

Our Ref LJ8709/Lt4: JMcA/ar

Contact John McArthur

2 February 2011

SMK Consultants
PO Box 281
The Gap QLD 4061

Attention: Mr Ralph Kinsella

Dear Ralph

RE: Flooding Assessment – Proposed Rural Residential Subdivision, Moloney Property

1.0 Introduction

We write to provide details regarding an additional flood assessment undertaken for the proposed rural residential subdivision on the Moloney property. This additional assessment has been carried out following further communication with the New South Wales Department of Environment Climate Change and Water (DECCW). The flood modelling presented in this letter supersedes previous analyses detailed in the Cardno Lawson Treloar (CLT) report dated March 2007 (Our Ref: LJ8709R1_V1) and letter dated 10 March 2010 (Our Ref: LJ8709/Lt3).

2.0 Flood Assessment

The modelling presented in the March 2010 correspondence incorporated the following modifications:

- Survey data as provided by SMK Consultants (received 23 October 2009); and
- Changes to the location, orientation and number of fill pads throughout the site.

The survey data included detailed ground survey of the Macintyre River bank adjacent to the property.

Modelling outcomes indicated a maximum predicted impact of 16mm adjacent to the Goondiwindi Levee in a 1% AEP flood event.

In order to limit flood impacts adjacent to the Goondiwindi Levee to 10mm or less as discussed with DECCW, some of the proposed fill pads throughout the site have been moved and / or re-orientated and 8 lots have been considered undevelopable in terms of filling. Based on the current SMK Consultants Pty Ltd development layout (included as reference drawings), these lots are 20, 22-26 and 37-38. In addition, the maximum fill footprint area on 16 lots has been reduced to 400m² from the previous proposed area of 800m². These lots are 40-41, 64-74 and 92-94.

Minor excavation has also been included in the modelling, involving 'trimming' of the existing ground surface by up to 150mm, with no excavation works occurring within 40m of the River's high bank.



Cardno (Qld) Pty Ltd
Trading as Cardno Lawson
Treloar
ABN 57 051 074 992

Level 11
515 St Paul's Terrace
Fortitude Valley QLD 4064
Australia

Locked Bag 4006
Fortitude Valley QLD 4006
Australia

Phone: 61 7 33102455
Fax: 61 7 3369 9722

www.cardno.com.au

Figure 1 shows the topography difference map associated with the overall site and presents the location and extent of the proposed fill pads and minor excavation.

The impact of the proposed changes to ground level on flow distribution and velocity has also been assessed.

3.0 Model Results

The predicted 1% AEP flood impact associated with this proposal is presented in Figure 2 and shows the maximum flood impact associated with the proposed development adjacent to the Goondiwindi Levee is less than 10mm.

Table 3.1 below summarises existing and developed 1% AEP peak flows at various locations upstream and downstream of the development site as shown on Figure 3.

Table 3.1 - 1% AEP Peak Flow Comparison

Flow Line	Peak Flow (m ³ /s)	
	Existing	Developed
No. 1	950.8	951.5
No. 2	555.5	555.6
No. 3	822.2	818.0
No. 4	75.3	76.2
No. 5	150.6	152.0
No. 6	434.7	436.9

The Table indicates there is only a very minor flow redistribution occurring with basically no change in peak flow entering the development site and a minor decrease (approximately 0.5%) in Macintyre River channel flow downstream of the site with a corresponding increase in floodplain flow.

Peak velocities and flow patterns are shown on Figures 4 and 5 for the existing and proposed Case 1% AEP events respectively. Peak floodplain velocities generally range between 0.25 and 1.0 m/s. Figure 6 shows the pre and post velocity difference and indicates velocity changes are confined to the development site.

4.0 Conclusions

Flood modelling of revised earthworks extents within the Moloney property has been undertaken. This has included:

- No development on eight (8) current Lots;
- Maximum fill pad area limited to 400m² on sixteen (16) current Lots with the remaining Lots having a maximum fill footprint area of 800m²;and
- Minor excavation involving 'trimming' of the existing surface by up to 150mm with no excavation works occurring within 40m of the River's high bank

The predicted maximum flood impact adjacent to the Goondiwindi Levee is less than 10mm and the modelling demonstrates there is no significant change to existing flow distribution or floodplain velocity.

2 February 2011

Minimum fill pad levels can be determined from the current flood modelling but will typically be in the range of 218.0 to 218.5mAHD.

Please contact the undersigned should you require any further information.

Yours faithfully



John McArthur
Project Manager
For Cardno Lawson Treloar

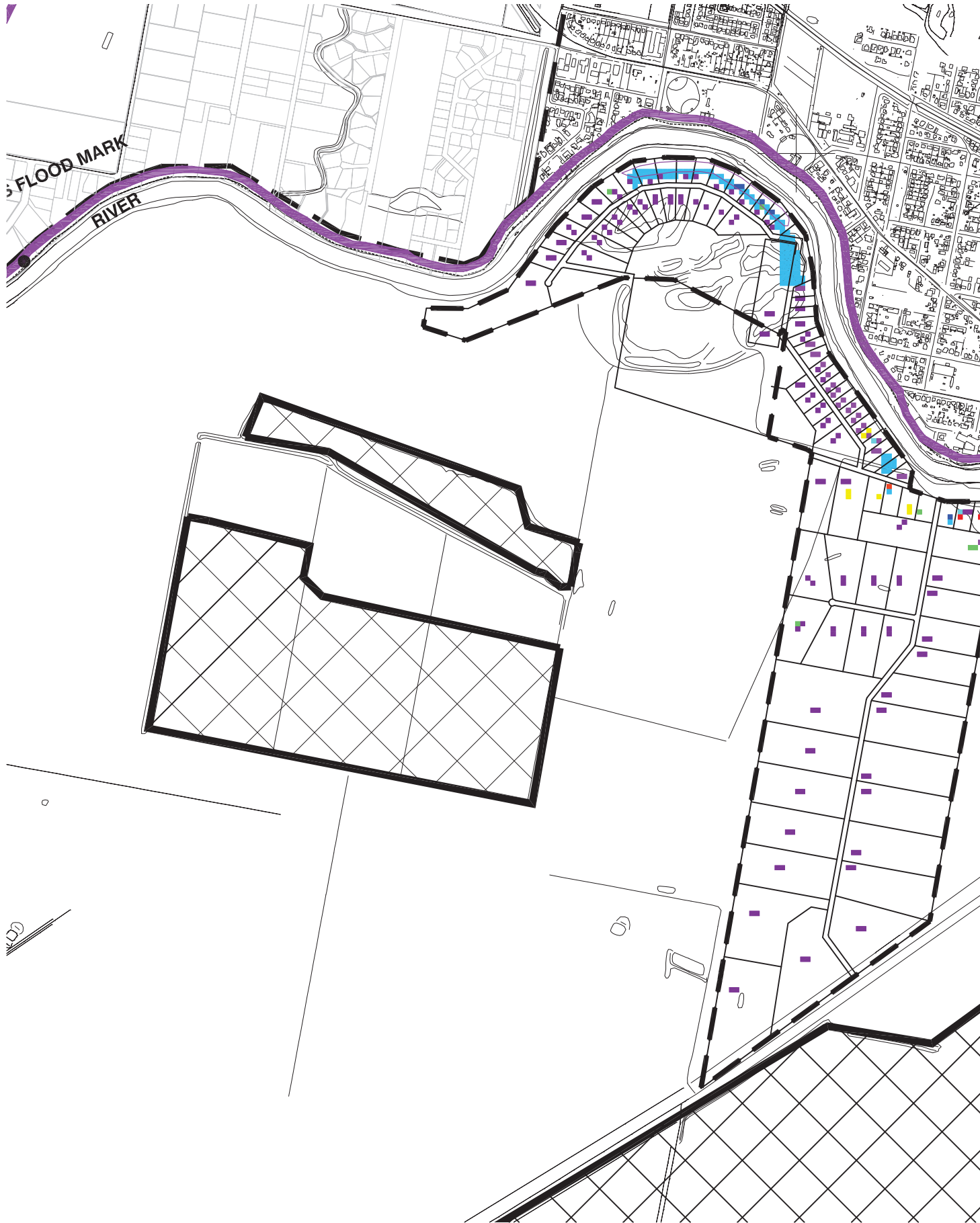
Enc:

