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ABN 72 412077971

Ref: 21153
Your Ref: **RAL21/0138**

20 June 2024

Fraser Coast Regional Council
PO Box 1943
Hervey Bay Qld 4655

Dear Sir,

Reconfiguring A Lot - One (1) Lot into Eighteen (18) Lots – Wilkinson Road, Tuan – Reference RAL21/0138

In accordance with the provisions of the Planning Act 2016 we provide the following formal response and attached information in response to your Information Request of 13 January 2022 request for further information.

Stormwater Management

Please refer attached Stormwater Management Plan (SMP) prepared by Storm Water Consulting.

The SMP demonstrates 'the proposed development would not create any adverse impacts on neighbouring private properties' thus demonstrating compliance with Stormwater Management No1

Please You will note the following attachments:

- Signed agreement with the Knights (Lot 3 SP155428) for the discharge of stormwater onto their property and the acceptance of the easement required by Council.
- This satisfies the request of the adjoining owner to retain access to stormwater overland flow to service the recharges of their onsite dam for that lot.
- Layout plans SK5 which details fill height in accordance with the SMP
- This demonstrates compliance with:
- The Flood Hazard Area for the 100 Year Average Recurrence Interval and
- Properties within the Storm-Tide Hazard

Coastal Protection Overlay

PO1- Table 8.2.6.3.2

Please refer attached Reference is made to the attached correspondence from International Coastal Management (ICM).

This demonstrates 'how the development mitigates adverse coastal hazard impacts' thus demonstrating compliance with PO1. that provides for an outcome in relation o the EPA and the State policy matters.

The mitigation works referred to by ICM in this letter, will form part of the development's application for whilst yet to be designed to Operational Works approval standards will involve the filling of land to mitigate the potential coastal impacts within the site.

The matters relating directly to providing an acceptable outcome for PO1 of the code are addressed in the referenced correspondence above.

PO7- Table 8.2.6.3.2

In relation to PO7, the adoption of the ICM's solution will result in the land being removed from the erosion prone area on the State overlay map, thus making PO7 Not Applicable. It is also relevant there has been no advice form SARA in relation to any land surrender on the site and based on recent experience, surrender is not expected in this instance.

PO9 - Table 8.2.6.3.2

PO9 defines seeks to limit the hazard impacts associated with medium hazard storm tide impact surge on resident populations.

In this instance it is proposed to construct the SMP demonstrates the proposed development will delivers lot above the to a level above the identified as 'medium hazard storm tide' risk and thus provide for new lots with suitable platform levels to remove this risk. 'avoids any increase in risk to people or property from coastal hazard impacts'.

Layout and Neighbourhood Design

Given the clear constraints associated with the existing conditions on the land immediately north and the identified matters of local and State interest, the practicality of developing the site is limited and as such a point of connectivity is unlikely to provide any sustainable planning outcomes.

We acknowledge the Walkable Neighbourhoods policy seeks to promote connectivity and limit the use of cul-de-sacs, however in this instance given the investigations that have been done for the current application, the layout proposed is the most practical planning outcome and will not in our view prejudice and future planning in the immediate locality.

Information Required

1 Demonstrate compliance with Walkable Neighbourhoods, Schedule 12A, Part 2, assessment benchmark 4 (ii).

Response

The Site and Future Development

The sites adjoining the development are:

- a forestry reserve to the west and to the south,
- Wilkinsons Road to the east and
- Lot 2 RP192532 (Lot2) and Lot3 SP155428 (Lot3) to the north

Lot 3 and the reserve to the west and to the south, are not lawfully capable of subdivision.

While Lot 2 is zoned low density residential, and of sufficient size to be capable of subdivision, the land currently is within the erosion prone area overlay and under the provision of State Code 8 Residential development in that zone is currently prohibited.

Therefore, at the time of determination of this Application the land is not capable of lawful future residential development.

Further, the land is also constrained from future development by the capability of complying with other relevant assessment benchmarks. To satisfy these constraints Lot 2 would be required to be filled. However, the topography of the area demonstrates that lots 1, 2 and 3 of SP 155428 all have contours that all fall towards Lot 2. A significant engineering solution would need to be found to allow stormwater collected on these three sites to continue to be discharged to their natural contour.

Further lot 2 would also need to be protected from the entry of seawater under the 2100 sea level height benchmark before development could be approved. A still further complication is a solution to the discharging of stormwater below sea level heights.

The site also sits within the protected wetland buffer area.

In conclusion, while it may technically be possible to resolve all these complicating factors for Lot2, the economics of developing this site now or in the future are highly problematic and very speculative.

Further, in July 2019 the Department of State Development, Manufacturing, Infrastructure and Planning (DSDMIP) released a model code titled Model Code for Neighbourhood Design-A Code for Reconfiguring A Lot. The document provides 36 Performance Outcomes and some Acceptable Outcomes. The Queensland Government proposed to make some elements of the model code mandatory for all new residential development.

The Department went out to consultation from 21 July to 1 September 2019. This included conducting surveys of the community.

The overarching goal from consultation was to hear from Queenslanders about how planning supports healthier and active communities and whether walkable neighbourhoods should be prioritised through mandatory provisions and had 4 objectives

- Manage expectations about what the planning system can and can't achieve
- Deliver change that supports more active communities
- Provide opportunities for meaningful conversation about planning healthy and active communities
- Raise community awareness about the need for healthier and more active communities and the role planning can play

In December 2019 that Department released their Consultation Report Creating healthy and active communities (CH&AC). CH&AC advised that in response to the survey question –
do you agree with mandatory provisions.

One of the top 5 responses was '…don't remove cul-de-sac these create a sense of community safe environment and are highly valued'

The CH&AC reveals that 18,300 persons responded to a quick poll in which the community when asked the question:

do you think the proposed model should become mandatory?'

Only 58% of respondents were for the affirmative. 42% opposed the concept and that the CH&AC observed – There was mixed support for the use of a grid-like street network.

And most significant of the CH&AC findings was that:
Local governments did not support proposed mandatory provisions due to concerns about statewide provisions impacting local decision-making powers to deliver local outcomes, cost and benefits of the provisions, and impacts on council budgets.

And on the matter of - 'the need for mandatory provisions
….. there were differing views from industry and local government on technical aspects and how these may be best implemented across Queensland'

In August 2020, (one month prior to the gazettal of Schedule 12A) Queensland Treasury Planning Group published a document also titled Model Code for Neighbourhood Design-A Code for Reconfiguring A Lot. The publication indicated that it was drafted in June 2020. The document advised that the:
.. model provisions have been developed to assist local government to address aspects of the Liveable community's state interest of the State Planning Policy (SPP) by providing a contemporary set of standards that can be used by local government to assist in integrating the state interest.

Despite this feedback however, state government went ahead, and on 28 September 2020 and using the Planning (Walkable Neighbourhoods) Amendment Regulation 2020 inserted Schedule 12A into Planning Regulation 2017.

The Explanatory notes to the Amendment Regulation (SL 2020 No. 162) advised that"
The objective of the Planning (Walkable Neighbourhoods) Amendment Regulation 2020 is to ensure new residential neighbourhoods are designed to encourage walking for (the purposes of) transport, leisure, recreation and exercise. 1

This has been enshrined in the legislation (Part 2 Section 3 of Schedule 12A) except the style of "walking" has been moderated to only include the "convenient and comfortable type and restricted in application to only "in the locality of the lot" that has been the subject of a Reconfiguration approval - after September 2020.

Then went on to explain
To achieve the policy objectives requires development applications for residential subdivisions be assessed against assessment benchmarks standards for 5 aspects

- *connected street layout,*
- *shorter block lengths,*
- *footpaths,*
- *street trees and*
- *proximity to parks and open space.*

These five design elements, parliament apparently believes will contributing to creating supportive environments to improved physical activity and health outcomes for those residence living within such a setting.

No Science based study is referenced to support the proposition that legislations achieve motivational outcomes. However, cited was a Walking in Queensland Report 2019 (Report) resulting

from a survey of 2,713 Queenslanders3 and a case study involving the 'connection of the community of Burleigh Waters on the Gold Coast.
Not provided was: the demographics of those surveyed or methodology of selection.

It appears the study did not include small communities in remote locations.

The introduction of the Report advised
Walking for transport can reduce traffic congestion and pollution and help tackle climate change. (Not applicable to Tuan)

Walking contributes to the vitality of our cities and towns (No mention of small communities)— Walkable environments attract people who in turn support local businesses.
(No mention of small communities - without any businesses)

People who walk regularly can improve their overall health and reduce their risk of chronic diseases. (Aspirational and not applicable to CODE assessment development)

In May 2021 the Department of State Development, Infrastructure, Local Government and Planning published the document Delivery of state interests through the Planning Regulation 2017- Guidance for local government"

Under the Liveable Communities section of the document the term 'walkable communities' did not get a mention and the State government's document provided no guidance to local government in the administration of Schedule 12A of the regulations published in September 2020 [8 Months Earlier].

Conclusion

This decision by the State government to make the provisions apply throughout the whole of Queensland was ill considered and calls into question the process by which it has been achieved, seeming more to have evolved from political aspiration for larger urban area than from sound community planning principles.

Further - Planning Confusion

Schedule 12A applies to subdivision of land in all the residential style, use zones, except rural residential zones.

- Rural residential zones under Councils planning scheme have the same minimum frontage and minimum depth to frontage ratio as low-density residential zones. The zoning of the subject development application.
- The only difference between the two zonings is minimum area. Which for Rural is 4000m2 and in low-density is 2000m2
- Given that the frontage for both zones are the same and the stated purpose for walkable neighbourhoods appears to be exposure to streetscape from the purpose of 'ensuring convenient and comfortable walking in the locality of the lot' and given this, walkability criteria in rural residential zones could, in accordance with Council planning requirements, provide the same circumstances as a low-density residential zones provides, making it difficult to understand the planning principals this piece of legislation seek to deliver in low-density residential zones.

Received by FCRC
RAL21/0138
20 June 2024

Conclusion

The difference between rural residential and low density residential under Schedule 12A seems arbitrary in so much as the circumstance in one has been placed within the purview of Walkable Communities and the same circumstance in the other - has not.!

Tuan

It was difficult to locate any accurate historical information on the establishment of the fishing village which come to be known as Tuan but it would be reasonable to assume it did so in the last quarter of the 19th century particularly as a consequence of the discovery of gold in Gympie in 1867.

We think there would be little challenge to the assumption that Tuan started off a fishermen camp, plying their trade in the Great Sandy Strait and providing much-needed sea foods resources to the burgeoning population areas around Maryborough and Gympie.

We also know that in the 2016 census, the locality of Tuan had a population of 153 people and in the 2021 census, the population was 140 people. A decline of 8.3% while in the same period that the Queensland went from 4,703,193 people to 5,156,138 million. An increase of 9.7%

We know there is approximately 158 parcels of land in Tuan ranging in size from 754 m^2 up to 4.01 ha. Of those 158 properties, 118 have structures erected on them. The other 40 remained vacant- Giving in 2021 an occupancy density of 1.18 person per structure.

Tuan has a geographic area of approximately 82ha with a spatial density of 1 person to every 5870m2. Tuan sits nestled between the 33,000 ha of forestry reserve and the vast reaches of the Great Sandy Strait with 25 kilometres and a 19-minute drive to the nearest town.

Under the current projected Coastal Management Sea Level Rise benchmark only 47 existing properties in Tuan will not be impacted by sea level rises - by the year 2100.

Boasting, no shop or tourist accommodation facilities or employment opportunities Tuan only attraction remains the attention of persons interested in boating and fishing or living in a quite beach house location.

Tuan is not a community functionally suitable for the necessity of the objectives of Schedule 12A of the planning regulations.

Further - The Law

Queensland Treasury's Planning Group published a documentation, undated but titled Invested in Planning For Your Future- Walkable Neighbourhoods in which the Planning Group set out an overview of what was intended in the application of the assessment benchmarks created by the adoption of schedule 12A of the regulations, by local governments throughout Queensland.

In that document they reflected, we believe, on circumstances existing and revealed in the public consultation session about the applicability of this legislative facility outside the big growth regions of the State by reminding assessment managers that 'while they must assess development applications in accordance with the new assessment benchmarks, assessment managers have discretion to determine the extent to which a benchmark is relevant to any particular development application'.

And went on to reinforce this advice by stating that 'in exercise of that discretion, this will be the way that the new essentials provided in the assessment benchmarks will have the flexibility that will be required to deal with the many circumstances encountered by local governments across the State.'

Of course, what the Planning Group were reflecting on, was the legislative flexibility already existing in the Planning Act 2016 (Act) with particular reference to section 60 which states in essence that:

To the extent a development application involves a development that requires code assessment, and of course, subject to a referral agency's response, the assessment manager, after carrying out the assessment must approve the application if it complies with ALL of the assessment benchmarks BUT may still approve the development application even if the development Does Not comply with some of the assessment benchmarks.

And of course, the important relevance of section 65 (Permitted development conditions) of the Act reminds us that a condition imposed on a development approval

- *must be relevant to, and not be an unreasonable imposition on, the development or the use of premises as a consequence of the development and*
- *must be reasonably required in relation to the development or the use of premises as a consequence of the development.*

Conclusion

The current and future inhabitants of Tuan, as the consequence of approval of this development, are not in need of any the facilities that Schedule 12A of the planning regulations, to ensure their health, peace, tranquillity and well-being. – The legislation is designed for the very dense an 'open space' constrained urbanized part of our state, such as the major growth corridors of Brisbane, the Gold Coast and the provincial cities.

The imposition on this development application by applying all the benchmark provisions set out in schedule 12A of the planning regulations in relation to a location in Tuan are not relevant to the social structure, the nature of the community, the topography of the country or the type of lifestyle in that community; and could never be considered to be reasonably required in relation to the developments use that would flow from the approval of this development.

2 Demonstrate compliance with performance outcome PO2 of the Reconfiguring a lot code.

Note the following attachments:

Layout plans SK6 which is the latest layout plan presented in Appendix E of the SMP

This demonstrates lot design compliance with:

- Low density residential zone code (6.2.1)
- Reconfiguring a lot code (9.4.3)

Yours faithfully,

Ward Veitch
Urban Planet Town Planning Consultants

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Ref: 21153
Your Ref: 2112-26497 SRA
FCRC Ref: **RAL21/0138**

20 June 2024

WBBSARA
PO Box 979
BUNDABERG 4670

Dear Sir,

Reconfiguring A Lot - One (1) Lot into Eighteen (18) Lots – Wilkinson Road, Tuan – Reference 2112-26497 SRA

In accordance with the provisions of the Planning Act 2016 we provide the following formal response and attached information in response to your Information Request of 7 January 2022 for further information.

Development in the erosion prone area

Reference is made to the attached correspondence from International Coastal Management that provides for an outcome which demonstrates how the development can achieve compliance in relation to the EPA and the State policy matters. PO1 of State Code 8. The mitigation works referred to in this their letter, will form part of the development's development application for whilst yet to be designed to Operational Works approval standards will involve the filling of land to mitigate the potential coastal impacts within the site.

Hydrology and water quality

Please refer attached stormwater management plan prepared by Storm Water Consulting. This report demonstrates the development will have provides for response outcomes to the matters of HES and shows that there is no impact imposed on the values of the wetland in the protected wetland area or the Great Barrier Reef wetland protect area thus achieving compliance with PO3, PO4 and PO5 of State Code 9 wetland area.

This is the formal response to your request for further information. We will be happy to provide clarification of any matters that may arise in your final assessment of the application. on an informal basis. We look forward to receipt of your approval.

Yours faithfully,

Ward Veitch
Urban Planet Town Planning Consultants

B/C FCRC

AGREEMENT

We the undersigned acknowledge and understand the following:

1. We understand that Mark and Julianne Grunskie (our neighbours) are desirous of developing their parcel of land [Lot 51 MCH 567] for further residential development.
2. We understand that if the development proceeds there will be some changes to the natural overland stormwater flows path, that historically have in part, transited across our adjoining property [**Lot 3 SP155428**].
3. We have historically relied upon this phenonium to recharging our dam storage facilities, on our property.
4. We have had discussions with our neighbours in relation to this situation and our desire to continue to access some of that overland flow stormwater, for that purpose.
5. We have perused the proposed subdivisional layout plan [**20057-Sk5**] prepared by our neighbour's engineers which incorporates facility for collection of:
    a. **some** of that overland stormwater from the upland forestry area; plus
    b. **all** the rainwater that falls on lot 51; and

    to discharged that stormwater directly across the common boundary into our property.
6. We understand that it will be a requirement of Fraser Coast Regional Council that a protective **easement** of 5 meters square (25m2) abutting the boundary, will need to be granted in favour of Council, for maintenance purposes around that discharge point.
7. We understand that this outcome, including the provisioning of the required easements, will be undertaken at no cost to us.

