ARCADIS Design & Consultancy for natural and built assets

4653 – 4691 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

Hydraulic Impact Assessment

8TH DECEMBER 2023

Incorporating Hyder

CONTACT

DARLAN CASTRO
Principal Engineer

T + 61 7 5503 4822
M + 61 410 720 757
E darlan.castro@arcadis.com

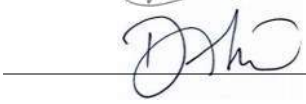
GARY ELLIS
Technical Director

T + 61 7 3337 0859
M + 61 41 817 290
E gary.ellis@arcadis.com

Arcadis
Level 35, 111 Eagle Street
Brisbane City, QLD 4000

MACLEAN ESTATES PTY LTD
4653 – 4691 MOUNT LINDSAY HIGHWAY, NORTH MACLEAN

Hydraulic Impact Assessment

Author	Darlan Castro	
Checker	Gary Ellis	
Approver	Darlan Castro RPEQ 19918	
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REVISIONS

Revision	Date	Description	Prepared by	Approved by
01	08/07/2022	Draft Issue for Review	DC	DC
02	18/07/2022	Issue to EDQ	DC	DC
03	25/01/2023	Information Request Response	DC	DC
04	13/03/2023	Revised Lot Layout	DC	DC
05	11/10/2023	Revised Site Access	DC	DC
06	08/12/23	Revised interim site-east catchment parameters	DC	DC

CONTENTS

APPENDICES

1 EXECUTIVE SUMMARY

Arcadis has been engaged by Maclean Estates Pty Ltd to prepare a Hydraulic Impact Assessment (HIA) report for the proposed industrial development, situated at 4563 - 4691 Mount Lindesay Highway, North Maclean. The site is located in the Greater Flagstone Priority Development Area located within the Logan City Council local government area. The proposed development involves the reconfiguration of one lot into two lots nominated for 'Industry' and 'Environment Conservation' uses.

The purpose of this HIA is to assess the impact of the proposed development against the existing condition at the areas immediately downstream and upstream of the site. The assessment considers the development proposal and if the works would cause corresponding changes to the existing flood behaviour and thereby would cause any actionable nuisance. The assessment included all rainfall events from 50% to a 1% Annual Exceedance Probability (AEP).

In order to determine any potential impacts Arcadis has created a TUFLOW model to represent the following scenarios:

1. Existing Condition – The site discharge prior to development and surrounding external catchments; existing LiDAR information used to generate the terrain file with survey data collected on land areas to the south of the site involving recent earthworks.

2. Developed Condition – Proposed development including detained stormwater discharges and surrounding external catchments; proposed earthwork design tin and existing LiDAR for surrounding external catchments used to generate the terrain file with survey data collected on land areas to the south of the site involving recent earthworks.

In assessing the area constraints and the flood characteristics surrounding the site, Arcadis assigned a 2m grid size to the TUFLOW model, with resulting increased accuracy of the results in flood sensitive areas compared to larger grid sizes.

The model prepared as part of this study has been used to assess the development in the following events: 50%, 20%, 10%, 5%, 2%, and 1% AEP. Results from the model were assessed for peak water surface level afflux between the existing and developed scenarios.

This report presents the methodology and results of a flood modelling assessment which has included the analysis of the impacts of the proposed development in comparison to the existing scenario. In particular, this assessment has focused on the impact immediately upstream and downstream of the site where complex flood behaviours are apparent, with flows currently draining through private properties.

Results indicate that the proposed development will generally improve flood conditions downstream of the site by applying the reduction of site stormwater discharge via the proposed detention basin and augmenting the proposed earthworks to allow adequate flood storage and conveyance through the site.

1.1 Revision 03

The Hydraulic Impact Assessment revealed that the previously proposed combined detention and bioretention basin proposed for the western catchment caused adverse flood impacts upstream of the proposed development. As such, this report (Revision 3) proposes a modified development footprint with adjusted hydrology inflow into the TUFLOW model.

Further to this, the design works progression on the development land directly north of the site and as discussed in section 3.3.1 of this report, a combined modelling solution has been adopted to optimise the flood outcomes and ensure a synergised approach to managing the external catchment flows.

The proposed TUFLOW model includes the proposed earthworks, stormwater conveyance channels, stormwater detention devices and 1-D hydraulic control structures from the development land to the north in addition to the proposed works over the site in the developed case model to fully capture the resultant flood outcomes from the individual development of the sites whilst improving the collection

and discharge of stormwater. Finally, additional survey data has been collected on land areas to the south of the site involving recent earthworks and determining smaller pipe connections which convey stormwater through to the development site from the upstream overland flow path.

1.2 Revision 04

The proposed layout has been amended to reflect the two proposed lots with an easement, road reserve and service road resumption. The HIA has been updated accordingly.

1.3 Revision 05

The proposed layout has been amended to reflect the proposed changes to the site access from the service road.

1.1 Revision 06

Revision 6 of this report has been prepared in response to EDQ requirements to assess the site in its interim scenario. Specifically, modification to the site's eastern catchment, which will eventually control stormwater discharge through underground tanks. This section of the site has been modelled to simulate temporary stormwater control structures associated with ES&C measures.

2 INTRODUCTION

Arcadis has been engaged by Maclean Estates Pty Ltd to prepare a Hydraulic Impact Assessment (HIA) for a Reconfiguration of Lot (ROL) application for the proposed industrial development situated at 4563 - 4691 Mount Lindesay Highway, North Maclean. The site is situated within the Greater Flagstone Priority Development Area (PDA) located within the Logan City Council (LCC) local government area.

The proposed development involves the reconfiguration of the existing lot into two lots:

- Proposed Lot 1: 17.438ha with an 'Industry' land use;
- Proposed Lot 2: 16.592ha with an 'Environment and Conservation' use.

An additional 1.4015ha land strip along the eastern site boundary is to be dedicated to the Department of Transport and Main Roads (DTMR) / Council for the widening of Mount Lindsay Highway / extension of the service road. This has been referred to as the "Service Road Resumption".

A second 0.553ha land strip situated between Proposed Lot 1 and the Service Road Resumption is to be dedicated as road reserve.

Finally, a third 0.470ha land strip along the south-east of Proposed Lot 1 forms an easement.

The proposed lot reconfiguration is shown in Figure 2-1, below.

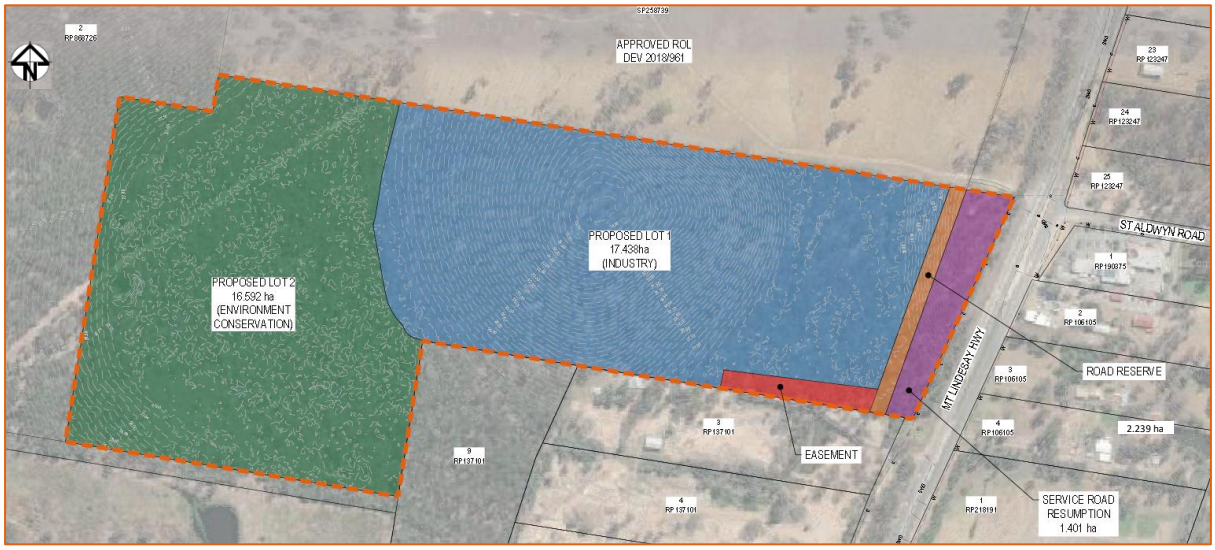


Figure 2-1 - Proposed Reconfiguration of Lot Layout (Please also refer Place ROL Plan)

The following report demonstrates the proposed development will be constructed and operated in accordance with the Water Sensitive Urban Design (WSUD) requirements of Council, the Queensland State Planning Policy (SPP 2017), the Queensland Development Code, the Queensland Urban Drainage Manual (QUDM), Economic Development Queensland (EDQ) PDA guidelines and the Environmental Protection (Water) Policy (2009) with respect to the attenuation of stormwater runoff from both quality and quantity perspectives.

3 SITE CHARACTERISTICS

3.1 Site Description

The subject site is located within Logan, South-East Queensland, Australia on the following lot:

- Lot 1 on RP113251 (4653-4691 Mount Lindesay Highway, North Maclean)

The site in generally bounded by the following co-ordinates (GDA94 / MGA zone 56)

- North-West: 500713, 6928697
- South-East: 501553, 6928285

3.2 Existing Land Usage

The subject site is currently occupied by trees and grassed open areas and adjoins 4499-4651 Mount Lindesay Highway to the north which has an approved ROL decision (DEV 2018/961). The site currently has direct property frontage to Mount Lindesay Highway to the east and predominantly cleared land to the west. An operational works approval for earthworks has been obtained for the land to the south and is currently underway.

A MEDQ Approved context plan published 10 September 2021 includes the subject site. The site is approved for specific land use "*Industry and Business Zone*" with overlay for indicative future bio-diversity corridor. An existing High Voltage electrical easement has been identified running through the site into the existing rural residential dwelling to the north. It is understood that as part of the adjacent approval to the north, this electrical easement is set to undergo works and the electricity supply will be temporarily switched off. Figure 3-1 below shows the site locality plan in relation to the discussed items above.

Figure 3-1- Development Locality Plan (Source: NearMap, June 2022)

3.3 Existing Topography and Site Drainage

Based on LiDAR data obtained for the site, the natural site generally grades in radial directions from the existing highpoint located within the centre of the site (approximately RL36m) to low lying land (approximately RL26) in the western and eastern portions of the site which form a natural overland flow path for the external upstream catchments. Grades vary between approximately 2.7% towards the eastern portion of the overland flow path and 3.39% towards the western portion of the overland flow path.

The external upstream catchments are shown in Figure 3-2.

Figure 3-2 - Existing External Catchments (Image Source: NearMap 2022)

As can be seen in Figure 3-2, above, the overland flow path enters the site across the northern boundary in the western portion of the site and exits the site before re-entering across the southern boundary in the eastern portion of the site. The overland flow path is fed by an extensive area external to the site.

Figure 3-3 shows the proposed earthwork levels across the site. As seen in the figure, the existing mound is to be flattened with the remaining levels lifted to achieve a relative consistent slope and level across the site. It is proposed that the eastern portion of the site grades towards the north boundary of the eastern section of the overland flow path. No earthworks are proposed in the western portion of the site, thus the existing flow path and grading shall remain as per the existing case.

The nominated discharge points for the site are indicated by thick red lines along the property boundary. Proposed Lot 1 has been shaped to allow for the conveyance of flows from the overland flow path through the site, without inundating the developable land.

Detailed earthworks plans have been included within the engineering plans enclosed with Appendix B.

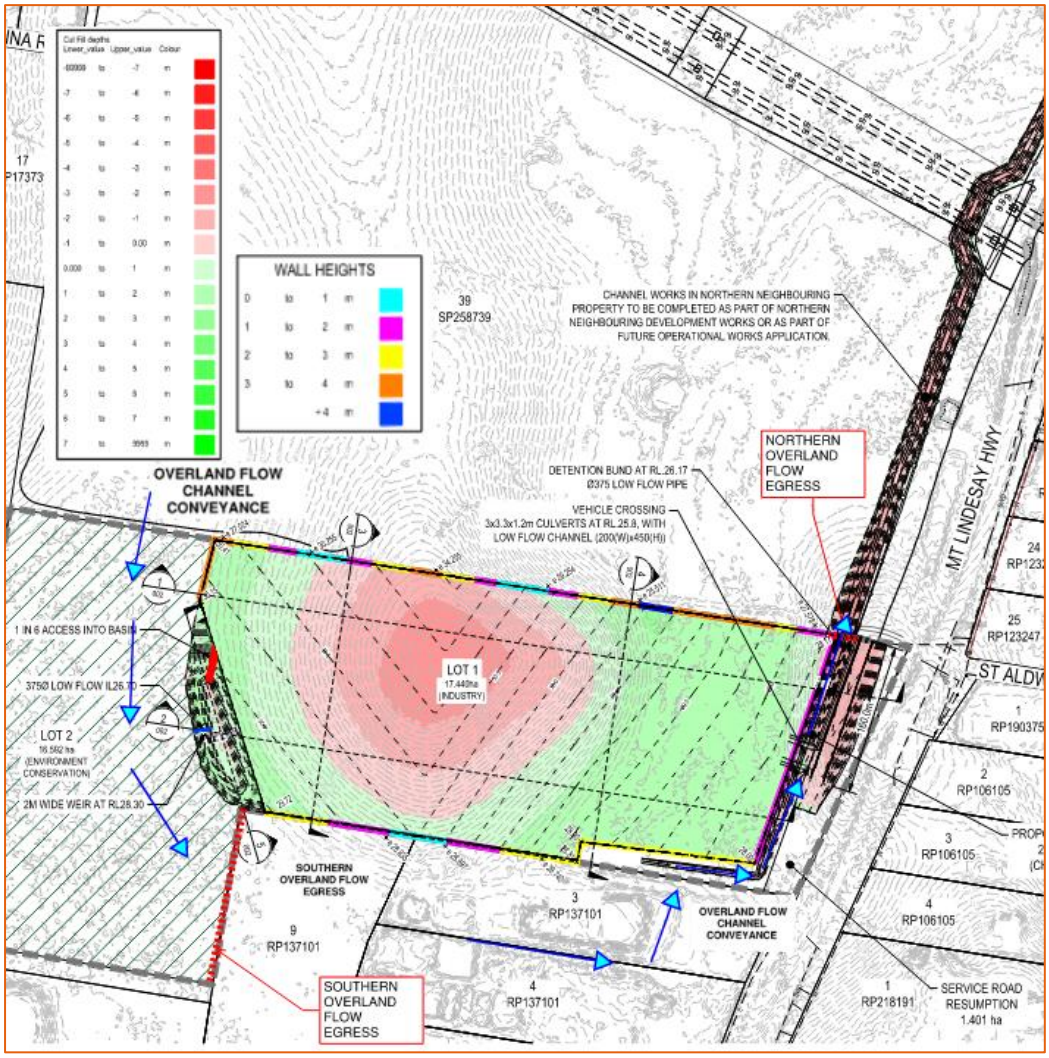


Figure 3-3 – Concept Proposed Bulk Earthworks Layout

3.3.1 Neighbouring Approvals

Figure 3-4 shows the location of adjacent approval (DEV 2018/961) in relation to the proposed development site. The approved site is described as 4499-4651 Mount Lindesay Highway, North Maclean, with a real property description of Lot 39 on RP25373. It is understood that this approval is for a PDA Development Permit for a reconfiguring a lot – 1 lot into 4 lots with associated roads and open space. As part of this approval Operational Works Approvals have been awarded, these works include:

- Construction of a service road along the western side of the Mount Lindesay Highway accessed via the existing Crowson Lane / Mount Lindesay Highway off ramp roundabout;
- Construction of a trunk rising sewer main running through the existing electrical main of the proposed development, ending at Greenbank Road.
- Connection to existing potable water mains along Crowson Lane and the Mount Lindesay Highway
- Proposed stormwater infrastructure;
- Construction of internal roads; and

- Proposed connection to existing underground electrical and telecommunication services along Crowson Lane and the Mount Lindesay Highway.

Further details on the works associated with the adjacent approval can be found within the relevant Decision Notice attached within Appendix D.

Figure 3-4 – Location of Neighbouring Approval

4 HYDROLOGICAL ASSESSMENT

Arcadis has undertaken a hydrological assessment to ensure the flows discharged from the proposed development does not exceed pre-development flow rates.

4.1 Temporal Patterns

Rainfall Intensities Frequency Duration data were obtained from The Bureau of Meteorology (http://www.bom.gov.au/water/designRainfalls/revised-ifd/?year=2016). The Latitude and Longitude of used for the site is summarised in Table 4-1 below.

Table 4-1 Site Latitude & Longitude

Parameter	Value
Latitude	-27.7679
Longitude	153.0109

4.2 Model Condition

Two hydrologic conditions have been modelled to appropriately demonstrate the stormwater quantity, detention and hydraulic objectives:

1. **Existing Condition** – The site discharge prior to development and surrounding external catchments; existing LiDAR information used to generate the terrain file with survey data collected on land areas to the south of the site involving recent earthworks.
2. **Developed Condition** – Proposed development including detained stormwater discharges and surrounding external catchments; proposed earthwork design tin and existing LiDAR for surrounding external catchments used to generate the terrain file with survey data collected on land areas to the south of the site involving recent earthworks.

4.3 Catchments

All catchments have been assessed at their respective outlet locations. Refer to Figure 4-1 for a graphical representation of the existing catchments and Figure 4-2 for the proposed catchments.

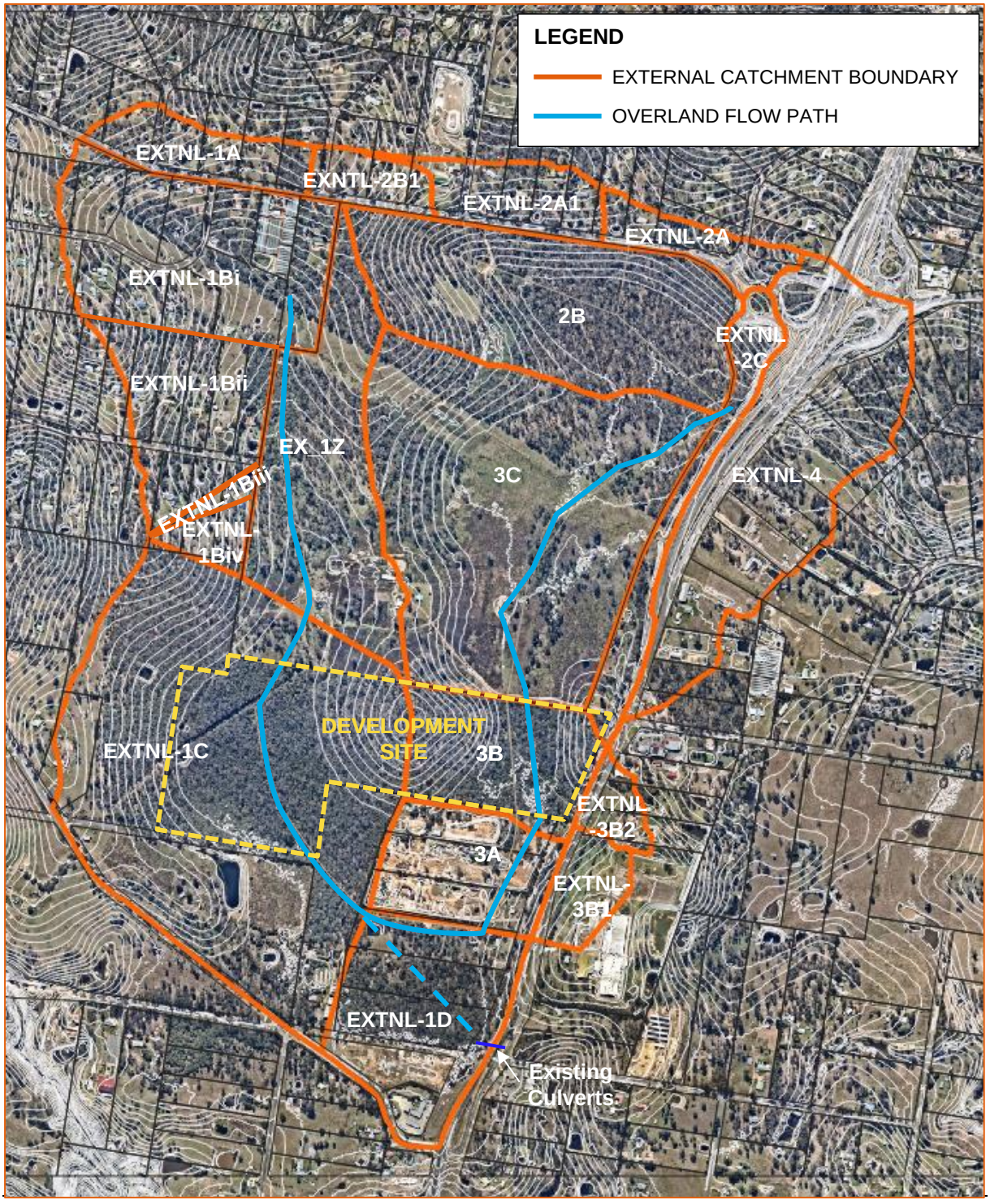


Figure 4-1: Existing Catchment Plan

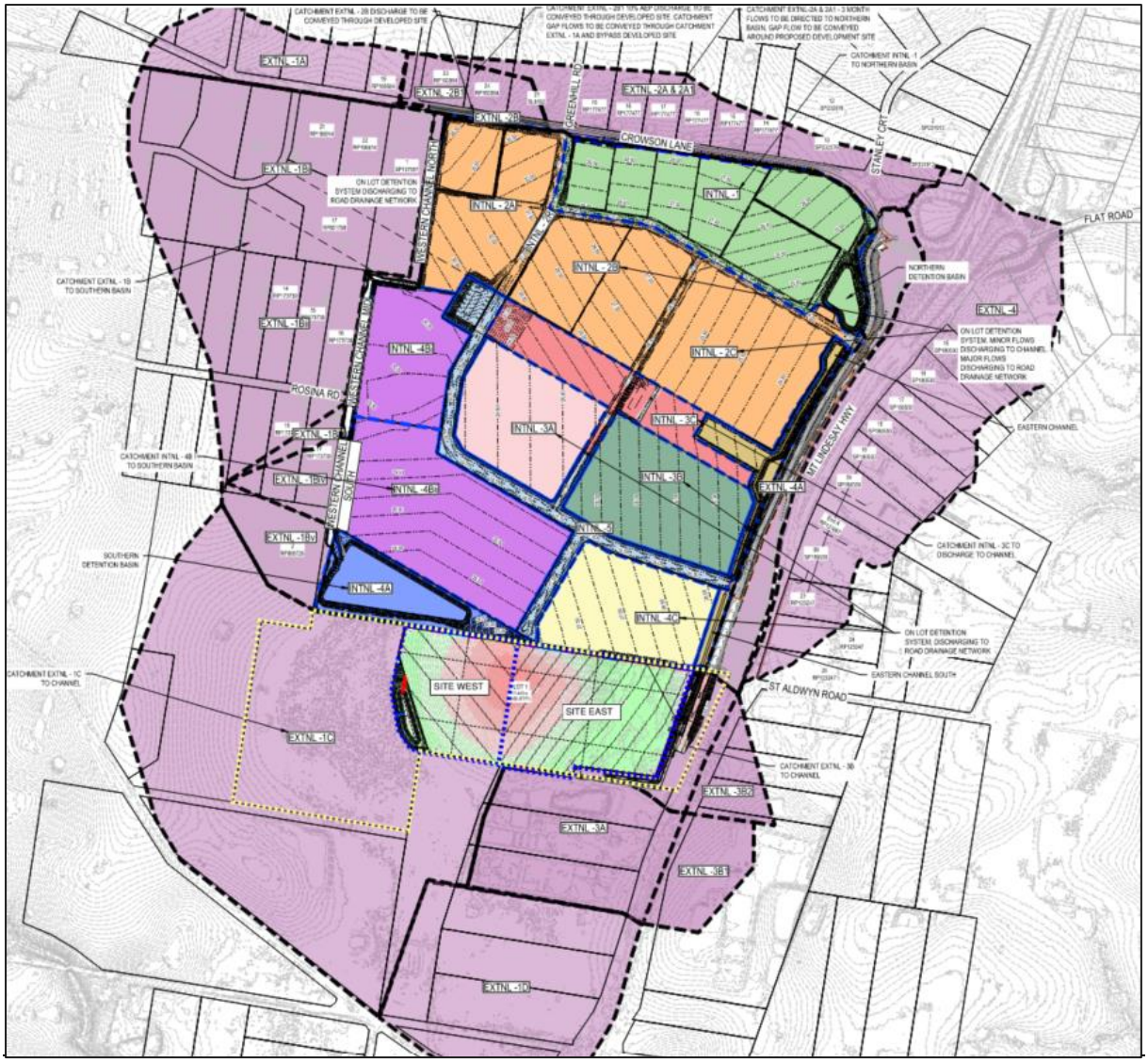


Figure 4-2: Developed Catchment Plan

A DRAINS model has been developed using a combination of the RAFTS and ILSAX methods to determine the development's hydraulic/ hydrological impacts in the context of the undeveloped case. ILSAX was used to model the developed catchment with RAFTS used to model the relatively undeveloped existing and external catchments. Table 4-2 and 4-3 below illustrate the catchment details used within DRAINS for the purpose of the stormwater hydrology assessment.

