 | 4.85 | 574.93 | 0.68 | 5.77 | 574.94 | 0.73 | 7.76 | 574.98 | 0.81 | 37.56 | 575.27 | 1.46 |
| 10 | trib 9 | 9b | 0.18 | 2.27 | 575.19 | 0.64 | 3.06 | 575.22 | 0.71 | 3.98 | 575.25 | 0.77 | 4.85 | 575.27 | 0.82 | 5.77 | 575.30 | 0.86 | 7.76 | 575.34 | 0.94 | 37.56 | 575.62 | 1.60 |
| 11 | trib 9 | 9b | 0.23 | 1.31 | 576.61 | 2.93 | 2.06 | 576.63 | 2.99 | 2.94 | 576.64 | 0.31 | 3.78 | 576.64 | 0.39 | 4.67 | 576.64 | 0.49 | 6.60 | 576.66 | 0.60 | 37.06 | 576.84 | 1.22 |
| 12 | trib 9 | 9 | 0.31 | 1.56 | 576.27 | 1.02 | 2.04 | 576.29 | 1.10 | 2.59 | 576.68 | 0.17 | 3.09 | 576.70 | 0.19 | 3.62 | 576.72 | 0.21 | 4.83 | 576.76 | 0.26 | 22.06 | 576.51 | 2.55 |
| 13 | trib 9 | 9 | 0.34 | 1.56 | 577.09 | 1.01 | 2.04 | 577.11 | 1.05 | 2.59 | 577.12 | 1.23 | 3.09 | 577.15 | 1.17 | 3.62 | 577.16 | 1.30 | 4.83 | 577.18 | 1.44 | 22.06 | 577.37 | 1.89 |
| 14 | trib 9 | 9 | 0.38 | 1.56 | 578.13 | 1.07 | 2.04 | 578.17 | 1.06 | 2.59 | 578.18 | 1.21 | 3.09 | 578.21 | 1.22 | 3.62 | 578.22 | 1.30 | 4.83 | 578.25 | 0.56 | 22.06 | 578.31 | 1.27 |
| 15 | trib 9 | 9 | 0.46 | 1.56 | 579.91 | 0.78 | 2.04 | 579.87 | 1.90 | 2.59 | 579.90 | 2.13 | 3.09 | 579.87 | 2.87 | 3.62 | 579.87 | 3.49 | 4.83 | 579.90 | 2.45 | 22.06 | 580.10 | 3.99 |
| 16 | trib 9 | 9 | 0.52 | 1.56 | 581.01 | 1.12 | 2.04 | 581.04 | 1.22 | 2.59 | 581.06 | 1.31 | 3.09 | 581.08 | 1.41 | 3.62 | 581.08 | 1.66 | 4.83 | 581.16 | 1.43 | 22.06 | 581.47 | 2.46 |
| 17 | trib 9 | 9 | 0.56 | 0.67 | 583.21 | 1.17 | 0.87 | 582.00 | 1.16 | 1.11 | 582.02 | 1.27 | 1.41 | 582.02 | 1.40 | 1.71 | 582.03 | 1.51 | 2.32 | 582.06 | 1.64 | 10.94 | 582.25 | 2.32 |
| 18 | trib 9 | 9 | 0.63 | 0.67 | 583.21 | 0.56 | 0.87 | 583.22 | 0.60 | 1.11 | 583.24 | 0.65 | 1.41 | 583.25 | 0.71 | 1.71 | 583.26 | 0.76 | 2.32 | 583.28 | 0.84 | 10.94 | 583.46 | 1.39 |
| 19 | trib 9 | 9 | 0.7 | 0.11 | 585.45 | 0.65 | 0.13 | 585.41 | 0.60 | 0.16 | 585.46 | 0.73 | 0.18 | 585.47 | 0.72 | 0.21 | 585.47 | 0.84 | 0.27 | 585.49 | 0.78 | 1.20 | 585.56 | 1.13 |
| 20 | trib 9 | 9 | 0.74 | 0.11 | 586.68 | 0.66 | 0.13 | 586.69 | 0.60 | 0.16 | 586.69 | 0.65 | 0.18 | 586.70 | 0.67 | 0.21 | 586.70 | 0.71 | 0.27 | 586.71 | 0.77 | 1.20 | 586.78 | 1.27 |
| 21 | trib 9 | 9 | 0.85 | 0.11 | 590.70 | 0.30 | 0.13 | 590.71 | 0.33 | 0.16 | 590.72 | 0.31 | 0.18 | 590.72 | 0.33 | 0.21 | 590.72 | 0.34 | 0.27 | 590.73 | 0.39 | 1.20 | 590.81 | 0.58 |
| 22 | trib 2 | 2 | 0.04 | 3.56 | 571.35 | 2.01 | 4.80 | 571.45 | 1.97 | 6.41 | 571.55 | 2.03 | 8.26 | 571.58 | 2.46 | 9.92 | 571.68 | 2.36 | 15.32 | 571.81 | 2.81 | 72.94 | 572.51 | 4.30 |
| 23 | trib 2 | 2 | 0.06 | 3.56 | 572.31 | 1.46 | 4.80 | 572.34 | 1.66 | 6.41 | 572.39 | 1.85 | 8.26 | 572.43 | 2.08 | 9.92 | 572.47 | 2.21 | 15.32 | 572.61 | 2.35 | 72.94 | 573.37 | 3.34 |
| 24 | trib 2 | 2 | 0.1 | 3.56 | 573.42 | 1.39 | 4.80 | 573.46 | 1.49 | 6.41 | 573.51 | 1.60 | 8.26 | 573.56 | 1.68 | 9.92 | 573.58 | 1.82 | 15.32 | 573.72 | 1.88 | 72.94 | 574.33 | 2.84 |
| 25 | trib 2 | 2 | 0.11 | 3.56 | 574.33 | 0.13 | 4.80 | 574.37 | 0.17 | 6.41 | 574.41 | 0.21 | 8.26 | 574.45 | 0.26 | 9.92 | 574.48 | 0.30 | 15.32 | 574.57 | 0.41 | 72.94 | 575.18 | 1.09 |
| 26 | trib 2 | 2 | 0.14 | 2.57 | 575.40 | 1.52 | 3.45 | 575.46 | 1.26 | 4.59 | 575.50 | 1.27 | 5.87 | 575.53 | 1.32 | 7.03 | 575.55 | 1.41 | 10.84 | 575.59 | 0.31 | 50.93 | 575.61 | 1.39 |
| 27 | trib 2 | 2 | 0.17 | 2.57 | 575.71 | 0.76 | 3.45 | 575.75 | 0.81 | 4.59 | 575.80 | 0.86 | 5.87 | 575.85 | 0.88 | 7.03 | 575.88 | 0.92 | 10.84 | 575.98 | 1.02 | 50.93 | 576.17 | 2.90 |
| 28 | trib 2 | 2 | 0.2 | 2.57 | 576.63 | 1.59 | 3.45 | 576.68 | 1.74 | 4.59 | 576.76 | 1.84 | 5.87 | 576.83 | 1.94 | 7.03 | 576.88 | 2.02 | 10.84 | 577.05 | 2.17 | 50.93 | 577.34 | 3.80 |
| 29 | trib 2 | 2 | 0.23 | 2.57 | 577.25 | 1.00 | 3.45 | 577.32 | 1.12 | 4.59 | 577.40 | 1.24 | 5.87 | 577.47 | 1.36 | 7.03 | 577.53 | 1.46 | 10.84 | 577.69 | 1.72 | 50.93 | 578.39 | 3.28 |
| 30 | trib 2 | 2 | 0.25 | 2.57 | 577.58 | 1.05 | 3.45 | 577.66 | 1.15 | 4.59 | 577.74 | 1.26 | 5.87 | 577.83 | 1.36 | 7.03 | 577.90 | 1.43 | 10.84 | 578.08 | 1.64 | 50.93 | 579.00 | 2.84 |
| 31 | trib 2 | 2 | 0.26 | 2.57 | 578.06 | 1.39 | 3.45 | 578.13 | 1.52 | 4.59 | 578.21 | 1.67 | 5.87 | 578.29 | 1.81 | 7.03 | 578.35 | 1.93 | 10.84 | 578.39 | 2.77 | 50.93 | 579.30 | 4.47 |
| 32 | trib 2 | 2 | 0.28 | 2.57 | 578.86 | 1.54 | 3.45 | 578.93 | 1.70 | 4.59 | 579.01 | 1.85 | 5.87 | 579.08 | 2.00 | 7.03 | 579.14 | 2.12 | 10.84 | 579.34 | 2.33 | 50.93 | 580.27 | 4.07 |
| 33 | trib 2 | 2 | 0.32 | 2.57 | 579.84 | 1.28 | 3.45 | 579.92 | 1.41 | 4.59 | 580.01 | 1.55 | 5.87 | 580.10 | 1.67 | 7.03 | 580.18 | 1.77 | 10.84 | 580.38 | 2.01 | 50.93 | 581.25 | 3.91 |
| 34 | trib 2 | 2 | 0.34 | 2.57 | 580.67 | 1.35 | 3.45 | 580.74 | 1.50 | 4.59 | 580.82 | 1.67 | 5.87 | 580.90 | 1.82 | 7.03 | 580.97 | 1.95 | 10.84 | 581.14 | 2.33 | 50.93 | 582.19 | 4.35 |
| 35 | trib 2 | 2 | 0.37 | 2.57 | 581.81 | 1.60 | 3.45 | 581.91 | 1.74 | 4.59 | 582.02 | 1.89 | 5.87 | 582.12 | 2.03 | 7.03 | 582.21 | 2.14 | 10.84 | 582.44 | 2.44 | 50.93 | 583.60 | 3.80 |
| 36 | trib 2 | 2 | 0.42 | 2.57 | 584.43 | 1.92 | 3.45 | 584.50 | 2.01 | 4.59 | 584.57 | 2.18 | 5.87 | 584.64 | 2.34 | 7.03 | 584.73 | 2.27 | 10.84 | 584.88 | 2.47 | 50.93 | 585.67 | 2.91 |
| 37 | trib 2 | 2 | 0.45 | 2.57 | 585.32 | 1.40 | 3.45 | 585.37 | 1.55 | 4.59 | 585.38 | 2.03 | 5.87 | 585.49 | 1.89 | 7.03 | 585.48 | 2.30 | 10.84 | 585.65 | 2.50 | 50.93 | 586.43 | 2.94 |
| 38 | trib 2 | 2 | 0.47 | 2.57 | 585.99 | 1.71 | 3.45 | 586.04 | 1.87 | 4.59 | 586.11 | 1.98 | 5.87 | 586.22 | 1.90 | 7.03 | 586.27 | 1.97 | 10.84 | 586.37 | 2.43 | 50.93 | 586.90 | 4.01 |
| 39 | trib 2 | 2 | 0.5 | 2.57 | 586.53 | 2.28 | 3.45 | 586.58 | 2.44 | 4.59 | 586.63 | 2.63 | 5.87 | 586.69 | 2.75 | 7.03 | 586.73 | 2.81 | 10.84 | 586.85 | 3.17 | 50.93 | 587.43 | 4.93 |
| 40 | trib 2 | 2 | 0.55 | 2.57 | 589.25 | 1.66 | 3.45 | 589.32 | 1.78 | 4.59 | 589.40 | 1.86 | 5.87 | 589.48 | 1.89 | 7.03 | 589.62 | 1.07 | 10.84 | 589.64 | 1.51 | 50.93 | 589.94 | 2.39 |
| 41 | trib 2 | 2 | 0.59 | 2.57 | 589.54 | 0.43 | 3.45 | 589.64 | 0.49 | 4.59 | 589.74 | 0.55 | 5.87 | 589.83 | 0.62 | 7.03 | 589.88 | 0.70 | 10.84 | 590.02 | 0.88 | 50.93 | 590.64 | 2.02 |
| 42 | trib 2 | 2 | 0.61 | 2.57 | 591.06 | 1.41 | 3.45 | 591.10 | 1.56 | 4.59 | 591.15 | 1.71 | 5.87 | 591.21 | 1.83 | 7.03 | 591.25 | 1.93 | 10.84 | 591.38 | 2.20 | 50.93 | 591.88 | 1.98 |
| 43 | trib 2 | 2 | 0.63 | 2.57 | 591.27 | 0.28 | 3.45 | 591.34 | 0.33 | 4.59 | 591.43 | 0.37 | 5.87 | 591.51 | 0.42 | 7.03 | 591.58 | 0.45 | 10.84 | 591.77 | 0.54 | 50.93 | 592.22 | 1.36 |
| 44 | trib 2 | 2 | 0.65 | 1.88 | 591.35 | 0.78 | 2.52 | 591.41 | 0.82 | 3.33 | 591.49 | 0.86 | 4.23 | 591.56 | 0.89 | 5.04 | 591.63 | 0.93 | 7.80 | 591.81 | 1.03 | 36.25 | 591.99 | 3.75 |
| 45 | trib 2 | 2 | 0.68 | 1.88 | 592.15 | 1.48 | 2.52 | 592.10 | 2.29 | 3.33 | 592.19 | 2.37 | 4.23 | 592.27 | 2.46 | 5.04 | 592.34 | 2.54 | 7.80 | 592.49 | 2.86 | 36.25 | 593.29 | 4.28 |
| 46 | trib 2 | 2 | 0.71 | 1.88 | 595.20 | 1.95 | 2.52 | 595.25 | 2.07 | 3.33 | 595.31 | 2.19 | 4.23 | 595.37 | 2.28 | 5.04 | 595.43 | 2.22 | 7.80 | 595.55 | 2.25 | 36.25 | 596.00 | 2.33 |
| 47 | trib 2 | 2 | 0.74 | 1.88 | 597.38 | 0.97 | 2.52 | 597.40 | 1.07 | 3.33 | 597.43 | 1.17 | 4.23 | 597.45 | 1.22 | 5.04 | 597.47 | 1.32 | 7.80 | 597.54 | 1.39 | 36.25 | 597.60 | 1.70 |
| 48 | trib 2 | 2 | 0.78 | 1.88 | 598.47 | 0.87 | 2.52 | 598.49 | 0.96 | 3.33 | 598.51 | 1.07 | 4.23 | 598.54 | 1.17 | 5.04 | 598.55 | 1.24 | 7.80 | 598.62 | 1.34 | 36.25 | 598.88 | 1.90 |
| 49 | trib 2 | 2 | 0.83 | 1.41 | 599.88 | 1.58 | 1.92 | 599.90 | 1.73 | 2.57 | 599.92 | 1.89 | 3.32 | 599.99 | 1.25 | 3.99 | 600.01 | 1.32 | 6.19 | 600.07 | 1.43 | 28.98 | 600.33 | 2.30 |
| 50 | trib 2 | 2 | 0.87 | 1.41 | 601.18 | 1.41 | 1.92 | 601.23 | 1.28 | 2.57 | 601.27 | | | | | | | | | | | | | |