We therefore hereby agree to the proposal, as defined above and detailed in **Attachment A.**

David Kevin Knight

Suzan Mary Knight

Dated 27/4/24

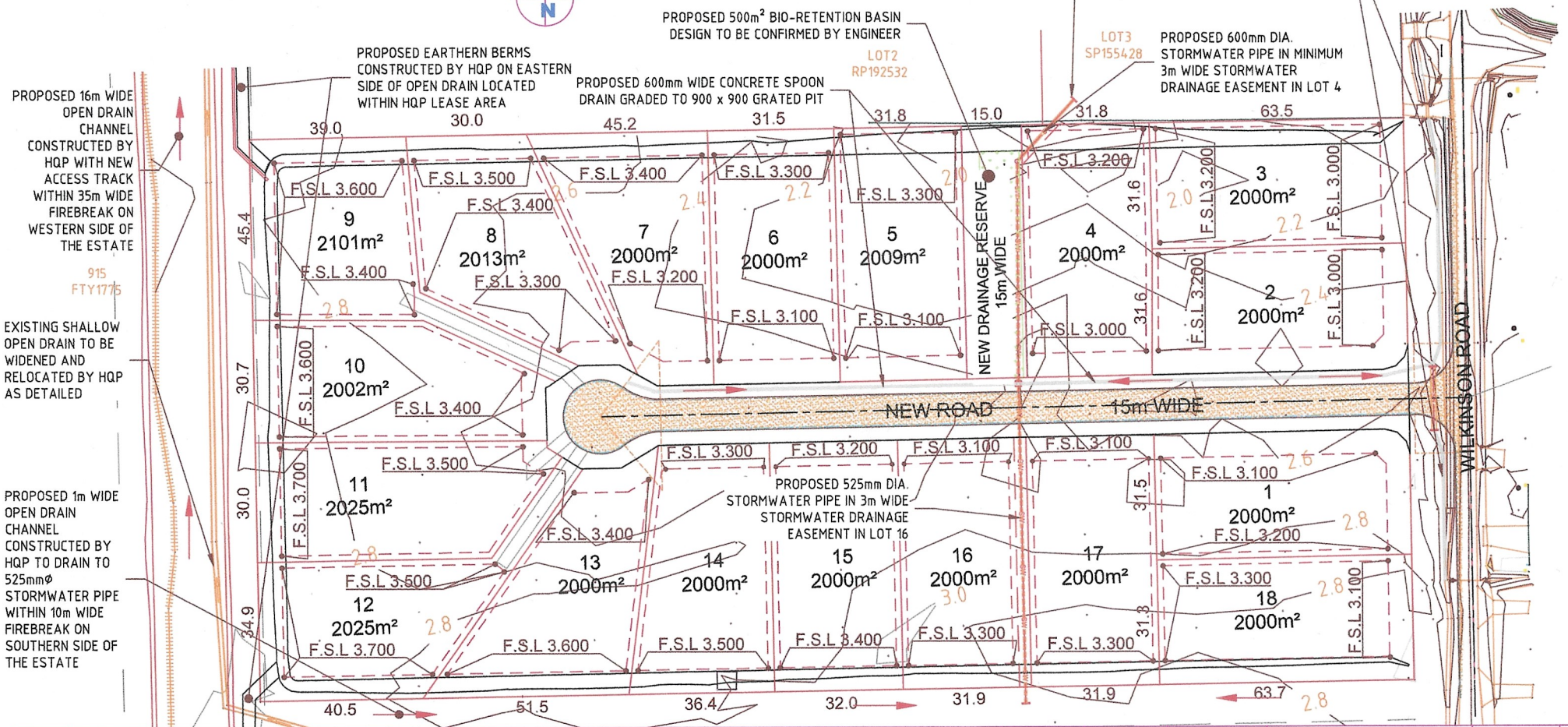
APPENDIX A

LEGEND

- EXISTING CONTOUR (0.20m) A.H.D.
- EXISTING STORMWATER DRAINAGE LINE
- EXISTING EDGE OF BITUMEN
- EXISTING GRADE OF OPEN DRAIN
- EXISTING TELSTRA SERVICE (PIT)
- EXISTING O/H ELECTRICITY (POWER POLE)
- EXISTING UNFORMED TRACK
- PROPOSED AC SURFACED ROAD PAVEMENT
- PROPOSED MOUNTABLE KERB (TYPE L)
- PROPOSED EDGE RESTRAINT (TYPE Q)
- PROPOSED OPEN CHANNEL DRAIN
- PROPOSED CONCRETE SPOON DRAIN
- F.S.L 3.300 PROPOSED TOPSOILED F.S. PAD LEVELS
- PROPOSED 3m BITUMEN DRIVEWAYS

R.P. DETAILS
LOT 51
MCH 567

NOTES
1. PROPOSED STAGE 1: LOTS 1 TO 3 & 18.
2. PROPOSED LOT DIMENSIONS AND AREAS ARE APPROXIMATE ONLY AND SUBJECT TO FINAL SURVEY.



No	DATE	AMENDMENTS
		DK 27/4/24

ASSOCIATED PLANNING CONSULTANT
URBAN PLANET

ASSOCIATED SURVEYING CONSULTANT
PACIFIC COAST SURVEYS PTY LTD

CLIENT
MARK & JULIANNE GRUNSKE

PROJECT
PROPOSED SUBDIVISION AT WILKINSON STREET TUAN

SIGNED: 26/04/24
for and on behalf of
TONY McVEY Pty Ltd
ABN 18 051 348 436
Consulting Engineer
P.O. BOX 941, HERVEY BAY 4655
Phone : (07) 4128 4499
Mobile: 0427 082 952
Email: hbmcvey@bigpond.com
Director: Tony McVey B.E.(Civil), M.I.E.Aust., R.P.E.Q. No. 2648

DESIGNED BY	DRAWN BY	DATE
T.McVey	T.McVey	26/04/2024
CHECKED BY	APPROVED BY	SCALES
T.McVey	T.McVey	1:1000

FIGURED DIMENSIONS TAKE PRECEDENCE OVER SCALES
VERIFY ALL DIMENSIONS ON SITE.

0 10 20

TITLE
ESTATE EARTHWORKS, ROADWORKS & STORMWATER DRAINAGE LAYOUT PLAN

JOB NUMBER **C20057**
SHEET SIZE **A3**
DRAWING NUMBER **20057- Sk5**

Meeting Notes

Date-Time 7 March 2024 @2:00pm

PRESENT

Project manager	Warren Bolton
Council Engineer	Neale Glanfield
Council Planner	Emily Burke

TOPICS

Corporate Knowledge

1. Council records contain no material relevant to any pre-lodgement meeting or officer discussions held between the applicant or their representative with Council and has no corporate knowledge of a '*previously approved*' SWMP as detailed in the DA supporting Planning Report.
2. Council original engineer involved with development was Ian Gay
3. For Lot 51 MCH567 (subject site)
   a. AHD for 2100 Sea Level rise is 2.25m
   b. AHD for AHT at Tuan is 1.95m
   c. AHD for Storm Tide is 2.40m
   d. AHD for allotments filling is the projected water level for an overland flooding event of Annual Exceedance Probability [AEP] of 1% + 300mm.

State and Council Code Requirement

4. Despite addressing issues under Code State Code 8 (SC8) and State Code 9 (SC9) (Codes) with the Referral Agency (SARA), Council's
   a. *Coastal protection overlay code 8.2.6* and
   b. *Biodiversity areas, waterways and wetlands overlay code 8.2.4*

   for the same issues will still need to be addressed in a response to Council on these issues, raised in Councils Information Request.

5. The applicant advised that professional engineers are being engaged to demonstrate to the SARA for the application of SC8 that the *coastal hazard threat,* designation as *erosion prone area* can be mitigated on the subject site by the application of ameliorating engineering solutions.

   Acceptance by SARA of this submission for the ***erosion prone*** *area* will be recognised by Council for the purposes of application of planning scheme provisions.

6. The applicant advised that professional engineers have been briefed to demonstrate to the SARA for the application of SC9 that the development can achieve the required *Performance Outcomes* of the code for the *Protected Wetland* by the application of engineering solutions.

   Acceptance by the referral agency of this submission for the ***wetlands*** will be recognised by Council for that situation within the application of planning scheme provisions.

Storm Water Management Plan

7. The Stormwater Management Plan is required to demonstrate the development will not result in any ⁎**adverse impacts** on the:
   a. adjoining **wetland** area; or
   b. **neighbouring** sites

   as a consequence of a designated AEP1% overland flooding event.

   ⁎*adverse impacts* are not quantified and have been interpreted as **zero**

8. The Stormwater Management Plan must reassure confidence for the development's stormwater handling, including site permeability and flow friction from the development into the existing roadway's stormwater system and demonstrate the system's ability to accommodate the discharge from the development for a AEP1% onsite event. – The roadway stormwater drainage system's flow path is northward along Wilkinson Road and then eastwards in Turon Street then discharging into the Great Sandy Strait via a pipe under The Esplanade.

9. Council will accept consideration, in the Stormwater Management Plan, of off-site flooding mitigation works being incorporated into the Bush Fire protection barriers for the forestry practice, inland of the development site (L915 FTY1775) , provided suitable documented provisions, including a suitable management plan of the area with HQ Plantations - is provided.

10. Any discharge of stormwater onto other than the road drainage system is to be protected at the point of discharge by a 5mx5m easement in favour of council

Walkable Neighbourhoods

11. Councils position in relation to *walkable connectivity* for the development is that the adjoining northern lot 2 is capable of future subdivision, and accordingly

provision should be made within the development to provide design facility for the connection of a future road associated with the development of Lot 2 RP192532.

Council acknowledges however that the ***walkability*** provisions of Schedule 12A of the Planning Regulations provide Council with discretionary flexibility in regards to their application, based on local circumstances and the provisions of Schedule 12A within the Regulation and the Planning Act in meeting the 'reasonability criteria', for application of requirements and conditioning.

Further, the applicant expressed the opinion that the likelihood of development of the adjoining Lot 2 is the only probable area to which the provisions of Schedule1A has any application and further given the constraints on Lot 2 going forward with an ever-increasing impediments of sea level rise and enhanced flooding constraints affecting financial viability of development, Lot 2 presents circumstances where the probabilities of such a development ever occurring are very low.

And

The benefits of *walkable connectivity* for the residents of Tuan, given its nature and the scope for ongoings developments in the vicinity of the subject development, if implemented, would at best be marginal.

The applicant will seek to provide evidence to support these positions

Warren Bolton

Friday, 8 March 2024

Stormwater Management Plan

Lot 51 Wilkinson Road, Tuan

5 June 2024

J9009 v1.1

STORM WATER CONSULTING

Job No: J9009 v1.1

Job Name: Lot 51 Wilkinson Road, Tuan

Report Name	Date	Report No.
Stormwater Management Plan	22 May 2024	J9009 v1.0
Stormwater Management Plan	5 June 2024	J9009 v1.1

Project Engineer: Jack Hu
BE Civil (Hons), MIEAust, CPEng, NER, RPEQ
E jack@stormw.com.au

Reviewed By: Steve Hughes
BE Civil, MIEAust, CPEng, NER, RPEQ 16468

Storm Water Consulting Pty Ltd
ACN 105 078 377

1/820 Old Cleveland Rd, Carina QLD 4152
07 3398 4992
www.stormw.com.au

Table of Contents

1.0 INTRODUCTION

Storm Water Consulting Pty Ltd was commissioned by M & JM Grunske to prepare a Stormwater Management Plan for the proposed development on Lot 51 Wilkinson Road, Tuan.

This report has been prepared to address the following issues associated with the proposed Reconfiguration of Lot (ROL):

- Identify the extent of flooding during a major overland flow event, assess potential impacts on neighbouring properties and set minimum lot levels.
- Assess potential stormwater quantity impacts from the proposed development.
- Conceptualise a stormwater quality treatment train for the proposed development.

2.0 SITE CONDITIONS

2.1 Existing Site

The site is a vacant lot vegetated by short grass and sparse tree cover. The site is bound by Wilkinson Road to the east, Tuan Forest to the south and west and residential properties to the north. An existing site plan is presented in Figure 1, Appendix A. A locality plan is presented in Figure 2.1 below.

Figure 2.1 – Locality Plan (Source: Google Earth)

2.2 Developed Site

It is proposed to subdivide the site into freehold lots (Reconfiguration of Lot). A new road is proposed to be constructed to provide access to the new lots (new cross drainage culverts are proposed below the new road, in front of the site). Drainage pipes are proposed through the site to maintain some flows to the existing dams north of the site (as per the neighbouring property owners' requests). A bio-retention basin is proposed for the development to meet water quality objectives. A widened open drain and diversion berm is proposed on the upstream Tuan Forest land. A developed site plan is presented in Figure 2, Appendix A. Design plans are presented in Appendix E.

The site is located within the Great Barrier Reef wetland protection area, as demonstrated in Figure 2.2 on the following page. The proposed development avoids the use of wetlands for stormwater treatment, as the proposed stormwater treatment device is located outside of the mapped wetland area. The proposed development also avoids the direct discharge

of stormwater into the mapped wetland area. The widened open drain and diversion berm proposed within the Tuan Forest land would generally maintain the surface water hydrology by directing the runoff northward along its current flow path. The proposed development would comply with PO3, PO4 and PO5 of State Code 9 (extract presented in Figure 2.3 below).

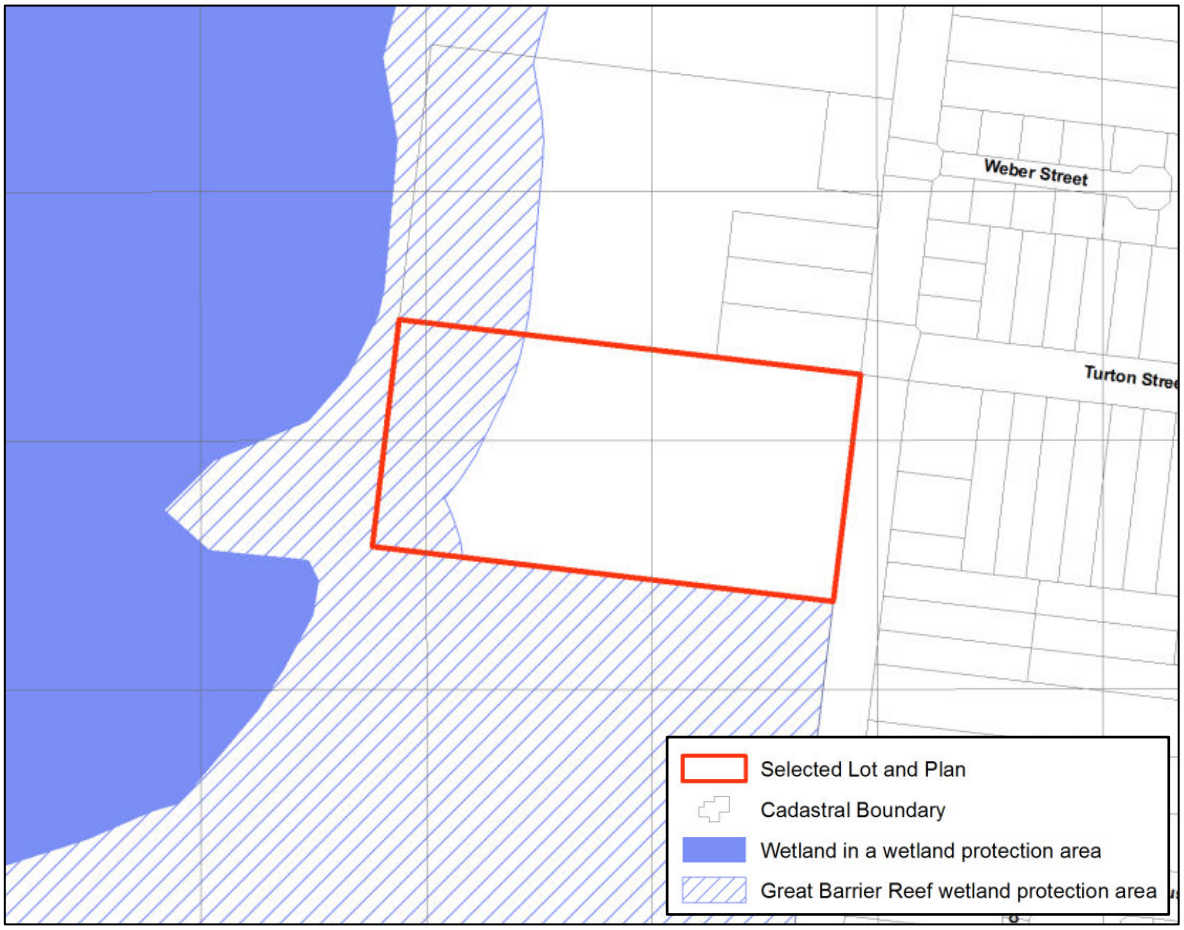


Figure 2.2 – Extract from Map of Great Barrier Reef Wetland Protection Areas

Hydrology
PO3 Development maintains or improves the existing surface and groundwater hydrology in a **wetland protection area**.
Water quality
PO4 Development does not unacceptably impact the water quality of the **wetland** in the **wetland protection area** and in the **wetland buffer**.
PO5 Development does not use the **wetland** in the **wetland protection area** for stormwater treatment.

Figure 2.3 – Extract from State Code 9: Great Barrier Reef Wetland Protection Areas

3.0 HYDROLOGIC ANALYSIS

3.1 Hydrologic Impact Assessment

The property is affected by overland flow from a catchment to the west, which flows through the site toward the north-eastern site corner (Point-1). An open drain is located at the rear of the site, within Tuan Forest. The open drain flows in a northerly direction, before turning to flow in an easterly direction where flows spread out, flowing across bushland before traversing across Wilkinson Road at Point-2, heading toward the Great Sandy Strait. A catchment plan is presented in Figure 3, Appendix A.

Rational Method calculations were undertaken for the catchments flowing to Point-1 and Point-2 (in accordance with recommendations contained in QUDM 2016). A summary of the peak flows is presented in Table 3.1 below. Detailed Rational Method calculations are presented in Appendix C.

Table 3.1 – Rational Method Calculation Summary

AEP	Point-1 Peak Flow	Point-2 Peak Flow
%	m^3/s	m^3/s
63	1.16	6.49
50	1.39	7.82
20	2.13	12.01
10	2.67	15.08
5	3.24	18.41
2	4.20	24.03
1	4.93	28.29

URBS hydrologic modelling was undertaken to assess the potential stormwater quantity impacts resulting from the proposed development at Point-1, as well as to produce inflow hydrographs for input into the TUFLOW hydrodynamic model. A schematic representation of the existing URBS model (existing site catchment, developed external catchment, with existing routing) is presented in Figure 4a, Appendix A. URBS data files are presented in Appendix D. A summary of the adopted URBS parameters is presented in Table 3.2 on the following page.

Table 3.2 – URBS Model Parameters

AEP	Storage Coefficient	Non-Linearity Index	Initial Rainfall Loss	Continuing Rainfall Loss
%	α	m	mm	mm/hr
63	1.2	0.8	15	2.5
50	1.2	0.8	15	2.5
20	1.2	0.8	15	2.5
10	1.2	0.8	15	2.5
5	1.2	0.8	15	2.5
2	1.2	0.8	15	2.5
1	1.2	0.8	0	2.5

A comparison of the peak URBS flows (existing site catchment, developed external catchment) and Rational Method flows at Point-1 and Point-2 is presented in Tables 3.3 and 3.4 below.

