Prepared for
Transport for NSW
ABN: 123456789

Elizabeth Drive - East Upgrade

Surface Water and Groundwater Assessment Report

08-Sep-2023

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Client: Transport for NSW

ABN: 123456789

Prepared by

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Glossary and abbreviations

Glossary / key proposal terms

Term	Description
Construction ancillary facilities	Dedicated areas of land required for construction amenities, parking, materials/equipment storage, mobile asphalt batch plants and stockpiling.
Construction footprint	The area needed to construct the proposal, including for example construction ancillary facilities, access roads, haulage, and water quality basins.
Nearside	Left-hand side in direction of travel.
Offside	Right-hand side in direction of travel.
Operational footprint	The area needed for the operation of the proposal including the concept design.
Proposal	The upgrade of about 7.8 kilometres of Elizabeth Drive between Badgerys Creek Road near the future M12 Motorway and about 600 metres east of Duff Road at Cecil Hills.
Search area	Area reviewed under a database search (varies depending on database and search criteria).
Study area	Area investigated for each environmental factor relative to the proposal and construction footprint in terms of potential impacts (varies depending on environmental factor). The investigation area may be a defined area such as an entire local government area or it may be an area around the proposal, for example, a 100-metre area either side of the existing road.
State Environmental Planning Policy	A type of planning instrument made under Part 3 of the EP&A Act.

Abbreviations / acronyms

Acronym	Definition
ACM	Asbestos containing material
ADWG	Australian Drinking Water Guidelines
AEP	Annual exceedance probability
ANZECC	Australian and New Zealand Environment and Conservation Council, Guidelines for Fresh and Marine Water Quality
APEC	Areas of potential environmental concern
ARR	Australian Rainfall and Runoff
ASS	Acid sulfate soils
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BoM	Bureau of Meteorology
BTEXN	Benzene, toluene, ethylbenzene, xylenes and naphthalene
CEMP	Construction Environmental Management Plan
CoPC	Contaminants of potential concern
CRC CARE	Cooperative Research Centre for Contamination Assessment and Remediation of the Environment
CSIRO	Commonwealth Scientific and Industrial Research Organisation

Acronym	Definition
DECCW	NSW Department of Environment, Climate Change and Water
DPE	NSW Department of Planning and Environment
DPIE	NSW Department of Planning, Industry and Environment, now known as Department of Planning and Environment
EIS	Environmental Impact Statement
ENM	Excavated natural material
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EP&A Regulation	Environmental Planning and Assessment Regulation 2021 (NSW)
EPA	NSW Environment Protection Authority
FM Act	*Fisheries Management Act 1994* (NSW)
GDE	Groundwater dependent ecosystem
HRC	Healthy Rivers Commission
km	kilometres
LEP	Local Environmental Plan
LGA	Local Government Area
m	metres
mAHD	metres above Australian Height Datum
mbgl	metres below ground level
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NWQMS	National Water Quality Management Strategy
PAH	Polycyclic aromatic hydrocarbons
PCB	Polychlorinated biphenyls
PFAS	Per- and poly-fluoroalkyl substances
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
PEI	Preliminary Environmental Investigation
REF	Review of environmental factors
RFO	River Flow Objectives
Roads and Maritime	NSW Roads and Maritime Services, now known as Transport
SEPP	State Environmental Planning Policy
SWMP	Soil and Water Management Plan
TN	Total Nitrogen
TP	Total Phosphorus
Transport for NSW	Transport for New South Wales (‘Transport’)
TRH	Total recoverable hydrocarbons
TSS	Total Suspended Solids
VENM	Virgin excavated natural material
WM Act	*Water Management Act 2000* (NSW)

Acronym	Definition
WQO	NSW Water Quality Objectives
WSA	Western Sydney Airport
WSUD	Water Sensitive Urban Design

Executive summary

Transport for NSW (Transport) proposes to upgrade about 7.8 kilometres (km) of Elizabeth Drive between Badgerys Creek Road near the future M12 Motorway and about 600 metres east of Duff Road at Cecil Hills (the proposal). The proposal would connect Elizabeth Drive with the future M12 Motorway connection to the proposed Western Sydney Airport.

This Surface Water and Groundwater Technical Report has been prepared as part of the Review of Environmental Factors (REF) for the proposal. This report assesses the potential impacts of the proposal on surface water and groundwater.

The findings of this report are summarised below.

Existing environment

Surface water

The proposal sits within the Hawkesbury-Nepean Catchment, as part of the South Creek sub-catchment. This catchment has been extensively modified and disturbed due to land clearing for agricultural purposes and more recently increasing urbanisation. Surface waterways within the construction footprint comprise Badgerys Creek, South Creek, Kemps Creek, the sub-catchment of Ropes Creek and a number of farm dams.

A desktop review of available water quality data indicates that South Creek (and its tributaries of Badgerys Creek and Kemps Creek) has poor water quality, which fails to meet several relevant Australian and New Zealand Water Quality Guideline (ANZG) values for protection of aquatic ecosystems in the Hawkesbury-Nepean Catchment.

Flooding

A Hydraulic Impact and Flooding Assessment (refer to Appendix A to this report) prepared for the proposal identified the existing flood conditions along Elizabeth Drive. The assessment determined that Elizabeth Drive is subject to relatively shallow depth of flood inundation for events as frequent as the fifty per cent (1 in 2) Annual Exceedance Probability (AEP). Major overtopping of the road only occurs at the location where it crosses the floodplains of Badgerys Creek, South Creek and Kemps Creek.

Groundwater

Groundwater within the study area (within the groundwater area of investigation which comprises a 2 km radius from the construction footprint) is predominantly recharged by rainfall and surface water infiltration. A desktop review of available geological and hydrogeological information indicates that there are two main groundwater aquifer types in the construction footprint. These comprise:

- Unconfined to semi-confined alluvial aquifers associated with Badgerys Creek, South Creek, Kemps Creek which intersect the proposal, and Ropes Creek, located north within the eastern portion of the study area
- Semi-confined to confined aquifers within the Bringelly Shale.

Existing groundwater quality has been compared against the Australia Drinking Water and the ANZECC Water Quality Guidelines. Elevated heavy metals and nutrient concentrations are present in groundwater within the Bringelly Shale. There was insufficient publicly available data to inform the existing quality of the alluvial aquifers.

Groundwater Dependent Ecosystems

Low to high potential terrestrial Groundwater Dependent Ecosystems (GDE) have been identified within isolated areas of the proposal and at Badgerys Creek, South Creek and Kemps Creek. No aquatic, subterranean, or high priority GDEs were identified within the study area.

Potential impacts

Construction

The key potential construction phase impacts identified in this assessment include:

- Increased surface water runoff (eg due to removal of vegetation) and associated impacts to surface water quality due to the increased mobilisation of sediments (soil erosion) and contaminant laden stormwater
- Disturbance of saline soils and associated impacts to surface water and shallow groundwater quality
- Accidental spills and leaks of substances (eg fuel and oils) and associated impacts to surface water and groundwater quality
- Changes to existing groundwater levels and quality and associated impacts to surrounding GDE due to groundwater interference activities (eg active (temporary) dewatering of excavations for buried services and piling for bridge piers).
- Changes to existing surface water and groundwater flow pathways during construction of new bridges over Badgerys, South and Kemps Creeks (eg during the proposed temporary diversion of the creeks) and the use of erosion and sediment controls (eg diverting surface water around the construction worksite). These changes have the potential to affect flood and groundwater levels, lead to sedimentation of waterways, and to impact on water quality
- Flooding impacts to construction activities are low risk within the road corridor as major overtopping of the road only occurs at the location where it crosses the floodplains of Badgerys Creek, South Creek and Kemps Creek for events between the two and 10 per cent AEP up to a maximum depth of 350 mm. Flooding is unlikely to impact the ancillary construction sites as all of the four proposed ancillary sites are outside of the area of flood prone land affected by the one per cent AEP event.

The potential construction impacts of the proposal on surface water and groundwater are minor and manageable with the implementation of the mitigation measures identified in this report.

Operation

The key potential operational impacts identified in this assessment include:

- Changes to surface water runoff due to the increase in impervious surfaces, which could lead to increases in runoff flow rates and pollutant loads washing off the impervious surfaces
- Alteration of existing surface water and groundwater flow pathways, which may change the flow patterns within the shallow groundwater. This could result from cuttings which intersect shallow groundwater, or the reduced permeability of the substrate beneath embankments
- Accidental spills or leaks of substances, during routine operation and maintenance activities, have the potential to contaminate both groundwater and surface water
- Impacts to the stability of the banks and creek beds of Badgerys, South and Kemps Creeks (through erosion) due to the establishment of new structures associated with the new bridges
- Contamination of groundwater and surface water quality due to accidental spills and leaks of substances (eg fuels and oils) during routine operation and maintenance activities
- Impact to the durability of the proposed new infrastructure due to the presence of saline soils. If not managed appropriately, salinity may corrode the steel reinforcement in the concrete of bridges and stormwater infrastructure, and salts may accelerate the deterioration of pavements.

To mitigate the increases in contaminants in surface runoff associated with new impervious surfaces, bioretention basins are proposed. Water quality modelling carried out for the proposal indicates that these water quality measures would be highly effective at reducing pollutants.

A comparison of the proposal to the existing conditions showed that the proposal is likely to result in a reduction of Total Suspended Solids (TSS) (60 per cent), Total Phosphorus (TP) (38 per cent), and

Total Nitrogen (TN) (six per cent) pollutants. On balance, the provision of the proposed stormwater treatment devices is anticipated to result in a net benefit to operational water quality. Consequently, the water quality objectives are not expected to be impacted by the quality of stormwater runoff during the operation phase.

The potential operational impacts of the proposal on surface water and groundwater are considered to be minor and manageable with the implementation of the mitigation measures identified in this report.

Cumulative impacts

Projects considered in the cumulative impact assessment have the potential to impact surface water during respective construction phases. However due to the limited overlap in construction timeframes with the proposal, the potential for cumulative surface water quality impacts would be minimal and manageable through mitigation measures.

Where there are overlaps in the timing of the construction of assessed projects and the proposal, there would be potential cumulative impacts from overlapping groundwater drawdown areas associated with excavation dewatering being carried out during the proposal and other projects. However, these cumulative impacts are likely to be temporary and/or localised as groundwater drawdown associated with these projects would be minimised after construction completion.

During operation, the provision of the proposed stormwater treatment devices as part of this proposal is anticipated to result in a net benefit to operational water quality. Cumulative groundwater drawdown impacts during the operational phase are considered to be unlikely as potential areas of drawdown associated with the proposal would be localised.

As such, the proposal is unlikely to have significant cumulative surface and groundwater impacts with surrounding projects.

Conclusions

The construction and operation of the proposal has the potential to impact surface water and groundwater. However, the implementation of mitigation and management measures outlined in this report is anticipated to result in minimal impact.

1.0 Introduction

Elizabeth Drive is the main east-west corridor between Liverpool and surrounding suburbs. Between Badgerys Creek Road, Badgerys Creek, and Duff Road, Cecil Hills, Elizabeth Drive is predominantly a two-lane undivided road, with no footpath and no median.

Future projected and planned growth in this region of Western Sydney is expected with the planned development of the Western Sydney Aerotropolis. It is projected that an expansion of industrial and commercial precincts would be prompted in response to the development of the Western Sydney Aerotropolis, as well as related planned land releases for residential precincts and employment zones in the area.

This projected growth would require the upgrade of Elizabeth Drive to provide increased capacity between the existing and planned road corridors in the surrounding area, and to support the projected and planned development of the Western Sydney Aerotropolis.

1.1 Proposal overview

Transport proposes to upgrade about 7.8 kilometres (km) of Elizabeth Drive between Badgerys Creek Road near the future M12 Motorway and about 600 metres east of Duff Road at Cecil Hills. The proposal would connect Elizabeth Drive with the future M12 Motorway connection to the proposed Western Sydney Airport.

The location and extent of the proposal is provided in **Figure 1-1**.

FIGURE 1-1:
LOCATION OF THE PROPOSAL

Legend

- Construction footprint
- Operational footprint
- LGA boundary
- Road design
- Primary road
- Local road

1.2 Purpose of this technical report

This technical report provides an assessment of the potential surface water and groundwater impacts associated with the proposal and has been prepared to inform the review of environmental factors (REF). It contributes to fulfilling the requirements of Section 5.5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) which requires that Transport NSW examine and consider to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

2.0 Proposal description

Key features of the proposal would include (subject to detailed design):

- Upgrade of Elizabeth Drive from a two-lane rural road, to a four-lane road (two lanes in each direction) with provision of a central median to allow for future upgrade to six lanes
- Signalisation of intersections along Elizabeth Drive: Luddenham Road, Martin Road, Western Road, Devonshire Road, Salisbury Ave, Mamre Road, Range Road and Duff Road
- Replacement of three twin bridges along Elizabeth Drive over Badgerys Creek, South Creek and Kemps Creek
- Active transport provision along the full corridor with the inclusion of shared paths along both sides of the Elizabeth Drive corridor
- Inclusion of public transport infrastructure with bus priority at intersection and bus stops facilities
- New stormwater drainage infrastructure
- Property acquisitions and adjustments on both sides of Elizabeth Drive and some side roads.
- Relocation/adjustment of existing utilities.

Subject to detailed design and construction planning, construction of the proposal is anticipated to take about 48 months to complete.

The following four temporary construction ancillary facilities would be established to support construction of the proposal:

- Western Road (construction ancillary facility 1) – located 200 metres south of the Elizabeth Drive and Western Road intersection on the western side
- Bill Anderson Reserve (construction ancillary facility 2) – located on the southern side of the Elizabeth Drive within Bill Anderson Reserve
- Salisbury Avenue (construction ancillary facility 3) – located 100 metres north of the Elizabeth Drive and Salisbury Avenue intersection on the eastern side
- Mamre Road (construction ancillary facility 4) – Located 500 metres north of the Elizabeth Drive and Mamre Road intersection on the eastern side.

Each construction ancillary facility may include the following:

- Establishment of site office/s, amenities, and temporary infrastructure, such as fencing and car parking areas
- Laydown and storage areas, and delivery of plant, equipment and materials
- Secure and bunded storage areas for re-fuelling and chemical storage
- Concrete batching plant
- Material crushing
- Stockpiling areas and spoil management (topsoil, excavated natural material, contaminated material). Stockpile locations would be determined during subsequent design stages using the criteria set out in the Stockpile Management Guideline (RTA, 2015).

Construction of the proposal would involve the following general activities:

- Site establishment including set up of construction ancillary facilities
- Utility adjustments, relocations and replacements, where required
- Demolition of existing buildings/structures
- Property adjustments (eg adjustments to fencing, property accesses)
- Vegetation removal

- Earthworks and drainage work
- Adjustments to existing farm dams within the construction footprint, including dewatering and re-shaping where required
- Bridge work over Badgerys Creek, South Creek and Kemps Creek, including installation of temporary diversion (if required) and temporary creek crossing, construction of new twin bridge structures and demolition/removal of the existing bridges
- Elizabeth Drive upgrade roadwork, including intersections with local roads and walking and cycling infrastructure
- Landscaping and finishing work.

3.0 Legislative context

This section describes the legislation, guidelines and policy that are relevant to the assessment.

3.1.1 Relevant Legislation

The following NSW legislation and statutory requirements apply to the surface water and groundwater assessment. A number of these requirements have been detailed in the following sections and in Chapter 4 of the REF:

- *Environmental Planning and Assessment Act 1979* (EP&A Act)
- *Protection of the Environment Operations Act 1997* (POEO Act)
- *Protection of the Environment Administration Act 1991*
- *Local Government Act 1993*
- *Fisheries Management Act 1994*
- *Contaminated Land Management Act 1997*
- *Water Management Act 2000* and the Water Management (General) Regulation 2011
- State Environmental Planning Policy (Transport and Infrastructure) 2021
- State Environmental Planning Policy (Precincts-Western Parkland City) 2021
- State Environmental Planning Policy no 55 – Remediation of Land (Resilience and Hazards) 2021
- NSW Aquifer Interference Policy (AIP) 2012
- National Environment Protection (Assessment of Site Contamination) Measure 2013.

3.1.2 Construction phase guidelines

The following design guidelines and management procedures were reviewed to identify management and mitigation measures to be implemented during the construction phase of the proposal:

- NSW DECC 2008 ‘Managing Urban Stormwater-Volume 2D Main Road Construction’, NSW Department of Environment, Climate Change and Water (known as the Blue Book Volume 2)
- Landcom, 2004 ‘Managing Urban Stormwater - Soils and Construction, Volume 1’, 4th Edition (known as the Blue Book Volume 1)
- Roads and Traffic Authority, 2005, ‘Guidelines for the Management of Acid Sulfate Materials: Acid Sulfate Soils, Acid Sulfate Rock and Monosulfidic Black’.
- Roads and Traffic Authority 2009, ‘Erosion and Sediment Management Procedure’
- Roads and Traffic Authority 2012, ‘Environmental Direction: Management of Tannins from Vegetation Mulch’
- Roads and Maritime 2011 ‘Technical Guideline: Temporary Stormwater Drainage for Road Construction’

- Roads and Maritime 2011 ‘Technical Guideline – Environmental Management of Construction Site Dewatering’.
- Roads and Maritime 2015 ‘Guideline for Batter Surface Stabilisation using vegetation’.
- Groundwater assessment as per Appendix 3 (Preliminary Groundwater Assessment template) in the Groundwater Assessment Guideline (Transport, 2020).

3.1.3 Operational phase guidelines

The following design guidelines and management procedures were reviewed to identify management and mitigation measures to be implemented during the operational phase of the proposal:

- Roads and Traffic Authority 2003 Procedure for selecting treatment strategies to control road runoff
- Austroads, 2001 Road Runoff and Drainage: Environmental Impact and Management Options, Austroads AP-R180
- Austroads, 2003 Guidelines for Treatment of Stormwater Runoff from the Road Infrastructure, Austroads AP-R232
- Austroads, 2013 Guide to Road Design, Part 5: Drainage – General and Hydrology Considerations
- Austroads, 2013 Guide to Road Design, Part 5A: Drainage – Road Surface, Networks, Basins and Subsurface
- Austroads, 2013 Guide to Road Design, Part 5B: Drainage – Open Channels, Culverts and Floodways
- Groundwater assessment as per Appendix 3 (Preliminary Groundwater Assessment template) in the Groundwater Assessment Guideline (Transport, 2020).

3.1.4 Surface water and groundwater specific policies and guidelines

The following water quality guidelines were reviewed to identify applicable water quality objectives for the South Creek Catchment and surrounding area.

National Water Quality Management Strategy

The National Water Quality Management Strategy (NWQMS) was formulated with the objective of achieving sustainable use of the nation’s water resources by protecting and enhancing water quality while maintaining economic and social development. The Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC) are part of the NWQMS and are relevant to the proposal as discussed below.

Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC Water Quality Guidelines) (2000)

The ANZECC Water Quality Guidelines 2000 provide an agreed framework for assessing water quality in terms of whether the water is suitable for a range of environmental values/water quality objectives (including human uses). The guidelines contain trigger values for key indicators that are applied in the assessment of water quality. The ANZECC (2000) guidelines have recently been revised as the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018).

NSW Water Quality Objectives

For each catchment in NSW, the state government has endorsed the community’s environmental values for water, known as the NSW Water Quality Objectives (WQOs) (NSW Department of Environment, Climate Change and Water (DECCW) 2006). These objectives are consistent with the agreed national framework of the ANZECC Water Quality Guidelines.

The Hawkesbury-Nepean catchment was subject to an independent inquiry by the Healthy Rivers Commission (HRC). The HRC inquiry outlined WQOs and recommended water quality guideline values for the Hawkesbury-Nepean system, based on the identified ‘environmental values’ and uses for waterways, as shown in Table 3-1.

Table 3-1: Key water quality environmental values from ANZECC (2018) Water Quality Guidelines

Environmental Value	Indicator	Guideline value
Aquatic ecosystems – maintaining or improving the ecological condition of waterbodies and riparian zones over long term	Total phosphorus	0.025 mg/L
	Total nitrogen	0.35 mg/L
	Turbidity	6-50 NTU
	Salinity	30-350 µS/cm
	Dissolved oxygen	85 – 110% saturation
	pH	6.5 – 8.5
	Toxicants	As per ANZG (2018) toxicant default guideline values (95% level of protection for slightly to moderately disturbed ecosystems and 99% level of protection for toxicants that bioaccumulate).
Visual amenity – aesthetic qualities of waters	Visual clarity and colour	Natural visual clarity should not be reduced by more than 20%. Natural hue of water should not be changed by more than 10 points on the Munsell Scale. The natural reflectance of the water should not be changed by more than 50%.
	Surface films and debris	Oils and petrochemicals should not be noticeable as a visible film on the water, nor should they be detectable by odour. Waters should be free from floating debris and litter n/a (no quantitative value specified).
	Nuisance organisms	Macrophytes, phytoplankton scums, filamentous algal mats, blue-green algae, sewage fungus and leeches should not be present in unsightly amounts n/a (no quantitative value specified).
Primary contact recreation – maintaining or improving water quality for activities such as swimming where there is a high probability of water being swallowed	Faecal coliforms, enterococci, algae and blue-green algae	As per the NHMRC (2008) Guidelines for managing risks in recreational water.
	Protozoans	Pathogenic free-living protozoans should be absent from bodies of fresh water.
	Chemical contaminants	Waters containing chemicals that are either toxic or irritating to the skin or mucus membranes are unsuitable for recreation. Toxic substances should not exceed values in table 9.3 of the NHMRC (2008) guidelines.
	Visual clarity and colour	As per the visual amenity guidelines.
	Temperature	15° – 35°C for prolonged exposure.
Secondary contact recreation – maintaining or improving water quality of activities such as boating and wading, where there is a low probability of water	Faecal coliforms, enterococci, algae and blue-green algae	As per the NHMRC (2008) Guidelines for managing risks in recreational water. Secondary contact recreation – maintaining or improving water quality for activities such as boating and

Environmental Value	Indicator	Guideline value
being swallowed		wading, where there is a low probability of water being swallowed.
	Nuisance organisms	As per the visual amenity guidelines. Large numbers of midges and aquatic worms are undesirable.
	Chemical contaminants	Waters containing chemicals that are either toxic or irritating to the skin or mucous membranes are unsuitable for recreation. Toxic substances should not exceed values in Table 9.3 of NHMRC (2008) guidelines.
	Visual clarity and colour	As per the visual amenity guidelines.
	Surface films	As per the visual amenity guidelines.
Irrigation water supply – protecting the quality of waters applied to crops and pastures	Algae and blue-green algae	Should not be visible. No more than low algal levels are desired to protect irrigation equipment.
	Salinity	To assess the salinity and sodicity of water for irrigation use, a number of interactive factors must be considered including irrigation water quality, soil properties, plant salt tolerance, climate, landscapes and water and soil management. For more information, refer to Chapter 4.2.4 of ANZECC/ARMCANZ 2000 Guidelines.
	Thermotolerant coliforms (faecal coliforms)	Trigger values for thermotolerant coliforms in irrigation water used for food and non-food crops are provided in Table 4.2.2 of the ANZECC/ARMCANZ 2000 Guidelines.
	Heavy metals and metalloids	Long term trigger values (LTV) and short-term trigger values (STV) for heavy metals and metalloids in irrigation water are presented in Table 4.2.10 of the ANZECC/ARMCANZ (2000) guidelines.
Livestock water supply – protecting water quality to maximise production of healthy livestock	Algae and blue-green algae	An increasing risk to livestock health is likely when cell counts of microcystins exceed 11 500 cells/mL and/or concentrations of microcystins exceed 0.0023mg/L expressed as microcystin-LR toxicity equivalents.
	Salinity	Recommended concentrations of total dissolved solids in drinking water for livestock are given in Table 4.3.1 of the ANZECC/ARMCANZ (2000) Guidelines.
	Thermotolerant coliforms (faecal coliforms)	Drinking water for livestock should contain less than 100 thermotolerant coliforms per 100 mL (median value).

Environmental Value	Indicator	Guideline value
	Chemical contaminants	Refer to Table 4.3.2 of the ANZECC/ARMCANZ (2000) Guidelines for heavy metals and metalloids in livestock drinking water. Refer to Australian Drinking Water Guidelines (NHMRC and NRMMC, 2018) for information regarding pesticides and other organic contaminants, using criteria for raw drinking water.
Aquatic foods (cooked) – refers to protecting water quality so that it is suitable for production of aquatic foods for human consumption and aquaculture activities	Algae and blue-green algae	No guideline is directly applicable, but toxins present in blue green algae may accumulated in other aquatic organisms.
	Faecal coliforms	Guideline in water for shellfish: The median faecal coliform concentration should not exceed 14 MPN/100mL; with no more than 10 per cent of the samples exceeding 43 MPN/100mL. Standard in edible tissue: Fish destined for human consumption should not exceed a limit of 2.3 MPN E Coli/g of flesh with a standard plate count of 100,000 organisms/g.
	Toxicants (as applied to aquaculture activities)	Metals: Copper – less than 0.005mg/L Mercury – less than 0.001mg/L Zinc – less than 0.005mg/L. Organochlorines: Chlordane – less than 0.004mg/L (saltwater production) PCBs – less than 0.002mg/L.
	Physico-chemical indicators	Suspended solids: less than 0.04mg/L Temperature: less than 2°C change over one hour.

Managing Urban Stormwater: Soils and Construction – Volumes 1 and 2D

The principles for the management of soil and water, to minimise the extent of erosion and sediment production occurring at any development site, particularly during construction work, are documented in this publication, otherwise known as ‘the Blue Book’. The Blue Book and these management principles have been accounted for in the safeguards and management measures developed for the proposal.

Australian Rainfall and Runoff: A Guide to Flood Estimation, 2019

The Australian Rainfall and Runoff guideline is the primary technical publication for hydrological estimates and design considerations used in assessment of flooding and drainage.

Water Sensitive Urban Design

The Water Sensitive Urban Design (WSUD) (RMS, 2016) guideline does not mandate the use of WSUD techniques but sets the expectation that these are included in Transport projects and describes how they can be incorporated into design. Water quality objectives should be developed with consideration to the sensitivity of the receiving environment and the potential pollution impacts of the proposal. The stormwater provisions made in the design were agreed in consultation between the proposal design team and Transport.

Sydney Water Western Sydney Aerotropolis Stormwater (Sydney Water, 2022)

Sydney Water, as the trunk drainage authority for stormwater in the Western Sydney Aerotropolis, is responsible for the stormwater network, as well as drinking water, wastewater and recycled water networks. The Western Sydney Aerotropolis integrated water system is currently in preparation in consultation with DPE and local councils, and would aim to include stormwater harvesting, treatment and reuse. Transport would liaise with Sydney Water regarding this scheme at the detailed design phase of the proposal, as relevant. Other guidance

Reference was made to Transport guidelines and standards including the following proposal specific standards:

- P.0036917 – QA Specification ED East PS211: Environmental Assessment, Project Review of Environmental Factors (REF), Roads and Maritime Services
- P.0036917 – QA Specification ED East PS271: Hydrology and Drainage Design, Roads and Maritime Services
- QA Specification ED West PS271: Hydrology and Drainage Design, Roads and Maritime Services
- QA Specification ED West PS371: Hydrology and Drainage Design, Roads and Maritime Services.

4.0 Methodology

This section describes the method of assessment used in this technical assessment report.

4.1.1 Data and information sources

The following data and information sources were acquired, reviewed and adopted to understand the existing conditions of the construction footprint and conduct this impact assessment. These sources are summarised in **Table 4-1.**

Table 4-1: Relevant data and information sources summary

Relevance	Document / dataset	Data source	Description	Date
Technical data and documentation	Hydraulic Impact and Flooding Assessment	AECOM	Elizabeth Drive Upgrade East – Concept design	2022
	Drainage and Water Quality Management Report	AECOM	Elizabeth Drive Upgrade East – Concept design	2022
	Phase 1 Contamination Assessment – Elizabeth Drive East	AECOM	Phase 1 Contamination Assessment	2022
	Geotechnical Interpretive Report – Elizabeth Drive East and West	AECOM	Geotechnical Interpretative Report for the concept design	2021
	Western Sydney Airport Environmental Impact Statement – Surface Water Quality Assessment	GHD	Nearby project	2016
	M12 Motorway Environmental Impact Statement – Surface Water Quality and Hydrology Assessment	Roads and Maritime Services (RMS)	Nearby project	2015
	Mamre Road Upgrade Stage 1 – Concept Design REF and Detailed Design	Aurecon	Nearby project	2021
Spatial and geological data	Elevation data	NSW Government Spatial Services	Digital Elevation Model (DEM) at a resolution of 1 m obtained from ELVIS (Elevation Information System)	2011
	Design drawings	AECOM	Concept Design	2022
	Contours	NSW Government – Spatial Services	Derived from the Digital Elevation Model (DEM)	2011
	Registered groundwater users	WaterNSW and Australian Government's Bureau of Meteorology	WaterNSW Realtime Data online database and the BoM Australian Groundwater Explorer	2022
	Groundwater dependent ecosystems	Australian Government's Bureau of Meteorology	BoM Groundwater Dependent Ecosystem Atlas online database	2022
	Surface geology	Geological Survey of NSW	Penrith 1:100,000 geological map	1991

Relevance	Document / dataset	Data source	Description	Date
	Aerial imagery	NSW SIX Maps/NearMap	Aerial imagery used to define the existing surface and in figures	2022
	Acid Sulfate Soils	CSIRO	Atlas of Australian Acid Sulfate Soils	2013

4.1.2 Study area

The assessment study areas for each technical component of this report are described in **Table 4-2.**

Table 4-2: Study Area Description:

Technical Component	Description of study area	Figure reference
Surface Water	The catchments of local water courses (Badgerys Creek, South Creek and Kemps Creek) and drainage lines which traverse the construction footprint.	Refer to **Figure 5-7** for the South Creek catchment extent. The catchments include local water courses considered in the surface water study area.
Groundwater	All land within two kilometres of the construction footprint.	Refer to **Figure 5-10** for the groundwater study area (2 km buffer from the construction footprint).

4.1.3 Field investigation

A field investigation of the construction footprint was carried out on 28 and 29 June 2022 to inform a biodiversity constraints assessment. This included targeted searches for threatened flora, and inspections of culverts and bridges where possible to identify the presence of fauna. Visual inspections of waterways within the construction footprint were also carried out. Field investigation findings have informed Section 5.6.2.

4.1.4 Desktop review

Key features of the existing environment were identified through a desktop review of publicly available existing reports and information, as listed in **Table 4-1**. This included consideration of the following:

- Surface Water:
  - Desktop review of publicly available information on water quality of surface waters, existing catchment conditions, general creek conditions (size and flow characteristics) and land use
  - Definition of the catchments and identification of downstream environments and water users potentially impacted by the proposal
  - Definition of the area that influences the soil, surface water, and groundwater environments
- Flooding:
  - Definition of the catchments that would be impacted by the proposal and identification of upstream and downstream environments potentially impacted by the proposal, based on publicly available information
  - Review of existing, publicly available flood studies and existing flood conditions
  - Review of existing flood conditions
- Groundwater:
  - Desktop review of publicly available information on water quality of groundwater, existing groundwater catchment conditions, and aquifer uses

- Definition of the aquifer catchments that could be impacted by the road project and identification of Groundwater Dependent Ecosystems (GDE) potentially impacted by the proposal.

4.1.5 Impact assessment methodology

A qualitative impact assessment was carried out, which included the following:

- Surface Water:
  - Identification of potential impacts of construction, including the proposed construction compound/laydown sites, and operational activities on surface water environments, including watercourse hydrology and potential impact on water quality with reference to the ANZG (2018) water quality guidelines
  - Impacts during operation assessed with Model for Urban Stormwater Improvement Conceptualisation (MUSIC) modelling to quantify the extent of treatment provided by the design
- Flooding:
  - Identification of potential impacts of construction (including the proposed construction compound/laydown sites) and operational activities on existing flowpaths and flooding
  - Impacts during operation assessed with review of existing flood conditions and the design flood simulations to determine the flood immunity for the proposal, and the potential for off-site impacts downstream and upstream
- Groundwater
  - Identification of potential impacts of construction on groundwater, considering groundwater vulnerability (surface source potential contaminants) and construction activities that may intercept shallow groundwater resources
  - Review of the reference design and design elements likely to cause an impact on groundwater during operational activities
  - Development of a conceptual hydrogeological model detailing the groundwater regime(s) within the groundwater study area
  - Assessment of potential groundwater impacts against the criteria specified in the *NSW Aquifer Interference Policy*
  - Identification of GDE from publicly available mapping and consideration if they are likely to be impacted by the proposal. If required, recommendations for monitoring would be included, to quantify any potential inflow or drawdown impacts at excavations at risk of intercepting groundwater.

Mitigation and management measures

A list of mitigation and management measures has been prepared and outlined in Section 10.0, which would be implemented during construction and operation to effectively reduce the generation of pollutants and minimise the impact on the receiving environment.

4.1.6 Cumulative impact assessment

A cumulative impact assessment has been carried out for both construction and operation, to assess the potential cumulative impacts of the proposal with other projects in the area. This was carried out based on a screening of other nearby projects to determine those that have the potential to cause cumulative impacts. The screening considered projects that have been approved but where construction has not commenced, projects that have commenced construction, and projects that have recently been completed. The screening process is described further in Chapter 6 of the REF.

The cumulative impact assessment was based on the residual impacts of the proposal (ie those that are expected to exist after application of management and mitigation measures).

4.1.7 Assumptions and limitations

- This assessment has been carried out based on publicly available information.
- This assessment is partially based on the reports prepared and issued as part of the Concept Design the Elizabeth Drive West and East upgrades including the Hydraulic and Flooding Assessment report (Appendix A of this report), Drainage and Water Quality Management Report (AECOM, 2022a), Elizabeth Drive East and West. and Geotechnical interpretative Report (AECOM, 2022b).
- The assessment under the *Groundwater Assessment Guideline* (Transport, 2020) has been based on the understanding that the proposal would have a minimal impact on groundwater (eg limited to intercepting groundwater within and adjacent to piles at bridge crossing and underboring (directional drilling) with minimal groundwater impacts).

5.0 Existing environment

This section provides a description of the existing environment as it relates to surface water and groundwater.

5.1 Climate

5.1.1 Rainfall

The proposal is in a region with a temperate climate. Two nearby Bureau of Meteorology (BoM) weather stations were reviewed for annual rainfall statistics, see **Table 5-1**. These indicated an average annual rainfall of 691 mm for the region.

Table 5-1: Mean monthly rainfall (mm)

Location (Site Number)	Distance from Proposal	Mean Monthly Rainfall (mm)												
		January	February	March	April	May	June	July	August	September	October	November	December	Annual
Badgerys Creek AWS (067108)	6 km (South)	78	112	95	45	38	59	25	37	34	54	70	57	**675**
Rossmore (South Creek) (67061)	6.2 km (South)	88	135	125	68	37	82	50	31	33	41	56	65	**708**
Average		83	124	110	56	38	71	38	34	34	48	63	61	**691**

Source: Bureau of Meteorology (BoM), retrieved on 4 August 2022.

Notes:

Badgerys Creek AWS (067108) – data between November 1995 to July 2022

Rossmore (South Creek) (67061) – data between March 2007 to July 2022

5.1.2 Evaporation

Evaporation data has not been measured at the meteorological stations included in **Table 5-1**; however, interpolation of information from the Bureau of Meteorology (BoM) (refer to **Figure 5-1**), indicates that the total average annual evaporation in the region exceeds rainfall, and is between 1,400 mm and 1,600 mm.

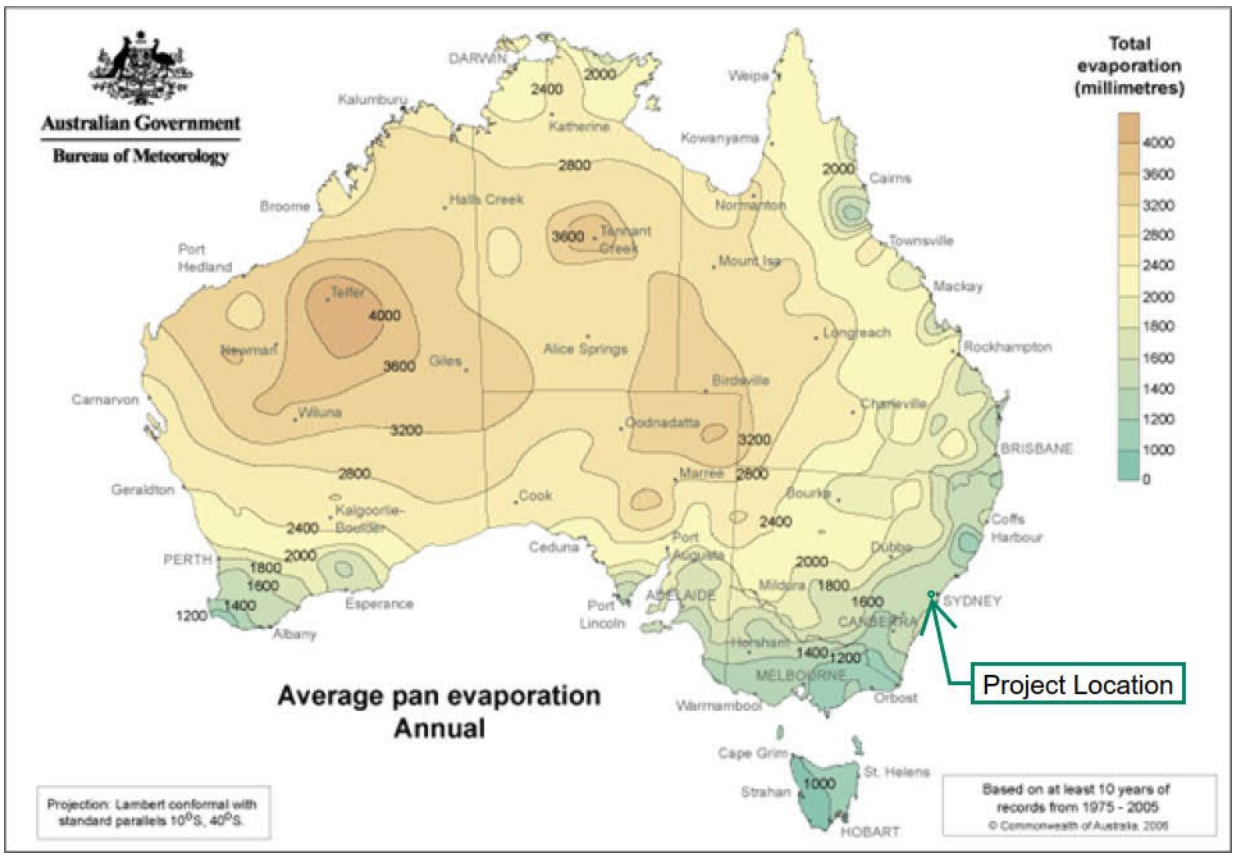

Figure 5-1: Average annual evaporation (BoM, 2006)

5.1.3 Temperature

Annual temperature statistics were collected from Badgerys Creek McMasters F.Stn (067068), located 6 km south of the proposal (refer to **Figure 5-2**). January is the warmest month, with a mean monthly maximum temperature of 30.2°C, and July is the coolest month, with a mean temperature of 17.5°C (data series 1995 and February 2022) (retrieved from BoM on 23 March 2022).

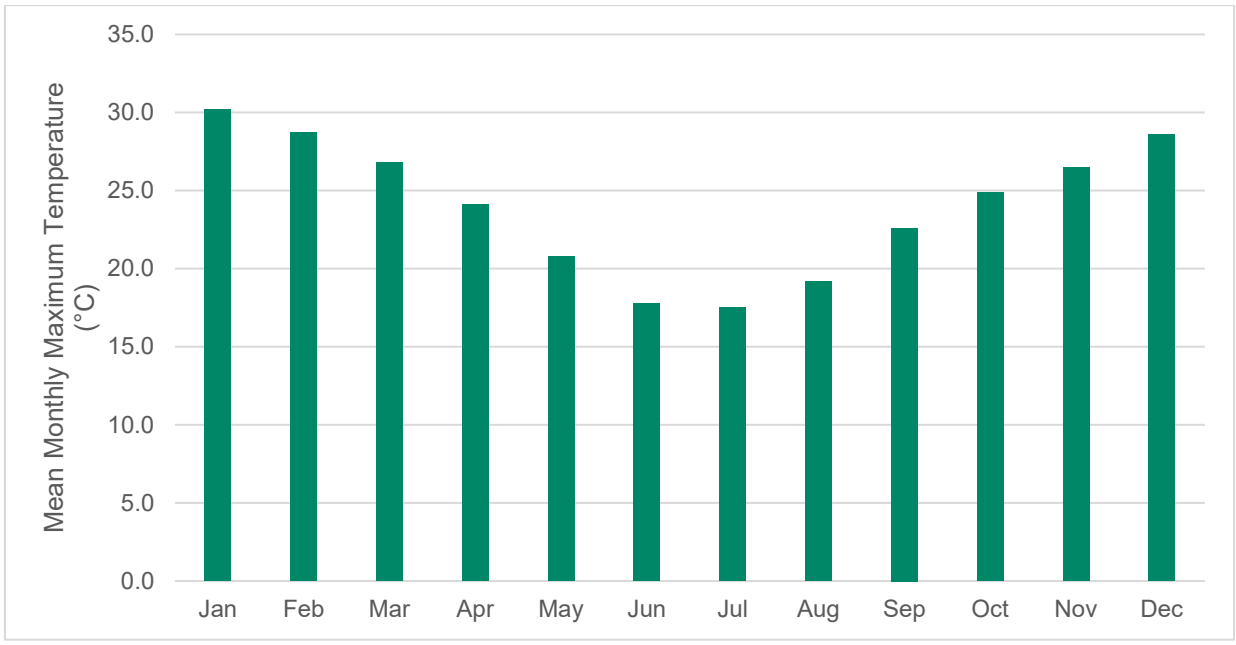

Figure 5-2: Mean monthly maximum temperature from nearby BoM station

5.2 Topography

The study area topography is described as low rolling to steep low hills, with convex narrow (20–300 m height) ridges and hillcrests grading into moderately inclined side slopes with narrow concave drainage lines (eSPADE, 2022). The Geotechnical Interpretive Report prepared for the Elizabeth Drive East and West concept design reports (AECOM, 2022b) outlines where cuttings and embankments are proposed within the construction footprint.

Local watercourses within the study area include Badgerys Creek, South Creek and Kemps Creek (refer to 5-3). The construction footprint is elevated at about 48 metres above Australian Height Datum (mAHD) at its western extent and about 110 mAHD at its eastern extent.

FIGURE 5-3:
TOPOGRAPHY

N

0 250 500 m

Legend

- Construction footprint
- Motorway
- Primary road
- Local road
- Watercourse
- Drainage line
- 1m contour

5.3 Geology and soil landscapes

Geology

According to the Penrith 1:100,000 Geological Map (Geological Survey of NSW, 1991) (**Figure 5-4**) two surface geological units are mapped within the construction footprint:

- Quaternary alluvium (Q_af), comprising fine-grained sand, silt, and clay, is present within and immediately adjacent to areas of surface water features including Badgerys Creek, South Creek, and Kemps Creek.
- Middle Triassic Bringelly Shale (Twib) of the Wianamatta Group, comprising shale, carbonaceous claystone, claystone, fine to medium grained sandstone, rare coal, and tuff.

The geological mapping indicates that there are two lineaments within the construction footprint. One geological lineation is mapped running parallel to Badgerys Creek in a north to south direction, and the other is mapped running parallel to South Creek also in a north to south direction. The Rossmore Anticline is located about 1.6 km south of the proposal. There are no other geological structural features within the construction footprint, such as dykes, folds or faults.

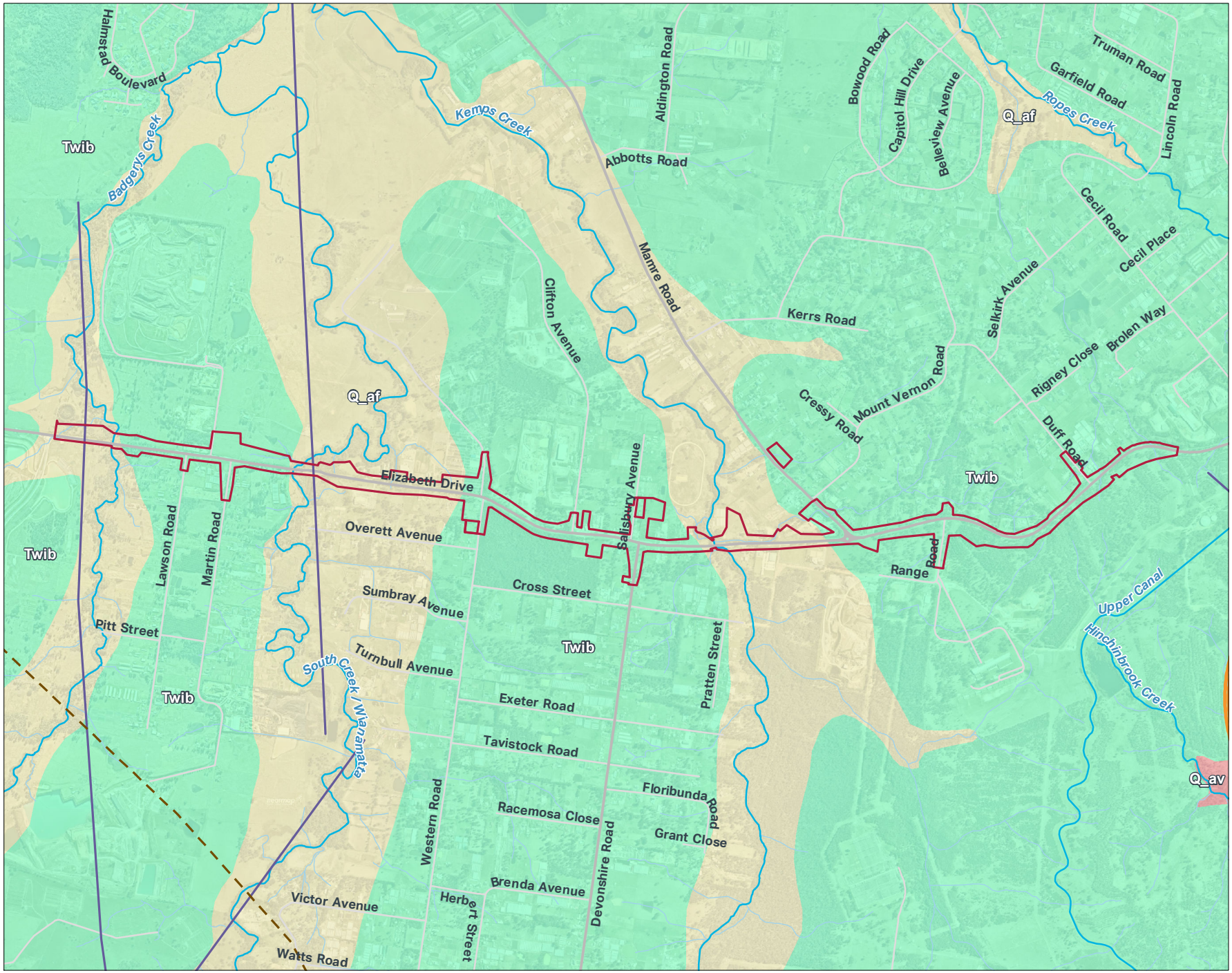

FIGURE 5-4:
SURFACE GEOLOGY

N

0 250 500 m

Legend

- Construction footprint
- Motorway
- Primary road
- Local road
- Watercourse
- Drainage line

NSW Seamless Geology

- Q_af - Quaternary alluvium – fine grained sand, silt, clay
- Q_av - Quaternary alluvium – medium grained sand, clay, silt
- Twib - Bringelly Shale
- Fault/fold
- Lineament

Soil landscapes and characteristics

According to the Penrith 1:100,000 Soil Landscape Map (Bannerman, S. M and Hazelton, P. A, 1990) (**Figure 5-5**), there are four different soil types mapped within the study area:

- Berkshire Park (bp): Alluvial deposits located on gently undulating low rises on the terraces between creek channels. Relevant limitations for development include moderately to highly erodibility, strongly acidic, hard setting, high stoniness and low permeability
- Blacktown (bt): Residual soils located in gently undulating terrain on Bringelly Shale between creek channels. Relevant limitations for development include moderate erodibility, strongly acidic, hard setting, high shrink-swell, low permeability and salinity
- Luddenham (lu): Erosional soils located on the undulating to rolling low hills on Bringelly Shale within the eastern portion of the construction footprint. These soils present a high erosion hazard, a high shrink-swell potential and are of low wet strength and low permeability
- South Creek (sc): Alluvial deposits located within the drainage depressions of Badgerys Creek, South Creek and Kemps Creek. Relevant limitations for development include high to very high erodibility, hard setting, strongly acidic, saline and seasonal waterlogging. The erosion hazard has the potential to be very high to extreme as the soil landscape is an active floodplain which is reworked by fluvial processes.

Salinity

A review of online resources (eSPADE, 2022) shows the soils within the eastern portion of the construction footprint have a moderate overall salinity hazard and soils within the western portion of the construction footprint, including the regions of Badgerys, South and Kemp Creeks, have a very high overall salinity hazard.

Acid sulfate soils

A search of the Atlas of Australian Acid Sulfate Soils (CSIRO) and the Environmental Planning Instrument Acid Sulfate Soils (NSW Department of Planning and Environment (DPE)) indicates the acid sulfate soils (ASS) risk within the study area is Class C with extremely low probability of occurrence (refer further to Appendix M (Phase 1 Contamination Assessment Report) of the REF).

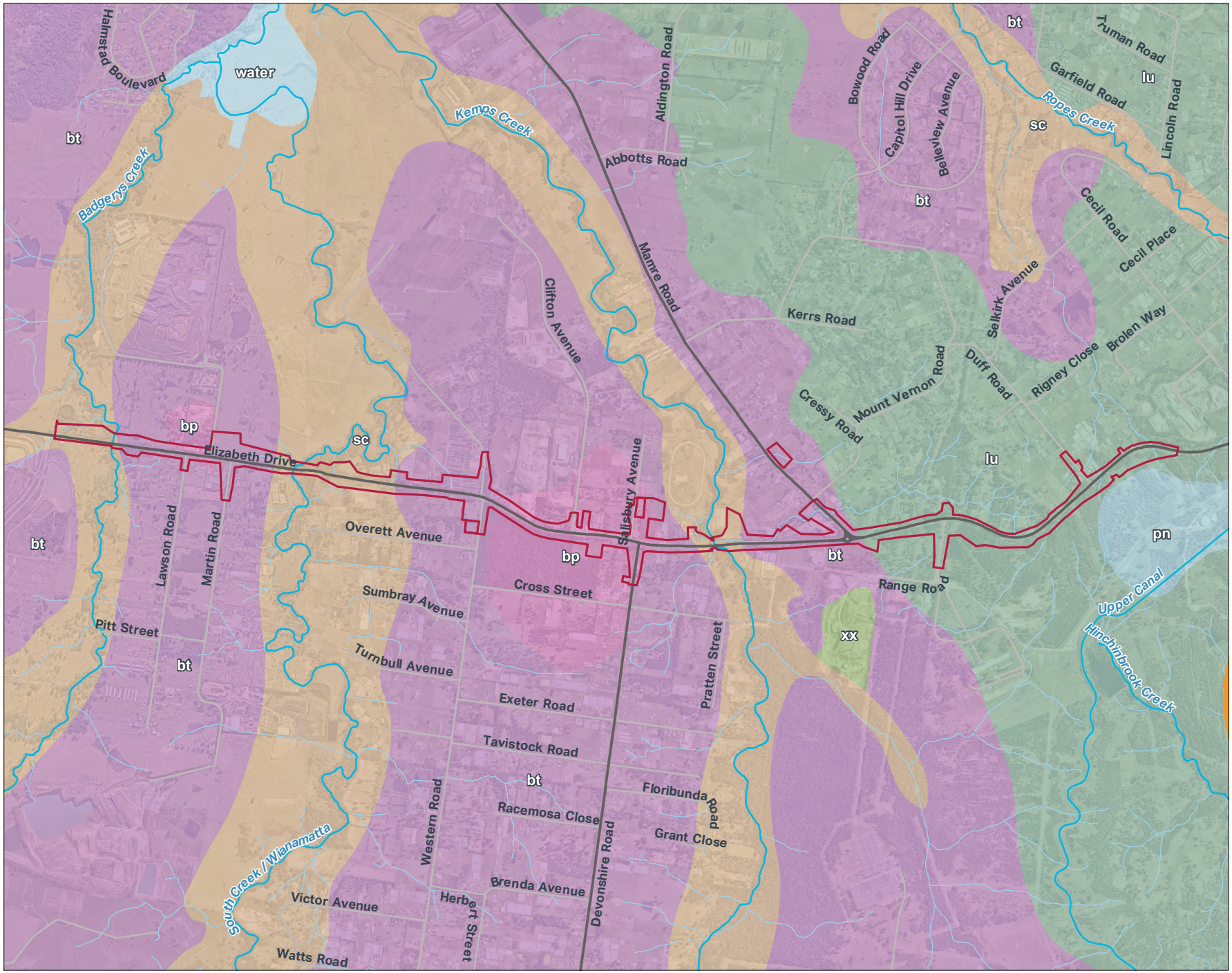

FIGURE 5-5:
SOIL LANDSCAPES

N

0 250 500 m

Legend

- Construction footprint
- Motorway
- Primary road
- Local road
- Watercourse
- Drainage line

Soil Landscapes

- bp - Berkshire Park alluvial soils
- bt - Blacktown residual soils
- lu - Luddenham erosional soils
- pn - Picton colluvial soils
- sc - South Creek alluvial soils
- xx - Disturbed soils
- water

5.4 Land use

The proposal is located within the Liverpool, Penrith and Fairfield LGAs, and partially located on land subject to State Environmental Planning Policy (Precincts-Western Parkland City) 2021 (WPCSEPP). This includes land within the Western Sydney Aerotropolis and an area of unzoned land within the Western Sydney Parklands.

Land use planning within the construction footprint is governed by the provisions of WPCSEPP, Penrith LEP, Fairfield LEP and Liverpool LEP. Land use zones within and surrounding the construction footprint are shown in **Figure 5-6** and comprise:

- ENT Enterprise
- ENZ Environment and recreation
- SP2 Infrastructure
- RU1 Primary production
- RU2 Rural landscape
- RU4 Primary production small lots
- RE1 Public recreation
- IN1 General industrial
- IN2 Light industrial
- C4 Environmental living.

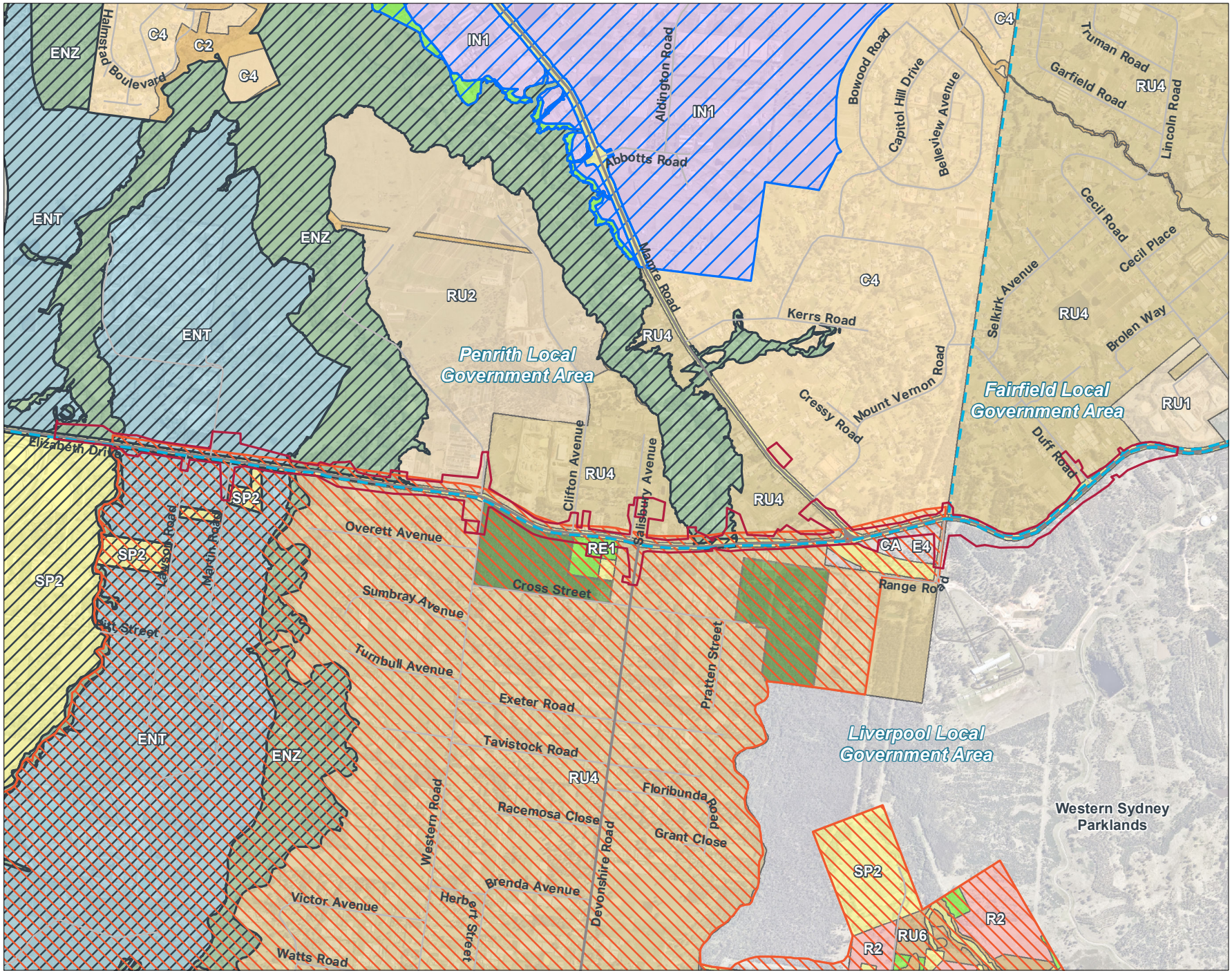

FIGURE 5-6:

LAND USE ZONES WITHIN AND AROUND THE PROPOSAL AREA

N

0 250 500 m

Legend

- Construction footprint
- LGA boundary
- Primary road
- Local road

Land Use Zones

- ENZ Environment and Recreation
- ENT Enterprise
- C2 Environmental Conservation
- C4 Environmental Living
- IN1 General Industrial
- R2 Low Density Residential
- RE1 Public Recreation
- RU1 Primary Production
- RU2 Rural Landscape
- RU4 Primary Production Small Lots
- RU6 Transition
- SP2 Infrastructure

Planning Instruments

- SEPP (Industry and Employment) 2021

SEPP – (Precincts – Western Parklands City 2021)

- Chapter 3 Sydney region growth centres – South West Growth Centre
- Public Recreation - Regional

Original SEPP (Sydney Region Growth Centres) 2006 (superseded)

- Chapter 4 Western Sydney Aerotropolis

5.5 Soil contamination

5.5.1 Current and historical land use

A review of site history information included in Appendix M of the REF indicates that the construction footprint has been a road since before 1949. The surrounding area was originally vacant farmland and dense woodland. The surrounding area appears to change significantly between 1949 and 2021 through land clearing, construction of dams and built structures. Development along the road appears to start in 1961 and intensifies in the 1970s and 80s to broadly resemble its existing configuration.

The following five properties were identified in the Phase 1 Contamination Assessment (refer to Appendix M of the REF) within the construction footprint as requiring further investigations, due to potentially contaminating activities:

- BP (Apex) Petroleum located at 1443 Elizabeth Drive Kemps Creek
- United Petroleum Kemps Creek located at 1463 Elizabeth Drive Kemps Creek
- Caltex (Ampol) Service station located at 1413 Elizabeth Drive Kemps Creek
- Sydney Recycling Park operated by Hi-Quality group located at 1503-1519 Elizabeth Drive Kemps Creek
- Luddenham Auto Repairs located 1489 Elizabeth Drive Kemps Creek.

There are no sites that are on the contaminated land public register that are considered to impact the construction footprint and there are no per- and poly-fluoroalkyl substances investigation or management program sites located within proximity to the proposal.

5.5.2 Areas of potential environmental concern (APEC)

A number of properties were identified within the construction footprint as potentially contaminating. It is also assumed that the fill material used to construct the road and road shoulder of Elizabeth Drive would likely comprise general fill material and/or topsoil sourced locally from other construction work or imported fill material. Fill material may have also been used in areas such as farm dams, and other areas across existing properties. There is also the potential for historic land filling although no obvious instances were detected during this desktop review. This is considered ‘uncharacterised fill’.

Although not observed during the site inspection there is also the potential for fly tipped waste to be present which may represent a contamination source, although the risk is considered low as it would unlikely to be widespread. The land associated with agricultural land use may also be impacted with organochlorine pesticides (OCP) and organophosphate pesticides (OPP), which may represent a contamination source. Based on the desktop review, source areas of potential contamination were identified within the study area associated with the uncharacterised fill, fly tipped waste and areas of former agricultural land described above.

For these source areas, contaminants of potential concern (CoPCs) were identified, based on likely composition of material. A likelihood for risk of contamination was then assigned for the source area. **Table 5-2** outlines each APEC and its contamination risk likelihood.

Table 5-2: Area of potential environmental concern and likelihood of risk

Source area	Source area located within or outside study area	CoPC	Likelihood for risk of contamination
Uncontrolled fill within the construction footprint	Within the construction footprint	Asbestos, heavy metals, Organochlorine pesticides (OCP) and organophosphate pesticides (OPP)	High – There is the potential for contaminated fill which could potentially be widespread. More information is required through the collection of samples to characterise this potential source

Source area	Source area located within or outside study area	CoPC	Likelihood for risk of contamination
Contaminated material produced from fly tipping	Within the construction footprint	Asbestos, heavy metals, OCP and OPP	Low – No obvious signs of fly tipping were observed during the site inspection. Any instances of fly tipping are unlikely to be widespread.
Areas of former and current agricultural land including former building structures	Within the construction footprint	Asbestos, heavy metals, OCP and OPP, petroleum hydrocarbons	High – There is the potential for contamination to be present based on past or current agricultural land use and past demolition practises of any former structures.
Apex Petroleum	Entrance to property is within the construction footprint	Asbestos, heavy metals, OCP and OPP, petroleum hydrocarbons	Moderate – There is the potential for contamination to be present based on land use (Petrol Station)
United Petroleum	Entrance to property is within the construction footprint	Asbestos, heavy metals, OCP and OPP, petroleum hydrocarbons	Moderate – There is the potential for contamination to be present based on land use (Petrol Station)
Caltex Service Station	Entrance to property is within the construction footprint	Asbestos, heavy metals, OCP and OPP, petroleum hydrocarbons	Moderate – There is the potential for contamination to be present based on land use (Petrol Station)
Luddenham Auto Repairs	Entrance to property is within the construction footprint	Asbestos, heavy metals, OCP and OPP, petroleum hydrocarbons	Moderate – There is the potential for contamination to be present based on land use (auto repairs)
Sydney Recycling Park	Entrance to property is within the construction footprint	Asbestos, heavy metals, OCP and OPP, petroleum hydrocarbons	Moderate – There is the potential for contamination to be present based on land use (landfill / waste recovery)

5.6 Catchment features

The proposal lies within the Lower Nepean River Management Zone of the Hawkesbury-Nepean Catchment. A large portion of the Hawkesbury-Nepean Catchment is protected in national parks and water catchment reserves; however, the proposal is part of the South Creek sub-catchment, see **Figure 5-7**, which has been extensively modified and disturbed due to land clearing for agriculture and increasing urbanisation. The Hawkesbury River is the ultimate downstream receiving environment and is located about 30 kilometres northwest of the proposal.

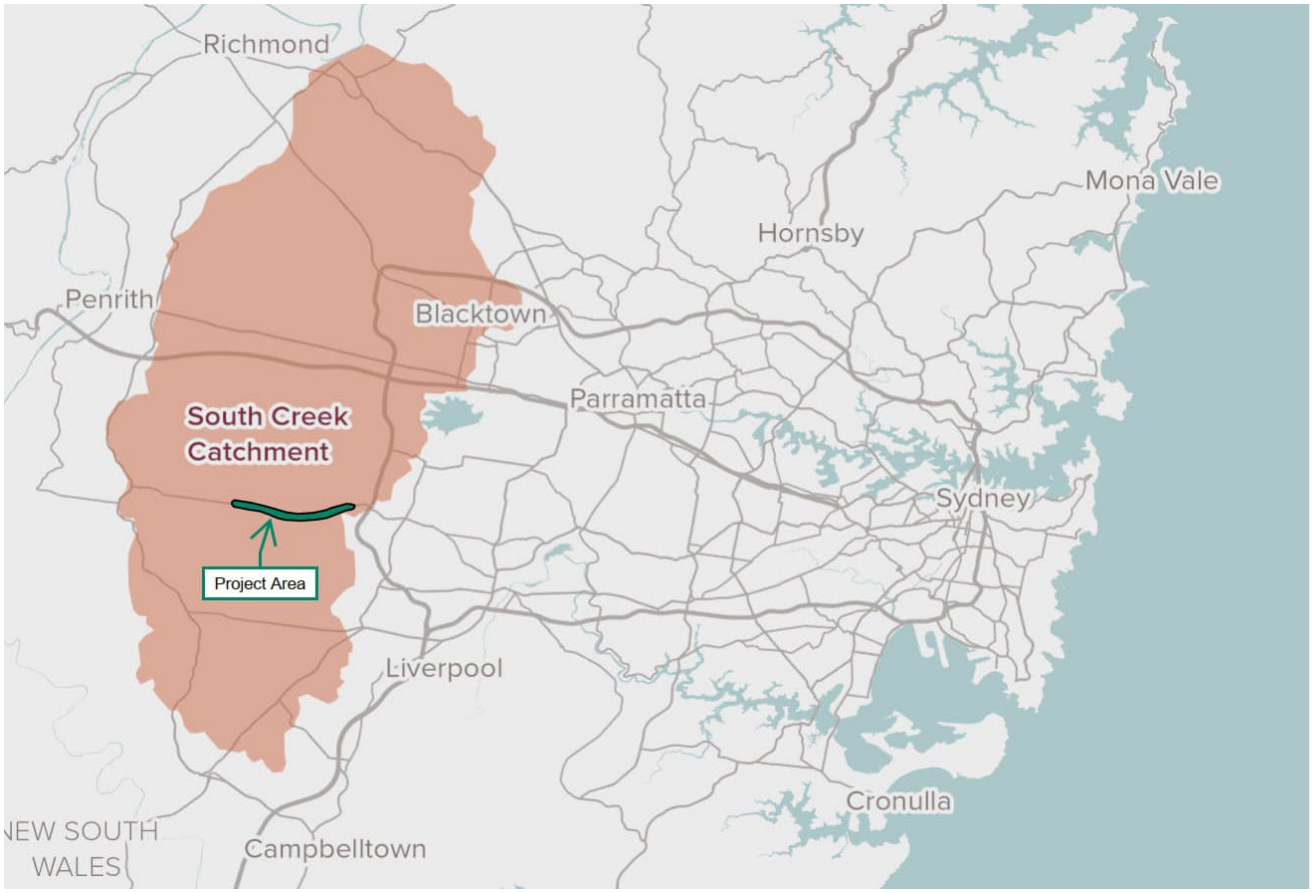

Figure 5-7: South Creek sub-catchment (Infrastructure Australia, 2020)

5.6.1 Key Watercourses

The proposal traverses Badgerys Creek, South Creek and Kemps Creek (from west to east) and enters the catchment of Ropes Creek. Badgerys Creek and Kemps Creek are tributaries of South Creek. **Figure 5-8** shows key watercourses surrounding the proposal.

Badgerys Creek

Badgerys Creek is a fourth order stream at the location it traverses the proposal. Originating at Bringelly, about 9 km upstream of the proposal, the creek flows north before its confluence with South Creek. Land use within the Badgerys Creek catchment consists of agricultural, landfill and residential uses. Ecologically sensitive riparian vegetation also exists within the catchment (GHD, 2016).

South Creek

South Creek has a catchment area of 414 km^2. South Creek flows generally north, joined by seventeen tributaries including Badgerys Creek, Kemps Creek, Ropes Creek and Eastern Creek, until it flows into the Hawkesbury River, near Windsor. South Creek, at the location of the proposal, is a sixth order stream. Due to long-term clearing of vegetation and increased imperviousness resulting from urbanisation, the South Creek catchment is considered one of the most degraded sub-catchments in the Sydney region (RMS, 2019b).

Kemps Creek

Kemps Creek is a fourth order stream at the location it traverses the proposal. Originating about two kilometres east of Catherine Fields, about 12 km upstream of the proposal, the creek flows north before its confluence with South Creek. Land use within the Kemps Creek catchment consists of predominantly semi-rural land type with increasing urbanisation.

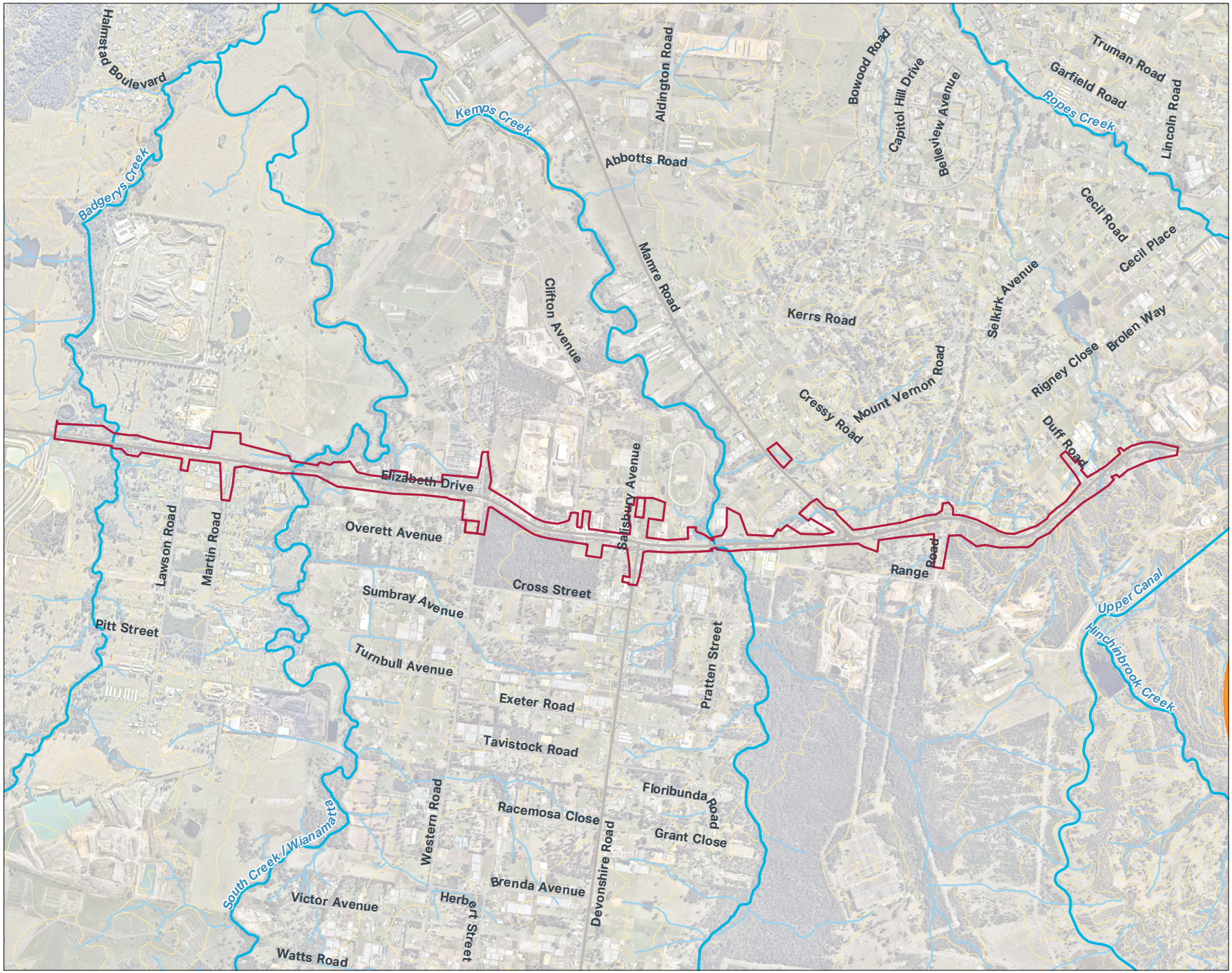

FIGURE 5-8:

KEY WATERCOURSES IN THE STUDY AREA

N

0 250 500 m

Legend

- Construction footprint
- Motorway
- Primary road
- Local road
- Watercourse
- Drainage line
- 10m contour

5.6.2 Sensitive receiving environments

Sensitive receiving environments have a high conservation or community value or support ecosystems/human uses of water that are particularly sensitive to pollution or degradation of water quality.

Key Fish Habitats

The *Fisheries Management Act 1994* (FM Act) has an objective to preserve Key Fish Habitats. The proposal would impact Badgerys Creek, South Creek and Kemps Creek which are identified as Key Fish Habitat for the purposes of the FM Act (Refer **Table 5-3)**. No records of threatened aquatic species have been recorded within 5 km of the study area on the BioNet Atlas of NSW. In addition, a field investigation carried out on 28 and 29 June 2022 identified a degree of channel modification, riparian degradation and weed ingress across the study area, with minimal suitable habitat for threatened aquatic species.

Table 5-3: Nearby waterways identified as Key Fish Habitat (KFH)

Watercourse name	Classification
Badgerys Creek	Type 2 – moderately sensitive Key Fish Habitat (DPI, 2013). Contains large woody debris providing significant fish refuge during wetter seasons.
South Creek	Type 1 – highly sensitive Key Fish Habitat (DPI, 2013). Contains semi-permanent pools for fish refuge and large woody debris.
Kemps Creek	Type 1 – highly sensitive Key Fish Habitat (DPI, 2013). Contains semi-permanent pools for fish refuge and large woody debris.

As stated in M12 EIS (RMS, 2019)

Wetlands

A review of State Environmental Planning Policy no 55 – Remediation of Land (Resilience and Hazards) 2021 and its online mapping database (NSW Government 2018), identified that there are no mapped wetlands, coastal wetlands, coastal lakes or littoral rainforests within the study area or immediately downstream of the proposal. The closest wetland is about 25 kilometres downstream of the proposal near the confluence of South Creek and Eastern Creek.

5.7 Flooding

The Hydraulic Impact and Flooding Assessment (refer to Appendix A of this report) identified the existing flood conditions along Elizabeth Drive. The assessment determined that Elizabeth Drive is subject to relatively shallow depth of flood inundation for events as frequent as the 50 per cent (1 in 2) Annual Exceedance Probability (AEP). Major overtopping of the road only occurs at the location where it crosses the floodplains of Badgerys Creek, South Creek and Kemps Creek.

5.7.1 Badgerys Creek

Under existing conditions, Elizabeth Drive in the vicinity of Badgerys Creek is overtopped during events greater than a 10 per cent AEP design flood event. Depths of flow across the road at this location range from about 250 mm during a 5 per cent AEP flood event to 350 mm during a 1 per cent AEP flood event.

The existing bridge crossing over Badgerys Creek is capable of passing the one per cent AEP flows without overtopping Elizabeth Drive. The peak flows are estimated to be in the order of 90 cubic meters per second.

While there is no overtopping of Elizabeth Drive at the bridge location during the one per cent AEP event, there is some overtopping at the nearby low point within the road, which is about 235 metres west of the bridge. This overtopping is caused by floodwaters breaking out of Badgerys Creek and spreading across the floodplain.

These breakout flows then reach a level across the floodplain which causes overtopping of the road. It is estimated that about 21 cubic metres per second would overtop this low point in a one per cent AEP

flood event. This would cause inundation of the road for a length of about 200 metres, with floodwaters overtopping the road expected to reach a peak depth of 250 millimetres. The flood hazards across this section of road remain at the lowest level of hazard (H1).

5.7.2 South Creek

Flood events less than or equal to the 20 per cent AEP are contained within South Creek with no significant overland flow. South Creek is about 19 metres wide (however, this varies depending on location) and the one per cent AEP overland flow extent is indicative of the flood prone nature of the area.

During flood events greater than 10 per cent AEP, major overtopping of Elizabeth Drive starts to occur to the east of the existing South Creek bridge, with a maximum overtopping depth of 300 millimetres.

Both the western South Creek bridge and eastern South Creek overflow bridge crossings are capable of passing the one per cent AEP flows beneath the bridge deck, with at least 0.7 metres of freeboard. With peak water levels well below the underside of the bridge deck, flows can freely flow underneath both bridges. It is estimated that the one per cent AEP peak discharge rate at this location is about 150 cubic metres per second per bridge, equating to a total flow of about 300 cubic metres per second being conveyed in South Creek at this location.

Road levels along Elizabeth Drive are raised where it passes over these two bridge crossings, at up to 1.4 metres above the nearest low point, which is to the east. Peak flows overtopping Elizabeth Drive in this low point are estimated to be about 23 cubic metres per second in a one AEP flood event. These flows inundate a large section of the road for a length of about 530 metres, with peak overtopping depths likely to reach 0.15 metres in a one per cent AEP flood event. These breakout flows of South Creek spread across the floodplain on the eastern side of the creek and cause inundation to a number of industrial and rural residential properties.

While a large section of road would become inundated in a 1 per cent AEP flood event, the flow depths are relatively shallow and the flood hazard remains at an H1 category (the lowest hazard, generally safe for people, vehicles and buildings) across this entire length of inundation.

5.7.3 Kemps Creek

The Kemps Creek flowpath starts about 1.5 kilometres upstream of Elizabeth Drive and connects about 4.8 kilometres downstream of the alignment to South Creek (the main tributary). During the one per cent AEP event, the deepest flood depth areas are contained within Kemps Creek, reaching up to about 4.1 metres in depth. Events less than or equal to the 50 per cent AEP are mostly contained within Kemps Creek. Overland flow, of H3 hazard category (unsafe for all vehicles) for the one per cent AEP occurs 400 metres south of Elizabeth Drive, where breakout flows extend up to 200 metres either side of Kemps Creek. Kemps Creek is about six metres wide (varies depending on location), and the one per cent AEP overland flow extent is indicative of the flood prone nature of the area.

Under existing conditions, Kemps Creek bridge is able to pass the one per cent AEP design flood event without causing overtopping of Elizabeth Drive. Model results for the future base case (i.e. the conditions before-Elizabeth Drive road upgrade, but after the completion of the M12 Motorway and WSA) indicate that the existing bridge deck has 450 millimetres of freeboard to the one per cent AEP event, with the flood level in this event estimated to be 180 millimetres above the underside of the deck. This indicates that the bridge opening provides a slight obstruction to flows. Peak flows passing through the bridge are estimated to be about 180 cubic metres per second in a one per cent AEP flood event. While the one per cent AEP flows break out of Kemps Creek onto the floodplain at other locations, they do not result in overtopping of Elizabeth Drive, as the flood levels across the Kemps Creep floodplain remain below road levels.

5.7.4 Sub-catchment of Ropes Creek

The sub-catchment of Ropes Creek starts about 350 metres upstream of Elizabeth Drive and connects about two kilometres downstream of the construction footprint to Ropes Creek (the main tributary). Existing culverts convey flow beneath the road at three channels of this sub-catchment, east of Duff Road. During the one per cent AEP event, the deepest flood depth areas are mostly contained within Ropes Creek sub-catchment, reaching up to about 1.6 metres. Some minor overland flow, of H1 hazard

for the one per cent AEP occurs about 70 metres north of Elizabeth Drive, where the breakout from the sub-catchment extends up to 70 metres either side of channelised areas.

Flood events less than or equal to the 50 per cent AEP are mostly contained within the channels within the sub-catchment of Ropes Creek. The channel widths are about four metres (varies depending on location), and the relatively flat downstream area (north of Elizabeth Drive), and one per cent AEP overland flow is indicative of the flood prone nature of the area.

Under existing conditions, the sub-catchment of Ropes Creek does not cause overtopping of Elizabeth Drive.

5.8 Surface water quality

Surface water quality in the construction footprint is influenced by stormwater runoff. Stormwater entrains material (soluble or insoluble) in its path of flow and these materials may pollute the quality of runoff. Stormwater runoff quality in the construction footprint is likely to be influenced by surface pollutants typical of urban catchments, including:

- Oils and hydrocarbons
- Heavy metals
- Chemicals from spills, localised pesticide application or inappropriate waste disposal
- Sediments
- Gross pollutants including litter and debris.

No existing water quality treatment devices have been identified within the construction footprint.

The following documents have been reviewed to develop a summary of recent water quality data for Badgerys Creek and South Creek:

- Western Sydney Airport Environmental Impact Statement – Surface Water Quality Assessment (GHD 2016)
- Badgerys Creek Environmental Field Survey (SMEC 2014)
- M12 Motorway Environmental Impact Statement – Surface water quality and hydrology assessment (RMS 2019)
- Mamre Road Upgrade Stage 1- Concept Design, REF and Detailed Design – Water quality and soil impact assessment (Aurecon 2021).

Overall, the data summary presented in **Table 5-4** demonstrates the poor water quality of Badgerys Creek, South Creek and Kemps Creek as it fails to meet several relevant ANZECC Water Quality Guidelines for protection of aquatic ecosystems in the Hawkesbury-Nepean Catchment. Parameters that exceeded the guidelines include:

- Dissolved oxygen
- Conductivity
- Ammonia
- Total Nitrogen
- Total Phosphorus
- Zinc
- Copper.

Therefore, the existing water quality of the named watercourses within the construction footprint and the receiving environments can be classified as poor and degraded due to low dissolved oxygen concentrations and elevated nutrients (RMS, 2019). This has likely been caused by urban development and agricultural activities in the upstream catchment.

There are also a number of privately owned farm dams within the construction footprint. Existing water quality within these dams was not established as part of this REF; however, would be considered during detailed design.

Table 5-4: Summary of available water quality data (RMS, 2019)

Source	Location	Sampling Date	DO % sat	pH	Conductivity (uS/cm)	Turbidity NTU	Ammonia (mg/L)	TSS (mg/L)	TN (mg/L)	TP (mg/L)	Zinc (mg/L)	Copper (mg/L)	Lead (mg/L)
ANZECC Water Quality Guidelines –for protection of Aquatic Ecosystems (as stated in M12 EIS (RMS 2019))			**85-110**	**6.5-8.5**	**125-2200**	**6-50**	**0.02**	**40**	**0.35**	**0.025**	**0.008**	**0.0014**	**0.0034**
Western Sydney Airport EIS – Surface Water Quality Assessment (GHD 2016)	Badgerys Creek	Median results (2015-2018)	46.7	7.36	2372	23.8	0.08	14	1.7	0.19	0.01	0.005	0.002
	South Creek (SCUS)	March 2015	No data	No data	1680	No data	0.3	<5	1.2	0.27	No data	No data	No data
	Badgerys Creek (L1)	Averaged monthly data (2015-2016)	44.4	7.28	1486	39.9	No data	14.2	3.7	0.4	0.027	0.0043	0.002
Badgerys Creek Environmental Field Survey (SMEC 2014) reported in WSA EIS (GHD 2016)	Badgerys Creek (B1)	September 2014	Noted as within range	Noted as within range	Noted as above range	3.2	No data	10	2.8	1.6	No data	No data	No data
	Badgerys Creek (B2)	September 2014	Noted as within range	Noted as within range	Noted as above range	14	No data	17	2.5	0.5	No data	No data	No data
	Badgerys Creek (B3)	September 2014	48	Noted as within range	Noted as within range	11	No data	16	2.6	0.5	No data	No data	No data
M12 Motorway EIS – Surface water quality and hydrology assessment (RMS 2019)	South Creek	Project Specific Single Sample – June 2018	80.1	8.47	2640	14.3	No data	16	1.4	<0.05	No data	No data	No data
	Kemps Creek	Project Specific Single Sample – June 2018	35.9	7.28	1500	12.1	No data	10	6.6	0.6	No data	No data	No data
	Kemps Creek – Liverpool City Council	Median results 2017 - 2018	31.1	7.66	1889	10.7	0.065	No data	4.5	0.75	No data	No data	No data

Source	Location	Sampling Date	DO % sat	pH	Conductivity (uS/cm)	Turbidity NTU	Ammonia (mg/L)	TSS (mg/L)	TN (mg/L)	TP (mg/L)	Zinc (mg/L)	Copper (mg/L)	Lead (mg/L)
ANZECC Water Quality Guidelines –for protection of Aquatic Ecosystems (as stated in M12 EIS (RMS 2019))			**85-110**	**6.5-8.5**	**125-2200**	**6-50**	**0.02**	**40**	**0.35**	**0.025**	**0.008**	**0.0014**	**0.0034**
Mamre Road Upgrade Stage 1- Concept Design, REF and Detailed Design – Water quality and soil impact assessment (Aurecon 2021)	WaterNSW Water Monitoring Site (ID: 212048) for South Creek at Luddenham Road	Median Results for data recorded between: 01/01/2018-22/10/2020	52	7.31	908	22.7	No data	28	0.778	0.1	0.0105	0.003	0.002

Notes: Red cells represent failure to meet ANZECC Guidelines
DO: Dissolved Oxygen, TSS: Total Suspended Solids, TN: Total Nitrogen, TP: Total Phosphorus

5.9 Groundwater

5.9.1 Hydrogeology

According to publicly available information (RMS, 2019a, Aurecon, 2021 and WaterNSW, 2022), there are two main groundwater system types within the study area (within a two km radius from the construction footprint):

- Overlying unconfined to semi-confined alluvial aquifers associated with Badgerys Creek, South Creek and Kemps Creek which intersect the proposal, and Ropes Creek, located north within the eastern portion of the study area. The groundwater system is limited to these surface water features. The alluvium is limited in thickness and extent, as this fluvial deposition is directly related to these perennial surface water drainages
- Semi confined to confined aquifers within the Bringelly Shale bedrock.

Alluvial deposit groundwater system

A groundwater investigation was carried out in August 2018 for the proposed M12 Motorway project (RMS, 2019a), located north of the proposal, within the groundwater study area (see **Figure 5-9**). Monitoring bores were installed adjacent to the Badgerys, South and Kemps Creeks, which indicated that alluvium deposits were thin, ranging between 2 and 6 metres thick, and comprised silty sandy clay and gravelly clay fluvial deposits.

Depth to water measurements within alluvium monitoring bores ranged between 2 and 5 metres below ground level (mbgl). Groundwater in this thin alluvium unit was conceptualised to mimic flow in the primary surface water features in the area (Badgerys, South and Kemps Creek) (RMS, 2019a).

Groundwater recharge to the alluvium is from rainfall and loss from surface water features, which are hydraulically connected to alluvium. There is potential that upward leakage from the confined Bringelly Shale to the overlying alluvium can occur when vertical hydraulic gradients allow (ie during dry seasons).

It is likely that groundwater in the alluvium discharges to surface water features during the dry season, as baseflow. Thus, the surface water systems are considered losing systems during the wet season (flow from surface water to alluvium) and then gaining systems at the end of the wet seasons (groundwater discharging to the surface water) and to a lesser extent to the underlying Bringelly Shale (expected during wet seasons).

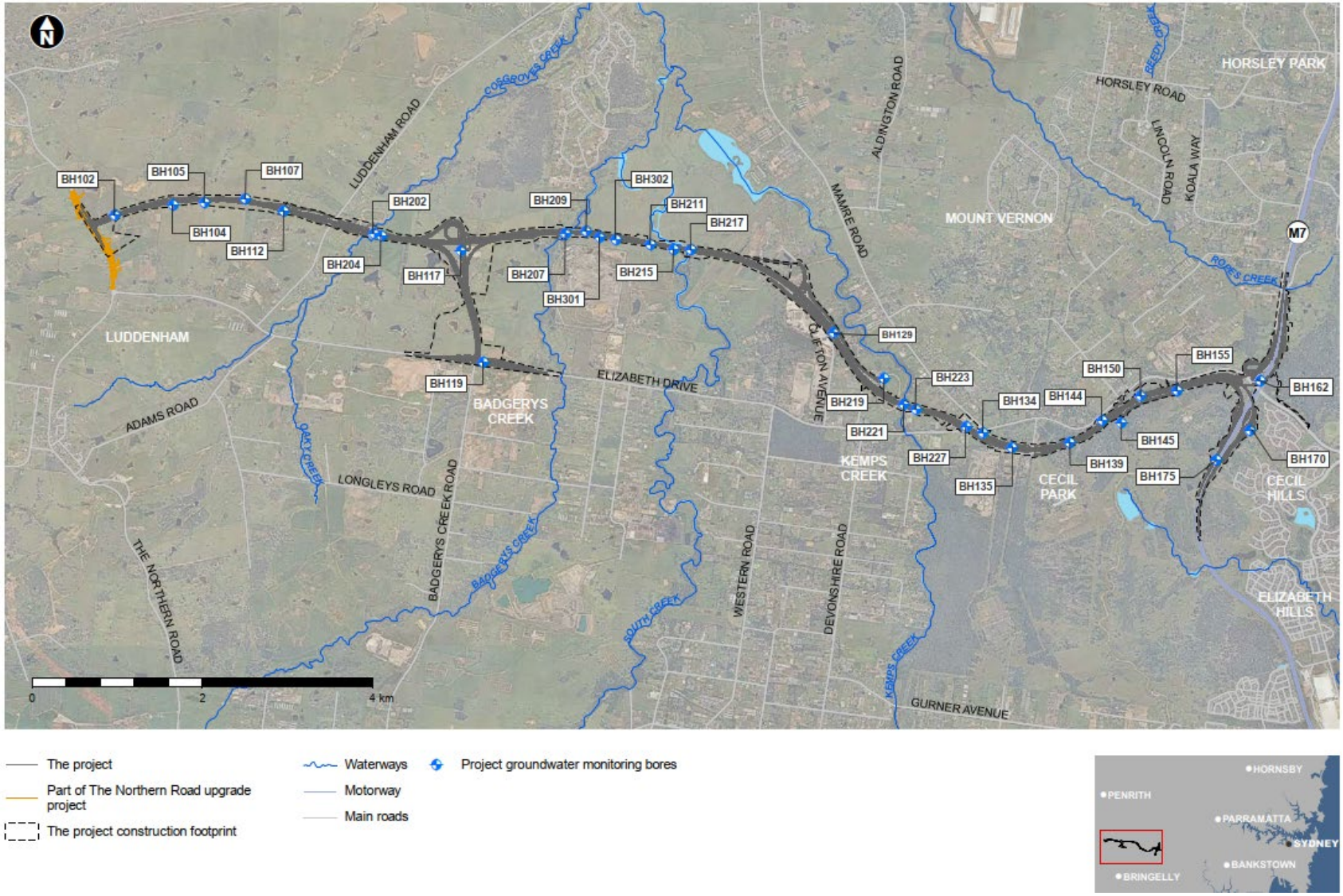

Figure 5-9 Groundwater investigation bore locations for the proposed M12 Motorway (figure obtained from RMS, 2019a)

Bringelly Shale groundwater system

Depth to water within the Bringelly Shale ranged from 1 to 19 mbgl within the 2018 investigation study area (RMS, 2019a, see Figure 5-9); however, registered groundwater bores within the study area have indicated that depth to groundwater may extend to about 53 mbgl. The wide range of groundwater level measurements is likely due to the differing confining conditions associated with the shale (ie semi-confined to confined aquifer conditions).

Regional groundwater within the Bringelly Shale is inferred to flow in a westerly direction towards the Nepean River and Warragamba Dam located over 10 kilometres from the proposal (Lotsearch, 2022). Hydraulic testing completed in August 2018 suggested the aquifer is not productive (RMS, 2019a). Groundwater is likely predominantly recharged from rainfall in areas of outcrop and shallow subcrop and, to a lesser extent, from connectivity to surface water features (when hydraulic gradients and connectivity allow).

Downward leakage from the overlying alluvium into the Bringelly Shale system is expected in the region of major drainage lines including Badgerys, South and Kemps Creeks during wet seasons. Upward leakage from the Bringelly Shale to the overlying alluvium groundwater system in the region of major drainage lines, including Badgerys, South and Kemps Creeks, is expected during dry seasons.

5.9.2 Existing groundwater quality

A groundwater investigation was carried out in August 2018 for the proposed M12 Motorway project (RMS, 2019a), as shown on Figure 5-9. Groundwater was sampled from seven bores within the study area.

Five bores were screened across both the shallow silty clays (alluvial aquifer) and underlying Bringelly Shale at depths ranging between 0.5 to 18.28 mbgl (resulting in composite water samples and water levels), and two bores were screened solely across the Bringelly Shale at depths ranging between 5.9 to 20.0 mbgl.

