



Water Engineering
Partners

Water Engineering Partners Pty Ltd

Flood Impact Assessment Oonoonba, Townsville

Prepared for: Economic Development Queensland

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Disclaimer

The flood modelling presented in this report was based and relies on the adopted Council flood model.

The flood modelling presented in this report is based and relies on survey data and other data obtained from third parties. While all reasonable steps have been taken to verify the data, Water Engineering Partners does not guarantee the data obtained or supplied for the investigation

Rainfall is variable in nature. The modelling presented in this report is based on available rainfall data sourced from government agencies, with appropriate factors added to account for climate change estimates in accordance with guidance from local and state government bodies relevant to the study location in their planning schemes. Actual rainfall patterns and totals in the future could vary from those adopted for this report.

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1 Introduction

1.1 Background and Site Description

Water Engineering Plus (WEP) was commissioned by Economic Development Queensland (EDQ) to undertake a flood impact assessment for the purpose of confirming that development can proceed over part of EDQ's land holding at Oonoonba, Townsville without causing unacceptable flood impacts.

The land holding is described as Lot 9001 on SP306214 and is situated at Oonoonba, Townsville (the **Site**). The Site is situated within the City of Townsville local government area.

The Site forms part of the overall development of The Village, Oonoonba, a portion of which has already been developed. The Site consists of open space in its present form.

Figure 1-1 shows the location of the Site.

Flood levels and assessments for previous stages of The Village, Oonoonba were based on 2013 *Ross River Flood Study Base-line Flooding Assessment* completed by Townsville City Council and its associated MIKEFLOOD hydraulic model.

Post the Townsville 2019 flood event, Council commissioned a new TUFLOW hydraulic model of the Ross River. The results of the assessment are presented in the *Ross River Flood Study, Base-line Flooding Assessment* (October 2021). Although not officially adopted by Council at the time of this report, it represents the best flood model available of the Ross River. In the vicinity of the Site, the model also indicates higher flood levels than the previous 2013 model. Given these factors, it is preferred for use to consider development impacts and set development levels.

Council made a copy of the 2021 model available to EDQ and it was adopted for the investigation.

Flood levels at the site are dominated by regional flooding from the Ross River. In addition to regional flooding, flooding can occur as a result of local catchment rainfall events within the site. These events tend to be associated with shorter duration storms than regional events and produce peak levels for minor flood events within the site.

The supplied Council model includes both the short duration storms that are critical for local catchment flooding and the longer duration storms that are critical for regional flooding.



Figure 1-1: Site Location

1.2 Proposed Development

The proposed development includes filling part of Lot 9001 for residential pads as well as the development of wetlands within the central drainage corridor, the northern bank adjacent the Ross River as well as a portion of the wetland adjacent to the transport corridor to the east.

Figure 1-2 shows the proposed DEM for the site. Figure 1-3 presents the proposed RAL plan (RPS Plan No. 15703-13).

1.3 Scope

WEP was commissioned to complete a flood impact assessment in support of the proposed development to demonstrate that an acceptable outcome with regards to flooding and flood impacts can be achieved.

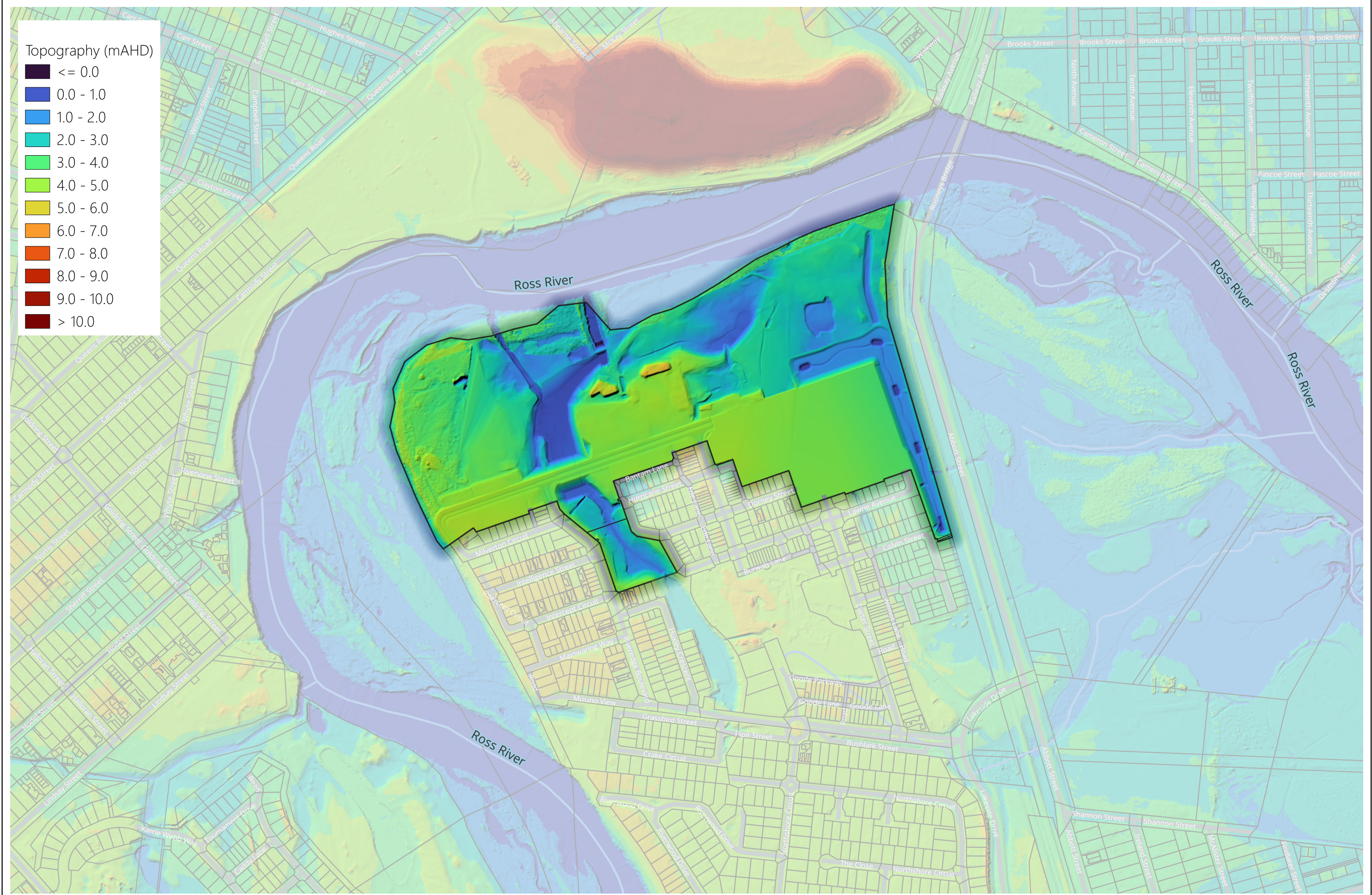
The investigation comprised the following analysis.

- **Regional Catchment Hydraulic Assessment**

Existing and developed case TUFLOW two-dimensional hydraulic modelling of the regional Ross River catchment was undertaken to demonstrate no unacceptable adverse off-site impacts with respect to regional catchment flooding.

- **Local Catchment Hydraulic Assessment**

Existing and developed case TUFLOW two-dimensional hydraulic modelling of the local catchments was undertaken to demonstrate no unacceptable adverse off-site impacts with respect to local catchment flooding.



Topography (mAHd)

<= 0.0
0.0 - 1.0
1.0 - 2.0
2.0 - 3.0
3.0 - 4.0
4.0 - 5.0
5.0 - 6.0
6.0 - 7.0
7.0 - 8.0
8.0 - 9.0
9.0 - 10.0
> 10.0

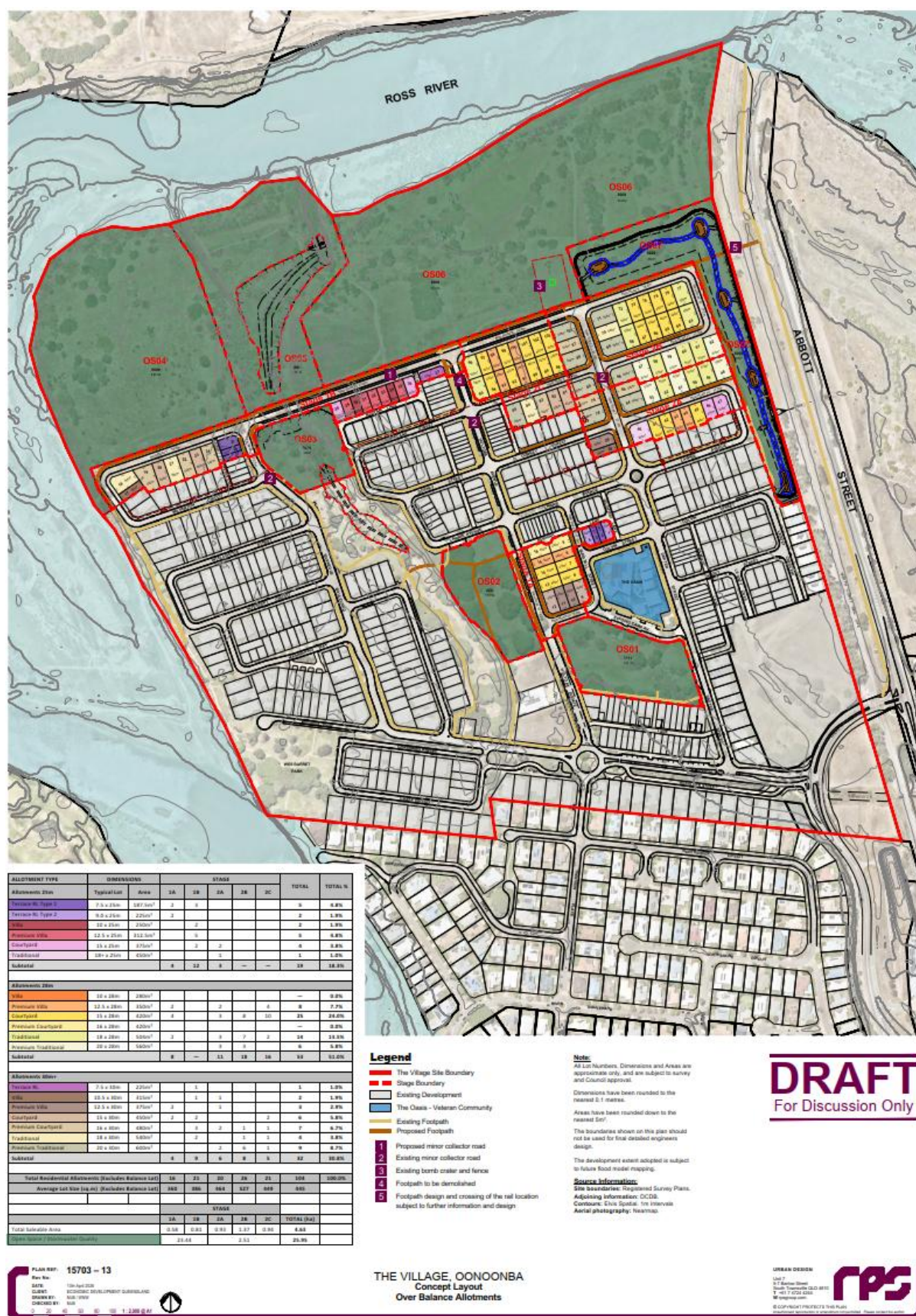
Data Sources:
Photography: Google Earth
Topography: 2016 and 2019 LIDAR
Cadastral: Queensland Globe
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Legend:
 Property Boundaries



PROJECT: Flood Modelling Oonoonba, Townsville
CLIENT: Economic Development Queensland
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 Water Engineering Partners www.wep.com.au	SCALE: 0 3,000 6,000 m 	FIGURE NUMBER: 1-2 DATE: 02-June-2026	REVISION: A
	Developed Case Model DEM		



2 Hydraulic Assessment

The assessments for the proposed development were based on the current TUFLOW hydraulic model of the Ross River and adjacent catchments. The TUFLOW model was commissioned by Council subsequent to the 2019 flood event to provide an updated model using the latest *Australian Rainfall and Runoff* (ARR) 2019 design flood methodology.

Details of the model development including regional and local catchment hydrology, calibration, model extent and development are in the AECOM report '*Ross River Flood Study. Base-line Flooding Assessment*' (14 October 2021).

2.1 Base Case Modelling

2.1.1 Overview

To establish base case flood levels for the site, the TUFLOW model provided by Council was utilised. A review of the model was conducted to establish its suitability to represent the site in its current state.

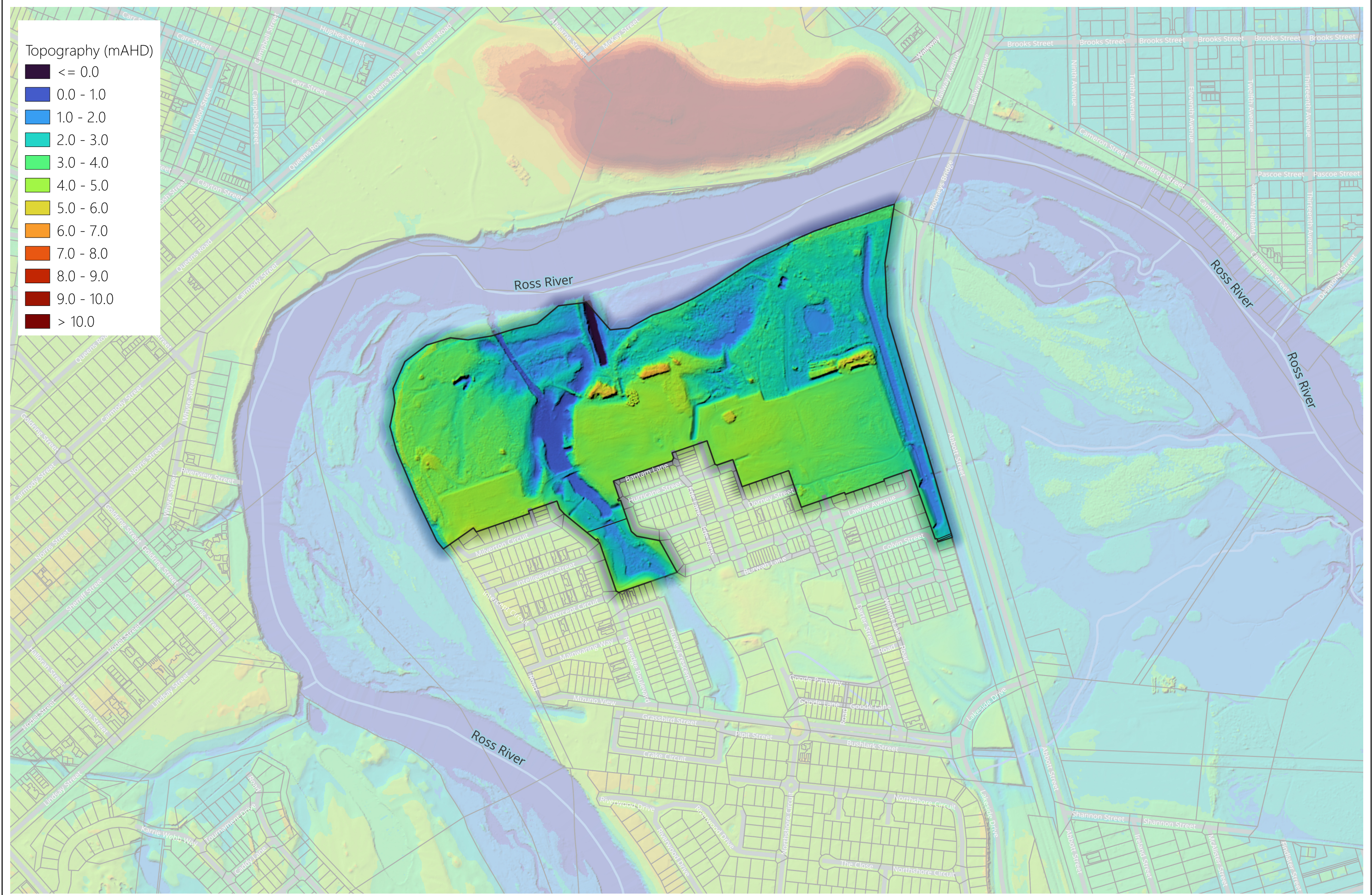
The review established that TUFLOW model suitably represented the current site and site ground levels and was representative of the present-day site. Consequently, the model was adopted generally without modification. The only modification made to the model was in relation to conditions in the north east of the site where a temporary stockpile from previous development was captured by the Lidar used in the Council model. The levels in this area were replaced by survey completed prior to the stockpiling of material.