| Cross Section ID* | River | Reach | River Station | 20% AEP | | | 10% AEP | | | 5% AEP | | | 2% AEP | | | 1% AEP | | | 0.5% AEP | | | PMF | | |
|-------------------|--------|-------|---------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|
| | | | | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) |
| 60 | trib 4 | 4c | 0.12 | 10.52 | 567.97 | 1.84 | 14.46 | 568.00 | 2.27 | 19.56 | 568.09 | 2.44 | 26.58 | 568.26 | 2.38 | 33.80 | 568.30 | 2.82 | 43.93 | 568.49 | 2.72 | 205.83 | 570.06 | 1.98 |
| 61 | trib 4 | 4c | 0.15 | 10.52 | 568.60 | 0.78 | 14.46 | 568.68 | 0.89 | 19.56 | 568.75 | 1.07 | 26.58 | 568.83 | 1.27 | 33.80 | 568.90 | 1.46 | 43.93 | 569.00 | 1.64 | 205.83 | 570.11 | 2.72 |
| 62 | trib 4 | 4c | 0.2 | 9.55 | 568.91 | 1.96 | 13.28 | 569.10 | 1.52 | 18.17 | 569.18 | 1.72 | 24.92 | 569.28 | 1.93 | 31.88 | 569.37 | 2.11 | 41.47 | 569.20 | 3.82 | 195.23 | 569.89 | 6.23 |
| 63 | trib 4 | 4 | 0.22 | 5.34 | 569.05 | 1.65 | 7.36 | 569.38 | 0.78 | 10.19 | 569.49 | 0.87 | 14.78 | 569.62 | 0.97 | 19.62 | 569.73 | 1.07 | 24.11 | 569.37 | 2.64 | 104.45 | 569.95 | 4.04 |
| 64 | trib 4 | 4 | 0.26 | 5.34 | 570.33 | 1.70 | 7.36 | 570.37 | 2.01 | 10.19 | 570.46 | 2.14 | 14.78 | 570.60 | 2.15 | 19.62 | 570.71 | 2.28 | 24.11 | 570.78 | 2.43 | 104.45 | 571.64 | 3.23 |
| 65 | trib 4 | 4 | 0.29 | 5.34 | 571.20 | 1.77 | 7.36 | 571.29 | 1.88 | 10.19 | 571.40 | 1.38 | 14.78 | 571.46 | 1.68 | 19.62 | 571.43 | 2.45 | 24.11 | 571.47 | 2.66 | 104.45 | 572.32 | 2.82 |
| 66 | trib 4 | 4 | 0.32 | 5.34 | 571.66 | 1.37 | 7.36 | 571.74 | 1.50 | 10.19 | 571.83 | 1.66 | 14.78 | 571.96 | 1.85 | 19.62 | 572.09 | 1.99 | 24.11 | 572.18 | 2.09 | 104.45 | 572.84 | 2.93 |
| 67 | trib 4 | 4 | 0.36 | 5.34 | 572.27 | 1.38 | 7.36 | 572.35 | 1.51 | 10.19 | 572.45 | 1.64 | 14.78 | 572.58 | 1.80 | 19.62 | 572.69 | 1.94 | 24.11 | 572.78 | 2.05 | 104.45 | 573.59 | 3.00 |
| 68 | trib 4 | 4 | 0.42 | 5.34 | 573.63 | 1.18 | 7.36 | 573.69 | 1.28 | 10.19 | 573.76 | 1.44 | 14.78 | 573.88 | 1.65 | 19.62 | 573.96 | 1.76 | 24.11 | 574.03 | 1.85 | 104.45 | 574.59 | 2.50 |
| 69 | trib 4 | 4 | 0.48 | 5.34 | 574.11 | 1.00 | 7.36 | 574.22 | 1.18 | 10.19 | 574.31 | 1.35 | 14.78 | 574.42 | 1.55 | 19.62 | 574.58 | 0.69 | 24.11 | 574.48 | 2.20 | 104.45 | 574.95 | 1.84 |
| 70 | trib 4 | 4 | 0.49 | 5.34 | 574.30 | 0.73 | 7.36 | 574.51 | 0.82 | 10.19 | 574.79 | 0.89 | 14.78 | 575.08 | 1.00 | 19.62 | 575.03 | 1.38 | 24.11 | 574.96 | 1.80 | 104.45 | 575.59 | 1.65 |
| 71 | trib 4 | 4 | 0.52 | 5.34 | 575.13 | 1.63 | 7.36 | 575.17 | 1.85 | 10.19 | 575.24 | 1.92 | 14.78 | 575.28 | 2.42 | 19.62 | 575.26 | 3.36 | 24.11 | 575.30 | 3.29 | 104.45 | 575.88 | 2.77 |
| 72 | trib 4 | 4 | 0.54 | 5.34 | 575.68 | 1.58 | 7.36 | 575.75 | 1.61 | 10.19 | 575.79 | 1.86 | 14.78 | 575.88 | 1.91 | 19.62 | 575.95 | 2.03 | 24.11 | 575.98 | 2.22 | 104.45 | 576.37 | 2.83 |
| 73 | trib 4 | 4 | 0.58 | 5.21 | 576.02 | 1.21 | 7.19 | 576.03 | 1.63 | 9.97 | 576.09 | 1.99 | 14.50 | 576.20 | 1.26 | 19.29 | 576.25 | 1.42 | 23.68 | 576.28 | 1.61 | 102.39 | 576.69 | 2.38 |
| 74 | trib 4 | 4 | 0.62 | 5.21 | 576.61 | 0.55 | 7.19 | 576.61 | 0.75 | 9.97 | 576.63 | 0.82 | 14.50 | 576.66 | 0.92 | 19.29 | 576.69 | 1.01 | 23.68 | 576.72 | 1.08 | 102.39 | 577.05 | 1.74 |
| 75 | trib 4 | 4 | 0.65 | 5.21 | 576.87 | 0.67 | 7.19 | 576.91 | 0.74 | 9.97 | 576.93 | 0.86 | 14.50 | 576.97 | 1.01 | 19.29 | 577.01 | 1.14 | 23.68 | 577.04 | 1.26 | 102.39 | 577.35 | 1.82 |
| 76 | trib 4 | 4 | 0.7 | 5.21 | 577.25 | 1.00 | 7.19 | 577.29 | 1.09 | 9.97 | 577.33 | 1.26 | 14.50 | 577.39 | 1.39 | 19.29 | 577.44 | 1.47 | 23.68 | 577.59 | 1.07 | 102.39 | 577.82 | 2.37 |
| 77 | trib 4 | 4 | 0.75 | 5.21 | 577.69 | 0.83 | 7.19 | 577.72 | 0.85 | 9.97 | 577.75 | 0.90 | 14.50 | 577.80 | 0.97 | 19.29 | 577.84 | 1.03 | 23.68 | 577.93 | 0.87 | 102.39 | 578.24 | 1.69 |
| 78 | trib 4 | 4 | 0.8 | 5.09 | 578.06 | 0.37 | 7.06 | 578.06 | 0.52 | 9.82 | 578.09 | 0.60 | 14.36 | 578.13 | 0.72 | 19.12 | 578.17 | 0.82 | 23.29 | 578.20 | 0.89 | 100.82 | 578.56 | 1.58 |
| 79 | trib 4 | 4 | 0.85 | 5.09 | 578.33 | 0.49 | 7.06 | 578.37 | 0.59 | 9.82 | 578.41 | 0.68 | 14.36 | 578.46 | 0.79 | 19.12 | 578.51 | 0.89 | 23.29 | 578.55 | 0.97 | 100.82 | 578.98 | 1.83 |
| 80 | trib 4 | 4 | 0.92 | 5.09 | 578.90 | 0.96 | 7.06 | 578.93 | 1.05 | 9.82 | 578.98 | 0.98 | 14.36 | 579.00 | 1.27 | 19.12 | 579.04 | 1.36 | 23.29 | 579.07 | 1.42 | 100.82 | 579.48 | 2.10 |
| 81 | trib 4 | 4 | 0.96 | 5.09 | 579.05 | 0.52 | 7.06 | 579.09 | 0.57 | 9.82 | 579.13 | 0.64 | 14.36 | 579.19 | 0.74 | 19.12 | 579.24 | 0.83 | 23.29 | 579.28 | 0.89 | 100.82 | 579.75 | 1.62 |
| 82 | trib 4 | 4 | 1.02 | 5.09 | 579.50 | 1.05 | 7.06 | 579.53 | 1.21 | 9.82 | 579.58 | 1.24 | 14.36 | 579.63 | 1.32 | 19.12 | 579.68 | 1.40 | 23.29 | 579.72 | 1.47 | 100.82 | 580.15 | 2.29 |
| 83 | trib 4 | 4 | 1.06 | 5.09 | 579.93 | 0.79 | 7.06 | 579.97 | 0.94 | 9.82 | 580.01 | 1.08 | 14.36 | 580.07 | 1.24 | 19.12 | 580.12 | 1.38 | 23.29 | 580.16 | 1.50 | 100.82 | 580.60 | 2.46 |
| 84 | trib 4 | 4 | 1.14 | 5.09 | 580.55 | 0.65 | 7.06 | 580.56 | 0.84 | 9.82 | 580.60 | 0.95 | 14.36 | 580.65 | 1.11 | 19.12 | 580.70 | 1.22 | 23.29 | 580.74 | 1.30 | 100.82 | 581.21 | 2.12 |
| 85 | trib 5 | 5b | 0.02 | 6.03 | 568.97 | 1.95 | 5.92 | 569.21 | 0.71 | 7.98 | 569.32 | 0.72 | 10.14 | 569.45 | 0.69 | 12.26 | 569.57 | 0.69 | 37.36 | 569.28 | 3.67 | 175.78 | 570.02 | 5.73 |
| 86 | trib 5 | 5b | 0.06 | 6.03 | 570.75 | 1.92 | 5.92 | 570.74 | 1.91 | 7.98 | 570.83 | 2.04 | 10.14 | 570.93 | 2.09 | 12.26 | 571.04 | 1.97 | 37.36 | 571.35 | 2.93 | 175.78 | 572.01 | 4.29 |
| 87 | trib 5 | 5b | 0.08 | 6.03 | 571.14 | 1.48 | 5.92 | 571.14 | 1.47 | 7.98 | 571.24 | 1.54 | 10.14 | 571.32 | 1.61 | 12.26 | 571.39 | 1.69 | 37.36 | 571.65 | 2.99 | 175.78 | 572.42 | 4.33 |
| 88 | trib 5 | 5b | 0.1 | 6.03 | 571.53 | 1.66 | 5.92 | 571.52 | 1.66 | 7.98 | 571.60 | 1.72 | 10.14 | 571.67 | 1.79 | 12.26 | 571.74 | 1.85 | 37.36 | 572.07 | 2.77 | 175.78 | 572.80 | 4.11 |
| 89 | trib 5 | 5b | 0.13 | 6.03 | 572.18 | 2.33 | 5.92 | 572.17 | 2.34 | 7.98 | 572.23 | 2.53 | 10.14 | 572.27 | 2.73 | 12.26 | 572.31 | 2.83 | 37.36 | 572.69 | 3.47 | 175.78 | 573.41 | 4.28 |
| 90 | trib 5 | 5b | 0.14 | 6.03 | 573.30 | 1.48 | 5.92 | 573.27 | 1.66 | 7.98 | 573.34 | 1.63 | 10.14 | 573.39 | 1.71 | 12.26 | 573.42 | 1.85 | 37.36 | 573.58 | 2.09 | 175.78 | 574.07 | 2.93 |
| 91 | trib 5 | 5b | 0.16 | 5.79 | 573.99 | 0.29 | 2.08 | 573.88 | 0.13 | 2.66 | 573.91 | 0.15 | 3.26 | 573.93 | 0.18 | 3.87 | 573.95 | 0.21 | 25.31 | 574.16 | 0.78 | 110.06 | 574.73 | 1.52 |
| 92 | trib 5 | 5 | 0.17 | 1.60 | 573.99 | 0.09 | 2.08 | 573.88 | 0.15 | 2.66 | 573.91 | 0.18 | 3.26 | 573.93 | 0.21 | 3.87 | 573.95 | 0.25 | 25.31 | 574.17 | 0.95 | 110.06 | 574.74 | 1.73 |
| 93 | trib 5 | 5 | 0.18 | 1.60 | 573.98 | 0.87 | 2.08 | 574.00 | 1.00 | 2.66 | 574.00 | 1.20 | 3.26 | 574.02 | 1.24 | 3.87 | 574.03 | 1.37 | 25.31 | 574.32 | 2.12 | 110.06 | 574.75 | 3.04 |
| 94 | trib 5 | 5 | 0.24 | 1.60 | 574.37 | 0.64 | 2.08 | 574.40 | 0.68 | 2.66 | 574.42 | 0.72 | 3.26 | 574.44 | 0.75 | 3.87 | 574.46 | 0.79 | 25.31 | 574.77 | 1.14 | 110.06 | 575.20 | 1.63 |
| 95 | trib 5 | 5 | 0.3 | 1.60 | 575.00 | 0.09 | 2.08 | 575.00 | 0.11 | 2.66 | 575.00 | 0.15 | 3.26 | 575.00 | 0.18 | 3.87 | 575.00 | 0.21 | 25.31 | 575.29 | 1.03 | 110.06 | 575.58 | 1.95 |
| 96 | trib 5 | 5 | 0.32 | 1.60 | 575.76 | 0.76 | 2.08 | 575.77 | 0.82 | 2.66 | 575.78 | 0.92 | 3.26 | 575.79 | 0.93 | 3.87 | 575.79 | 0.94 | 25.31 | 575.79 | 0.24 | 110.06 | 575.91 | 1.17 |
| 97 | trib 5 | 5 | 0.36 | 1.60 | 576.10 | 0.22 | 2.08 | 576.10 | 0.29 | 2.66 | 576.10 | 0.37 | 3.26 | 576.10 | 0.46 | 3.87 | 576.10 | 0.54 | 25.31 | 576.22 | 0.12 | 110.06 | 576.22 | 0.53 |
| 98 | trib 5 | 5 | 0.4 | 1.60 | 576.11 | 0.01 | 2.08 | 576.11 | 0.01 | 2.66 | 576.11 | 0.02 | 3.26 | 576.12 | 0.02 | 3.87 | 576.12 | 0.03 | 25.31 | 576.23 | 0.22 | 110.06 | 576.36 | 0.95 |
| 99 | trib 5 | 5 | 0.45 | 1.60 | 576.11 | 0.36 | 2.08 | 576.12 | 0.47 | 2.66 | 576.12 | 0.59 | 3.26 | 576.13 | 0.71 | 3.87 | 576.14 | 0.83 | 25.31 | 576.41 | 1.28 | 110.06 | 576.73 | 2.07 |
| 100 | trib 5 | 5 | 0.48 | 1.60 | 576.51 | 0.46 | 2.08 | 576.52 | 0.52 | 2.66 | 576.53 | 0.66 | 3.26 | 576.54 | 0.71 | 3.87 | 576.56 | 0.75 | 25.31 | 576.82 | 1.46 | 110.06 | 577.17 | 2.60 |
| 101 | trib 5 | 5 | 0.51 | 1.60 | 576.68 | 0.50 | 2.08 | 576.70 | 0.55 | 2.66 | 576.72 | 0.59 | 3.26 | 576.74 | 0.65 | 3.87 | 576.75 | 0.70 | 25.31 | 577.02 | 0.96 | 110.06 | 577.47 | 1.66 |
| 102 | trib 5 | 5 | 0.55 | 1.51 | 577.11 | 0.66 | 1.97 | 577.13 | 0.72 | 2.53 | 577.15 | 0.79 | 3.11 | 577.17 | 0.84 | 3.70 | 577.18 | 0.88 | 25.09 | 577.42 | 1.51 | 109.03 | 577.70 | 2.88 |
| 103 | trib 5 | 5 | 0.64 | 1.42 | 578.64 | 0.91 | 1.86 | 578.66 | 1.01 | 2.39 | 578.69 | 1.10 | 2.95 | 578.71 | 1.18 | 3.50 | 578.73 | 1.25 | 24.83 | 579.07 | 2.05 | 107.79 | 579.66 | 2.46 |
| 104 | trib 5 | 5 | 0.73 | 0.98 | 580.66 | 1.26 | 1.43 | 580.72 | 0.98 | 1.93 | 580.72 | 1.31 | 2.41 | 580.77 | 1.07 | 2.95 | 580.77 | 1.33 | 24.23 | 581.07 | 2.28 | 94.10 | 581.57 | 2.15 |
| 105 | trib 5 | 5 | 0.76 | 0.72 | 581.67 | 1.80 | 1.08 | 581.70 | 2.00 | 1.51 | 581.74 | 2.04 | 1.92 | 581.80 | 1.81 | 2.37 | 581.84 | 1.57 | 23.49 | 582.08 | 2.89 | 90.62 | 582.23 | 5.35 |
| 106 | trib 5 | 5 | 0.8 | 0.80 | 582.74 | 1.24 | 1.07 | 582.76 | 1.23 | 1.38 | 582.77 | 1.28 | 1.67 | 582.78 | 1.39 | 1.98 | 582.79 | 1.43 | 22.79 | 583.06 | 3.56 | 97.83 | 583.37 | 6.56 |
| 107 | trib 5 | 5 | 0.87 | 0.75 | 584.33 | 2.38 | 1.01 | 584.34 | 2.54 | 1.31 | 584.36 | 2.73 | 1.57 | 584.37 | 2.85 | 1.89 | 584.38 | 3.01 | 22.64 | 584.66 | 5.31 | 97.25 | 585.05 | 7.98 |
| 108 | trib 5 | 5 | 0.9 | 0.71 | 586.96 | 1.56 | 0.95 | 586.99 | 1.57 | 1.23 | 587.02 | 1.67 | 1.49 | 587.03 | 1.90 | 1.80 | 587.06 | 1.84 | 22.50 | 587.56 | 2.86 | 96.68 | 587.90 | 5.91 |