Table 4-2 Catchment Details - Existing

Scenario	Area (ha)	Impervious (%)	Slope (%)	Manning's Value (n)
EXTNL-1A	7.224	1	2.65	0.05
EXTNL-1Bi	23.636	10	2.49	0.05
EXTNL-1Bii	16.974	5	4.19	0.05
EXTNL-1Biii	0.9034	5	4.22	0.05
EXTNL-1Biv	3.3656	5	4.44	0.05
EXNL-1C	74.256	0	1.26	0.1
EX_1Z	25.142	0.5	0.98	0.055
EXTNL-1D	19.78	10	0.26	0.055
EXTNL-2A	5.218	2	2.01	0.045
EXTNL-2A1	7.434	2	2.01	0.055
2B	32.260	0	2.05	0.060
EXTNL-2B1	4.077	2	3.71	0.045
EXTNL-2C	8.764	10	3.552	0.050
EXTNL-3A	12.15	0	1.64	0.055
EXTNL-3B	14.09	0	2.91	0.1
EXTNL-3B1	4.83	25	2.17	0.035
EXTNL-3B2	2.81	5	1.56	0.04
3C	55.530	1	1.62	0.050
EXTNL-4	34.632	25	3.76	0.040

Table 4-3 Catchment Details - Developed

Catchment	Area (ha)	Impervious (%)	Slope (%)	Mannings 'n'
EXTNL-1A	7.224	1	2.65	0.050
EXTNL-1Bi	23.636	10	2.48	0.050
EXTNL-1Bii	16.974	5	4.19	0.050
EXTNL-1Biii	0.9034	5	4.22	0.050
EXTNL-1Biv	3.3656	5	4.44	0.050
EXTNL-1Bv	4.2025	5	4.02	0.050
EXTNL-1C	58.266	0.5	1.26	0.100
EXTNL-1D	19.780	10	0.26	0.055
EXTNL-2A	5.218	2	2.01	0.045
EXTNL-2A1	7.434	2	2.01	0.055
EXTNL-2B1	2.0703	2	3.71	0.045
EXTNL-1C (Crowson Lane)	2.007	90	3.14	0.015
EXTNL-2C	8.764	10	3.55	0.050
EXTNL-3A	12.15	0	1.64	0.055
EXTNL-3B	3.780	5	0.45	0.100
EXTNL-3B1	4.83	25	2.17	0.035
EXTNL-3B2	2.81	5	1.56	0.040
EXTNL-4	34.632	25	3.76	0.040
Site-east	10.031	0	0.9	0.040
Catchment	Area (ha)	Impervious (%)	Impervious Time of Concentration (minutes)	Pervious Time of Concentration (minutes)
Site-west	6.987	90	5	5
INTNL-1	17.052	85	15	15
INTNL-2A	8.918	90	10	10
INTNL-2B	8.821	90	10	10
INTNL-2C	10.478	90	10	10
INTNL-2R	3.472	75	20	20

Catchment	Area (ha)	Impervious (%)	Slope (%)	Mannings 'n'
Catchment	Area (ha)	Impervious (%)	Impervious Time of Concentration (minutes)	Pervious Time of Concentration (minutes)
INTNL-3A	7.740	90	10	10
INTNL-3B	9.165	90	10	10
INTNL-3C	6.271	90	17	17
INTNL-4Bi	6.5529	75	15	24
INTNL-4Bii	13.9671	75	15	24
INTNL-4C	7.916	90	10	10
INTNL-5	5.958	75	20	20
Catchment	Area (ha)	Impervious (%)	Slope (%)	Mannings 'n'
INTNL-4A	5.529	0	1	0.035
Channel South	0.5458	0	0.5	0.035
Channel North	2.9041	0	0.5	0.035

4.4 Detention System Design

The proposed detention systems evaluated in this report have been modelled according to the requirements of 4653-4691 Mount Lindsay Highway, North Maclean, Site-based Stormwater Management Plan, Revision 9, prepared by Arcadis (report number EAG003-30139050-AAR-09 4653-469). This report should be referred to for details on these structures.

5 FLOODING AND CONVEYANCE MANAGEMENT

5.1 Flood Management

A review of the LCC Flood Hazard Trigger Overlay Map OM-05 has indicated that the subject site is not affected by flooding.

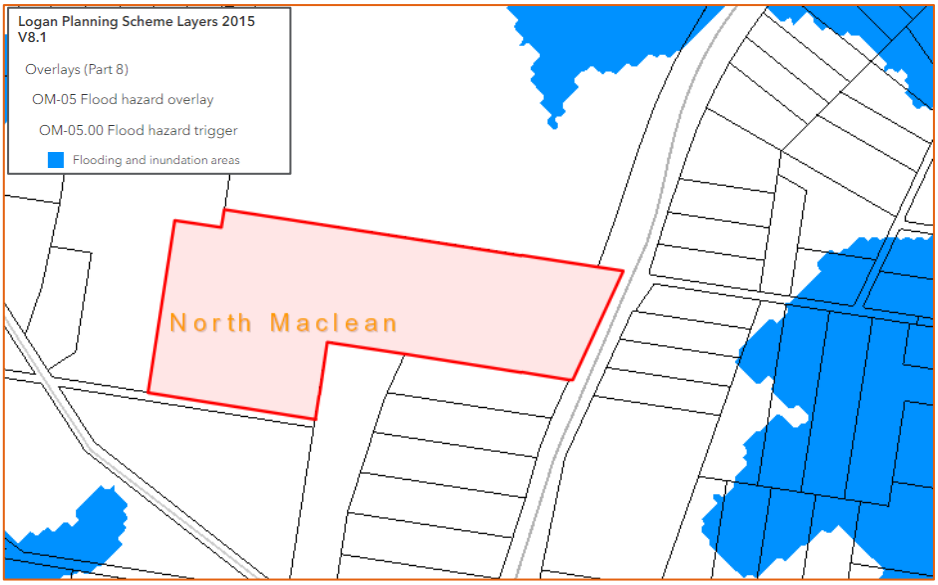


Figure 5-1 Logan City Council Overlay Map OM-5 – Flood Hazard

5.2 Conveyance Management

According to Logan City Council Overlay Map OM-14 “Waterway Corridors and Wetlands Trigger”, a minor waterway traverses the site (previously referred to in this report as an overland flow path). Two major wetland areas are also mapped within the site boundaries. The western wetland area is situated within proposed Lot 2 which is dedicated as an environmental conservation area. The eastern wetland area is situated within proposed Lot 1; however, the developable portion of Proposed Lot 1 has been configured to provide a vegetated drainage channel to convey the external stormwater flows. This area will form part of the proposed regional flooding strategy and be used for conveyance of flows to the downstream development. The proposed corridor characteristics have been designed to match existing conditions as much as practically possible. Refer to Section 6 of the report for further details.

Figure 5-2 Logan City Council Overlay Map OM-14 – Waterway Corridors and Wetlands

6 HYDRAULIC ASSESSMENT

6.1 Methodology

The hydraulic assessment has been undertaken to evaluate how the proposed on-site detention devices and proposed development pad will manage flows being conveyed through the overland flow path.

The hydraulic assessment of the proposed overland flow path required a detailed understanding of the hydraulic and hydrological characteristics under a series of storm events.

To assess the complex flood behaviour around the site a TUFLOW two-dimensional flood model has been identified as the preferred method to accurately determine any impacts caused by the proposed development.

The hydraulic and hydrological impact assessment undertaken via a two-dimensional model presents more accurate results through utilising a grid to represent the catchment topography and complex existing flow distribution. The results are particularly relevant around the inflow and outflow locations of the site, determining peak flow rates, the extent of flood inundation as well as flow distribution.

6.2 Objectives

The primary objective of this assessment is to ensure the site's proposed stormwater management will not significantly change the flood behaviour against the existing condition at the areas immediately downstream and upstream of the site. The assessment considers the changes and if they would cause any actionable nuisance to existing private properties.

6.3 Model Set Up and Adopted Data

A TUFLOW 2D flood model has been created to assess any changes in flood behaviour caused by the proposed development as well as the conveyance of external flows through the site and flood impacts upstream and downstream of the site. The following sections provide discussion on the adopted inputs into the TUFLOW model.

6.3.1 Hydrology

Due to intrinsic complexity of 2D modelling and particularly modelling time, a DRAINS rainfall runoff model was used to determine the hydrograph for each Annual Exceedance Probability (AEP) event: 50%, 20%, 10%, 5%, 2% and 1% AEP. The results for this model were then used to give an indication of which duration would be critical at the assessment point (i.e. northern site boundary) however, the routing of flows through the catchment and determination of median temporal pattern has been undertaken in TUFLOW.

6.3.1.1 Determination of Critical Durations and Median Temporal Pattern

TUFLOW was run initially for the storm durations ranging from 60 minutes to 540 minutes using all 10 temporal patterns based on the results of the DRAINS modelling. Although the critical durations throughout the model were found to vary, at the upstream and downstream portions of the model, the critical durations would vary from 90min to 540min in the existing and developed case. As such, the model was then run for all these durations to determine potential impacts.

Once the critical durations were selected, the simulation output was processed as follows:

- For each storm duration, the median flood grid was extracted from the 10 temporal pattern flood grids using the TUFLOW utility asc_to_asc.exe, -statMedian switch.
- The median flood grids for each of the simulated durations were combined to form the maximum median flood grid for each AEP storm event (max max).

6.3.2 Boundary Conditions

The downstream boundary condition has been set approximately 1460m to the north of the site boundary, downstream of the Mount Lindesay Highway drainage crossing (west to east). This set up has allowed the system to be generally free discharging with the main hydraulic control being the culvert crossing beneath Mount Lindesay Highway. It is noted however that an existing access road adjacent to the site boundary acts like a ‘weir’ in the existing and developed case allowing additional ponding within the site.

Finally, a second crossing exists to the south of the site beneath the Mount Lindesay Highway which generally only activates for the external catchment flow contributing to the overland flow path through the site in the larger storm events. A second boundary has been setup downstream of this culvert crossing to mimic loss of flood water from the overland flow path into this minor secondary flow direction.

6.3.3 Grid Size

A 2m grid has been adopted in the model to accurately represent the hydraulic features of the existing and proposed overland flow path.

6.3.4 Manning’s Values

The Manning’s values adopted as part of this assessment are provided in Table 6-1.

Table 6-1 Manning’s Values

Land use	Manning’s n
Medium Scrub	0.055 – 0.06
Dense Vegetation	0.1
Scattered Scrub	0.05

Land use	Manning's n
Open Ground (sparce grass)	0.027
Road	0.018

6.3.5 Existing Downstream Drainage Infrastructure

Northern Mount Lindesay Highway drainage crossing (west to east) – 4 x 1.8m high x 2.1m wide RCBC;

Southern Mount Lindesay Highway drainage crossing (west to east) – 2 x 0.6m high x 1.2m wide RCBC.

6.3.6 Existing Upstream Drainage Infrastructure

Mount Lindesay Highway drainage crossing (east to west) – 900mm dia RCP;

Crowson Lane West (north to south) – 1200mm dia RCP;

Crowson Lane East (north to south) – 1300mm dia RCP;

Crowson Lane East (north to south) – 900mm dia RCP;

Private drainage infrastructure in the southern lot – 300mm dia RCP, 375mm dia RCP, 2x525mm dia RCP and 1 x 0.25m high x 0.7m wide RCBC.

6.3.7 Existing Model Scenario

The existing terrain has been represented based on LiDAR information for the area. Aerial photos as well as site visits have been used to determine the existing condition roughness. Additional survey data has been collected on land areas to the south of the site involving recent earthworks and determining smaller pipe connections which convey stormwater.

6.3.8 Developed Model Scenario

Given the design works progression on the development land directly north of the site and as discussed in section 3.3.1 of this report, a combined modelling solution has been adopted to optimise the flood outcomes and ensure a synergised approach to managing the external catchment flows.

The proposed TUFLOW model includes the proposed earthworks, stormwater conveyance channels, stormwater detention devices and 1-D hydraulic control structures from the development land to the north in addition to the proposed works over the site in the developed case model to fully capture the resultant flood outcomes from the individual development of the sites whilst improving the collection and discharge of stormwater.

Reference should be made to report EAG001-30109334-AAR-09 - 4499-4651 Mount Lindesay SBSMP for further details and description of the development works to the north of the site.

6.3.9 Model Blockage Values

Both existing and developed scenarios incorporate 1-D hydraulic structures. As described in QUDM, blockage values have then been applied to all road culvert crossings and hydraulic controls to a value of 25%, across both existing and developed modelling scenarios.

6.4 Assumptions and Limitations

6.4.1 Key Limitations

6.4.1.1 LiDAR Ground Survey

The model topography has been based on LiDAR survey information (2018) provided in digital format with a 1m grid resolution. Additional LiDAR data and ground truthing survey have been undertaken on land to the south of the development site to ascertain recent earthworks activities and appropriately collect 1-D hydraulic structure information for inclusion into the model.

It is recommended this report be reviewed and amended as required in conjunction with the detailed design once detailed survey of the site and its boundaries is obtained.

6.4.1.2 Climate Change

Climate change has not been considered in this assessment.

6.4.1.3 Sensitivity

No sensitivity assessment for blockages or roughness have been considered in this assessment.

6.4.2 Key Assumptions

6.4.2.1 Proposed Development

This report has made assumptions on finished surface levels and roughness values of particular land use areas to show that a solution is available for the proposed development. In the event the development changes in any form or further applications are lodged with EDQ, this report **must** be updated to reflect the changes made to the hydraulic conveyance capacity of the development site.

6.5 Model Results

The primary assessment of flood impacts has been undertaken using a comparison of the peak water surface levels resulting from the proposed development stormwater management and earthworks against the existing scenario terrain, under a variety of flood events. Appendix C of this report shows existing and developed scenario peak water depth ranges along with peak water surface level changes for a range of flood events (50%, 20%, 10%, 5%, 2% and 1% AEP). Additionally, the results section includes peak velocity maps for the existing and proposed scenarios.

6.5.1 Flood Depths

The project site hydraulic properties have been designed with the aim of minimising changes in flood behaviour both upstream and downstream of the site. Maximum depths in the existing case 1% AEP storm event are seen to reach approximately 1m adjacent to Mount Lindesay Highway.

Immediately downstream of the site flood depth in the 1% AEP reaches approximately 0.6m in the existing case.

The proposed earthworks changes create a concentrated overland flow channel crossing the site from south to north and linking to the proposed channel as part of the currently under assessment development proposal. Depth within the channel within the bounds of the site reach approximately 1.5m in the 1% AEP upstream of the road crossing in the north-east corner of the site.

below, provide the 1% AEP peak flood depths for both existing and developed cases respectively.

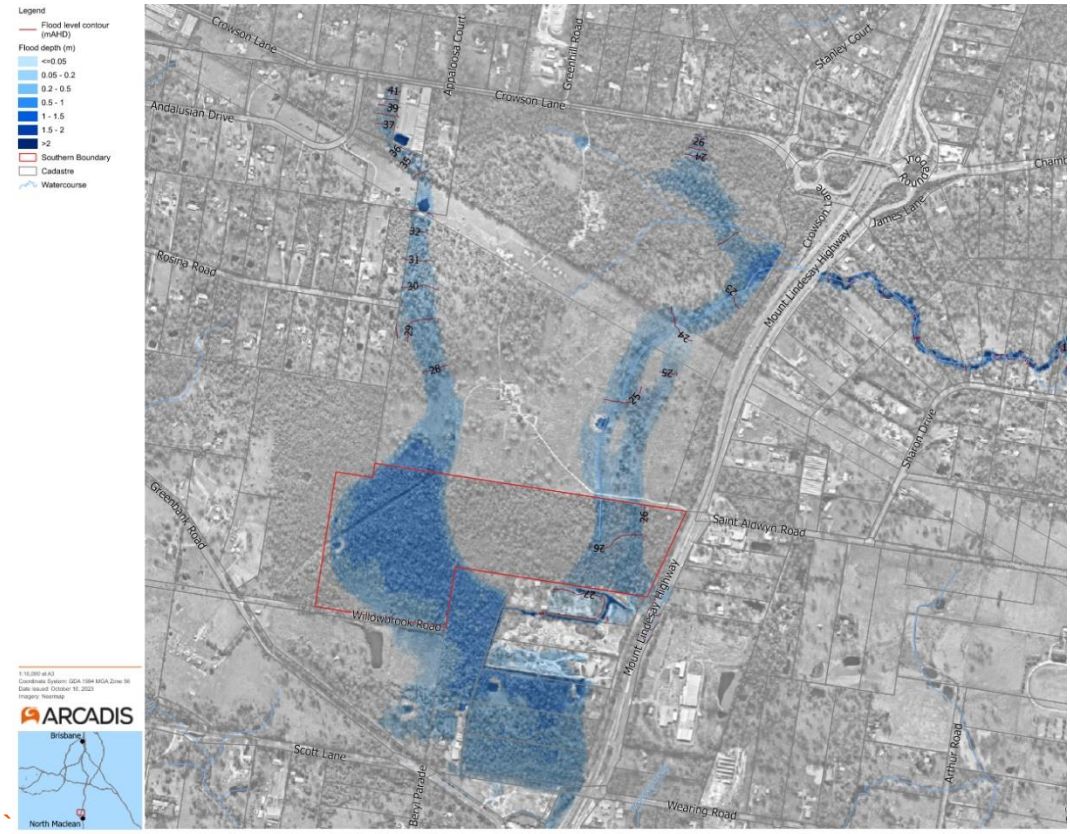


Figure 6-1 - Existing Peak Water Depth - 1% AEP

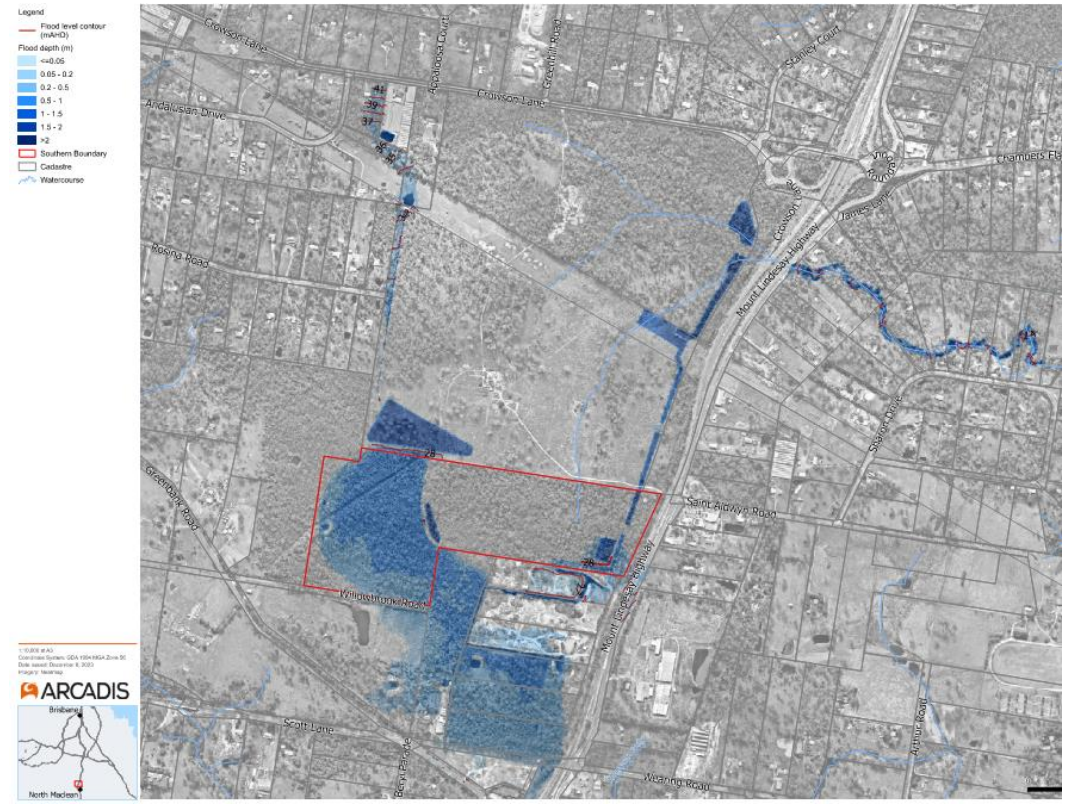


Figure 6-2 - Developed Peak Water Depth - 1% AEP

6.5.2 Peak Water Surface Level Change

Modelling results show that generally, the existing flood behaviour outside of the site is maintained as per the existing condition. Changes in the water surface levels are generally positive with a reduction in levels in the proposed case scenario. Increase in water surface levels are contained to the site boundary, where earthworks are proposed.