No bores were screened exclusively within the alluvium and, therefore, no groundwater quality information could be obtained for this groundwater system.

The following findings were noted regarding groundwater quality in the Bringelly Shale:

- Piper plot analysis indicated that the groundwater type is sodium chloride dominant
- Concentrations of chloride (730-5,580 mg/L), sodium (807 mg/L), and total dissolved solids (TDS) (2,650 mg/L) exceeded the ADWG aesthetic criteria of 250 mg/L, 180 mg/L, and 600 mg/L, respectively (NHMRC, 2015)
- Concentrations of arsenic (10 µg/L) and nickel (33 µg/L) exceeded the ADWG health criteria of 10 µg/L and 20 µg/L, respectively (NHMRC, 2015)
- TDS was 2,650 mg/L indicating brackish water conditions
- Concentrations of dissolved copper, nickel and zinc exceeded the ANZECC Water Quality Guidelines for the protection of 95 per cent of freshwater species (ANZECC/ARMCANZ, 2000a).

Potential sources for the elevated heavy metals and nutrient concentrations in groundwater include agricultural land use in the area, the Elizabeth Drive landfill facility and fill material from unknown sources. There is potential that concentrations are representative of background concentrations (RMS, 2019b).

Concentrations of TDS within fractures of Wianamatta Group shales of western Sydney, including the Bringelly Shale, are typically 5,000-30,000 mg/L (McNally, 2009).

5.9.3 Groundwater users

A search of the WaterNSW Realtime Data online database and the BoM Australian Groundwater Explorer (BoM, 2022a) carried out in March 2022 indicated that there are 31 registered groundwater bores located within the study area, as summarised in **Table 5-5**. Registered groundwater bores are shown in **Figure 5-10**.

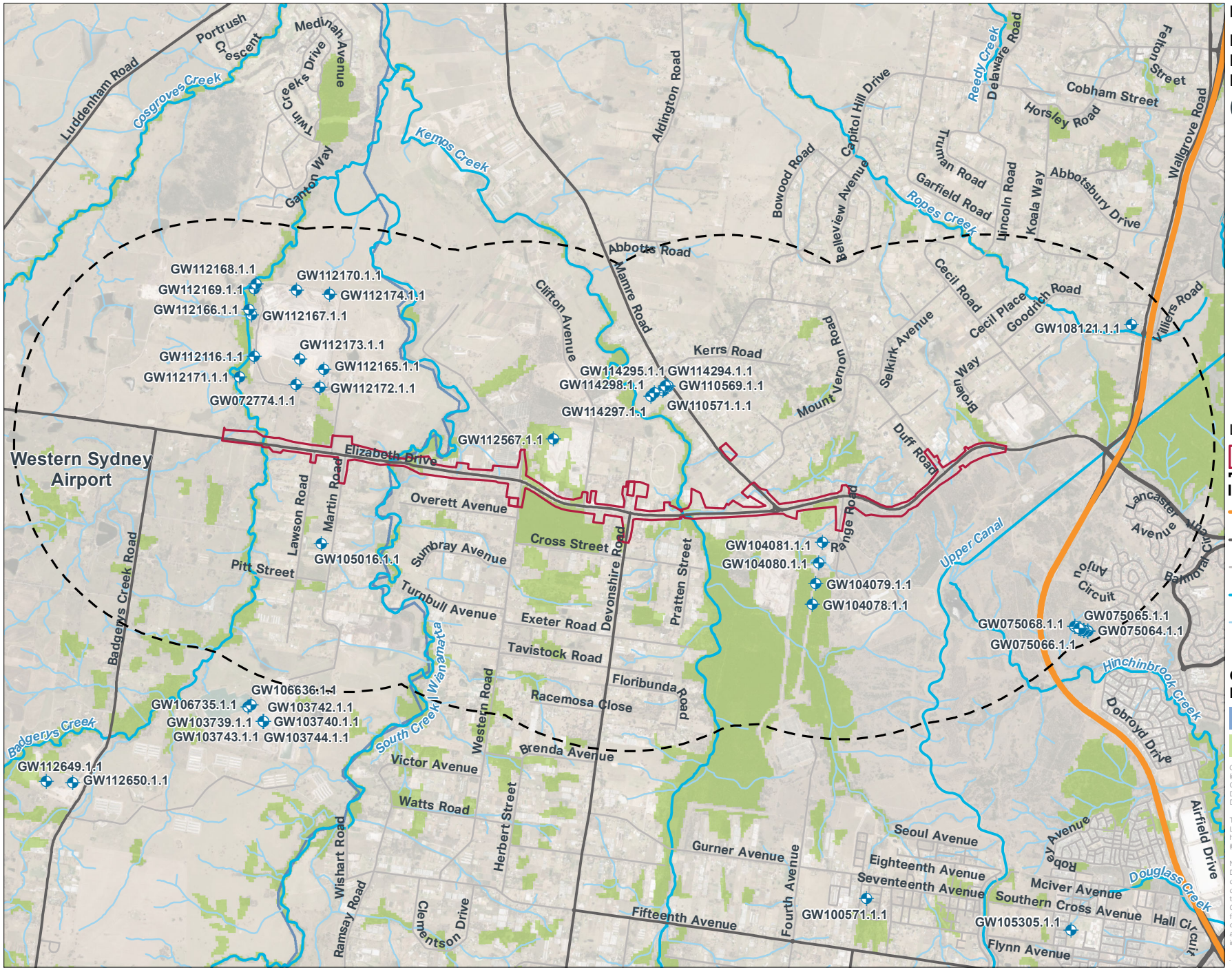

FIGURE 5-10:

REGISTERED GROUNDWATER BORES AND GROUDWATER DEPENDENT ECOSYSTEMS

N

0 0.5 1 km

Legend

- Construction footprint
- Study area
- Motorway
- Primary road
- Local road
- Watercourse
- Drainage line
- Registered groundwater bore

Groundwater Dependent Ecosystems

- Aquatic
- Terrestrial

Two of the 31 bores (GW105016.1.1 and GW112567.1.1) had a purpose relating to water supply (ie irrigation, stock and domestic, water supply or commercial/industrial) and based on reported bore depth and bore logs, at least one of these two bores (GW105016.1.1) was inferred to be accessing the Bringelly Shale groundwater. The closest of these two bores (GW112567.1.1), relating to water supply, is located about 285 metres north of the construction footprint.

Table 5-5: Summary of registered groundwater bores within the study area

Bore ID	Date installed	Purpose	Status	Bore depth (m)	Standing water level (mbgl)	Screened lithology
GW072774.1.1	26/10/1994	Exploration	Unknown	30	Unknown	Shale
GW075064.1.1	26/08/1999	Monitoring	Unknown	4.5	Unknown	Sandstone
GW075065.1.1	26/08/1999	Monitoring	Unknown	6	Unknown	Sandstone
GW075066.1.1	26/08/1999	Monitoring	Unknown	6	Unknown	Sandstone
GW075067.1.1	26/08/1999	Monitoring	Unknown	9	Unknown	Sandstone
GW075068.1.1	26/08/1999	Monitoring	Unknown	10	Unknown	Sandstone
GW104078.1.1	3/10/2001	Monitoring	Unknown	30	Unknown	Shale
GW104079.1.1	4/10/2001	Monitoring	Unknown	30	Unknown	Shale
GW104080.1.1	5/10/2001	Monitoring	Unknown	30	Unknown	Shale
GW104081.1.1	6/10/2001	Monitoring	Current	30	Unknown	Shale
GW105016.1.1	1/04/2003	Stock, domestic	Current	252.5	53	Sandstone/shale
GW110569.1.1	25/08/2009	Monitoring	Current	6	4.4	Clay
GW110570.1.1	25/08/2009	Monitoring	Unknown	12	4.4	Clay
GW110571.1.1	25/08/2009	Monitoring	Unknown	12	4.4	Clay
GW112116.1.1	9/11/1995	Monitoring	Unknown	23.4	Unknown	Unknown
GW112165.1.1	26/08/1992	Monitoring	Current	34.95	Unknown	Unknown
GW112166.1.1	21/08/1992	Monitoring	Unknown	32.34	Unknown	Unknown
GW112167.1.1	5/03/1993	Monitoring	Unknown	20.6	Unknown	Unknown
GW112168.1.1	28/08/1992	Monitoring	Unknown	26.5	Unknown	Unknown
GW112169.1.1	8/03/1993	Monitoring	Unknown	16.55	Unknown	Unknown
GW112170.1.1	19/07/1991	Monitoring	Unknown	26.9	Unknown	Unknown
GW112171.1.1	23/07/1991	Monitoring	Unknown	32	Unknown	Unknown
GW112172.1.1	17/07/1991	Monitoring	Unknown	36.5	Unknown	Unknown
GW112173.1.1	10/03/1993	Monitoring	Unknown	24	Unknown	Unknown
GW112174.1.1	15/07/1991	Monitoring	Unknown	22	Unknown	Unknown
GW112567.1.1	13/09/2007	Industrial	Current	20	Unknown	Unknown
GW114294.1.1	28/04/2011	Monitoring	Current	6	Unknown	Unknown
GW114295.1.1	28/04/2011	Monitoring	Unknown	6	Unknown	Unknown
GW114296.1.1	28/04/2011	Monitoring	Unknown	6	Unknown	Unknown
GW114297.1.1	28/04/2011	Monitoring	Unknown	8	Unknown	Unknown
GW114298.1.1	28/04/2011	Monitoring	Unknown	7	Unknown	Unknown

Notes: m – metres, mbgl – metres below ground level

5.9.4 Groundwater dependent ecosystems

The BOM GDE Atlas (BOM, 2022b) was reviewed to determine the potential for GDEs to exist within the study area. The atlas mapping is shown in **Figure 5-10** and summarised as follows:

- South Creek, which intersects the construction footprint, is mapped as a high potential aquatic GDE (based on national assessment).
- Terrestrial GDE's mapped within the study area include:
  - Cumberland River Flat Forest – High potential GDE located within the construction footprint in isolated areas within the eastern portion of the proposal, and along Badgerys, South and Kemp Creek that transect the proposal
  - Cumberland Shale Hills Woodland – Moderate potential GDE located within the construction footprint in isolated areas between Badgerys, South and Kemp Creek
  - Cumberland Shale Plains Woodland – Low potential GDE located within the construction footprint in isolated areas between South and Kemp Creek.
- There are no subterranean GDEs that have been mapped in the study area

Additionally, Appendix 2 of the Water Sharing Plan for the Greater Metropolitan Region, Groundwater Sources 2011 (NSW Government) indicates that there are no high priority GDEs (karst and wetlands) mapped within the study area.

5.9.5 Conceptual Hydrogeological Model

The conceptual hydrogeological model for the alluvial groundwater systems and the Bringelly Shale groundwater system is presented on **Figure 5-11**.

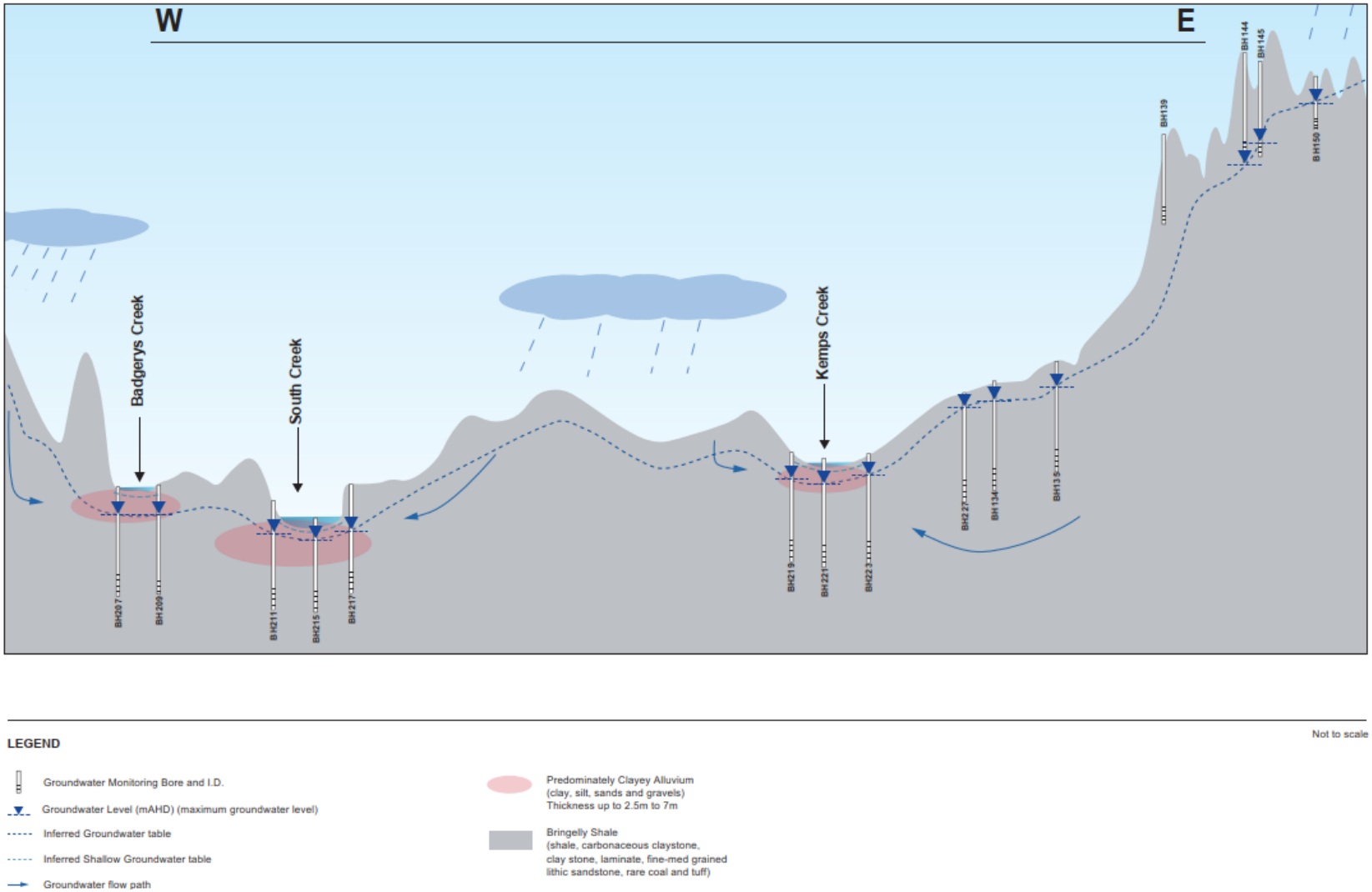

Figure 5-11: Conceptual hydrogeological model – proposal study area

6.0 Construction impact assessment

This section provides an assessment of potential construction impacts on surface water and groundwater resources from the proposal.

6.1 Surface water

6.1.1 Surface water drainage

Earthworks have the potential to increase surface runoff, disrupt existing flow paths and to impact surface water quality with the mobilisation of sediments and contaminant laden stormwater.

Section 3 of the REF provides a detailed description of work associated with bridge construction activities for Badgerys Creek, South Creek and Kemps Creek. Potential impacts could include:

- Localised ponding
- Runoff moving as concentrated rather than sheet flows, which could potentially create drainage/flooding issues within neighbouring properties or downstream
- Impact to the stability of banks, creek bed, and existing surface water drainage behaviour from instream bridge construction work at and during temporary diversion of creek channels.

If existing cross drainage structures were to become partially or fully blocked as part of construction work, then floodwaters could potentially overtop the road during frequent rainfall events. This would present a safety risk to traffic moving along Elizabeth Drive and other nearby roads.

6.1.2 Flooding

Construction work required for the proposal has the potential to impact existing flood behaviour. During runoff events or flood conditions, the following may occur:

- Work sites may increase runoff volumes and peak flows (eg maximum flow rates) due to an increase in impermeable surfaces or soil compaction
- Drainage infrastructure may become blocked (eg by soil, vegetation, waste) or be temporarily diverted due to construction activities
- Earthworks could alter overland flow paths, which could direct more flow to some areas. This would risk overloading existing drainage systems
- Instream construction work and temporary diversion of creek channels could impact existing surface water behaviour.

Conveyance of floodwaters is not likely to change due to construction phase activities if existing drainage paths are not impacted (blocked or inappropriately redirected). Construction activities would be managed to minimise the potential that drainage infrastructure becomes blocked (eg by soil, vegetation, waste) or obstructed. **Figure 6-1** shows the peak flood depths in the study area for the 1 per cent AEP storm events in relation to the construction footprint and construction ancillary facilities.

The four construction ancillary facilities are located outside of the 1 per cent AEP floodplains, as see in **Figure 6-1**, and are not likely to be impacted by flooding during the construction phase.

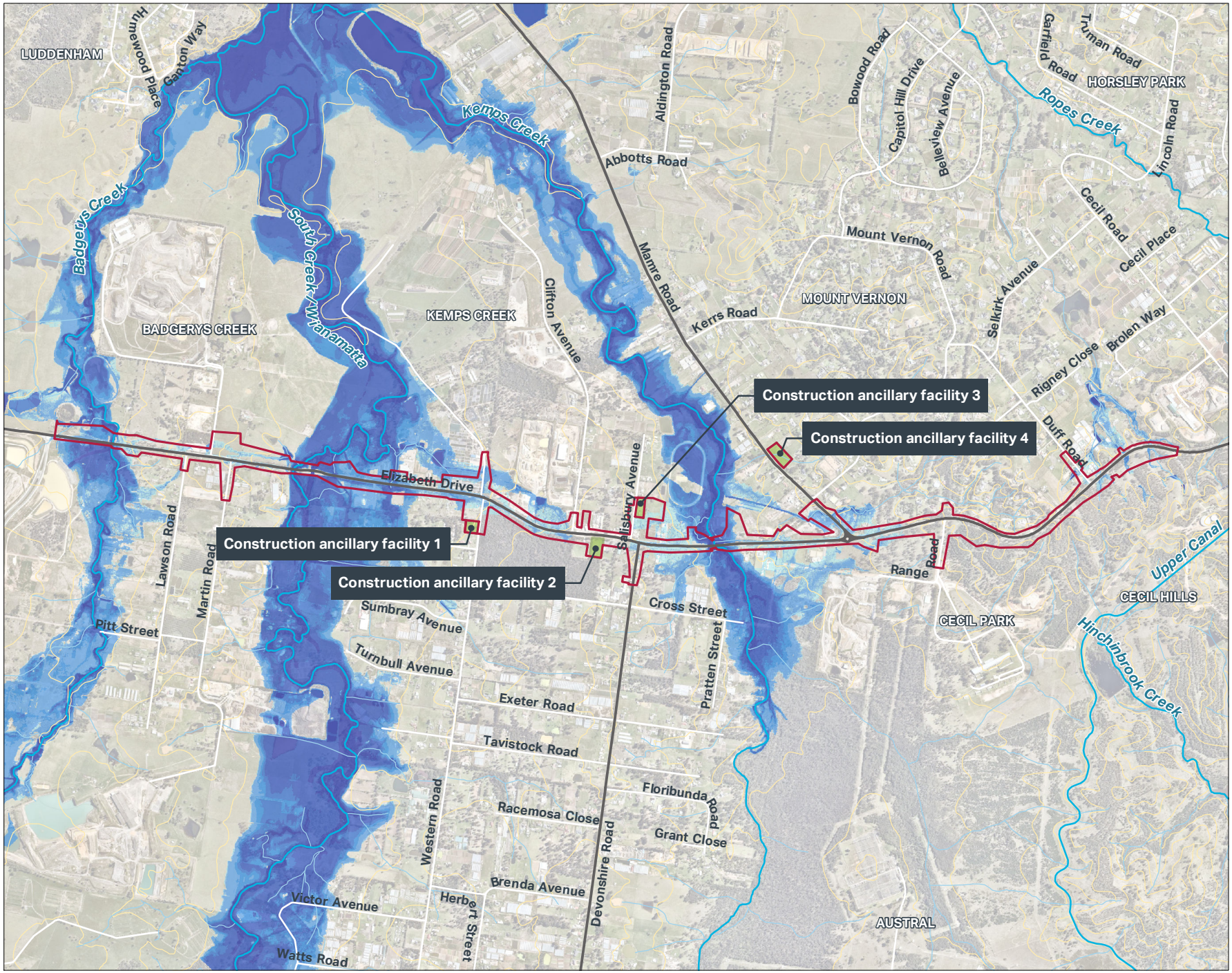

FIGURE 6-1: CONSTRUCTION ANCILLARY FACILITIES UNDER A ONE PERCENT AEP STORM EVENT

N

0 0.5 1 km

Legend

- Construction footprint
- Construction ancillary facility
- Primary road
- Watercourse
- Drainage line
- 10m contour

1% AEP Peak Flood Depth (m)

- <=0.02
- 0.02 - 0.05
- 0.05 - 0.1
- 0.12 - 0.5
- 0.52 - 0.75
- 0.75 - 1.00
- 1.00 - 2.00
- 2.00 - 7.00
- >7.00

6.1.3 Surface water quality

Table 6-1 provides a summary of the potential surface water quality related impacts from construction activities on receiving waterways including Badgerys Creek, South Creek, Kemps Creek and Ropes Creek. Each of the potential impacts outlined in **Table 6-1** is considered with respect to the environmental values and WQOs listed in **Table 3-1**.

Table 6-1: Potential impacts to surface water quality during construction

ID	Activity/Source	Pollutants or Factor of Concern	Potential Impact to receiving waterways and associated water quality objectives
C1	Clearing of vegetation and the resultant exposed soils could result in mobilisation and release of sediment laden runoff from construction areas or stockpiles of soil The direct disturbance of waterway bed and/or banks as a result of earthworks and construction of instream structures could result in soil and bank erosion and mobilisation of sediments into receiving waterways. The loading and transporting of building materials, stockpiling, earthworks, and demolition of structures (including the existing bridges) could result in dust, litter and other pollutants being mobilised by wind and stormwater runoff into waterways Vehicle movement across construction site areas may loosen soils and transport sediment onto public roads and into the waterways either by runoff carrying sediment from loosened soils or through sediments attached to the vehicles traversing drainage lines.	Sediment, nutrients, contaminants, gross pollutants, and damage to vegetation	• Sediments could smother receiving waterways impacting aquatic ecosystems. • Increased turbidity, lower dissolved oxygen levels, and increases in toxicant concentrations could impact aquatic ecosystems. • Nutrients associated with sediments could lead to algal blooms and aquatic weed growth, which could impact aquatic ecosystems, recreation, irrigation, livestock, and aquatic foods. • Reduced visual amenity could result from turbid water and visible gross pollutants, impacting recreation and visual amenity.
C2	Spills from machinery or equipment, during refuelling or accidental spill could potentially result in pollutants such as petroleum hydrocarbons, lubricants, effluent, oils, and greases being conveyed to downstream waterways.	Hydrocarbons, oil and grease, hydraulic fluids, other hazardous chemicals	• Oil sheen on water surface could impact amenity or recreation • Increases in toxicant concentration could lead to fish kills and other aquatic ecosystem impacts, livestock, and aquatic foods.

ID	Activity/Source	Pollutants or Factor of Concern	Potential Impact to receiving waterways and associated water quality objectives
C3	Concreting activities could impact receiving waterways as follows: • Concrete washout water being discharged into waterways • Chemicals used in treatment and curing of concrete and mobilisation of concrete dust through wind and runoff could impact waterways. Spills of excess or waste concrete could be discharged into stormwater systems	High pH, chromium, contaminants, waste, sediment, gross pollutants	• Increases in alkalinity and toxicant concentration which could lead to impacts to aquatic ecosystems such as fish kills and undesirable impacts to livestock • Increased turbidity could impact aquatic ecosystems, amenity, and recreation.
C4	Earthworks and changes to the site resulting in concentrated flows, as opposed to sheet flow, that have potential to disrupt existing surface water flow paths, scour the earth and increase sediment loads carried by surface waters	Sediment, nutrients, contaminants	• Increased turbidity, lower dissolved oxygen levels and increased nutrients which could lead to algal blooms and aquatic weed growth which could impact aquatic ecosystems • Increases in toxicant concentration • Reduced visual amenity (turbidity) • Localised ponding could occur, creating drainage/flooding issues within nearby properties and surrounding downstream environment
C5	Dewatering open excavations following periods of rainfall, which may contain sediments and other pollutants mobilised by the rainfall.	Sediment, nutrients, contaminants	• Increased turbidity, lower dissolved oxygen levels and nutrients which could lead to algal blooms and aquatic weed growth could impact aquatic ecosystems, amenity, recreation, livestock, and irrigation • Increases in toxicant concentration could impact aquatic ecosystems, livestock, and aquatic foods.
C6	Construction within areas of moderate to very high-risk saline soils could expose saline soils, allowing salts to be entrained in runoff to the receiving environment.	Salts	• Saline runoff could impact aquatic ecosystems with the potential for fish kills and loss of biodiversity and the loss of aquatic foods. • Salts could make water unsuitable for uses such as irrigation, and livestock.

ID	Activity/Source	Pollutants or Factor of Concern	Potential Impact to receiving waterways and associated water quality objectives
			• Construction within areas of moderate to very high-risk saline soils would be managed in accordance with the Soil and Water Management Plan (SWMP), under the Construction Environmental Management Plan (CEMP).
C7	Impacts to ambient water quality as a result of poorly treated discharges	Heavy metals, pH, oil and grease, sediment, nutrients	• Increases in alkalinity and toxicant concentration which could lead to fish kills and other undesirable impacts to aquatic ecosystems, livestock, and aquatic foods • Increased turbidity, lower dissolved oxygen levels and nutrients which could lead to algal blooms and aquatic weed growth, which could impact aquatic ecosystems, amenity, recreation, irrigation, livestock, and aquatic foods.

The proposal is located in an area where soils are highly erodible. If not adequately managed, these construction activities could lead to erosion of exposed soil and stockpiled materials and an increase in sediment loads entering nearby watercourses.

The proposal could also result in the accumulation of potential contaminated sediments in sedimentation and water quality basins. Water quality impacts include increased turbidity and elevated concentrations of nutrients and other pollutants.

Erosion and sedimentation controls outlined in **Section 10.0** and procedures for the management of sedimentation and water quality basins would be outlined in the Soil and Water Management PLAN (SWMP) contained in the Construction Environmental Management Plan (CEMP). With the implementation of these controls, potential construction related erosion and sedimentation impacts to surface water would be appropriately managed and would be minor.

6.2 Groundwater

This section provides an assessment of the potential impacts that the proposal may have on groundwater resources during construction. Groundwater may be impacted where construction excavation activities intersect shallow groundwater and/or where construction impacts on the surface water regimes hydraulically connected to shallow groundwater, including the following:

- Reshaping of waterways and embankments to accommodate the bridge work at Badgerys Creek, South Creek, and Kemps Creek
- Trenching for new or realigned stormwater drainage and utilities
- Fill embankments and cuttings (deeper than the alluvium water table)
- Dewatering of temporary excavations and farm dams.

6.2.1 Groundwater recharge

The impervious surface area within the construction footprint is expected to increase due to the construction of the new paved surfaces. However, this area is small relative to the overall extent of aquifers across the larger regional area, such that the net impact on regional recharge due to construction of the proposal is considered negligible.

6.2.2 Groundwater levels and flow

There is potential that dewatering would be required during the construction phase. Dewatering may be necessary within cuts in the topography, required to achieve the desired road grades. Should the cuts intersect shallow groundwater then the cuts would need to include groundwater weep holes to facilitate safe work embankments. The weepholes could reduce groundwater levels and resources in the immediate area around these cuts. Strip drains and weep holes in these areas, typically installed for cut stability, would result in seepage during high groundwater level conditions. Relatively shallow cuts and weepholes, typically installed some 0.6 m above ground level, would limit the volumes of seepage in these discrete zones. As design progresses from concept to detailed, the design for each individual cutting should be independently assessed with additional geotechnical investigations (AECOM, 2022b). It is noted that cuts greater than about five metres have been identified generally along Elizabeth Drive near its intersection with Range Road (with cuts up to about 10 metres) and between Duff Road and Range Road (with cuts up to about five to six metres). The maximum upper groundwater level in the area of these cuts was reported to be 19 mbgl (RMS, 2019a), and unlikely to be intercepted.

Excavations required for the installation of buried services, such as stormwater pipes, are generally shallow, one to two metres deep. However, there is a small chance that shallow groundwater may be intersected during excavation (particularly subsequent to wet weather (refer Section 5.9.1).

Temporary dewatering during these excavations may lead to localised groundwater drawdown and cause the surrounding groundwater to flow towards the excavations. It is assumed that all dewatering work would be temporary and required only while the construction activity is being carried out to provide safe working conditions.

Groundwater removal / extraction would be required during the bridge construction work. The installation of piles results in the removal of saturated alluvium and shale, the volumes of saturated material is, however, limited (some 10 to 20 L of groundwater dependent on pile type and depth). This groundwater extraction is not considered to have a measurable impact on the groundwater resources. In addition, it is a requirement under Transport's QA Specification B59 that temporary casing is to be used while bridge pilings are being constructed, if groundwater is encountered during construction work. The specifications would be outlined in the SWMP.

Bridge pilings are assumed to not be continuous (such as a secant wall), such that the piles would not markedly alter groundwater flow.

Temporary channel diversion of Badgerys, South and Kemps Creeks to allow construction work to be carried out within the existing creek channels have the potential to impact on groundwater flow patterns and levels and there is potential for induced hydraulic connectivity between groundwater and surface water locally.

It is noted that embankments constructed greater than five metres are located generally around the intersection of Elizabeth Drive and Badgerys Creek Road. Groundwater levels in this area are unknown. Embankments have the potential to compact the underlying alluvial aquifer which can result in localised groundwater mounding conditions, particularly in areas that flood. Inundation can occur from any embankment that obstructs natural drainage pathways. To manage inundation and subsequent impacts to groundwater flow, it is assumed that drainage infrastructure would be constructed in association with the earthworks for the proposal.

6.2.3 Groundwater quality

Groundwater quality is expected to remain generally consistent with the existing conditions (as described in **Section 5.9.2**); however, it should be noted that groundwater quality for the alluvial aquifer is unknown. There is a risk that groundwater quality could be impacted during construction from the following:

- Unintended spills and leaks of hydrocarbons (oils, fuels and lubricants) and other chemicals related to use of heavy plant, equipment, and fuel storages
- Migration of water mixtures and emulsions related to washdown areas
- Upward seepage along piles/soil interfaces of groundwater from the deeper semi-confined aquifer into the alluvial aquifers. There is a minor potential for mixing of the two aquifers prior to the piles being filled with concrete/cement
- Salts mobilised from surface soils during excavation and/or shallow groundwater level changes
- Disturbance of contaminated land(s) near watercourses, and the disturbance or dewatering of potentially contaminated farm dams, resulting in potentially contaminated runoff entering watercourses and potentially to recharge areas
- Seepage from spoil areas / material won from the proposal that may contain unstable sulphide minerals when unsaturated.

Small leaks and spills in the order of a few litres would likely remain in the topsoil until the affected soil is recovered and removed. Larger-volume leaks, especially if not immediately observed and contained, may penetrate further into the substrate.

Impacts to groundwater quality could also arise during the installation of the pilings for the construction of the new bridges over Badgerys, South and Kemps Creeks. The concrete slurry used is alkaline and can have an impact on the pH and salinity of the groundwater immediately adjacent to the piles while curing occurs (that is, drying and hardening of the concrete). Any such changes are likely to be temporary, localised and small given the small contact areas of piling surfaces and groundwater compared to the scale of the groundwater flow systems.

The groundwater quality of seepage (weep holes) from the cuts, which are more likely to occur in elevated areas within the Bringelly Shale, is expected to be brackish to saline (refer **Section 5.9.2**). The estimated inflow rate to cuts in rock during construction is likely to be low based on the low hydraulic conductivity of the units.

As stated in Section 5.3, there is an extremely low probability of ASS occurrence within the construction footprint; however, there is a potential for ASS to be encountered in water bodies. Where potential acid sulfate soils are present, they would be expected to be limited in vertical extent in localised areas associated with pilings and footings for the bridge structures.

Groundwater levels are variable within the Bringelly Shale, between 1 and 19 mbgl across the construction footprint. The construction of the proposal has the potential to exacerbate dryland salinity in the construction footprint. Naturally occurring salts, generally present in the soil or groundwater would be transported by rising groundwater associated with the removal of deep-rooted vegetation or other activities which could raise the groundwater table above normal seasonal levels and result in the mobilisation of salts.

As discussed in Section 5.3, moderate to very high-risk areas of saline soils are present throughout the construction footprint. During construction activities, the saline soils have the potential to be disturbed and, as a result, could impact on surface water, shallow groundwater, soil erosion and constructed structures associated with the proposal.

6.2.4 Groundwater users

As stated in Section 5.9.3, the nearest groundwater bore (GW112567.1.1) used for the purposes of water supply is about 285 metres north of the construction footprint. Impacts to groundwater levels at registered groundwater bores due to dewatering induced drawdown is considered to be low based on the low hydraulic conductivity of the units. It is assumed that all dewatering work associated with bridge work would be temporary, only being required while the construction activity is being carried out to provide safe working conditions. Additionally, deep cuts (greater than five metres) are located more than 2.7 km away from the nearest groundwater bore used for water supply.

The potential for groundwater quality to be impacted at registered groundwater bores during construction from spills or leaks is unlikely since the proposed work in any particular location is expected to be of short duration and limited in extent.

6.2.5 Groundwater dependent ecosystems

There is potential that construction activities could impact the Cumberland River Flat Forest (terrestrial vegetation), an identified high potential terrestrial GDE that intercepts the proposal at Badgerys, South and Kemps Creeks. Bridge work includes demolishing the existing bridges and replacement with new twin bridges. For each new bridge location, this includes the establishment of a crane pad near the creek bank, temporary diversion of the creek channel, installation of concrete piers and temporary rock platforms. These construction activities have potential to disrupt groundwater flow, impact groundwater levels, and impact on the water quality. Mitigation measures, including the identification of options to minimise interruption to water flows should be considered during detailed design.

6.2.6 Surface water and groundwater interaction

There may be interaction between surface water and groundwater in close proximity to the watercourses traversed by the proposal. Primary interactions between surface water and groundwater in proximity to the study area are likely to include:

- Surface water acting as recharge to underlying groundwater units, where hydraulic gradients permit
- Groundwater discharging to surface water as baseflow, especially in areas of low elevation, where hydraulic gradients permit
- Induced flow of surface water into groundwater due to potential groundwater drawdown resultant from dewatering work during construction.

Surface water and groundwater interactions may occur during construction activities involving diversion/reshaping of waterways and embankments and dewatering of farm dams to accommodate the bridgework, which could result in induced flow from dewatering activities.

7.0 Operational impact assessment

This section provides an assessment of potential operational impacts on surface water and groundwater from the proposal.

7.1 Contamination

There are minor contamination risks associated with the operation of the proposal which would be limited to:

- Spills from industrial heavy vehicles such as oil tankers
- Accidents from general motorists causing oil and petrol spills.

Spills and other contamination sources during operation would be appropriately managed by implementing standard emergency spill environmental safeguards. Further, stormwater treatment systems such as swales and bioretention basins are proposed for runoff from most of the alignment, and these would act as buffers to slow or trap the contamination resulting from spills.

7.2 Surface Water

The potential impacts of operation on surface water environments are discussed below.

7.2.1 Surface water drainage

The road longitudinal drainage has been designed to accommodate the 10-year ARI storm event (10 per cent AEP) for the minor storm event and 50 years ARI (2 per cent AEP) for the major storm event.

The proposed widening of Elizabeth Drive from two lanes to four lanes between Badgerys Creek Road and up to about 600 metres east of Duff Road at Cecil Hills would increase impervious surfaces, in turn increasing runoff generated by the proposal site. The existing impervious area within the road corridor 27.7 ha. The proposal would result in a doubling of the impervious area to about 55.4 ha (refer to **Table 7-1**).

Table 7-1: Proposal footprint and imperviousness

	Existing	Post development
Total area of operational footprint (ha)	101.1	101.1
Impervious area (ha)	27.7	55.4
Imperviousness (%)	27.5	54.8

Increased runoff from impervious areas has the potential to alter the performance of drainage systems immediately downstream of the operational footprint. Hence, appropriate drainage infrastructure is required to reduce risk of flooding and scour/erosion.

7.2.2 Flooding

Flooding impacts resulting from the proposal were assessed for Badgerys Creek, South Creek and Kemps Creek and are described fully in AECOM Flooding Assessment (2022a). The flooding assessment carried out in the vicinity of the proposal indicates that the proposed road design generally meets the required design criteria, with the exception of those areas described below.

At Badgerys Creek and South Creek, the proposal would not cause an unacceptable increase in peak flood levels (afflux), velocities and hazard outside of the construction footprint. As such, it expected that there would be no significant adverse impacts to structures, properties or road users in this area.

At Kemps Creek, the change in flood levels (afflux) for design events up to and including the 1 per cent AEP design event are within acceptable tolerances with affluxes greater than 100 mm generally contained within the construction footprint. There is some afflux downstream of Kemps Creek where afflux is greater than 100 mm and outside the proposal footprint. It is recommended that in future design

stages, consideration be given to raising the soffit of Kemps Creek and reducing the size of the relief culvert (summarised in **Table 7-2**).

Table 7-2 Flooding afflux at Kemps Creek

Lot Number	Zoning	Flooding Source	Design Afflux (mm)	Max. Proposed Area of construction or project footprint
Lot 5 / DP860456	Enterprise	Compared to the future base case (ie the conditions before-Elizabeth Drive road upgrade, but after-M12 Motorway and after completion of WSA) the project design channels direct more flow into a dam. Mitigation options can be explored during detailed design to resolve impacts.	170	6336
Lot 11 / DP 1266422 and Lot 19 / DP 1266422 (formerly Lot 19 / DP30265 and Lot 29 / DP30265)	Primary Production Small Lots	Drainage infrastructure (culvert) near the property is oversized (for bridge design purposes) and conveys more flow than in the future base case. This can be resolved in later bridge design stages.	121	1887

Other key outcomes from the flooding assessment include:

- Road immunity: there is one lane trafficable in each direction for all design events up to and including the 1 per cent AEP design flood event for the proposal.
- Change in velocities: There are no materially substantial increases in velocity on the floodplain for all design flood events assessed.
- Duration of road inundation: Given that the upgrade is not overtopped during a 1 per cent AEP design flood event, there has been no increase in the duration of road inundation and a significant improvement in the time of closure.
- For the future base case (the conditions before-Elizabeth Drive road upgrade, but after completion of M12 Motorway and WSA), flood extents for all design events up to and including the 1 in 2000 AEP design event remain materially unchanged from the existing case.

The assessment confirms that there would be no major impacts to structures or the safety of road users as a result of the proposal.

7.2.3 Surface water quality

Table 7-3 provides a summary of the potential surface water quality related impacts to receiving waterways including Badgerys Creek, South Creek, Kemps Creek and Ropes Creek. Each of the potential impacts outlined in **Table 7-3** is considered with respect to the environmental values and WQOs listed in **Table 3-1**.

Table 7-3: Potential impacts to surface water quality during operation

ID	Activity/Source	Pollutants or Factor of Concern	Potential Impact to receiving waterways and associated water quality objectives
O1	Stormwater runoff from hard surfaces being discharged to receiving waterways. Litter from vehicles and incorrect disposal of rubbish can increase the potential for pollutants to occur in road runoff, stormwater systems, treatment systems and receiving environments. Damage to or erosion of road pavements, landscaping, batters and stormwater assets from major storm events, leading to potential pollution of the receiving environment and waterways.	Gross pollutants, TSS, nutrients, heavy metals, oil, and grease	• Sediments could smother receiving waterways impacting aquatic ecosystems. • Increased turbidity, lower dissolved oxygen levels, and increases in toxicant concentrations could impact aquatic ecosystems and livestock. • Nutrients in runoff could lead to algal blooms and aquatic weed growth, which could impact aquatic ecosystems, recreation, irrigation, livestock, and aquatic foods. • Reduced visual amenity could result from turbid water and visible gross pollutants, impacting recreation and visual amenity. These impacts are largely mitigated by the proposed stormwater treatment devices. However, the environmental protection provided could be compromised by blockages or damage to stormwater treatment systems, leading to poor water quality improvement performance and potential increased pollution to receiving environments.
O2	Accidental spills or leakage events due to vehicle movements and operation of the highway	Oil and grease and various hazardous fuels and chemicals that may be transported by vehicles or caused by spills or road accidents	• Increases in toxicant concentration in soil, surface water and groundwater, which could impact aquatic ecosystems, livestock, and aquatic foods.
O3	Potential increase in stormwater runoff discharges due to increased imperviousness across the construction footprint	Stormwater runoff	• Increase in scour and erosion due to increase in stormwater runoff rate and volume, which could impact aquatic ecosystems, amenity, and recreation These impacts are largely mitigated by the proposed stormwater treatment devices. However, the attenuation protection provided could be compromised by blockages or damage to stormwater treatment systems.
O4	Maintenance of pavements, road assets, stormwater network and treatment systems, and vegetation including: • Repairs to pavement or other infrastructure	Gross pollutants, sediment, TSS, nutrients, odour and noise, green waste.	• If waste recovered during maintenance operations is not disposed of correctly this can impact visual amenity and recreation, pollute receiving waterways, and negatively impact the downstream aquatic ecosystems.

ID	Activity/Source	Pollutants or Factor of Concern	Potential Impact to receiving waterways and associated water quality objectives
	• Collection of waste and pollutants • Disposal of waste and pollutants • Operation of maintenance equipment		

With the safeguards outlined in Section 10.0, the implementation of the proposed stormwater treatment devices, and implementation of procedures for spills management, potential operation impacts to surface water would be appropriately managed and would be minor and would not be expected to impact the environmental values and water quality objectives of the receiving environment.

Treatment Opportunities

To mitigate the surface water quality impacts during the operation of the proposal, opportunities for stormwater treatment were considered during the design process. Stormwater treatments considered are described in **Table 7-4**.

Table 7-4: Potential treatment opportunities

Treatment Options	Associated Constraints or Opportunities
Buffer strips	Can be used where road runoff is shed laterally down a vegetated road embankment. Drainage design for the proposal requires a piped network that is conveyed down the batter in a batter chute. Buffer strips were not considered as part of the proposal.
Grass swales	Can be used where longitudinal drainage is maintained on the surface in grass-lined channels. Typically requires a minimum 0.5 % grade. Grass swales are proposed for drainage along most of the proposal alignment.
Bioretention systems	Requires about 1000 mm hydraulic grade from the inlet to the outlet, so as to drain treated runoff from subsurface pipes. This can typically be accommodated near streams and several bioretention systems are proposed.
Creek filtration system (flow spreader)	May be appropriate where road runoff discharges onto rural land or alluvial plains. Treatment is provided as water infiltrates into alluvial soils.
Constructed wetlands	Suited to treating large catchments on a floodplain in flat terrain. Constructed wetlands were not considered due to the large land take that would be required.

Following discussions with Transport, analysis of the road design, proposal specifications and other available GIS data; the following treatment devices are proposed to treat stormwater runoff from the proposal:

- Grass Swales
- Bioretention Systems

These two treatment measures are discussed in the following sections.

Grass Swales

Grass swales are proposed for water conveyance parallel to the road alignment. The grass swales would convey water as follows:

- Downstream side of the road (north) – Swales would collect road runoff from the road stormwater drainage network to convey this runoff to the nearest watercourse
- Upstream side of the road (south) – Swales would collect road runoff from the road stormwater drainage network to convey this runoff to the nearest stream. Swales would also be designed as catch drains to divert external catchment runoff safely around the road to the watercourses or other cross drainage structures.

Swales treating external catchments can be expected to provide treatment for road runoff in addition to their function as clean water catch drains for the external upstream catchments. Swale treatment is expected to function as follows:

- Road runoff is discharged to the swale immediately after rain falls. Hence, the swales would provide treatment for road runoff before runoff from the surrounding catchments reaches the swale.
- Upstream rural or natural area runoff is subject to high initial losses (Ladson, 2016). Initial losses in rural areas are commonly 20 to 30 mm. Hence, many rain events would not generate runoff to the swales. Further, the catchment response time of rural catchments is typically much longer (hours to days) than impervious catchments (minutes). Therefore, for most events, road runoff would have reached the swale prior to runoff from natural catchments.

The external catchments may be developed in future, at which time developers would be required to provide their own on-lot stormwater treatment. Therefore, pollutant loads from the surrounding catchments to the swales are not expected to increase substantially as the catchments are developed.

As outlined in Section 3.1.4, Sydney Water are preparing the 'Western Sydney Aerotropolis Stormwater' guidance, which would aim to include stormwater harvesting, treatment and reuse. Transport would liaise with Sydney Water regarding this scheme at the detailed design phase of the proposal, as relevant.

Bioretention Systems

Bioretention basins are vegetated areas where runoff is filtered through a filter media layer (eg loamy-sand) as it percolates downwards. It is then collected via perforated under-drains and flows to downstream waterways. Bioretention basins often use temporary ponding above the filter media surface as a buffer storage to maximise the volume of runoff treated through the filter media.

Treatment at bioretention systems would comprise the following:

- High flow bypass, Bioretention systems would be sized to achieve the treatment targets for the road catchments. Typically, this can be met by used a high-flow bypass that directs flows smaller than the three-month average recurrence interval event (four exceedances per year on average) to the bioretention system, and larger flows are directed around the bioretention system to avoid scour or damage to the asset.
- Sediment forebay. A forebay or sediment basin is recommended to prevent sediments from accumulating and potentially disrupting the flow of water across the filter media.
- Flow distribution. This is required in systems larger than 400 m^2 to ensure that the vegetation is evenly watered with each rain event.
- Saturated zone bioretention system. The submerged zone allows soil moisture to be maintained to sustain vegetation for two to three months without rainfall/stormwater inflows (the plants draw from this saturated zone over the dry season).

Treatment Locations

Based on the current road and drainage design for the proposal, nine locations have been identified where bioretention systems are feasible. These locations are indicative (subject to detailed design) and are shown in **Figure 7-1**. There are catchments within the construction footprint where treatment is adequate or where treatment cannot be provided due to space and topographical constraints, as summarised in **Table 7-5**.

Table 7-5: Proportion of EDU-West proposal catchments with adequate stormwater treatment.

Proportion of catchments	Treatment provisions	Details
55 %	Fully treated. Swales/Open Channels and Bioretention System.	Some catchments 'overtreated' to 'offset' deficiencies in treatment in other catchments
32 %	Partially treated. Swales/Open Channels	Swale treatment only
8 %	Directed to M12 drainage network and stormwater treatment measures	Design by others, assumed that runoff would be treated.
6 %	No Treatment provided as part of this design	Space and topography prevent inclusion of treatment systems

Some catchments could not be drained to the proposed bioretention systems. About 32 per cent would receive partial treatment by vegetated swales, and it would not be possible to provide stormwater treatment for a further six per cent of catchments due to steep topography.

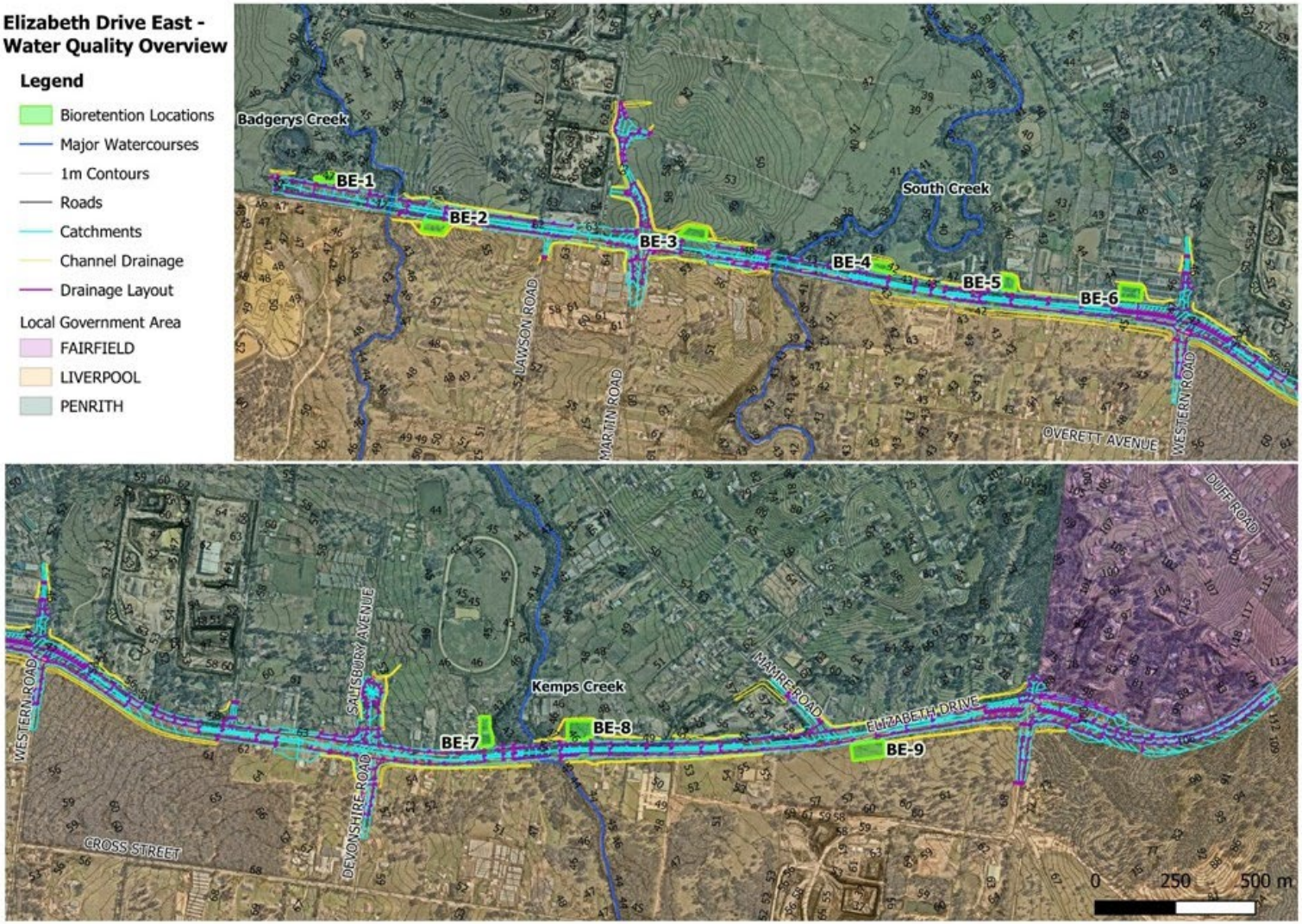

Figure 7-1: Location of bioretention systems

MUSIC Modelling Results

MUSIC software has been used to quantify the extent of treatment provided for the design. MUSIC is the industry standard software used to estimate pollutant loads generated by development, and to assess the effectiveness of the proposed mitigation measures. The impervious areas of the proposal were modelled as these are the pollutant generating surfaces, and the catchments directed to the treatment devices.

The MUSIC modelling results showing the effectiveness of the proposal treatment train are shown in **Table 7-6**. These results include the pollutants generated and discharged from areas where treatment could not be provided.

Table 7-6: MUSIC Modelling Results for stormwater treatment provided by the proposal.

Parameter	Sources	Residual Load	% Reduction
Flow (ML/yr)	401	390	2.8
Total Suspended Solids (kg/yr)	142000	33000	76.7
Total Phosphorus (kg/yr)	236	88.7	62.4
Total Nitrogen (kg/yr)	965	537	44.3
Gross Pollutants (kg/yr)	10400	1440	86.2

The proposed water quality management strategy results in a substantial mitigation of the pollutants expected to be generated from the road surface of Elizabeth Drive. This reduction in pollutants would help to mitigate the impact to downstream environments and watercourses, which were identified as being in poor and degraded condition in the assessment of existing conditions.

The residual impact of the proposal was also assessed against the existing condition to determine if the total pollutants discharged to the receiving environment would change in comparison to the existing condition. The current land use within the project boundary (two lane road and verges) was compared to the proposal. These results are presented in **Table 7-7**. This assessment showed that the proposal is likely to result in a reduction of Total Suspended Solids (60 per cent), Total Phosphorus (38 per cent), and Total Nitrogen (6 per cent) pollutants in comparison to the existing condition. On balance, the provision of the proposed stormwater treatment devices is anticipated to result in a net benefit to operational water quality. Consequently, the water quality objectives are not expected to be impacted by the quality of stormwater runoff during the operation phase.

Table 7-7: MUSIC Modelling Comparison of the existing and post-development scenarios for pollutant load discharges to the receiving environment

Parameter	Existing	Proposal	% Reduction
Flow (ML/yr)	239	403	(69 % increase)
Total Suspended Solids (kg/yr)	83500	33000	60
Total Phosphorus (kg/yr)	143	89	38
Total Nitrogen (kg/yr)	578	541	6
Gross Pollutants (kg/yr)	7300	2590	65

7.3 Groundwater

This section provides an assessment of the potential impact that the proposal could have on the groundwater regime during road operations.

7.3.1 Groundwater recharge

Groundwater within the study area is predominantly recharged by rainfall runoff and infiltration through the soil profile. The impervious surface area within the operation footprint is expected to increase due to the new paved surfaces. However, this area is small relative to the overall aquifer such that the net impact on regional recharge due to operation of the proposal is considered negligible.

7.3.2 Groundwater levels and flow

Badgerys, South and Kemps Creeks would return to their original channel once temporary construction work has been removed and disturbed areas rehabilitated. Groundwater levels are expected to return to pre-construction levels, as noted in **Section 5.9.1**.

Ongoing seepage at weepholes where cuts have intercepted shallow groundwater could reduce groundwater levels and resources in the immediate area around these cuts. There is also a potential that constructed embankments can lead to localised mounding on one side of the embankment, leading to inundation in flood prone areas and/or impacts on local flow patterns and on groundwater levels. Further, long-term inundation areas have potential to impact on embankment stability.

Drainage infrastructure included to mitigate impacts to groundwater levels and flow would be constructed in association with the earthworks for the proposal.

7.3.3 Groundwater quality

Groundwater quality has potential to be impacted from accidental spills and leaks of substances as a part of normal operation and maintenance activities. Surficial spills are less likely to affect groundwater where the proposal intersects the Bringelly Shale due to the lower rate of recharge and higher rate of runoff that occurs over the weathered bedrock.

Should a major spill occur that reaches the alluvium water table, there is potential that the contaminated groundwater could migrate towards the local creeks. With standard industry management techniques and the recommended safeguards such as spill clean-up kits and staff training, the potential for adverse impact to occur to groundwater is considered low.

Sufficient flow attenuation is provided in the road stormwater drainage network and treatment systems to allow for spills to be contained and treated through emergency response procedures.

7.3.4 Groundwater users

As discussed in **Section 5.9.3**, the nearest registered groundwater bore used for water supply purposes is located about 285 m north of the proposal. Impacts to groundwater availability would be negligible as the proposal would not require groundwater extraction during operation and would not inhibit recharge. The proposal would not restrict any landowners from accessing their bores.

7.3.5 Groundwater dependent ecosystems

Badgerys, South and Kemps Creeks would return to their original channel, temporary construction work would have been removed and disturbed areas rehabilitated. Groundwater levels are also expected to recover to pre-construction levels after construction activities for the proposal have been completed.

There is potential for GDEs to be impacted from poor groundwater quality due to contaminated surface water runoff caused by spills or leaks in areas of high hydraulic connectivity. The potential for interaction with groundwater during operation is considered to be low given the expected depth of groundwater along the proposal alignment.

7.3.6 Surface water and groundwater interaction

There is potential that contaminated surface water runoff, due to spills or leaks, may impact on groundwater quality where it is hydraulically connected.

8.0 Cumulative impact assessment

A cumulative impact assessment has been carried out for both construction and operation, to assess the potential cumulative impacts of the proposal with other projects in the area. This was carried out based on a screening of other nearby projects to determine those that have the potential to cause cumulative impacts. The screening considered projects that have been approved but where construction has not commenced, projects that have commenced construction, and projects that have recently been completed. The screening process is described further in Chapter 3 of the REF.

The cumulative impact assessment was based on the residual impacts of the proposal (ie impacts that are expected to exist after application of management and mitigation measures).

8.1.1 Surface water

Developments considered in this assessment have the potential to impact surface water during respective construction phases, and it is expected that appropriate mitigation and management measures would be implemented to mitigate potential impacts. In particular, the following projects have been identified to be likely to contribute to a cumulative impact of the proposal during construction for surface water:

- WSA – Adjoins Elizabeth Drive to the west between Adams Road and Badgerys Creek Road and includes Badgerys Creek (tributary of South Creek). Earthworks proposed are substantial with 22 million cubic metres of soil redistribution. The overlap with WSA is confined to a small overlap at the western extent of the project. At the time of writing, construction is in progress, due for completion in 2026.
- Sydney Metro Western Sydney Airport – Crosses through and is adjacent to the construction footprint. At the time of writing, construction is in progress, due for completion in 2026.
- Elizabeth Drive West Upgrade – Adjacent to the construction footprint at the western boundary. The proposal has the potential to be impacted by the Elizabeth Drive Upgrade – West proposal as the road pavement and a construction compound proposed for the Badgerys Creek catchment would drain to Badgerys Creek, within the catchment of this Elizabeth Drive Upgrade – West proposal. The road pavement is typically constructed in short sections and quickly sealed and stabilised afterwards, such that any potential impact is limited to a small footprint and short duration. For the construction compound, provided that surface water impacts are managed and mitigated appropriately at the site there are not expected to be any impacts offsite. Construction timeframes are anticipated to overlap with this proposal.

The WSA and Sydney Metro Western Sydney Airport are planned to open in 2026 and therefore any overlapping construction activities with the Elizabeth Drive upgrades would be limited in duration and are likely to coincide with the enabling construction activities of the proposal. It is likely that construction sites associated with WSA and Sydney Metro Western Sydney Airport would be rehabilitated prior to the majority of construction work for the proposal. Due to the limited overlap in construction timeframes with the proposal, the potential for cumulative surface water quality impacts would be minimal and manageable through mitigation measures for the proposal (refer to **Table 10-1**).

Design for both the proposal and the Elizabeth Drive West Upgrade have sought to mitigate any identified surface water impacts. Provided that surface water impacts from the Elizabeth Drive upgrades are managed and mitigated appropriately (refer to **Table 10-1**), impacts to surrounding surface waters would be unlikely. As such, the proposal is unlikely to have significant cumulative surface water impacts with surrounding projects.

During operation, the provision of the proposed stormwater treatment devices as part of this proposal is anticipated to result in a net benefit to operational water quality. Provided that nearby projects implement appropriate treatments to meet the required targets for surface water quality, it is expected that potential surface water quality impacts would be managed to an acceptable level.

8.1.2 Groundwater

The cumulative impact assessment focuses on impacts related to the quality and quantity of the groundwater resource and how it can impact GDEs, groundwater users, and/or groundwater-surface

water interactions. In particular, the following projects have been identified as likely to contribute to a cumulative impact of the proposal for groundwater:

- WSA – Earthworks proposed are substantial and there would be dewatering around areas of subsurface infrastructure and up-gradient of cuttings where seepage is occurring. Groundwater drawdown effects due to inflows would be limited following the initial effects of bulk earthworks and excavation. Significant groundwater inflows to underground infrastructure are not expected and would be controlled, if necessary, through the use of lining or other engineering controls.
- Sydney Metro Western Sydney Airport – There would be dewatering associated with underground infrastructure during the construction phase. During operation, the underground infrastructure are designed as “tanked” structures such that groundwater ingress would be limited.
- Elizabeth Drive Upgrade West – Minimal dewatering associated with cuts in the topography to achieve desired road grades, shallow excavations and during the new bridge construction over Cosgroves Creek.

The WSA and Sydney Metro Western Sydney Airport are planned to open in 2026 and therefore any overlapping construction activities with the Elizabeth Drive upgrades would be for a short period and are likely to coincide with the enabling construction activities of the proposal. Where there are overlaps in the timing of the construction of these projects and the proposal, there would be potential cumulative impacts from overlapping groundwater drawdown areas associated with excavation dewatering being carried out during the proposal and other projects.

These cumulative impacts are likely to be temporary and/or localised as groundwater drawdown associated with these projects would be minimised after construction completion.

Cumulative groundwater drawdown impacts during the operational phase are considered to be unlikely as potential areas of drawdown associated with the proposal would be localised. Additionally, groundwater seepage to underground infrastructure associated with the WSA and Sydney Metro Western Sydney Airport projects would be managed and/or mitigated through design to minimise long-term groundwater drawdown.

Groundwater impacts associated with Elizabeth Drive West Upgrade construction and operation would be temporary and/or localised.

Provided that groundwater impacts from the proposal remain within the proposal footprint and are managed and mitigated appropriately, the potential for cumulative impacts during construction and the operational phase are considered unlikely.

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9.0 Policy compliance

9.1 New South Wales Aquifer Interference Policy

The NSW AIP sets out minimal impact considerations that aim to maintain water levels, water pressure and water quality in aquifers in order to protect the groundwater resource, as well as connected water sources, groundwater users, culturally significant sites and the environment. Demonstrated compliance with the minimal impact considerations are summarised in **Table 9-1:**.

Table 9-1: Minimal impact consideration

Minimal impact considerations		Response
Water Table		
Level 1	Less than or equal to 10 per cent cumulative variation in the water table, allowing for typical climatic "post-water sharing plan" variations, 40 metres from any: a. high priority groundwater dependent ecosystem; or b. high priority culturally significant site; listed in the schedule of the relevant water sharing plan. A maximum of a two-metre decline cumulatively at any water supply work.	Appendix 2 of the water sharing plan legislation indicated that there were no High Priority GDEs (karst and wetlands) or culturally significant sites mapped within about 10 kilometres of the study area. It is unlikely that the groundwater level at the nearest water supply bore would decline greater than two metres due to construction of the proposal, based on the following: • Any drawdown caused from dewatering cuts/excavations would likely be localised. The nearest water supply bore is about 285 metres from the proposal • It is assumed dewatering work would be temporary and only be required while construction activity is being carried out.
Level 2	If more than 10 per cent cumulative variation in the water table, allowing for typical climatic "post- water sharing plan" variations, 40 metres from any: a. high priority groundwater dependent ecosystem; or b. high priority culturally significant site; listed in the schedule of the relevant water sharing plan if appropriate studies demonstrate to the Minister's satisfaction that the variation would not prevent the long-term viability of the dependent ecosystem or significant site. If more than a two-metre decline cumulatively at any water supply work then make good provisions should apply.	Appendix 2 of the water sharing plan legislation indicated that there were no High Priority GDEs (karst and wetlands) or culturally significant sites mapped within about 10 kilometres of the study area. It is unlikely that the groundwater level at the nearest water supply bore would decline greater than two metres due to construction of the proposal, based on the following: • Any drawdown caused from dewatering cuts/excavations would likely be localised. The nearest water supply bore is about 285 metres from the proposal It is assumed dewatering work would be temporary and only be required while construction activity is being carried out.

Minimal impact considerations		Response
Water pressure		
Level 1	A cumulative pressure head decline of not more than a two-metre decline, at any water supply work.	It is unlikely that the groundwater level at the nearest water supply bore would decline greater than two metres due to construction of the proposal, based on the following: • Any drawdown caused from dewatering cuts/excavations would likely be localised. The nearest water supply bore is about 285 metres from the proposal • It is assumed dewatering work would be temporary and only be required while construction activity is being carried out.
Level 2	If the predicted pressure head decline is greater than requirement 1. above, then appropriate studies are required to demonstrate to the Minister's satisfaction that the decline would not prevent the long-term viability of the affected water supply works unless make good provisions apply.	
Water quality		
Level 1	Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres from the activity.	The proposal is not anticipated to result in a change in groundwater quality which would lower the beneficial use category with the implementation of mitigation measures outlined in **Section 10.0.**
Level 2	If condition 1 is not met then appropriate studies would need to demonstrate to the Minister's satisfaction that the change in groundwater quality would not prevent the long-term viability of the dependent ecosystem, significant site or affected water supply works.	
Additional considerations		
Potential for: • acidity issues to arise, for example exposure of acid sulphate soils • waterlogging or water table rise to occur, which could potentially affect land use, GDEs, and/or other aquifer interference activities. Specific limits would be determined on a case-by-case basis, depending on the sensitivity of the surrounding land and groundwater dependent ecosystems to waterlogging and other aquifer interference activities to water intrusion.		Acidity issues are not anticipated. The risk of encountering potential acid sulfate soils/ASS is extremely low.

Mitigation measures outlined **Section 10.0** would be implemented to manage potential impacts on groundwater resources and users. Provided the identified risks are managed effectively and in accordance with the relevant protocols, management plans and standards, the proposal would have a minimal impact on the receiving environment.

10.0 Safeguards and management measures

This section describes safeguards and management measures to address the potential impacts of the proposal. These measures would be incorporated into the detailed design, construction and/or operation stages of the proposal where relevant. The recommended safeguards and management measures are described in **Table 10-1**.

Table 10-1: Safeguards and management measures

Impact	Environmental safeguards / management measures	Responsibility	Timing
General			
Sydney Water stormwater scheme	Transport will liaise with Sydney Water regarding the Western Sydney Aerotropolis integrated water system scheme at the detailed design phase of the proposal, as relevant. Consultation will be carried out in regard to the stormwater network, drinking water, wastewater and recycled water networks	Transport	Detailed design
General	A Soil and Water Management Plan will be prepared in accordance with QA Specification G38 and implemented as part of the CEMP. The Soil and Water Management Plan will identify all reasonably foreseeable risks relating to surface water and groundwater quality, and water pollution associated with carrying out the activity. It will describe how these risks would be managed and minimised during construction. This will include arrangements for managing pollution risks associated with spillage or contamination on the site and adjoining areas. Monitoring of surface water and groundwater quality will be carried out prior to, during and after construction. This will include key watercourses, and farm dams potentially impacted by the proposal.	Contractor	Pre-construction/Construction
Erosion and sediment control mitigation			
Erosion and sediment control mitigation	The anticipated water discharge from sediment basins will be assessed in line with the Guideline for Assessing the Impacts of Treated Water Discharge from Water Quality Treatment Controls (Transport for NSW, 2020). The results of such assessment will inform design of sediment basins to adhere to Environment Protection Licence (EPL) discharge requirements	Contractor	Pre-construction
Erosion and sediment control mitigation	A site-specific Erosion and Sediment Control Plan (the plan) will be prepared and implemented and included in the Soil and Water Management Plan (part of the CEMP). The plan will identify detailed measures and controls to be applied to minimise erosion and sediment control risks including, but not limited to: • Runoff, diversion, and drainage points • Sediment basins and sumps • Scour protection • Stabilising disturbed areas as soon as possible • Check dams, fencing and swales • Installation of measures at work entry and exit points to minimise	Contractor	Pre-construction/Construction

Impact	Environmental safeguards / management measures	Responsibility	Timing
	movement of material onto adjoining roads at entry and exit points • Staged implementation arrangements • Appropriate location and storage of construction materials, fuels, and chemicals, including bunding where appropriate. • Arrangements for managing wet weather events, including monitoring of potential high-risk events (such as storms) and specific controls and follow-up measures to be applied in the event of wet weather		
Erosion and sediment control mitigation	Stockpiles will be designed, established, operated and decommissioned in accordance with the Stockpile Site Management Guideline (RMS, 2015)	Contractor	Pre-construction/Construction
Erosion and sediment control mitigation	The rehabilitation of disturbed areas will be carried out progressively as construction stages are completed, and in accordance with: • Landcom's Managing Urban Stormwater: Soils and Construction series (Landcom, 2004) • RMS Landscape design guideline (RMS, 2018) • RMS Guideline for Batter Stabilisation using Vegetation (RMS, 2015)	Contractor	Construction
Water Quality			
Surface water mitigation	The proposed bioretention basins will be established as construction sediment basins during the construction stage of the proposal to capture sediment and other pollutants mobilised during construction.	Contractor	Pre-construction/Construction
Surface water mitigation	Road drainage would be treated by sediment basins. The requirements for sediment basins (ie number, location and size) will be determined during the proposal detailed design phase.	Contractor	Pre-construction/Construction
Surface water mitigation	A site-specific emergency spill plan will include spill management measures in accordance with the Transport *Code of Practice for Water Management* (RTA, 1999) and relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including Transport and EPA officers), regular inspections and maintenance of equipment and spill-control structures such as hardstand areas and containment.	Contractor	Pre-construction

Impact	Environmental safeguards / management measures	Responsibility	Timing
Surface water mitigation	Waste recovered during maintenance will be disposed of at a suitable recycling facility or licensed landfill site. The proposed bioretention basins will undergo regular scheduled maintenance to ensure the ongoing treatment efficiency during the road's operational life	Transport	Operation
Surface water mitigation	Sediment and erosion controls are to be used for in-stream works to avoid impacts on water quality and fish passage e.g. erosion fencing, stockpile covers and silt curtains. Clean rock is to be used for any instream temporary rock platforms	Contractor	Construction
Flooding			
Flooding and hydrology	Further design refinement will be carried out within the vicinity of creeks which traverse the proposal, to minimise potential increases in the afflux where possible (for example, refining the sizing of culverts and drainage infrastructure)	Transport	Detailed design
Flooding and hydrology	Floor level surveys will be carried out at buildings within the modelled area, to ascertain ground floor heights	Transport	Detailed design
Flooding and hydrology	A Flood Response Management Plan will be prepared as part of the CEMP. The Flood Response Management Plan will address, but not necessarily be limited to: • Processes for monitoring and mitigation flood risk • Steps to be taken in the event of a flood warning including removal or securing of loose material, equipment, fuels and chemicals • Monitoring long term rainfall forecasts and scheduling high risk work activities around these forecasts • Identifying contingency locations for the temporary flood storage of equipment and materials outside of potential inundation areas • Contingency measures to secure and stabilise work areas and compound sites prior to flooding	Contractor	Construction
Groundwater			
Groundwater	Any dewatering activities will be carried out in accordance with the 'Technical Guideline – Environmental Management of Construction Site Dewatering' (Roads and Maritime 2011) in a manner that prevents pollution of waters.	Contractor	Construction

Impact	Environmental safeguards / management measures	Responsibility	Timing
Salinity			
Salinity	Construction within areas of moderate to very high-risk saline soils will be managed in accordance with the Soil and Water Management Plan and procedures set out in the Salinity Training Handbook (NSW Department of Primary Industries, 2014). Specific measures will also include (but not be limited to): • Identification and management of saline discharge sites, for example seepage from cuts • Testing to confirm the presence of saline soils in areas of high salinity potential prior to disturbance • Progressive stabilisation and revegetation of exposed areas following disturbance as soon as is practicable • Groundwater quality monitoring carried out prior to and throughout construction	Contractor	Construction
Acid sulfate soils			
Acid sulfate soils	Prior to ground disturbance in areas of potential acid sulfate soil occurrence, testing will be carried out to determine the actual presence of acid sulfate soils. If acid sulfate soils are encountered, they will be managed in accordance with the *Acid Sulfate Soil Manual* (Acid Sulfate Soil Management Advisory Committee, 1998) and the *Guidelines for the Management of Acid Sulfate Materials: Acid Sulfate Soils, Acid Sulfate Rock and Monosulfidic Black Ooze* (NSW Roads and Traffic Authority 2005).	Contractor	Pre-construction/ construction

11.0 Conclusion

This Surface Water and Groundwater Technical Assessment has been prepared to support the REF for this proposal. Specifically, this report has assessed the potential impacts of construction and operation of the proposal.

The key potential construction phase impacts include:

- Moderate to very high-risk areas of saline soils mapped throughout the construction footprint with the potential to impact on surface water, shallow groundwater and constructed structures associated with the proposal, if not managed appropriately
- Accidental spills or leaks of substances (such as fuels, oils, lubricating fluids and seepage from potentially high saline spoil) have the potential to contaminate surface water and groundwater if not appropriately managed
- Groundwater levels may be impacted where construction activities intersect groundwater and/or where construction impacts surface water regimes that are hydraulically connected to shallow groundwater (eg dewatering)
- Construction activities could potentially impact the Cumberland River Flat Forest (terrestrial vegetation), an identified high potential GDE mapped within the construction footprint at Badgerys, South and Kemps Creek. These construction activities, including the temporary diversion of the creeks, have potential to disrupt groundwater flow pathways, impact groundwater levels, lead to sedimentation of water ways, and impact on water quality.

The key potential operational impacts identified as part of this assessment include:

- Alteration of existing surface water and groundwater flow pathways due to new infrastructure or modified landforms including piles, embankments, or other closely spaced structures
- This assessment showed that the proposal would be likely to result in a reduction of TSS (60 per cent), TP (38 per cent), and TN (6 per cent) pollutants in comparison to the existing condition. On balance, the provision of the proposed stormwater treatment devices should result in a net benefit to operational water quality. Consequently, the water quality objectives are not expected to be impacted by the quality of stormwater runoff during the operation phase.
- Cuttings intersecting shallow groundwater and disrupting the existing groundwater flow regime
- The reduced permeability of the substrate beneath embankments may modify the flow direction of shallow groundwater in portions of the alluvium and possibly the saturated portion of weathered bedrock
- Accidental spills or leaks of substances, during routine operation and maintenance activities, have the potential to contaminate both surface water and groundwater.

Mitigation and management measures were identified as part of this assessment to address the above impacts. The implementation of the mitigation and management measures outlined in this report, would ensure that the proposal would have a minimal impact. In addition, the WQOs are not expected to be impacted by the quality of stormwater runoff during the operation phase.

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Appendix A

Hydraulic Impact and Flooding Assessment

Prepared for
Transport for NSW
ABN: 18 804 239 602

Flooding Assessment

Elizabeth Drive East and West – 100% Concept Design

08-Sep-2023
Elizabeth Drive Upgrade - East & West
Doc No. EDU-REP-10-0000-SM-072C

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Delivering a better world

Flooding Assessment

Elizabeth Drive West and East - 100% Concept Design

Client: Transport for NSW

ABN: 18 804 239 602

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Quality Information

Document Flooding Assessment

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Date 08-Sep-2023

Prepared by Ramith Fernando & Frank Fernando

Reviewed by Anthony Gaffney and Ben Regan

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
0	16-Nov-2021	100% Concept Design for Review	Andrew Huzij Project Manager	AHuzij
1	03-May-2022	100% Concept Design for ED-West	Ana Perez Torrero Project Manager	ATorrero
2	20-May-2022	100% Concept Design for ED-West and East	Ana Perez Torrero Project Manager	ATorrero
3	23-Dec-2022	Updates requested by Transport	Priscilla Tang A/Project Manager	PTang
4	08-Sep-2023	Final for client issue	Tessa Drayson Senior Environmental Scientist	TDrayson

Table of Contents

Executive Summary

E1 Project Overview

Elizabeth Drive (ED) is the main east-west corridor between Liverpool and the suburbs of Western Sydney. Transport for NSW (Transport) is planning for two upgrades of Elizabeth Drive between The Northern Road, Luddenham and Duff Road, Cecil Hills (referred to collectively as the Elizabeth Drive upgrades), to support the projected and planned development of the Western Sydney International (Nancy-Bird Walton) Airport (WSA) precinct, known as the Western Sydney Aerotropolis.

The planned upgrades include:

- Elizabeth Drive West Upgrade, which would include the upgrade of about 3.6 kilometres of Elizabeth Drive between The Northern Road at Luddenham to near Badgerys Creek Road at Badgerys Creek where it would connect with the future M12 Motorway
- Elizabeth Drive East Upgrade, which would include the upgrade of about 7.8 kilometres of Elizabeth Drive between Badgerys Creek Road near the future M12 Motorway and about 600 metres east of Duff Road at Cecil Hills.

Of relevance to this flooding assessment, the Elizabeth Drive upgrades would include the construction of additional lanes, raising the alignment and upgrading drainage.

The sections of Elizabeth Drive which would be subject to the Elizabeth Drive West Upgrade and East Upgrade are referred to in this report as ED-West and ED-East, respectively. ED-West crosses Cosgroves Creek and Oaky Creek. ED-East crosses Badgerys Creek, South Creek, Kemps Creek and the Ropes Creek catchment.

E2 Report Purpose

The purpose of this report is to provide a summary of the flooding assessment undertaken for waterways crossing the ED-West section of Elizabeth Drive (Cosgroves Creek and Oaky Creek) and the ED-East section of Elizabeth Drive (Badgerys Creek, South Creek, Kemps Creek and Ropes Creek). The report summarises the methodology, key assumptions and results used to inform 100% Concept Design of the road upgrades and to ensure compliance with required design criteria.

E3 Design Criteria

The flooding assessment has been undertaken in accordance with several guidelines, standards and specifications including:

- QA Specification PS271 – Hydrology and Drainage Design (2020)
- QA Specification PS371 – Hydrology and Drainage Design (2020)
- QA Specification PS261 – Bridge and Structure Concept Design (2020).

A summary of the key design criteria for the flooding assessment are provided in Section 1.4. Key performance criteria include:

- Provision of 1 per cent Annual Exceedance Probability (AEP) flood immunity with a minimum of one lane trafficable in each direction
- Ensuring changes in flood extent, level, depth, velocity and hazard are within acceptable tolerances
- Bridges are required to have a minimum of 300 millimetres (mm) freeboard to the soffit in a 1 per cent AEP design flood event.
- No floodplain property damage in a 1 per cent AEP event.

E4 Modelling Approach

Flood modelling was carried out using TUFLOW hydraulic modelling software with hydrologic inputs derived from RAFTS hydrologic models (refer to Sections 3.0 and 4.0 for modelling set-up details).

Hydrologic and hydraulic modelling was generally undertaken in accordance with Australian Rainfall and Runoff 2019 (ARR2019) for the 50 per cent, 20 per cent, 10 per cent, 5 per cent, 2 per cent and 1 per cent AEP design events for storm durations ranging from 5 minutes to 168 hours. The 0.05 per cent AEP (1 in 2000 AEP) and PMF events were also assessed.

E5 Modelled Scenarios

Hydrologic and hydraulic modelling of the following scenarios has been undertaken:

- Existing Conditions (pre-ED road upgrades)
- Future Base Case Conditions (pre-ED road upgrades, and post the construction of the M12 Motorway and WSA)
- Design Case Conditions (post-ED road upgrades, and post the construction of the M12 Motorway and WSA).

An assessment of flood behaviour for Existing Conditions was previously undertaken by Lyall and Associates (2019), with the assessment of Future Base Case and Design Case Conditions undertaken by AECOM as part of this study.

The main topographic and geometric elements comprising the Future Base Case scenario included:

- 2011 and 2017 LiDAR from previous hydraulic investigations (Lyall and Associates, 2019)
- The M12 Motorway digital elevation model (DEM) and structural drawings (GHD, 2021)
- The WSA Development DEM (AAJV, 2020)
- Existing bridges and culverts.

In modelling Design Case Conditions, the Future Base Case hydraulic model was updated to include:

- The horizontal and vertical alignment of Elizabeth Drive
- Four (4) bridge upgrades
- Eighteen (18) culvert replacements
- Construction of thirteen (13) additional culverts.

E6 Design Case Bridge and Culvert Upgrades

A summary of the hydraulic structure upgrades proposed as part of the Elizabeth Drive upgrades (with greater than 8m^2 in cross sectional area) is provided in Table E1, with a summary of all hydraulic structure upgrades provided in Section 4.5.

Table E1 Summary of Hydraulic Structure Upgrades

Section	Chainage (m)	Existing Structure Type	Design Case Structure Type (Section 4.5.2)
ED-West	1750	No existing culvert	6/2700 x 600 Reinforced Concrete Box Culvert (RCBC)
ED-West	1700	10m total length, 3 span bridge at Cosgroves Creek	Single 22m span bridge at Cosgroves Creek
ED-West	2200	3/1800 x 1500 RCBC at Oaky Creek	3/1800 x 1500 RCBC at Oaky Creek
ED-East	5300	5/1500 x 1500 RCBC	2/7000 x 4000 RCBC
ED-East	5400	36m total length 2 span bridge at Badgerys Creek	2 x 17m span bridge at Badgerys Creek
ED-East	6600	34m total length, 5 span bridge at South Creek	6 x 28m span bridge at South Creek

Section	Chainage (m)	Existing Structure Type	Design Case Structure Type (Section 4.5.2)
ED-East	6750	26m total length, 2 span bridge at South Creek	
ED-East	6900	4/1350 x 900 RCBC	6/1800 x 1200 RCBC
ED-East	7270	3/2000 x 600 RCBC	4/2400 x 1200 RCBC
ED-East	9500	34m total length 2 span bridge at Kemps Creek	6 x 18m span bridge at Kemps Creek
ED-East	9610	No existing culvert	8/1200 x 1800 RCBC

E7 Summary of Flooding Assessment

A summary of the key outcomes of the hydraulic assessment is provided herein for the following scenarios and sections of Elizabeth Drive:

- Existing Conditions Flooding (ED-West)
- Existing Conditions Flooding (ED-East)
- Future Base Case Flooding (ED-West)
- Future Base Case Flooding (ED-East)
- Design Case Flooding (ED-West)
- Design Case Flooding (ED-East).

Flood inundation maps illustrating design event flood levels, depths, velocities, hazard, and change in level (afflux) are provided for the Design Case in Appendix A of this report.

Existing Conditions Flooding (ED-West and ED-East)

In relation to the existing flood immunity of Elizabeth Drive, Lyall and Associates (2019) determined that Elizabeth Drive is subject to relatively shallow depth of flood inundation for events as frequent as the 50 per cent (1 in 2) AEP. Major overtopping of the road only occurs at the location where it crosses the floodplains of Cosgroves Creek, Oaky Creek, Badgerys Creek, South Creek and Kemps Creek. More specifically:

- Overtopping of Elizabeth Drive occurs adjacent to the existing culverts located at Chainage 1150 and Chainage 2700 during floods as frequent as the 50 per cent AEP. While depths of overtopping do not exceed 100 mm adjacent to the existing culvert at Chainage 1150, depths reach up to 350 mm at this location during a 1 per cent AEP design flood event
- Elizabeth Drive in the vicinity of Badgerys Creek is overtopped during events greater than a 10 per cent AEP design flood event. Depths of flow across the road at this location range from approximately 250 mm during a 5 per cent AEP flood event to 350 mm during a 1 per cent AEP flood event
- Major overtopping of Elizabeth Drive commences to occur to the east of the existing South Creek bridges during flood events larger than approximately 10 per cent AEP, with a maximum depth of overtopping of 300 mm shown to occur in a 1 per cent AEP design flood event at this location
- Elizabeth Drive in the vicinity of the existing Kemps Creek bridge crossing overtops for events greater than or equal to a 2 per cent AEP, with the road inundated to a maximum depth of about 250 mm during a 1 per cent AEP design flood event.

Future Base Case Flooding (ED-West)

Future Base Case results (refer to Section 5.0) for ED-West show that Elizabeth Drive overtops:

- Along a 200 metre (m) length of road in the 50 per cent AEP design flood event between Chainages 1500 and 1700 to depths of up to 100mm

- Along a 900m length of road in the 1 per cent AEP design flood event. Overtopping occurs between Chainage 1000 and 1900 with flood depths mostly in the range 10mm to 200mm, with maximum depths of overtopping reaching 500mm in some isolated locations in the 1 per cent AEP design flood event.

Future Base Case Flooding (ED-East)

Future Base Case results (refer to Section 5.0) for ED-East show that Elizabeth Drive overtops:

- Along an 800m length of road in the 50 per cent AEP design flood event between Chainages 7700 and 8500 to depths up to 110mm
- At multiple locations during the 1 per cent AEP design flood event. The longest linear length of overtopping is 800m occurring at South Creek between Chainage 6850 and 7650.

Design Case Flooding (ED-West)

A comparison of the flood model results for Design Conditions relative to Future Base Case Conditions was completed. The flooding assessment undertaken in the vicinity of ED-West indicates that the proposed ED road design meets the required road design criteria (refer to Section 6.0). Key outcomes are as follows:

- Bridge freeboard: The proposed Cosgroves Creek bridge upgrade has greater than 300mm freeboard to the soffit for the 1 per cent AEP design event meeting the design criteria
- Road immunity: There is one lane trafficable in each direction for all design events up to and including the 1 per cent AEP design flood event
- Flood extents for all design events up to and including the 1 in 2000 AEP design event remain materially unchanged from the Future Base Case
- Afflux: The change in flood levels (afflux) around the alignment of the Elizabeth Drive upgrades for design events up to and including the 1 per cent AEP design event are within acceptable tolerances with affluxes greater than 100mm contained within the Land Acquisition Extent (operational footprint) for the project, except for the following location:
    - Lot 106 / DP846962 immediately upstream of Cosgroves Creek Bridge: The flooding assessment indicates the potential for Lot 106 / DP846962 to experience a maximum of 130mm of afflux in the 1 per cent AEP design event outside of the existing Land Acquisition Extent. Increases in flood depth would generally be contained within Cosgroves Creek on land zoned as ENZ – Environment and Recreation. No buildings have been identified in the affected area based on a review of aerial imagery
- Velocity: Velocities in the vicinity of structures do not exceed 2.5m/s for all events up to and including the 1 per cent AEP design flood event
- Change in velocity: There are no material increases in velocity on the floodplain for all design flood events assessed
- Change in hazard: There is no material increase in flood hazard outside of the ED design road corridor for design flood events up to and including the 1 per cent AEP design flood event
- Duration of road inundation: Given that the ED upgrade is not overtopped during a 1 per cent AEP design flood event, there has been no increase in the duration of road inundation and a reduction in the time of closure
- Bridge Scour: A preliminary bridge scour assessment has been undertaken for bridge structures located on ED for the 1 per cent AEP and 0.05 per cent AEP (1 in 2000 AEP) design flood events using empirical equations. Scour depths were estimated to be 0.5m and 1.1m for the 1 per cent AEP and 1 in 2000 AEP design flood events respectively
- Sensitivity Assessments: A sensitivity analysis of hydraulic structure blockage was undertaken for the 1 per cent AEP design flood event and found to not result in ED road overtopping.

- Extreme Events: The 0.05 per cent AEP (1 in 2000 AEP) and PMF design flood events were assessed. It is noted that significant levels of afflux and velocity increases were identified in some locations during the PMF event as Elizabeth Drive is overtopped in this event.
- Property Impacts: Flood model results indicate that estimated increases in 1 per cent AEP flood level and velocities outside of the Land Acquisition Extent are within acceptable tolerances.

Design Case Flooding (ED-East)

A comparison of the flood model results for Design Conditions to Future Base Case Conditions was completed. The flooding assessment undertaken in the vicinity of ED-East indicates that the proposed road design generally meets the required road design criteria (refer to Section 6.0), with the exception of those detailed in Table E2. Key outcomes are as follows:

- Bridge freeboard: The proposed Badgerys Creek, South Creek and Kemps Creek bridge designs each have greater than 300mm freeboard to the soffit for the 1 per cent AEP design event meeting the design criteria. Badgerys Creek and Kemps Creek bridges meet the freeboard requirement due to the upstream flood levels being reduced from the Future Base Case, by significantly upsizing the size of nearby design relief culverts. Detailed design development is recommended to include review of the size of relief culverts (i.e. to reduce size) and simultaneously raise the Kemps Creek bridge soffit to account for the resultant increase in flood levels caused by reducing the relief culvert size
- Road immunity: There is one lane trafficable in each direction for all design events up to and including the 1 per cent AEP design flood event
- Flood extents for all design events up to and including the 1 in 2000 AEP design event remain materially unchanged from the Future Base Case
- Afflux: The change in flood levels (afflux) around the EDU alignment for design events up to and including the 1 per cent AEP design event are within acceptable tolerances, with the exception of two locations (refer Table E2). It is noted that there is some afflux downstream of Kemps Creek Bridge where afflux is greater than 100mm and outside the Land Acquisition Extent. It is recommended that during detailed design development opportunities to raise the soffit of Kemps Creek and reduce the size of the relief culvert at this location are considered.
- Velocity: Velocities in the vicinity of structures do not exceed 2.5m/s for all events up to and including the 1 per cent AEP design flood event
- Change in velocity: There are no material increases in velocity on the floodplain for all design flood events assessed.
- Change in hazard: Flood hazard is expected to increase in a number of isolated locations however, material increases in flood hazard are confined to the existing Land Acquisition Extent and fall within acceptable tolerances
- Duration of road inundation: Given that the ED upgrade is not overtopped during a 1 per cent AEP design flood event, there has been no increase in the duration of road inundation and a substantial improvement in the time of closure
- Bridge Scour: A preliminary bridge scour assessment has been undertaken for bridge structures located on ED for the 1 per cent AEP and 0.05 per cent AEP design flood events using empirical equations. For Badgerys Creek scour depths were estimated to be 2.4m and 2.8m for the 1 per cent AEP and 0.05 per cent AEP design flood events respectively. For South Creek scour depths were estimated to be 6.7m and 12.4m for the 1 per cent AEP and 0.05 per cent AEP design flood events respectively. For Kemps Creek scour depths were estimated to be 6.6m and 14.7m for the 1 per cent AEP and 0.05 per cent AEP design flood events respectively
- Sensitivity Assessments: A sensitivity analysis of hydraulic structure blockage was undertaken for the 1 per cent AEP design flood event and found to not result in ED road overtopping
- Extreme Events: The 1 in 2000 AEP and PMF design flood events were assessed. It is noted that significant levels of afflux and velocity increases were identified in some locations during the PMF event as Elizabeth Drive is overtopped in this event

- Property Impacts: Flood model results indicate that estimated increases in 1 per cent AEP flood level and velocities outside of the existing Land Acquisition Extent are within acceptable tolerances with the exception of the following locations:

Table E2 Properties with Afflux Exceeding Criteria around Design Alignment

Lot Number	Zoning	Flooding Source	Design Afflux (mm)
Lot 5 / DP860456	Enterprise	Design channels direct flow into a dam, more than in the Future Base Case.	170
Lot 19 / DP30265 and Lot 29 / DP30265	Primary Production Small Lots	The culvert at Chainage 9600 is oversized (for bridge design purposes) and sends more flow than in the Future Base Case. This would be reviewed further during detailed design development	121

E8 Recommendations for Future Design Stages

It is recommended that consideration be given to the following items during the detailed design stage:

- Chainage 1100, Lot 1 / DP220176: the design of this culvert is recommended to be further refined during detailed design
- Chainage 5300, Lot 2 / DP1260971: Review opportunities to raise the soffit of the design bridge at Badgerys Creek and reduce the size of the relief culvert PXD11
- Chainage 9600, Lot 1 / DP1266517: At this location there is some afflux downstream of Kemps Creek Bridge in the order of 100mm occurring outside of the Land Acquisition Extent. It is recommended that in detailed design, consideration be given to raising the soffit of Kemps Creek and reducing the size of the relief culvert (ID:PXD28, 8/1800x1200 mm RCBC), or acquiring further land within Lot 19/ DP30265 and Lot 29/ DP30265.
- The flooding assessment indicates the potential for Lot 106 / DP846962 (located immediately upstream of Cosgroves Creek Bridge) to experience a maximum of 130mm of afflux in the 1 per cent AEP design event outside of the existing Land Acquisition Extent. This lot is currently zoned Environmental and Recreational land-use. It is recommended that further design development consider opportunities to minimise this afflux.

Report Acronyms

Table 1 provides a summary of the acronyms used in this report.

Table 1 Table of acronyms and definitions

Name	Acronym Expansion	Description
1D	One Dimensional	A modelling approach where only the cross-sectional area is considered between sections using energy equations along a longitudinal profile.
2D	Two Dimensional	A modelling approach where the momentum equation account for the movement of flow in the X and Y direction, and hydraulic data is averaged vertically in the Z direction (e.g. constant velocity in a vertical column).
3D	Three Dimensional	Data comprising values in the X, Y and Z direction.
AAToS	Annual Average Time of Submergence (hours/year)	The expected average time per year of submergence of the road caused by flooding.
AEP	Annual Exceedance Probability	The probability that a given event will be exceeded in any one year.
AFF	Above Floor Flooding	Occurrence of water levels above building floor levels
AGRD	Austroads Guide to Road Design	Guidelines related to road design.
AHD	Australian Height Datum	Australian Height Datum is the official vertical height datum of Australia. Levels relative to this datum are in general terms the elevations above mean sea level.
ARF	Areal Reduction Factor	Areal reduction factors (ARFs), are used to convert estimates of point rainfall to estimates of area-averaged rainfall based on catchment size.
ARI	Average Recurrence Interval	The average, or expected value of the periods between exceedances of a given rainfall total accumulated over a given duration (BoM, 2022).
ARR	Australian Rainfall and Runoff	National guidelines for hydrologic modelling and assessment of rainfall.
ARR 2016	Australian Rainfall and Runoff Guidelines – 2016 Edition	2016 Edition of ARR.
BoM	Bureau of Meteorology	National organization for collection and interpretation of meteorological data.
CC	Climate Change	Long-term shifts in temperature and weather patterns.
D/S	Downstream	-
DCDB	Digital Cadastral Database	Digital outlines of properties indicating ownership of land.
DEM	Digital Elevation Model	A 3D digital dataset to represent terrain typically consisting of spatially varying latitude, longitude and elevation values.
DRAINS	-	A hydrologic software package.
ED	Elizabeth Drive	The road alignment being investigated in this project.
EDU	Elizabeth Drive upgrades	The current project name – including the Elizabeth Drive East Upgrade proposal and the Elizabeth Drive West Upgrade proposal.
FLC	Form Loss Coefficient	A value used in the energy equation to factor in losses through structures.
GIS	Geographic Information System	A service to view, edit and process vector and raster layers.
GSDM	Generalised Short-Duration Method	A method for estimating extreme rainfall events
ICCF	Interim Climate Change Factor	Factors to increase rainfall predictions to account for greater concentration of air contaminants.