| Cross Section ID* | River | Reach | River Station | 20% AEP | | | 10% AEP | | | 5% AEP | | | 2% AEP | | | 1% AEP | | | 0.5% AEP | | | PMF | | |
|-------------------|---------|-------|---------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|
| | | | | Q Total (m³/s) | W.S. Elev (mAHd) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHd) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHd) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHd) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHd) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHd) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHd) | Vel Chnl (m/s) |
| 120 | trib 6 | 6b | 0.22 | 582.34 | 0.97 | 0.77 | 582.36 | 1.12 | 1.02 | 582.38 | 1.16 | 1.27 | 582.39 | 1.25 | 1.58 | 582.41 | 1.24 | 22.17 | 582.71 | 2.86 | 96.85 | 583.11 | 4.02 | |
| 121 | trib 6 | 6b | 0.26 | 583.34 | 1.03 | 0.77 | 583.38 | 1.18 | 1.02 | 583.42 | 1.28 | 1.27 | 583.45 | 1.37 | 1.58 | 583.49 | 1.47 | 22.17 | 584.03 | 1.93 | 96.85 | 584.42 | 2.92 | |
| 122 | trib 6 | 6b | 0.29 | 584.26 | 0.13 | 0.59 | 584.30 | 0.17 | 0.74 | 584.34 | 0.20 | 0.84 | 584.36 | 0.22 | 0.99 | 584.40 | 0.25 | 21.27 | 585.15 | 1.42 | 91.05 | 585.79 | 1.90 | |
| 123 | trib 6 | 6b | 0.32 | 584.70 | 1.10 | 0.59 | 584.71 | 1.17 | 0.74 | 584.73 | 1.26 | 0.84 | 584.73 | 1.32 | 0.99 | 584.75 | 1.31 | 21.27 | 585.38 | 1.27 | 91.05 | 586.05 | 2.74 | |
| 124 | trib 6 | 6b | 0.36 | 586.26 | 0.79 | 0.59 | 586.28 | 0.71 | 0.74 | 586.28 | 0.81 | 0.84 | 586.28 | 0.98 | 0.99 | 586.28 | 1.06 | 21.27 | 586.58 | 2.46 | 91.05 | 586.88 | 4.02 | |
| 125 | trib 6 | 6b | 0.39 | 587.43 | 0.53 | 0.59 | 587.43 | 0.67 | 0.74 | 587.44 | 0.78 | 0.84 | 587.44 | 0.68 | 0.99 | 587.44 | 1.03 | 21.27 | 587.66 | 2.39 | 91.05 | 587.92 | 4.13 | |
| 126 | trib 6 | 6b | 0.42 | 588.49 | 5.00 | 0.59 | 588.54 | 1.30 | 0.74 | 588.54 | 1.26 | 0.84 | 588.57 | 0.83 | 0.99 | 588.58 | 0.84 | 21.27 | 588.88 | 2.47 | 91.05 | 589.22 | 4.23 | |
| 127 | trib 6 | 6b | 0.47 | 590.29 | 3.91 | 0.59 | 590.41 | 1.11 | 0.74 | 590.44 | 1.14 | 0.84 | 590.45 | 1.19 | 0.99 | 590.46 | 1.25 | 21.27 | 590.74 | 1.91 | 91.05 | 590.74 | 8.14 | |
| 128 | trib 6 | 6 | 0.51 | 591.37 | 0.97 | 0.37 | 591.39 | 1.05 | 0.47 | 591.41 | 1.13 | 0.53 | 591.43 | 1.13 | 0.63 | 591.45 | 1.17 | 20.83 | 591.67 | 2.46 | 89.00 | 592.05 | 4.55 | |
| 129 | trib 6 | 6 | 0.53 | 592.23 | 1.10 | 0.05 | 592.24 | 0.87 | 0.06 | 592.25 | 0.68 | 0.06 | 592.25 | 0.64 | 0.07 | 592.26 | 0.60 | 20.09 | 592.60 | 3.02 | 85.42 | 592.90 | 5.14 | |
| 130 | trib 6 | 6 | 0.56 | 593.95 | 0.57 | 0.05 | 593.95 | 0.60 | 0.06 | 593.95 | 0.66 | 0.06 | 593.96 | 0.67 | 0.07 | 593.96 | 0.73 | 20.09 | 594.36 | 3.46 | 85.42 | 594.66 | 5.90 | |
| 131 | trib 6 | 6 | 0.59 | 595.89 | 0.44 | 0.05 | 595.89 | 0.49 | 0.06 | 595.90 | 0.43 | 0.06 | 595.90 | 0.47 | 0.07 | 595.90 | 0.60 | 20.09 | 596.25 | 3.42 | 85.42 | 596.66 | 5.47 | |
| 132 | trib 6 | 6 | 0.62 | 597.78 | 0.72 | 0.05 | 597.77 | 3.37 | 0.06 | 597.79 | 0.66 | 0.06 | 597.80 | 0.70 | 0.07 | 597.80 | 0.71 | 20.09 | 598.26 | 3.15 | 85.42 | 598.64 | 4.99 | |
| 133 | trib 6 | 6 | 0.64 | 599.04 | 0.40 | 0.05 | 599.03 | 0.71 | 0.06 | 599.03 | 0.61 | 0.06 | 599.04 | 0.52 | 0.07 | 599.05 | 0.52 | 20.09 | 599.54 | 1.84 | 85.42 | 600.08 | 2.68 | |
| 134 | trib 7 | 7 | 0.01 | 591.08 | 1.07 | 0.33 | 591.10 | 1.06 | 0.40 | 591.11 | 1.15 | 0.46 | 591.13 | 1.17 | 0.53 | 591.15 | 1.14 | 20.67 | 591.74 | 4.07 | 88.20 | 592.17 | 6.25 | |
| 135 | trib 7 | 7 | 0.03 | 592.07 | 1.19 | 0.22 | 592.08 | 1.23 | 0.26 | 592.09 | 1.28 | 0.30 | 592.09 | 1.31 | 0.35 | 592.10 | 1.40 | 20.44 | 592.59 | 4.40 | 87.06 | 593.00 | 6.56 | |
| 136 | trib 7 | 7 | 0.04 | 593.55 | 1.10 | 0.22 | 593.55 | 1.16 | 0.26 | 593.56 | 1.21 | 0.30 | 593.57 | 1.23 | 0.35 | 593.58 | 1.28 | 20.44 | 594.01 | 4.34 | 87.06 | 594.37 | 6.58 | |
| 137 | trib 7 | 7 | 0.07 | 595.18 | 0.87 | 0.22 | 595.19 | 0.92 | 0.26 | 595.20 | 0.95 | 0.30 | 595.20 | 0.98 | 0.35 | 595.21 | 1.02 | 20.44 | 595.52 | 3.81 | 87.06 | 595.85 | 6.69 | |
| 138 | trib 7 | 7 | 0.09 | 597.36 | 0.83 | 0.12 | 597.36 | 0.91 | 0.15 | 597.37 | 0.94 | 0.17 | 597.38 | 0.95 | 0.19 | 597.38 | 0.97 | 20.24 | 597.82 | 3.95 | 86.15 | 598.22 | 6.98 | |
| 139 | trib 7 | 7 | 0.12 | 599.08 | 1.10 | 0.12 | 599.08 | 1.13 | 0.15 | 599.09 | 1.18 | 0.17 | 599.09 | 1.23 | 0.19 | 599.09 | 1.26 | 20.24 | 599.51 | 5.36 | 86.15 | 600.10 | 7.60 | |
| 140 | trib 7 | 7 | 0.13 | 601.25 | 0.88 | 0.12 | 601.26 | 0.94 | 0.15 | 601.26 | 1.02 | 0.17 | 601.27 | 1.02 | 0.19 | 601.27 | 1.09 | 20.24 | 601.73 | 3.81 | 86.15 | 602.45 | 4.70 | |
| 141 | trib 7 | 7 | 0.15 | 602.46 | 0.17 | 0.12 | 602.46 | 0.20 | 0.15 | 602.46 | 0.25 | 0.17 | 602.46 | 0.28 | 0.19 | 602.46 | 0.33 | 20.24 | 602.82 | 1.94 | 86.15 | 603.39 | 3.18 | |
| 142 | trib 8 | 8 | 0.01 | 572.30 | 0.36 | 1.89 | 572.34 | 0.17 | 2.40 | 572.37 | 0.20 | 2.86 | 572.40 | 0.22 | 3.21 | 572.42 | 0.23 | 23.80 | 572.36 | 2.08 | 97.59 | 572.57 | 4.73 | |
| 143 | trib 8 | 8 | 0.02 | 573.19 | 1.32 | 1.89 | 573.20 | 1.44 | 2.40 | 573.22 | 1.53 | 2.86 | 573.22 | 1.70 | 3.21 | 573.23 | 1.77 | 23.80 | 573.47 | 3.28 | 97.59 | 573.90 | 5.15 | |
| 144 | trib 8 | 8 | 0.04 | 574.03 | 1.28 | 1.89 | 574.04 | 1.38 | 2.40 | 574.06 | 1.48 | 2.86 | 574.07 | 1.57 | 3.21 | 574.09 | 1.48 | 23.80 | 574.43 | 2.24 | 97.59 | 575.08 | 3.55 | |
| 145 | trib 8 | 8 | 0.05 | 574.52 | 1.39 | 1.89 | 574.53 | 1.48 | 2.40 | 574.54 | 1.61 | 2.86 | 574.53 | 2.18 | 3.21 | 574.52 | 3.12 | 23.80 | 574.67 | 2.79 | 97.59 | 574.89 | 5.05 | |
| 146 | trib 8 | 8 | 0.06 | 575.45 | 1.21 | 1.89 | 575.48 | 1.22 | 2.40 | 575.49 | 1.39 | 2.86 | 575.49 | 1.41 | 3.21 | 575.51 | 1.51 | 23.80 | 575.79 | 2.78 | 97.59 | 576.53 | 3.50 | |
| 147 | trib 8 | 8 | 0.07 | 576.23 | 1.99 | 1.89 | 576.33 | 2.10 | 2.40 | 576.45 | 1.98 | 2.86 | 576.55 | 1.80 | 3.21 | 576.60 | 0.11 | 23.80 | 576.60 | 0.79 | 97.59 | 576.95 | 1.94 | |
| 148 | trib 8 | 8 | 0.09 | 578.11 | 0.36 | 1.89 | 578.19 | 0.44 | 2.40 | 578.26 | 0.51 | 2.86 | 578.32 | 0.56 | 3.21 | 578.32 | 0.62 | 23.80 | 578.52 | 1.51 | 97.59 | 579.04 | 1.91 | |
| 149 | trib 8 | 8 | 0.12 | 578.59 | 0.14 | 1.89 | 578.61 | 0.17 | 2.40 | 578.61 | 0.23 | 2.86 | 578.60 | 0.28 | 3.21 | 578.60 | 0.31 | 23.80 | 578.83 | 0.97 | 97.59 | 579.22 | 1.90 | |
| 150 | trib 8 | 8 | 0.14 | 578.63 | 0.16 | 0.95 | 578.63 | 0.21 | 1.20 | 578.64 | 0.26 | 1.43 | 578.66 | 0.27 | 1.71 | 578.64 | 0.37 | 22.24 | 578.92 | 1.11 | 95.58 | 578.94 | 4.48 | |
| 151 | trib 8 | 8 | 0.15 | 578.63 | 0.23 | 0.64 | 578.64 | 0.29 | 0.81 | 578.65 | 0.36 | 0.93 | 578.66 | 0.40 | 1.10 | 578.65 | 0.49 | 21.43 | 579.19 | 2.27 | 91.74 | 579.87 | 3.51 | |
| 152 | trib 8 | 8 | 0.17 | 578.66 | 0.84 | 0.64 | 578.68 | 0.98 | 0.81 | 578.70 | 1.08 | 0.93 | 578.72 | 1.12 | 1.10 | 578.75 | 1.19 | 21.43 | 579.48 | 0.92 | 91.74 | 580.40 | 1.43 | |
| 153 | trib 8 | 8 | 0.19 | 578.84 | 0.61 | 0.64 | 578.87 | 0.62 | 0.81 | 578.90 | 0.65 | 0.93 | 578.92 | 0.66 | 1.10 | 578.94 | 0.69 | 21.43 | 579.52 | 0.86 | 91.74 | 580.42 | 1.37 | |
| 154 | trib 8 | 8 | 0.21 | 578.86 | 0.25 | 0.64 | 578.89 | 0.27 | 0.81 | 578.92 | 0.30 | 0.93 | 578.94 | 0.13 | 1.10 | 578.97 | 0.14 | 21.43 | 579.57 | 0.66 | 91.74 | 580.50 | 1.13 | |
| 155 | trib 8 | 8 | 0.23 | 578.86 | 0.14 | 0.30 | 578.90 | 0.10 | 0.36 | 578.93 | 0.11 | 0.41 | 578.95 | 0.11 | 0.48 | 578.97 | 0.12 | 20.61 | 579.58 | 0.58 | 87.68 | 580.51 | 1.02 | |
| 156 | trib 8 | 8 | 0.25 | 578.87 | 0.11 | 0.30 | 578.90 | 0.11 | 0.36 | 578.93 | 0.11 | 0.41 | 578.95 | 0.11 | 0.48 | 578.98 | 0.11 | 20.61 | 579.58 | 0.85 | 87.68 | 580.49 | 1.35 | |
| 157 | trib 8 | 8 | 0.27 | 579.30 | 0.84 | 0.30 | 579.32 | 0.81 | 0.36 | 579.32 | 1.04 | 0.41 | 579.34 | 0.91 | 0.48 | 579.33 | 1.14 | 20.61 | 579.69 | 2.94 | 87.68 | 580.23 | 4.43 | |
| 158 | trib 8 | 8 | 0.29 | 579.97 | 1.16 | 0.30 | 579.99 | 1.22 | 0.36 | 580.01 | 1.27 | 0.41 | 580.02 | 1.29 | 0.48 | 580.04 | 1.38 | 20.61 | 580.58 | 2.98 | 87.68 | 581.11 | 4.43 | |
| 159 | trib 8 | 8 | 0.32 | 581.00 | 0.87 | 0.30 | 581.02 | 0.85 | 0.36 | 581.02 | 0.97 | 0.41 | 581.03 | 0.98 | 0.48 | 581.03 | 1.03 | 20.61 | 581.29 | 2.87 | 87.68 | 581.69 | 4.51 | |
| 160 | trib 8 | 8 | 0.35 | 582.20 | 0.79 | 0.30 | 582.21 | 0.87 | 0.36 | 582.22 | 0.83 | 0.41 | 582.23 | 0.84 | 0.48 | 582.24 | 0.77 | 20.61 | 582.71 | 1.78 | 87.68 | 583.19 | 2.83 | |
| 161 | trib 8 | 8 | 0.36 | 582.37 | 1.18 | 0.09 | 582.41 | 0.55 | 0.10 | 582.41 | 0.67 | 0.12 | 582.41 | 0.66 | 0.14 | 582.42 | 0.73 | 20.18 | 582.91 | 1.32 | 85.86 | 583.15 | 3.72 | |
| 162 | trib 8 | 8 | 0.38 | 583.40 | 0.49 | 0.09 | 583.40 | 0.52 | 0.10 | 583.41 | 0.51 | 0.12 | 583.41 | 0.27 | 0.14 | 583.41 | 0.32 | 20.18 | 583.88 | 1.88 | 85.86 | 584.27 | 2.66 | |
| 163 | Trib 11 | 1 | 0.05 | 577.02 | 1.19 | 0.69 | 577.04 | 1.34 | 0.97 | 577.05 | 1.42 | 1.16 | 577.06 | 1.51 | 1.41 | 577.07 | 1.62 | 1.96 | 577.10 | 1.78 | 10.35 | 577.24 | 2.90 | |
| 164 | Trib 11 | 1 | 0.06 | 578.56 | 0.78 | 0.69 | 578.49 | 5.64 | 0.97 | 578.54 | 2.54 | 1.16 | 578.61 | 0.96 | 1.41 | 578.54 | 3.41 | 1.96 | 578.65 | 1.00 | 10.35 | 578.82 | 1.64 | |
| 165 | Trib 11 | 1 | 0.08 | 579.57 | 0.67 | 0.69 | 579.60 | 0.75 | 0.97 | 579.62 | 0.81 | 1.16 | 579.63 | 0.85 | 1.41 | 579.64 | 0.91 | 1.96 | 579.67 | 1.00 | 10.35 | 579.82 | 1.82 | |
| 166 | Trib 11 | 1 | 0.09 | 581.05 | 0.41 | 0.69 | 581.08 | 0.46 | 0.97 | 581.10 | 0.52 | 1.16 | 581.12 | 0.56 | 1.41 | 581.13 | 0.61 | 1.96 | 581.16 | 0.68 | 10.35 | 581.36 | 1.09 | |
| 167 | Trib 11 | 1 | 0.1 | 582.62 | 0.57 | 0.69 | 582.65 | 0.60 | 0.97 | 582.66 | 0.70 | 1.16 | 582.68 | 0.70 | 1.41 | 582.68 | 0.77 | 1.96 | 582.71 | 0.80 | 10.35 | 582.89 | 1.13 | |
| 168 | Trib 11 | 1 | 0.13 | 567.86 | 0.39 | 1.83 | 567.98 | 0.35 | 2.20 | 568.12 | 0.32 | 2.53 | 568.28 | 0.28 | 2.95 | 568.44 | 0.27 | 3.95 | 568.65 | 0.28 | 15.88 | 570.22 | 0.42 | |
| 169 | Trib 11 | 1 | 0.14 | 567.96 | 1.26 | 1.83 | 568.00 | 1.24 | 2.20 | 568.12 | 0.91 | 2.53 | 568.28 | 0.66 | 2.95 | 568.44 | 0.52 | 3.95 | 568.65 | 0.46 | 15.88 | 570.22 | 0.44 | |
| 170 | Trib 11 | 1 | 0.18 | 568.12 | 0.46 | 1.83 | 568.16 | 0.49 | 2.20 | 568.21 | 0.50 | 2.53 | 568.32 | 0.44 | 2.95 | 568.46 | 0.37 | 3.95 | 568.66 | 0.35 | 15.88 | 570.22 | 0.40 | |
| 171 | Trib 11 | 1 | 0.22 | 568.40 | | | | | | | | | | | | | | | | | | | | |