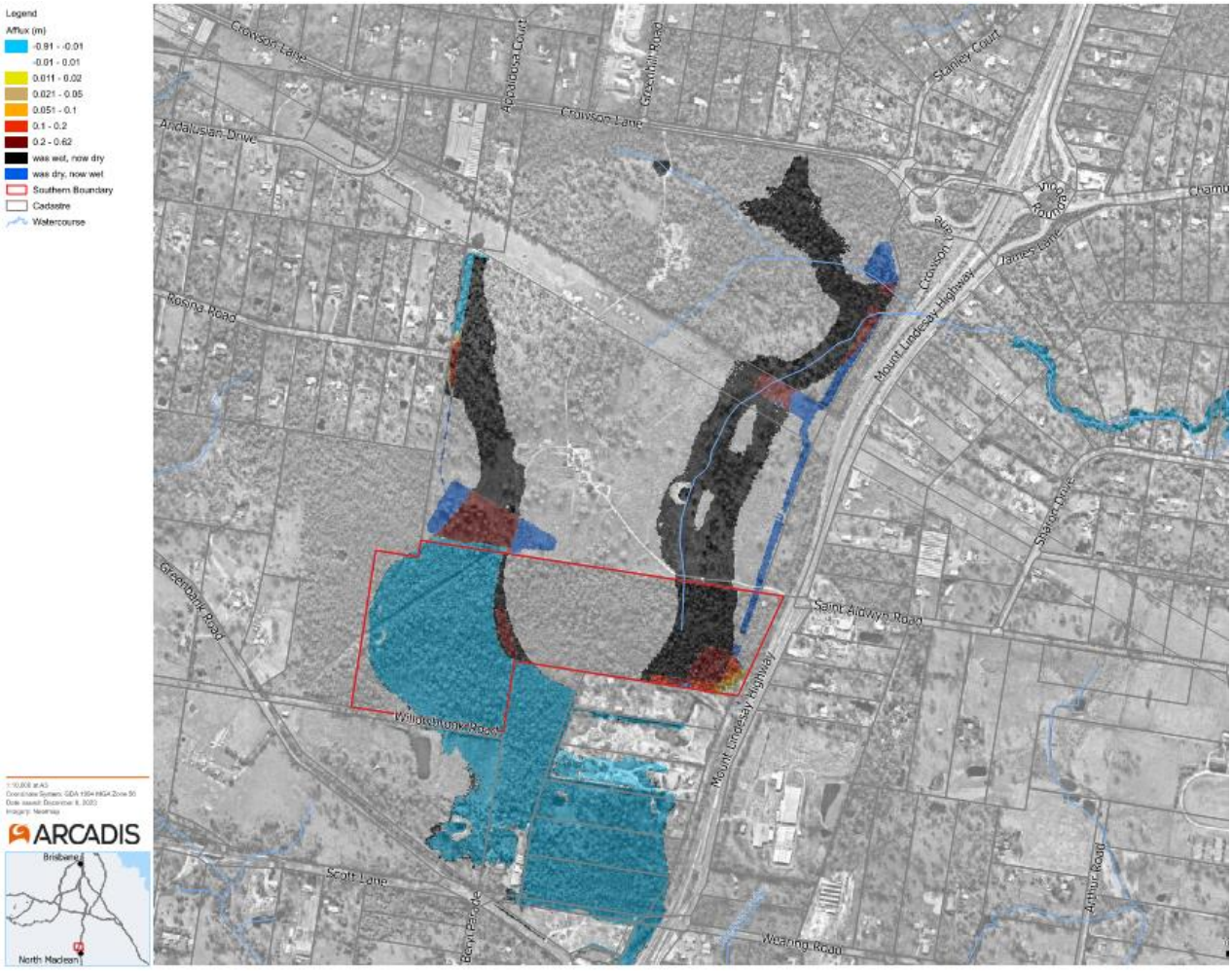


Figure 6-3 - Developed Peak Water Surface Level Change - 1% AEP

6.5.3 Peak Velocities

Modelling results are presented in Appendix C to show the peak velocities reached within the assessment area. Figure 6-4 and Figure 6-5 below shows an extract of the 1% AEP flood event peak velocity, with the results indicating that velocities are generally below 1m/s and unchanged upstream and downstream of the site. Within the proposed overland flow channel created by the earthworks, velocities are higher than existing case, however still below 0.6m/s.

Figure 6-4 - Existing Peak Water Velocity - 1% AEP

Figure 6-5 - Developed Peak Water Velocity - 1% AEP

No significant change in flow velocity is observed outside of the site. Modelling results are presented in Appendix C showing change in velocity for all events up to the 1% AE.

Figure 6-6 – Change in Flow Velocity - 1% AEP

6.6 Objective Discussion

With the increased fraction impervious area resulting from the proposed industrial development, a large detention system is required to ensure the stormwater runoff discharged from the proposed development site does not exceed pre-development flows. Detention devices have been designed and proposed on the western and eastern catchments of the development pad, discharging to the overland flow path which meanders through the site and lands to the south and eventually to the north.

The above hydraulic investigation has demonstrated that suitable measures can be included in the design of the proposed development, to ensure that there is no increase in peak 1% AEP discharge being directed off-site to existing downstream infrastructure and no actionable nuisance caused to neighbouring properties as a result of the development.

Finally, it should be noted that the inclusion and modelling of a master planned approach has created catchment wide synergies for the ultimate stormwater and flood management scheme, integrating the detention devices and discharge points across adjoining sites for both upstream and downstream benefit. Specifically, the combined modelling approach has resulted in efficiencies through maximum utilisation of combined flood storage and a linked conveyance system as opposed to introducing separate and potentially redundant infrastructure to service the individual sites.

7 SUMMARY AND RECOMMENDATIONS

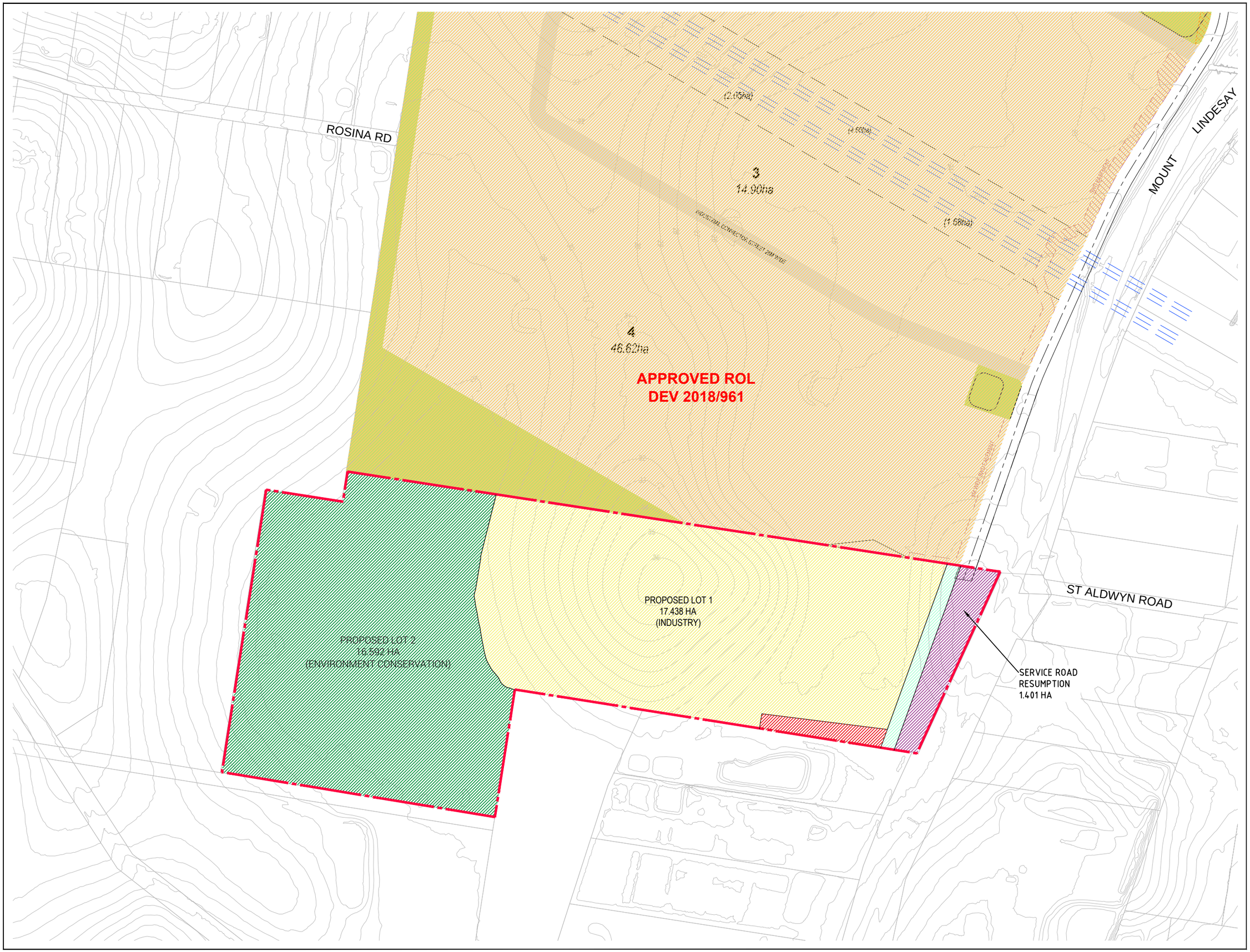
This report has presented the methodology and results of a flood modelling assessment which has included the analysis of the impacts of the proposed development in comparison to the existing scenario. In particular this assessment has concentrated on the impact immediately upstream and downstream of the site where complex flood behaviour exists.

To undertake the assessment of the hydraulic conveyance changes as a result of the proposed development, Arcadis has created a TUFLOW model using approved development conditions to the north of the site. The assumptions and limitations associated with the modelling exercises undertaken are highlighted in this report and the subsequent results are summarised as follows.

Results indicate that the proposed development will generally improve flood conditions downstream of the site by applying the reduction of site stormwater discharge via the proposed detention devices.

APPENDIX A

Place Design Group Proposed ROL Plan



place design group.

BRISBANE
131 Robertson Street
PO Box 419
Fortitude Valley QLD 4006
T + 61 7 3852 3922

PROJECT

4653-4691 MOUNT LINDESAY HIGHWAY

CLIENT

MACLEAN ESTATES

KEYS / NOTES

SUBJECT SITE
OPEN SPACE

ROAD LAYOUT
INDICATIVE ROAD LAYOUT

OTHER FEATURES

SERVICE ROAD RESUMPTION
PROPOSED LOT 2
PROPOSED LOT 1
ROAD RESERVE
EASEMENT

DRAWING TITLE

PROPOSED ROL PLAN

DESIGN : TW
DOCUMENT : RT
PROJECT : 1121084
SCALE :

NORTH

20 0 20 40 60 80 100 120 metres

SCALE 1:2500 @ A1 1:5000 @ A3

DRAWING NUMBER 1121084 - 05

REVISION B

APPENDIX B

Engineering Plans

WALL HEIGHTS

0	to	1	m	
1	to	2	m	
2	to	3	m	
3	to	4	m	
		+ 4	m	

NOTE:

FENCING AND HAZARD SIGNAGE TO BE PROVIDED AROUND DETENTION BASIN PERIMETER.

DEPTH INDICATOR TO BE PROVIDED WITHIN DETENTION BASIN.

14 RP173739
15 RP173739
16 RP173739
ROSINA RD
18 RP173739
17 RP173739
2 RP868726
1 RP121663
9 RP137101
3 RP137101
39 SP258739
15 SP180530
16 SP180530
18 SP180530
19 SP180530
54 SP180530
Emt A RP121667
59 SP180530
23 RP123247
24 RP123247
25 RP123247
ST ALDWYN ROAD
1 RP190375
2 RP106105
3 RP106105
4 RP106105
1 RP218191
MT LINDESAY HWY

CHANNEL WORKS IN NORTHERN NEIGHBOURING PROPERTY TO BE COMPLETED AS PART OF NORTHERN NEIGHBOURING DEVELOPMENT WORKS OR AS PART OF FUTURE OPERATIONAL WORKS APPLICATION.

DETENTION BUND AT RL.26.17
Ø375 LOW FLOW PIPE

VEHICLE CROSSING
3x3.3x1.2m CULVERTS AT RL.25.8, WITH LOW FLOW CHANNEL (200(W)x450(H))

1 IN 6 ACCESS INTO BASIN

375Ø LOW FLOW IL26.70

LOT 1
17.440ha
(INDUSTRY)

LOT 2
16.592 ha
(ENVIRONMENT CONSERVATION)

2M WIDE WEIR AT RL28.30

PROPOSED LOT 3
2.239 ha
(CHANNEL)

SERVICE ROAD RESUMPTION
1.401 ha

INDICATIVE SEDIMENT BASIN TO BE IN PLACE FOR DURATION OF CONSTRUCTION PHASE AND INTERIM BULK EARTHWORKS PHASE IN ACCORDANCE WITH SECTION 8 OF THE SBSMP (REF EAG003-30139050-AAR-09)

Cut Fill depths Lower_value		Upper_value	Colour
-99999	to	-7	m
-7	to	-6	m
-6	to	-5	m
-5	to	-4	m
-4	to	-3	m
-3	to	-2	m
-2	to	-1	m
-1	to	0.00	m
0.000	to	1	m
1	to	2	m
2	to	3	m
3	to	4	m
4	to	5	m
5	to	6	m
6	to	7	m
7	to	9999	m

CUT & FILL VOLUMES

	CUT	FILL	BALANCE
INSIDE PROPOSED BOUNDARY	-182,964 m^3	226,383 m^3	43,419 m^3
OUTSIDE PROPOSED BOUNDARY	-24,002 m^3	921 m^3	-23,081 m^3
TOTAL	-206,966 m^3	227,304 m^3	20,338 m^3

LEGEND

- PROPOSED SITE BOUNDARY
- LOT BOUNDARIES
- DESIGN CONTOUR MAJOR
- DESIGN CONTOUR MINOR
- EXISTING CONTOURS
- DESIGN PADS
- DESIGN BATTER
- EXISTING FENCE
- EXISTING OVERHEAD POWER LINE
- EXISTING UNDERGROUND ELECTRICITY
- EXISTING STORMWATER DRAINAGE
- EXISTING WATER MAIN
- EXISTING COMMUNICATIONS
- ENVIRONMENT CONSERVATION AREA

Issue	Description	DR	CH	VE	Date
09	ISSUED FOR ROL APPROVAL	LS	LS	DO	07.12.23
08	ISSUED FOR ROL APPROVAL	LS	LS	DO	22.09.23
07	ISSUE FOR ROL APPROVAL	NN	SS	DO	17.08.23
06	EDQ INFORMATION REQUEST	JG	SS	GE	02.03.23
05	DESIGN UPDATES	JG	GE	GE	13.01.23
04	DESIGN UPDATES	JG	GE	GE	21.12.22
03	DESIGN UPDATES	JG	PC	GE	09.11.22
02	DESIGN UPDATES	JG	PC	GE	28.10.22
01	ORIGINAL ISSUE	PC	EP	GE	14.07.22

100mm on Original

Scales

0 50 100 150 200 250m

1 : 2500

Surveyor: WOLTER consulting group (Planning, Urban Design, Landscape, Environment, Surveying)

Architect

Client: MACLEAN ESTATES PTY LTD

Status: CONCEPT DESIGN ONLY
NOT TO BE USED FOR CONSTRUCTION

Original Issue Signatures			
Drawn	J.GRIEBELER	Original Size	A1
Designed	J.GRIEBELER	Height Datum	AHD
Project Manager	G.ELLIS	Grid	
Verified	G.ELLIS		

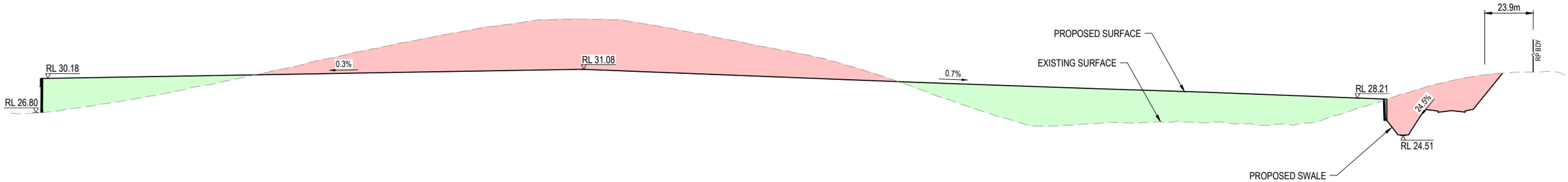
Project: 4653-4691 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

Title: BULK EARTHWORKS SKETCH PLAN

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 16, 580 George Street
SYDNEY NSW 2000
ABN 76 104 485 289
Tel No: +61 2 8907 9000
www.arcadis.com/au

Project No.	Folder Prefix	Zone	Stage	Phase	Discipline	Type	Drawing No.	Issue
30139050 -	AAP -	WS00	OP -	CV -	SKT -	001 -	09	

Date Plotted: 6 Dec 2023 - 11:27AM File Name: C:\Users\ls28099\DC\ACCDocs\Arcadis\AAU-30139050-North Maclean 2\Project Files\01_WIP\01_STG-00_Civil_CV\Drawings\30139050-AAP-WS00OP-CV-SKT-001-BulkEW.dwg V1



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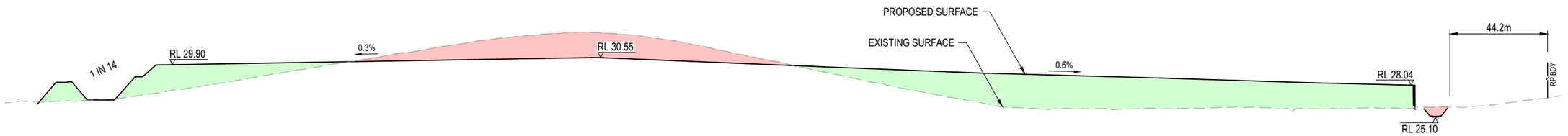
VERT 1:200



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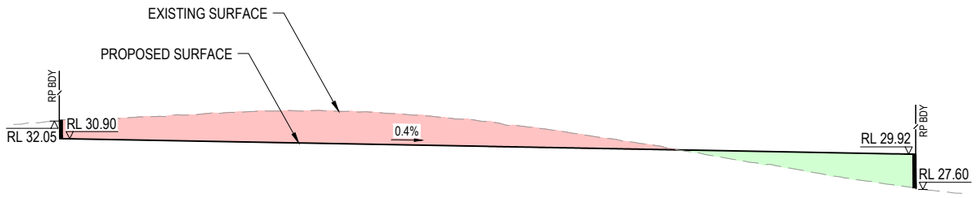

SECTION 3
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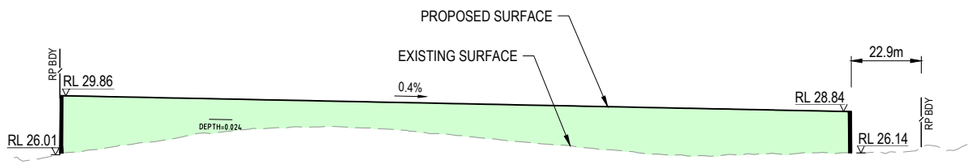

SECTION 4
HORZ 1:1000 001
VERT 1:200

SECTION 5
HORZ 1:1000 001

Issue	Description	DR	CH	VE	Date
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05	EDQ INFORMATION REQUEST	JG	SS	GE	02.03.23
04	DESIGN UPDATES	JG	GE	GE	13.01.23
03	DESIGN UPDATES	JG	GE	GE	21.12.22
02	DESIGN UPDATES	JG	PC	GE	09.11.22
01	ORIGINAL ISSUE	JG	PC	GE	28.10.22

100mm on Original

Scales
HORZ 0 10 20 40 60 80 100m
1:1000
VERT 0 5 10 15 20m
1 : 200

Surveyor
WOLTER consulting group
Planning Urban Design Landscape Environment Surveying

Architect

Client
MACLEAN ESTATES PTY LTD

Status
CONCEPT DESIGN ONLY
NOT TO BE USED FOR CONSTRUCTION

Original Issue Signatures

Drawn	J.GRIEBELER	Original Size	A1
Designed	J.GRIEBELER	Height Datum	AHD
Project Manager	G.ELLIS	Grid	
Verified	G.ELLIS		

Project
4653-4691 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

Title
BULK EARTHWORKS SECTIONS SHEET 1

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 16, 580 George Street
SYDNEY NSW 2000
ABN 76 104 485 289
Tel No: +61 2 8907 9000
www.arcadis.com/au

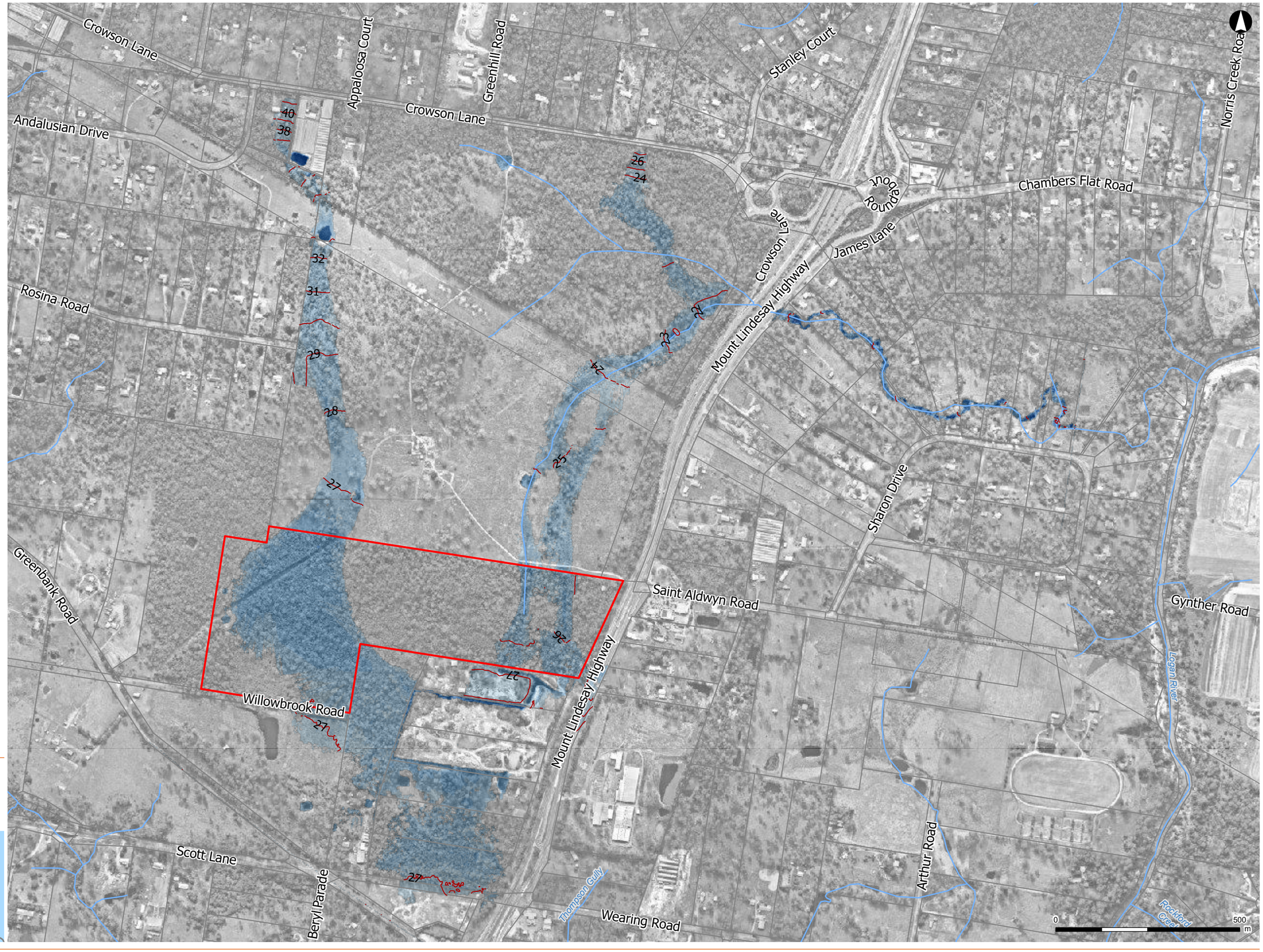
Project No.	Folder Prefix	Zone | Stage | Phase	Discipline	Type	Drawing No.	Issue
30139050 -	AAP -	WS00OP -	CV -	SKT -	002 -	06

Date Plotted: 6 Oct 2023 - 09:13AM File Name: C:\Users\ls28099\DC\ACCDocs\Arcadis\AAU-30139050-North Maclean 2\Project Files\01_WIP\01_STG-00_Civil_CV\Drawings\30139050-AAP-WS00OP-CV-SKT-002-BulkEWSections.dwg V1

APPENDIX C

Flood Maps

Figure E-1 - Flood Depths - Existing Case - 50% AEP



Legend

- Flood level contour (mAHD)