Name	Acronym Expansion	Description
ID	Identification	-
IEAust	Institution of Engineers Australia	An engineering governing body.
IFD	Intensity-Frequency-Duration	Data for rainfall depths (mm) for different theoretical events.
lfcsh	Layered Flow Constrictions	A modelling file uses to simulate the pier form loss of bridges, decks and railings.
LiDAR	Light Detection and Ranging	A method for determining distances by targeting an object with a laser and measuring the time for the reflected light to return to the receiver. It is used to make digital 3D representations of terrain or bathymetry.
m	Metres	-
mm	Millimetres	-
M12	-	A future motorway (currently under construction) connecting the Western Sydney Airport to Sydney's motorway network.
NA	Not Applicable	-
NSW	New South Wales	-
PMF	Probable Maximum Flow	The flow resulting from the largest possible theoretical rainfall event.
PMP	Probable Maximum Precipitation	The rainfall resulting from the largest possible theoretical event.
QA	Quality Assurance	The maintenance of a desired level of quality in a service or product.
RAFTS	-	A hydrologic software executable.
RCBC	Reinforced Concrete Box Culvert	-
RCP	Reinforced Concrete Pipe	-
RCPs	Representative Concentration Pathways	RCPs are concentration pathways used by the Intergovernment Panel on Climate Change. They are prescribed pathways for greenhouse gas and aerosol concentrations, together with land use change, that are consistent with a set of broad climate outcomes used by the climate modelling community.
RMS	Roads and Maritime Services	Former government agency, now part of Transport for NSW
SA	Source Area	TUFLOW hydraulic modelling terminology for the inflow locations where hydrographs are applied.
SX	Source External	A TUFLOW hydraulic model connection to connect the 1D to the 2D domain.
Transport	Transport for NSW	The NSW Government's transport and road agency.
TP	Temporal Pattern	The distribution of rainfall with respect to time.
WSA	Western Sydney Airport	A new international airport currently under construction of the south of Elizabeth Drive. The operational Western Sydney Airport has been included in this investigations' future base case.
XP-RAFTS	-	A hydrologic modelling software package.

1.0 Introduction

1.1 Background

Elizabeth Drive (ED) is the main east-west corridor between Liverpool and the suburbs of Western Sydney. Transport for NSW (Transport) is planning for two upgrades of Elizabeth Drive between The Northern Road, Luddenham and Duff Road, Cecil Hills (referred to collectively as the Elizabeth Drive upgrades), to support the projected and planned development of the Western Sydney International (Nancy-Bird Walton) Airport (WSA) precinct, known as the Western Sydney Aerotropolis.

The planned upgrades include:

- Elizabeth Drive West Upgrade, which would include the upgrade of about 3.6 kilometres of Elizabeth Drive between The Northern Road at Luddenham to near Badgerys Creek Road at Badgerys Creek where it would connect with the future M12 Motorway
- Elizabeth Drive East Upgrade, which would include the upgrade of about 7.8 kilometres of Elizabeth Drive between Badgerys Creek Road near the future M12 Motorway and about 600 metres east of Duff Road at Cecil Hills.

Of relevance to this flooding assessment, the Elizabeth Drive upgrades would include the construction of additional lanes, raising the alignment and upgrading drainage.

The sections of Elizabeth Drive which would be subject to the Elizabeth Drive West Upgrade and East Upgrade are referred to in this report as ED-West and ED-East, respectively.

The road upgrades traverse several watercourses (refer to Figure 1), including (from west to east):

- Cosgroves Creek
- Oaky Creek
- Badgerys Creek
- South Creek
- Kemps Creek
- Ropes Creek.

ED-West crosses Cosgroves Creek and Oaky Creek. ED-East crosses Badgerys Creek, South Creek, Kemps Creek and the Ropes Creek catchment.

There are six existing main flow path crossings (i.e., bridges or culverts) along the section of ED to be upgraded – two at the South Creek crossing and one at every other creek crossing. There are also several additional existing culvert crossings that convey flow beneath the road at local gullies. Design of the proposed road upgrade will include a series of bridge and culvert upgrades to ensure that the new road meets required design standards and achieves the required flood immunity. These structures are not limited to the main creek locations, as the road upgrade will significantly impede the natural flowpath, and design standards must be met at all locations, where hydraulic effects due to the alignment occur.

1.2 Report purpose

The purpose of this report is to provide a summary of the flooding assessment undertaken for waterways crossing the ED-West section of ED (Cosgroves Creek and Oaky Creek) and the ED-East section of ED (Badgerys Creek, South Creek, Kemps Creek and Ropes Creek). The report summarises the methodology, key assumptions and results used to inform the 100% Concept Design of the road upgrades and to ensure compliance with required design criteria.

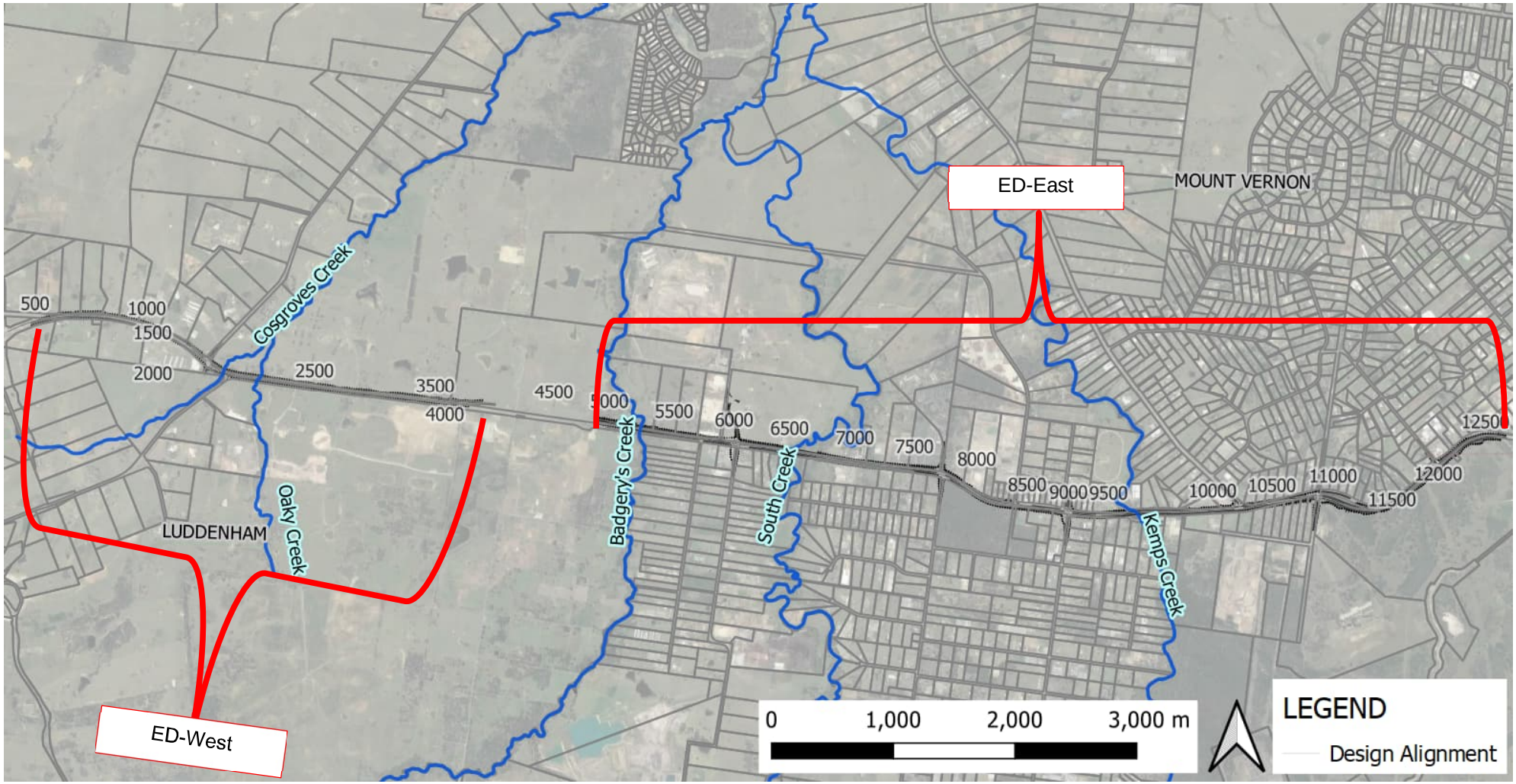


Figure 1 ED-West and ED-East ranges

1.3 Assumptions and Limitations

The following assumptions and limitations apply to this report:

- The hydrologic and hydraulic models used in this study are based on the uncalibrated flood models received from Lyall & Associates (2019). These models and associated data are assumed to be accepted by Transport as a reasonable basis for the hydrologic and hydraulic modelling undertaken for this project
- There are limitations in the topographic information available which once obtained could alter the model representation and results. This is of key relevance under bridges. Topography is assumed accurate from previous stages
- The M12 Motorway is represented in the hydraulic model through application of a digital elevation model (DEM) representing the horizontal and vertical profile of the road, with openings in the DEM for the bridge crossings. Culverts have been represented using an industry standard one-dimensional hydraulic modelling approach
- The Sydney Metro Western Sydney Airport development (a new metro line currently under construction) was considered when developing the model terrain however, since this development will generally sit outside the range of modelled floods, it was deemed likely to have a minimal impact on project design and was therefore not included in the hydraulic model
- The WSA development and M12 Motorway alignment are assumed to be at a stage such that further design changes will not significantly alter the design of EDU
- The level of hydrologic and hydraulic modelling undertaken is considered to be sufficient for informing the 100% Concept Design of ED-West and East

This report has been prepared to inform the concept design and Review of Environmental Factors for the Elizabeth Drive Upgrades. Any use which a third party makes of this document, or any reliance on or decision to be made based on it, is the responsibility of such third parties. AECOM accepts no responsibility for damages, if any, suffered by any third party because of decisions or actions made based on this document. Where information has been supplied by the Client (Transport) or other external sources, the information has been assumed correct and accurate unless stated otherwise. No responsibility is accepted by AECOM for incorrect or inaccurate information supplied by others.

Australian Rainfall and Runoff Revision Project 15 (Two-dimensional Hydraulic Modelling in Urban Areas) (Engineers Australia, 2012) outlines several fundamental themes for all hydrologic and hydraulic models, which are also relevant to modelling results presented in this report:

- All models are coarse simplifications of very complex processes. No model can therefore be perfect, and no model can represent all the important processes accurately.
- Model accuracy and reliability will always be limited by the accuracy of the terrain and other input data
- Model accuracy and reliability will always be limited by the reliability / uncertainty of the inflow data
- A poorly constructed model can usually be calibrated to the observed data but will perform poorly in events both larger and smaller than the calibration data set
- No model is ‘correct’ therefore the results require interpretation
- A model developed for a specific purpose is probably unsuitable for another purpose without modification, adjustment, and recalibration. The responsibility must always remain with the modeller to determine whether the model is suitable for a given problem
- Recognition that no two flood events behave in the same manner
- Design floods are a best estimate of an ‘average’ flood for their probability of occurrence.

1.4 Design Criteria

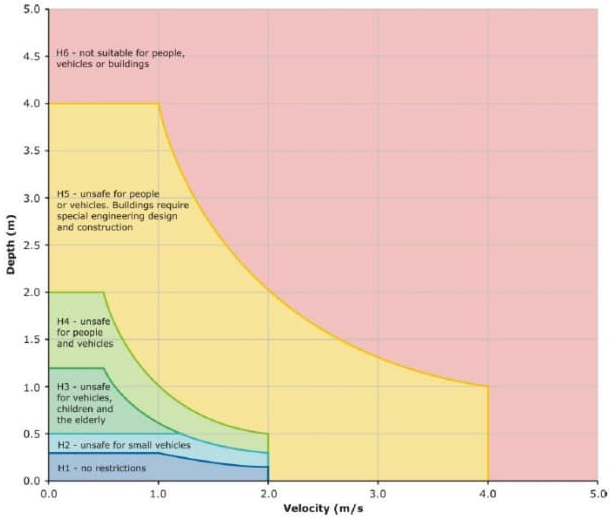
The following design guidelines, standards and specifications provide the design criteria for hydrology and flooding across the project:

- Austroads Guide to Road Design (AGRD) – Parts 5, 6 and 8 (2013)
- Austroads Bridge Waterway Design Guidelines (2019)
- Australian Rainfall and Runoff (ARR) (2019)
- Australian Rainfall and Runoff – Project 11: Blockage of Hydraulic Structures – Stage 2 Report (2016)
- Transport guidelines and standards including the following project specific standards:
  - QA Specification PS271 – Hydrology and Drainage Design (2020)
  - QA Specification PS371 – Hydrology and Drainage Design (2020)
  - QA Specification PS261 – Bridge and Structure Concept Design (2020)
- RMS Technical Guide: Climate Change Adaptation for the Road Network (2015)
- Flood plain Development Manual (NSW Department of Infrastructure, Planning and Natural Resources, 2005)
- South Creek Floodplain Risk Management Plan (Penrith City Council, 2020).

The key design criteria relevant to the project, and drawn from the above guidelines, standards, and specifications, are summarised in Table 2.

Table 2 Design criteria for hydrology and flooding

Design element		Design requirement	Reference
Bridge design	Structural engineering requirements	No structural damage in 1in2000 Annual Exceedance Probability (AEP)	QA Specification PS261 – Bridge and Structure Concept Design
	Bridge scour	The report must provide an estimate of the scour depth in a 1in2000 AEP event	QA Specification PS261 – Bridge and Structure Concept Design
	Waterway investigation	The report must provide a comparison of the existing and proposed conditions of flood level stream velocity and the change in flood flow distribution for the following events: • 5% AEP • 1% AEP • 1 in 2000 AEP • PMF	QA Specification PS261 – Bridge and Structure Concept Design
	Blockage	• Clear opening <3 m: Typical event blockage depends on risk of debris rafts and large floating debris. • Clear opening >3 m: 0% • Central piers: Typical event blockage depends on risk of debris wrapped around central piers.	Table 7.1 in ARR – Project 11: Blockage of Hydraulic Structures – Stage 2 Report
Floodplain	Floodplain Property impacts	No property damage in a 1% AEP event	QA Specification PS271 – Hydrology and Drainage Design
	1% AEP Flood Impacts[1]	Flood impacts within the proposed project corridor are negligible A maximum increase of 10mm in above-floor inundation to habitable rooms	(South Creek Floodplain Risk Management Study, 2020)

Design element		Design requirement	Reference
		A maximum increase of 50mm to residential, industrial, enterprise, commercial, or primary production small lots zoned land Current criteria[2]: A maximum increase of 100mm in inundation to rural or environment and recreational zoned land	M12 Motorway Package 1 (WSP, 2021)
	Hazard category	Hazard category should remain relatively unchanged unless completely unavoidable 	(Australian Emergency Management Institute, 2014)
Roadway	General flooding and flood immunity	Flood immunity in a 1% AEP, with the PMF checked	QA Specification PS271 – Hydrology and Drainage Design
	Trafficable lanes	There must be one trafficable lane free from inundation in the 1% AEP event	QA Specification PS271 – Hydrology and Drainage Design
	Shared path	63.2% AEP (1-year ARI)	QA Specification PS271 – Hydrology and Drainage Design

Notes:

1 – Current Criteria was updated in accordance with the Penrith Development Control Plan which supersedes the South Creek Floodplain Risk Management Plan

1.5 Modelling Approach

An overview of the hydrologic and hydraulic modelling approach adopted in this assessment is provided in the following sections.

1.5.1 Scenarios Assessed

To inform the concept design of the ED-East and ED-West sections of the ED upgrades, hydrologic and hydraulic modelling was undertaken to assess flood behaviour for 'Future Base Case' and 'Design Case' conditions.

1.5.1.1 Future Base Case Conditions

Future Base Case conditions were established to represent a "future base case" scenario which includes the existing floodplain condition, existing ED and associated hydraulic infrastructure, future M12 Motorway and future Western Sydney Airport (WSA). Future Base Case conditions are a pre-Project scenario that does not include the proposed ED upgrades. The floodplain conditions and key infrastructure associated with Future Base Case conditions are illustrated in Figure 2.

The M12 Motorway is represented in the hydraulic model through application of a digital elevation model (DEM) representing the horizontal and vertical profile of the road, with openings in the DEM for the bridge crossings. Culverts have been represented using an industry standard one-dimensional hydraulic modelling approach. Should further design refinement of the M12 layout occur in future, this may affect results around Elizabeth Drive at Kemps Creek and Badgerys Creek.

1.5.1.2 Design Case Conditions

Design conditions were established to represent a post-project scenario in which the ED upgrades have been added to the Future Base Case conditions described above. To satisfy the project design criteria, several hydraulic model iterations were required to inform proposed road profiles and associated bridge, culvert, and drainage infrastructure. The key infrastructure associated with Design Case conditions are illustrated in Figure 3.

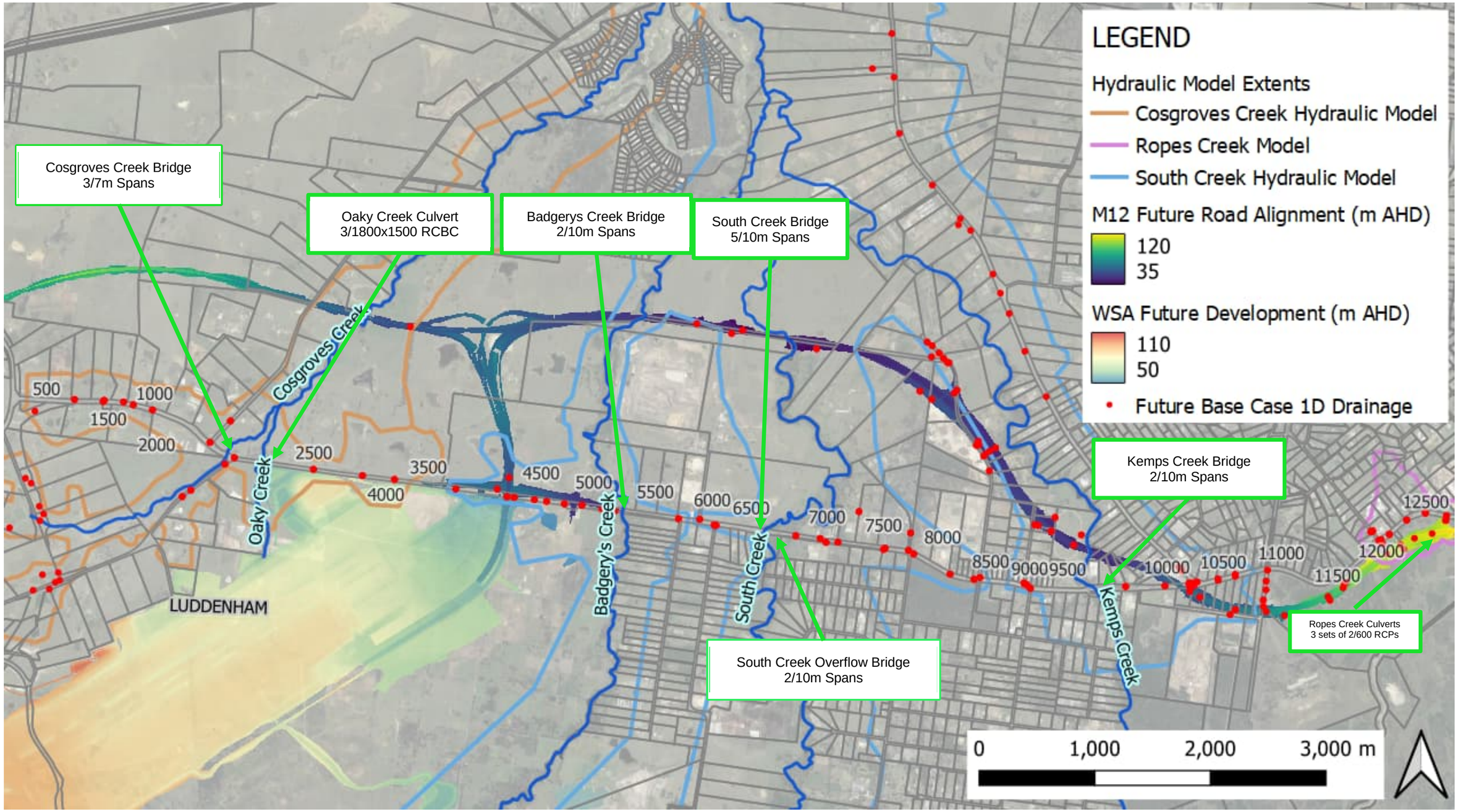


Figure 2 Future Base Case Conditions and Key Hydraulic Structures

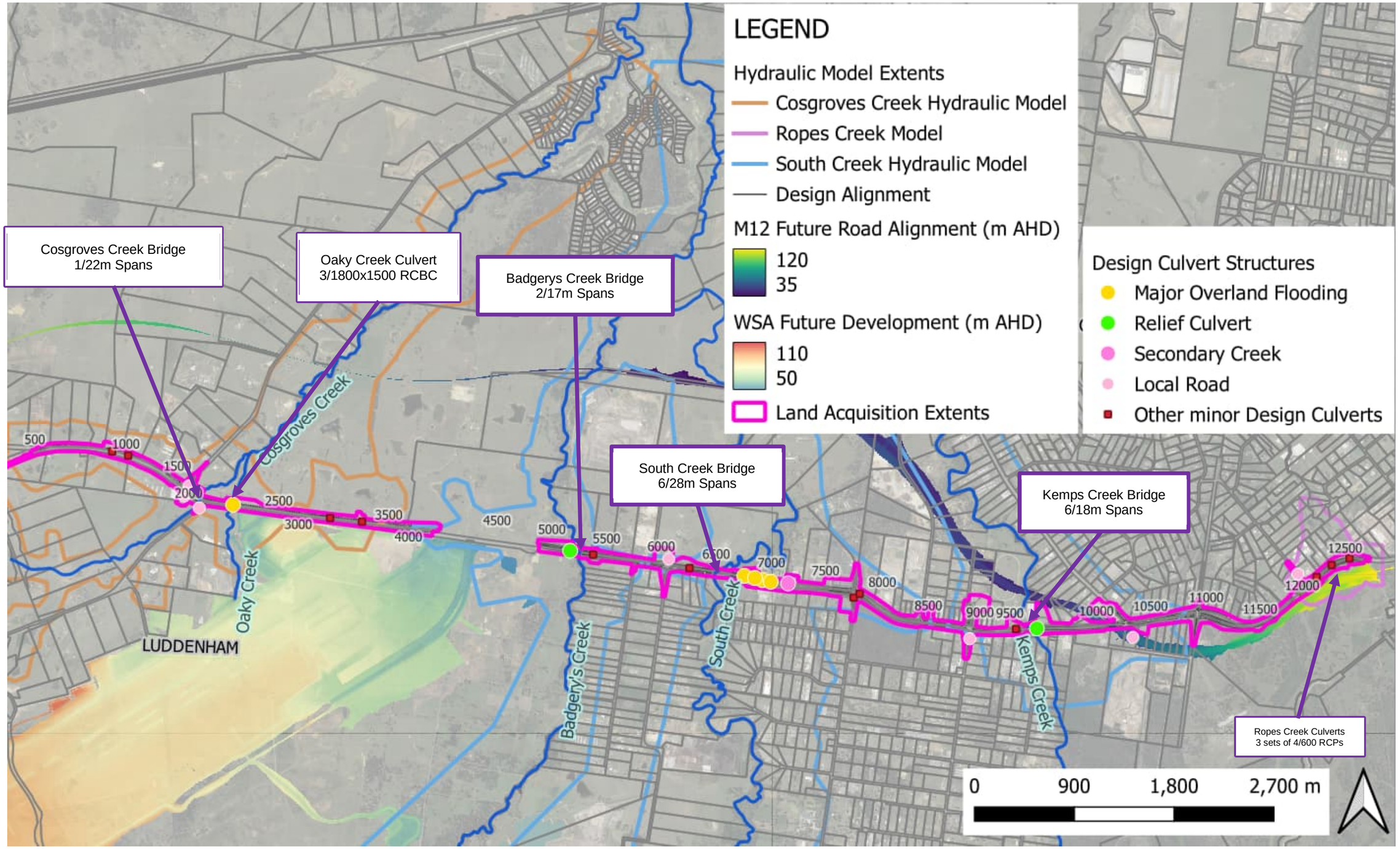


Figure 3 Design Conditions and Key Structures

1.5.2 Modelling Approach

The following methodology was adopted for the flooding assessment:

- Existing hydrologic (DRAINS) and hydraulic (TUFLOW) models of the local catchment and floodplain were supplied by Transport for adoption in this project. These models were originally developed as part of the *Elizabeth Drive Upgrade Flood and Drainage Investigation Strategic Design* (Lyall and Associates, 2019)
- A review of the supplied hydrologic models was undertaken, and the models were updated in accordance with ARR 2019 and the Future Base Case Conditions (refer Section 3.0)
- The hydrologic model was used to estimate design event runoff hydrographs for Future Base Case Conditions in accordance with ARR 2019 for the 50%, 20%, 10%, 5%, 2% and 1 per cent AEP design events for storm durations ranging from 5 minutes to 168 hours (refer Section 3.0). In addition to these events, the hydrologic model was used to assess the 1 in 2000 AEP and PMP design storm events
- A review of hydrologic model results was undertaken for each AEP in the vicinity of the project
- A review of the supplied TUFLOW model was undertaken and the model updated to represent Future Base Case Conditions (refer Section 4.0)
- The inflow boundary conditions of the TUFLOW model were updated through application of the ARR 2019 design event hydrographs obtained from the updated hydrologic model. Design flood event simulations were subsequently undertaken for the 50%, 20%, 10%, 5%, 2%, 1 per cent AEP, 0.05 per cent AEP (1 in 2000 AEP) and PMF design events for storm durations ranging from 30min to 18hrs (refer Section 5.1)
- A detailed review of hydraulic model results was undertaken for Future Base Case Conditions including a review of the existing flood immunity of ED, the capacity of existing cross drainage infrastructure, and general flood behaviour and characteristics
- The Future Base Case hydraulic model was updated to represent the Design Case. This included “stamping” the proposed road geometry onto the Future Base Case digital elevation model, updating cross drainage infrastructure details and addition of flood mitigation measures including local diversion channels, additional longitudinal drainage, and excavation for conveyance and storage. The setup of the hydraulic model is described in Section 4.0
- Hydraulic model simulations for the range of design events and identified critical storm durations (from the Future Base Case) was undertaken in the Design Case TUFLOW model. A suite of durations was also run for the 1 per cent AEP to confirm the critical duration. Key flood characteristics including flood extent, levels, velocity, and hazard were compared to pre-project (Future Base Case) conditions to assess the hydraulic performance of the proposed road upgrade against the key flooding and hydraulic design criteria. Where required, the road geometry, cross drainage infrastructure and mitigation measures were adjusted until required performance objectives were satisfactorily met. Flood inundation maps for the design case illustrating flood level, depth, velocity, hazard, and afflux (compared to the Future Base Case) for each AEP design event assessed were prepared (refer Appendix A)
- A sensitivity analysis (refer to Section 6.12) was carried out on the Design Case to assess the impact of culvert blockage and climate change on flood levels.

2.0 Available Information

2.1 Previous Flood Modelling

2.1.1 Existing Conditions (Pre-ED road upgrade)

Hydraulic modelling of flood behaviour for Existing Conditions was previously undertaken as part of the *Elizabeth Drive Upgrade Flood and Drainage Investigation* for the Strategic Design (Lyall and Associates, 2019). A suite of design flood events (ranging from 50 per cent AEP to the 1 per cent AEP) were assessed. These models were supplied by Transport as the flood modelling platforms to be adopted in this project.

In relation to the existing flood immunity of Elizabeth Drive, Lyall and Associates (2019) determined that Elizabeth Drive is subject to relatively shallow depth of flood inundation for events as frequent as the 50% (1 in 2) AEP. Major overtopping of the road only occurs at the location where it crosses the floodplains of Cosgroves Creek, Oaky Creek, Badgerys Creek, South Creek and Kemps Creek. More specifically:

- Overtopping of ED occurs adjacent to the existing culverts located at Chainage 1150 and Chainage 2700 during floods as frequent as the 50 per cent AEP. While depths of overtopping do not exceed 100 mm adjacent to the existing culvert at Chainage 1150, depths reach up to 350 mm at this location during a 1 per cent AEP design flood event
- ED in the vicinity of Badgerys Creek is overtopped during events greater than a 10 per cent AEP design flood event. Depths of flow across the road at this location range from approximately 250 mm during a 5 per cent AEP flood event to 350 mm during a 1 per cent AEP flood even
- Major overtopping of ED commences to occur to the east of the existing South Creek bridges during flood events larger than approximately 10 per cent AEP, with a maximum depth of overtopping of 300 mm shown to occur in a 1 per cent AEP design flood event at this location
- ED in the vicinity of the existing Kemps Creek bridge crossing overtops for events greater than or equal to a 2 per cent AEP, with the road inundated to a maximum depth of about 250 mm during a 1 per cent AEP design flood event.

2.1.2 Future Base Case Conditions (Pre-ED road upgrade, post-M12 Motorway, post-WSA)

As part of the 50% Concept Design completed by AECOM on the 8th of December 2021, AECOM updated the hydrologic and hydraulic models used in the Strategic Design phase to represent a Future Base Case scenario (refer Section 1.5.1). These updates included:

- Design event hydrology updated in accordance with ARR 2019 guidelines
- Adoption of contemporary hydraulic modelling approaches
- Inclusion of the M12 road design. The M12 design alignment, geometry and associated drainage structures were provided with the M12 80% Detailed Design Report by GHD (GHD, 2021)
- Hydraulic modelling updated to include inflow hydrographs from the WSA hydrologic model, with the model updated in accordance with ARR 2019. The Western Sydney Airport development hydrologic and hydraulic modelling and reporting was provided from the Western Sydney Airport Bulk Earthworks Package as part of an Aurecon Arcadis Joint Venture (AAJV, 2020)
- The design surface (i.e., DEM) from the WSA Hydraulic Model (AAJV, 2020) has been incorporated into the Future Base Case hydraulic model.

2.2 Terrain

Multiple terrain elements were applied to the hydraulic model, as summarised in Table 3. The Sydney Metro Western Sydney Airport development (a future metro line) was considered when developing the model terrain. However, since this development will generally sit outside the range of modelled floods, it was deemed likely to have a minimal impact on project design and was therefore not included in the hydraulic model.

Table 3 Terrain Summary

Source ID	Stage of Incorporation	Source Description
2011 LiDAR	Strategic Design	1 m LiDAR from February 2011 (Lyall and Associates, 2019)
2017 LiDAR	Strategic Design	1 m LiDAR from May 2017 (Lyall and Associates, 2019)
M12 Motorway	50% Concept Design	Design M12 DEM obtained on 04 June 2021 (GHD, 2021)
WSA	100% Concept Design	Western Sydney Airport DEM (AAJV, 2020)
AECOM ED design road	100% Concept Design	Road DEM by AECOM
AECOM ED design channel	100% Concept Design	Drainage DEM by AECOM

2.3 Key Hydraulic Features

Key hydraulic features including proposed developments, roads, cross drainage infrastructure and channels to inform the Future Base Case conditions hydrologic and hydraulic models were obtained from a variety of sources, as summarised in Table 4. The main areas where the M12 Motorway drainage structures affect the Elizabeth Drive upgrades is Badgerys Creek and Kemps Creek.

Table 4 Future Base Case Hydraulic Structure Data Sources

Source ID	Source Description
M12 TUFLOW	The 1d network copied from the M12 TUFLOW model
Assumed Width	Some culverts were only identified from aerial imagery without any known size. These culverts were set with an assumed width based on aerial imagery
EDU-E-SM-Drainage	Elizabeth Drive Concept Design Plan Drawings
12d-WEST	2020 12d Survey
M12-E.01	M12 Design Plan Drawings
WSA-Earthworks Package	WSA Design Plan Drawings
M12 Motorway Package - West	50% Concept Design Drawing (AECOM)

2.4 Property Boundaries

As part of the building impact assessment and afflux assessment, reference to property lot and plan details, and property boundaries are made. The property data have been obtained from publicly available information from NSW Six Maps (SIX Maps - Clip & Ship (nsw.gov.au)) and are correct as of December 2022. It should be noted that property details may be subject to change in future (e.g. due to subdivision).

3.0 Hydrologic Modelling

3.1 Hydrologic Models

Several hydrologic models were developed to estimate design event flood hydrographs for Future Base Case and Design conditions for catchments in the vicinity of the proposed road upgrade. These included:

- A RAFTS hydrologic model of the Cosgroves Creek catchment (using DRAINS software)
- A RAFTS hydrologic model of the Upper South Creek Catchment (using XP-RAFTS software)
- A RAFTS hydrologic model of the Lower South Creek Catchment (using DRAINS software)
- A RAFTS hydrologic model of the Ropes Creek catchment (using DRAINS software)
- A RAFTS hydrologic model of the WSA for Oaky Creek (using DRAINS software)
- A RAFTS hydrologic model of the WSA for Badgerys Creek (using DRAINS software).

It is noted that the setup of these hydrologic models was informed by the XP-RAFTS hydrologic model developed as part of the *Elizabeth Drive Upgrade Flood and Drainage Investigation* (Lyall and Associates, 2019), refer to Section 3) and supplied by Transport for the Concept Design development.

Figure 4 illustrates the extent of each of these models.

A summary of these model setups and key input parameters are provided in the sections below.

3.1.1 Model Sub-Catchments

In order to simulate the rainfall runoff process under Future Base Case (pre-project) and Design conditions, the sub-catchments in the existing hydrologic model (Lyall and Associates, 2019) were refined to account for the proposed Western Sydney Airport (WSA) and the M12 Motorway. Modelled sub-catchments are illustrated in Figure 5.

The total area of Cosgroves Creek catchment that has been modelled is approximately 15km^2, with 4.5km^2 of the catchment located upstream of the road upgrade. The total area of South Creek catchment that has been modelled is approximately 36km^2, with 21.8km^2 of the catchment located upstream of the road upgrade. The total area of Ropes Creek catchment that has been modelled is approximately 1.7km^2, with 0.7km^2 of catchment located upstream of the road upgrade.

It is noted that run-off from WSA will contribute to both Cosgroves Creek and South Creek catchments. The M12 motorway is located on the downstream side of ED, as well as two M12 related intersections at Elizabeth Drive Chainages 4000-5500 and 10300.

3.1.2 Land Use Characteristics

The manning's roughness of the Cosgroves Creek, South Creek and Ropes Creek models was set as 0.04 m and used the Horton/ILSAX hydrologic modelling approach. The WSA models used the Initial Loss – Continuing Loss modelling approach, with sub-catchment details provided in Appendix B.

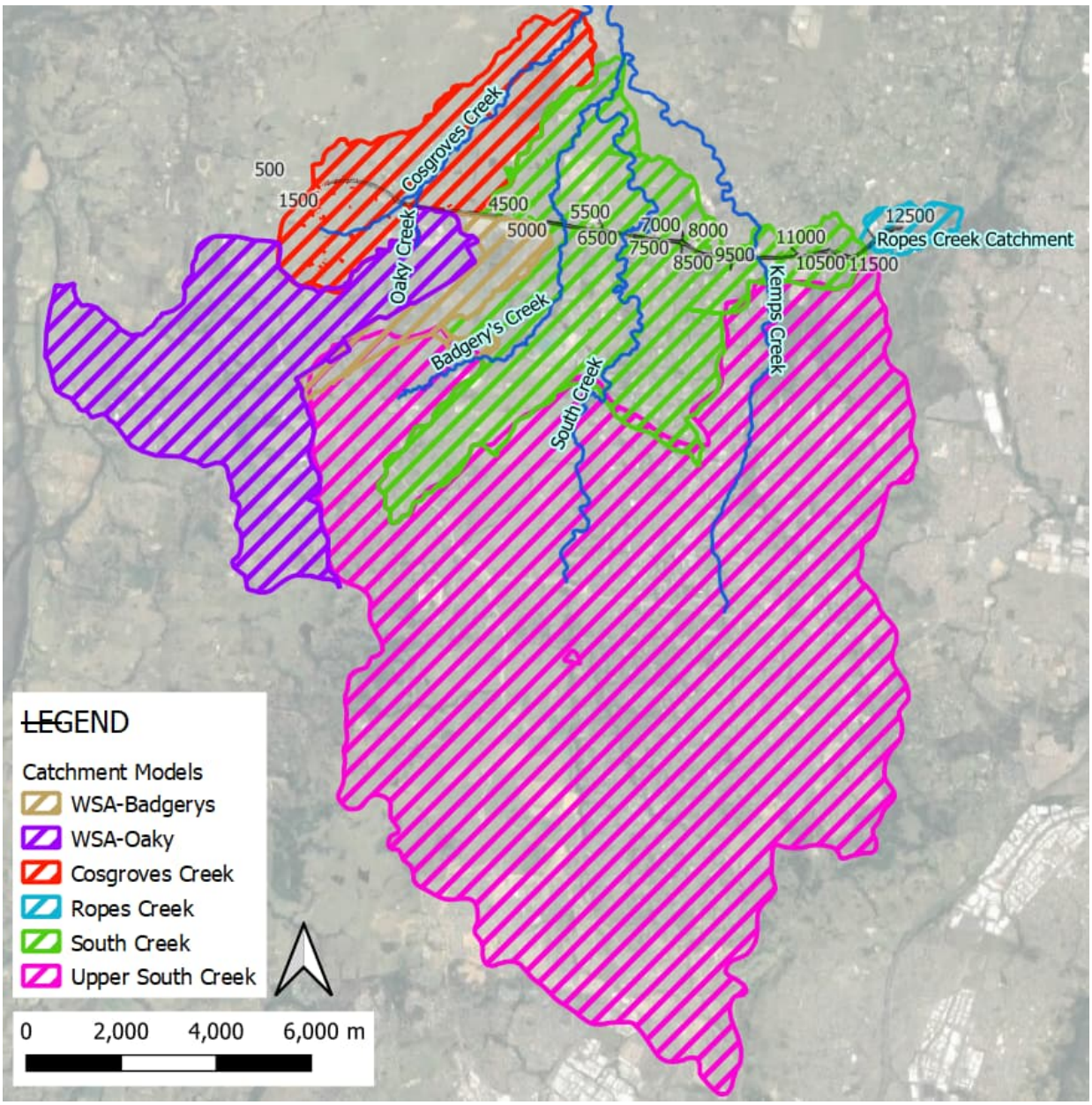


Figure 4 Hydrologic Model Catchment Extents

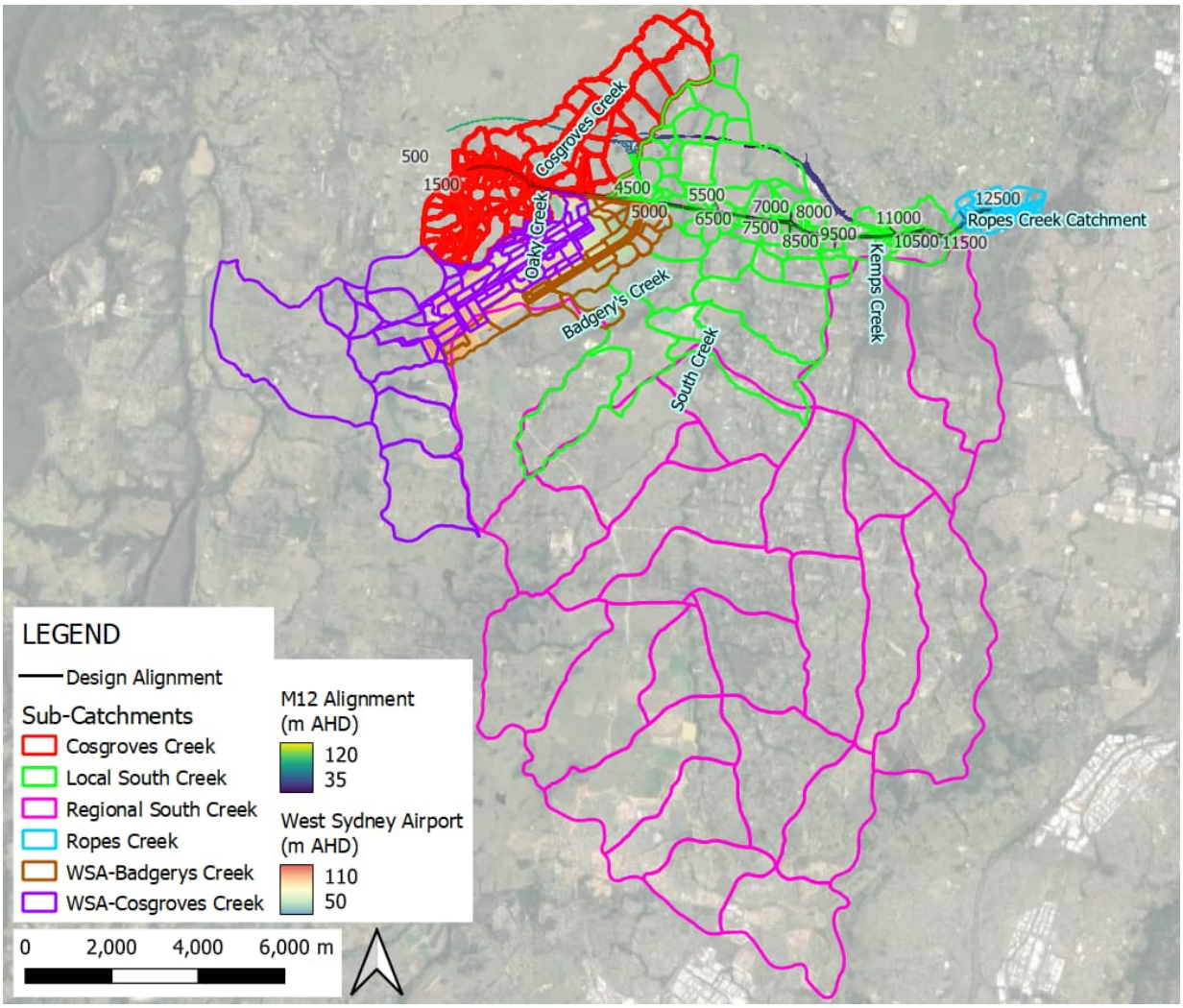


Figure 5 Elizabeth Drive upgrades Sub-Catchments

3.1.3 Rainfall IFD's and temporal patterns (50 per cent AEP to 1 per cent AEP)

The previous hydrologic modelling, undertaken by Lyall & Associates (2019) was undertaken in accordance with the ARR 1987 guidelines (IEAust, 1987) which have since been superseded by ARR 2019 guidelines. The ARR 1987 approach adopts a single, representative rainfall hyetograph for each of the storm durations modelled within the various AEPs.

As part of this project, the hydrologic modelling approach has been updated in line with the recommendations included in the latest version of ARR 2019. The ARR 2019 guidelines require the assessment of an ensemble of ten different temporal patterns for each storm duration within a single AEP. The temporal pattern (or rainfall hyetograph) which generates flood levels at a given location immediately above that producing the median flood levels is then adopted for that storm duration.

In updating the hydrologic model, that latest design rainfall Intensity-Frequency-Duration's (IFDs) were sourced from the Bureau of Meteorology (BoM) with the ensembles of temporal patterns obtained from the ARR Data Hub (IFD rainfall Data was obtained at the centroid of each hydrologic model). The adopted design rainfall intensities are provided in Appendix B.

Due to the relatively small size of the catchment areas draining to the road corridor, no areal reduction factor was applied.

3.1.4 Rainfall losses (50 per cent AEP to 1 per cent AEP)

An initial and continuing loss model was used in the RAFTS hydrologic model. In the absence of calibrated loss rates, initial and continuing loss rates were obtained from the ARR Data Hub in accordance with ARR 2019 guidelines. Continuing Losses were multiplied by 0.4, a multiple specific to NSW (ARR, 2022).

Pre-burst rainfall has been incorporated into all hydrologic models.

The adopted rainfall losses are summarised in Table 5.

Table 5 Adopted rainfall losses

Parameter	**Cosgroves Creek model** (Including Cosgroves Creek and Oaky Creek)	**Upper South Creek model** (Including Badgerys Creek, South Creek and Kemps Creek)	**Lower South Creek model**	**Local Ropes Creek model**
Initial loss for impervious areas	2 mm	2 mm	1 mm	2 mm
Initial loss for pervious areas	46 mm	41 mm	41 mm	41 mm
Continuing loss for impervious areas	0 mm/hour	0 mm/ hour	0 mm/ hour	0 mm/hr
Continuing loss for pervious areas	1.36 mm/hour	0.92 mm/ hour	0.92 mm/ hour	0.92 mm/hr

3.1.5 1 in 2000 AEP and PMP design events

The 1 in 2000 event was calculated with IFD data sourced from ARR Datahub (refer to Appendix B). The PMP total rainfall depth was calculated using the Generalised Short-Duration Method (GSDM) (BoM, 2022). Notable input values for the GSDM method are detailed in Table 6.

Table 6 GSDM Inputs

Variable	Description	Value
EAF	Elevation Adjustment Factor	1
MAF	Moisture Adjustment Factor	0.69
S	Portion of Area Considered Smooth	1
R	Portion of Area Considered Rough	0

3.1.6 Design events simulations and results

Hydrologic modelling was undertaken for Future Base Case and Design Case for the following events:

- 50%, 20%, 10%, 5%, 2% and 1 per cent AEP design events for storm durations ranging from 10 minutes to 72 hours with ten temporal patterns run for each storm duration
- 1 in 2000 AEP design event for storm durations ranging from 5 minutes to 168 hours with ten temporal patterns run for each storm duration
- PMF design event for multiple durations, with a single temporal pattern for each duration.

Hydrographs were extracted from the hydrologic models for the full range of design events described above and used to establish inflow boundary conditions in each hydraulic model (refer Section 4.0). Hydrographs representing the total runoff (total flow) from upstream catchments were extracted from the hydrologic model at locations representing the intersection of modelled waterways and the upstream boundary of the hydraulic model. These hydrographs were applied as upstream inflow boundaries in the hydraulic models. Hydrographs representing local catchment runoff (local flows) from sub-catchments located within the 2D hydraulic model domain were extracted from the hydrologic models and input into the hydraulic models at representative inflow location points (via TULFOW SA polygons) as ‘local flow’ inflow hydrographs.

4.0 Hydraulic Model Set-up

4.1 Overview

The following two-dimensional (TUFLOW) hydraulic models were developed to assess flood behaviour for Future Base Case and Design conditions:

- A TUFLOW hydraulic model including Cosgroves Creek and Oaky Creek (the Cosgroves Creek model) encompassing ED-West
- A TUFLOW hydraulic model including Badgerys Creek, South Creek and Kemps Creek (the South Creek model) encompassing ED-East
- A TUFLOW hydraulic model including Ropes Creek encompassing ED-East.

The extent of these hydraulic models is illustrated in Figure 6 with key model details provided in Table 7.

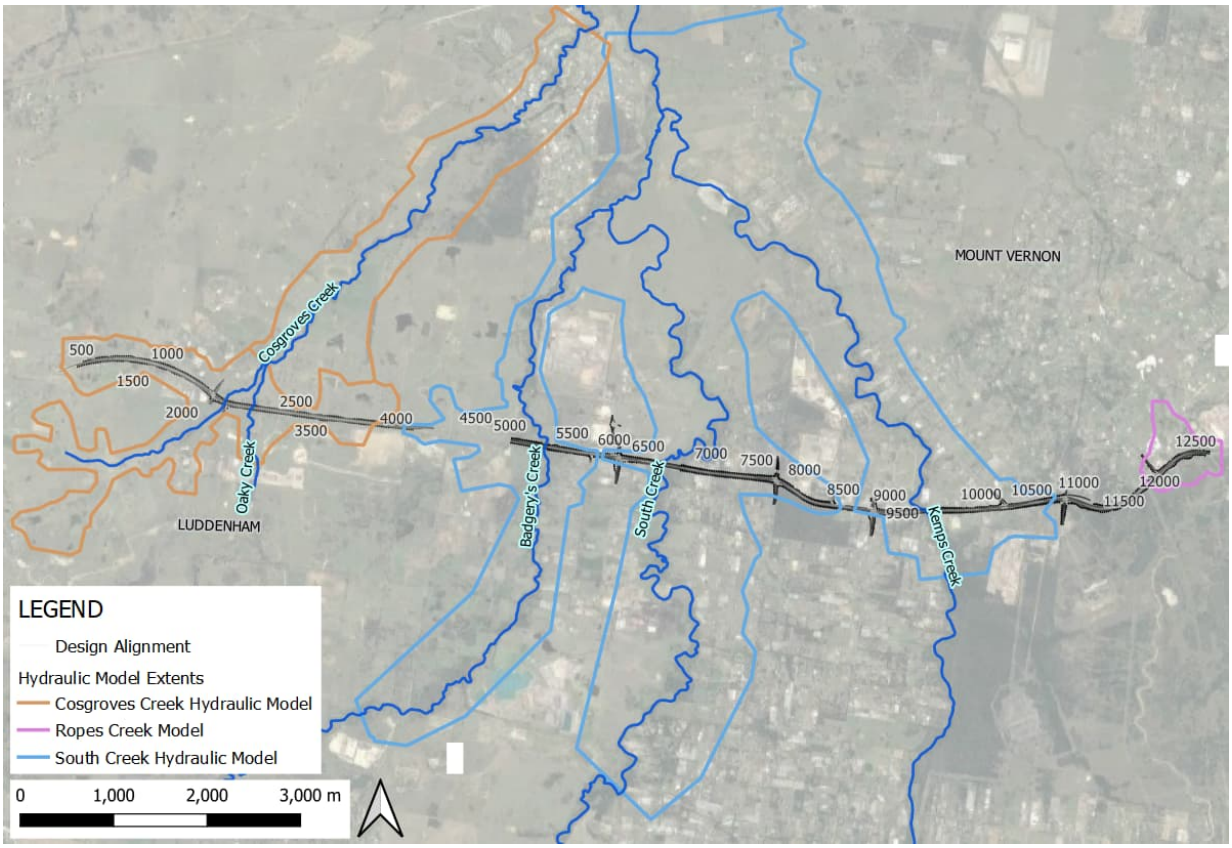


Figure 6 Hydraulic Model Extents

Table 7 Key TUFLOW model details

Component	Cosgroves Creek model (including Cosgroves Creek and Oaky Creek)	South Creek model (including Badgerys Creek, South Creek and Kemps Creek)	Ropes Creek model
Model version	2020-10-AB	2020-10-AB	2020-10-AB
Solution scheme	HPC GPU	HPC GPU	HPC GPU
Grid size	2.0 m	5.0 m, increased for efficient runtimes, and compared with 2.0m grid modelling	2.0 m
Modelled AEPs	50%, 20%, 10%, 5%, 2%, 1% AEPs, 1in2000 AEP and Probable Maximum Flood (PMF)		
Digital Elevation Model (DEM)	• ALS Survey (2011 & 2017) • Design of the M12 Motorway (2020) • Design of the WSA development (2020)	• ALS Survey (2011 & 2017) • Design of the M12 Motorway (2020) • Design of the WSA development (2020)	• ALS Survey (2011 & 2017)
Inflows	• Inflow hydrographs generated in accordance with ARR 2019 • Inflow hydrographs from DRAINS were applied at the upstream boundary of the Cosgroves Creek model • Inflow hydrographs from DRAINS were applied across the model area • Inflow source area locations were adjusted to not cause artificial overtopping of the road or culvert instabilities	• Inflow hydrographs generated in accordance with ARR 2019 • Inflow hydrographs from XP-RAFTS were applied at the upstream boundary of the South Creek model • Inflow hydrographs from DRAINS were applied across the model area • Inflow source area locations were adjusted to not cause artificial overtopping of the road or culvert instabilities	• Inflow hydrographs generated in accordance with ARR 2019 • Inflow hydrographs from DRAINS were applied across the model area • Inflow source area locations were adjusted to not cause artificial overtopping of the road or culvert instabilities
Downstream boundary conditions	Stage-discharge boundary based on a friction slope	Free discharge	Stage-discharge boundary based on a friction slope
Roughness	Spatially varying distribution based on type of land use		

4.2 Design Events Assessed

Hydraulic modelling was undertaken for Future Base Case for the following design flood events:

- 50%, 20%, 10%, 5%, 2% and 1 per cent AEP design events for storm durations ranging from 30 minutes to 24 hours with ten temporal patterns run for each storm duration
- 1 in 2000 AEP design event for storm durations ranging from 30 minutes to 24 hours with ten temporal patterns run for each storm duration
- PMF design event for a single temporal pattern per duration.

For hydraulic modelling of the Design Case, a sub-set of critical storm durations was identified for assessment based on a review of the Future Base Case model results. Model results for the design case were reviewed to confirm that a sufficient range of critical storm durations had been captured to adequately inform a 100% concept level of design. Hydraulic modelling for the Design Case was undertaken for the following design flood events:

- 50%, 20%, 10%, 5%, 2% and 1 per cent AEP design events for the 1hr to 18 hr storm events with ten temporal patterns run for each storm duration.
- 1 in 2000 AEP design event for the 1hr, 3hr, 6 hr and 12hr storm events with ten temporal patterns run for each storm duration.
- PMF design event for a single temporal pattern for a critical duration.

4.3 Boundary Conditions

Hydraulic model boundary conditions consisted of the application of inflow hydrographs sourced from the hydrologic models described in Section 3.0 at upstream boundaries, local inflows at key locations within the hydraulic model domain and outflow boundaries at the downstream hydraulic model extents. The location, hydrologic model source and type of boundary conditions applied to the hydraulic models are illustrated in Figure 7.

It is noted that compared to the model provided by Lyall and Associates (2019) some local inflow locations (TUFLOW SA Source Areas) were shifted to be sufficiently upstream of structures and within channels (i.e. assuming longitudinal drainage is sufficiently sized for local runoff). This helped in maintaining culvert stability. Some SA's were also shifted to not be on top of the design alignment and result in artificial road overtopping.

In the Cosgroves Creek hydraulic model, a single stage-discharge downstream boundary was applied. In the South Creek hydraulic model, as single free outflow boundary was applied. In the Ropes Creek model a single stage-discharge downstream boundary was applied. The backwater effects from these model outlet boundaries do not affect hydraulic results within the design area.

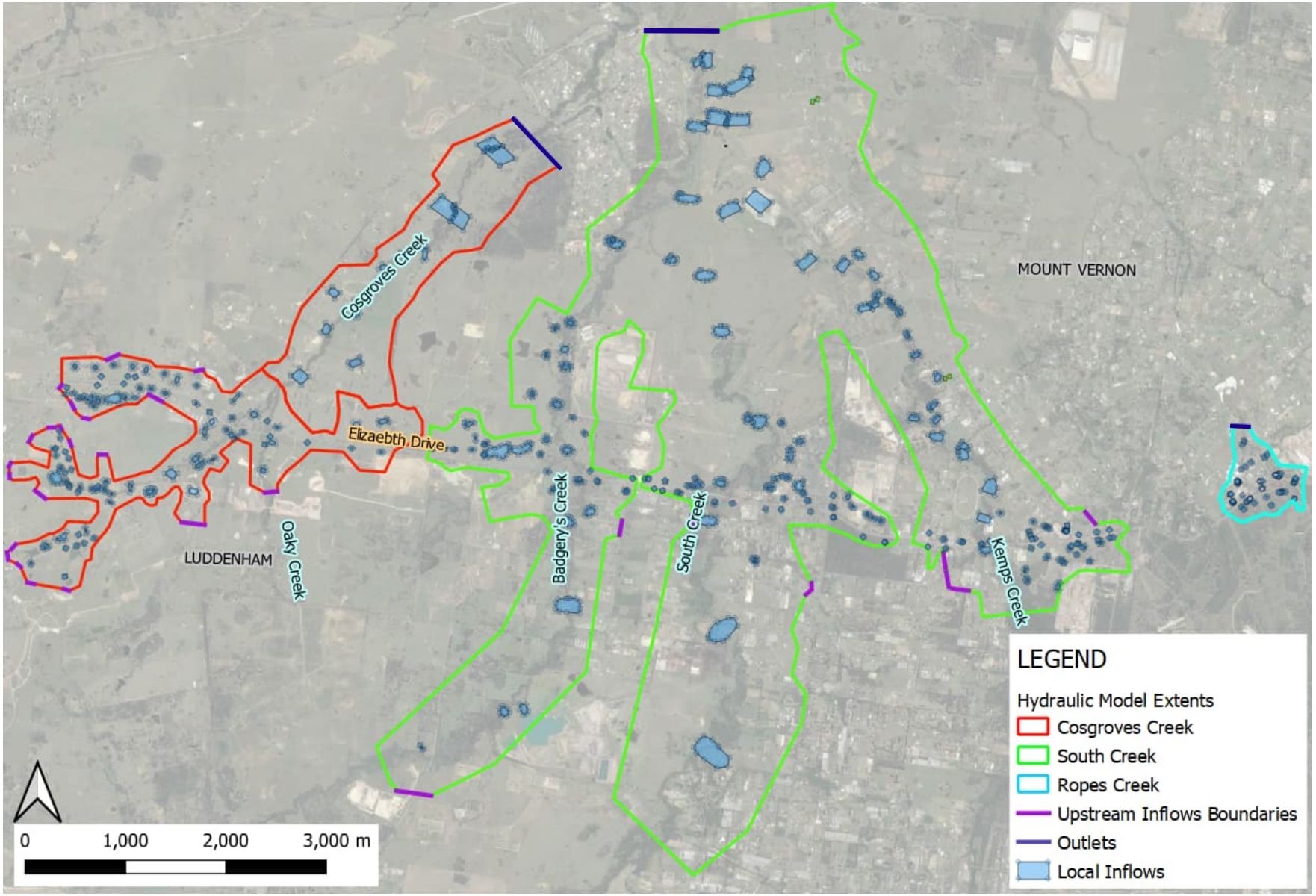


Figure 7 Hydraulic Model Primary Boundary Conditions

4.3.1 Initial Water Level

There are a number of farms dams within the Cosgroves Creek, South Creek and Ropes Creek hydraulic models that were set to full capacity at the commencement of model simulations.

In the South Creek model, the flood level results from the 50 per cent AEP (18-hour storm duration) was adopted as the global initial water level, to fill in any minor dams not manually accounted for.

4.3.2 Hydraulic Roughness

The spatial variation in surface roughness has been represented in the TUFLOW hydraulic models by applying Manning's roughness factors onto different areas within the model domain. These values were based on the (Lyall and Associates, 2019) hydraulic model. The range in Manning's values (and primary areas of application) are shown in Table 8, with the spatial variation in Manning's roughness illustrated in Figure 8.

Table 8 Adopted surface roughness values

Surface material	Manning's roughness (n) value
Reinforced concrete pipes and box culverts	0.015
Roads	0.020 or 0.030
Remnant cleared pastureland	0.045
South Creek channel bed	0.050
Macrophytes	0.060
Light vegetation	0.070
Trees and shrubs	0.090
Allotments	0.100
Dense vegetation	0.120
Buildings	10.000

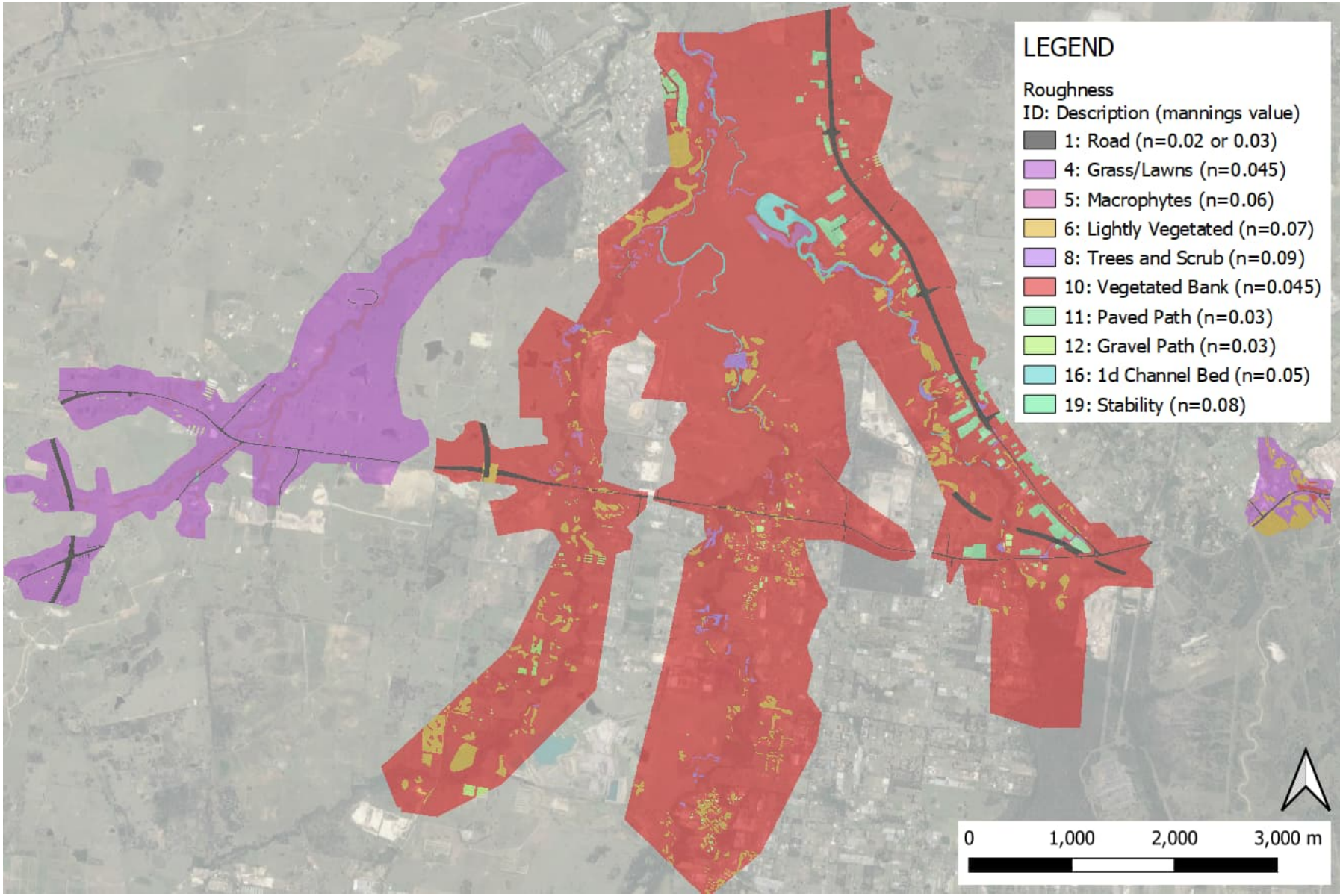


Figure 8 Manning's Extents

4.4 Hydraulic Model Topography

4.4.1 Future Base Case Conditions Topography

The following datasets were used to inform the Future Base Case Conditions topography of the Cosgrove Creek, South Creek and Ropes Creek TUFLOW models:

- LiDAR data (2011 and 2017, NSW Government - Spatial Services, 1m gridding
- Western Sydney Airport (WSA) digital elevation model (supplied by Transport)
- M12 digital elevation model (GHD, 2021).

To more accurately define the invert level and dimensions of gullies, TUFLOW Z shapes were used to define key gully lines.

For the Cosgroves Creek model, some of the gully lines were removed to induce more stable water levels with the new TUFLOW solver.

4.4.2 Design Conditions Topography

To represent the geometry of the proposed road upgrades, the Future Base Case conditions topography was modified in the TUFLOW models by ‘stamping’ on the proposed road surface. The following datasets were applied in this regard:

- Elizabeth Drive West Concept Design Road Model dated 6 July 2021 (AECOM, 2021)
- Elizabeth Drive East Concept Design Road Model dated 15 March 2022 (AECOM, 2022)
- Longitudinal drainage concept design dated 15 March 2022 (AECOM, 2022).

Figure 9 provides a comparison of design conditions topography compared to Future Base Case conditions topography and illustrates the proposed change in ground surface.

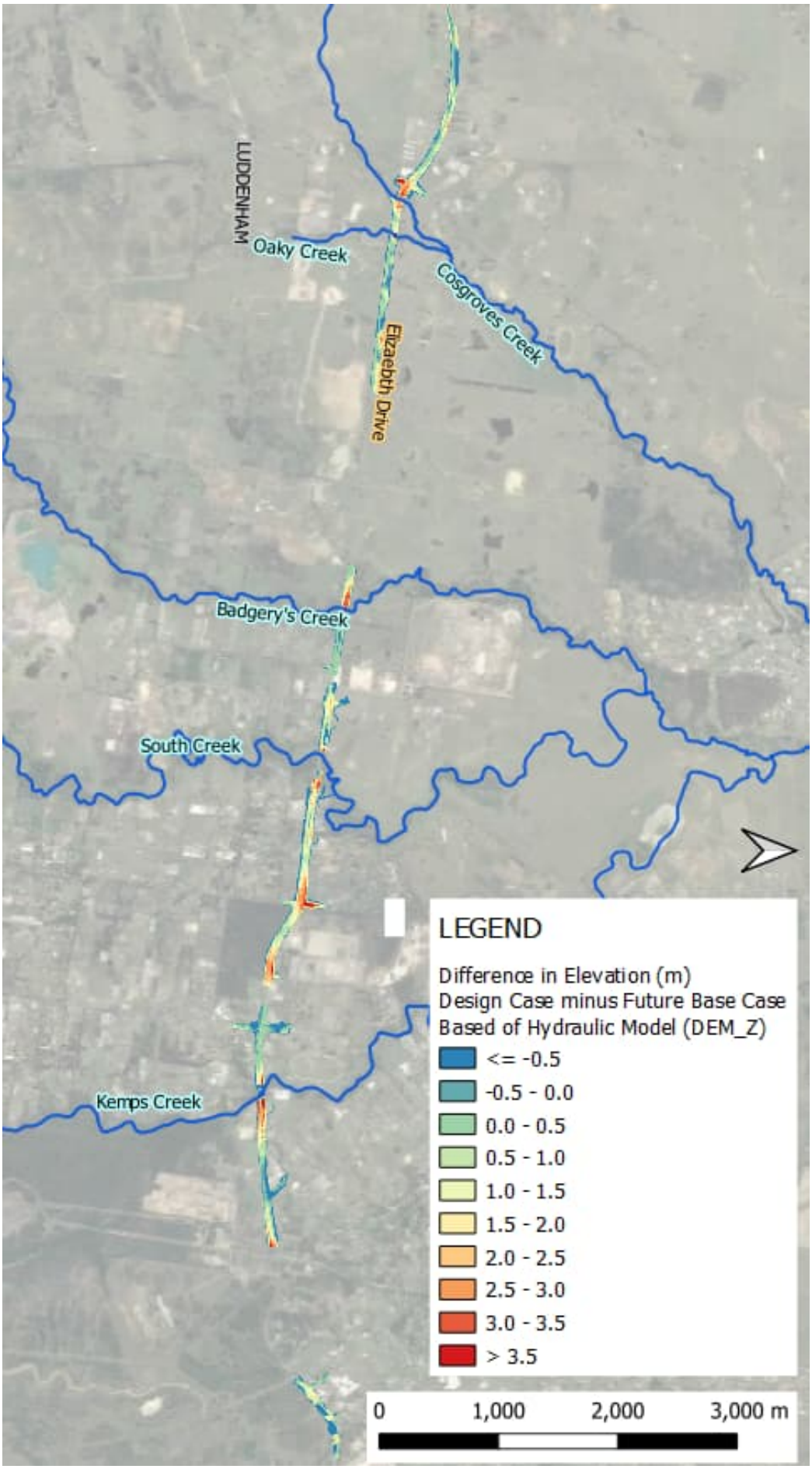


Figure 9 Difference in elevation between design and existing hydraulic modelling

4.5 Hydraulic Structures

Hydraulic structures (bridges and culverts) with potential to influence flood behaviour in both Future Base Case and Design conditions have been included in the Cosgrove Creek, South Creek and Ropes Creek TUFLOW models respectively.

Culverts have been modelled in 1D as 1D networks, with connections into the 2D domain (TUFLOW SX connections) to collect and outlet flood waters.

Bridges have been modelled as TUFLOW layered flow constrictions (lfsch) with Blockage and Form Loss Coefficients (FLC) calculated using guidance from Hydraulics of Bridge Waterways (Bradley, 1960), with calculation charts presented in Appendix E.

4.5.1 Future Base Case Condition Hydraulic Structures

The location and type of Future Base Case hydraulic structures (bridges and culverts) located within the TUFLOW model domain are illustrated in Figure 10 with key details (including dimensions, assumptions, and data source) provided in Appendix C.

It is noted that bridge details including deck/soffit dimensions and pier geometry have been obtained from "As Constructed" bridge drawings sourced from the Department of Main Roads, NSW.

4.5.2 Design Condition Hydraulic Structures

The location, type and dimensions of the hydraulic structures (bridges and culverts) associated with the proposed road upgrades are illustrated in Figure 11 with key details of hydraulic structure upgrades (including dimensions, assumptions and data source) provided for bridge structures in Table 10 and culvert structures in Table 11. An overall summary of cross drainage structures is presented in Table 9.

It is noted that proposed bridges are assumed to be comprised of super T type, with 11 circular piers in parallel with bored piles.

The configuration of bridges and culverts are based on the concept design prepared for the Elizabeth Drive upgrades and would be subject to detailed design development.

Table 9 Summary of Design Culverts

Chainage	EDU Section / Hydraulic Model	Number of New Culverts	Largest Culvert Structure
200 - 1700	West/Cosgroves	2	3/600 RCP
1700-3600	West/Cosgroves	7	6/2700x600 RCBC
5000 - 6000	East/South	2	5/1500x1500 RCBC
6000 - 7800	East/South	10	6/1800x1200 RCBC
7800 - 9000	East/South	5	6/750 RCP
9000 - 10800	East/South	2	8/1800x1200 RCBC
12060 - 12780	East/Ropes	4	4/600 RCP

Table 10 Summary of Design Bridges

Chainage	EDU Section / Hydraulic Model	Bridge Name	Design Bridge Details	Existing Bridges (to be replaced with Design Bridge)
1900	West/Cosgroves	Cosgroves Creek Bridge	1/22m Spans	3/7m Spans
5400	East/South	Badgerys Creek Bridge	2/17m Spans	2/10m Spans
6700	East/South	South Creek Bridge	6/28m Spans	5/10m Spans and 2/10m Spans
9500	East/South	Kemps Creek Bridge	6/18m Spans	2/10m Spans

Table 11 Proposed Culverts (Replacement and Additions)

Location	Culvert	Chainage	Proposed Culvert Size	Addition or Replacement
West	PXD01	1000	3/1200x600 RCBC	Replacement of 3/375 RCP
West	PXD30	1150	900 RCP	Replacement of 2/375 RCP
West	PXD03	1750	6/2700x600 RCBC	Addition
West	PXD04	1760	2/600 RCP	Addition
West	EXD05b	1900	450 RCP	Replacement of 450 RCP
West	PXD12	2200	3/1800x1500 RCBC	Replacement of 3/1800x1500 RCBC
West	PXD15	3100	600 RCP	Replacement of 375 RCP
West	PXD09	3400	525 RCP	Replacement of 2/600 RCP
East	PXD11	5300	5/1500x1500 RCBC	Replacement of 2/7000x4000 RCBC
East	AE120	5530	525 RCP	Addition
East	PXD32	6150	2/450 RCP	Replacement of 375 RCP
East	PXD11a	6200	600 RCP	Addition
East	AE124	6385	2/600 RCP	Addition
East	Box_9	6900	6/1800x1200 RCBC	Replacement of 4/1350x900 RCBC
East	PXD29	6980	4/1200 RCP	Addition
East	PXD27	7060	3/900 RCP	Addition
East	PXD33	7130	2/1800x600 RCBC	Addition
East	PXD31	7270	4/2400x1200 RCBC	Replacement of 3/2000x600 RCBC
East	EXD19	7680	2/750 RCP	Replacement of 2/750 RCP
East	PXD16A	7900	6/750 RCP	Addition
East	Pipe_12	7900 (Further North)	4/1500x1500 RCBC	Replacement of 2/375 RCP
East	PXD16A	7900 (North)	525 RCP	Addition

Location	Culvert	Chainage	Proposed Culvert Size	Addition or Replacement
East	EXD21	8300	3/525 RCP	Replacement of 3/535 RCP
East	PXD25	9020	750 RCP	Addition
East	PXD20	9420	4/1200 RCP	Addition
East	PXD28	9610	8/1200x1800 RCBC	Addition
East	Pipe_16	10400	4/1800x900 RCBC	Replacement of 3/1350 RCP
East	RC_PXD29	12300	4/600 RCP	Replacement of 2/600 RCP
East	RC_PXD30	12475	4/600 RCP	Replacement of 2/600 RCP
East	RC_PXXD31	12650	4/600 RCP	Replacement of 2/600 RCP
East	Duff Rd	12200	600 RCP	Replacement of 1/525 RCP

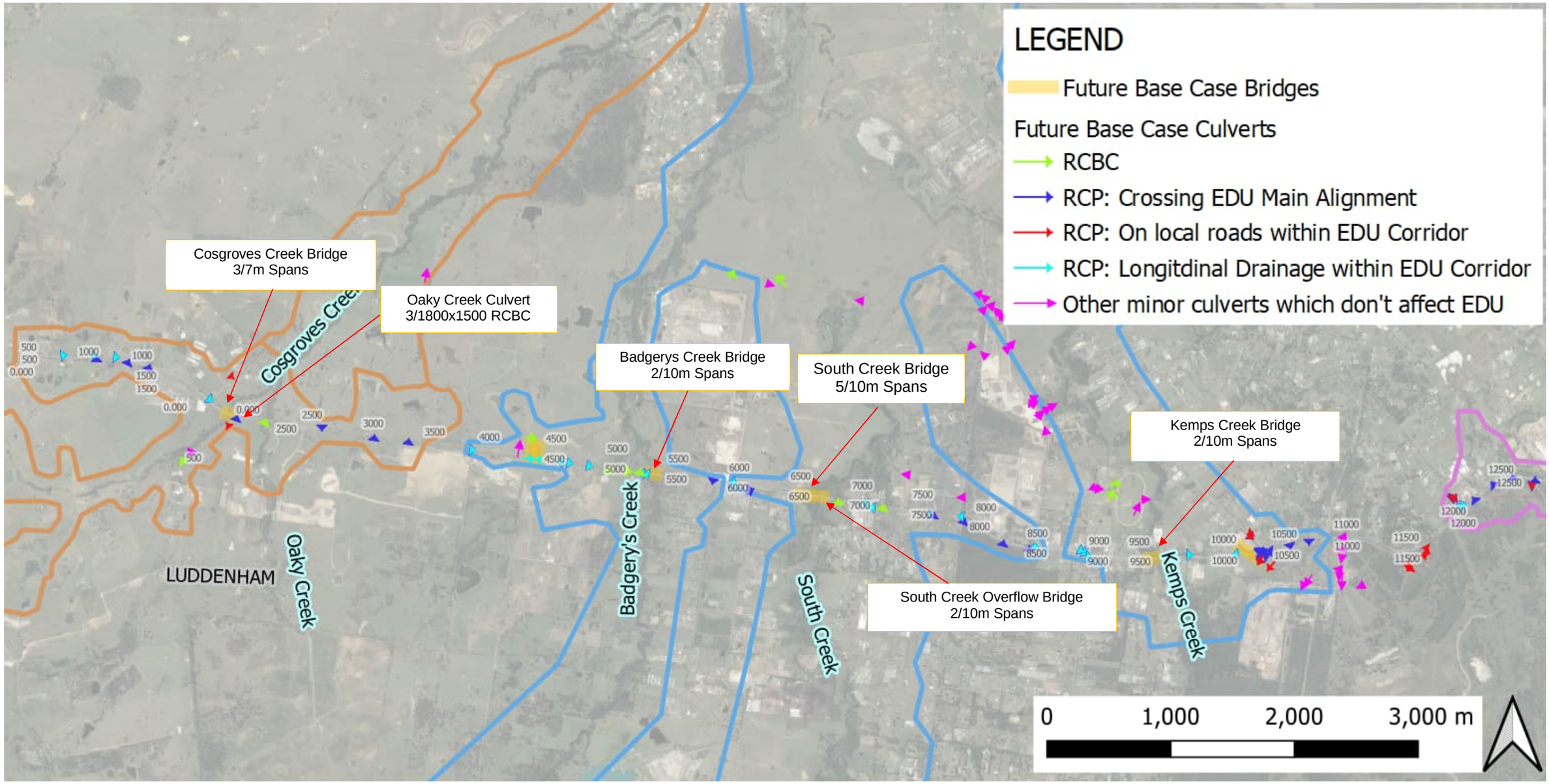


Figure 10 Future Base Case Structures

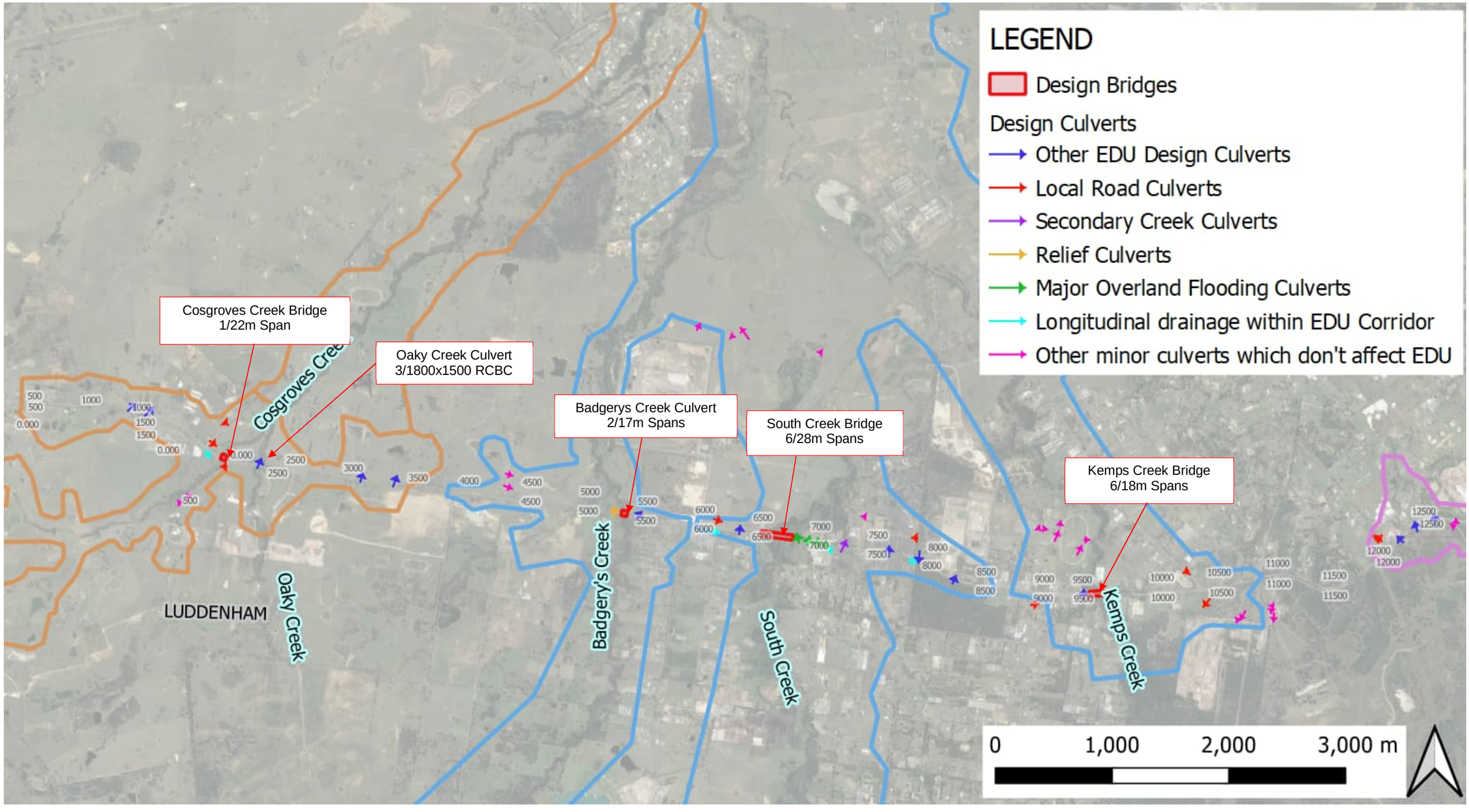


Figure 11 Design Case Structures

5.0 Future Base Case Flood Behaviour

This section provides a summary of the hydraulic modelling and key results for Future Base Case conditions including:

- Identification of critical storm durations (refer Section 5.1)
- Summary of design event hydraulic model results (refer Section 5.2)
- Flood depths (refer Section 5.3)
- Velocities (refer Section 5.4)
- Hazard (refer Section 5.5)
- Flood behaviour at creek crossings (refer Section 5.6).

5.1 Identification of Critical Storm Durations

The critical storm duration for a given AEP design flood event is the storm duration and associated temporal pattern that results in the peak flood level at a given location of interest.

Table 12 provides a summary of the critical storm durations and temporal patterns identified for each AEP design event for Future Base Case conditions at bridge locations.

While the hydrologic model can be used to identify critical storm durations and temporal patterns (TPs) based on peak flow rate, it may not capture local storage effects and other hydraulic influences. As a result, it is noted that the full range of storm durations and temporal patterns have been simulated in the hydraulic model for a given AEP to identify maximum expected flood levels and associated critical storm durations at key locations.

Table 12 Critical durations and temporal patterns at bridge crossings

Model / Catchment	Bridge crossing	Event AEP	Critical duration	Median temporal pattern
Cosgroves Creek catchment	Cosgroves Creek Oaky Creek	PMF	60 min (1 hour)	NA
		0.05%	180 min (3 hour)	TP 1 (ID=4627)
		1%	120 min (2 hour)	TP 6 (ID=4626)
		2%	120 min (2 hour)	TP 6 (ID=4626)
		5%	180 min (3 hour)	TP 4 (ID=4624)
		10%	180 min (3 hour)	TP 4 (ID=4624)
		20%	360 min (6 hour)	TP 5 (ID=4696)
		50%	1440 min (24 hour)	TP 8 (ID=4871)
South Creek catchment	Badgerys Creek South Creek (west) South Creek (east) Kemps Creek	PMF	360 min (6 hour)	NA
		0.05%	720 min (12 hour)	TP 1 (ID=4703)
		1%	720 min (12 hour)	TP 5 (ID=4791)
		2%	720 min (12 hour)	TP 10 (ID=4801)
		5%	720 min (12 hour)	TP 7 (ID=4793)
		10%	720 min (12 hour)	TP 8 (ID=4794)
		20%	1080 min (18 hour)	TP 7 (ID=4827)
		50%	1080 min (18 hour)	TP 8 (ID=4828)
Ropes Creek catchment	Ropes Creek	PMF	30 min (0.5 hours)	NA
		0.05%	45min (0.75 hour)	TP 9 (ID=4543)
		1%	60 min (1 hour)	TP 7 (ID=4569)
		2%	60 min (1 hour)	TP 6 (ID=4568)
		5%	60 min (1 hour)	TP 7 (ID=4569)
		10%	60 min (1 hour)	TP 3 (ID=4565)
		20%	60 min (1 hour)	TP 8 (ID=4772)
		50%	180 min (3 hour)	TP 7 (ID=4665)

5.2 Summary of Future Base Case Hydraulic Model Results

A summary of hydraulic model results at existing waterway crossings and key locations along ED (refer Figure 12) are provided in Table 14.

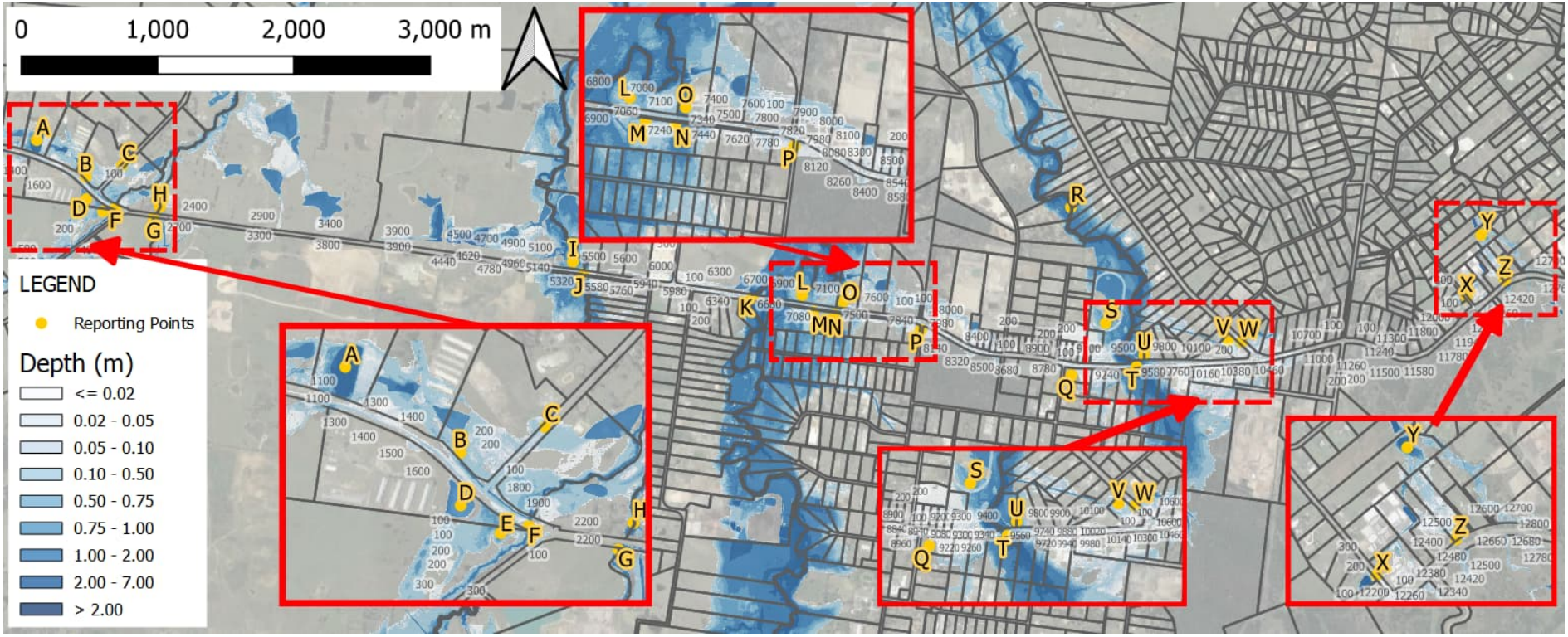


Figure 12 1 per cent AEP Future Base Case flood depths with key reporting point locations for Table 13

Table 13 Summary of Future Base Case Results (50 per cent AEP and 1 per cent AEP)

Location			Critical Storm Duration (hrs)	Results [1]			
ID	Chainage	Structure Type		Peak Flood Level (mAHD)	Flow Depth (m) [2]	Hazard Classification [3]	Velocity (m/s)
A	1150	Dam	24 / 2	65.1 / 65.2	2.2 / 2.4	5 / 5	0.2 / 0.2
B	1600	Floodplain	24 / 2	59.3 / 59.8	0.4 / 0.9	2 / 5	0.5 / 1.1
C	1750	Road	24 / 2	58.1 / 58.2	0.1 / 0.2	1 / 1	0 / 0.2
D	1700	Dam	24 / 2	59.7 / 60	1 / 1.3	3 / 3	0 / 0
E	1840	Floodplain	24 / 2	58.7 / 59	0.8 / 1.1	3 / 3	0 / 0.1
F	1900	Cosgroves Creek Bridge	24 / 2	57.6 / 58.3	1.3 / 2	4 / 5	0.5 / 1.1
G	2200	Culvert CC_EXD14 (US)	24 / 2	55.9 / 56.8	0.3 / 1.2	1 / 4	0.2 / 0.7
H	2200	Culvert CC_EXD14 (DS)	24 / 2	55.9 / 56.4	1.2 / 1.7	3 / 5	0.3 / 0.7
I	5300	Culvert SC_EXD57 (DS)	18 / 12	0 / 46.1	0 / 0.7	0 / 3	0 / 0.4
J	5380	Badgerys Creek Bridge	18 / 12	45.8 / 46.9	2.7 / 3.8	5 / 6	0.8 / 2
K	6640	South Creek Bridge	18 / 12	42 / 43.2	3.6 / 4.9	5 / 6	0.5 / 1
L	7000	Floodplain, Culvert in the design case	18 / 12	41.5 / 42.2	0 / 0.4	3 / 2	0.1 / 0.3
M	7100	Floodplain, Culvert in the design case	18 / 12	0 / 43.2	0 / 0.2	0 / 1	0 / 0
N	7260	Culvert SC_EXD18 (US)	18 / 12	41.6 / 43.2	0 / 1.6	1 / 4	0.1 / 0.3

Location			Critical Storm Duration (hrs)	Results [1]			
ID	Chainage	Structure Type		Peak Flood Level (mAHD)	Flow Depth (m) [2]	Hazard Classification [3]	Velocity (m/s)
O	7300	Culvert SC_EXD18 (DS)	18 / 12	40.9 / 42.1	0.4 / 1.6	H3 / H4	0.1 / 0.5
P	7900	Road	18 / 12	0 / 47.8	0 / 0.1	0 / H1	0 / 0.2
Q	9080	Floodplain, Culvert in the design case	18 / 12	0 / 55.9	0 / 0	0 / H1	0 / 0
R	9300	Creek	18 / 12	42.6 / 44	2.2 / 3.7	H5 / H6	0.7 / 0.8
S	9320	Dam	18 / 12	0 / 46.2	0 / 0.8	0 / H3	0 / 0.1
T	9540	Kemps Creek Bridge	18 / 12	45.6 / 47.5	2 / 3.9	H5 / H6	0.4 / 1.8
U	9600	Floodplain, Culvert in the design case	18 / 12	0 / 46.9	0 / 1.1	0 / H3	0 / 0.3
V	10240	Culvert SC_Pipe_16 (DS)	18 / 12	0 / 57.5	0 / 0.2	0 / H1	0 / 0.3
W	10400	Road	18 / 12	58.5 / 58.7	0.1 / 0.2	H1 / H1	0.4 / 0.6
X	12200	Road	3 / 1	0 / 103	0 / 0.2	0 / H1	0 / 0.3
Y	12540	Dam	3 / 1	92.2 / 92.8	2.8 / 3.4	H5 / H5	0 / 0.1
Z	12480	Floodplain, Culvert in the design case	3 / 1	0 / 101.1	0 / 0	0 / H1	0 / 0.8

[1] – Results are presented for different AEPs as 50% / 1 per cent AEP

[2] – Depths are rounded to the nearest 100mm; therefore some values will register as zero, but may in fact be very shallow

[3] – Hazard and Change in Hazard is based on the Australian Emergency Management Institute (2014) H1 to H6 flood hazard classification

5.3 Flood Depth

The existing Elizabeth Drive alignment is overtopped at a number of locations within the ED-West and ED-East sections of the Elizabeth Drive upgrades, as described in the following sections.

5.3.1 ED-West

In the 1 per cent AEP design event, overtopping flood depths are generally shallow (less than 200mm) with some sections of ED overtopped by depths of up to 500mm (refer Figure 13). The overtopped sections of road and the design intention of raising the road to be immune in a 1 per cent AEP design flood event imply that significant afflux will occur if sufficient cross drainage is not provided as part of the road upgrade. It is noted there is no overtopping of ED in the 1 per cent AEP design flood event in the vicinity of Oaky Creek in the Future Base Case scenario.