Figure 2-1 shows the model DEM representing the site used for the base case assessments.

For the current assessments, the base case model was run for the 5% and 1% regional Ross River events and 1% local catchment event flooding scenarios. Regional flood events more frequent than the 5% AEP event were not considered as they did not produce breakouts from the Ross River that affect the Site.

In addition to above events, the following events were also considered:

- 0.2% AEP regional Ross River event in accordance with Table SC6.7.4 of the *Flood hazard planning scheme policy of Townsville City Plan*; and
- the 2019 flood event to provide guidance in relation to the flood levels associated with the 2019 event if the development had been in place in 2019.



Data Sources:
Photography: Google Earth
Topography: 2016 and 2019 LIDAR
Cadastral: Queensland Globe

Coordinate System: GDA94 / MGA zone 55

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Legend:

□ Property Boundaries



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CLIENT: Economic Development Queensland

Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figures\Report\Figure DEMs_2.qgz

WEP Water Engineering Partners www.wep.com.au	SCALE: 0 3,000 6,000 m	Base Case Model DEM	
		FIGURE NUMBER: 2-1	REVISION: A
DATE: 02-June-2026			

2.1.2 Results

Results presented include peak water levels, peak depths and peak velocities.

Flood mapping for the 5% AEP, 1% AEP and 0.2% AEP regional event base cases is provided in Appendix A:

- Figure A-1: 5% AEP Peak Flood Level – Existing Case;
- Figure A-2: 1% AEP Peak Flood Level – Existing Case;
- Figure A-3: 0.2% AEP Peak Flood Level – Existing Case;
- Figure A-4: 5% AEP Peak Flood Depth – Existing Case;
- Figure A-5: 1% AEP Peak Flood Depth – Existing Case;
- Figure A-6: 0.2% AEP Peak Flood Depth – Existing Case;
- Figure A-7: 5% AEP Peak Flood Velocity – Existing Case;
- Figure A-8: 1% AEP Peak Flood Velocity – Existing Case; and
- Figure A-9: 0.2% AEP Peak Flood Velocity – Existing Case.

Flood mapping for the 1% AEP local event base case modelling is provided in Appendix B:

- Figure B-1: 1% AEP Peak Flood Level – Existing Case;
- Figure B-2: 1% AEP Peak Flood Depth – Existing Case; and
- Figure B-3: 1% AEP Peak Flood Velocity – Existing Case.

It is noted that the local event flood mapping results presented are an envelope of peak results for the range of event durations provided. Given the results achieved for the 1% AEP event, it was considered that the modelling of lesser local events was not warranted.

2.2 Developed Case Modelling

2.2.1 Overview

Based on an iterative process, an earthworks design DEM was developed by civil consultants Stantec and tested in the flood model. It is noted that the DEM The ultimately derived model is presented in Figure 1-2. It is noted that the model includes the stormwater management measures developed by DesignFlow.

The DEM was incorporated into the base case model and run for the 5%, 1% and 0.2% AEP regional Ross River events and the 1% AEP local catchment event flooding scenarios. Results presented include peak water levels, peak depths and peak velocities.

The model was also run to consider the 1% AEP event including climate change as per the adopted Council model (to ensure that appropriate development levels which are based on the 1% AEP event with freeboard and the 1% AEP event with climate change were obtained.

Finally, the model was also used to simulate the historic 2019 event.

2.2.2 Results

Flood mapping for the regional event design case modelling is provided in Appendix C:

- Figure C-1: 5% AEP Peak Regional Impacts – Developed Case;
- Figure C-2: 5% AEP Peak Regional Level – Developed Case;
- Figure C-3: 5% AEP Peak Regional Depth – Developed Case;

- Figure C-4: 5% AEP Peak Regional Velocity – Developed Case;
- Figure C-5: 1% AEP Peak Regional Impacts – Developed Case;
- Figure C-6: 1% AEP Peak Regional Level – Developed Case;
- Figure C-7: 1% AEP Peak Regional Depth – Developed Case;
- Figure C-8: 1% AEP Peak Regional Velocity – Developed Case.
- Figure C-9: 0.2% AEP Peak Regional Impacts – Developed Case;
- Figure C-10: 0.2% AEP Peak Regional Level – Developed Case;
- Figure C-11: 0.2% AEP Peak Regional Depth – Developed Case;
- Figure C-12: 0.2% AEP Peak Regional Velocity – Developed Case;
- Figure C-13: 1% AEP With Climate Change Peak Regional Level – Developed Case;
- Figure C-14: 2019 Event Peak Level – Developed Case;
- Figure C-15: 2019 Event Peak Depth – Developed Case; and
- Figure C-16: 2019 Event Peak Velocity – Developed Case.

Flood mapping for the local event design case modelling is provided in Appendix D:

- Figure D-1: 1% AEP Peak Local Impacts – Developed Case;
- Figure D-2: 1% AEP Peak Local Level – Developed Case;
- Figure D-3: 1% AEP Peak Local Depth – Developed Case; and
- Figure D-4: 1% AEP Peak Local Velocity – Developed Case.

As per the base case, the local event flood mapping results presented are an envelope of peak results for the range of event durations provided.

Based on the base and developed case modelling, a flood impact assessment was conducted to compare the developed case against the base case to assess the potential flood impacts resulting from the proposed development.

The results from the regional and local modelling were considered.

- ***Regional Flooding***

Events up to 1% AEP Event

With reference to Figure C-1 in Appendix C, there are no offsite impacts in excess of 10mm for the 5% AEP regional flood event.

Figure 2.2 presents the 1% AEP regional flood impacts.

For the regional case, a limited area of impact was identified beyond the Site boundary for the 1% AEP event (refer Y:\Jobs\30200-30299\30257_Ooononba\06_GIS\Figures\Report\002.01\Figure 2-2_rev.pdf

Figure 2-2). Areas of impact include:

- within the internal channel that drains from The Village Ooononba through the Site (without impacting existing properties) and
- Adjacent to the eastern wetland boundary.

The impacts within the internal channel do not impact existing properties however increases are noted within internal roads, particular at the southern end of the channel. It is noted that the proposed road crossing at the northern end of the channel is a restriction which is governing these impacts. The proposed crossing currently consists of 4/1200mm diameter pipes. Further refinement of this crossing can be completed as part of final design.

An assessment of the magnitude of the impacts adjacent to the eastern wetlands indicated that the impact is predominantly less than 17mm.

As the impacts are both small in quantum and are already over an area of existing inundation within the transport corridor, the calculated impacts are therefore considered to be acceptable.

Further, it is noted that the approval previously issued with respect to the area included a significantly greater impact on the road and rail corridor. Figure 2-5 presents the impact that was previously approved (DEV2016/749). The lesser impacts compared to those approved previously reflect the reduced footprint being considered in this case.

0.2% AEP Event

In accordance with the Flood hazard planning scheme policy (Attachment 2), an impact assessment of the 0.2% AEP has been undertaken.

The impact results are presented in Figure 2-4.

The impacts presented indicate a limited number of properties experiencing >100mm inundation to the south of the internal channel. This rapidly reduces to less than 20mm within approximately 100m. As the event is beyond the design standard 1% AEP event, the changes in level are considered to be acceptable as they are not associated with a change in flow paths or flood warning times.

The railway/road corridor to the east experiences up to 50mm impact. However, as this corridor would not be trafficable for the event, the impact is not considered to be of significance.

2019 Event

The 2019 event was also run to determine the levels that would have occurred if the development was in place at the time of the 2019 event.

With reference to Figure C-15, the modelling indicated depths of flooding within lots typically of the order of 80-200 mm, with a maximum of 220mm. Consequently, it is considered that should an event with a magnitude equivalent to the 2019 event occur again, it would generally not result in the inundation of floors in new lots.

- **Local Flooding**

Figure 2.3 presents the 1% AEP local flood impacts.

For the local catchment 1% AEP case (refer Figure 2-3), only minor very localised impacts are observed within some local streets. These impacts are predicted to be between 10-50mm. However, a review of these impacts indicates that the resultant flood levels do not impact on the trafficability of these roads.

The main channel through The Village Oonoonba is not impacted by the proposed development for this event.

2.3 Minimum Development Levels

Performance Outcome PO4 to the *Flood hazard overlay code of Townsville City Plan 2024* (the **Planning Scheme**) requires that '*siting and layout of development maintains the safety of people and property in medium hazard areas*'.

Acceptable Outcome AO4.1 to PO4 is for floor levels to be 300 mm above the Defined Flood Level. Schedule 1 of the Planning Scheme states that the Defined Flood Level is the flood level caused by the 1% AEP flood event (the Defined Flood Event).

Section SC6.7.4.4.7 of the *Flood hazard planning scheme policy* of the Planning Scheme states that a climate change sensitivity should be completed with respect to the Defined Flood Event, with sea levels increased by 0.88 m and rainfall intensities increased by 15%.

The planning scheme policy indicates that commentary should be provided about areas where the floor level freeboard above the normal Defined Flood Event (i.e., the Defined Flood Level) is exceeded.

To satisfy the requirements of the code and the climate change sensitivity, minimum development levels are to be set as the higher of:

- The Defined Flood Level (1% AEP event) plus 300 mm; and
- The 1% AEP event with climate change.

Figure C-13 in Appendix C presents the peak flood levels for the 1% AEP event including climate change.

The flood level envelopes for the 1% AEP event and the 1% AEP event with climate change were provided to Stantec for the development of their earthworks model.

It is noted that the mapping for the climate change case indicates some inundation of the fill pad. Interrogation of the levels indicated a depth of water of generally between 50 and 80 mm, with a maximum of about 100 mm. As houses would be provided with a minimum slab thickness of 200mm, it is considered that the flood levels including climate change will remain below floor level, thereby satisfying the requirements of the planning scheme.



Impact (mm)

Dark Blue	≤ -1000
Dark Purple	-300 - -200
Purple	-200 - -100
Blue	-100 - -50
Light Blue	-50 - -40
Cyan	-40 - -30
Light Cyan	-30 - -20
White	-20 - -10
Light Green	-10 - 10
Yellow	10 - 20
Orange	20 - 30
Dark Orange	30 - 40
Red	40 - 50
Dark Red	50 - 100
Dark Red	100 - 200
Dark Red	>=1000
Green	Was Wet Now Dry
Pink	Was Dry Now Wet

DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

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Economic Development Queensland

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TITLE:
1% AEP Peak Regional Impacts - Developed Case

CLIENT:
WEP Water Engineering Partners
WWW.WEP.COM.AU

SCALE:
0 100 200 m

FIGURE:
2-2

DATE:
02-June-2026

REV:



DATA SOURCE:
Photography: Google Earth

Topography:

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TITLE:
1% AEP Peak Local Flood Impacts - Developed Case



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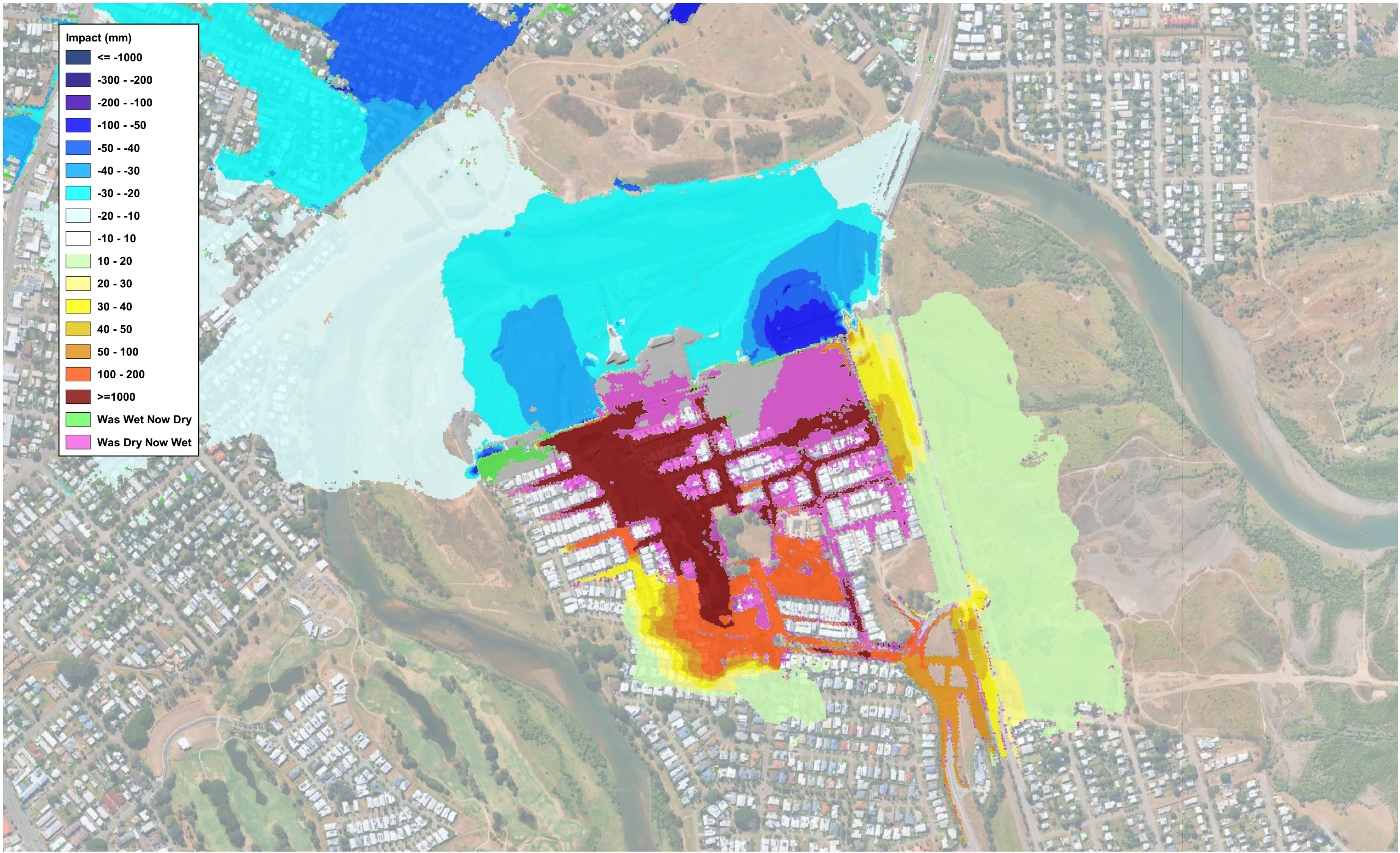
www.wep.com.au

