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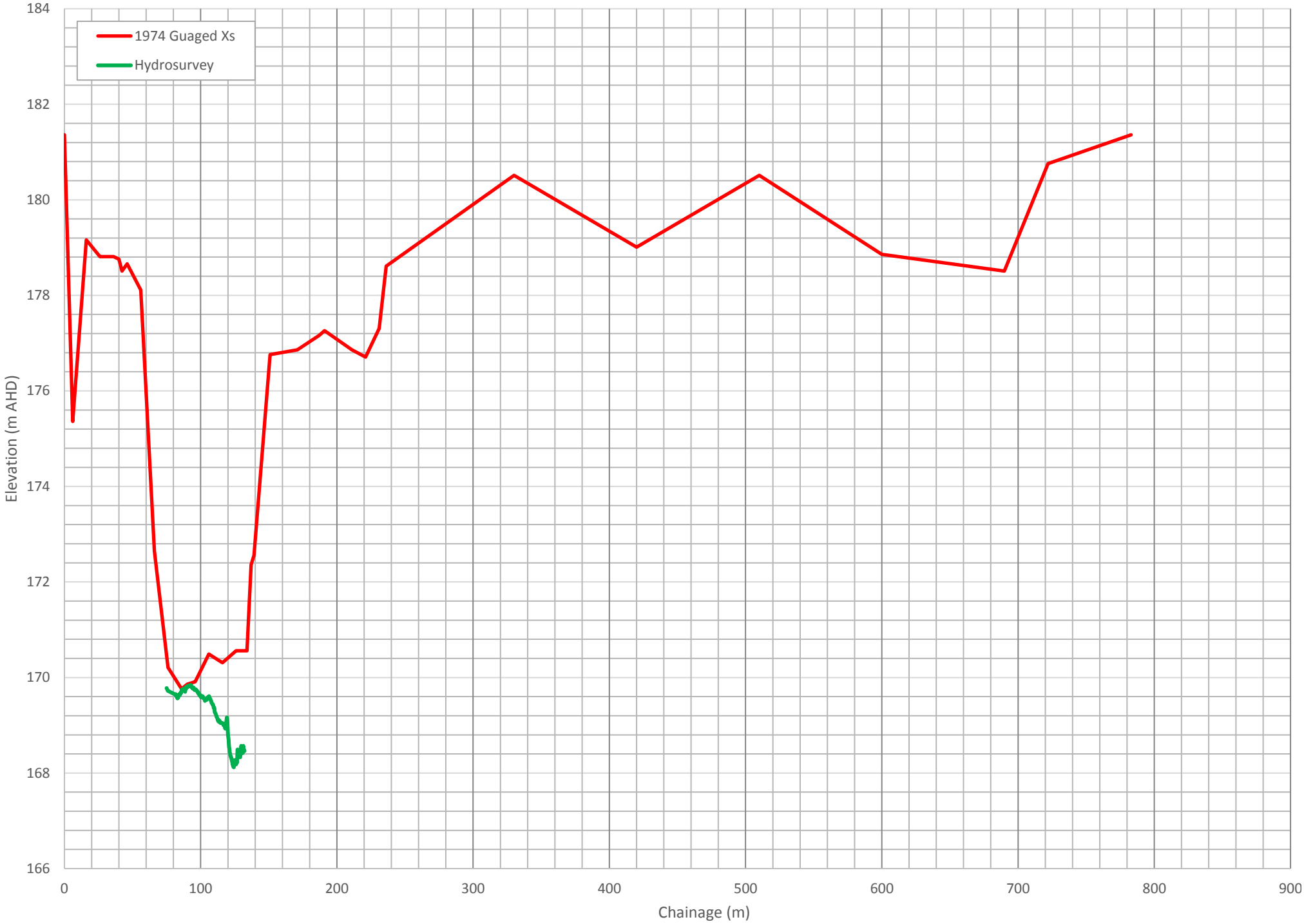
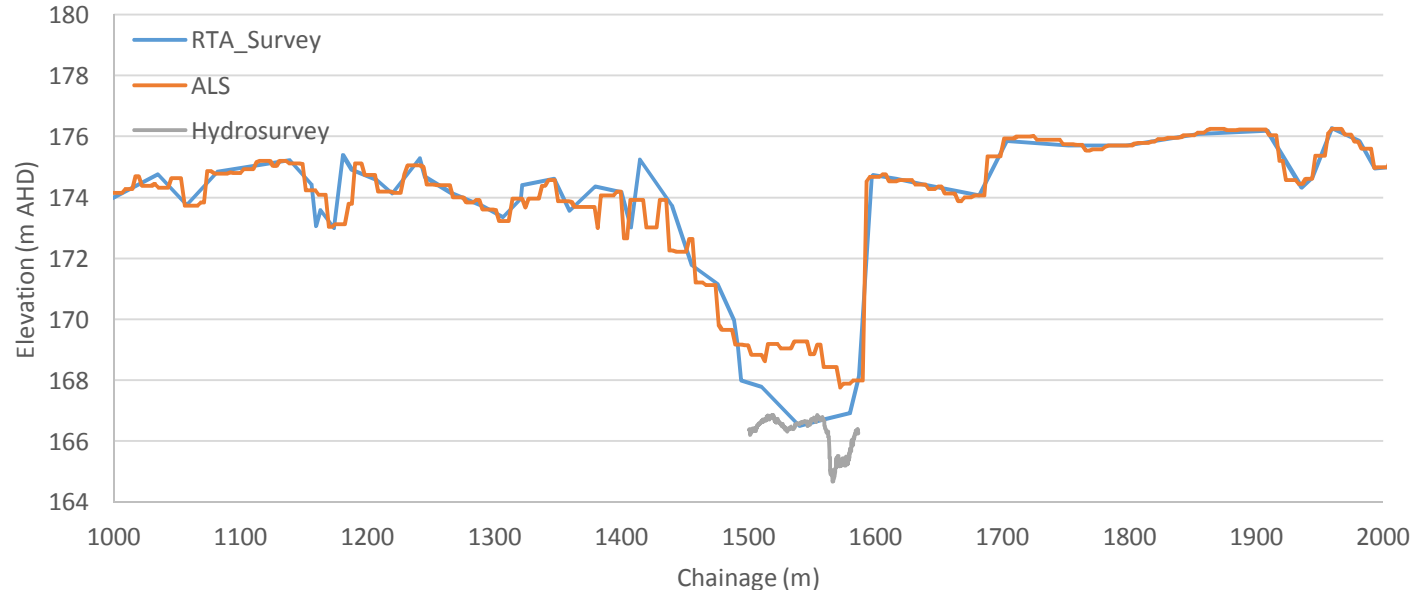
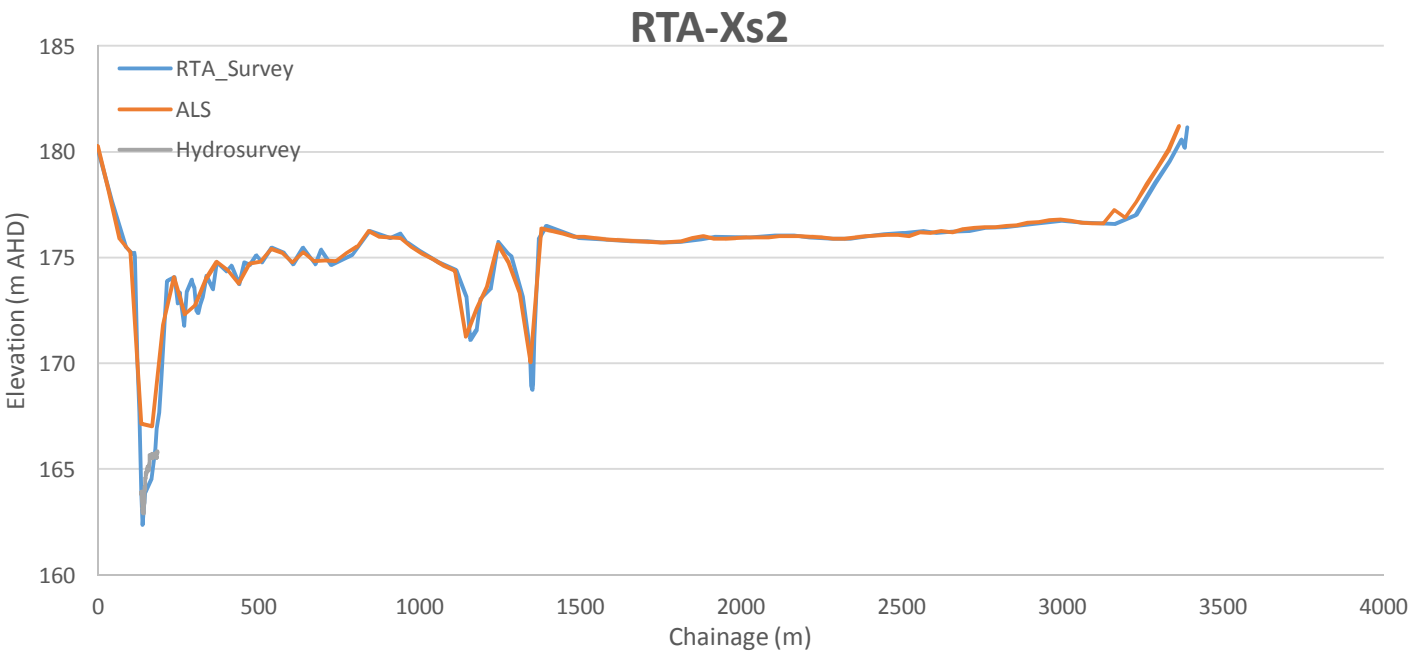