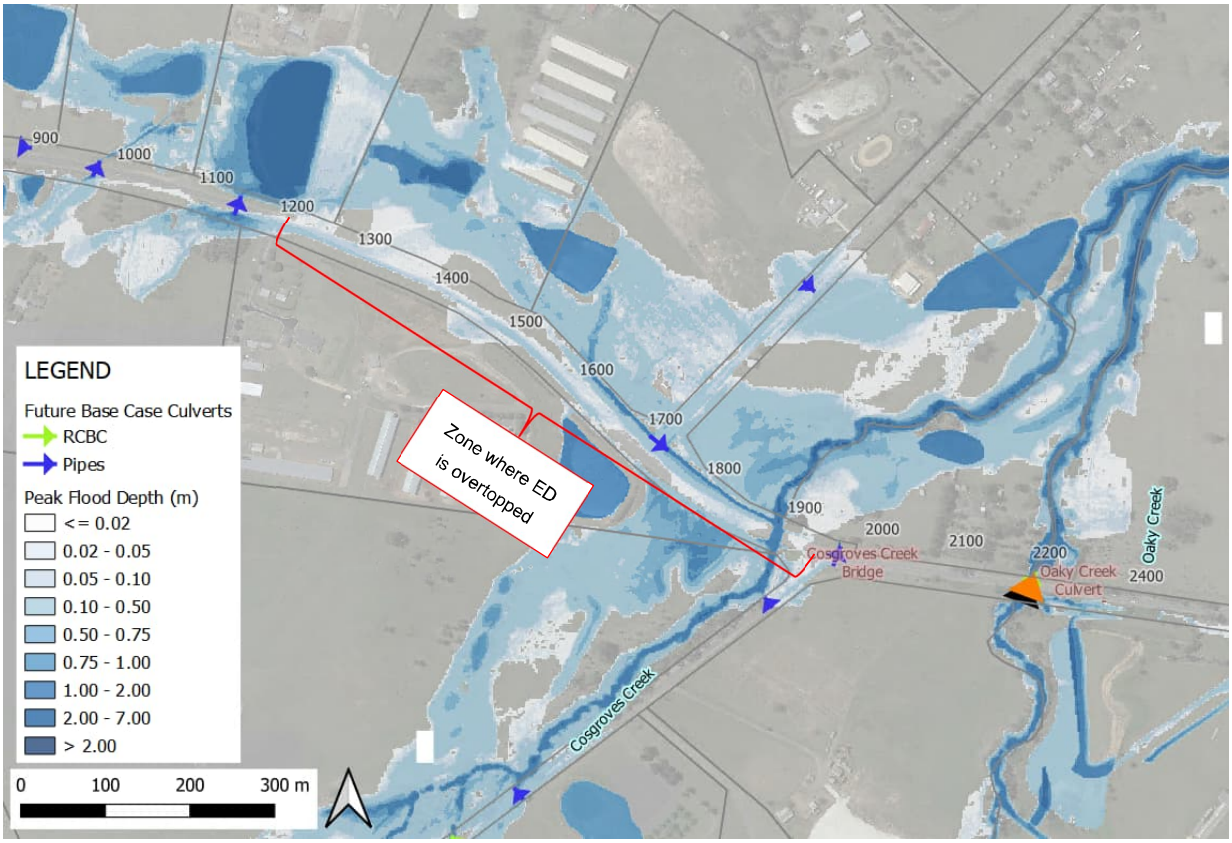


Figure 13 ED-West at Cosgroves Creek - Future Base Case 1 per cent AEP Flood Depth

5.3.2 ED-East

The depth of overtopping in the 1 per cent AEP design flood event for the ED-East section of ED in the vicinity of Badgerys Creek, South Creek, Kemps Creek and Ropes Creek is provided in Figure 14, Figure 15, Figure 16, and Figure 17 respectively. Overtopping flood depths reach a maximum of 600mm, 350mm and 100mm for Badgerys Creek, South Creek and Kemps Creek respectively, which significantly affects the trafficability of the existing road in such an event. It is noted there is no overtopping of the road expected during a 1 per cent AEP design flood event in the vicinity of Ropes Creek (refer to Figure 17).

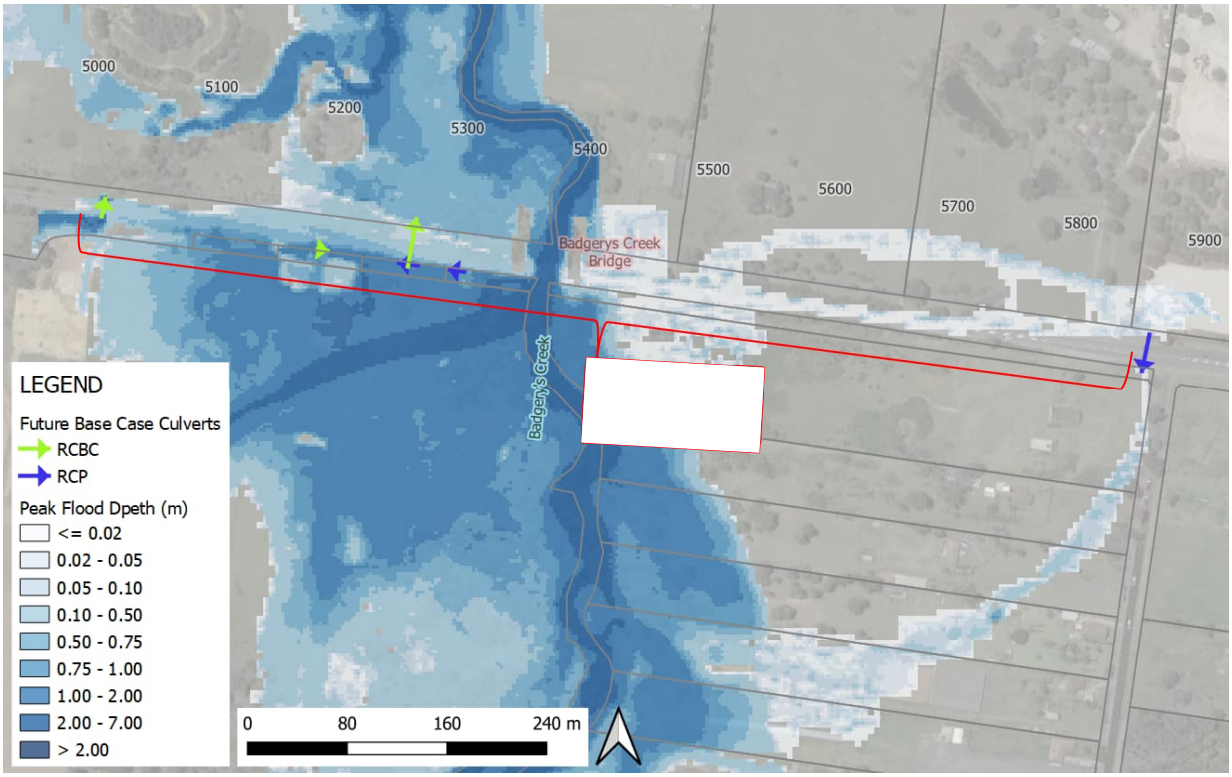


Figure 14 ED-East at Badgerys Creek - Future Base Case 1 per cent AEP Flood Depth

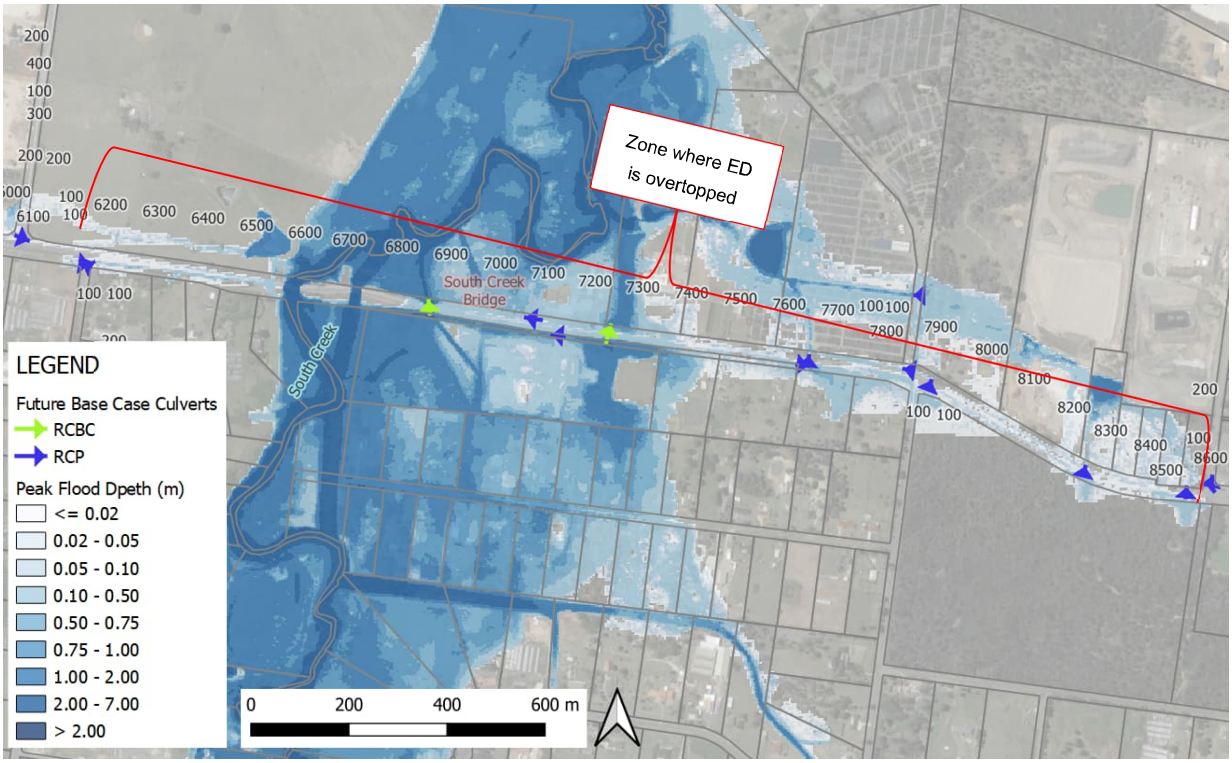


Figure 15 ED-East at South Creek - Future Base Case 1 per cent AEP Flood Depth

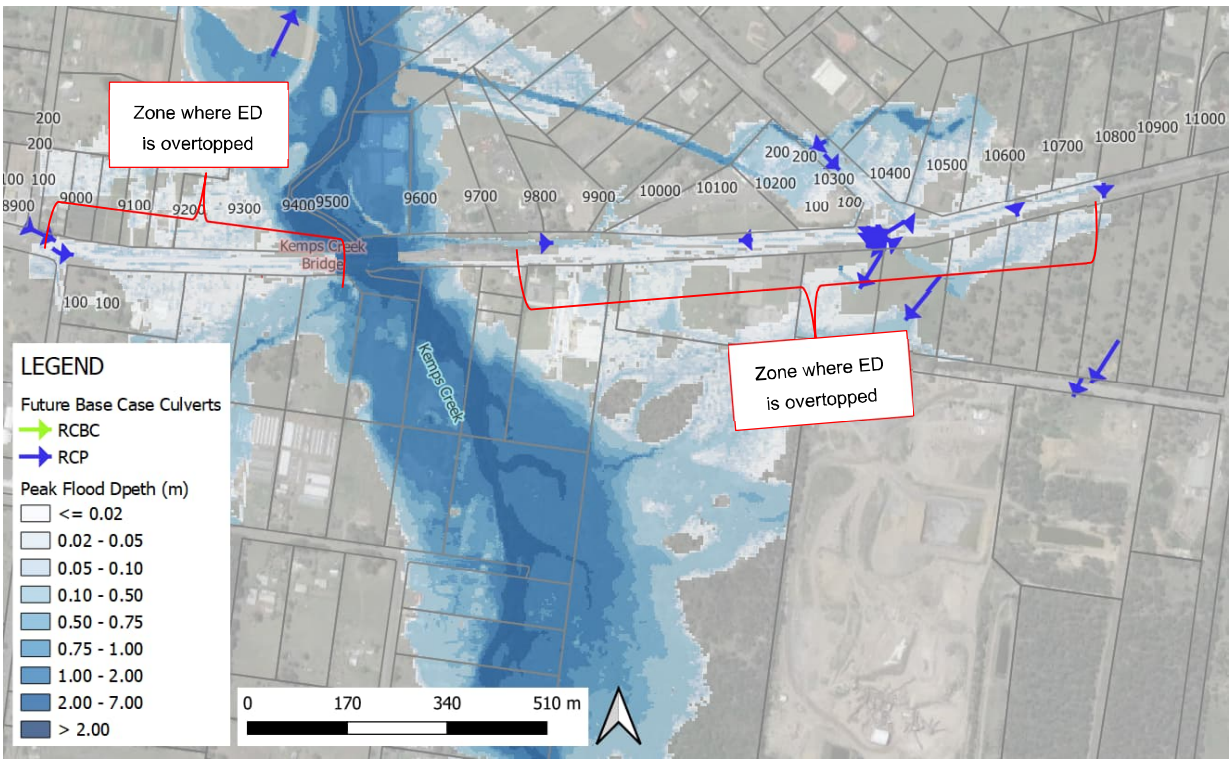


Figure 16 ED-East at Kemps Creek - Future Base Case 1 per cent AEP Flood Depth

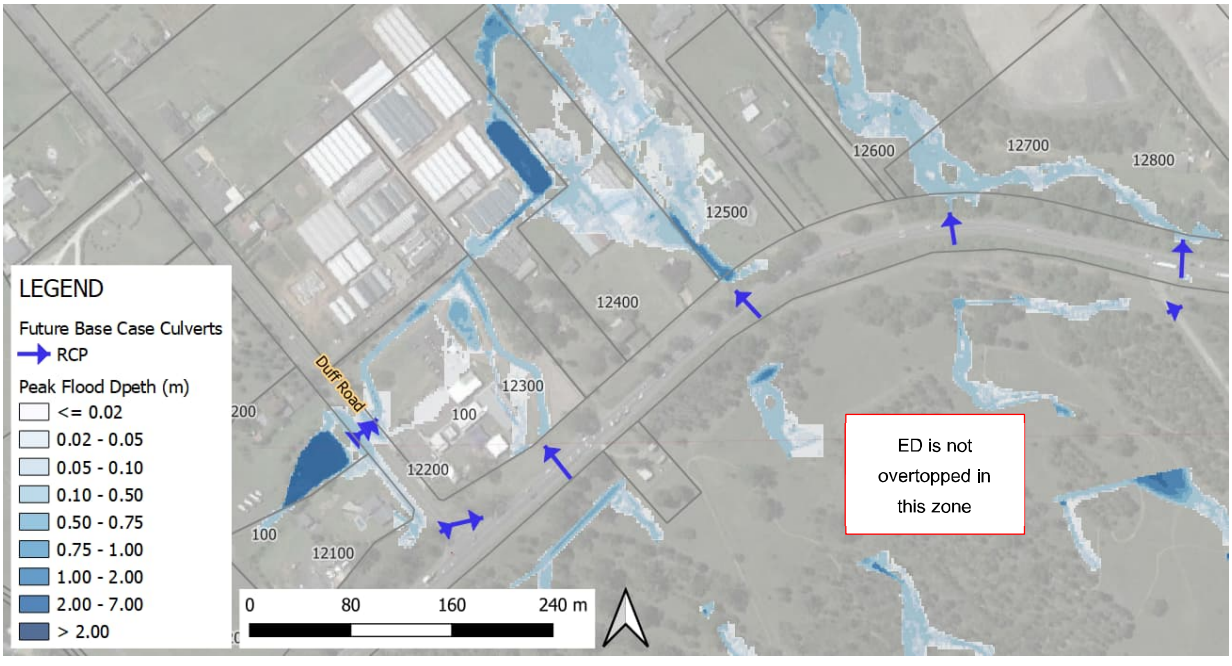


Figure 17 ED-East at Ropes Creek Catchment - Future Base Case 1 per cent AEP Flood Depth

5.4 Flood Velocity

Peak flood velocities along the Elizabeth Drive alignment are presented in Figure 18 for the 1 per cent AEP design flood event. Reference to Figure 18 illustrates that velocities generally do not exceed 2.5 m/s within the study area.

5.5 Flood Hazard

A flood hazard map illustrating 1 per cent AEP flood hazard is provided in Figure 19. It is noted that flood hazard has been mapped in accordance with the Australian Emergency Management Institute (2014) H1 to H6 flood hazard classifications, which include the following:

- H1: Generally safe for vehicles, people and buildings.
- H2: Unsafe for small vehicles.
- H3: Unsafe for vehicles, children and the elderly.
- H4: Unsafe for vehicles and people.
- H5: Unsafe for vehicles and people. All building types vulnerable to structural damage. Some less robust building types vulnerable to failure.
- H6: Unconditionally dangerous. Unsafe for vehicles and people. All building types considered vulnerable to failure.

Across the current Elizabeth Drive alignment, the flood hazard category is H1 (i.e., generally safe) on the crest and H2 (unsafe for small vehicles) on the verge. The creeks reach up to hazard classification H5 (Unsafe for all people/vehicles) and H6 (Unconditionally dangerous).

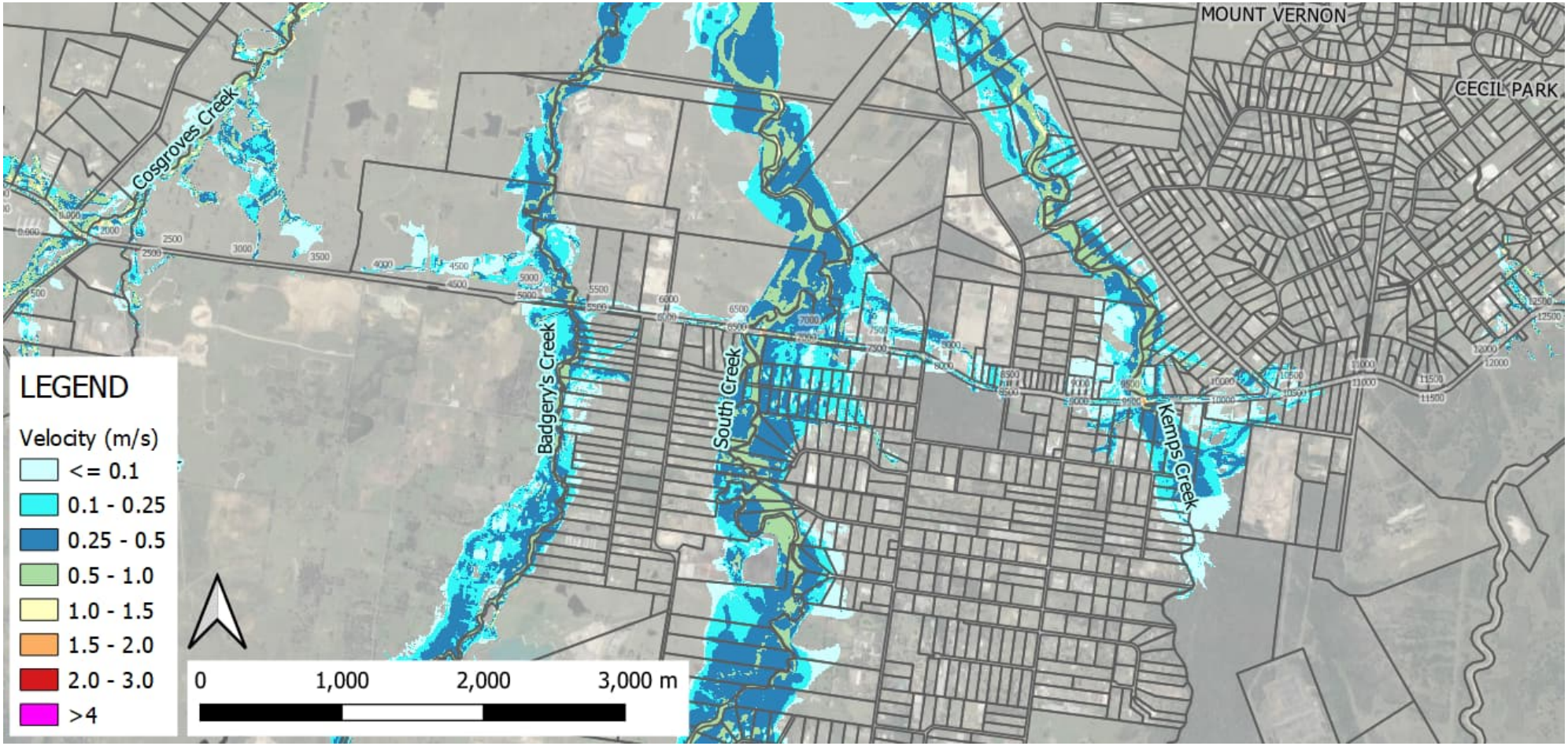


Figure 18 Future Base Case 1 per cent AEP Velocities

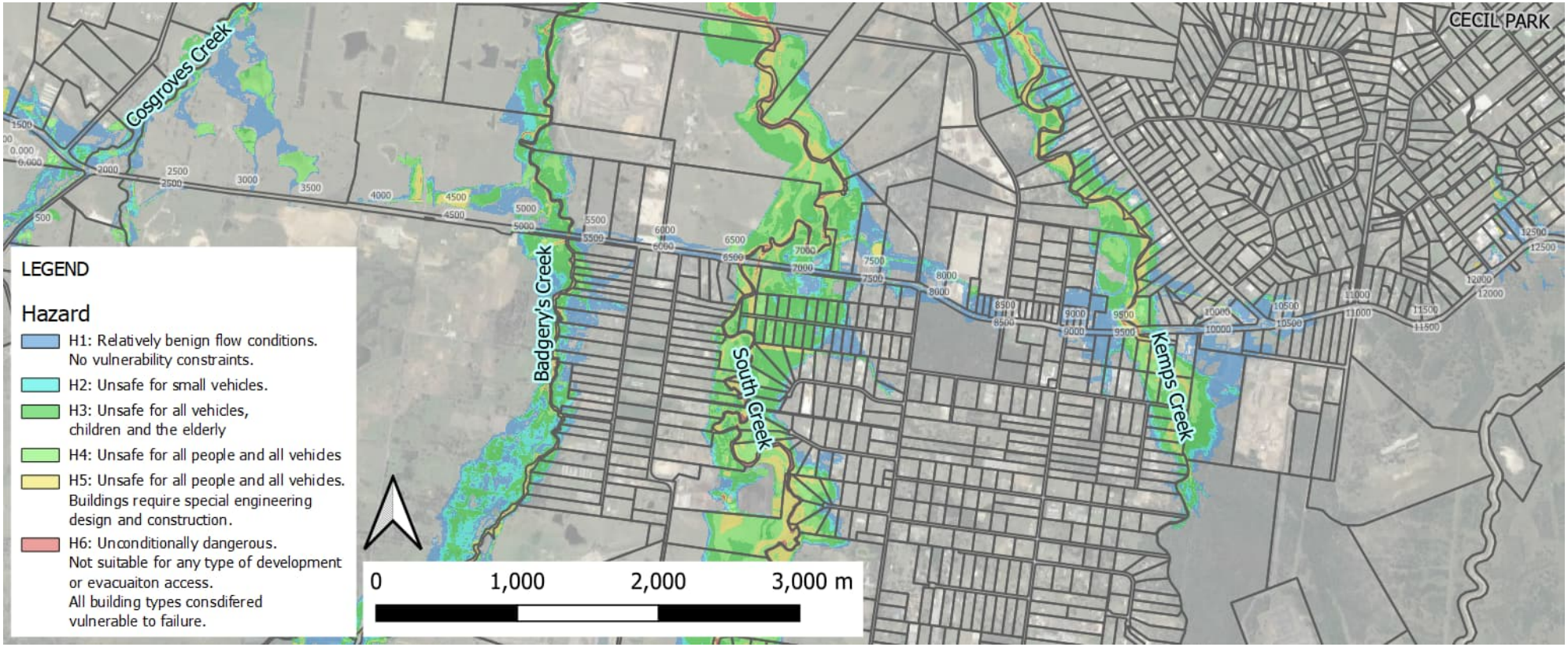


Figure 19 Future Base Case 1 per cent AEP Flood Hazard

5.6 Flood Behaviour at Creek Crossings

An summary of design event flood levels relative to existing bridge and culvert levels is provided in Table 14 and Table 15 with 1 per cent AEP design flooding discussed in the following sections.

It is noted that the hydraulic characteristics at the existing bridges are not detrimental to the integrity of the bridges, the effects of raising the alignment (to avoid road inundation in some sections) will imply demolishing of the existing bridges and replacement with design bridges conforming to the latest design standards. The existing bridges were constructed pre 1970 and since this point guidelines have been updated to reflect greater vehicle conveyance and structural loading. Additionally, raising of sections of road (without cross drainage upgrades) has the potential to increase upstream flood levels to unacceptable levels that need to be mitigated by upgrading cross drainage infrastructure in some locations.

Table 14 Flood Levels at Creek Crossings

Location	Crossing Details	Deck Level or Road Crown (mAHD)	Soffit or Obvert Level (mAHD)	Peak Flood Level (mAHD)							
				50%	20%	10%	5%	2%	1%	0.05%	PMF
Cosgroves Creek	10m total length, 3 span	58.585	57.95	57.6	57.9	57.9	58.0	58.1	58.3	58.5	59.6
Oaky Creek	3/1800x1500 RCBC	58.17	55.15	55.9	56.1	56.3	56.4	56.6	56.8	56.8	58.8
Badgerys Creek	36m total length 2 span bridge at Badgerys Creek	47	46.27	45.8	46.2	46.4	46.7	46.8	46.9	47.1	48.5
South Creek	34m total length, 5 span bridge and 26m total length, 2 span bridge	44.25	43.49	41.9	42.3	42.6	42.8	42.9	43.0	43.3	45.6
Kemps Creek	34m total length 2 span bridge at Kemps Creek	47.6	46.965	45.9	46.5	46.8	47.1	47.4	47.6	47.9	50.2

Note: Flood levels overtopping deck level or road crown at waterway crossings highlighted as red text. Minimum soffit and deck levels quoted.

Table 15 Flood Levels relative to Bridge Soffit (or culvert obvert) at Creek Crossings

Location	Crossing Details	Deck Level or Road Crown (mAHD)	Soffit or Obvert Level (mAHD)	Peak Flood Level relative to bridge soffit or culvert obvert (m)							
				50%	20%	10%	5%	2%	1%	0.05%	PMF
Cosgroves Creek	10m total length, 3 span	58.585	57.95	+0.30	+0.07	+0.09	-0.02	-0.17	-0.40	-0.51	-1.70
Oaky Creek	3/1800x1500 RCBC	58.17	55.1455	-0.74	-0.98	-1.17	-1.28	-1.49	-1.60	-1.69	-3.66
Badgerys Creek	36m total length 2 span bridge at Badgerys Creek	47	46.27	+0.46	+0.02	-0.12	-0.40	-0.51	-0.60	-0.85	-2.26
South Creek	34m total length, 5 span bridge and 26m total length, 2 span bridge	44.25	43.49	+1.64	+1.21	+0.94	+0.73	+0.58	+0.46	+0.16	-2.08
Kemps Creek	34m total length 2 span bridge at Kemps Creek	47.6	46.965	+1.02	+0.49	+0.20	-0.15	-0.44	-0.65	-0.97	-3.27

Note: Soffit or culvert obvert overtopping depths at waterway crossings highlighted as red text. Minimum soffit and deck levels quoted.

5.6.1 Cosgroves Creek

Cosgroves Creek is the main tributary in the modelled catchment. Review of the future base case modelling results indicates that the flowpath starts about 2.5 km upstream of the proposal area. Overland flow is generally H1 hazard category (generally safe) for the one per cent AEP, along the western and eastern sides of Cosgroves Creek, up to 60 metres. One per cent AEP flows are mostly contained within Cosgroves Creek with no significant overland flow, indicating that the area is not substantially flood prone.

The total flow passing under Cosgroves Creek bridge is estimated to be about 230 m^3/s in the one per cent AEP flood event. Currently, freeboard is not achieved at the bridge soffit, but the bridge deck is not overtopped. Peak flood velocities generally do not exceed 2.5 m per second.

Overtopping occurs over Luddenham Road and Elizabeth Drive in the one per cent AEP storm event, with generally shallow depths (less than 200 mm), and some sections of Elizabeth Drive overtopped by depths of up to 500 mm. There are multiple farms dams within the area acting as flood storage areas.

5.6.2 Oaky Creek

Oaky Creek has mostly sufficient capacity to convey the 1 per cent AEP design event within the banks of the creek, estimated to be in the order of 16 m^3/s with adequate culvert cover.

There is some inundation across ED, approximately 80 m east of the Oaky Creek Bridge. However, this flooding is caused by local flows draining along the road as opposed to mainstream flows breaking out of the creek and overtopping the road.

5.6.3 Badgerys Creek

The Badgerys Creek flowpath starts about 3.4 km upstream of Elizabeth Drive along Badgerys Creek Road and connects about 3.3 km downstream of the alignment to South Creek (the main tributary). The deepest one per cent AEP flood depth areas are contained within Badgerys Creek reaching up to about 4.5 metres. For more frequent events, peak flood depths can be contained within Badgerys Creek. Events less than or equal to the twenty per cent AEP are also contained within Badgerys Creek with no significant overland flow. Badgerys Creek is generally about 15 m wide, and the one per cent AEP overland flow is indicative of the flood prone nature of the area.

Under existing conditions, Elizabeth Drive in the vicinity of Badgerys Creek is overtopped during events greater than a ten per cent AEP flood event. Depths of flow across the road at this location range from about 250 mm during a five per cent AEP flood event to 350 mm during a one per cent AEP flood event.

The existing bridge crossing over Badgerys Creek is capable of conveying all of the one per cent AEP flows without overtopping Elizabeth Drive. The peak flows are estimated to be in the order of 90 m^3/s.

While there is no overtopping of Elizabeth Drive at the bridge location during the one per cent AEP event, there is some overtopping at the nearby low point within the road, which is about 235 m west of the bridge. This overtopping is caused by floodwaters breaking out of Badgerys Creek and spreading across the floodplain. These breakout flows then reach a level across the floodplain which causes overtopping of the road.

It is estimated that t flows of about 21 m^3/s second would overtop the low point in a one per cent AEP flood event. This would cause inundation of the road for a length of about 200 m, with floodwaters overtopping the road expected to reach a peak depth of 250 mm in the one per cent AEP flood event. The flood hazards across this section of road remain at the lowest level of hazard (i.e. a hazard category of H1).

5.6.4 South Creek

South Creek is the main tributary of the South Creek catchment, where the flowpath starts about 6.1 km upstream of Elizabeth Drive. During the one per cent AEP event, the deepest flood depth areas are contained within South Creek, reaching up to about five metres. Overland flow, of generally H3 hazard category (i.e. unsafe for all vehicles) for the one per cent AEP occurs south of Elizabeth Drive.

Flood events less than or equal to the twenty per cent AEP are contained within South Creek with no significant overland flow. South Creek is about 19 m wide (however this varies depending on location) and the one per cent AEP overland flow is indicative of the flood prone nature of the area.

During flood events greater than 10 per cent AEP, major overtopping of Elizabeth Drive starts to occur to the east of the existing South Creek bridge. A maximum depth of overtopping of 300 mm is shown to occur in a one per cent AEP design flood event at this location.

Both the western South Creek bridge and eastern South Creek overflow bridge crossings are capable of conveying the one per cent AEP flows beneath the bridge deck, with at least 0.7 m of freeboard. With peak water levels well below the underside of the bridge deck, flows can freely flow underneath both bridges. It is estimated that the 1 per cent AEP peak discharge rate at this location is about 150 m^3/s per bridge, equating to a total flow of about 300 m^3/s being conveyed in South Creek at this location.

Road levels along Elizabeth Drive are raised where it passes over these two bridge crossings. These raised road levels are up to 1.4 m above the nearest low point, to the east. Peak flows overtopping Elizabeth Drive in this low point are estimated to be about 23 m^3/s in a one per cent AEP flood event. These flows inundate a large section of the road for a length of about 530 m, with peak overtopping depths likely to reach 0.15 m in a one per cent AEP flood event. These breakout flows of South Creek spread across the floodplain on the eastern side of the creek and cause inundation to a number of industrial and rural residential properties.

While a large section of road would become inundated in a one per cent AEP flood event, the flow depths are relatively shallow and the flood hazard is classified as H1 (generally safe) across this entire length of inundation.

5.6.5 Kemps Creek

The Kemps Creek flowpath starts about 1.5 km upstream of Elizabeth Drive and connects about 4.8 km downstream of the alignment to South Creek (the main tributary). During the one per cent AEP event, the deepest flood depth areas are contained within Kemps Creek, reaching up to about 4.1 m. Overland flow, of H3 hazard category (i.e. unsafe for all vehicles) for the one per cent AEP occurs 400m south of Elizabeth Drive, where the breakout of flows from the creek extends up to 200 m either side of Kemps Creek. For more frequent events, peak flood depths can be contained within the creek. Events less than or equal to the 50 per cent AEP are mostly contained within Kemps Creek. Kemps Creek is about 6 m wide (varies depending on location), and the one per cent AEP overland flow is indicative of the flood prone nature of the area.

Under existing conditions, Kemps Creek bridge is able to convey the one per cent AEP design flood event without causing overtopping of Elizabeth Drive. Model results for the future base case indicate that the existing bridge deck has 450 mm of freeboard to the one per cent AEP event, with the flood level in this event estimated to be 180mm above the underside of the deck. This indicates that the bridge opening provides a slight obstruction to flows. Peak flows passing through the bridge are estimated to be about 180 m^3/s in a one per cent AEP flood event. While the one per cent AEP flows break out of Kemps Creek onto the floodplain at other locations, they do not result in overtopping of Elizabeth Drive, as the flood levels across the Kemps Creep floodplain remain below Elizabeth Drive road levels.

5.6.6 Ropes Creek Catchment

The sub-catchment of Ropes Creek starts about 350 m upstream of Elizabeth Drive and connects about two km downstream of the proposal area to Ropes Creek (the main tributary). Three channels of this sub-catchment traverse the proposal area east of Duff Road. During the one per cent AEP event, the deepest flood depth areas are mostly contained within Ropes Creek, reaching up to about 1.6 m. Some minor overland flow, of H1 hazard category (low hazard) for the one per cent AEP occurs about 70 m north of Elizabeth Drive, where the breakout from the sub-catchment extends up to 70 m either side of channelised areas.

Flood events less than or equal to the 50 per cent AEP are mostly contained within the channels within the sub-catchment of Ropes Creek. The channel widths are about 4 m (varies depending on location), and the relatively flat downstream area (north of Elizabeth Drive) and one per cent AEP overland flow is indicative of the flood prone nature of the area.

Under existing conditions, the sub-catchment of Ropes Creek as it traverses the proposal area does not cause overtopping of Elizabeth Drive.

6.0 Design Case Flood Behaviour

This chapter summarises the results of the Design Case flood assessment, with the ED road upgrades including bridges, cross drainage and drainage works in place. This includes:

- Identification of critical storm durations (refer Section 6.1)
- Summary of design event hydraulic model results (refer Section 6.2)
- Flood depths (refer Section 6.3)
- Change in flood velocity (refer Section 6.4)
- Change in flood hazard (refer Section 6.5)
- Change in flood levels (refer Section 6.5)
- Flood impacts in areas affected by overland flooding (refer Section 6.7)
- Flood impacts in vicinity of creek crossings (refer Section 6.8)
- Bridge scour (refer Section 6.8.7)
- Duration of road inundation (refer Section 6.9)
- Sensitivity Assessments: including impact of culvert blockage (refer Section 6.12.1) and Climate Change (refer Section 6.12.2)
- Extreme Events: 0.05 per cent AEP (refer Section 6.12.3) and PMF (refer Section 6.12.4)

6.1 Identification of Critical Storm Durations

For hydraulic modelling of the Design Case, a sub-set of critical storm durations was identified for assessment based on a review of the full suite of Future Base Case model results. Model results for the Design Case were reviewed to confirm that a sufficient range of critical storm durations had been captured to adequately inform a 100% concept level of design. Hydraulic modelling for the Design Case was undertaken for the following design flood events:

- 50%, 20%, 10%, 5%, 2% and 1 per cent AEP design events for the 1hr to 18 hr storm durations with ten temporal patterns run for each storm duration in accordance with ARR 2019.
- 0.05 per cent AEP (1 in 2000 AEP) design event for the 1hr, 3hr, 6 hr and 12 hr storm durations with ten ARR 2019 temporal patterns run for each storm duration.
- PMF design event for a single temporal pattern for a critical storm duration.

6.2 Summary of Design Event Hydraulic Model Results

A summary of hydraulic model results at existing and proposed waterway crossings of ED and at key locations along ED (refer Figure 20) are provided in Table 16 for the 50 per cent AEP and 1 per cent AEP design flood events. Flood inundation maps illustrating the spatial variation in peak flood level, depth, velocity, hazard and afflux are provided in Appendix A.

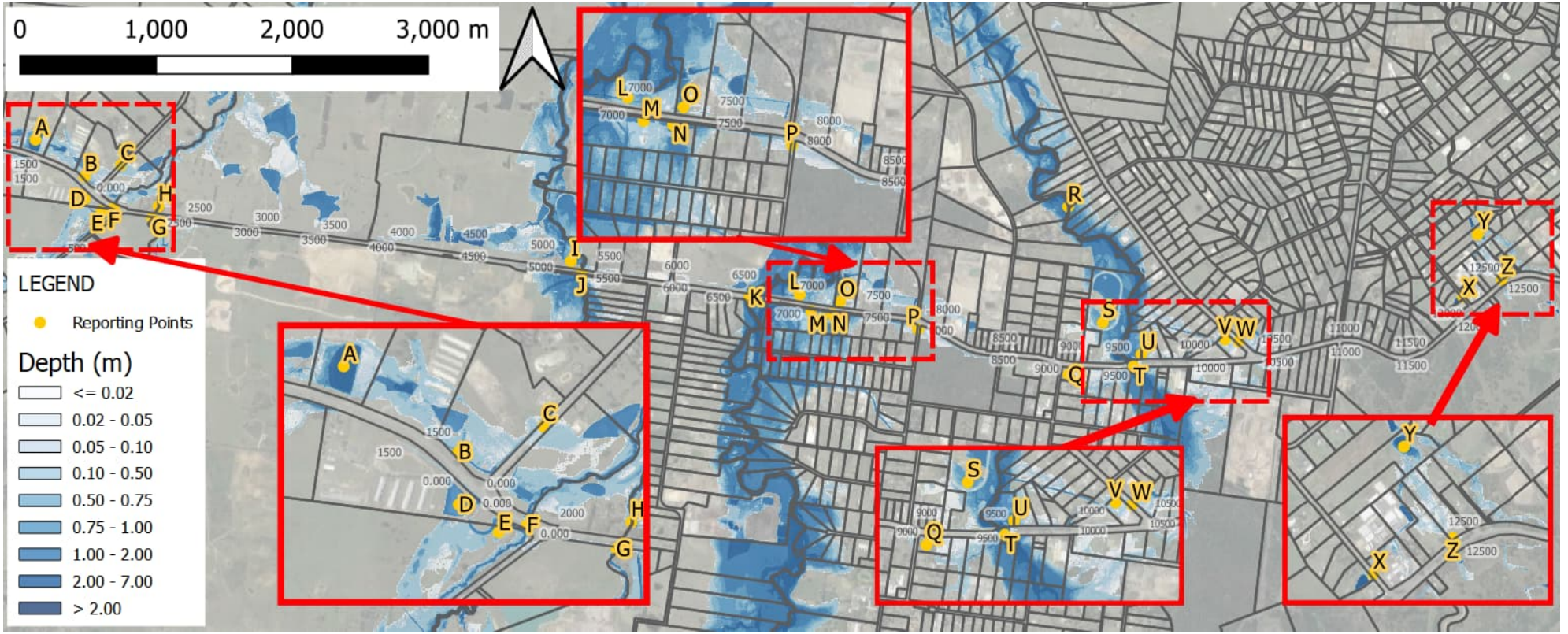


Figure 20 1 per cent AEP Design Case flood depths with key reporting point locations for Table 16

Table 16 Summary of Design Case Hydraulic Model Results (50 per cent AEP and 1 per cent AEP) at key locations

Point			Critical Storm Durations (hrs) [1]	Results [1]				Change in Results from Future Base Case [1]		
ID	Chainage	Structure Type		Peak Flood Level (m AHD)	Flow Depth (m) [2]	Hazard [3]	Velocity (m/s)	Level/ Afflux (mm)	Hazard [2]	Velocity (m/s)
A	1150	Dam	24 / 2	65.1 / 65.3	2.2 / 2.4	H5 / H5	0.2 / 0.2	+38 / +36	0 / 0	0 / 0
B	1600	Floodplain	24 / 2	59.1 / 59.9	0.7 / 1.5	H3 / H5	0.7 / 0.8	-223 / +99	+1 / 0	0.2 / -0.2
C	1750	Road	24 / 2	58.2 / 58.2	0.1 / 0.2	H1 / H1	0.1 / 0.3	+17 / +22	0 / 0	0.1 / 0.1
D	1700	Dam	24 / 2	59.9 / 60	1.1 / 1.3	H3 / H4	0 / 0	+153 / -23	0 / +1	0 / 0
E	1840	Floodplain	24 / 2	0 / 58.8	0 / 0.9	0 / H3	0 / 0.1	Was Wet/Now Dry / -178	-3 / 0	0 / 0.1
F	1900	Cosgroves Creek Bridge	24 / 2	57.5 / 58.6	1.2 / 2.3	H4 / H5	0.7 / 1.3	-126 / +254	0 / 0	0.2 / 0.2
G	2200	Culvert PXD12 (US)	24 / 2	55.9 / 56.8	0.3 / 1.3	H1 / H4	0.1 / 0.6	+3 / +64	0 / 0	0 / 0
H	2200	Culvert PXD12 (DS)	24 / 2	55.9 / 56.4	1.2 / 1.8	H3 / H5	0.3 / 0.7	+1 / +14	0 / 0	0 / 0
I	5300	Culvert PXD11 (DS)	18 / 12	45.4 / 46.2	0 / 0.8	H1 / H4	0.1 / 1	Was Dry/Now Wet / +115	+1 / +1	0.1 / 0.5
J	5380	Badgerys Creek Bridge	18 / 12	45.8 / 47	2.7 / 3.8	H5 / H6	0.8 / 1.4	+5 / +19	0 / 0	0 / -0.5

Point			Critical Storm Durations (hrs) [1]	Results [1]				Change in Results from Future Base Case [1]		
ID	Chainage	Structure Type		Peak Flood Level (m AHD)	Flow Depth (m) [2]	Hazard [3]	Velocity (m/s)	Level/ Afflux (mm)	Hazard [2]	Velocity (m/s)
K	6640	South Creek Bridge	18 / 12	42 / 43.2	3.7 / 4.9	H5 / H6	0.5 / 1	17 / -11	0 / 0	0 / 0
L	7000	Culvert PXD29 (DS)	18 / 12	41.5 / 42.3	2.7 / 3.5	H5 / H5	0.1 / 0.2	-30 / +111	+2 / +3	0 / -0.1
M	7100	Culvert PXD33 (US)	18 / 12	0 / 43.3	0 / 1.5	0 / H4	0 / 0.3	0 / +133	0 / +3	0 / 0.3
N	7260	Culvert PXD31 (US)	18 / 12	40.9 / 43.3	0.3 / 2.7	H1 / H5	0 / 0.2	-730 / +74	0 / +1	-0.1 / -0.1
O	7300	Culvert PXD31 (DS)	18 / 12	40.9 / 42.2	0.4 / 1.7	3 / 5	0 / 0.4	-6 / 62	0 / 1	0 / -0.1
P	7900	Road	18 / 12	0 / 0	0 / 0	0 / 0	0 / 0	0 / Was Wet/Now Dry	0 / -1	0 / -0.2
Q	9080	Culvert PXD25 (DS)	18 / 12	0 / 0	0 / 0	0 / 0	0 / 0	0 / Was Wet/Now Dry	0 / -1	0 / 0
R	9300	Creek	18 / 12	42.6 / 44.1	2.2 / 3.7	5 / 6	0.7 / 0.8	-1 / 87	0 / 0	0 / 0
S	9320	Dam	18 / 12	0 / 46.3	0 / 0.9	0 / 3	0 / 0.1	0 / 161	0 / 0	0 / 0

Point			Critical Storm Durations (hrs) [1]	Results [1]				Change in Results from Future Base Case [1]		
ID	Chainage	Structure Type		Peak Flood Level (m AHD)	Flow Depth (m) [2]	Hazard [3]	Velocity (m/s)	Level/ Afflux (mm)	Hazard [2]	Velocity (m/s)
T	9540	Kemps Creek Bridge	18 / 12	45.7 / 47.1	2 / 3.5	5 / 5	0.3 / 0.6	51 / -422	0 / -1	0 / -1.2
U	9600	Culvert PXD28 (DS)	18 / 12	0 / 47.1	0 / 1.2	0 / 3	0 / 0.4	0 / 147	0 / 0	0 / 0.1
V	10240	Culvert Pipe_16 (DS)	18 / 12	0 / 0	0 / 0	0 / 0	0 / 0	0 / Was Wet/Now Dry	0 / -1	0 / -0.3
W	10400	Road	18 / 12	0 / 0	0 / 0	0 / 0	0 / 0	Was Wet/Now Dry / Was Wet/Now Dry	-1 / -1	-0.4 / -0.6
X	12200	Road	3 / 1	0 / 103.2	0 / 0.1	0 / 1	0 / 1.1	0 / 161	0 / 0	0 / 0.8
Y	12540	Dam	3 / 1	92.1 / 92.9	2.8 / 3.5	5 / 5	0 / 0.1	-15 / 109	0 / 0	0 / 0
Z	12480	Culvert RC_PXD30 (DS)	3 / 1	100.5 / 100.7	1 / 1.2	3 / 3	0.3 / 0.5	Was Dry/Now Wet / -379	3 / 2	0.3 / -0.3

[1] – Results are presented for different AEPs as 50% / 1 per cent AEP

[2] – Depths are rounded to the nearest 100mm; therefore, some values will register as zero, but will just be very shallow

[3] – Hazard and Change in Hazard is based on the Australian Emergency Management Institute (2014) H1 to H6 flood hazard classification

6.3 Flood Depth

A set of maps illustrating maximum expected flood depths for the full range of design flood events assessed (50 per cent AEP to the PMF) is provided in Appendix A.

The map numbers for the flood depths maps provided in Appendix A are as follows:

- Cosgroves/Oaky Creek: Maps A001 to A008
- Badgerys Creek: Maps A033 to A040
- South Creek: Maps A065 to A072
- Kemps Creek: Maps A097 to A104
- Ropes Creek: Maps A129 to A136

Flood depth maps for the 1 per cent AEP results are provided in Maps A006, A038, A070, A102 and A134 for the Cosgroves/Oaky Creek, Badgerys Creek, South Creek, Kemps Creek and Ropes Creek hydraulic models respectively.

An overview of 1 per cent AEP flood depths for the Design Case is presented in Figure 20 (refer Section 6.2). Figure 20 illustrates that the ED-upgrades are not overtopped in the 1 per cent AEP design flood event. A comparison of Design Case flood levels to Future Base Case flood levels (i.e., afflux) is presented in Section 6.5.

6.4 Flood Velocity

A set of maps illustrating maximum expected flood velocities for the full range of design flood events assessed (50 per cent AEP to the PMF) is provided in Appendix A.

The map numbers for the velocity maps provided in Appendix A are as follows:

- Cosgroves/Oaky Creek: Maps A009 to A016
- Badgerys Creek: Maps A041 to A048
- South Creek: Maps A073 to A080
- Kemps Creek: Maps A0105 to A112
- Ropes Creek: Maps A137 to A144

Flood velocity maps for the 1 per cent AEP results are provided in Maps A014, A046, A078, A110 and A142 for the Cosgroves/Oaky Creek, Badgerys Creek, South Creek, Kemps Creek and Ropes Creek hydraulic models respectively. The flood velocity maps provided in Appendix A illustrated that maximum 1 per cent AEP velocities do not exceed 2.5 m/s. This implies no requirement for greater scour protection measures (Austroads, 2013).

Figure 21 to Figure 24 illustrate the estimated change in maximum flood velocities for the 5 per cent AEP, 1 per cent AEP, 0.05 per cent AEP and PMF design events respectively caused by the ED-upgrades relative to the Future Base Case scenario.

Figure 22 shows maximum 1 per cent AEP velocity increases of approximately 0.5m/s. This is a relatively minor change and is not likely to significantly affect the transportability of debris, trafficability for sections of local road overtopping or change in scour potential.

The PMF is noted to have increased velocities by more than 1 m/s.

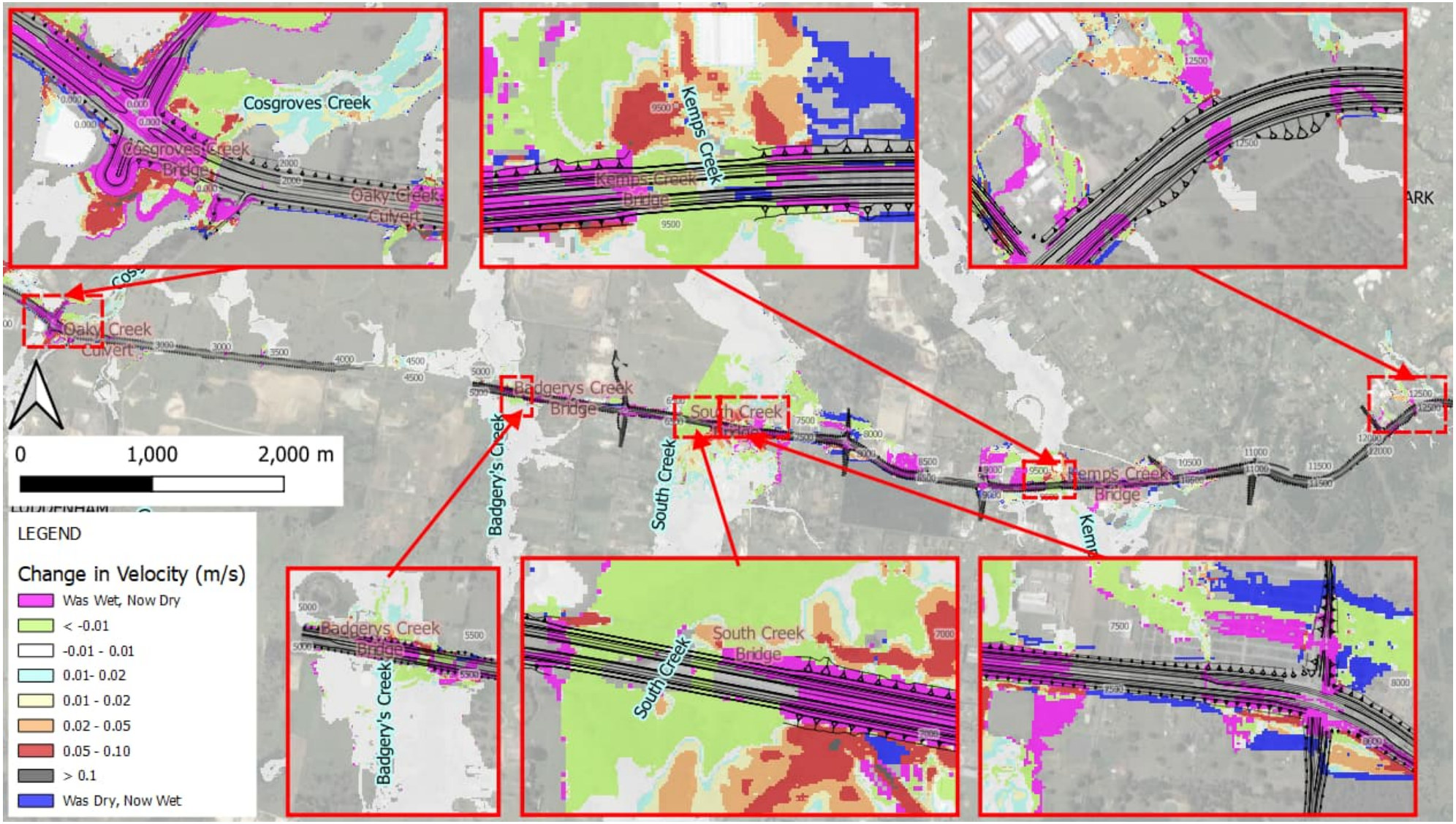


Figure 21 Change in Velocity for the 5 per cent AEP Design Flood Event [Design Case compared to Future Base Case]

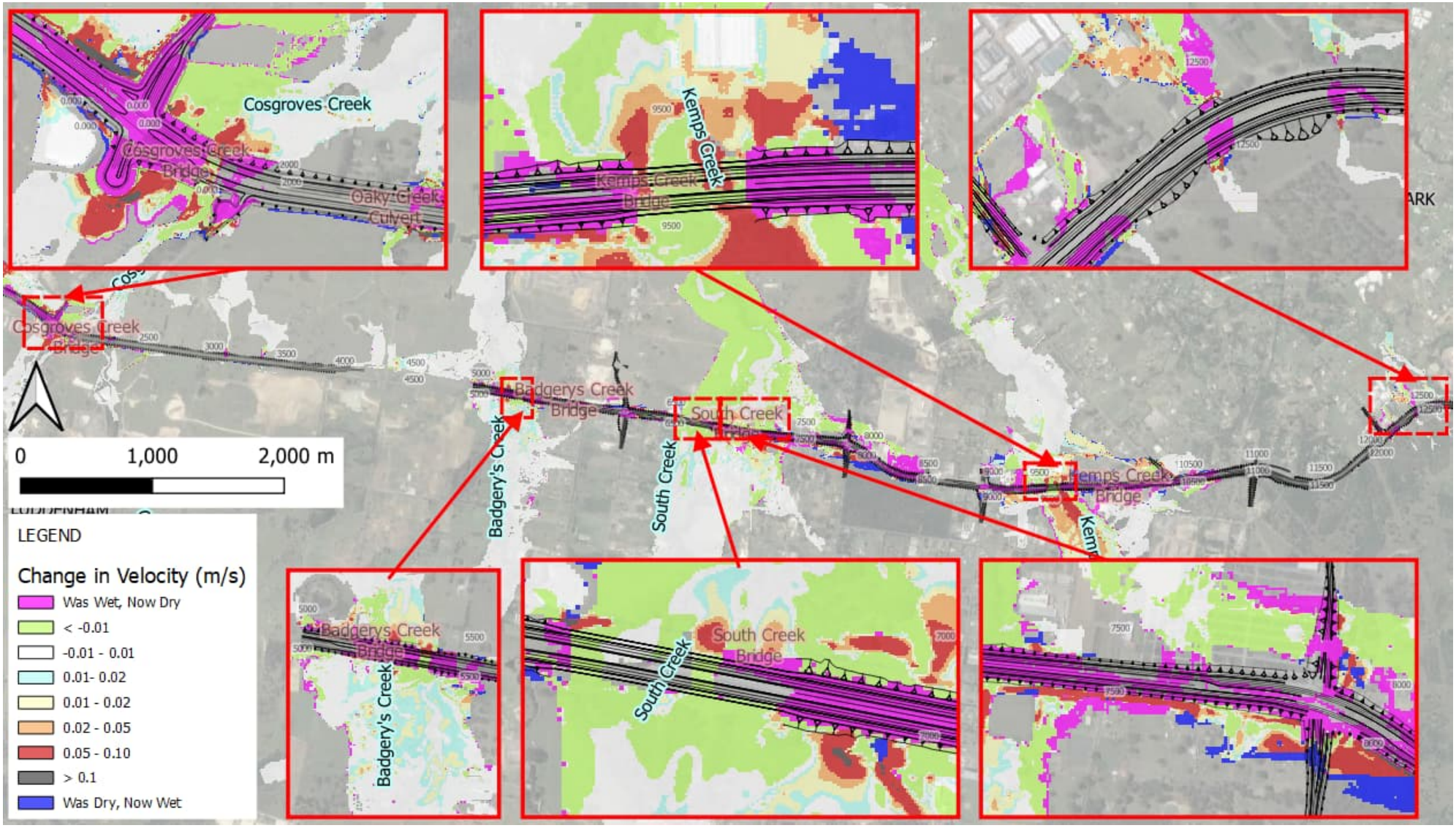


Figure 22 Change in Velocity for the 1 per cent AEP Design Flood Event [Design Case compared to Future Base Case]

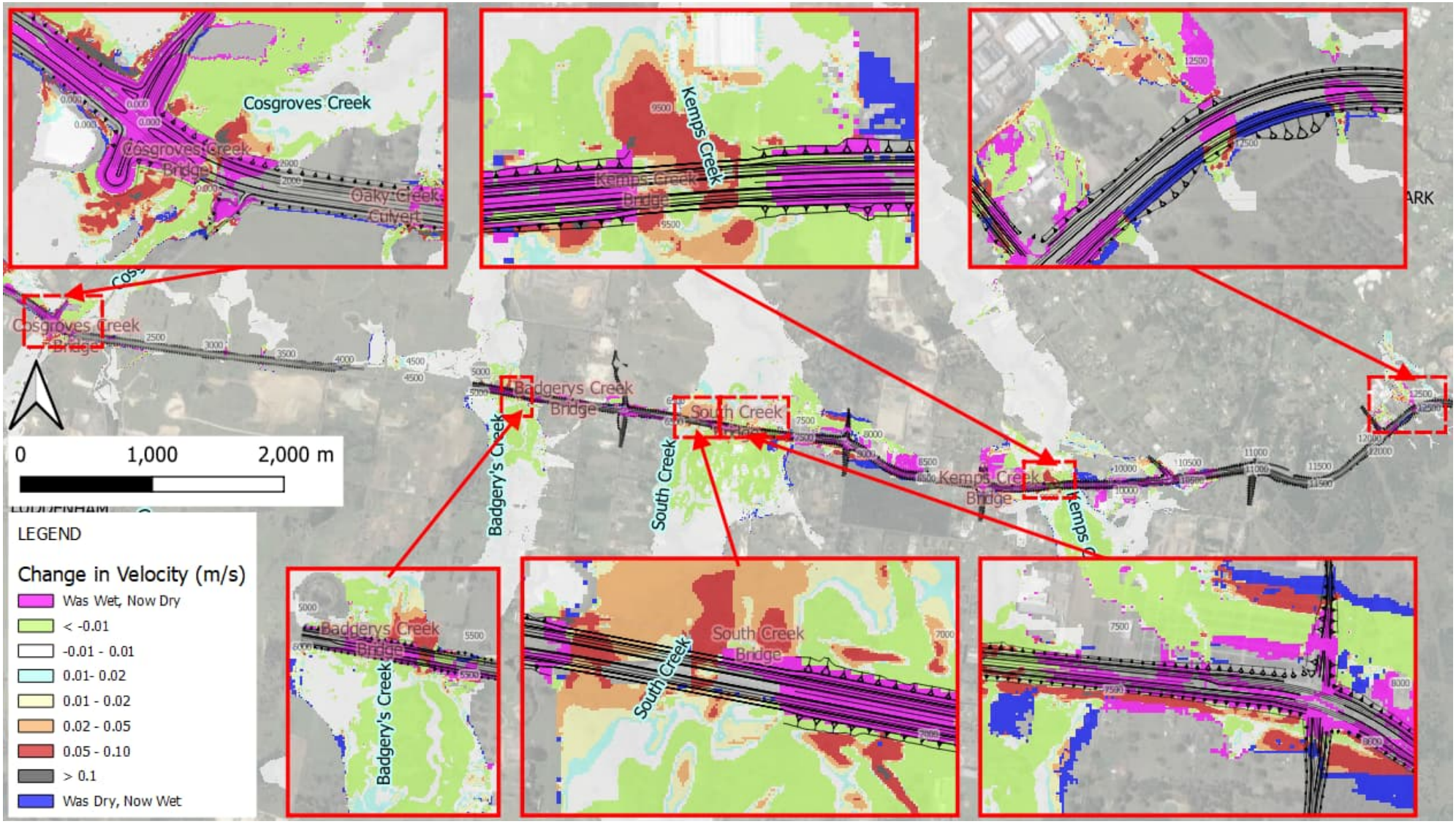


Figure 23 Change in Velocity for the 1 in 2000 AEP Event compared to the Future Base Case

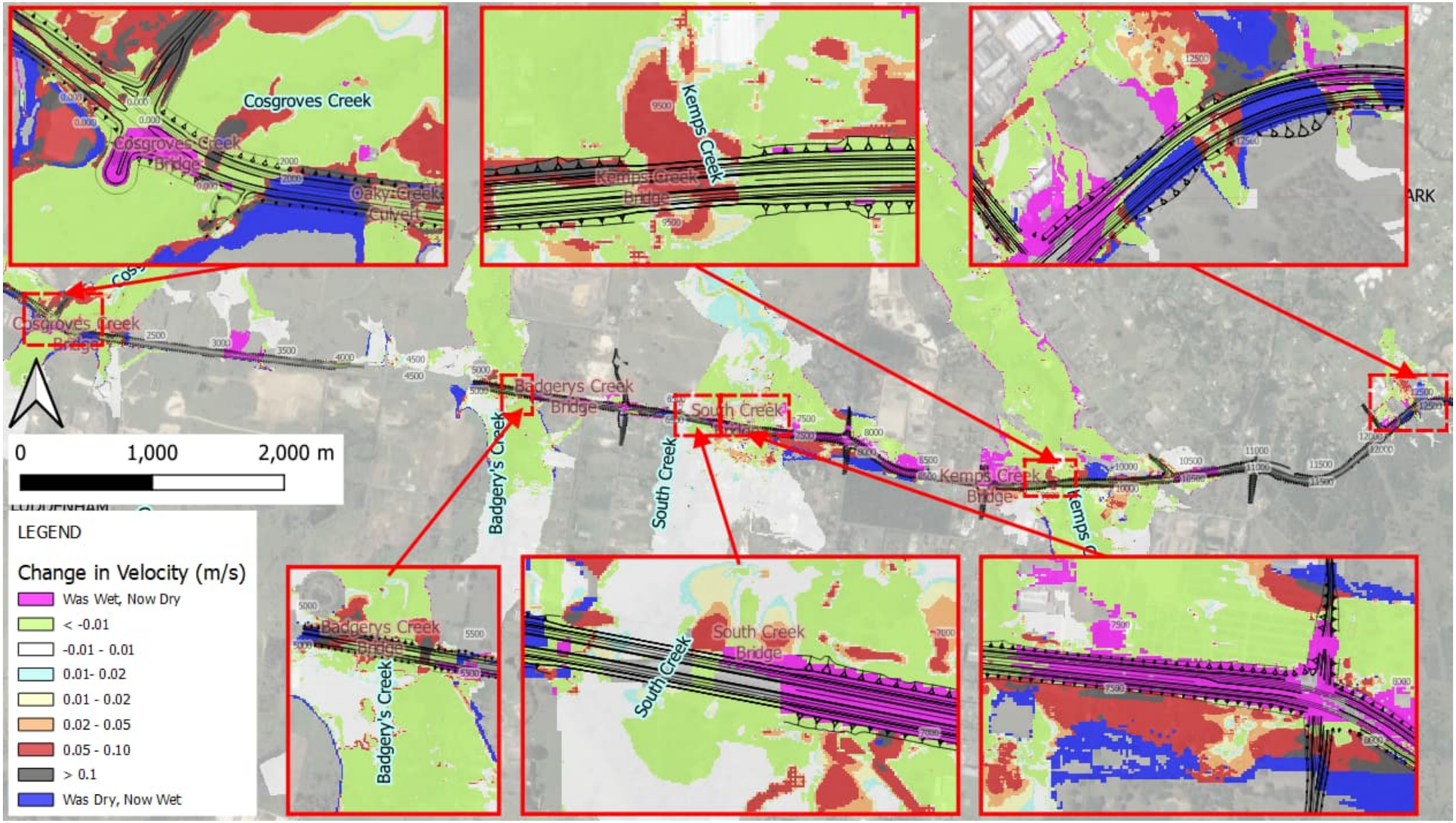


Figure 24 Change in Velocity for the PMF Event compared to the Future Base Case

6.5 Flood Hazard

A set of maps illustrating maximum expected flood hazard for the full range of design flood events assessed (50 per cent AEP to the PMF) is provided in Appendix A.

The map numbers for the hazard maps provided in Appendix A are as follows:

- Cosgroves/Oaky Creek: Maps A025 to A032
- Badgerys Creek: Maps A057 to A064
- South Creek: Maps A089 to A096
- Kemps Creek: Maps A121 to A128
- Ropes Creek: Maps A153 to A160

Flood hazard maps for the 1 per cent AEP design flood event are provided in Maps A030, A062, A094, A126 and A158 for the Cosgroves/Oaky Creek, Badgerys Creek, South Creek, Kemps Creek and Ropes Creek hydraulic models respectively.

An overview of the change in 1 per cent AEP flood hazard category for the Design Case is provided in Figure 25. Model results indicate that increases in flood hazard are generally contained within creeks and design drains under the Environmental and Recreational land classification, whereas everywhere else there is an estimated reduction in flood hazard. The most significant changes in 1 per cent AEP flood hazard and rationale for meeting performance criteria are summarised in Table 17.

Table 17 Summary of notable worsened hazard areas for the 1 per cent AEP

ID	Approximate Elizabeth DriveChainage	Nearby Creek	Increase in H1 to H6 Hazard Category	Hydraulic Explanation	Rationale for meeting performance critiera
1	7000	South Creek	+4 (H1 to H4)	Design channel works (longitudinal drainage along the length of the alignment) direct a significant amount of flow into a large design culvert and the increased culvert entrance velocities result in an increased hazard classification.	This flood hazard increase is contained in a design channel
2	9500	Kemps Creek	+4 (H1 to H4)	Excavation under the bridge to remove the current bridge implies deeper depths and this in turn increases flood hazard.	This flood hazard increase is contained within the creek, and within the project corridor

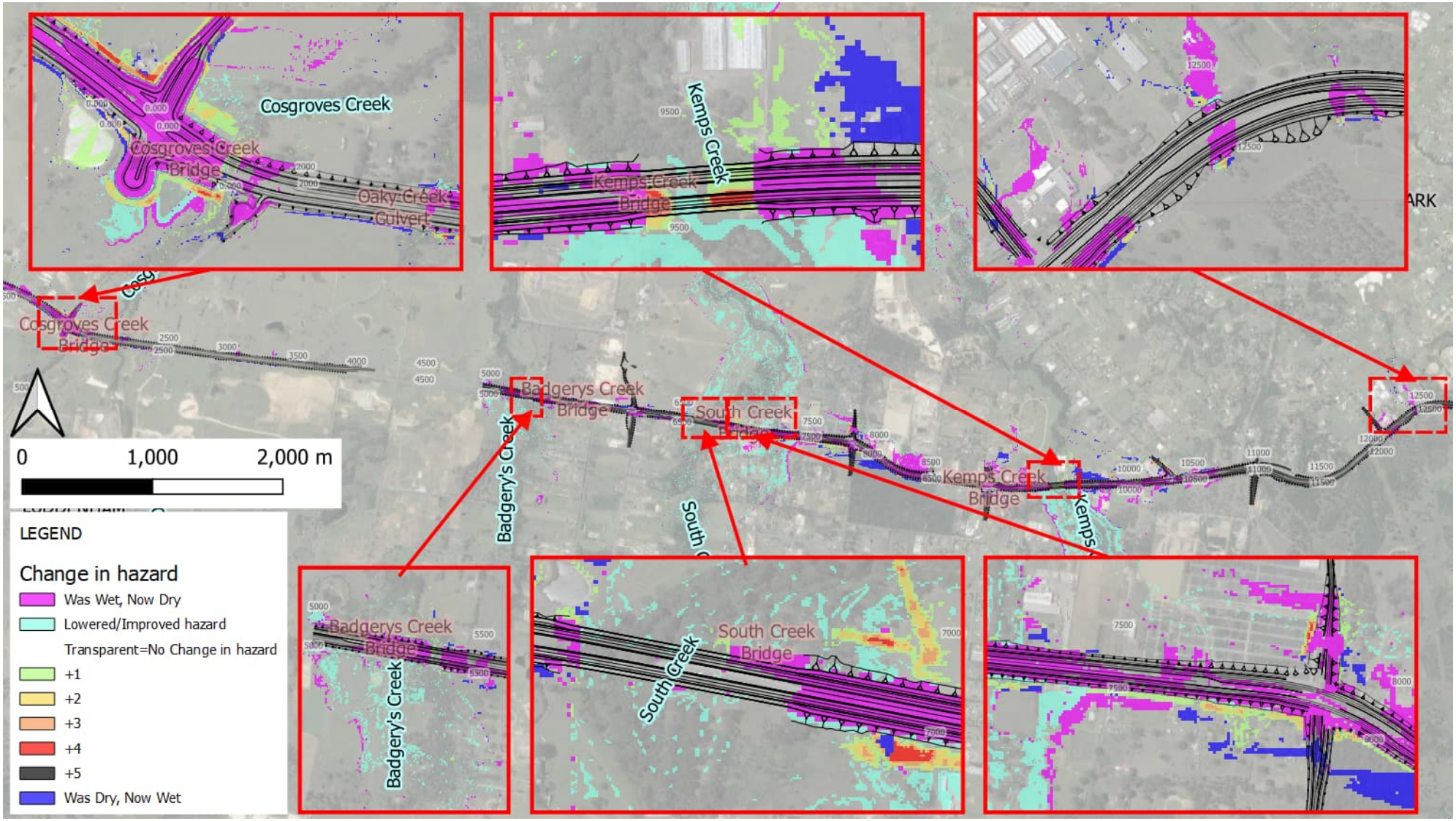


Figure 25 Change in Hazard for the 1 per cent AEP Event compared to the Future Base Case

6.6 Flood Afflux Mapping

The impact of the proposed road upgrade on Future Base Case flood levels was undertaken for the 50%, 20%, 10%, 5%, 2%, 1% AEP, 0.05% AEP and PMF design flood events. Flood afflux maps illustrating the estimated change in flood levels caused by the proposed road upgrade are provided in Appendix A as follows:

- Cosgroves/Oaky Creek: Maps A025 to A032
- Badgerys Creek: Maps A057 to A064
- South Creek: Maps A081 to A088
- Kemps Creek: Maps A0113 to A120
- Ropes Creek: Maps A145 to A152

It is noted that:

- Afflux assessments are undertaken with no structure blockage, whereas the road immunity assessment considers structure blockage. All maps are presented without structure blockage.
- Overland flooding is reduced with the inclusion of the longitudinal drainage channels (refer to ED-West design drawings *EDU W - EDU-REP-10-1000-SM-070A*, and ED-East design drawings *EDU E - EDU-REP-10-2000-SM-071A)*.

Flood impacts on properties is summarised in Section 6.11, with full results (including land use zoning) provided in Appendix G.

6.7 Flood Impact Assessment (Overland Flooding)

An assessment of the change in flood levels induced by the proposed ED-upgrades in areas of the floodplain located outside of areas directly affected by creek flooding was undertaken. Model results indicate a number of locations of notable afflux (refer to Figure 26 to Figure 29). These areas and the degree of compliance with 1 per cent AEP afflux criteria are discussed in the follow sections.

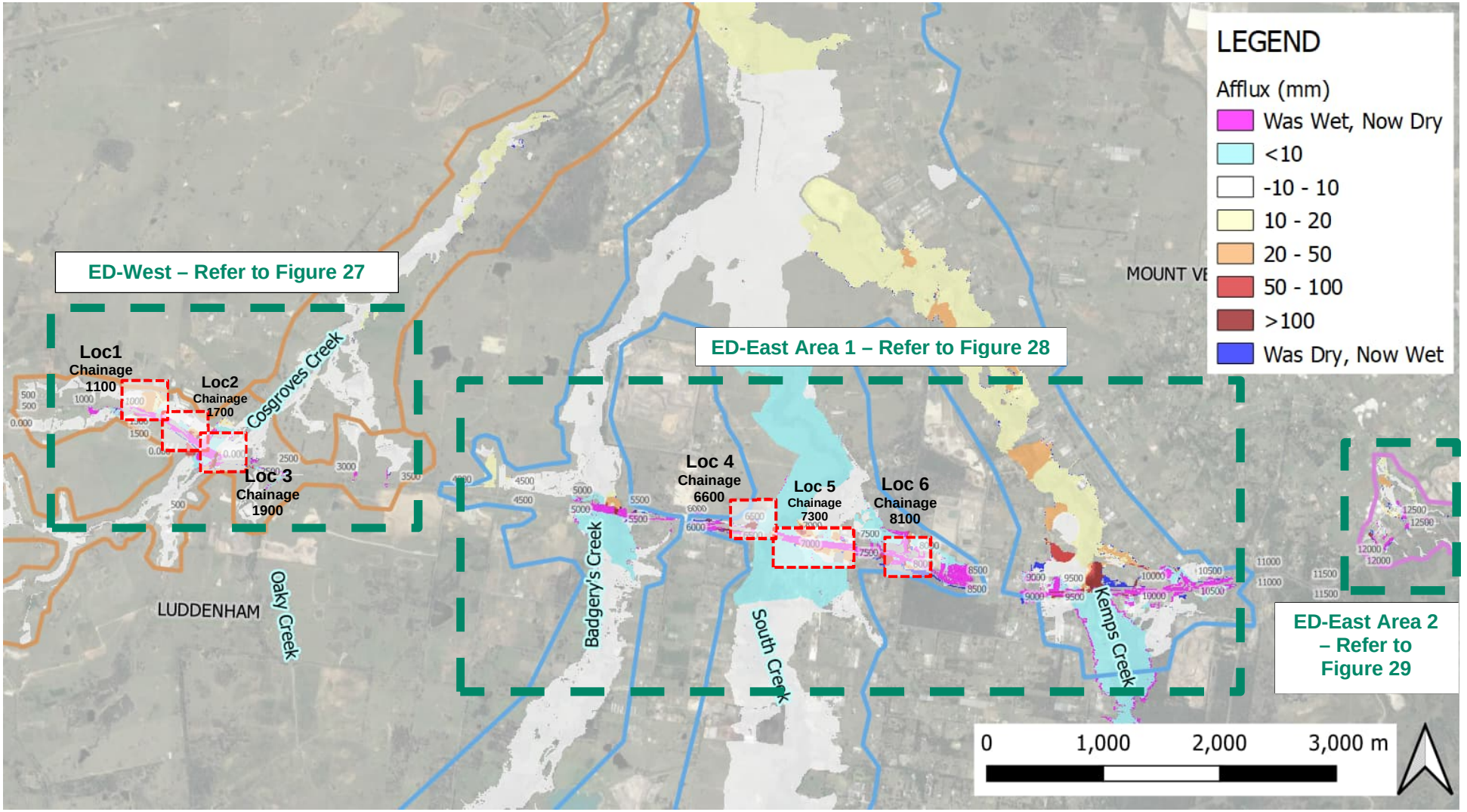


Figure 26 Areas of notable 1 per cent AEP afflux

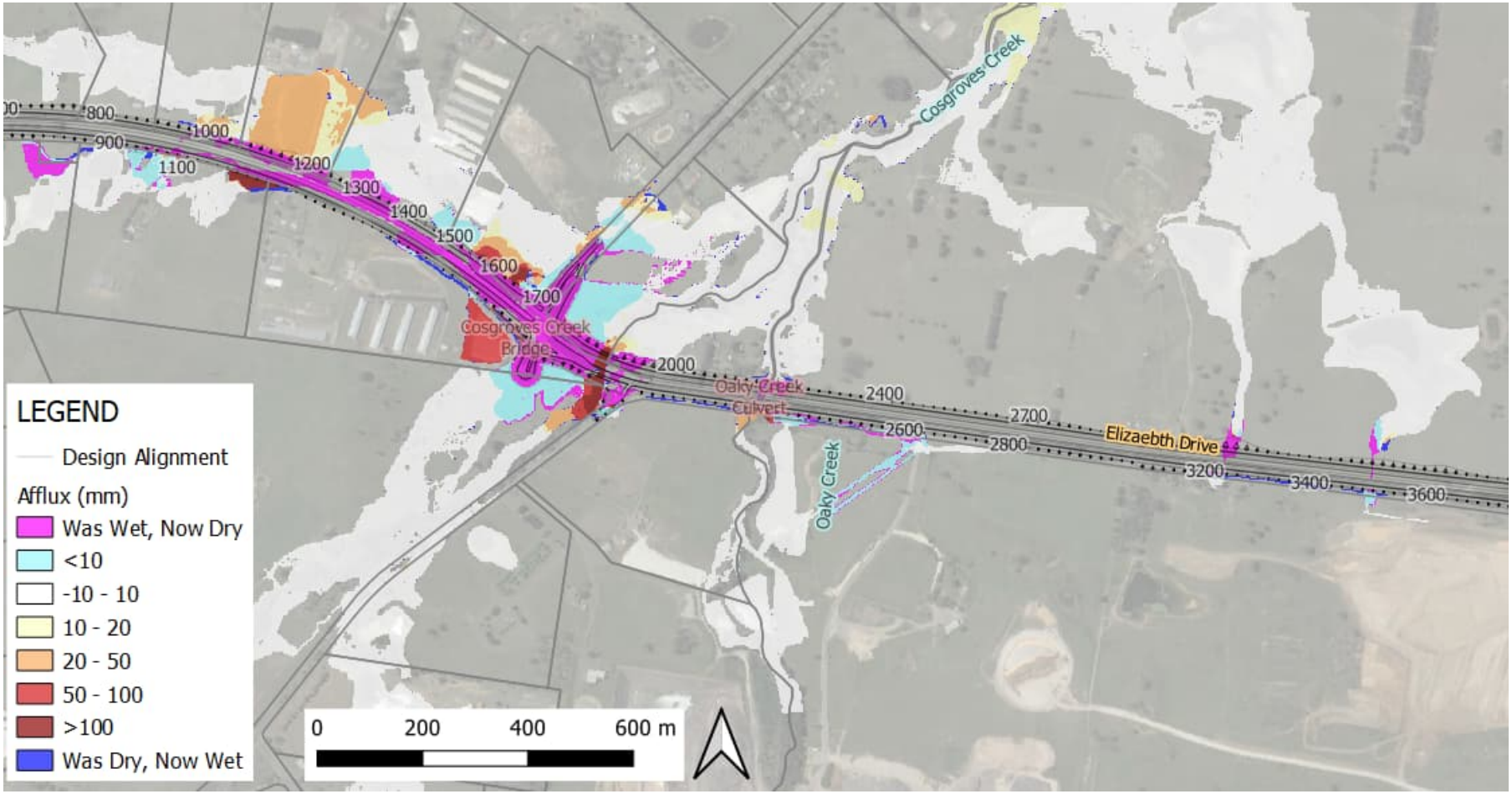


Figure 27 EDU West (1 per cent AEP Afflux)

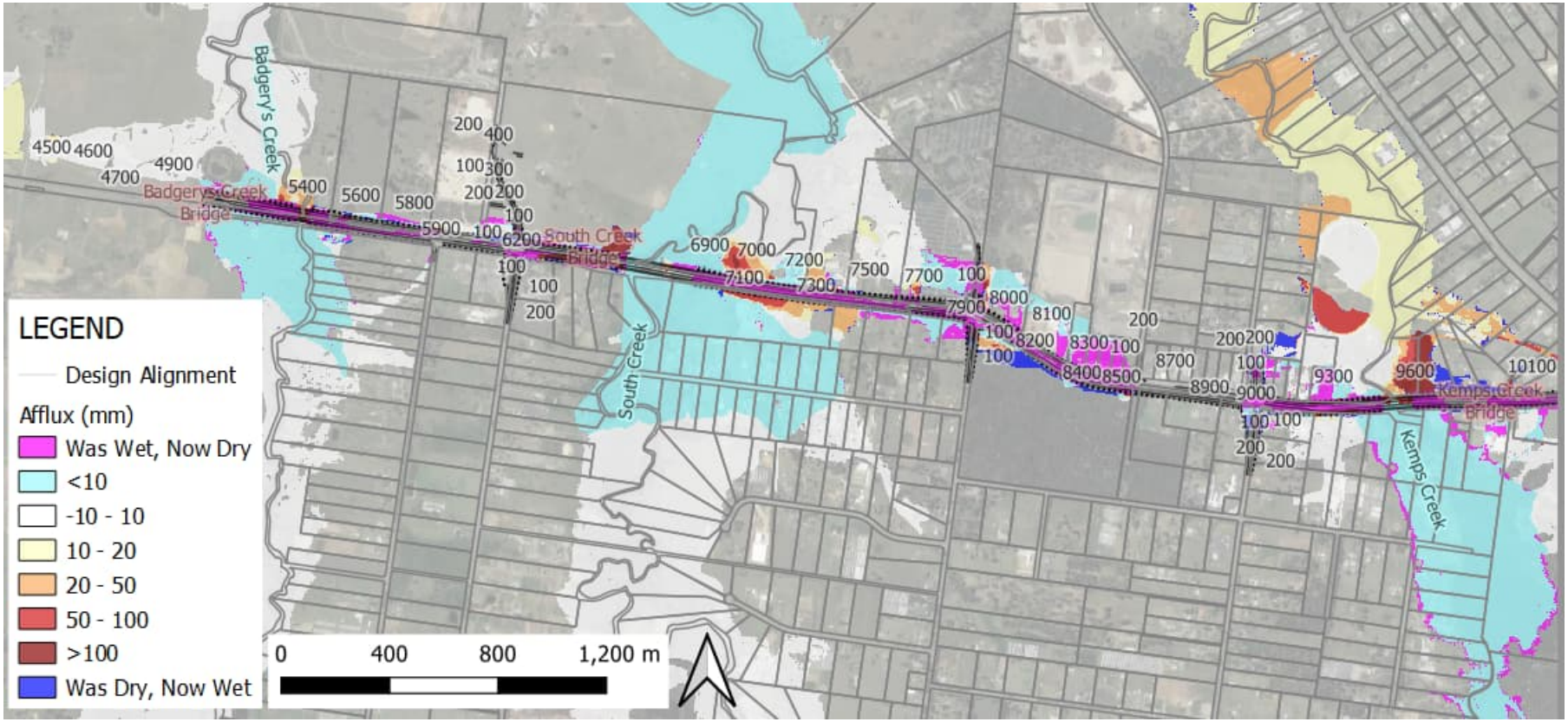


Figure 28 EDU East Area 1 (1 per cent AEP Afflux)

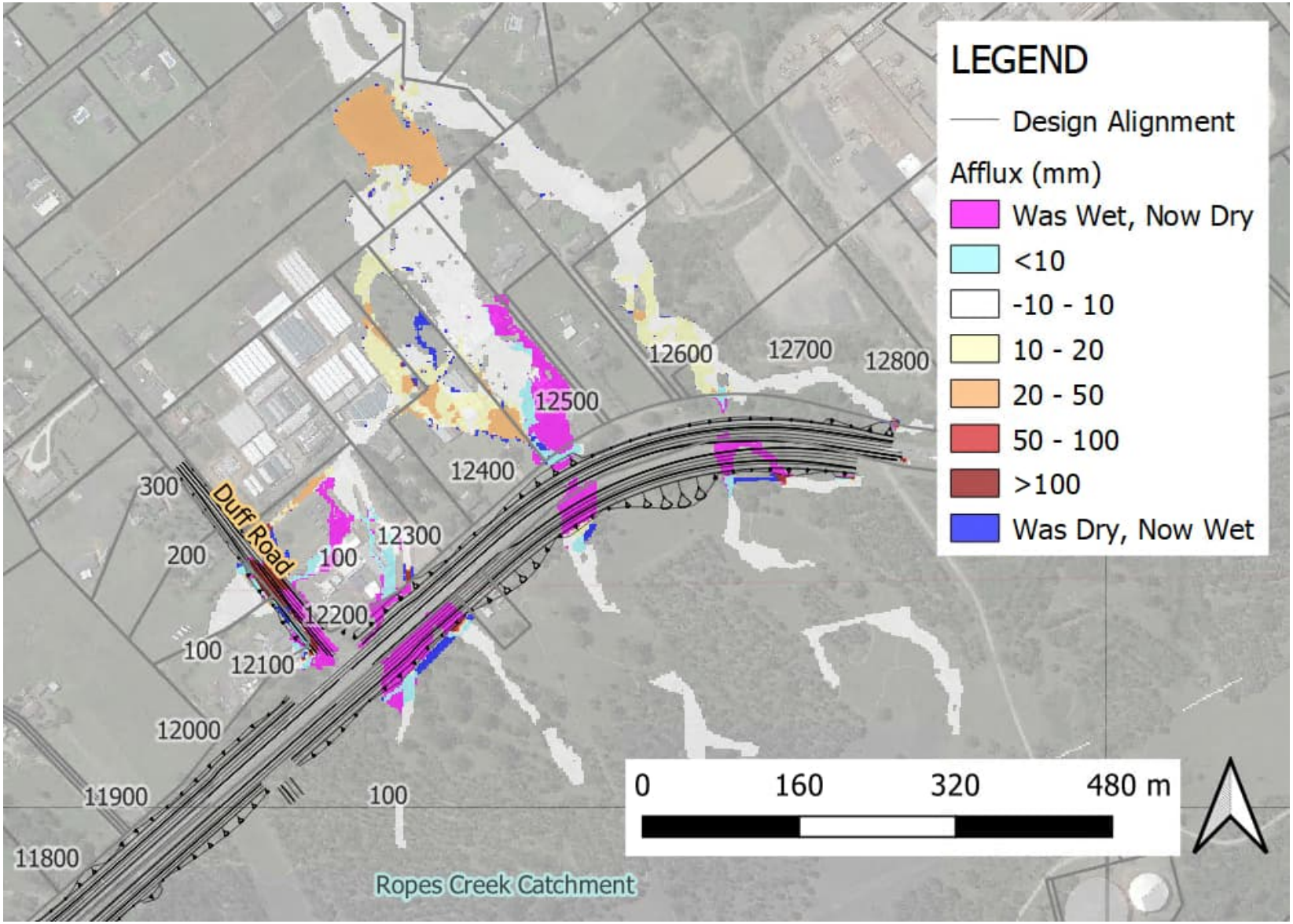


Figure 29 EDU East Area 2 (1 per cent AEP Afflux)

6.7.1 Location 1 (Chainage 1100)

Figure 30 illustrates the magnitude of flood afflux in the vicinity of ED Chainage 1100.

Figure 30 illustrates that there are three lots (Lot 8/DP32026, Lot 1/DP529885, and Lot 10/DP32026 located downstream of the ED upgrades with 1 per cent AEP flood afflux in the range 20 to 50mm occurring on these lots outside of the Land Acquisition Extent (operational footprint). Given that the location of afflux on each of these lots falls within an Environment and Recreation land use zoning (as per State Environmental Planning Policy (Precincts – Western Parkland City) 2021), with a maximum allowable afflux of 100mm, the estimated afflux across these lots is deemed to meet the performance criteria (Refer Table 2, Section 1.4). It is noted that:

- There are some isolated spots on Lot 1/DP529885 where afflux is in the range 50 to 100mm. This is within the maximum allowable afflux of 100mm
- Lot 1/DP529885 and Lot 10/DP3206 experience a minor increase in flood inundation extent ('was dry, now wet') however, the increase in flood depth in this area is less than 5mm and within acceptable limits.

Figure 30 illustrates that upstream of Culvert PXD30, there is an area of afflux greater than 100mm occurring on Lot 1/ DP220176, although most of this afflux is contained within the existing Land Acquisition Extent. The small area outside the land acquisition extent would be subject to further detailed survey at detailed design stage. In order to avoid even greater levels of afflux on Lot 1/DP32026, overland flows have been redirected into a local farm dam (refer to Figure 30) on property Lot 1/DP529885 resulting in affluxes less than 31 mm on this lot. It is recommended that the design of this culvert be further refined during detailed design to minimise this impact.

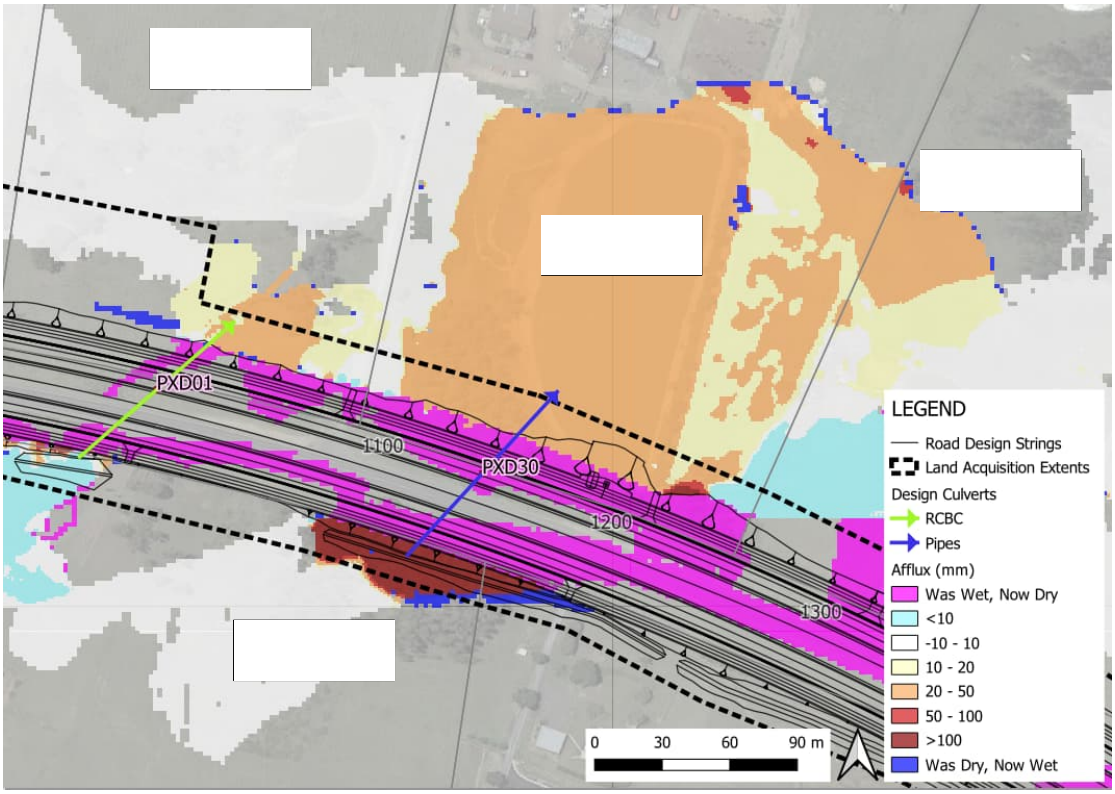


Figure 30 1 per cent AEP Afflux in vicinity of Chainage 1100

6.7.2 Location 2 (Chainage 1700)

Figure 31 illustrates the magnitude of 1 per cent AEP flood afflux in the vicinity of ED Chainage 1700.

It is noted that:

- There is flood afflux greater than 100 mm upstream of culvert PXD03 on Lot 1/DP3206, caused by the ED-upgrades blocking off a natural overland flow path. This afflux is mostly contained within the proposed Land Acquisition Extent. Where afflux is greater than 100mm outside the Land Acquisition Extent, this would be subject to a more detailed survey at detailed design stage. This afflux has also been minimised by increasing the size of longitudinal drains and optimising the size of PXD03 as much as the current vertical alignment can allow
- There is an area of afflux (maximum of 21mm) on Lot 12/DP32026 with some additional inundation extent ('was dry, now wet') that is less than 5mm deep. Given that this lot is currently zoned as Enterprise land-use with a maximum allowable afflux of 50mm, the estimated afflux across this lot is deemed to meet the performance criteria (Refer Table 2, Section 1.4).