Table 3.3 – Comparison of Flows at Point-1

AEP	Rational Method Flows	URBS Flows	Difference	Difference
%	m^3/s	m^3/s	m^3/s	%
63	1.13	1.07	0.06	5%
50	1.36	1.30	0.06	4%
20	2.08	2.11	0.03	1%
10	2.60	2.74	0.14	5%
5	3.16	3.44	0.28	9%
2	4.10	4.43	0.33	8%
1	4.81	5.29	0.48	10%

Table 3.4 – Comparison of Flows at Point-2

AEP	Rational Method Flows	URBS Flows	Difference	Difference
%	m^3/s	m^3/s	m^3/s	%
63	5.68	4.65	1.03	18%
50	6.84	6.00	0.84	12%
20	10.55	10.23	0.32	3%
10	13.28	13.75	0.47	4%

5	16.25	17.54	1.29	8%
2	21.29	23.05	1.76	8%
1	25.12	27.51	2.39	10%

The results presented above show that the URBS flows compare favourably with the Rational Method flows. The URBS model would therefore generate flows suitable for comparison of peak flows at Point-1, as well as for adoption in the TUFLOW model as boundary conditions.

A widened open drain and diversion berm is proposed within Tuan Forest upstream of the site. The catchment contributing to flows at Point-1 would be reduced, as the berm would divert a portion of the upstream catchment away from the site. A schematic representation of the developed URBS model (developed site catchment, developed external catchment, with developed routing) is presented in Figure 4b, Appendix A. The impervious fraction of the URBS sub area representing the site was increased to reflect the proposed development. URBS sub area routing was modified to reflect the surface flow regime following the adoption of the widened open drain and diversion berm.

A comparison of the peak URBS flows from the existing and developed URBS model at Point-1 is presented in Table 3.5 below.

Table 3.5 – Comparison of Flows at Point-1 (Existing v Developed)

AEP	Existing URBS	Developed URBS	Increase	Increase
%	m^3/s	m^3/s	m^3/s	%
63	1.07	0.39	-0.68	-64%
50	1.30	0.45	-0.85	-65%
20	2.11	0.70	-1.41	-67%
10	2.74	0.90	-1.84	-67%
5	3.44	1.07	-2.37	-69%
2	4.43	1.31	-3.12	-70%
1	5.29	1.61	-3.68	-70%

The above results show that the proposed development (with the widened open drain and diversion berm) would not increase the peak discharges flowing to Point-1. As such, on-site detention would not be considered to be required for the proposed development.

A comparison of the peak URBS flows from the existing and developed URBS model at Point-2 is presented in Table 3.6 on the following page.

Table 3.6 – Comparison of Flows at Point-2 (Existing v Developed)

AEP	Existing URBS	Developed URBS	Increase	Increase
%	m^3/s	m^3/s	m^3/s	%
63	4.65	4.70	0.05	1.1%
50	6.00	6.04	0.04	0.7%
20	10.23	10.29	0.06	0.6%
10	13.75	13.87	0.12	0.9%
5	17.54	17.69	0.15	0.9%
2	23.05	23.22	0.17	0.7%
1	27.51	27.80	0.29	1.1%

The above results show that the proposed works would result in minor increases to peak discharges at Point-2. The hydraulic impacts of the proposed works at this location are further assessed in TUFLOW (refer Section 4.0).

3.2 Hydraulic Model Boundary Conditions

Inflow hydrographs from the URBS model for flows contributing to the diversion berm (i.e upstream of the site) were adopted as boundary conditions in TUFLOW to assess the impacts of flow diversion (i.e. adopting the diversion berm). The 1% AEP inflow hydrographs adopted in TUFLOW are presented in Figure 3.1 below.

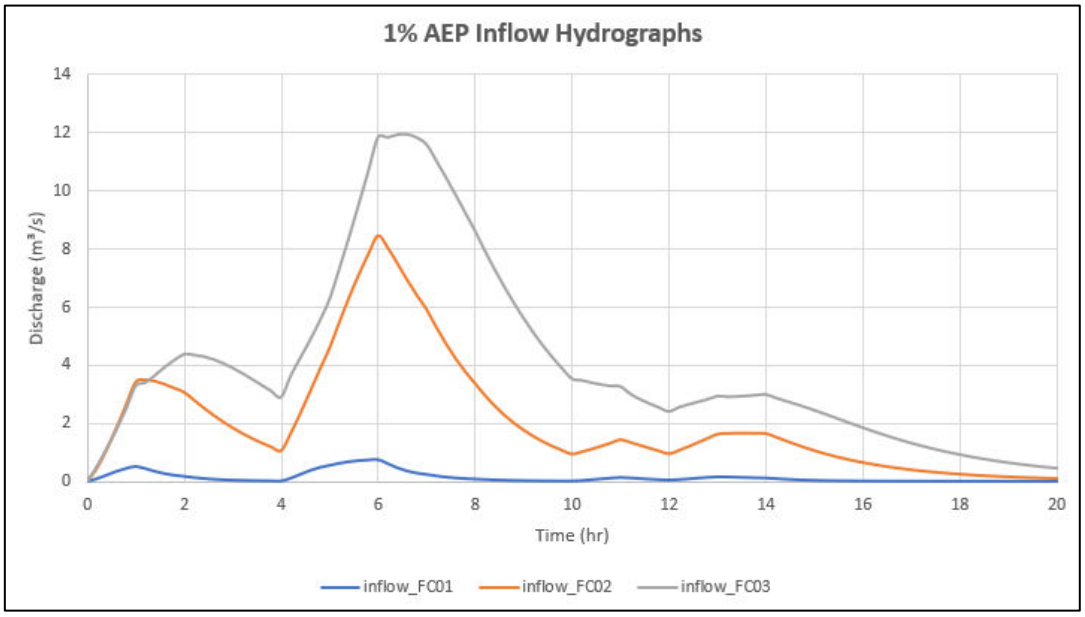


Figure 3.1 – Inflow Hydrographs for TUFLOW

4.0 HYDRODYNAMIC MODELLING

TUFLOW 2D hydrodynamic modelling was undertaken to determine the extent of inundation, to assess potential hydraulic impacts and to set minimum lot levels for the proposed development. The model setup and results are discussed below.

4.1 Existing TUFLOW Model

A schematic of the existing TUFLOW model is presented in Figure 5, Appendix A. The TUFLOW model was based on a 2m grid size with elevation data assigned from the ALS survey data sourced from the Queensland State Government. The inflow hydrographs presented in Figure 3.1 were input into the model as a discharge-time (QT) boundary condition. The downstream boundary condition was set as a height-discharge (HQ) relationship based on the natural ground slope. Manning's roughness coefficient values of n=0.10 and n=0.02 were used in the model to represent private properties and roads respectively.

The existing 1% AEP overland flow contours, depths, velocities and velocity-depths are presented in Figures 6a to 6d, Appendix A respectively. The model results show that the majority of the property would be inundated during a 1% AEP event.

4.2 Developed TUFLOW Model

A schematic of the developed TUFLOW model is presented in Figure 7, Appendix A. The developed model replicates the existing model and incorporates changes to the site condition based on the proposed development. A civil design TIN of the proposed development, widened open drain and diversion berm (prepared by Tony McVey Pty Ltd) was input into the model. Fill was not proposed all the way to the site boundary to allow minor surface runoff to be conveyed around the development. The proposed drainage systems on the site and in front of the site were incorporated using 1d_nwk layers. All other model parameters and inputs remain the same as the existing model.

The developed 1% AEP overland flow contours, depths, velocities and velocity-depths are presented in Figures 8a to 8d, Appendix A respectively. An afflux impact plot of the model results is presented in Figure 9, Appendix A. The plot shows that the proposed development would not create any adverse impacts on neighbouring private properties. The majority of the impacts are contained within the road reserve, within the Tuan Forest land, or in a location where no existing buildings or structures exist.

It is understood that preliminary agreements have been sourced from the stakeholders of Tuan Forest to accept flood impacts within the forest land. Formal agreements would need to be sourced and finalised. In addition, agreements would need to be sourced from neighbouring property owners to accept the minor localised hydraulic impacts on adjoining lands.

4.3 Minimum Lot Levels

Lots are recommended to be set above the highest upstream 1% AEP overland flow level. The highest upstream 1% AEP overland flow level along the western boundary is 3.6 m AHD. The finished surface levels at the rear of Lots 9 to 12 are recommended to be above 3.6 m AHD. The highest upstream 1% AEP overland flow level along the northern boundary is 3.0 m AHD. The finished surface levels of Lots 1 to 8 are recommended to be above 3.0 m AHD. The highest upstream 1% AEP overland flow level along the southern boundary is 3.1 m AHD. The finished surface levels of Lots 13 to 18 are recommended to be above 3.1 m AHD. The proposed finished surface levels for each lot would comply with these recommendations.

5.0 STORMWATER QUALITY MANAGEMENT

5.1 State Planning Policy (July 2017)

The State Planning Policy (SPP) sets out the requirements for water quality in the interest of the State. Developments which trigger the requirements summarised in Table 5.1 below would need to meet water quality objectives listed in Table B, Appendix 2 of the SPP.

Table 5.1 – Development Applications affecting Receiving Waters

State Planning Policy Criteria	Application to Development
(1) A material change of use for urban purposes that involves a land area greater than 2500 square metres that: (a) will result in an impervious area greater than 25 per cent of the net developable area, or	Criterion is NOT applicable to development.
(b) will result in six or more dwellings, or	Criterion is NOT applicable to development.
(2) Reconfiguring a lot for urban purposes that involves a land area greater than 2500 square metres and will result in six or more lots, or	Criterion is applicable to development.
(3) Operational works for urban purposes that involve disturbing more than 2500 square metres of land.	Criterion is NOT applicable to development.

The proposed development triggers the SPP, hence water quality objectives indicated in Table B, Appendix 2 of the SPP would need to be met.

5.2 Water Quality – Construction Phase

During the construction phase of a development, the pollutants listed in Table 5.2 are typically generated. Measures are required during the construction phase to manage each of these pollutants. These measures may include but are not limited to; bins and mini-skips, erosion and sediment control measures (discussed below), wash down and spill containment areas, bunds, spill clean-up kits, street sweeping and chemical agents.

Table 5.2 – Pollutants Generated during the Construction Phase

Pollutant	Source
Litter	Paper, construction packaging, food packaging, cement bags, off-cuts
Sediment	Unprotected exposed soils and stockpiles during earthworks and building operations
Hydrocarbons	Fuel and oil spills leaks from construction equipment
Toxic materials	Cement slurry, asphalt primer, solvents, cleaning agents, wash waters (e.g. from tile works)
pH altering substances	Acid sulphate soils, cement slurry and wash waters

5.2.1 Erosion and Sediment Control

During the construction phase of the development, an Erosion and Sediment Control Program (E&SCP) is required to minimise water quality impacts. Such an E&SCP should provide complete and detailed instructions on the following procedures;

- Before construction activities begin, sediment fences should be constructed on the downstream site boundaries and at the base of all proposed soil stockpiles;
- Areas for plant and construction material storage should be designated. Runoff from these areas should be directed to small holding ponds in case of spillages;
- Catch drains at the downstream boundary of construction activities should also be created to ensure that any sediment-laden runoff is contained and directed into a sediment basin and not permitted to flow unmitigated to downstream areas;
- Sediment basins should be constructed at appropriate locations to collect sediment at the downstream ends of the catch drains that convey runoff from exposed areas;
- Site personnel should be educated on the sediment and control measures implemented on site; and
- Following rainfall events greater than 20mm, inspection of silt fences, sedimentation basins and other erosion control measures should be carried out. Where necessary, collected material should be removed and damaged equipment should be replaced immediately.

5.3 Water Quality – Operational Phase

During the operational (post-construction) phase of the proposed development, the following pollutants are typically generated;

- Sediment,
- Litter,
- Faecal coliforms,
- Hydrocarbons,
- Heavy Metals,
- Thermal Pollution,
- Nutrients (N & P) and
- Surfactants.

5.3.1 Water Quality Objectives

Key pollutant levels will be reduced to the levels indicated in Table B, Appendix 2 of the State Planning Policy. The Water Quality Objectives are summarised in Table 5.3 below.

Table 5.3 – Water Quality Objectives for Central Queensland (South)

Parameter	Load-based Reduction
Total Suspended Solids (TSS)	85%
Total Phosphorus (TP)	60%
Total Nitrogen (TN)	45%
Gross Pollutants > 5mm	90%

Note that the percentage reduction refers to a comparison between the un-mitigated developed site and the mitigated developed site.

6.0 STORMWATER QUALITY MODELLING

A stormwater treatment train is proposed to meet the WQOs stated in Section 5.3.1. The Stormwater Quality Improvement Device (SQID) for the treatment train was selected based on site constraints, opportunities and practicality.

A bio-retention basin has been selected to meet the water quality objectives. Details of the MUSIC stormwater quality analysis and specifications of the proposed system are presented below.

6.1 Source Nodes

A schematic of the MUSIC sub catchments is presented in Figure 10, Appendix A. The MUSIC source nodes, their areas, node type and fraction impervious proportions are summarised in Table 6.1 below. The adopted roof area for each new lot is 250 m². The small area around the perimeter of the site which remains as grass and which would not flow to the bio-retention basin have been excluded from the MUSIC model.

Table 6.1 – Source Node Fractions Impervious

Source Node	Area	Type	Fraction Impervious
Residential Roof	0.450 ha	Residential Roof	100%
Residential Roads	0.373 ha	Residential Road	60%
Residential Ground	2.897 ha	Residential Ground	15%

Rainfall-runoff parameters were assigned to the source nodes in accordance with the Water by Design MUSIC Modelling Guidelines Version 1.0 – 2010 Residential Use of the site. These parameters are summarised in Table 6.2 below.

Table 6.2 – Rainfall – Runoff Parameters

Parameter		Residential
Impervious Area Properties	Rainfall threshold (mm/day)	1
Pervious Area Properties	Soil storage capacity (mm)	500
	Initial storage (% of capacity)	10
	Field Capacity (mm)	200
	Infiltration Capacity Coefficient – a	211
	Infiltration Capacity Exponent – b	5
Groundwater Properties	Initial depth (mm)	50
	Daily recharge rate (%)	28
	Daily base flow rate (%)	27
	Daily deep seepage rate (%)	0

Pollutant export parameters were assigned according to the Water by Design MUSIC Modelling Guidelines Version 1.0 – 2010. The pollutant export parameters adopted in the MUSIC model are summarised in Table 6.3 below.

Table 6.3 – Pollutant Export Parameters (Residential)

Source		Log_{10} TSS (mg/L)		Log_{10} TP (mg/L)		Log_{10} TN (mg/L)	
		Base flow	Storm flow	Base flow	Storm flow	Base flow	Storm flow
Roof	Mean	NA	1.30	NA	-0.89	NA	0.26
	Std Dev	NA	0.39	NA	0.31	NA	0.23
Road	Mean	1.00	2.43	-0.97	-0.30	0.20	0.26
	Std Dev	0.34	0.39	0.31	0.31	0.20	0.23
Ground	Mean	1.00	2.18	-0.97	-0.47	0.20	0.26
	Std Dev	0.34	0.39	0.31	0.31	0.20	0.23

6.2 Treatment Node – Bio-Retention

A bio-retention basin is proposed to meet water quality objectives. The input parameters adopted in MUSIC are presented in Table 6.4 below.

Table 6.4 – Bio-Retention Parameters

Inlet Properties	Bio-Retention
Low Flow Bypass (m^3/s)	0
High Flow Bypass (m^3/s)	100
Extended Detention Depth	0.3 m
Surface Area	500 m^2
Filter Area	500 m^2
Unlined Filter Media Perimeter	0.01 m
Saturated Hydraulic Conductivity	200 mm/hr
Filter Depth	0.6 m
Exfiltration Rate	0 mm/hr

A potential location for the bio-retention basin is presented on plans in Appendix E. The final location and specifications for the basin would be finalised during the detailed design stage.

6.2.1 Maintenance

A bio-retention basin maintenance checklist is presented in Appendix F.

6.3 MUSIC Analysis

The quality of stormwater runoff and the impact of the proposed SQIDs were analysed using MUSICX version 1.10.0 in accordance with the water quality objectives from Table B, Appendix 2 of the State Planning Policy.

The MUSIC model was based on the 1991 to 2000 rainfall series for Maryborough with 6-minute time steps. The MUSIC model schematic is presented in Figure 6.1 below. The MUSIC modelling results are presented in Table 6.5 below.

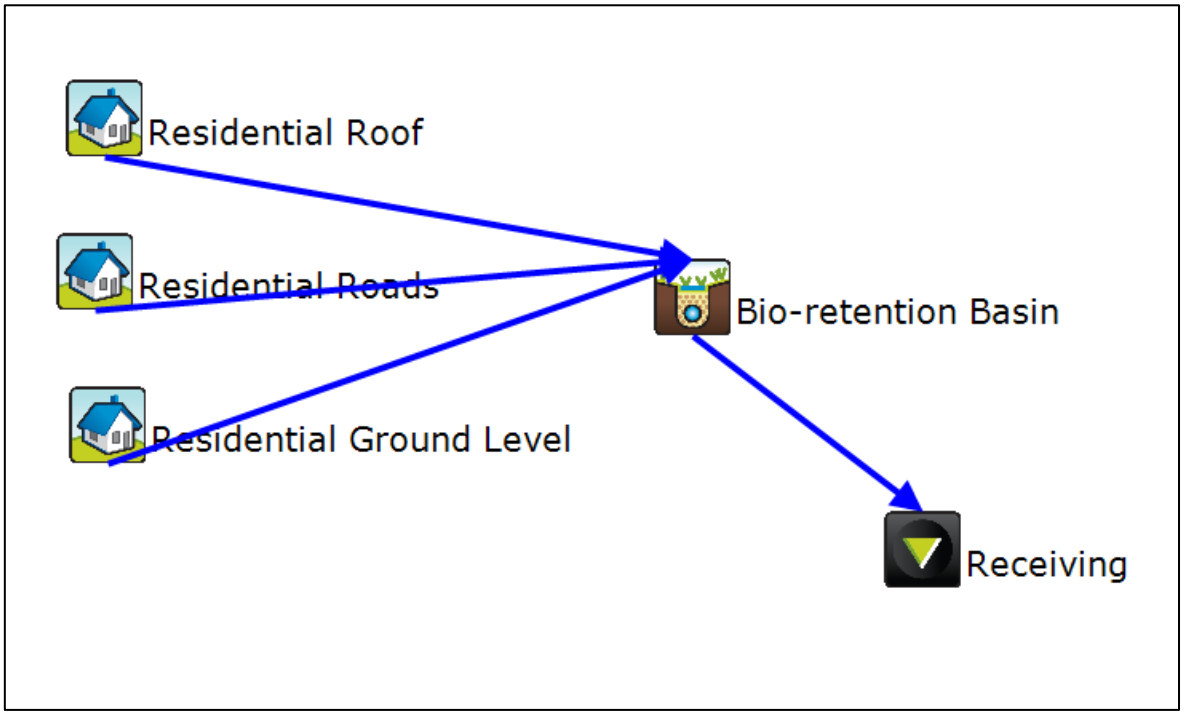


Figure 6.1 – MUSIC Model Schematic

Table 6.5 – MUSIC Model Results

Indicator	Annual Loads (kg/yr)		Reduction	
	Without SQIDs	With SQIDs	Actual	Target
TSS	2221.43	256.09	88%	85%
TP	4.64	0.85	81%	60%
TN	26.25	10.29	60%	45%
GP	328.26	0.00	100%	90%

The results above indicate that the required water quality objectives are met for the proposed development.