- Figure 1: Topography Difference
- Figure 2: Peak Water Level Impacts
- Figure 3: Flow Extraction Line Locations
- Figure 4: Existing Peak Velocities and Flow Patterns
- Figure 5: Developed Peak Velocities and Flow Patterns
- Figure 6: Peak Velocity Difference

Reference Drawings

FIGURES

Flooding Assessment
Proposed Rural Residential Subdivision on Moloney



© Cardno Lawson Treloar Pty Ltd All Rights Reserved 2010.
Copyright in the whole and every part of this drawing belongs to Cardno Lawson Treloar Pty Ltd and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or on any media, to any person other than by agreement with Cardno Lawson Treloar Pty Ltd.

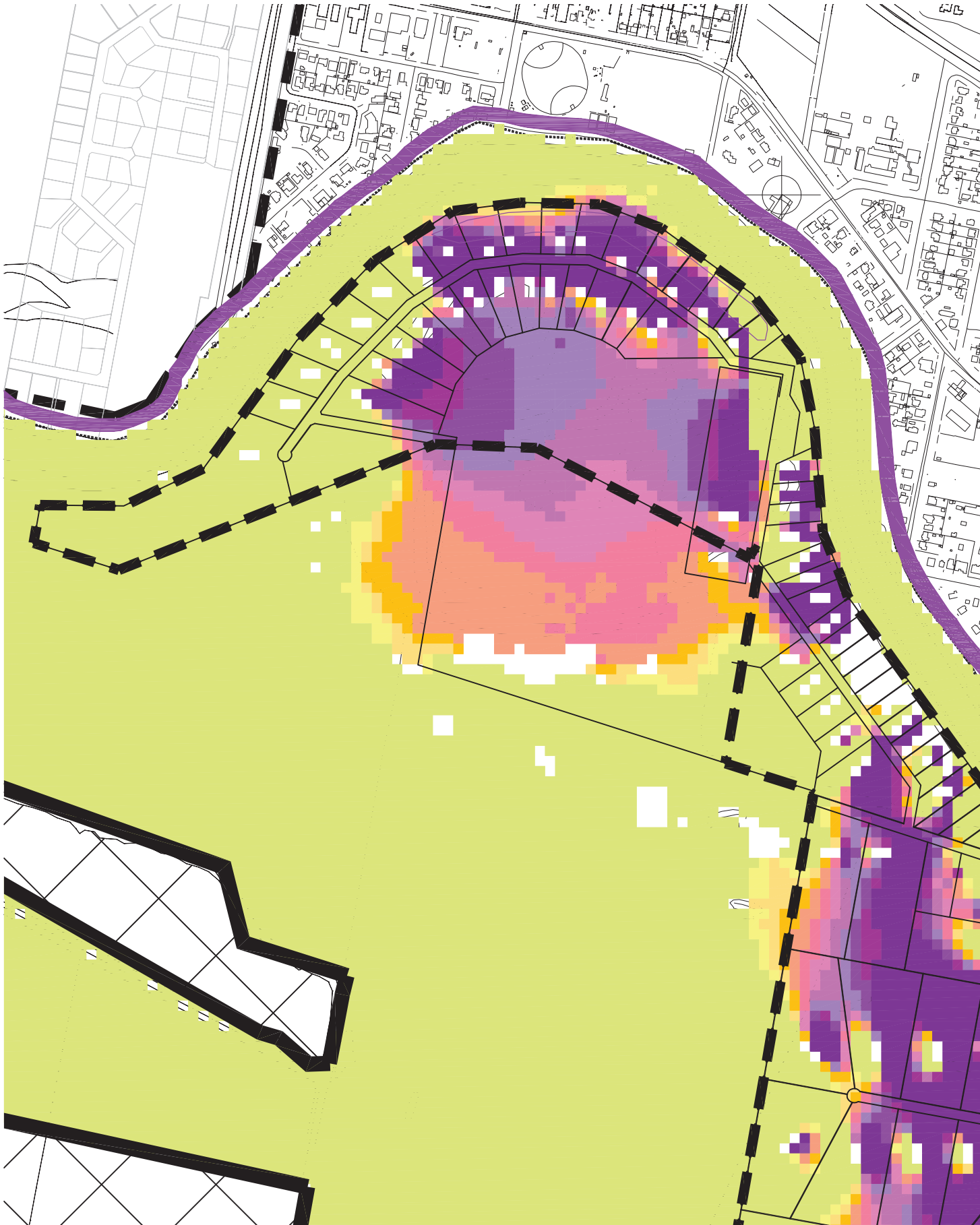
This document is produced by Cardno Lawson Treloar Pty Ltd solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Lawson Treloar Pty Ltd does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

Rev: Orig. Date: December 2010

SMK Irrigation Consultants Pty Ltd

CAD FILE: 0:\Work\LAT\J8709\SOBEK\RESULTS\figures\DE35_p\Figures Proposed Case DE35 Q100.dwg
XREF's: J7803FigureBase; Levees 1996; Results; Waggamba_Shire_2005; velocity; XR J8609 Moloney Layout March 2007