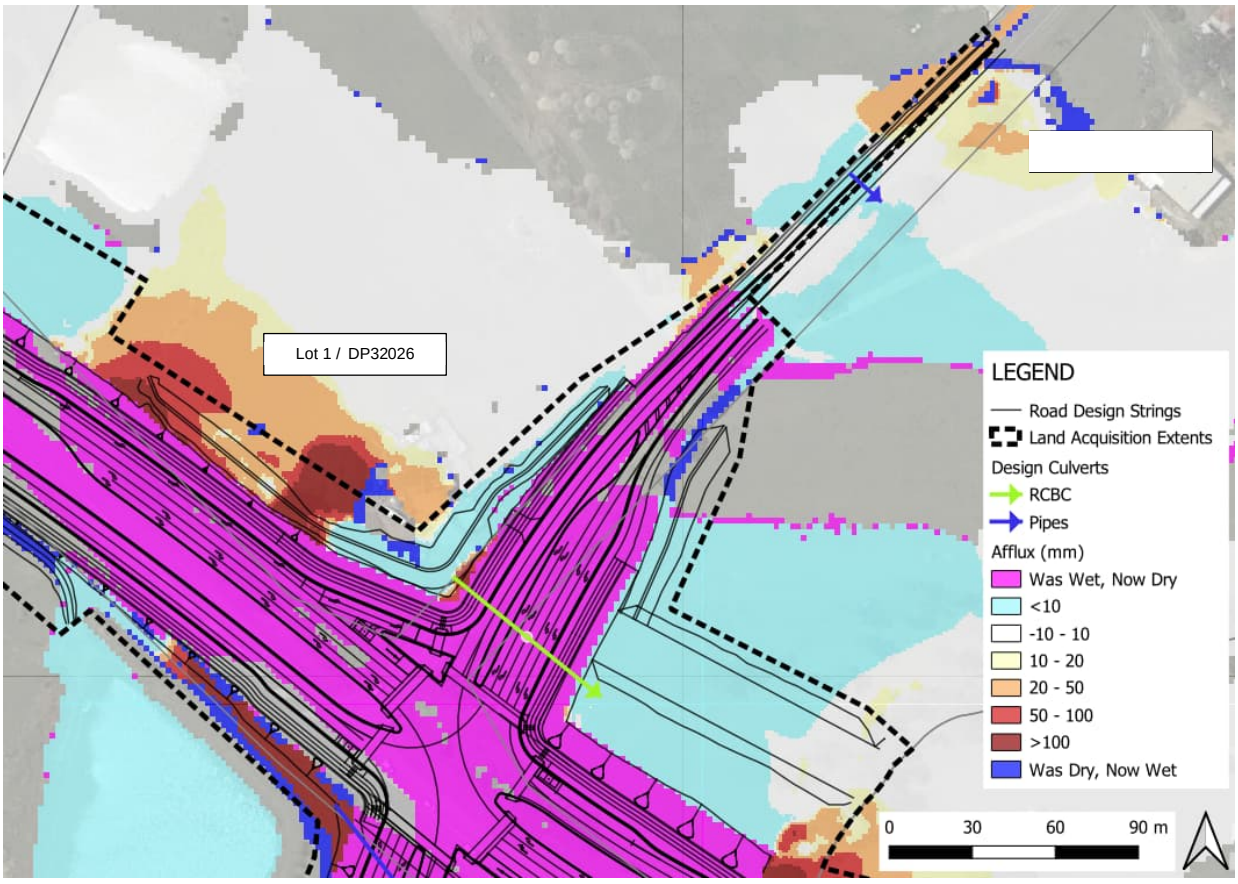


Figure 31 1 per cent AEP Flood Afflux in vicinity of Chainage 1700 (upstream of culvert PXD03)

6.7.3 Location 3 (Chainage 1900)

Figure 32 illustrates the magnitude of 1 per cent AEP flood afflux in the vicinity of ED Chainage 1900.

It is noted that:

- There is an area of afflux on Lot 13 / DP32026 in the range 10mm to 50mm. Given that this area of affected lot currently falls within an Environment and Recreation land-use zoning with a maximum allowable afflux of 100mm, the estimated afflux across this lot is deemed to meet the performance criteria (Refer Table 2, Section 1.4)
- There is flood afflux greater than 100 mm at the outlet of Culvert EXD05b on Lot 106 / DP846962 However, this occurs within an Environment and Recreation land-use zoning and also within the Land Acquisition Extent and is therefore acceptable
- There is flood afflux of approximately 130mm on Lot 106 / DP846962 immediately upstream of Cosgroves Creek Bridge occurring outside of the existing Land Acquisition Extent. Given that this lot is zoned Environmental and Recreational land-use, and afflux is greater than 100mm, It is recommended that further design development consider opportunities to minimise this afflux.

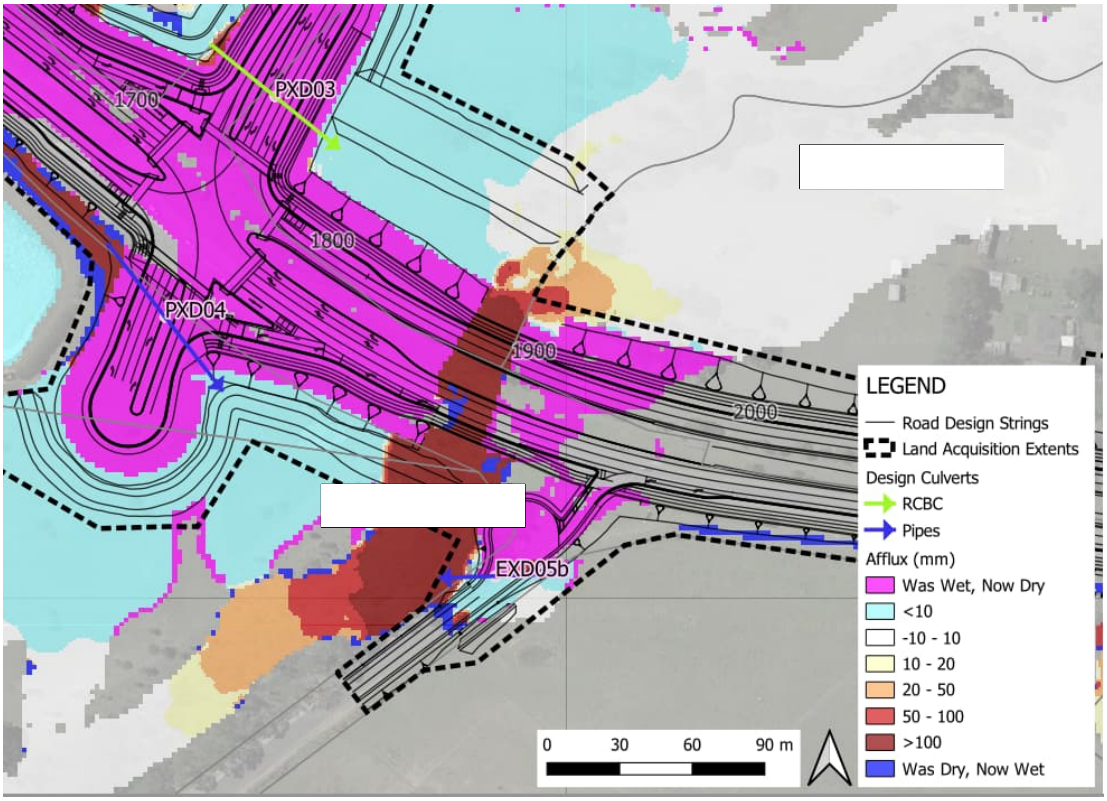


Figure 32 1 per cent AEP Afflux in vicinity of Chainage 1900 (near Cosgrove Creek Bridge)

6.7.4 Location 4 (Chainage 6600)

Figure 33 illustrates the magnitude of 1% AEP flood afflux in the vicinity of ED Chainage 6600.

It is noted that:

- There is an area of afflux on Lot 5 / DP860456 in the order of 170mm, and an additional area of inundation with greater than 5mm ('was dry, now wet'). Given that this lot is currently zoned as Enterprise land-use with a maximum allowable afflux of 50mm, the estimated afflux across this lot is deemed to not meet the performance criteria (Refer Table 2, Section 1.4). Detailed design would involve investigation of measures to further minimise this afflux
- There is an area of afflux on Lot 1 / DP255566 in the range 50mm to 100mm outside of the Land Acquisition Extents. Given that this lot is currently zoned as Environment and Recreation land-use with a maximum allowable afflux of 100mm, the estimated afflux across this lot is deemed to meet the performance criteria (Refer Table 2, Section 1.4).

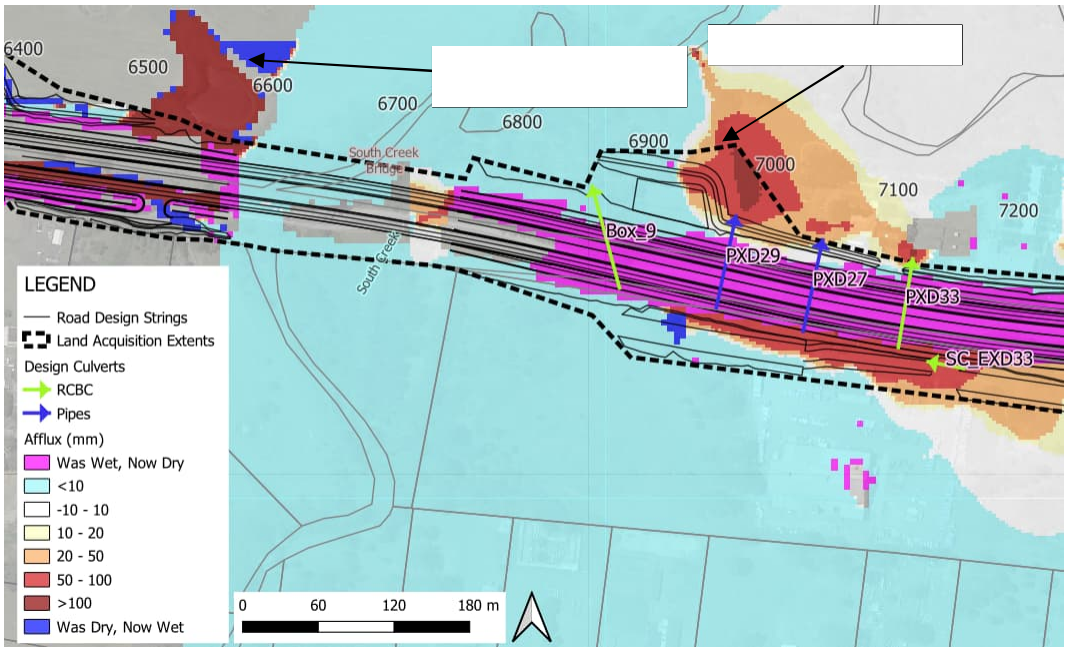


Figure 33 1 per cent AEP Flood Afflux in vicinity of Chainage 6600

6.7.5 Location 5 (Chainage 7300)

Figure 34 illustrates the magnitude of 1 per cent AEP flood afflux in the vicinity of ED Chainage 7300.

There are four lots located outside of existing Land Acquisition Extents with positive afflux. These are:

- Lot 1 / DP255566 with a maximum afflux > 100mm at the outlet of PXD29, and 50 to 100mm at the outlet of PXD33.
- Lot 21 / DP601022 with flood afflux in the range 10mm to 50mm downstream of the outlet of PXD31.
- Lot 3 / DP858141 with flood afflux in the range 10mm to 50mm upstream of the inlet of PXD33 and PXD31.
- Lot 2 / DP 858141 with flood afflux in the range 10mm to 50mm.

It is noted that:

- Lot 1 / DP255566 is zoned as Environment and Recreation land-use with a maximum permissible afflux of 100mm (refer Table 2). There is an area of land with >100mm of afflux on this lot, although given it is within the Land Acquisition Extents it is still allowable
- Lot 21 / DP601022 includes land zoned as Environment and Recreation and Rural Landscape with a with a maximum permissible afflux of 50mm (refer Table 2). Given that the afflux on this lot is less than 50mm, the impact is considered to be acceptable
- Lot 3 / DP858141 is zoned as Primary Production Small Lots with a with a maximum permissible afflux of 50mm (refer Table 2). Given that the afflux on this lot is less than 50mm, the impact is considered to be acceptable
- Lot 2 / DP 858141 is zoned as Primary Production Small Lots with a with a maximum permissible afflux of 50mm (refer Table 2). Given that the afflux on this lot is less than 50mm, the impact is considered to be acceptable.

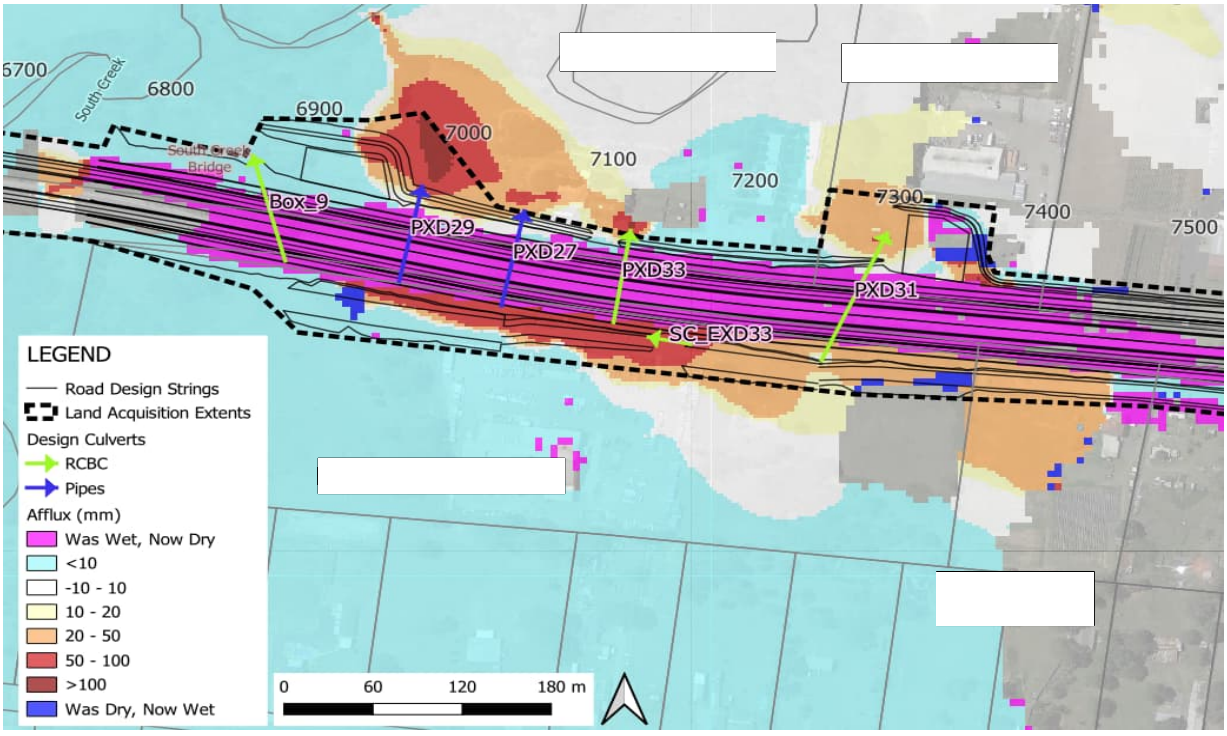


Figure 34 1 per cent AEP Flood Afflux in vicinity of Chainage 7300

6.7.6 Location 6 (Chainage 8100)

Figure 35 illustrates the magnitude of 1 per cent AEP flood afflux in the vicinity of ED Chainage 8100.

There are two locations of significant afflux in this area:

- Lot 5 / DP1114311: There is a region of newly wetted area (i.e., was dry, now wet) at Chainage 8100, south of the alignment, with maximum afflux in the range 20mm to 100mm. Given that Lot 5 / DP1114311 is not currently zoned, a maximum allowable afflux of 100mm has been assumed in this area
- Lot 1 / DP716403: There is afflux in the range 10mm to 100mm with some additional areas of inundation to depths less than 5mm (was dry, now wet). This lot is currently zoned Primary Production Small Lots with a maximum allowable afflux of 50mm, and given that afflux greater than 50mm is contained with the Land Acquisition Extents, it meets the design criteria.

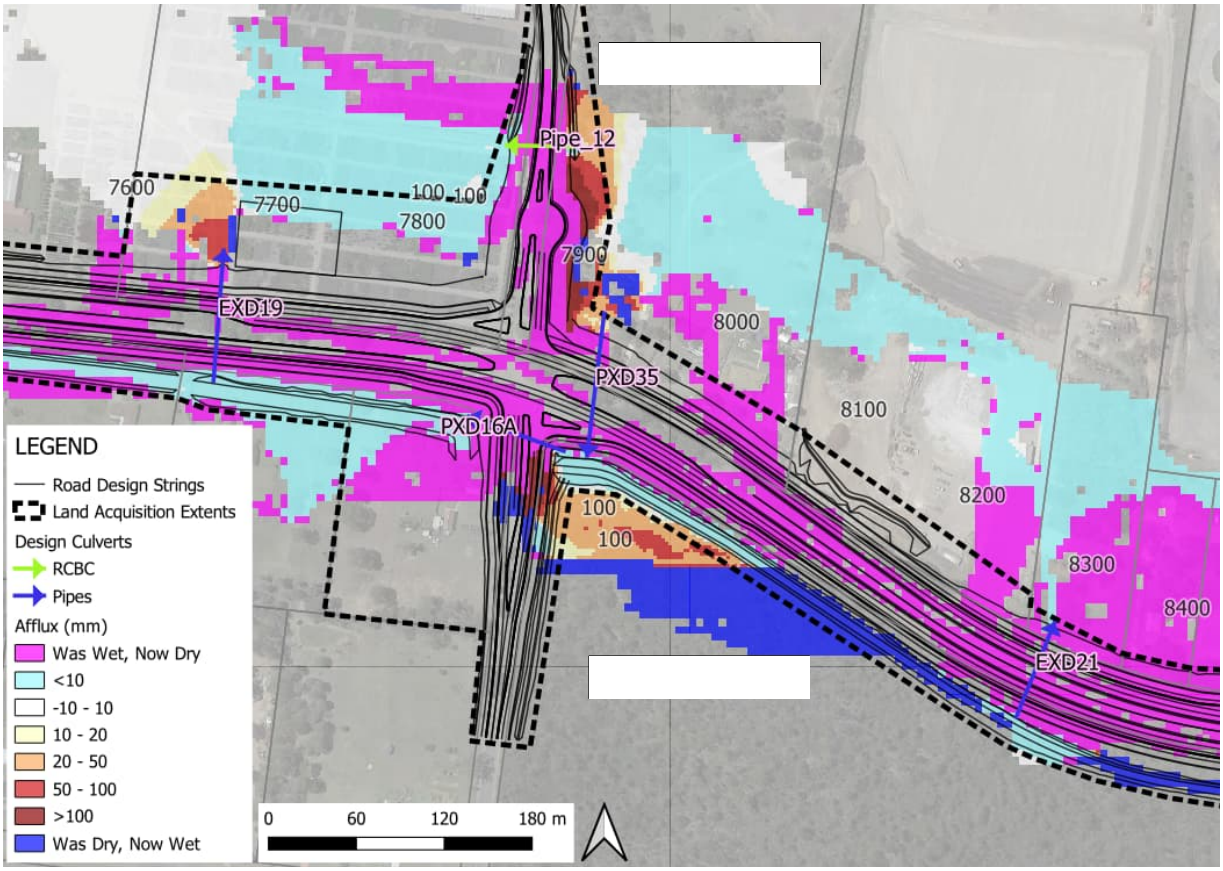


Figure 35 1 per cent AEP Flood Afflux in vicinity of Chainage 8100

6.8 Flood Impact Assessment (Creek Crossings)

A flood impact assessment in the vicinity of bridge crossings was undertaken to inform the design of creek crossings and assess conformance of bridge and culvert designs with design criteria.

A summary of Design Case flood levels relative to proposed bridge and culvert levels is provided in Table 14 and Table 15 with 1 per cent AEP design flooding discussed in the following sections.

Table 18 Design Case Flood Levels at Creek Crossings

Location	Proposd Crossing Details	Deck Level or Road Crown (mAHD)	Soffit or Obvert Level (mAHD)	Peak Flood Level (mAHD)							
				50%	20%	10%	5%	2%	1%	0.05%	PMF
Cosgroves Creek	1/22m Spans	60	59	57.5	57.8	57.8	58.0	58.2	58.6	58.8	61.1
Oaky Creek	3/1800x1500 RCBC	58.5	56.65	55.9	56.2	56.3	56.5	56.7	56.8	56.9	59.5
Badgerys Creek	2/17m Spans	48.9	47.28	45.8	46.3	46.4	46.6	46.8	47.0	47.4	49.7
South Creek	6/28m Spans	44.8	43.4	41.9	42.3	42.5	42.7	42.9	43.0	43.5	45.7
Kemps Creek	6/18m Spans	48.8	47.47	45.7	46.1	46.4	46.7	46.9	47.1	47.5	51.0

Note: Flood levels overtopping deck level or road crown at waterway crossings highlighted as red text. Minimum soffit and deck levels quoted.

Table 19 Design Case Flood Levels relative to Bridge Soffit (or culvert obvert) at Creek Crossings

Location	Proposed Crossing Details	Deck Level or Road Crown (mAHD)	Soffit or Obvert Level (mAHD)	Peak Flood Level relative to bridge soffit or culvert obvert (m)							
				50%	20%	10%	5%	2%	1%	0.05%	PMF
Cosgroves Creek	1/22m Spans	60	59	+1.48	+1.17	+1.17	+1.01	+0.77	+0.40	+0.22	-2.06
Oaky Creek	3/1800x1500 RCBC	58.5	56.65	+0.77	+0.45	+0.30	+0.18	-0.02	-0.16	-0.22	-2.86
Badgerys Creek	2/17m Spans	48.9	47.28	+1.46	+1.02	+0.85	+0.66	+0.46	+0.33	-0.10	-2.40
South Creek	6/28m Spans	44.8	43.4	+1.52	+1.11	+0.88	+0.69	+0.52	+0.36	-0.10	-2.34
Kemps Creek	6/18m Spans	48.8	47.47	+1.78	+1.33	+1.08	+0.77	+0.56	+0.35	-0.07	-3.57

Note: Soffit or culvert obvert overtopping depths at waterway crossings highlighted as red text. Minimum soffit and deck levels quoted.

Table 20 Change in flood levels (Design Case vs Future Base Case)

Location	Proposed Crossing Details	Deck Level or Road Crown (mAHD)	Soffit or Obvert Level (mAHD)	Change in flood level (m) [Design Case vs Future Base Case]							
				50%	20%	10%	5%	2%	1%	0.05%	PMF
Cosgroves Creek	1/22m Spans	60	59	-0.13	-0.04	-0.03	+0.02	+0.11	+0.25	+0.31	+1.41
Oaky Creek	3/1800x1500 RCBC	58.5	56.65	-0.01	+0.07	+0.03	+0.04	+0.03	+0.06	+0.03	+0.70
Badgerys Creek	2/17m Spans	48.9	47.28	+0.01	+0.01	+0.04	-0.05	+0.04	+0.08	+0.26	+1.15
South Creek	6/28m Spans	44.8	43.4	+0.02	+0.01	-0.03	-0.05	-0.04	+0.01	+0.17	+0.16
Kemps Creek	6/18m Spans	48.8	47.47	-0.25	-0.33	-0.37	-0.41	-0.50	-0.49	-0.39	+0.81

Note: Soffit or culvert obvert overtopping depths at waterway crossings highlighted as red text. Minimum soffit and deck levels quoted.

6.8.1 Cosgroves Creek

The proposed hydraulic infrastructure in the vicinity of Cosgroves Creek Bridge (Chainage 1700) includes:

- Replacement of the existing Single 3x7m span bridge at Cosgroves Creek with a Single 22m span bridge with lowest level on the soffit increased from 57.98m AHD to 59.00m AHD
- Addition of 6/2700x600mm RCBC's at location PXD03
- Addition of 2/600mm RCPs at location PXD04
- Addition of 1/450mm RCPs at location EXD05b
- Longitudinal drainage channels conveying flow to PXD03 and PXD04.

Flood maps illustrating the change in flood levels (Design Case vs Future Base Case) estimated for the 50 per cent AEP to PMF design flood events are provided in Appendix A (refer Maps A025 to A032).

A flood afflux map illustrating the estimated change in flood levels for the 1 per cent AEP design event at Cosgroves Creek Bridge is provided as Figure 36, with a peak flood velocity map provided as Figure 37. Design Case flood levels at the cross section located immediately upstream of Cosgroves Creek Bridge provided in Figure 38.

An assessment of hydraulic model results in the vicinity of Cosgroves Creek Bridge indicates:

- The soffit of the proposed Cosgroves Creek Bridge is clear of the 1 per cent AEP design flood level by 400mm
- The bridge deck has approximately 1400mm freeboard to the 1 per cent AEP design event
- The ED-upgrades will not generally cause an unacceptable increase in peak flood levels (afflux), velocities and hazard outside of the Land Acquisition Extents. As such, it expected that there will be no substantial adverse impacts to properties in this area.

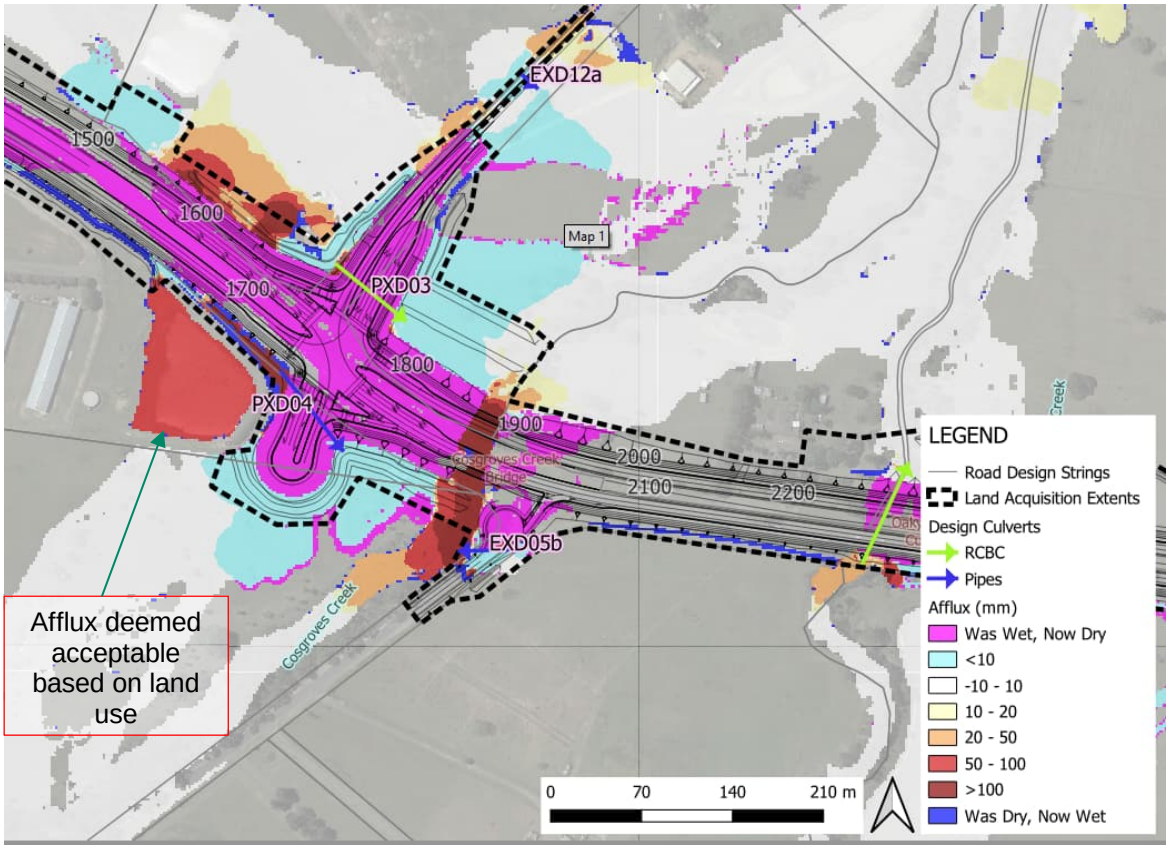


Figure 36 Cosgroves Creek Bridge 1 per cent AEP Afflux
Note: presented afflux in this figure results are slightly different to those in the Appendix and other sections, as here it is intended to show worst impacts, comparing just the 2 hour storm, instead of the full enveloped suite of storms

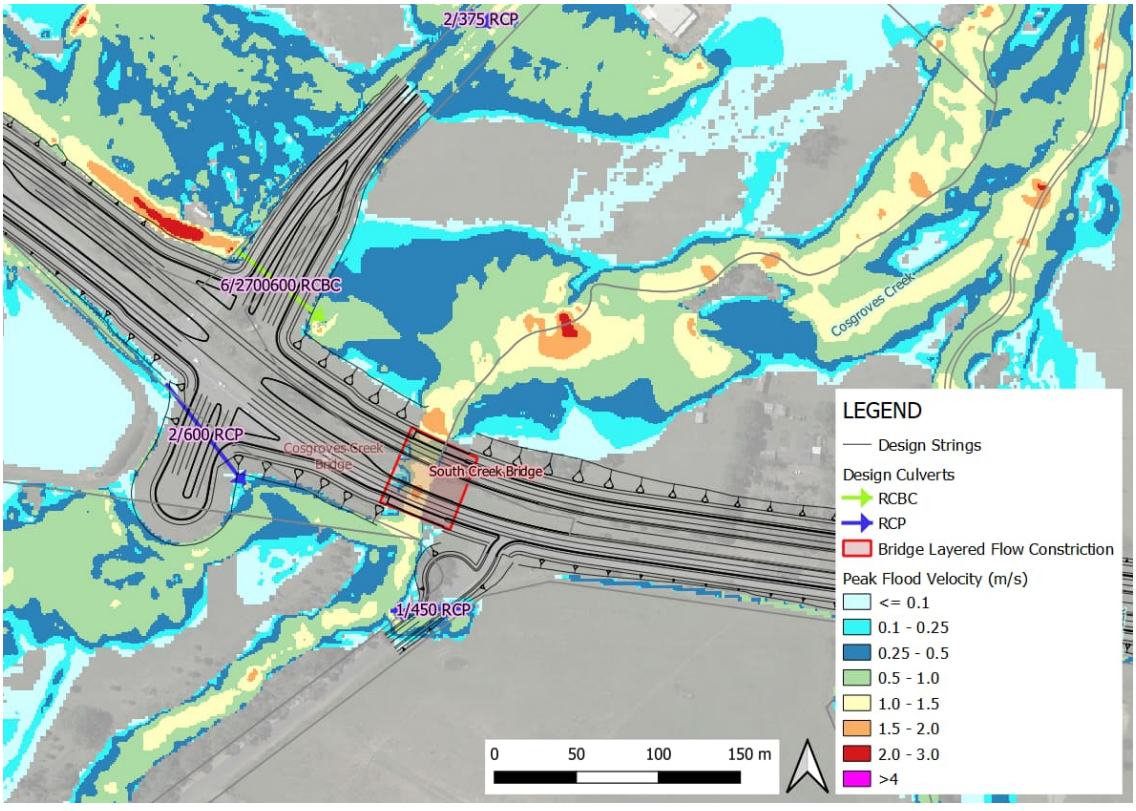


Figure 37 Cosgroves Creek Bridge 1 per cent AEP Velocity

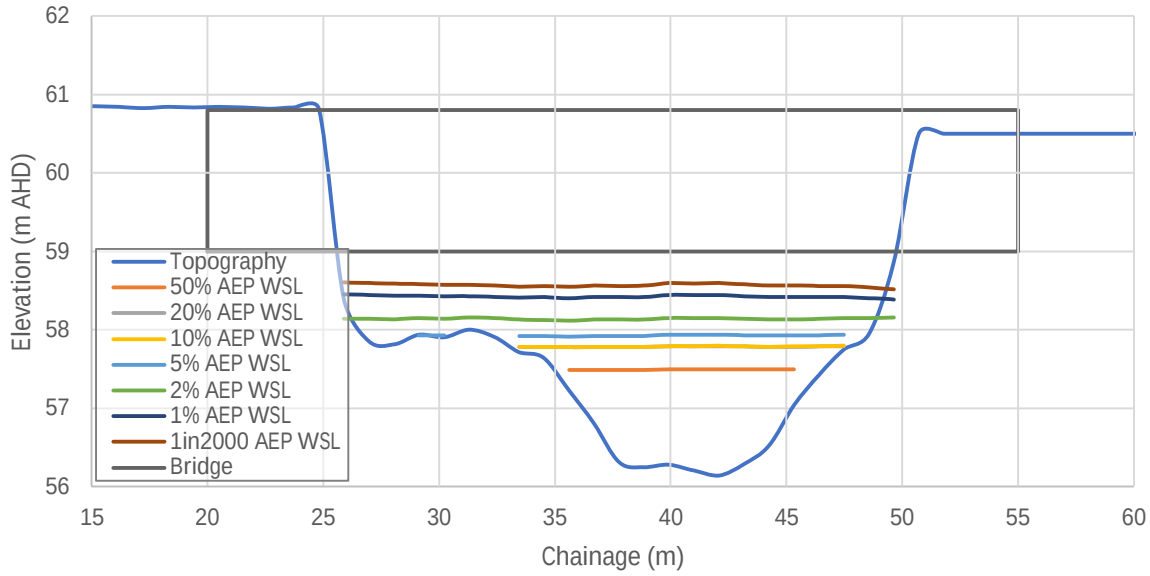


Figure 38 Cosgroves Bridge Flood Levels

General Design Notes:

Development of the design bridge considered multiple hydraulic results before arriving at a final design. Some design considerations included:

- No excavation under Cosgroves Creek Bridge in the creek is required to mitigate afflux.
- There is up to 20 mm of afflux in the 1 per cent AEP (allowable) due to different timing of flows from the different locations (Luddenham Road, Cosgroves Creek and Oaky Creek).
- Velocities through the bridge are minor, peaking at approximately 1.6m/s for the 1 per cent AEP on the upstream face of the bridge (refer to Figure 44), which do not imply significant works for erosion or scour control.
- Flood levels at the bridge centreline (refer to Figure 38) indicate that flood levels do not reach the bridge soffit and the bridge has sufficient freeboard.

6.8.2 Oaky Creek

The proposed hydraulic infrastructure in the vicinity of Oaky Creek culvert (Chainage 2200) includes:

- Replacement of the existing 3/1800x1500mm RCBC's with a 3/1800x1500mm RCBC's (i.e. the same size but the design culvert will be longer due to the additional design lane) at similar invert level with road crown increased from 58.20m AHD to 58.54m AHD
- Longitudinal drainage channels conveying flow to the Oaky Creek Culvert (chainage 2200).

Flood maps illustrating the change in flood levels (Design Case vs Future Base Case) estimated for the 50 per cent AEP to PMF design flood events are provided in Appendix A (refer Maps A025 to A032).

Flood maps illustrating the estimated change in flood levels and the peak flood velocity for the 1 per cent AEP design event at the Oaky Creek culvert are provided as Figure 39 and Figure 40 respectively.

A longitudinal flood profile of the 1 per cent AEP design event, and cross-sectional plot immediately upstream of the Oaky Creek culvert are provided in Figure 41 and Figure 42 respectively.

An assessment of hydraulic model results in the vicinity of the Oaky Creek culvert indicates:

- The Elizabeth Drive road shoulder has 1700mm freeboard to the 1 per cent AEP design event
- The obvert of the Oaky Creek culvert is submerged by the 1 per cent AEP design flood level by 160mm
- The ED-upgrades will not cause an unacceptable increase in peak flood levels (afflux), velocities and hazard outside of the Land Acquisition Extents. As such, it expected that there will be no substantial adverse impacts to properties in this area.

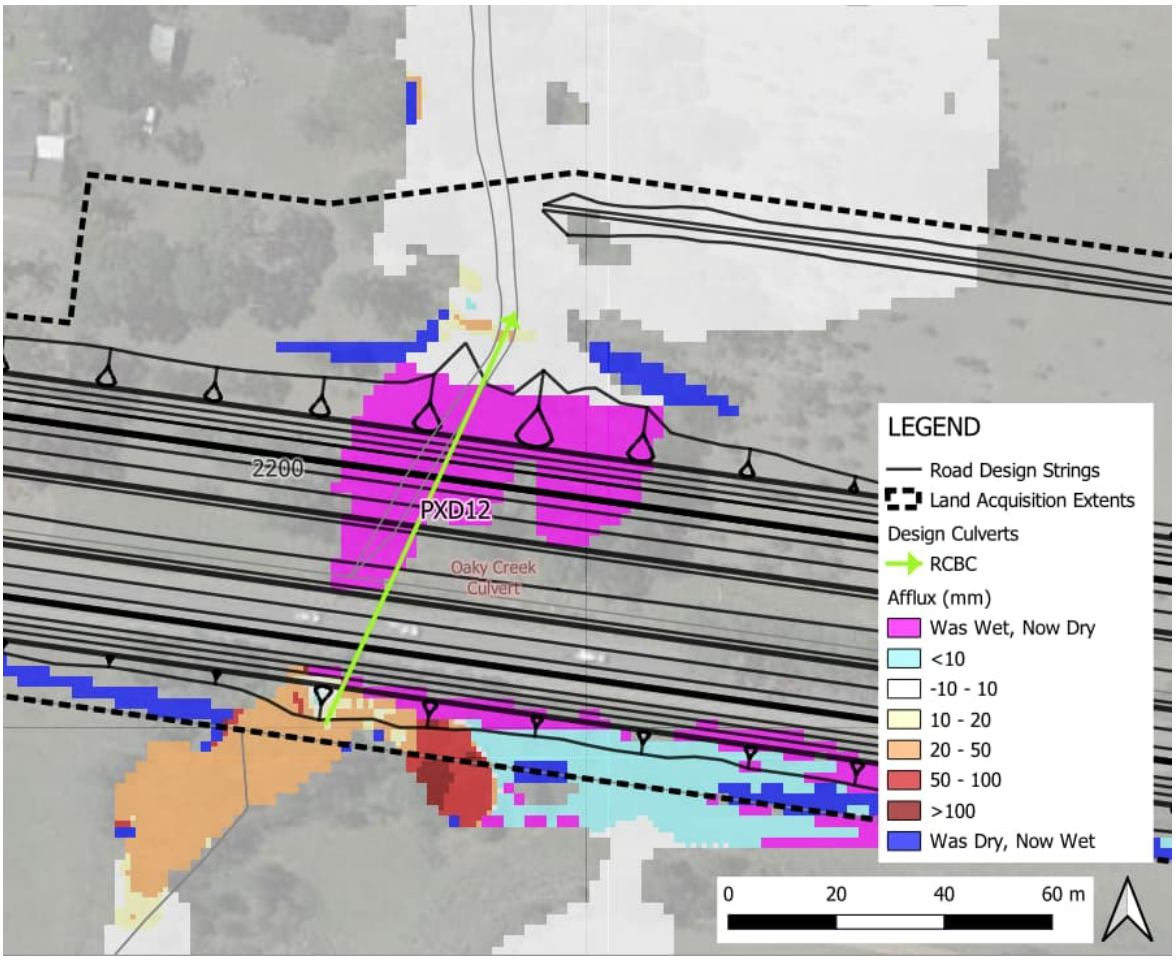


Figure 39 Oaky Creek Culvert 1 per cent AEP Afflux

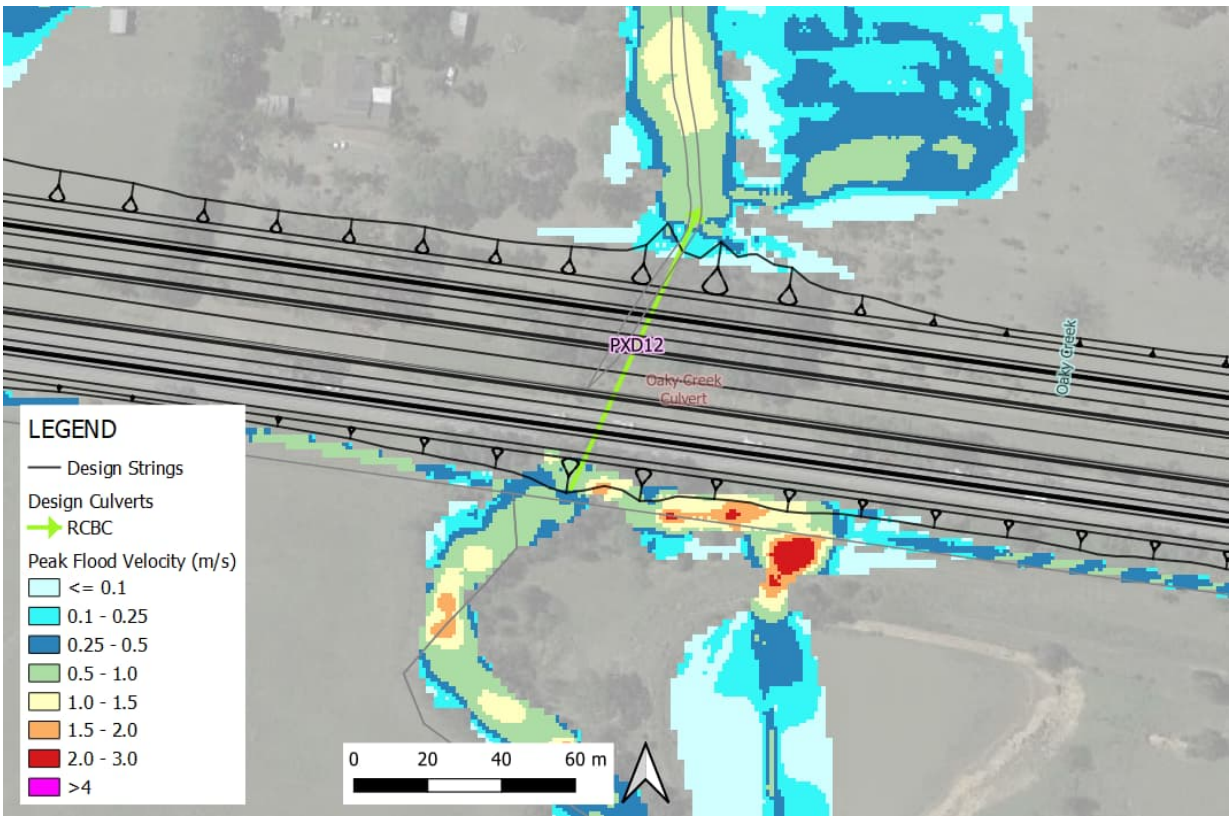


Figure 40 Oaky Creek Culvert 1 per cent AEP Velocities

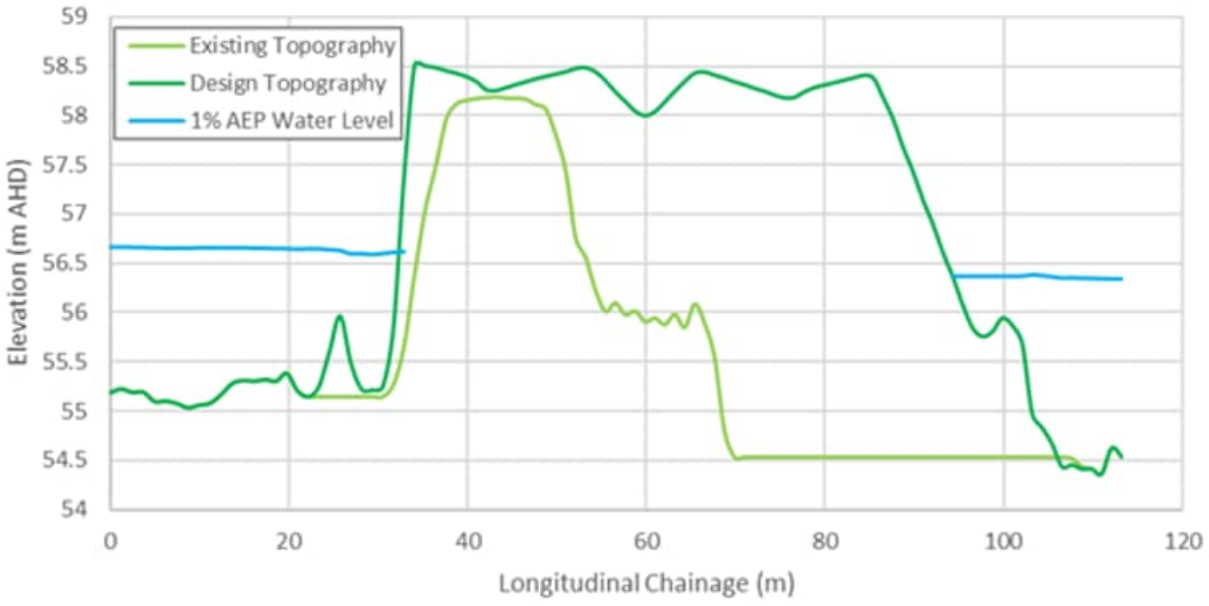


Figure 41 1 per cent AEP Long Section through Oaky Creek culvert (upstream to downstream – left to right)

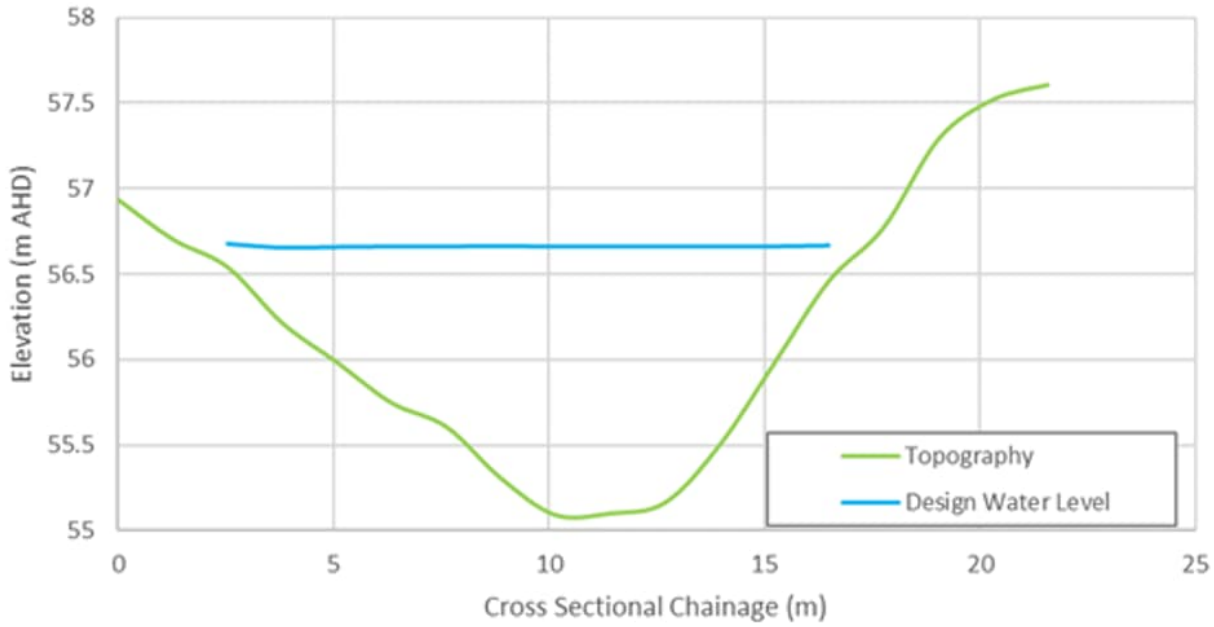


Figure 42 1 per cent AEP Cross Section Upstream of Oaky Creek Culvert

General Design Notes:

Key design considerations of the culvert at this location included:

- The culvert is fully submerged/activated for 20% of the time of the 1 per cent AEP critical storm duration, passing approximately 16.1 m^3/s
- 1 per cent AEP flows in the upstream main creek reach up to 9 m^3/s indicating the flows from the design drainage channels make up the remaining 7.1 m^3/s through the culvert, or it is not fully capable of taking all the flow and positive afflux will occur
- 1 per cent AEP velocities through the barrel of this culvert reach 3.2 m/s. Inlet and outlet velocities in the peak around 0.9 m/s and 0.7 m/s respectively
- 1 per cent AEP flood afflux is acceptable as increased impacts are generally contained within the main creek and meet performance criteria.

6.8.3 Badgerys Creek

The proposed hydraulic infrastructure in the vicinity of Badgerys Creek Bridge (Chainage 5400) includes:

- Replacement of the existing 2x10m span bridge at Badgerys Creek with a 2x17m span bridge with lowest level on the soffit level increased from 46.27m AHD to 47.28m AHD
- Replacement of the existing 2/7000x4000mm RCBC's with 5/1500x1500 RCBC's at similar invert level with road crown increased from 47.20m AHD to 48.90m AHD
- Addition of the 1/525mm RCP at location AE120
- Longitudinal drainage channels conveying flow to Badgerys Creek Bridge.

Flood maps illustrating the change in flood levels (Design Case vs Future Base Case) estimated for the 50 per cent AEP to PMF design flood events are provided in Appendix A (refer Maps A057 to A064).

Flood maps illustrating the estimated change in flood levels and the peak flood velocity for the 1 per cent AEP design event at the Badgerys Creek Bridge are provided as Figure 43 and Figure 44 respectively. Design Case flood levels at the cross section located immediately upstream of Badgerys Creek Bridge are provided in Figure 45.

An assessment of hydraulic model results in the vicinity of Badgerys Creek Bridge indicates:

- The soffit of the proposed Badgerys Creek Bridge is clear of the 1 per cent AEP design flood level by 330mm
- The bridge deck has approximately 1900mm freeboard to the 1 per cent AEP design event
- The ED-upgrades will not cause an unacceptable increase in peak flood levels (afflux), velocities and hazard outside of the Land Acquisition Extents. As such, it expected that there will be no substantial adverse impacts to properties in this area.

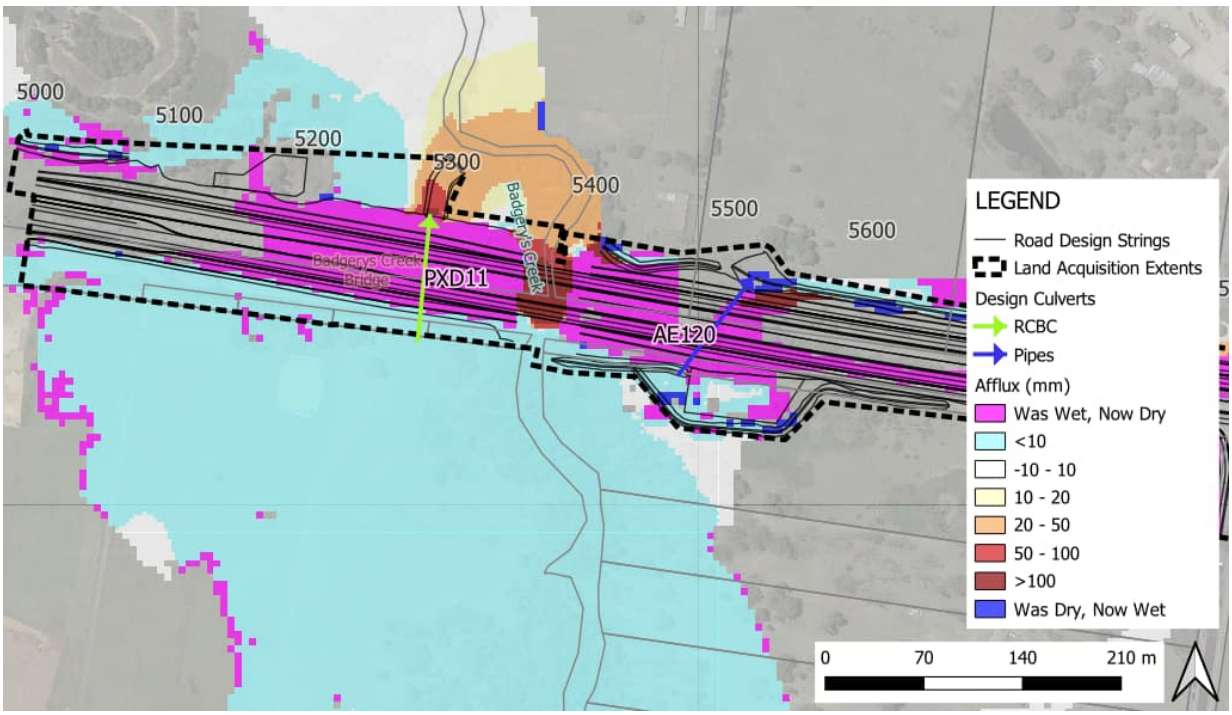


Figure 43 Badgerys Creek Bridge 1 per cent AEP Afflux

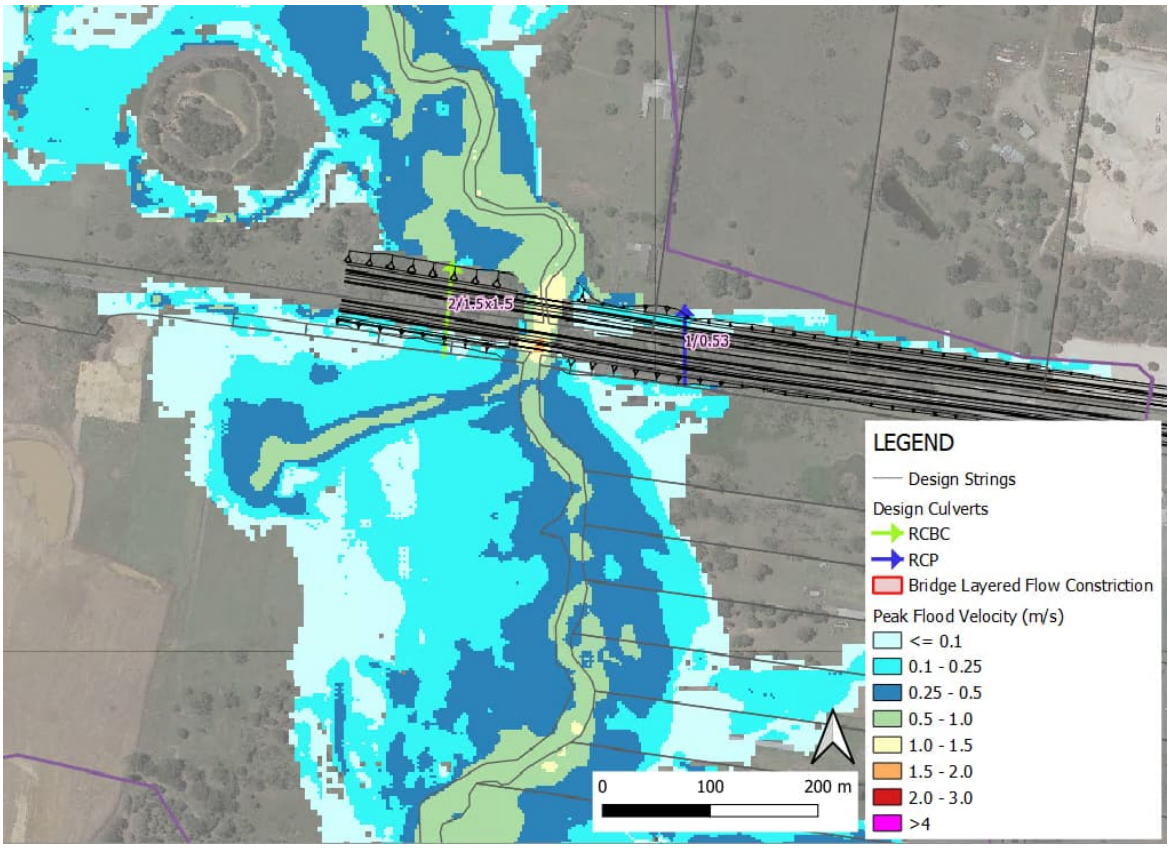


Figure 44 Badgerys Creek Bridge 1 per cent AEP Velocities

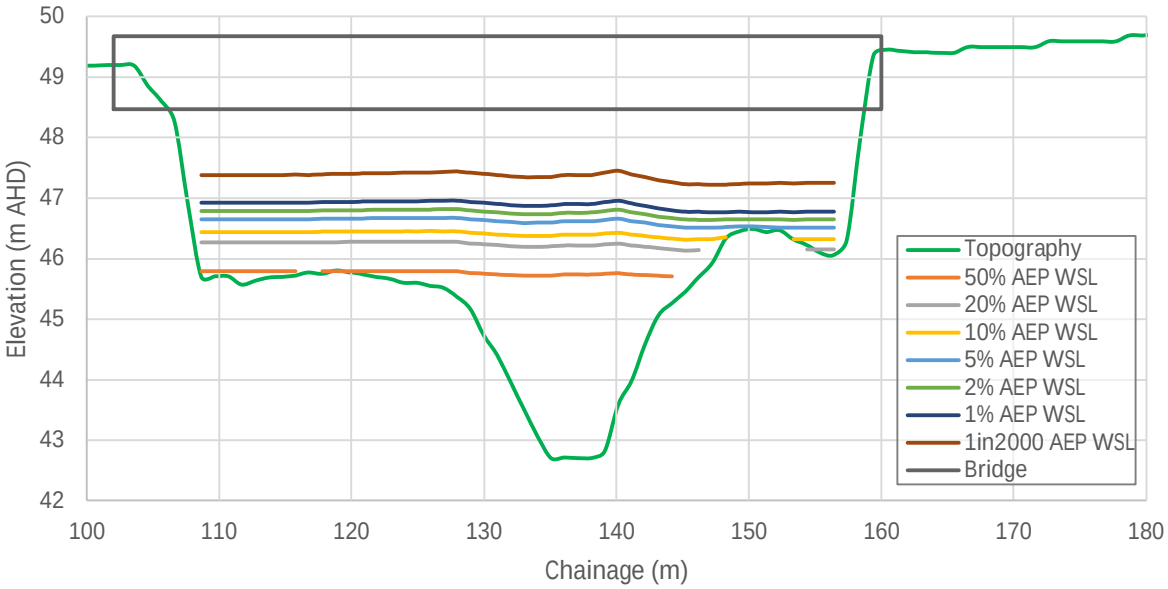


Figure 45 Badgerys Bridge Cross Section Results

General Design Notes:

Development of the design bridge considered multiple hydraulic results before arriving at a final design. Some design considerations included:

- No excavation is required in the vicinity of Badgerys Creek bridge to mitigate afflux
- The 1 per cent AEP afflux shown in Figure 43 is contained within the creek (maximum afflux 70 mm), which is within the afflux criteria (100 mm) designated for Environment and Recreation land-use zoning
- 1 per cent AEP velocities through the bridge are minor, peaking at approximately 1.6m/s for the 1 per cent AEP on the upstream face of the bridge (refer to Figure 44), which do not imply significant works for erosion or scour control
- Flood levels at the centreline of the bridge (refer to Figure 45) indicate that design event flood levels do not reach the bridge soffit and that the bridge has sufficient freeboard
- The relief culvert (ID:PXD11, 5/1500x1500 mm RCBC, refer to the culvert on the west of the bridge in Figure 41) was sized to allow sufficient freeboard to the bridge soffit. This culvert is oversized, and the flood modelling shows that this could reduce upstream 1 per cent AEP design flood levels below the Future Base Case flood levels, however this may not reflect a realistic scenario. It is recommended that options to raise the road and bridge level in this location, and to reduce the size of the proposed culvert, are considered in detailed design.

6.8.4 South Creek

The proposed hydraulic infrastructure in the vicinity of South Creek Bridge (Chainage 6675) includes:

- Replacement of the existing 5x10m span bridge and 2x10m span bridge at South Creek with a 6x28m span bridge with lowest level on the soffit lowered from 43.49m AHD to 43.4m AHD (note the soffit level ranges substantially along the cross section)
- Replacement of the existing 4/1350x900mm RCBC's with 6/1800x1200 RCBC's at similar invert level with road crown increased from 43.0m AHD to 44.7m AHD at location Box_9
- Addition of 4/1200 RCPs, 3/900mm RCPs, 2/1800x600 RCBC's at locations PXD29, PXD27 and PXD33 respectively
- Replacement of the existing 3/2000x60mm RCBC's with 4/2400x1200mm RCBC's at similar invert level with road crown increased from 43.0m AHD to 43.4m AHD at location PXD31
- Longitudinal drainage channels conveying flow to South Creek as well as locations PXD29, PXD27, PXD33 and PXD31.

Flood maps illustrating the change in flood levels (Design Case vs Future Base Case) estimated for the 50 per cent AEP to PMF design flood events are provided in Appendix A (refer Maps A089 to A096).

Flood maps illustrating the estimated change in flood levels and the peak flood velocity for the 1 per cent AEP design event at the South Creek Bridge are provided as Figure 46 and Figure 47 respectively. Design Case flood levels at the cross section located immediately upstream of South Creek Bridge provided in Figure 48.

An assessment of hydraulic model results in the vicinity of South Creek Bridge indicates:

- The soffit of the proposed South Creek Bridge is clear of the 1 per cent AEP design flood level by 360mm
- The bridge deck has approximately 100mm freeboard to the 1 per cent AEP design event
- The ED-upgrades will not cause an unacceptable increase in peak flood levels (afflux), velocities and hazard outside of the Land Acquisition Extents or design elements (i.e., design channels). As such, it expected that there will be no substantial adverse impacts to properties in this area.

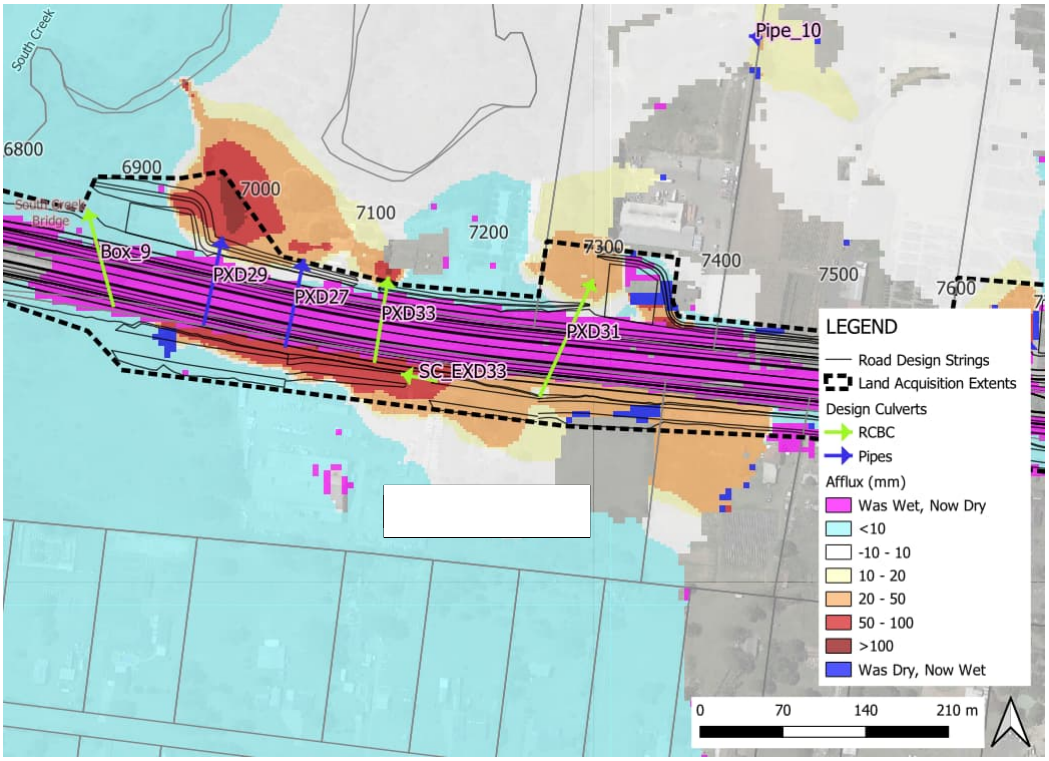


Figure 46 South Creek Bridge 1 per cent AEP Afflux

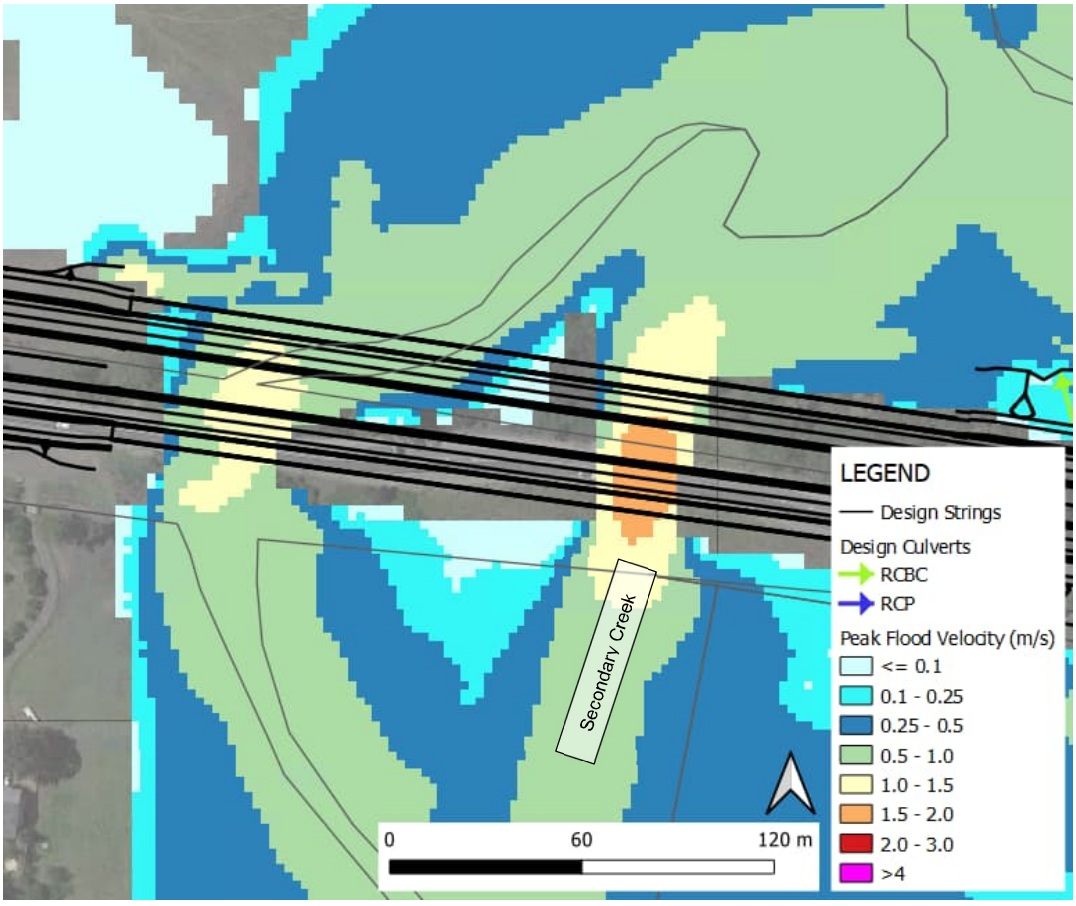


Figure 47 South Creek Bridge 1 per cent AEP Velocities

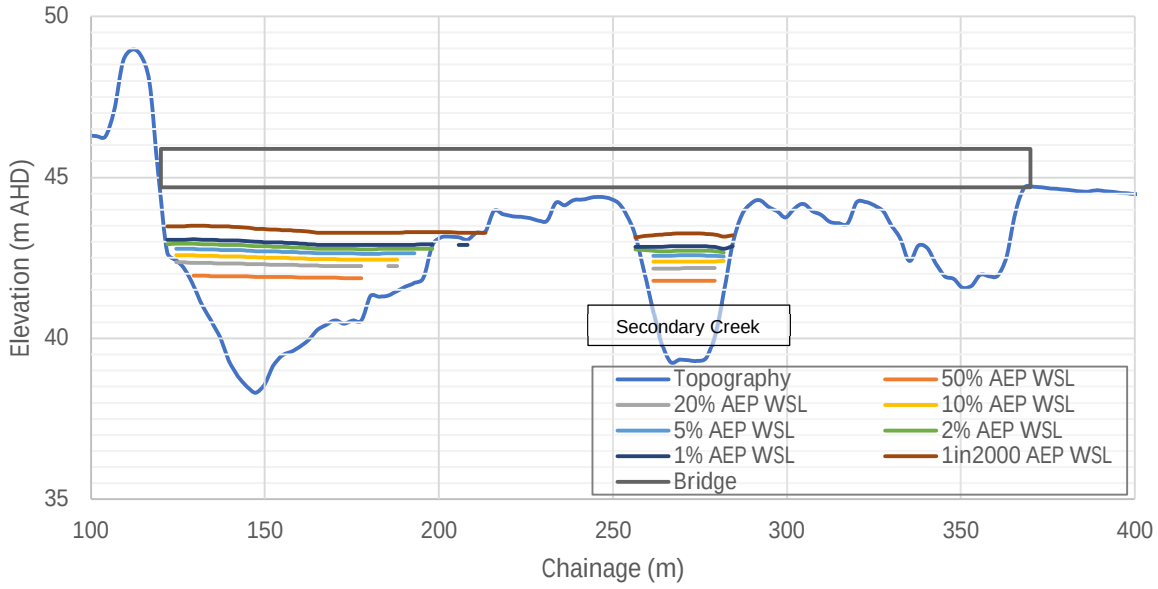


Figure 48 South Creek Bridge Cross Section Results

General Design Notes:

Development of the design bridge considered multiple hydraulic results before arriving at a final design. Key design considerations included:

- No excavation is required for flood mitigation, although later design stages are noted to excavate the area in between the main and secondary creek (refer to cross section chainage 230 to 240 in Figure 48) for maintenance access. This will likely not adversely affect hydraulic results, although later design stages need to consider this.
- There is negative afflux (i.e., reduction in flood levels) in the 1 per cent AEP upstream of South Creek due to the proposed culverts located to the east of the bridge which are required to stop water backing up behind the design road and off Lot ID: DP858141).
- 1 per cent AEP velocities through the bridge are minor, peaking at approximately 1.75m/s for the 1 per cent AEP through the Secondary Creek (refer to Figure 47 and Figure 48 for the location of the Secondary Creek), which do not imply significant works for erosion or scour control.
- Design event flood levels at the centreline of the bridge (refer to Figure 48) indicate that modelled flood levels do not reach the bridge soffit.

6.8.5 Kemps Creek

The proposed hydraulic infrastructure in the vicinity of Kemps Creek Bridge (Chainage 9500) includes:

- Replacement of the existing 2x10m span bridge at Kemps Creek with a 6x18m span bridge with lowest level on the soffit increased from 46.965m AHD to 47.47m AHD
- Addition of 4/1200mm RCP's at location PXD20
- Addition of 8/1800x1200mm RCBC's at location PXD28
- Longitudinal drainage channels conveying flow to Kemps Creek.

Flood maps illustrating the change in flood levels (Design Case vs Future Base Case) estimated for the 50 per cent AEP to PMF design flood events are provided in Appendix A (refer Maps 121 to 128).

Flood maps illustrating the estimated change in flood levels and the peak flood velocity for the 1 per cent AEP design event at the Kemps Creek Bridge are provided as Figure 49 and Figure 50 respectively. Design Case flood levels at the cross section located immediately upstream of the Kemps Creek Bridge are provided in Figure 51.

An assessment of hydraulic model results in the vicinity of Kemps Creek Bridge indicates:

- The soffit of the proposed Kemps Creek Bridge is clear of the 1 per cent AEP design flood level by 350mm
- The bridge deck has approximately 1700mm freeboard to the 1 per cent AEP design event
- The change in flood levels (afflux) for design events up to and including the 1 per cent AEP design event are within acceptable tolerances with affluxes greater than 100mm generally contained within the Land Acquisition Extent for the project. There is some afflux downstream of Kemps Creek where afflux is greater than 100mm and outside the Land Acquisition Extent. It is recommended that detailed design development include consideration of raising the soffit of Kemps Creek and reducing the size of the relief culvert (ID:PXD28, 8/1800x1200 mm RCBC, refer to the culvert on the easy of the bridge in Figure 49)
- The newly wetted area is still compliant as it contains depths less than 50mm.

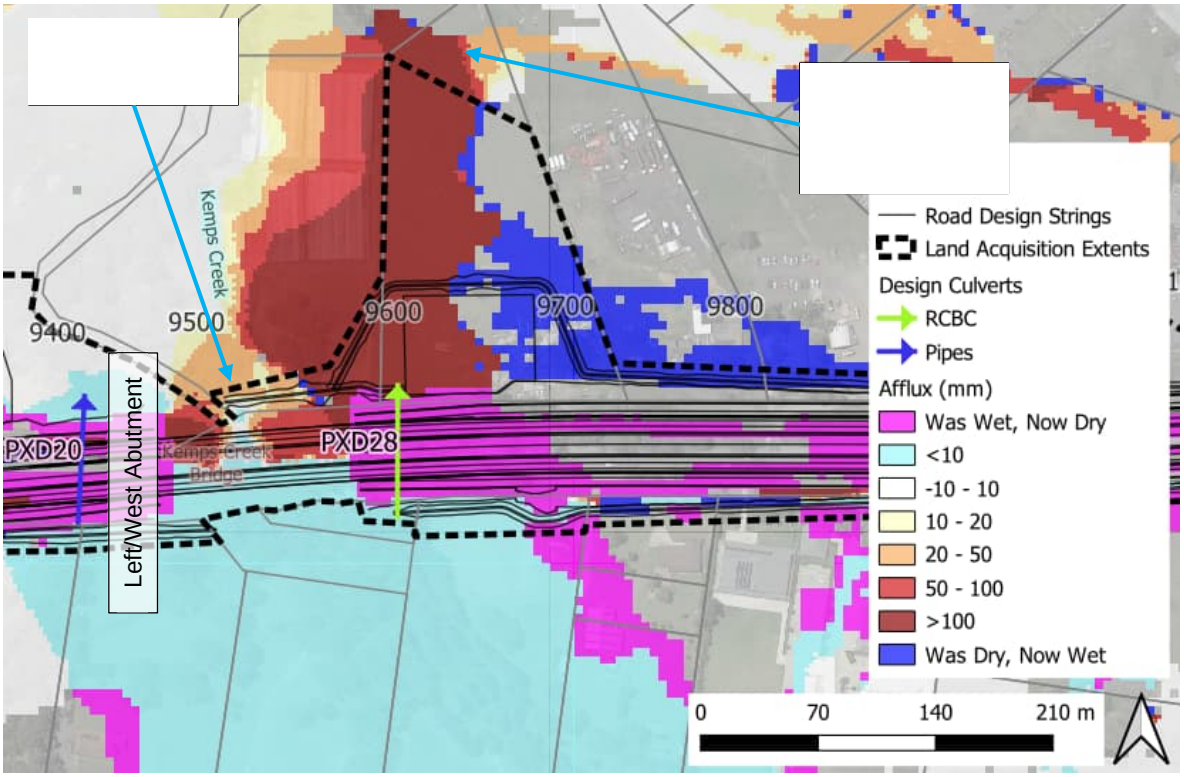


Figure 49 Kemps Creek Bridge 1 per cent AEP Afflux

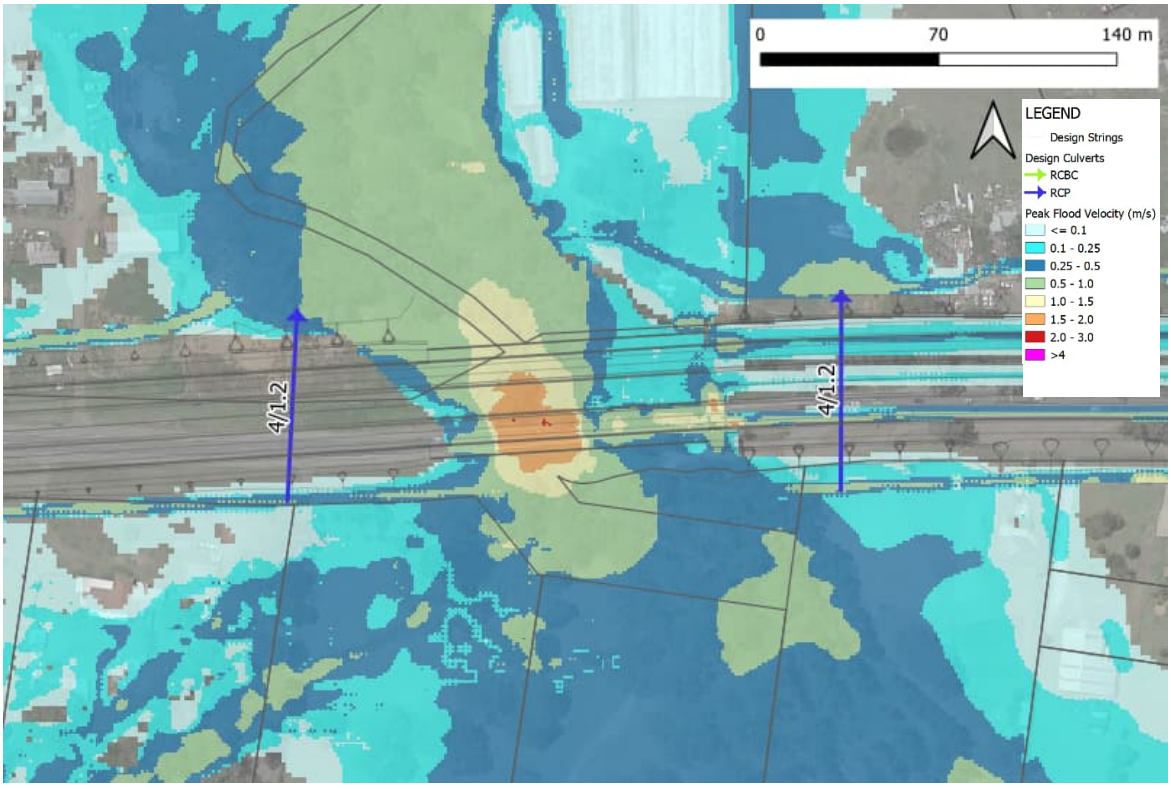


Figure 50 Kemps Creek Bridge 1 per cent AEP Velocities

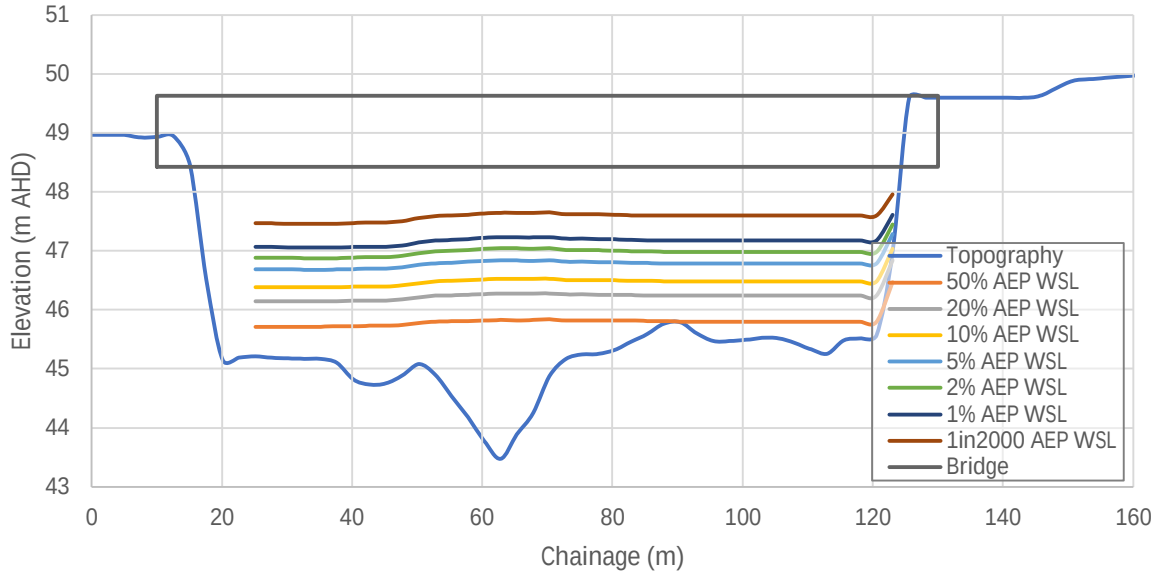


Figure 51 Kemps Creek Bridge Cross Section Results

General Design Notes:

Further detailed design development would involve investigation of opportunities to minimise flooding Based on this assessment, considerations for the detailed design stage include the following:

- Excavation of the existing alignment is necessary to remove the current bridge. This would also support in reducing surrounding afflux
- Afflux for Kemps Creek Bridge is presented in Figure 49, with the bridge opening shifted sufficiently west (i.e. there should be an opening at approximately Chainage 9470) to keep the main flow path open
- The afflux shown in Figure 49 under the bridge is within allowable tolerances, with the exception of 175m downstream, where later design stages can allow for with a raised bridge soffit
- Velocities peak at approximately 1.8m/s for the 1 per cent AEP (refer to Figure 50) underneath the bridge, which is not a serious concern with respect to erosion or scour control
- Bridge water levels at the centreline (refer to Figure 51) are used to identify that flood levels do not reach the bridge soffit and has sufficient freeboard
- It is noted that the current road embankment intrudes on the eastern bank of the creek on the upstream side of the face. It is not a significant intrusion to substantially impede flows
- To minimise afflux upstream of Kemps Creek, the flow area near the west abutment would need to be increased, such that there is a free-flowing area into the main creek (refer to Figure 49). An alternative method to achieve this would be to shift the bridge west or skew the abutments parallel to the flowpath travelling north-west
- To allow sufficient freeboard to the bridge soffit, the culvert immediately East of the bridge (ID:PXD28, 8/1800x1200 mm RCBC, refer to the culvert on the easy of the bridge in Figure 49) is oversized, which also implies greater peak water levels downstream. As such it is recommended to raise the road and bridge soffit level here, to reduce the size of the culvert and match existing conditions better. This alignment raising can be undertaken in later design stages. The majority of this afflux is on Rural land with a large portion being land acquired by the project, hence it is allowable, although a small area exceeds 80mm and is on Primary Small Production Lots under property Lot 19/ DP30265 and Lot 29/ DP30265. The afflux will also be reduced once the bridge soffit is raised and the eastern relief culverts is reduced in size. There is also positive afflux in a farm dam, although given it is less than 100mm it is allowable, since it is zoned as Environmental and Recreation land.

6.8.6 Overall Bridge Summary

A summary of 1 per cent AEP peak flows, velocities and flood levels is provided in Table 21.

Table 21 Preliminary Bridge Results

Bridge Name	Bridge Details	Lowest Point on Soffit (m AHD)	1% AEP Peak Flow (m^3/s) [1]	1% AEP Peak Velocity (m/s) [2]		1% AEP Peak Flood Level (m AHD)	
				Peak	Average [3]	Upstream [4]	Bridge
Cosgroves Creek	Single 22m span bridge	59	24.20	1.18	1.05	58.8	58.6
Badgerys Creek	2x17m span bridge	47.28	94.91	1.38	1.23	47.1	47.0
South Creek	6x28m span bridge	43.4	280.21	1.49	0.61	43.2	43.0
Kemps Creek	6x18m span	47.47	173.47	1.84	1.55	47.2	47.1

[1] Flows taken through the bridge centreline across the entire creek
[2] Taken at critical cross section underneath the bridge where results are the highest
[3] Average cross section velocity is generally used for bridge loading
[4] Taken 20 m upstream of the upstream bridge face

6.8.7 Scour Assessment

A preliminary scour assessment was undertaken to assess maximum expected depth of scour due to flow contraction and influence of piers on flow behaviour. A summary of maximum estimated scour depths for the 1 per cent AEP and 0.05 per cent AEP design events is provided in Table 22. The scour assessment was undertaken in accordance with Austroads Guide to Bridge Technology Part 8 (Austroads, 2018) with key scour inputs extracted from relevant hydraulic models.

Table 22 Preliminary Bridge Scour Assessment

Bridge Name	Bridge Details	1% AEP Scour Depth	0.05% AEP Scour Depth
Cosgroves Creek	Single 22m span bridge	0.5	1.1
Badgerys Creek	2x17m span bridge	2.4	2.8
South Creek	6x28m span bridge	6.7	12.4
Kemps Creek	6x18m span	6.6	14.7

In relation to the scour depth estimates, it is noted that:

- If in future design stages the modelled bridge parameters are changed (e.g., the bridge pier blockage coefficients), flood depths and velocities will change and different scour estimates will result
- Scour is calculated as a single constant value for simplicity. In reality there will be different scour depths at different points along the bridge cross-section. This is due to the different empirical equations at different structural elements (i.e., piers and abutments) and the extraction of different hydraulic results (e.g., velocity and depth) being variable along the cross section. Scour will need to be re-calculated and updated in later stages of design, where the values require more precision for different disciplines
- Scour is large for South Creek and Kemps Creek as the ratio of widths between the upstream cross section and cross section at the bridge is large which increases the calculated value of horizontal contraction scour.

6.9 Duration of Road Inundation

In accordance with the design criteria, the ED road alignment has been designed with 1 per cent AEP flood immunity. Given that some sections of the ED road alignment are currently inundated (under existing floodplain conditions) in events as frequent as the 50 per cent AEP (refer Section 2.1.2), this represents a substantial improvement in existing road immunity and reduction in the duration of inundation.

As the proposed Elizabeth Drive road corridor would not be overtopped during a one per cent AEP design flood event, there would be no increase in the duration of road inundations. There would also be a substantial reduction in the frequency of road closures, and a subsequent safety improvement for road users as a result of the proposal.

6.10 Building Impact Assessment

A hydraulic modelling assessment was undertaken to estimate the number of buildings impacted by above floor flooding (AFF) in 'Future Base Case' (pre-road upgrade) and 'Design Case' (post-road upgrade) conditions. The following methodology and data were used in the assessment:

- A dataset of building footprints was sourced from Bing 2020
- The ground level at the centroid of each building was extracted from client supplied LiDAR data
- One per cent AEP peak flood levels were extracted from the TUFLOW hydraulic model at the centroid of building footprints
- In the absence of floor level survey, all building floor levels were assumed to be 300mm above the ground level at the centroid of the building extent. It is noted that floor level survey would be required to inform a more accurate assessment of AFF.

It is noted that the assessment does not take into account proposed land acquisition extents for the EDU road upgrade.

Table 23 provides a summary of the number of buildings impacted by AFF in the 1 per cent AEP design flood event with a summary of impacts at every property provided in Appendix G.

The location of impacted buildings (with the database including a total of 1593 buildings) is provided in Figure 52 to Figure 56. Results indicate:

- 153 buildings (one within the vicinity of ED West and 152 within the vicinity of ED East) are estimated to experience above floor flooding in 'Future Base Case' conditions and 147 buildings (one near ED West and 146 near ED East) in 'Design Case conditions estimated to experience above floor flooding. This represents a net reduction of six buildings (4% of buildings) that are expected to experience above floor flooding in 'Design Case' (post-road upgrade) conditions
- The depth of above floor flooding is estimated to increase at 20 buildings (refer Table 24) due to construction of the proposal (none in West, and 20 in East by up to 111mm). Of these buildings, the proposed road design is estimated to:
    - Cause AFF to one building that did not experience AFF in the 'Future Base Case' (pre-road upgrade) conditions
    - Increase the depth of flooding in 20 buildings by more than 1mm, that experience AFF in 'Future Base Case' (pre-road upgrade) conditions
    - Increase the depth of AFF by more than 10mm in 15 buildings (75% of the total 20 buildings), by more than 20mm in eight buildings (40% of the total 20 buildings), by more than 50mm in three buildings (15% of the total 20 buildings), and by more than 100mm in one building (5% of the total 20 buildings).