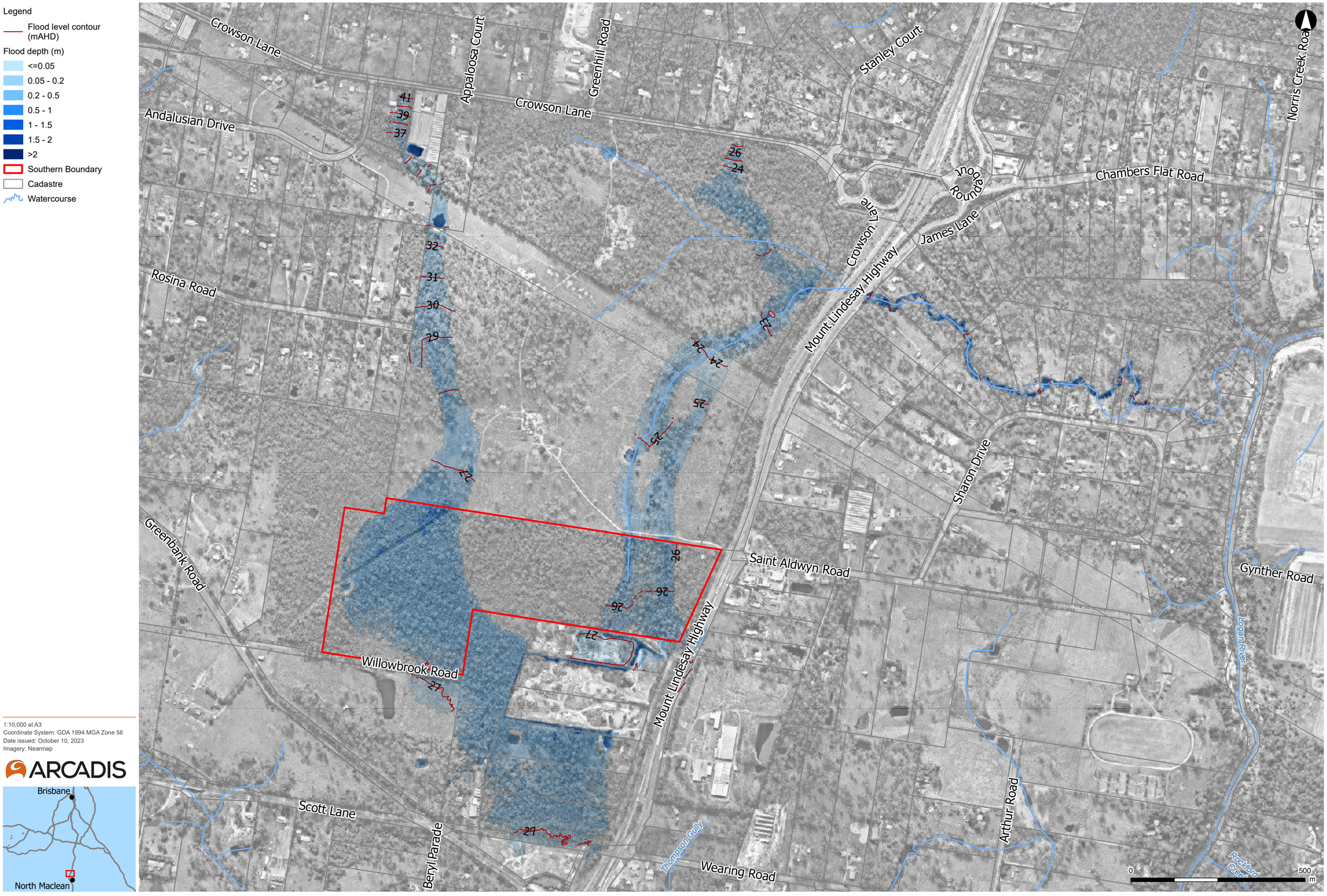
Flood depth (m)

- <=0.05
- 0.05 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- >2
- Southern Boundary
- Cadastre
- Watercourse

1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: October 10, 2023
Imagery: Nearmap

ARCADIS

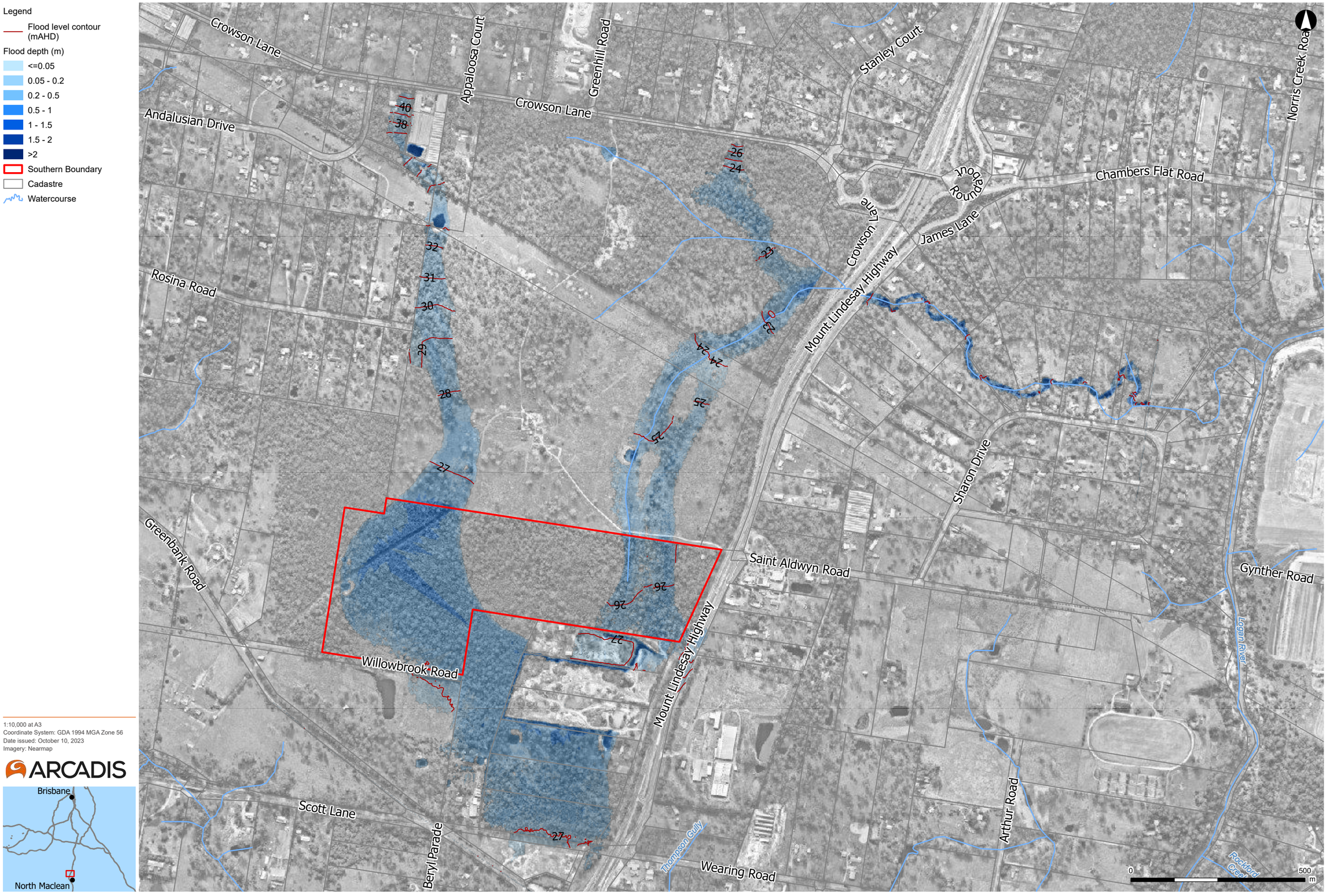
Figure E-2 - Flood Depths - Existing Case - 20% AEP



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: October 10, 2023
Imagery: Nearmap

ARCADIS

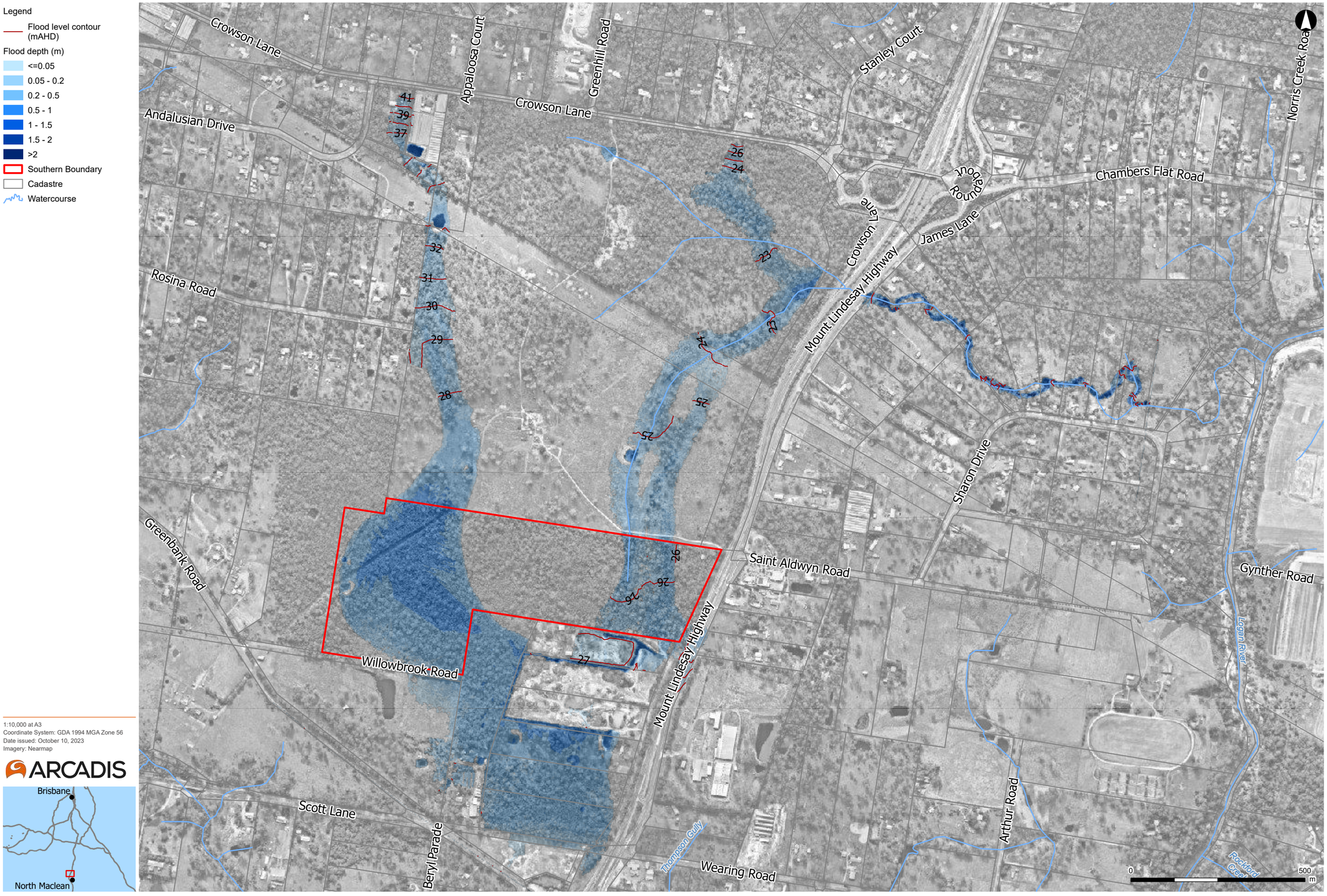
Figure E-3 - Flood Depths - Existing Case - 10% AEP



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: October 10, 2023
Imagery: Nearmap

ARCADIS

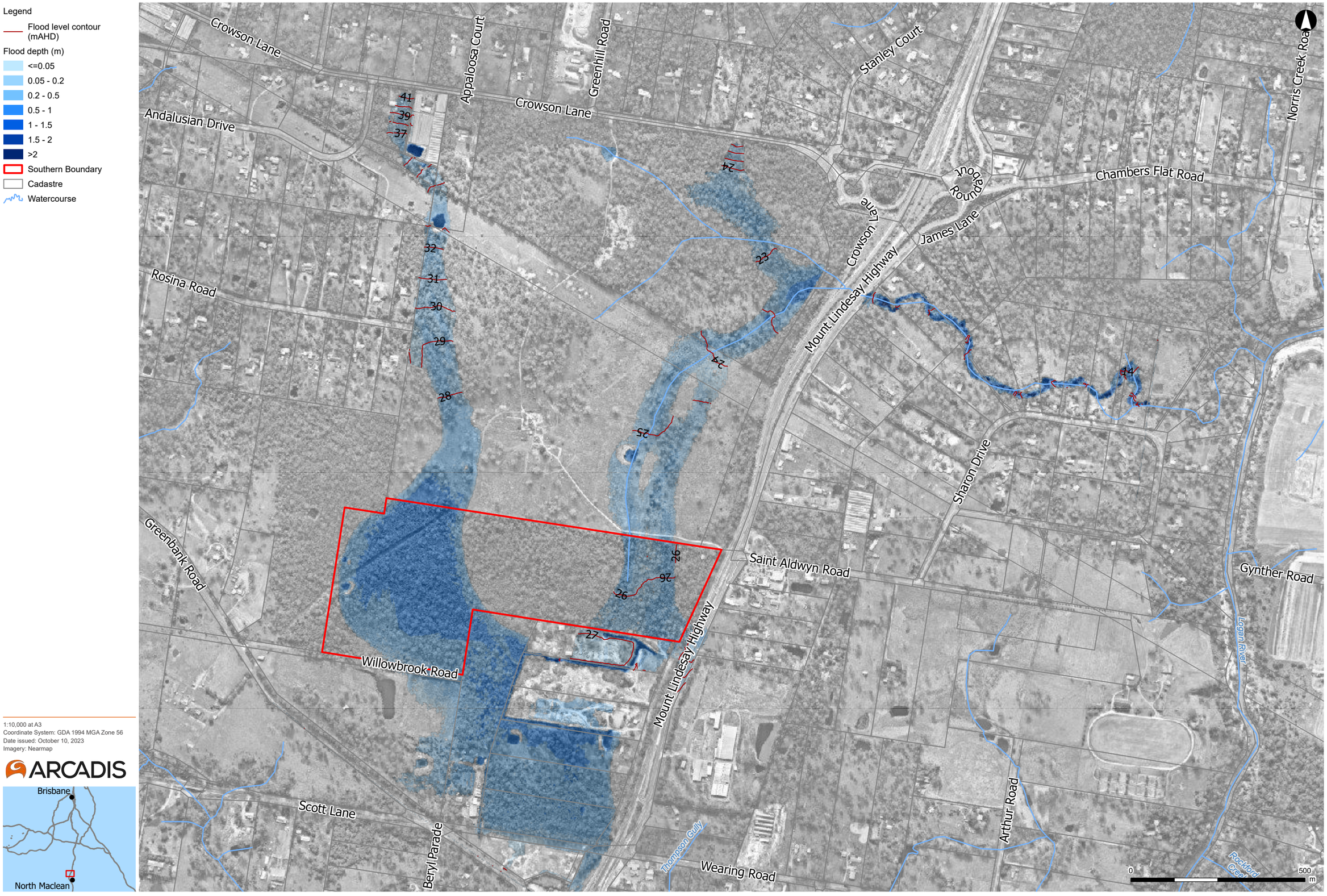
Figure E-4 - Flood Depths - Existing Case - 5% AEP



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: October 10, 2023
Imagery: Nearmap

ARCADIS

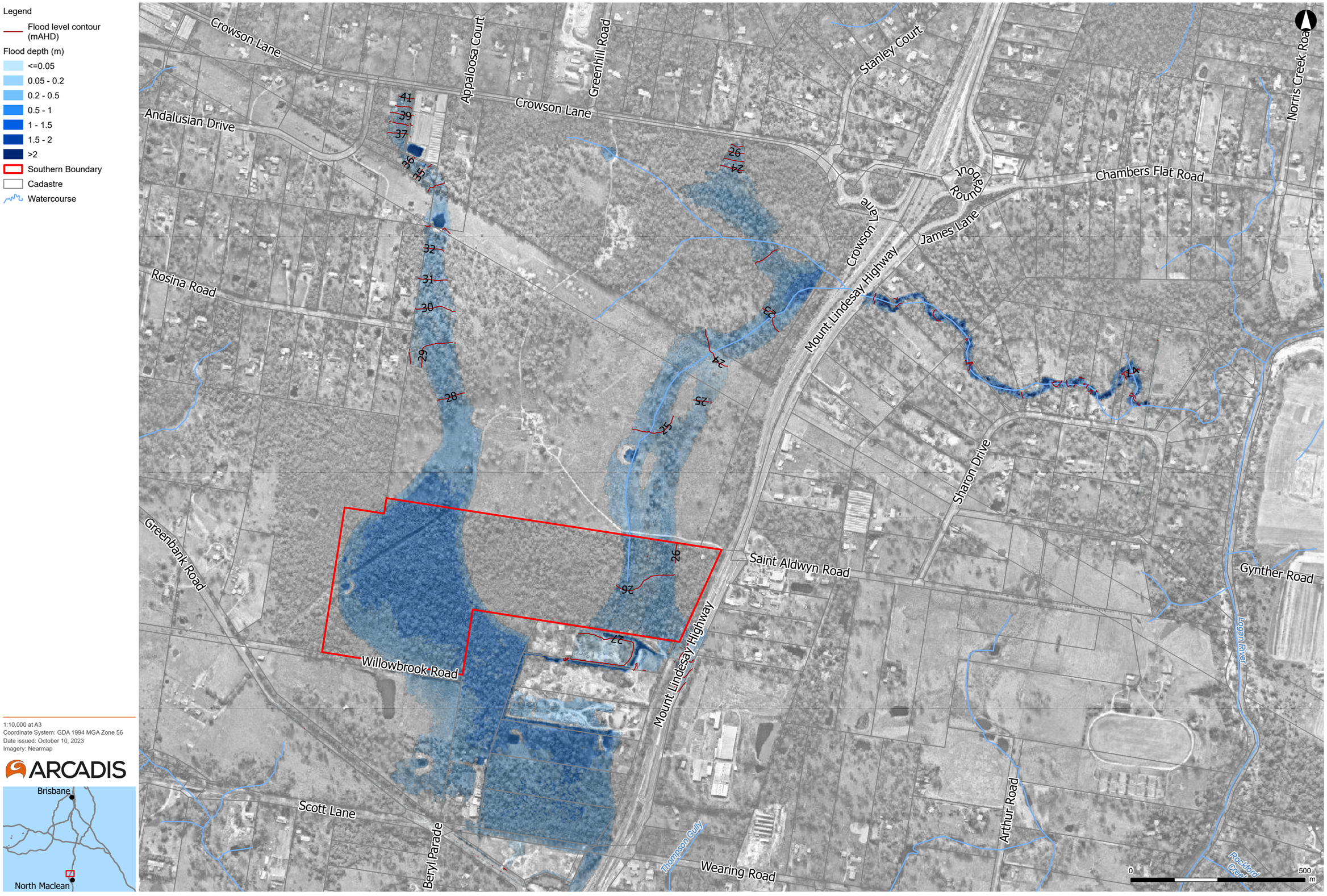
Figure E-5 - Flood Depths - Existing Case - 2% AEP



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: October 10, 2023
Imagery: Nearmap

ARCADIS

Figure E-6 - Flood Depths - Existing Case - 1% AEP



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: October 10, 2023
Imagery: Nearmap

ARCADIS

Figure E-7 - Flow Velocity - Existing Case - 50% AEP

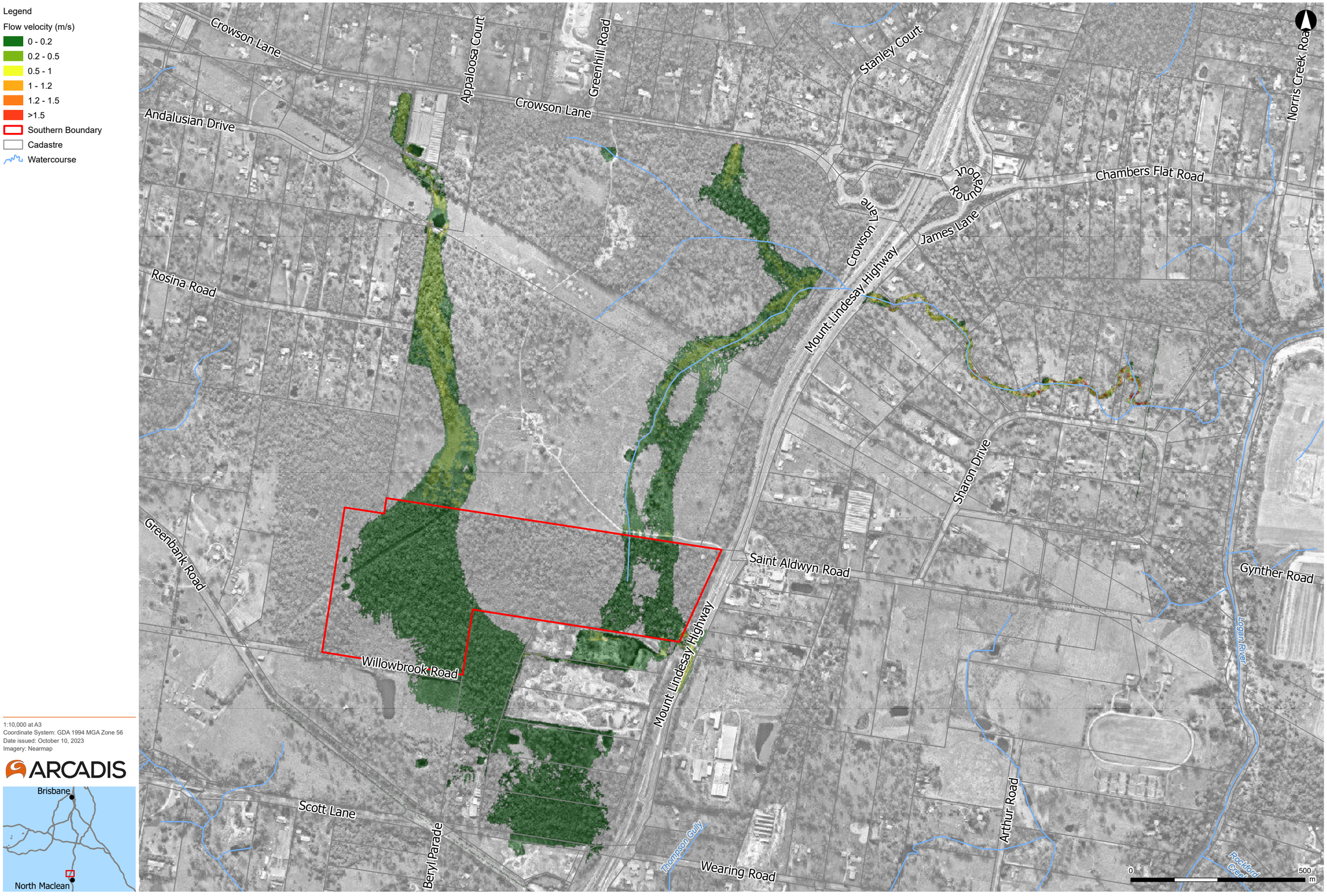
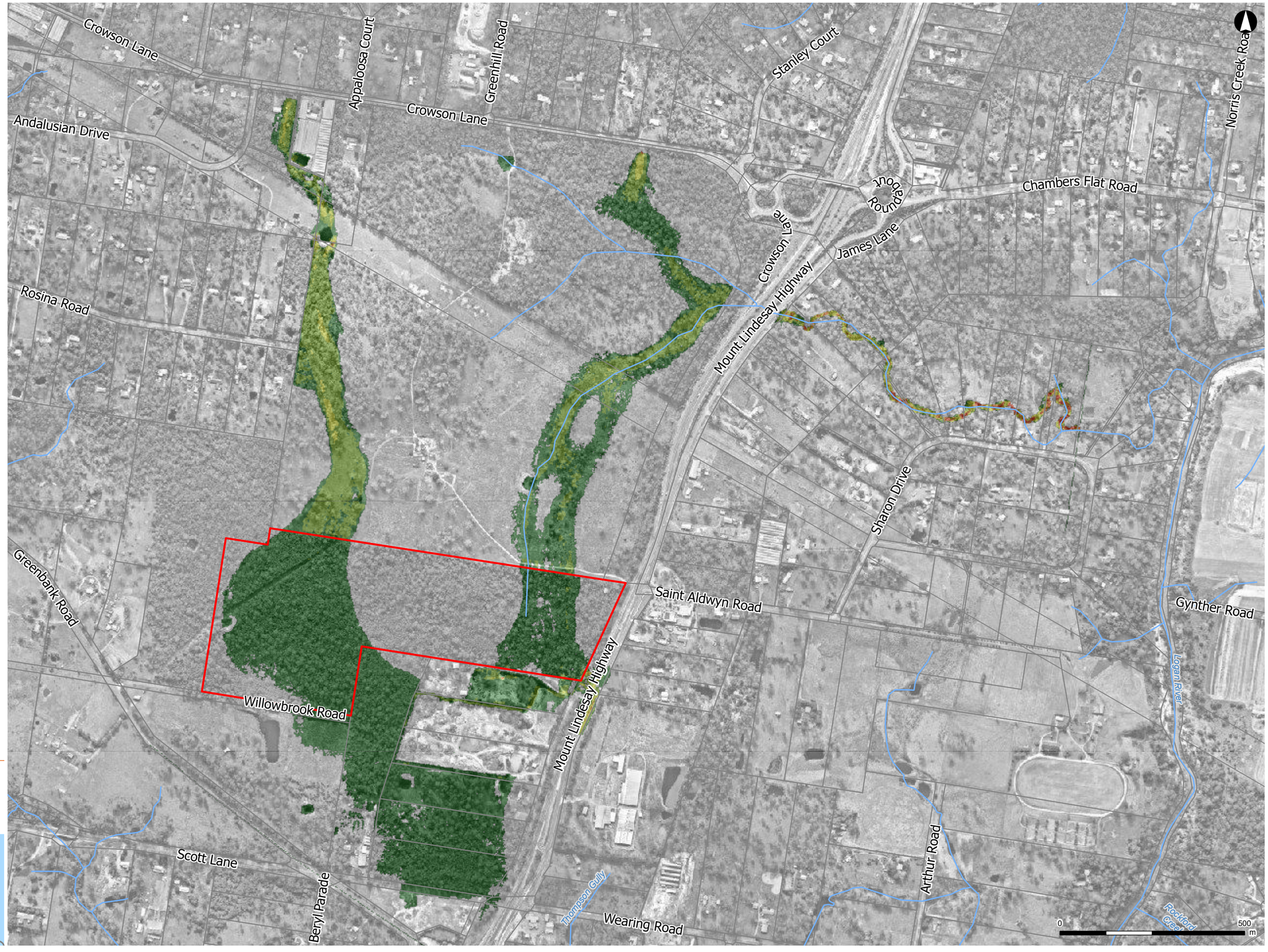