FIGURE 4
1974 GAUGED CROSS SECTION
HYDROSURVEY COMPARISON

FIGURE 5
RTA CROSS SECTION HYDROSURVEY COMPARISON





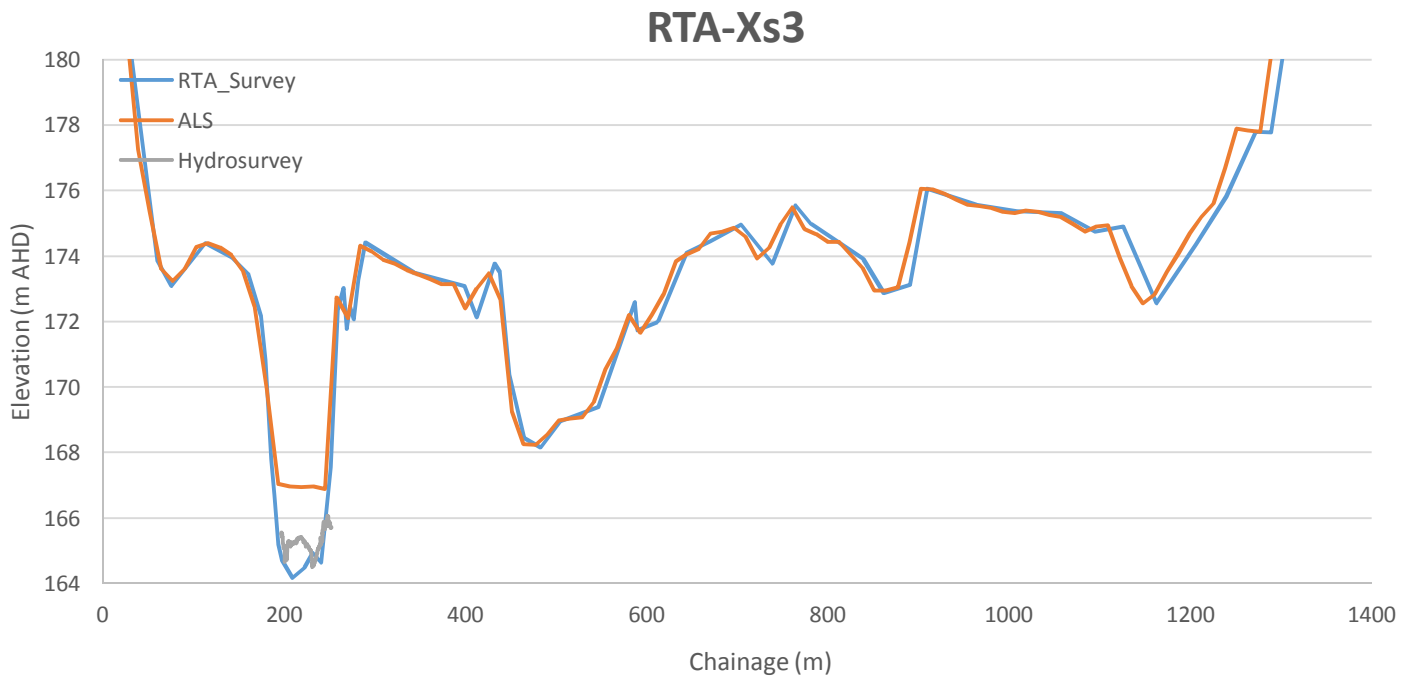


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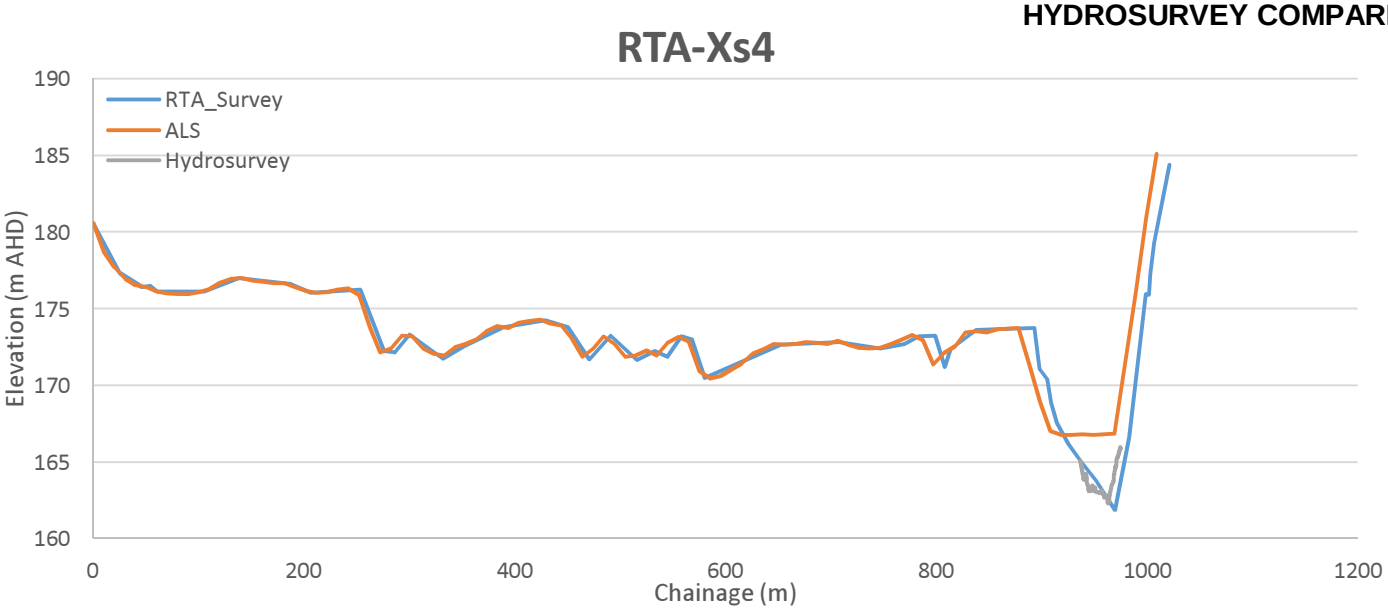
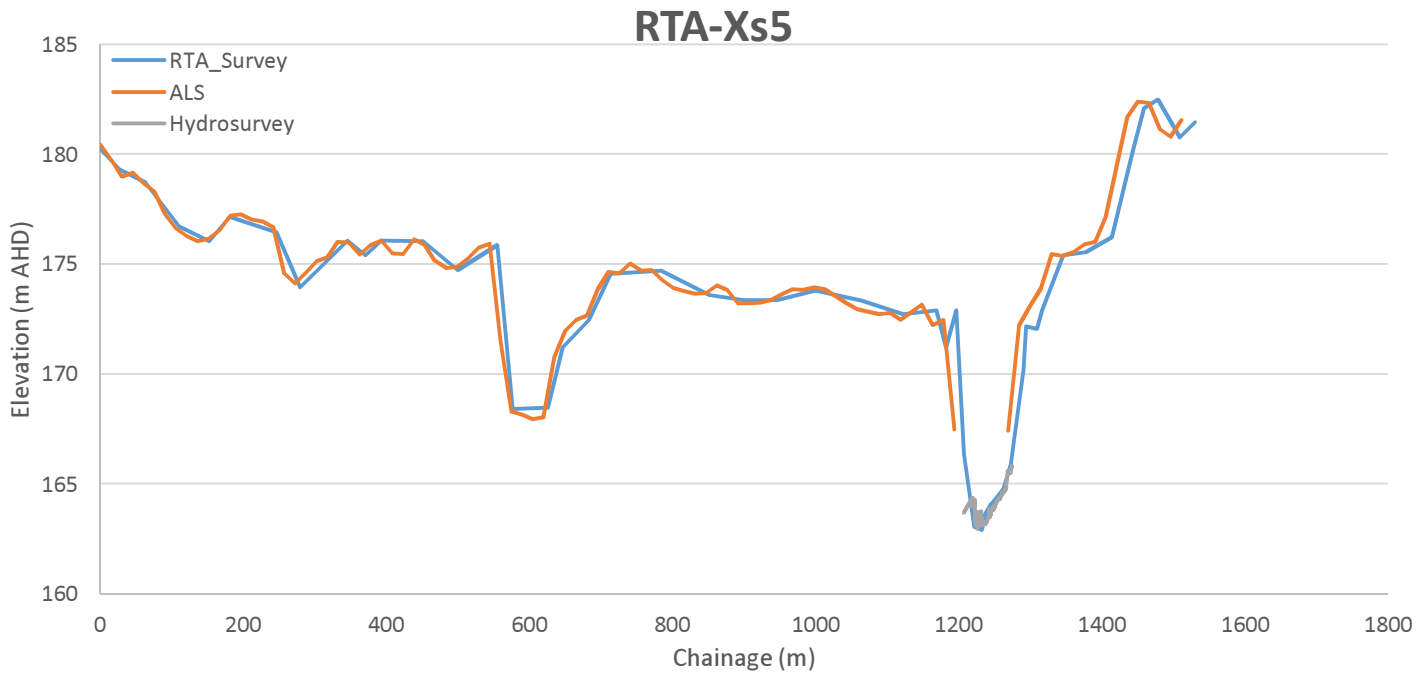
FIGURE 6
RTA CROSS SECTION
HYDROSURVEY COMPARISON