| Cross Section ID* | River | Reach | River Station | 20% AEP | | | 10% AEP | | | 5% AEP | | | 2% AEP | | | 1% AEP | | | 0.5% AEP | | | PMF | | |
|-------------------|---------|-------|---------------|-----------------------------|------------------|----------------|-----------------------------|------------------|----------------|-----------------------------|------------------|----------------|-----------------------------|------------------|----------------|-----------------------------|------------------|----------------|-----------------------------|------------------|----------------|-----------------------------|------------------|----------------|
| | | | | Q Total (m ³ /s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m ³ /s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m ³ /s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m ³ /s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m ³ /s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m ³ /s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m ³ /s) | W.S. Elev (mAHD) | Vel Chnl (m/s) |
| 180 | Trib 11 | 1 | 0.39 | 1.48 | 572.75 | 0.83 | 1.83 | 572.88 | 0.49 | 2.20 | 573.22 | 0.24 | 2.53 | 573.52 | 0.17 | 2.95 | 573.53 | 0.20 | 3.95 | 573.56 | 0.26 | 15.88 | 573.75 | 0.81 |
| 181 | Trib 11 | 1 | 0.41 | 1.10 | 573.18 | 1.60 | 1.31 | 573.18 | 1.71 | 1.56 | 573.19 | 1.85 | 1.90 | 573.52 | 0.32 | 2.25 | 573.53 | 0.37 | 2.92 | 573.56 | 0.44 | 13.14 | 573.78 | 1.14 |
| 182 | Trib 11 | 1 | 0.42 | 1.10 | 573.55 | 1.13 | 1.31 | 573.57 | 1.17 | 1.56 | 573.59 | 1.23 | 1.90 | 573.61 | 1.27 | 2.25 | 573.64 | 1.30 | 2.92 | 573.68 | 1.39 | 13.14 | 573.96 | 2.21 |
| 183 | Trib 11 | 1 | 0.43 | 1.10 | 574.76 | 0.30 | 1.31 | 574.77 | 0.35 | 1.56 | 574.78 | 0.41 | 1.90 | 574.80 | 0.47 | 2.25 | 574.82 | 0.54 | 2.92 | 574.85 | 0.66 | 13.14 | 575.07 | 1.95 |
| 184 | Trib 11 | 1 | 0.45 | 1.10 | 574.76 | 0.28 | 1.31 | 574.77 | 0.33 | 1.56 | 574.78 | 0.38 | 1.90 | 574.81 | 0.44 | 2.25 | 574.82 | 0.51 | 2.92 | 574.85 | 0.63 | 13.14 | 575.11 | 2.03 |
| 185 | Trib 11 | 1 | 0.48 | 1.10 | 574.78 | 0.21 | 1.31 | 574.78 | 0.25 | 1.56 | 574.80 | 0.29 | 1.90 | 574.83 | 0.33 | 2.25 | 574.83 | 0.39 | 2.92 | 574.87 | 0.47 | 13.14 | 575.23 | 1.28 |
| 186 | Trib 11 | 1 | 0.49 | 1.10 | 574.78 | 0.28 | 1.31 | 574.79 | 0.33 | 1.56 | 574.81 | 0.37 | 1.90 | 574.84 | 0.40 | 2.25 | 574.84 | 0.48 | 2.92 | 574.89 | 0.54 | 13.14 | 575.30 | 1.18 |