Figure E-8 - Flow Velocity - Existing Case - 20% AEP



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: October 10, 2023
Imagery: Nearmap

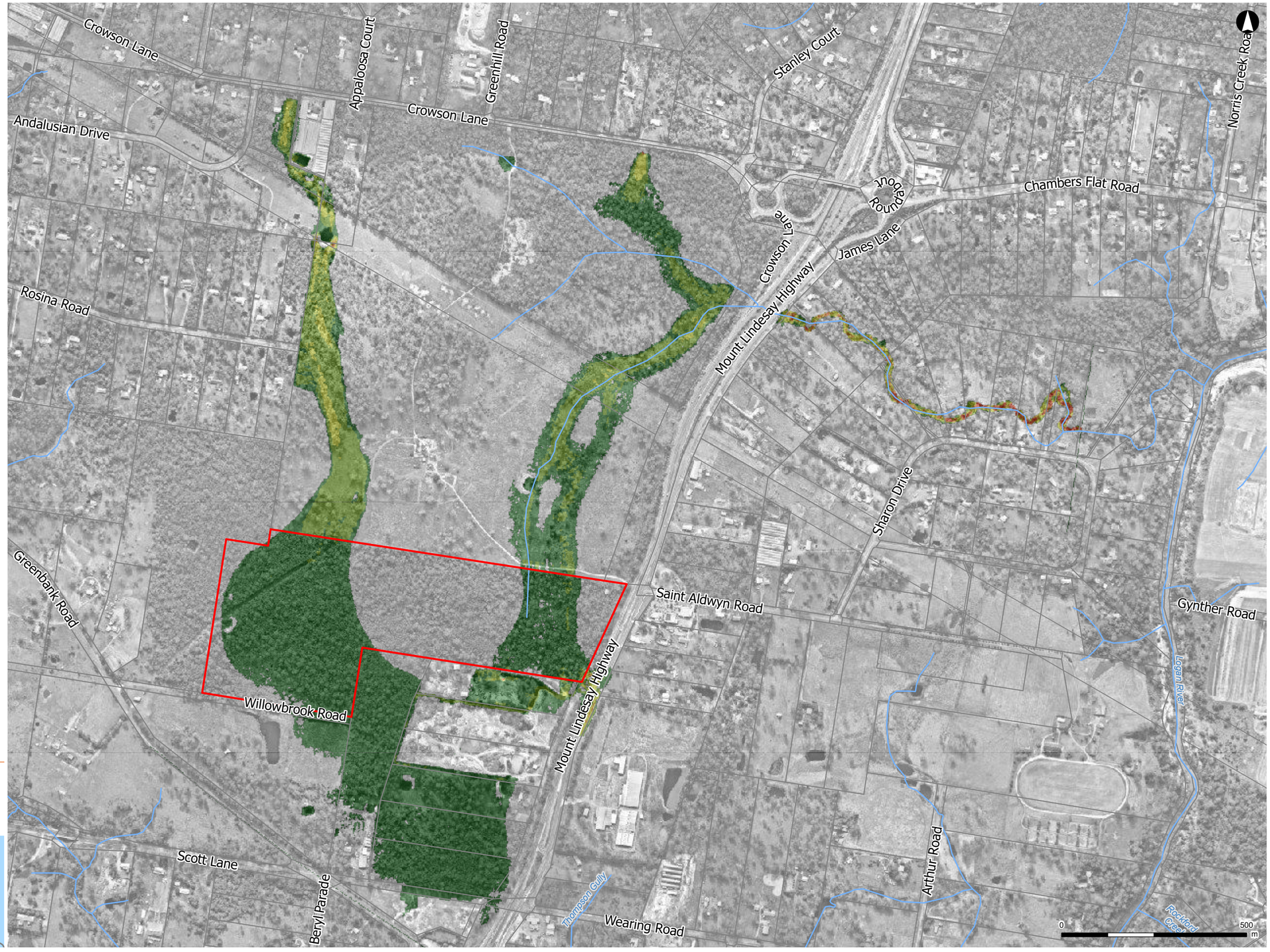
ARCADIS

Figure E-9 - Flow Velocity - Existing Case - 10% AEP

Legend

Flow velocity (m/s)

- 0 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.2
- 1.2 - 1.5
- >1.5
- Southern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: October 10, 2023
Imagery: Nearmap

ARCADIS

Figure E-10 - Flow Velocity - Existing Case - 5% AEP

1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: October 10, 2023
Imagery: Nearmap

ARCADIS

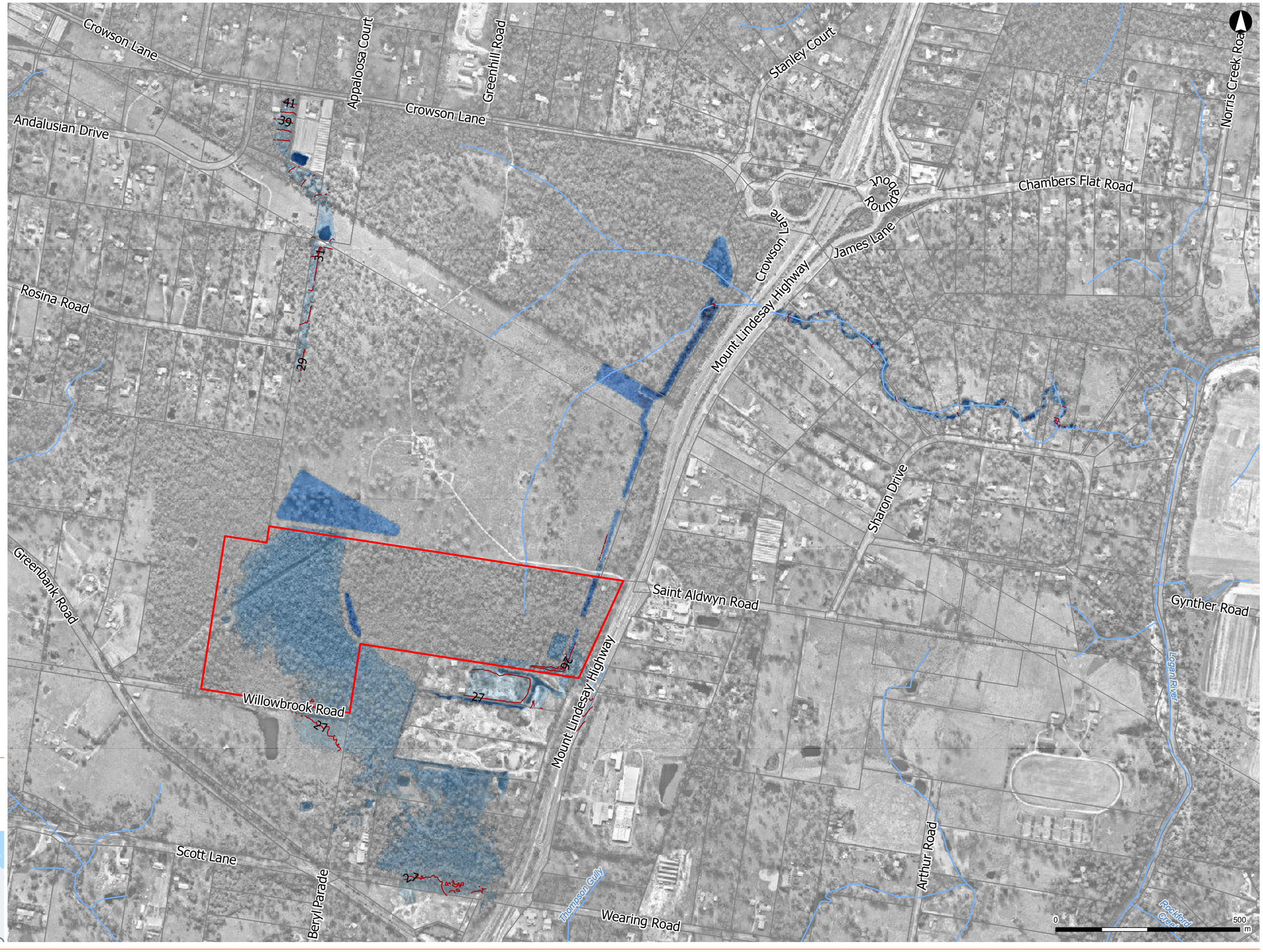
Figure E-11 - Flow Velocity - Existing Case - 2% AEP

1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: October 10, 2023
Imagery: Nearmap

ARCADIS

Figure E-12 - Flow Velocity - Existing Case - 1% AEP

Figure D-1 - Flood Depths - Design Case - 50% AEP



Legend

- Flood level contour (mAHD)

Flood depth (m)

- <=0.05
- 0.05 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- >2
- Southern Boundary
- Cadastre
- Watercourse

1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: December 8, 2023
Imagery: Nearmap

ARCADIS

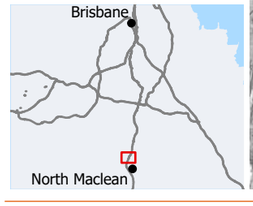


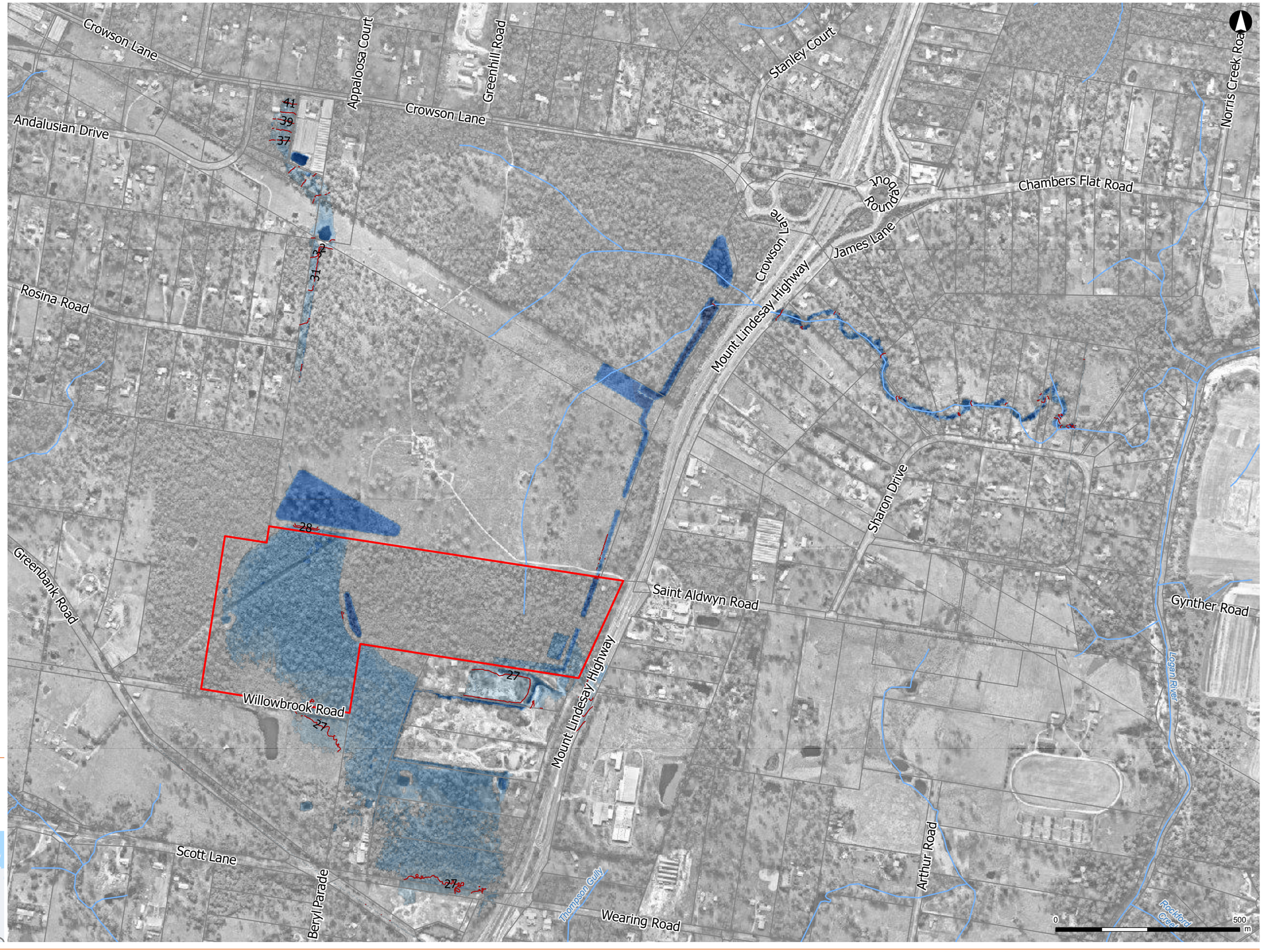
Figure D-2 - Flood Depths - Design Case - 20% AEP

Legend

- Flood level contour (mAHD)

Flood depth (m)

- <=0.05
- 0.05 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- >2
- Southern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: December 8, 2023
Imagery: Nearmap

ARCADIS

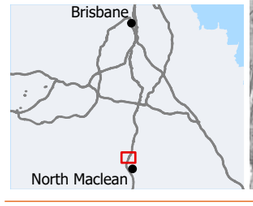


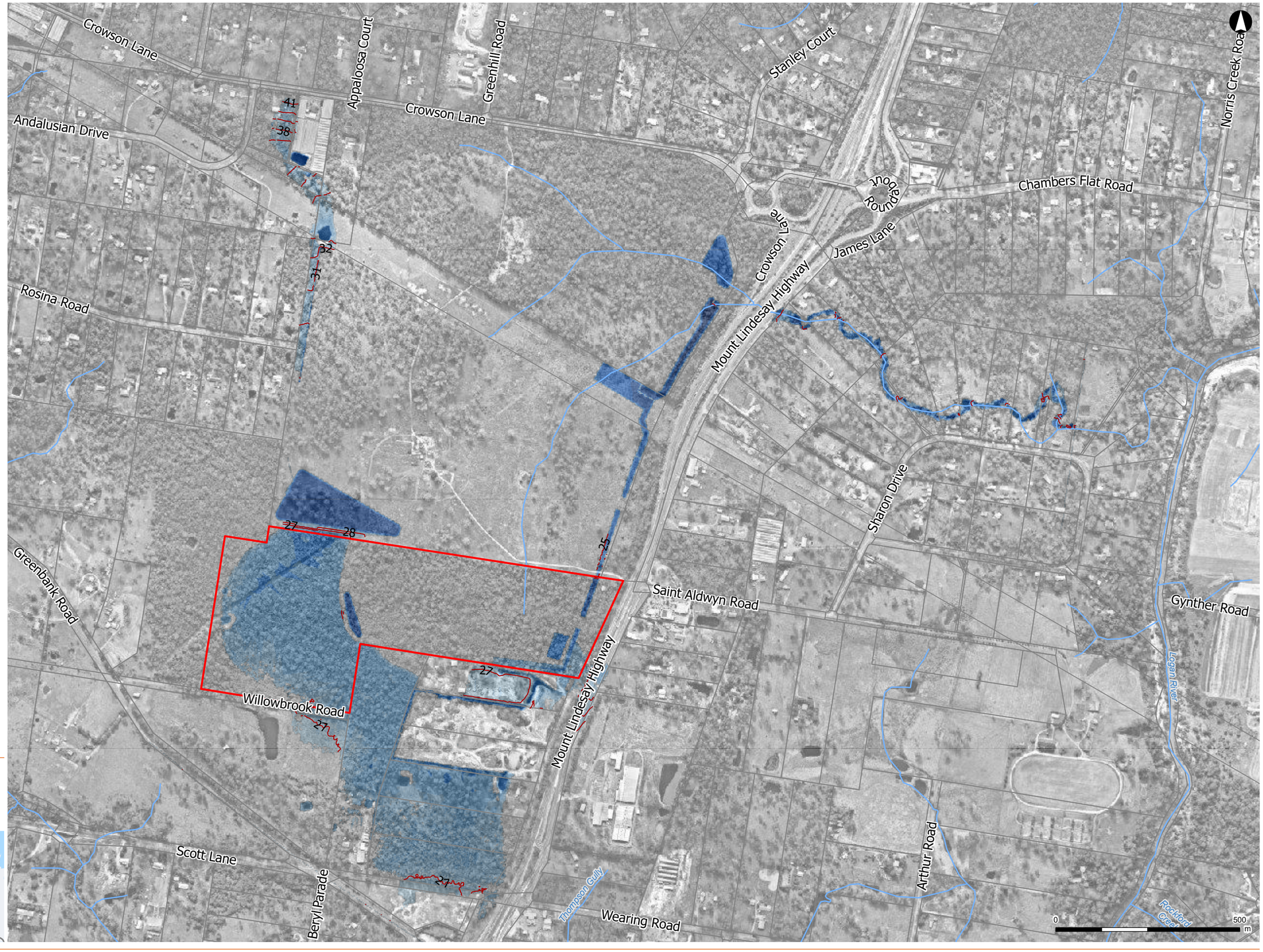
Figure D-3 - Flood Depths - Design Case - 10% AEP

Legend

- Flood level contour (mAHD)

Flood depth (m)

- <=0.05
- 0.05 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- >2
- Southern Boundary
- Cadastre
- Watercourse



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Coordinate System: GDA 1994 MGA Zone 56
Date issued: December 8, 2023
Imagery: Nearmap

ARCADIS

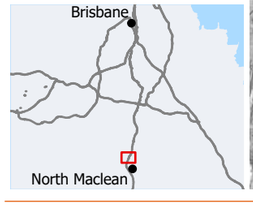


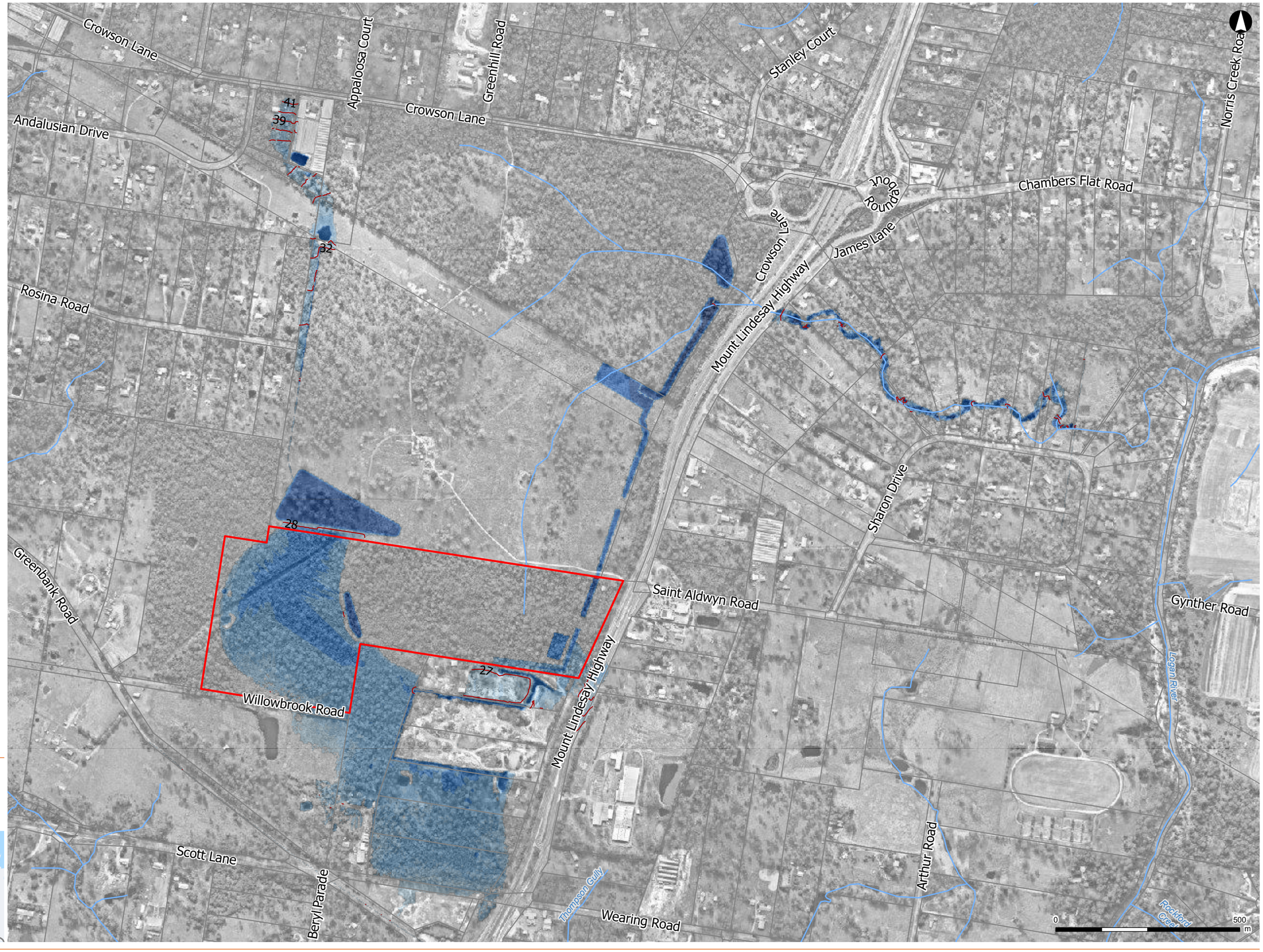
Figure D-4 - Flood Depths - Design Case - 5% AEP

Legend

- Flood level contour (mAHD)

Flood depth (m)

- <=0.05
- 0.05 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- >2
- Southern Boundary
- Cadastre
- Watercourse



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Coordinate System: GDA 1994 MGA Zone 56
Date issued: December 8, 2023
Imagery: Nearmap