200 0 200



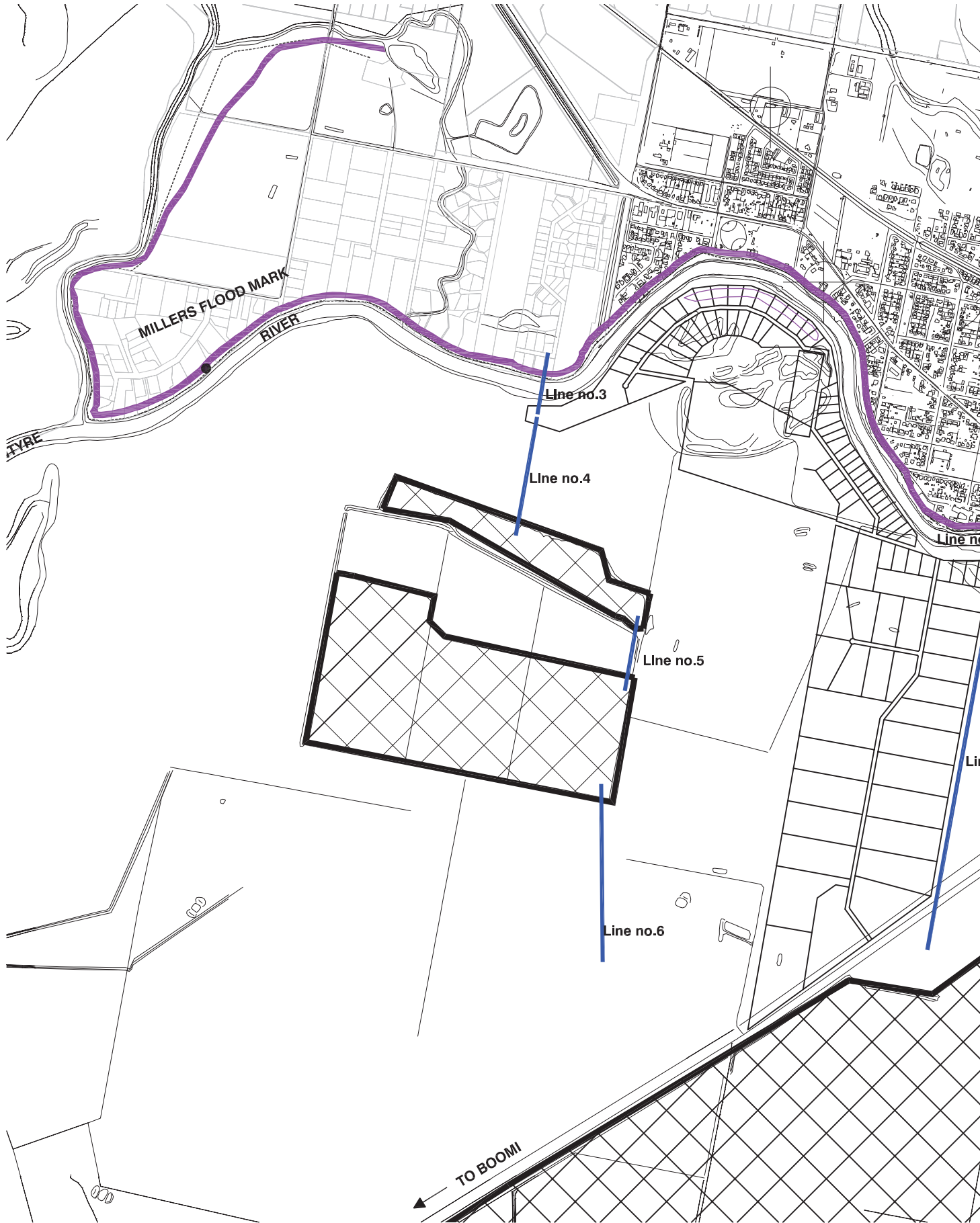
© Cardno Lawson Treloar Pty Ltd All Rights Reserved 2010.
Copyright in the whole and every part of this drawing belongs to Cardno Lawson Treloar Pty Ltd and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or on any media, to any person other than by agreement with Cardno Lawson Treloar Pty Ltd.

This document is produced by Cardno Lawson Treloar Pty Ltd solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Lawson Treloar Pty Ltd does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

Rev: Orig. Date: December 2010

SMK Irrigation Consultants Pty Ltd

CAD FILE: O:\Work\LAT\J8709\SOBEK\RESULTS\Figures\DE35_p\Figures Proposed Case DE35 Q100.dwg
XREF's: J7803\FigureBase; Levees 1996; Results; Waggamba_Shire_2005; velocity; XR J8609 Moloney Layout March 2007



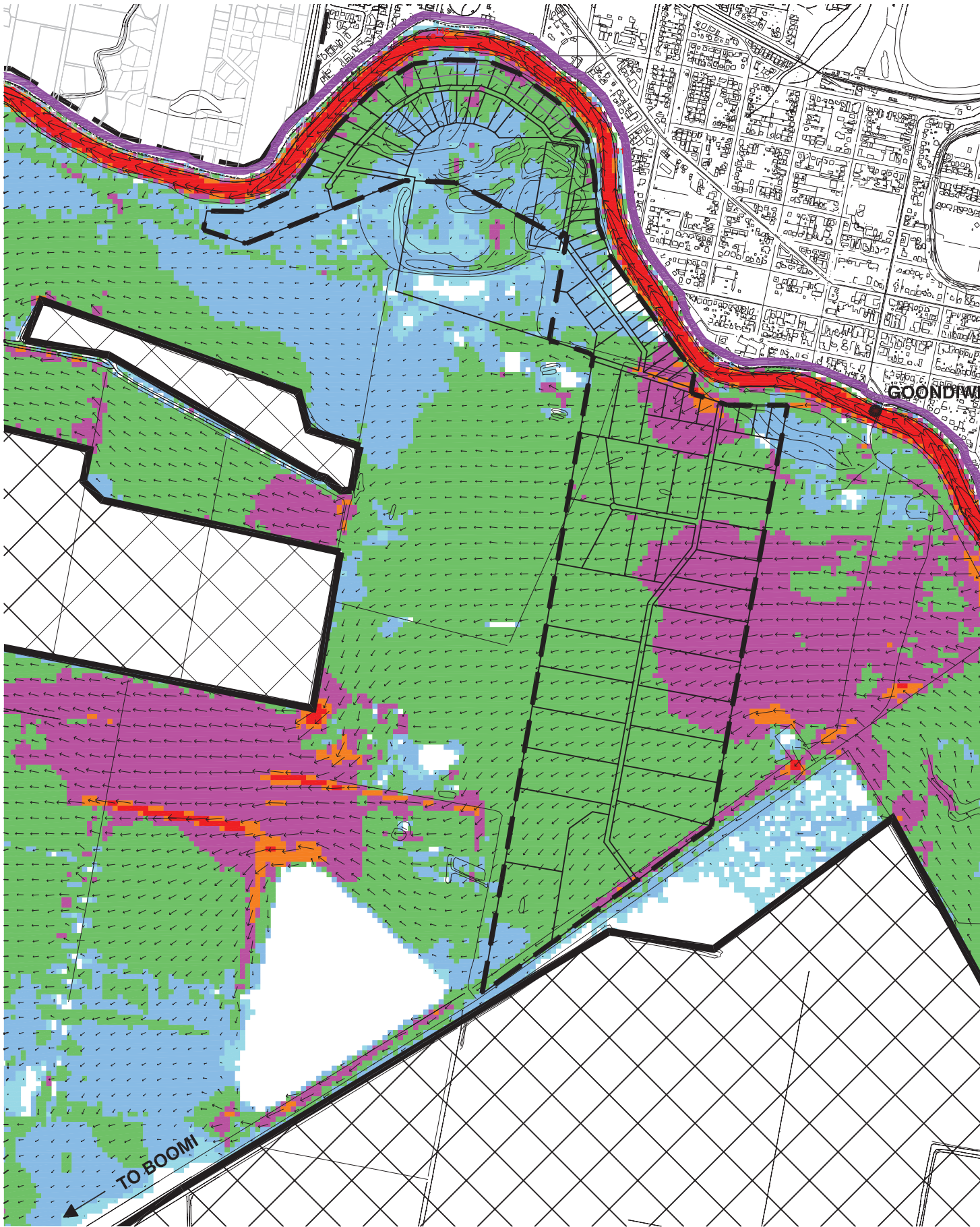
© Cardno Lawson Treloar Pty Ltd All Rights Reserved 2010.
Copyright in the whole and every part of this drawing belongs to Cardno Lawson Treloar Pty Ltd and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or on any media, to any person other than by agreement with Cardno Lawson Treloar Pty Ltd.

This document is produced by Cardno Lawson Treloar Pty Ltd solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Lawson Treloar Pty Ltd does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

Rev: Orig. Date: December 2010

SMK Irrigation Consultants Pty Ltd

CAD FILE: O:\Work\LAT\J8709\SOBEK\Figures\Extraction Line Locations.dwg
XREF's: J7803FigureBase; Levees 1996; Waggamba_Shire_2005; XR J8609 Moloney Layout March 2007



© Cardno Lawson Treloar Pty Ltd All Rights Reserved 2010.
Copyright in the whole and every part of this drawing belongs to Cardno Lawson Treloar Pty Ltd and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or on any media, to any person other than by agreement with Cardno Lawson Treloar Pty Ltd.