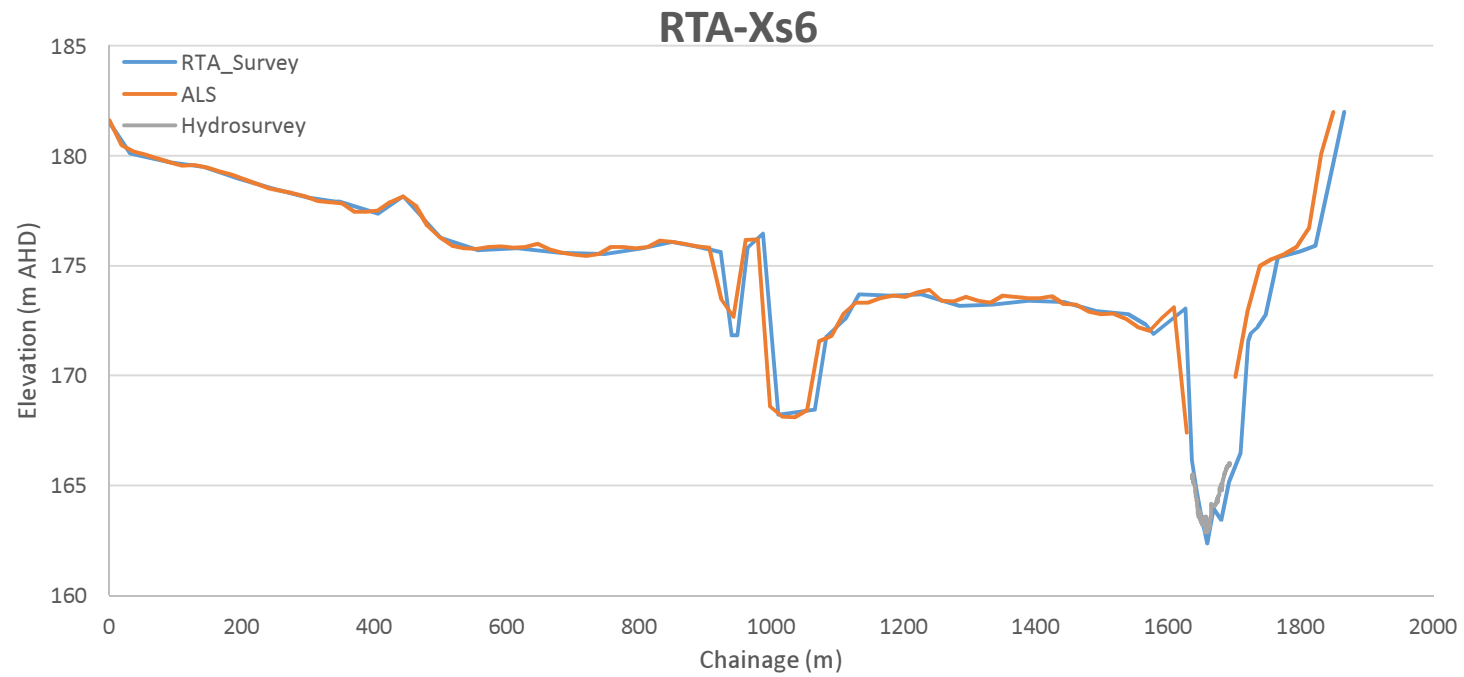


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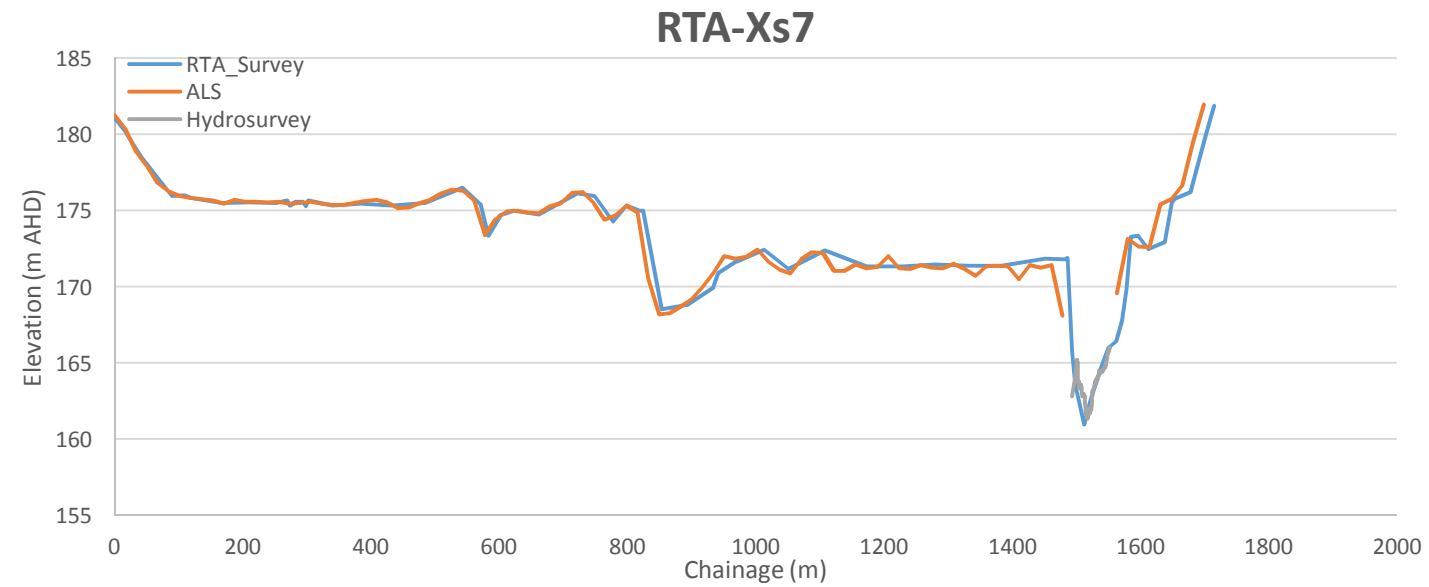
FIGURE 7
RTA CROSS SECTION
HYDROSURVEY COMPARISON