ARCADIS

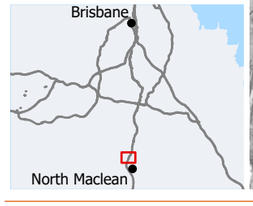


Figure D-5 - Flood Depths - Design Case - 2% AEP

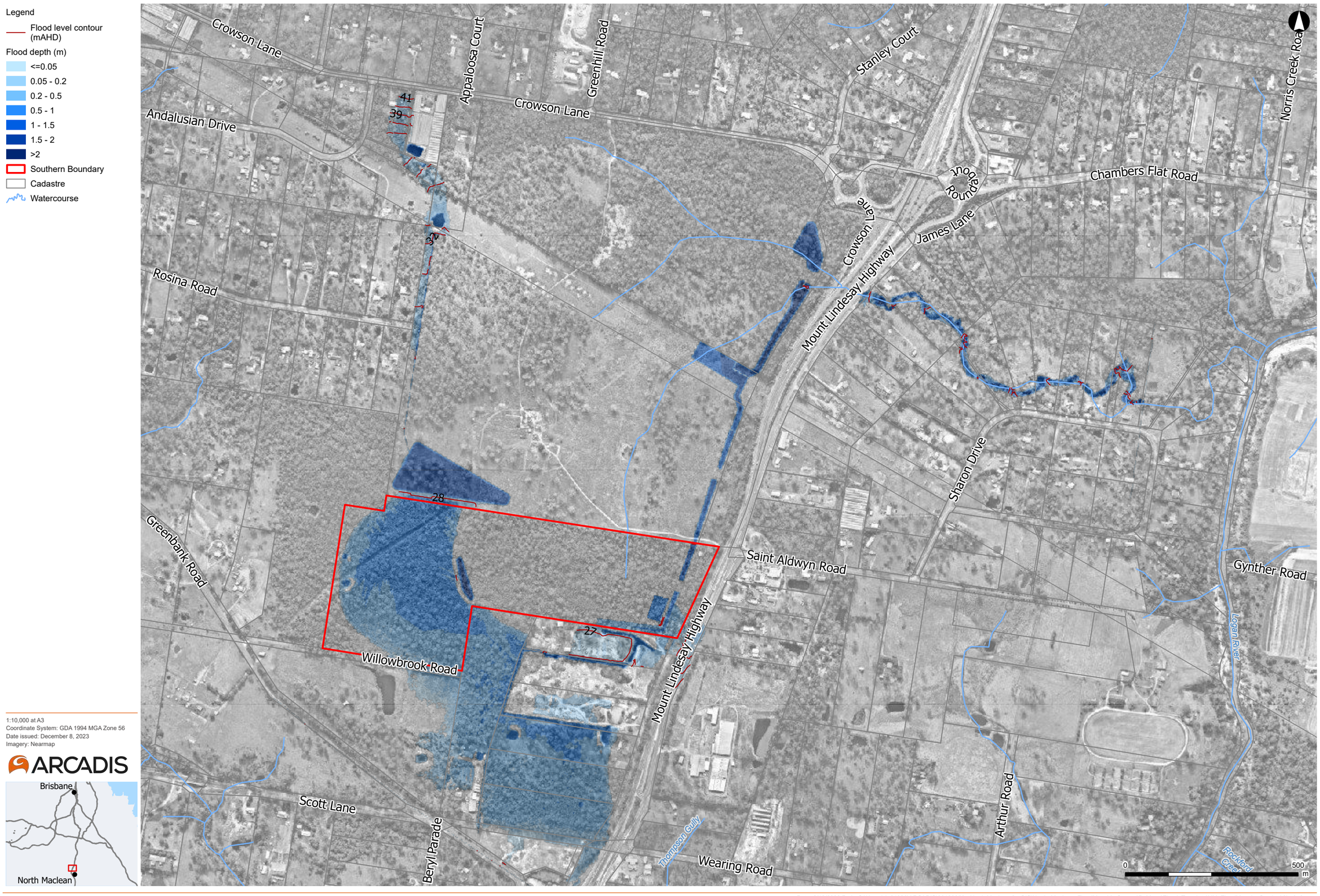
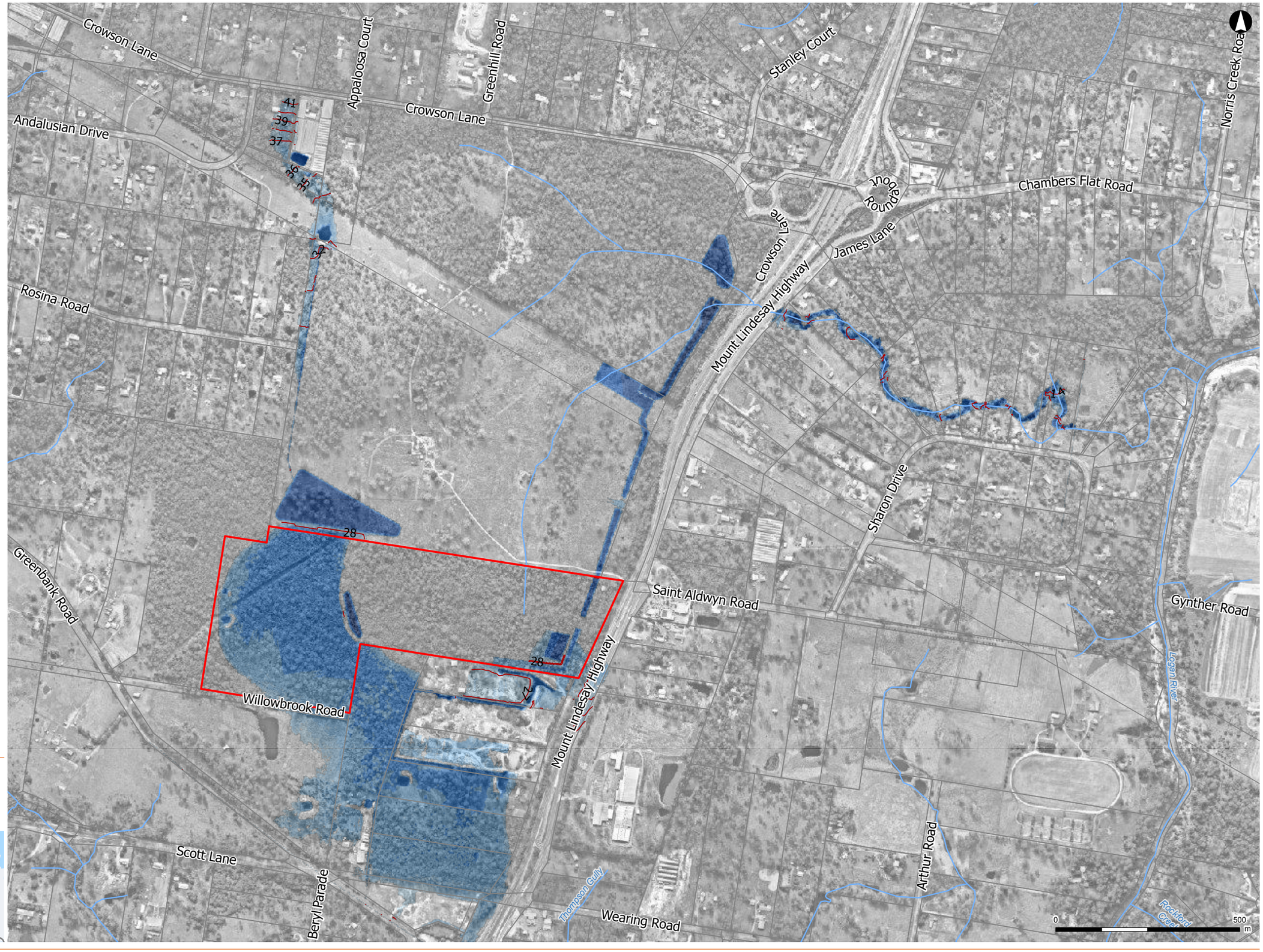


Figure D-6 - Flood Depths - Design Case - 1% AEP



Legend

- Flood level contour (mAHD)

Flood depth (m)

- <=0.05
- 0.05 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- >2
- Southern Boundary
- Cadastre
- Watercourse

1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: December 8, 2023
Imagery: Nearmap

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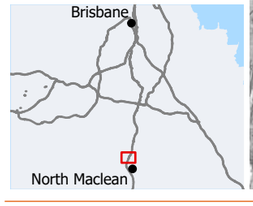


Figure D-7 - Flow Velocity - Design Case - 50% AEP

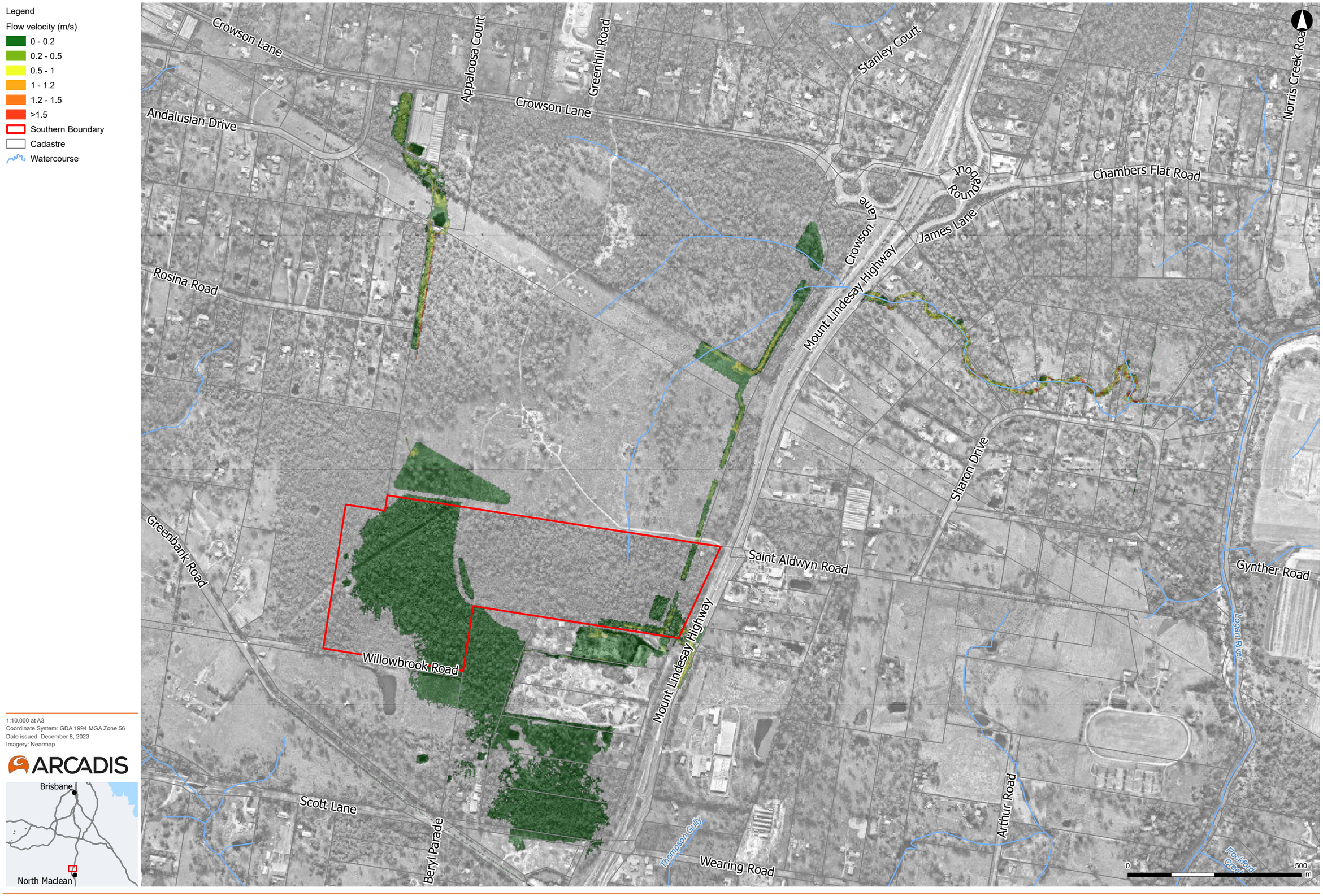
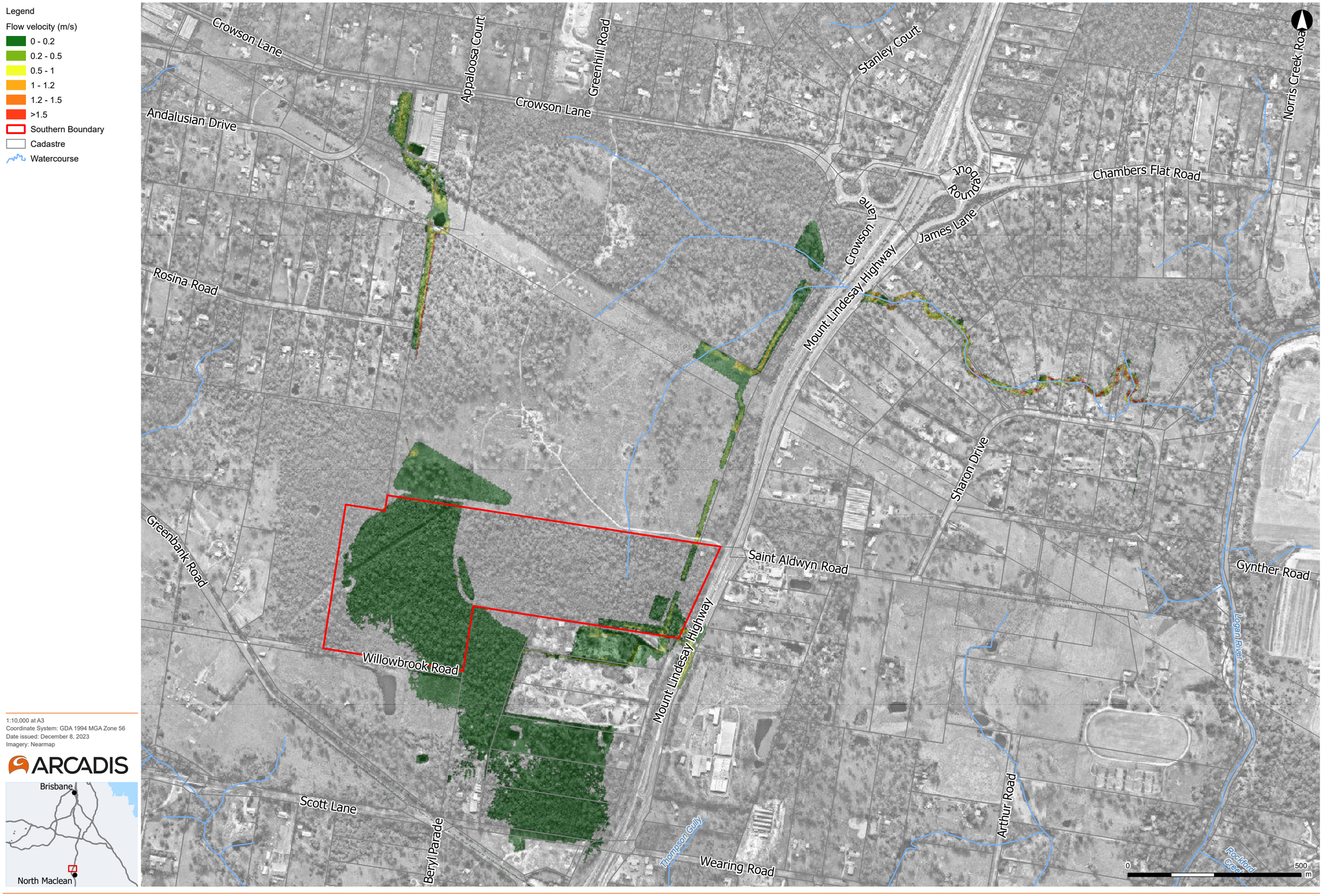


Figure D-8 - Flow Velocity - Design Case - 20% AEP



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: December 8, 2023
Imagery: Nearmap

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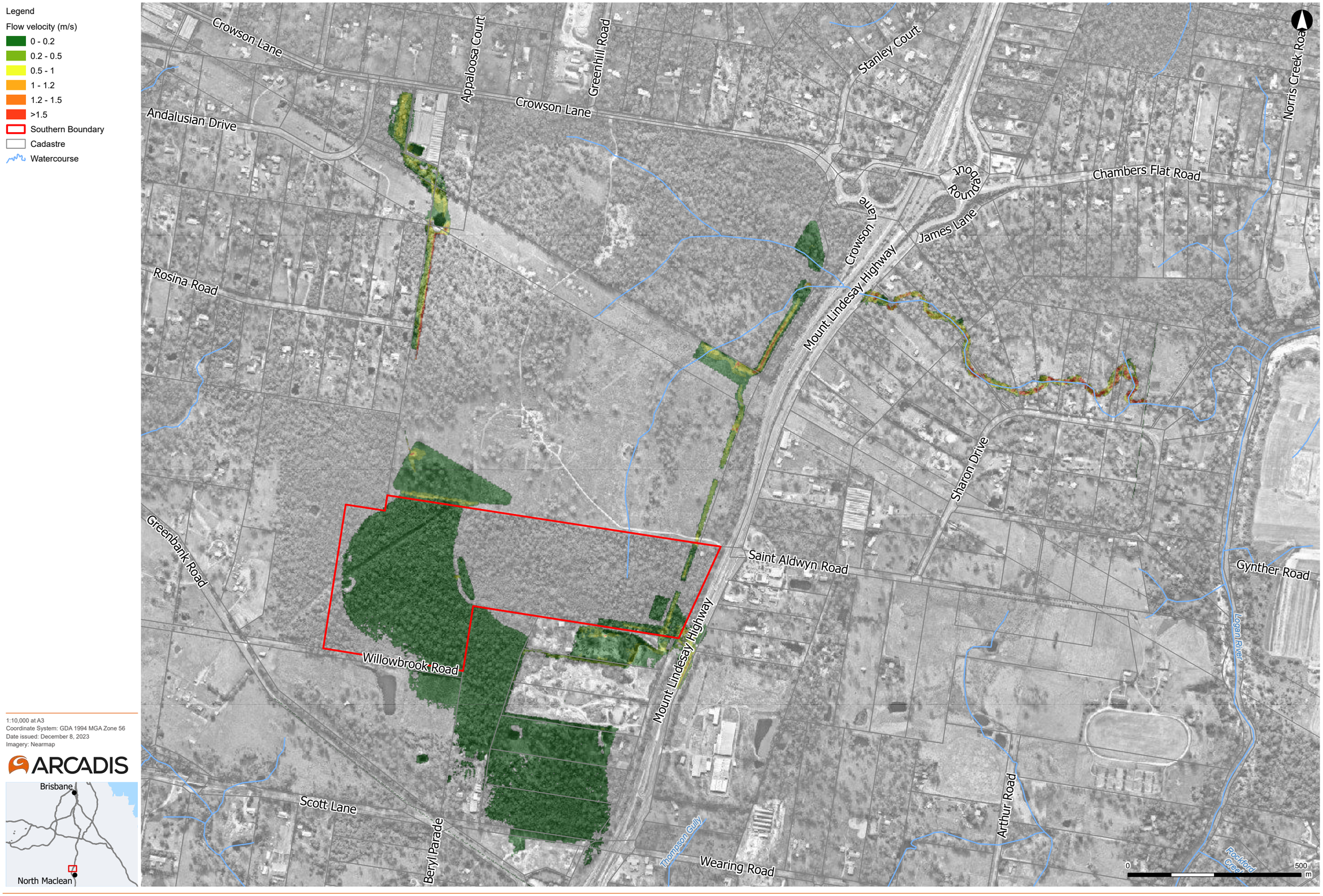
Figure D-9 - Flow Velocity - Design Case - 10% AEP



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: December 8, 2023
Imagery: Nearmap

ARCADIS

Figure D-10 - Flow Velocity - Design Case - 5% AEP

Legend

Flow velocity (m/s)

- 0 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.2
- 1.2 - 1.5
- >1.5
- Southern Boundary
- Cadastre
- Watercourse

1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: December 8, 2023
Imagery: Nearmap

ARCADIS

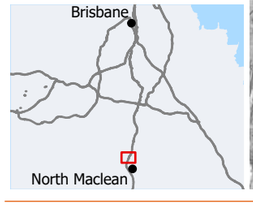


Figure D-11 - Flow Velocity - Design Case - 2% AEP

Legend

Flow velocity (m/s)

- 0 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.2
- 1.2 - 1.5
- >1.5
- Southern Boundary
- Cadastre
- Watercourse

1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: December 8, 2023
Imagery: Nearmap

ARCADIS

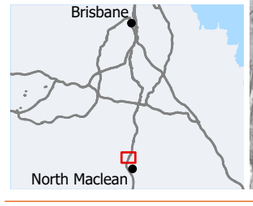
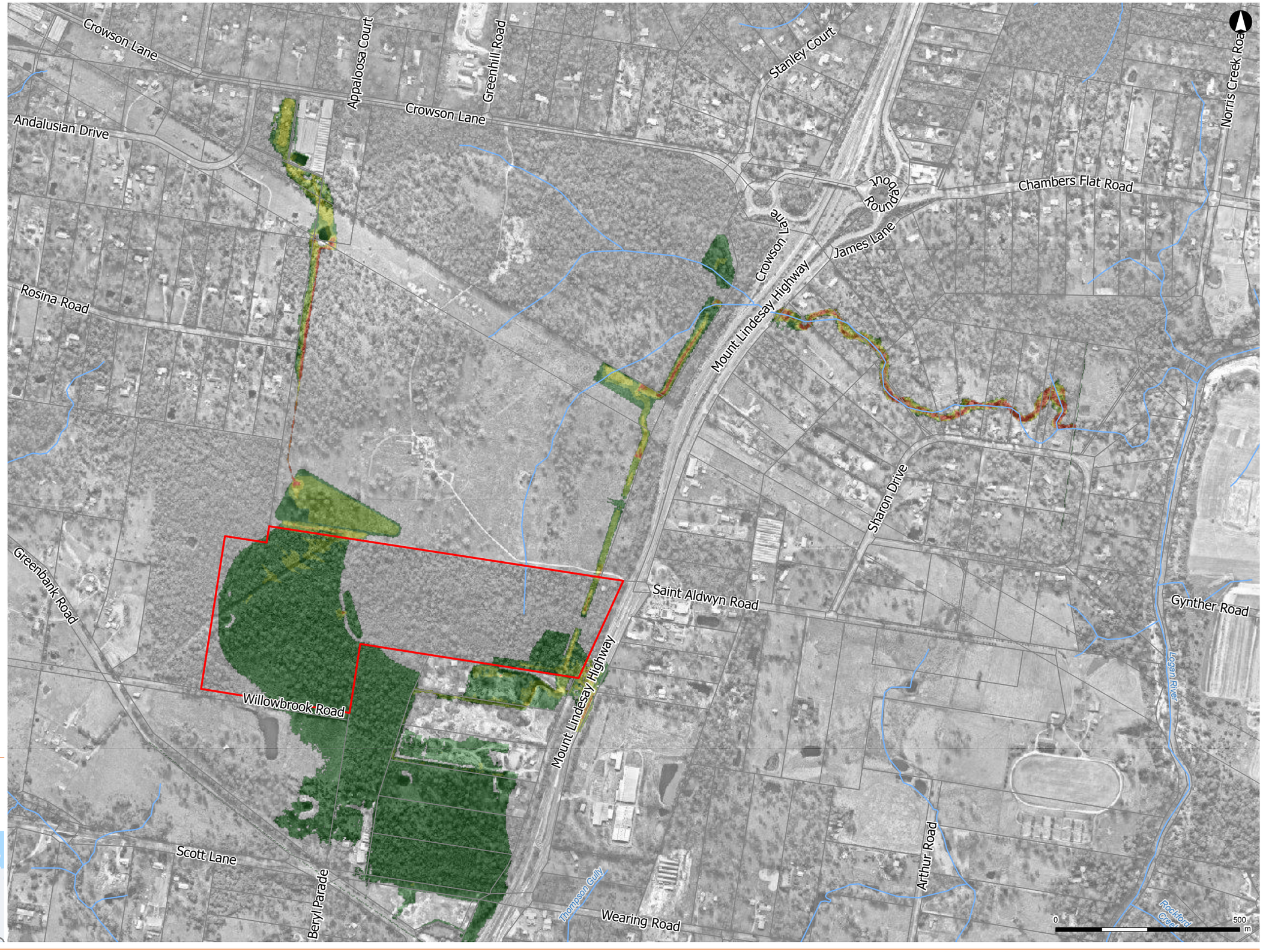