Table 23 Impacted Building Types for 1 per cent AEP Building Flood Impact assessment

Condition 1. Future Base Case Conditions (Flood Levels relative to Floor Levels)	Condition 2. Change in Design Flood Level relative to Future Base Case	Result. Design Case Conditions (Flood Levels relative to Floor Levels)	Count of impacted Buildings	Percentage of Total Buildings
Below Floor Flooding	Increase	Above Floor Flooding	**1**	0.1%
	Increase	Below Floor Flooding	**27**	1.7%
	No Change	Below Floor Flooding	1326	83.2%
	Decrease	Below Floor Flooding	**86**	5.4%
Above Floor Flooding	Increase	Above Floor Flooding	**19**	1.3%
	No Change	Above Floor Flooding	30	1.9%
	Decrease	Above Floor Flooding	**96**	6.0%
	Decrease	Below Floor Flooding	**7**	0.4%
Total Number of Buildings			1593	100%

Table 24 Summary of buildings impacted by 1 per cent AEP Above Floor Flooding

Building Specifications							Flood Level (mAHD)		Depth above floor (m)		Increase in flood level	
Building FID	Property (Lot# / Plan #)	Class	Region	Chainage	Ground Level (mAHD)	Assumed Floor Level (mAHD) Ground Level + 300mm	Future Base Case	Design Case	Future Base Case	Design Case	Afflux (mm)	% increase in above floor flooding depth
249	B/DP102214	5	South	9400	45.61	45.91	46.566	46.571	0.653	0.657	4.66	0.71%
258	16/DP30265	5	South	9600	44.96	45.26	45.613	45.627	0.354	0.368	14.29	4.04%
712	16/DP30265	5	South	9600	45.17	45.47	45.663	45.676	0.192	0.205	13.41	6.98%
196	30/DP30265	5	South	9600	45.50	45.80	46.503	46.553	0.705	0.754	49.64	7.04%
280	30/DP30265	5	South	9500	45.71	46.01	46.837	46.928	0.825	0.916	91.17	11.05%
681	30/DP30265	5	South	9500	45.28	45.58	46.650	46.672	1.070	1.091	21.36	2.00%
759	30/DP30265	5	South	9500	45.51	45.81	46.524	46.531	0.714	0.720	6.98	0.98%
846	30/DP30265	5	South	9500	45.32	45.62	46.723	46.812	1.103	1.192	89.04	8.07%
1091	30/DP30265	5	South	9600	45.71	46.01	46.749	46.860	0.735	0.845	110.49	15.03%
176	8/DP30265	5	South	9000	43.66	43.96	43.987	44.010	0.027	0.050	22.57	83.16%
699	8/DP30265	5	South	9100	43.65	43.95	44.012	44.036	0.064	0.087	23.08	35.94%
760	5/DP30265	5	South	8900	42.11	42.41	42.503	42.520	0.091	0.107	16.63	18.31%
684	2/DP30265	5	South	8800	41.52	41.82	41.909	41.927	0.093	0.111	17.88	19.20%
320	3/DP30265	5	South	8900	41.92	42.22	42.226	42.239	0.008	0.021	13.02	167.57%
341	3/DP30265	5	South	8900	41.88	42.18	42.236	42.250	0.061	0.074	13.61	22.47%
54	34/DP258414	1	South	7400	38.69	38.99	38.977	38.994	0.000	0.005	4.85	0.00%
885	3/DP858141	5	South	7200	42.99	43.29	43.352	43.356	0.060	0.064	3.93	6.59%
779	29/DP258414	5	South	6600	34.98	35.28	36.360	36.366	1.076	1.082	6	0.56%
160	1/DP255566	5	South	7100	41.43	41.73	42.055	42.087	0.323	0.355	31.7	9.82%
552	1/DP255566	5	South	7100	41.46	41.76	41.935	41.953	0.174	0.192	18.31	10.54%

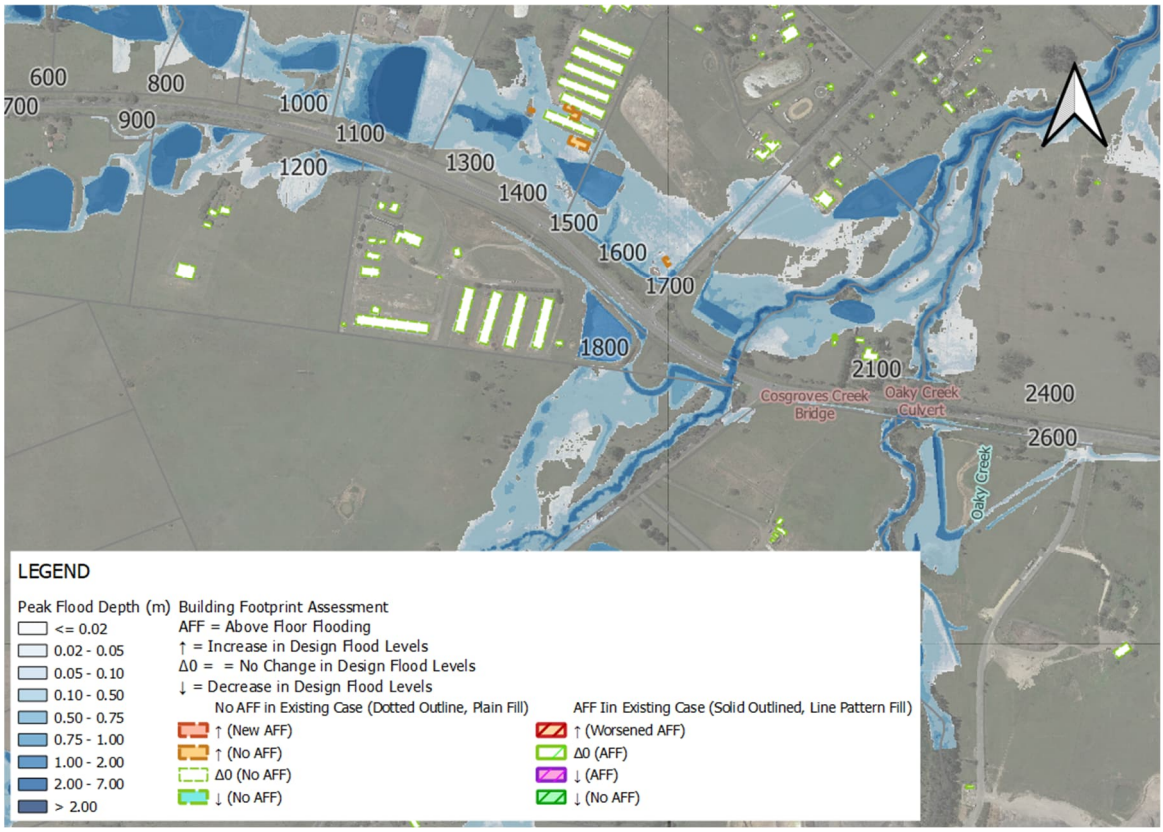


Figure 52 Building Impact Assessment for 1 per cent AEP Design Case, in vicinity of Cosgroves and Oaky Creek

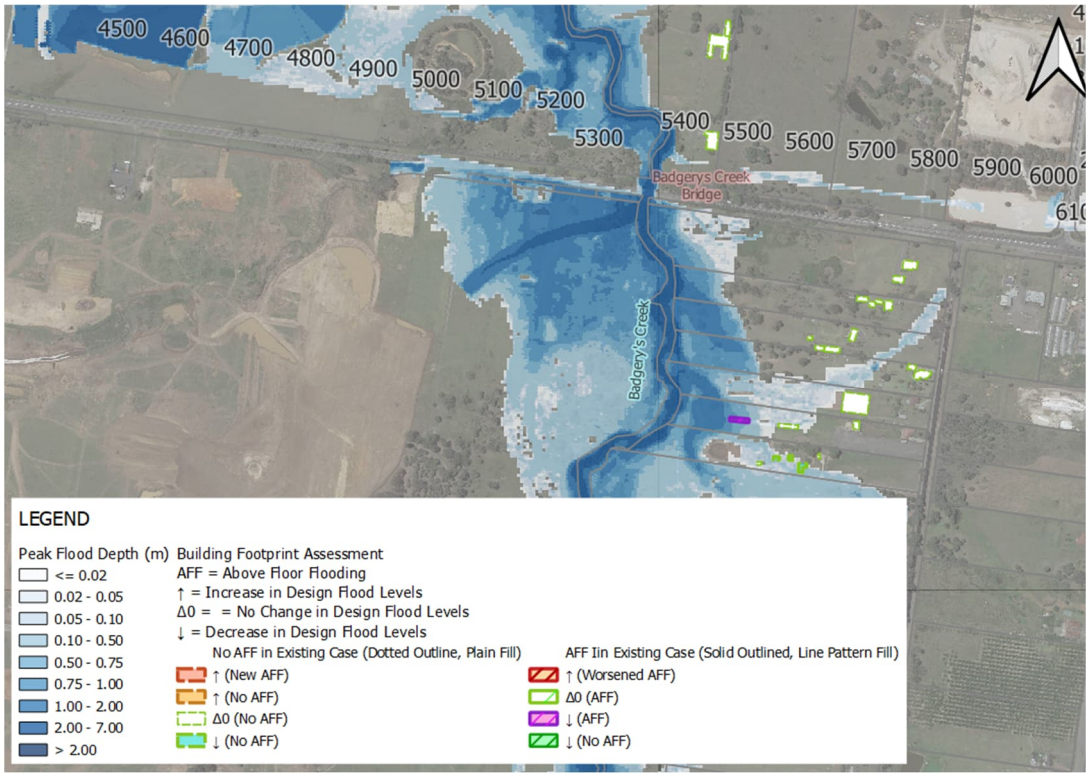


Figure 53 Building Impact Assessment for 1 per cent AEP Design Case, in vicinity of Badgerys Creek

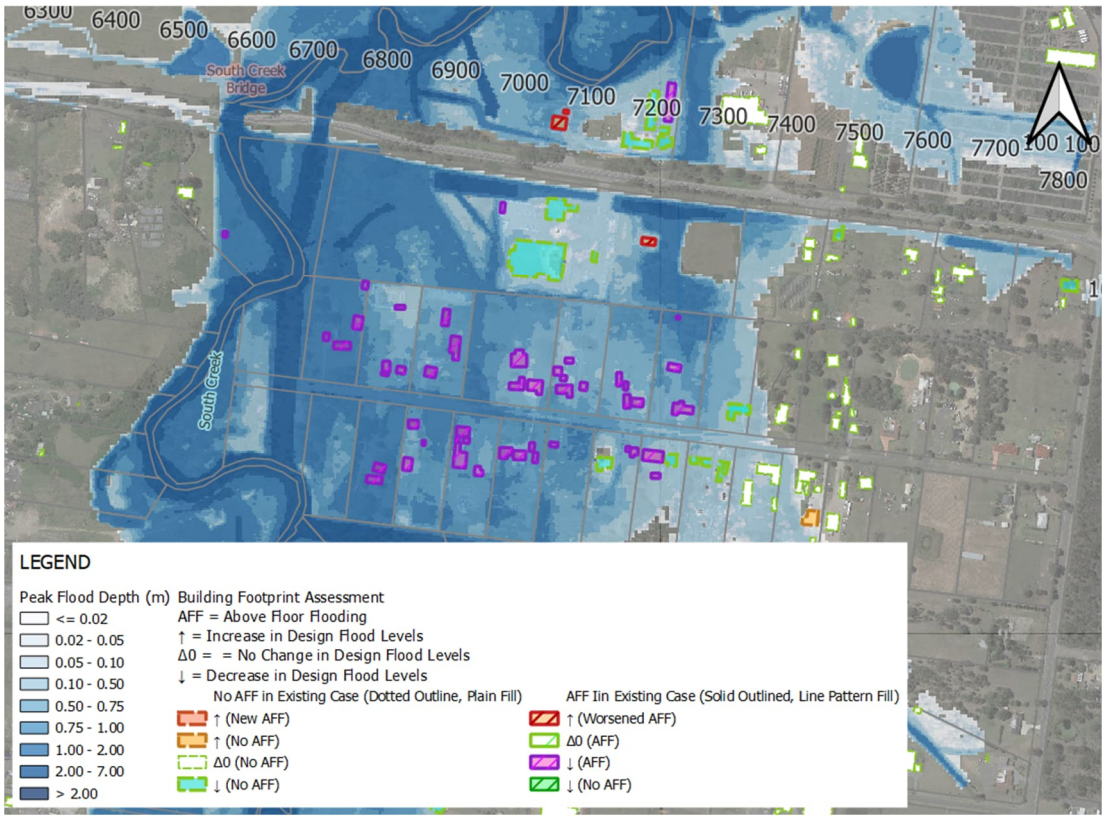


Figure 54 Building Impact Assessment for 1 per cent AEP Design Case, in vicinity of South Creek

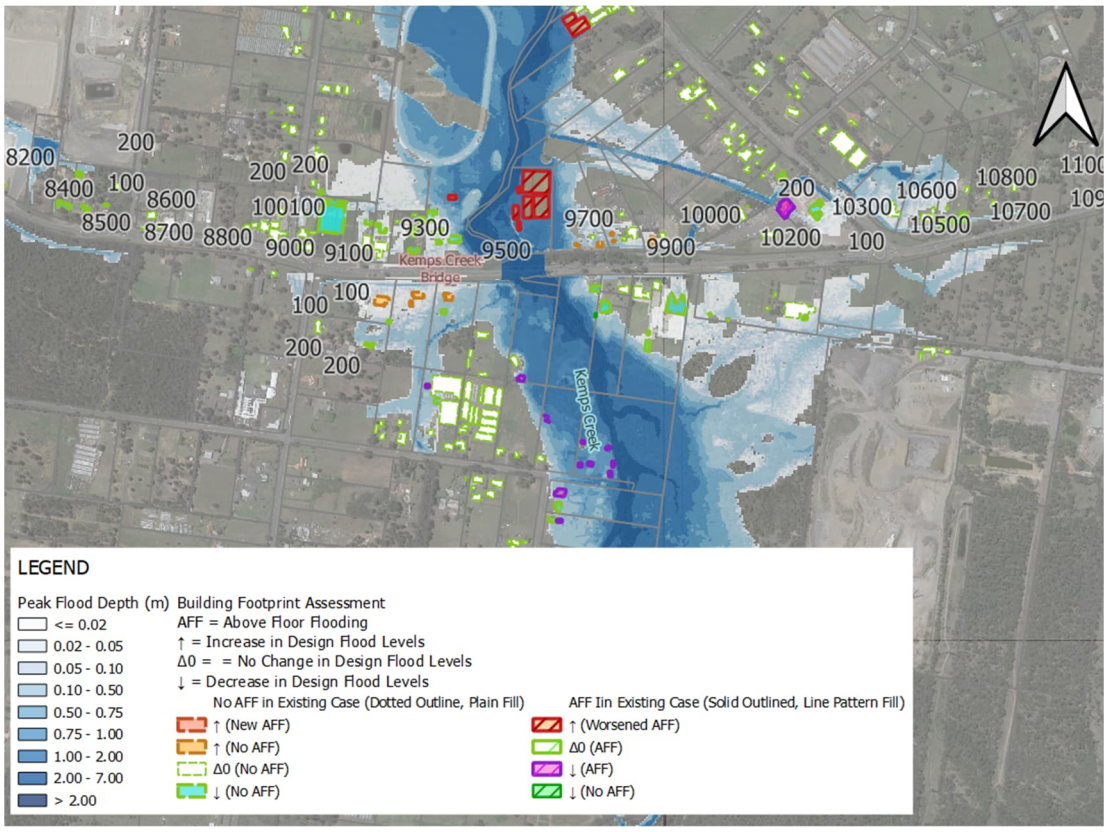


Figure 55 Building Impact Assessment for 1 per cent AEP Design Case, in vicinity of Kemps Creek

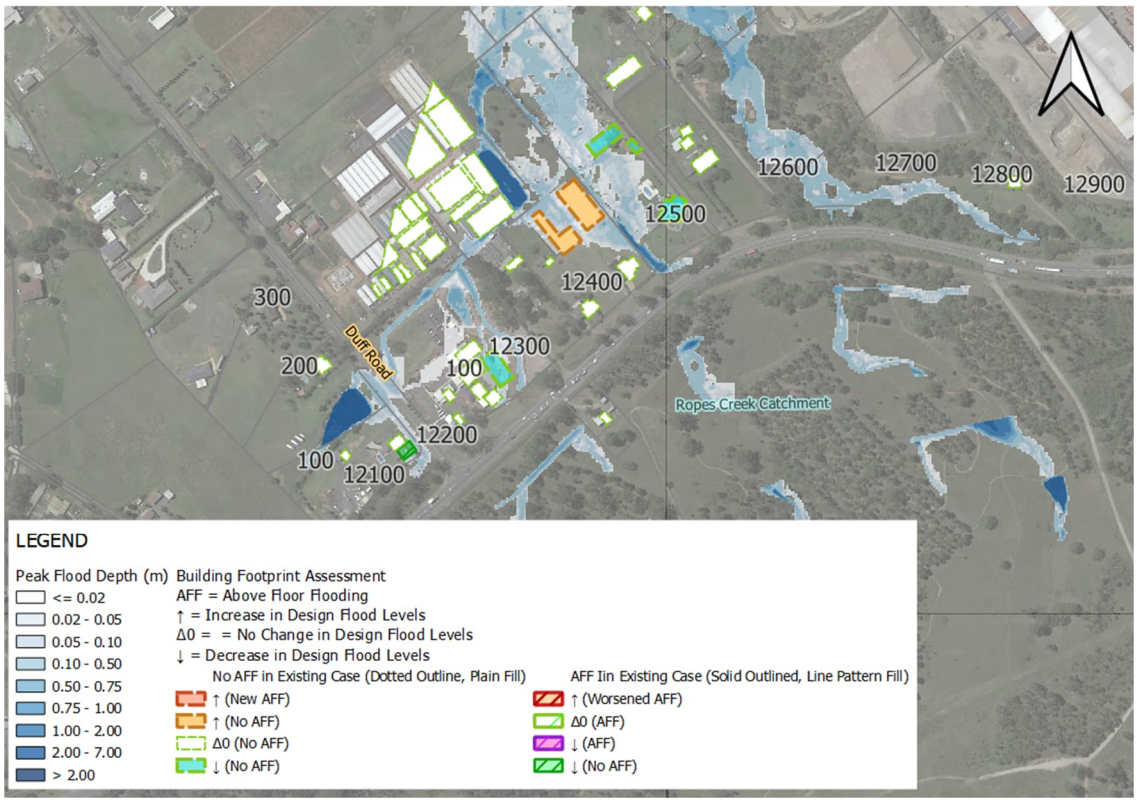


Figure 56 Building Impact Assessment for 1 per cent AEP Design Case, in vicinity of Ropes Creek

6.11 Property Impact Assessment

A lot-by-lot property impact assessment was undertaken for 922 properties by calculating the area (m^2) and percentage (%) of the lot area that experience the following impacts:

- An increase in flood level (afflux) resulting from the EDU road upgrade that is greater than 10mm, greater than 20mm, greater than 50mm, and greater than 100mm in magnitude
- Newly flooded areas of land (i.e. was dry, now wet).

6.11.1 Methodology

The following methodology was adopted:

1. Lots were sourced from publicly available information (SIX Maps - Clip & Ship (nsw.gov.au))
2. 1 per cent AEP Afflux was grouped into bands for afflux over 10mm, over 20mm, over 50mm and over 100mm
3. Newly wetted areas of land were identified for the 1 per cent AEP design event and assessed to identify areas of land where newly wetted flood depths were: greater than 10mm, greater than 20mm, greater than 50mm, and greater than 100mm in magnitude.

It is noted that the assessment does not take into account proposed land acquisition extents for the EDU road upgrade.

6.11.2 Results

A summary of the outcomes of the property impact assessment are presented in Table 25 to Table 30 below (with specific data for ED-East and ED-West for Table 31 to Table 36 and Table 37 to Table 42 respectively).

A lot-by-lot tabulated summary of impacts is provided in Appendix G (including land use zoning), which includes details of the land use zoning of each property.

By way of example:

- 55 properties experience an afflux that is greater than 100mm over more than 5m^2 of the lot area (refer to the last row of Table 25)
- Four properties experience an afflux that is greater than 100mm over more than 5% of the lot area (refer to the last row of Table 27)
- 95 properties contain newly inundated land following the EDU Road Upgrade (which was not previously inundated in the 'Future Base Case') across an area of land that is greater than 5m^2 (refer to the last row of Table 26)
- 16 properties contain newly inundated land (which was not previously inundated in the 'Future Base Case') across an area of land that is greater than 0.5% of the lot area (refer the last row of Table 28).

A total of 62 property lots experience afflux over 100mm, not taking into account the size of the area experiencing afflux (i.e. could be a spike caused by the hydraulic modelling software or associated with design elements such as drains) or land acquisition extents (refer to last row of Table 29). This includes 48 properties along ED-East and 14 properties along ED-West. Additionally, a total of 141 lots experience newly wetted areas which are greater than 10mm in depth, including 120 lots along ED-East and 21 lots along ED-West. The majority of these properties affected by increases in flood depth or with newly wetted areas would be within the proposed land acquisition extent.

Overall impacts for ED-West and ED-East

Table 25 Property area affected by afflux

		Count of Properties with impacts covering more than X m^2 of the property lot			
		5	50	100	300
Afflux > (mm)	10	163	141	136	125
	20	125	97	88	70
	50	76	49	35	26
	100	55	30	26	18

Table 26 Newly wetted property area

		Count of Properties with impacts covering more than X m^2 of the property lot			
		5	50	100	300
New Depths > (mm)	10	133	102	77	31
	20	131	94	68	23
	50	121	64	43	12
	100	95	41	26	11

Table 27 Proportion of property area affected by afflux

		Count of Properties with impacts covering more than X % of the property lot		
		> 5%	> 15%	> 30%
Afflux > (mm)	10	93	65	46
	20	42	23	9
	50	12	5	3
	100	4	3	3

Table 28 Proportion of property area newly wetted

		Count of Properties with impacts covering more than X % of the property lot		
		> 0.5%	> 1%	> 5%
New Depths > (mm)	10	42	21	5
	20	35	16	4
	50	22	13	3
	100	16	12	2

Table 29 Total number of properties within afflux bands

Afflux Ranges (mm)	Property Count
10-20	34
20-50	44
50-100	34
>100	62

Table 30 Total number of properties within newly wetted depth bands

Newly Wetted Depth Ranges (mm)	Property Count
10-20	3
20-50	7
50-100	24
>100	107

Results – ED-East

Table 31 Property area affected by afflux (East)

		Count of Properties with impacts covering more than X m^2 of the property lot			
		5	50	100	300
Afflux > (mm)	10	130	109	105	96
	20	101	81	73	59
	50	63	40	28	21
	100	45	24	21	13

Table 32 Newly wetted property area (East)

		Count of Properties with impacts covering more than X m^2 of the property lot			
		5	50	100	300
New Depths > (mm)	10	115	90	66	28
	20	115	82	60	21
	50	106	56	37	10
	100	84	33	22	9

Table 33 Total number of properties within afflux bands (East)

Afflux Ranges (mm)	Property Count
10-20	27
20-50	35
50-100	27
>100	48

Table 34 Property area affected by afflux (East)

		Count of Properties with impacts covering more than X % of the property lot		
		> 5%	> 15%	> 30%
Afflux > (mm)	10	81	62	45
	20	39	23	9
	50	11	5	3
	100	4	3	3

Table 35 Proportion of property area newly wetted (East)

		Count of Properties with impacts covering more than X % of the property lot		
		> 0.5%	> 1%	> 5%
New Depths > (mm)	10	41	20	5
	20	34	15	4
	50	21	12	3
	100	15	11	2

Table 36 Total number of properties within newly wetted depth bands (East)

Newly Wetted Depth Ranges (mm)	Property Count
10-20	2
20-50	6
50-100	21
>100	91

Results – ED-West

Table 37 Property area affected by afflux (West)

		Count of Properties with impacts covering more than X m^2 of the property lot			
		5	50	100	300
Afflux > (mm)	10	33	32	31	29
	20	24	16	15	11
	50	13	9	7	5
	100	10	6	5	5

Table 38 Newly wetted property area (West)

		Count of Properties with impacts covering more than X m^2 of the property lot			
		5	50	100	300
New Depths > (mm)	10	18	12	11	3
	20	16	12	8	2
	50	15	8	6	2
	100	11	8	4	2

Table 39 Total number of properties within afflux bands (West)

Afflux Ranges (mm)	Property Count
10-20	7
20-50	9
50-100	7
>100	14

Table 40 Proportion of property area affected by afflux (West)

		Count of Properties with impacts covering more than X % of the property lot		
		> 5%	> 15%	> 30%
Afflux > (mm)	10	12	3	1
	20	3	0	0
	50	1	0	0
	100	0	0	0

Table 41 Proportion of property area newly wetted (West)

		Count of Properties with impacts covering more than X % of the property lot		
		> 0.5%	> 1%	> 5%
New Depths > (mm)	10	1	1	0
	20	1	1	0
	50	1	1	0
	100	1	1	0

Table 42 Total number of of properties within newly wetted depth bands (West)

Newly Wetted Depth Ranges (mm)	Property Count
10-20	1
20-50	1
50-100	3
>100	16

6.12 Sensitivity Assessment

6.12.1 Road Immunity with Culvert Blockage

An assessment of the influence of culvert blockage on ED flood immunity was undertaken in accordance with ARR 2019 by increasing the % culvert blockage as per Table 43. The original design case modelling assumed zero % blockage for all culverts.

Table 43 Culvert Blockage Assessment

Nearest Creek	Culvert ID	Culvert Chainage	Culvert Dimensions	Design Case culvert blockage sensitivity case (% blocked)
Cosgroves Creek	PXD01	1000	3/1200x600	25%
Cosgroves Creek	PXD04	1750 (South)	2/600	25%
Cosgroves Creek	PXD03	1750 (North)	6/2700x600	10%
Oakey Creek	PXD12	2200	3/1800x1500	0%
Oakey Creek	PXD15	3100	1/600	10%
Oakey Creek	PXD09	3400	1/525	25%
Badgerys Creek	PXD11	5300	2/1500x1500	50%
Badgerys Creek	AE120	5500	1/525	50%
South Creek	Box_9	6900	6/1800x1200	25%
South Creek	PXD29	7000	4/1200	25%
South Creek	PXD27	7050	3/900	10%
South Creek	PXD31	7300	4/2400x1200	10%
Kemps Creek	PXD20	9400	4/1200	50%
Kemps Creek	PXD28	9600	4/1200	50%
Ropes Creek	RC_PXD29	12300	4/600	25%
Ropes Creek	RC_PXD30	12500	4/600	25%
Ropes Creek	RC_PXXD31	12650	4/600	25%

Figure 57 illustrates the 1 per cent AEP impact of culvert blockage in the vicinity of Cosgroves Creek and Oaky Creek. Figure 58 and Figure 59 illustrates the impact of culvert blockage on 1 per cent AEP flood levels in the vicinity of South Creek and Ropes Creek respectively.

Results indicate:

- In the design case, ED is flood free in the 1 per cent AEP design event with sufficient freeboard with an open lane at all times during the event
- Cosgroves/Oaky Creek: An existing section of Luddenham Road is overtopped, but the ED design ends prior to this
- South Creek: In the vicinity of South Creek there is no overtopping of the road estimated to occur for the culvert blockage sensitivity scenario (refer to Figure 58). There are some local roads where some overtopping occurs with shallow depths, but design guidance is for the main alignment, and at this stage that overtopping is allowable. An example of this is around Martin Road, where detailed design could raise the alignment. Around Chainage 7300 the culvert blockage is less than previously adopted as there is less likelihood of debris blocking all the culverts in series
- Ropes Creek: Design culverts in Ropes Creek were blocked by 25%, based on low criteria for mobility, transportability, and debris potential under ARR 2019 blockage calculations. Without

blockage, no overtopping of the main ED alignment occurs, and with 25% structure blockage the culvert at Chainage 12680 was at risk of not being capable of conveying all flow (and thereby overtopping the road), so an increase in pipe size was required. Whilst the main alignment doesn't overtop, Duff Road does overtop, even without the inclusion of blockage. The detailing of the dam upstream of Duffs Road is not known to adequately represent the area to form a design which does not overtop. Therefore, this area will require further review in detailed design.

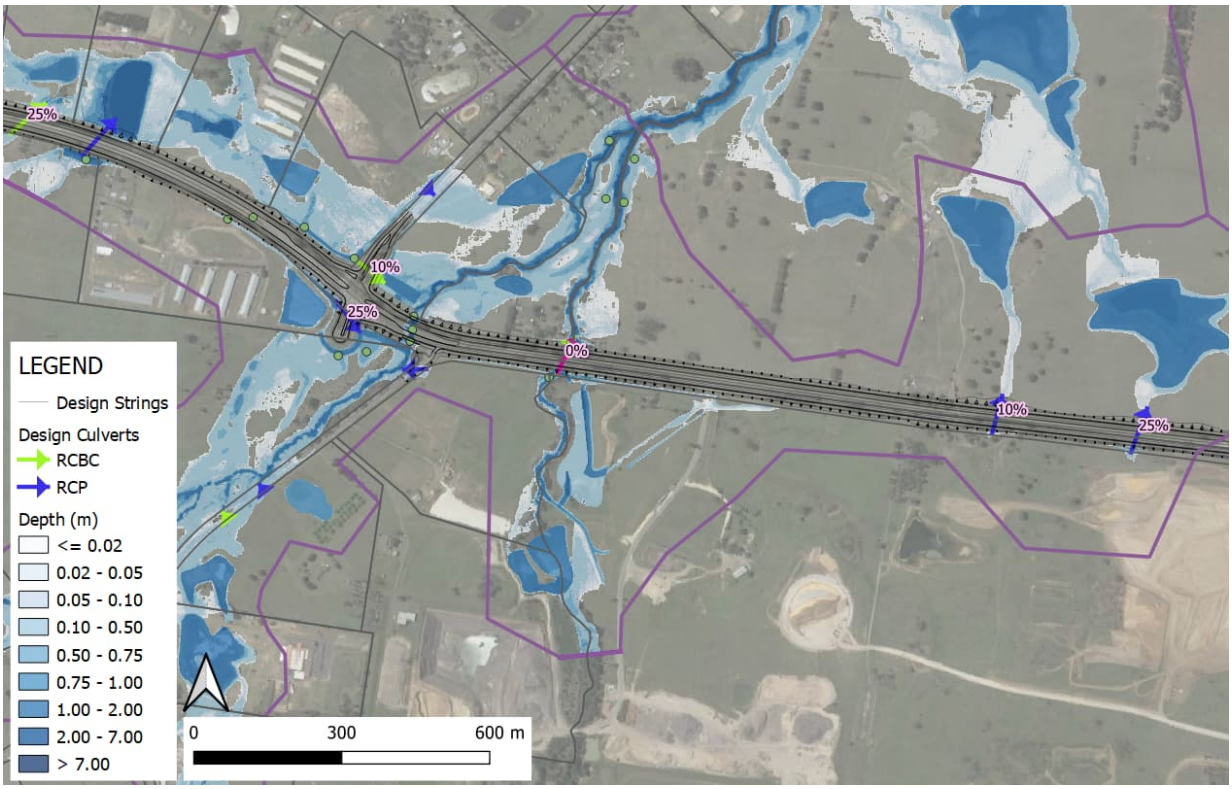


Figure 57 Cosgroves/Oaky Creek 1 per cent AEP Peak Flood Depth with Culvert Blockage

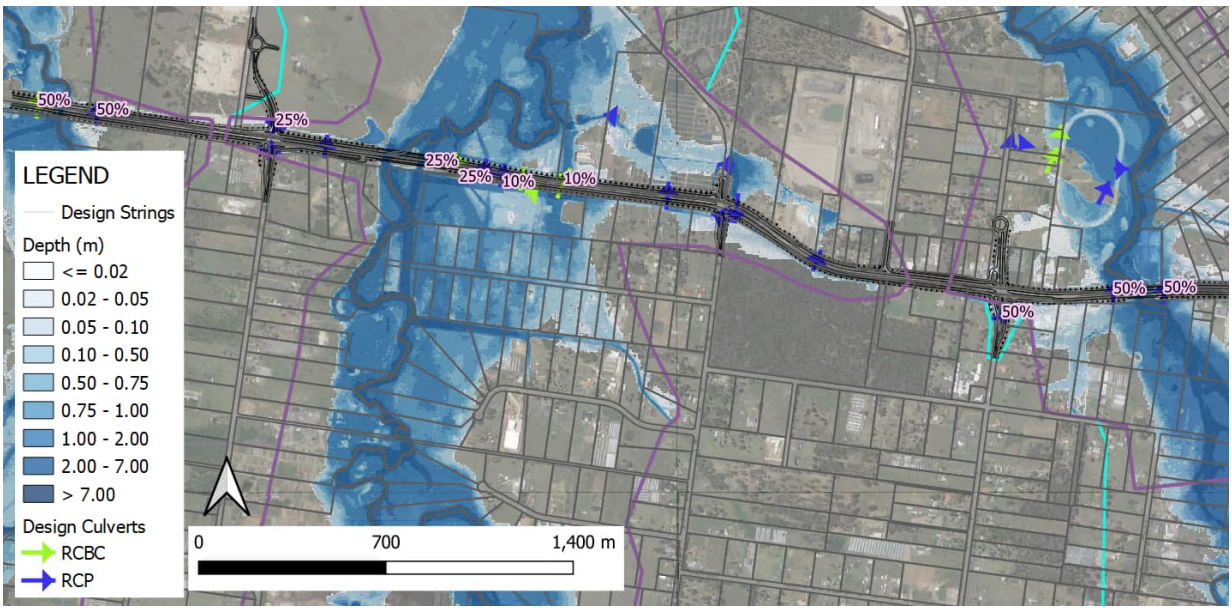


Figure 58 South Creek 1 per cent AEP Peak Flood Depth with Culvert Blockage

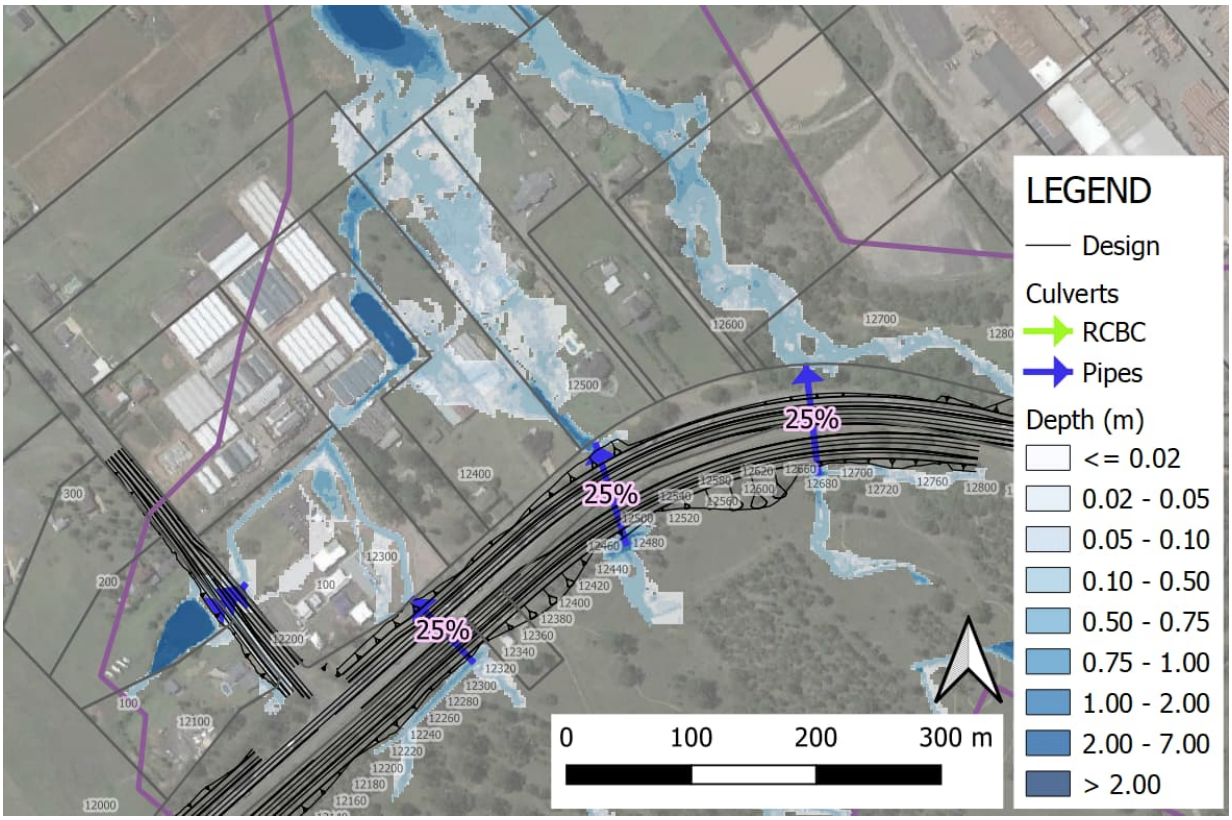


Figure 59 Ropes Creek 1 per cent AEP Peak Flood Depth with Culvert Blockage

6.12.2 Climate Change Assessment

A climate change assessment was undertaken for the 1 per cent AEP design flood event in the hydraulic model by factoring up hydraulic model inflows by 11.5%. This is generally consistent with the ARR Datahub Climate Change Factors for 2090 and Representative Concentration Pathway (RCP) 8.5.

Flood inundation maps illustrating the estimate change in flood levels for the ED design case for Cosgroves Creek/Oaky Creek, Badgerys Creek, South Creek and Ropes Creek are illustrated in Figures 54, 55 and 56 respectively.

Results indicate:

- The only area which overtops with the inclusion of climate change is east of South Creek (refer to Figure 61) where overtopping depths average around 200mm and reach up to a maximum of 530mm
- Cosgroves Creek: Inclusion of climate change corresponds to a 130mm increase in levels at Cosgroves Creek crossing. Figure 60 shows that with the inclusion of climate change there is a small section of design road overtopping between Chainages 1500 and 1650. Depths increase substantially in the channel, by up to 110mm. There is additional wetted area denoted by the dark blue areas in Figure 60
- Inclusion of climate change corresponds to a 200mm, 100mm and 150mm increase in levels at Badgerys Creek crossing, South Creek crossing and Kemps creek crossing respectively. Upstream of the culverts around Chainage 7300 there is greater than 200mm of afflux as the transverse culverts aren't capable of conveying all the flow
- The inclusion of climate change in the Ropes Creek model has minimal impact immediately south of the design alignment. Impacts are more evident downstream and localised to a local farm dam.

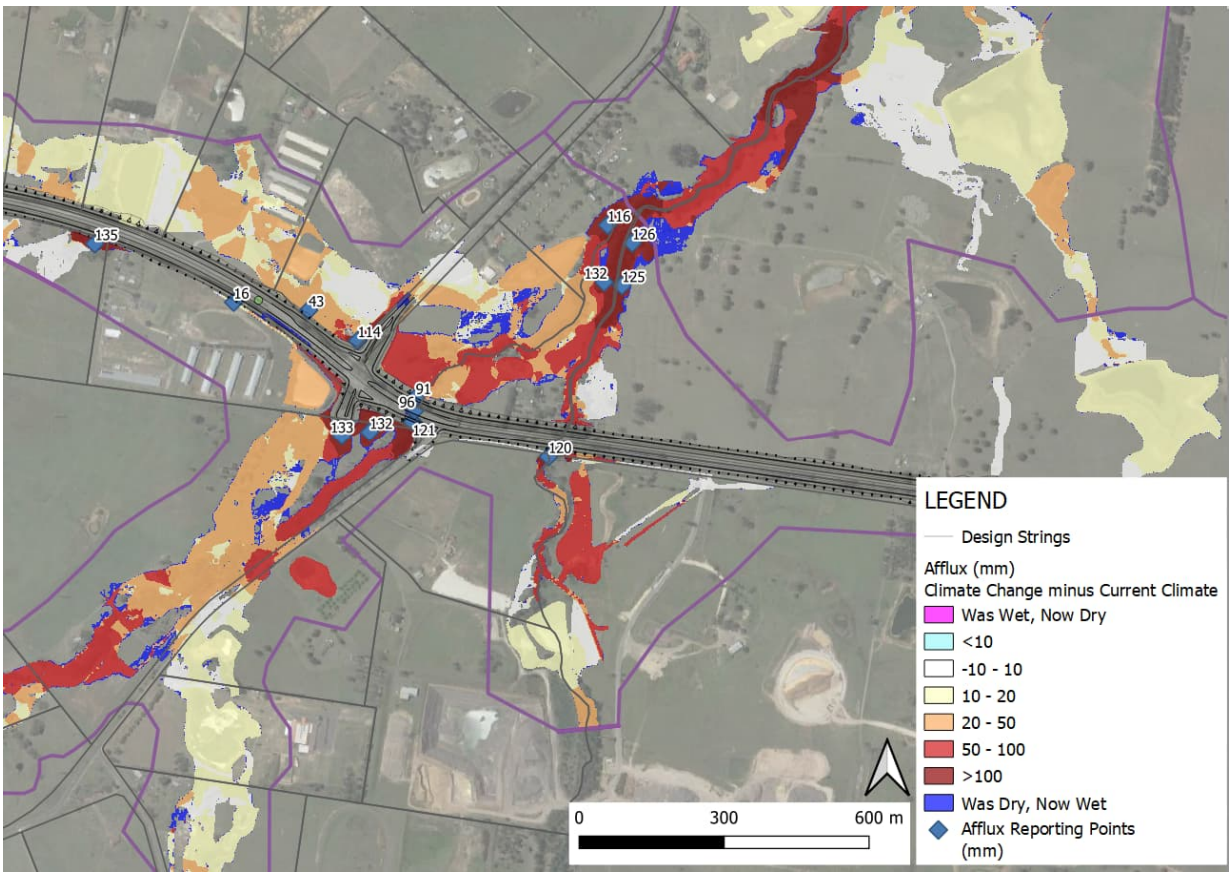


Figure 60 Cosgroves Creek Model 1 per cent AEP difference in levels with and without climate change

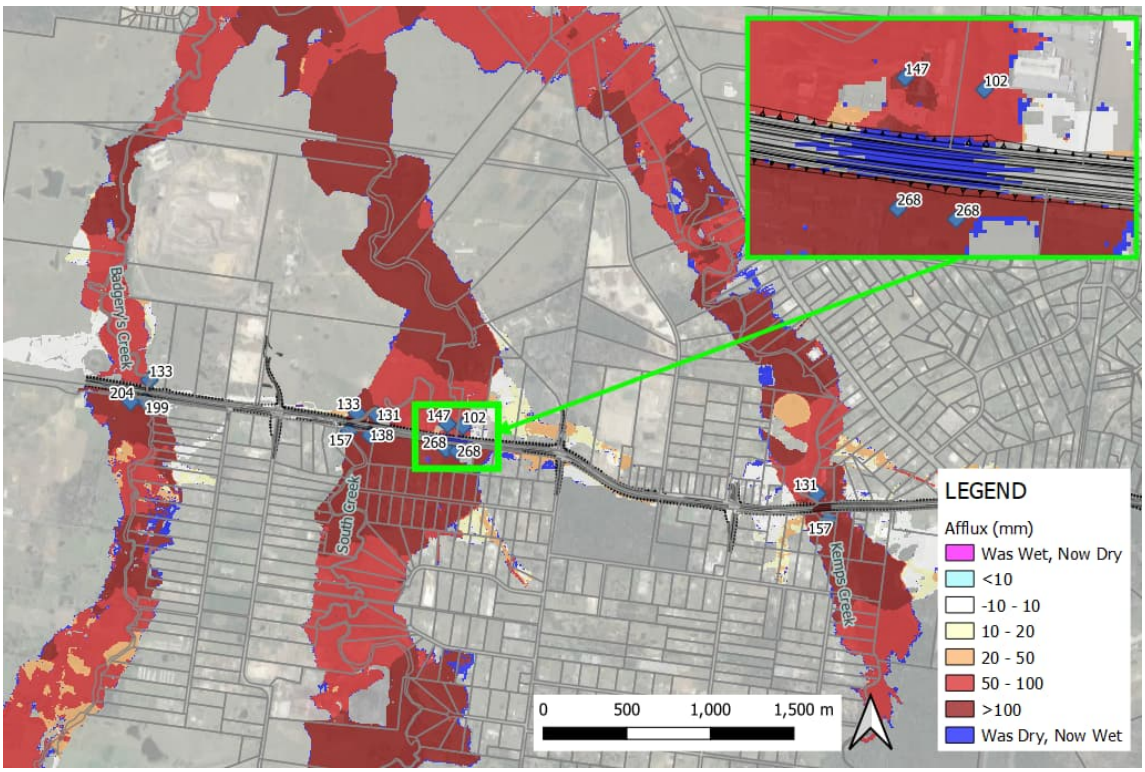


Figure 61 South Creek Model 1 per cent AEP difference in levels with and without climate change

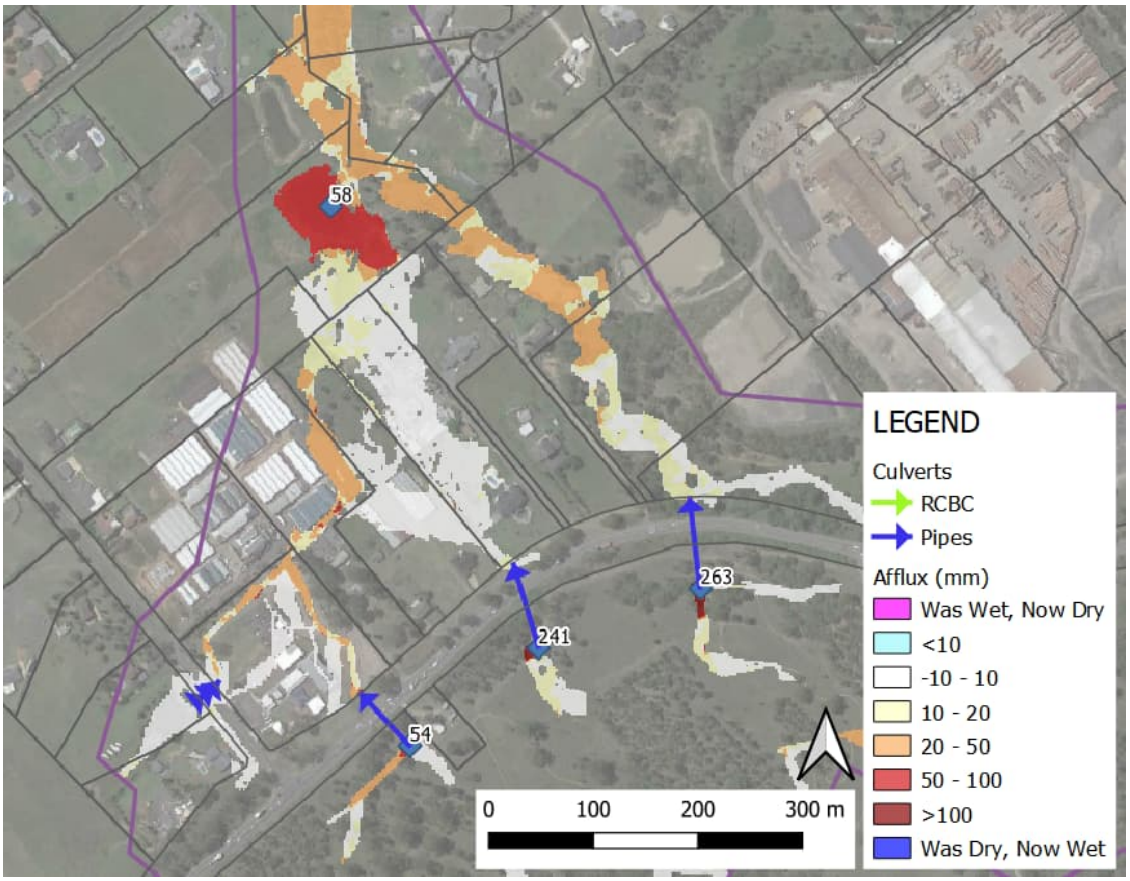


Figure 62 Ropes Creek Model 1 per cent AEP difference in levels with and without climate change

6.12.3 1 in 2000 AEP Assessment

The 0.05 per cent AEP design flood event was assessed to determine peak flow velocities in the vicinity of bridge structures to inform bridge design and to identify estimated afflux extents. A flood afflux map illustrating the change in flood levels caused by the ED-upgrades during a 0.05 per cent AEP design flood event is provided in Figure 63. More detailed flood maps (i.e. zoomed in) are provided for this scenario as Maps 31, 63, 95, 127 and 159 in Appendix A. A summary of the peak flood velocities for the 0.05 per cent AEP design event at each bridge structure is provided in Table 44.

Table 44 0.05 per cent AEP Flood Result Summary

Bridge Creek Crossing	Peak Flow (m^3/s)	Peaks Water Level (m AHD)	Peak Velocity (m/s)
Cosgroves	44.1	58.6	2.9
Badgerys	126	47.6	1.8
South	334	43.5	2.1
Kemps	213	48	1.9

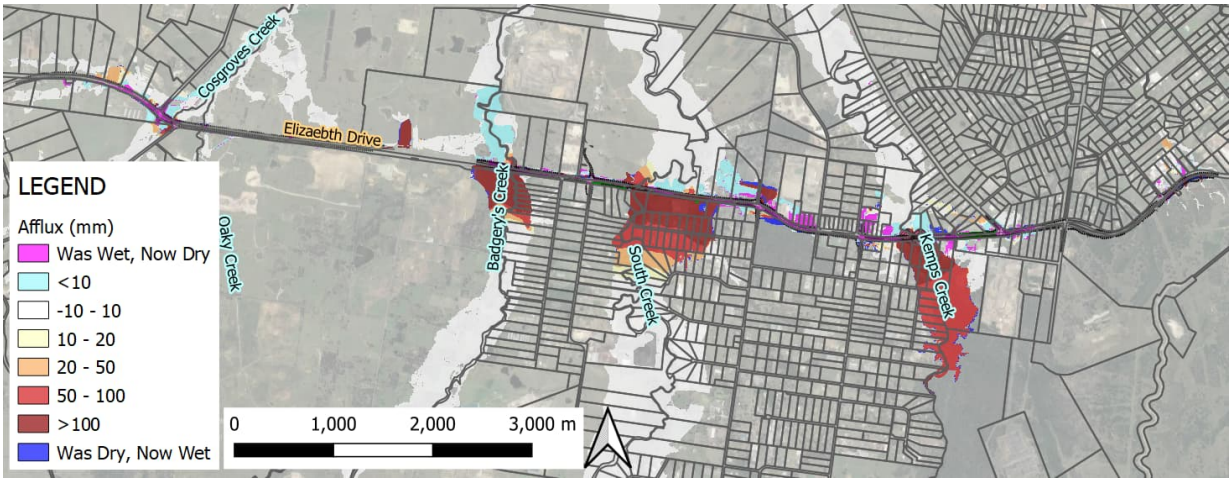


Figure 63 1 in 2000 AEP Afflux

6.12.4 PMF Assessment

A PMF assessment has been carried out to provide an indication of the worst case flow rate and the associated impacts, which would generally be greater compared to more frequent flood events. Results indicate that increased impacts upstream of the Elizabeth Drive road corridor are predicted due to more water being held by the road. Consequently, there would be some reductions in the water level downstream. Further, afflux upstream of the proposal area compared to the future base case would exceed 1000 mm, 300 mm, 600 mm and 650 mm at Badgerys Creek, South Creek, Kemps Creek and Ropes Creek respectively. Velocities would be generally less than 1 m/s on the floodplain. The majority of the road corridor would be overtopped, particularly around the bridge crossings, with about a 100 m stretch changing from ‘dry’ to ‘wet’, where depths would vary substantially.

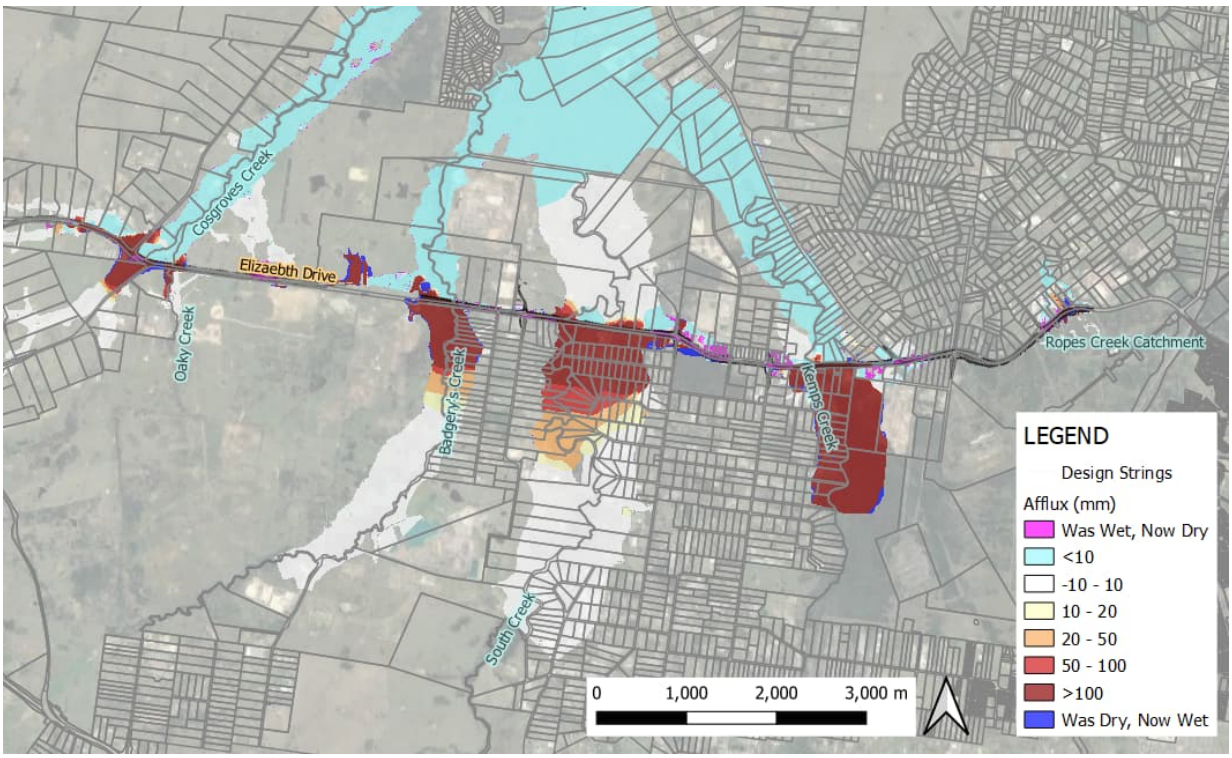


Figure 64 PMF Afflux

7.0 Conclusion

A detailed flood modelling assessment has been undertaken to inform the 100% Concept Design of the Elizabeth Drive West (ED-West) and Elizabeth Drive East (ED-East) road upgrades and to ensure compliance with required road design criteria. The results of the flood modelling assessment indicate that the proposed design meets the required road design criteria. However, areas outside of the existing land acquisition extents would potentially experience increased afflux exceeding maximum allowable levels, which would require further consideration during the detailed design stage. The detailed design stage would involve further review of flooding impacts informed by survey (for example to determine topography, structures, bathymetry and floor levels).

8.0 References

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Appendix A

Flood Maps

Map Number	Map Name
A01	Flood Depth Cosgroves/Oaky Creek 50% AEP Design Case
A02	Flood Depth Cosgroves/Oaky Creek 20% AEP Design Case
A03	Flood Depth Cosgroves/Oaky Creek 10% AEP Design Case
A04	Flood Depth Cosgroves/Oaky Creek 5% AEP Design Case
A05	Flood Depth Cosgroves/Oaky Creek 2% AEP Design Case
A06	Flood Depth Cosgroves/Oaky Creek 1% AEP Design Case
A07	Flood Depth Cosgroves/Oaky Creek 1in2000 AEP Design Case
A08	Flood Depth Cosgroves/Oaky Creek PMF Design Case
A09	Velocity Cosgroves/Oaky Creek 50% AEP Design Case
A10	Velocity Cosgroves/Oaky Creek 20% AEP Design Case
A11	Velocity Cosgroves/Oaky Creek 10% AEP Design Case
A12	Velocity Cosgroves/Oaky Creek 5% AEP Design Case
A13	Velocity Cosgroves/Oaky Creek 2% AEP Design Case
A14	Velocity Cosgroves/Oaky Creek 1% AEP Design Case
A15	Velocity Cosgroves/Oaky Creek 1in2000 AEP Design Case
A16	Velocity Cosgroves/Oaky Creek PMF Design Case
A17	Hazard Cosgroves/Oaky Creek 50% AEP Design Case
A18	Hazard Cosgroves/Oaky Creek 20% AEP Design Case
A19	Hazard Cosgroves/Oaky Creek 10% AEP Design Case
A20	Hazard Cosgroves/Oaky Creek 5% AEP Design Case
A21	Hazard Cosgroves/Oaky Creek 2% AEP Design Case
A22	Hazard Cosgroves/Oaky Creek 1% AEP Design Case
A23	Hazard Cosgroves/Oaky Creek 1in2000 AEP Design Case
A24	Hazard Cosgroves/Oaky Creek PMF Design Case
A25	Afflux Cosgroves/Oaky Creek 50% AEP Design Case
A26	Afflux Cosgroves/Oaky Creek 20% AEP Design Case

Map Number	Map Name
A27	Afflux Cosgroves/Oaky Creek 10% AEP Design Case
A28	Afflux Cosgroves/Oaky Creek 5% AEP Design Case
A29	Afflux Cosgroves/Oaky Creek 2% AEP Design Case
A30	Afflux Cosgroves/Oaky Creek 1% AEP Design Case
A31	Afflux Cosgroves/Oaky Creek 1in2000 AEP Design Case
A32	Afflux Cosgroves/Oaky Creek PMF Design Case
A33	Flood Depth Badgerys Creek 50% AEP Design Case
A34	Flood Depth Badgerys Creek 20% AEP Design Case
A35	Flood Depth Badgerys Creek 10% AEP Design Case
A36	Flood Depth Badgerys Creek 5% AEP Design Case
A37	Flood Depth Badgerys Creek 2% AEP Design Case
A38	Flood Depth Badgerys Creek 1% AEP Design Case
A39	Flood Depth Badgerys Creek 1in2000 AEP Design Case
A40	Flood Depth Badgerys Creek PMF Design Case
A41	Velocity Badgerys Creek 50% AEP Design Case
A42	Velocity Badgerys Creek 20% AEP Design Case
A43	Velocity Badgerys Creek 10% AEP Design Case
A44	Velocity Badgerys Creek 5% AEP Design Case
A45	Velocity Badgerys Creek 2% AEP Design Case
A46	Velocity Badgerys Creek 1% AEP Design Case
A47	Velocity Badgerys Creek 1in2000 AEP Design Case
A48	Velocity Badgerys Creek PMF Design Case
A49	Hazard Badgerys Creek 50% AEP Design Case
A50	Hazard Badgerys Creek 20% AEP Design Case
A51	Hazard Badgerys Creek 10% AEP Design Case
A52	Hazard Badgerys Creek 5% AEP Design Case
A53	Hazard Badgerys Creek 2% AEP Design Case

Map Number	Map Name
A54	Hazard Badgerys Creek 1% AEP Design Case
A55	Hazard Badgerys Creek 1in2000 AEP Design Case
A56	Hazard Badgerys Creek PMF Design Case
A57	Afflux Badgerys Creek 50% AEP Design Case
A58	Afflux Badgerys Creek 20% AEP Design Case
A59	Afflux Badgerys Creek 10% AEP Design Case
A60	Afflux Badgerys Creek 5% AEP Design Case
A61	Afflux Badgerys Creek 2% AEP Design Case
A62	Afflux Badgerys Creek 1% AEP Design Case
A63	Afflux Badgerys Creek 1in2000 AEP Design Case
A64	Afflux Badgerys Creek PMF Design Case
A65	Flood Depth South Creek 50% AEP Design Case
A66	Flood Depth South Creek 20% AEP Design Case
A67	Flood Depth South Creek 10% AEP Design Case
A68	Flood Depth South Creek 5% AEP Design Case
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A71	Flood Depth South Creek 1in2000 AEP Design Case
A72	Flood Depth South Creek PMF Design Case
A73	Velocity South Creek 50% AEP Design Case
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A75	Velocity South Creek 10% AEP Design Case
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A79	Velocity South Creek 1in2000 AEP Design Case
A80	Velocity South Creek PMF Design Case
A81	Hazard South Creek 50% AEP Design Case
A82	Hazard South Creek 20% AEP Design Case

Map Number	Map Name
A83	Hazard South Creek 10% AEP Design Case
A84	Hazard South Creek 5% AEP Design Case
A85	Hazard South Creek 2% AEP Design Case
A86	Hazard South Creek 1% AEP Design Case
A87	Hazard South Creek 1in2000 AEP Design Case
A88	Hazard South Creek PMF Design Case
A89	Afflux South Creek 50% AEP Design Case
A90	Afflux South Creek 20% AEP Design Case
A91	Afflux South Creek 10% AEP Design Case
A92	Afflux South Creek 5% AEP Design Case
A93	Afflux South Creek 2% AEP Design Case
A94	Afflux South Creek 1% AEP Design Case
A95	Afflux South Creek 1in2000 AEP Design Case
A96	Afflux South Creek PMF Design Case
A97	Flood Depth Kemps Creek 50% AEP Design Case
A98	Flood Depth Kemps Creek 20% AEP Design Case
A99	Flood Depth Kemps Creek 10% AEP Design Case
A100	Flood Depth Kemps Creek 5% AEP Design Case
A101	Flood Depth Kemps Creek 2% AEP Design Case
A102	Flood Depth Kemps Creek 1% AEP Design Case
A103	Flood Depth Kemps Creek 1in2000 AEP Design Case
A104	Flood Depth Kemps Creek PMF Design Case
A105	Velocity Kemps Creek 50% AEP Design Case
A106	Velocity Kemps Creek 20% AEP Design Case
A107	Velocity Kemps Creek 10% AEP Design Case
A108	Velocity Kemps Creek 5% AEP Design Case
A109	Velocity Kemps Creek 2% AEP Design Case
A110	Velocity Kemps Creek 1% AEP Design Case
A111	Velocity Kemps Creek 1in2000 AEP Design Case

Map Number	Map Name
A112	Velocity Kemps Creek PMF Design Case
A113	Hazard Kemps Creek 50% AEP Design Case
A114	Hazard Kemps Creek 20% AEP Design Case
A115	Hazard Kemps Creek 10% AEP Design Case
A116	Hazard Kemps Creek 5% AEP Design Case
A117	Hazard Kemps Creek 2% AEP Design Case
A118	Hazard Kemps Creek 1% AEP Design Case
A119	Hazard Kemps Creek 1in2000 AEP Design Case
A120	Hazard Kemps Creek PMF Design Case
A121	Afflux Kemps Creek 50% AEP Design Case
A122	Afflux Kemps Creek 20% AEP Design Case
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A127	Afflux Kemps Creek 1in2000 AEP Design Case
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A129	Flood Depth Ropes Creek 50% AEP Design Case
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A135	Flood Depth Ropes Creek 1in2000 AEP Design Case
A136	Flood Depth Ropes Creek PMF Design Case

Map Number	Map Name
A137	Velocity Ropes Creek 50% AEP Design Case
A138	Velocity Ropes Creek 20% AEP Design Case
A139	Velocity Ropes Creek 10% AEP Design Case
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A143	Velocity Ropes Creek 1in2000 AEP Design Case
A144	Velocity Ropes Creek PMF Design Case
A145	Hazard Ropes Creek 50% AEP Design Case
A146	Hazard Ropes Creek 20% AEP Design Case
A147	Hazard Ropes Creek 10% AEP Design Case
A148	Hazard Ropes Creek 5% AEP Design Case
A149	Hazard Ropes Creek 2% AEP Design Case
A150	Hazard Ropes Creek 1% AEP Design Case
A151	Hazard Ropes Creek 1in2000 AEP Design Case
A152	Hazard Ropes Creek PMF Design Case
A153	Afflux Ropes Creek 50% AEP Design Case
A154	Afflux Ropes Creek 20% AEP Design Case
A155	Afflux Ropes Creek 10% AEP Design Case
A156	Afflux Ropes Creek 5% AEP Design Case
A157	Afflux Ropes Creek 2% AEP Design Case
A158	Afflux Ropes Creek 1% AEP Design Case
A159	Afflux Ropes Creek 1in2000 AEP Design Case
A160	Afflux Ropes Creek PMF Design Case

Appendix B

ARR19 Datahub Data

Cosgroves Creek

Results - ARR Data Hub
[STARTTXT]

Input Data Information
[INPUTDATA]
Latitude,-33.869000
Longitude,150.719000
[END_INPUTDATA]

River Region
[RIVREG]
Division,South East Coast (NSW)
River Number,12
River Name,Hawkesbury River
[RIVREG_META]
Time Accessed,03 May 2021 12:17PM
Version,2016_v1
[END_RIVREG]

ARF Parameters
[LONGARF]
Zone,SE Coast
a,0.06
b,0.361
c,0.0
d,0.317
e,8.11e-05
f,0.651
g,0.0
h,0.0
i,0.0
[LONGARF_META]
Time Accessed,03 May 2021 12:17PM
Version,2016_v1
[END_LONGARF]

Storm Losses
[LOSSES]
ID,21179.0
Storm Initial Losses (mm),46.0
Storm Continuing Losses (mm/h),3.4
[LOSSES_META]
Time Accessed,03 May 2021 12:17PM
Version,2016_v1
[END_LOSSES]

Temporal Patterns
[TP]
code,ECsouth
Label,East Coast South
[TP_META]
Time Accessed,03 May 2021 12:17PM
Version,2016_v2
[END_TP]

Areal Temporal Patterns
[ATP]
code,ECsouth
arealabel,East Coast South
[ATP_META]
Time Accessed,03 May 2021 12:17PM
Version,2016_v2
[END_ATP]

Median Preburst Depths and Ratios
[PREBURST]
min (h)\AEP(%),50,20,10,5,2,1
60 (1.0),1.4 (0.055),1.2 (0.033),1.1 (0.024),0.9 (0.018),2.6 (0.042),3.8 (0.054)
90 (1.5),1.7 (0.058),1.8 (0.044),1.9 (0.038),1.9 (0.034),2.0 (0.029),2.0 (0.026)
120 (2.0),0.0 (0.000),0.2 (0.005),0.4 (0.007),0.5 (0.009),1.3 (0.017),1.8 (0.022)
180 (3.0),0.5 (0.014),2.6 (0.052),4.1 (0.066),5.4 (0.076),4.3 (0.050),3.4 (0.035)
360 (6.0),2.7 (0.055),11.9 (0.180),18.0 (0.228),23.9 (0.259),19.5 (0.176),16.2 (0.129)
720 (12.0),1.5 (0.023),5.8 (0.065),8.7 (0.080),11.4 (0.090),17.1 (0.113),21.3 (0.125)
1080 (18.0),1.2 (0.015),6.4 (0.059),9.8 (0.075),13.1 (0.085),14.8 (0.080),16.1 (0.077)
1440 (24.0),0.0 (0.000),4.0 (0.032),6.6 (0.044),9.2 (0.052),10.4 (0.049),11.4 (0.047)
2160 (36.0),0.0 (0.000),1.9 (0.013),3.1 (0.017),4.3 (0.020),5.4 (0.021),6.3 (0.022)
2880 (48.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.7 (0.002),1.2 (0.004)
4320 (72.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
[PREBURST_META]
Time Accessed,03 May 2021 12:17PM
Version,2018_v1

Note,Preburst interpolation methods for catchment wide preburst has been slightly altered. Point values remain unchanged.
[END_PREBURST]From preburst class

10% Preburst Depths
[PREBURST10]
min (h)\AEP(%),50,20,10,5,2,1
60 (1.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
90 (1.5),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
120 (2.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
180 (3.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
360 (6.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
720 (12.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
1080 (18.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
1440 (24.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
2160 (36.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
2880 (48.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
4320 (72.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
[PREBURST10_META]
Time Accessed,03 May 2021 12:17PM
Version,2018_v1
Note,Preburst interpolation methods for catchment wide preburst has been slightly altered. Point values remain unchanged.
[END_PREBURST10]From preburst class

25% Preburst Depths
[PREBURST25]
min (h)\AEP(%),50,20,10,5,2,1
60 (1.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
90 (1.5),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
120 (2.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
180 (3.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
360 (6.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
720 (12.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
1080 (18.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
1440 (24.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
2160 (36.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
2880 (48.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
4320 (72.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
[PREBURST25_META]
Time Accessed,03 May 2021 12:17PM
Version,2018_v1
Note,Preburst interpolation methods for catchment wide preburst has been slightly altered. Point values remain unchanged.
[END_PREBURST25]From preburst class

75% Preburst Depths
[PREBURST75]
min (h)\AEP(%),50,20,10,5,2,1
60 (1.0),16.8 (0.641),16.8 (0.460),16.8 (0.384),16.8 (0.328),21.2 (0.346),24.5 (0.352)
90 (1.5),14.8 (0.500),18.0 (0.438),20.1 (0.408),22.1 (0.384),22.3 (0.323),22.4 (0.286)
120 (2.0),9.4 (0.289),20.2 (0.450),27.3 (0.510),34.2 (0.546),31.6 (0.421),29.7 (0.348)
180 (3.0),24.7 (0.663),36.4 (0.714),44.2 (0.724),51.6 (0.725),46.1 (0.540),42.0 (0.434)
360 (6.0),17.1 (0.354),36.9 (0.558),50.0 (0.634),62.6 (0.679),75.1 (0.678),84.4 (0.673)
720 (12.0),30.0 (0.462),37.3 (0.416),42.2 (0.391),46.8 (0.371),56.2 (0.371),63.3 (0.369)
1080 (18.0),23.3 (0.299),32.5 (0.298),38.6 (0.294),44.4 (0.288),53.5 (0.290),60.3 (0.289)
1440 (24.0),13.6 (0.154),22.2 (0.178),27.9 (0.185),33.3 (0.188),38.7 (0.182),42.7 (0.178)
2160 (36.0),11.6 (0.111),16.3 (0.109),19.4 (0.107),22.4 (0.104),33.4 (0.130),41.5 (0.143)
2880 (48.0),4.2 (0.036),5.8 (0.034),6.8 (0.033),7.8 (0.032),13.4 (0.046),17.5 (0.054)
4320 (72.0),0.0 (0.000),0.3 (0.002),0.5 (0.002),0.7 (0.003),8.1 (0.024),13.7 (0.036)
[PREBURST75_META]
Time Accessed,03 May 2021 12:17PM
Version,2018_v1
Note,Preburst interpolation methods for catchment wide preburst has been slightly altered. Point values remain unchanged.
[END_PREBURST75]From preburst class

90% Preburst Depths
[PREBURST90]
min (h)\AEP(%),50,20,10,5,2,1
60 (1.0),47.0 (1.800),52.9 (1.448),56.7 (1.294),60.5 (1.179),83.0 (1.351),100.0 (1.435)
90 (1.5),46.6 (1.571),66.6 (1.619),79.8 (1.619),92.4 (1.606),82.2 (1.192),74.5 (0.953)
120 (2.0),42.1 (1.295),81.8 (1.826),108.1 (2.016),133.3 (2.129),124.0 (1.653),117.1 (1.376)
180 (3.0),49.5 (1.329),82.6 (1.617),104.4 (1.713),125.4 (1.763),126.1 (1.479),126.7 (1.309)
360 (6.0),41.5 (0.858),77.0 (1.164),100.5 (1.272),123.0 (1.334),134.8 (1.218),143.6 (1.145)
720 (12.0),51.9 (0.798),75.6 (0.841),91.2 (0.847),106.3 (0.843),118.7 (0.784),128.1 (0.748)
1080 (18.0),45.3 (0.582),60.1 (0.552),69.9 (0.533),79.3 (0.515),98.4 (0.533),112.8 (0.540)
1440 (24.0),31.1 (0.352),43.7 (0.350),52.0 (0.345),60.0 (0.338),75.2 (0.354),86.7 (0.361)
2160 (36.0),38.0 (0.365),43.1 (0.288),46.5 (0.255),49.7 (0.231),71.1 (0.276),87.1 (0.300)
2880 (48.0),29.4 (0.253),32.9 (0.196),35.3 (0.172),37.6 (0.155),58.4 (0.201),73.9 (0.226)
4320 (72.0),7.8 (0.059),18.1 (0.094),24.9 (0.105),31.4 (0.112),39.6 (0.118),45.7 (0.122)
[PREBURST90_META]
Time Accessed,03 May 2021 12:17PM
Version,2018_v1

Note,Preburst interpolation methods for catchment wide preburst has been slightly altered. Point values remain unchanged.
[END_PREBURST90]From preburst class

Interim Climate Change Factors
[CCF]
,RCP 4.5,RCP6,RCP 8.5
2030,0.869 (4.3%),0.783 (3.9%),0.983 (4.9%)
2040,1.057 (5.3%),1.014 (5.1%),1.349 (6.8%)
2050,1.272 (6.4%),1.236 (6.2%),1.773 (9.0%)
2060,1.488 (7.5%),1.458 (7.4%),2.237 (11.5%)
2070,1.676 (8.5%),1.691 (8.6%),2.722 (14.2%)
2080,1.810 (9.2%),1.944 (9.9%),3.209 (16.9%)
2090,1.862 (9.5%),2.227 (11.5%),3.679 (19.7%)

[CCF_META]
Time Accessed,03 May 2021 12:17PM
Version,2019_v1
Note,ARR recommends the use of RCP4.5 and RCP 8.5 values. These have been updated to the values that can be found on the climate change in Australia website.
[END_CCF]

Probability Neutral Burst Initial Loss
[BURSTIL]
min (h)\AEP(%),50.0,20.0,10.0,5.0,2.0,1.0
60 (1.0),26.0,17.6,16.0,16.0,15.2,12.3
90 (1.5),29.5,17.9,15.9,15.9,14.3,12.9
120 (2.0),32.3,18.5,15.8,14.7,13.3,11.8
180 (3.0),32.4,17.1,14.4,13.9,13.3,10.0
360 (6.0),32.7,18.7,15.0,13.6,11.3,7.0
720 (12.0),31.5,21.9,20.3,19.0,16.8,9.3
1080 (18.0),33.9,25.1,23.5,22.6,19.7,11.5
1440 (24.0),38.6,30.4,28.7,28.7,25.0,17.3
2160 (36.0),39.3,33.0,32.6,33.6,29.5,15.5
2880 (48.0),43.0,37.1,37.2,42.2,33.6,17.3
4320 (72.0),48.1,42.1,41.4,46.6,37.3,25.6
[BURSTIL_META]
Time Accessed,03 May 2021 12:17PM
Version,2018_v1
Note,As this point is in NSW the advice provided on losses and pre-burst on the NSW Specific Tab of the ARR Data Hub is to be considered. In NSW losses are derived considering a hierarchy of approaches depending on the available loss information. Probability neutral burst initial loss values for NSW are to be used in place of the standard initial loss and pre-burst as per the losses hierarchy.
[END_BURSTIL]

Transformational Pre-burst Rainfall
[PREBURST_TRANS]
min (h)\AEP(%),50.0,20.0,10.0,5.0,2.0,1.0
60 (1.0),19.9,28.3,29.9,29.9,30.7,33.6
90 (1.5),16.4,28.0,30.0,30.0,31.6,33.0
120 (2.0),13.6,27.4,30.1,31.2,32.6,34.1
180 (3.0),13.5,28.8,31.5,32.0,32.6,35.9
360 (6.0),13.2,27.2,30.9,32.3,34.6,38.9
720 (12.0),14.4,24.0,25.6,26.9,29.1,36.6
1080 (18.0),12.0,20.8,22.4,23.3,26.2,34.4
1440 (24.0),7.3,15.5,17.2,17.2,20.9,28.6
2160 (36.0),6.6,12.9,13.3,12.3,16.4,30.4
2880 (48.0),2.9,8.8,8.7,3.7,12.3,28.6
4320 (72.0),0.0,3.8,4.5,0.0,8.6,20.3
[PREBURST_TRANS_META]
The tranformational pre-burst is intended for software suppliers in the NSW area and is simply the Initial Loss - Burst Initial Loss. It is not appropriate to use these values if considering a calibrated initial loss.
[END_PREBURST_TRANS]

[ENDTXT]

All Design Rainfall Depth (mm)

Issued: 15-Jan-21

Location Label:

Requested coordinate: Latitude -33.869 Longitude 150.719

Nearest grid cell: Latitude 33.8625 (S) Longitude 150.7125 (E)

		Exceedances per Year (EY) / Annual Exceedance Probability (AEP)																	
Duration	Duration in min	12EY	6EY	4EY	3EY	2EY	63.20%	50%	0.5EY	20%	0.2EY	10%	5%	2%	1%	1 in 200	1 in 500	1 in 1000	1 in 2000
1 min	1	0.789	0.913	1.14	1.3	1.54	1.98	2.28	2.53	3.21	3.28	3.87	4.54	5.44	6.15	6.66	7.52	8.16	8.81
2 min	2	1.34	1.57	1.95	2.21	2.59	3.23	3.66	4.06	5.07	5.18	6.08	7.1	8.48	9.63	10.6	12	13.1	14.1
3 min	3	1.81	2.13	2.67	3.05	3.58	4.5	5.1	5.67	7.1	7.24	8.51	9.94	11.9	13.5	14.8	16.7	18.2	19.7
4 min	4	2.22	2.62	3.3	3.79	4.47	5.66	6.45	7.15	9.01	9.19	10.8	12.6	15.1	17.1	18.7	21.1	22.9	24.8
5 min	5	2.59	3.05	3.86	4.44	5.27	6.71	7.66	8.51	10.8	11	12.9	15.1	18.1	20.5	22.3	25.1	27.3	29.5
10 min	10	3.96	4.67	5.94	6.87	8.23	10.7	12.3	13.6	17.4	17.7	21	24.6	29.5	33.3	36	40.6	44.1	47.5
15 min	15	4.9	5.77	7.35	8.51	10.2	13.3	15.3	17	21.8	22.2	26.3	30.8	37	41.8	45.1	50.9	55.2	59.6
20 min	20	5.63	6.62	8.41	9.74	11.7	15.2	17.5	19.4	24.9	25.4	30	35.2	42.3	47.8	51.7	58.3	63.3	68.3
25 min	25	6.22	7.31	9.28	10.7	12.9	16.7	19.2	21.4	27.3	27.8	32.9	38.6	46.3	52.3	56.7	64	69.5	75.1
30 min	30	6.73	7.9	10	11.6	13.8	18	20.6	22.9	29.2	29.8	35.2	41.3	49.5	56	60.8	68.6	74.5	80.5
45 min	45	7.92	9.28	11.7	13.5	16.1	20.8	23.8	26.4	33.5	34.1	40.3	47.1	56.5	64	69.6	78.5	85.4	92.3
1 hour	60	8.83	10.3	13	14.9	17.8	22.9	26.1	29	36.5	37.2	43.9	51.3	61.5	69.7	75.8	85.6	93.1	101
1.5 hour	90	10.2	11.9	15	17.2	20.4	26.2	29.7	32.9	41.1	41.9	49.3	57.5	69	78.2	85.1	96	104	113
2 hour	120	11.3	13.2	16.5	19	22.5	28.8	32.5	36.1	44.8	45.7	53.6	62.6	75	85.1	92.4	104	113	122
3 hour	180	13.1	15.2	19	21.8	25.9	33.1	37.3	41.4	51	52.1	61	71.1	85.3	96.8	105	118	128	138
4.5 hour	270	15	17.5	22	25.3	30	38.4	43.2	48	59	60.2	70.5	82.2	98.6	112	121	136	147	159
6 hour	360	16.6	19.4	24.4	28.1	33.4	43	48.4	53.7	66.1	67.5	79	92.2	111	125	135	152	164	177
9 hour	540	19.1	22.4	28.4	32.8	39.2	50.8	57.4	63.7	78.8	80.3	94.2	110	132	150	161	180	196	211
12 hour	720	21.1	24.9	31.6	36.6	44	57.5	65.1	72.2	89.9	91.7	108	126	151	171	184	207	224	241
18 hour	1080	24.2	28.7	36.7	42.8	51.7	68.3	77.9	86.4	109	111	131	154	185	209	225	253	275	296
24 hour	1440	26.6	31.6	40.7	47.6	57.8	77	88.3	98	125	127	151	177	213	240	260	293	319	344
30 hour	1800	28.4	33.9	43.9	51.5	62.8	84.2	97	108	138	141	168	197	237	267	299	342	376	410
36 hour	2160	29.9	35.8	46.6	54.7	67	90.3	104	116	150	153	182	215	257	290	329	379	418	459
48 hour	2880	32.2	38.8	50.8	59.8	73.6	99.9	116	129	168	172	205	243	290	327	373	430	475	521
72 hour	4320	35	42.6	56.2	66.6	82.4	113	132	146	193	197	236	280	334	376	423	482	529	577
96 hour	5760	36.6	44.6	59.5	70.8	87.9	121	141	157	207	211	254	301	359	403	446	506	551	597
120 hour	7200	37.4	45.7	61.5	73.5	91.6	126	147	163	215	219	263	312	372	417	457	517	562	607
144 hour	8640	37.7	46.2	62.7	75.3	94.1	130	151	167	219	223	267	317	378	423	462	524	569	614
168 hour	10080	37.8	46.3	63.4	76.4	95.9	132	153	170	220	224	268	317	379	423	463	528	574	621

South Creek

Results - ARR Data Hub
[STARTTXT]

Input Data Information
[INPUTDATA]
Latitude,-33.875225
Longitude,150.761093
[END_INPUTDATA]

River Region
[RIVREG]
Division,South East Coast (NSW)
River Number,12
River Name,Hawkesbury River
[RIVREG_META]
Time Accessed,03 May 2021 12:07PM
Version,2016_v1
[END_RIVREG]

ARF Parameters
[LONGARF]
Zone,SE Coast
a,0.06
b,0.361
c,0.0
d,0.317
e,8.11e-05
f,0.651
g,0.0
h,0.0
i,0.0
[LONGARF_META]
Time Accessed,03 May 2021 12:07PM
Version,2016_v1
[END_LONGARF]

Storm Losses
[LOSSES]
ID,1914.0
Storm Initial Losses (mm),41.0
Storm Continuing Losses (mm/h),2.3
[LOSSES_META]
Time Accessed,03 May 2021 12:07PM
Version,2016_v1
[END_LOSSES]

Temporal Patterns
[TP]
code,ECsouth
Label,East Coast South
[TP_META]
Time Accessed,03 May 2021 12:07PM
Version,2016_v2
[END_TP]

Areal Temporal Patterns
[ATP]
code,ECsouth
arealabel,East Coast South
[ATP_META]
Time Accessed,03 May 2021 12:07PM
Version,2016_v2
[END_ATP]

Median Preburst Depths and Ratios
[PREBURST]
min (h)\AEP(%),50,20,10,5,2,1
60 (1.0),1.4 (0.054),1.2 (0.033),1.1 (0.024),0.9 (0.018),2.6 (0.041),3.8 (0.054)
90 (1.5),1.7 (0.058),1.8 (0.044),1.9 (0.038),1.9 (0.033),2.0 (0.029),2.0 (0.026)
120 (2.0),0.0 (0.000),0.2 (0.005),0.4 (0.007),0.5 (0.009),1.3 (0.017),1.8 (0.021)
180 (3.0),0.5 (0.014),2.6 (0.052),4.1 (0.066),5.4 (0.076),4.3 (0.050),3.4 (0.035)
360 (6.0),2.7 (0.055),11.9 (0.182),18.0 (0.232),23.9 (0.263),19.5 (0.179),16.2 (0.131)
720 (12.0),1.5 (0.024),5.8 (0.066),8.7 (0.083),11.4 (0.093),17.1 (0.117),21.3 (0.129)
1080 (18.0),1.2 (0.016),6.4 (0.061),9.8 (0.078),13.1 (0.089),14.8 (0.084),16.1 (0.081)
1440 (24.0),0.0 (0.000),4.0 (0.033),6.6 (0.046),9.2 (0.054),10.4 (0.051),11.4 (0.050)
2160 (36.0),0.0 (0.000),1.9 (0.013),3.1 (0.018),4.3 (0.021),5.4 (0.022),6.3 (0.023)
2880 (48.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.7 (0.002),1.2 (0.004)
4320 (72.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
[PREBURST_META]
Time Accessed,03 May 2021 12:07PM

Version,2018_v1
Note,Preburst interpolation methods for catchment wide preburst has been slightly altered. Point values remain unchanged.
[END_PREBURST]From preburst class

10% Preburst Depths
[PREBURST10]
min (h)\AEP(%),50,20,10,5,2,1
60 (1.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
90 (1.5),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
120 (2.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
180 (3.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
360 (6.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
720 (12.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
1080 (18.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
1440 (24.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
2160 (36.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
2880 (48.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
4320 (72.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
[PREBURST10_META]
Time Accessed,03 May 2021 12:07PM
Version,2018_v1
Note,Preburst interpolation methods for catchment wide preburst has been slightly altered. Point values remain unchanged.
[END_PREBURST10]From preburst class

25% Preburst Depths
[PREBURST25]
min (h)\AEP(%),50,20,10,5,2,1
60 (1.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
90 (1.5),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
120 (2.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
180 (3.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
360 (6.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
720 (12.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
1080 (18.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
1440 (24.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
2160 (36.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
2880 (48.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
4320 (72.0),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000),0.0 (0.000)
[PREBURST25_META]
Time Accessed,03 May 2021 12:07PM
Version,2018_v1
Note,Preburst interpolation methods for catchment wide preburst has been slightly altered. Point values remain unchanged.
[END_PREBURST25]From preburst class

75% Preburst Depths
[PREBURST75]
min (h)\AEP(%),50,20,10,5,2,1
60 (1.0),16.8 (0.635),16.8 (0.456),16.8 (0.380),16.8 (0.326),21.2 (0.344),24.5 (0.351)
90 (1.5),14.8 (0.496),18.0 (0.434),20.1 (0.405),22.1 (0.382),22.3 (0.321),22.4 (0.285)
120 (2.0),9.4 (0.287),20.2 (0.448),27.3 (0.507),34.2 (0.544),31.6 (0.420),29.7 (0.348)
180 (3.0),24.7 (0.661),36.4 (0.713),44.2 (0.724),51.6 (0.726),46.1 (0.542),42.0 (0.436)
360 (6.0),17.1 (0.356),36.9 (0.565),50.0 (0.642),62.6 (0.689),75.1 (0.690),84.4 (0.684)
720 (12.0),30.0 (0.471),37.3 (0.427),42.2 (0.404),46.8 (0.383),56.2 (0.384),63.3 (0.382)
1080 (18.0),23.3 (0.309),32.5 (0.310),38.6 (0.306),44.4 (0.300),53.5 (0.302),60.3 (0.301)
1440 (24.0),13.6 (0.159),22.2 (0.185),27.9 (0.193),33.3 (0.197),38.7 (0.190),42.7 (0.186)
2160 (36.0),11.6 (0.116),16.3 (0.114),19.4 (0.112),22.4 (0.110),33.4 (0.136),41.5 (0.151)
2880 (48.0),4.2 (0.038),5.8 (0.036),6.8 (0.035),7.8 (0.034),13.4 (0.048),17.5 (0.056)
4320 (72.0),0.0 (0.000),0.3 (0.002),0.5 (0.002),0.7 (0.003),8.1 (0.026),13.7 (0.038)
[PREBURST75_META]
Time Accessed,03 May 2021 12:07PM
Version,2018_v1
Note,Preburst interpolation methods for catchment wide preburst has been slightly altered. Point values remain unchanged.
[END_PREBURST75]From preburst class

90% Preburst Depths
[PREBURST90]
min (h)\AEP(%),50,20,10,5,2,1
60 (1.0),47.0 (1.783),52.9 (1.435),56.7 (1.283),60.5 (1.171),83.0 (1.344),100.0 (1.431)
90 (1.5),46.6 (1.557),66.6 (1.606),79.8 (1.608),92.4 (1.597),82.2 (1.186),74.5 (0.950)
120 (2.0),42.1 (1.285),81.8 (1.814),108.1 (2.005),133.3 (2.122),124.0 (1.649),117.1 (1.375)
180 (3.0),49.5 (1.323),82.6 (1.615),104.4 (1.713),125.4 (1.766),126.1 (1.483),126.7 (1.314)
360 (6.0),41.5 (0.863),77.0 (1.178),100.5 (1.290),123.0 (1.354),134.8 (1.238),143.6 (1.164)
720 (12.0),51.9 (0.814),75.6 (0.865),91.2 (0.873),106.3 (0.870),118.7 (0.811),128.1 (0.772)
1080 (18.0),45.3 (0.600),60.1 (0.573),69.9 (0.555),79.3 (0.537),98.4 (0.556),112.8 (0.563)
1440 (24.0),31.1 (0.366),43.7 (0.365),52.0 (0.361),60.0 (0.354),75.2 (0.370),86.7 (0.378)
2160 (36.0),38.0 (0.382),43.1 (0.303),46.5 (0.268),49.7 (0.243),71.1 (0.290),87.1 (0.316)
2880 (48.0),29.4 (0.267),32.9 (0.206),35.3 (0.181),37.6 (0.163),58.4 (0.211),73.9 (0.238)
4320 (72.0),7.8 (0.063),18.1 (0.099),24.9 (0.111),31.4 (0.118),39.6 (0.124),45.7 (0.128)
[PREBURST90_META]
Time Accessed,03 May 2021 12:07PM
Version,2018_v1

Note,Preburst interpolation methods for catchment wide preburst has been slightly altered. Point values remain unchanged.
[END_PREBURST90]From preburst class

Interim Climate Change Factors
[CCF]
,RCP 4.5,RCP6,RCP 8.5
2030,0.869 (4.3%),0.783 (3.9%),0.983 (4.9%)
2040,1.057 (5.3%),1.014 (5.1%),1.349 (6.8%)
2050,1.272 (6.4%),1.236 (6.2%),1.773 (9.0%)
2060,1.488 (7.5%),1.458 (7.4%),2.237 (11.5%)
2070,1.676 (8.5%),1.691 (8.6%),2.722 (14.2%)
2080,1.810 (9.2%),1.944 (9.9%),3.209 (16.9%)
2090,1.862 (9.5%),2.227 (11.5%),3.679 (19.7%)

[CCF_META]
Time Accessed,03 May 2021 12:07PM
Version,2019_v1
Note,ARR recommends the use of RCP4.5 and RCP 8.5 values. These have been updated to the values that can be found on the climate change in Australia website.
[END_CCF]

Probability Neutral Burst Initial Loss
[BURSTIL]
min (h)\AEP(%),50.0,20.0,10.0,5.0,2.0,1.0
60 (1.0),26.0,17.6,16.0,16.0,15.2,12.3
90 (1.5),29.5,17.9,15.9,15.9,14.3,12.9
120 (2.0),32.3,18.5,15.8,14.7,13.3,11.8
180 (3.0),32.4,17.1,14.4,13.9,13.3,10.0
360 (6.0),32.7,18.7,15.0,13.6,11.3,7.0
720 (12.0),31.5,21.9,20.3,19.0,16.8,9.3
1080 (18.0),33.9,25.1,23.5,22.6,19.7,11.5
1440 (24.0),38.6,30.4,28.7,28.7,25.0,17.3
2160 (36.0),39.3,33.0,32.6,33.6,29.5,15.5
2880 (48.0),43.0,37.1,37.2,42.2,33.6,17.3
4320 (72.0),48.1,42.1,41.4,46.6,37.3,25.6
[BURSTIL_META]
Time Accessed,03 May 2021 12:07PM
Version,2018_v1
Note,As this point is in NSW the advice provided on losses and pre-burst on the NSW Specific Tab of the ARR Data Hub is to be considered. In NSW losses are derived considering a hierarchy of approaches depending on the available loss information. Probability neutral burst initial loss values for NSW are to be used in place of the standard initial loss and pre-burst as per the losses hierarchy.
[END_BURSTIL]

Transformational Pre-burst Rainfall
[PREBURST_TRANS]
min (h)\AEP(%),50.0,20.0,10.0,5.0,2.0,1.0
60 (1.0),15.0,23.4,25.0,25.0,25.8,28.7
90 (1.5),11.5,23.1,25.1,25.1,26.7,28.1
120 (2.0),8.7,22.5,25.2,26.3,27.7,29.2
180 (3.0),8.6,23.9,26.6,27.1,27.7,31.0
360 (6.0),8.3,22.3,26.0,27.4,29.7,34.0
720 (12.0),9.5,19.1,20.7,22.0,24.2,31.7
1080 (18.0),7.1,15.9,17.5,18.4,21.3,29.5
1440 (24.0),2.4,10.6,12.3,12.3,16.0,23.7
2160 (36.0),1.7,8.0,8.4,7.4,11.5,25.5
2880 (48.0),0.0,3.9,3.8,0.0,7.4,23.7
4320 (72.0),0.0,0.0,0.0,0.0,3.7,15.4
[PREBURST_TRANS_META]
The tranformational pre-burst is intended for software suppliers in the NSW area and is simply the Initial Loss - Burst Initial Loss. It is not appropriate to use these values if considering a calibrated initial loss.
[END_PREBURST_TRANS]

[ENDTXT]

All Design Rainfall Depth (mm)
Issued: 22-Dec-20
Location Label:
Requested coordinate: Latitude -33.8752 Longitude 150.7611
Nearest grid cell: Latitude 33.8875 (S) Longitude 150.7625 (E)

		Exceedances per Year (EY) / Annual Exceedance Probability (AEP)																	
Duration	Duration in min	12EY	6EY	4EY	3EY	2EY	63.20%	50%	0.5EY	20%	0.2EY	10%	5%	2%	1%	1 in 200	1 in 500	1 in 1000	1 in 2000
1 min	1	0.802	0.925	1.15	1.31	1.55	2	2.29	2.54	3.23	3.3	3.89	4.54	5.43	6.12	6.65	7.5	8.16	8.81
2 min	2	1.36	1.59	1.97	2.24	2.62	3.27	3.71	4.11	5.14	5.24	6.15	7.16	8.55	9.67	10.7	12.1	13.2	14.3
3 min	3	1.85	2.17	2.7	3.08	3.62	4.54	5.16	5.73	7.17	7.32	8.59	10	11.9	13.5	14.8	16.7	18.2	19.8
4 min	4	2.27	2.67	3.34	3.82	4.51	5.71	6.5	7.22	9.08	9.26	10.9	12.7	15.2	17.1	18.7	21.1	23	24.9
5 min	5	2.64	3.1	3.91	4.48	5.31	6.76	7.72	8.57	10.8	11	13	15.2	18.1	20.4	22.2	25.1	27.3	29.5
10 min	10	4.03	4.74	6.01	6.94	8.29	10.7	12.3	13.7	17.5	17.8	21	24.6	29.4	33.1	35.9	40.5	44	47.5
15 min	15	4.99	5.86	7.44	8.59	10.3	13.4	15.4	17.1	21.9	22.3	26.4	30.8	36.9	41.5	45	50.8	55.2	59.6
20 min	20	5.72	6.72	8.51	9.84	11.8	15.3	17.6	19.6	25	25.5	30.2	35.3	42.2	47.6	51.6	58.3	63.3	68.4
25 min	25	6.33	7.42	9.39	10.8	13	16.8	19.4	21.5	27.5	28	33.1	38.7	46.3	52.2	56.7	64.1	69.6	75.3
30 min	30	6.84	8.01	10.1	11.7	14	18.1	20.8	23.1	29.4	30	35.5	41.5	49.6	56	60.9	68.7	74.7	80.8
45 min	45	8.04	9.4	11.8	13.6	16.2	21	24	26.7	33.8	34.4	40.6	47.4	56.7	64.1	69.9	78.9	85.9	92.9
1 hour	60	8.95	10.5	13.1	15.1	17.9	23.1	26.4	29.3	36.8	37.6	44.2	51.6	61.8	69.9	76.2	86.1	93.7	101
1.5 hour	90	10.3	12.1	15.1	17.3	20.6	26.4	29.9	33.2	41.5	42.3	49.6	57.9	69.3	78.4	85.5	96.5	105	114
2 hour	120	11.4	13.3	16.6	19.1	22.6	29	32.8	36.4	45.1	46	53.9	62.8	75.2	85.2	92.7	105	114	123
3 hour	180	13.1	15.3	19.1	21.9	26	33.3	37.4	41.6	51.1	52.1	61	71	85.1	96.4	105	118	128	138
4.5 hour	270	15	17.5	21.9	25.2	29.9	38.5	43.2	47.9	58.7	59.9	69.9	81.5	97.6	111	120	135	146	158
6 hour	360	16.5	19.3	24.3	27.9	33.3	42.9	48.1	53.4	65.4	66.7	77.9	90.8	109	123	133	150	162	175
9 hour	540	18.9	22.1	28	32.4	38.7	50.3	56.6	62.8	77.1	78.7	92	107	129	146	157	177	191	206
12 hour	720	20.8	24.4	31	36	43.2	56.5	63.7	70.7	87.4	89.1	104	122	146	166	178	201	218	235
18 hour	1080	23.6	27.9	35.8	41.6	50.3	66.5	75.5	83.8	105	107	126	148	177	200	216	244	265	286
24 hour	1440	25.8	30.6	39.4	46	55.9	74.5	85	94.4	119	122	144	169	203	229	249	281	306	330
30 hour	1800	27.4	32.7	42.3	49.6	60.5	81	92.9	103	132	135	160	188	225	254	285	327	359	392
36 hour	2160	28.8	34.5	44.8	52.6	64.3	86.5	99.6	111	142	145	173	204	245	276	314	361	399	438
48 hour	2880	30.8	37.2	48.6	57.2	70.2	95.2	110	122	160	163	195	231	276	311	355	409	452	497
72 hour	4320	33.4	40.6	53.5	63.3	78.2	107	124	138	182	186	224	266	318	358	402	459	503	549
96 hour	5760	34.7	42.4	56.5	67.1	83.2	114	133	148	196	199	241	287	342	384	425	481	524	568
120 hour	7200	35.5	43.3	58.3	69.6	86.6	119	138	154	203	207	249	298	355	398	436	493	535	578
144 hour	8640	35.8	43.7	59.5	71.3	89	122	142	158	206	210	253	303	360	404	441	499	542	584
168 hour	10080	35.9	43.7	60.2	72.5	90.8	125	144	160	207	211	253	304	360	404	442	503	547	591