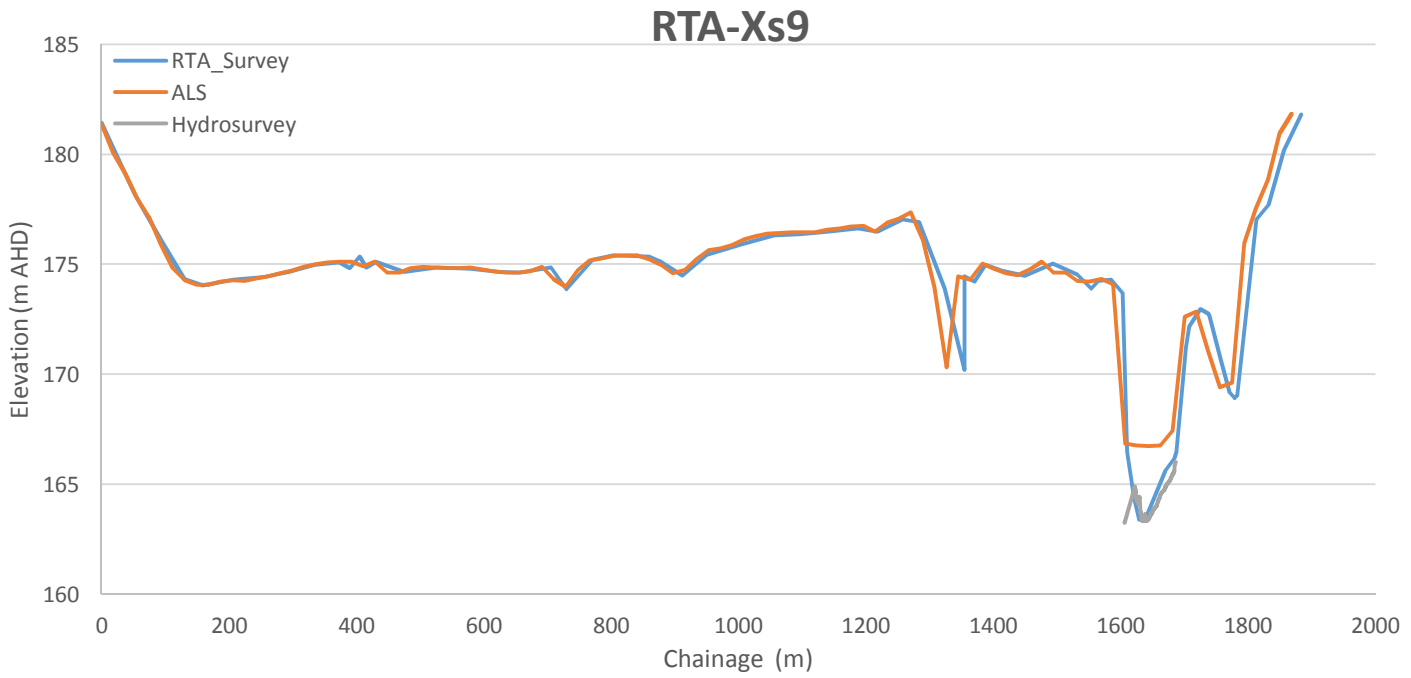


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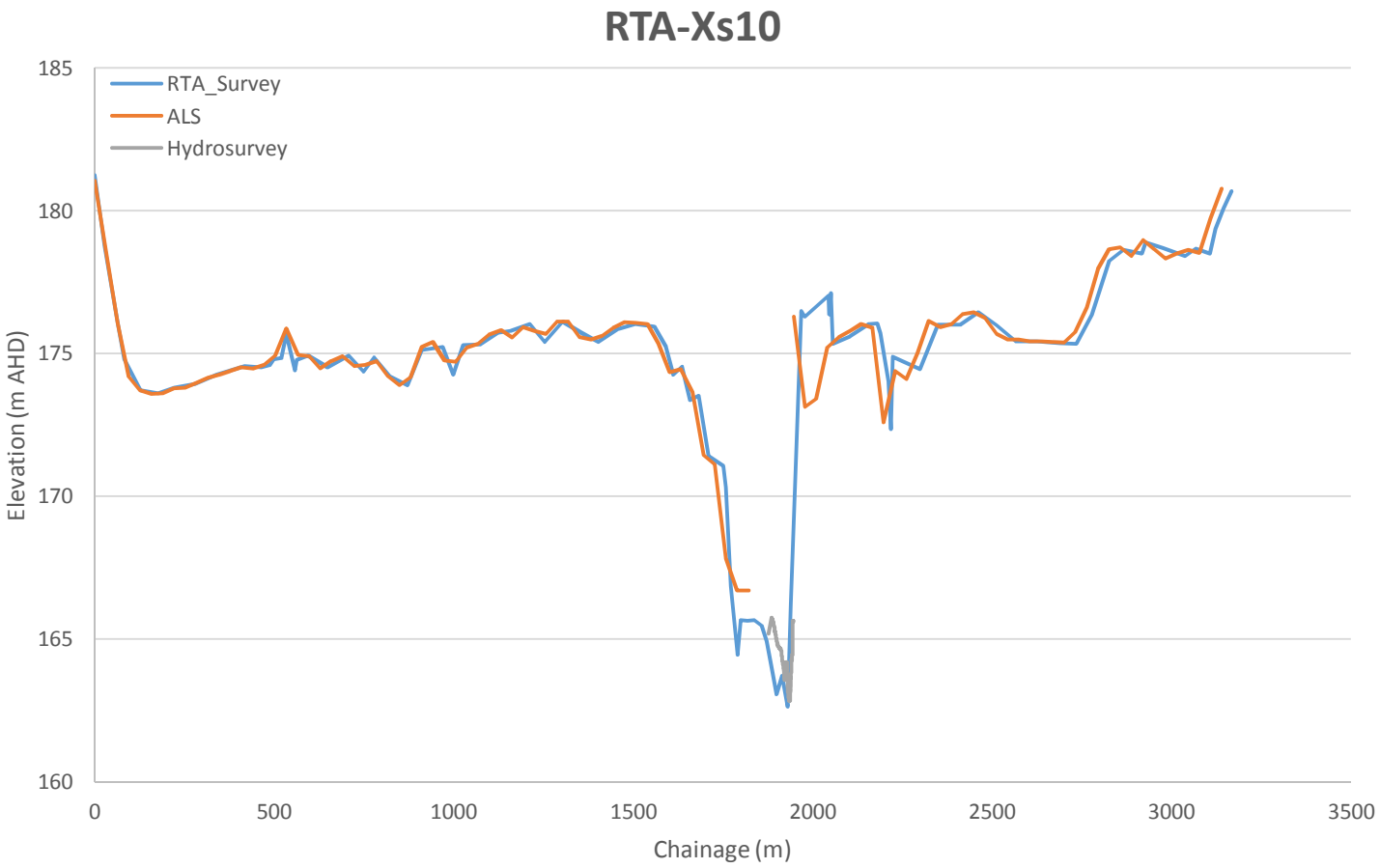
FIGURE 8
RTA CROSS SECTION
HYDROSURVEY COMPARISON



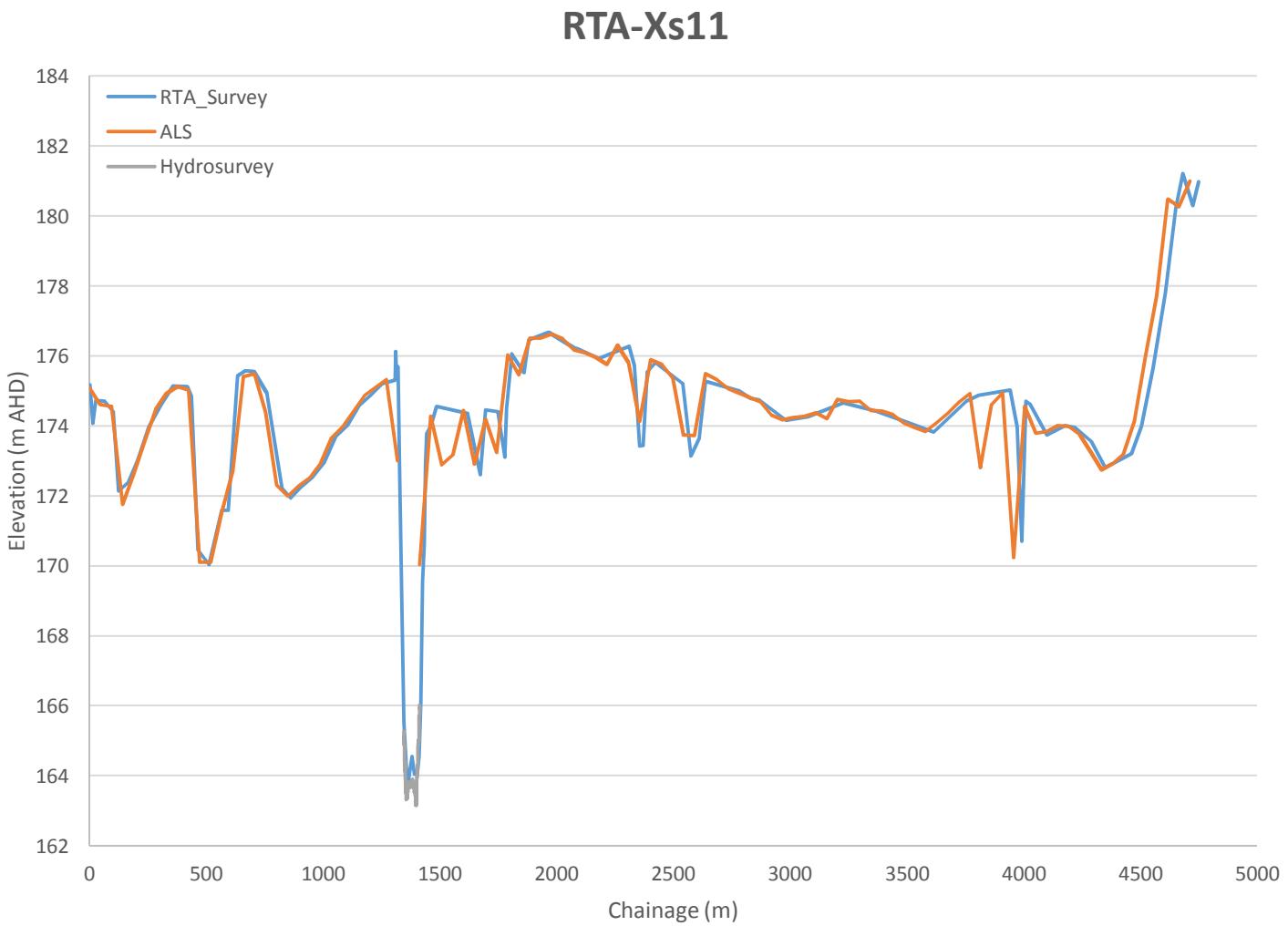


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FIGURE 09
ROUGHNESS COMPARISON LOCATIONS