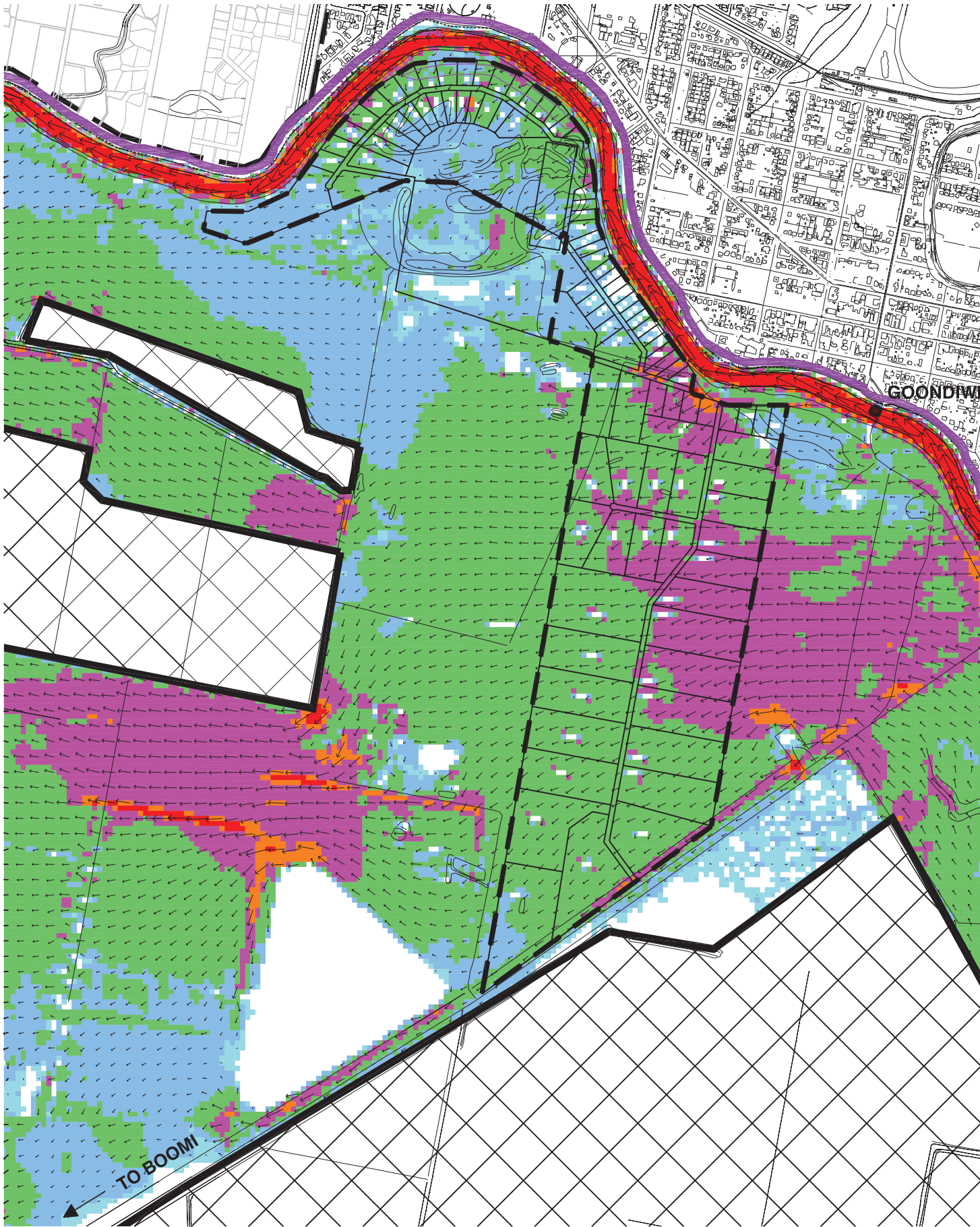
This document is produced by Cardno Lawson Treloar Pty Ltd solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Lawson Treloar Pty Ltd does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

Rev: Orig. Date: November 2010

SMK Irrigation Consultants Pty Ltd

CAD FILE: O:\work\LAT\J8709\SOBEK\RESULTS\figures\EX03b_n\Figures Proposed Case DE34 Q100.dwg
XREF's: J7803\FigureBase; Levees 1996; Results; Waggamba_Shire_2005; velocity; XR J8609 Moloney Layout March 2007

EXISTING CASE EX03



© Cardno Lawson Treloar Pty Ltd All Rights Reserved 2010.
Copyright in the whole and every part of this drawing belongs to Cardno Lawson Treloar Pty Ltd and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or on any media, to any person other than by agreement with Cardno Lawson Treloar Pty Ltd.

This document is produced by Cardno Lawson Treloar Pty Ltd solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Lawson Treloar Pty Ltd does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

Rev: Orig. Date: November 2010

SMK Irrigation Consultants Pty Ltd

CAD FILE: O:\Work\LAT\J8709\SOBEK\RESULTS\figures\DE35_p\Figures Proposed Case DE35 Q100.dwg
XREF's: J7803\FigureBase; Levees 1996; Results; Waggamba_Shire_2005; velocity; XR J8609 Moloney Layout March 2007

PROPOSED DEVELOPED CASE DE35

Flooding Assessment
Proposed Rural Residential Subdivision on Moloney



© Cardno Lawson Treloar Pty Ltd All Rights Reserved 2010.
Copyright in the whole and every part of this drawing belongs to Cardno Lawson Treloar Pty Ltd and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or on any media, to any person other than by agreement with Cardno Lawson Treloar Pty Ltd.

This document is produced by Cardno Lawson Treloar Pty Ltd solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Lawson Treloar Pty Ltd does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