7.0 CONCLUSIONS

This report has been prepared to address the following issues associated with the proposed Reconfiguration of Lot (ROL) on Lot 51 Wilkinson Road, Tuan:

- Identify the extent of flooding during a major overland flow event, assess potential impacts on neighbouring properties and set minimum lot levels.
- Assess potential stormwater quantity impacts from the proposed development.
- Conceptualise a stormwater quality treatment train for the proposed development.

The TUFLOW model results show that the proposed development would not create any adverse impacts on neighbouring private properties. The majority of the impacts are contained within the road reserve, within the Tuan Forest land, or in a location where no existing buildings or structures exist. Minimum lot level recommendations are presented in Section 4.3.

URBS hydrologic model results show that the proposed development would not increase the peak discharges flowing to the location immediately downstream of the site. There would not be any adverse impacts on downstream properties. As such, on-site detention would not be considered to be required for the proposed development.

MUSIC model results show that a 500 m² filter area bio-retention basin would ensure the proposed development meets the water quality objectives required under the State Planning Policy (July 2017).

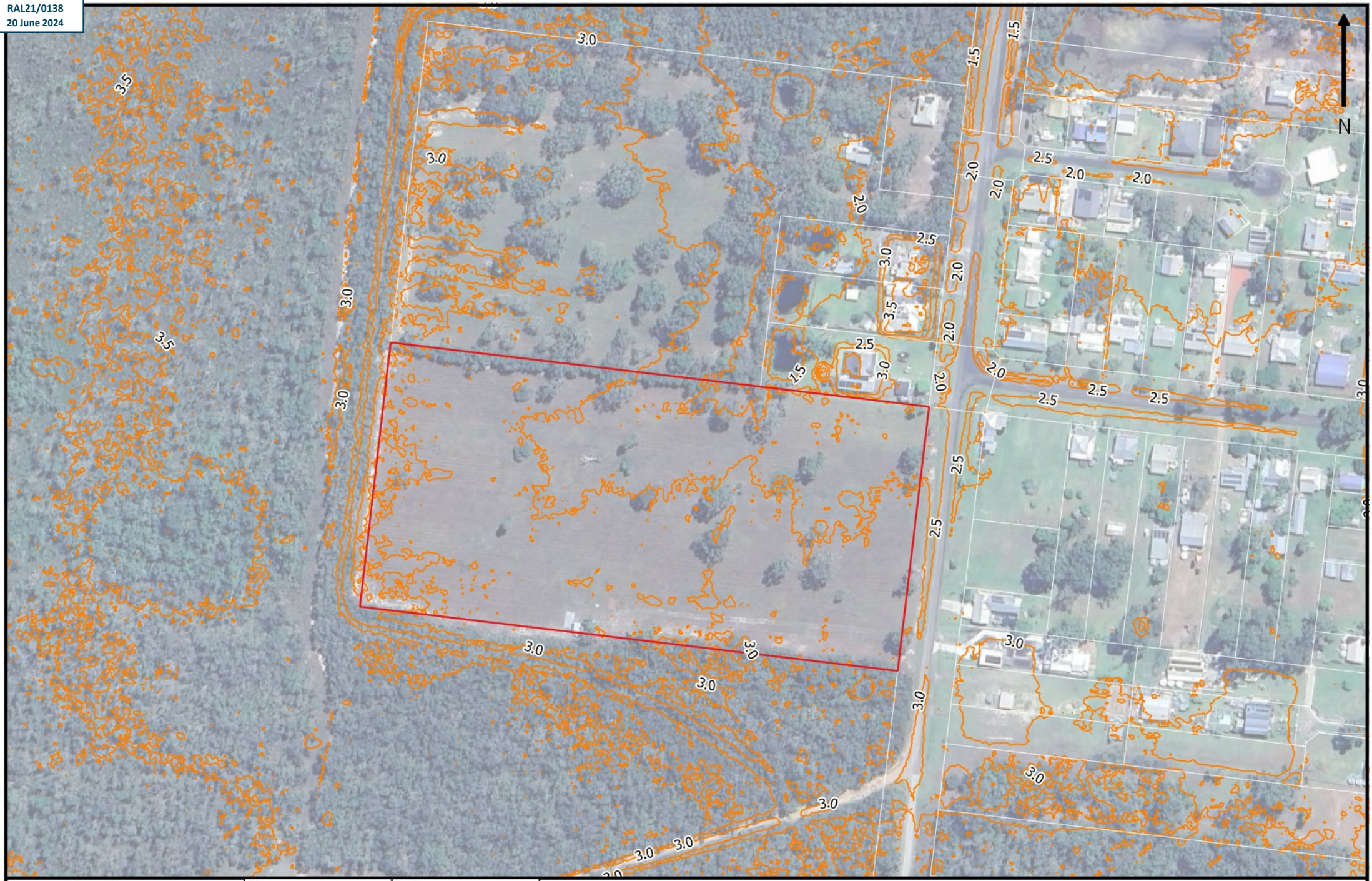
The site is located within the Great Barrier Reef wetland protection area. The proposed development avoids the use of wetlands for stormwater treatment, as the proposed stormwater treatment device is located outside of the mapped wetland area. The proposed development also avoids the direct discharge of stormwater into the mapped wetland area. The widened open drain and diversion berm proposed within the Tuan Forest land would generally maintain the surface water hydrology by directing the runoff northward along its current flow path. The proposed development would comply with PO3, PO4 and PO5 of State Code 9.

Steve Hughes
BE Civil, MIE Aust, CPEng, RPEQ 16468

LIST OF APPENDICIES

APPENDIX A

Figures



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Drawn	JH
Checked	SNH
Date	22/05/24
Scale	1:2,500 (A4)

Lot 51 Wilkinson Road, Tuan

Job No. J9009

Figure 1
Existing Site Plan

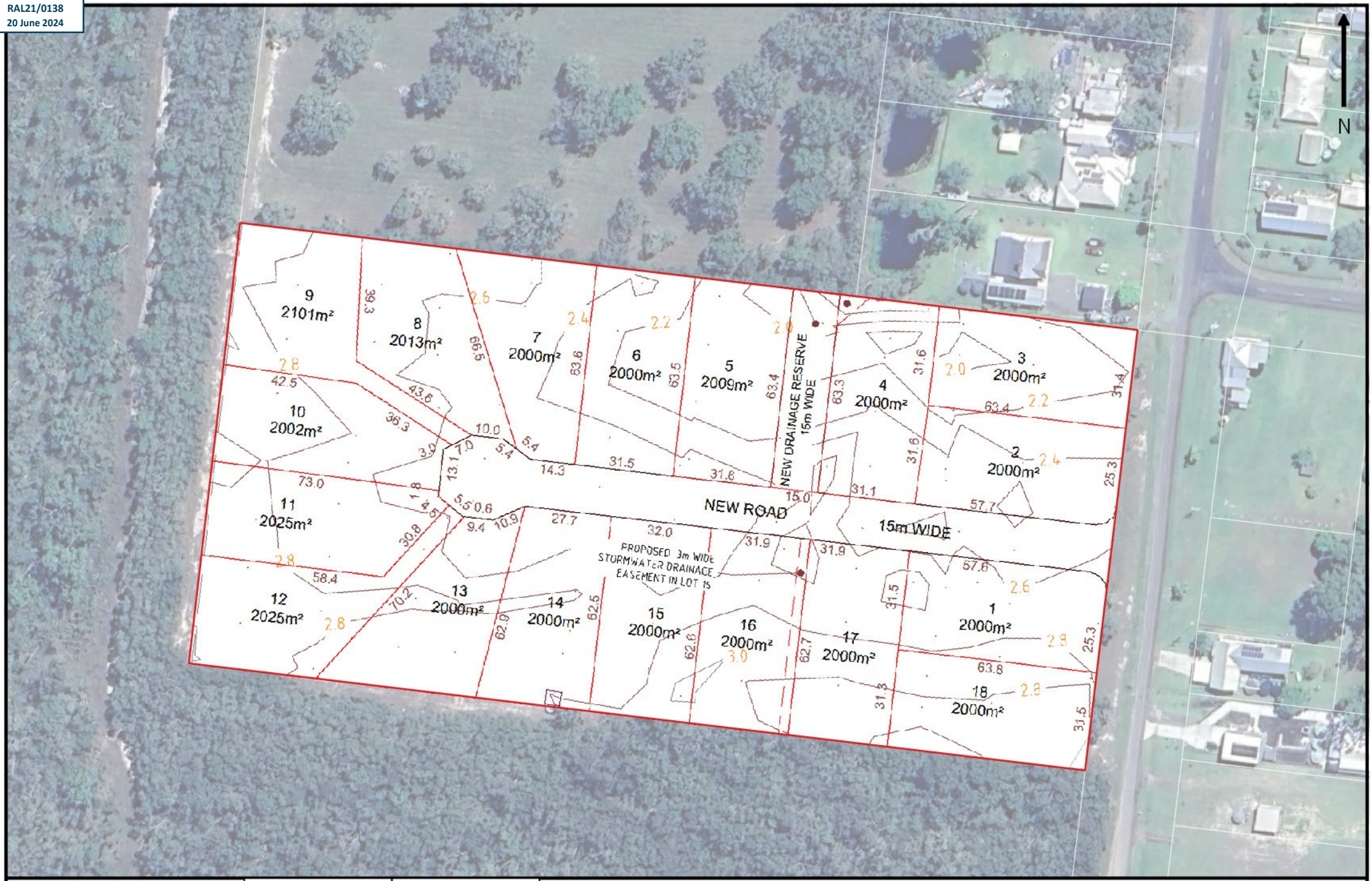

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Figure 2
Developed Site Plan