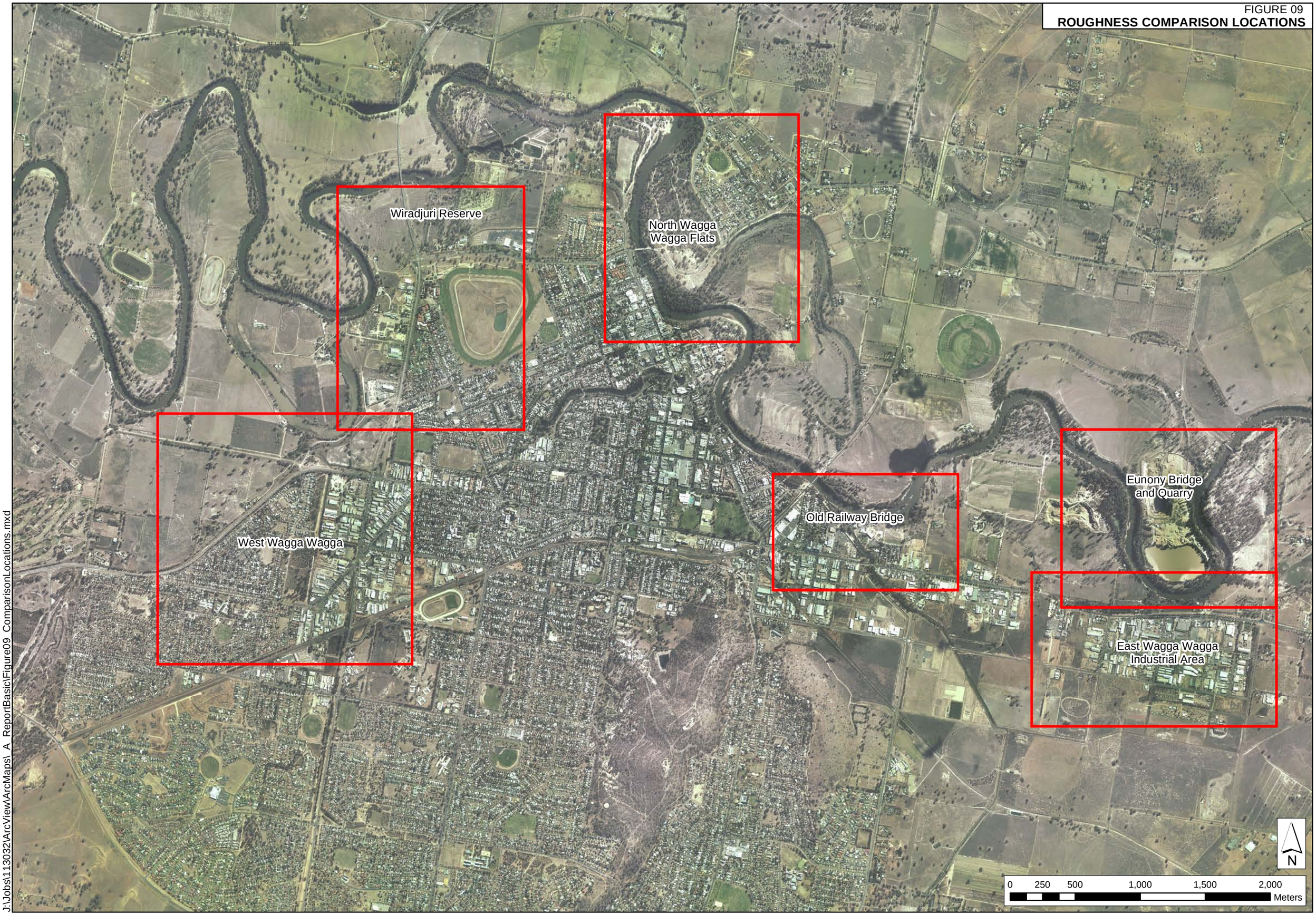

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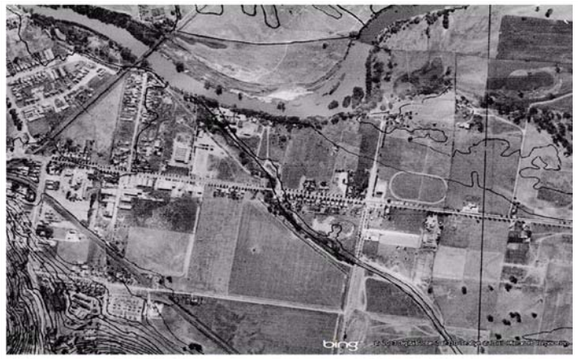
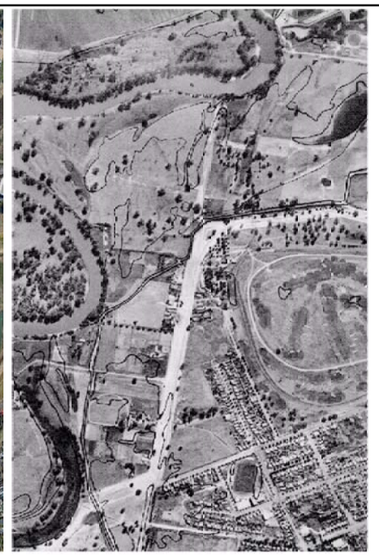
FIGURE 10
ROUGHNESS VARIATION
PRESENT V PAST

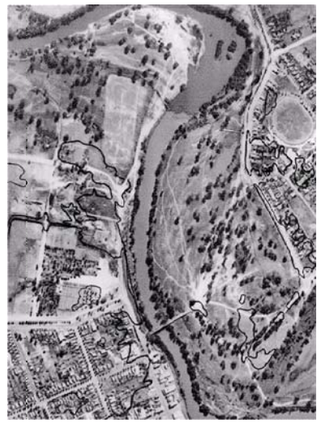


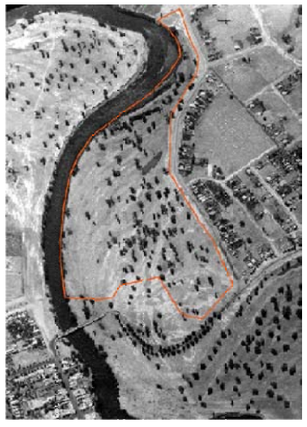
Old Railway Bridge
July 2012* v April 1971*
Location of 1974 Flood flow measurement.
Flat cropping area replaced with high density industrial and residential development mostly protected by the main Wagga Wagga Levee.



Wiradjuri Reserve
July 2012* v April 1971*
Evident Increase in River Red Gum and Yellow Box tree density on floodplain between Wagga Wagga and the Murrumbidgee River.

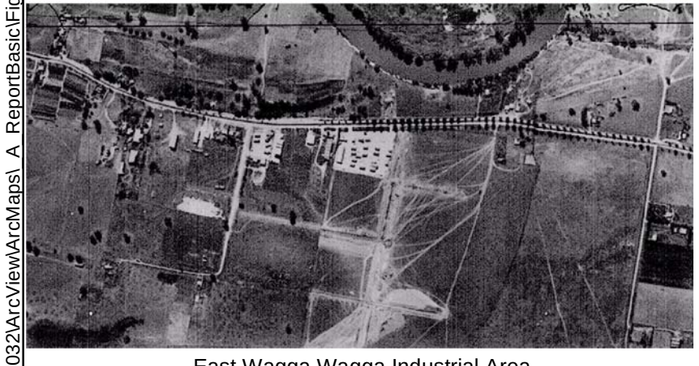
Eunony Lagoon and East Wagga Wagga
July 2012* v April 1971*
Evident increase in River Red Gum and Yellow Box tree density.





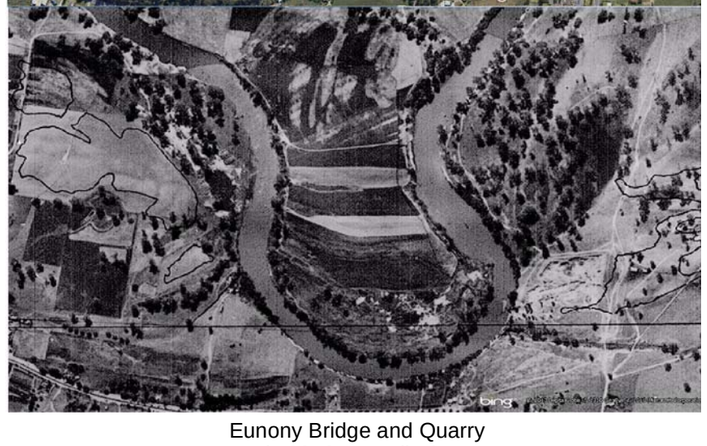
North Wagga Flats
July 2012* v April 1971* v March 1944*
Significant reduction in tree density on the banks adjacent the Murrumbidgee River and North Wagga floodplain

West Wagga Wagga
Cropping area with low tree cover replaced with expansive residential area
- Outside of 1974 of extent so unlikely to be affected by flooding.



East Wagga Wagga Industrial Area
July 2012* v April 1971*
Flat cropping area with low development replaced with dense industrial zone removing the area from the effective conveyance floodplain.

***Sources:**
2012 Aerial - City of Wagga Wagga Council
1971 Aerial - Central Mapping Authority, Department of Lands
1944 Aerial - Survey Flight, Royal Australian Airforce



Eunony Bridge and Quarry
July 2012* v April 1971*
Eunony Bridge not completed until 1975.
Quarries and perimeter temporary levees not present during 1974 event.