SCALE:
0 100 200 m

FIGURE:
2-3

DATE:
02-June-2026

REV:



Impact (mm)

≤ -1000

-300 - -200

-200 - -100

-100 - -50

-50 - -40

-40 - -30

-30 - -20

-20 - -10

-10 - 10

10 - 20

20 - 30

30 - 40

40 - 50

50 - 100

100 - 200

≥1000

Was Wet Now Dry

Was Dry Now Wet

DATA SOURCE:
Photography: Google Earth

Topography:

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PROJECT:
Flood Modelling Oonoonba, Townsville

TITLE:
0.2% AEP Peak Regional Impacts - Developed Case

CLIENT:
Economic Development Queensland

www.wep.com.au

SCALE:
0 100 200 m

FIGURE:
2-4

REV:

DATE:
02-June-2026

Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep\TCC_MP_2026_Dev06_E04_rep.qgz

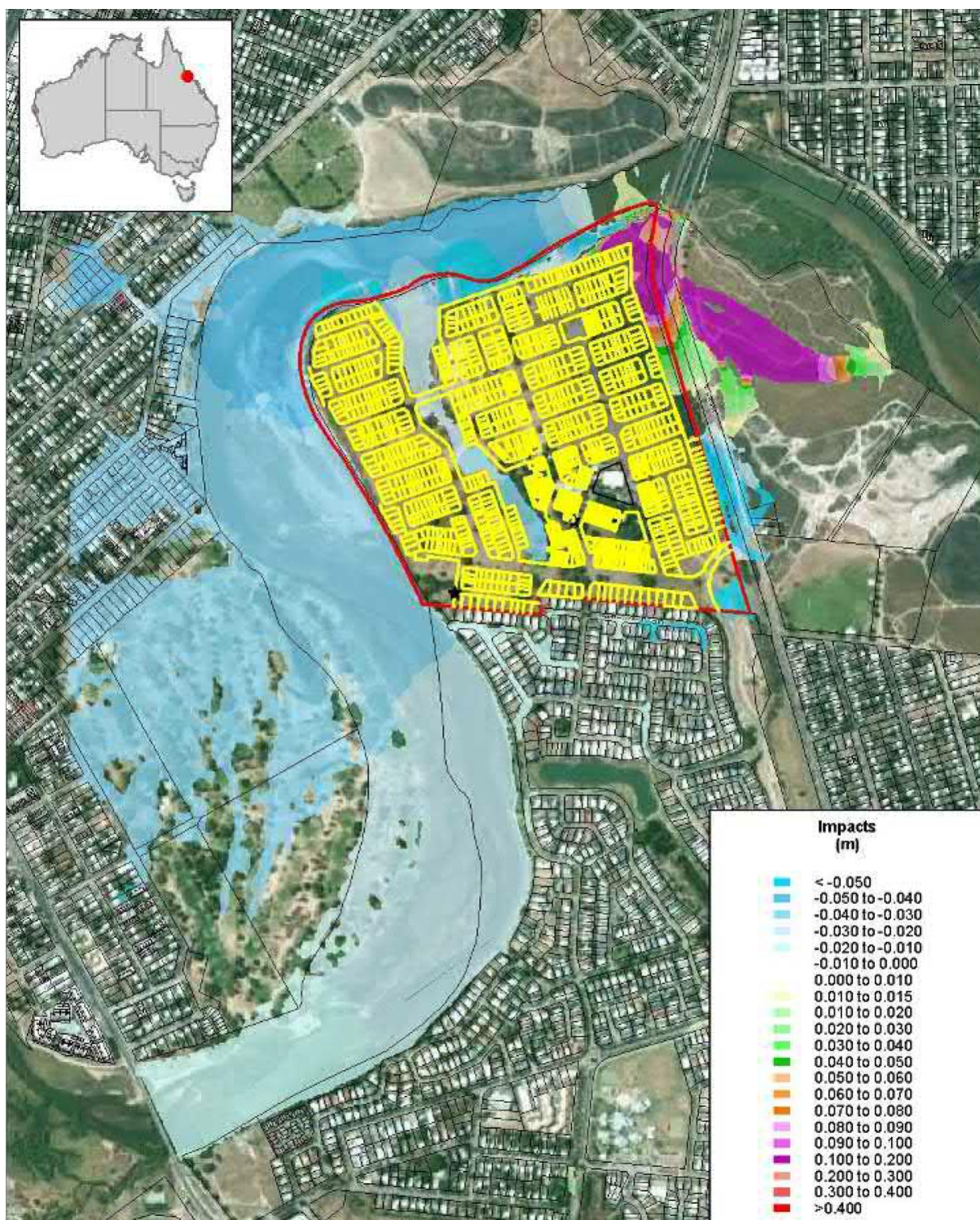


Figure 2-5: Previous Approval, 1% AEP Regional Flood Impacts

3 Conclusion

Water Engineering Partners (WEP) completed a flood impact assessment for the proposed development of EDQ's land holding at Oonoonba, Townsville.

The assessment was based on a provided earthworks DEM incorporating filling of the site and excavation of the adjacent wetlands to the north and east of the site.

Modelling was undertaken using a TUFLOW two-dimensional flood model of the site and surrounding area based on City of Townsville's latest model, as documented in the AECOM report *Ross River Flood Study. Base-line Flooding Assessment*.

Regional catchment flood events were investigated for the 5%, 1% AEP, 1% AEP with climate change and the 0.2% AEP events. The 1% AEP event for the local catchment design flood event.

In addition, the historic 2019 event was modelled.

Based on the results of the flood impact assessment, it is considered that the proposed development in its current form does not result in unacceptable adverse off-site flood impacts.

Appendix A Base Case Regional Catchment Results



DATA SOURCE:
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PROJECT: Flood Modelling Oonoonba, Townsville		TITLE: 5% AEP Peak Flood Level - Existing Case	
CLIENT: Economic Development Queensland	 WWW.WEP.COM.AU	SCALE: 0 100 200 m 	FIGURE: A-1 DATE: 02-June-2026
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DATA SOURCE:
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PROJECT: Flood Modelling Oonoonba, Townsville	TITLE: 1% AEP Peak Flood Level - Existing Case		
CLIENT: Economic Development Queensland	 WWW.WEP.COM.AU	SCALE: 0 100 200 m 	FIGURE: A-2
Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_ex_E04_rep\TCC_Results_ex_E04_rep.qgz		REV:	DATE: 02-June-2026



DATA SOURCE:
Photography: Google Earth

Topography:

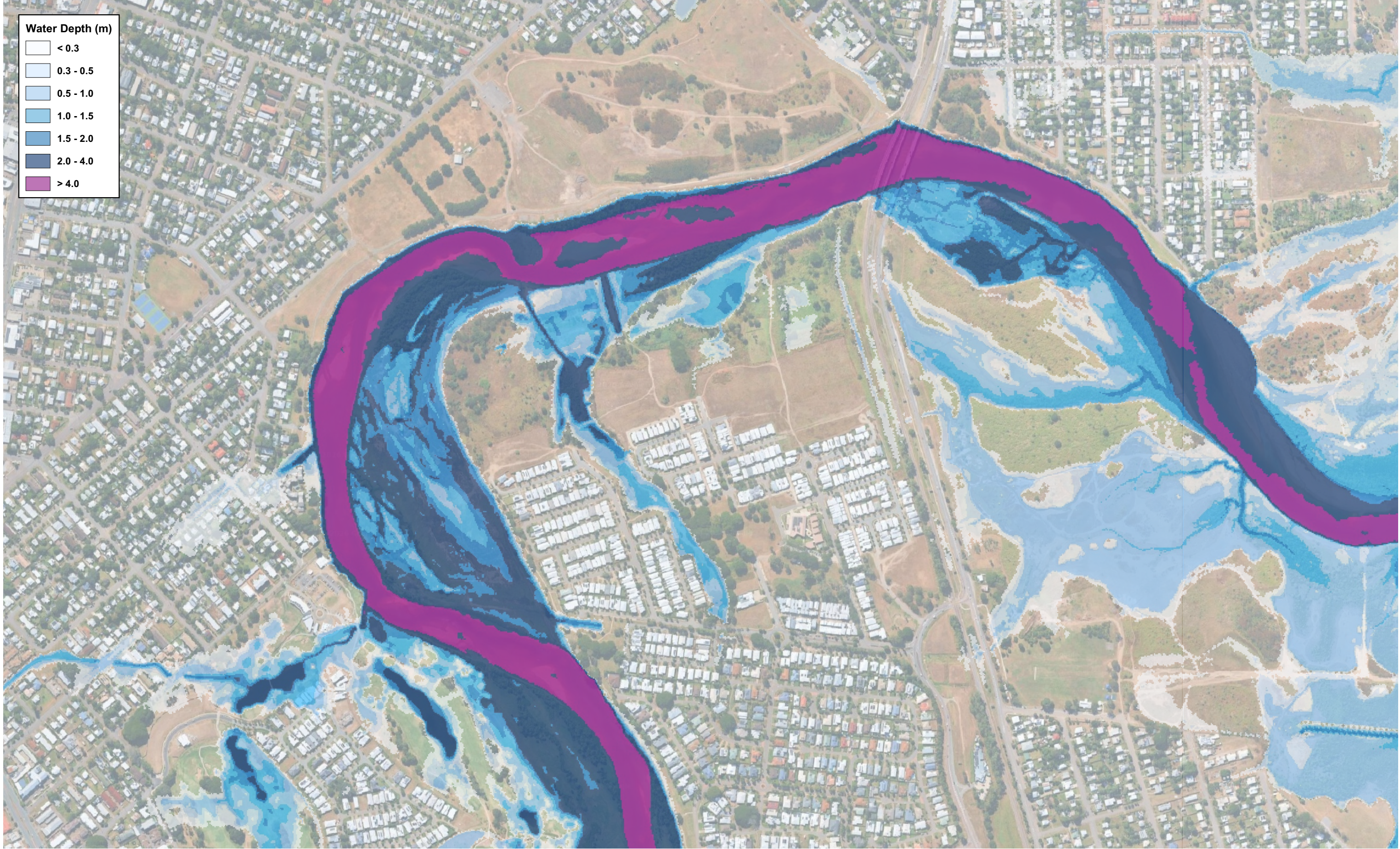
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CLIENT: Economic Development Queensland	 www.wep.com.au	SCALE: 0 100 200 m 	FIGURE: A-3 DATE: 02-June-2026
Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_ex_E04_rep\TCC_Results_ex_E04_rep.qgz			



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TITLE:
5% AEP Peak Flood Depth - Existing Case

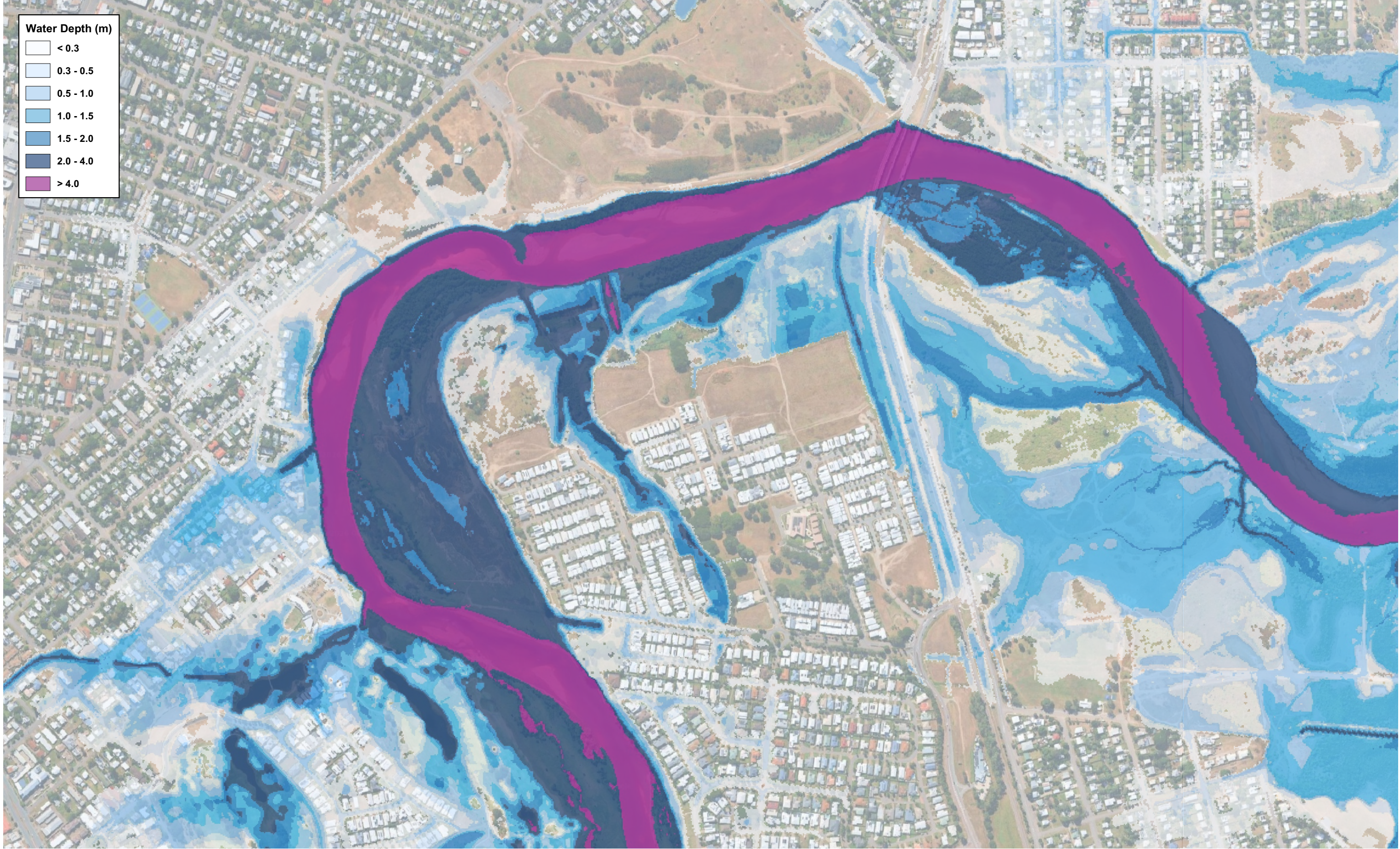
 **WEP** | Water Engineering Partners
WWW.WEP.COM.AU

SCALE:
0 100 200 m


FIGURE:
A-4

REV:

DATE:
02-June-2026



Water Depth (m)

< 0.3
0.3 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.0
2.0 - 4.0
> 4.0

DATA SOURCE:
Photography: Google Earth

Topography:

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Economic Development Queensland