* Refer to the flood map in Section 5 for location of cross section

Table E2 - HEC-RAS Model Results for Kandos

| Cross Section ID* | River | Reach | River Station | 20% AEP | | | 10% AEP | | | 5% AEP | | | 2% AEP | | | 1% AEP | | | 0.5% AEP | | | PMF | | |
|-------------------|---------|-------|---------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|
| | | | | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) |
| 1 | | 1 1a | 0.06 | 6.89 | 621.03 | 0.45 | 8.19 | 621.08 | 0.48 | 9.88 | 621.13 | 0.50 | 11.63 | 621.18 | 0.53 | 13.42 | 621.23 | 0.55 | 18.54 | 621.34 | 0.61 | 95.91 | 622.27 | 1.05 |
| 2 | | 1 1a | 0.11 | 6.89 | 621.75 | 1.31 | 8.19 | 621.78 | 1.35 | 9.88 | 621.83 | 1.29 | 11.63 | 621.85 | 1.33 | 13.42 | 621.88 | 1.37 | 18.54 | 621.82 | 1.47 | 95.91 | 622.34 | 2.63 |
| 3 | | 1 1a | 0.14 | 6.89 | 622.30 | 1.07 | 8.19 | 622.28 | 1.49 | 9.88 | 622.31 | 1.43 | 11.63 | 622.33 | 1.53 | 13.42 | 622.35 | 1.57 | 18.54 | 622.40 | 1.62 | 95.91 | 622.71 | 3.01 |
| 4 | | 1 1a | 0.18 | 6.89 | 623.24 | 1.04 | 8.19 | 623.26 | 1.08 | 9.88 | 623.28 | 1.08 | 11.63 | 623.29 | 1.13 | 13.42 | 623.30 | 1.20 | 18.54 | 623.35 | 1.28 | 95.91 | 623.73 | 2.06 |
| 5 | | 1 1a | 0.22 | 6.89 | 624.52 | 0.86 | 1.24 | 624.86 | 1.08 | 1.47 | 624.95 | 0.16 | 1.69 | 625.22 | 0.06 | 13.42 | 625.54 | 0.17 | 2.56 | 626.05 | 0.02 | 95.91 | 626.47 | 0.46 |
| 7 | | 1 1c | 0.27 | 5.86 | 625.56 | 3.32 | 6.96 | 625.62 | 1.45 | 8.41 | 625.66 | 1.21 | 9.95 | 625.69 | 1.19 | 11.44 | 625.70 | 1.25 | 15.98 | 626.04 | 0.50 | 82.43 | 626.42 | 1.35 |
| 8 | | 1 1c | 0.31 | 5.86 | 626.60 | 2.01 | 6.96 | 626.69 | 1.02 | 8.41 | 626.63 | 2.03 | 9.95 | 626.65 | 1.97 | 11.44 | 626.67 | 1.92 | 15.98 | 626.72 | 1.84 | 82.43 | 627.22 | 2.01 |
| 9 | | 1 1c | 0.36 | 5.86 | 627.74 | 1.19 | 6.96 | 627.77 | 1.20 | 8.41 | 627.78 | 1.35 | 9.95 | 627.80 | 1.42 | 11.44 | 627.82 | 1.43 | 15.98 | 627.87 | 1.63 | 82.43 | 628.24 | 2.73 |
| 10 | | 1 1c | 0.4 | 5.84 | 628.66 | 1.65 | 6.93 | 628.67 | 1.77 | 8.38 | 628.69 | 1.89 | 9.93 | 628.70 | 1.99 | 11.40 | 628.72 | 2.05 | 15.92 | 628.75 | 2.28 | 81.96 | 629.04 | 3.94 |
| 11 | | 1 1c | 0.44 | 5.84 | 629.55 | 1.08 | 6.93 | 629.57 | 1.13 | 8.38 | 629.58 | 1.28 | 9.93 | 629.54 | 2.04 | 11.40 | 629.55 | 2.15 | 15.92 | 629.66 | 1.53 | 81.96 | 630.19 | 2.10 |
| 12 | | 1 | 0.49 | 4.13 | 630.39 | 1.26 | 5.19 | 630.41 | 1.37 | 6.55 | 630.44 | 1.45 | 8.10 | 630.46 | 1.50 | 9.46 | 630.48 | 1.59 | 13.68 | 630.54 | 1.73 | 80.65 | 630.92 | 3.51 |
| 13 | | 1 | 0.52 | 4.13 | 631.16 | 1.17 | 5.19 | 631.17 | 1.36 | 6.55 | 631.20 | 1.48 | 8.10 | 631.23 | 1.57 | 9.46 | 631.25 | 1.64 | 13.68 | 631.31 | 1.88 | 79.12 | 631.81 | 3.73 |
| 14 | | 1 | 0.55 | 4.13 | 631.94 | 1.21 | 5.19 | 631.95 | 1.39 | 6.55 | 631.99 | 1.34 | 8.10 | 632.01 | 1.48 | 9.46 | 632.03 | 1.59 | 13.68 | 632.08 | 1.73 | 72.49 | 632.46 | 3.08 |
| 15 | | 1 | 0.59 | 4.13 | 633.04 | 1.37 | 5.19 | 633.07 | 1.30 | 6.55 | 633.08 | 1.58 | 8.00 | 633.10 | 1.63 | 9.43 | 633.12 | 1.70 | 13.13 | 633.16 | 1.86 | 69.23 | 633.47 | 3.36 |
| 16 | | 1 | 0.62 | 4.13 | 634.07 | 1.06 | 5.19 | 634.05 | 1.54 | 6.55 | 634.11 | 1.21 | 8.00 | 634.13 | 1.31 | 9.43 | 634.14 | 1.46 | 13.13 | 634.17 | 1.67 | 69.23 | 634.49 | 3.05 |
| 17 | | 1 | 0.66 | 4.13 | 635.12 | 1.25 | 5.19 | 635.15 | 1.28 | 6.55 | 635.19 | 1.35 | 8.30 | 635.22 | 1.45 | 9.72 | 635.24 | 1.51 | 13.13 | 635.30 | 1.64 | 69.52 | 635.83 | 2.54 |
| 18 | | 1 | 0.7 | 3.58 | 636.11 | 0.92 | 4.41 | 636.13 | 1.02 | 5.25 | 636.13 | 1.21 | 6.34 | 636.16 | 1.14 | 7.47 | 636.17 | 1.30 | 10.42 | 636.21 | 1.42 | 58.33 | 636.49 | 2.91 |
| 19 | | 1 | 0.74 | 3.58 | 637.08 | 1.03 | 4.41 | 637.09 | 1.19 | 5.25 | 637.13 | 1.44 | 6.34 | 637.13 | 1.30 | 7.47 | 637.15 | 1.37 | 10.42 | 637.20 | 1.46 | 58.33 | 637.54 | 2.93 |
| 20 | | 1 | 0.78 | 3.58 | 637.84 | 1.23 | 4.41 | 637.87 | 1.29 | 5.25 | 637.89 | 1.37 | 6.34 | 637.91 | 1.43 | 7.47 | 637.93 | 1.50 | 10.42 | 637.98 | 1.65 | 58.33 | 638.47 | 2.60 |
| 21 | | 1 | 0.83 | 2.19 | 639.42 | 1.07 | 2.75 | 639.44 | 1.18 | 3.33 | 639.46 | 1.24 | 4.17 | 639.48 | 1.30 | 5.03 | 639.50 | 1.44 | 7.06 | 639.54 | 1.59 | 39.13 | 639.84 | 2.90 |
| 22 | | 1 | 0.87 | 2.19 | 641.10 | 0.57 | 2.75 | 641.13 | 0.60 | 3.33 | 641.15 | 0.64 | 4.17 | 641.19 | 0.68 | 5.03 | 641.22 | 0.72 | 7.06 | 641.27 | 0.81 | 39.13 | 641.76 | 1.46 |
| 23 | | 1 | 0.91 | 2.19 | 643.02 | 1.23 | 2.75 | 643.06 | 1.00 | 3.33 | 643.06 | 1.19 | 4.17 | 643.07 | 1.28 | 5.03 | 643.10 | 1.28 | 7.06 | 643.13 | 1.41 | 39.13 | 643.45 | 2.41 |
| 24 | | 1 | 0.96 | 0.22 | 644.60 | 1.11 | 0.28 | 644.60 | 1.14 | 0.61 | 644.63 | 1.44 | 0.94 | 644.64 | 1.54 | 1.20 | 644.66 | 1.62 | 1.87 | 644.69 | 1.71 | 11.98 | 644.85 | 2.57 |
| 25 | | 1 | 1.01 | 0.22 | 646.96 | 0.27 | 0.28 | 646.97 | 0.28 | 0.61 | 647.00 | 0.38 | 0.94 | 647.03 | 0.43 | 1.20 | 647.04 | 0.47 | 1.87 | 647.08 | 0.52 | 11.98 | 647.32 | 1.03 |
| 26 | | 1 | 1.05 | 0.22 | 648.55 | 0.23 | 0.28 | 648.55 | 0.25 | 0.61 | 648.58 | 0.34 | 0.94 | 648.61 | 0.40 | 1.20 | 648.62 | 0.43 | 1.87 | 648.66 | 0.50 | 11.98 | 648.92 | 0.92 |
| 27 | | 1 | 1.08 | 0.22 | 649.90 | 0.60 | 0.28 | 649.90 | 0.66 | 0.61 | 649.91 | 0.94 | 0.94 | 649.92 | 1.08 | 1.20 | 649.93 | 1.18 | 1.84 | 649.94 | 1.36 | 10.32 | 650.02 | 2.55 |
| 28 | | 1 | 1.11 | 0.22 | 650.76 | 1.22 | 0.28 | 650.77 | 1.33 | 0.61 | 650.79 | 1.44 | 0.94 | 650.81 | 1.55 | 1.20 | 650.82 | 1.62 | 1.84 | 650.84 | 1.81 | 10.32 | 650.98 | 2.87 |
| 29 | | 1 | 1.13 | 0.17 | 651.84 | 0.65 | 0.28 | 651.85 | 0.76 | 0.42 | 651.87 | 0.80 | 0.59 | 651.89 | 0.88 | 0.75 | 651.90 | 0.94 | 1.18 | 651.93 | 1.07 | 7.38 | 652.13 | 1.63 |
| 30 | trib 10 | 10b | 0.08 | 1.12 | 619.95 | 0.89 | 1.35 | 619.97 | 0.90 | 1.64 | 619.98 | 0.92 | 1.96 | 620.00 | 0.93 | 2.29 | 620.01 | 0.97 | 3.11 | 620.03 | 1.06 | 16.33 | 620.27 | 1.69 |
| 31 | trib 10 | 10b | 0.13 | 1.12 | 620.49 | 0.41 | 1.35 | 620.50 | 0.44 | 1.64 | 620.52 | 0.49 | 1.96 | 620.53 | 0.52 | 2.29 | 620.55 | 0.55 | 3.11 | 620.58 | 0.60 | 16.33 | 620.85 | 1.03 |
| 32 | trib 10 | 10b | 0.15 | 1.12 | 620.73 | 0.99 | 1.35 | 620.76 | 0.94 | 1.64 | 620.76 | 1.08 | 1.96 | 620.79 | 1.03 | 2.29 | 620.79 | 1.24 | 3.11 | 620.83 | 1.26 | 16.33 | 621.11 | 1.82 |
| 33 | trib 10 | 10b | 0.18 | 1.12 | 621.20 | 0.60 | 1.35 | 621.21 | 0.67 | 1.64 | 621.24 | 0.67 | 1.96 | 621.25 | 0.74 | 2.29 | 621.28 | 0.72 | 3.11 | 621.32 | 0.82 | 16.33 | 621.61 | 1.51 |
| 34 | trib 10 | 10b | 0.2 | 1.12 | 621.50 | 0.97 | 1.35 | 621.52 | 0.91 | 1.64 | 621.54 | 0.91 | 1.96 | 621.55 | 0.99 | 2.29 | 621.56 | 1.11 | 3.11 | 621.59 | 1.16 | 16.33 | 621.90 | 1.79 |
| 35 | trib 10 | 10b | 0.22 | 1.12 | 621.85 | 5.52 | 1.35 | 621.86 | 5.57 | 1.64 | 621.86 | 5.59 | 1.96 | 621.94 | 1.51 | 2.29 | 621.88 | 5.67 | 3.11 | 621.89 | 5.74 | 16.33 | 622.01 | 6.12 |
| 36 | trib 10 | 10 | 0.24 | 0.46 | 622.12 | 0.23 | 0.56 | 622.05 | 0.77 | 0.69 | 622.15 | 0.25 | 0.84 | 621.99 | 5.52 | 0.98 | 622.02 | 0.83 | 1.36 | 622.22 | 0.31 | 7.05 | 622.18 | 2.06 |
| 37 | trib 10 | 10 | 0.26 | 0.46 | 623.07 | 0.65 | 0.56 | 623.07 | 0.64 | 0.69 | 623.08 | 0.67 | 0.84 | 623.08 | 0.77 | 0.84 | 623.09 | 0.86 | 1.36 | 623.04 | 5.32 | 7.05 | 623.25 | 1.35 |
| 38 | trib 10 | 10 | 0.28 | 0.46 | 623.58 | 0.57 | 0.56 | 623.59 | 0.63 | 0.69 | 623.51 | 4.04 | 0.84 | 623.61 | 0.70 | 0.98 | 623.63 | 0.71 | 1.36 | 623.62 | 1.02 | 7.05 | 623.80 | 1.63 |
| 39 | trib 10 | 10 | 0.3 | 0.46 | 624.35 | 0.88 | 0.56 | 624.37 | 0.75 | 0.69 | 624.38 | 0.81 | 0.84 | 624.35 | 1.56 | 0.98 | 624.35 | 2.04 | 1.36 | 624.41 | 1.00 | 7.05 | 624.55 | 1.66 |
| 40 | trib 10 | 10 | 0.32 | 0.46 | 625.24 | 0.82 | 0.56 | 625.22 | 1.51 | 0.69 | 625.24 | 1.19 | 0.84 | 625.24 | 1.50 | 0.98 | 625.24 | 1.55 | 1.36 | 625.26 | 1.49 | 7.05 | 625.35 | 2.75 |
| 41 | trib 10 | 10 | 0.34 | 0.46 | 626.38 | 0.84 | 0.56 | 626.40 | 0.82 | 0.69 | 626.40 | 0.77 | 0.84 | 626.41 | 0.75 | 0.98 | 626.41 | 0.80 | 1.36 | 626.42 | 0.96 | 7.05 | 626.56 | 1.43 |
| 42 | trib 10 | 10 | 0.36 | 0.46 | 627.07 | 0.59 | 0.56 | 627.06 | 0.92 | 0.69 | 627.07 | 0.92 | 0.84 | 627.07 | 1.06 | 0.98 | 627.08 | 1.12 | 1.36 | 627.09 | 1.28 | 7.05 | 627.25 | 1.93 |
| 43 | trib 10 | 10 | 0.38 | 0.46 | 627.93 | 2.44 | 0.56 | 627.99 | 0.81 | 0.69 | 628.00 | 0.92 | 0.84 | 628.01 | 0.90 | 0.98 | 628.02 | 0.95 | 1.36 | 628.05 | 1.02 | 7.05 | 628.21 | 1.79 |
| 44 | trib 10 | 10 | 0.41 | 0.46 | 628.63 | 0.95 | 0.56 | 628.66 | 0.79 | 0.69 | 628.67 | 0.82 | 0.84 | 628.68 | 0.91 | 0.98 | 628.69 | 0.95 | 1.36 | 628.72 | 1.06 | 7.05 | 628.93 | 1.49 |
| 45 | trib 11 | 11 | 0.04 | 1.10 | 623.48 | 1.30 | 1.32 | 623.48 | 1.47 | 1.61 | 623.50 | 1.53 | 1.92 | 623.51 | 1.54 | 2.24 | 623.52 | 1.76 | 3.06 | 623.54 | 1.97 | 16.07 | 623.76 | 2.70 |
| 46 | trib 11 | 11 | 0.07 | 1.10 | 625.07 | 0.85 | 1.32 | 625.09 | 0.85 | 1.61 | 625.10 | 0.91 | 1.92 | 625.10 | 1.01 | 2.24 | 625.12 | 0.98 | 3.06 | 625.14 | 1.05 | 16.07 | 625.33 | 1.74 |
| 47 | trib 11 | 11 | 0.1 | 1.10 | 625.81 | 0.70 | 1.32 | 625.82 | 0.76 | 1.61 | 625.83 | 0.80 | 1.92 | 625.84 | 0.80 | 2.24 | 625.85 | 0.89 | 3.06 | 625.87 | 0.99 | 16.07 | 626.06 | 1.57 |
| 48 | trib 11 | 11 | 0.12 | 0.91 | 626.19 | 0.54 | 1.09 | 626.10 | 2.22 | 1.33 | 626.22 | 0.59 | 1.59 | 626.23 | 0.63 | 1.86 | 626.25 | 0.64 | 2.55 | 626.29 | 0.70 | 13.32 | 626.53 | 1.19 |
| 49 | trib 11 | 11 | 0.16 | 0.42 | 627.51 | 0.68 | 0.52 | 627.52 | 0.75 | 0.67 | 627.52 | 0.91 | 0.82 | 627.48 | 2.17 | 0.97 | 627.55 | 0.98 | 1.41 | 627.58 | 1.05 | 7.98 | 627.80 | 1.70 |
| 50 | trib 11 | 11 | 0.18 | 0.42 | 628.25 | 1.03 | 0.52 | 628.26 | 1.18 | 0.67 | 628.27 | 1.22 | 0.82 | 628.30 | 1.18 | 0.97 | 628.29 | 1.48 | 1.41 | 628.32 | 1.66 | 7.98 | 628.56 | 2.40 |
| 51 | trib 11 | 11 | 0.21 | 0.42 | 629.89 | 0.69 | 0.52 | 629.90 | 0.68 | 0.67 | 629.91 | 0.76 | 0.82 | 629.91 | 0.88 | 0.97 | | | | | | | | |