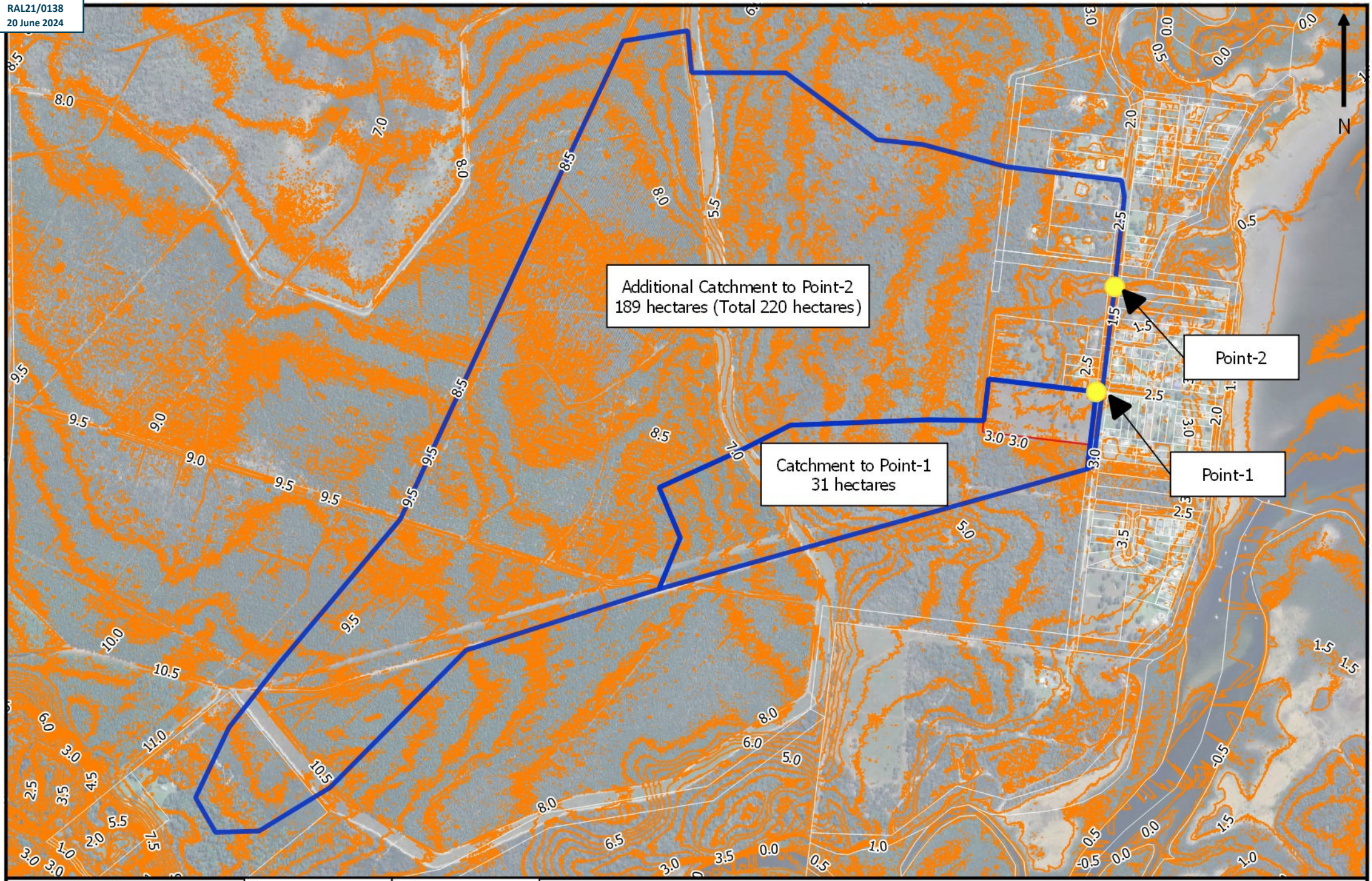

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Figure 3
Catchment Plan

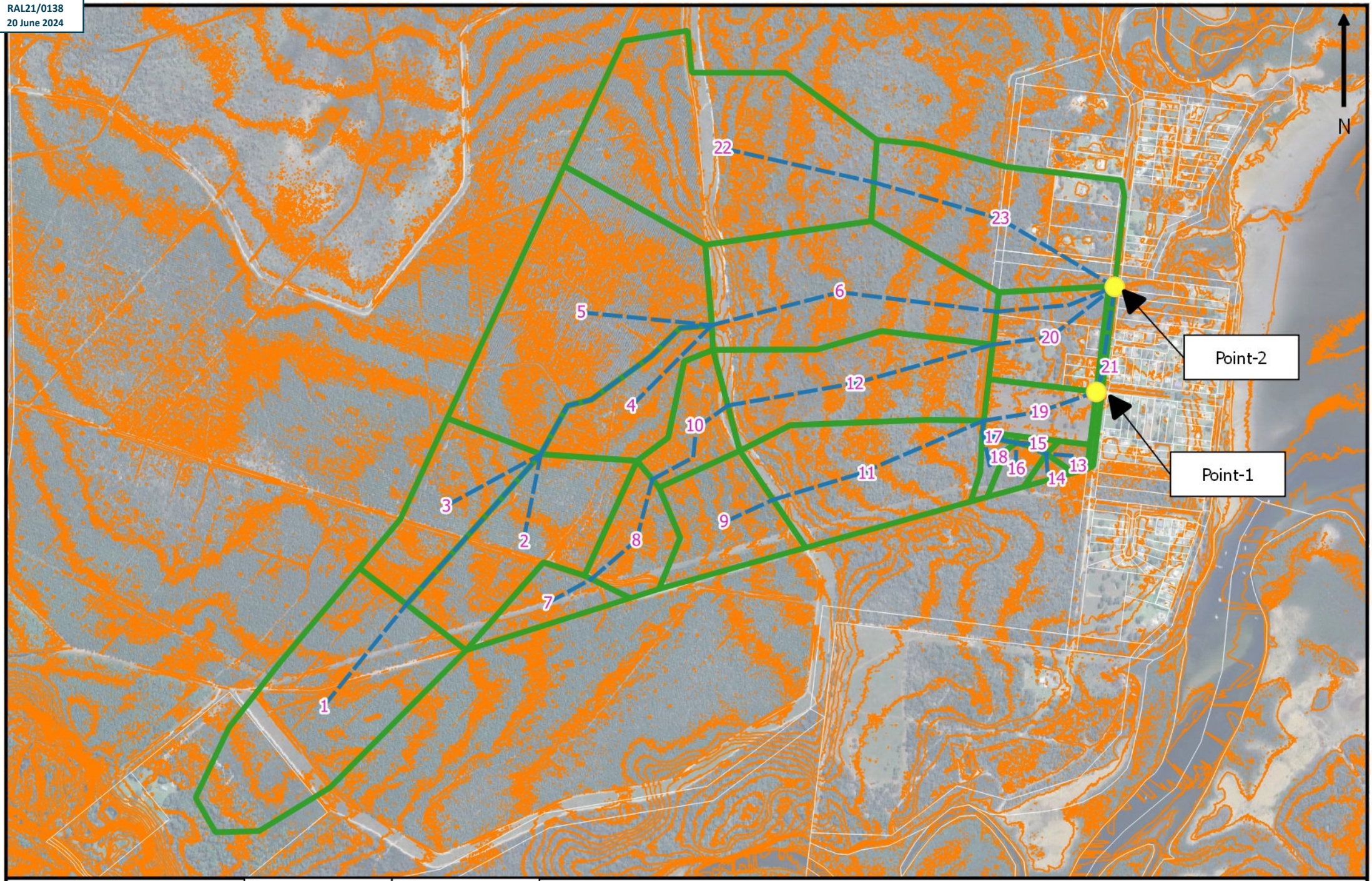

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Figure 4a

Existing URBS Model Schematic

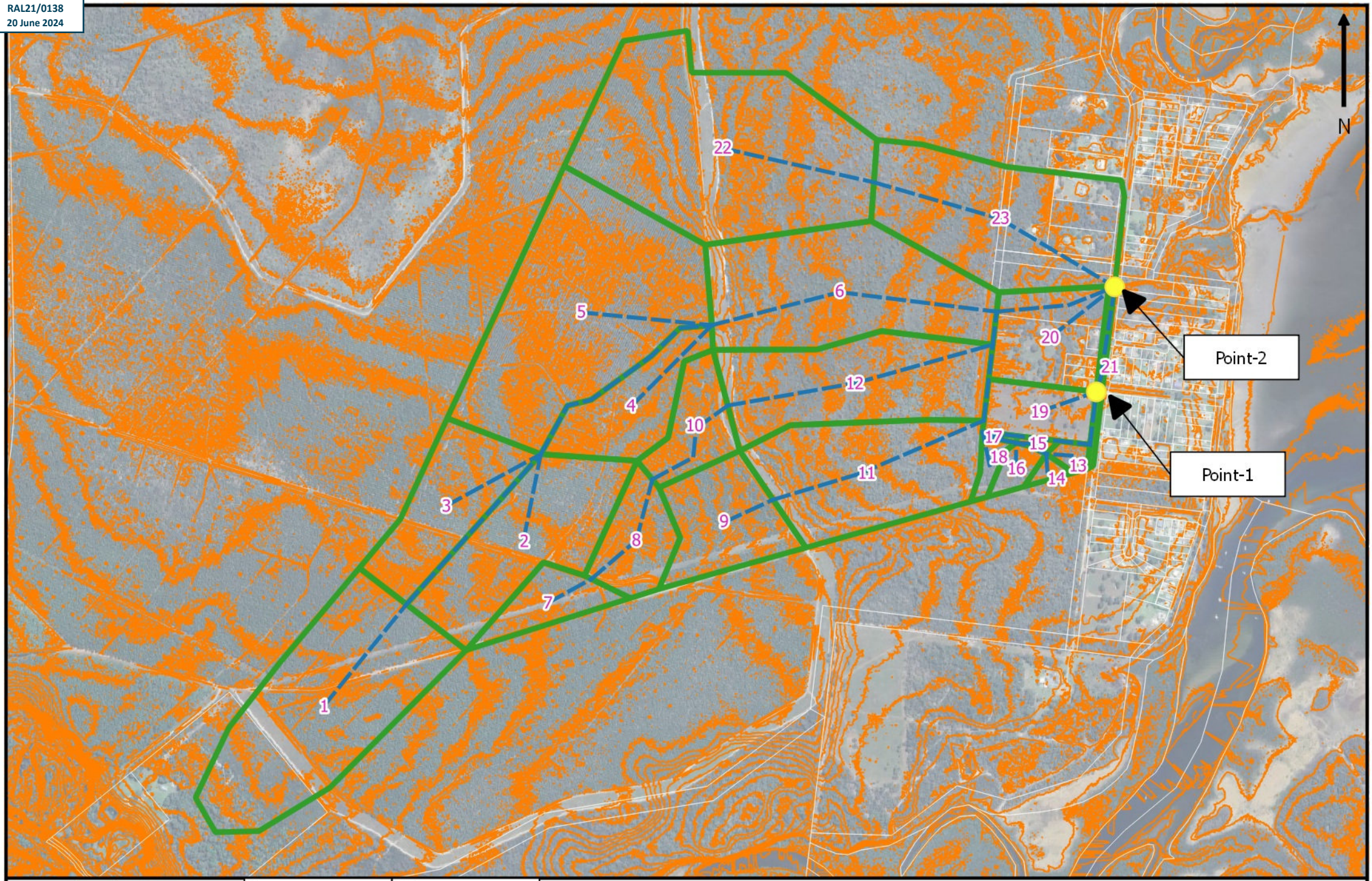

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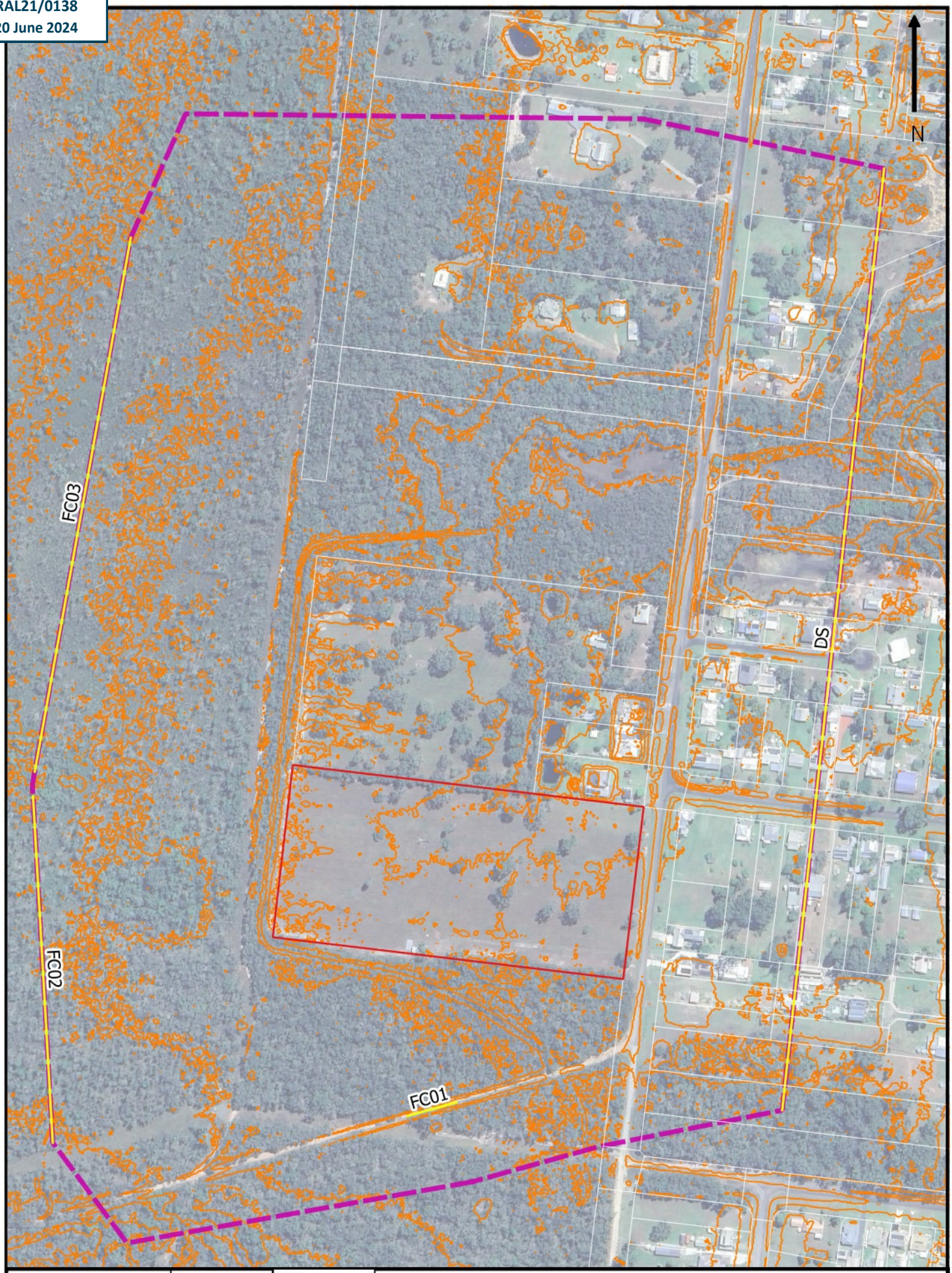
Figure 4b

Developed URBS Model Schematic



STORM WATER CONSULTING 1/820 Old Cleveland Rd Carina QLD 4152 Phone (07) 3398 4992	Drawn	JH	Lot 51 Wilkinson Road, Tuan		Figure 5
	Checked	SNH			
	Date	22/05/24			
	Scale	1:4,000 (A4)	Job No.	J9009	Existing TUFLOW Model

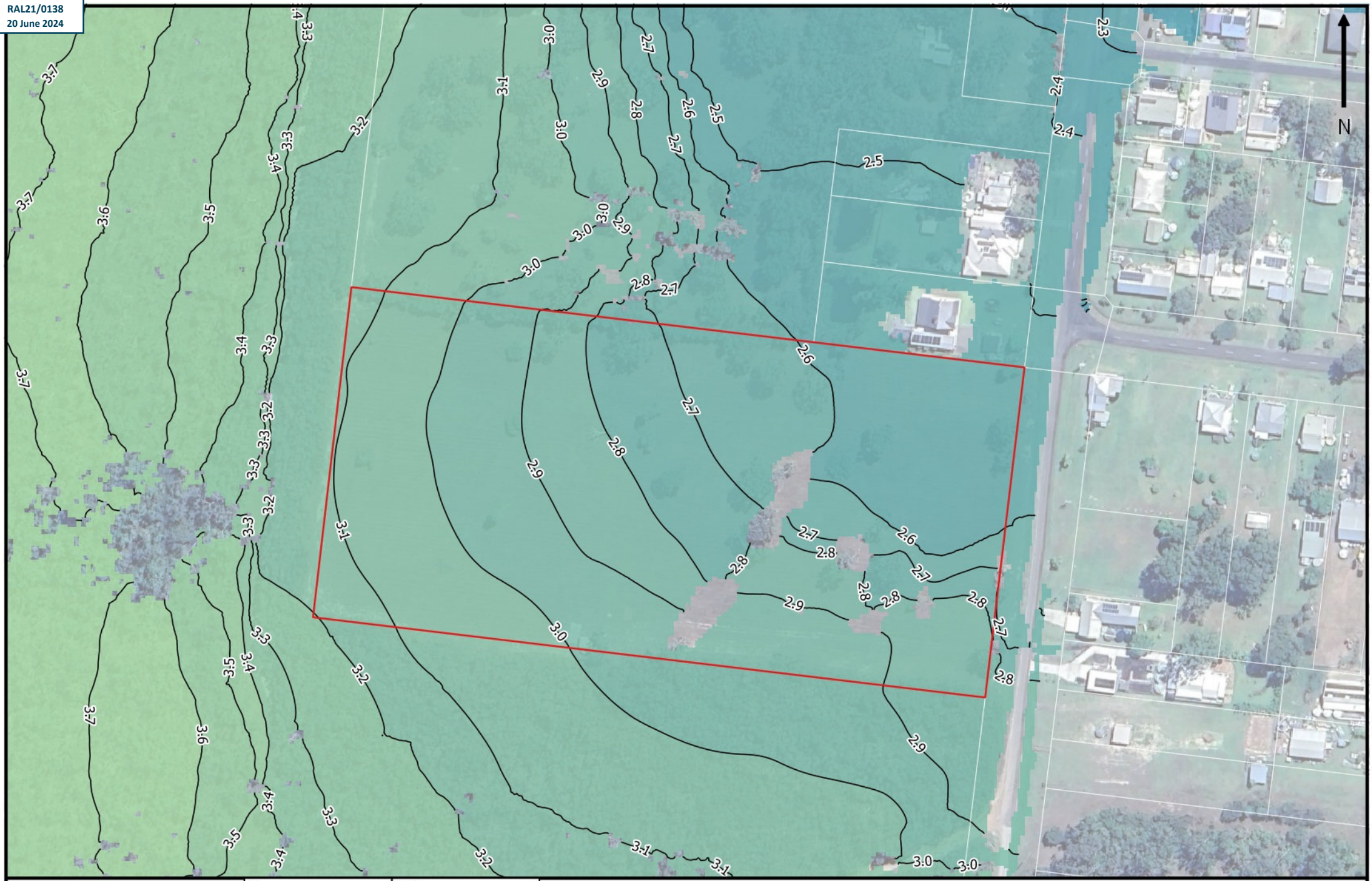


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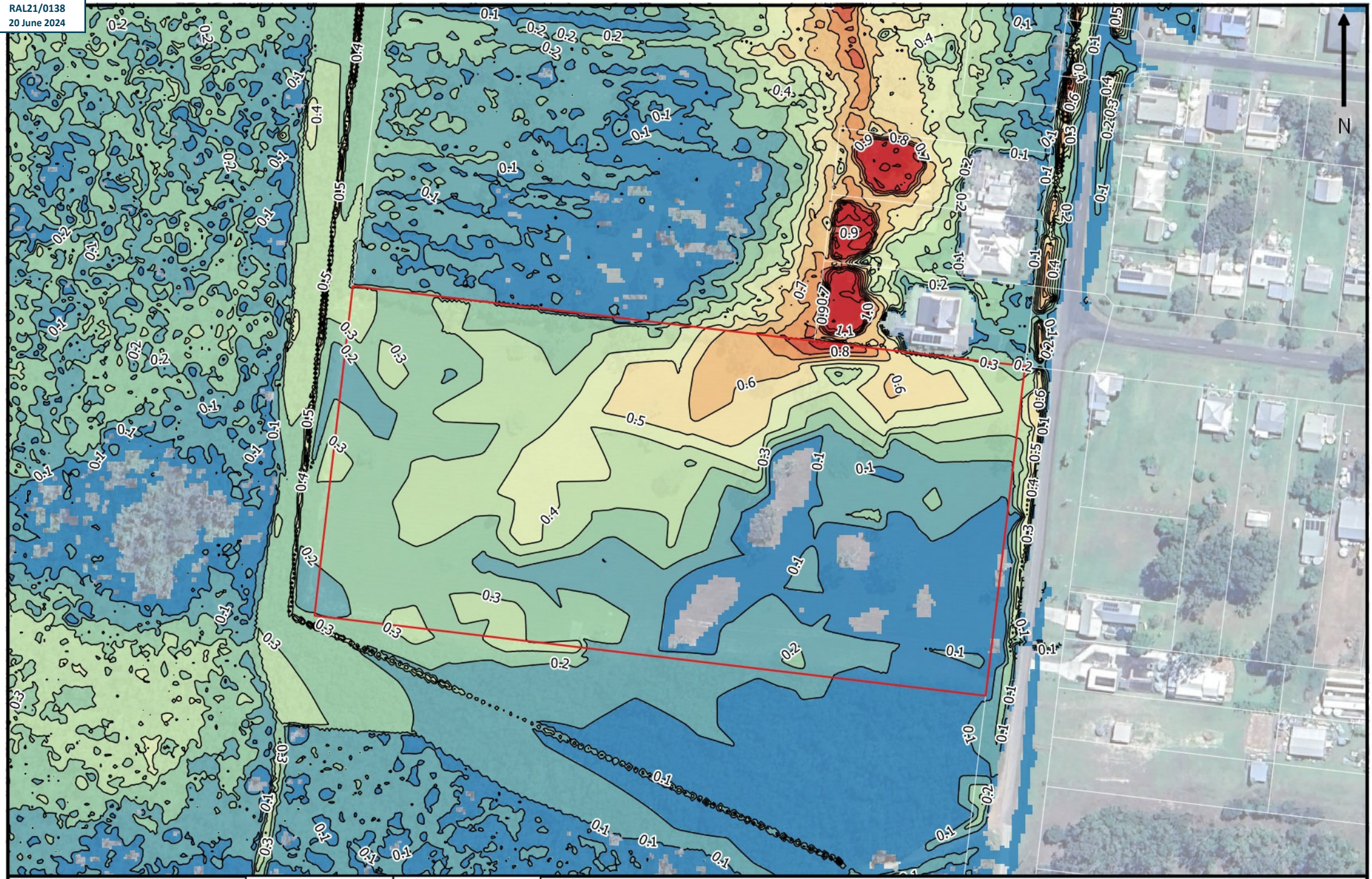
Figure 6a

Existing 1% AEP Levels (m AHD)



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Date	22/05/24
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Figure 6b

Existing 1% AEP Depths (metres)

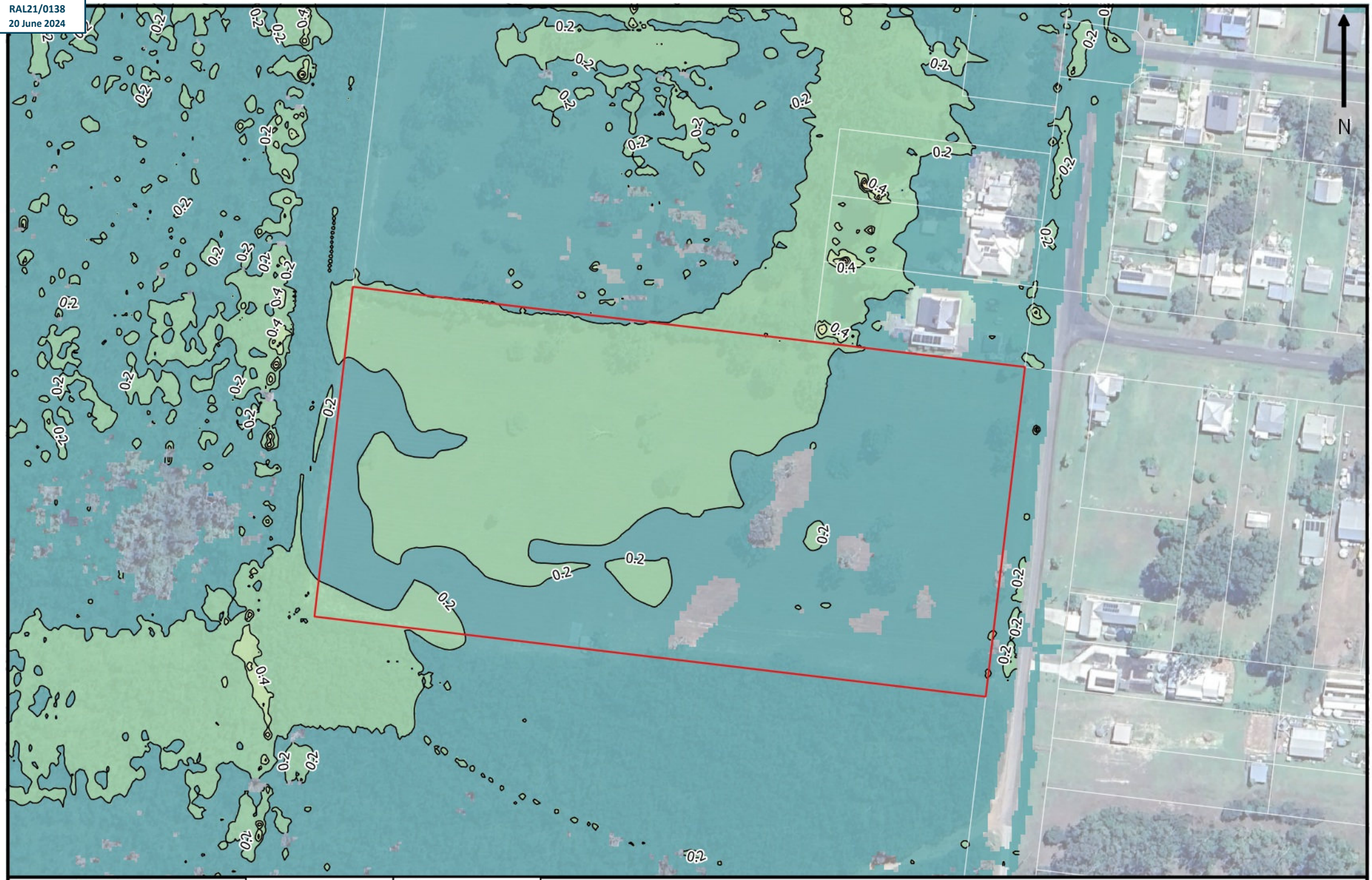

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Figure 6c

Existing 1% AEP Velocity (m/s)