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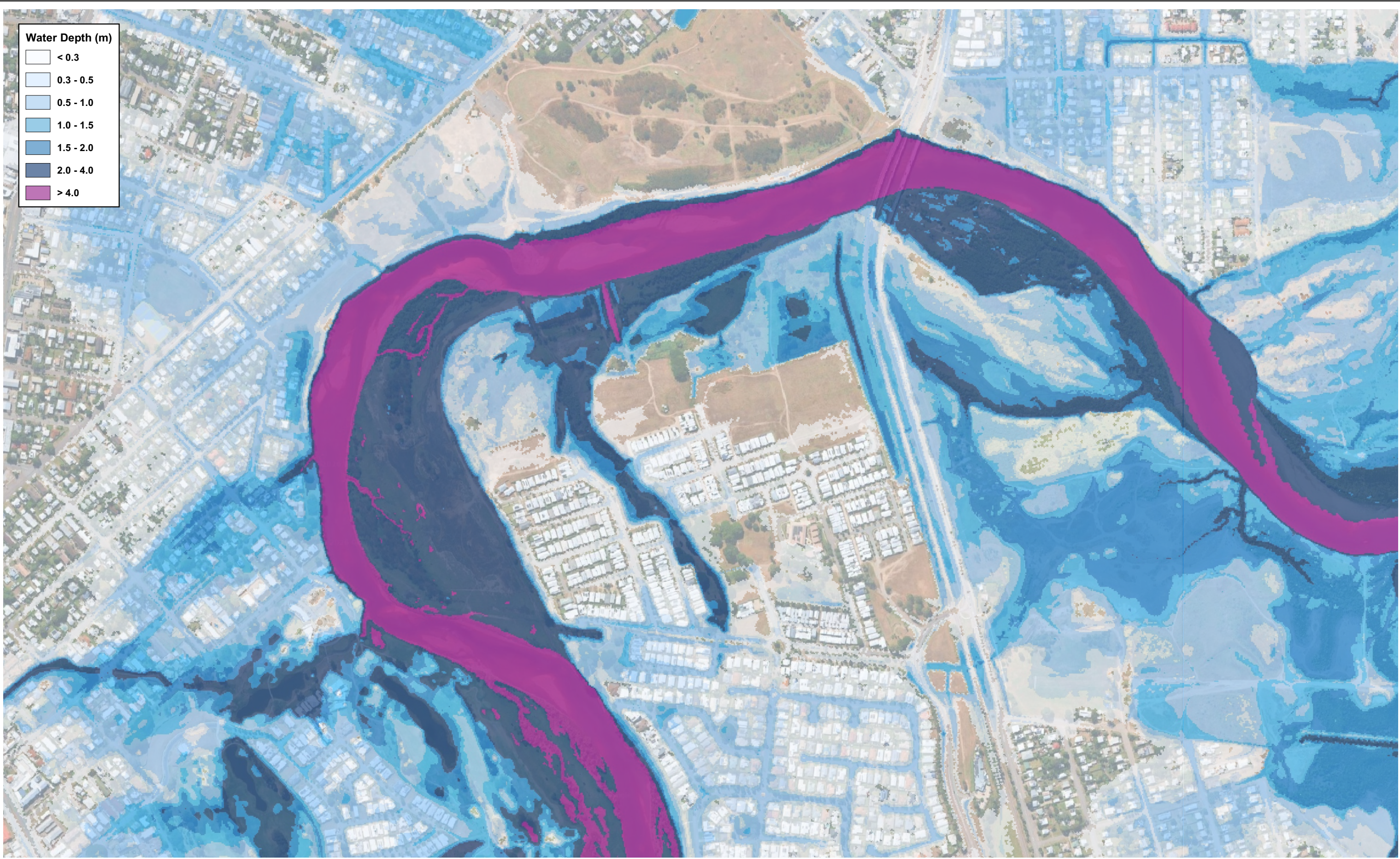
TITLE:
1% AEP Peak Flood Depth - Existing Case

SCALE:
0 100 200 m

FIGURE:
A-5

DATE:
02-June-2026

REV:



Water Depth (m)

< 0.3
0.3 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.0
2.0 - 4.0
> 4.0

DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

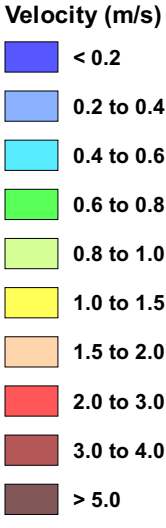
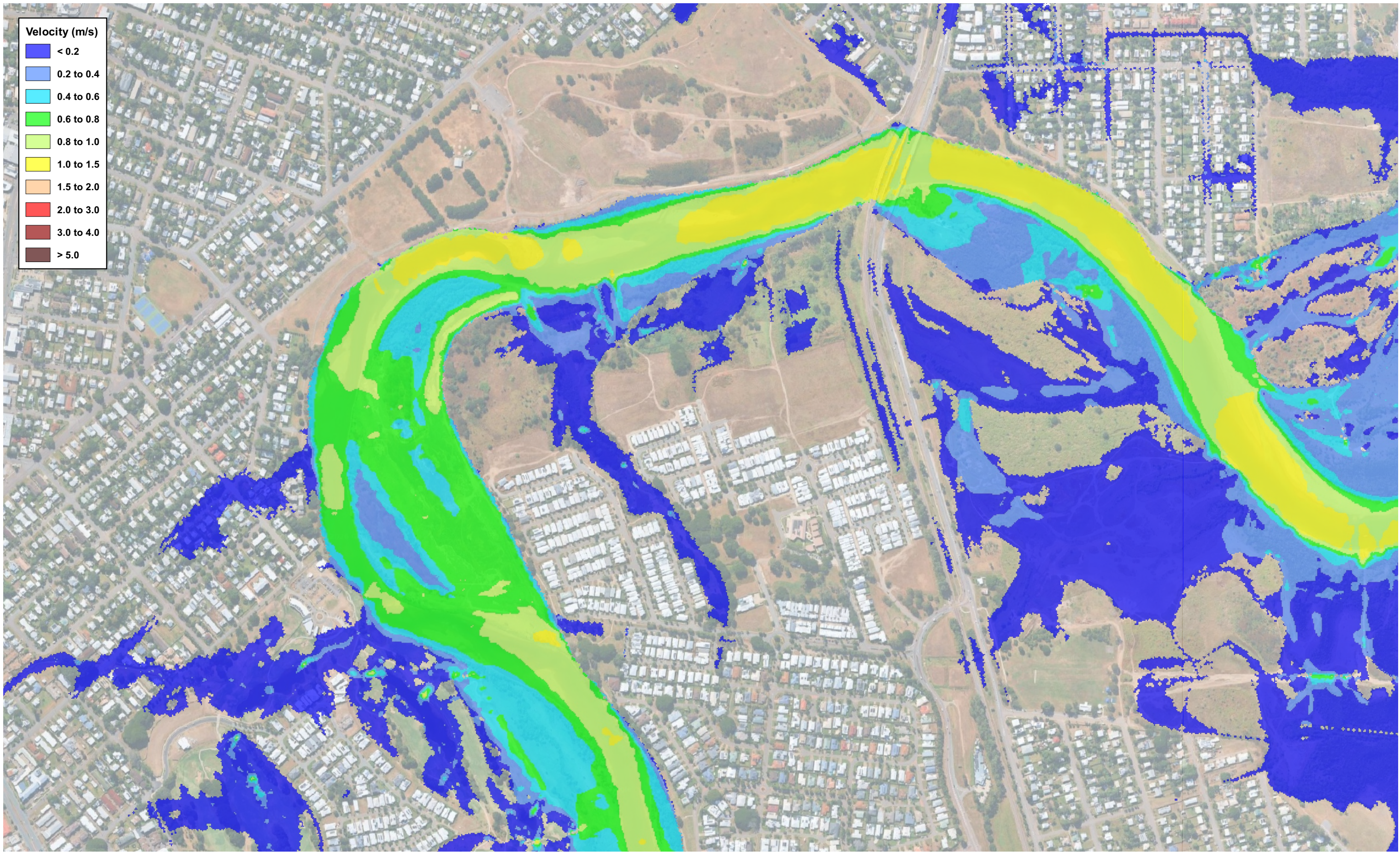
Coordinate System: GDA94 / MGA zone 55

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Legend



PROJECT: Flood Modelling Oonoonba, Townsville		TITLE: 0.2% AEP Peak Flood Depth - Existing Case	
CLIENT: Economic Development Queensland	 www.wep.com.au	SCALE: 	FIGURE: A-6
Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_ex_E04_rep\TCC_Results_ex_E04_rep.qgz			REV: DATE: 02-June-2026



DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

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Legend



PROJECT:
Flood Modelling Oonoonba, Townsville

CLIENT:
Economic Development Queensland

Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_ex_E04_rep\TCC_Results_ex_E04_rep.qgz

TITLE:
5% AEP Peak Flood Velocity - Existing Case

CLIENT: **WEP** Water Engineering Partners

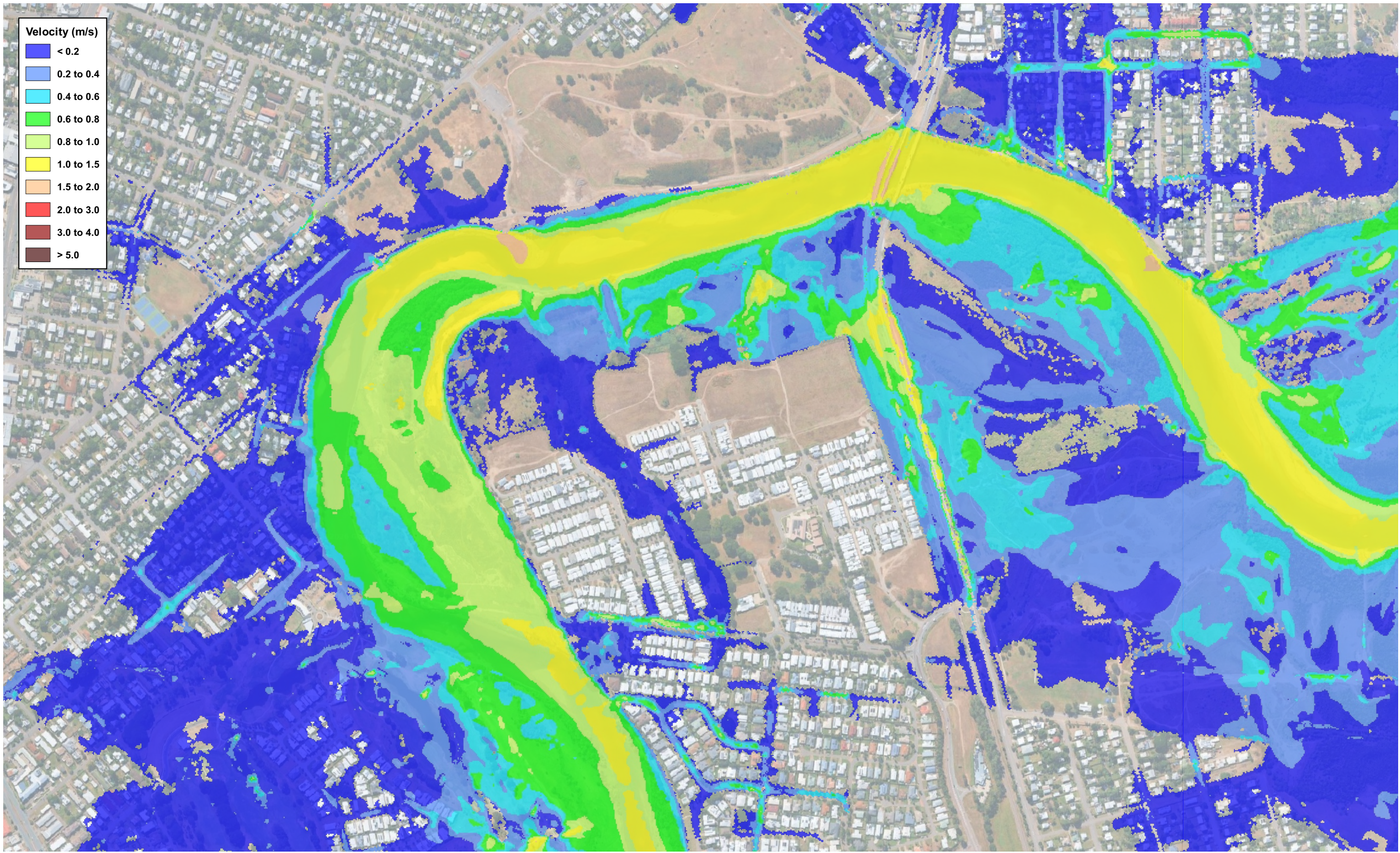
WWW.WEP.COM.AU

SCALE:
0 100 200 m

FIGURE:
A-7

DATE:
02-June-2026

REV:



Legend



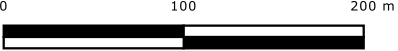
DATA SOURCE:
Photography: Google Earth

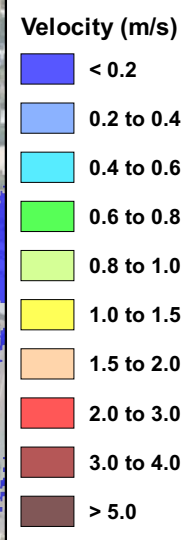
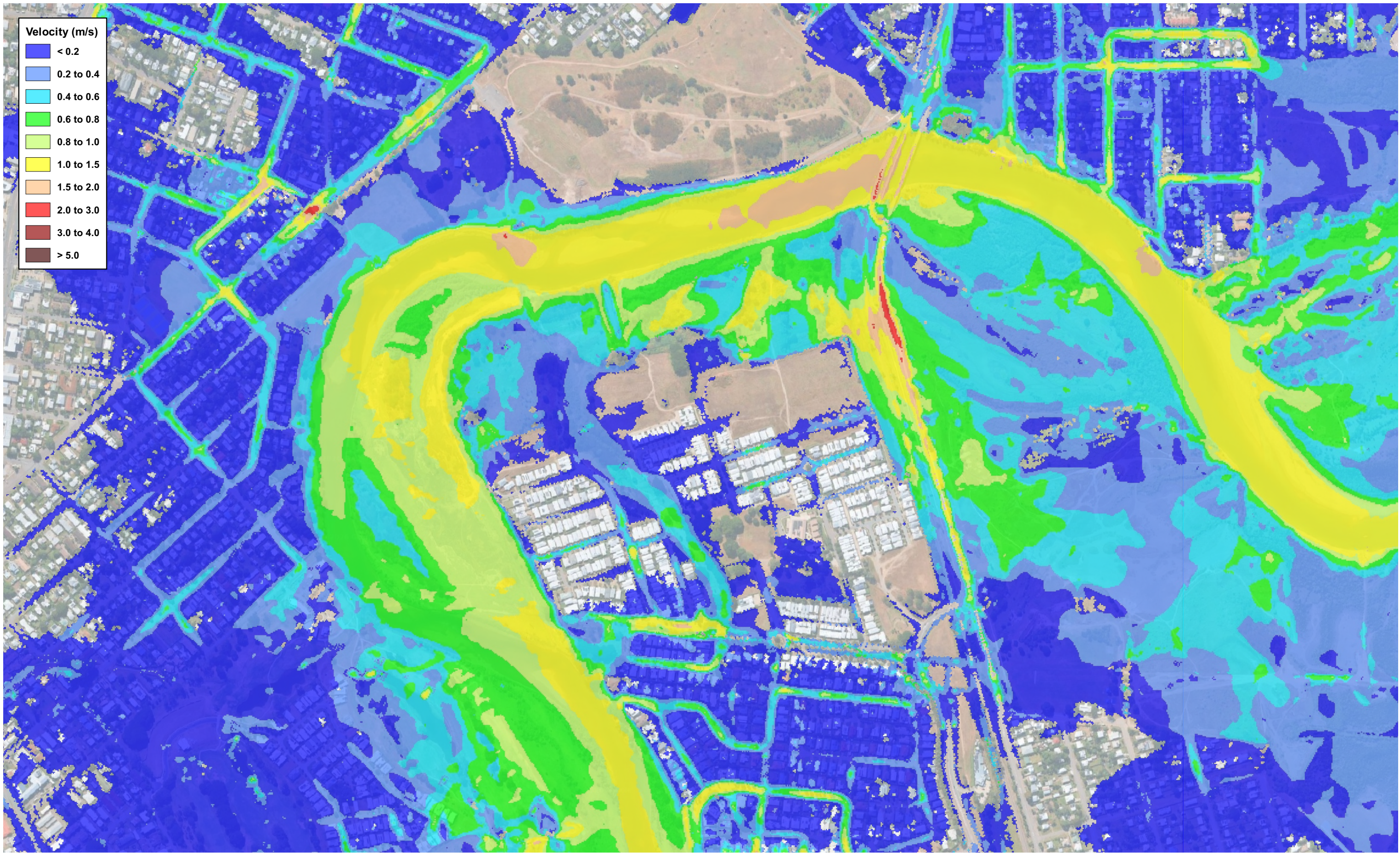
Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

Water Engineering Partners endeavours to ensure that the information provided in this map is correct at the time of publication. Water Engineering Partners does not warrant, guarantee or make any representations regarding the currency, accuracy or validity of information contained in this map.