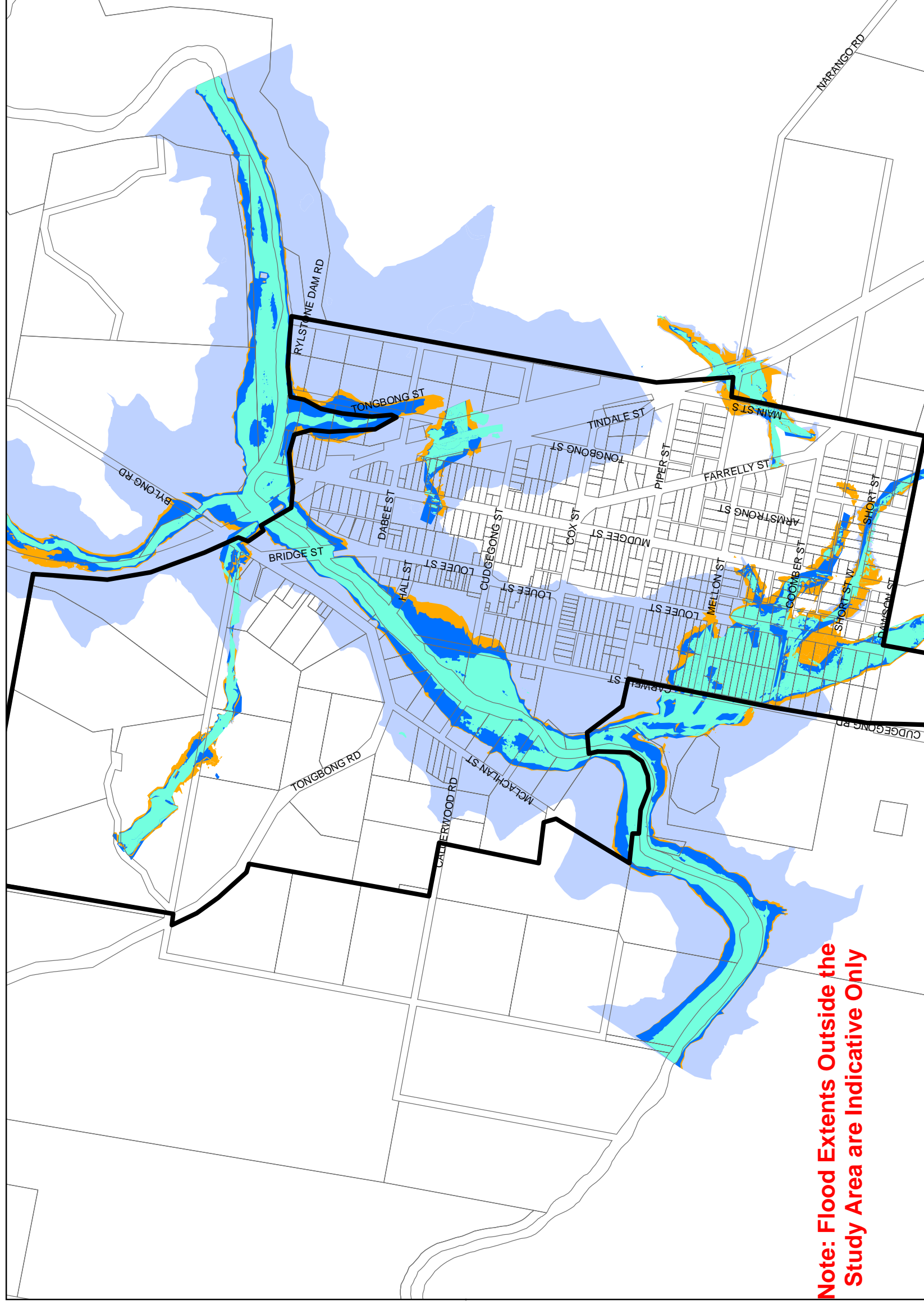
| Cross Section ID* | River | Reach | River Station | 20% AEP | | | 10% AEP | | | 5% AEP | | | 2% AEP | | | 1% AEP | | | 0.5% AEP | | | PMF | | |
|-------------------|--------|-------|---------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|
| | | | | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) |
| 61 | | 14 | 0.46 | 6.91 | 619.26 | 1.49 | 8.42 | 619.28 | 1.63 | 10.47 | 619.31 | 1.77 | 12.72 | 619.33 | 1.90 | 14.92 | 619.35 | 2.01 | 21.56 | 619.42 | 2.22 | 124.25 | 619.90 | 3.16 |
| 62 | | 14 | 0.48 | 6.91 | 619.91 | 1.36 | 8.42 | 619.98 | 1.51 | 10.47 | 619.98 | 1.51 | 12.72 | 620.02 | 1.57 | 14.92 | 620.05 | 1.63 | 21.56 | 620.12 | 1.79 | 124.25 | 620.49 | 3.92 |
| 63 | | 14 | 0.51 | 6.91 | 620.58 | 3.42 | 8.42 | 620.63 | 3.30 | 10.47 | 620.63 | 3.30 | 12.72 | 620.65 | 3.46 | 14.92 | 620.66 | 3.63 | 21.56 | 620.69 | 4.56 | 124.25 | 621.03 | 7.32 |
| 64 | | 14 | 0.6 | 6.20 | 625.73 | 1.11 | 7.54 | 625.74 | 1.27 | 9.38 | 625.77 | 1.34 | 11.40 | 625.80 | 1.38 | 13.44 | 625.82 | 1.44 | 19.42 | 625.89 | 1.55 | 112.42 | 626.38 | 2.30 |
| 65 | | 14 | 0.66 | 6.20 | 625.94 | 0.42 | 7.54 | 625.98 | 0.45 | 9.38 | 626.01 | 0.50 | 11.40 | 626.05 | 0.53 | 13.44 | 626.09 | 0.58 | 19.42 | 626.18 | 0.66 | 112.42 | 626.77 | 1.25 |
| 66 | | 14 | 0.7 | 6.20 | 627.16 | 1.42 | 7.54 | 627.18 | 1.54 | 9.38 | 627.21 | 1.59 | 11.40 | 627.23 | 1.70 | 13.44 | 627.25 | 1.80 | 19.42 | 627.30 | 1.99 | 112.42 | 627.55 | 3.25 |
| 67 | | 14 | 0.77 | 6.20 | 629.53 | 1.25 | 7.54 | 629.55 | 1.31 | 9.38 | 629.56 | 1.49 | 11.40 | 629.58 | 1.58 | 13.44 | 629.59 | 1.65 | 19.42 | 629.64 | 1.86 | 112.42 | 629.99 | 2.75 |
| 68 | | 14 | 0.81 | 3.20 | 630.83 | 1.08 | 3.99 | 630.85 | 1.18 | 5.13 | 630.88 | 1.15 | 6.55 | 630.91 | 1.28 | 7.80 | 630.92 | 1.38 | 11.83 | 630.98 | 1.55 | 71.59 | 631.24 | 3.27 |
| 69 | | 14 | 0.86 | 3.20 | 631.87 | 1.01 | 3.99 | 631.89 | 1.06 | 5.13 | 631.91 | 1.25 | 6.55 | 631.94 | 1.32 | 7.80 | 631.97 | 1.36 | 11.83 | 632.03 | 1.53 | 71.59 | 632.56 | 2.44 |
| 70 | trib 2 | 2 | 0.03 | 1.30 | 631.10 | 0.97 | 1.51 | 631.11 | 0.96 | 1.78 | 631.12 | 1.07 | 2.04 | 631.12 | 1.17 | 2.34 | 631.13 | 1.17 | 2.95 | 631.14 | 1.39 | 15.23 | 631.36 | 2.25 |
| 71 | trib 2 | 2 | 0.08 | 1.30 | 632.12 | 0.52 | 1.51 | 632.12 | 0.59 | 1.78 | 632.14 | 0.58 | 2.04 | 632.15 | 0.59 | 2.34 | 632.16 | 0.65 | 2.95 | 632.19 | 0.66 | 15.23 | 632.43 | 1.22 |
| 72 | trib 2 | 2 | 0.11 | 1.30 | 634.33 | 0.86 | 1.51 | 634.27 | 0.93 | 1.78 | 634.34 | 0.93 | 2.04 | 634.35 | 0.98 | 2.34 | 634.36 | 1.01 | 2.95 | 634.36 | 1.21 | 15.23 | 634.51 | 1.88 |
| 73 | trib 2 | 2 | 0.15 | 1.30 | 636.00 | 0.98 | 1.51 | 636.02 | 0.94 | 1.78 | 636.02 | 1.09 | 2.04 | 636.03 | 1.11 | 2.34 | 636.04 | 1.16 | 2.95 | 636.07 | 1.08 | 15.23 | 636.24 | 1.95 |
| 74 | trib 2 | 2 | 0.2 | 0.76 | 637.99 | 0.54 | 0.89 | 637.99 | 0.69 | 1.04 | 637.99 | 0.80 | 1.19 | 638.00 | 0.74 | 1.37 | 638.00 | 0.70 | 1.72 | 638.01 | 0.72 | 8.81 | 638.09 | 1.22 |
| 75 | trib 2 | 2 | 0.24 | 0.76 | 638.91 | 0.34 | 0.89 | 638.91 | 0.38 | 1.04 | 638.92 | 0.42 | 1.19 | 638.94 | 0.42 | 1.37 | 638.95 | 0.45 | 1.72 | 638.97 | 0.49 | 8.81 | 639.22 | 0.85 |
| 76 | trib 2 | 2 | 0.26 | 0.76 | 640.32 | 0.92 | 0.89 | 640.32 | 1.06 | 1.04 | 640.32 | 1.20 | 1.19 | 640.33 | 1.26 | 1.37 | 640.34 | 1.28 | 1.72 | 640.35 | 1.33 | 8.81 | 640.47 | 2.45 |
| 77 | trib 2 | 2 | 0.29 | 0.76 | 641.54 | 0.39 | 0.89 | 641.54 | 0.43 | 1.04 | 641.55 | 0.46 | 1.19 | 641.56 | 0.47 | 1.37 | 641.57 | 0.48 | 1.72 | 641.60 | 0.49 | 8.81 | 641.81 | 0.91 |
| 78 | trib 2 | 2 | 0.33 | 0.76 | 642.95 | 0.42 | 0.89 | 642.95 | 0.46 | 1.04 | 642.97 | 0.48 | 1.19 | 642.98 | 0.49 | 1.37 | 642.99 | 0.51 | 1.72 | 643.01 | 0.54 | 8.81 | 643.19 | 0.79 |
| 79 | trib 2 | 2 | 0.35 | 0.76 | 643.93 | 0.70 | 0.89 | 643.94 | 0.77 | 1.04 | 643.94 | 0.77 | 1.19 | 643.94 | 0.80 | 1.37 | 643.95 | 0.84 | 1.72 | 643.96 | 0.90 | 8.81 | 644.08 | 1.69 |
| 80 | trib 2 | 2 | 0.05 | 1.03 | 625.93 | 0.80 | 1.24 | 625.94 | 0.90 | 1.47 | 625.94 | 0.97 | 1.69 | 625.95 | 0.97 | 1.98 | 625.95 | 1.16 | 2.56 | 626.04 | 0.48 | 13.48 | 626.47 | 0.43 |
| 81 | trib 3 | 3 | 0.1 | 1.03 | 627.31 | 1.15 | 1.24 | 627.31 | 1.25 | 1.47 | 627.32 | 1.24 | 1.69 | 627.32 | 1.34 | 1.98 | 627.34 | 1.32 | 2.56 | 627.35 | 1.47 | 13.48 | 627.46 | 2.50 |
| 82 | trib 3 | 3 | 0.13 | 1.03 | 629.64 | 0.85 | 1.24 | 629.64 | 0.98 | 1.47 | 629.66 | 0.87 | 1.69 | 629.66 | 0.99 | 1.98 | 629.69 | 0.84 | 2.56 | 629.69 | 1.02 | 13.48 | 629.89 | 1.52 |
| 83 | trib 3 | 3 | 0.17 | 0.58 | 629.73 | 0.17 | 0.79 | 629.75 | 0.19 | 1.02 | 629.55 | 2.26 | 1.22 | 629.78 | 0.24 | 1.51 | 629.80 | 0.27 | 2.06 | 629.83 | 0.31 | 12.81 | 630.12 | 0.65 |
| 84 | trib 3 | 3 | 0.21 | 0.36 | 631.42 | 0.61 | 0.53 | 631.42 | 0.85 | 0.71 | 631.44 | 0.69 | 0.87 | 631.44 | 0.83 | 1.09 | 631.46 | 0.70 | 1.53 | 631.47 | 0.85 | 10.56 | 631.61 | 1.76 |
| 85 | trib 3 | 3 | 0.25 | 0.36 | 633.04 | 0.28 | 0.53 | 633.04 | 0.37 | 0.71 | 633.07 | 0.34 | 0.87 | 633.07 | 0.39 | 1.09 | 633.10 | 0.38 | 1.53 | 633.12 | 0.44 | 10.36 | 633.32 | 0.90 |
| 86 | trib 3 | 3 | 0.28 | 0.35 | 633.41 | 1.29 | 0.34 | 633.41 | 1.39 | 0.46 | 633.42 | 1.49 | 0.60 | 633.43 | 1.57 | 0.75 | 633.43 | 1.62 | 1.06 | 633.45 | 1.76 | 6.42 | 633.55 | 2.66 |
| 87 | trib 3 | 3 | 0.3 | 0.17 | 635.00 | 0.54 | 0.26 | 635.00 | 0.69 | 0.36 | 635.02 | 0.75 | 0.45 | 635.02 | 0.75 | 0.58 | 635.05 | 0.90 | 0.84 | 635.05 | 0.90 | 5.13 | 635.20 | 1.59 |
| 88 | trib 3 | 3 | 0.09 | 1.80 | 617.09 | 0.24 | 2.12 | 617.10 | 0.26 | 2.52 | 617.12 | 0.28 | 3.05 | 617.14 | 0.30 | 3.52 | 617.16 | 0.31 | 4.72 | 617.20 | 0.35 | 30.06 | 617.66 | 0.68 |
| 89 | | 87 | 0.2 | 1.80 | 620.27 | 0.93 | 2.12 | 620.29 | 0.85 | 2.52 | 620.30 | 0.98 | 3.05 | 620.31 | 1.00 | 3.52 | 620.32 | 1.06 | 4.72 | 620.35 | 1.11 | 30.06 | 620.59 | 1.84 |
| 90 | | 87 | 0.32 | 1.80 | 623.87 | 1.08 | 2.12 | 623.88 | 1.14 | 2.52 | 623.89 | 1.14 | 3.05 | 623.90 | 1.28 | 3.52 | 623.90 | 1.32 | 4.72 | 623.91 | 1.59 | 30.06 | 624.12 | 1.99 |
| 91 | | 87 | 0.38 | 1.73 | 625.87 | 1.04 | 2.03 | 625.89 | 1.07 | 2.42 | 625.90 | 1.13 | 2.94 | 625.92 | 1.13 | 3.39 | 625.94 | 1.17 | 4.53 | 625.98 | 1.22 | 27.38 | 626.01 | 1.58 |
| 92 | | 87 | 0.51 | 1.61 | 630.31 | 0.15 | 1.89 | 630.32 | 0.15 | 2.26 | 630.33 | 0.15 | 2.76 | 630.34 | 0.17 | 3.18 | 630.35 | 0.18 | 4.28 | 630.36 | 0.21 | 27.76 | 630.55 | 0.26 |
| 93 | | 87 | 0.57 | 1.18 | 632.61 | 0.36 | 1.37 | 632.62 | 0.37 | 1.61 | 632.63 | 0.39 | 2.00 | 632.65 | 0.40 | 2.47 | 632.67 | 0.43 | 3.89 | 632.72 | 0.46 | 24.77 | 632.93 | 0.83 |
| 94 | | 87 | 0.64 | 1.03 | 635.24 | 0.85 | 1.20 | 635.24 | 0.83 | 1.41 | 635.25 | 0.81 | 1.75 | 635.26 | 0.85 | 2.18 | 635.27 | 0.96 | 3.56 | 635.29 | 1.15 | 23.07 | 635.43 | 2.30 |
| 95 | | 87 | 0.7 | 1.03 | 637.34 | 0.84 | 1.20 | 637.34 | 0.92 | 1.41 | 637.35 | 0.94 | 1.75 | 637.37 | 0.92 | 2.18 | 637.39 | 0.90 | 3.56 | 637.43 | 0.96 | 23.07 | 637.62 | 1.77 |
| 96 | | 87 | 0.77 | 0.55 | 640.18 | 1.19 | 0.87 | 640.20 | 0.95 | 1.21 | 640.21 | 1.17 | 1.63 | 640.22 | 1.12 | 2.08 | 640.23 | 1.81 | 3.20 | 640.23 | 1.91 | 20.91 | 640.38 | 3.09 |
| 97 | | 87 | 0.79 | 0.54 | 641.30 | 0.55 | 0.83 | 641.30 | 0.74 | 1.18 | 641.32 | 0.78 | 1.59 | 641.33 | 0.93 | 2.03 | 641.36 | 0.79 | 3.14 | 641.38 | 0.90 | 20.73 | 641.59 | 1.55 |
| 98 | | 40 | 0.04 | 0.56 | 623.69 | 0.17 | 0.66 | 623.70 | 0.18 | 0.77 | 623.71 | 0.19 | 0.87 | 623.72 | 0.19 | 1.00 | 623.73 | 0.20 | 1.28 | 623.76 | 0.22 | 6.80 | 624.05 | 0.40 |
| 99 | | 40 | 0.07 | 0.56 | 624.87 | 0.91 | 0.66 | 624.88 | 0.85 | 0.77 | 624.89 | 0.94 | 0.87 | 624.89 | 1.02 | 1.00 | 624.92 | 0.89 | 1.28 | 624.93 | 1.00 | 6.80 | 625.12 | 1.46 |
| 100 | | 40 | 0.08 | 0.56 | 625.89 | 0.66 | 0.66 | 625.84 | 2.34 | 0.77 | 625.90 | 0.76 | 0.87 | 625.91 | 0.76 | 1.00 | 625.91 | 0.94 | 1.28 | 625.91 | 1.21 | 6.80 | 625.97 | 3.39 |
| 101 | | 40 | 0.1 | 0.56 | 626.28 | 1.39 | 0.66 | 626.30 | 1.42 | 0.77 | 626.33 | 1.43 | 0.87 | 626.34 | 1.54 | 1.00 | 626.37 | 1.57 | 1.28 | 626.43 | 1.58 | 6.80 | 626.91 | 2.49 |
| 102 | | 40 | 0.11 | 0.56 | 627.12 | 0.17 | 0.66 | 627.12 | 0.16 | 0.77 | 627.15 | 0.06 | 0.87 | 627.15 | 0.07 | 1.00 | 627.15 | 0.08 | 1.28 | 627.15 | 0.10 | 6.80 | 627.73 | 0.35 |
| 103 | | 40 | 0.13 | 0.56 | 627.30 | 1.34 | 0.66 | 627.32 | 1.42 | 0.77 | 627.32 | 0.89 | 0.87 | 627.32 | 0.99 | 1.00 | 627.32 | 1.13 | 1.28 | 627.32 | 1.52 | 6.80 | 628.03 | 2.95 |
| 104 | | 40 | 0.14 | 0.56 | 628.52 | 0.05 | 0.66 | 628.53 | 0.06 | 0.77 | 628.54 | 0.07 | 0.87 | 628.55 | 0.07 | 1.00 | 628.55 | 0.09 | 1.28 | 628.57 | 0.10 | 6.80 | 628.75 | 0.37 |
| 105 | | 40 | 0.16 | 0.18 | 628.52 | 0.30 | 0.21 | 628.53 | 0.30 | 0.24 | 628.54 | 0.29 | 0.28 | 628.48 | 2.36 | 0.32 | 628.54 | 0.34 | 0.39 | 628.57 | 0.31 | 1.95 | 628.75 | 0.45 |
| 106 | | 40 | 0.17 | 0.18 | 628.93 | 0.61 | 0.21 | 628.94 | 0.63 | 0.24 | 628.94 | 0.66 | 0.28 | 628.94 | 0.70 | 0.32 | 628.94 | 0.71 | 0.39 | 628.96 | 0.71 | 1.95 | 629.05 | 1.20 |
| 107 | | 40 | 0.19 | 0.18 | 629.54 | 0.75 | 0.21 | 629.54 | 0.82 | 0.24 | 629.54 | 0.91 | 0.28 | 629.55 | 0.95 | 0.32 | 629.55 | 0.98 | 0.39 | 629.56 | 0.99 | 1.95 | 629.65 | 1.64 |
| 108 | | 40 | 0.2 | 0.18 | 630.29 | 0.79 | 0.21 | 630.29 | 0.78 | 0.24 | 630.30 | 0.79 | 0.28 | 630.31 | 0.83 | 0.32 | 630.31 | 0.87 | 0.39 | 630.32 | 0.96 | 1.95 | 630.42 | 1.56 |
| 109 | | 40 | 0.22 | 0.18 | 631.96 | 1.24 | 0.21 | 631.96 | 1.57 | 0.24 | 631.95 | 2.05 | 0.28 | 631.96 | 2.16 | 0.32 | 631.96 | 2.11 | 0.39 | 631.97 | 1.83 | 1.95 | 632.00 | 3.72 |
| 110 | | 40 | 0.23 | 0.18 | 633.61 | 0.79 | 0.21 | 633.62 | 0.76 | 0.24 | 633.63 | 0.74 | 0.28 | 633.64 | 0.77 | 0.32 | 633.64 | 0.81 | 0.39 | 633.65 | 0.92 | 1.95 | 633.79 | 1.24 |
| 111 | | 28 | | | | | | | | | | | | | | | | | | | | | | |