Figure D-12 - Flow Velocity - Design Case - 1% AEP

Legend

Flow velocity (m/s)

- 0 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.2
- 1.2 - 1.5
- >1.5
- Southern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: December 8, 2023
Imagery: Nearmap

ARCADIS

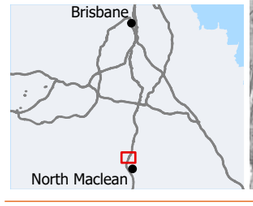


Figure D-13 - Flood Level Afflux - Design Case - 50% AEP

Figure D-14 - Flood Level Afflux - Design Case - 20% AEP

1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: December 8, 2023
Imagery: Nearmap

ARCADIS

Figure D-15 - Flood Level Afflux - Design Case - 10% AEP

1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: December 8, 2023
Imagery: Nearmap

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Figure D-16 - Flood Level Afflux - Design Case - 5% AEP

Legend

Afflux (m)

- -0.91 - -0.01
- -0.01 - 0.01
- 0.011 - 0.02
- 0.021 - 0.05
- 0.051 - 0.1
- 0.1 - 0.2
- 0.2 - 0.62
- was wet, now dry
- was dry, now wet
- Southern Boundary
- Cadastre
- Watercourse

1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: December 8, 2023
Imagery: Nearmap

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Figure D-17 - Flood Level Afflux - Design Case - 2% AEP

Figure D-18 - Flood Level Afflux - Design Case - 1% AEP

1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: December 8, 2023
Imagery: Nearmap

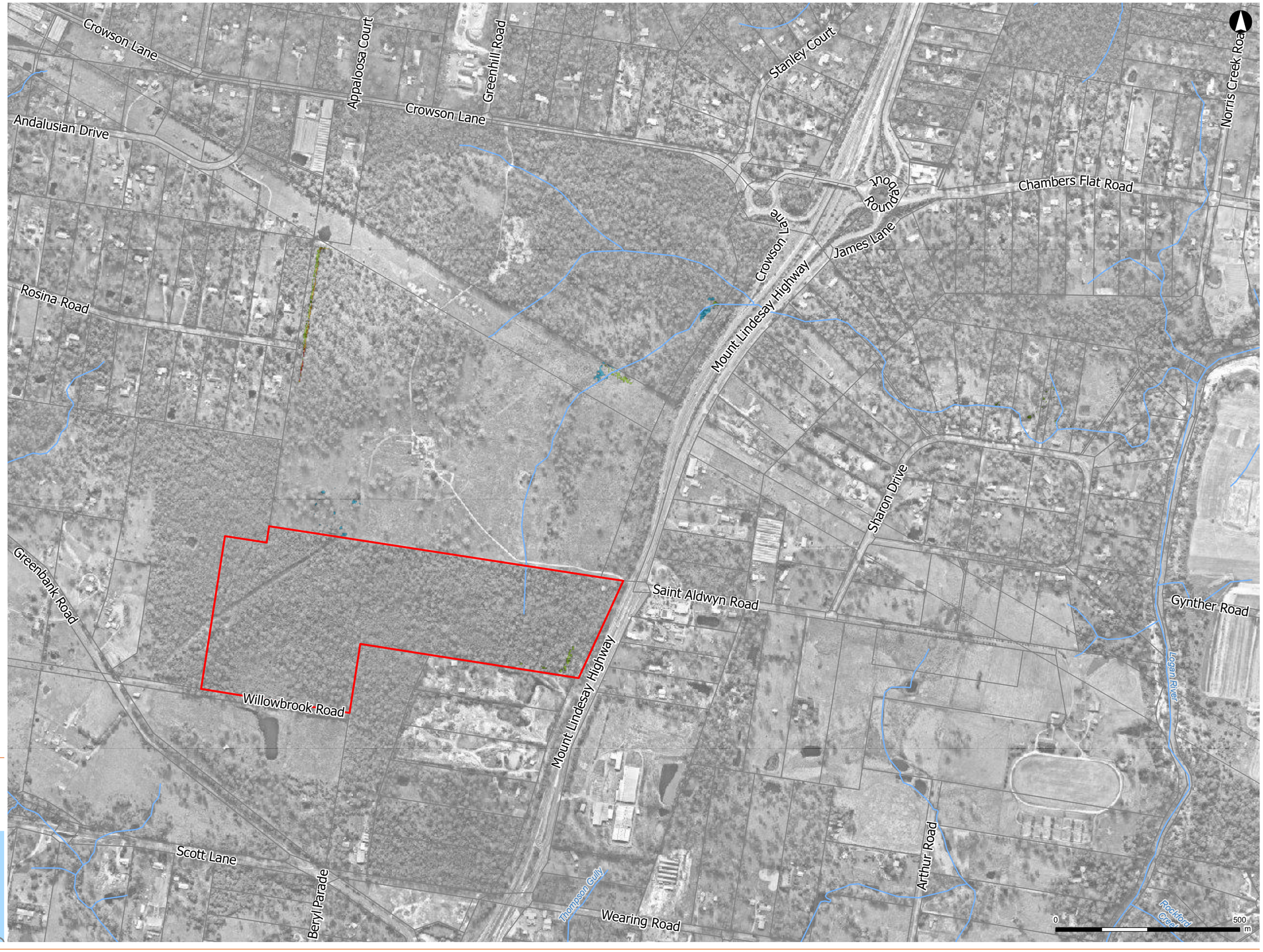
ARCADIS

Figure D-19 - Velocity Change - 50% AEP

Legend

Velocity Change (m/s)

- -0.91 - -0.21
- -0.21 - 0.2
- 0.21 - 0.5
- 0.51 - 1
- 1.1 - 2
- >2
- Southern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: October 10, 2023
Imagery: Nearmap

ARCADIS

Figure D-20 - Velocity Change - 20% AEP

1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: October 10, 2023
Imagery: Nearmap

ARCADIS

Figure D-21 - Velocity Change - 10% AEP

1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: October 10, 2023
Imagery: Nearmap

ARCADIS

Figure D-22 - Velocity Change - 5% AEP

1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: October 10, 2023
Imagery: Nearmap

ARCADIS

Figure D-23 - Velocity Change - 2% AEP

Figure D-24 - Velocity Change - 1% AEP

Legend

Velocity Change (m/s)

- -0.91 - -0.21
- -0.21 - 0.2
- 0.21 - 0.5
- 0.51 - 1
- 1.1 - 2
- >2
- Southern Boundary
- Cadastre
- Watercourse

1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: October 10, 2023
Imagery: Nearmap

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APPENDIX D

DEV 2018/961 Decision Notice

Queensland Government

Department of
State Development, Infrastructure, Local Government and Planning

Our ref: DEV2018/961

10 September 2021

Wearco Pty Ltd
C/- Reel Planning Pty Ltd
Att: Ms Amy Adamson
PO Box 2088
MILTON QLD 4064

Email: amy@reelplanning.com

Dear Amy

S89(1)(a) Approval of PDA development application
PDA Development Permit for reconfiguring a lot – 1 lot into 4 lots, plus roads and open space at 4499-4651 Mount Lindesay Highway, North Maclean described as Lot 39 on RP253739

On 10 September 2021, pursuant to s.85(4)(b) of the *Economic Development Act 2012,* the Minister for Economic Development Queensland (MEDQ) decided to grant **all** of the PDA development application applied for, in accordance with the attached PDA decision notice.

The PDA decision notice and approved plans / documents can also be viewed in the MEDQ Development Approvals Register via the Department website at www.dsdilgp.qld.gov.au/pda-da-applications.

If you require any further information, please contact Mr Brandon Bouda, Manager, Development Assessment, in Economic Development Queensland, by telephone on (07) 3452 7422 or at brandon.bouda@dsdilgp.qld.gov.au, who will be pleased to assist.

Yours sincerely

Jeanine Stone
Director
Development Assessment
Economic Development Queensland

Economic Development Queensland
GPO Box 2202
Brisbane Queensland 4001 Australia
Website www.edq.qld.gov.au
ABN 76 590 288 697

PDA Decision Notice

Site information		
Name of priority development area (PDA)	Greater Flagstone	
Site address	4499 – 4651 Mount Lindesay Highway, North Maclean	
Lot on plan description	Lot number	Plan description
	39	SP258739

PDA development application details	
DEV reference number	DEV2018/961
'Properly made' date	19 October 2018
Type of application	☒ PDA development application for: ☐ Material change of use ☐ Preliminary approval ☐ Development permit ☒ Reconfiguring a lot ☐ Preliminary approval ☒ Development permit ☐ Operational work ☐ Preliminary approval ☐ Development permit ☐ Application to change PDA development approval ☐ Application to extend currency period
Proposed development	1 into 4 lots, with road, open space and a context plan

PDA development approval details	
Decision of the MEDQ	The MEDQ has decided to grant **all** of the PDA development approval applied for, **subject to** PDA development conditions forming part of this decision notice. The approval is for: • 1 into 4 lots, with road, open space and a context plan
Decision date	10 September 2021
Currency period	6 years from the date of the decision

Economic Development Queensland
GPO Box 2202
Brisbane Queensland 4001 Australia
Website www.edq.qld.gov.au
ABN 76 590 288 697

Approved plans and documents			
The plans and documents approved by the MEDQ and referred to in the PDA development conditions for the PDA development approval are detailed below.			
Approved plans and documents		**Number**	**Date**
1.	Proposed Development Layout Plan	TIEL2020159.CIV.DA 010, Issue H	07/07/21 (as amended in red dated 08/09/2021)
2.	Staging Plan	TIELK202159.CIV.DA, Dwg No. 16, Issue C	07/07/2021 (as amended in red date 03/09/2021)
3.	Concept Earthworks Layout Plan	TIEL202159.CIV.DA, Dwg No. 015, Issue G	07/07/21
4.	Concept Water Reticulation Layout Plan	TIEL202159.CIV.DA, Dwg No. 014, Issue G	07/07/21
5.	Concept Sewer Reticulation Layout Plan	TIEL202159.CIV.DA, Dwg No. 012, Issue G	07/07/21 (as amended in red dated 03/09/2021)
6.	Concept Stormwater Drainage Layout Plan	TIEL202159.CIV.DA, Dwg No. 013, Issue H	07/07/21
7.	Concept Catchment Layout Plan	TIEL202159.CIV.DA, Dwg No. 008, Issue I	07/07/21
8.	Swale Cross Section	TIEL202159.CIV.DA.DWG No 019, Issue C	07/07/21
9.	Swale Longitudinal Section	TIEL202159.CIV.DA, Dwg No 018, Issue B	07/07/21
10.	Traffic Impact Assessment	16378, Version 3	01/03/19
11.	Bushfire Management Plan	Report 16014, Final V3	13 July 2018
12.	Addendum to the bushfire management plan for the proposed development at 4499-4651 Mount Lindsay Highway, North Maclean		18 February 2019
13.	North Maclean Enterprise Precinct (4499-4651 Mount Lindesay Highway, North Maclean) – Progression of Ecological Issues		31 March 2017

Supporting Plans and Documents

To remove any doubt, the following documents are not approved documents for the purposes of this PDA development approval, but rather are supporting documents.

	Supporting plans, reports and specifications	**Number** *(if applicable)*	**Date** *(if applicable)*
Endorsed Context Plan			
1.	North Maclean Enterprise Context Plan Land Use and Road Network		12/07/2021 (as amended in red dated 03/09/2021)
2.	North Maclean Enterprise Context Plan Land Use and Road Network (Wider Locality)		12/07/2021
3.	North Maclean Enterprise Context Plan Ultimate Water and Sewer Network		12/07/2021
4.	North Maclean Enterprise Context Plan Ultimate Stormwater Network		12/07/2021 (as amended in red dated 03/09/2021)
Supporting Plans, Reports and Specifications			
5.	Site Based Stormwater Management Plan	TEL202159, Issue A	08 July 2021
6.	Engineering Services Report	TEL202159, Issue A	06/07/21.

PDA development conditions

PREAMBLE AND ABBREVIATIONS

PREAMBLE

For the purpose of interpreting this PDA Development Approval, including the PDA Development Conditions, the following applies:

Compliance assessment

Where a condition of this approval requires Compliance Assessment, Compliance Assessment is required in accordance with the following:

a) The applicant must:

   i) pay to MEDQ at the time of submission the relevant fee for Compliance Assessment, including any third party peer review costs which will be charged on a 100% cost recovery basis. The Compliance Assessment fees are set out in EDQ Development Assessment Fees and Charges Schedule[1] (as amended from time to time).
   ii) submit to EDQ DA a duly completed Compliance Assessment form[2].

   iii) submit to EDQ DA the documentation as required under the relevant condition.

b) Where EDQ is satisfied the documentation submitted for Compliance Assessment meets the requirements of the relevant condition (or element of the condition), EDQ will endorse the documentation and advise by written notice.

[1] The EDQ Development Assessment Fees and Charges Schedule is available at EDQ's website.

[2] The Compliance Assessment form is available at EDQ's website. It sets out how to submit documentation for Compliance Assessment and how to pay Compliance Assessment fees.

c) Compliance Assessment and endorsement can be repeated where a different design or solution, to that already endorsed, is sought.

d) The process and timeframes that apply to Compliance Assessment are as follows:

i) applicant submits items required under a) above to EDQ DA for Compliance Assessment.

ii) **within 30 business days** – EDQ assesses the documentation and:
1. if satisfied, endorses the documentation; or
2. if not satisfied, notifies the applicant accordingly.

iii) if the applicant is notified under ii.2. above, revised documentation must be submitted **within 30 business days** from the date of notification.

iv) **within 30 business days** – EDQ assesses the revised documentation and:
1. if satisfied, endorses the revised documentation; or
2. if not satisfied, notifies the applicant accordingly.

v) where EDQ notifies the applicant as stated under iv.2. above, repeat steps iii. and iv. above. If either party is not satisfied by the outcome of this process, that party can elect to enter into a mediation process with an independent mediator agreed to by both parties.

Despite note v. above, the condition (or element of the condition) is determined to have been met only when EDQ endorses relevant documentation.

SUBMITTING DOCUMENTATION TO EDQ:

Where a condition of this approval requires documentation to be submitted to either EDQ DA or EDQ TS, submit the documentation to:

a) EDQ DA at: pdadevelopmentassessment@dsdmip.qld.gov.au.

b) EDQ TS at: EDQ_PrePostConstruction@dsdmip.qld.gov.au.

ABBREVIATIONS

For the purposes of interpreting the PDA Development Conditions, the following is a list of abbreviations utilised:

1. **AILA** means a Landscape Architect registered Australian Institute Landscape Architect.

2. **Certification Procedures Manual** means the document titled *Certification Procedures Manual*, prepared by the Department of Infrastructure, Local Government and Planning, dated 16 October 2017 (as amended from time to time).

3. **Contributed Asset** means an asset constructed under a PDA development approval or Infrastructure Agreement that will become the responsibility of an External Authority. For the purposes of operational works for a Contributed Asset, the following definitions apply:
   a. **External Authority** means a public-sector entity other than the MEDQ;
   b. **Parkland** means carrying out operational work related to the provision of parkland infrastructure;

c. **Roadworks** means carrying out any operational work within existing or proposed road(s), to a depth of 1.5m measured from the top of kerb, and includes Streetscape Works;
d. **Sewer Works** means carrying out any operational work related to the provision of wastewater infrastructure;
e. **Streetscape Works** means carrying out any operational work within the verge of a road, including footpath surface treatments, street furniture, street lighting and landscaping;
f. **Stormwater Works** means carrying out any operational work related to the provision of stormwater infrastructure; and
g. **Water Works** means carrying out any operational work related to the provision of water infrastructure.

4. **Council** means Logan City Council.

5. **DSDILGP** means The Department of State Development, Infrastructure, Local Government and Planning

6. **EDQ** means Economic Development Queensland

7. **EDQ DA** means Economic Development Queensland's – Development Assessment team.

8. **EDQ TS** means Economic Development Queensland's – Technical Services team.

9. **IFF** means Infrastructure Funding Framework.

10. **MEDQ** means The Minister of Economic Development Queensland.

11. **PDA** means Priority Development Area.

12. **RPEQ** means Registered Professional Engineer of Queensland

No.	Condition	Timing
General		
1.	**Carry out the approved development** Carry out the approved development generally in accordance with the approved plans and documents; and any other documentation endorsed via Compliance Assessment as required by these conditions.	Prior to survey plan endorsement for the relevant stage
2.	**Street naming** Submit to EDQ DA a schedule of street names approved by Council.	Prior to survey plan endorsement for the relevant stage
Construction		
3.	**Hours of work - construction** Unless otherwise endorsed, via Compliance Assessment for out of hours work, construction hours for the approved development are limited to Monday to Saturday between 6:30am to 6:30pm, excluding public holidays.	During construction unless otherwise endorsed

4.	**Out of hours work - Compliance Assessment** Where out of hours work is proposed, submit to EDQ DA, for Compliance Assessment, an out of hours work request. The out of hours work request must include a duly completed out of hours work request form[3].	Minimum of 10 business days prior to proposed out of hours work commencement date
5.	**Certification of Operational Work** Carry out all Operational Work under this approval in accordance with the *Certification Procedures Manual.*	At all times
6.	**Construction management plan** a) Submit to EDQ TS a site-based Construction Management Plan (CMP), prepared by the principal site contractor and reviewed by a suitably qualified and experienced person responsible for overseeing the site works, to manage construction impacts, including: i) noise and dust in accordance with the EP Act; ii) stormwater flows around and through the site without increasing the concentration of total suspended solids or Prescribed Water Contaminants (as defined in the EP Act), causing erosion, creating any ponding and causing any actionable nuisance to upstream and downstream properties; iii) contaminated land, where required under a site suitability statement prepared in accordance with section 389 of the EP Act; iv) complaints procedures; v) site management: 1. for the provision of safe and functional alternative pedestrian routes, past, through or around the site; 2. to mitigate impacts to public sector entity assets, including street trees, on or external to the site; 3. for safe and functional temporary vehicular access points and frequency of use; 4. for the safe and functional loading and unloading of materials including the location of any remote loading sites; 5. for the location of materials, structures, plant and equipment; 6. of waste generated by construction activities; 7. detailing how materials are to be loaded/unloaded; 8. of proposed external hoardings and gantries (with clearances to street furniture and other public sector entity assets); 9. of employee and visitor parking areas; 10. of anticipated staging and programming; 11. for the provision of safe and functional emergency exit routes; and 12. any out of hours work as endorsed via Compliance Assessment. b) A copy of the CMP submitted under part a) of this condition must be current and available on site.	a) Prior to commencing work for the relevant stage b) During construction

[3] The out of hours work request form is available at EDQ's website.

	c) Carry out all construction work generally in accordance with the CMP submitted under part a) of this condition.	c) During construction
7.	**Erosion and sediment management** a) Submit to EDQ TS an Erosion and Sediment Control Plan (ESCP), certified by a RPEQ or an accredited professional in erosion and sediment control, and prepared generally in accordance with the following: **i)** construction phase stormwater management design objectives of the *State Planning Policy 2017* (Appendix 2 Table A); **ii)** *Healthy Land and Water Technical Note: Complying with the SPP – Sediment Management on Construction Sites*. b) Implement the certified ESCP submitted under part a) of this condition.	a) Prior to commencing work for the relevant stage b) During construction
8.	**Dispersive soil management** a) Submit to EDQ TS a Dispersive Soil Management Plan, prepared by a soil science/soil chemistry specialist that details for the design, construction, and operational phases of the development including: i. the suite of methods required to identify and address potential issues associated with the exposure and re-use of dispersive soils, ii. details of the areas where dispersive soils will be disturbed and treated/rehabilitated. b) Implement and monitor the actions identified in the Dispersive Soil Management Plan as required under part a) of this condition.	a) Prior to commencing site works b) At all times during construction
9.	**Traffic Management Plan** a) Submit to EDQ TS a Traffic Management Plan (TMP), certified by a person holding a current Traffic Management Design qualification. The TMP must include the following: i) provision for the safe and functional management of traffic around and through the site during and outside of construction work hours; ii) provision for the safe and functional management of pedestrian traffic, including alternative pedestrian routes past, through or around the site; iii) provision of parking for workers and materials delivery; iv) risk identification, assessment and identification of mitigation measures; v) ongoing monitoring, management review and certified updates (as required); and vi) traffic control plans and/or traffic control diagrams, prepared in accordance with *Austroads Guide to Temporary Traffic Management*, for any temporary part or full road closures. b) Carry out all construction work generally in accordance with the certified TMP submitted under part a) of this condition, which is to be current and available on site.	a) Prior to commencing work for the relevant stage b) During construction

	***Advice Note**: Operational traffic changes, such as temporary and permanent lane modifications, relaxation of clearway zone hours or footpath closures may require authorisation from Council or DTMR as road manager. It is recommended that applicants engage directly with the applicable road manager.*	
10.	**Public infrastructure (damage, repairs and relocation)** a) Repair any damage to existing public infrastructure caused by works carried out in association with the approved development. b) Where existing public infrastructure require repair or relocation, due to the approved development and/or works associated with the approved development, repair and/or relocate the public infrastructure at no cost to others and in accordance with statutory requirements and adopted design standards. ***Advice Note**: It is recommended applicants record their own dated photographic evidence of the condition of relevant existing public infrastructure both before and after works carried out in association with the approved development.*	a) Prior to survey plan endorsement for the relevant stage b) Prior to survey plan endorsement for the relevant stage
Earthworks and retaining walls		
11.	**Compliance Assessment - Earthworks** a) Submit to EDQ DA for Compliance Assessment detailed earthworks plans, certified by a RPEQ, and designed generally in accordance with: i) Australian Standard AS3798 – 2007 Guidelines on Earthworks for Commercial and Residential Developments and ii) the approved Concept Earthworks Layout Plan, Plan No. TIEL202159.CIV.DA, Dwg No. 015, Issue G, Prepared by Telford Civil, dated 07/07/21. The certified earthworks plans are to: i) include a geotechnical soils assessment of the site; ii) accord with the Erosion and Sediment Control Plan, as required by condition 7 – Erosion and sediment management; iii) accord with the Dispersive Soil Management Plan, as required by condition 8 – Dispersive soil management; iv) include the location and finished surface levels of any cut and/or fill; v) provide details of any areas where surplus soils are to be stockpiled; vi) detail protection measures to: 1. ensure adjoining properties and roads are not impacted by ponding or nuisance stormwater resulting from earthworks associated with the approved development; 2. preserve all drainage structures from structural loading impacts resulting from earthworks associated with the approved development.	a) Prior to commencing earthworks for the relevant stage

	b) Carry out earthworks generally in accordance with the certified plans endorsed by EDQ through part a) of this condition. c) Submit to EDQ TS RPEQ certification that: i) all earthworks have been carried out generally in accordance with the certified plans submitted under part a) of this condition; and ii) any unsuitable material encountered has been treated or replaced with suitable material.	b) Prior to survey plan endorsement for the relevant stage c) Prior to survey plan endorsement for the relevant stage
12.	**Retaining walls (excluding the western boundary retaining wall)** a) Submit to EDQ TS detailed engineering plans, certified by a RPEQ, of all retaining walls 1m or greater in height. Retaining walls must be: i) certified to achieve a minimum 50 year design life; ii) designed generally in accordance with *AS4678 – Earth Retaining Structures* and relevant material standards (e.g. *AS3600 – Concrete Structures*); b) Construct retaining walls generally in accordance with the certified plans required under part a) of this condition. c) Submit to EDQ TS certification from an RPEQ that all retaining wall works 1.0m or greater in height have been constructed generally in accordance with the certified plans submitted under part a) of this condition.	a) Prior to commencing earthworks for the relevant stage b) Prior to survey plan endorsement for the relevant stage c) Prior to survey plan endorsement for the relevant stage
13.	**Compliance Assessment – Western boundary retaining wall** a) Submit to EDQ DA for Compliance Assessment preliminary engineering plans, certified by a RPEQ, of the proposed western boundary retaining wall adjoining the swale. The retaining wall must be: i) fully contained, including footings, within the private lots; ii) designed based on a professional geotechnical advice; iii) take into consideration scour and flood impacts from the adjoining swale; and iv) appropriately fenced (fauna exclusion). b) Submit to EDQ TS detailed engineering plans, certified by a RPEQ, of the proposed retaining wall along the western swale, generally in accordance with the endorsed plans required under part a) of this condition. The retaining wall must be: i) certified to achieve a minimum 100 year design life; ii) designed generally in accordance with *AS4678 – Earth Retaining Structures* and relevant material standards (e.g. *AS3600 – Concrete Structures*); c) Construct retaining walls generally in accordance with the certified plans required under part b) of this condition.	a) Prior to commencing earthworks for Stage 2 b) Prior to survey plan endorsement for Stage 2 c) Prior to survey plan endorsement for Stage 2

	d) Submit to EDQ TS: i) 'as-constructed' plans, certified by a RPEQ, demonstrating that the retaining wall has been constructed generally in accordance with the certified plans submitted under part a) of this condition. ii) A survey plan identifying the location of wall and footings to the property boundary.	d) Prior to survey plan endorsement for Stage 2
Roadworks, urban servicing and stormwater management		
14.	**Compliance Assessment - Road 1, Road 3 and Road 4**	
	a) Submit to EDQ DA for Compliance Assessment functional layout plans, certified by a RPEQ, for Road 1, Road 3 and Road 4 generally in accordance with: i) PDA Guideline No. 13 Engineering standards; and ii) Proposed Development Layout Plan, Plan No. TIEL202159.CIV.DA, Dwg No. 010, Issue H, prepared by Telford Civil and dated 07/07/21 iii) Industrial Connector Street Cross-Section as identified in the Engineering Services Report prepared by Telford Civil and dated 06/07/21. The roads are to be designed to allow for the use of heavy vehicles (B-doubles).	a) Prior to commencing site works
	b) Submit to EDQ TS detailed engineering plans, certified by a RPEQ, for roadworks for Road 1, Road 3 and Road 4, including parking bays, traffic devices and footpaths generally in accordance with: i) PDA Guideline No. 13 Engineering standards; and ii) functional layout plans endorsed under part a) of this condition.	b) Prior to commencing roadworks for the relevant stage
	c) Construct roadworks generally in accordance with the certified plans submitted under part b) of this condition.	c) Prior to survey plan endorsement for the relevant stage
	d) Submit to EDQ TS: i) certification from a RPEQ that all roadworks have been constructed generally in accordance with the certified plans submitted under part a) of this condition; and ii) all documentation as required by the *Certification Procedures Manual*. iii) as-constructed drawings, asset register and test results, certified by a RPEQ, in a format acceptable to the end asset owners for all roadworks constructed under this condition.	d) Prior to survey plan endorsement for the relevant stage
15.	**Compliance assessment – Crowson Lane and Greenhill Road intersection interim layout** Unless ultimate intersection works are already delivered by Council as part of the Crowson Lane augmentation project:	
	a) Submit to EDQ DA for Compliance Assessment engineering design and construction drawings, certified by a RPEQ, for the auxiliary left-turn treatment and channelised right turn lane	a) Prior to commencing intersection works

	treatment at the Crowson Lane/Greenhill Road intersection, generally in accordance with the following plans/documents: i. PDA Guideline No. 13 Engineering standards; and ii. Traffic Impact Assessment, Report No. 16378, Version 3 prepared by Rytenskild Traffic Engineering and dated 1 March 2019.	
	b) Construct the works generally in accordance with the endorsed plans submitted under part a) of this condition.	b) Prior to survey plan endorsement for the first stage
	c) Submit to EDQ TS: i) certification from a RPEQ that the intersection works have been constructed generally in accordance with the certified plans submitted under part b) of this condition; and ii) all documentation as required by the Certification Procedures Manual. iii) as-constructed drawings, asset register and test results, certified by a RPEQ, in a format acceptable to the end asset owners for all roadworks constructed under this condition.	c) Prior to survey plan endorsement for the first stage
16.	**Mount Lindesay Highway Service Road (Road 2)**	
	a) Submit to EDQ TS, approval from the Department of Transport and Main Roads for the Mount Lindesay Highway service lane, identified as Road 2 on Proposed Development Layout Plan, Plan No. TIEL202159.CIV.DA, Dwg No. 010, Issue H, prepared by Telford Civil and dated 07/07/21 The service lane is to be designed to allow for the use of heavy vehicles (B-doubles).	a) Prior to commencing works for Stage 1
	b) Construct the extent of Road 2 as shown on Proposed Development Layout Plan, Plan No. TIEL202159.CIV.DA, Dwg No. 010, Issue H, prepared by Telford Civil and dated 07/07/21 from the intersection with Road 1 to the Crowson Lane Interchange with the first stage of development in accordance with the approval from DTMR as required under part a)	b) As indicated
	c) Construct the extent of Road 2 as shown on Proposed Development Layout Plan, Plan No. TIEL202159.CIV.DA, Dwg No. 010, Issue H, prepared by Telford Civil and dated 07/07/21 from the intersection with Road 3 to the intersection of Road 1 with the second stage of development in accordance with the approval from DTMR as required under part a).	c) As indicated
	d) Submit to EDQ TS, certification from a RPEQ that all roadworks have been constructed generally in accordance part a) of this condition. ***Advice Note****: Construction of this service lane in accordance with the Industrial Connector cross-section or as alternatively agreed to by EDQ and meets EDQ's minimum requirements for offsetable infrastructure, can be considered offsetable.*	d) Prior to survey plan endorsement for the relevant stage

17.	**Street lighting** Comply with either parts a) and c) or parts b) and c) of this condition.	
	a) Design and install a Rate 2 street lighting system, certified by a RPEQ, to all roads, including footpaths/bikeways within road reserves. The design of the street lighting system must: i) meet the relevant standards of Energex; ii) be endorsed by Energex as 'Rate 2 Public Lighting'; iii) be endorsed by Council as the Energex 'billable customer'; iv) be generally in accordance with *Australian Standards AS1158 – 'Lighting for Roads and Public Spaces*.	a) Prior to survey plan endorsement for the relevant stage
	b) Design and install a Rate 3 street lighting system, certified by a suitably qualified and experienced RPEQ, to all roads, including footpaths/bikeways within road reserves. The design of the street lighting system must: i) be in accordance with *Australian Standards AS1158 – 'Lighting for Roads and Public Spaces'* ii) meet the requirements of AS3000 – '*SAA Wiring Rules'.* iii) meet the requirements of Energex for unmetered supply iv) be endorsed by the relevant ownership authority.	b) Prior to survey plan endorsement for the relevant stage
	c) Submit to EDQ TS 'as-constructed' plans and test documentation, certified by a RPEQ, in a format acceptable to Council.	c) Prior to survey plan endorsement for the relevant stage
18.	**Compliance Assessment - Water reticulation**	
	a) Submit to EDQ DA for Compliance Assessment a detailed water network plan, supported by hydraulic analysis, certified by RPEQ. The water network plan shall be prepared in accordance with: i) *SEQ Water Supply and Sewerage Design and Construction Code*; and ii) Concept Water Reticulation Layout Plan, Plan no. TIEL202159.CIV.DA, Dwg No 014, Issue G, prepared by Telford Civil and dated 07/07/21.	a) Prior to commencing works for Stage 1
	b) Submit to EDQ TS detailed water reticulation design plans, certified by a RPEQ. The certified water reticulation design plans must be designed generally in accordance with: i) *SEQ Water Supply and Sewerage Design and Construction Code*; and ii) the endorsed water network analysis required under part a) of this condition.	b) Prior commencing water reticulation work for the relevant stage
	c) Construct water reticulation works generally in accordance with the certified plans submitted under part a) of this condition.	c) Prior to survey plan endorsement for the relevant stage

	d) Submit to EDQ TS 'as constructed' plans, certified by a RPEQ, of all water reticulation infrastructure constructed in accordance with this condition, including an asset register, pressure and bacterial test results in accordance with: i) SEQ Water Supply and Sewerage Design and Construction Code - Asset Information.	d) Prior to survey plan endorsement for the relevant stage
19.	**Compliance Assessment – Internal Sewer reticulation**	
	a) Submit to EDQ DA for Compliance Assessment a detailed internal sewerage network plan, supported by hydraulic analysis, certified by RPEQ. The internal sewer network plan shall be prepared in accordance with: i) *SEQ Water Supply and Sewerage Design and Construction Code*; and ii) Concept Sewer Reticulation Layout Plan, Plan No. TIEL202159.CIV.DA, Dwg No 012, Issue G, prepared by Telford Civil and dated 07/07/21. The sewerage network plan shall include the extension of the internal sewer reticulation to the southern boundary to service the external catchment falling to the site.	a) Prior to commencing works for the relevant stage
	b) Submit to EDQ TS detailed sewer reticulation design plans, certified by a RPEQ. The certified sewer reticulation design plans must be designed generally in accordance with: i) *SEQ Water Supply and Sewerage Design and Construction Code;* and ii) the endorsed sewer network plan required under part a) of this condition	b) Prior to commencing works for the relevant stage
	c) Construct the internal sewer reticulation works generally in accordance with the certified plans submitted under part b) of this condition.	c) Prior to survey plan endorsement for the relevant stage
	d) Submit to EDQ TS 'as constructed' plans, certified by an RPEQ, of all internal sewer reticulation infrastructure constructed in accordance with this condition, including an asset register, pressure and CCTV results in accordance with: *i) SEQ Water Supply and Sewerage Design and Construction Code - Asset Information.* **Advice Note:** *The Sub-Regional sewerage pump station NM1 and external sewer rising main will be constructed and put in operation by Council.*	d) Prior to survey plan endorsement for the relevant stage
20.	**Temporary sewage tankering of wastewater** Unless the Sub-Regional sewerage pump station NM1 and external rising main is completed and in operation by Council:	
	a) Enter into a tankering agreement with Council for the collection and disposal of wastewater for any lots created; and	a) Prior to survey plan endorsement for the first stage
	b) Maintain the tankering agreement required by part a) of this condition until Sub-Regional sewerage pump station NM1 is commissioned.	b) As indicated

21.	**Compliance Assessment – Updated Site Based Stormwater Management Plan** Submit to EDQ DA for Compliance Assessment an updated Site Base Stormwater Management Plan (SBSMP), certified by a RPEQ, for the management of stormwater within the site to ensure non-worsening to downstream properties, including Mt Lindesay Highway, generally in accordance with *PDA Guideline No. 13 Engineering standards, Stormwater Quantity and Stormwater Quality*. The updated SBSMP shall include the following: i) Confirmation that the subject site is not impacted by flooding. This confirmation is to be provided through the undertaking of a site based flood model. If impacted by flood, provide further details on the Q100 line and the type of inundation – conveyance and/or storage Or Demonstrate that the updated current solution identified in the SBSMP ensures that there is no worsening at lawful point of discharge based on Council's nominated 1% AEP flood level at Mt Lindesay Highway. ii) he on-site detention/bio-retention basins form part of the overall solution. Provide an engineering and legal strategy/mechanism (e.g. Easement) to ensure that these devices can continue to perform as designed into the future. iii) Demonstrate that the design of the road stormwater system will convey runoff from the road reserve and the pre-developed lots to the proposed detention / bio-retention basin. iv) Demonstrate that the configuration, sizing and operation of the proposed detention / bio-retention basin system will accommodate runoff from the road stormwater system as per part (iii) above and result in no net worsening downstream of the site. v) Conveyance of existing external flows to the existing lawful point of discharge, ensuring no-net worsening downstream of the site.	Prior to commencing works
22.	**Stormwater Conveyance System** a) Submit to EDQ TS detailed engineering drawings and hydraulic calculations, certified by a RPEQ, for the stormwater conveyance system designed generally in accordance with: i) *PDA Guideline No. 13 Engineering standards* – Stormwater quantity; and ii) Updated Site Based Stormwater Management Plan, required by Condition 21 of this approval. b) Construct stormwater network generally in accordance with the certified plans submitted under part a) of this condition.	a) Prior to commencing works for the relevant stage b) Prior to survey plan endorsement for the relevant stage

	c) Submit to EDQ TS "as constructed" plans, certified by a RPEQ including an asset register in a format acceptable to Council.	c) Prior to survey plan endorsement for the relevant stage
23.	**Compliance Assessment - Stormwater detention/bio-retention basin** a) Submit to EDQ DA for Compliance Assessment detailed engineering drawings and hydraulic calculations, certified by a RPEQ, for the proposed detention/bio-retention basin designed generally in accordance with: i) PDA Guideline No. 13 Engineering standards – Stormwater Quantity and Stormwater Quality; and ii) Updated Site Based Stormwater Management Plan, required by Condition 21 of this approval. b) Construct the basin generally in accordance with the endorsed plans required under part a) of this condition. c) Submit to EDQ TS "as constructed" plans, certified by a RPEQ including an asset register in a format acceptable to Council. **Advice Note:** *The proposed industrial allotments will have lot-based on-site stormwater detention and water quality treatment measures in the post-development phase. These treatment devices will be installed by the future lot owner with their size and location being allocated to suit the end use. Maintenance of these devices will be the responsibility of the future lot owners.*	a) Prior to commencing works b) Prior to survey plan endorsement for the first stage c) Prior to survey plan endorsement for the first stage
24.	**Compliance Assessment – Swale** a) Submit to EDQ DA for Compliance Assessment detailed engineering drawings and hydraulic calculations, certified by a RPEQ, for the stormwater swale on the western boundary of the land designed generally in accordance with: i) PDA Guideline No. 13 Engineering standards – Stormwater quantity and: ii) Concept Catchment Layout Plan, Plan No. TIEL202159.CIV.DA, Dwg No. 008 Issue I, Prepared by Telford Civil and dated 07/07/2021 iii) Swale Longitudinal Section, Plan No. TIEL202159.CIV.DA, Dwg No 018 Issue B, Prepared by Telford Civil and dated 07/07/2021 iv) Swale Cross Sections, Plan No. TIEL202159.CIV.DA, Dwg No 019 Issue C, Prepared by Telford Civil and dated 07/07/2021 The detailed design shall ensure that the swale: i) has adequate capacity to convey overland flow up to including the 1 in 100year event with appropriate freeboard ii) is free flowing with no ponding iii) is provided with an adjacent track to allow future maintenance iv) maintain a depth*velocity product not exceeding 0.6 up to including 1 in 100year event unless agreed in writing by Council	a) Prior to commencing works

	v) is appropriately fenced (fauna exclusion) along the eastern side of the swale.	
	b) Construct the swale generally in accordance with the endorsed plans required under part a) of this condition.	b) Prior to survey plan endorsement for Stage 2
	c) Submit to EDQ TS swale "as constructed" plans, certified by a RPEQ including an asset register in a format acceptable to Council.	c) Prior to survey plan endorsement for Stage 2
25.	**Electricity**	
	a) Submit to EDQ TS a Certificate of Electricity Supply from ENERGEX for the provision of electricity supply to the approved development.	a) Prior to survey plan endorsement for the relevant stage
	b) Connect the approved development in accordance with the Certificate of Electricity Supply submitted under part a) of this condition.	b) Prior to survey plan endorsement for the relevant stage
26.	**Telecommunications**	
	a) Submit to EDQ TS documentation from an authorised telecommunication service provider confirming that an agreement has been entered into for the provision of underground telecommunication services to the approved development.	a) Prior to survey plan endorsement for the relevant stage
	b) Connect the approved development in accordance with the documentation submitted under part a) of this condition.	b) Prior to survey plan endorsement for the relevant stage
27.	**Broadband**	
	a) Submit to EDQ TS written agreement, from an authorised telecommunications service provider, confirming that fibre-ready pit and pipe infrastructure designed to service the approved development can accommodate services compliant with *Industry Guideline G645:2017 Fibre-Ready Pit and Pipe Specification for Real Estate Development Projects*.	a) Prior to survey plan endorsement for the relevant stage
	b) Construct the fibre-ready pit and pipe infrastructure specified in the agreement submitted under part a) of this condition.	b) Prior to survey plan endorsement for the relevant stage
28.	**Gas**	
	a) Submit to EDQ TS, documentation from an authorised gas service provider, confirming that an agreement has been entered into for the provision of underground gas services to the proposed development.	a) Prior to survey plan endorsement for the relevant stage
	b) Connect the development to underground gas services in accordance with the agreement mentioned in part a) of this condition.	b) Prior to survey plan endorsement for the relevant stage

Landscape and environment		
29.	**Streetscape works – Compliance Assessment** a) Submit to EDQ DA, for Compliance Assessment, detailed streetscape works drawings, certified by an AILA, for proposed streetscape works of Roads 1, 3 and 4, including a schedule of proposed standard and non-standard Contributed Assets to be transferred to Council. The certified drawings are to include, where relevant: 1. location and type of street lighting in accordance with AS1158 –*'Lighting for Roads and Public Spaces';* 2. footpath treatments; 3. location and specifications of streetscape furniture; 4. location and size of stormwater treatment devices; and 5. street trees and plants, including species, size and location generally in accordance with Council's adopted planting schedules and guidelines. b) Construct streetscape works generally in accordance with the streetscape plans endorsed under part a) of this condition. c) Submit to EDQ TS 'as constructed' plans, certified by an AILA, and asset register in a format acceptable to Council.	a) Prior to commencing streetscape work for the relevant stage b) Prior to survey plan endorsement for the relevant stage c) Prior to survey plan endorsement for the relevant stage
30.	**Vegetation Clearing** a) Submit to EDQ TS a vegetation clearing plan prepared by an ecologist for each stage that excludes the 25m buffer corridor and lot identified for open space. b) Undertake vegetation clearing generally in accordance with the plan submitted under part a) of this condition. The clearing is to be undertaken with the stage to be developed. c) Vegetation clearing is to be supervised by an Ecologist. d) Submit to EDQ TS written certification from an Ecologist that vegetation clearing has been carried out generally in accordance with part b) of this condition.	a) Prior to commencement of clearing for relevant stage b) At all times c) At all times d) Within 3 months of completion of clearing of the relevant stage
31.	**Fauna Spotter** a) A licensed Wildlife Spotter/Catcher under the N*ature Conservation Act 1992* is to undertake a survey of the site to identify any fauna or habitat features (e.g. nests, tree hollows) and certify that any necessary fauna protection measures or relocation procedures have been implemented. b) A licensed Wildlife Spotter/Catcher must be present during the vegetation clearing.	a) Prior to commencement of vegetation clearing for the relevant stage b) At all times during vegetation clearing

	c) Submit to EDQ TS certification from the licensed Wildlife Spotter/Catcher that vegetation clearing and fauna protection measures was carried out generally in accordance with the conditions of approval. **Advice Note:** *Where an Environmental Protection and Biodiversity Conservation Act 1999 (EPBC) approval has been granted and includes fauna spotter requirements, the fauna spotter requirements under this condition will not be applicable for the same matters under the EPBC approval*.	c) Within 3 months of the completion of vegetation clearing of the relevant stage
32.	**Vegetation – Compensatory Planting**	
	a) Submit to EDQ TS a planting plan certified by an ecologist showing the extent of compensatory planting to be undertaken in lot identified as 'Open Space' on Proposed Development Layout Plan, Plan No. TIEL2020159.CIV.DA, Dwg 10, Issue H dated 07/07/2021, excluding the minimum 25m buffer on the western boundary, including, type and extent of planting, as set out in the EDQ Guideline 17: Remnant Vegetation and Koala Habitat Obligations in Greater Flagstone and Yarrabilba PDAs dated May 2015.	a) Prior to commencement of vegetation clearing for the relevant stage
	b) Undertake compensatory planting in accordance with a) of this condition.	b) Within 3 months of commencement of vegetation clearing
	c) Once compensatory planting has been undertaken, submit to EDQ TS confirmation from a qualified arborist (AQF Level 5) or ecologist that the compensatory planting has been undertaken in accordance with b) of this condition.	c) Within 12 months of commencement of vegetation clearing of the relevant stage
33.	**Bushfire management**	
	a) Carry out bushfire management works in accordance with: (i) Section 6 of the approved Bushfire Management Plan, Report 16014, Final V3, dated 13 July 2018 (ii) Addendum to the Bushfire Management Plan for the proposed development at 4499-4651 Mount Lindsay Highway, North Maclean dated 18 February 2021.	a) Prior to survey plan endorsement for the relevant stage
	b) Submit to EDQ TS verification from a suitably qualified professional that the works required for bushfire management and mitigation within the relevant stages have been carried out generally in accordance with the relevant approved plans and documents. **Advice Note**: *If the adjoining landowner obtains approval for vegetation clearing that reduces bushfire impact, then this can be articulated though an updated context plan supported by a new bushfire advice.*	b) Prior to survey plan endorsement for the relevant stage

Surveying, land transfers and easements		
34.	**Land transfers - contaminated land** Submit to EDQ TS a copy of a site suitability statement, as required under the EP Act, confirming that all land conditioned to be transferred to a trustee is suitable for the intended purpose(s). The site suitability statement must be prepared by a suitably qualified person and be certified by an approved auditor in accordance with the EP Act. *NOTES:* *For the purpose of this condition a suitably qualified person is defined in the EP Act.* *A list of approved auditors can be found at the following website:* https://www.qld.gov.au/environment/pollution/management/contaminated-land/auditor-engagement.	Prior to survey plan endorsement for the relevant stage
35.	**Land transfers – drainage and offset area** Transfer, in fee simple, to Council as trustee, the Lot identified as Open Space as shown on the approved plans for drainage and offset open space purposes.	At registration of survey plan for Stage 2
36.	**Land transfers – Sewerage pump station** a) Submit to EDQ TS, confirmation from Council on the size and location of the Sewer pump station site. b) Transfer in fee simple, to Council as trustee, land for the proposed sub-regional pump station generally in accordance as shown on: i) Concept Sewer Reticulation Layout Plan, Plan No. TIEL202159.CIV.DA, Dwg No. 012, Issue G, prepared by Teleford Civil and dated 07/07/21. The land metes and bounds must be to the satisfaction of the Chief Executive Officer of the authority. ***Advice Note**: This land forms part of the sub-regional sewer infrastructure to be delivered by Council. Offsets for the land may be available.*	a) Prior to survey plan endorsement of the first stage b) At registration of survey plan for the first stage
37.	**Rising main easement** Provide a 6m wide easement, in favour of and at no cost to the Council, along the southern boundary for the proposed sub-regional sewerage rising main generally in accordance as shown on: i) Concept Sewer Reticulation Layout Plan, Plan No. TIEL202159.CIV.DA, Dwg No. 012, Issue G, prepared by Teleford Civil and dated 07/07/21. The terms of public utility easements are to be to the satisfaction of the Chief Executive Officer of the authority which is to accept and maintain the Contributed Assets. ***Advice Note:** If an alternative route for the rising main is pursued, the easement can be cancelled at the agreement of Council.*	At registration of survey plan for the first stage

38.	**Easements over infrastructure** Provide public utility easements, in favour of and at no cost to the grantee, over infrastructure located in land (other than road) for Contributed Assets. . The terms of public utility easements are to be to the satisfaction of the Chief Executive Officer of the authority which is to accept and maintain the Contributed Assets.	At registration of survey plan for the relevant stage

STANDARD ADVICE

Please note that to lawfully undertake development, it may be necessary to obtain approvals other than this PDA development approval. For advice on other approvals that may be necessary in relation to your proposal, it is recommended that you seek professional advice.

**** End of Package ****