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FIGURE 11

LAND USE & ROUGHNESS MAP
2010, 2012 & ALL DESIGN EVENTS

HOULAGHANS CREEK
ESTELLA
CARTWRIGHTS HILL
BOMEN
MALEBO GAP
NORTH WAGGA WAGGA
YARRAGUNDRY
ASHMONT
WAGGA WAGGA
GUMLY GUMLY
BRAEHOUR
OURA
SANDY CREEK
KYEAMBA CREEK
FOREST HILL

MATERIAL

- General
- Deep Channel
- Riperian Vegetation
- Riperian Vegetation
- Urban
- Rural
- Cropping
- Industrial
- Parks
- Golf Courses
- Low Density Trees
- Wagga Hills
- Medium Density Trees
- Floodplain
- Olympic Traverse
- Cartwrights Hill
- North Wagga Flats
- Lagoon
- River Banks

N

0 0.75 1.5 3 4.5 6
(km)

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FIGURE 12
LAND USE & ROUGHNESS MAP
1974 DESIGN EVENT

HOULAGHANS CREEK
ESTELLA
CARTWRIGHTS HILL
BOMEN
MALEBO GAP
NORTH WAGGA WAGGA
YARRAGUNDRY
ASHMONT
WAGGA WAGGA
GUMLY GUMLY
BRAEHOUR
OURA
SANDY CREEK
KYEAMBA CREEK
FOREST HILL

MATERIAL
- General
- Deep Channel
- Riperian Vegetation
- Riperian Vegetation
- Urban
- Rural
- Cropping
- Industrial
- Parks
- Golf Courses
- Low Density Trees
- Wagga Hills
- Medium Density Trees
- Floodplain
- Olympic Traverse
- Cartwrights Hill
- North Wagga Flats
- Lagoon
- River Banks

N

0 0.75 1.5 3 4.5 6
(km)

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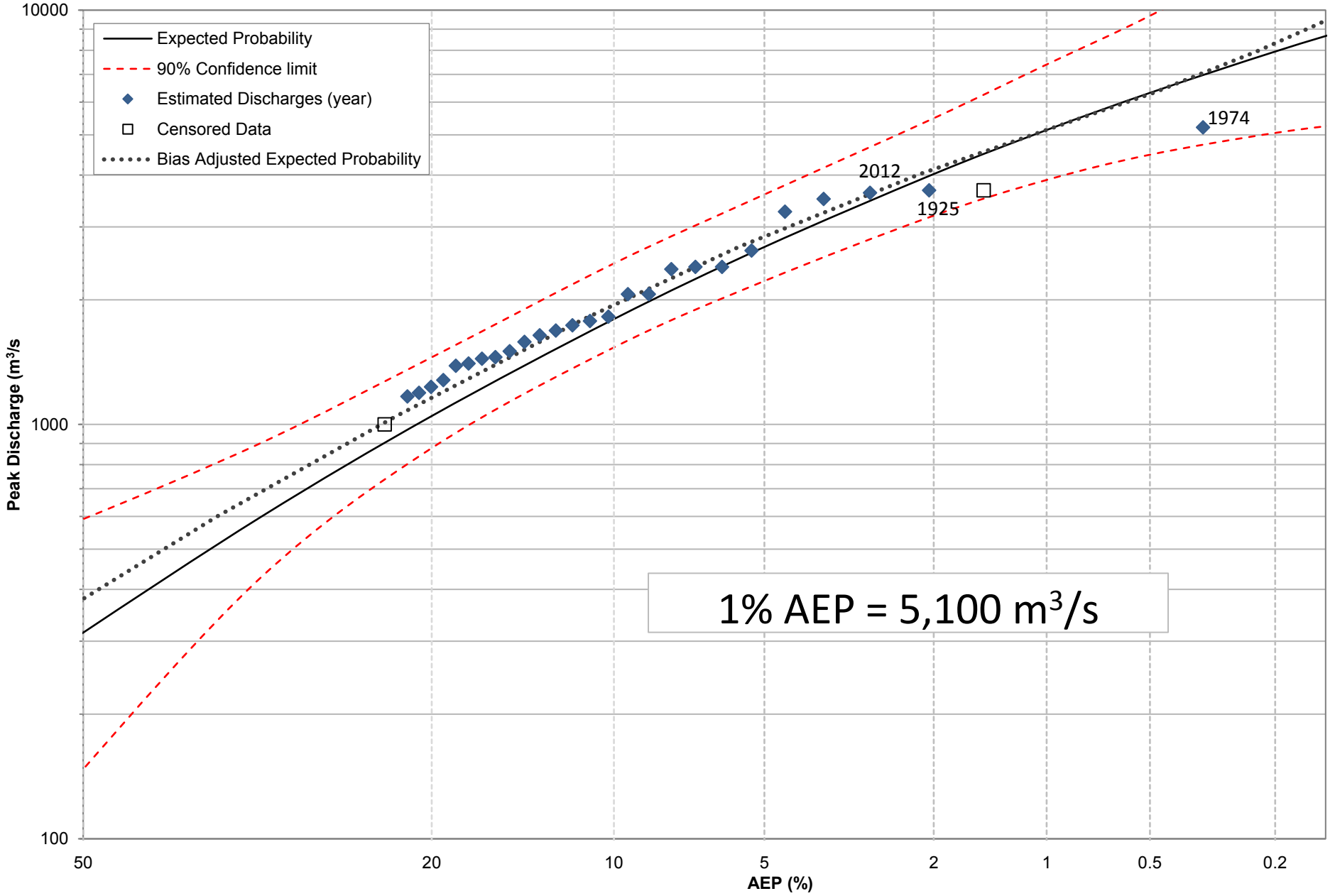

FIGURE 13
WAGGA WAGGA - MODEL DERIVED RATINGS
1853, 1870 EVENTS LARGER THAN THE 1925 EVENT WITH 52 YEARS BELOW THRESHOLD
TRUNCATED SERIES (93 Events < 1000 m³/s)
LP3 ANALYSIS - BAYESIAN

FIGURE 14
HYDRAULIC MODEL FEATURES

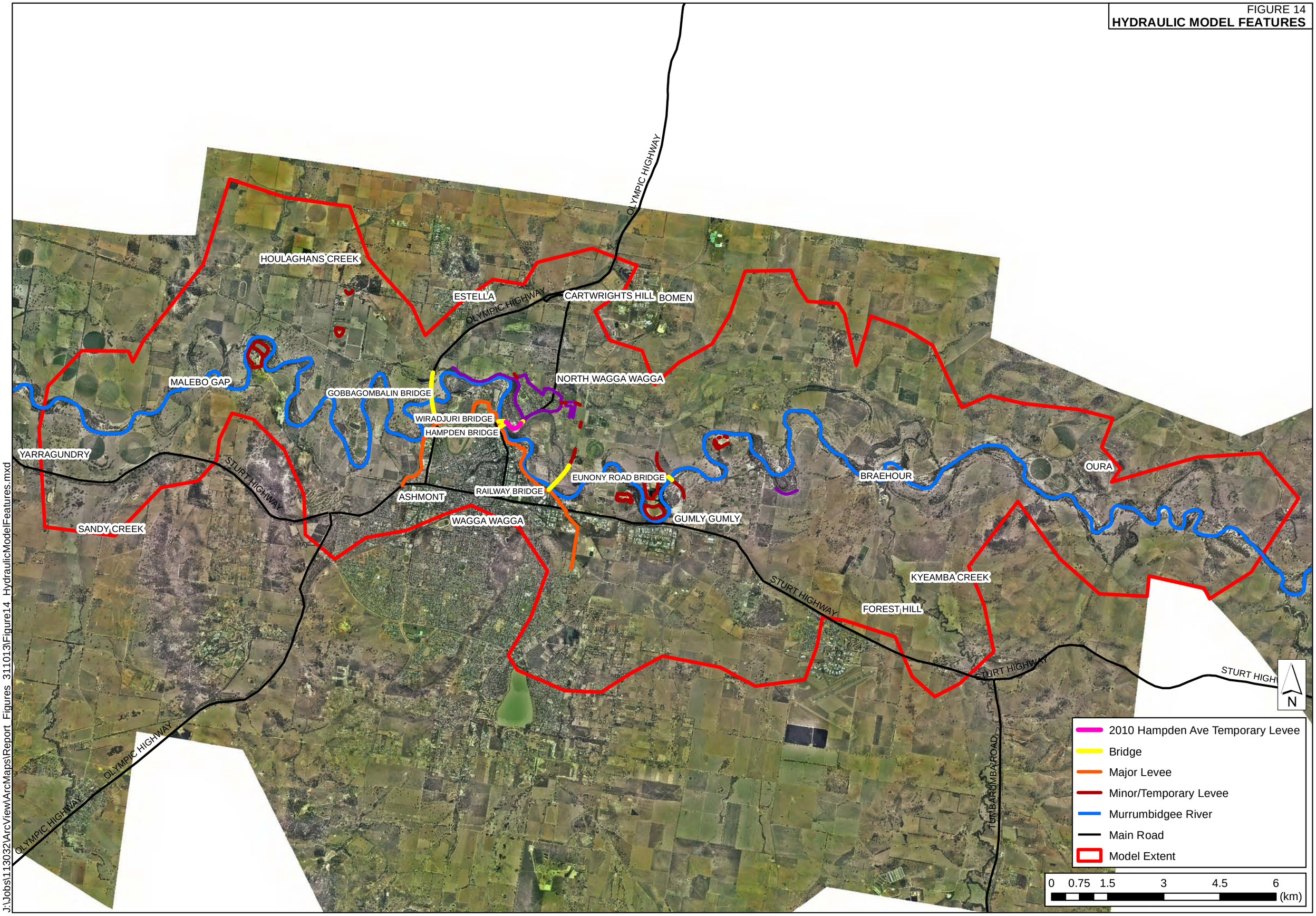

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FIGURE 15
CALIBRATION EVENT
MARCH 2012