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Scale	1:2,000 (A4)

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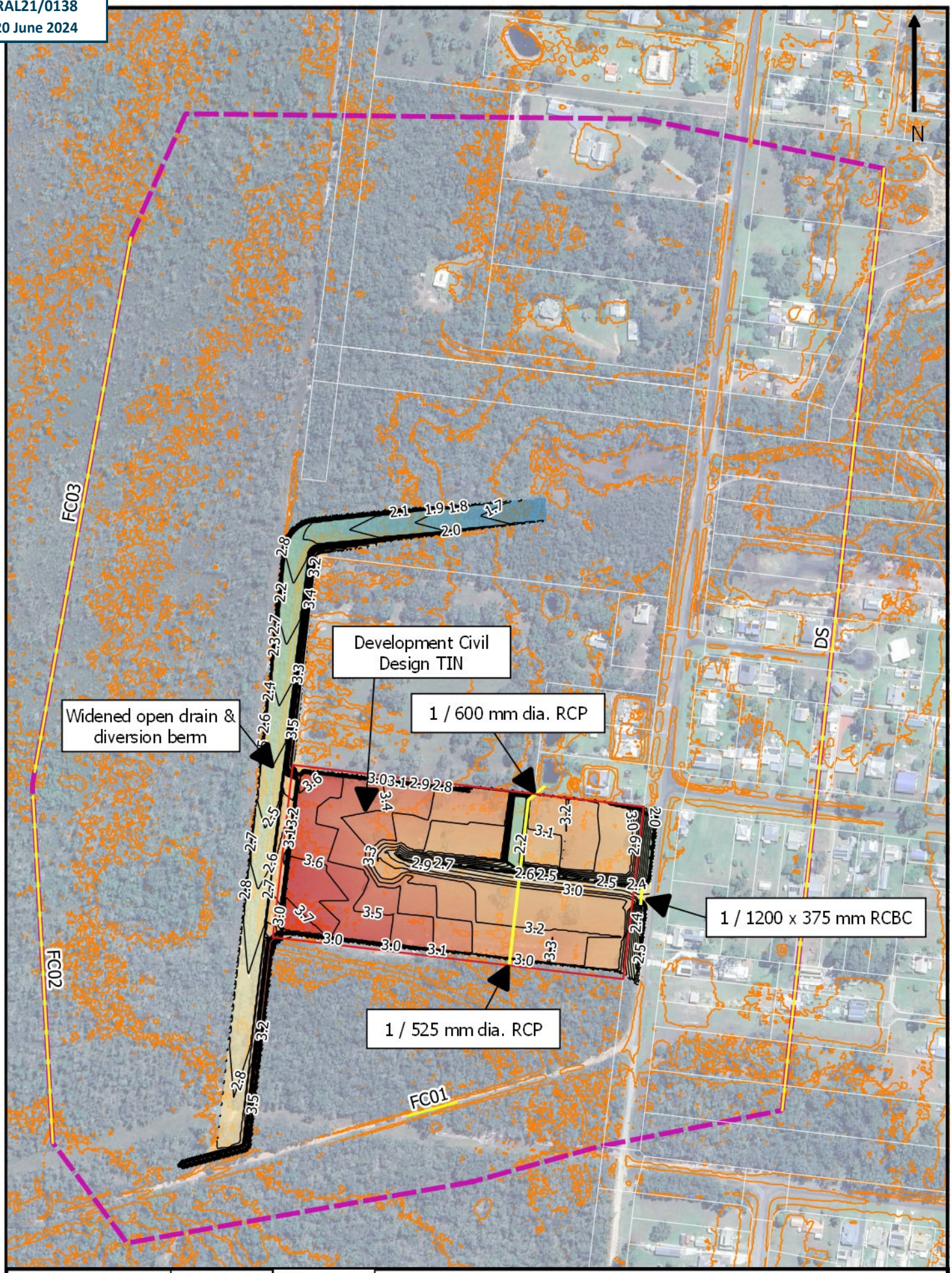
Figure 6d

Existing 1% AEP Velocity-Depth (m^2/s)



STORM WATER CONSULTING 1/820 Old Cleveland Rd Carina QLD 4152 Phone (07) 3398 4992	Drawn	JH	Lot 51 Wilkinson Road, Tuan		Figure 7
	Checked	SNH			
	Date	22/05/24			
	Scale	1:4,000 (A4)	Job No.	J9009	Developed TUFLOW Model

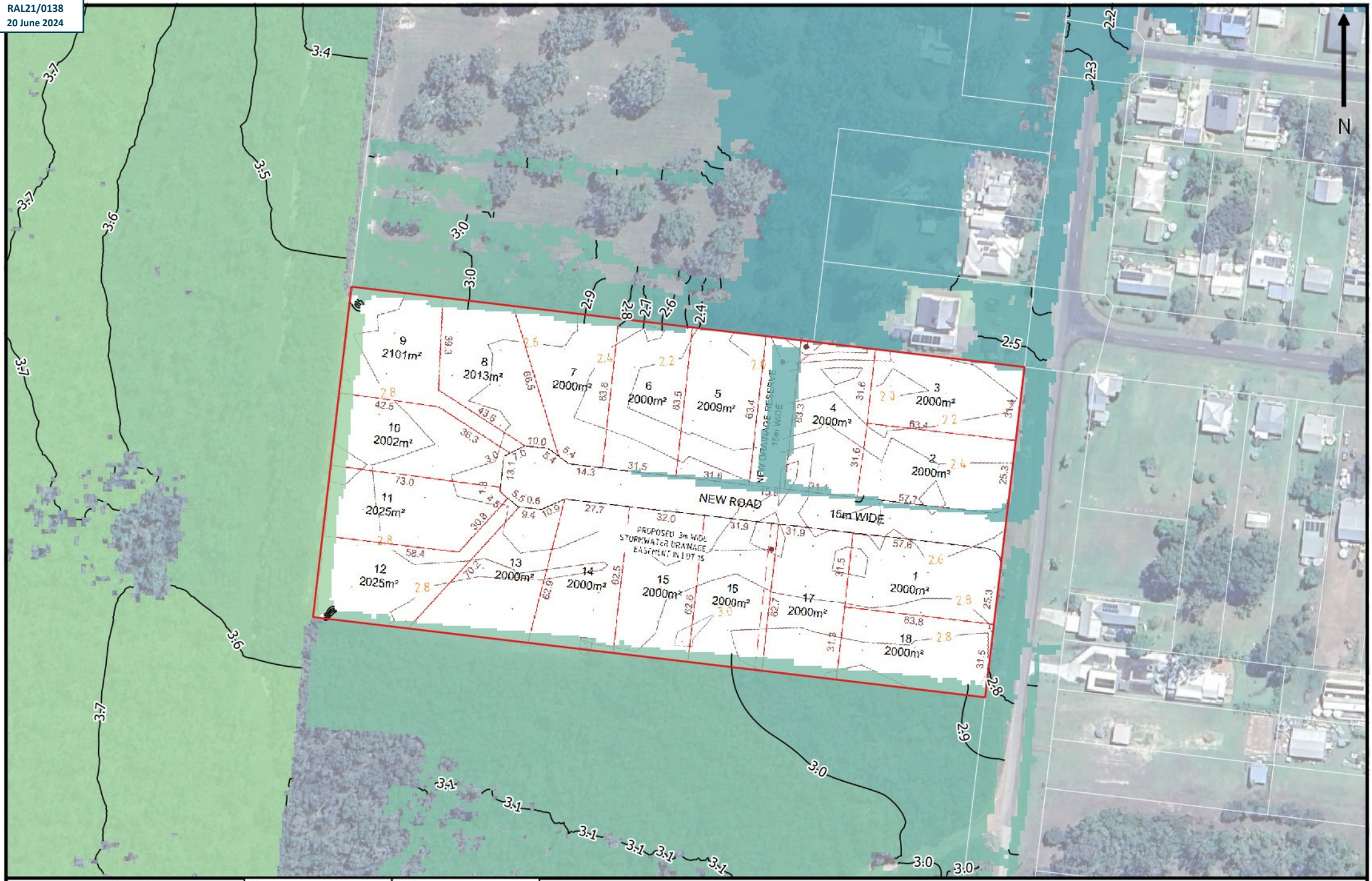


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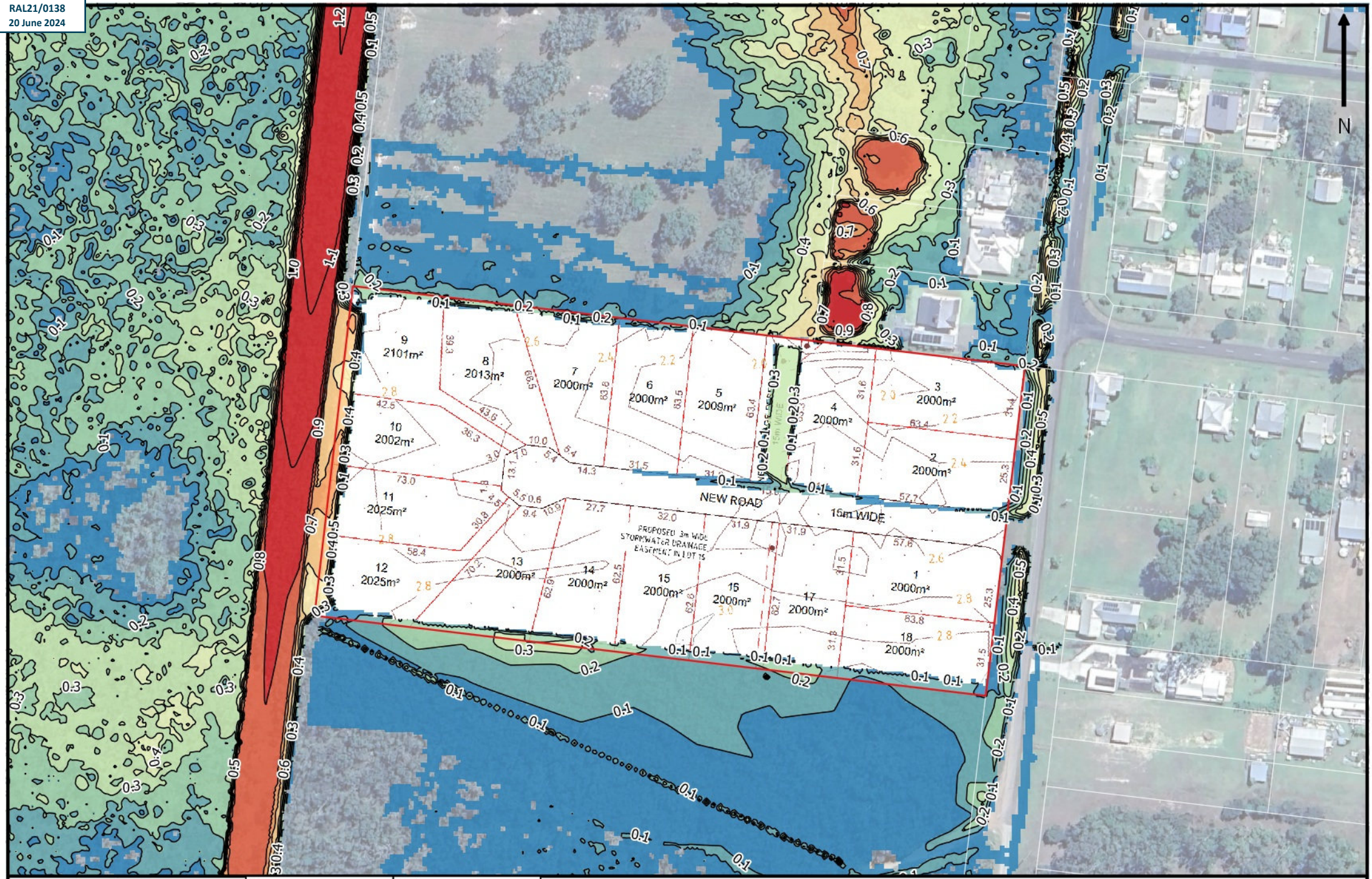
Figure 8a

Developed 1% AEP Levels (m AHD)



STORM WATER CONSULTING
1/820 Old Cleveland Rd, Carina QLD 4152
Phone (07) 3398 4992

Drawn	JH
Checked	SNH
Date	22/05/24
Scale	1:2,000 (A4)

Lot 51 Wilkinson Road, Tuan

Job No. J9009

Figure 8b

Developed 1% AEP Depths (metres)

STORM WATER CONSULTING
1/820 Old Cleveland Rd, Carina QLD 4152
Phone (07) 3398 4992

Drawn	JH
Checked	SNH
Date	22/05/24
Scale	1:2,000 (A4)

Lot 51 Wilkinson Road, Tuan

Job No. J9009

Figure 8c

Developed 1% AEP Velocity (m/s)

STORM WATER CONSULTING
1/820 Old Cleveland Rd, Carina QLD 4152
Phone (07) 3398 4992

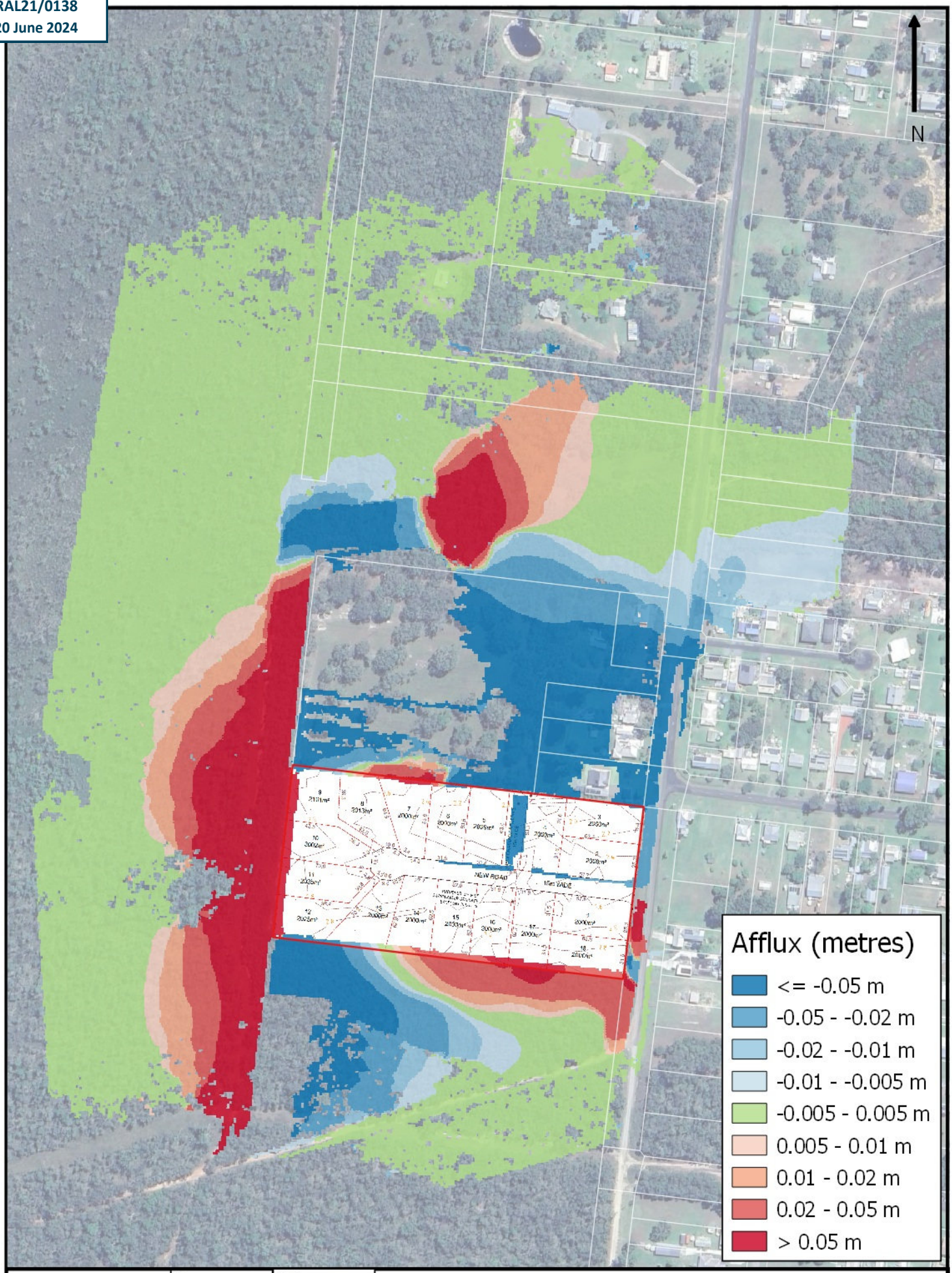
Drawn	JH
Checked	SNH
Date	22/05/24
Scale	1:2,000 (A4)

Lot 51 Wilkinson Road, Tuan

Job No. J9009

Figure 8d

Developed 1% AEP Velocity-Depth (m^2/s)



STORM WATER CONSULTING
1/820 Old Cleveland Rd
Carina QLD 4152
Phone (07) 3398 4992