PROJECT: Flood Modelling Oonoonba, Townsville		TITLE: 1% AEP Peak Flood Velocity - Existing Case	
CLIENT: Economic Development Queensland	 www.wep.com.au	SCALE: 	FIGURE: A-8
Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_ex_E04_rep\TCC_Results_ex_E04_rep.qgz			REV: DATE: 02-June-2026



Legend



DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

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PROJECT: Flood Modelling Oonoonba, Townsville		TITLE: 0.2% AEP Peak Flood Velocity - Existing Case	
CLIENT: Economic Development Queensland	 www.wep.com.au	SCALE: 	FIGURE: A-9
Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_ex_E04_rep\TCC_Results_ex_E04_rep.qgz		REV: DATE: 02-June-2026	

Appendix B Base Case Local Catchment Results

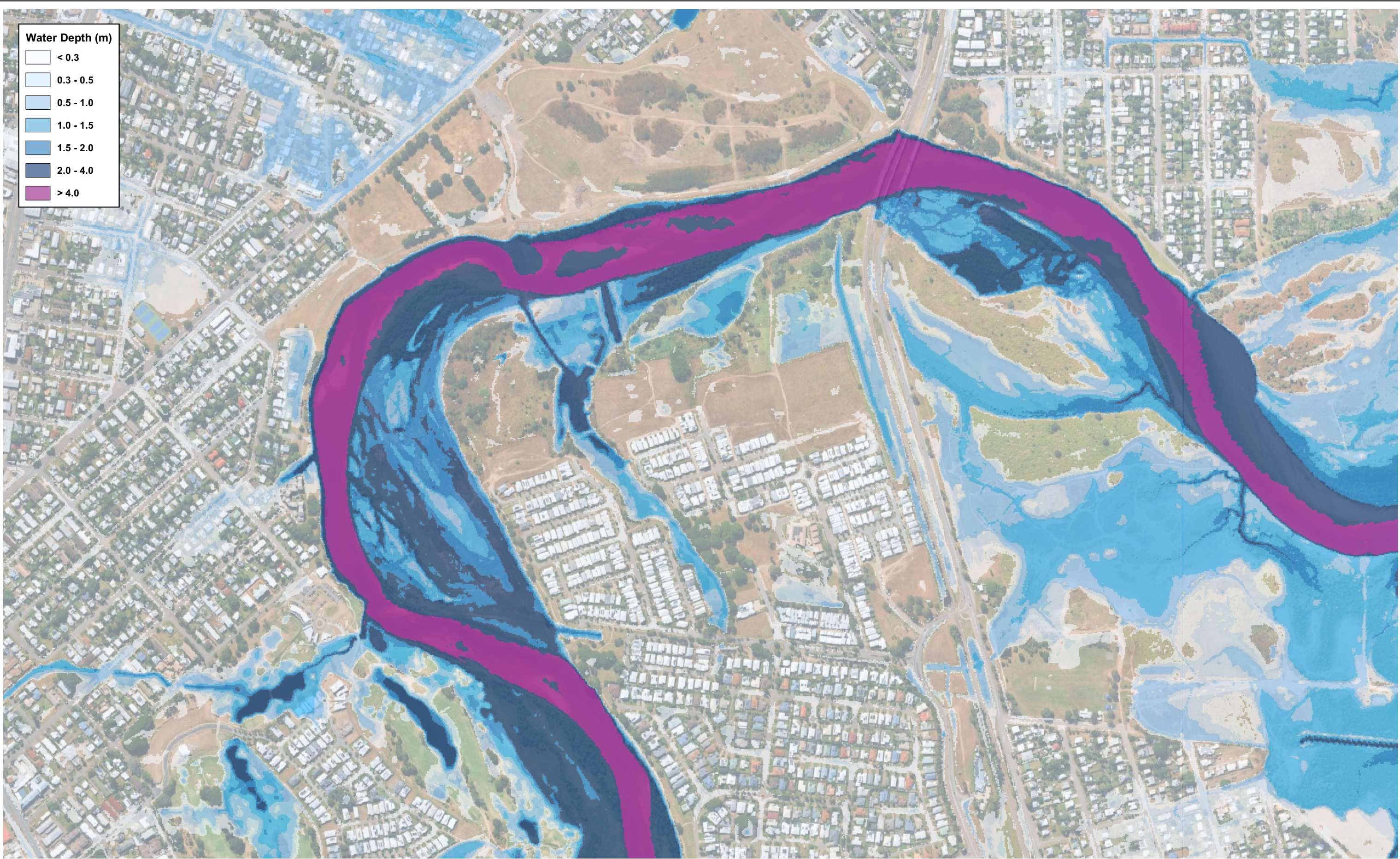


DATA SOURCE:
Photography: Google Earth
Topography:
Cadastral: © The State of Queensland (Department of Resources), 2024
Coordinate System: GDA94 / MGA zone 55
Water Engineering Partners endeavours to ensure that the information provided in this map is correct at the time of publication. Water Engineering Partners does not warrant, guarantee or make any representations regarding the currency, accuracy or validity of information contained in this map.

Legend

*Note: Depths below 100mm are not reported

PROJECT: Flood Modelling Oonoonba, Townsville		TITLE: 1% AEP Peak Local Flood Level - Existing Case	
CLIENT: Economic Development Queensland	 www.wep.com.au	SCALE: 0 100 200 m 	FIGURE: B-1 DATE: 02-June-2026
Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_ex_rep_E04_local\TCC_Results_ex_rep_E04_local.qgz			



Water Depth (m)

< 0.3
0.3 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.0
2.0 - 4.0
> 4.0

DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

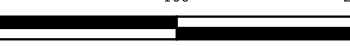
Coordinate System: GDA94 / MGA zone 55

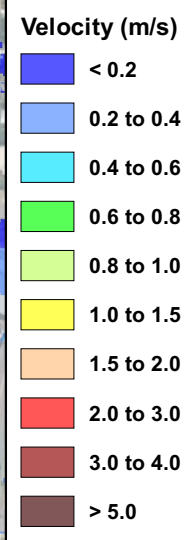
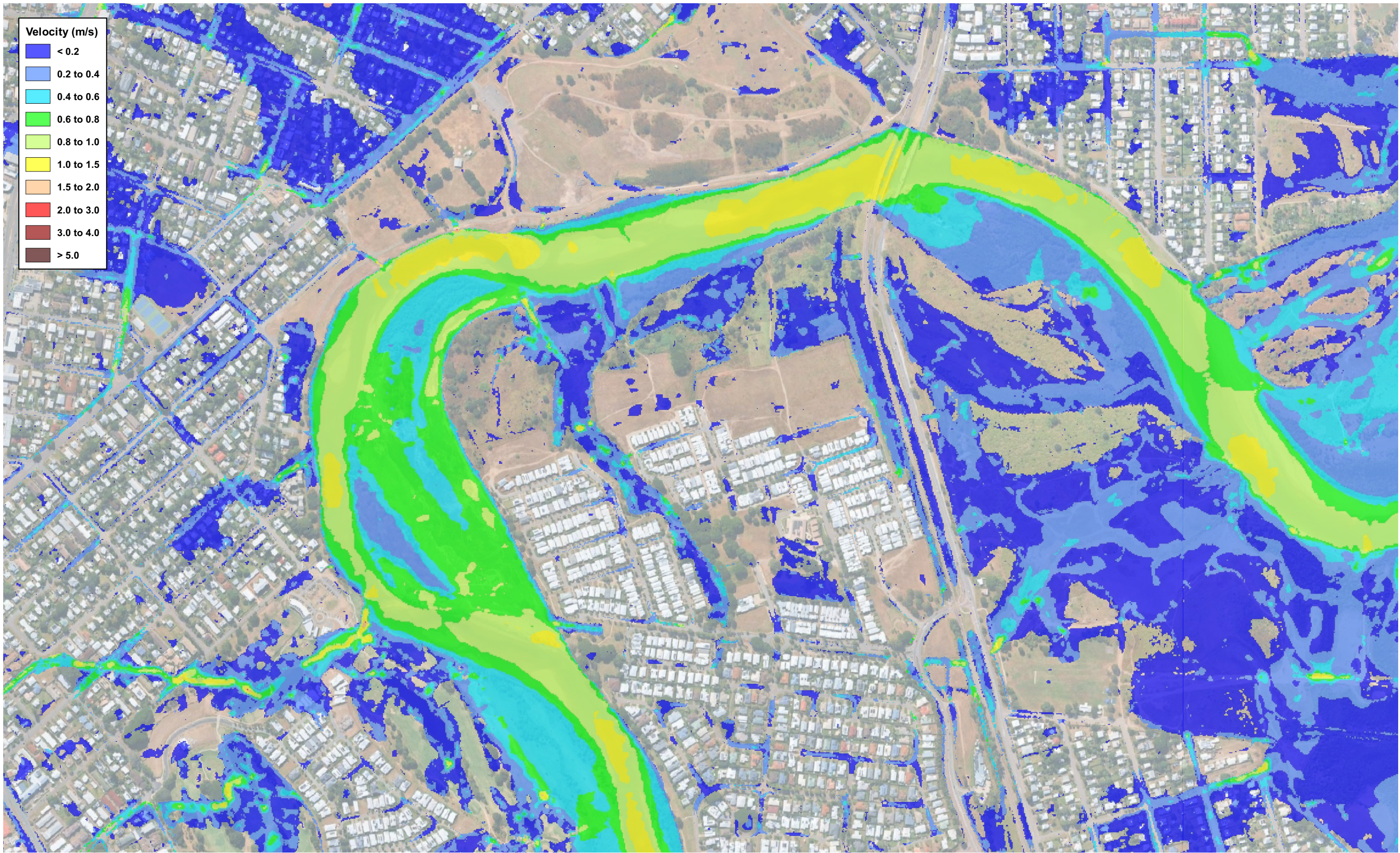
Water Engineering Partners endeavours to ensure that the information provided in this map is correct at the time of publication. Water Engineering Partners does not warrant, guarantee or make any representations regarding the currency, accuracy or validity of information contained in this map.

Legend



*Note: Depths below 100mm are not reported

PROJECT: Flood Modelling Oonoonba, Townsville	TITLE: 1% AEP Peak Local Flood Depth - Existing Case		
CLIENT: Economic Development Queensland	 WWW.WEP.COM.AU	SCALE: 0 100 200 m 	FIGURE: B-2
Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_ex_rep_E04_local\TCC_Results_ex_rep_E04_local.qgz			REV: DATE: 02-June-2026



Legend



DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

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*Note: Depths below 100mm are not reported

PROJECT:
Flood Modelling Oonoonba, Townsville

CLIENT:
Economic Development Queensland

Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_ex_rep_E04_local\TCC_Results_ex_rep_E04_local.qgz

TITLE: 1% AEP Peak Local Flood Velocity - Existing Case			
 WWW.WEP.COM.AU	SCALE: 0 100 200 m 	FIGURE: B-3	REV:
	DATE: 02-June-2026		

Appendix C Developed Case Regional Catchment Results



DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

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Legend

PROJECT:
Flood Modelling Oonoonba, Townsville

CLIENT:
Economic Development Queensland

Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep\TCC_MP_2026_Dev06_E04_rep.qgz

TITLE:
5% AEP Peak Regional Impacts - Developed Case

Water Engineering Partners

WWW.WEP.COM.AU

SCALE:
0 100 200 m

FIGURE:
C-1

DATE:
03-June-2026

REV:



DATA SOURCE:
Photography: Google Earth

Topography:

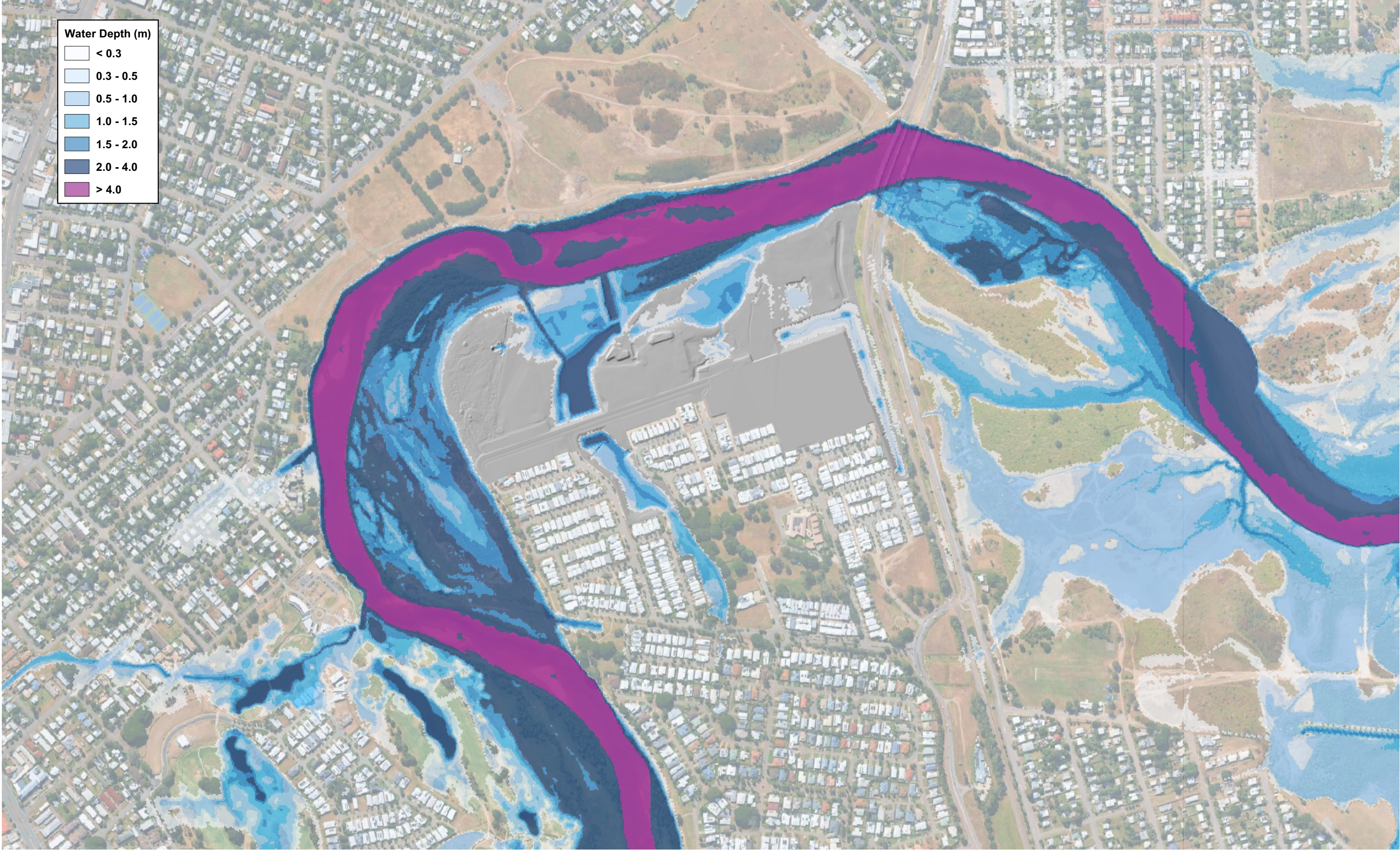
Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

Water Engineering Partners endeavours to ensure that the information provided in this map is correct at the time of publication. Water Engineering Partners does not warrant, guarantee or make any representations regarding the currency, accuracy or validity of information contained in this map.