Model	Node Name	Area (ha)	Impervious Area (ha)	Average Slope (%)
Cosgroves	TNR_46_Catch_002	8.2544	0	3.46363
Cosgroves	TNR_46_Catch_008	2.7532	0	9.29236
Cosgroves	TNR_46_Catch_009	13.3903	0	6.61744
Cosgroves	TNR_46_Catch_011	3.7055	0	4.5108
Cosgroves	TNR_46_Catch_012	2.4168	0	5.5281
Cosgroves	TNR_46_Catch_013	1.2377	0	2.2902
Cosgroves	TNR_46_Catch_014	7.4969	0	6.35695
Cosgroves	TNR_46_Catch_017	3.5382	5	9.30279
Cosgroves	TNR_46_Catch_022	4.5415	0	2.60616
Cosgroves	TNR_46_Catch_059	26.0279	10	2.4494
Cosgroves	TNR_46_Catch_060	3.7835	30	5.08282
Cosgroves	TNR_46_Catch_061	9.0902	30	5.41214
Cosgroves	TNR_46_Catch_062	11.2848	20	3.64548
Cosgroves	TNR_46_Catch_063	1.1624	0	5.41883
Cosgroves	TNR_46_Catch_069	1.4311	0	7.95956
Cosgroves	TNR_46_Catch_071	1.9531	0	12.2195
Cosgroves	TNR_46_Catch_130	12.3776	0	4.05079
Cosgroves	TNR_46_Catch_131	9.0505	0	4.65859
Cosgroves	TNR_46_Catch_132	9.1139	0	7.15836
Cosgroves	TNR_46_Catch_146	0.724	0	4.96264
Cosgroves	TNR_46_Catch_016	2.1273	5	5.234
Cosgroves	TNR_46_Catch_023B	13.118	5	2.38873
Cosgroves	TNR_46_Catch_015	10.9482	5	8.56317
Cosgroves	TNR_46_Catch_143B	2.5023	0	8.0841
Cosgroves	TNR_46_Catch_143A	1.9767	0	10.0632
Cosgroves	TNR_46_Catch_004	4.9013	5	6.64656
Cosgroves	TNR_46_Catch_001	10.6318	0	4.30177
Cosgroves	TNR_46_Catch_021	6.9688	0	7.72342
Cosgroves	TNR_46_Catch_144	6.0865	0	6.17611
Cosgroves	TNR_46_Catch_067	8.3626	5	5.00879
Cosgroves	TNR_46_Catch_018B	4.435	5	3.96529
Cosgroves	TNR_46_Catch_018A	5.5016	5	3.6616
Cosgroves	TNR_46_Catch_003A	1.5341	0	5.25981
Cosgroves	TNR_46_Catch_003B	0.5331	0	7.57512
Cosgroves	TNR_46_Catch_005B	1.875	0	7.2737

Model	Node Name	Area (ha)	Impervious Area (ha)	Average Slope (%)
Cosgroves	TNR_46_Catch_005A	0.6943	5	5.59973
Cosgroves	TNR_46_Catch_006B	2.5624	0	3.938
Cosgroves	TNR_46_Catch_006A	0.7339	25	6.10872
Cosgroves	TNR_46_Catch_145B	2.9989	0	3.45555
Cosgroves	TNR_46_Catch_145A	0.5014	0	5.67573
Cosgroves	TNR_46_Catch_007A	6.1133	0	4.36627
Cosgroves	TNR_46_Catch_147	1.1006	0	5.5692
Cosgroves	TNR_46_Catch_020	7.8218	10	7.56376
Cosgroves	TNR_46_Catch_010A	1.2119	0	1.57786
Cosgroves	TNR_46_Catch_148A	1.1098	0	6.15661
Cosgroves	TNR_46_Catch_148B	0.5962	50	7.14679
Cosgroves	TNR_46_Catch_149B	1.5884	15	6.48645
Cosgroves	TNR_46_Catch_068B	2.2252	10	8.31089
Cosgroves	TNR_46_Catch_070A	8.6212	5	7.312
Cosgroves	CC_07c	6.712	10	2.534
Cosgroves	TNR_46_Catch_256	52.065	0	1.9469
Cosgroves	TNR_46_Catch_257	15.97	0	1.92683
Cosgroves	TNR_46_Catch_260b	20.916	0	1.57335
Cosgroves	TNR_46_Catch_261	7.99	0	1.63161
Cosgroves	TNR_46_Catch_264	19.569	0	2.675
Cosgroves	TNR_46_Catch_265f	2.74	15	9.24
Cosgroves	TNR_46_Catch_266	5.53	0	3.346
Cosgroves	TNR_46_Catch_267b	3.76	0	4.93362
Cosgroves	TNR_46_Catch_023A	3.913	5	1.81
Cosgroves	TNR_46_Catch_010B	0.6609	20	1.57786
Cosgroves	CC_05d	6.871	0	7.014
Cosgroves	CC_06b	6.105	0	6.494
Cosgroves	CC_13h	2.567	10	3.461
Cosgroves	CC_16e	0.621	20	2.268
Cosgroves	CC_15b	0.936	15	2.55
Cosgroves	CC_07e	51.984	0	2.27
Cosgroves	CC_10	40.2	0	1.23
Cosgroves	CC_09c	41.34	0	1.5
Cosgroves	CC_08	69.48	0	2.03
Cosgroves	CC_11	74.17	0	1.4
Cosgroves	CC_12	24.11	0	3.55

Model	Node Name	Area (ha)	Impervious Area (ha)	Average Slope (%)
Cosgroves	CC_17b	87.278	0	1.41
Cosgroves	CC_17a	27.744	0	1.41
Cosgroves	CC_19	41.94	0	2
Cosgroves	CC_18	60.96	0	1.74
Cosgroves	CC_21	54.99	0	1.51
Cosgroves	CC_20	66.66	0	1.37
Cosgroves	CC_23	80.53	0	2.44
Cosgroves	CC_22	104.41	0	1.44
Cosgroves	CC_24	40.97	0	0.78
Cosgroves	TNR_46_Catch_265d	12.137	0	2.07424
Cosgroves	TNR_46_Catch_265e	3.883	0	0.687
Cosgroves	TNR_46_Catch_265b	4.481	0	4.461
Cosgroves	TNR_46_Catch_265c	0.612	25	4.025
Cosgroves	TNR_46_Catch_265a	6.11	5	4.09
Cosgroves	CC_13g	4.5118	0	5.278
Cosgroves	CC_13f	1.773	0	4.1154
Cosgroves	CC_13d	2.4858	5	5.9376
Cosgroves	CC_13e	2.407	10	4.268
Cosgroves	CC_14	5.649	0	5.2112
Cosgroves	CC_13b	0.6197	30	6.761
Cosgroves	CC_05b	5.585	5	8.229
Cosgroves	CC_05c	3.943	0	4.7303
Cosgroves	CC_06c	4.362	0	6.27
Cosgroves	CC_06d	5.149	0	2.727
Cosgroves	CC_06e	53.858	0	3.26
Cosgroves	CC_06f	10.048	5	3.053
Cosgroves	CC_07b	4.27	10	3.843
Cosgroves	CC_07a	2.84	5	3.221
Cosgroves	CC_09a	4.403	5	4.129
Cosgroves	CC_09b	20.066	0	3.2
Cosgroves	CC_16a	1.786	15	1.438
Cosgroves	CC_15c	0.682	5	4.278
Cosgroves	CC_07d	23.723	0	6.193
Cosgroves	CC_06a	6.833	0	7.784
Cosgroves	CC_05a	26.752	0	7.247
Cosgroves	CC_16f	8.271	0	4.668

Model	Node Name	Area (ha)	Impervious Area (ha)	Average Slope (%)
Cosgroves	CC_16g	17.258	0	1.025
Cosgroves	TNR_46_Catch_267a	0.5548	0	4.93362
South	SC_42	351.689	10	0.439
South	SC_82	272.2655	2	0.435
South	SC_41	76.4079	20	1
South	SC_39	357.099	15	0.286
South	SC_43	197.2565	5	0.368
South	SC_104	2.2138	0	1.47
South	SC_97	0.3817	0	1.395
South	SC_110	4.1133	0	0.843
South	SC_87	1.2271	0	1.906
South	SC_86	3.5582	0	2.393
South	SC_91	4.6177	0	1.426
South	SC_92	1.4568	0	2.67
South	SC_96a	13.2774	0	0.839
South	SC_98	9.0518	0	1.016
South	SC_108	4.2953	0	1.766
South	SC_109	4.0445	0	1.124
South	SC_80	16.1008	20	1.082
South	SC_45	74.8115	10	0.603
South	SC_148	26.1463	10	1.129
South	SC_149	0.3056	50	4.17
South	SC_147	0.3152	50	0
South	SC_146	2.2729	0	2.043
South	SC_105	11.9401	2	1.358
South	SC_111	12.1542	2	1.111
South	SC_106	21.1736	2	1.035
South	SC_114	21.1975	0	0.531
South	SC_115	17.6589	0	1.408
South	SC_113	25.7888	0	1.955
South	SC_112	28.3312	0	1.436
South	SC_70	73.3828	10	1
South	SC_116	19.8036	0	1.267
South	SC_117	11.9966	0	1.484
South	SC_119	38.9644	0	1.179
South	SC_118	57.2327	0	0.301

Model	Node Name	Area (ha)	Impervious Area (ha)	Average Slope (%)
South	SC_120	28.1054	0	0.589
South	SC_122	81.9703	0	0.597
South	SC_123	34.42	0	1.103
South	SC_121	32.365	0	0.326
South	SC_107	183.503	0	0.274
South	SC_69	33.7516	0	0.792
South	SC_143	13.4553	0	1.622
South	SC_75	0.3224	80	0
South	SC_77	0.3008	70	0
South	SC_76	1.2545	10	0.893
South	SC_78	0.7679	10	2.215
South	SC_79	23.4701	10	0.986
South	SC_60	8.0014	10	2.283
South	SC_62	3.4647	15	3.013
South	SC_73	1.4391	15	2.736
South	SC_74	0.1594	20	0
South	SC_144	0.3186	90	0
South	SC_72	0.2438	25	0
South	SC_71	0.3745	50	0
South	SC_64	0.1945	30	0
South	SC_145	0.4131	25	0
South	SC_66	2.5944	0	0.605
South	SC_63	6.8619	30	0.224
South	SC_65	5.7549	10	4.385
South	SC_61	21.7334	10	0.45
South	SC_58	3.3957	30	0.232
South	SC_59	1.2547	0	1.208
South	SC_54	1.6091	15	0.446
South	SC_142	0.3467	50	0
South	SC_52	3.4358	5	0.9
South	SC_53	10.5724	10	0.639
South	SC_48	2.1639	10	0.652
South	SC_50	5.9774	10	0.358
South	SC_51	10.7844	10	0.744
South	SC_38	3.4409	10	1.058
South	SC_32	8.9553	5	1.324

Model	Node Name	Area (ha)	Impervious Area (ha)	Average Slope (%)
South	SC_49	0.3885	10	0
South	SC_124	15.9903	2	1.088
South	SC_46	0.9574	30	0
South	SC_47	0.1232	40	0.983
South	SC_57	6.7984	10	0.712
South	SC_151	20.818	5	0.946
South	SC_150	15.4085	10	0.545
South	SC_34	40.2472	10	0.411
South	SC_33	58.675	10	0.89
South	SC_44	99.4772	10	0.255
South	SC_40	381.727	15	0.305
South	SC_28	39.4791	10	0.905
South	SC_29	9.0862	40	1.563
South	SC_132	12.3258	10	1.409
South	SC_36	5.8892	5	1.282
South	SC_37	3.2529	10	1.39
South	SC_140	4.7565	50	1.356
South	SC_35	8.1089	5	1.181
South	SC_31	19.2669	5	0.52
South	SC_130	2.3822	35	1.752
South	SC_129	0.3315	75	0
South	SC_137	0.3277	40	0
South	SC_138	0.3167	30	1.536
South	SC_134	0.3171	60	0
South	SC_135	0.3509	25	0
South	SC_131	35.7069	10	0.797
South	SC_139	0.2413	60	0
South	SC_136	0.3503	25	0
South	SC_30	3.0184	20	0.759
South	SC_22	3.8502	0	0.995
South	SC_21	12.3688	0	0.76
South	SC_1	1.2857	50	0.697
South	SC_2	78.2791	10	0.759
South	SC_8	0.6318	0	1.289788
South	SC_7	3.0218	0	1.068
South	SC_9b	3.52	0	0.946

Model	Node Name	Area (ha)	Impervious Area (ha)	Average Slope (%)
South	SC_20	1.8762	60	0.748
South	SC_24	0.5849	15	0
South	SC_26	0.4006	15	0
South	SC_25	0.135	40	0
South	SC_16	1.7548	20	1.438222
South	SC_18	0.1303	30	0
South	SC_19	0.0384	50	0
South	SC_27	2.298	35	1.586061
South	SC_17	0.1374	0	0.687
South	SC_15	0.1801	20	0
South	SC_14	13.2805	20	2.196
South	SC_12	0.0867	100	0
South	SC_11	0.0558	100	0
South	SC_13	0.1169	60	0
South	SC_6	0.348	80	0
South	SC_5	1.0742	10	2.154
South	SC_127	1.8862	0	1.532
South	SC_125	0.9853	0	1.908
South	SC_4	3.1567	15	1.747
South	SC_3	63.9316	10	1.453
South	SC_56	5.3738	0	0.839
South	SC_55	25.6857	10	1.082
South	SC_67	4.1594	5	1.259
South	SC_68	37.1272	2	0.111
South	SC_141	29.1728	10	0.402
South	SC_126	0.4947	50	0
South	SC_128	0.2096	50	0
South	SC_10	0.9411	30	0.999
South	SC_23	0.2176	20	0
South	SC_96b	3.234	0	1.814
South	SC_133b	20.7689	15	0.46
South	SC_133a	20.298	15	0.46
South	SC_FB22	2.722	30	4.861765
South	SC_FB23	1.7647	80	1.724973
South	SC_FB10	0.3855	100	0
South	SC_FB12	1.0705	100	0

Model	Node Name	Area (ha)	Impervious Area (ha)	Average Slope (%)
South	SC_FB01	0.4273	100	0
South	SC_FB02	4.2563	100	0
South	SC_FB03	0.0913	100	0
South	SC_FB24	5.5912	0	4.127326
South	SC_FB04	2.9937	100	0
South	SC_FB06	0.7811	0	1.700188
South	SC_FB05	1.9894	100	0
South	SC_FB07	0.8575	100	0
South	SC_FB08	0.196	0	3.436828
South	SC_9a	0.29	0	0.946
South	SC_M12_1	1.358	100	0
South	SC_M12_2	0.886	100	0
South	SC_M12_3	1.449	100	0
Ropes	RC_49	1.4749	0	3.782
Ropes	RC_52	1.5452	0	5.297
Ropes	RC_53	1.0967	0	3.729
Ropes	RC_54	1.4989	0	3.241
Ropes	RC_41	2.2496	0	2.821
Ropes	RC_3	1.1622	0	4.66
Ropes	RC_2	4.5167	0	3.536
Ropes	RC_8	1.6092	0	5.019
Ropes	RC_7	5.086	0	3.546
Ropes	RC_50	2.0094	0	4.408
Ropes	RC_51	2.7136	0	2.968
Ropes	RC_57	1.1841	5	2.34
Ropes	RC_58	1.2216	0	1.767
Ropes	RC_46	1.2704	10	2.353
Ropes	RC_47	2.631	5	1.816
Ropes	RC_48	1.2022	0	1.717
Ropes	RC_45	1.4458	0	2.358
Ropes	RC_70	0.3965	90	1.635
Ropes	RC_43	0.8169	5	3.41
Ropes	RC_44	0.3693	20	2.954
Ropes	RC_72	0.3239	0	3.679
Ropes	RC_42	3.8669	0	4.867
Ropes	RC_40	1.0403	0	3.578

Model	Node Name	Area (ha)	Impervious Area (ha)	Average Slope (%)
Ropes	RC_39	0.5738	0	2.655
Ropes	RC_25	2.0006	10	6.223
Ropes	RC_60	0.645	10	1.47
Ropes	RC_63	0.5118	10	3.138
Ropes	RC_62	2.9336	5	1.798
Ropes	RC_61	0.6789	20	2.885
Ropes	RC_23	0.9373	20	2.989
Ropes	RC_59	0.3909	90	2.669
Ropes	RC_71	1.8127	5	2.289
Ropes	RC_64	0.9618	10	2.458
Ropes	RC_68	1.3935	20	3.304
Ropes	RC_37	1.8989	0	4.765
Ropes	RC_38	1.9329	0	7.509
Ropes	RC_30	1.7637	0	6.072
Ropes	RC_32	1.5604	0	2.35
Ropes	RC_34	2.1946	100	2.517
Ropes	RC_36	0.5614	0	0.405
Ropes	RC_35	0.9378	90	1.513
Ropes	RC_31	2.8317	0	2.584
Ropes	RC_26	0.9491	30	5.505
Ropes	RC_29	0.7419	5	5.475
Ropes	RC_1	0.2041	90	7.601
Ropes	RC_65	2.994	5	4.106
Ropes	RC_66	2.0761	5	2.964
Ropes	RC_6	19.6993	80	1.898
Ropes	RC_69	3.7888	15	1.506
Ropes	RC_24	4.3869	10	1.559
Ropes	RC_21	8.2205	20	1.64
Ropes	RC_22	2.1881	20	1.476
Ropes	RC_20	0.6344	10	1.607
Ropes	RC_19	3.0022	50	1.798
Ropes	RC_15	1.5502	60	2.642
Ropes	RC_16	0.8963	10	1.267
Ropes	RC_14	1.0256	50	1.284
Ropes	RC_17	0.1738	80	0.122
Ropes	RC_18	0.5314	80	0.53

Model	Node Name	Area (ha)	Impervious Area (ha)	Average Slope (%)
Ropes	RC_11	0.3683	20	1.784
Ropes	RC_55	0.1318	80	0.72
Ropes	RC_4	0.5586	5	2.177
Ropes	RC_5	5.8296	15	1.102
Ropes	RC_12	0.2381	90	2.977
Ropes	RC_13	0.2599	90	2.881
Ropes	RC_67	13.3146	20	1.693
Ropes	RC_33	9.5359	5	2.415
Ropes	RC_28	3.1167	0	4.221
Ropes	RC_27	2.55	30	1.486
Ropes	RC_9	0.0383	90	0.379
Ropes	RC_56	0.3292	60	1.945
Ropes	RC_10	0.3043	90	1.855
WSA-Oaky	N181992	27.46	1.37	0.5
WSA-Oaky	D1_Internal	27.46	0.19	0.5
WSA-Oaky	E5 Internal	7.95	0.00	0.5
WSA-Oaky	E1 External	104.15	0.00	0.5
WSA-Oaky	C O S9	73.3	0.00	0.5
WSA-Oaky	N267116	1.06	0.00	0.5
WSA-Oaky	N267118	12.19	0.80	0
WSA-Oaky	D1 External 1A	25.18	0.00	0.5
WSA-Oaky	E5 External	5.2	0.00	0
WSA-Oaky	E1 Internal	6.2	0.00	0.5
WSA-Oaky	C O S9 EXST	73.3	0.00	0.5
WSA-Oaky	D1	85.85	0.00	0.5
WSA-Oaky	D2	130	0.00	0.5
WSA-Oaky	E1	109.3	0.00	0.5
WSA-Oaky	E5 EXST	152.2	0.00	0.5
WSA-Oaky	E4-1	14.3	0.00	0.5

Model	Node Name	Area (ha)	Impervious Area (ha)	Average Slope (%)
WSA-Oaky	E4-2	51.5	0.00	0.5
WSA-Oaky	E4-3	38.9	0.00	0.5
WSA-Oaky	E2 EXST	49.13	0.00	0.5
WSA-Oaky	Fuel Farm	8.34	0.00	0.5
WSA-Oaky	E2	49.13	0.00	0.5
WSA-Oaky	E3	117.51	0.00	0.5
WSA-Oaky	E4	104.7	0.00	0.5
WSA-Oaky	E3 EXST	117.51	0.00	0.5
WSA-Oaky	D3 EXST	143.57	0.00	0.5
WSA-Oaky	T005.01	10.09	9.36	0
WSA-Oaky	T005.03	3.62	3.28	0
WSA-Oaky	T031.01	0.98	0.98	0
WSA-Oaky	T031.02	2.17	1.89	0.5
WSA-Oaky	T031.03	0.83	0.72	0.5
WSA-Oaky	T031.04	0.83	0.72	0.5
WSA-Oaky	T031.06	8.46	2.47	0.5
WSA-Oaky	N182002	8.81	1.37	0.5
WSA-Oaky	Basin 6	12.5	0.78	0.5
WSA-Oaky	T028.01	8.55	4.09	0.5
WSA-Oaky	T027.04	1.73	1.43	0.5
WSA-Oaky	N181982	8.41	1.74	0.5
WSA-Oaky	T029.02	3.27	2.43	0.5
WSA-Oaky	T027.03	0.83	0.48	0.5
WSA-Oaky	T030.01	1.9	1.48	0.5
WSA-Oaky	T027.02	2.3	1.04	0.5
WSA-Oaky	T034.01	1.95	1.44	0.5

Model	Node Name	Area (ha)	Impervious Area (ha)	Average Slope (%)
WSA-Oaky	T034.03	3.486	2.44	0.5
WSA-Oaky	T034.04	1.66	1.33	0.5
WSA-Oaky	T033.02	8.55	4.83	0.5
WSA-Oaky	T033.03	8.03	2.03	0.5
WSA-Oaky	T035.01	6.94	5.48	0
WSA-Oaky	T035.02	2.45	2.33	0.5
WSA-Oaky	T037.01	25.51	1.28	0.5
WSA-Oaky	T037.03	10.22	10.05	0.5
WSA-Oaky	T037.06	15.57	6.49	0.5
WSA-Oaky	T037.07	7.95	2.15	0.5
WSA-Oaky	Basin 7	9.7	0.04	0.5
WSA-Oaky	T038.03	20.56	3.19	0.5
WSA-Oaky	T038.04	2.41	2.06	0.5
WSA-Oaky	T038.05	0.83	0.72	0.5
WSA-Oaky	T041.01	9.1	4.27	0.5
WSA-Oaky	T041.02	6.52	3.74	0.5
WSA-Oaky	T039.06	8.55	4.83	0.5
WSA-Oaky	T039.07	25.82	4.44	0.5
WSA-Oaky	N188533	15.47	3.06	0.5
WSA-Oaky	T044.01	3.69	3.68	0.5
WSA-Oaky	HW1	48.86	5.57	0.5
WSA-Oaky	T039.05	0.52	0.52	0.5
WSA-Oaky	HW2	7.77	0.47	0.5
WSA-Oaky	HW3	21.26	6.38	0.5
WSA-Oaky	T032.04	4.95	2.15	0.5
WSA-Oaky	T032.05	8.56	4.80	0.5

Model	Node Name	Area (ha)	Impervious Area (ha)	Average Slope (%)
WSA-Badgerys	B1 06-1	9.16	7.6486	0
WSA-Badgerys	N34568	9.5	2.4985	0
WSA-Badgerys	N34569	9.83	9.83	0
WSA-Badgerys	N34570	9.14	1.25218	0
WSA-Badgerys	N34571	5.81	5.80419	0
WSA-Badgerys	N34572	12.27	0.82209	0
WSA-Badgerys	N34574	1.89	0.09072	0
WSA-Badgerys	B1 08-10	1.56	0.0936	0
WSA-Badgerys	N34586	4.92	0.4428	1
WSA-Badgerys	Basin1	8.77	0.49112	0
WSA-Badgerys	N34577	7.46	1.40248	0
WSA-Badgerys	N34581	5.4	0.3294	0
WSA-Badgerys	N34583	1.39	0.0556	0
WSA-Badgerys	T001.01	2.54	2.54	0
WSA-Badgerys	T001.02	0.82	0.82	0
WSA-Badgerys	T001.05	1.44	1.44	0
WSA-Badgerys	T001.08	1.7	1.7	0
WSA-Badgerys	T001.13	2.18	2.18	0
WSA-Badgerys	T001.17	0.92	0.92	0
WSA-Badgerys	T001.19	0.87	0.87	0
WSA-Badgerys	T001.22	1.4	1.0528	0.5
WSA-Badgerys	T001.26	1.52	1.11416	0.5
WSA-Badgerys	T001.30	1.52	1.43336	0.5
WSA-Badgerys	T001.34	1.57	1.57	0.5
WSA-Badgerys	T001.38	1.83	1.83	0.5
WSA-Badgerys	T001.42	1.76	1.76	0.5

Model	Node Name	Area (ha)	Impervious Area (ha)	Average Slope (%)
WSA-Badgerys	T001.45	1.08	1.08	0.5
WSA-Badgerys	T001.48	1.39	1.28575	0.5
WSA-Badgerys	T004.02	4.14	4.14	0
WSA-Badgerys	T004.15	5.3	5.3	0
WSA-Badgerys	T004.19	4.78	4.78	0
WSA-Badgerys	T004.23	1.74	1.16928	0
WSA-Badgerys	T004.27	9.95	1.2338	0
WSA-Badgerys	T004.30	14.75	14.337	0
WSA-Badgerys	T004.36	12.21	12.11232	1
WSA-Badgerys	T002.01	4.88	4.88	0.5
WSA-Badgerys	T002.06	4.26	4.26	0
WSA-Badgerys	N391098	25.68	1.284	0.5
WSA-Badgerys	N391101	25.68	1.284	0.5
WSA-Badgerys	N391104	60.95	3.0475	0.5
WSA-Badgerys	N391093	29.5	1.475	0.5
WSA-Badgerys	N391088	32.5	1.625	0.5
WSA-Badgerys	T013.06	16.6	0.83	0.5
WSA-Badgerys	N391108	16	12.976	0
WSA-Badgerys	N391109	21.4	1.07	0.5
WSA-Badgerys	N391112	21.4	1.07	0.5
WSA-Badgerys	T003.10	10.6	8.3952	0
WSA-Badgerys	N887582	21.96	17.39232	0
WSA-Badgerys	N887579	15.7	12.9839	0
WSA-Badgerys	N887578	13.3	10.7863	0
WSA-Badgerys	N887577	18.92	16.04416	0

Appendix C

Future Base Case Culverts

Name	Size	Upstream Invert (m AHD)	Downstream Invert (m AHD)	Geographical Location (Easting/Northings of Centroid)	Source
C22300	0.45 RCP	55.62	55.565	295005 / 6250522	M12 TUFLOW
pStg2_17	0.525 RCP	42.612	42.474	295154 / 6250838	M12 TUFLOW
pStg2_18	0.375 RCP	43.2	43.088	295141 / 6250840	M12 TUFLOW
pStg2_19	0.6 RCP	43.248	43.242	295107 / 6250876	M12 TUFLOW
SC_EXD44	0.525 RCP	49.398	48.716	291826 / 6249617	Assumed Width
SC_EXD45	1.8x1.8 RCBC	45.009	44.748	291977 / 6249605	EDU-E-SM-Drainage
SC_EXD46	0.6x0.6 RCBC	55.918	55.448	292153 / 6249571	12d-WEST
SC_EXD47	0.75 RCP	55.449	55.268	292222 / 6249560	12d-WEST
SC_EXD41	0.45 RCP	62.008	61.327	290885 / 6249745	12d-WEST
SC_EXD42	0.45 RCP	55.06	55.033	291566 / 6249653	EDU-E-SM-Drainage
SC_EXD43	0.525 RCP	52.883	52.347	291671 / 6249638	EDU-E-SM-Drainage
SC_EXD33	0.525 RCP	42.093	41.999	294091 / 6249283	12d-WEST
SC_EXD34	0.375 RCP	58.4	58.2	297169 / 6249040	12d-WEST
SC_EXD36	20.45 RCP	55.884	55.369	291244 / 6249745	EDU-E-SM-Drainage
SC_EXD30	0.3 RCP	55.097	54.61	291390 / 6249672	12d-WEST
SC_EXD31	20.6 RCP	45.222	45.053	292260 / 6249554	12d-WEST
SC_EXD32	0.375 RCP	42.318	42.082	294040 / 6249317	12d-WEST
CC_EXD08	20.375 RCP	85.86	85.82	287585 / 6250519	Provided TUFLOW Model
CC_TNR6_NA	20.375 RCP	77.4	77.24	287841 / 6250512	Provided TUFLOW Model
CC_EXD10	0.375 RCP	73.5	73.45	290078 / 6249861	12d-WEST
CC_EXD11	20.6 RCP	66.4	66.3	290355 / 6249827	12d-WEST
CC_TNR6_NB	30.9 RCP	66.75	66.7	288093 / 6250473	Provided TUFLOW Model

Name	Size	Upstream Invert (m AHD)	Downstream Invert (m AHD)	Geographical Location (Easting/Northings of Centroid)	Source
CC_EXD04	30.375 RCP	64.36	64.26	288260 / 6250429	12d-WEST
CC_EXD05	0.375 RCP	59.04	58.94	288968 / 6250015	Provided TUFLOW Model
CC_EXD06	0.375 RCP	65.65	65.55	289653 / 6249915	12d-WEST
SC_EXD53	1.5 RCP	61.162	60.104	297634 / 6248701	M12-E.01
SC_EXD55	22.7x1.5 RCBC	45.3	44.9	296040 / 6249380	M12-E.01
SC_EXD54	30.9 RCP	45.1	44.7	296235 / 6249259	M12-E.01
SC_EXD56	33.6x1.5 RCBC	37.17	36.8	293368 / 6251118	M12-E.01
SC_EXD48	0.3 RCP	44.974	44.448	294589 / 6249222	12d-WEST
SC_EXD49	0.375 RCP	59.529	58.208	295422 / 6248979	12d-WEST
SC_EXD50	1.8 RCP	47.784	47.577	296684 / 6248901	12d-WEST
SC_EXD52	0.3 RCP	54.921	54.642	297023 / 6248906	12d-WEST
SC_ED_Pipe1	0.45 RCP	58	57.5	297232 / 6248905	EDU-E-SM-Drainage
SC_ED_Pipe2	0.45 RCP	57.5	57.3	297232 / 6248899	EDU-E-SM-Drainage
SC_ED_Pipe3	0.525 RCP	58.5	58.3	297298 / 6248936	Provided TUFLOW Model
SC_ED_Pipe4	0.525 RCP	58.3	57.6	297269 / 6248922	Provided TUFLOW Model
SC_EXD18	30.6x2 RCBC	40.67	40.4	294193 / 6249285	EDU-E-SM-Drainage
SC_EXD28	0.55 RCP	65.96	65.78	297632 / 6248992	Provided TUFLOW Model
SC_EXD27	0.55 RCP	62.21	62.05	297484 / 6248957	Provided TUFLOW Model
SC_ED_Pipe9	0.45 RCP	58.8	58	297232 / 6248919	EDU-E-SM-Drainage
SC_EXD22	20.45 RCP	58.15	58.03	295371 / 6248963	12d-WEST
SC_EXD21	30.525 RCP	55.55	55.43	295164 / 6249008	Provided TUFLOW Model

Name	Size	Upstream Invert (m AHD)	Downstream Invert (m AHD)	Geographical Location (Easting/Northings of Centroid)	Source
SC_EXD20	0.75 RCP	47.05	47	294849 / 6249183	Provided TUFLOW Model
SC_EXD19	20.75 RCP	44.35	44.3	294601 / 6249233	Provided TUFLOW Model
SC_EXD40	0.375 RCP	55.899	54.296	291329 / 6249678	EDU-E-SM-Drainage
SC_12030	31.05 RCP	57.8	57	297324 / 6248809	M12-E.01
SC_A1-5150	42.7x1.5 RCBC	53.75	53.5	291347 / 6249844	Provided TUFLOW Model
SC_Pipe_13	0.375 RCP	57.69	57.5	295826 / 6248916	Provided TUFLOW Model
SC_Pipe_14	0.375 RCP	57.75	57.69	295805 / 6248926	Provided TUFLOW Model
SC_Pipe_15	0.375 RCP	57.05	56.95	295859 / 6248885	EDU-E-SM-Drainage
SC_Pipe_16	31.35 RCP	56.35	56.16	297146 / 6249069	EDU-E-SM-Drainage
SC_Box_9	41.35x0.9 RCBC	40.13	40.1	293828 / 6249340	EDU-E-SM-Drainage
SC_Pipe_10	0.75 RCP	40.4	40.3	294375 / 6249549	Provided TUFLOW Model
SC_Pipe_11	0.6 RCP	46.2	46.1	294803 / 6249213	12d-WEST
SC_Pipe_12	20.375 RCP	45.38	45.3	294822 / 6249364	Provided TUFLOW Model
SC_EXD14	0.45 RCP	60.82	60.5	292813 / 6249489	12d-WEST
SC_Pipe_6	0.45 RCP	61.55	61.5	292997 / 6249482	Provided TUFLOW Model
SC_Pipe_7	0.375 RCP	57.35	57.3	293138 / 6249430	Provided TUFLOW Model
SC_Pipe_8	0.375 RCP	57.4	57.35	293126 / 6249429	Provided TUFLOW Model
SC_ED_Pipe5	20.45 RCP	57.6	57.3	297239 / 6248902	Provided TUFLOW Model
SC_ED_Pipe6	0.45 RCP	57.49	57.39	297246 / 6248918	Provided TUFLOW Model
SC_ED_Pipe7	0.45 RCP	57.54	57.49	297270 / 6248904	Provided TUFLOW Model

Name	Size	Upstream Invert (m AHD)	Downstream Invert (m AHD)	Geographical Location (Easting/Northings of Centroid)	Source
SC_ED_Pipe8	0.45 RCP	57.49	57.39	297256 / 6248907	Provided TUFLOW Model
pStg2_14	0.9 RCP	48.62	48.045	295392 / 6250123	M12 TUFLOW
C22410	0.675 RCP	47.932	47.295	295224 / 6250601	M12 TUFLOW
C22840	0.6 RCP	48.585	48.512	295408 / 6250159	M12 TUFLOW
C23810	22.7x0.6 RCBC	44.433	44.35	296072 / 6249499	M12 TUFLOW
C22981	21.35 RCP	43.708	43.586	295557 / 6250102	M12 TUFLOW
C23680	30.9 RCP	48.486	48.407	295896 / 6249436	M12 TUFLOW
C23710	0.45 RCP	48.108	48.035	295926 / 6249429	M12 TUFLOW
pStg2_13	0.9 RCP	48.097	47.527	295455 / 6250030	M12 TUFLOW
C22409	0.45 RCP	50	49.945	295198 / 6250574	Provided TUFLOW Model
C22890	31.05 RCP	47.606	47.551	295413 / 6250126	M12 TUFLOW
C22990	21.2 RCP	47.473	47.397	295468 / 6250044	M12 TUFLOW
C22980	21.35 RCP	45.345	45.138	295506 / 6250071	M12 TUFLOW
C26441	1.05 RCP	88.689	88.5	298452 / 6248782	M12 TUFLOW
C21170	21.35 RCP	38.422	38.276	294009 / 6250958	M12 TUFLOW
C20400	0.45 RCP	40.583	39.064	293273 / 6251090	Provided TUFLOW Model
C25860	1.5 RCP	67.49	67.118	297899 / 6248684	Provided TUFLOW Model
RCourse_1	0.45 RCP	44.282	43.203	296300 / 6249348	M12 TUFLOW
C25150	0.9 RCP	57.137	56.905	297245 / 6248893	M12 TUFLOW
C25160	1.05 RCP	56.905	56.31	297239 / 6248859	M12 TUFLOW
C22170	0.6 RCP	53.577	53.442	294904 / 6250591	M12 TUFLOW
pStg2_21	0.375 RCP	42.525	42.502	295009 / 6250985	M12 TUFLOW

Name	Size	Upstream Invert (m AHD)	Downstream Invert (m AHD)	Geographical Location (Easting/Northings of Centroid)	Source
pStg2_22	20.6 RCP	41.699	41.559	294966 / 6251017	M12 TUFLOW
pStg2_26	0.45 RCP	44.766	44.523	295004 / 6250888	M12 TUFLOW
C26020	0.6 RCP	72.061	71.5	298058 / 6248651	M12 TUFLOW
pStg2_09	0.375 RCP	72.369	72.137	297898 / 6248872	M12 TUFLOW
pStg2_10	0.3 RCP	68.474	68.333	297877 / 6248727	M12 TUFLOW
pStg2_12	0.3 RCP	51.664	51.637	295503 / 6249903	M12 TUFLOW
pStg2_20	0.6 RCP	42.406	42.117	295069 / 6250921	M12 TUFLOW
C20090	23.6x1.5 RCBC	39.867	39.58	292971 / 6251175	M12 TUFLOW
pStg2_06	0.525 RCP	74.833	73.816	297899 / 6248948	M12 TUFLOW
pStg2_07	0.45 RCP	68.785	67.603	297875 / 6248784	M12 TUFLOW
pStg2_08	0.375 RCP	81.169	79.485	297911 / 6249043	M12 TUFLOW
RC_EXD33	20.45 RCP	114.06	113.55	299795 / 6249549	Provided TUFLOW Model
RC_EXD34	31.05 RCP	112.93	112.22	299976 / 6249608	12d-WEST
RC_EXD35	0.45 RCP	112.16	111.67	300127 / 6249633	Provided TUFLOW Model
RC_EXD39A	2.1x0.6 RCBC	110.15	109.97	300425 / 6249461	Provided TUFLOW Model
RC_EXD29	20.6 RCP	101.97	101.51	298966 / 6249352	EDU-E-SM-Drainage
RC_EXD30	20.6 RCP	101.13	101.01	299116 / 6249477	EDU-E-SM-Drainage
RC_EXD31	0.9 RCP	102.09	101.6	299278 / 6249536	EDU-E-SM-Drainage
RC_EXD32	0.45 RCP	110.53	110.23	299460 / 6249513	EDU-E-SM-Drainage
CC_EXD05a	31.8x0.9 RCBC	59.95	59.83	288517 / 6249679	Provided TUFLOW Model
CC_EXD13	0.375 RCP	70.182	69.599	288010 / 6250498	12d-WEST
CC_EXD14	31.8x1.5 RCBC	55.1455	54.5331	289199 / 6249986	12d-WEST

Name	Size	Upstream Invert (m AHD)	Downstream Invert (m AHD)	Geographical Location (Easting/Northings of Centroid)	Source
CC_EXD40	0.375 RCP	77.867	77.342	287834 / 6250502	12d-WEST
CC_EXD12	30.9 RCP	57.05	56.93	288758 / 6250148	12d-WEST
CC_EXD05b	0.45 RCP	58.1	58.04	288887 / 6249961	Provided TUFLOW Model
CC_EXD12a	20.375 RCP	57.53	57.45	288935 / 6250334	Provided TUFLOW Model
CC_EXD05c	0.525 RCP	59.6	59.32	288592 / 6249735	Provided TUFLOW Model
C26440	0.9 RCP	89.9	88.5	298435 / 6248813	M12 TUFLOW
C26612	0.675 RCP	95.988	94.483	298566 / 6248891	M12 TUFLOW
C26611	0.675 RCP	97.096	95.988	298579 / 6248926	M12 TUFLOW
C26610	0.675 RCP	98.8	97.096	298594 / 6248939	M12 TUFLOW
RC_EXD41	0.45 RCP	110.484	110.426	299454 / 6249473	12d-WEST
RC_EXD36	0.375 RCP	111.66	111.804	300496 / 6249570	12d-WEST
SC_EXD57	27x4 RCBC	46.1	45.54	292225 / 6249577	WSA-Earthworks Package
CC_EXD41	0.45 RCP	56.68	54.27	290492 / 6251149	M12 Motorway Package - West
RC_PIPE3	0.525 RCP	101.95	101.9	298808 / 6249373	Provided TUFLOW Model
RC_PIPE4	0.375 RCP	103.9	103.8	298894 / 6249305	EDU-E-SM-Drainage
RC_PIPE5	0.375 RCP	103.95	103.9	298878 / 6249300	EDU-E-SM-Drainage
RC_PIPE6	20.9 RCP	104.4	104.3	300013 / 6249757	Provided TUFLOW Model
RC_EXD29B	2.4x0.6 RCBC	109.92	109.66	300427 / 6249497	Provided TUFLOW Model
RC_EXD40	1.05 RCP	108.95	108.27	300475 / 6249536	Provided TUFLOW Model
RC_PIPE1	0.525 RCP	101.8	101.75	298820 / 6249383	Provided TUFLOW Model

Name	Size	Upstream Invert (m AHD)	Downstream Invert (m AHD)	Geographical Location (Easting/Northings of Centroid)	Source
RC_PIPE2	0.525 RCP	101.9	101.8	298814 / 6249377	Provided TUFLOW Model
Range_Rd_1	0.6 RCP	59.15	58.941	297587 / 6248658	M12 TUFLOW

Appendix D

Design Case Culverts

Location	Culvert	Chainage	Size
West	PXD01	1000	3/1200x600 RCBC
West	PXD03	1750	6/2700x600 RCBC
West	PXD04	1760	2/600 RCP
West	PXD09	3400	525 RCP
West	EXD05b	1900	450 RCP
West	PXD12	2200	3/1800x1500 RCBC
West	PXD15	3100	600 RCP
West	PXD30	1150	900 RCP
East	PXD11	5300	5/1500x1500 RCBC
East	PXD11a	6200	600 RCP
East	PXD16A	7900	6/750 RCP
East	PXD20	9420	4/1200 RCP
East	PXD25	9020	750 RCP
East	PXD27	7060	3/900 RCP
East	PXD28	9610	8/1200x1800 RCBC
East	PXD29	6980	4/1200 RCP
East	PXD31	7270	4/2400x1200 RCBC
East	Box_9	6900	6/1800x1200 RCBC
East	EXD19	7680	2/750 RCP
East	EXD21	8300	3/525 RCP
East	Pipe_16	200	4/1800x900 RCBC
East	AE124	6385	2/600 RCP
East	AE120	5530	525 RCP
East	PXD32	6150	2/450
East	Pipe_12	7900 (Further North)	4/1500x1500 RCBC
East	PXD16A	7900 (North)	525 RCP
East	PXD33	7130	2/1800x600
East	RC_PXD29	12300	4/600 RCP
East	RC_PXD30	12475	4/600 RCP
East	RC_PXXD31	12650	4/600 RCP
East	Duff Rd	12200	600 RCP

Appendix E

Bridge Loss Calculations

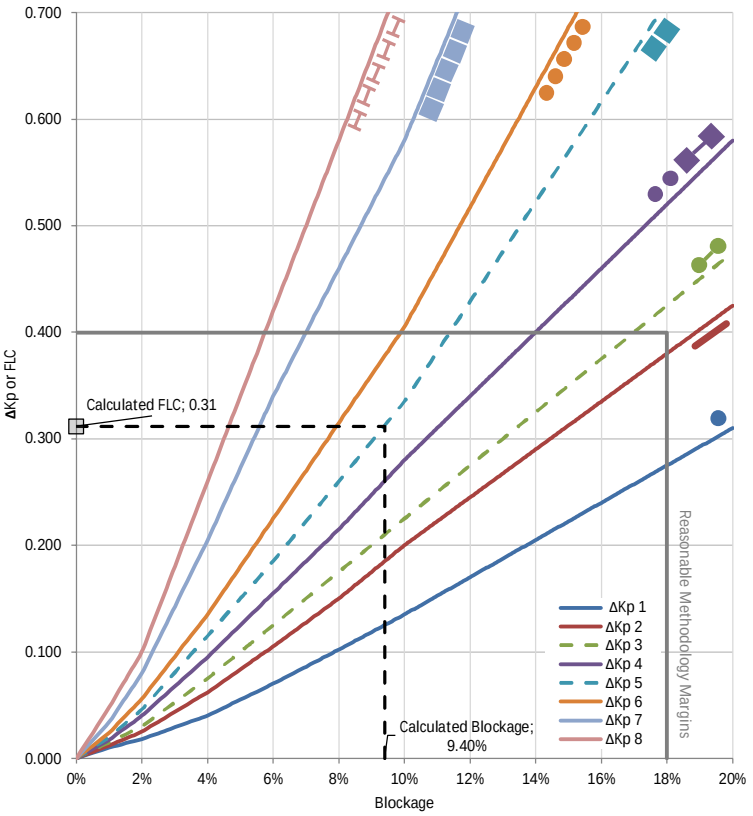

Figure 65 Cosgroves Creek Existing Bridge FLC

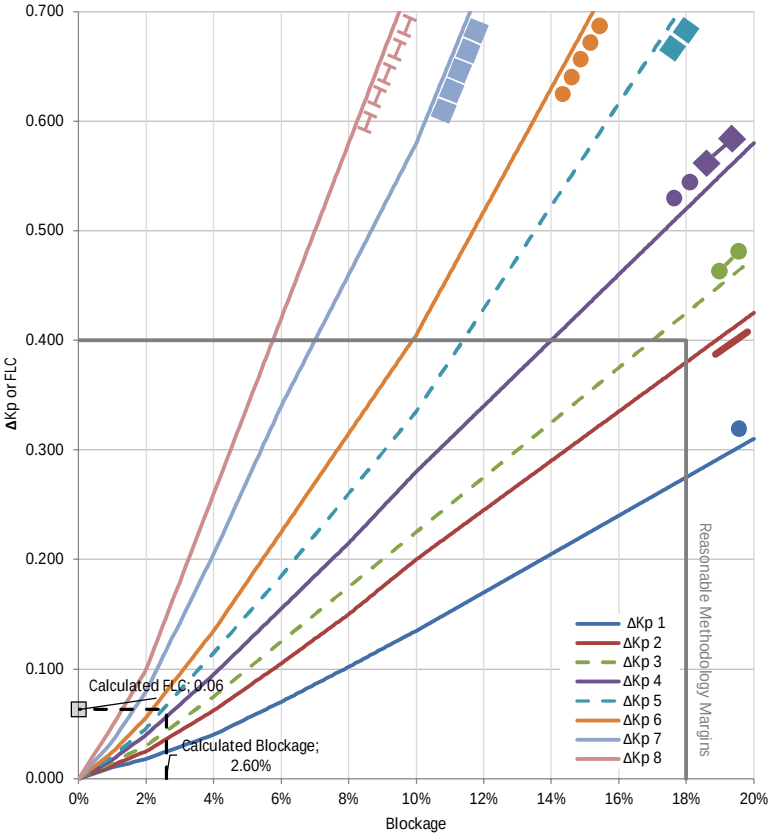

Figure 66 Badgerys Creek Existing Bridge FLC

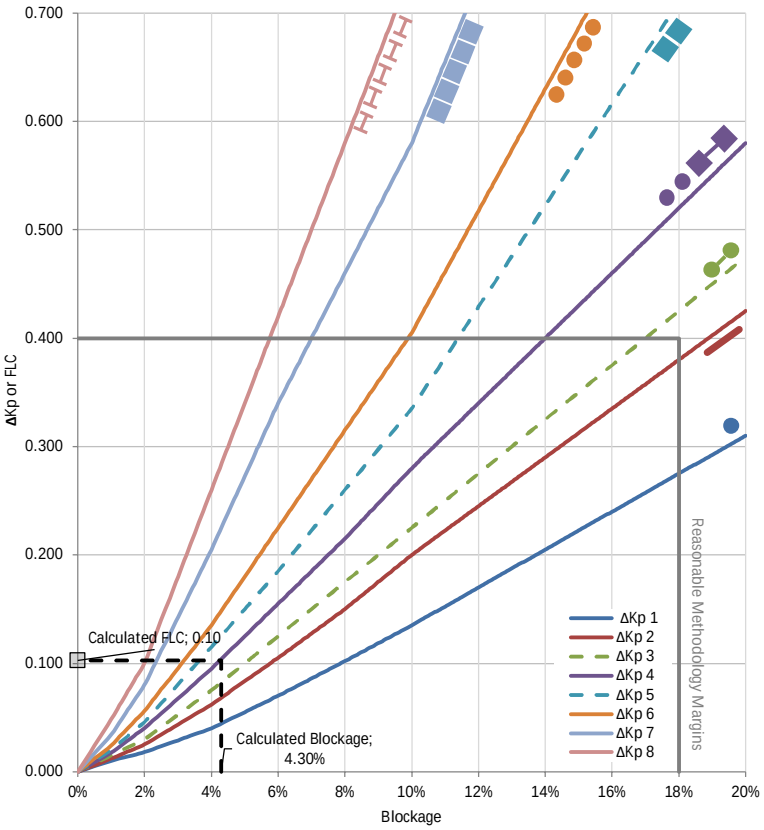

Figure 67 South Creek Floodway Existing Bridge FLC

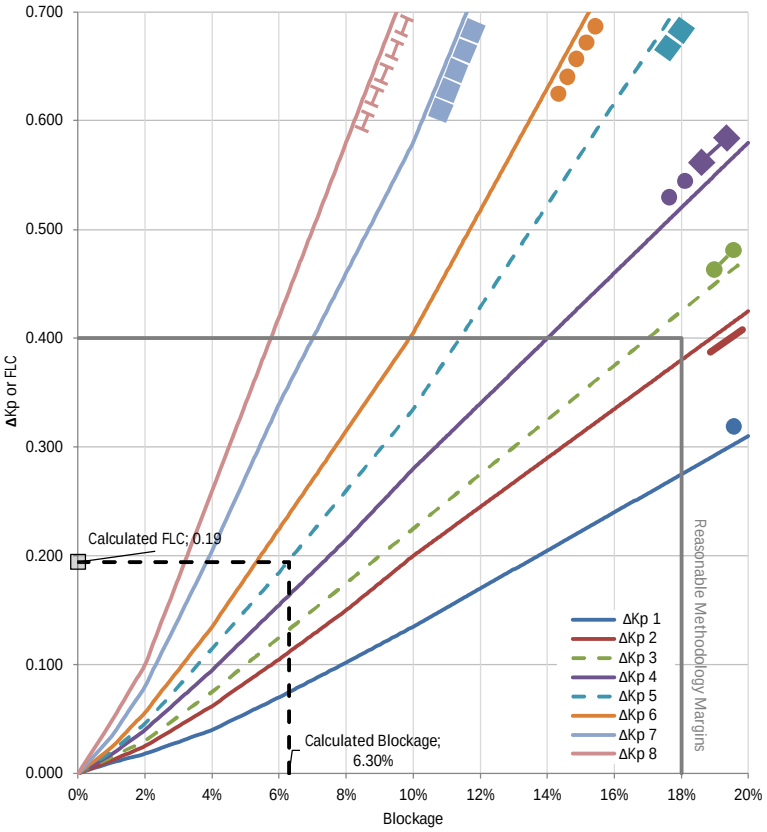

Figure 68 South Creek Floodway Existing Bridge FLC

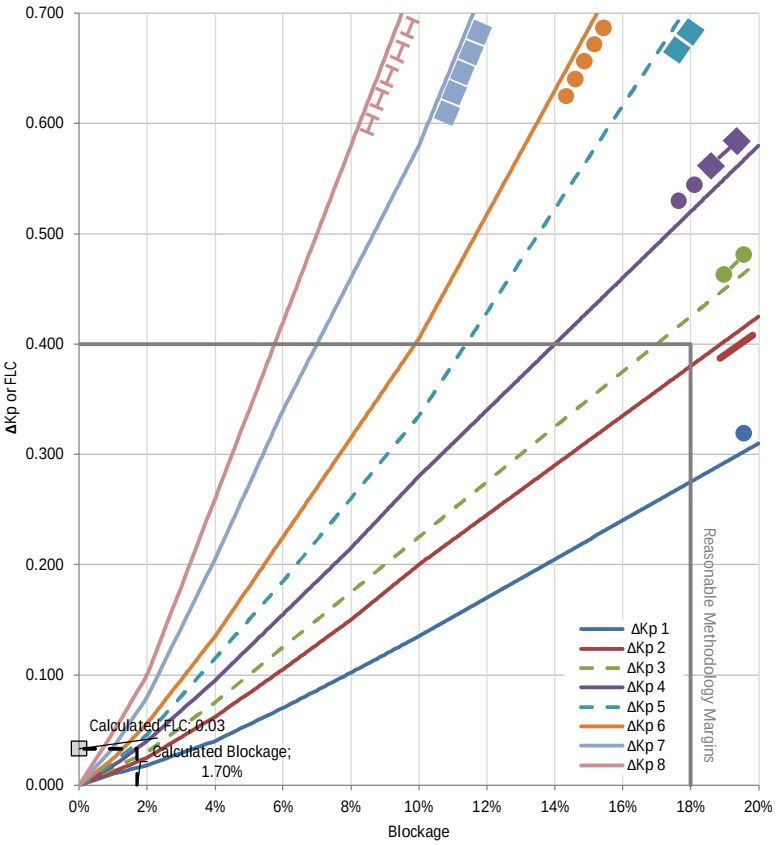

Figure 69 Kemps Creek Existing Bridge FLC

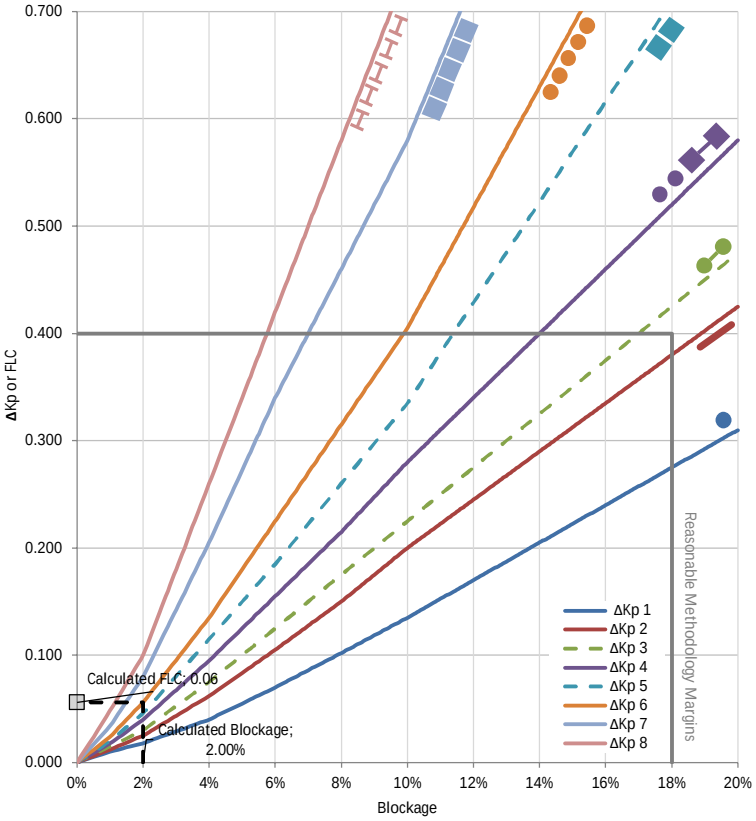

Figure 70 Cosgroves Creek Design Bridge FLC

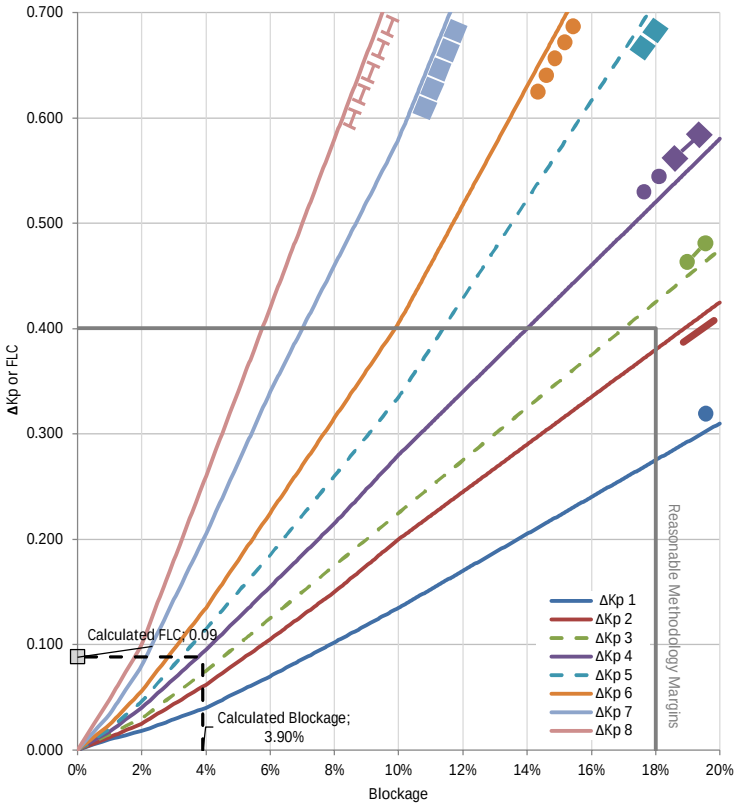

Figure 71 Badgerys Creek Design Bridge FLC

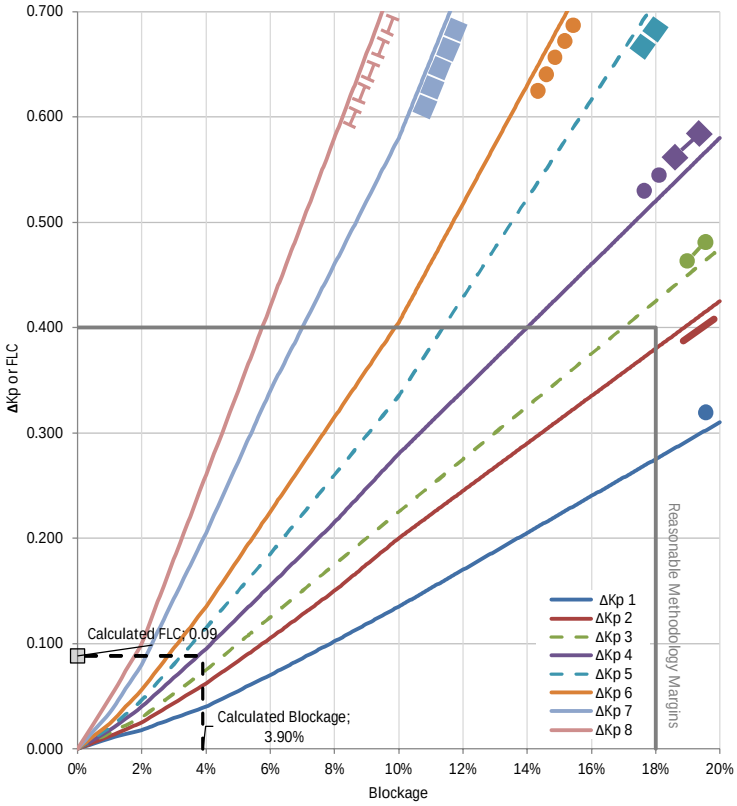

Figure 72 South Creek Design Bridge FLC

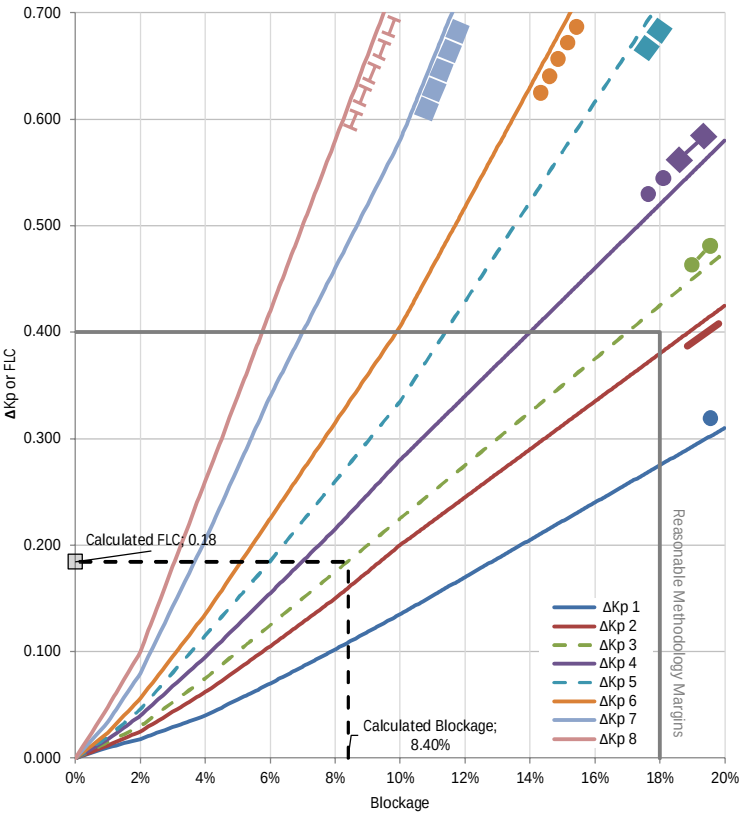

Figure 73 Kemps Creek Design Bridge FLC

Appendix F

Building Impact Assessment

Appendix G

Property Impact Assessment

Appendix G Afflux Property Impact Assessment

This assessment does not filter out modelling spikes or flooding on design elements (e.g. up the design embankment, in design drains, or over side roads) as it is intended as indicative findings

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
1/DP240718	112236	East	ENT	1555	100	0.09%	-1	1882	784.56	768.57	430.26	382.52	0.70%	0.68%	0.38%	0.34%
5/DP860456	575245	East	ENT	7993	4335	0.75%	-12	1823	7455.12	7227.18	6956.25	6826.28	1.30%	1.26%	1.21%	1.19%
9/DP1266422	15871	East	RU4	9	2244	14.14%	1402	1421	8.9	8.9	8.9	8.9	0.06%	0.06%	0.06%	0.06%
13/DP1266422	12834	East	RU4	1926	618	4.81%	219	1369	1919.55	1919.55	1365.49	511.48	14.96%	14.96%	10.64%	3.99%
2/DP240718	101180	East	ENT	523	566	0.56%	27	796	504.87	490.87	474.88	455.88	0.50%	0.49%	0.47%	0.45%
1/DP716403	112099	East	RU4	5117	719	0.64%	1	738	4450.12	3832.27	2065.69	994.76	3.97%	3.42%	1.84%	0.89%
3/DP1087825	1607240	East	SP2	15904	731	0.05%	-3	658	459.91	230.96	166.97	105.98	0.03%	0.01%	0.01%	0.01%
29/DP29832	22615	East	RU4	1952	150	0.66%	-47	605	5.6	5.6	5.6	5.6	0.02%	0.02%	0.02%	0.02%
2/DP220176	116058	West	AGB	7943	1612	1.39%	-2	573	7878.71	7868.33	7805.71	572.32	6.79%	6.78%	6.73%	0.49%
28/DP29832	21507	East	RU4	6950	0	0.00%	5	546	1307.97	795.08	606.92	489.35	6.08%	3.70%	2.82%	2.28%
124/DP1164402	44515	East	RU4	532	419	0.94%	-237	496	325.81	262.14	181.91	108.67	0.73%	0.59%	0.41%	0.24%
1/DP508759	20398	East	RU4	4872	329	1.61%	-14	489	808.01	592.93	176.09	121.34	3.96%	2.91%	0.86%	0.59%
12/DP507590	20531	East	RU4	3027	72	0.35%	15	477	1958.6	461.03	26.65	12.	9.54%	2.25%	0.13%	0.06%
1/DP529885	366161	West	ENT	29753	172	0.05%	25	429	27661.45	22200.56	119.96	56.98	7.55%	6.06%	0.03%	0.02%
7/DP1014394	10239	East	RU4	2159	17	0.17%	0	377	130.29	118.29	96.39	82.89	1.27%	1.16%	0.94%	0.81%
2/DP1274964	204392	East	ENT	17967	173	0.08%	0	364	12700.28	220.18	145.53	59.66	6.21%	0.11%	0.07%	0.03%
4/DP1274964	4127	East	ENZ	1488	0	0.00%	81	335	1431.5	1387.74	866.68	478.82	34.69%	33.63%	21.00%	11.60%
106/DP846962	424796	West	AGB	72941	214	0.05%	-14	300	4088.2	3910.4	2445.62	1286.25	0.96%	0.92%	0.58%	0.30%
2/DP30265	33705	East	ENZ	29477	227	0.67%	16	282	29285.34	700.43	50.03	24.71	86.89%	2.08%	0.15%	0.07%
1/DP551852	20353	East	RU4	12871	198	0.97%	-4	276	1199.46	496.81	31.42	8.73	5.89%	2.44%	0.15%	0.04%
1/DP220176	116241	West	AGB	2422	545	0.47%	-3	275	1877.71	1803.52	1630.47	1482.81	1.62%	1.55%	1.40%	1.28%
5/DP1114311	274808	East	RU4	5440	10728	3.90%	-68	269	5121.54	4519.72	1255.5	230.74	1.86%	1.64%	0.46%	0.08%
12/DP32026	78712	West	ENZ	17921	516	0.66%	-5	254	2343.63	1017.1	574.72	473.37	2.98%	1.29%	0.73%	0.60%
16/DP1268721	9886	East	IN2	258	0	0.00%	-45	249	128.97	100.98	45.99	19.	1.30%	1.02%	0.47%	0.19%
15/DP1266923	60119	East	ENZ	37638	188	0.31%	25	246	22874.57	8990.45	8572.87	35.99	38.05%	14.95%	14.26%	0.06%
12/DP1266422	8135	East	RU4	1572	100	1.23%	59	235	1553.13	1544.13	1063.55	127.97	19.09%	18.98%	13.07%	1.57%
1/DP1287712	1719324	West	ENT	155001	512	0.03%	2	234	21247.01	186.43	36.99	24.99	1.24%	0.01%	0.00%	0.00%
11/DP1266422	20870	East	RU4	10046	5480	26.26%	132	232	10046.18	10046.18	10046.18	10019.54	48.14%	48.14%	48.14%	48.01%
8/DP30265	25862	East	ENZ	14493	304	1.17%	25	223	14493.	14466.01	58.99	33.99	56.04%	55.93%	0.23%	0.13%
11/DP507590	20276	East	RU4	6843	679	3.35%	15	218	4944.35	1697.64	10.92	6.26	24.39%	8.37%	0.05%	0.03%
13/DP32026	58134	West	ENZ	32666	215	0.37%	4	218	1824.11	367.86	32.56	30.94	3.14%	0.63%	0.06%	0.05%
12/DP1266923	69762	East	ENZ	38435	376	0.54%	29	210	13187.06	12201.33	11572.13	847.59	18.90%	17.49%	16.59%	1.21%
11/DP32026	101171	West	ENT	28334	369	0.36%	4	206	8523.35	7055.05	2664.37	956.86	8.42%	6.97%	2.63%	0.95%
8/DP1014394	10001	East	RU4	933	106	1.06%	-124	205	39.41	33.41	14.48	6.23	0.39%	0.33%	0.14%	0.06%
401/DP812923	24939	East	RU4	3489	4974	19.94%	0	203	556.15	299.41	96.46	18.79	2.23%	1.20%	0.39%	0.08%
14/DP1266422	9448	East	RU4	1683	60	0.63%	49	201	1682.71	1646.42	737.46	11.56	17.81%	17.43%	7.81%	0.12%
8/DP1240511	66735	West	AGB	12598	8	0.01%	0	186	7.	6.	3.	2.	0.01%	0.01%	0.00%	0.00%
30/DP30265	30072	East	ENZ	27864	75	0.25%	56	183	20153.11	17043.47	12551.93	9046.81	67.02%	56.68%	41.74%	30.08%
4/DP658310	6716	East	RU4	54	0	0.00%	-655	182	50.43	41.23	26.51	15.2	0.75%	0.61%	0.39%	0.23%
2/DP1240511	96023	West	AGB	20837	12	0.01%	0	175	4.	3.	1.	1.	0.00%	0.00%	0.00%	0.00%
1/DP533788	29291	East	RU1	4105	26	0.09%	4	174	765.01	116.96	33.28	9.37	2.61%	0.40%	0.11%	0.03%
600/DP830470	20776	East	RU4	5486	1089	5.24%	-15	168	840.85	507.92	219.38	98.98	4.05%	2.44%	1.06%	0.48%
11/DP1146142	281452	East	RU4	380	96	0.03%	-96	168	44.74	44.74	38.74	21.62	0.02%	0.02%	0.01%	0.01%
21/DP601022	143890	East	ENZ	13583	574	0.40%	-5	163	8145.05	3638.83	236.94	34.99	5.66%	2.53%	0.16%	0.02%
1/DP255566	96171	East	ENZ	25482	0	0.00%	-22	150	19560.63	14590.12	5729.73	891.78	20.34%	15.17%	5.96%	0.93%

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
33/DP258414	136552	East	IN1	52534	30	0.02%	17	129	52403.85	100.72	63.36	44.37	38.38%	0.07%	0.05%	0.03%
32/DP258414	144843	East	IN1	52294	0	0.00%	17	129	52278.94	4.25	1.62	1.62	36.09%	0.00%	0.00%	0.00%
19/DP1266422	2966	East	RU4	2085	38	1.29%	75	125	1899.8	1739.72	1253.32	1079.01	64.06%	58.66%	42.26%	36.38%
32/DP1277434	1066477	West	ENZ	45077	0	0.00%	12	125	38699.97	235.87	59.98	36.99	3.63%	0.02%	0.01%	0.00%
47/DP270417	856887	East	RE2	208793	154	0.02%	10	125	180997.14	419.89	259.93	179.95	21.12%	0.05%	0.03%	0.02%
100/DP1263171	14265242	West	SP2	12979	129	0.00%	-11	124	354.89	342.3	151.2	45.58	0.00%	0.00%	0.00%	0.00%
6/DP255578	104873	West	ENT	3904	0	0.00%	18	123	3883.14	222.8	5.	2.	3.70%	0.21%	0.00%	0.00%
39/A/DP2566	15085	East	RU4	1289	337	2.24%	63	122	1288.73	1288.73	618.56	199.95	8.54%	8.54%	4.10%	1.33%
19/DP30265	32048	East	RU4	12883	496	1.55%	23	120	11719.42	5476.49	704.1	497.18	36.57%	17.09%	2.20%	1.55%
38/DP258414	101524	East	ENZ	49942	550	0.54%	16	119	49942.42	673.05	45.99	10.	49.19%	0.66%	0.05%	0.01%
74/DP1277011	459988	East	ENT	28094	152	0.03%	-4	113	11205.73	7159.57	308.12	2.33	2.44%	1.56%	0.07%	0.00%
4/DP860456	100976	East	ENT	620	112	0.11%	-175	112	620.46	620.46	60.05	4.	0.61%	0.61%	0.06%	0.00%
281/DP571171	110120	West	AGB	2622	23	0.02%	1	112	539.42	490.03	6.04	1.04	0.49%	0.44%	0.01%	0.00%
54/DP734584	106032	East	RU2	4347	104	0.10%	15	107	4341.18	80.65	24.99	10.	4.09%	0.08%	0.02%	0.01%
3/DP858141	106188	East	RU4	17448	800	0.75%	-18	104	15702.54	13174.07	5316.68	120.97	14.79%	12.41%	5.01%	0.11%
4/DP255566	100146	East	RU2	13553	250	0.25%	-11	101	2793.33	1466.65	549.87	6.	2.79%	1.46%	0.55%	0.01%
26/DP30265	20426	East	RU4	217	350	1.71%	-91	100	120.57	70.58	56.58	6.	0.59%	0.35%	0.28%	0.03%
2/DP858141	18989	East	RU4	8050	150	0.79%	13	98	7723.84	7298.03	24.99	0.	40.67%	38.43%	0.13%	0.00%
17/DP1268721	6856	East	IN2	1038	125	1.82%	-12	95	596.87	249.95	65.99	0.	8.71%	3.65%	0.96%	0.00%
15/DP1266422	5578	East	RU4	4560	505	9.06%	15	93	2530.88	1141.99	70.98	0.	45.38%	20.47%	1.27%	0.00%
5/DP1266422	17638	East	RU4	5529	311	1.76%	23	91	5501.74	3056.95	43.99	0.	31.19%	17.33%	0.25%	0.00%
3/DP240718	101200	East	ENT	98	384	0.38%	-211	90	94.36	85.36	45.92	0.	0.09%	0.08%	0.05%	0.00%
37/DP211842	114009	West	ENT	6917	72	0.06%	2	89	1379.39	82.98	75.98	0.	1.21%	0.07%	0.07%	0.00%
2/DP707256	40739	East	RU4	12876	176	0.43%	19	87	7367.25	6184.78	9.	0.	18.08%	15.18%	0.02%	0.00%
25/DP30265	22060	East	RU4	101	26	0.12%	-209	85	82.75	74.75	51.61	0.	0.38%	0.34%	0.23%	0.00%
15/DP1268721	11781	East	IN2	15	0	0.00%	-146	81	15.	15.	6.	0.	0.13%	0.13%	0.05%	0.00%
2/DP1266422	26504	East	RU4	8234	279	1.05%	16	77	7988.57	1871.26	33.99	0.	30.14%	7.06%	0.13%	0.00%
7/DP1266422	10378	East	RU4	0	31	0.30%	77	77	0.49	0.49	0.49	0.	0.00%	0.00%	0.00%	0.00%
34/DP211842	100112	West	ENT	18614	0	0.00%	11	77	14050.26	9.8	3.8	0.	14.03%	0.01%	0.00%	0.00%
5/DP255578	107151	West	ENT	21109	0	0.00%	13	70	19325.05	22.99	3.	0.	18.04%	0.02%	0.00%	0.00%
13/DP236527	32422	East	RU1	5371	78	0.24%	10	69	2301.38	160.99	3.	0.	7.10%	0.50%	0.01%	0.00%
6/DP1266422	13771	East	RU4	979	150	1.09%	29	68	964.24	732.47	48.99	0.	7.00%	5.32%	0.36%	0.00%
2/DP736951	18504	East	RU4	4446	125	0.68%	24	67	4445.86	4430.65	20.05	0.	24.03%	23.94%	0.11%	0.00%
1/DP1271142	753497	East	IN1	63855	275	0.04%	12	67	62057.79	160.96	66.98	0.	8.24%	0.02%	0.01%	0.00%
2/DP1277409	111160	West	ENT	22605	0	0.00%	10	65	9523.8	13.	4.	0.	8.57%	0.01%	0.00%	0.00%
3/DP30265	24714	East	ENZ	21473	123	0.50%	14	63	21373.31	13.59	3.59	0.	86.48%	0.05%	0.01%	0.00%
30/DP209399	100942	West	ENT	18077	0	0.00%	10	63	11782.29	27.99	12.	0.	11.67%	0.03%	0.01%	0.00%
20/DP30265	23218	East	RU4	7191	450	1.94%	21	61	5994.81	3996.81	29.99	0.	25.82%	17.21%	0.13%	0.00%
G/DP30440	40573	East	RU4	5241	32	0.08%	4	61	128.32	10.	1.	0.	0.32%	0.02%	0.00%	0.00%
20/DP1276633	102514	West	ENT	15267	0	0.00%	4	60	4779.6	6.19	1.2	0.	4.66%	0.01%	0.00%	0.00%
211/DP1272676	777975	East	RU2	189254	1400	0.18%	4	57	158815.02	80.98	10.	0.	20.41%	0.01%	0.00%	0.00%
1/DP30265	24333	East	ENZ	21535	191	0.79%	18	56	21279.74	5226.53	3.36	0.29	87.45%	21.48%	0.01%	0.00%
1/DP1266517	28430	East	RU4	36	0	0.00%	-483	56	26.89	18.93	3.93	0.	0.09%	0.07%	0.01%	0.00%
14/DP236527	34616	East	RU1	5800	24	0.07%	2	55	15.	8.	1.	0.	0.04%	0.02%	0.00%	0.00%
18/DP1266422	7563	East	RU4	2956	0	0.00%	15	54	1536.31	1073.89	69.98	0.	20.31%	14.20%	0.93%	0.00%
10/DP32026	101166	West	ENT	30580	140	0.14%	1	54	2918.21	1628.18	3.	0.	2.88%	1.61%	0.00%	0.00%
5/DP255566	100098	East	RU2	2	5	0.01%	54	54	1.82	1.82	1.82	0.	0.00%	0.00%	0.00%	0.00%
2/DP1267640	99025	East	ENZ	47417	575	0.58%	17	53	47289.13	703.89	4.	0.	47.75%	0.71%	0.00%	0.00%