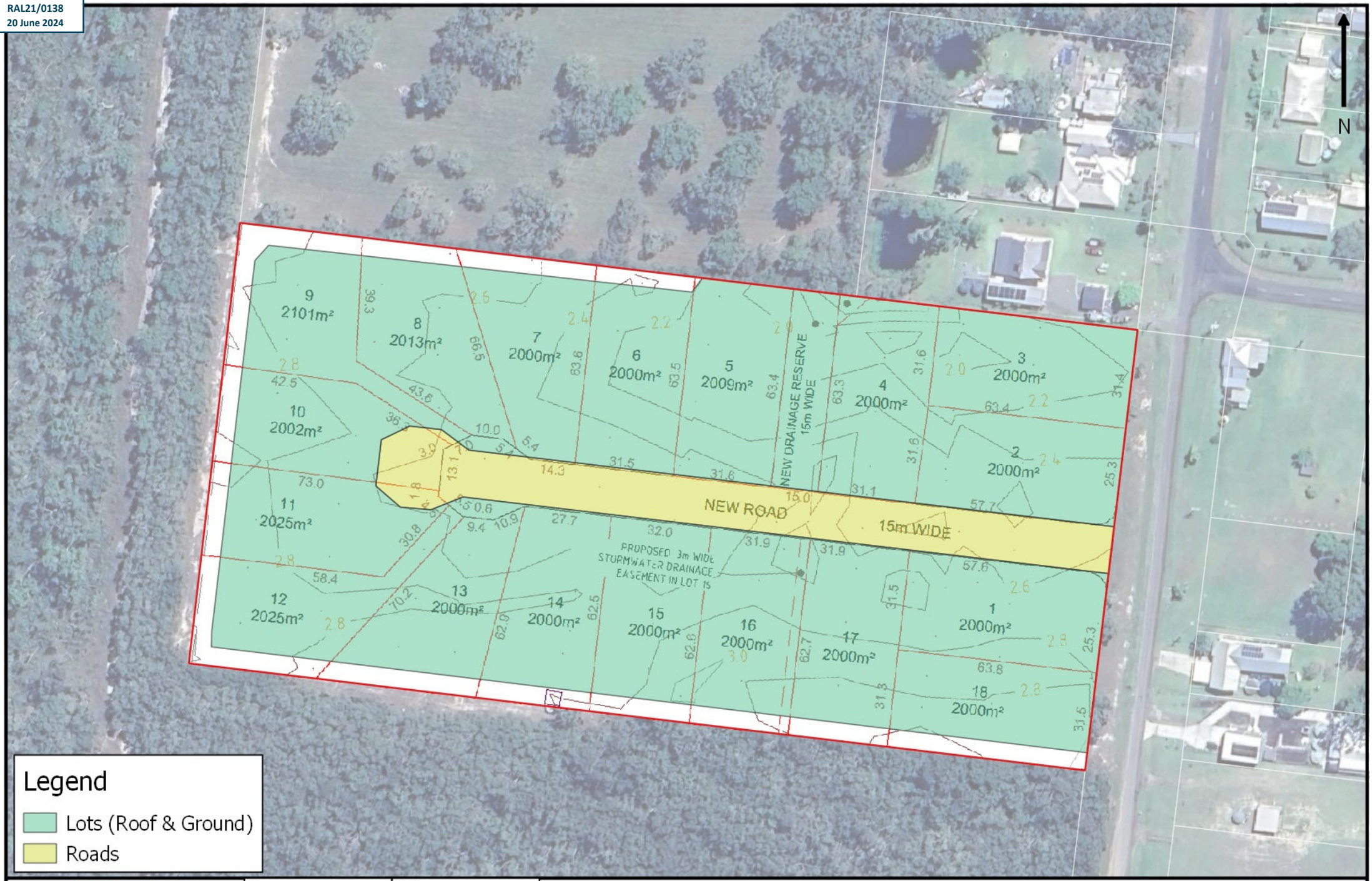
Drawn	JH
Checked	SNH
Date	22/05/24
Scale	1:4,000 (A4)

Lot 51 Wilkinson Road, Tuan

Job No. J9009

Figure 9

Afflux Impact Plot (metres)



STORM
WATER CONSULTING
1/820 Old Cleveland Rd, Carina QLD 4152
Phone (07) 3398 4992

Drawn	JH
Checked	SNH
Date	22/05/24
Scale	1:1,500 (A4)

Lot 51 Wilkinson Road, Tuan

Job No. J9009

Figure 10
MUSIC Sub Areas

APPENDIX B

Photographs

Photograph 1 – Existing site condition (looking west)

APPENDIX C

Rational Method Calculations

RATIONAL METHOD CALCULATIONS

Table C 1 a

Project: Tuan J9009

Location: Point 1 - Total Flow - DS

Comments:

Time of Concentration

Upper Catchment Slope	0.5%	
100m sheet flow across dense grass	30	min
Travel Length	1000	metres
Fall	6	metres
Travel Time (Argue)	13	min
Delta for	4	
Time of Concentration	**82.0**	**min**

Rainfall Data:
Rainfall Intensity Frequency Duration data for TUAN

Sub-Areas and Runoff Coefficients

	Area	C10		Areas included in Calculations				Separate c100 > 1.0 and c100 < 1.0					
	ha	Exist	Dev	Condition	Area	C10	C10 x A	C10	C10	C10 x A	C10 x A	Area	Area
Cmt to P1	31.00	0.00	0.53	**Developed**	**31.00**	**0.53**	**16.43**	0.53		16.43		31.00	
Cmt to P2	220.00	0.00	0.53										
					31.00		Sum			16.43	0.00	31.00	0.00
							Total		0.530		16.430		31.000
							Individual	0.530	0.000	16.430	0.000	31.000	0.000

Discharge Calculations

tc **82.0**

C100>1 Average c10 **0.000**
Area (ha) **0.00**

C100<1 **c10 - 2** Average **0.530**
Area (ha) **31.00**

Total Catchment 31 ha

Depth	AEP	Fy	Runoff Coefficients		Rainfall	Discharge m³/s		
mm	%		C100>1	C100<1	(mm/hr)	1	2	Total
42	**63**	0.80	0.00	0.42	30.99	0.00	1.13	**1.13**
48	**50**	0.85	0.00	0.45	35.02	0.00	1.36	**1.36**
65	**20**	0.95	0.00	0.50	47.91	0.00	2.08	**2.08**
78	**10**	1.00	0.00	0.53	56.98	0.00	2.60	**2.60**
90	**5**	1.05	0.00	0.56	66.00	0.00	3.16	**3.16**
107	**2**	1.15	0.00	0.61	78.17	0.00	4.10	**4.10**
120	**1**	1.20	0.00	0.64	87.88	0.00	4.81	**4.81**
137	**0.5**	1.20	0.00	0.64	99.99	0.00	5.48	**5.48**
160	**0.2**	1.20	0.00	0.64	117.27	0.00	6.42	**6.42**

EY	Discharge m³/s	% of 63% AEP
12	0.283	25%
6	0.453	40%
4	0.566	50%
3	0.679	60%
2	0.849	75%
1.3	1.018	90%
1	1.132	100%

RATIONAL METHOD CALCULATIONS

Table C 1 b

Project: Tuan J9009

Location: Point 2 - Total Flow - DS

Comments:

Time of Concentration

Upper Catchment Slope	0.5%	
200m sheet flow across dense grass	40	min
Travel Length	2500	metres
Fall	8	metres
Travel Time (Argue)	24	min
Delta for	4	
Time of Concentration	**136.0**	**min**

Rainfall Data:
Rainfall Intensity Frequency Duration data for TUAN

Sub-Areas and Runoff Coefficients

	Area	C10		Areas included in Calculations				Separate c100 > 1.0 and c100 < 1.0					
	ha	Exist	Dev	Condition	Area	C10	C10 x A	C10	C10	C10 x A	C10 x A	Area	Area
Cmt to P1	31.00	0.00	0.53										
Cmt to P2	220.00	0.00	0.53	**Developed**	**220.00**	**0.53**	**116.60**	0.53		116.60		220.00	
					220.00		Sum			116.60	0.00	220.00	0.00
							Total		0.530		116.600		220.000
							Individual	0.530	0.000	116.600	0.000	220.000	0.000

Discharge Calculations

tc **136.0**

C100>1 Average c10 **0.000**
Area (ha) **0.00**

C100<1 **c10 - 2** Average **0.530**
Area (ha) **220.00**

Total Catchment 220 ha

Depth	AEP	Fy	Runoff Coefficients		Rainfall	Discharge m³/s		
mm	%		C100>1	C100<1	(mm/hr)	1	2	Total
50	**63**	0.80	0.00	0.42	21.93	0.00	5.68	**5.68**
56	**50**	0.85	0.00	0.45	24.86	0.00	6.84	**6.84**
78	**20**	0.95	0.00	0.50	34.29	0.00	10.55	**10.55**
93	**10**	1.00	0.00	0.53	40.99	0.00	13.28	**13.28**
108	**5**	1.05	0.00	0.56	47.79	0.00	16.25	**16.25**
130	**2**	1.15	0.00	0.61	57.16	0.00	21.29	**21.29**
146	**1**	1.20	0.00	0.64	64.63	0.00	25.12	**25.12**
167	**0.5**	1.25	0.00	0.66	73.69	0.00	29.83	**29.83**
196	**0.2**	1.30	0.00	0.69	86.49	0.00	36.42	**36.42**

EY	Discharge m³/s	% of 63% AEP
12	1.421	25%
6	2.273	40%
4	2.842	50%
3	3.410	60%
2	4.263	75%
1.3	5.115	90%
1	5.684	100%

APPENDIX D

URBS Data

9009_Ex.DAT

```
"Index","Area","UF","UR","I"
#1,0.23117,1.00,0.00,0.05
#2,0.13860,1.00,0.00,0.05
#3,0.09571,1.00,0.00,0.05
#4,0.07232,1.00,0.00,0.05
#5,0.27893,1.00,0.00,0.05
#6,0.20129,1.00,0.00,0.05
#7,0.03762,1.00,0.00,0.05
#8,0.05160,1.00,0.00,0.05
#9,0.08068,1.00,0.00,0.05
#10,0.04885,1.00,0.00,0.05
#11,0.15386,1.00,0.00,0.05
#12,0.15437,1.00,0.00,0.05
#13,0.00655,1.00,0.00,0.05
#14,0.00454,1.00,0.00,0.05
#15,0.00272,1.00,0.00,0.05
#16,0.01157,1.00,0.00,0.05
#17,0.00128,1.00,0.00,0.05
#18,0.00868,1.00,0.00,0.05
#19,0.04047,0.00,1.00,0.05
#20,0.07365,0.00,1.00,0.20
#21,0.00742,0.00,1.00,0.80
#22,0.30520,1.00,0.00,0.05
#23,0.19305,0.80,0.20,0.15
```

9009_Ex.U

```
Tuan - Existing
MODEL: Basic
USES: L, U
Default Parameters: alpha=1.20 m=0.8
Catchment File=9009_Ex.dat

Rain    #13     L=0.067
Store.
Rain    #14     L=0.046
Get.
Route thru      #15     L=0.086
Store.
Rain    #15     L=0.059
Store.
Rain    #16     L=0.067
Get.
Get.
Route thru      #17     L=0.097
Store.
Rain    #17     L=0.053
Store.
Rain    #18     L=0.090
Get.
Get.
Route thru      #11     L=0.030
Store.
Rain    #9      L=0.140
Route thru      #11     L=0.241
Add Rain        #11     L=0.356
Get.
Route thru      #19     L=0.148
Add Rain        #19     L=0.161
Print. P1
Route thru      #21     L=0.042
Add Rain        #21     L=0.241
Store.
Rain    #7      L=0.131
Route thru      #8      L=0.157
Add Rain        #8      L=0.167
Route thru      #10     L=0.200
Add Rain        #10     L=0.104
Route thru      #12     L=0.344
Add Rain        #12     L=0.378
Route thru      #20     L=0.153
Add Rain        #20     L=0.217
Store.
Rain    #1      L=0.346
Route thru      #2      L=0.534
Store.
Rain    #2      L=0.231
Store.
```

```
Rain    #3      L=0.286
Get.
Get.
Route thru      #4      L=0.599
Store.
Rain    #4      L=0.301
Store.
Rain    #5      L=0.351
Get.
Get.
Route thru      #6      L=0.350
Add Rain        #6      L=0.419
Route thru      #20     L=0.323
Store.
Rain    #22     L=0.412
Route thru      #23     L=0.347
Add Rain        #23     L=0.354
Get.
Get.
Get.
Print. P2
end of catchment details.
```

9009_Dev1.DAT

```
"Index","Area","UF","UR","I"
#1,0.23117,1.00,0.00,0.05
#2,0.13860,1.00,0.00,0.05
#3,0.09571,1.00,0.00,0.05
#4,0.07232,1.00,0.00,0.05
#5,0.27893,1.00,0.00,0.05
#6,0.20129,1.00,0.00,0.05
#7,0.03762,1.00,0.00,0.05
#8,0.05160,1.00,0.00,0.05
#9,0.08068,1.00,0.00,0.05
#10,0.04885,1.00,0.00,0.05
#11,0.15386,1.00,0.00,0.05
#12,0.15437,1.00,0.00,0.05
#13,0.00655,1.00,0.00,0.05
#14,0.00454,1.00,0.00,0.05
#15,0.00272,1.00,0.00,0.05
#16,0.01157,1.00,0.00,0.05
#17,0.00128,1.00,0.00,0.05
#18,0.00868,1.00,0.00,0.05
#19,0.04047,0.00,1.00,0.31
#20,0.07365,0.00,1.00,0.20
#21,0.00742,0.00,1.00,0.80
#22,0.30520,1.00,0.00,0.05
#23,0.19305,0.80,0.20,0.15
```

9009_Dev1.U

```
Tuan - Development1
MODEL: Basic
USES: L, U
Default Parameters: alpha=1.20 m=0.8
Catchment File=9009_Dev1.dat

Rain    #13     L=0.067
Store.
Rain    #14     L=0.046
Get.
Route thru      #15     L=0.086
Store.
Rain    #15     L=0.059
Store.
Rain    #16     L=0.067
Get.
Get.
Route thru      #17     L=0.097
Store.
Rain    #17     L=0.053
Store.
Rain    #18     L=0.090
Get.
Get.
Route thru      #17     L=0.287
Route thru      #21     L=0.141
```

```
Store.
Rain    #19     L=0.161
Get.
Print. P1
Route thru      #21     L=0.042
Add Rain        #21     L=0.241
Store.
Rain    #9      L=0.140
Route thru      #11     L=0.241
Add Rain        #11     L=0.356
Route thru      #12     L=0.203
Store.
Rain    #7      L=0.131
Route thru      #8      L=0.157
Add Rain        #8      L=0.167
Route thru      #10     L=0.200
Add Rain        #10     L=0.104
Route thru      #12     L=0.344
Add Rain        #12     L=0.378
Get.
Route thru      #6      L=0.088
Store.
Rain    #1      L=0.346
Route thru      #2      L=0.534
Store.
Rain    #2      L=0.231
Store.
Rain    #3      L=0.286
Get.
Get.
Route thru      #4      L=0.599
Store.
Rain    #4      L=0.301
Store.
Rain    #5      L=0.351
Get.
Get.
Route thru      #6      L=0.350
Add Rain        #6      L=0.419
Get.
Route thru      #20     L=0.323
Store.
Rain    #20     L=0.217
Store.
Rain    #22     L=0.412
Route thru      #23     L=0.347
Add Rain        #23     L=0.354
Get.
Get.
Get.
Print. P2
end of catchment details.
```

APPENDIX E

Design Plans

Received by FCRC
RAL21/0138
20 June 2024

APPENDIX A

LEGEND

- EXISTING CONTOUR (0.20m) A.H.D.
- EXISTING STORMWATER DRAINAGE LINE
- EXISTING EDGE OF BITUMEN
- EXISTING GRADE OF OPEN DRAIN
- EXISTING TELSTRA SERVICE (PIT)
- EXISTING O/H ELECTRICITY (POWER POLE)
- EXISTING UNFORMED TRACK
- PROPOSED AC SURFACED ROAD PAVEMENT
- PROPOSED MOUNTABLE KERB (TYPE L)
- PROPOSED EDGE RESTRAINT (TYPE Q)
- PROPOSED OPEN CHANNEL DRAIN
- PROPOSED CONCRETE SPOON DRAIN
- F.S.L 3.300 PROPOSED TOPSOILED F.S. PAD LEVELS
- PROPOSED 3m BITUMEN DRIVEWAYS

PROPOSED 600mm DIA. STORMWATER PIPE IN MINIMUM 3m WIDE STORMWATER DRAINAGE EASEMENT IN LOT 4 TO DISCHARGE INTO DAM ON LOT3 SP155428 WITH WRITTEN AGREEMENT OF EXISTING OWNER

PROPOSED 600mm WIDE CONCRETE SPOON DRAINS GRADED TO PROPOSED & EXISTING HEADWALLS IN WILKINSON ROAD

R.P. DETAILS
LOT 51
MCH 567

NOTES
1. PROPOSED STAGE 1: LOTS 1 TO 3 & 18.
2. PROPOSED LOT DIMENSIONS AND AREAS ARE APPROXIMATE ONLY AND SUBJECT TO FINAL SURVEY.