Legend

PROJECT: Flood Modelling Oonoonba, Townsville		TITLE: 5% AEP Peak Peak Regional Level - Developed Case	
CLIENT: Economic Development Queensland	 www.wep.com.au	SCALE: 0 100 200 m 	FIGURE: C-2 DATE: 03-June-2026
Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep\TCC_MP_2026_Dev06_E04_rep.qgz			



DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

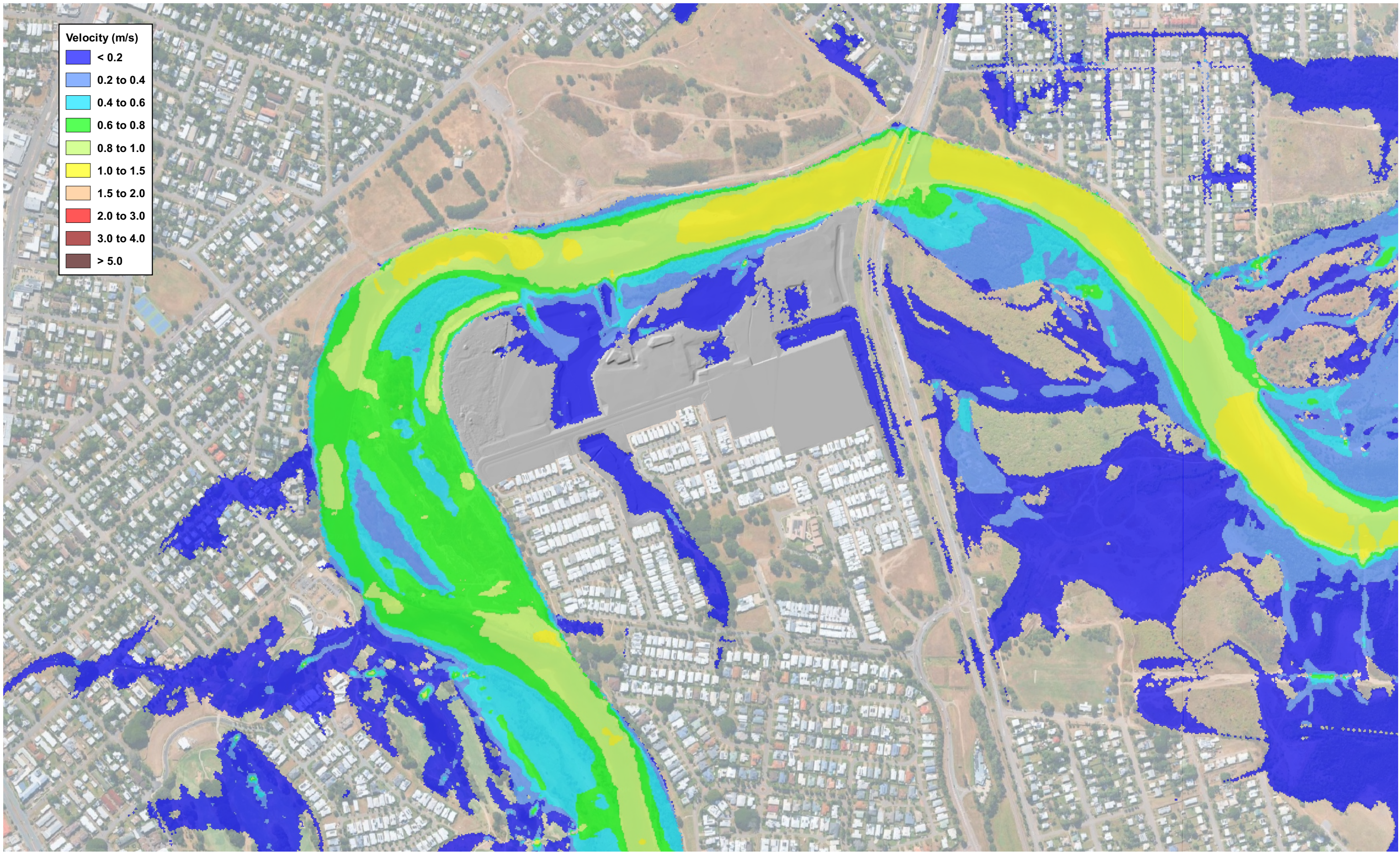
Coordinate System: GDA94 / MGA zone 55

Water Engineering Partners endeavours to ensure that the information provided in this map is correct at the time of publication. Water Engineering Partners does not warrant, guarantee or make any representations regarding the currency, accuracy or validity of information contained in this map.

Legend

PROJECT: Flood Modelling Oonoonba, Townsville		TITLE: 5% AEP Peak Peak Regional Depth - Developed Case	
CLIENT: Economic Development Queensland	 WWW.WEP.COM.AU	SCALE: 0 100 200 m 	FIGURE: C-3 DATE: 03-June-2026
Rev:			

Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep\TCC_MP_2026_Dev06_E04_rep.qgz



DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

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Legend



PROJECT:
Flood Modelling Oonoonba, Townsville

CLIENT:
Economic Development Queensland

Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep\TCC_MP_2026_Dev06_E04_rep.qgz

TITLE: 5% AEP Peak Peak Regional Velocity - Developed Case	
 WWW.WEP.COM.AU	SCALE: 0 100 200 m
	FIGURE: C-4 DATE: 03-June-2026



Impact (mm)

Dark Blue	<= -1000
Dark Purple	-300 - -200
Purple	-200 - -100
Blue	-100 - -50
Light Blue	-50 - -40
Cyan	-40 - -30
Light Cyan	-30 - -20
White	-20 - -10
Light Green	-10 - 10
Green	10 - 20
Yellow	20 - 30
Orange	30 - 40
Light Orange	40 - 50
Dark Orange	50 - 100
Red	100 - 200
Dark Red	>=1000
Light Green	Was Wet Now Dry
Pink	Was Dry Now Wet

DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

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Legend

PROJECT:
Flood Modelling Oonoonba, Townsville

CLIENT:
Economic Development Queensland

Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep\TCC_MP_2026_Dev06_E04_rep.qgz

TITLE:
1% AEP Peak Regional Impacts - Developed Case

CLIENT:
WEP Water Engineering Partners
WWW.WEP.COM.AU

SCALE:
0 100 200 m

FIGURE:
C-5

DATE:
03-June-2026

REV:



DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

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Legend

PROJECT:
Flood Modelling Oonoonba, Townsville

CLIENT:
Economic Development Queensland

Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep\TCC_MP_2026_Dev06_E04_rep.qgz

TITLE:
1% AEP Peak Peak Regional Level - Developed Case

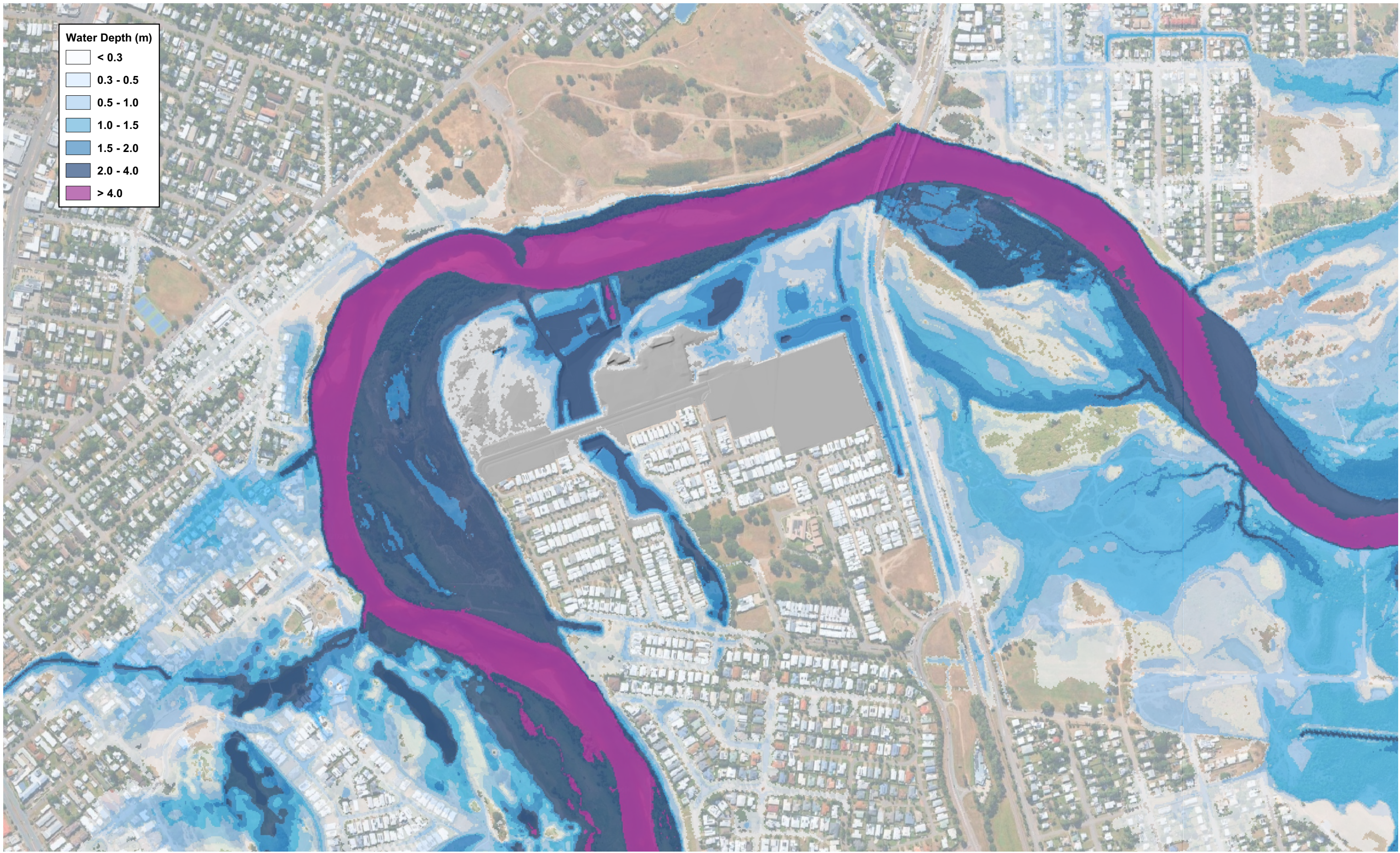
CLIENT:
WEP Water Engineering Partners
www.wep.com.au

SCALE:
0 100 200 m

FIGURE:
C-6

DATE:
03-June-2026

REV:



Water Depth (m)

< 0.3
0.3 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.0
2.0 - 4.0
> 4.0

DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

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Legend

PROJECT:
Flood Modelling Oonoonba, Townsville

CLIENT:
Economic Development Queensland

Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep\TCC_MP_2026_Dev06_E04_rep.qgz

TITLE:
1% AEP Peak Peak Regional Depth - Developed Case

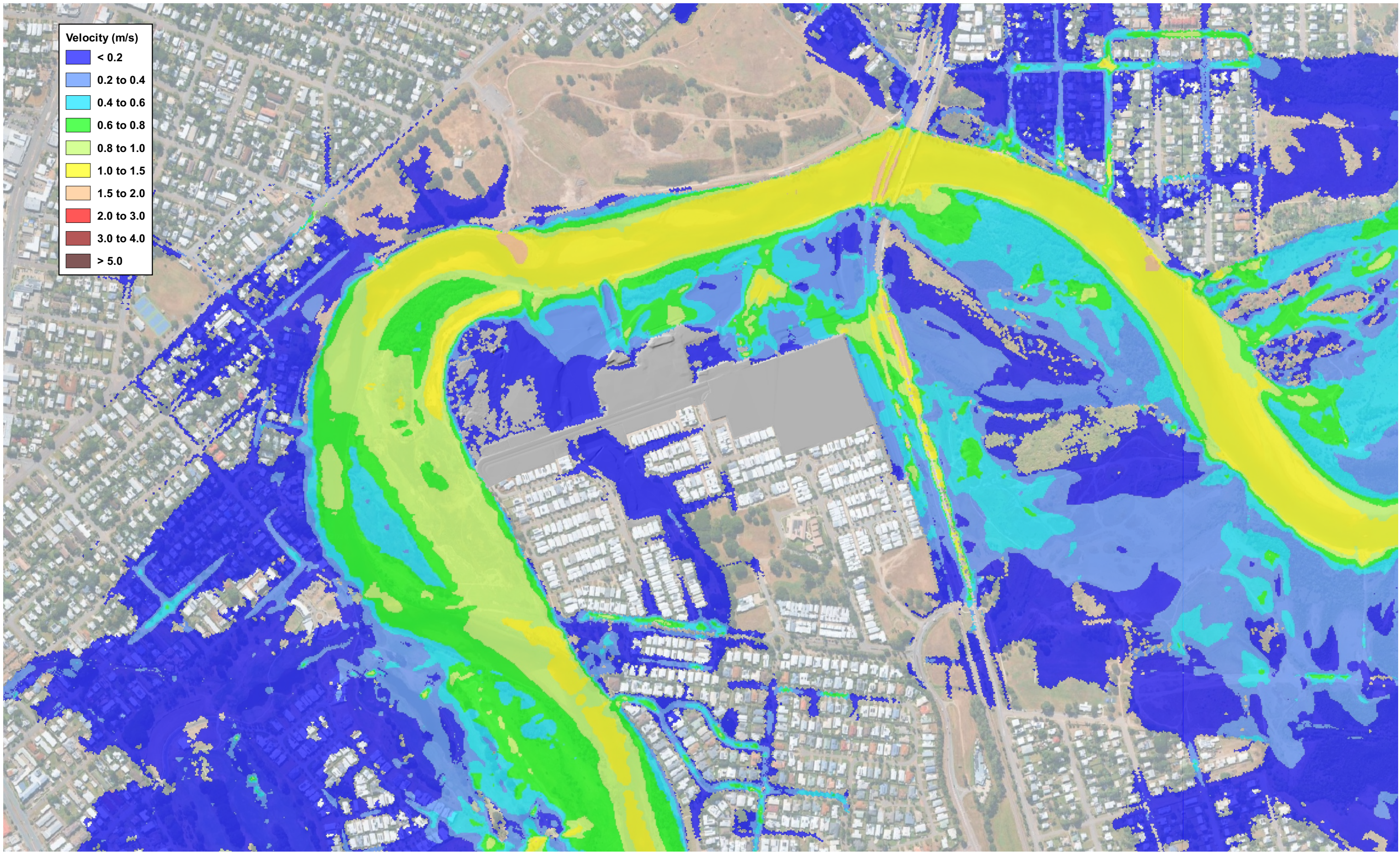
WWW.WEP.COM.AU

SCALE:
0 100 200 m

FIGURE:
C-7

REV:

DATE:
03-June-2026



DATA SOURCE:
Photography: Google Earth

Topography:

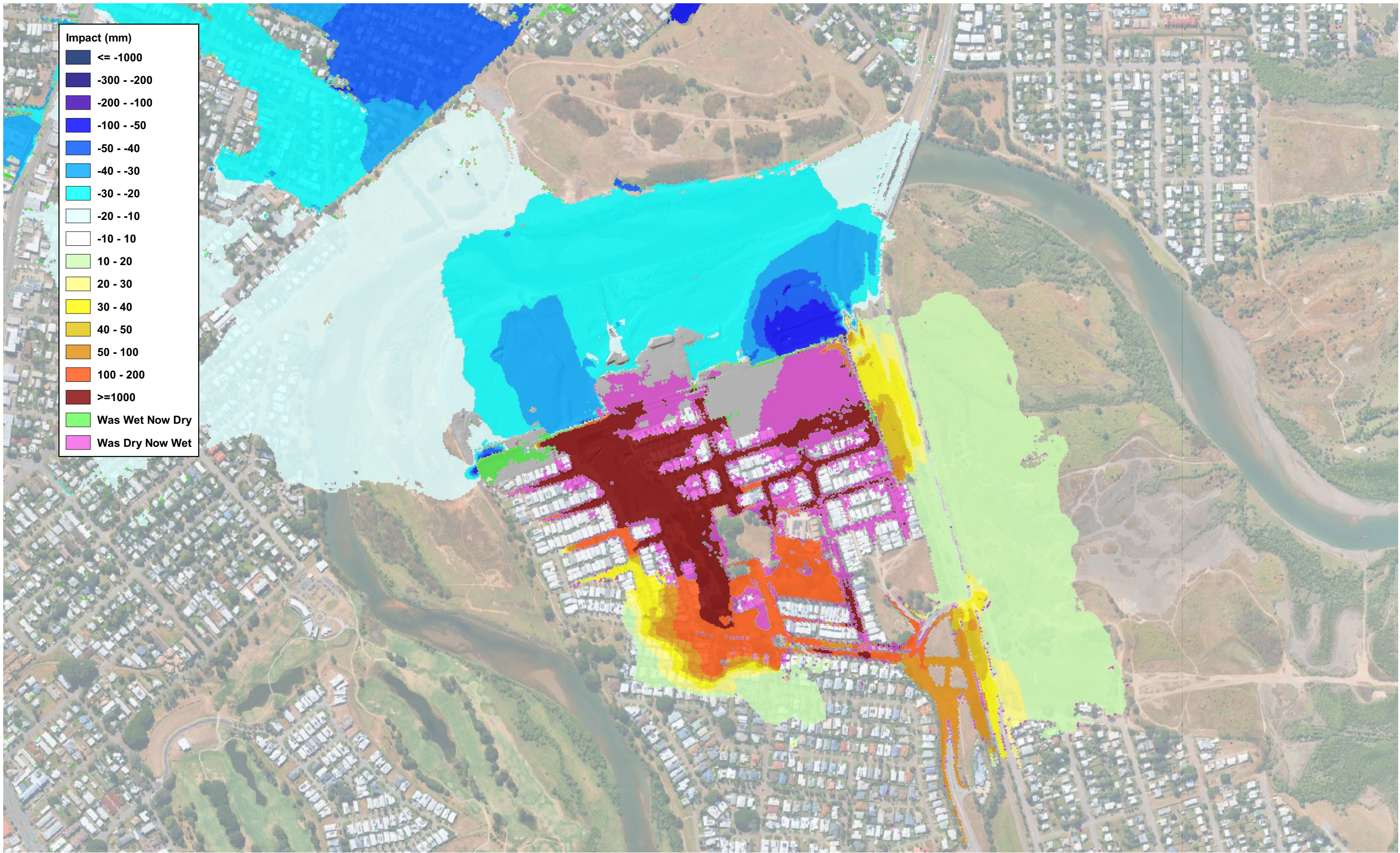
Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

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Legend

PROJECT: Flood Modelling Oonoonba, Townsville		TITLE: 1% AEP Peak Peak Regional Velocity - Developed Case	
CLIENT: Economic Development Queensland	 www.wep.com.au	SCALE: 	FIGURE: C-8
Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep\TCC_MP_2026_Dev06_E04_rep.qgz		REV: DATE: 03-June-2026	



Impact (mm)

- <= -1000
- 300 - -200
- 200 - -100
- 100 - -50
- 50 - -40
- 40 - -30
- 30 - -20
- 20 - -10
- 10 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 - 100
- 100 - 200
- >=1000
- Was Wet Now Dry
- Was Dry Now Wet

DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

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Legend

PROJECT:
Flood Modelling Oonoonba, Townsville

CLIENT:
Economic Development Queensland

Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep\TCC_MP_2026_Dev06_E04_rep.qgz

TITLE:
0.2% AEP Peak Regional Impacts - Developed Case

Water Engineering Partners
WWW.WEP.COM.AU

SCALE:
0 100 200 m

FIGURE:
C-9

DATE:
03-June-2026

REV:



DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

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Legend

N

PROJECT:
Flood Modelling Oonoonba, Townsville

CLIENT:
Economic Development Queensland

Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep\TCC_MP_2026_Dev06_E04_rep.qgz

TITLE:
0.2% AEP Peak Peak Regional Level - Developed Case

CLIENT:
WEP Water Engineering Partners
WWW.WEP.COM.AU

SCALE:
0 100 200 m

FIGURE:
C-10

REV:

DATE:
03-June-2026



Water Depth (m)

< 0.3
0.3 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.0
2.0 - 4.0
> 4.0

DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

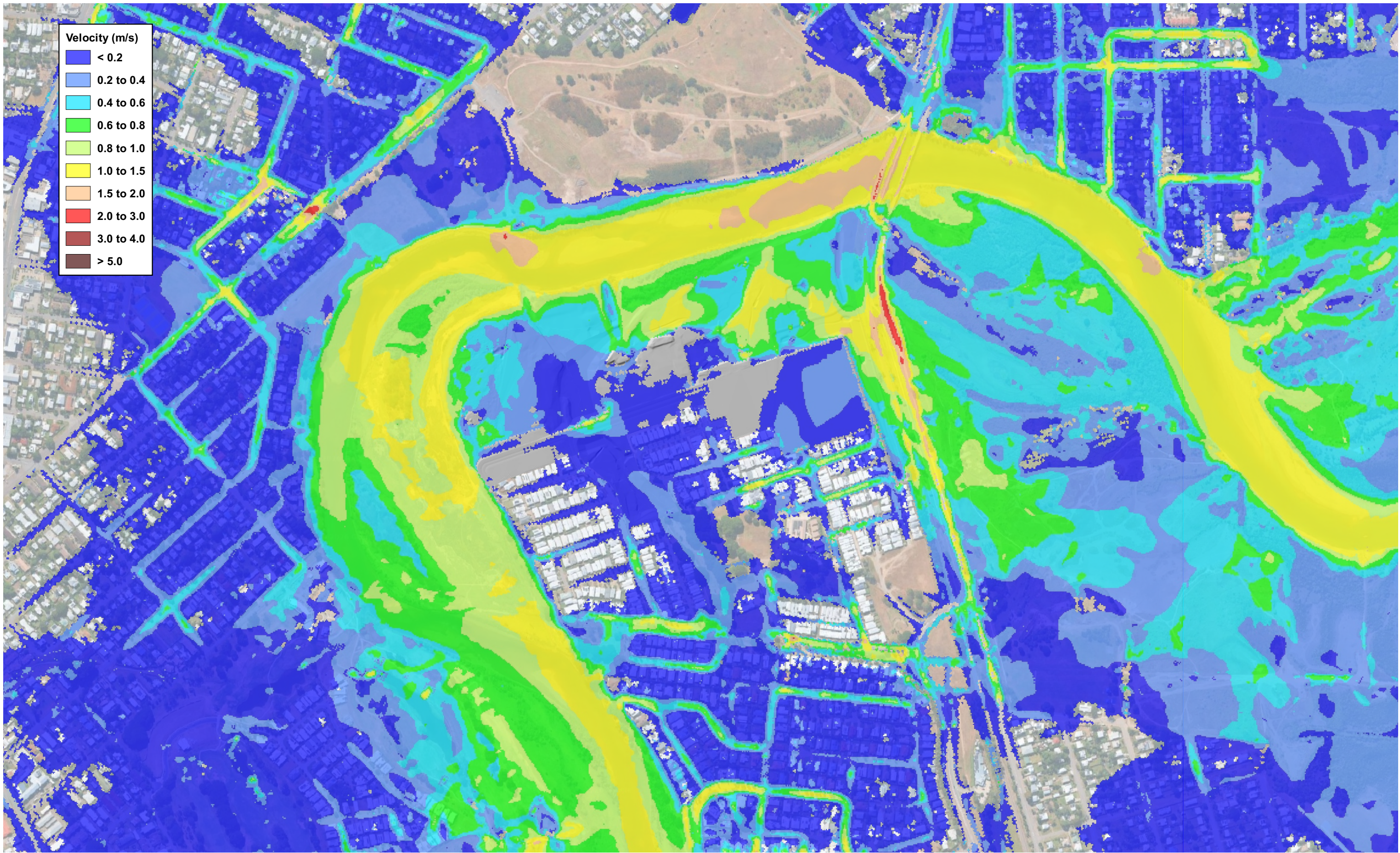
Coordinate System: GDA94 / MGA zone 55

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Legend

PROJECT: Flood Modelling Oonoonba, Townsville		TITLE: 0.2% AEP Peak Peak Regional Depth - Developed Case	
CLIENT: Economic Development Queensland	 WWW.WEP.COM.AU	SCALE: 0 100 200 m 	FIGURE: C-11 DATE: 03-June-2026
Rev:			

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DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

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Legend

PROJECT: Flood Modelling Oonoonba, Townsville		TITLE: 0.2% AEP Peak Peak Regional Velocity - Developed Case	
CLIENT: Economic Development Queensland	 www.wep.com.au	SCALE: 0 100 200 m 	FIGURE: C-12 DATE: 03-June-2026
Rev:			

Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep\TCC_MP_2026_Dev06_E04_rep.qgz



DATA SOURCE:
Photography: Google Earth

Topography:

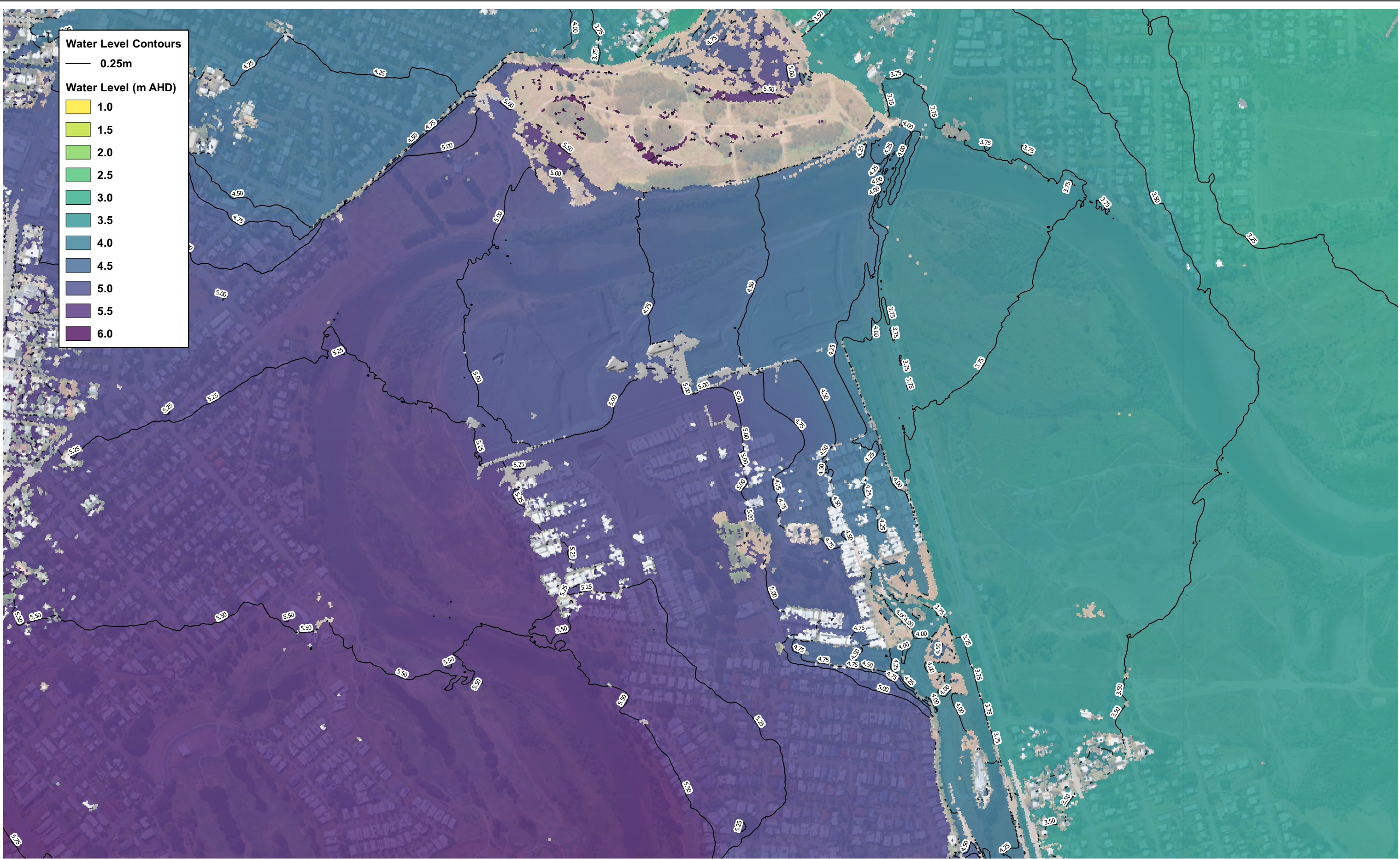
Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

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Legend

PROJECT: Flood Modelling Oonoonba, Townsville		TITLE: 1% AEP with Climate Change Peak Regional level - Developed Case	
CLIENT: Economic Development Queensland	 WWW.WEP.COM.AU	SCALE: 0 100 200 m 	FIGURE: C-13 REV: DATE: 03-June-2026
Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep\TCC_MP_2026_Dev06_E04_rep.qgz			



DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

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Legend

PROJECT: Flood Modelling Oonoonba, Townsville		TITLE: 2019 Event Peak Level - Developed Case	
CLIENT: Economic Development Queensland	 WWW.WEP.COM.AU	SCALE: 0 100 200 m 	FIGURE: C-14 REV: DATE: 03-June-2026
Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep\TCC_MP_2026_Dev06_E04_rep.qgz			



DATA SOURCE:
Photography: Google Earth

Topography:

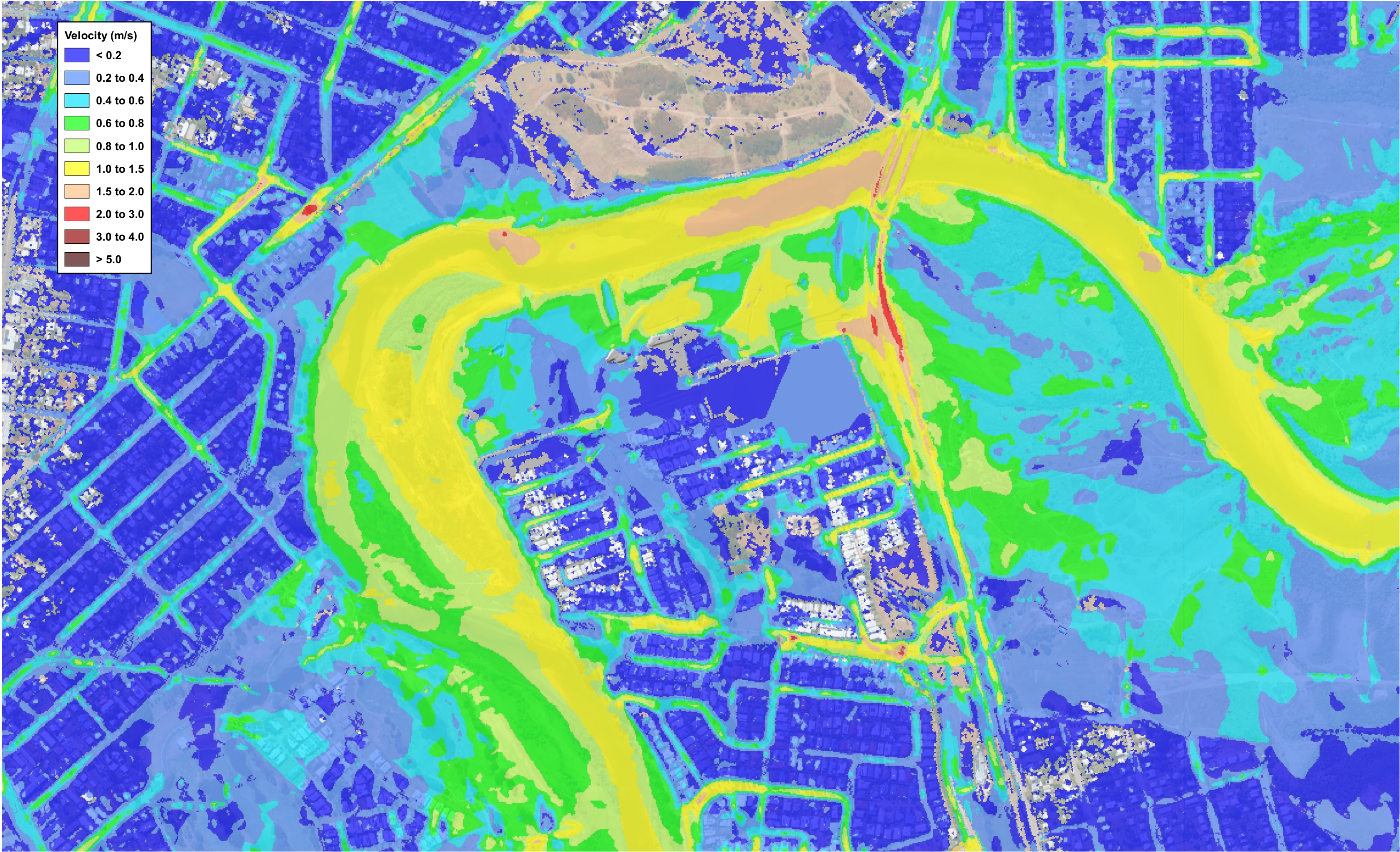
Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

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Legend

PROJECT: Flood Modelling Oonoonba, Townsville		TITLE: 2019 Event Peak Depth - Developed Case	
CLIENT: Economic Development Queensland	 www.wep.com.au	SCALE: 0 100 200 m 	FIGURE: C-15 DATE: 03-June-2026
Rev:			
Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep\TCC_MP_2026_Dev06_E04_rep.qgz			



DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

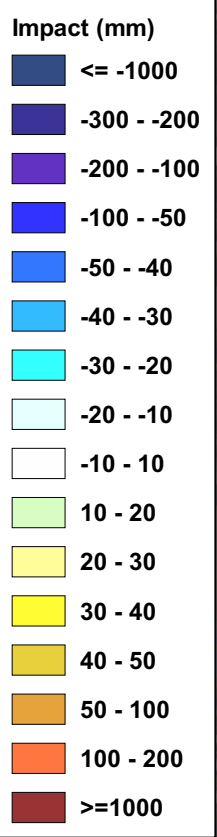
Water Engineering Partners endeavours to ensure that the information provided in this map is correct at the time of publication. Water Engineering Partners does not warrant, guarantee or make any representations regarding the currency, accuracy or validity of information contained in this map.

Legend

PROJECT: Flood Modelling Oonoonba, Townsville		TITLE: 2019 Event Peak Velocity - Developed Case	
CLIENT: Economic Development Queensland	 www.wep.com.au	SCALE: 0 100 200 m 	FIGURE: C-16 DATE: 03-June-2026
Rev:			

Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep\TCC_MP_2026_Dev06_E04_rep.qgz

Appendix D Developed Case Local Catchment Results



DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

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Legend



PROJECT:
Flood Modelling Oonoonba, Townsville

CLIENT:
Economic Development Queensland

Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep_local\TCC_MP_2026_1p_Dev06-E04_local.qgz

TITLE:
1% AEP Peak Local Flood Impacts - Developed Case

CLIENT:

WEP Water Engineering Partners

WWW.WEP.COM.AU

SCALE:

0 100 200 m

FIGURE:
D-1

DATE:
02-June-2026

REV:



DATA SOURCE:
Photography: Google Earth

Topography:

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Legend

0.25m

Water Level (m AHD)

1.0

1.5

2.0

2.5

3.0

3.5

4.0

4.5

5.0

5.5

6.0

PROJECT:
Flood Modelling Oonoonba, Townsville

CLIENT:
Economic Development Queensland

TITLE:
1% AEP Peak Local Flood Level - Developed Case

WEP Water Engineering Partners
WWW.WEP.COM.AU

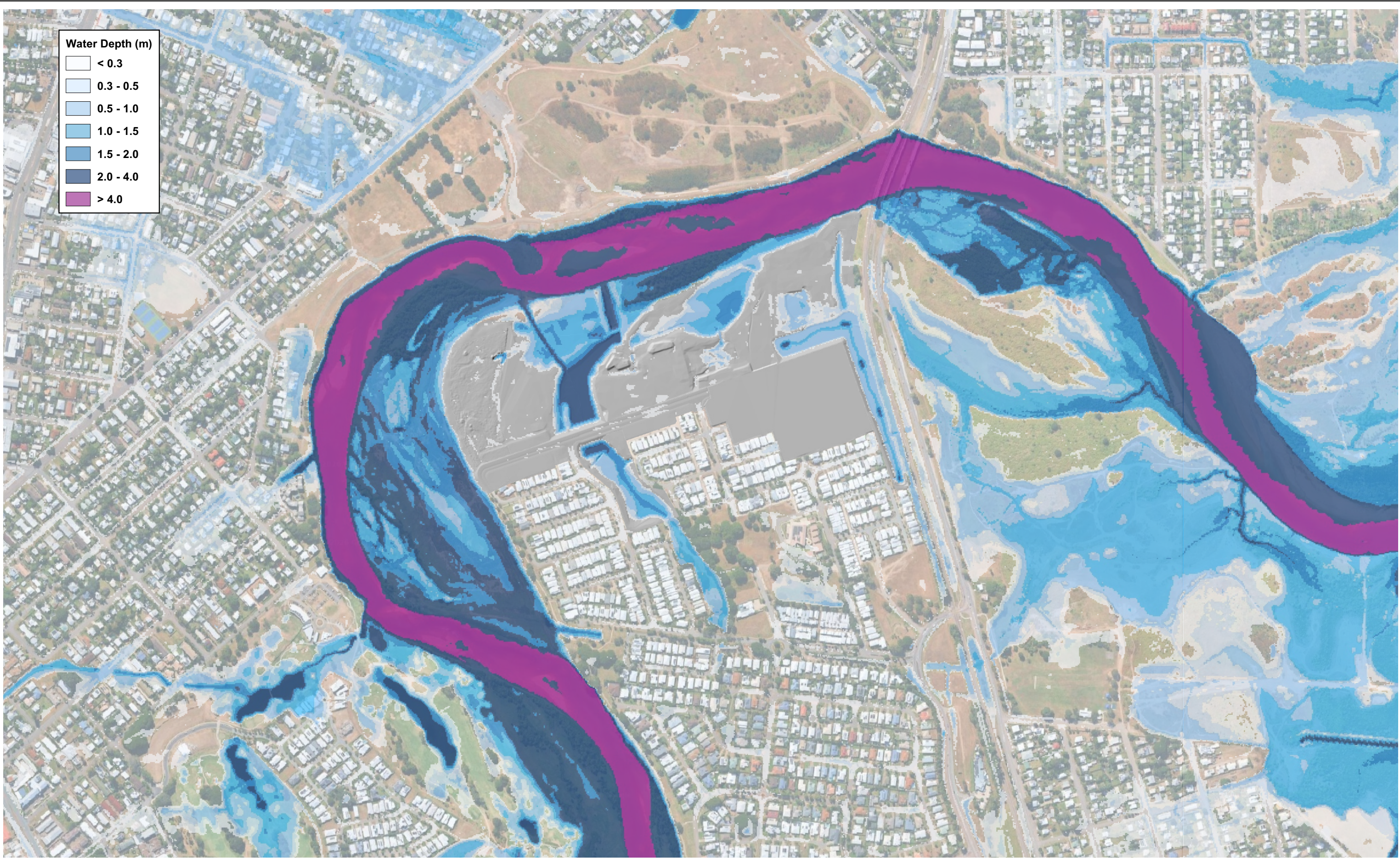
SCALE:
0 100 200 m

FIGURE:
D-2

REV:

DATE:
02-June-2026

Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep_local\TCC_MP_2026_1p_Dev06-E04_local.qgz



Water Depth (m)

< 0.3
0.3 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.0
2.0 - 4.0
> 4.0

DATA SOURCE:
Photography: Google Earth

Topography:

Cadastral: © The State of Queensland (Department of Resources), 2024

Coordinate System: GDA94 / MGA zone 55

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Legend

N

PROJECT:
Flood Modelling Oonoonba, Townsville

CLIENT:
Economic Development Queensland

Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep_local\TCC_MP_2026_1p_Dev06-E04_local.qgz

TITLE:
1% AEP Peak Local Flood Depth - Developed Case

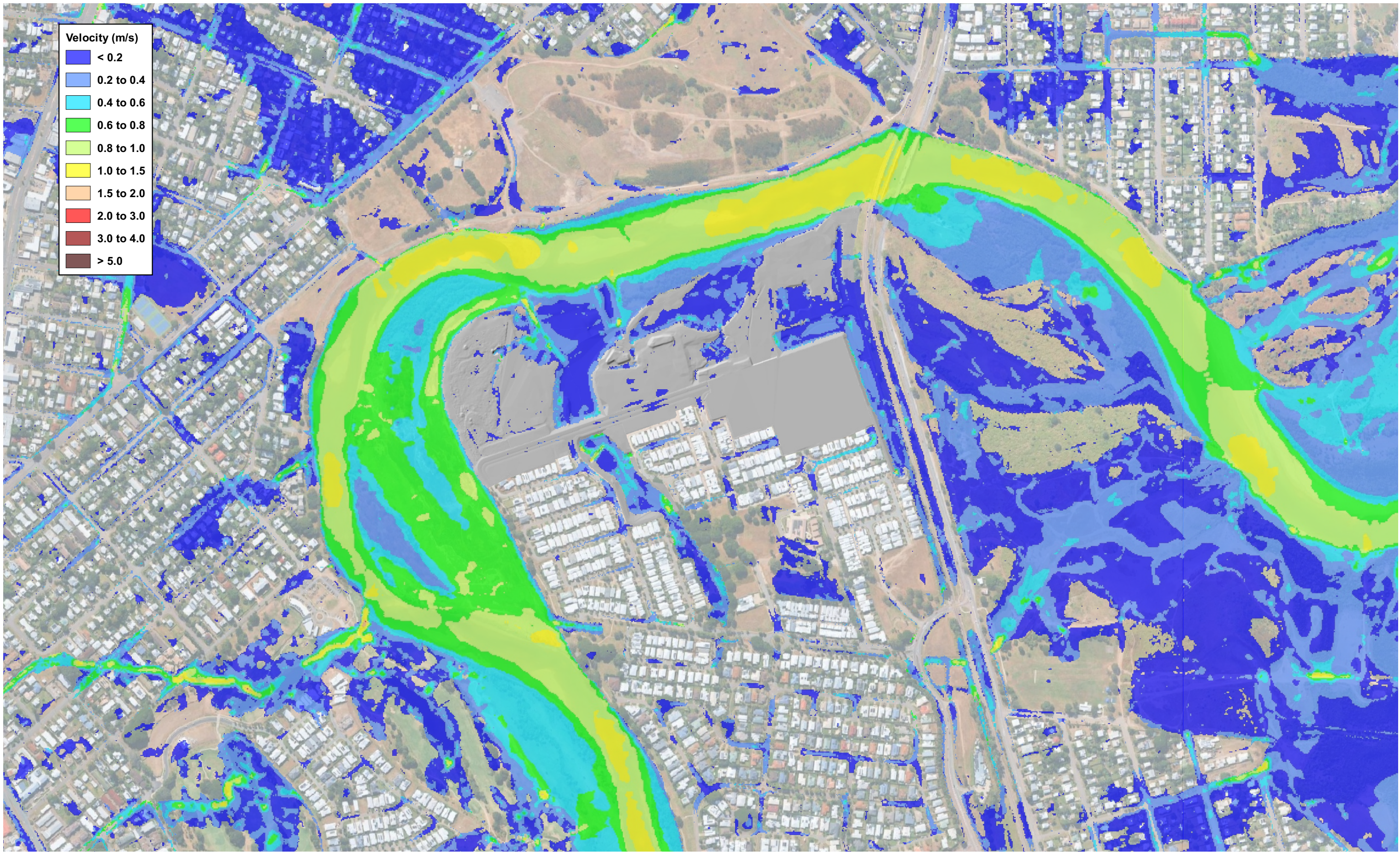
WEP Water Engineering Partners
WWW.WEP.COM.AU

SCALE:
0 100 200 m

FIGURE:
D-3

REV:

DATE:
02-June-2026



DATA SOURCE:
Photography: Google Earth

Topography:

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Coordinate System: GDA94 / MGA zone 55

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Legend

PROJECT:
Flood Modelling Oonoonba, Townsville

CLIENT:
Economic Development Queensland

TITLE:
1% AEP Peak Local Flood Velocity - Developed Case

CLIENT: www.wep.com.au

SCALE: 0 100 200 m

FIGURE: D-4

DATE: 02-June-2026

Filepath: Y:\Jobs\30200-30299\30257_Oonoonba\06_GIS\Figure_Generator\TCC_MP_2026_rep_local\TCC_MP_2026_1p_Dev06-E04_local.qgz