Rev: Orig. Date: November 2010

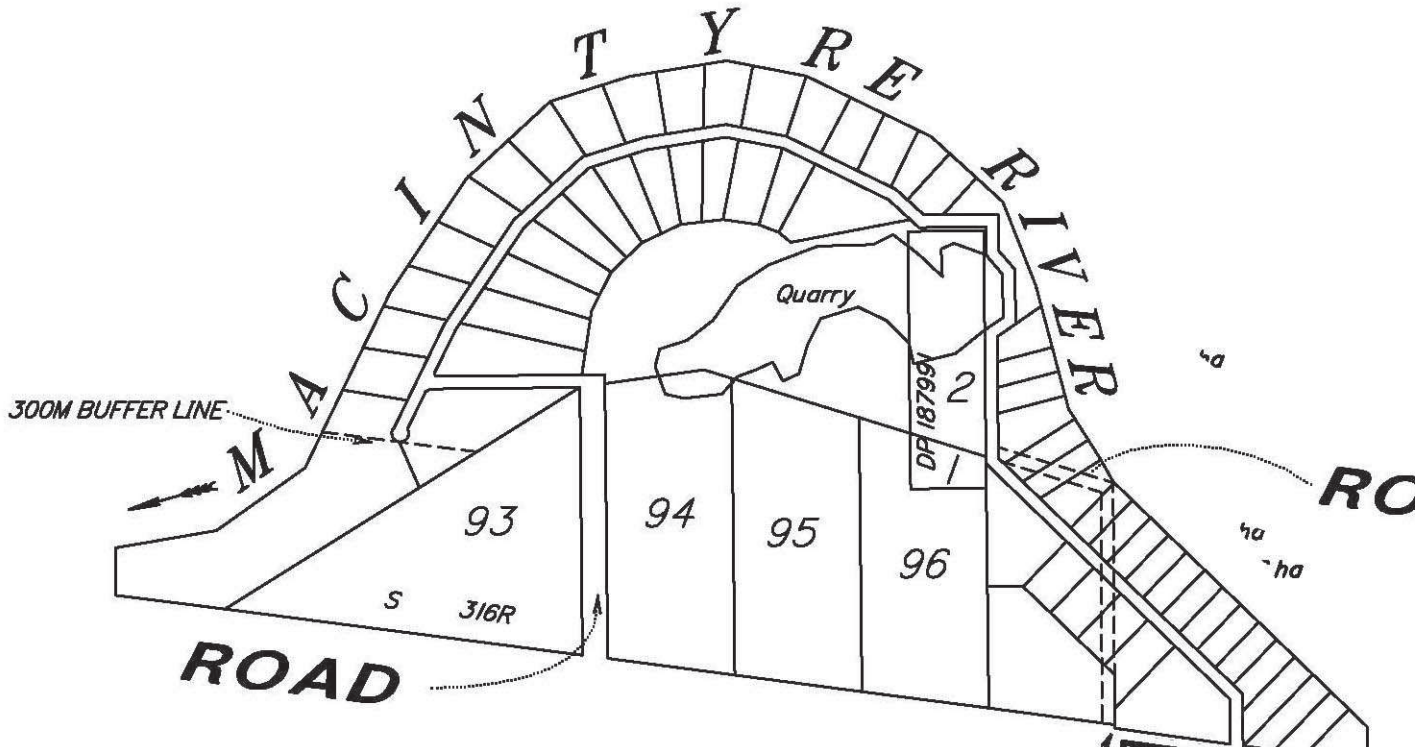
SMK Irrigation Consultants Pty Ltd

CAD FILE: 0:\Work\LAT\J8709\SOBEK\RESULTS\figures\DE35_p\Figures Proposed Case DE35 Q100.dwg
XREF's: J7803FigureBase; Levees 1996; Results; Waggamba_Shire_2005; velocity; XR J8609 Moloney Layout March 2007

200 0 2
[Scale bar]

REFERENCE DRAWINGS

SEE PLAN 1

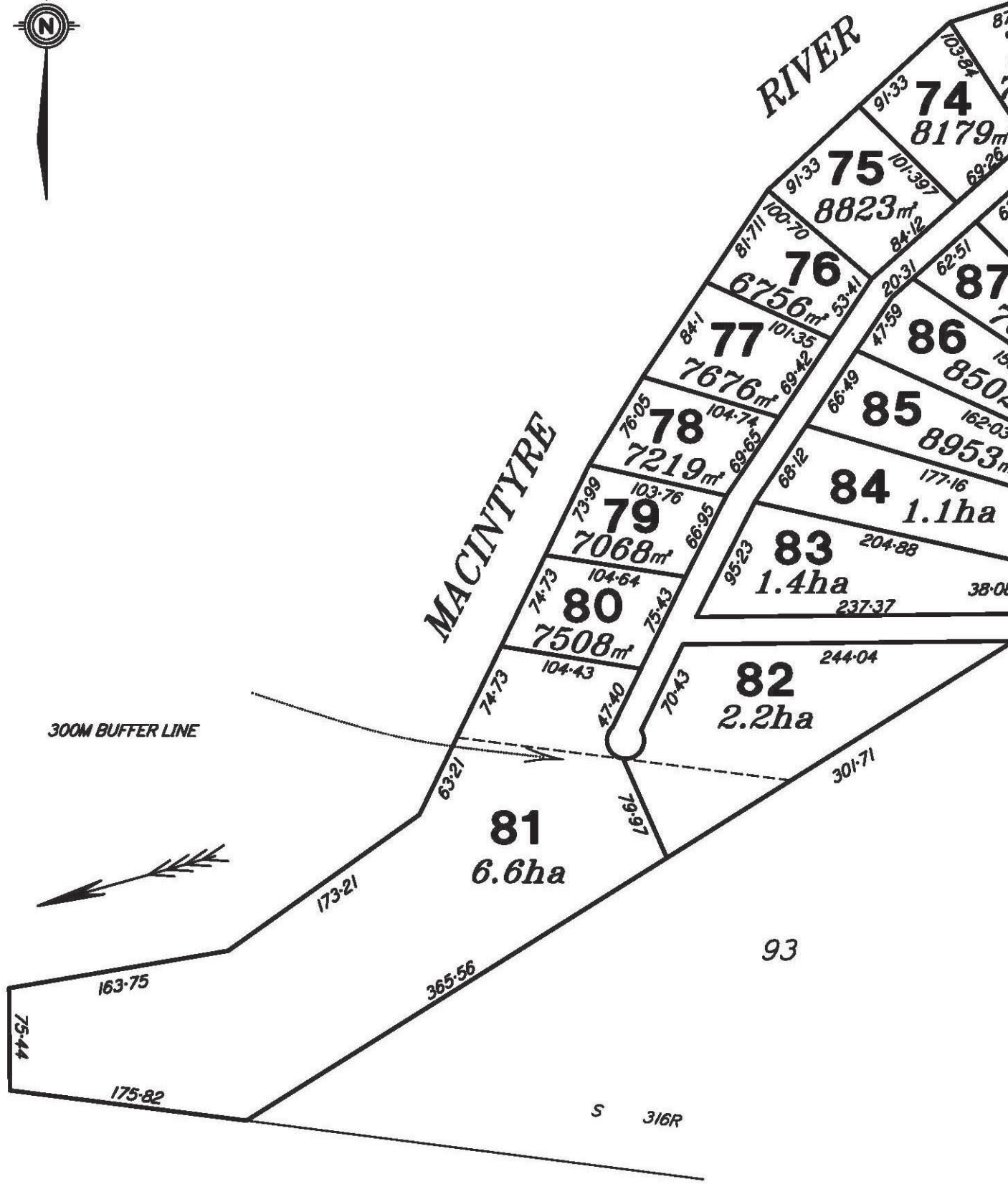


R
O
A
D

SEE PLAN 3

Note:
This plan was prepared for MV & JR Moloney as a proposed subdivision to accompany a subdivision application to the Moree Plains Shire Council and should not be used for any other purpose. The dimensions, areas and total