| Cross Section ID* | River | Reach | River Station | 20% AEP | | | 10% AEP | | | 5% AEP | | | 2% AEP | | | 1% AEP | | | 0.5% AEP | | | PMF | | |
|-------------------|--------|-------|---------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|----------------|------------------|----------------|
| | | | | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) | Q Total (m³/s) | W.S. Elev (mAHD) | Vel Chnl (m/s) |
| 121 | | | 0 | 0.29 | 632.45 | 0.70 | 0.42 | 632.47 | 0.94 | 0.69 | 632.51 | 1.11 | 1.14 | 632.54 | 1.16 | 1.69 | 632.57 | 1.29 | 11.07 | 632.83 | 2.15 | 11.07 | 632.83 | 2.15 |
| 122 | | | 0 | 0.31 | 633.44 | 0.61 | 0.42 | 633.48 | 0.55 | 0.69 | 633.48 | 0.85 | 1.14 | 633.51 | 0.93 | 1.69 | 633.53 | 1.04 | 11.07 | 633.74 | 1.56 | 11.07 | 633.74 | 1.56 |
| 123 | | | 0 | 0.34 | 633.98 | 0.33 | 0.42 | 633.98 | 0.54 | 0.69 | 633.99 | 0.49 | 1.14 | 634.02 | 0.62 | 1.69 | 634.03 | 0.72 | 11.07 | 634.19 | 1.43 | 11.07 | 634.19 | 1.43 |
| 124 | | | 0 | 0.03 | 625.43 | 0.31 | 0.83 | 625.45 | 0.33 | 0.99 | 625.48 | 0.36 | 1.27 | 625.52 | 0.37 | 1.64 | 625.57 | 0.40 | 8.48 | 626.09 | 0.63 | 8.48 | 626.09 | 0.63 |
| 125 | | | 0 | 0.07 | 627.26 | 0.81 | 0.83 | 627.27 | 0.91 | 0.99 | 627.27 | 1.02 | 1.27 | 627.31 | 0.88 | 1.64 | 627.31 | 1.10 | 8.48 | 627.52 | 1.62 | 8.48 | 627.52 | 1.62 |
| 126 | | | 0 | 0.11 | 628.03 | 0.53 | 0.83 | 628.04 | 0.53 | 0.99 | 628.05 | 0.58 | 1.27 | 628.07 | 0.65 | 1.64 | 628.09 | 0.71 | 8.48 | 628.17 | 2.25 | 8.48 | 628.17 | 2.25 |
| 127 | | | 0 | 0.13 | 628.91 | 1.37 | 0.83 | 628.94 | 1.38 | 0.99 | 628.96 | 1.44 | 1.27 | 629.01 | 1.54 | 1.64 | 629.05 | 1.65 | 8.48 | 629.60 | 2.79 | 8.48 | 629.60 | 2.79 |
| 128 | | | 0 | 0.18 | 632.23 | 0.01 | 0.73 | 632.24 | 0.01 | 0.87 | 632.25 | 0.01 | 1.10 | 632.25 | 0.01 | 1.41 | 632.26 | 0.01 | 7.94 | 632.38 | 0.07 | 7.94 | 632.38 | 0.07 |
| 129 | | | 0 | 0.19 | 632.23 | 0.01 | 0.71 | 632.24 | 0.01 | 0.84 | 632.25 | 0.01 | 1.07 | 632.25 | 0.01 | 1.36 | 632.26 | 0.02 | 7.05 | 632.38 | 0.07 | 7.05 | 632.38 | 0.07 |
| 130 | | | 0 | 0.22 | 632.23 | 0.08 | 0.71 | 632.24 | 0.09 | 0.84 | 632.24 | 0.11 | 1.07 | 632.24 | 0.14 | 1.36 | 632.26 | 0.17 | 7.05 | 632.36 | 0.83 | 7.05 | 632.36 | 0.83 |
| 131 | | | 0 | 0.25 | 632.26 | 0.10 | 0.42 | 632.28 | 0.11 | 0.49 | 632.30 | 0.13 | 0.56 | 632.32 | 0.15 | 0.65 | 632.34 | 0.17 | 4.18 | 634.56 | 0.07 | 4.18 | 634.56 | 0.07 |
| 132 | | | 0 | 0.27 | 633.40 | 0.96 | 0.42 | 633.41 | 0.84 | 0.49 | 633.41 | 0.95 | 0.65 | 633.44 | 0.82 | 0.81 | 633.44 | 1.02 | 4.18 | 634.56 | 0.13 | 4.18 | 634.56 | 0.13 |
| 133 | | | 0 | 0.3 | 634.48 | 0.67 | 0.42 | 634.47 | 0.81 | 0.49 | 634.49 | 0.81 | 0.65 | 634.50 | 0.86 | 0.81 | 634.50 | 0.98 | 4.18 | 634.66 | 1.36 | 4.18 | 634.66 | 1.36 |
| 134 | | | 0 | 0.32 | 635.00 | 0.58 | 0.42 | 635.01 | 0.54 | 0.49 | 635.01 | 0.62 | 0.65 | 635.03 | 0.66 | 0.81 | 635.04 | 0.70 | 4.18 | 635.16 | 1.22 | 4.18 | 635.16 | 1.22 |
| 135 | | | 0 | 0.35 | 635.77 | 0.29 | 0.42 | 635.77 | 0.32 | 0.49 | 635.78 | 0.32 | 0.56 | 635.80 | 0.35 | 0.81 | 635.81 | 0.37 | 4.18 | 635.98 | 0.64 | 4.18 | 635.98 | 0.64 |
| 136 | | | 0 | 0.37 | 637.06 | 0.80 | 0.42 | 637.07 | 0.76 | 0.49 | 637.07 | 0.78 | 0.56 | 637.08 | 0.82 | 0.65 | 637.10 | 0.91 | 4.18 | 637.25 | 1.30 | 4.18 | 637.25 | 1.30 |
| 137 | | | 0 | 0.02 | 626.82 | 0.38 | 1.92 | 626.84 | 0.39 | 2.14 | 626.86 | 0.41 | 2.46 | 626.88 | 0.43 | 2.78 | 626.91 | 0.44 | 18.53 | 627.45 | 0.83 | 18.53 | 627.45 | 0.83 |
| 138 | | | 0 | 0.04 | 627.39 | 1.82 | 1.92 | 627.41 | 1.86 | 2.14 | 627.50 | 1.52 | 2.78 | 627.53 | 1.51 | 2.78 | 627.56 | 1.52 | 18.53 | 627.95 | 2.37 | 18.53 | 627.95 | 2.37 |
| 139 | | | 0 | 0.06 | 627.60 | 0.69 | 1.92 | 627.63 | 0.72 | 2.14 | 627.66 | 0.78 | 2.46 | 627.69 | 0.86 | 2.78 | 627.72 | 0.94 | 18.53 | 628.35 | 3.56 | 18.53 | 628.35 | 3.56 |
| 140 | | | 0 | 0.09 | 628.46 | 0.38 | 1.72 | 628.66 | 0.36 | 1.93 | 628.96 | 0.34 | 2.23 | 629.13 | 0.40 | 3.48 | 629.44 | 0.49 | 17.26 | 631.15 | 1.40 | 17.26 | 631.15 | 1.40 |
| 141 | | | 0 | 0.11 | 629.39 | 0.46 | 1.72 | 629.54 | 0.44 | 1.93 | 629.79 | 0.41 | 2.23 | 630.25 | 0.34 | 2.58 | 630.73 | 0.31 | 17.26 | 632.75 | 0.13 | 17.26 | 632.75 | 0.13 |
| 142 | | | 0 | 0.14 | 631.67 | 0.93 | 1.35 | 631.67 | 0.95 | 1.57 | 631.68 | 1.04 | 1.96 | 631.70 | 1.04 | 2.30 | 631.72 | 1.07 | 16.13 | 632.75 | 0.24 | 16.13 | 632.75 | 0.24 |
| 143 | | | 0 | 0.18 | 631.96 | 1.69 | 0.92 | 631.97 | 1.79 | 1.25 | 631.98 | 1.97 | 1.62 | 631.99 | 2.05 | 1.96 | 631.99 | 2.13 | 14.76 | 632.75 | 0.40 | 14.76 | 632.75 | 0.40 |
| 144 | | | 0 | 0.21 | 634.70 | 0.83 | 0.48 | 634.71 | 1.07 | 0.73 | 634.73 | 1.09 | 1.03 | 634.75 | 1.15 | 1.31 | 634.76 | 1.20 | 13.44 | 634.92 | 2.49 | 13.44 | 634.92 | 2.49 |
| 145 | | | 0 | 0.23 | 635.21 | 0.76 | 0.48 | 635.24 | 0.83 | 0.73 | 635.27 | 0.93 | 1.03 | 635.29 | 1.01 | 1.31 | 635.31 | 1.11 | 13.44 | 635.68 | 1.62 | 13.44 | 635.68 | 1.62 |
| 146 | | | 0 | 0.25 | 635.27 | 0.29 | 0.48 | 635.31 | 0.38 | 0.73 | 635.35 | 0.45 | 1.03 | 635.38 | 0.51 | 1.31 | 635.41 | 0.56 | 13.44 | 635.48 | 3.93 | 13.44 | 635.48 | 3.93 |
| 147 | | | 0 | 0.27 | 636.09 | 1.37 | 0.48 | 636.11 | 1.56 | 0.73 | 636.13 | 1.73 | 1.03 | 636.15 | 1.88 | 1.31 | 636.17 | 1.93 | 13.44 | 636.40 | 3.57 | 13.44 | 636.40 | 3.57 |
| 148 | | | 0 | 0.29 | 637.06 | 0.70 | 0.48 | 637.09 | 0.80 | 0.73 | 637.11 | 0.85 | 1.03 | 637.13 | 0.94 | 1.31 | 637.14 | 1.01 | 13.44 | 637.39 | 2.07 | 13.44 | 637.39 | 2.07 |
| 149 | trib 9 | | 9 | 0.1 | 612.91 | 2.24 | 7.09 | 612.99 | 2.38 | 9.08 | 612.99 | 2.38 | 13.01 | 613.06 | 2.55 | 16.42 | 613.12 | 2.66 | 98.20 | 613.74 | 3.56 | 98.20 | 613.74 | 3.56 |
| 150 | trib 9 | | 9 | 0.13 | 614.26 | 1.70 | 7.09 | 614.27 | 1.79 | 9.08 | 614.30 | 1.96 | 13.01 | 614.35 | 2.22 | 16.42 | 614.39 | 2.42 | 98.20 | 614.84 | 4.49 | 98.20 | 614.84 | 4.49 |
| 151 | trib 9 | | 9 | 0.21 | 616.23 | 1.33 | 7.09 | 616.25 | 1.36 | 9.08 | 616.29 | 1.45 | 13.01 | 616.35 | 1.59 | 16.42 | 616.40 | 1.68 | 98.20 | 616.97 | 2.58 | 98.20 | 616.97 | 2.58 |
| 152 | trib 9 | | 9 | 0.28 | 617.09 | 2.10 | 7.09 | 617.12 | 1.88 | 9.08 | 617.14 | 2.02 | 13.01 | 617.18 | 2.26 | 16.42 | 617.21 | 2.50 | 98.20 | 617.61 | 4.69 | 98.20 | 617.61 | 4.69 |
| 153 | trib 9 | | 9 | 0.32 | 618.82 | 1.54 | 7.09 | 618.82 | 1.79 | 9.08 | 618.85 | 1.98 | 13.01 | 618.92 | 2.27 | 16.42 | 618.97 | 2.40 | 98.20 | 619.66 | 3.92 | 98.20 | 619.66 | 3.92 |
| 154 | trib 9 | | 9 | 0.35 | 619.50 | 2.48 | 7.09 | 619.60 | 1.68 | 9.08 | 619.64 | 1.78 | 13.01 | 619.73 | 1.91 | 16.42 | 619.78 | 2.07 | 98.20 | 620.58 | 2.95 | 98.20 | 620.58 | 2.95 |
| 155 | trib 9 | | 9 | 0.38 | 620.34 | 1.61 | 7.09 | 620.39 | 1.38 | 9.08 | 620.42 | 1.51 | 13.01 | 620.47 | 1.75 | 16.42 | 620.51 | 1.86 | 98.20 | 621.05 | 3.31 | 98.20 | 621.05 | 3.31 |
| 156 | trib 9 | | 9 | 0.41 | 621.10 | 1.24 | 7.09 | 621.11 | 1.31 | 9.08 | 621.14 | 1.40 | 13.01 | 621.20 | 1.58 | 16.42 | 621.24 | 1.70 | 98.20 | 621.78 | 3.24 | 98.20 | 621.78 | 3.24 |
| 157 | trib 9 | | 9 | 0.45 | 621.85 | 1.25 | 7.09 | 621.85 | 1.31 | 9.08 | 621.88 | 1.45 | 13.01 | 621.95 | 1.64 | 16.42 | 621.99 | 1.81 | 98.20 | 622.56 | 3.67 | 98.20 | 622.56 | 3.67 |
| 158 | trib 9 | | 9 | 0.51 | 623.22 | 3.12 | 7.09 | 623.22 | 3.35 | 9.08 | 623.24 | 3.86 | 13.01 | 623.27 | 4.63 | 16.42 | 623.28 | 5.22 | 98.20 | 623.52 | 9.78 | 98.20 | 623.52 | 9.78 |
| 159 | trib 9 | | 9 | 0.56 | 625.14 | 2.47 | 7.06 | 625.19 | 2.58 | 9.03 | 625.31 | 2.80 | 12.94 | 625.53 | 3.17 | 16.32 | 625.70 | 3.41 | 98.20 | 628.09 | 0.36 | 98.20 | 628.09 | 0.36 |
| 160 | trib 9 | | 9 | 0.59 | 627.85 | 0.62 | 7.06 | 628.11 | 0.06 | 9.03 | 628.15 | 0.07 | 12.94 | 628.20 | 0.10 | 16.32 | 628.24 | 0.12 | 98.20 | 628.77 | 0.53 | 98.20 | 628.77 | 0.53 |
| 161 | trib 9 | | 9 | 0.6 | 628.18 | 1.18 | 7.06 | 628.20 | 1.22 | 9.03 | 628.22 | 1.32 | 12.94 | 628.28 | 1.45 | 16.32 | 628.31 | 1.56 | 98.20 | 628.87 | 2.61 | 98.20 | 628.87 | 2.61 |
| 162 | trib 9 | | 9 | 0.66 | 628.99 | 1.00 | 7.06 | 628.92 | 1.64 | 9.03 | 628.97 | 1.62 | 12.94 | 629.00 | 1.91 | 16.32 | 629.04 | 2.07 | 98.20 | 629.46 | 3.86 | 98.20 | 629.46 | 3.86 |
| 163 | trib 9 | | 9 | 0.69 | 629.60 | 1.25 | 7.06 | 629.61 | 1.35 | 9.03 | 629.64 | 1.42 | 12.94 | 629.70 | 1.55 | 16.32 | 629.75 | 1.67 | 98.20 | 630.37 | 2.79 | 98.20 | 630.37 | 2.79 |
| 164 | trib 9 | | 9 | 0.73 | 629.94 | 1.79 | 7.06 | 629.95 | 1.86 | 9.03 | 629.98 | 2.05 | 12.94 | 630.03 | 2.19 | 16.32 | 630.06 | 2.35 | 98.20 | 630.60 | 3.67 | 98.20 | 630.60 | 3.67 |
| 165 | trib 9 | | 9 | 0.75 | 630.50 | 1.26 | 7.06 | 630.51 | 1.31 | 9.03 | 630.55 | 1.35 | 12.94 | 630.59 | 1.55 | 16.32 | 630.63 | 1.64 | 98.20 | 630.91 | 4.53 | 98.20 | 630.91 | 4.53 |
| 166 | trib 9 | | 9 | 0.77 | 630.75 | 0.89 | 7.06 | 630.76 | 0.93 | 9.03 | 630.79 | 1.04 | 12.94 | 630.86 | 1.15 | 16.32 | 630.76 | 2.20 | 98.20 | 630.82 | 5.01 | 98.20 | 630.82 | 5.01 |
| 167 | trib 9 | | 9 | 0.78 | 630.14 | 5.07 | 6.77 | 630.78 | 2.52 | 8.72 | 630.65 | 3.72 | 10.96 | 631.00 | 3.27 | 13.09 | 631.14 | 3.46 | 98.20 | 634.59 | 6.76 | 98.20 | 634.59 | 6.76 |
| 168 | trib 9 | | 9 | 0.82 | 631.79 | 0.85 | 6.77 | 632.05 | 0.93 | 8.72 | 632.41 | 1.00 | 10.96 | 632.89 | 1.04 | 13.09 | 633.57 | 1.00 | 98.20 | 636.92 | 0.26 | 98.20 | 636.92 | 0.26 |
| 169 | trib 9 | | 9 | 0.83 | 632.24 | 0.87 | 1.99 | 632.24 | 1.09 | 2.56 | 632.47 | 0.37 | 3.23 | 632.96 | 0.12 | 3.81 | 633.63 | 0.06 | 33.14 | 636.92 | 0.09 | 33.14 | 636.92 | 0.09 |
| 170 | trib 9 | | 9 | 0.9 | 634.16 | 0.52 | 1.99 | 634.18 | 0.52 | 2.56 | 634.15 | 0.94 | 3.23 | 634.18 | 0.87 | 3.81 | 634.17 | 1.06 | 33.14 | 636.92 | 0.13 | 33.14 | 636.92 | 0.13 |
| 171 | trib 9 | | 9 | 0.96 | 634.40 | 0.13 | 1.99 | 634.42 | 0.16 | 2.56 | 634.45 | 0.17 | 3.23 | 634.47 | 0.19 | 3.81 | 634.50 | 0.16 | 33.14 | 636.92 | | | | |