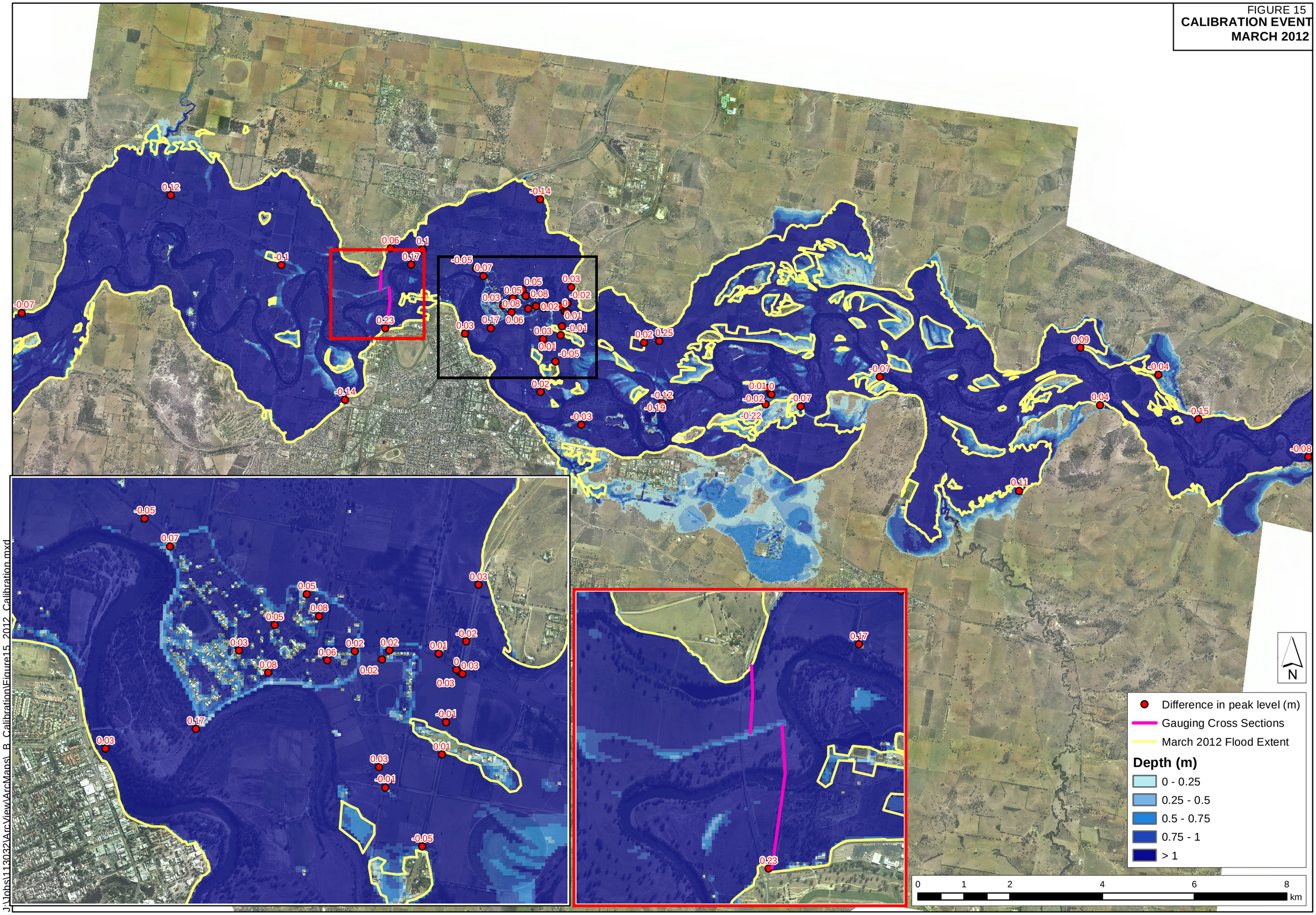

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FIGURE 16
VALIDATION EVENT DECEMBER 2010

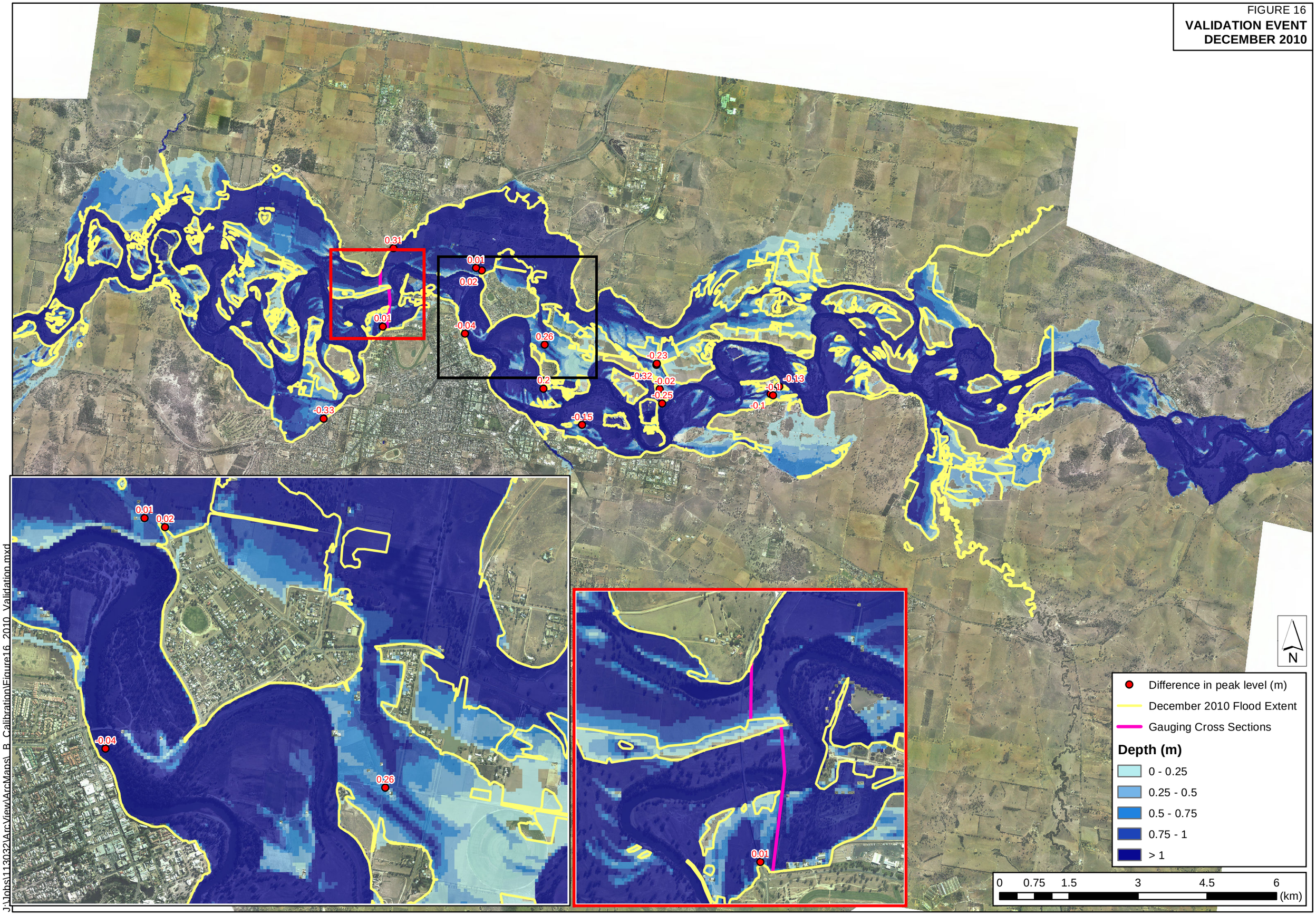

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FIGURE 17
MODEL RESULTS
AUGUST 1974