BUR



300M BUFFER LINE

MV & JR MOLONEY

PLAN OF PROPOSED S

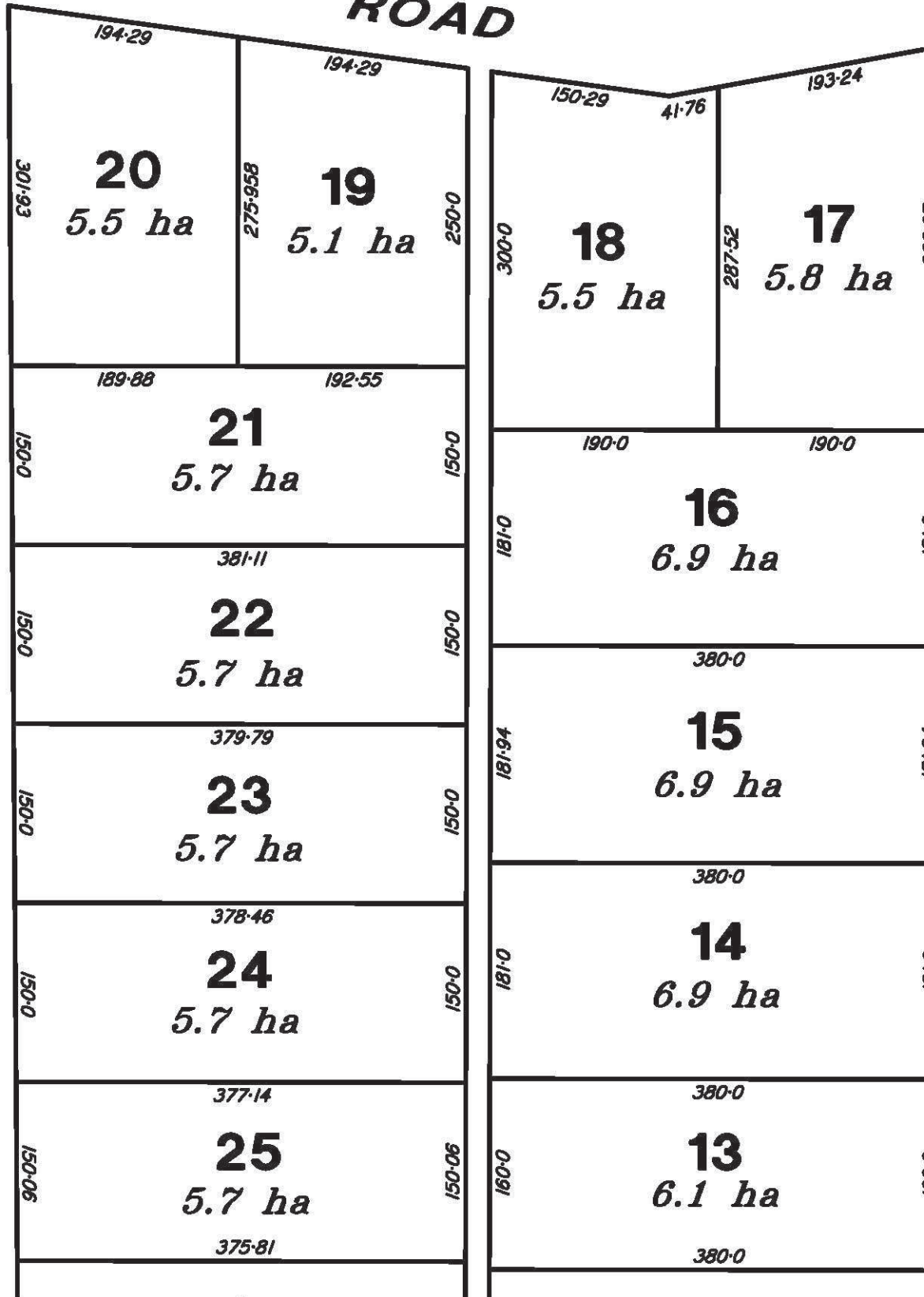
SMK
CONSULTANTS PTY LTD.

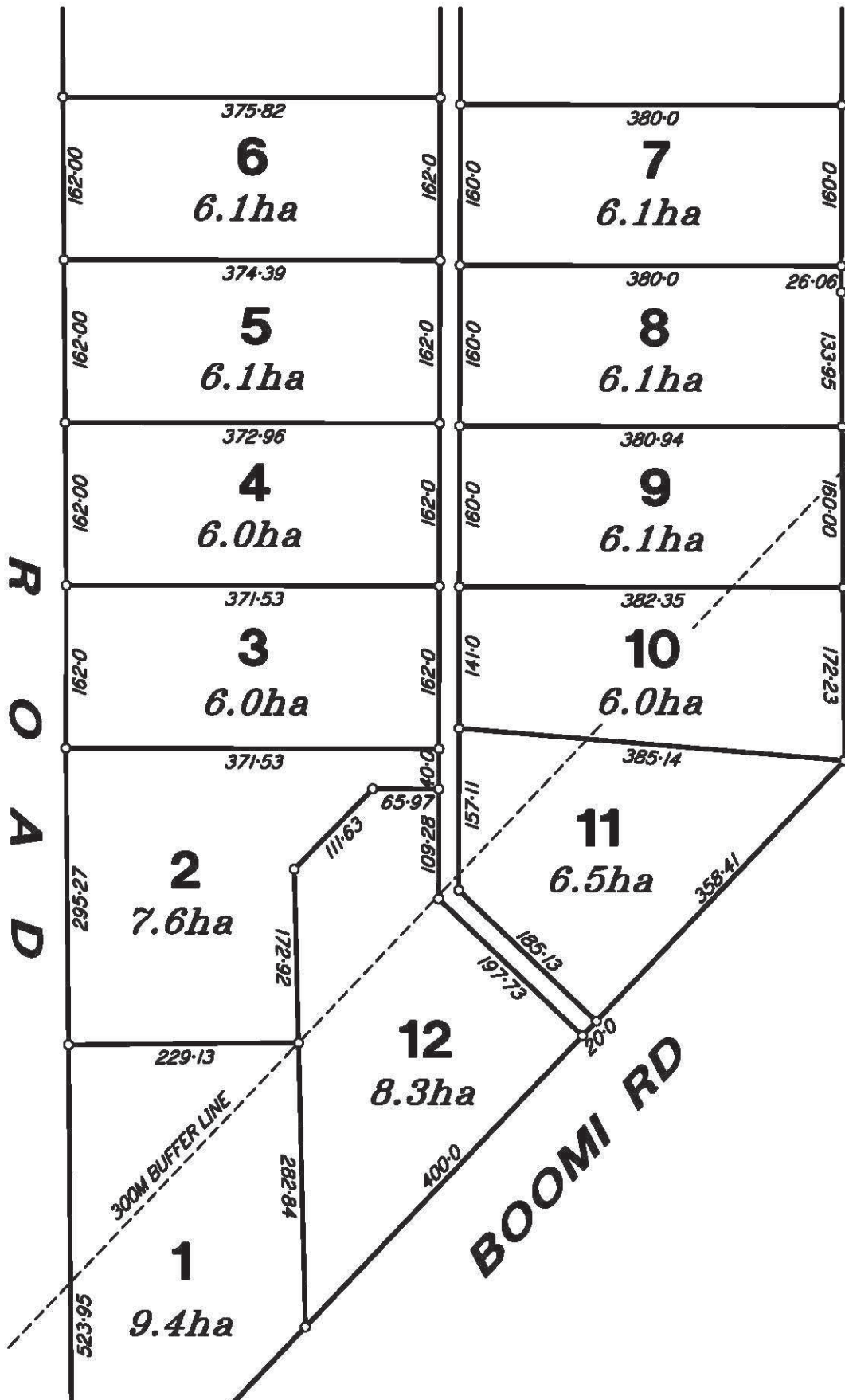
Goondiwindi 130 Marshall St Goondiwindi 4390
Ph (07)4671 2445 Fax (07)4671 2561
E-Mail qld@smk.com.au
Moree 13 Frome St Moree 2400
Ph (02)6752 1640 Fax (02)6752 5070