Appendix F Combined Riverine and Overland Flood Maps for Rylstone

Figure F-1 Combined Flood Extents for Rylstone



LEGEND

-  Study Area
-  20% AEP Flood Extent
-  1% AEP Flood Extent
-  Provisional Flood Planning Area
-  PMF Flood Extent

The flood inundation map is based on the available data and the assumptions made in the flood study. Hence, the flood study report must be read to draw any conclusion on the basis of the flood inundation map.

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○ [GDA1994 MGA ZONE 55]
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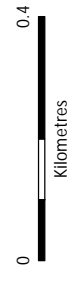
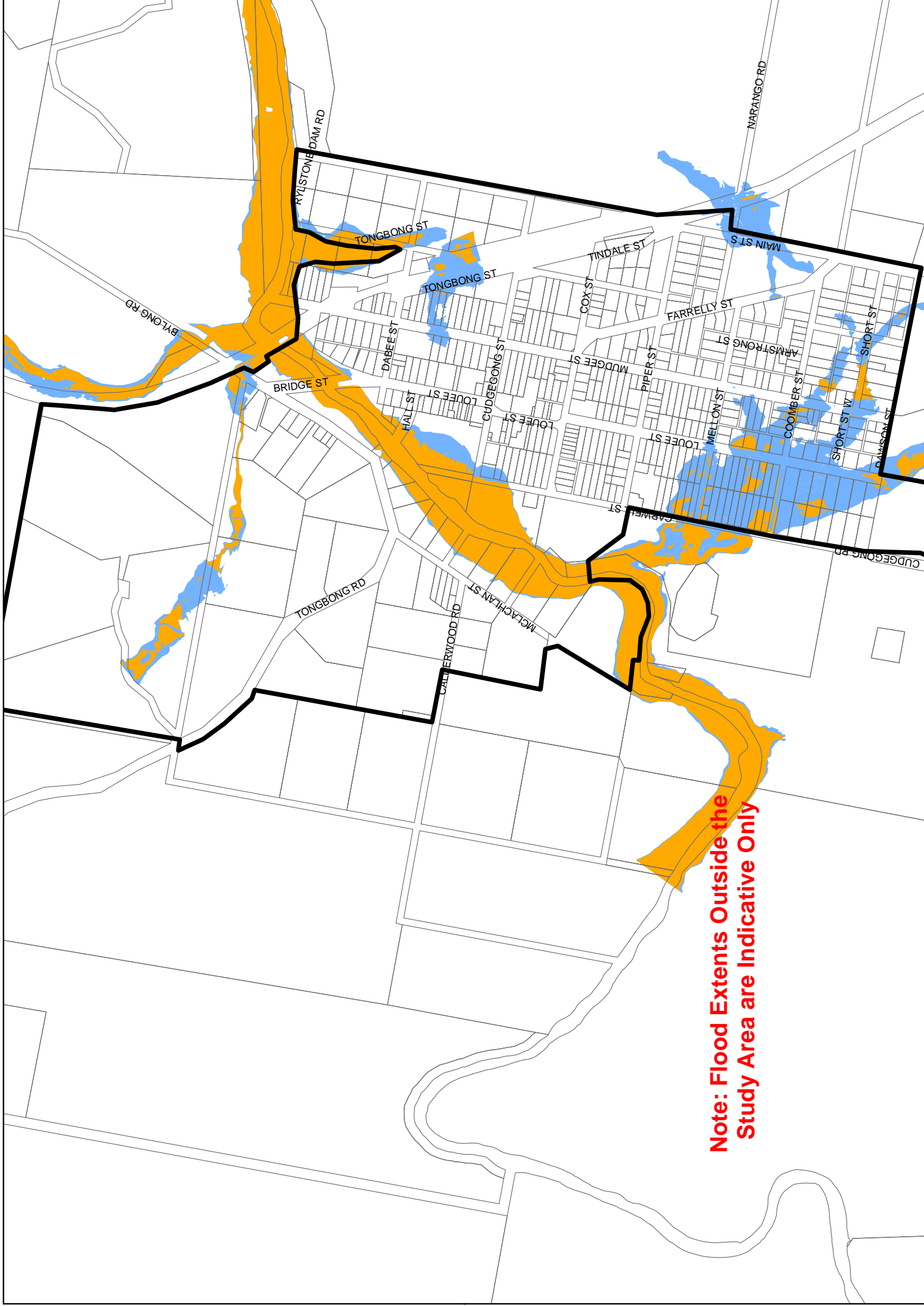


Figure F-2 Combined Provisional Flood Hazard Categorisation for Rylstone



LEGEND

-  Study Area
-  High Hazard
-  Low Hazard

The flood inundation map is based on the available data and the assumptions made in the flood study. Hence, the flood study report must be read to draw any conclusion on the basis of the flood inundation map.

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