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1/DP1160625	42806	East	RU4	1762	51	0.12%	-10	52	111.57	51.58	6.16	0.	0.26%	0.12%	0.01%	0.00%
39/DP258414	101280	East	ENZ	66677	435	0.43%	18	50	66677.15	12957.41	4.	0.	65.83%	12.79%	0.00%	0.00%
24/DP137415	6956	East	RU4	40	125	1.80%	-121	49	6.28	6.28	0.	0.	0.09%	0.09%	0.00%	0.00%
17/DP1266422	4670	East	RU4	2546	0	0.00%	10	48	768.42	354.14	0.	0.	16.45%	7.58%	0.00%	0.00%
25/DP1277418	100081	West	ENT	10596	0	0.00%	13	48	10535.87	11.	0.	0.	10.53%	0.01%	0.00%	0.00%
23/DP258414	191587	East	ENZ	101852	450	0.23%	11	48	101716.85	24.99	0.	0.	53.09%	0.01%	0.00%	0.00%
36/DP258414	102925	East	IN1	29278	428	0.42%	16	46	29238.3	5486.31	0.	0.	28.41%	5.33%	0.00%	0.00%
101/DP1271336	126001	East	RU2	33423	321	0.25%	16	44	33422.76	59.27	0.	0.	26.53%	0.05%	0.00%	0.00%
34/DP258414	136232	East	ENZ	99724	245	0.18%	18	44	99723.93	81.03	0.	0.	73.20%	0.06%	0.00%	0.00%
8/DP32026	101439	West	ENT	4057	188	0.19%	3	43	2426.29	1442.56	0.	0.	2.39%	1.42%	0.00%	0.00%
10/DP858140	43874	East	ENT	1646	450	1.03%	-77	38	20.99	6.	0.	0.	0.05%	0.01%	0.00%	0.00%
38/DP211842	97447	West	ENT	10790	316	0.32%	5	38	769.98	200.94	0.	0.	0.79%	0.21%	0.00%	0.00%
40/DP258414	101255	East	ENZ	56710	374	0.37%	19	38	56626.38	17728.55	0.	0.	55.92%	17.51%	0.00%	0.00%
8/DP812284	61024	East	ENZ	35825	375	0.61%	21	38	33055.31	13876.63	0.	0.	54.17%	22.74%	0.00%	0.00%
11/DP30265	30311	East	ENZ	17506	178	0.59%	18	37	17494.89	169.96	0.	0.	57.72%	0.56%	0.00%	0.00%
37/DP258414	102993	East	ENZ	50618	297	0.29%	16	37	50617.87	8347.12	0.	0.	49.15%	8.10%	0.00%	0.00%
701/DP1280779	111348	East	ENZ	53001	125	0.11%	18	36	53001.15	7911.63	0.	0.	47.60%	7.11%	0.00%	0.00%
6/DP858141	1273	East	SP2	10	0	0.00%	36	36	10.3	10.3	0.	0.	0.81%	0.81%	0.00%	0.00%
10/DP812284	148696	East	ENZ	90962	1763	1.19%	19	36	90687.72	16749.25	0.	0.	60.99%	11.26%	0.00%	0.00%
7/DP858141	5077	East	SP2	20	0	0.00%	-24	35	19.59	19.59	0.02	0.	0.39%	0.39%	0.00%	0.00%
7/DP812284	145046	East	RU2	61512	545	0.38%	15	35	61043.03	2742.56	0.	0.	42.09%	1.89%	0.00%	0.00%
5/DP812284	60867	East	RU4	25009	125	0.21%	24	32	25009.06	24821.07	0.	0.	41.09%	40.78%	0.00%	0.00%
3/DP1240511	158770	West	AGB	34794	20	0.01%	0	31	2.	1.	0.	0.	0.00%	0.00%	0.00%	0.00%
22/DP1148371	10106	East	RU4	2170	8	0.08%	2	31	6.	3.	0.	0.	0.06%	0.03%	0.00%	0.00%
7/DP30265	25317	East	RU4	2338	79	0.31%	23	31	2325.76	1405.69	0.	0.	9.19%	5.55%	0.00%	0.00%
9/DP30265	22523	East	ENZ	13104	244	1.08%	22	30	13104.42	12845.36	0.	0.	58.18%	57.03%	0.00%	0.00%
1/DP623799	103785	West	AGB	8541	16	0.02%	0	29	56.28	9.14	0.	0.	0.05%	0.01%	0.00%	0.00%
15/DP1106105	9987	East	RU4	2556	8	0.08%	6	29	12.3	1.	0.	0.	0.12%	0.01%	0.00%	0.00%
10/DP30265	27924	East	ENZ	16483	151	0.54%	20	28	16420.92	7490.81	0.	0.	58.80%	26.83%	0.00%	0.00%
3/DP255566	100049	East	RU2	52233	300	0.30%	2	26	4016.18	104.87	0.	0.	4.01%	0.10%	0.00%	0.00%
1/DP707256	19998	East	RU4	1009	20	0.10%	3	26	15.	5.	0.	0.	0.07%	0.02%	0.00%	0.00%
12/DP30265	36416	East	ENZ	21800	148	0.41%	17	26	21799.11	9.	0.	0.	59.86%	0.02%	0.00%	0.00%
73/DP1277011	143305	East	ENT	23765	50	0.03%	1	25	1213.19	182.01	0.	0.	0.85%	0.13%	0.00%	0.00%
53/DP734584	101295	East	ENZ	63224	274	0.27%	17	25	63223.83	4913.68	0.	0.	62.42%	4.85%	0.00%	0.00%
15/DP30265	22488	East	RU4	6718	75	0.33%	15	24	6656.64	24.99	0.	0.	29.60%	0.11%	0.00%	0.00%
31/DP1277434	97640	West	ENT	5958	0	0.00%	12	24	5783.65	2.	0.	0.	5.92%	0.00%	0.00%	0.00%
1/DP235124	174322	West	ENT	9048	28	0.02%	7	24	1681.58	1.	0.	0.	0.96%	0.00%	0.00%	0.00%
1/DP736951	18537	East	RU4	7046	50	0.27%	23	23	7046.43	7046.43	0.	0.	38.01%	38.01%	0.00%	0.00%
6/DP30265	32422	East	RU4	11098	50	0.15%	17	23	11097.74	27.99	0.	0.	34.23%	0.09%	0.00%	0.00%
9/DP812284	85971	East	ENZ	56173	265	0.31%	17	23	56172.54	41.99	0.	0.	65.34%	0.05%	0.00%	0.00%
31/DP258414	291694	East	ENZ	127565	75	0.03%	7	22	79488.17	9.	0.	0.	27.25%	0.00%	0.00%	0.00%
16/DP1106105	9991	East	RU4	3309	28	0.28%	9	22	58.54	1.	0.	0.	0.59%	0.01%	0.00%	0.00%
21/DP1277418	23265	West	ENZ	5237	0	0.00%	13	21	5173.4	2.	0.	0.	22.24%	0.01%	0.00%	0.00%
70/DP1266063	33055	East	RU4	8925	75	0.23%	19	21	8924.95	2505.77	0.	0.	27.00%	7.58%	0.00%	0.00%
16/DP1271571	591721	West	ENT	9140	0	0.00%	6	20	8021.23	1.	0.	0.	1.36%	0.00%	0.00%	0.00%
14/DP30265	23072	East	ENZ	16577	125	0.54%	17	19	16576.72	0.	0.	0.	71.85%	0.00%	0.00%	0.00%
5/DP30265	26363	East	RU4	12283	100	0.38%	17	19	12283.33	0.	0.	0.	46.59%	0.00%	0.00%	0.00%
4/DP30265	20771	East	RU4	9904	200	0.96%	15	19	9897.55	0.	0.	0.	47.65%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
30/DP258414	309923	East	ENZ	133699	25	0.01%	4	18	27412.32	0.	0.	0.	8.84%	0.00%	0.00%	0.00%
23/DP1277418	56899	West	ENT	8350	0	0.00%	12	18	6361.09	0.	0.	0.	11.18%	0.00%	0.00%	0.00%
7/DP255578	116155	West	ENT	1	0	0.00%	18	18	0.52	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
13/DP30265	24844	East	ENZ	14260	125	0.50%	16	18	13418.08	0.	0.	0.	54.01%	0.00%	0.00%	0.00%
8/DP1266422	7145	East	RU4	9	0	0.00%	-284	17	6.	0.	0.	0.	0.08%	0.00%	0.00%	0.00%
1/DP1277409	10825	West	ENZ	10699	0	0.00%	13	16	10685.92	0.	0.	0.	98.72%	0.00%	0.00%	0.00%
16/DP30265	22401	East	ENZ	12565	25	0.11%	13	15	12564.55	0.	0.	0.	56.09%	0.00%	0.00%	0.00%
51/DP30266	20247	East	SP2	341	141	0.70%	-147	15	15.	0.	0.	0.	0.07%	0.00%	0.00%	0.00%
32/DP211842	100616	West	ENT	20493	0	0.00%	8	15	503.33	0.	0.	0.	0.50%	0.00%	0.00%	0.00%
33/DP211842	98880	West	ENT	3573	0	0.00%	8	14	108.85	0.	0.	0.	0.11%	0.00%	0.00%	0.00%
135/DP270417	4027	East	RE2	206	25	0.62%	12	14	206.29	0.	0.	0.	5.12%	0.00%	0.00%	0.00%
28/DP258414	244469	East	ENZ	138175	200	0.08%	4	14	20.	0.	0.	0.	0.01%	0.00%	0.00%	0.00%
6/DP1114311	40495	East	RU4	0	70	0.17%	14	14	0.04	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP1266422	28685	East	ENZ	13375	0	0.00%	13	13	13360.21	0.	0.	0.	46.58%	0.00%	0.00%	0.00%
22/DP1266422	134	East	ENZ	134	0	0.00%	13	13	133.77	0.	0.	0.	100.00%	0.00%	0.00%	0.00%
248/DP270417	4000	East	RE2	504	50	1.25%	12	13	504.02	0.	0.	0.	12.60%	0.00%	0.00%	0.00%
6/DP1107465	9354	East	RU4	613	32	0.34%	8	13	17.33	0.	0.	0.	0.19%	0.00%	0.00%	0.00%
136/DP270417	4145	East	RE2	584	25	0.60%	11	12	567.72	0.	0.	0.	13.70%	0.00%	0.00%	0.00%
139/DP270417	4470	East	RE2	357	0	0.00%	12	12	357.35	0.	0.	0.	7.99%	0.00%	0.00%	0.00%
141/DP270417	6193	East	RE2	2097	0	0.00%	8	12	699.62	0.	0.	0.	11.30%	0.00%	0.00%	0.00%
140/DP270417	5413	East	RE2	1873	25	0.46%	12	12	1872.64	0.	0.	0.	34.59%	0.00%	0.00%	0.00%
247/DP270417	4001	East	RE2	37	21	0.51%	12	12	36.52	0.	0.	0.	0.91%	0.00%	0.00%	0.00%
14/DP1106105	10003	East	RU4	840	0	0.00%	2	12	2.	0.	0.	0.	0.02%	0.00%	0.00%	0.00%
A/DP102214	19940	East	RU4	3812	0	0.00%	-2	11	6.	0.	0.	0.	0.03%	0.00%	0.00%	0.00%
21/DP1276633	9816	West	ENZ	2315	0	0.00%	2	11	228.92	0.	0.	0.	2.33%	0.00%	0.00%	0.00%
137/DP270417	4131	East	RE2	184	0	0.00%	11	11	183.66	0.	0.	0.	4.45%	0.00%	0.00%	0.00%
138/DP270417	4366	East	RE2	14	0	0.00%	11	11	14.01	0.	0.	0.	0.32%	0.00%	0.00%	0.00%
2001/DP1036837	67182	East	ENZ	39971	0	0.00%	9	11	268.8	0.	0.	0.	0.40%	0.00%	0.00%	0.00%
24/DP258414	193127	East	ENZ	98763	50	0.03%	10	11	85714.93	0.	0.	0.	44.38%	0.00%	0.00%	0.00%
5/DP1107465	9122	East	RU4	108	0	0.00%	4	10	0.77	0.	0.	0.	0.01%	0.00%	0.00%	0.00%
26/DP258414	209001	East	ENZ	129834	225	0.11%	8	9	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
27/DP258414	234038	East	ENZ	131095	75	0.03%	5	8	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP1237488	121343	West	AGB	21372	12	0.01%	0	7	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
29/DP258414	291449	East	ENZ	149476	50	0.02%	3	7	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
17/DP1106105	10028	East	RU4	126	0	0.00%	7	7	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
17/DP1240511	43231	West	SP2	435	0	0.00%	0	6	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/DP32026	101189	West	ENT	777	8	0.01%	0	4	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP1234822	34824	West	SP2	1141	0	0.00%	0	3	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP1240511	135477	West	AGB	717	4	0.00%	0	3	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
53/DP30266	20249	East	SP2	146	425	2.10%	-13	2	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP508759	20423	East	RU4	28	0	0.00%	1	2	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
9/DP1240511	115836	West	AGB	32835	0	0.00%	-3	2	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP137414	6972	East	RU4	4	0	0.00%	-8	1	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP1240511	142159	West	AGB	15898	0	0.00%	0	1	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP623799	101111	West	AGB	22847	0	0.00%	0	1	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP519034	118740	West	AGB	9953	0	0.00%	0	1	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP232996	161620	West	AGB	13012	0	0.00%	0	1	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP1234822	96705	West	AGB	8764	1	0.00%	0	1	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
9/DP1240153	44726	West	AGB	1650	0	0.00%	0	1	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP32026	101378	West	ENT	1326	0	0.00%	0	1	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/DP1240153	98247	West	AGB	5	0	0.00%	0	1	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP827223	123609	West	AGB	890	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
31/DP563121	229950	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP1234822	26928	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
9/DP1234822	309	West	SP2	300	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
16/DP1240511	37599	West	SP2	660	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
102/DP791433	825	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/DP616737	1118	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
17/DP3050	42011	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
14/DP3050	40643	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
15/DP3050	42400	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
16/DP3050	46953	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP1278780	411048	East	ENT	1640	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
18/DP3050	43070	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
19/DP3050	47135	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP1278780	760438	East	ENT	63	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
31/DP28050	20262	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP1123344	1822174	East	ENT	245	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
35/DP28050	27146	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
34/DP28050	20278	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP706775	2073	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP534435	20255	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
7004/DP93052	8027	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/DP706775	2054	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
24/DP1036912	660	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP706775	2064	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/DP1233751	35667	West	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP1048172	1003	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
14/DP1233751	736951	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
11/DP1233751	3406	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
22/DP700302	727	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
25/DP700302	14791	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
23/DP700302	787	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
24/DP700302	787	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
70/DP1091926	66744	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP71367	1962	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP1234822	856	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/DP1234822	578	West	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
7/DP1234822	5097	West	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP1234822	840	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP553744	520287	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/DP1238032	6228	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
101/DP732746	22575	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
100/DP732746	22812	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
22/DP601022	111080	East	RU2	43	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
24/A/DP2566	27810	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
29/A/DP2566	15096	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
32/A/DP2566	15085	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
7/A/DP2566	6052	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
31/DP30266	20596	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/A/DP2566	6179	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
A/DP415712	20236	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
16/DP209399	101193	West	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
7/DP32026	101621	West	ENT	66	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP32026	102133	West	ENT	832	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP1274964	10274	East	ENT	20	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
20/DP1271571	5346	West	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
24/DP1277418	62979	West	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP542395	195108	East	ENT	112	0	0.00%	-2	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/DP232324	539	West	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
13/DP1238032	182	West	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
7/DP232324	636	West	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
71/DP1277011	81352	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
110/DP1271336	5024	East	RU2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
105/DP1271336	16176	East	RU2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
212/DP1272676	687855	East	ENZ	1420	0	0.00%	-5	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
A/DP394280	20229	West	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
265/DP270417	4001	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
264/DP270417	4002	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
267/DP270417	4009	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
266/DP270417	4010	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
271/DP270417	4001	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
272/DP270417	4007	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
269/DP270417	4008	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
270/DP270417	4001	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
268/DP270417	4008	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
72/DP1277011	424565	East	ENT	511	0	0.00%	-3	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
22/DP1277418	103417	West	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
18/DP1271571	39085	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
162/DP270417	4001	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
161/DP270417	4001	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
241/DP270417	4435	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
163/DP270417	4376	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
242/DP270417	4200	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
243/DP270417	4369	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
315/DP270417	4010	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
316/DP270417	4000	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
314/DP270417	7322	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
328/DP270417	4000	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
329/DP270417	3999	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
326/DP270417	4000	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
327/DP270417	4000	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
324/DP270417	4000	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
325/DP270417	4000	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
322/DP270417	4004	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
323/DP270417	4000	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
347/DP270417	349186	East	ENZ	1962	0	0.00%	-4	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
102/DP1271336	135518	East	ENT	0	0	0.00%	-9	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
81/DP1277406	44011	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
91/DP270417	4002	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
93/DP270417	5302	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
89/DP270417	4482	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
90/DP270417	4420	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
87/DP270417	4411	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
88/DP270417	4127	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
221/DP270417	9365	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP270417	3299	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
216/DP270417	1500	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
212/DP270417	1500	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
204/DP270417	1501	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
203/DP270417	1499	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
206/DP270417	1536	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
205/DP270417	1501	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
208/DP270417	1500	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
207/DP270417	1539	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
210/DP270417	1500	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
209/DP270417	1500	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
215/DP270417	1974	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
211/DP270417	1500	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
214/DP270417	1752	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP1271142	136108	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
199/DP270417	1770	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
202/DP270417	2170	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
201/DP270417	1610	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
160/DP270417	4003	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
213/DP270417	1500	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
85/DP270417	4000	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
152/DP270417	4315	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
146/DP270417	5722	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
148/DP270417	5320	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
150/DP270417	4942	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
157/DP270417	4000	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
156/DP270417	4000	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
159/DP270417	4000	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
158/DP270417	4000	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
240/DP270417	4000	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
239/DP270417	4000	East	RE2	0	0	0.00%	-1	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
245/DP270417	4506	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
246/DP270417	5169	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
147/DP270417	4578	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP270417	4090	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
81/DP270417	4153	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
79/DP270417	4000	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
86/DP270417	5029	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
80/DP270417	4395	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
21/DP1268721	6397	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
20/DP1268721	6873	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
23/DP1268721	7391	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
22/DP1268721	6603	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
25/DP1268721	9747	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
24/DP1268721	8224	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
27/DP1268721	14722	East	SP2	0	0	0.00%	-5	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
26/DP1268721	12661	East	SP2	0	0	0.00%	-20	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
29/DP1268721	369	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
28/DP1268721	8775	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
30/DP1268721	857	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
30/DP651001	23616	East	RU4	6	0	0.00%	-593	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP1169433	672981	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP875790	780929	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP1238606	92314	West	ENT	3814	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
21/DP270417	4011	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
261/DP270417	6724	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
19/DP270417	4021	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
20/DP270417	4832	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
18/DP270417	4777	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
84/DP270417	4000	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
82/DP270417	4002	East	RE2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
16/DP713582	20038	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
35/B/DP2566	15360	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
14/DP713582	20030	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/DP713582	20008	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP25759	12144	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP25759	12140	East	RU4	1413	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP25759	12141	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP25759	12148	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP25759	12141	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
28/DP25759	20237	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
30/DP25759	24284	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
29/DP25759	12156	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
7001/DP1028872	26443	East	RE1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
68/DP1098248	41184	East	RE1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP797652	14224	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
11/DP1268721	17397	East	IN2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
13/DP1268721	14368	East	IN2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
12/DP1268721	15079	East	IN2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
19/DP1268721	11505	East	IN2	0	0	0.00%	-2	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
18/DP1268721	4270	East	IN2	0	0	0.00%	-5	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/DP253503	101525	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
55/DP734584	101373	East	RU2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
52/DP259135	101560	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
1/DP1285305	109139	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
8/DP253503	102673	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
51/DP259135	101502	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
53/DP259135	101164	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
61/DP259135	37528	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
59/DP259135	230283	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP104958	522569	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
60/DP259135	101242	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP1285305	101254	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP1285305	120963	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP1285305	125707	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP1285305	101246	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/DP1266422	13456	East	RU4	0	3848	28.59%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
482/DP1139768	10117	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1182/DP1048440	11166	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1181/DP1048440	10053	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
322/DP1130961	10018	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP250002	101203	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP822317	6374	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
9/DP253503	101472	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
35/DP258414	53894	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP250002	101648	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
25/DP255560	101256	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/DP250002	101342	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
26/DP255560	25467	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP250002	106783	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP250002	101495	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
24/DP255560	101398	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP250002	116135	East	IN1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
411/DP1041986	10000	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
412/DP1041986	10265	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
38/DP30266	20273	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
39/DP30266	20275	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
460/DP1012491	10043	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
47/DP30266	37380	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP865810	10261	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP865810	10151	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP866550	10126	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
45/DP30266	20249	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
481/DP1139768	10747	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
461/DP1012491	10205	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1153/DP1159139	9140	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1151/DP1159139	9134	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP1175090	10555	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1152/DP1159139	9142	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP1194415	10001	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP1175090	10556	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP1194415	10259	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
4/DP1267157	123882	East	RU2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
8/DP1267157	97	East	RU2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
700/DP1276770	13073	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
702/DP1276770	2402	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
701/DP1276770	5846	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
33/A/DP2566	15090	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP981721	21303	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
700/DP1280779	17165	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
8/DP1267640	19622	East	RU2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP1267640	44262	East	RU2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP1280136	22205	East	RU2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
47/DP734584	107018	East	RU2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP1280136	287821	East	RU2	0	0	0.00%	-11	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
57/DP30266	20213	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
52/DP30266	20554	East	SP2	522	0	0.00%	-53	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
54/DP30266	20222	East	SP2	4	0	0.00%	-87	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
60/DP30266	21063	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
592/DP1029321	9399	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
58/DP30266	20210	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
502/DP854130	10118	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
591/DP1029321	10832	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
361/DP863909	10239	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
360/DP863909	10240	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
9/A/DP2566	6222	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/A/DP2566	6401	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
13/A/DP2566	7068	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
8/A/DP2566	6135	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
28/A/DP2566	14997	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP812284	89022	East	RU2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
B/DP416720	7168	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
B/DP415712	9918	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP812284	86714	East	RU2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
321/DP1130961	10297	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
110/DP1137261	6643	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
111/DP1137261	6208	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
112/DP1137261	6126	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1160/DP1061191	10820	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1161/DP1061191	10005	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
402/DP812923	20277	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
72/DP1266063	12020	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
74/DP1266063	6220	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
11/DP1267157	4046	East	RU2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
28/DP28050	20498	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
29/DP28050	20541	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
27/DP28050	20515	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
48/DP3050	57218	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/DP28050	22999	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
17/DP28050	21152	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
22/DP626147	272114	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
36/DP28050	21044	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
25/DP28050	20483	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP119786	42657	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
19/DP28050	22477	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
49/DP3050	41073	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
18/DP28050	21868	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
24/DP28050	23521	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
39/DP28050	20262	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
21/DP28050	22062	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
30/DP28050	20260	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
33/DP28050	20262	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
14/DP28050	20583	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
32/DP28050	20265	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
12/DP28050	22409	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP589918	31915	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
37/DP28050	20263	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
16/DP28050	20936	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
11/DP28050	20281	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
9/DP28050	21396	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP1083552	20166	East	RU4	6	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
13/DP28050	21932	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP226912	61069	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP1083552	35067	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP566109	22683	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP566109	20613	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP237229	20237	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
11/DP800072	20002	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP237229	20248	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP739051	20010	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP739051	20006	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP800072	20005	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/DP739051	25900	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP800072	20712	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
26/DP28050	20466	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP589918	20243	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/DP226912	20352	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP226912	20262	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/DP800072	20001	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP800072	20006	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP226912	20262	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
8/DP800072	22409	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
A/DP406215	244801	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP565512	41524	East	ENT	0	0	0.00%	-1	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
50/DP222177	29898	East	RU4	411	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP800072	20007	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
7/DP800072	22787	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP226912	20262	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
30/DP3050	28334	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/DP800072	22354	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
32/DP3050	28329	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
54/DP28050	23129	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
40/DP28050	20262	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
53/DP28050	27532	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
15/DP28050	20266	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
38/DP28050	20266	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP589918	20251	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
8/DP28050	22231	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
56/DP3050	108888	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
21/DP626147	40402	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
34/DP3050	28326	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
54/DP3050	111579	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/DP25759	12142	East	RU4	6700	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
31/DP3050	28333	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP589918	40497	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP567860	101887	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
50/DP549457	165823	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
20/DP28050	21514	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
27/DP25759	12140	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
14/DP531743	21010	East	ENT	0	0	0.00%	-27	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
22/DP552531	21524	East	ENT	144	0	0.00%	-57	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
13/DP531743	21283	East	ENT	0	0	0.00%	-47	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP3050	52123	East	ENT	4	0	0.00%	-7	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP104049	22284	East	ENT	171	0	0.00%	-15	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
9/DP3050	37383	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/DP3050	46614	East	ENT	0	0	0.00%	-2	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP1084967	20524	East	ENT	0	0	0.00%	-30	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
102/DP1263171	48279	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
101/DP1263171	47790	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
55/DP3050	124407	East	ENZ	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP1278780	489761	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
17/DP747390	20394	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP739051	19977	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
33/DP3050	28327	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
8/DP25759	12143	East	RU4	0	0	0.00%	-4	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
7/DP25759	12138	East	RU4	3294	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP611519	25446	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
35/DP3050	28325	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP611519	19997	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP611519	20033	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
9/DP25759	12141	East	RU4	0	0	0.00%	-12	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
29/DP3050	28321	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
36/DP3050	28325	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP611519	19997	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
14/DP739051	20000	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
18/DP747390	20199	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
1/DP237229	26705	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP237229	24403	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
7/DP739051	20021	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP553886	31504	East	ENT	9	0	0.00%	-18	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/DP860338	26964	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/DP747390	20298	East	RU4	350	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
11/DP739051	34950	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
9/DP800072	20002	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
12/DP739051	20625	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP565512	39313	East	ENT	0	0	0.00%	-1	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP226912	20262	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
9/DP226448	20483	East	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
12/DP226448	20722	East	ENT	0	6	0.03%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
30/DP1251450	151185	West	AGB	15179	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP1188956	399836	East	ENT	5934	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP250030	100681	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
21/DP747390	20297	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP237229	20246	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
7/DP747390	20303	East	RU4	41	0	0.00%	-2	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP747390	20303	East	RU4	2317	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
9/DP739051	40681	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
22/DP774035	24803	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
13/DP739051	19995	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/DP739051	20029	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
23/DP774035	24308	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
20/DP747390	20293	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
17/DP739051	20000	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
16/DP739051	19995	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
15/DP739051	20009	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
15/DP747390	21050	East	RU4	0	0	0.00%	-1	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
8/DP739051	20123	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
51/DP752019	154924	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
52/DP752019	273492	East	RU4	101	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
19/DP747390	20291	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP1107465	9195	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP1107465	9213	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
18/DP1106105	15012	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP1107465	9225	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
21/DP1148371	11578	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
101/DP1118021	10170	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
30/DP1181356	10254	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
142/DP1240152	11381	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
151/DP1214873	11612	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
47/DP752016	1443	East	ENT	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP229406	20253	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/C/DP1451	46901	West	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/C/DP1451	70056	West	AGB	21172	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/DP250030	101785	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
5/DP250030	101762	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
7/DP250030	101788	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP623799	191208	West	AGB	4971	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
7/DP1240511	102900	West	AGB	2968	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/DP1240511	133021	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
71/DP1044837	10119	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
72/DP1044837	10114	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
8/DP229406	20242	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP229406	20229	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
105/DP610012	39968	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
62/DP869167	10105	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
61/DP869167	10115	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
32/DP1033581	10117	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP229406	20244	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
9/DP229406	20229	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
25/DP653888	47973	East	RU1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP1022633	10006	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP1022633	10239	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP533788	20226	East	RU1	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/DP1014394	10241	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP1014394	9982	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
12/DP1065416	30097	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
91/DP1101411	77408	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
22/DP747390	20344	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
7/DP201168	20234	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
103/DP1061160	20199	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP739051	20013	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP210021	20241	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
31/B/DP2566	30769	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP747390	20316	East	RU4	45	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP747390	20314	East	RU4	4459	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP240667	20239	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP240667	20236	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
601/DP830470	20037	East	RU4	80	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP210021	25794	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
8/DP216960	20646	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP733714	23442	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP842539	19988	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
23/DP747390	26764	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
12/DP800072	20005	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
9/DP216960	20212	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
11/DP216960	31967	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP596093	23058	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP739051	20093	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP201168	20251	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP240667	25676	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP240667	20238	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
602/DP830470	20076	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
1/DP535965	12134	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP160984	20292	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/DP216960	20235	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
100/DP801637	20234	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP540504	14967	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
102/DP801637	35553	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
101/DP801637	20234	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
32/DP867457	20246	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
A/DP403776	21672	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
C/DP403776	21536	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP532554	3695	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP212255	20218	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
B/DP403776	21575	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
11/B/DP2566	15356	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP212255	20236	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/B/DP2566	15356	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
8/B/DP2566	15355	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/B/DP2566	30724	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
13/B/DP2566	21555	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
12/B/DP2566	15356	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
9/B/DP2566	15355	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
8/DP747817	20449	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
7/B/DP2566	15356	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
251/DP1127189	20236	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
9/DP747817	20448	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/G/DP1094	36436	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
252/DP1127189	20236	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
B/DP415320	75812	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP512746	37994	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
21/DP1139225	20014	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
22/DP1139225	17997	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
14/DP1065416	70380	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
90/DP1101411	307130	East	RU4	6	0	0.00%	-4	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
13/DP1065416	75129	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
17/B/DP2566	15360	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/B/DP2566	30712	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
49/B/DP2566	15416	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
33/B/DP2566	15360	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
36/B/DP2566	15360	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
24/B/DP2566	15360	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP713582	20016	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/B/DP2566	15360	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
13/DP713582	20042	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP29832	20414	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
17/DP713582	20039	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
20/DP713582	20043	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP29832	20372	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP713582	20018	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
23/DP29832	20806	East	RU4	78	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP29832	20432	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP956138	48057	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP29832	20227	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
7/DP713582	20013	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
102/DP1061160	20237	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP713582	20027	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
22/DP29832	20819	East	RU4	14	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP29832	20393	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
50/DP28050	21636	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
28/DP1094	32374	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
100/DP1210132	108056	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP500847	36172	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
16/C/DP1094	38092	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
27/DP1094	28327	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP500847	39932	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
15/B/DP2566	15360	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/B/DP2566	15359	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
27/B/DP2566	15350	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
19/B/DP2566	15360	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP713582	20019	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
12/DP713582	27144	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/DP713582	20015	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
23/DP713582	20006	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
50/B/DP2566	15416	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
28/B/DP2566	15350	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
19/DP713582	20042	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
101/DP1061160	20254	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP943122	4053	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
100/DP1061160	20271	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
16/B/DP2566	15360	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP208940	23082	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
32/B/DP2566	15360	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
18/B/DP2566	15360	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
37/B/DP2566	15360	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
25/B/DP2566	15361	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
14/B/DP2566	21587	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
38/B/DP2566	21607	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
15/DP713582	20033	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
30/B/DP2566	30658	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
9/DP713582	20021	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
22/DP713582	20012	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
8/DP713582	20013	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
18/DP713582	20041	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP733714	23910	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/DP201168	20208	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP733714	23888	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP208940	23079	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
12/DP29832	20401	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
8/DP29832	20276	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
9/DP29832	20340	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
101/DP736729	20149	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
7/DP29832	20281	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
13/DP29832	20504	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/DP29832	20251	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
24/DP29832	20804	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
11/DP29832	20397	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP747390	20331	East	RU4	1477	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
18/DP739051	20024	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP747390	20413	East	RU4	2331	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP240667	20238	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP596093	23037	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP945241	4037	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP201168	20252	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP842539	19984	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
34/B/DP2566	15360	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
29/B/DP2566	15350	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP713582	20013	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
21/DP713582	20019	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP842539	24159	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP800072	20009	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
103/DP791433	825	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
100/DP626326	828	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
128/DP1076374	301	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
102/DP1076374	723	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
39/DP245819	1323	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
38/DP245819	1180	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
3/DP1073290	33367	West	AGB	3593	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
124/DP246068	20912	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
123/DP1076374	701	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
122/DP1076374	728	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
118/DP1076374	730	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
121/DP1076374	700	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
41/DP245819	1005	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
40/DP245819	1301	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
42/DP245819	862	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
43/DP245819	856	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
110/DP1076374	600	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
44/DP245819	836	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
510/DP700775	13216	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
108/DP1076374	600	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
49/DP28050	20246	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
47/DP28050	20251	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP918430	42155	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
48/DP28050	20253	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2621/DP811282	20014	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
2/B/DP2566	15359	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/DP29832	20298	East	RU4	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
105/DP1076374	701	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
8/DP1234822	5097	West	SP2	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
119/DP1076374	700	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
117/DP1076374	700	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
113/DP1076374	600	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
120/DP1076374	730	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
111/DP1076374	600	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
112/DP1076374	600	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
107/DP1076374	650	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
109/DP1076374	600	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
104/DP1076374	700	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
106/DP1076374	700	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
101/DP1076374	700	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
103/DP1076374	650	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP629074	25220	West	AGB	362	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
127/DP1076374	272	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP215715	33081	West	AGB	4836	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP629074	797	West	AGB	0	0	0.00%	0	0	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
330/DP270417	4000	East	ENT	0	0	0.00%	-1	-1	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
740/DP810111	621811	East	ENT	0	0	0.00%	-3	-1	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
12/DP747390	32297	East	RU4	0	0	0.00%	-5	-1	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
13/DP747390	31624	East	RU4	0	0	0.00%	-2	-1	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
14/DP747390	28481	East	RU4	0	0	0.00%	-1	-1	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
16/DP747390	20454	East	RU4	0	0	0.00%	-1	-1	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
23/DP137415	6996	East	RU4	0	0	0.00%	-15	-1	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
23/DP552531	22296	East	ENT	0	0	0.00%	-63	-1	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
17/DP1271571	9487	East	ENT	0	0	0.00%	-3	-2	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
12/DP1271571	8021	East	ENT	0	0	0.00%	-3	-2	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
107/DP1271336	34106	East	ENT	0	0	0.00%	-7	-2	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
104/DP1271336	64910	East	ENT	0	0	0.00%	-7	-2	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP565512	40241	East	ENT	0	0	0.00%	-3	-2	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
9/DP747390	20334	East	RU4	0	0	0.00%	-9	-2	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP530595	74497	East	ENZ	0	0	0.00%	-7	-3	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
11/DP747390	31474	East	RU4	0	0	0.00%	-7	-3	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP1212980	135434	East	RU4	0	0	0.00%	-46	-3	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP530595	22668	East	ENT	0	0	0.00%	-5	-4	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/DP747390	20349	East	RU4	0	0	0.00%	-8	-4	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP226448	22667	East	ENT	0	0	0.00%	-5	-5	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
8/DP747390	20289	East	RU4	0	0	0.00%	-9	-5	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
741/DP810111	784625	East	ENT	0	0	0.00%	-11	-7	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/DP25759	12144	East	RU4	0	0	0.00%	-13	-7	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
100/DP747285	18994	East	RU4	0	0	0.00%	-74	-7	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
108/DP1271336	20161	East	RU2	0	0	0.00%	-11	-8	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP587135	405754	East	RU2	0	0	0.00%	-12	-8	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
8/DP226448	22448	East	ENT	0	0	0.00%	-19	-8	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
103/DP1271336	92733	East	ENZ	0	0	0.00%	-11	-9	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
12/DP25759	12136	East	RU4	0	0	0.00%	-11	-9	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
11/DP25759	12139	East	RU4	0	0	0.00%	-11	-9	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
13/DP25759	12138	East	RU4	0	0	0.00%	-11	-9	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
14/DP25759	12137	East	RU4	0	0	0.00%	-12	-9	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
15/DP25759	12137	East	RU4	0	0	0.00%	-13	-9	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
16/DP25759	12092	East	RU4	0	0	0.00%	-13	-9	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
17/DP25759	12645	East	RU4	0	0	0.00%	-15	-11	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP858141	15785	East	RU4	0	0	0.00%	-25	-11	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
4/DP226448	23406	East	ENT	0	0	0.00%	-13	-11	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
24/DP25759	12117	East	RU4	0	0	0.00%	-14	-12	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
232/DP619773	12145	East	RU4	0	0	0.00%	-15	-12	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
26/DP25759	12143	East	RU4	0	0	0.00%	-15	-13	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
25/DP25759	12142	East	RU4	0	0	0.00%	-14	-13	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
31/DP25759	15450	East	RU4	0	0	0.00%	-16	-13	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP226448	22357	East	ENT	0	0	0.00%	-14	-13	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
8/DP858141	15	East	SP2	0	0	0.00%	-22	-13	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
22/DP25759	20235	East	RU4	0	0	0.00%	-19	-14	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
6/DP226448	22233	East	ENT	0	0	0.00%	-16	-14	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
231/DP619773	12136	East	RU4	0	0	0.00%	-17	-14	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
21/DP25759	12138	East	RU4	0	0	0.00%	-20	-15	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
7/DP226448	22702	East	ENT	0	0	0.00%	-18	-15	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
20/DP25759	12137	East	RU4	0	0	0.00%	-20	-16	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
19/DP25759	12141	East	RU4	0	0	0.00%	-21	-17	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
18/DP25759	12033	East	RU4	0	0	0.00%	-21	-18	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/DP1087346	15737	East	RU4	0	0	0.00%	-56	-20	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP553886	20879	East	ENZ	0	0	0.00%	-25	-20	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
230/DP1134016	110126	East	RU4	0	0	0.00%	-60	-23	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP858141	25628	East	RU4	0	50	0.20%	-494	-27	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP1090754	6765	East	RU4	0	0	0.00%	-69	-30	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
16/A/DP2566	6595	East	RU4	0	0	0.00%	-74	-57	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP1230172	796	East	SP2	0	0	0.00%	-107	-63	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
101/DP747285	17245	East	RU4	25	208	1.20%	-186	-73	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2/DP996420	782	East	SP2	0	0	0.00%	-113	-113	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP996420	768	East	SP2	0	0	0.00%	-115	-113	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP129675	769	East	SP2	0	0	0.00%	-125	-116	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
18/DP29832	22883	East	RU4	0	0	0.00%	-122	-117	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
16/DP29832	22341	East	RU4	0	0	0.00%	-122	-119	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
2622/DP811282	26513	East	RU4	0	0	0.00%	-132	-119	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
11/DP806494	1293298	East	SP2	0	0	0.00%	-123	-122	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
15/DP29832	22140	East	RU4	0	0	0.00%	-142	-122	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
19/DP29832	22572	East	RU4	0	0	0.00%	-123	-122	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
17/DP29832	23053	East	RU4	0	0	0.00%	-122	-122	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
20/DP29832	20248	East	RU4	0	0	0.00%	-123	-123	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
21/DP29832	21379	East	RU4	0	0	0.00%	-131	-123	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/B/DP2566	60643	East	RU4	0	0	0.00%	-123	-123	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
14/DP29832	22165	East	RU4	0	0	0.00%	-193	-142	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
14/DP1268721	13697	East	IN2	0	50	0.36%	-216	-143	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
14/A/DP2566	7130	East	RU4	0	0	0.00%	-193	-184	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Overall Afflux		Area of afflux greater than (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Lot Newly Wet	Average Afflux in Lot (mm)	Max Afflux in Lot (mm)	10mm	20mm	50mm	100mm	>10mm	>20mm	>50mm	>100mm
27/DP29832	47247	East	RU4	0	0	0.00%	-280	-201	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
10/DP226448	20310	East	ENT	0	80	0.39%	-748	-229	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
26/DP29832	20801	East	RU4	0	0	0.00%	-344	-257	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
33/DP29832	16483	East	RU4	0	0	0.00%	-383	-341	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
25/DP29832	20802	East	RU4	0	0	0.00%	-397	-358	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
31/DP29832	21401	East	RU4	0	0	0.00%	-529	-413	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
31/DP867457	28308	East	RU4	0	1584	5.60%	-1118	-484	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
5/DP858141	1680	East	SP2	0	0	0.00%	-514	-484	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
1/DP256528	2320	East	RU4	0	0	0.00%	-511	-503	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
55/DP30266	20218	East	SP2	0	451	2.23%	-628	-507	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
56/DP30266	20217	East	SP2	0	99	0.49%	-831	-623	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
11/DP226448	20944	East	SP2	0	64	0.31%	-995	-815	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%
11/DP860338	26893	East	ENT	0	0	0.00%	-2716	-2692	0.	0.	0.	0.	0.00%	0.00%	0.00%	0.00%

Appendix G Newly Wetted Depths Property Impact Assessment

This assessment does not filter out modelling spikes or flooding on design elements (e.g. up the design embankment, in design drains, or over side roads) as it is intended as indicative findings

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU constrution (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
1/DP240718	112236	East	ENT	1555	100	0.09%	0.14	0.38	0.84	3.67	84.98	84.98	84.98	44.99	0.08%	0.08%	0.08%	0.04%
5/DP860456	575245	East	ENT	7993	4335	0.75%	0.06	1.34	1.36	5.07	2723.30	2327.66	1397.65	801.70	0.47%	0.40%	0.24%	0.14%
9/DP1266422	15871	East	RU4	9	2244	14.14%	0.09	0.63	0.10	0.99	1832.98	1600.56	884.01	521.19	11.55%	10.08%	5.57%	3.28%
13/DP1266422	12834	East	RU4	1926	618	4.81%	0.13	0.59	0.54	1.55	457.75	431.91	295.94	225.95	3.57%	3.37%	2.31%	1.76%
2/DP240718	101180	East	ENT	523	566	0.56%	0.09	1.18	0.07	1.18	308.81	270.82	210.94	161.96	0.31%	0.27%	0.21%	0.16%
1/DP716403	112099	East	RU4	5117	719	0.64%	0.09	0.40	0.21	0.96	658.49	607.50	428.18	212.23	0.59%	0.54%	0.38%	0.19%
3/DP1087825	1607240	East	SP2	15904	731	0.05%	0.31	1.20	0.35	5.59	620.81	603.80	539.89	480.91	0.04%	0.04%	0.03%	0.03%
29/DP29832	22615	East	RU4	1952	150	0.66%	0.07	0.15	0.24	1.24	149.97	149.97	83.98	50.99	0.66%	0.66%	0.37%	0.23%
2/DP220176	116058	West	AGB	7943	1612	1.39%	0.28	1.72	0.96	2.12	1565.39	1530.40	1422.43	1228.67	1.35%	1.32%	1.23%	1.06%
28/DP29832	21507	East	RU4	6950	0	0.00%	0.00	0.00	0.11	0.83	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
124/DP1164402	44515	East	RU4	532	419	0.94%	0.12	0.49	0.73	2.07	324.28	300.27	253.28	133.81	0.73%	0.67%	0.57%	0.30%
1/DP508759	20398	East	RU4	4872	329	1.61%	0.08	0.48	0.18	0.92	152.33	134.96	103.30	69.43	0.75%	0.66%	0.51%	0.34%
12/DP507590	20531	East	RU4	3027	72	0.35%	0.06	0.92	1.63	3.73	17.30	12.00	9.00	7.00	0.08%	0.06%	0.04%	0.03%
1/DP529885	366161	West	ENT	29753	172	0.05%	0.02	0.17	1.02	2.53	93.97	54.98	12.00	5.00	0.03%	0.02%	0.00%	0.00%
7/DP1014394	10239	East	RU4	2159	17	0.17%	0.14	0.27	1.72	2.51	16.26	16.00	14.00	11.00	0.16%	0.16%	0.14%	0.11%
2/DP1274964	204392	East	ENT	17967	173	0.08%	0.23	1.12	1.31	11.00	122.73	112.73	86.30	73.30	0.06%	0.06%	0.04%	0.04%
4/DP1274964	4127	East	ENZ	1488	0	0.00%	0.00	0.00	1.20	4.10	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
106/DP846962	424796	West	AGB	72941	214	0.05%	0.03	0.30	0.41	2.94	124.22	94.86	43.71	7.00	0.03%	0.02%	0.01%	0.00%
2/DP30265	33705	East	ENZ	29477	227	0.67%	0.06	0.44	0.64	4.18	130.75	116.75	68.76	26.77	0.39%	0.35%	0.20%	0.08%
1/DP551852	20353	East	RU4	12871	198	0.97%	0.52	1.24	0.14	1.65	109.75	107.34	99.09	91.36	0.54%	0.53%	0.49%	0.45%
1/DP220176	116241	West	AGB	2422	545	0.47%	0.36	1.53	0.49	1.67	533.97	519.44	482.93	410.50	0.46%	0.45%	0.42%	0.35%
5/DP1114311	274808	East	RU4	5440	10728	3.90%	0.12	0.62	0.14	1.63	7714.01	6158.84	3924.37	3092.57	2.81%	2.24%	1.43%	1.13%
12/DP32026	78712	West	ENZ	17921	516	0.66%	0.07	0.62	0.54	2.77	200.21	130.23	100.92	95.92	0.25%	0.17%	0.13%	0.12%
16/DP1268721	9886	East	IN2	258	0	0.00%	0.00	0.00	0.07	0.52	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
15/DP1266923	60119	East	ENZ	37638	188	0.31%	0.09	0.47	1.02	3.93	152.57	146.57	92.14	43.99	0.25%	0.24%	0.15%	0.07%
12/DP1266422	8135	East	RU4	1572	100	1.23%	0.57	1.16	0.80	1.37	99.68	99.68	95.68	95.68	1.23%	1.23%	1.18%	1.18%
1/DP1287712	1719324	West	ENT	155001	512	0.03%	0.09	0.52	0.61	3.81	334.90	245.93	156.95	117.97	0.02%	0.01%	0.01%	0.01%
11/DP1266422	20870	East	RU4	10046	5480	26.26%	0.11	1.12	0.55	1.52	4888.68	4360.21	3082.54	1958.13	23.42%	20.89%	14.77%	9.38%
8/DP30265	25862	East	ENZ	14493	304	1.17%	0.04	0.19	0.69	4.18	248.94	168.96	76.98	27.99	0.96%	0.65%	0.30%	0.11%
11/DP507590	20276	East	RU4	6843	679	3.35%	0.02	0.47	0.17	1.44	239.89	120.63	30.90	13.63	1.18%	0.59%	0.15%	0.07%
13/DP32026	58134	West	ENZ	32666	215	0.37%	0.10	0.61	0.43	2.74	127.22	106.39	85.40	68.40	0.22%	0.18%	0.15%	0.12%
12/DP1266923	69762	East	ENZ	38435	376	0.54%	0.05	0.16	0.84	4.02	296.93	232.95	159.96	48.99	0.43%	0.33%	0.23%	0.07%
11/DP32026	101171	West	ENT	28334	369	0.36%	0.19	1.76	0.36	2.14	282.65	227.67	146.40	90.97	0.28%	0.23%	0.14%	0.09%
8/DP1014394	10001	East	RU4	933	106	1.06%	0.05	0.11	0.09	1.82	100.59	91.59	50.60	5.00	1.01%	0.92%	0.51%	0.05%
401/DP812923	24939	East	RU4	3489	4974	19.94%	0.01	0.09	0.01	0.31	1262.71	453.90	15.00	0.00	5.06%	1.82%	0.06%	0.00%
14/DP1266422	9448	East	RU4	1683	60	0.63%	0.32	1.04	0.68	1.13	44.72	44.72	31.72	30.87	0.47%	0.47%	0.34%	0.33%
8/DP1240511	66735	West	AGB	12598	8	0.01%	0.00	0.01	1.13	1.84	1.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
30/DP30265	30072	East	ENZ	27864	75	0.25%	1.20	2.12	1.66	4.07	74.98	74.98	74.98	74.98	0.25%	0.25%	0.25%	0.25%
4/DP658310	6716	East	RU4	54	0	0.00%	0.00	0.00	0.15	0.44	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP1240511	96023	West	AGB	20837	12	0.01%	0.03	0.14	1.32	2.57	7.00	5.00	3.00	1.00	0.01%	0.01%	0.00%	0.00%
1/DP533788	29291	East	RU1	4105	26	0.09%	0.03	0.09	0.14	0.58	7.43	5.84	1.00	0.00	0.03%	0.02%	0.00%	0.00%
600/DP830470	20776	East	RU4	5486	1089	5.24%	0.21	0.68	0.06	0.68	847.14	807.82	696.84	636.86	4.08%	3.89%	3.35%	3.07%
11/DP1146142	281452	East	RU4	380	96	0.03%	0.04	0.10	0.42	2.80	83.84	54.51	31.49	4.00	0.03%	0.02%	0.01%	0.00%
21/DP601022	143890	East	ENZ	13583	574	0.40%	0.12	0.55	1.02	4.31	415.46	310.49	244.13	218.13	0.29%	0.22%	0.17%	0.15%
1/DP255566	96171	East	ENZ	25482	0	0.00%	0.00	0.00	1.38	6.28	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
33/DP258414	136552	East	IN1	52534	30	0.02%	0.02	0.12	3.43	6.13	4.00	4.00	4.00	4.00	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU constrution (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
32/DP258414	144843	East	IN1	52294	0	0.00%	0.01	0.01	3.79	6.10	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
19/DP1266422	2966	East	RU4	2085	38	1.29%	0.02	0.05	0.28	0.98	27.93	25.14	1.59	0.00	0.94%	0.85%	0.05%	0.00%
32/DP1277434	1066477	West	ENZ	45077	0	0.00%	0.00	0.00	0.68	4.01	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
47/DP270417	856887	East	RE2	208793	154	0.02%	0.10	0.42	1.97	7.86	114.37	88.38	82.38	53.36	0.01%	0.01%	0.01%	0.01%
100/DP1263171	14265242	West	SP2	12979	129	0.00%	0.16	0.67	0.59	5.24	126.63	120.48	94.29	61.20	0.00%	0.00%	0.00%	0.00%
6/DP255578	104873	West	ENT	3904	0	0.00%	0.00	0.00	1.26	2.82	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
39/A/DP2566	15085	East	RU4	1289	337	2.24%	0.04	0.11	0.12	0.40	271.34	228.35	109.82	29.99	1.80%	1.51%	0.73%	0.20%
19/DP30265	32048	East	RU4	12883	496	1.55%	0.02	0.35	0.52	4.02	237.12	136.76	49.99	28.99	0.74%	0.43%	0.16%	0.09%
38/DP258414	101524	East	ENZ	49942	550	0.54%	0.07	0.34	1.28	5.45	446.47	404.48	258.50	112.43	0.44%	0.40%	0.25%	0.11%
74/DP1277011	459988	East	ENT	28094	152	0.03%	0.22	0.65	0.92	4.89	134.21	128.21	100.65	91.65	0.03%	0.03%	0.02%	0.02%
4/DP860456	100976	East	ENT	620	112	0.11%	0.06	0.14	0.17	0.66	111.92	94.97	56.17	15.00	0.11%	0.09%	0.06%	0.01%
281/DP571171	110120	West	AGB	2622	23	0.02%	0.04	0.17	0.50	2.05	16.69	12.69	9.82	3.50	0.02%	0.01%	0.01%	0.00%
54/DP734584	106032	East	RU2	4347	104	0.10%	0.04	0.10	0.27	0.82	94.89	54.90	40.00	0.00	0.09%	0.05%	0.04%	0.00%
3/DP858141	106188	East	RU4	17448	800	0.75%	1.68	2.74	1.00	2.91	799.80	799.80	793.81	787.81	0.75%	0.75%	0.75%	0.74%
4/DP255566	100146	East	RU2	13553	250	0.25%	0.59	1.95	0.31	2.41	231.94	225.95	171.96	119.97	0.23%	0.23%	0.17%	0.12%
26/DP30265	20426	East	RU4	217	350	1.71%	0.19	0.51	0.15	0.86	304.93	283.94	264.94	229.95	1.49%	1.39%	1.30%	1.13%
2/DP858141	18989	East	RU4	8050	150	0.79%	0.06	0.16	0.49	1.59	143.97	131.97	72.98	26.99	0.76%	0.69%	0.38%	0.14%
17/DP1268721	6856	East	IN2	1038	125	1.82%	0.00	0.02	0.07	0.40	20.00	6.00	0.00	0.00	0.29%	0.09%	0.00%	0.00%
15/DP1266422	5578	East	RU4	4560	505	9.06%	0.02	0.39	0.28	1.12	178.37	149.37	78.25	40.12	3.20%	2.68%	1.40%	0.72%
5/DP1266422	17638	East	RU4	5529	311	1.76%	0.02	0.13	0.11	0.39	185.82	116.84	10.00	6.00	1.05%	0.66%	0.06%	0.03%
3/DP240718	101200	East	ENT	98	384	0.38%	0.15	0.46	0.15	0.52	320.03	308.03	256.93	191.95	0.32%	0.30%	0.25%	0.19%
37/DP211842	114009	West	ENT	6917	72	0.06%	0.04	0.33	0.76	3.41	41.99	29.99	18.99	8.00	0.04%	0.03%	0.02%	0.01%
2/DP707256	40739	East	RU4	12876	176	0.43%	0.04	0.12	0.93	3.62	25.00	19.00	9.00	2.00	0.06%	0.05%	0.02%	0.00%
25/DP30265	22060	East	RU4	101	26	0.12%	0.89	1.28	0.23	1.72	26.11	26.11	26.11	26.11	0.12%	0.12%	0.12%	0.12%
15/DP1268721	11781	East	IN2	15	0	0.00%	0.00	0.00	0.07	0.51	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP1266422	26504	East	RU4	8234	279	1.05%	0.03	0.09	0.35	2.05	186.78	139.18	45.99	0.00	0.70%	0.53%	0.17%	0.00%
7/DP1266422	10378	East	RU4	0	31	0.30%	0.00	0.02	0.00	0.02	1.15	0.00	0.00	0.00	0.01%	0.00%	0.00%	0.00%
34/DP211842	100112	West	ENT	18614	0	0.00%	0.00	0.00	0.54	3.54	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP255578	107151	West	ENT	21109	0	0.00%	0.00	0.00	0.53	3.91	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
13/DP236527	32422	East	RU1	5371	78	0.24%	0.00	0.00	0.22	0.79	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP1266422	13771	East	RU4	979	150	1.09%	0.01	0.05	0.07	0.42	71.98	49.99	6.00	0.00	0.52%	0.36%	0.04%	0.00%
2/DP736951	18504	East	RU4	4446	125	0.68%	0.02	0.06	0.36	0.68	71.98	53.99	9.00	0.00	0.39%	0.29%	0.05%	0.00%
1/DP1271142	753497	East	IN1	63855	275	0.04%	0.04	0.15	1.67	7.79	179.95	164.96	95.98	45.99	0.02%	0.02%	0.01%	0.01%
2/DP1277409	111160	West	ENT	22605	0	0.00%	0.00	0.00	0.49	4.43	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP30265	24714	East	ENZ	21473	123	0.50%	0.08	0.46	0.57	4.66	65.21	46.21	36.21	36.21	0.26%	0.19%	0.15%	0.15%
30/DP209399	100942	West	ENT	18077	0	0.00%	0.00	0.00	0.65	3.91	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
20/DP30265	23218	East	RU4	7191	450	1.94%	0.02	0.15	0.14	0.85	221.95	133.97	40.99	15.00	0.96%	0.58%	0.18%	0.06%
G/DP30440	40573	East	RU4	5241	32	0.08%	0.00	0.00	0.89	2.89	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
20/DP1276633	102514	West	ENT	15267	0	0.00%	0.00	0.00	0.52	4.27	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
211/DP1272676	777975	East	RU2	189254	1400	0.18%	0.03	0.27	1.17	4.91	996.76	682.83	258.94	42.99	0.13%	0.09%	0.03%	0.01%
1/DP30265	24333	East	ENZ	21535	191	0.79%	0.03	0.14	0.57	4.44	145.09	117.49	40.51	11.91	0.60%	0.48%	0.17%	0.05%
1/DP1266517	28430	East	RU4	36	0	0.00%	0.00	0.00	1.60	4.22	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
14/DP236527	34616	East	RU1	5800	24	0.07%	0.00	0.00	0.34	0.88	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
18/DP1266422	7563	East	RU4	2956	0	0.00%	0.01	0.01	0.26	1.24	0.01	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP32026	101166	West	ENT	30580	140	0.14%	0.07	0.36	0.44	2.57	103.97	83.97	49.98	29.99	0.10%	0.08%	0.05%	0.03%
5/DP255566	100098	East	RU2	2	5	0.01%	0.06	0.11	0.08	0.13	5.35	5.35	1.72	1.72	0.01%	0.01%	0.00%	0.00%
2/DP1267640	99025	East	ENZ	47417	575	0.58%	0.02	0.14	1.53	4.77	300.93	220.95	104.98	15.00	0.30%	0.22%	0.11%	0.02%
1/DP1160625	42806	East	RU4	1762	51	0.12%	0.09	0.30	0.04	0.44	25.56	25.56	25.50	15.00	0.06%	0.06%	0.06%	0.04%
39/DP258414	101280	East	ENZ	66677	435	0.43%	0.05	0.24	1.09	5.56	318.14	277.00	174.40	47.53	0.31%	0.27%	0.17%	0.05%

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU constrution (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
24/DP137415	6956	East	RU4	40	125	1.80%	0.06	0.16	0.07	0.37	124.97	109.98	49.99	29.99	1.80%	1.58%	0.72%	0.43%
17/DP1266422	4670	East	RU4	2546	0	0.00%	0.00	0.00	0.18	0.95	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
25/DP1277418	100081	West	ENT	10596	0	0.00%	0.00	0.00	0.48	3.12	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
23/DP258414	191587	East	ENZ	101852	450	0.23%	0.04	0.34	2.16	7.54	305.93	244.94	109.97	33.99	0.16%	0.13%	0.06%	0.02%
36/DP258414	102925	East	IN1	29278	428	0.42%	0.05	0.36	0.72	5.97	334.92	282.93	153.96	58.99	0.33%	0.27%	0.15%	0.06%
101/DP1271336	126001	East	RU2	33423	321	0.25%	0.05	0.19	0.48	4.31	261.50	237.50	104.97	41.99	0.21%	0.19%	0.08%	0.03%
34/DP258414	136232	East	ENZ	99724	245	0.18%	0.03	0.29	2.43	6.17	158.96	103.98	43.99	20.00	0.12%	0.08%	0.03%	0.01%
8/DP32026	101439	West	ENT	4057	188	0.19%	0.23	0.66	0.58	1.97	178.95	175.95	156.95	130.96	0.18%	0.17%	0.15%	0.13%
10/DP858140	43874	East	ENT	1646	450	1.03%	0.14	0.45	0.57	4.85	349.91	314.92	287.92	235.94	0.80%	0.72%	0.66%	0.54%
38/DP211842	97447	West	ENT	10790	316	0.32%	0.01	0.15	0.89	3.46	162.95	77.98	7.00	1.00	0.17%	0.08%	0.01%	0.00%
40/DP258414	101255	East	ENZ	56710	374	0.37%	0.02	0.09	1.11	6.79	232.46	118.65	30.99	0.00	0.23%	0.12%	0.03%	0.00%
8/DP812284	61024	East	ENZ	35825	375	0.61%	0.03	0.13	0.46	1.85	257.94	191.96	66.98	6.00	0.42%	0.31%	0.11%	0.01%
11/DP30265	30311	East	ENZ	17506	178	0.59%	0.01	0.03	0.95	3.40	60.20	16.00	0.00	0.00	0.20%	0.05%	0.00%	0.00%
37/DP258414	102993	East	ENZ	50618	297	0.29%	0.04	0.40	1.37	6.16	143.97	117.97	65.98	33.99	0.14%	0.11%	0.06%	0.03%
701/DP1280779	111348	East	ENZ	53001	125	0.11%	0.11	0.55	1.47	3.92	71.98	59.99	49.99	39.99	0.06%	0.05%	0.04%	0.04%
6/DP858141	1273	East	SP2	10	0	0.00%	0.00	0.00	0.01	0.03	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP812284	148696	East	ENZ	90962	1763	1.19%	0.02	0.17	1.18	4.41	1067.63	674.33	225.43	49.07	0.72%	0.45%	0.15%	0.03%
7/DP858141	5077	East	SP2	20	0	0.00%	0.00	0.00	1.34	1.85	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7/DP812284	145046	East	RU2	61512	545	0.38%	0.04	0.15	0.41	3.95	393.91	296.93	162.96	35.99	0.27%	0.20%	0.11%	0.02%
5/DP812284	60867	East	RU4	25009	125	0.21%	0.07	0.23	1.71	5.15	124.97	110.97	69.98	29.99	0.21%	0.18%	0.11%	0.05%
3/DP1240511	158770	West	AGB	34794	20	0.01%	0.07	0.36	0.77	2.80	12.00	9.00	8.00	4.00	0.01%	0.01%	0.01%	0.00%
22/DP1148371	10106	East	RU4	2170	8	0.08%	0.00	0.00	0.03	0.20	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7/DP30265	25317	East	RU4	2338	79	0.31%	0.06	0.39	0.75	4.32	50.99	38.99	38.99	10.00	0.20%	0.15%	0.15%	0.04%
9/DP30265	22523	East	ENZ	13104	244	1.08%	0.01	0.06	0.88	4.14	114.97	56.99	6.00	0.00	0.51%	0.25%	0.03%	0.00%
1/DP623799	103785	West	AGB	8541	16	0.02%	0.02	0.06	0.67	1.68	10.00	8.00	2.00	0.00	0.01%	0.01%	0.00%	0.00%
15/DP1106105	9987	East	RU4	2556	8	0.08%	0.00	0.00	0.34	1.29	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP30265	27924	East	ENZ	16483	151	0.54%	0.01	0.07	1.00	4.44	72.77	41.99	12.00	0.00	0.26%	0.15%	0.04%	0.00%
3/DP255566	100049	East	RU2	52233	300	0.30%	0.09	0.81	0.44	2.57	229.38	213.39	132.78	70.80	0.23%	0.21%	0.13%	0.07%
1/DP707256	19998	East	RU4	1009	20	0.10%	0.00	0.00	0.07	0.29	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
12/DP30265	36416	East	ENZ	21800	148	0.41%	0.02	0.08	1.03	3.37	79.98	52.99	18.00	0.00	0.22%	0.15%	0.05%	0.00%
73/DP1277011	143305	East	ENT	23765	50	0.03%	0.01	0.04	1.06	2.46	19.99	8.00	0.00	0.00	0.01%	0.01%	0.00%	0.00%
53/DP734584	101295	East	ENZ	63224	274	0.27%	0.07	0.27	0.97	5.29	228.47	198.48	122.96	58.99	0.23%	0.20%	0.12%	0.06%
15/DP30265	22488	East	RU4	6718	75	0.33%	0.05	0.11	0.97	3.69	62.99	47.99	24.99	15.00	0.28%	0.21%	0.11%	0.07%
31/DP1277434	97640	West	ENT	5958	0	0.00%	0.00	0.00	1.27	4.46	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP235124	174322	West	ENT	9048	28	0.02%	0.01	0.04	0.80	3.76	10.00	5.00	0.00	0.00	0.01%	0.00%	0.00%	0.00%
1/DP736951	18537	East	RU4	7046	50	0.27%	0.04	0.11	0.71	1.35	41.99	35.99	9.00	9.00	0.23%	0.19%	0.05%	0.05%
6/DP30265	32422	East	RU4	11098	50	0.15%	0.06	0.25	0.77	2.98	22.99	19.00	19.00	15.00	0.07%	0.06%	0.06%	0.05%
9/DP812284	85971	East	ENZ	56173	265	0.31%	0.03	0.16	1.38	5.82	145.65	112.66	51.99	6.00	0.17%	0.13%	0.06%	0.01%
31/DP258414	291694	East	ENZ	127565	75	0.03%	0.25	1.25	2.35	6.18	64.98	55.99	43.99	30.99	0.02%	0.02%	0.02%	0.01%
16/DP1106105	9991	East	RU4	3309	28	0.28%	0.00	0.00	0.41	0.80	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
21/DP1277418	23265	West	ENZ	5237	0	0.00%	0.00	0.00	0.40	4.15	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
70/DP1266063	33055	East	RU4	8925	75	0.23%	0.04	0.10	1.13	4.40	62.99	56.99	32.99	0.00	0.19%	0.17%	0.10%	0.00%
16/DP1271571	591721	West	ENT	9140	0	0.00%	0.00	0.00	1.13	4.65	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
14/DP30265	23072	East	ENZ	16577	125	0.54%	0.03	0.10	1.19	3.75	76.98	64.99	33.99	0.00	0.33%	0.28%	0.15%	0.00%
5/DP30265	26363	East	RU4	12283	100	0.38%	0.04	0.11	1.57	4.24	81.98	57.99	21.00	6.00	0.31%	0.22%	0.08%	0.02%
4/DP30265	20771	East	RU4	9904	200	0.96%	0.03	0.12	0.41	4.17	138.97	61.99	29.99	6.00	0.67%	0.30%	0.14%	0.03%
30/DP258414	309923	East	ENZ	133699	25	0.01%	0.56	1.16	2.08	6.17	20.99	20.99	20.99	20.99	0.01%	0.01%	0.01%	0.01%
23/DP1277418	56899	West	ENT	8350	0	0.00%	0.00	0.00	0.57	4.13	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7/DP255578	116155	West	ENT	1	0	0.00%	0.00	0.00	0.29	1.34	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU constrution (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
13/DP30265	24844	East	ENZ	14260	125	0.50%	0.05	0.29	0.88	3.56	81.98	54.99	28.99	15.00	0.33%	0.22%	0.12%	0.06%
8/DP1266422	7145	East	RU4	9	0	0.00%	0.30	0.30	0.58	1.42	0.30	0.30	0.30	0.30	0.00%	0.00%	0.00%	0.00%
1/DP1277409	10825	West	ENZ	10699	0	0.00%	0.00	0.00	0.75	4.43	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
16/DP30265	22401	East	ENZ	12565	25	0.11%	0.01	0.04	1.66	3.68	4.00	4.00	0.00	0.00	0.02%	0.02%	0.00%	0.00%
51/DP30266	20247	East	SP2	341	141	0.70%	0.68	1.77	0.51	1.92	141.31	126.31	111.32	111.32	0.70%	0.62%	0.55%	0.55%
32/DP211842	100616	West	ENT	20493	0	0.00%	0.00	0.00	0.40	2.96	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
33/DP211842	98880	West	ENT	3573	0	0.00%	0.00	0.00	0.42	3.05	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
135/DP270417	4027	East	RE2	206	25	0.62%	0.07	0.15	0.19	0.42	20.99	20.99	9.00	9.00	0.52%	0.52%	0.22%	0.22%
28/DP258414	244469	East	ENZ	138175	200	0.08%	0.02	0.09	1.97	5.94	115.97	85.98	20.99	0.00	0.05%	0.04%	0.01%	0.00%
6/DP1114311	40495	East	RU4	0	70	0.17%	0.01	0.05	0.01	0.05	18.46	16.00	6.00	0.00	0.05%	0.04%	0.01%	0.00%
1/DP1266422	28685	East	ENZ	13375	0	0.00%	0.00	0.00	1.35	3.84	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
22/DP1266422	134	East	ENZ	134	0	0.00%	0.00	0.00	2.50	3.77	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
248/DP270417	4000	East	RE2	504	50	1.25%	0.04	0.09	0.21	0.50	41.99	23.99	18.00	0.00	1.05%	0.60%	0.45%	0.00%
6/DP1107465	9354	East	RU4	613	32	0.34%	0.00	0.00	0.12	0.43	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
136/DP270417	4145	East	RE2	584	25	0.60%	0.05	0.10	0.17	0.45	20.99	15.00	9.00	0.00	0.51%	0.36%	0.22%	0.00%
139/DP270417	4470	East	RE2	357	0	0.00%	0.00	0.00	0.35	0.74	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
141/DP270417	6193	East	RE2	2097	0	0.00%	0.00	0.00	0.19	0.48	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
140/DP270417	5413	East	RE2	1873	25	0.46%	0.05	0.09	0.36	0.75	20.99	15.00	9.00	0.00	0.39%	0.28%	0.17%	0.00%
247/DP270417	4001	East	RE2	37	21	0.51%	0.08	0.21	0.10	0.24	16.60	16.60	16.60	4.62	0.41%	0.41%	0.41%	0.12%
14/DP1106105	10003	East	RU4	840	0	0.00%	0.00	0.00	0.41	0.94	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
A/DP102214	19940	East	RU4	3812	0	0.00%	0.00	0.00	0.09	0.85	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
21/DP1276633	9816	West	ENZ	2315	0	0.00%	0.00	0.00	0.88	4.04	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
137/DP270417	4131	East	RE2	184	0	0.00%	0.00	0.00	0.18	0.41	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
138/DP270417	4366	East	RE2	14	0	0.00%	0.00	0.00	0.14	0.26	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2001/DP1036837	67182	East	ENZ	39971	0	0.00%	0.00	0.00	1.53	6.41	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
24/DP258414	193127	East	ENZ	98763	50	0.03%	0.02	0.06	2.10	7.11	20.00	20.00	4.00	0.00	0.01%	0.01%	0.00%	0.00%
5/DP1107465	9122	East	RU4	108	0	0.00%	0.00	0.00	0.13	0.26	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
26/DP258414	209001	East	ENZ	129834	225	0.11%	0.01	0.06	2.14	6.75	83.98	48.99	6.00	0.00	0.04%	0.02%	0.00%	0.00%
27/DP258414	234038	East	ENZ	131095	75	0.03%	0.02	0.04	2.31	7.92	56.99	25.99	0.00	0.00	0.02%	0.01%	0.00%	0.00%
1/DP1237488	121343	West	AGB	21372	12	0.01%	0.01	0.10	1.00	2.90	5.00	1.00	1.00	0.00	0.00%	0.00%	0.00%	0.00%
29/DP258414	291449	East	ENZ	149476	50	0.02%	0.01	0.03	1.78	6.10	20.00	14.00	0.00	0.00	0.01%	0.00%	0.00%	0.00%
17/DP1106105	10028	East	RU4	126	0	0.00%	0.00	0.00	0.32	0.53	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
17/DP1240511	43231	West	SP2	435	0	0.00%	0.00	0.00	0.18	0.56	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP32026	101189	West	ENT	777	8	0.01%	0.00	0.00	1.04	1.80	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP1234822	34824	West	SP2	1141	0	0.00%	0.00	0.00	0.10	0.49	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP1240511	135477	West	AGB	717	4	0.00%	0.04	0.07	0.63	1.44	4.00	2.00	2.00	0.00	0.00%	0.00%	0.00%	0.00%
53/DP30266	20249	East	SP2	146	425	2.10%	0.19	0.43	0.19	1.73	379.92	364.92	298.94	274.94	1.88%	1.80%	1.48%	1.36%
2/DP508759	20423	East	RU4	28	0	0.00%	0.00	0.00	0.14	0.26	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
9/DP1240511	115836	West	AGB	32835	0	0.00%	0.00	0.00	0.93	1.67	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP137414	6972	East	RU4	4	0	0.00%	0.00	0.00	0.04	0.34	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP1240511	142159	West	AGB	15898	0	0.00%	0.00	0.00	0.37	1.54	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP623799	101111	West	AGB	22847	0	0.00%	0.00	0.00	1.06	2.63	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP519034	118740	West	AGB	9953	0	0.00%	0.00	0.00	0.28	2.22	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP232996	161620	West	AGB	13012	0	0.00%	0.00	0.00	0.76	1.47	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP1234822	96705	West	AGB	8764	1	0.00%	0.00	0.00	1.23	2.22	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
9/DP1240153	44726	West	AGB	1650	0	0.00%	0.00	0.00	0.51	1.81	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP32026	101378	West	ENT	1326	0	0.00%	0.00	0.00	0.87	1.57	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP1240153	98247	West	AGB	5	0	0.00%	0.00	0.00	0.89	1.03	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP827223	123609	West	AGB	890	0	0.00%	0.00	0.00	1.16	1.45	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU constrution (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
31/DP563121	229950	West	AGB	0	0	0.00%	0.00	0.00	0.51	1.94	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP1234822	26928	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
9/DP1234822	309	West	SP2	300	0	0.00%	0.00	0.00	0.03	0.10	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
16/DP1240511	37599	West	SP2	660	0	0.00%	0.00	0.00	0.10	0.38	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
102/DP791433	825	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP616737	1118	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
17/DP3050	42011	East	ENT	0	0	0.00%	0.00	0.00	0.66	4.57	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
14/DP3050	40643	East	ENT	0	0	0.00%	0.00	0.00	0.90	4.30	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
15/DP3050	42400	East	ENT	0	0	0.00%	0.00	0.00	0.93	4.04	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
16/DP3050	46953	East	ENT	0	0	0.00%	0.00	0.00	0.73	4.37	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP1278780	411048	East	ENT	1640	0	0.00%	0.00	0.00	1.21	4.57	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
18/DP3050	43070	East	ENT	0	0	0.00%	0.00	0.00	1.07	3.87	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
19/DP3050	47135	East	ENT	0	0	0.00%	0.00	0.00	0.63	3.62	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP1278780	760438	East	ENT	63	0	0.00%	0.00	0.00	0.87	5.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
31/DP28050	20262	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP1123344	1822174	East	ENT	245	0	0.00%	0.00	0.00	1.23	6.56	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
35/DP28050	27146	East	RU4	0	0	0.00%	0.00	0.00	0.43	1.03	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
34/DP28050	20278	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP706775	2073	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP534435	20255	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7004/DP93052	8027	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP706775	2054	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
24/DP1036912	660	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP706775	2064	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP1233751	35667	West	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP1048172	1003	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
14/DP1233751	736951	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
11/DP1233751	3406	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
22/DP700302	727	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
25/DP700302	14791	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
23/DP700302	787	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
24/DP700302	787	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
70/DP1091926	66744	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP71367	1962	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP1234822	856	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP1234822	578	West	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7/DP1234822	5097	West	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP1234822	840	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP553744	520287	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP1238032	6228	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
101/DP732746	22575	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
100/DP732746	22812	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
22/DP601022	111080	East	RU2	43	0	0.00%	0.00	0.00	0.18	0.51	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
24/A/DP2566	27810	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
29/A/DP2566	15096	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
32/A/DP2566	15085	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7/A/DP2566	6052	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
31/DP30266	20596	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/A/DP2566	6179	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU constrution (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
A/DP415712	20236	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
16/DP209399	101193	West	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7/DP32026	101621	West	ENT	66	0	0.00%	0.00	0.00	0.97	1.54	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP32026	102133	West	ENT	832	0	0.00%	0.00	0.00	0.49	2.09	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP1274964	10274	East	ENT	20	0	0.00%	0.00	0.00	0.18	0.61	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
20/DP1271571	5346	West	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
24/DP1277418	62979	West	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP542395	195108	East	ENT	112	0	0.00%	0.00	0.00	0.86	3.92	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP232324	539	West	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
13/DP1238032	182	West	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7/DP232324	636	West	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
71/DP1277011	81352	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
110/DP1271336	5024	East	RU2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
105/DP1271336	16176	East	RU2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
212/DP1272676	687855	East	ENZ	1420	0	0.00%	0.00	0.00	1.38	5.29	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
A/DP394280	20229	West	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
265/DP270417	4001	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
264/DP270417	4002	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
267/DP270417	4009	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
266/DP270417	4010	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
271/DP270417	4001	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
272/DP270417	4007	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
269/DP270417	4008	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
270/DP270417	4001	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
268/DP270417	4008	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
72/DP1277011	424565	East	ENT	511	0	0.00%	0.00	0.00	0.97	5.10	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
22/DP1277418	103417	West	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
18/DP1271571	39085	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
162/DP270417	4001	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
161/DP270417	4001	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
241/DP270417	4435	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
163/DP270417	4376	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
242/DP270417	4200	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
243/DP270417	4369	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
315/DP270417	4010	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
316/DP270417	4000	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
314/DP270417	7322	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
328/DP270417	4000	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
329/DP270417	3999	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
326/DP270417	4000	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
327/DP270417	4000	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
324/DP270417	4000	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
325/DP270417	4000	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
322/DP270417	4004	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
323/DP270417	4000	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
347/DP270417	349186	East	ENZ	1962	0	0.00%	0.00	0.00	2.30	6.14	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
102/DP1271336	135518	East	ENT	0	0	0.00%	0.00	0.00	1.28	4.51	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
81/DP1277406	44011	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
91/DP270417	4002	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
93/DP270417	5302	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
89/DP270417	4482	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
90/DP270417	4420	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
87/DP270417	4411	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
88/DP270417	4127	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
221/DP270417	9365	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP270417	3299	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
216/DP270417	1500	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
212/DP270417	1500	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
204/DP270417	1501	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
203/DP270417	1499	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
206/DP270417	1536	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
205/DP270417	1501	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
208/DP270417	1500	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
207/DP270417	1539	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
210/DP270417	1500	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
209/DP270417	1500	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
215/DP270417	1974	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
211/DP270417	1500	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
214/DP270417	1752	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP1271142	136108	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
199/DP270417	1770	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
202/DP270417	2170	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
201/DP270417	1610	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
160/DP270417	4003	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
213/DP270417	1500	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
85/DP270417	4000	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
152/DP270417	4315	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
146/DP270417	5722	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
148/DP270417	5320	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
150/DP270417	4942	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
157/DP270417	4000	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
156/DP270417	4000	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
159/DP270417	4000	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
158/DP270417	4000	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
240/DP270417	4000	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
239/DP270417	4000	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
245/DP270417	4506	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
246/DP270417	5169	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
147/DP270417	4578	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP270417	4090	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
81/DP270417	4153	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
79/DP270417	4000	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
86/DP270417	5029	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
80/DP270417	4395	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
21/DP1268721	6397	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
20/DP1268721	6873	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
23/DP1268721	7391	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
22/DP1268721	6603	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU constrution (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
25/DP1268721	9747	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
24/DP1268721	8224	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
27/DP1268721	14722	East	SP2	0	0	0.00%	0.00	0.00	0.14	0.78	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
26/DP1268721	12661	East	SP2	0	0	0.00%	0.00	0.00	0.21	0.73	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
29/DP1268721	369	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
28/DP1268721	8775	East	SP2	0	0	0.00%	0.00	0.00	0.07	1.66	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
30/DP1268721	857	East	SP2	0	0	0.00%	0.00	0.00	0.06	0.19	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
30/DP651001	23616	East	RU4	6	0	0.00%	0.00	0.00	0.60	2.60	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP1169433	672981	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP875790	780929	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP1238606	92314	West	ENT	3814	0	0.00%	0.00	0.00	1.36	1.82	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
21/DP270417	4011	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
261/DP270417	6724	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
19/DP270417	4021	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
20/DP270417	4832	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
18/DP270417	4777	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
84/DP270417	4000	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
82/DP270417	4002	East	RE2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
16/DP713582	20038	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
35/B/DP2566	15360	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
14/DP713582	20030	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP713582	20008	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP25759	12144	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP25759	12140	East	RU4	1413	0	0.00%	0.00	0.00	0.07	0.21	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP25759	12141	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP25759	12148	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP25759	12141	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
28/DP25759	20237	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
30/DP25759	24284	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
29/DP25759	12156	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7001/DP1028872	26443	East	RE1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
68/DP1098248	41184	East	RE1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP797652	14224	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
11/DP1268721	17397	East	IN2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
13/DP1268721	14368	East	IN2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
12/DP1268721	15079	East	IN2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
19/DP1268721	11505	East	IN2	0	0	0.00%	0.00	0.00	0.06	0.52	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
18/DP1268721	4270	East	IN2	0	0	0.00%	0.00	0.00	0.12	0.61	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP253503	101525	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
55/DP734584	101373	East	RU2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
52/DP259135	101560	East	IN1	0	0	0.00%	0.00	0.00	1.55	1.90	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP1285305	109139	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
8/DP253503	102673	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
51/DP259135	101502	East	IN1	0	0	0.00%	0.00	0.00	0.13	0.29	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
53/DP259135	101164	East	IN1	0	0	0.00%	0.00	0.00	1.43	1.91	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
61/DP259135	37528	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
59/DP259135	230283	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP104958	522569	East	IN1	0	0	0.00%	0.00	0.00	0.10	0.17	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
60/DP259135	101242	East	IN1	0	0	0.00%	0.00	0.00	0.03	0.10	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
4/DP1285305	101254	East	IN1	0	0	0.00%	0.00	0.00	0.05	0.15	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP1285305	120963	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP1285305	125707	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP1285305	101246	East	IN1	0	0	0.00%	0.00	0.00	0.04	0.12	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP1266422	13456	East	RU4	0	3848	28.59%	0.08	0.56	0.08	0.56	2806.11	2427.03	1625.16	1016.25	20.85%	18.04%	12.08%	7.55%
482/DP1139768	10117	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1182/DP1048440	11166	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1181/DP1048440	10053	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
322/DP1130961	10018	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP250002	101203	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP822317	6374	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
9/DP253503	101472	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
35/DP258414	53894	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP250002	101648	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
25/DP255560	101256	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP250002	101342	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
26/DP255560	25467	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP250002	106783	East	IN1	0	0	0.00%	0.00	0.00	0.10	0.25	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP250002	101495	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
24/DP255560	101398	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP250002	116135	East	IN1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
411/DP1041986	10000	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
412/DP1041986	10265	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
38/DP30266	20273	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
39/DP30266	20275	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
460/DP1012491	10043	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
47/DP30266	37380	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP865810	10261	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP865810	10151	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP866550	10126	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
45/DP30266	20249	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
481/DP1139768	10747	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
461/DP1012491	10205	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1153/DP1159139	9140	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1151/DP1159139	9134	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP1175090	10555	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1152/DP1159139	9142	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP1194415	10001	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP1175090	10556	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP1194415	10259	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP1267157	123882	East	RU2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
8/DP1267157	97	East	RU2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
700/DP1276770	13073	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
702/DP1276770	2402	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
701/DP1276770	5846	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
33/A/DP2566	15090	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP981721	21303	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
700/DP1280779	17165	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
8/DP1267640	19622	East	RU2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU constrution (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
5/DP1267640	44262	East	RU2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP1280136	22205	East	RU2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
47/DP734584	107018	East	RU2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP1280136	287821	East	RU2	0	0	0.00%	0.00	0.00	1.08	5.16	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
57/DP30266	20213	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
52/DP30266	20554	East	SP2	522	0	0.00%	0.00	0.00	0.27	1.58	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
54/DP30266	20222	East	SP2	4	0	0.00%	0.00	0.00	0.13	0.71	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
60/DP30266	21063	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
592/DP1029321	9399	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
58/DP30266	20210	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
502/DP854130	10118	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
591/DP1029321	10832	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
361/DP863909	10239	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
360/DP863909	10240	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
9/A/DP2566	6222	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/A/DP2566	6401	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
13/A/DP2566	7068	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
8/A/DP2566	6135	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
28/A/DP2566	14997	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP812284	89022	East	RU2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
B/DP416720	7168	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
B/DP415712	9918	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP812284	86714	East	RU2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
321/DP1130961	10297	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
110/DP1137261	6643	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
111/DP1137261	6208	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
112/DP1137261	6126	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1160/DP1061191	10820	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1161/DP1061191	10005	East	ENZ	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
402/DP812923	20277	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
72/DP1266063	12020	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
74/DP1266063	6220	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
11/DP1267157	4046	East	RU2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
28/DP28050	20498	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
29/DP28050	20541	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
27/DP28050	20515	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
48/DP3050	57218	East	ENT	0	0	0.00%	0.00	0.00	1.91	5.01	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP28050	22999	East	RU4	0	0	0.00%	0.00	0.00	0.24	0.91	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
17/DP28050	21152	East	RU4	0	0	0.00%	0.00	0.00	0.85	3.96	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
22/DP626147	272114	East	ENZ	0	0	0.00%	0.00	0.00	1.24	6.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
36/DP28050	21044	East	RU4	0	0	0.00%	0.00	0.00	0.52	1.18	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
25/DP28050	20483	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP119786	42657	East	ENT	0	0	0.00%	0.00	0.00	0.56	1.84	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
19/DP28050	22477	East	RU4	0	0	0.00%	0.00	0.00	1.34	3.93	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
49/DP3050	41073	East	ENT	0	0	0.00%	0.00	0.00	0.85	2.61	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
18/DP28050	21868	East	RU4	0	0	0.00%	0.00	0.00	1.34	3.72	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
24/DP28050	23521	East	RU4	0	0	0.00%	0.00	0.00	0.23	0.45	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
39/DP28050	20262	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
21/DP28050	22062	East	RU4	0	0	0.00%	0.00	0.00	1.43	3.41	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU constrution (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
30/DP28050	20260	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
33/DP28050	20262	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
14/DP28050	20583	East	RU4	0	0	0.00%	0.00	0.00	1.30	3.05	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
32/DP28050	20265	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
12/DP28050	22409	East	RU4	0	0	0.00%	0.00	0.00	1.13	5.50	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP589918	31915	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
37/DP28050	20263	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
16/DP28050	20936	East	RU4	0	0	0.00%	0.00	0.00	1.11	3.32	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
11/DP28050	20281	East	RU4	0	0	0.00%	0.00	0.00	0.94	4.22	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
9/DP28050	21396	East	RU4	0	0	0.00%	0.00	0.00	0.11	0.26	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP1083552	20166	East	RU4	6	0	0.00%	0.00	0.00	0.96	4.95	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
13/DP28050	21932	East	RU4	0	0	0.00%	0.00	0.00	1.21	2.98	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP226912	61069	East	ENT	0	0	0.00%	0.00	0.00	0.82	4.39	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP1083552	35067	East	RU4	0	0	0.00%	0.00	0.00	0.74	1.60	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP566109	22683	East	ENT	0	0	0.00%	0.00	0.00	0.71	4.39	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP566109	20613	East	ENT	0	0	0.00%	0.00	0.00	0.64	4.40	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP237229	20237	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
11/DP800072	20002	East	RU4	0	0	0.00%	0.00	0.00	0.06	0.11	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP237229	20248	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP739051	20010	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP739051	20006	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP800072	20005	East	RU4	0	0	0.00%	0.00	0.00	0.81	2.47	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP739051	25900	East	RU4	0	0	0.00%	0.00	0.00	1.49	4.20	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP800072	20712	East	RU4	0	0	0.00%	0.00	0.00	1.65	3.39	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
26/DP28050	20466	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP589918	20243	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP226912	20352	East	ENT	0	0	0.00%	0.00	0.00	0.40	1.56	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP226912	20262	East	ENT	0	0	0.00%	0.00	0.00	0.05	0.19	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP800072	20001	East	RU4	0	0	0.00%	0.00	0.00	0.24	1.43	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP800072	20006	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP226912	20262	East	ENT	0	0	0.00%	0.00	0.00	0.20	1.56	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
8/DP800072	22409	East	RU4	0	0	0.00%	0.00	0.00	1.50	5.42	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
A/DP406215	244801	East	ENZ	0	0	0.00%	0.00	0.00	1.82	5.79	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP565512	41524	East	ENT	0	0	0.00%	0.00	0.00	1.09	5.21	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
50/DP222177	29898	East	RU4	411	0	0.00%	0.00	0.00	0.25	1.32	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP800072	20007	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7/DP800072	22787	East	RU4	0	0	0.00%	0.00	0.00	2.11	5.65	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP226912	20262	East	ENT	0	0	0.00%	0.00	0.00	0.60	1.66	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
30/DP3050	28334	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP800072	22354	East	RU4	0	0	0.00%	0.00	0.00	1.81	5.77	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
32/DP3050	28329	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
54/DP28050	23129	East	RU4	0	0	0.00%	0.00	0.00	0.73	1.76	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
40/DP28050	20262	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
53/DP28050	27532	East	RU4	0	0	0.00%	0.00	0.00	0.95	1.91	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
15/DP28050	20266	East	RU4	0	0	0.00%	0.00	0.00	1.02	4.53	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
38/DP28050	20266	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP589918	20251	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
8/DP28050	22231	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
56/DP3050	108888	East	ENZ	0	0	0.00%	0.00	0.00	1.23	4.17	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU constrution (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
21/DP626147	40402	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
34/DP3050	28326	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
54/DP3050	111579	East	ENZ	0	0	0.00%	0.00	0.00	1.27	5.40	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP25759	12142	East	RU4	6700	0	0.00%	0.00	0.00	0.12	0.33	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
31/DP3050	28333	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP589918	40497	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP567860	101887	East	ENT	0	0	0.00%	0.00	0.00	1.11	4.38	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
50/DP549457	165823	East	RU4	0	0	0.00%	0.00	0.00	1.43	4.90	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
20/DP28050	21514	East	RU4	0	0	0.00%	0.00	0.00	1.32	2.60	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
27/DP25759	12140	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
14/DP531743	21010	East	ENT	0	0	0.00%	0.00	0.00	0.52	3.88	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
22/DP552531	21524	East	ENT	144	0	0.00%	0.00	0.00	0.79	4.42	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
13/DP531743	21283	East	ENT	0	0	0.00%	0.00	0.00	0.72	3.63	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP3050	52123	East	ENT	4	0	0.00%	0.00	0.00	0.37	4.04	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP104049	22284	East	ENT	171	0	0.00%	0.00	0.00	0.57	4.12	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
9/DP3050	37383	East	ENT	0	0	0.00%	0.00	0.00	0.49	4.42	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP3050	46614	East	ENT	0	0	0.00%	0.00	0.00	0.28	3.80	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP1084967	20524	East	ENT	0	0	0.00%	0.00	0.00	0.80	3.96	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
102/DP1263171	48279	East	SP2	0	0	0.00%	0.00	0.00	0.58	4.29	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
101/DP1263171	47790	East	SP2	0	0	0.00%	0.00	0.00	0.51	4.01	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
55/DP3050	124407	East	ENZ	0	0	0.00%	0.00	0.00	1.18	4.79	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP1278780	489761	East	ENT	0	0	0.00%	0.00	0.00	0.81	4.74	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
17/DP747390	20394	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP739051	19977	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
33/DP3050	28327	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
8/DP25759	12143	East	RU4	0	0	0.00%	0.00	0.00	0.17	0.52	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7/DP25759	12138	East	RU4	3294	0	0.00%	0.00	0.00	0.12	0.34	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP611519	25446	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
35/DP3050	28325	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP611519	19997	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP611519	20033	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
9/DP25759	12141	East	RU4	0	0	0.00%	0.00	0.00	0.27	0.67	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
29/DP3050	28321	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
36/DP3050	28325	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP611519	19997	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
14/DP739051	20000	East	RU4	0	0	0.00%	0.00	0.00	0.29	2.26	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
18/DP747390	20199	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP237229	26705	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP237229	24403	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7/DP739051	20021	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP553886	31504	East	ENT	9	0	0.00%	0.00	0.00	1.53	4.70	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP860338	26964	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP747390	20298	East	RU4	350	0	0.00%	0.00	0.00	0.33	0.93	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
11/DP739051	34950	East	RU4	0	0	0.00%	0.00	0.00	1.71	4.49	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
9/DP800072	20002	East	RU4	0	0	0.00%	0.00	0.00	0.69	2.25	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
12/DP739051	20625	East	RU4	0	0	0.00%	0.00	0.00	0.83	5.20	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP565512	39313	East	ENT	0	0	0.00%	0.00	0.00	1.54	5.09	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP226912	20262	East	ENT	0	0	0.00%	0.00	0.00	0.06	0.16	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
9/DP226448	20483	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
12/DP226448	20722	East	ENT	0	6	0.03%	0.08	0.09	0.08	0.09	6.23	6.23	6.23	0.00	0.03%	0.03%	0.03%	0.00%
30/DP1251450	151185	West	AGB	15179	0	0.00%	0.00	0.00	0.22	1.07	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP1188956	399836	East	ENT	5934	0	0.00%	0.00	0.00	0.41	3.97	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP250030	100681	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
21/DP747390	20297	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP237229	20246	East	ENT	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7/DP747390	20303	East	RU4	41	0	0.00%	0.00	0.00	0.36	1.30	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP747390	20303	East	RU4	2317	0	0.00%	0.00	0.00	0.60	1.45	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
9/DP739051	40681	East	RU4	0	0	0.00%	0.00	0.00	1.89	4.99	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
22/DP774035	24803	East	RU4	0	0	0.00%	0.00	0.00	1.39	2.29	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
13/DP739051	19995	East	RU4	0	0	0.00%	0.00	0.00	0.94	2.89	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP739051	20029	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
23/DP774035	24308	East	RU4	0	0	0.00%	0.00	0.00	0.74	1.72	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
20/DP747390	20293	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
17/DP739051	20000	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
16/DP739051	19995	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
15/DP739051	20009	East	RU4	0	0	0.00%	0.00	0.00	0.08	0.80	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
15/DP747390	21050	East	RU4	0	0	0.00%	0.00	0.00	1.17	5.24	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
8/DP739051	20123	East	RU4	0	0	0.00%	0.00	0.00	0.66	4.47	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
51/DP752019	154924	East	RU4	0	0	0.00%	0.00	0.00	1.33	4.84	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
52/DP752019	273492	East	RU4	101	0	0.00%	0.00	0.00	1.35	5.75	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
19/DP747390	20291	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP1107465	9195	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP1107465	9213	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
18/DP1106105	15012	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP1107465	9225	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
21/DP1148371	11578	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
101/DP1118021	10170	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
30/DP1181356	10254	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
142/DP1240152	11381	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
151/DP1214873	11612	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
47/DP752016	1443	East	ENT	0	0	0.00%	0.00	0.00	0.17	0.34	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP229406	20253	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/C/DP1451	46901	West	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/C/DP1451	70056	West	AGB	21172	0	0.00%	0.00	0.00	0.39	1.60	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP250030	101785	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP250030	101762	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7/DP250030	101788	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP623799	191208	West	AGB	4971	0	0.00%	0.00	0.00	1.08	1.66	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7/DP1240511	102900	West	AGB	2968	0	0.00%	0.00	0.00	0.79	1.52	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP1240511	133021	West	AGB	0	0	0.00%	0.00	0.00	0.07	0.18	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
71/DP1044837	10119	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
72/DP1044837	10114	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
8/DP229406	20242	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP229406	20229	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
105/DP610012	39968	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
62/DP869167	10105	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
61/DP869167	10115	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
32/DP1033581	10117	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU constrution (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
2/DP229406	20244	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
9/DP229406	20229	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
25/DP653888	47973	East	RU1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP1022633	10006	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP1022633	10239	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP533788	20226	East	RU1	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP1014394	10241	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP1014394	9982	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
12/DP1065416	30097	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
91/DP1101411	77408	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
22/DP747390	20344	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7/DP201168	20234	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
103/DP1061160	20199	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP739051	20013	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP210021	20241	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
31/B/DP2566	30769	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP747390	20316	East	RU4	45	0	0.00%	0.00	0.00	0.01	0.04	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP747390	20314	East	RU4	4459	0	0.00%	0.00	0.00	0.45	1.51	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP240667	20239	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP240667	20236	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
601/DP830470	20037	East	RU4	80	0	0.00%	0.00	0.00	0.12	0.30	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP210021	25794	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
8/DP216960	20646	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP733714	23442	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP842539	19988	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
23/DP747390	26764	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
12/DP800072	20005	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
9/DP216960	20212	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
11/DP216960	31967	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP596093	23058	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP739051	20093	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP201168	20251	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP240667	25676	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP240667	20238	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
602/DP830470	20076	East	RU4	0	0	0.00%	0.00	0.00	0.06	0.17	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP535965	12134	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP160984	20292	East	RU4	0	0	0.00%	0.00	0.00	0.15	0.25	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP216960	20235	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
100/DP801637	20234	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP540504	14967	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
102/DP801637	35553	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
101/DP801637	20234	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
32/DP867457	20246	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
A/DP403776	21672	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
C/DP403776	21536	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP532554	3695	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP212255	20218	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
B/DP403776	21575	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
11/B/DP2566	15356	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU constrution (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
2/DP212255	20236	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/B/DP2566	15356	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
8/B/DP2566	15355	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/B/DP2566	30724	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
13/B/DP2566	21555	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
12/B/DP2566	15356	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
9/B/DP2566	15355	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
8/DP747817	20449	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7/B/DP2566	15356	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
251/DP1127189	20236	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
9/DP747817	20448	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/G/DP1094	36436	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
252/DP1127189	20236	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
B/DP415320	75812	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP512746	37994	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
21/DP1139225	20014	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
22/DP1139225	17997	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
14/DP1065416	70380	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
90/DP1101411	307130	East	RU4	6	0	0.00%	0.00	0.00	0.07	0.45	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
13/DP1065416	75129	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
17/B/DP2566	15360	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/B/DP2566	30712	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
49/B/DP2566	15416	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
33/B/DP2566	15360	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
36/B/DP2566	15360	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
24/B/DP2566	15360	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP713582	20016	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/B/DP2566	15360	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
13/DP713582	20042	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP29832	20414	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
17/DP713582	20039	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
20/DP713582	20043	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP29832	20372	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP713582	20018	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
23/DP29832	20806	East	RU4	78	0	0.00%	0.00	0.00	0.23	1.19	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP29832	20432	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP956138	48057	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP29832	20227	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7/DP713582	20013	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
102/DP1061160	20237	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP713582	20027	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
22/DP29832	20819	East	RU4	14	0	0.00%	0.00	0.00	0.24	0.75	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP29832	20393	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
50/DP28050	21636	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
28/DP1094	32374	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
100/DP1210132	108056	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP500847	36172	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
16/C/DP1094	38092	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
27/DP1094	28327	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU construction (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
2/DP500847	39932	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
15/B/DP2566	15360	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/B/DP2566	15359	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
27/B/DP2566	15350	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
19/B/DP2566	15360	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP713582	20019	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
12/DP713582	27144	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP713582	20015	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
23/DP713582	20006	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
50/B/DP2566	15416	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
28/B/DP2566	15350	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
19/DP713582	20042	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
101/DP1061160	20254	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP943122	4053	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
100/DP1061160	20271	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
16/B/DP2566	15360	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP208940	23082	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
32/B/DP2566	15360	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
18/B/DP2566	15360	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
37/B/DP2566	15360	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
25/B/DP2566	15361	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
14/B/DP2566	21587	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
38/B/DP2566	21607	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
15/DP713582	20033	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
30/B/DP2566	30658	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
9/DP713582	20021	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
22/DP713582	20012	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
8/DP713582	20013	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
18/DP713582	20041	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP733714	23910	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP201168	20208	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP733714	23888	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP208940	23079	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
12/DP29832	20401	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
8/DP29832	20276	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
9/DP29832	20340	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
101/DP736729	20149	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7/DP29832	20281	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
13/DP29832	20504	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP29832	20251	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
24/DP29832	20804	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
11/DP29832	20397	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP747390	20331	East	RU4	1477	0	0.00%	0.00	0.00	0.04	0.41	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
18/DP739051	20024	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP747390	20413	East	RU4	2331	0	0.00%	0.00	0.00	0.36	1.56	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP240667	20238	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP596093	23037	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP945241	4037	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP201168	20252	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU constrution (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
1/DP842539	19984	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
34/B/DP2566	15360	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
29/B/DP2566	15350	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP713582	20013	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
21/DP713582	20019	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP842539	24159	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP800072	20009	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
103/DP791433	825	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
100/DP626326	828	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
128/DP1076374	301	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
102/DP1076374	723	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
39/DP245819	1323	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
38/DP245819	1180	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
3/DP1073290	33367	West	AGB	3593	0	0.00%	0.00	0.00	0.94	2.47	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
124/DP246068	20912	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
123/DP1076374	701	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
122/DP1076374	728	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
118/DP1076374	730	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
121/DP1076374	700	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
41/DP245819	1005	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
40/DP245819	1301	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
42/DP245819	862	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
43/DP245819	856	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
110/DP1076374	600	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
44/DP245819	836	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
510/DP700775	13216	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
108/DP1076374	600	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
49/DP28050	20246	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
47/DP28050	20251	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP918430	42155	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
48/DP28050	20253	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2621/DP811282	20014	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/B/DP2566	15359	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP29832	20298	East	RU4	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
105/DP1076374	701	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
8/DP1234822	5097	West	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
119/DP1076374	700	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
117/DP1076374	700	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
113/DP1076374	600	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
120/DP1076374	730	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
111/DP1076374	600	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
112/DP1076374	600	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
107/DP1076374	650	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
109/DP1076374	600	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
104/DP1076374	700	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
106/DP1076374	700	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
101/DP1076374	700	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
103/DP1076374	650	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP629074	25220	West	AGB	362	0	0.00%	0.00	0.00	0.11	0.30	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU constrution (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
127/DP1076374	272	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP215715	33081	West	AGB	4836	0	0.00%	0.00	0.00	0.77	1.59	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP629074	797	West	AGB	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
330/DP270417	4000	East	ENT	0	0	0.00%	0.00	0.00	0.09	0.11	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
740/DP810111	621811	East	ENT	0	0	0.00%	0.00	0.00	1.04	5.02	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
12/DP747390	32297	East	RU4	0	0	0.00%	0.00	0.00	1.16	5.01	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
13/DP747390	31624	East	RU4	0	0	0.00%	0.00	0.00	1.30	5.30	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
14/DP747390	28481	East	RU4	0	0	0.00%	0.00	0.00	1.14	5.14	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
16/DP747390	20454	East	RU4	0	0	0.00%	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
23/DP137415	6996	East	RU4	0	0	0.00%	0.00	0.00	0.03	0.12	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
23/DP552531	22296	East	ENT	0	0	0.00%	0.00	0.00	1.12	4.32	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
17/DP1271571	9487	East	ENT	0	0	0.00%	0.00	0.00	0.99	4.45	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
12/DP1271571	8021	East	ENT	0	0	0.00%	0.00	0.00	1.84	4.58	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
107/DP1271336	34106	East	ENT	0	0	0.00%	0.00	0.00	1.29	4.53	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
104/DP1271336	64910	East	ENT	0	0	0.00%	0.00	0.00	1.71	4.98	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP565512	40241	East	ENT	0	0	0.00%	0.00	0.00	1.41	4.92	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
9/DP747390	20334	East	RU4	0	0	0.00%	0.00	0.00	1.07	2.35	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP530595	74497	East	ENZ	0	0	0.00%	0.00	0.00	1.58	5.15	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
11/DP747390	31474	East	RU4	0	0	0.00%	0.00	0.00	1.27	4.60	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP1212980	135434	East	RU4	0	0	0.00%	0.00	0.00	0.27	1.14	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP530595	22668	East	ENT	0	0	0.00%	0.00	0.00	0.99	1.99	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP747390	20349	East	RU4	0	0	0.00%	0.00	0.00	1.13	2.78	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP226448	22667	East	ENT	0	0	0.00%	0.00	0.00	1.00	1.99	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
8/DP747390	20289	East	RU4	0	0	0.00%	0.00	0.00	0.90	1.71	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
741/DP810111	784625	East	ENT	0	0	0.00%	0.00	0.00	1.25	5.34	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP25759	12144	East	RU4	0	0	0.00%	0.00	0.00	0.48	0.92	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
100/DP747285	18994	East	RU4	0	0	0.00%	0.00	0.00	0.45	1.35	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
108/DP1271336	20161	East	RU2	0	0	0.00%	0.00	0.00	0.66	1.83	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP587135	405754	East	RU2	0	0	0.00%	0.00	0.00	1.40	5.14	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
8/DP226448	22448	East	ENT	0	0	0.00%	0.00	0.00	2.69	4.86	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
103/DP1271336	92733	East	ENZ	0	0	0.00%	0.00	0.00	1.63	5.32	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
12/DP25759	12136	East	RU4	0	0	0.00%	0.00	0.00	0.92	1.72	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
11/DP25759	12139	East	RU4	0	0	0.00%	0.00	0.00	0.83	1.22	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
13/DP25759	12138	East	RU4	0	0	0.00%	0.00	0.00	0.88	1.51	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
14/DP25759	12137	East	RU4	0	0	0.00%	0.00	0.00	0.92	1.34	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
15/DP25759	12137	East	RU4	0	0	0.00%	0.00	0.00	1.27	1.67	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
16/DP25759	12092	East	RU4	0	0	0.00%	0.00	0.00	1.11	4.88	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
17/DP25759	12645	East	RU4	0	0	0.00%	0.00	0.00	1.65	4.80	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP858141	15785	East	RU4	0	0	0.00%	0.00	0.00	2.27	4.85	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
4/DP226448	23406	East	ENT	0	0	0.00%	0.00	0.00	1.24	4.92	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
24/DP25759	12117	East	RU4	0	0	0.00%	0.00	0.00	0.82	1.37	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
232/DP619773	12145	East	RU4	0	0	0.00%	0.00	0.00	0.71	1.14	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
26/DP25759	12143	East	RU4	0	0	0.00%	0.00	0.00	0.19	0.39	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
25/DP25759	12142	East	RU4	0	0	0.00%	0.00	0.00	0.55	1.20	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
31/DP25759	15450	East	RU4	0	0	0.00%	0.00	0.00	1.68	5.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
5/DP226448	22357	East	ENT	0	0	0.00%	0.00	0.00	1.79	4.68	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
8/DP858141	15	East	SP2	0	0	0.00%	0.00	0.00	1.36	2.53	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
22/DP25759	20235	East	RU4	0	0	0.00%	0.00	0.00	0.83	1.45	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
6/DP226448	22233	East	ENT	0	0	0.00%	0.00	0.00	2.56	4.91	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%

Property Details				General Flooding Details			Newly Wetted Depths		Overall Depths		Area of newly wetted depth > (m^2):				% Lot of newly wetted depth >			
Lot Number	Lot Area (m^2)	Relevant Section	Zoning	Wetted Area both in pre and post EDU constrution (m^2)	Area Newly Wet (m^2)	% Area Lot Newly Wet	Average Depth in Lot (m)	Max Depth in Lot (m)	Average Depth in Lot (m)	Max Depth in Lot (m)	10mm	20mm	50mm	100mm	10mm	20mm	50mm	100mm
231/DP619773	12136	East	RU4	0	0	0.00%	0.00	0.00	0.65	0.97	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
21/DP25759	12138	East	RU4	0	0	0.00%	0.00	0.00	0.83	1.28	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
7/DP226448	22702	East	ENT	0	0	0.00%	0.00	0.00	2.24	4.24	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
20/DP25759	12137	East	RU4	0	0	0.00%	0.00	0.00	0.73	1.36	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
19/DP25759	12141	East	RU4	0	0	0.00%	0.00	0.00	1.56	2.01	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
18/DP25759	12033	East	RU4	0	0	0.00%	0.00	0.00	1.96	4.65	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP1087346	15737	East	RU4	0	0	0.00%	0.00	0.00	0.74	2.23	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2/DP553886	20879	East	ENZ	0	0	0.00%	0.00	0.00	2.02	4.84	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
230/DP1134016	110126	East	RU4	0	0	0.00%	0.00	0.00	0.22	0.65	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP858141	25628	East	RU4	0	50	0.20%	0.13	0.20	0.13	0.25	49.99	49.99	43.99	35.99	0.20%	0.20%	0.17%	0.14%
1/DP1090754	6765	East	RU4	0	0	0.00%	0.00	0.00	0.15	0.39	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
16/A/DP2566	6595	East	RU4	0	0	0.00%	0.00	0.00	0.20	0.52	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP1230172	796	East	SP2	0	0	0.00%	0.00	0.00	1.32	3.64	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
101/DP747285	17245	East	RU4	25	208	1.20%	0.06	0.12	0.36	0.92	184.55	160.85	106.29	25.99	1.07%	0.93%	0.62%	0.15%
2/DP996420	782	East	SP2	0	0	0.00%	0.00	0.00	0.84	1.12	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP996420	768	East	SP2	0	0	0.00%	0.00	0.00	0.93	1.83	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP129675	769	East	SP2	0	0	0.00%	0.00	0.00	1.33	1.92	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
18/DP29832	22883	East	RU4	0	0	0.00%	0.00	0.00	0.89	2.94	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
16/DP29832	22341	East	RU4	0	0	0.00%	0.00	0.00	1.20	3.56	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
2622/DP811282	26513	East	RU4	0	0	0.00%	0.00	0.00	0.21	0.94	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
11/DP806494	1293298	East	SP2	0	0	0.00%	0.00	0.00	0.67	2.94	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
15/DP29832	22140	East	RU4	0	0	0.00%	0.00	0.00	1.20	3.71	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
19/DP29832	22572	East	RU4	0	0	0.00%	0.00	0.00	0.66	2.85	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
17/DP29832	23053	East	RU4	0	0	0.00%	0.00	0.00	1.19	3.21	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
20/DP29832	20248	East	RU4	0	0	0.00%	0.00	0.00	0.50	2.19	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
21/DP29832	21379	East	RU4	0	0	0.00%	0.00	0.00	0.45	2.41	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/B/DP2566	60643	East	RU4	0	0	0.00%	0.00	0.00	0.50	1.89	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
14/DP29832	22165	East	RU4	0	0	0.00%	0.00	0.00	1.10	3.88	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
14/DP1268721	13697	East	IN2	0	50	0.36%	0.03	0.10	0.11	0.51	34.99	16.00	10.00	6.00	0.26%	0.12%	0.07%	0.04%
14/A/DP2566	7130	East	RU4	0	0	0.00%	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
27/DP29832	47247	East	RU4	0	0	0.00%	0.00	0.00	1.68	4.49	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
10/DP226448	20310	East	ENT	0	80	0.39%	0.12	0.50	0.16	0.93	79.58	79.58	49.59	41.59	0.39%	0.39%	0.24%	0.20%
26/DP29832	20801	East	RU4	0	0	0.00%	0.00	0.00	1.00	1.83	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
33/DP29832	16483	East	RU4	0	0	0.00%	0.00	0.00	1.66	4.37	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
25/DP29832	20802	East	RU4	0	0	0.00%	0.00	0.00	0.72	1.26	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
31/DP29832	21401	East	RU4	0	0	0.00%	0.00	0.00	1.28	3.21	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
31/DP867457	28308	East	RU4	0	1584	5.60%	0.12	0.40	0.09	0.40	1520.67	1449.13	1249.04	810.82	5.37%	5.12%	4.41%	2.86%
5/DP858141	1680	East	SP2	0	0	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
1/DP256528	2320	East	RU4	0	0	0.00%	0.00	0.00	0.04	0.23	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
55/DP30266	20218	East	SP2	0	451	2.23%	0.16	0.42	0.18	0.42	406.35	375.07	285.09	273.09	2.01%	1.86%	1.41%	1.35%
56/DP30266	20217	East	SP2	0	99	0.49%	0.09	0.28	0.17	0.40	83.55	54.84	39.84	39.84	0.41%	0.27%	0.20%	0.20%
11/DP226448	20944	East	SP2	0	64	0.31%	0.11	0.38	0.13	0.38	64.23	64.23	41.82	25.73	0.31%	0.31%	0.20%	0.12%
11/DP860338	26893	East	ENT	0	0	0.00%	0.00	0.00	0.18	0.24	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%