PARISH: *BOGGABILLA* COUNTY



ROAD





R
O
A
D

BOOMI RD

1
9.4ha

2
7.6ha

3
6.0ha

4
6.0ha

5
6.1ha

6
6.1ha

12
8.3ha

11
6.5ha

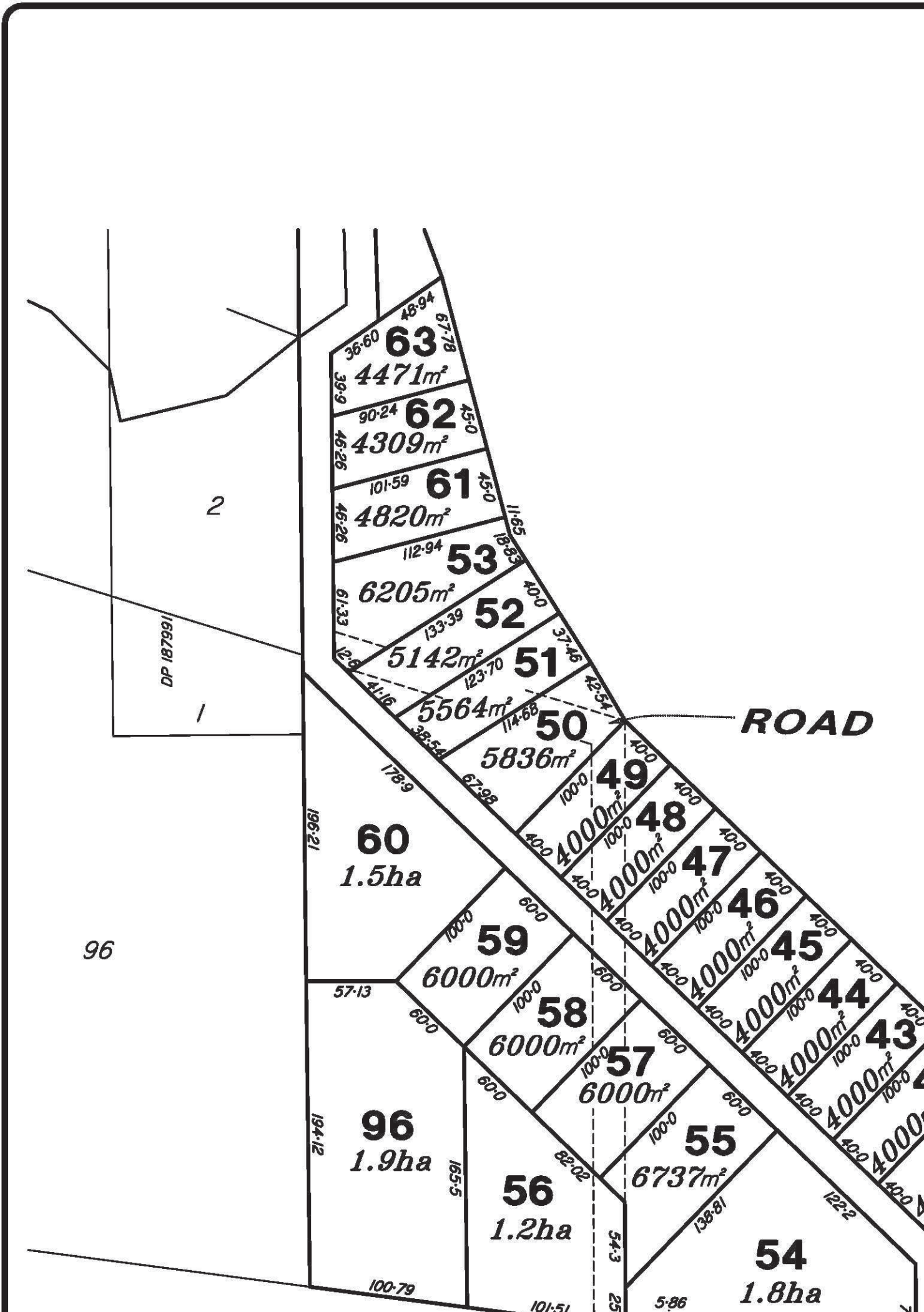
10
6.0ha

9
6.1ha

8
6.1ha

7
6.1ha

300M BUFFER LINE



DP 187991

ROAD

96

2

- 63**
4471m²
36.60 48.94 67.78 81.94 39.9
- 62**
4309m²
90.24 45.0 46.26
- 61**
4820m²
101.59 45.0 46.26
- 53**
6205m²
112.94 183.33 40.0 61.33
- 52**
5142m²
133.39 37.46 12.9
- 51**
5564m²
123.70 41.6 32.54
- 50**
5836m²
114.68 178.9 67.98
- 49**
4000m²
100.0 40.0 40.0
- 48**
4000m²
100.0 40.0 40.0
- 47**
4000m²
100.0 40.0 40.0
- 46**
4000m²
100.0 40.0 40.0
- 45**
4000m²
100.0 40.0 40.0
- 44**
4000m²
100.0 40.0 40.0
- 43**
4000m²
100.0 40.0 40.0
- 60**
1.5ha
196.21 178.9
- 59**
6000m²
100.0 60.0 57.13
- 58**
6000m²
100.0 60.0 60.0
- 57**
6000m²
100.0 60.0 60.0
- 56**
1.2ha
165.5 100.79 101.51
- 55**
6737m²
100.0 60.0 138.81 54.3 25
- 54**
1.8ha
5.86 122.2

Our Ref LJ8709/Lt5: JMcA/jmca

Contact John McArthur

4 April 2011

Senior Project Officer
Department of Environment & Resource Management
LMB 4
GOONDIWINDI Q 4390

Attention: Ainsley Hempseed

Dear Ainsley

**RE: Flooding Assessment – Proposed Rural Residential
Subdivision, Moloney Property**

1.0 Introduction

We write to provide details regarding an additional flood assessment undertaken for the proposed rural residential subdivision on the Moloney property. This additional assessment has been carried out following communication with the New South Wales Department of Environment Climate Change and Water (DECCW).

Prior to presenting outcomes of the flood modelling to DECCW, we request review and comment from both the Department of Environment & Resource Management (DERM) and Goondiwindi Regional Council (GRC). It is proposed that the DERM and GRC responses, in addition to the flood modelling presented in this letter, be included in the overall submission to DECCW.

2.0 Flood Assessment

Previous modelling presented to DECCW incorporated the following:

- Survey data as provided by SMK Consultants (received 23 October 2009); and
- Changes to the location, orientation and number of fill pads throughout the site.

The survey data included detailed ground survey of the Macintyre River bank adjacent to the property.

Modelling outcomes indicated a maximum predicted impact of 16mm adjacent to the Goondiwindi Levee in a 1% AEP flood event.

In order to limit flood impacts adjacent to the Goondiwindi Levee to 10mm or less as discussed with DECCW, some of the proposed fill pads throughout the site have been moved and / or re-orientated and 8 lots have been considered undevelopable in terms of filling. Based on the current SMK Consultants Pty Ltd development layout (included as reference drawings), these lots are 20, 22-26 and 37-38. In addition, the maximum fill footprint area on 16 lots has been reduced to 400m² from the previous proposed area of 800m². These lots are 40-41, 64-74 and 92-94.



Cardno (Qld) Pty Ltd
Trading as Cardno Lawson
Treloar
ABN 57 051 074 992

Level 11
515 St Paul's Terrace
Fortitude Valley QLD 4064
Australia

Locked Bag 4006
Fortitude Valley QLD 4006
Australia

Phone: 61 7 33102455
Fax: 61 7 3369 9722

www.cardno.com.au

Minor excavation has also been included in the modelling, involving 'trimming' of the existing ground surface by up to 150mm, with no excavation works occurring within 40m of the River's high bank.

Figure 1 shows the topography difference map associated with the overall site and presents the location and extent of the proposed fill pads and minor excavation.

The impact of the proposed ground level changes on flow distribution and velocity has also been assessed.

3.0 Model Results

The predicted 1% AEP flood impact associated with this proposal is presented in Figure 2 and shows the maximum flood impact associated with the proposed development adjacent to the Goondiwindi Levee is less than 10mm.

Table 3.1 below summarises existing and developed 1% AEP peak flows at various locations upstream and downstream of the development site as shown on Figure 3.

Table 3.1 - 1% AEP Peak Flow Comparison

Flow Line	Peak Flow (m ³ /s)	
	Existing	Developed
No. 1	950.8	951.5
No. 2	555.5	555.6
No. 3	822.2	818.0
No. 4	75.3	76.2
No. 5	150.6	152.0
No. 6	434.7	436.9

The Table indicates there is only a very minor flow redistribution occurring with basically no change in peak flow entering the development site and a minor decrease (approximately 0.5%) in Macintyre River channel flow downstream of the site with a corresponding increase in floodplain flow.