PROPOSED 500m² BIO-RETENTION BASIN DESIGN TO BE CONFIRMED BY ENGINEER

PROPOSED EARTHERN BERMS CONSTRUCTED BY HQP ON EASTERN SIDE OF OPEN DRAIN LOCATED WITHIN HQP LEASE AREA

PROPOSED 600mm WIDE CONCRETE SPOON DRAIN GRADED TO 900 x 900 GRATED PIT

LOT2 RP192532

LOT3 SP155428

PROPOSED 600mm DIA. STORMWATER PIPE IN MINIMUM 3m WIDE STORMWATER DRAINAGE EASEMENT IN LOT 4

PROPOSED 16m WIDE OPEN DRAIN CHANNEL CONSTRUCTED BY HQP WITH NEW ACCESS TRACK WITHIN 35m WIDE FIREBREAK ON WESTERN SIDE OF THE ESTATE

915 FTY1775

EXISTING SHALLOW OPEN DRAIN TO BE WIDENED AND RELOCATED BY HQP AS DETAILED

PROPOSED 1m WIDE OPEN DRAIN CHANNEL CONSTRUCTED BY HQP TO DRAIN TO 525mmØ STORMWATER PIPE WITHIN 10m WIDE FIREBREAK ON SOUTHERN SIDE OF THE ESTATE

NEW DRAINAGE RESERVE 15m WIDE

NEW ROAD 15m WIDE

WILKINSON ROAD

PROPOSED 525mm DIA. STORMWATER PIPE IN 3m WIDE STORMWATER DRAINAGE EASEMENT IN LOT 16

No	DATE	AMENDMENTS

ASSOCIATED PLANNING CONSULTANT
URBAN PLANET

ASSOCIATED SURVEYING CONSULTANT
PACIFIC COAST SURVEYS PTY LTD

CLIENT
MARK & JULIANNE GRUNSKE

PROJECT
PROPOSED SUBDIVISION AT WILKINSON STREET TUAN

SIGNED: A.J. McVey 26/04/24
for and on behalf of
TONY McVEY Pty Ltd
ABN 18 061 348 436
Consulting Engineer
P.O. BOX 941, HERVEY BAY 4655
Phone : (07) 4128 4699
Mobile: 0427 062 952
Email: hbmcvey@bigpond.com
Director: Tony McVey B.E.(Civil), M.I.E.Aust., R.P.E.Q. No. 2648

DESIGNED BY	DRAWN BY
T.McVey	T.McVey
CHECKED BY	APPROVED BY
T.McVey	T.McVey

DATE 26/04/2024
SCALES 1:1000 (0 10 20)

TITLE
ESTATE EARTHWORKS, ROADWORKS & STORMWATER DRAINAGE LAYOUT PLAN

JOB NUMBER **C20057**
SHEET SIZE **A3**
DRAWING NUMBER **20057-Sk5**

Received by FCRC
RAL21/0138
20 June 2024

ND

12.40 EXISTING CONTOUR (0.20m) A.H.D.

SW EXISTING STORMWATER DRAINAGE LINE

EXISTING EDGE OF BITUMEN

EXISTING GRADE OF OPEN DRAIN

T EXISTING TELSTRA SERVICE (PIT)

E PP EXISTING O/H ELECTRICITY (POWER POLE)

EXISTING UNFORMED TRACK

N

PROPOSED 15m WIDE DRAINAGE RESERVE FOR PROPOSED 500m² BIO-RETENTION BASIN DESIGN TO BE CONFIRMED BY ENGINEER

PROPOSED MINIMUM 3m WIDE STORMWATER DRAINAGE EASEMENT IN LOT 4 TO DISCHARGE INTO DAM ON LOT3 SP155428 WITH WRITTEN AGREEMENT OF EXISTING OWNER

R.P. DETAILS
LOT 51
MCH 567

NOTES
1. PROPOSED STAGE 1: LOTS 1 TO 3 & 18.

2. PROPOSED LOT DIMENSIONS AND AREAS ARE APPROXIMATE ONLY AND SUBJECT TO FINAL SURVEY.

LOT2
RP192532

LOT3
SP155428

915
FTY1775

EXISTING SHALLOW OPEN DRAINS IN HQP LEASE AREA

NEW DRAINAGE RESERVE 15m WIDE

NEW ROAD 15m WIDE

WILKINSON ROAD

PROPOSED 3m WIDE STORMWATER DRAINAGE EASEMENT IN LOT 16

1	2000m²	
2	2000m²	
3	2000m²	
4	2000m²	
5	2009m²	
6	2000m²	
7	2000m²	
8	2013m²	
9	2101m²	
10	2002m²	
11	2025m²	
12	2025m²	
13	2000m²	
14	2000m²	
15	2000m²	
16	2000m²	
17	2000m²	
18	2000m²	

No	DATE	AMENDMENTS

ASSOCIATED PLANNING CONSULTANT
URBAN PLANET

ASSOCIATED SURVEYING CONSULTANT
PACIFIC COAST SURVEYS PTY LTD

CLIENT
MARK & JULIANNE GRUNSKE

PROJECT
PROPOSED SUBDIVISION AT WILKINSON STREET TUAN

SIGNED: A.J.McVey 26/04/24
for and on behalf of
TONY McVEY Pty Ltd
ABN 18 061 348 436
Consulting Engineer
P.O. BOX 941, HERVEY BAY 4655
Phone : (07) 4128 4699
Mobile: 0427 062 952
Email: hbmcvey@bigpond.com
Director: Tony McVey B.E.(Civil), M.I.E.Aust., R.P.E.Q. No. 2648

DESIGNED BY	DRAWN BY
T.McVey	T.McVey
CHECKED BY	APPROVED BY
T.McVey	T.McVey

DATE 26/04/2024

SCALES 1:1000 (0 10 20)

TITLE
ESTATE LOT LAYOUT PLAN

JOB NUMBER C20057

SHEET SIZE A3

DRAWING NUMBER 20057-Sk6

APPENDIX F

Bio-Retention Basin Maintenance Checklist

BIORETENTION BASIN MAINTENANCE CHECKLIST				
Inspection Frequency:	1 to 6 monthly	Date of Visit:		
Location:				
Description:				
Asset I.D.				
Site Visit by:				
INSPECTION ITEMS:		Y	N	Action Required (details)
Sediment accumulation at inflow points?				
Litter within basin?				
Erosion at inlet or other key structures?				
Traffic damage present?				
Evidence of dumping (e.g. building waste)?				
Vegetation condition satisfactory (density, weeds etc)?				
Watering of vegetation required?				
Replanting required?				
Mowing/slashing required?				
Clogging of drainage points (sediment or debris)?				
Evidence of ponding?				
Damage/vandalism to structures present?				
Surface clogging visible?				
Drainage system inspected?				
Resetting of system required?				
COMMENTS				

International Coastal Management

25 March 2024

SARA Wide Burnett Bay
Level 1, 7 Takalvan Street, Bundaberg
PO Box 979,
Bundaberg QLD 4670
WBBSARA@dsdilgp.qld.gov.au

RE: Erosion Prone Area, Lot 51 MCH567

To whom it may concern,

This letter is to provide a response to the information requested by SARA in January 2022 regarding the Erosion Prone Area at the site, Lot 51 MCH567 in Tuan on the Fraser Coast, Queensland.

ICM are Coastal Specialists, with over three decades of coastal management experience in Queensland. We have reviewed the available information at this site to assess its vulnerability to short-term erosion, long-term erosion, and inundation due to sea level rise.

The site is located approximately 350m landward of HAT of the adjacent water body, The Great Sandy Strait. The site is on the leeward side of K'gari / Fraser Island and therefore not exposed to ocean waves, with the largest fetch being approximately 10km from the SE. Short term erosion due to storm events is not expected to be significant due to the relatively low energy that can be generated across this fetch. DES have categorised the erosion prone area landward extent (*due storm impact and long-term trends)* of this region as HAT + 40m; this is considered adequate given the relatively low energy environment and does not require re-classification. The subject site is located 310m landward of this extent line.

The site is mapped as *Erosion Prone Area* (and therefore within the *Coastal Management District*) only due to partial low lying surface area and therefore vulnerability to tidal inundation under future sea level rise conditions (i.e. HAT + 0.8m; planning scenario for 2100). This future HAT tidal inundation covers approximately 20% of the site and can be mitigated with minor earthworks and raising of this land by up to approximately 0.5m. These earthworks are proposed as part of the associated development works and in doing so, would effectively remove the *Erosion Prone Area / Coastal Management District* designation from the site.

HAT at the site has been determined from MSQ Tide Tables 2024, at Boonooroo / Big Tuan Boat Ramp, showing a level of RL 1.53m AHD. The 2100 sea level rise inundation contour is therefore RL 2.33m AHD. The existing surface at the site is as low as RL 1.8m AHD, with proposed finish levels approximately RL 3.0 – 3.7m AHD.

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WEBSITE www.coastalmanagement.com.au

International Coastal Management

While the detailed design for the proposed earthworks (including a perimeter retaining wall) has not yet been completed, this letter is to provide clarification of the proposed design intent and that an alternative solution to SDAP 8, PO1, that satisfies the purpose of the code and performance objective, can reasonably be achieved.

Kind regards,

Martin Mulcahy
Principal Coastal Engineer

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Appendix 1. Site Photographs

Figure 1. Turton Street foreshore.

Figure 2. Subject site, Lot 51 MCH567, (northern boundary with low surface level)

Figure 3. Subject site, Lot 51 MCH567

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Appendix 2. Erosion Prone Area Mapping

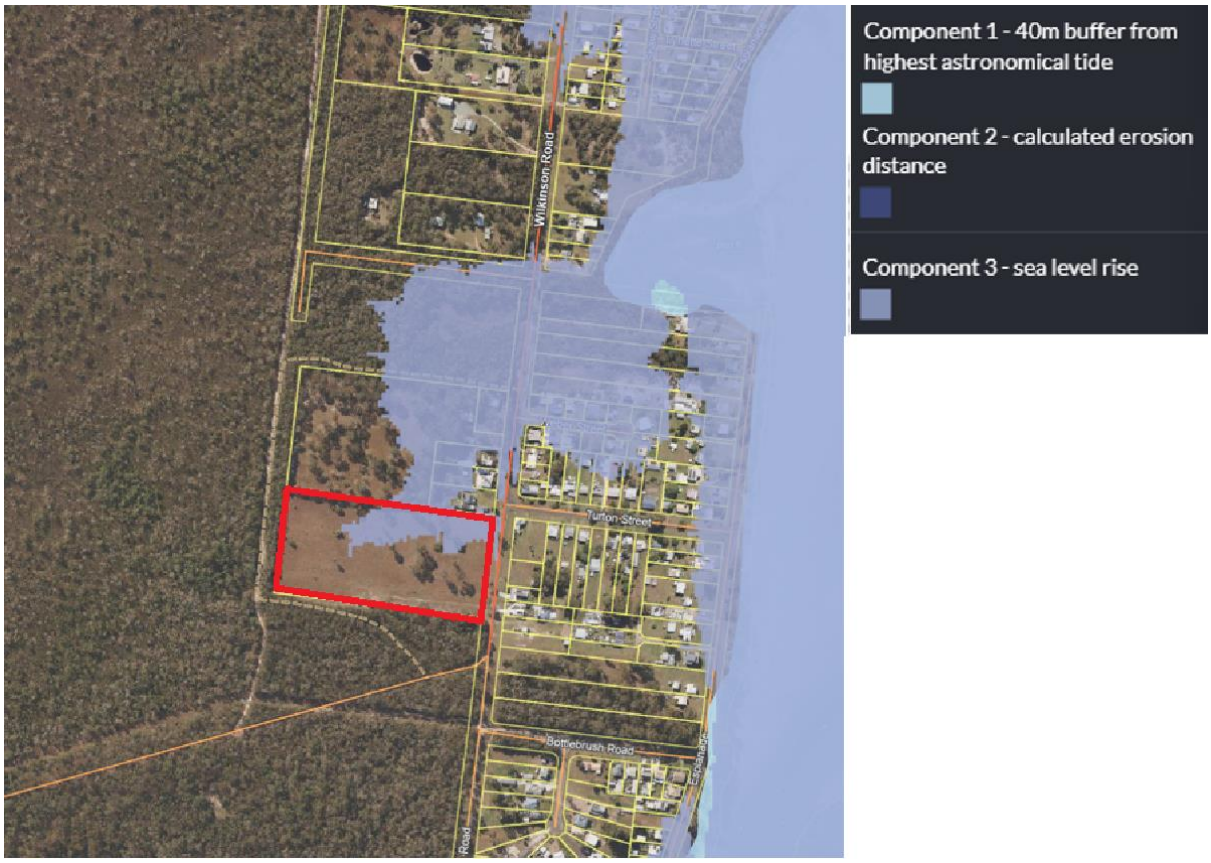

Figure 4. Erosion Prone Mapping (Qld Globe)

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20 June 2024

APPENDIX A

LEGEND

- EXISTING CONTOUR (0.20m) A.H.D.
- EXISTING STORMWATER DRAINAGE LINE
- EXISTING EDGE OF BITUMEN
- EXISTING GRADE OF OPEN DRAIN
- EXISTING TELSTRA SERVICE (PIT)
- EXISTING O/H ELECTRICITY (POWER POLE)
- EXISTING UNFORMED TRACK
- PROPOSED AC SURFACED ROAD PAVEMENT
- PROPOSED MOUNTABLE KERB (TYPE L)
- PROPOSED EDGE RESTRAINT (TYPE Q)
- PROPOSED OPEN CHANNEL DRAIN
- PROPOSED CONCRETE SPOON DRAIN
- F.S.L 3.300 PROPOSED TOPSOILED F.S. PAD LEVELS
- PROPOSED 3m BITUMEN DRIVEWAYS

PROPOSED 600mm DIA. STORMWATER PIPE IN MINIMUM 3m WIDE STORMWATER DRAINAGE EASEMENT IN LOT 4 TO DISCHARGE INTO DAM ON LOT3 SP155428 WITH WRITTEN AGREEMENT OF EXISTING OWNER

PROPOSED 600mm WIDE CONCRETE SPOON DRAINS GRADED TO PROPOSED & EXISTING HEADWALLS IN WILKINSON ROAD

R.P. DETAILS
LOT 51
MCH 567

NOTES
1. PROPOSED STAGE 1: LOTS 1 TO 3 & 18.
2. PROPOSED LOT DIMENSIONS AND AREAS ARE APPROXIMATE ONLY AND SUBJECT TO FINAL SURVEY.

PROPOSED 500m² BIO-RETENTION BASIN DESIGN TO BE CONFIRMED BY ENGINEER

PROPOSED EARTHERN BERMS CONSTRUCTED BY HQP ON EASTERN SIDE OF OPEN DRAIN LOCATED WITHIN HQP LEASE AREA

PROPOSED 600mm WIDE CONCRETE SPOON DRAIN GRADED TO 900 x 900 GRATED PIT

LOT2 RP192532

LOT3 SP155428

PROPOSED 600mm DIA. STORMWATER PIPE IN MINIMUM 3m WIDE STORMWATER DRAINAGE EASEMENT IN LOT 4

PROPOSED 16m WIDE OPEN DRAIN CHANNEL CONSTRUCTED BY HQP WITH NEW ACCESS TRACK WITHIN 35m WIDE FIREBREAK ON WESTERN SIDE OF THE ESTATE

915 FTY1775

EXISTING SHALLOW OPEN DRAIN TO BE WIDENED AND RELOCATED BY HQP AS DETAILED

PROPOSED 1m WIDE OPEN DRAIN CHANNEL CONSTRUCTED BY HQP TO DRAIN TO 525mmØ STORMWATER PIPE WITHIN 10m WIDE FIREBREAK ON SOUTHERN SIDE OF THE ESTATE

NEW DRAINAGE RESERVE 15m WIDE

NEW ROAD 15m WIDE

WILKINSON ROAD

PROPOSED 525mm DIA. STORMWATER PIPE IN 3m WIDE STORMWATER DRAINAGE EASEMENT IN LOT 16

No	DATE	AMENDMENTS

ASSOCIATED PLANNING CONSULTANT
URBAN PLANET

ASSOCIATED SURVEYING CONSULTANT
PACIFIC COAST SURVEYS PTY LTD

CLIENT
MARK & JULIANNE GRUNSKE

PROJECT
PROPOSED SUBDIVISION AT WILKINSON STREET TUAN

SIGNED: A.J. McVey 26/04/24
for and on behalf of
TONY McVEY Pty Ltd
ABN 18 061 348 436
Consulting Engineer
P.O. BOX 941, HERVEY BAY 4655
Phone : (07) 4128 4699
Mobile: 0427 062 952
Email: hbmcvey@bigpond.com
Director: Tony McVey B.E.(Civil), M.I.E.Aust., R.P.E.Q. No. 2648

DESIGNED BY	DRAWN BY
T.McVey	T.McVey
CHECKED BY	APPROVED BY
T.McVey	T.McVey

DATE 26/04/2024
SCALES 1:1000 (0 10 20)

TITLE
ESTATE EARTHWORKS, ROADWORKS & STORMWATER DRAINAGE LAYOUT PLAN

JOB NUMBER **C20057**
SHEET SIZE **A3**
DRAWING NUMBER **20057-Sk5**

Received by FCRC
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20 June 2024

ND

12.40 EXISTING CONTOUR (0.20m) A.H.D.

SW EXISTING STORMWATER DRAINAGE LINE

EXISTING EDGE OF BITUMEN

EXISTING GRADE OF OPEN DRAIN

T EXISTING TELSTRA SERVICE (PIT)

E PP EXISTING O/H ELECTRICITY (POWER POLE)

EXISTING UNFORMED TRACK

N

PROPOSED 15m WIDE DRAINAGE RESERVE FOR PROPOSED 500m² BIO-RETENTION BASIN DESIGN TO BE CONFIRMED BY ENGINEER

PROPOSED MINIMUM 3m WIDE STORMWATER DRAINAGE EASEMENT IN LOT 4 TO DISCHARGE INTO DAM ON LOT3 SP155428 WITH WRITTEN AGREEMENT OF EXISTING OWNER

R.P. DETAILS
LOT 51
MCH 567

NOTES
1. PROPOSED STAGE 1: LOTS 1 TO 3 & 18.

2. PROPOSED LOT DIMENSIONS AND AREAS ARE APPROXIMATE ONLY AND SUBJECT TO FINAL SURVEY.

LOT2
RP192532

LOT3
SP155428

915
FTY1775

EXISTING SHALLOW OPEN DRAINS IN HQP LEASE AREA

NEW DRAINAGE RESERVE 15m WIDE

NEW ROAD 15m WIDE

WILKINSON ROAD

PROPOSED 3m WIDE STORMWATER DRAINAGE EASEMENT IN LOT 16

1	2000m²	
2	2000m²	
3	2000m²	
4	2000m²	
5	2009m²	
6	2000m²	
7	2000m²	
8	2013m²	
9	2101m²	
10	2002m²	
11	2025m²	
12	2025m²	
13	2000m²	
14	2000m²	
15	2000m²	
16	2000m²	
17	2000m²	
18	2000m²	

No	DATE	AMENDMENTS

ASSOCIATED PLANNING CONSULTANT
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DESIGNED BY	DRAWN BY
T.McVey	T.McVey
CHECKED BY	APPROVED BY
T.McVey	T.McVey

DATE 26/04/2024

SCALES 1:1000 (0 10 20)

TITLE
ESTATE LOT LAYOUT PLAN

JOB NUMBER C20057

SHEET SIZE A3

DRAWING NUMBER 20057-Sk6