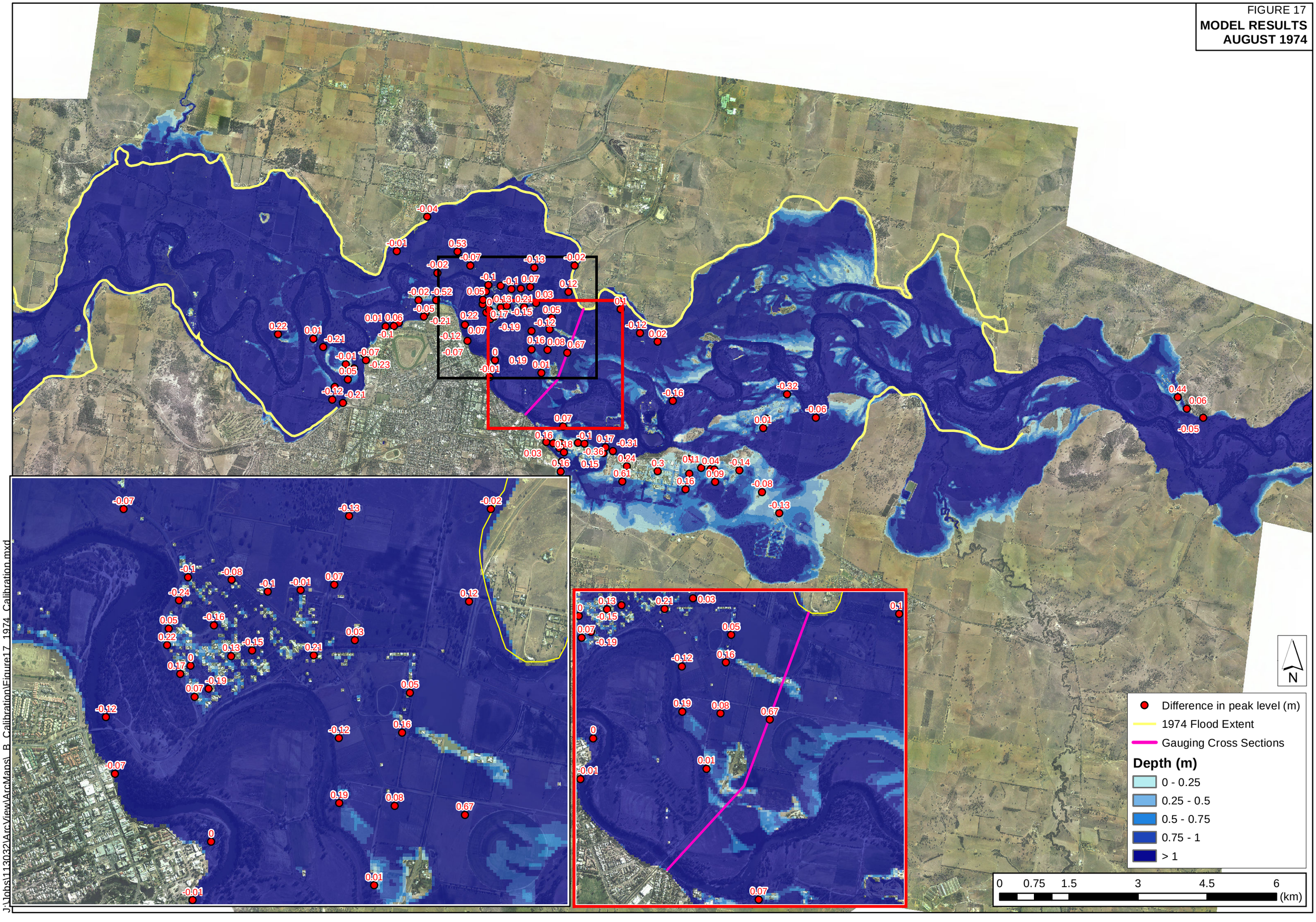

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FIGURE 18

PEAK DEPTHS AND LEVELS FOR DESIGN CONDITIONS
MAIN, NORTH WAGGA & RWCC LEVEES - 1% AEP

ESTELLA

NORTH WAGGA

HAMPDEN BRIDGE

WAGGA WAGGA

179.0
179.5
180.0
180.5
180.5
181.0
181.5
182.0
182.0
182.5
182.5
183.0
183.0
183.0
183.0
183.5
183.5
184.0

N

Contours (0.5m interval)
RWCC Levee
North Wagga Wagga Levee
Main Wagga Wagga Levee

Depth (m)
0 - 0.25
0.25 - 0.5
0.5 - 0.75
0.75 - 1
> 1

0 0.5 1 2 3 4 (km)

Disclaimer
Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of Murrumbidgee River flood behaviour. Inundation from local overland flow and tributary flow due to local rainfall is not shown and during events actual inundation patterns may vary. The order of accuracy of design peak flood levels is estimated to be ±0.25 m.

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FIGURE 19

PEAK DEPTHS AND LEVELS FOR DESIGN CONDITIONS MAIN, NORTH WAGGA & RWCC LEVEES - 5% AEP

ESTELLA

NORTH WAGGA

HAMPDEN BRIDGE

WAGGA WAGGA

178.0 178.5 179.0 179.5 180.0 180.5 181.0 181.5 182.0 182.5 183.0 183.5

N

Contours (0.5m interval)
RWCC Levee
North Wagga Wagga Levee
Main Wagga Wagga Levee

Depth (m)

0 - 0.25
0.25 - 0.5
0.5 - 0.75
0.75 - 1
> 1

0 0.5 1 2 3 4 (km)

Disclaimer
Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of Murrumbidgee River flood behaviour. Inundation from local overland flow and tributary flow due to local rainfall is not shown and during events actual inundation patterns may vary. The order of accuracy of design peak flood levels is estimated to be ±0.25 m.

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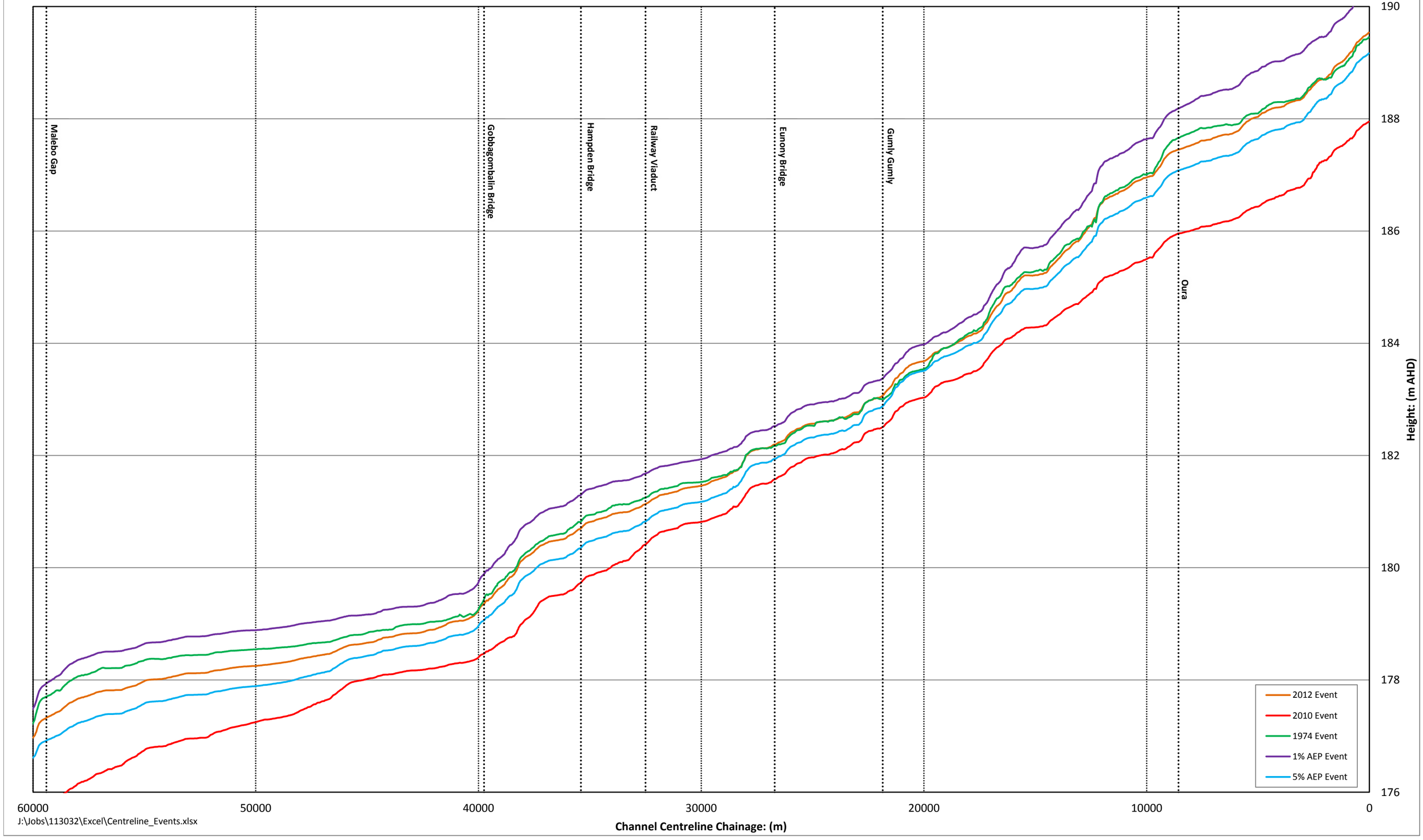
FIGURE 20

PEAK FLOOD LEVEL PROFILE
HISTORICAL AND DESIGN EVENTS



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