Peak velocities and flow patterns are shown on Figures 4 and 5 for the existing and proposed Case 1% AEP events respectively. Peak floodplain velocities generally range between 0.25 and 1.0 m/s. Figure 6 shows the pre and post velocity difference and indicates velocity changes are confined to the development site.

In addition a comparison of 1% AEP peak water levels (including 300mm freeboard) presented in the 'Goondiwindi Environs Flooding Investigation' Report prepared in March 2007 with peak flood levels resulting from the Moloney development proposal has been made. Figure 1.4 included in the reference drawing section of this correspondence indicates the Moloney proposal does not increase peak flood levels presented to GRC previously with reductions up to 340mm occurring.

4.0 Conclusions

Flood modelling of revised earthworks extents within the Moloney property has been undertaken. This has included:

- No development on eight (8) current Lots;
- Maximum fill pad area limited to 400m² on sixteen (16) current Lots with the remaining Lots having a maximum fill footprint area of 800m²;and
- Minor excavation involving 'trimming' of the existing surface by up to 150mm with no excavation works occurring within 40m of the River's high bank.

The predicted maximum flood impact adjacent to the Goondiwindi Levee is less than 10mm and the modelling demonstrates there is no significant change to existing flow distribution or floodplain velocity.

In addition, the 1% AEP (1 in 100 Year) flood levels due to the Moloney development proposal are lower than those presented in the March 2007 'Goondiwindi Environs Flooding Investigation' Report. This report provided the basis for proposed new levee heights and the modelling confirms these heights will not be compromised by the development.

Please contact the undersigned should you require any further information.

Yours faithfully



John McArthur
Project Manager
For Cardno Lawson Treloar

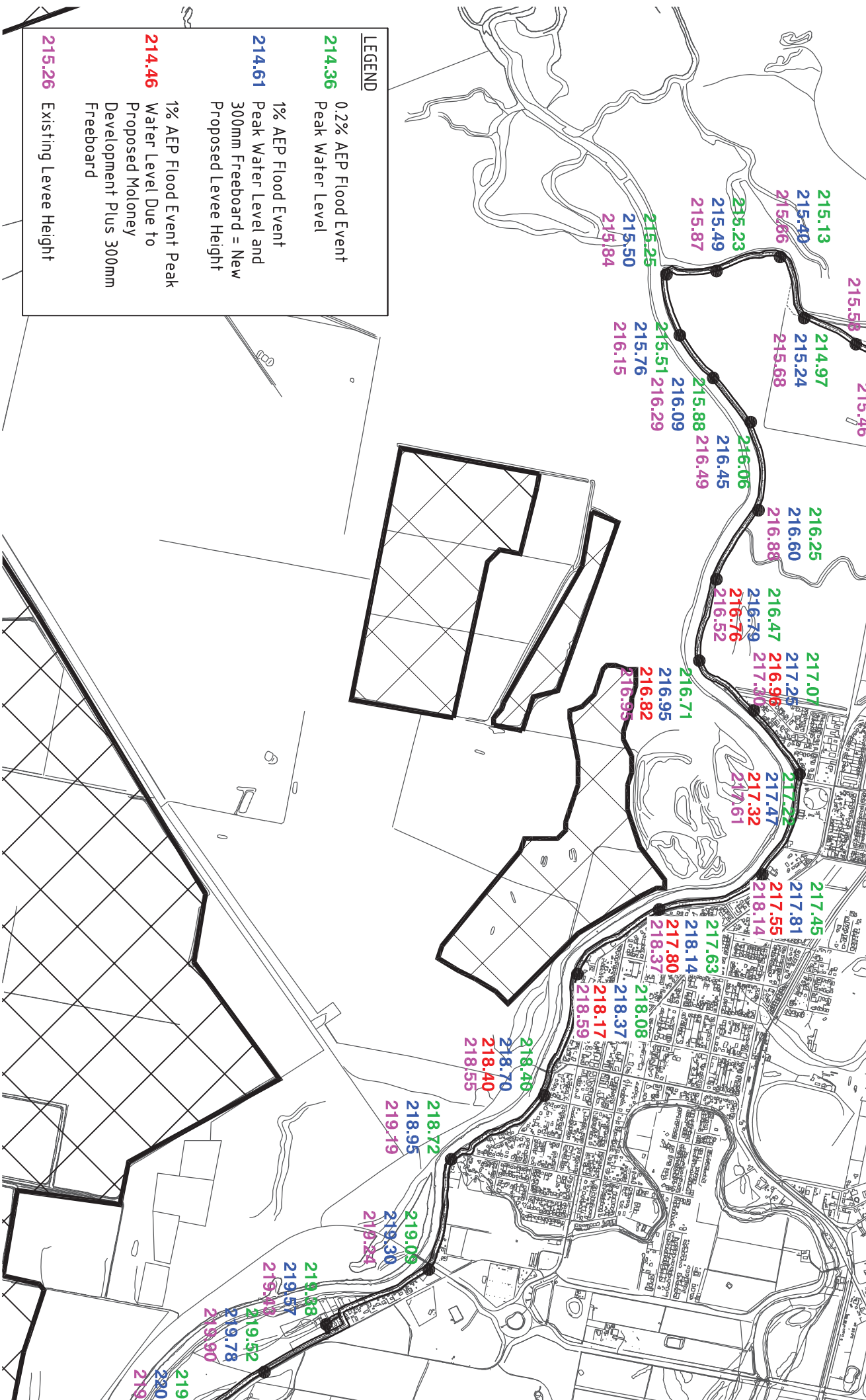
Cc Dave Burgess – Director of Engineering & Planning, Goondiwindi Regional Council

Enc:

- Figure 1: Topography Difference
- Figure 2: Peak Water Level Impacts
- Figure 3: Flow Extraction Line Locations
- Figure 4: Existing Peak Velocities and Flow Patterns
- Figure 5: Developed Peak Velocities and Flow Patterns
- Figure 6: Peak Velocity Difference

Reference Drawings

- Lot Layouts (5 off) prepared by SMK Consultants
- Figure 1.4 (updated from Goondiwindi Environs Flooding Investigation Report)



LEGEND	
214.36	0.2% AEP Flood Event Peak Water Level
214.61	1% AEP Flood Event Peak Water Level and 300mm Freeboard = New Proposed Levee Height
214.46	1% AEP Flood Event Peak Water Level Due to Proposed Moloney Development Plus 300mm Freeboard
215.26	Existing Levee Height



0.2% AEP PEAK WATER LEVELS AND PRC

© Cardno Lawson Trelor Pty Ltd All Rights Reserved 2006.
 Copyright in the whole and every part of this drawing belongs to Cardno Lawson Trelor Pty Ltd and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or on any media, to any person other than by agreement with Cardno Lawson Trelor Pty Ltd.
 This document is produced by Cardno Lawson Trelor Pty Ltd solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Lawson Trelor Pty Ltd does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

Rev: Orig. Date: March 2007

Our Ref LJ8709/Lt6: JMcA/jmca

Contact John McArthur

05 July 2012

The Chief Executive Officer
Goondiwindi Regional Council
LMB 7
INGLEWOOD Q 4387

Attention: Rod Slack-Smith

Dear Sir,

RE: Flooding Assessment



Cardno (Qld) Pty Ltd
Trading as Cardno Lawson
Treloar
ABN 57 051 074 992

Level 11
515 St Paul's Terrace
Fortitude Valley QLD 4064
Australia

Locked Bag 4006
Fortitude Valley QLD 4006
Australia

Phone: 61 7 33102455
Fax: 61 7 3369 9722

www.cardno.com.au

ERROR: invalidfont
OFFENDING COMMAND: show

STACK: