Pacific Highway Upgrade
FREDERICKTON TO EUNGAI

HYDROLOGICAL MITIGATION REPORT

Design Package	FS000
Zone	00G General
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THIESS FOR ROADS AND MARITIME SERVICES

Pacific Highway Upgrade FREDERICKTON TO EUNGAI

Design Package FS000

Document Title Hydrological Mitigation Report

Document Revisions

Rev	Date	Reason for issue
	Thursday,22 October 2013	DRAFT – ISSUED FOR DISCUSSION
A1	Monday, 19 August	Consultation with RMS
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A3	Friday, 30 August	Draft Approved by RMS for release
A4	Tuesday, 22 October	Final with response to DoP comments added

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Signature			
Date	22.10.2013	22.10.2013	22.10.2013

CONTENTS

TABLES

FIGURES

APPENDICES

1 INTRODUCTION

The NSW Roads and Maritime Services (RMS) are upgrading the Pacific Highway on the Mid North Coast of NSW between Kempsey and Eungai. The Kempsey to Eungai Pacific Highway upgrade project comprises approximately 41 kilometres of dual carriageway road that would bypass the towns of Kempsey and Frederickton. As described in the Kempsey to Eungai Pacific Highway Upgrade Project Staging Report, the project is being delivered in stages with Stage 1 consisting of the 14.5 kilometre bypass of Kempsey and Frederickton, and Stage 2 consisting of the remaining 26 kilometres of dual carriageway between Frederickton and Eungai. Construction of Stage 2 of the Kempsey to Eungai project commenced in September 2013.

Roads and Maritime Services completed an environmental assessment of the Kempsey to Eungai upgrade project (the Project EA) in 2007. The Project EA identified a range of environmental, social and planning issues associated with the construction and operation of the Kempsey to Eungai upgrade and proposed measures to mitigate or manage those potential impacts.

The Project EA was publicly exhibited in August 2007 for a period of 30 days. Following public exhibition, submissions from stakeholders were received and addressed by RMS in the Submissions Report which was lodged with the Director-General in March 2008.

After consideration of the Project EA and Submissions Report, the Minister for Planning approved the Kempsey to Eungai Pacific Highway upgrade under part 75J of the Environmental Planning and Assessment Act 1979 (EP&A Act) on 10 July 2008 subject to the Minister's Conditions of Approval (CoA) being met. These conditions were subsequently modified on 12 March 2010, 26 November 2010 and 10 January 2012.

The approved route for the Frederickton to Eungai section of the Pacific Highway Upgrade is to the west of the existing Pacific Highway between Frederickton and Eungai Rail and passes through the lower Macleay water catchment area. The Collombatti floodplain and Doughboy Swamp are two wetland areas that the road will intersect. The area has a history of flooding which was considered during the detailed Environmental Assessment for the Kempsey to Eungai Pacific Highway upgrade Project.

As a condition of approval consent for the Kempsey to Eungai Project, RMS is required to provide reasonable and feasible flood mitigation measures for all properties where flood impacts are predicted to increase as a result of the Project. Flood mitigation measures along the Frederickton to Eungai section of the Project are minimal and relate to maintaining stock refuge and replacing the emergency stock evacuation route to the North of Collombatti Creek. Negotiations have been undertaken with Landowners to provide livestock safety refuge. This report details how the conditions of approval have been met, through a process of consultation with landowners, Environment Protection Authority (EPA), State Emergency Services (SES) and Kempsey Shire Council, the detailing the agreed compensatory works that are to be put in place.

Planning for movement of stock in flood events has been undertaken with landowners during property acquisition negotiations and specifically addresses Conditions of Approval: 2.2, 2.4, 2.5 (a-d, f-g), 2.6 and Statements of Commitments: C5, HF1, HF2, HF3, HF4, HF5. Stock movement across, under and over the alignment during flood events will be addressed in in the flood emergency evacuation section 3.4 of this report plan including provisions for livestock to be moved from Raymonds Lane to Mill Lane.

The Kempsey Bypass Hydrological Mitigation Report June 2010 provides the reasonable and feasible mitigation measures RMS implemented in consultation with landowners for Stage 1 of the Kempsey to Eungai Project. The flood modelling based on Stage 2 of the project shows no impact to farm infrastructure or residence and minimal impact to livestock movements. This report aims to address the Ministers Conditions of Approval before commencement of construction and will include sections on the hydrological predictions, the movement of livestock during the construction and operation phases of the project and the replacement evacuation route.

1.1 PROJECT APPROVAL

The Kempsey to Eungai Environment Assessment identified that flooding could affect properties through the modification of the value of agricultural land, the ability for stock to find refuge and emergency accesses.

The proposed F2E upgrade crosses a number of ridges in the western half of the Collombatti precinct. These ridges, which extend into flood-prone land, are used by graziers for stock refuge during floods. Individual property owners were consulted during the EA as to their requirements for stock refuge. The proposed alignment was designed to accommodate these requirements, and does not affect the ability of stock to reach high ground during floods, resulting in no mitigations measures required.

Access for stock, including emergency access during flood to agricultural land, was considered in consultation with landholders. Farm access underpasses have been provided at specific locations along the highway to allow stock, machinery and farm vehicles to pass underneath the road. These have been combined with fauna underpasses and waterway crossings in relevant locations. In particular, Raymonds Lane (east) will be closed at the proposed upgrade, which is currently used as a route for stock from the floodplain, especially during floods. To mitigate the access constraint, Access Road A will link Raymonds Lane (east) and Seashore Lane (south) to Mill Lane overbridge, providing access to higher ground.

In addition, individual farm and stock accesses are provided within under the large cross drainage bridges (Collombatti Creek BR003, Collombatti Overflow BR006, Clybucca Creek BR008 and Johnsons CreekBR012), as well as at the Wizzenbucca Creek crossing.

At the northern end of the project, in the Barraganyatti and Eungai Rail precinct, where the alignment traverses undulating terrain, the Environment Assessment did not identify any impacts associated with flooding conditions.

1.2 CONDITIONS OF APPROVAL

This report addresses several of the Conditions of Approval (CoA) and Statements of Commitments (SoC) for the Project associated with hydrological conditions. Table 1-1Table 1-1 Table 1-1 Table 1-1 and Table 1-2Table 1-2 Table 1-2 Table 1-2 details the relevant clauses to comply with and identifies where in this document, the compliance is demonstrated.

Table 1-1 Kempsey to Eungai Project Conditions of Approvals associated with hydrological conditions

Condition of Approval (CoA)	Response reference
2.1 **The Proponent shall subsidise any new or necessary update(s) to the relevant Kempsey Shire Council, Nambucca Shire Council and State Emergency Service plans and documents to reflect changes in flooding levels, flows and characteristics as a result of the project.**	Kempsey Shire Council, Nambucca Shire Council and the State Emergency Services will be provided with the hydrological mitigation report, detailed design drawings of the stock evacuation route and the flood modeling undertaken by WMA Water and Thiess.

Condition of Approval (CoA)	Response reference
2.2 **The Proponent shall undertake further flood modeling during detailed design to ensure that the project is designed and constructed with the aim of not exceeding the afflux and flood-flow velocity performance criteria specified for the Macleay River Floodplain in Section 10 of the Kempsey to Eungai – Upgrading the Pacific Highway: Environmental Assessment and Section 2.2.8 of the Kempsey to Eungai – Upgrading the Pacific Highway: Submissions Report, referred to in condition 1.1 of this approval.**	Flood modeling has been undertaken during detailed design and shows that the aim of not exceeding the afflux and the flood-flow velocity performance criteria has been met. Refer references in Section 2 of this hydrological mitigation report.
2.3 **Should modeling required by condition 2.2 identify changes to drainage patterns along the existing Pacific Highway that are directly attributable to the project, the Proponent shall alter or install drainage structures on the existing Pacific Highway to preserve or maintain current hydrological flow paths and flood regimes upstream of the existing highway.**	Modeling of the proposed detailed design shows no change in any drainage patterns along the existing Pacific Highway. Based on the modeling results the existing Pacific Highway will not require additional drainage structures.
2.4 **The Proponent shall employ a suitably qualified and experienced independent hydrological engineer approved by the Director-General prior to commencement of construction to assist affected property owners in negotiating reasonable and feasible mitigation measures.**	The Director General approved Mr Terry McKeown as the independent hydrological engineer on 22/10/2010 for the duration of the Kempsey to Eungai Project. Mr McKeown is available should any future design refinements affect property owners.
2.5 **Prior to commencement of construction, the Proponent shall submit a hydrological mitigation report to the Department detailing all reasonable and feasible flood mitigation measures for all properties where flood impacts are predicted to increase as a result of the project. The report shall:**	This report details the mitigation measures for Stage 2 of the Kempsey to Eungai Pacific Highway upgrade project. The Stage 1 *Kempsey Hydrological Mitigation Report* was submitted to DoPI June 2010 in accordance with MCoA.
2.5a **identify all properties likely to have an increased flooding impact and detail the predicted increased flooding impact;**	During Stage 1 the properties were identified and the predicted flooding impacts were mitigated through negotiations with property owners. These works have now concluded on Stage 1 and were captured in the *Kempsey Hydrological Mitigation Report*. Flood modeling for Stage 2 of the Project indicates minimal impact on rural properties and cattle movement during flood events.
2.5b **identify the at residence and/or general property protection measures to be employed to mitigate the predicted increases flooding impact;**	During Stage 1 the properties were identified and the predicted flooding impacts were mitigated through negotiations with property owners. These works have now concluded on Stage 1 and were captured in the *Kempsey Hydrological Mitigation Report*. Flood modeling for Stage 2 of the Project indicates minimal impact on rural properties and cattle movement during flood events. During property negotiations some affected landowners were given access to parcels of elevated land to allow stock movements onto higher ground.

Condition of Approval (CoA)	Response reference
2.5c **identify measures to be employed for directly impacted commercial/agricultural properties to assist in the protection or critical farm infrastructure and evacuation of stock during flood events;**	During Stage 1 the properties were identified and the predicted flooding impacts were mitigated through negotiations with property owners. These works have now concluded on Stage 1 and were captured in the *Kempsey Hydrological Mitigation Report*. Flood modeling for Stage 2 of the Project indicates minimal impact on rural properties and cattle movement during flood events. During property negotiations some landowners were given access to parcels of elevated land to allow stock movements onto higher ground. During the construction period landowners will be progressively consulted on stock evacuation routes across/under/over the alignment and given access to evacuate stock as required.
2.5d **identify measures to be implemented to minimize scour and dissipate energy at locations where flood velocities are predicted to increase as a result of the project and cause localised soil erosion and/or pasture damage;**	Section 3.5
2.5e **detail construction methods and landscaping treatments for the Frederickton levee;**	The Frederickton Levee has been constructed and landscaped. These works have now concluded on Stage 1 and were captured in the *Kempsey Hydrological Mitigation Report*.
2.5f **be developed in consultation with the relevant branches of Kempsey Shire Council, DECC, State Emergency Service and directly-affected property owners; and**	Consultation is now in progress with Kempsey Shire Council, Environment Protection Authority and the State Emergency Services. Consultation has been ongoing with property owners and will continue during the construction phase to assist in implementing a seamless flood evacuation plan for livestock.
2.5g **identify operational and maintenance responsibilities for items a) to e) inclusive.** **The Proponent shall not commence construction of the project on or within areas likely to alter flood conditions on the Macleay River floodplain until such time as works identified in the hydrological mitigation report have been completed unless otherwise agreed by the Director-General.**	During Stage 1 the properties were identified and the predicted flooding impacts were mitigated through negotiations with property owners. These works have now concluded on Stage 1 and were captured in the *Kempsey Hydrological Mitigation Report*. Flood modeling for Stage 2 of the Project indicates minimal impact on rural properties and cattle movement during flood events. During property negotiations some landowners were given access to parcels of elevated land to allow stock movements onto higher ground. During the construction period landowners will be progressively consulted on stock evacuation routes across/under/over the alignment, and given access to evacuate stock as required. An emergency flood evacuation plan is being developed by Thiess and consultation is underway with stakeholders on the emergency access route and stock movements during flood events.

Condition of Approval (CoA)	Response reference
2.6 **The Proponent shall prepare a schedule of flood mitigation measures for each directly-affected property in consultation with the property owner. The schedule shall be provided to the relevant property owner(s) no later than two months prior to the implementation of the mitigation works, unless others agreed by the Director-General. A copy of each schedule of flood mitigation measures shall be provided to Council and the Department prior to the implementation / construction of the mitigation measures on the property.**	During Stage 1 the properties were identified and the predicted flooding impacts were mitigated through negotiations with property owners. These works have now concluded on Stage 1 and were captured in the *Kempsey Hydrological Mitigation Report*. Flood modeling for Stage 2 of the Project indicates minimal impact on rural properties and cattle movement during flood events. During property negotiations some landowners were given access to parcels of elevated land to allow stock movements onto higher ground. During the construction period landowners will be progressively consulted on stock evacuation routes across/under/over the alignment and given access to evacuate stock as required. An emergency flood evacuation plan is being developed by Thiess and consultation is underway with stakeholders on the emergency access route and stock movements during flood events. Kempsey Shire Council, Nambucca Shire Council and the State Emergency Services will be provided with the hydrological mitigation report, detailed design drawings of the stock evacuation route and the flood modeling undertaken by WMA Water and Thiess.
2.7 **In the event that the Proponent and the relevant property owner cannot agree on reasonable and feasible flood mitigation measures to be applied to a property within one month of the first consultation on the measures (as required under condition 2.6), either party may refer the matter to the Director-General for resolution.**	All measures for stock evacuation have been determined in consultation with property owners during the property acquisition process

Table 1-2 Kempsey to Eungai Statement of Commitments (Revised) associated with hydrological conditions

Condition of Approval (CoA)	Response reference
C5 **Property owners will be consulted about the implementation of mitigation measures that affect their property and any issues raised will be addressed where reasonable and feasible.**	As per 2.7 above
HF1 **Flood modeling will be undertaken during the detailed design phase to further refine the bridging, drainage structure and flood mitigation requirements for the Macleay River and Collombatti Creek floodplains.**	*Frederickton to Eungai Bypass Impacts – Collombatti Creek March 2012* was completed by WMA Water (Appendix A). WMA Water completed a number of reports for the Kempsey Bypass that showed flood modeling on the Macleay River. These reports have been previously submitted to DoPI to show compliance with this SoC.

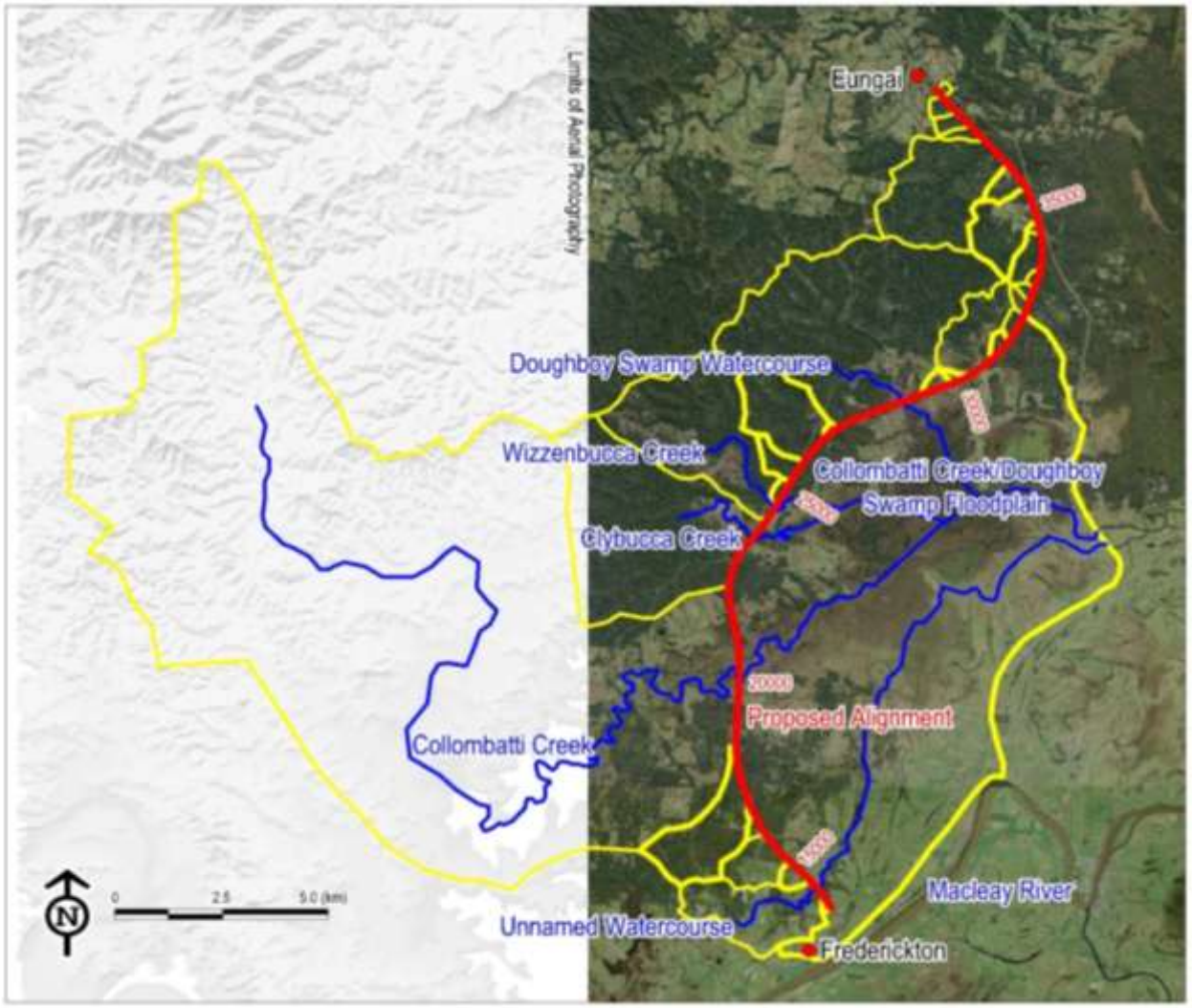
Condition of Approval (CoA)	Response reference
HF2 **Reasonable and feasible, property specific flood mitigation measures (e.g.: ring levees, scour protection, etc.) will be further developed and implemented for properties identified as flood affected by the Proposal (in Section 10.2.2 of the Environmental Assessment) in consultation with affected landholders.**	All measures for stock evacuation have been determined in consultation with property owners during the property acquisition process
HF3 **Where reasonable and feasible, houses identified as flood-affected by the Proposal (in Section 10.2.2 of the Environmental Assessment) will be raised so that the floor level is a minimum of 0.5m higher than the modeled 100 year ARI peak flood level. In consultation with affected landowners, alternative strategies to reduce damage during flooding would be developed and implemented for those premises that cannot be raised by the minimum required.**	During Stage 1 the properties were identified and the predicted flooding impacts were mitigated through negotiations with property owners. These works have now concluded on Stage 1 and were captured in the *Kempsey Hydrological Mitigation Report*. There are no houses identified in the Frederickton to Eungai section of the Kempsey to Eungai Project requiring mitigation.
HF4 **Stock mounds, yards and truck loading facilities will be provided for affected landholders along South West Rocks Road to assist in the refuge and / or evacuation of stock during floods. The location of the facilities will be determined in consultation with the affected landowners.**	South West Rocks Road were part of Stage 1 Kempsey to Eungai Project and the mitigation measures have been put in place in consultation with the landowners.
HF5 **A levee and associated flood control devices will be constructed at Frederickton prior to the commencement of construction of the Proposal on the Macleay River floodplain.**	The Frederickton Levee has been constructed and landscaped. These works have now concluded on Stage 1 and were captured in the *Kempsey Hydrological Mitigation Report*.

2 HYDROLOGY

The majority of the proposed F2E alignment is located along local catchments that drain from west to east into the low lying areas of the Collombatti Creek / Doughboy Swamp floodplain. The floodwaters move from these areas into tributaries of the Macleay River before emerging into the ocean at South West Rocks. Flood studies have predicted the flood conditions across the floodplains, using the detailed design, and show affluxes and flow velocity do not exceed the criteria set in the EA and Submissions Report.

Below shows the extent of the proposed F2E section of the Pacific Highway in relation to key locations and watercourses. The proposed route alignment runs in a north-south orientation between the town of Frederickton on the banks of the Macleay River and Eungai in the north.

Figure 2-1 F2E project extent and location



1. Two flooding mechanisms can affect the Collombatti Creek / Doughboy Swamp floodplain:

- Macleay River flooding: the floodplain can be inundated by rising Macleay River water levels, the inundation levels are controlled by the Macleay River, and the draining of the floodwaters can only occur after the Macleay River water levels have receded. This regional flood mechanism affects the Collombatti Creek / Doughboy Swamp floodplain, and is currently the most constraining flooding mechanism along the lower sections of the proposed F2E Pacific Highway. The Macleay River flooding conditions have been comprehensively studied by WMA Water as part of the Environmental Assessment (EA) and the EA Concept Design.
- Local catchment flooding: the runoff from the local catchments located west of the F2E alignment flows directly into the Collombatti Creek / Doughboy Swamp floodplain at several locations. Whilst the inflows to the floodplain are spatially disconnected, the runoff accumulates in the floodplain, where its vast flat low-lying areas and the downstream gates attenuate the downstream conveyance of flood flows. As a result, water levels in the floodplain slowly rise and create a hydraulic connection between the floodplain inflows. Where the F2E alignment falls within the local catchment's design flood predicted extents, the proposed design is likely to affect local flooding conditions, which effects have been comprehensively studied by Hyder Aurecon Joint Venture (HAJV) as part of the project's detailed design.

2. The studies by WMA Water (2012) and HAJV (2013) utilised a suite of computer based mathematical models to simulate flooding in the areas crossed by the F2E alignment. These models were reviewed and their accuracy in simulating flood flows confirmed. They were utilised to replicate the proposed highway and structures and indicate the impact the road would have on flood behaviour.

2.1 PREDICTIONS

As part of the design, hydrologic and hydraulic modelling has been undertaken at all the watercourses that are crossed by the project works to determine flooding and associated impacts. Two types of hydraulic modelling were applied depending on the influence of floodplains and downstream hydraulic controls:

- 1D steady state HEC-RAS modelling, for all crossings located outside of floodplains connected to Clybucca Creek at Clybucca. The associated watercourses are independent from each other at the crossings and the design flow conditions are controlled by the local channel geometry.
- 2D hydro-dynamic TUFLOW modelling, for the crossings located in the floodplains connected to Clybucca Creek at Clybucca. The local catchments of Collombatti Creek, Clybucca Creek, Wizzenbucca Creek and Doughboy Swamp all converge into a large flood storage area currently enclosed by the Pacific Highway embankment and regulated by flood gates and the water levels in the downstream Macleay River. F2E-00G-RPT-FS000-0001[B2] (HAJV, 2013) and Frederickton to Eungai Bypass Impacts – Collombatti Creek (WMA Water, 2012).

Details of these two hydrological models is presented in Appendix B and provide the details and impacts of the Local catchment and the Macleay River catchment overlaid on the region, together with the impacts where the project has increased local afflux levels.

2.2 PROPERTY SURVEY

An overall initial property survey has been undertaken of the properties within the project including the Macleay River, Collombatti and Doughboy Swamp floodplains together with local catchments. Currently, as determined by the hydraulic modelling, there is no residence affected by flood inundation on these properties and only isolated areas of farm land impacted.

A complete property survey and all impacts is provided in Appendix A

2.3 EFFECTS

The land affected by flooding is a mix of private agricultural lands and State Forests. The proposed design does not generate tangible damage, or compromise any of the property's functionality and usage that would not have otherwise been affected during Macleay River flood events. There is some minor isolated afflux impacts during the critical 100yr peak predicted flood levels but the main impact are not affected by the F2E design even is due to the influence of the Macleay River. There is some other isolated minor impact due to local catchment in the north of the project.

Details of the effected properties and the impacts are provided in Appendix B.

3 MITIGATION MEASURES

3.1 ACCEPTABLE EFFECTS

In the areas influenced by the backwater inundation from Collombatti floodplain and Doughboy Swamp and other Local catchments, the impact on flood conditions and nearby properties are considered minimal, reasonable and compliant where:

- Flood Planning Levels (FPLs) based on the most critical 1% Annual Exceedence Probability (AEP) flood conditions, as defined by the NSW Floodplain Development Manual, are not affected; and where
- The design does not:

  Increase inundation duration along flow path,

  Increase tangible damages,

  Prevent main access and egress to properties, or

Prevent the continuation of all on-going property activities, in properties where access and egress, functionality and property usage would not be fully or partially compromised at the peak of identical hydrologic conditions under existing pre F2E development conditions, during a 1% AEP design flood.

It is accepted that the construction of the highway upgrade will inevitably create afflux from local catchment conditions. For the avoidance of doubt, the resulting local catchment peak flood levels for events up and including the 1% AEP flood, will not exceed the existing controlling regional 100 year ARI Macleay River peak flood level within the area of influence of the afflux.

3.2 CONSULTATION

Consultation has been undertaken of all properties affected outside of the Macleay River impacts. The table below provides the details of these consultations:

Table 3-3 Summary of Consultation

Reference	Owner	Date of Consultation	Type of Consultation
ID 14	TAYLOR D.M. & K.J.	1st October 2013	Face to face meeting
ID 15	ROSSITER, W.J & J.A	3rd October 2013	Face to face meeting
ID 74	NSW FORESTRY	27th September 2013	Correspondence Ref App E
ID75	RMS(Land back to Forestry)	27th September 2013	Correspondence Ref App E
ID 79	STYLES A.J	2nd October 2013	Face to face meeting
ID 80	SCARFID(STYLES)	2nd October 2013	Face to face meeting
ID 81	CROSS C.C & T.M	2nd October 2013	Face to face meeting
ID 82	FERGUSON	22nd October 2013	Correspondence Ref App E
ID 83	RMS(Land back to Forestry)	27th September 2013	Correspondence Ref App E

Reference	Owner	Date of Consultation	Type of Consultation
ID 84	CRANE(NSW Forestry)	27th September 2013	Correspondence Ref App E
Id 85	NSW FORESTRY	27th September 2013	Correspondence Ref App E

Other consultations that have been undertaken:

Reference	Owner	Date of Consultation	Type of Consultation
	KEMPSEY COUNCIL	11th October 2013	Face to face meeting
	STATE EMERGENCY SERVICES	22nd October 2013	Phone call discussion

3.3 DETAILED PROPERTY IMPACTS

The following section contains details of the specific impacts for each flood impacted property. Appendix B depicts the location of the affected properties

3.3.1 PROPERTY (ID14)

Owner Name: K &R Taylor

Lots/DP of affected lots covered on this sheet: DP 713220

Index of affected lots owned: Lot 206

Address/Location: 107 Raymonds Lane Frederickton

Business Type: Rural Residential

Existing House Floor Level: Approx 1m above Ground level

Ground Level: 22m AHD

Flood level: (at the locations of the works)

Event	Boundary Flood Level (m)	Afflux (m)	Critical Storm duration (hr)
100 years • CML103	5.42	0.86	1
Impact Category	MINOR	Rural lands in the lower left corner of land	
100 year Current Road Design	6.9		

Discussions took place on: 1st October2013

Summary of Impact

- No additional Impact above the Environmental Assessment
- Flood Impact effected by the Macleay River flood management
- Culvert sizes equal to EA
    - CML 103 - 1x 1350mm RCP
- Egress via Raymonds Land
- Impact shown on maps is for the 1:100 yr(last storm event Feb 2013 was a 1:13Yr)
- Smaller storms will have a smaller afflux impact

Issues Raised:

- No concern with Flood impacts to property

3.3.2 PROPERTY (ID15)

Owner Name: ROSSITER, W.J & J.A

Lots/DP of affected lots covered on this sheet: DP 713220

Index of affected lots owned: Lot 205

Address/Location: Raymonds Lane Frederickton

Business Type: Rural Residential

Existing House Floor Level: Approx 1m above Ground level

Ground Level: 18m AHD

Flood level: (at the locations of the works)

Event	Boundary Flood Level (m)	Afflux (m)	Critical Storm duration (hr)
100 years • CML103	5.42	0.86	1
Impact Category	MINOR	Rural lands in the lower left corner of land	
100 year Current Road Design	6.9		

Discussions took place on: 3rd Ooctober2013

Summary of Impact

- No additional Impact above the Environmental Assessment
- Flood Impact effected by the Macleay River flood management
- Culvert sizes equal to

o CML 103 - EA 1x 1350mm RCP

- Egress via Raymonds Land
- Impact shown on maps is for the 1:100 yr(last storm event Feb 2013 was a 1:13Yr)

Smaller storms will have a smaller afflux impact Issues Raised:

- No concern with Flood impacts to property

3.3.3 PROPERTY (ID72)

Owner Name: NSW Forestry

Lots/DP of affected lots covered on this sheet: DP 1022011

Index of affected lots owned: Lot 1

Address/Location: NA

Business Type: Forestry

Existing House Floor Level: NA

Ground Level: NA

Flood level: (at the locations of the works)

Event	Boundary Flood Level (m)	Afflux (m)	Critical Storm duration (hr)
100 years • CML 305	9.36	0.76	1
Impact Category	MINOR	Afflux dissipates within Forestry Land and within the 50m exclusion Zone	
100 year Current Road Design	12.235		

Discussions took place on: Correspondence issued 27th September 2013

Response: Refer App E

Summary of Impact

- No additional Impact above the Environmental Assessment
- Flood Impact effected by the local catchment only
- Culvert sizes greater than EA
    - CML0 305 - 1x 2400x2400mm RCBC
- Egress via Forestry Tracks to the west
- Impact shown on maps is for the 1:100 yr(last storm event Feb 2013 was a 1:13Yr)
- Smaller storms will have a smaller afflux impact

Issues Raised:

- Nil issues raised

3.3.4 PROPERTY (ID74)

Owner Name: NSW Forestry

Lots/DP of affected lots covered on this sheet: DP 752403

Index of affected lots owned: Lot 57

Address/Location: NA

Business Type: Forestry

Existing House Floor Level: NA

Ground Level: NA

Flood level: (at the locations of the works)

Event	Boundary Flood Level (m)	Afflux (m)	Critical Storm duration (hr)
100 years • CML305 • CML 306	9.36 13.82	0.76 1.92	1
Impact Category	MINOR	Afflux dissipates within Forestry Land and within the 50m exclusion Zone	
100 year Current Road Design • CML305 • CML 306	12.235 15.600		

Discussions took place on: Correspondence issued 27/9/13

Response: Refer App E

Summary of Impact

- No additional Impact above the Environmental Assessment
- Flood Impact effected by the local catchment only
- Culvert sizes equal to EA
    - CML 306 - 1x 2400x2400mm RCBC
- Egress via Forestry Tracks to the west

- Impact shown on maps is for the 1:100 yr(last storm event Feb 2013 was a 1:13Yr)
- Smaller storms will have a smaller afflux impact

Issues Raised:

- Nil issues raised

3.3.5 PROPERTY (ID75)

Owner Name: NSW Forestry

Lots/DP of affected lots covered on this sheet: DP 1101344

Index of affected lots owned: Lot 11

Address/Location: NA

Business Type: Forestry

Existing House Floor Level: NA

Ground Level: NA

Flood level: (at the locations of the works)

Event	Boundary Flood Level (m)	Afflux (m)	Critical Storm duration (hr)
100 years • CML 310	13.01	1.71	1
Impact Category	MINOR	Afflux dissipates within Forestry Land and within the 50m exclusion Zone	
100 year Current Road Design	19.174		

Discussions took place on: Correspondence issued 27th September 2013

Response: Refer App E

Summary of Impact

- No additional Impact above the Environmental Assessment
- Flood Impact effected by the local catchment only
- Culvert sizes equal to EA
    - CML310 - 1x 2400x2400mm RCBC
- Egress via Forestry Tracks to the west
- Impact shown on maps is for the 1:100 yr(last storm event Feb 2013 was a 1:13Yr)
- Smaller storms will have a smaller afflux impact

Issues Raised:

- Nil issues raised

3.3.6 PROPERTY (ID79)

Owner Name: A J STYLES

Lots/DP of affected lots covered on this sheet: DP 752403

Index of affected lots owned: Lot 29

Address/Location: Nirvana Way

Business Type: Rural Residential

Existing House Floor Level: 1m above Ground Level

Ground Level: 20m AHD

Flood level: (at the locations of the works)

Event	Boundary Flood Level (m)	Afflux (m)	Critical Storm duration (hr)
100 years • CML312	7.86	1.06	3
Impact Category	MINOR	Rural lands in the lower corner of land	
100 year Current Road Design	8.575		

Discussions took place on: 2nd October2013

Summary of Impact

- No additional Impact above the Environmental Assessment
- Flood Impact effected by Local Catchment only
- Culvert sizes greater than EA
    - Cml 312- 2 x 2100mm RCP
- Egress via New Service Rd C connecting Barrgangyatti Hut Rd
- Impact shown on maps is for the 1:100 yr(last storm event Feb 2013 was a 1:13Yr)
- Smaller storms will have a smaller afflux impact

Issues Raised:

Nil issues raised No concern with Flood impacts to property

3.3.7 PROPERTY (ID80)

Owner Name: SCARFIDI(A J STYLES)

Lots/DP of affected lots covered on this sheet: DP 852798

Index of affected lots owned: Lot 32

Address/Location: Nirvana Way

Business Type: Rural Residential

Existing House Floor Level: NA

Ground Level: NA

Flood level: (at the locations of the works)

Event	Boundary Flood Level (m)	Afflux (m)	Critical Storm duration (hr)
100 years • CML312	7.86	1.06	3
Impact Category	MINOR	Rural lands in the lower corner of land	
100 year Current Road Design	8.575		

Discussions took place on: 2nd October2013

Summary of Impact

- No additional Impact above the Environmental Assessment
- Flood Impact effected by Local Catchment only
- Culvert sizes greater than EA
    - CML 312 - 2 x 2100mm RCP
- Egress via New Service Rd C connecting Barrgangyatti Hut Rd
- Impact shown on maps is for the 1:100 yr(last storm event Feb 2013 was a 1:13Yr)
- Smaller storms will have a smaller afflux impact

Issues Raised:

- No concern with Flood impacts to property

3.3.8 PROPERTY (ID81)

Owner Name: CROSS, C.C &T.M

Lots/DP of affected lots covered on this sheet: DP 829401

Index of affected lots: 22

Address/Location: Barrgangyatti Hut Rd

Business Type: Rural Residential

Existing House Floor Level: 1m above Ground Level

Ground Level: 20m AHD

Flood level: (at the locations of the works)

Event	Boundary Flood Level (m)	Afflux (m)	Critical Storm duration (hr)
100 years • CML 313	8.37	1.88	2
Impact Category	MINOR	Rural lands in the upper corner of land	
100 year Current Road Design	10.139		

Discussions took place on: 2nd October 2013

Summary of Impact

- No additional Impact above the Environmental Assessment
- Culvert sizes greater than EA
  - CML 313 - 2 x 1200mm RCP
- Egress via Barrgangyatti Hut Rd
- Impact shown on maps is for the 1:100 yr(last storm event Feb 2013 was a 1:13Yr)
- Smaller storms will have a smaller afflux impact

Issues Raised:

- No concern with Flood impacts to property

3.3.9 PROPERTY (ID82)

Owner Name: FERGUSON

Lots/DP of affected lots covered on this sheet: DP 705912

Index of affected lots: 304

Address/Location: Barrgangyatti Hut Rd

Business Type: Rural Residential

Existing House Floor Level: 1m above Ground Level

Ground Level: 20m AHD

Flood level: (at the locations of the works)

Event	Boundary Flood Level (m)	Afflux (m)	Critical Storm duration (hr)
100 years • CML 313	8.37	1.88	2
Impact Category	MINOR	Rural lands in the upper corner of land	
100 year Current Road Design	10.139		

Discussions took place on: Consultation Declined and letter sent 22nd October 2013

Response: Verbal advise was received no concern with flood impacts

Summary of Impact

- No additional Impact above the Environmental Assessment
- Culvert sizes greater than EA
  - CML 313 - 2 x 1200mm RCP
- Egress via Barrgangyatti Hut Rd
- Impact shown on maps is for the 1:100 yr(last storm event Feb 2013 was a 1:13Yr)
- Smaller storms will have a smaller afflux impact

Issues Raised:

- No concern with Flood impacts to property

3.3.10 PROPERTY (ID84)

Owner Name: NSW Forestry (Crane)

Lots/DP of affected lots covered on this sheet: DP 752403

Index of affected lots owned: Lot 48/68

Address/Location: NA

Business Type: Forestry

Existing House Floor Level: NA

Ground Level: NA

Flood level: (at the locations of the works)

Event	Boundary Flood Level (m)	Afflux (m)	Critical Storm duration (hr)
100 years • CML314 • CML315 • CML316	 6.38 10.41 12.36	 0.29 0.51 0.66	 4 1 1
Impact Category	MINOR	Afflux dissipates within Forestry Land and within the 50m exclusion Zone	
100 year Current Road Design CML 315 CML316	 11.555 15.170		

Discussions took place on: Correspondence issued 27th September 2013

Response: refer App E (Awaiting Response)

Summary of Impact

- No additional Impact above the Environmental Assessment

- Flood Impact effected by the local catchment only
- Culvert sizes equal to EA -
    - CML 314 - 3 x 2400x2400mm RCBC
    - CML315 - 1 x 1200mm RCP
    - CML316 - 1 x 1500mm RCP
- Egress via Forestry Tracks to the west
- Impact shown on maps is for the 1:100 yr(last storm event Feb 2013 was a 1:13Yr)

Smaller storms will have a smaller afflux impact Issues Raised:

Issues Raised:

- Nil issues raised

3.3.11 PROPERTY (ID85)

Owner Name: NSW Forestry

Lots/DP of affected lots covered on this sheet: DP Unknown

Index of affected lots owned: Lot Unknown

Address/Location: NA

Business Type: Forestry

Existing House Floor Level: NA

Ground Level: NA

Flood level: (at the locations of the works)

Event	Boundary Flood Level (m)	Afflux (m)	Critical Storm duration (hr)
100 years • CML314 • CML316	6.38 12.36	0.29 0.66	4 1
Impact Category	MINOR	Afflux dissipates within Forestry Land and within the 50m exclusion Zone	
100 year Current Road Design CML 315 CML316	11.555 15.170		

Discussions took place on: Correspondence issued 27th September 2013

Response: Refer Appendix E

Summary of Impact

- No additional Impact above the Environmental Assessment
- Flood Impact effected by the local catchment only
- Culvert sizes equal to EA -

  - CML 314 - 3 x 2400x2400mm RCBC
  - CML 316 - 1 x 1500mm RCP
- Egress via Forestry Tracks to the west
- Impact shown on maps is for the 1:100 yr.(last storm event Feb 2013 was a 1:13Yr)
- Smaller storms will have a smaller afflux impact

Issues Raised:

- Nil issues raised

3.4 STOCK EVACUATION

Increased flood levels may impact on the safety of stock in the area immediately downstream of the proposed project. During flood times landowners have different strategies depending on the flood extents, Landowners may:

- Evacuate their stock to high ground
- Let their stock to find their own way to high ground
- Move stock to a flood mound

Stock evacuation routes have been investigated both during construction and operations phases of the project.

- During operations (post construction) the following stock routes have been determined
- Dedicated stock refuge area on the eastern side of the Frederickton Interchange.
- Service Road C and Mill Land Bridge
    - Service Rd C is a new access road along the eastern boundary of the project between Raymond Lane and Mill Rd(Raymond Land was a stock route for the movement of cattle and evacuation during flooding and now will be closed at the project boundary)
    - Mill Lane has a new bridge constructed over the project and will provide access to Quarry Rd and the Collombatti Rd refuge area, replacing the route now that Raymonds Lane will be closed.
- Kemps Access
    - Kemps Access has a new bridge constructed over the project and will provide access to Quarry Rd and the Collombatti Rd refuge area.
- Seven Hills Road
    - Access is provided under the alignment (dedicated stock zone under bridge) to allow stock movement during flooding from east to west and the refuge area along Seven Hills Road.
- Private Property Access
    - The Saul and Whalan landowners have been provide with specific infrastructure as part of the compensation for land acquisition to facilitate stock movements
        - Saul (Collomabatti)
            - Flood access under Bridge 3 on Collombatti Creek
            - Flood access route along western side of project to Kemps Access
        - R Whalan(Doughboy Swamp)
            - Cattle underpass at Chainage 24500
            - Access to stock route under Seven Hill Rd Bridge 7

During construction the following stock evacuation protocol have been determined:

- Community updates are provided to all local landowners as construction proceeds and should road closure be required
- Pending flood water is managed by community notification from Kempsey Council and local landowners monitoring seasonal weather patterns.
- Landowner to contact the Thiess Community Manager on the 1800 number on the project web site to arrange for the movement of stock across the project should evacuations be required

This protocol is been developed and advised to all Landowners adjacent to the project as part of the community consultation strategy.

Stock Routes are detailed in Appendix C

3.5 PROTECTION AGAINST INCREASED VELOCITY

The proposed cross drainage structures will introduce flow contractions which will locally increase flow velocities. The design of these structures incorporates appropriate local scour protection and no additional scour protection outside of the property boundary is required.

Consultation with the Environmental Representatives Group (ERG) for the project has discussed the local scour protection across the project and have had the opportunity to contribute to the design on scour protection. EPA, NSW Fisheries, Kempsey Council have all been involved during the project delivery.

The design of scour protection at bridges has been undertaken by HAJV to prevent soil erosion at the bridge piers and abutments for all events up to and including the 2,000 year flood. As part of the exercise, hydraulic modelling was performed which determined how local velocities would increase slightly in the immediate vicinity of the floodplain bridges ie. Upstream and downstream of the bridge openings. Much of the affected land lies in the road corridor owned by RMS. It is intended for these areas to have suitable scour protection to minimise localised soil erosion and/or pasture damage.

HAJV has also designed scour protection for drainage outlet/inlet works at the culvert crossings to minimise localised soil erosion and/or pasture damage and all this is contained within the project boundary and no additional scour protection is required.

3.6 MAINTENANCE

Operational and maintenance responsibility for the works outside the property boundary (private lands) lie with the landowner following sign off that the works are complete as per the scope of works/deed agreement between RMS/Thiess and the landowner. For all the mitigation measures that are contained within the project boundary, RMS is responsible for maintenance. RMS is also responsible for all maintenance of the bridges, culverts and scour provision. Regular maintenance inspection will be undertaken during the operational phase of the project.

4 CONCLUSIONS

Due to the configuration of the farms crossed by the Frederickton to Eungai section of the Kempsey to Eungai project, the evacuation of stock from the floodplain would be carried out by walking stock to high ground. In most cases, higher ground is available within the properties, and access has been provided as a project requirement.

A summary of the flood mitigation elements provided as part of the F2E project is provided in the following

Table 4-4 Summary of F2E flood mitigations

Reference	Mitigation
Mill Lane	Mill Lane is an over bridge providing connectivity between access road A and Quarry Road for local traffic and can be used during flood events as an evacuation route. It runs east to west over the highway corridor and has been fitted with translucent throw screen to prevent 'spooking' of cattle. Temporary road diversions will be in place during construction to facilitate the movement of cattle during a flood event. An emergency evacuation plan will be developed in consultation with landowners
Kemps Access	Kemps Access is an over bridge identified in the EA as the primary stock emergency evacuation route. It runs east to west over the highway corridor and maintains connectivity for cattle to pass from the floodplain on the east to the higher ground on the west.
Clybucca Creek Bridge	A bridge identified in the EA that allows cattle to move from eastern side of the alignment to the western side and away from rising flood waters.
R. Whalen Access	Principle farm access identified in the EA that allows cattle to move from eastern side of the alignment to the western side farm access. In addition to the EA commitments RMS are providing cattle yards to assist with movement of cattle in flood events.
'Johnsons Creek' Bridge	A bridge identified in the EA that allows cattle to move from eastern side of the alignment to the western side and away from rising flood waters.
Campbell/Saul property	RMS provided a flood evacuation route through negotiations with landowner in lieu of the farm access identified in the EA. Landowner requested flood access between properties to allow cattle a natural escape route during flood events.
Cattle Movement	Cattle movement will be undertaken during construction in consultation with the landowner to allow stock to cross the construction works in time of flooding.

The project affluxes are deemed minimal and are not impacting nearby properties for the Frederickton to Eungai section of the overall Kempsey to Eungai Project. The F2E design is considered to be satisfactory and complies with the project's hydraulic impact requirements and no additional flood mitigation elements are required.

5 REFERENCES

- Hyder Aurecon Joint Venture, Frederickton to Eungai Flood Study, 2013
- NSW Department of Planning, Kempsey to Eungai – Approval by the NSW Minister of Planning Roads and Traffic Authority, July 2008
- NSW Government, Floodplain Development Manual April 2005
- Parsons Brinckerhoff, Kempsey to Eungai – Environmental Assessment Roads and Traffic Authority, July 2007.
- RTA, Kempsey to Eungai – Upgrading the Pacific Highway, Submissions Report, Appendix C Revised Statement of Commitments Roads and Traffic Authority, 6 Feb 2008
- WMAWater, Kempsey to Eungai – Upgrading the Pacific Highway, Project Application Report – Supporting Information, Flood Investigations Roads and Traffic Authority, July 2006.
- WMAWater, Kempsey to Eungai – Upgrading the Pacific Highway, Environmental Assessment Roads and Traffic Authority, May 2007.
- WMAWater, Kempsey Bypass –Flood Impact Assessment Kempsey Bypass Alliance, 2010
- WMAWater, Frederickton to Eungai Bypass Impacts – Collombatti Creek, 201

APPENDIX A

FREDERICKTON TO EUNGAI BYPASS IMPACTS – OVERALL PROJECT FLOOD IMPACT 100 YEARS ARI

Impacted Landowners Flood Mitigation Report

Date: 17/10/2013 16:40 Rev 11

SORT: All

Owner ID	Upstream/ downstream	Owner	DP No.	Lot No.	Ownership	Ownership/ Current Land Use	Existing House in floodplain	Existing 100yr ARI FL (local catchment) at u/s boundary of the works (m AHD)	Proposed 100yr ARI FL (local catchment) at u/s boundary of the works (m AHD)	Afflux at RMS Boundary (m)	Design storm duration (hours)	Main drainage structure ID	Included in 100 Year ARI Macleay River flood extents	Drainage works	Crossing capacity greater than Reference Design	Mitigation works	Notes	Consultation
1	Up	THE PROPRIETORS	853082	2				2.22	2.39	0.17	12	CML101	Y	Culvert CML101 (5 x 1650mm diameter RCPs) Culvert CML102 (2400W x 2400H RCBC), including fauna crossing	Y		FS000	
2	Up	- MACLEAY RIVER PROTEIN -TOLSAT PTY LTD	717943 703187	1713 - 1714 1711				2.22	2.39	0.17	12	CML101	Y	Culvert CML101 (5 x 1650mm diameter RCPs) Culvert CML102 (2400W x 2400H RCBC), including fauna crossing	Y		FS000	
3	Up	EST F A & AB HUGHES	752437	16				2.22	2.39	0.17	12	CML101	Y	Culvert CML101 (5 x 1650mm diameter RCPs) Culvert CML102 (2400W x 2400H RCBC), including fauna crossing	Y		FS000	
4	Up	REFEJU PTY LTD	630462	132				2.22	2.39	0.17	12	CML101	Y	Culvert CML101 (5 x 1650mm diameter RCPs) Culvert CML102 (2400W x 2400H RCBC), including fauna crossing	Y		FS000	
5	Up	WALSH	657660	4				2.22	2.39	0.17	12	CML101	Y	Culvert CML101 (5 x 1650mm diameter RCPs) Culvert CML102 (2400W x 2400H RCBC), including fauna crossing	Y		FS000	
5	Up	WALSH	724136	1				2.22	2.39	0.17	12	CML101	Y	Culvert CML101 (5 x 1650mm diameter RCPs) Culvert CML102 (2400W x 2400H RCBC), including fauna crossing	Y		FS000	
5	Up	WALSH	657660, 1076052, 724136	4, 1, 35				2.22	2.39	0.17	12	CML101	Y	Culvert CML101 (5 x 1650mm diameter RCPs) Culvert CML102 (2400W x 2400H RCBC), including fauna crossing	Y		FS000	
6	Up	RAMKE, S.L	752437	214-223				2.22	2.39	0.17	12	CML101	Y	Culvert CML101 (5 x 1650mm diameter RCPs) Culvert CML102 (2400W x 2400H RCBC), including fauna crossing	Y		FS000	

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Owner ID	Upstream/ downstream	Owner	DP No.	Lot No.	Ownership	Ownership/ Current Land Use	Existing House in floodplain	Existing 100yr ARI FL (local catchment) at u/s boundary of the works (m AHD)	Proposed 100yr ARI FL (local catchment) at u/s boundary of the works (m AHD)	Afflux at RMS Boundary (m)	Design storm duration (hours)	Main drainage structure ID	Included in 100 Year ARI Macleay River flood extents	Drainage works	Crossing capacity greater than Reference Design	Mitigation works	Notes	Consultation
8	Up	TURLEY, HEFFERNAN	857721	1				2.22	2.39	0.17	12	CML101	Y	Culvert CML101 (5 x 1650mm diameter RCPs) Culvert CML102 (2400W x 2400H RCBC), including fauna crossing	Y		FS000	
7	Up	ROOTS, G.N	752437	227-229				2.22	2.39	0.17	12	CML101	Y	Culvert CML101 (5 x 1650mm di	Y		FS000	
13	Up	RMS "Ramke" "The Proprietors" (old)	752437 96738	30,33 7009	RMS	Agriculture	No	2.22	2.39	0.17	12	CML101	Y	Culvert CML101 (5 x 1650mm diameter RCPs) Culvert CML102 (2400W x 2400H RCBC), including fauna crossing	Y		FS000	
17	Up	RAMKE, S.L	752437	38	Private	Rural residential	No	3.45	4.29	0.84	3	CML104	Y	Culvert CML104 (3 x 1500mm diameter RCPs)	Y	Access Road A, Mill Lane Bridge and Quarry Road: east to west access to and fron Raymonds Lane and Seashore Lane allowing cattle crossing in and out of floodplain, with improved Quarry Road flood immunity	DC001	
19	Up	FLANIGAN	855351	4				2.65	3.51	0.86	4	CML107	Y	Culvert CML107 (3 x 2700W x 2700H RCBCs) including fauna access	Y		DC001	
20	Up	RMS "Ramke" (old)	752437	45	RMS	Rural residential	No	2.65	3.51	0.86	4	CML107	Y	Culvert CML107 (3 x 2700W x 2700H RCBCs) including fauna access	Y		DC001	
21	Up	RAMKE, S.L	752437	51-52						0.00			y				Downstream of highway - NO HYDRAULIC IMPACT	
22	Up	LESTER	631274	3				2.70	2.86	0.16	> 24	BR003 BR004 BR006	Y	BR003 Collombatti Creek bridge BR004 Seven Oaks Drain Bridge BR006 Collambatti floodplain bridge	Y	East to west farm access under highway allowing crossing in and out of floodplain	Refer Frederickton to Eungai Bypass Impacts - Collombatti Creek (WMAWater, 2012)	

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SORT: All

Owner ID	Upstream/ downstream	Owner	DP No.	Lot No.	Ownership	Ownership/ Current Land Use	Existing House in floodplain	Existing 100yr ARI FL (local catchment) at u/s boundary of the works (m AHD)	Proposed 100yr ARI FL (local catchment) at u/s boundary of the works (m AHD)	Afflux at RMS Boundary (m)	Design storm duration (hours)	Main drainage structure ID	Included in 100 Year ARI Macleay River flood extents	Drainage works	Crossing capacity greater than Reference Design	Mitigation works	Notes	Consultation
23	Up	COOPER	631274	4				2.70	2.86	0.16	> 24	BR003 BR004 BR006	Y	BR003 Collombatti Creek bridge BR004 Seven Oaks Drain Bridge BR006 Collambatti floodplain bridge	Y	East to west farm access under highway allowing crossing in and out of floodplain	Refer Frederickton to Eungai Bypass Impacts - Collombatti Creek (WMAWater, 2012)	
24	Up	MENZ	752437	54				2.70	2.86	0.16	> 24	BR003 BR004 BR006	Y	BR003 Collombatti Creek bridge BR004 Seven Oaks Drain Bridge BR006 Collambatti floodplain bridge	Y	East to west farm access under highway allowing crossing in and out of floodplain	Refer Frederickton to Eungai Bypass Impacts - Collombatti Creek (WMAWater, 2012)	
25	Up	HAWKEN	702418	3				2.70	2.86	0.16	> 24	BR003 BR004 BR006	Y	BR003 Collombatti Creek bridge BR004 Seven Oaks Drain Bridge BR006 Collambatti floodplain bridge	Y	East to west farm access under highway allowing crossing in and out of floodplain	Refer Frederickton to Eungai Bypass Impacts - Collombatti Creek (WMAWater, 2012)	
26	Up	MUXLOW	1040040	1032				2.70	2.86	0.16	> 24	BR003 BR004 BR006	Y	BR003 Collombatti Creek bridge BR004 Seven Oaks Drain Bridge BR006 Collambatti floodplain bridge	Y	East to west farm access under highway allowing crossing in and out of floodplain	Refer Frederickton to Eungai Bypass Impacts - Collombatti Creek (WMAWater, 2012)	
27	Up	THE PROPRIETORS	308270	B				2.70	2.86	0.16	> 24	BR003 BR004 BR006	Y	BR003 Collombatti Creek bridge BR004 Seven Oaks Drain Bridge BR006 Collambatti floodplain bridge	Y	East to west farm access under highway allowing crossing in and out of floodplain	Refer Frederickton to Eungai Bypass Impacts - Collombatti Creek (WMAWater, 2012)	

Impacted Landowners Flood Mitigation Report

Date: 17/10/2013 16:40 Rev 11

SORT: All

Owner ID	Upstream/ downstream	Owner	DP No.	Lot No.	Ownership	Ownership/ Current Land Use	Existing House in floodplain	Existing 100yr ARI FL (local catchment) at u/s boundary of the works (m AHD)	Proposed 100yr ARI FL (local catchment) at u/s boundary of the works (m AHD)	Afflux at RMS Boundary (m)	Design storm duration (hours)	Main drainage structure ID	Included in 100 Year ARI Macleay River flood extents	Drainage works	Crossing capacity greater than Reference Design	Mitigation works	Notes	Consultation
28	Up	SAUL, G.G & R.C "Ramke" (old)	752437	104, 105, 178, 179, 181	Private	Agriculture	No	2.70	2.86	0.16	> 24	BR003 BR004 BR006	Y	BR003 Collombatti Creek bridge BR004 Seven Oaks Drain Bridge BR006 Collambatti floodplain bridge	Y	East to west farm access under highway at two locations (Bridges BR003 and BR006) allowing crossing in and out of floodplain	Refer Frederickton to Eungai Bypass Impacts - Collombatti Creek (WMAWater, 2012)	
31	Up	BARGH	1040040	1031				2.70	2.86	0.16	> 24	BR003 BR004 BR006	Y	BR003 Collombatti Creek bridge BR004 Seven Oaks Drain Bridge BR006 Collambatti floodplain bridge	Y	East to west farm access under highway at two locations (Bridges BR003 and BR006) allowing crossing in and out of floodplain	Refer Frederickton to Eungai Bypass Impacts - Collombatti Creek (WMAWater, 2012)	
33	Up	UNKNOWN	21463	1				2.70	2.86	0.16	> 24	BR003 BR004 BR006	Y	BR003 Collombatti Creek bridge BR004 Seven Oaks Drain Bridge BR006 Collambatti floodplain bridge	Y	East to west farm access under highway at two locations (Bridges BR003 and BR006) allowing crossing in and out of floodplain	Refer Frederickton to Eungai Bypass Impacts - Collombatti Creek (WMAWater, 2012)	
34	Up	SAUL	717797	21/22				2.70	2.86	0.16	> 24	BR003 BR004 BR006	Y	BR003 Collombatti Creek bridge BR004 Seven Oaks Drain Bridge BR006 Collambatti floodplain bridge	Y	East to west farm access under highway at two locations (Bridges BR003 and BR006) allowing crossing in and out of floodplain	Refer Frederickton to Eungai Bypass Impacts - Collombatti Creek (WMAWater, 2012)	
35	Up	BRIE	809123	7						0.00			Y				**Impact within the Macleay River Flood Plain. No additional Impacts**	

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Impacted Landowners Flood Mitigation Report

Date: 17/10/2013 16:40 Rev 11

SORT: All

Owner ID	Upstream/ downstream	Owner	DP No.	Lot No.	Ownership	Ownership/ Current Land Use	Existing House in floodplain	Existing 100yr ARI FL (local catchment) at u/s boundary of the works (m AHD)	Proposed 100yr ARI FL (local catchment) at u/s boundary of the works (m AHD)	Afflux at RMS Boundary (m)	Design storm duration (hours)	Main drainage structure ID	Included in 100 Year ARI Macleay River flood extents	Drainage works	Crossing capacity greater than Reference Design	Mitigation works	Notes	Consultation
36	Up	UNKNOWN	21463	3				2.70	2.86	0.16	> 24	BR003 BR004 BR006	Y	BR003 Collombatti Creek bridge BR004 Seven Oaks Drain Bridge BR006 Collambatti floodplain bridge	Y	East to west farm access under highway at two locations (Bridges BR003 and BR006) allowing crossing in and out of floodplain	Refer Frederickton to Eungai Bypass Impacts - Collombatti Creek (WMAWater, 2012)	
37	Up	owner not identified	21463	4				2.70	2.86	0.16	> 24	BR003 BR004 BR006	Y	BR003 Collombatti Creek bridge BR004 Seven Oaks Drain Bridge BR006 Collambatti floodplain bridge	Y	East to west farm access under highway at two locations (Bridges BR003 and BR006) allowing crossing in and out of floodplain	Refer Frederickton to Eungai Bypass Impacts - Collombatti Creek (WMAWater, 2012)	
40	Up	THE PROPRIETORS	364311	1				2.59	3.05	0.46	12	BR008	Y	BR008 Clybucca Creek Bridge	=	East to west farm access under highway at two locations (Bridge BR008 and culvert CML203a) allowing crossing in and out of floodplain	FS000	
41	Up	ARTC Name not on GIS	172701	1				2.59	3.05	0.46	12	BR008	Y	BR008 Clybucca Creek Bridge	=	East to west farm access under highway at two locations (Bridge BR008 and culvert CML203a) allowing crossing in and out of floodplain	FS000	
45	Up	THE PROPRIETORS	841050	92				2.59	3.05	0.46	12	BR008	Y	BR008 Clybucca Creek Bridge	=	East to west farm access under highway at two locations (Bridge BR008 and culvert CML203a) allowing crossing in and out of floodplain	FS000	
46	Up	DANDARAGA ENTERPRISE PTY LTD	841050	91				2.59	3.05	0.46	12	BR008	Y	BR008 Clybucca Creek Bridge	=	East to west farm access under highway at two locations (Bridge BR008 and culvert CML203a) allowing crossing in and out of floodplain	FS000	

Impacted Landowners Flood Mitigation Report

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SORT: All

Owner ID	Upstream/ downstream	Owner	DP No.	Lot No.	Ownership	Ownership/ Current Land Use	Existing House in floodplain	Existing 100yr ARI FL (local catchment) at u/s boundary of the works (m AHD)	Proposed 100yr ARI FL (local catchment) at u/s boundary of the works (m AHD)	Afflux at RMS Boundary (m)	Design storm duration (hours)	Main drainage structure ID	Included in 100 Year ARI Macleay River flood extents	Drainage works	Crossing capacity greater than Reference Design	Mitigation works	Notes	Consultation
47	Up	THE PROPRIETORS	188975	1				3.34	4.25	0.91	9	CML203 / CML204	Y	Culvert CML203 (5 x 1800mm diameter RCPs) Culvert CML204 (4 x 1800mm diameter RCPs)	Y	East to west farm access under highway at two locations (Bridge BR008 and culvert CML203a) allowing crossing in and out of floodplain	FS000	
50	Up	THE PROPRIETORS	657555	1				2.92 3.10 3.10	3.76 3.23 3.23	0.85 0.15 0.15	2	CML206 CML207 CML208	Y	Culvert CML206 (1 x 1800mm diameter RCP) Culvert CML207 (1 x 2700 x 2400mm RCBC) Culcvert CML208 (3 x 2700 x 900mm RCBC)	Y	East to west farm access under highway at two locations (Bridge BR008 and culvert CML203a) allowing crossing in and out of floodplain	FS000	
51	Up	KELLY, COLLINS, COLLINS	752428	22, 32, 37				3.10 3.10	3.23 3.23	0.15 0.15	2	CML207 CML208	Y	Culvert CML207 (1 x 2700 x 2400mm RCBC) Culcvert CML208 (3 x 2700 x 900mm RCBC)	Y	East to west farm access under highway at two locations (Bridge BR008 and culvert CML203a) allowing crossing in and out of floodplain	FS000	
52	Up	RMS	(LAND BACK TO FORESTRY)					3.10 3.10	3.23 3.23	0.15 0.15	2	CML207 CML208	Y	Culvert CML207 (1 x 2700 x 2400mm RCBC) Culcvert CML208 (3 x 2700 x 900mm RCBC)	Y	East to west farm access under highway at two locations (Bridge BR008 and culvert CML203a) allowing crossing in and out of floodplain	FS000	
60	Up	WATTS, D.J	789638	403	Private	Rural residential	No	2.18	2.29	0.11	18	BR012	Y	BR012 Johnsons Creek Bridge; Proposed bridge has span longer than the reference design	Y	East to west farm access under highway (Bridge BR012) allowing crossing in and out of floodplain	FS000	
61	Up	ROLICO PTY LTD	789638	402				2.18	2.29	0.11	18	BR012	Y	BR012 Johnsons Creek Bridge; Proposed bridge has span longer than the reference design	Y	East to west farm access under highway (Bridge BR012) allowing crossing in and out of floodplain	FS000	
62	Up	MACINTYRE, I.G & DANIAL G	789638	401				2.18	2.29	0.11	18	BR012	Y	BR012 Johnsons Creek Bridge; Proposed bridge has span longer than the reference design	Y	East to west farm access under highway (Bridge BR012) allowing crossing in and out of floodplain	FS000	
63	Up	RMS return to forestry	546108	3				2.18	2.29	0.11	18	BR012	Y	BR012 Johnsons Creek Bridge; Proposed bridge has span longer than the reference design	Y	East to west farm access under highway (Bridge BR012) allowing crossing in and out of floodplain	FS000	

Impacted Landowners Flood Mitigation Report

Date: 17/10/2013 16:40 Rev 11

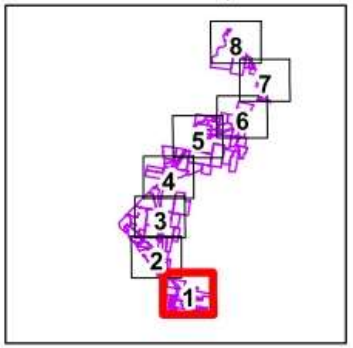
SORT: All

Owner ID	Upstream/ downstream	Owner	DP No.	Lot No.	Ownership	Ownership/ Current Land Use	Existing House in floodplain	Existing 100yr ARI FL (local catchment) at u/s boundary of the works (m AHD)	Proposed 100yr ARI FL (local catchment) at u/s boundary of the works (m AHD)	Afflux at RMS Boundary (m)	Design storm duration (hours)	Main drainage structure ID	Included in 100 Year ARI Macleay River flood extents	Drainage works	Crossing capacity greater than Reference Design	Mitigation works	Notes	Consultation
64	Up	KEITH L & EDWARDS, I.P	752428	39				2.18	2.29	0.11	18	BR012	Y	BR012 Johnsons Creek Bridge; Proposed bridge has span longer than the reference design	Y	East to west farm access under highway (Bridge BR012) allowing crossing in and out of floodplain	FS000	
65	Up	KELLY, COLLINS, COLLINS	752428	41				2.18	2.29	0.11	18	BR012	Y	BR012 Johnsons Creek Bridge; Proposed bridge has span longer than the reference design	Y	East to west farm access under highway (Bridge BR012) allowing crossing in and out of floodplain	FS000	
66	Up	BLOOMFIELD, A.R, K.J & P	752428	43				2.18	2.29	0.11	18	BR012	Y	BR012 Johnsons Creek Bridge; Proposed bridge has span longer than the reference design	Y	East to west farm access under highway (Bridge BR012) allowing crossing in and out of floodplain	FS000	
67	Up	BLOOMFIELD, A.R, K.J & P	752428	43				3.5	4.08	0.58	1	CML302	y	Culvert CML302 (2 x 825mm diameter RCP)	Y		DC003	
67	Up	MALCOLM EDWARD WRIGHT	774189	42				2.55	3.28	0.73	3	CML303	Y	Culvert CML303 (4 x 1500mm diameter RCP)	Y		FS000	
67	Up	MALCOLM EDWARD WRIGHT	774189	42				2.18	2.29	0.11	18	BR012	Y	BR012 Johnsons Creek Bridge; Proposed bridge has span longer than the reference design	Y	East to west farm access under highway (Bridge BR012) allowing crossing in and out of floodplain	FS000	
69	Up	MURPHY	774189	43				2.18	2.29	0.11	18	BR012	Y	BR012 Johnsons Creek Bridge; Proposed bridge has span longer than the reference design	Y	East to west farm access under highway (Bridge BR012) allowing crossing in and out of floodplain	FS000	
70	Up	DUFFY, DUFFY	787879	1862				2.55	3.28	0.73	3	CML303	Y	Culvert CML303 (4 x 1500mm diameter RCP)	Y		FS000	
71	Up	ROBSON, ROBSON	787879	1861				2.55	3.28	0.73	3	CML303	Y	Culvert CML303 (4 x 1500mm diameter RCP)	Y		FS000	

Land Impact Flood Extent Map

Legend

- Properties *Properties*
- Site Boundary
- Adjacent RMS Land
- RMS Owned Land for Habitat
- Land Proposed to Transfer to Forestry
- 100yr ARI Local Catchment Flood Extents – Existing
- 100yr ARI Regional Macleay River Flood Extents – Existing and Proposed
- 100yr ARI Local Catchment Flood Extents – Proposed



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Revision 1

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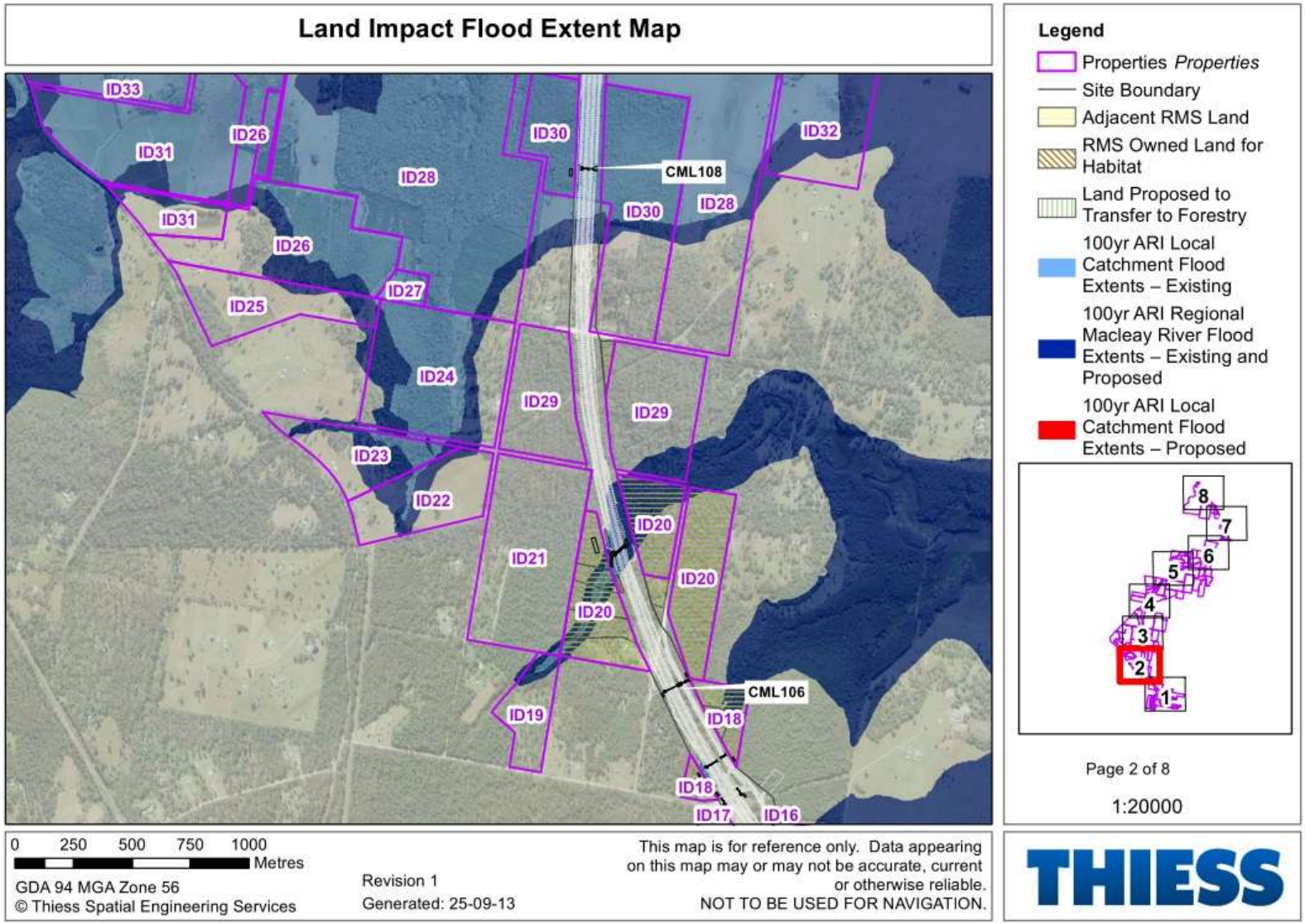
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Site Boundary
Adjacent RMS Land
RMS Owned Land for Habitat
Land Proposed to Transfer to Forestry
100yr ARI Local Catchment Flood Extents – Existing
100yr ARI Regional Macleay River Flood Extents – Existing and Proposed
100yr ARI Local Catchment Flood Extents – Proposed
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Page 2 of 8
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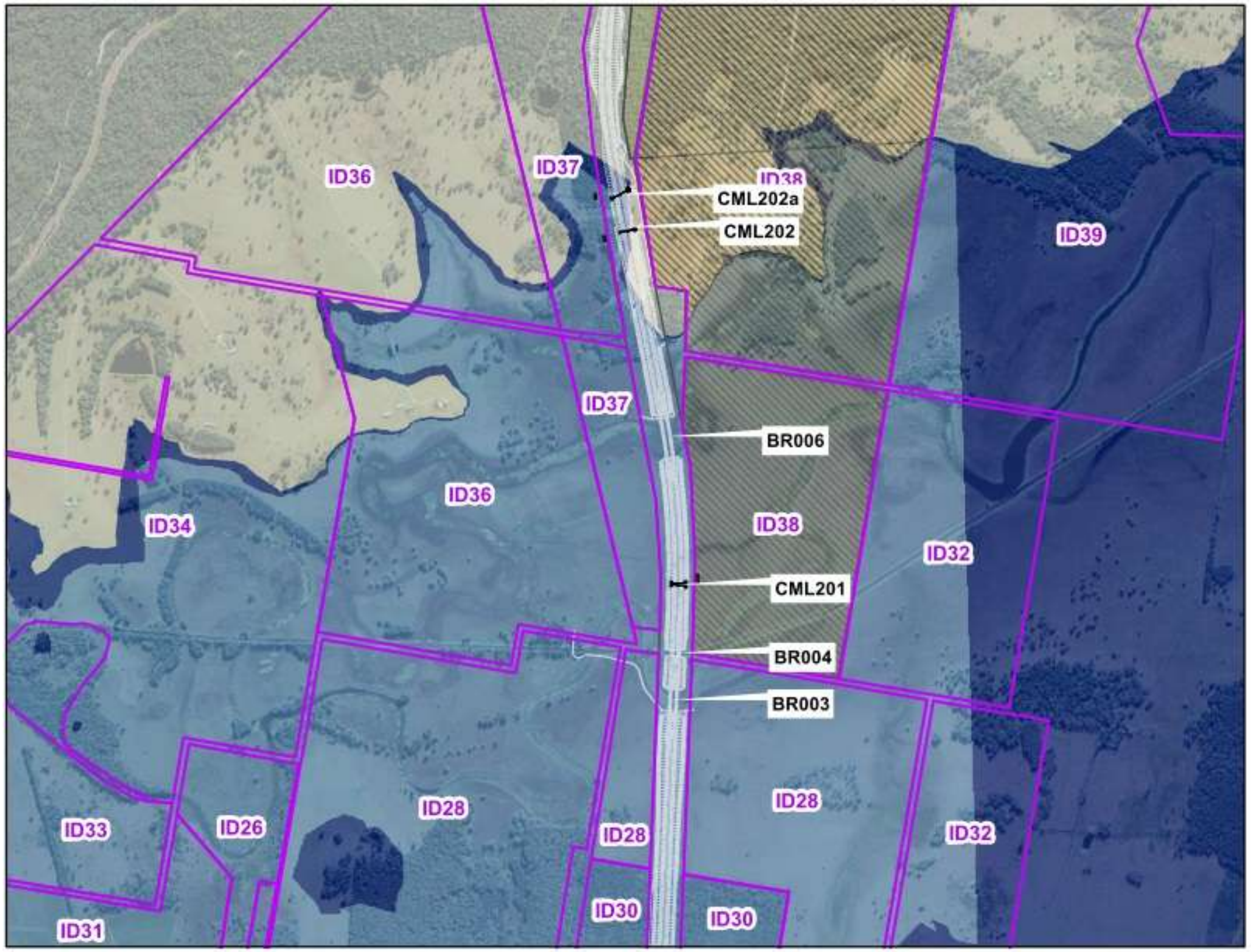
Land Impact Flood Extent Map



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- Properties *Properties*
- Site Boundary
- Adjacent RMS Land
- RMS Owned Land for Habitat
- Land Proposed to Transfer to Forestry
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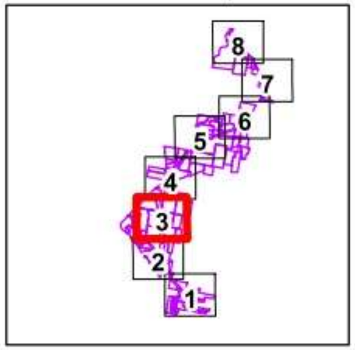
- 100yr ARI Regional Macleay River Flood Extents – Existing and Proposed
- 100yr ARI Local Catchment Flood Extents – Proposed



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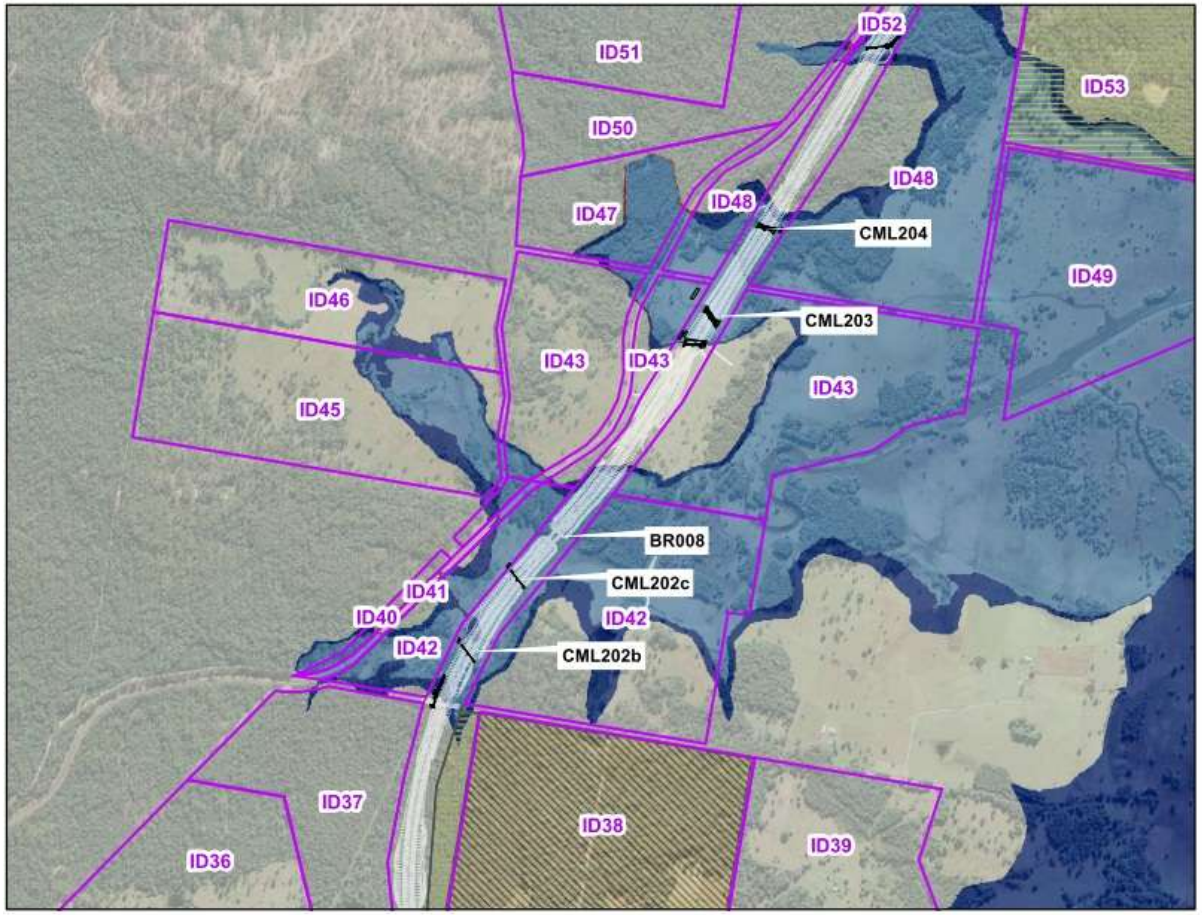

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- Adjacent RMS Land
- RMS Owned Land for Habitat
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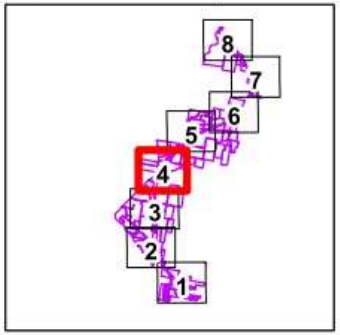

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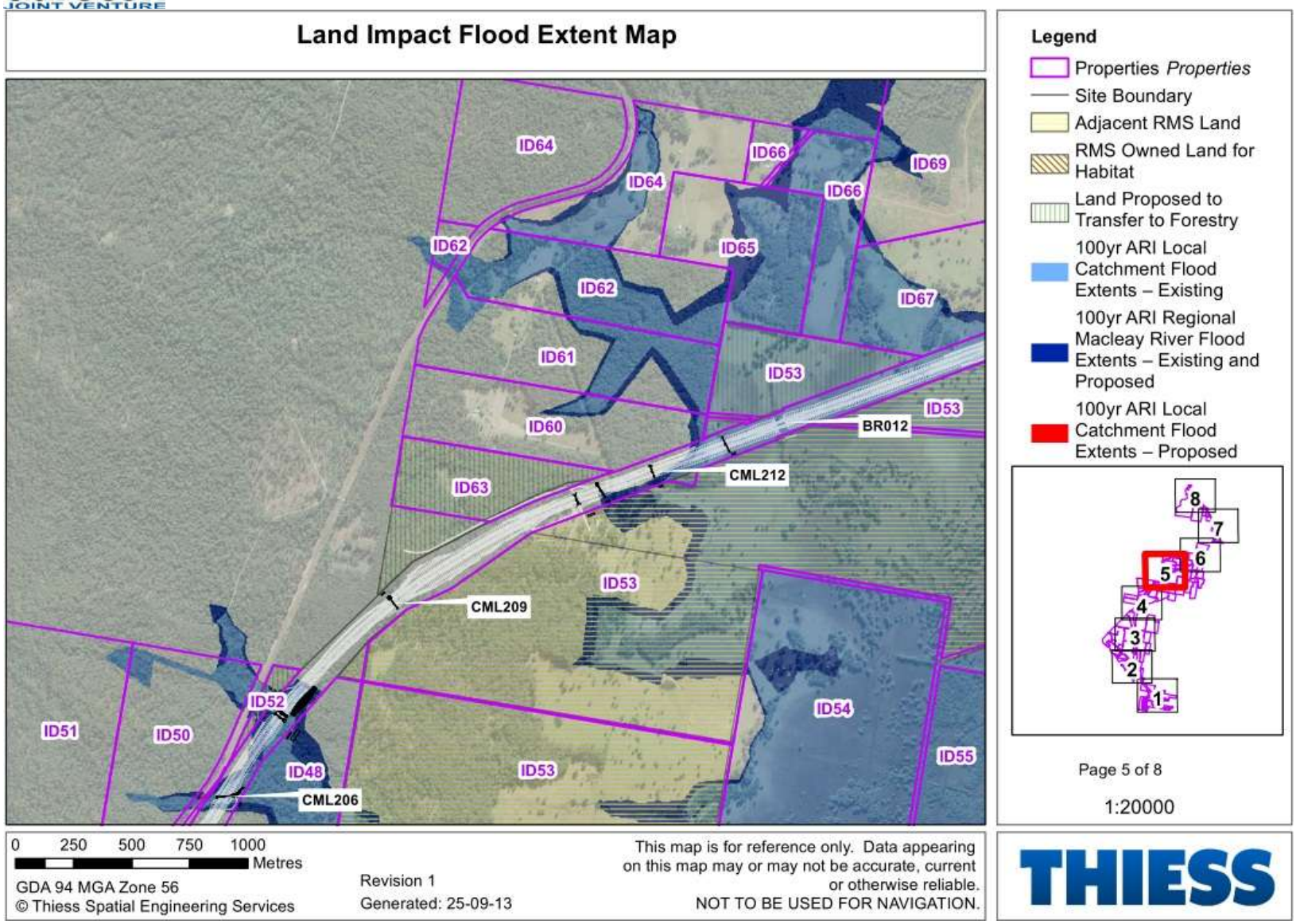
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CML209
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CML206
Legend
Properties Properties
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RMS Owned Land for Habitat
Land Proposed to Transfer to Forestry
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100yr ARI Regional Macleay River Flood Extents – Existing and Proposed
100yr ARI Local Catchment Flood Extents – Proposed
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Page 5 of 8
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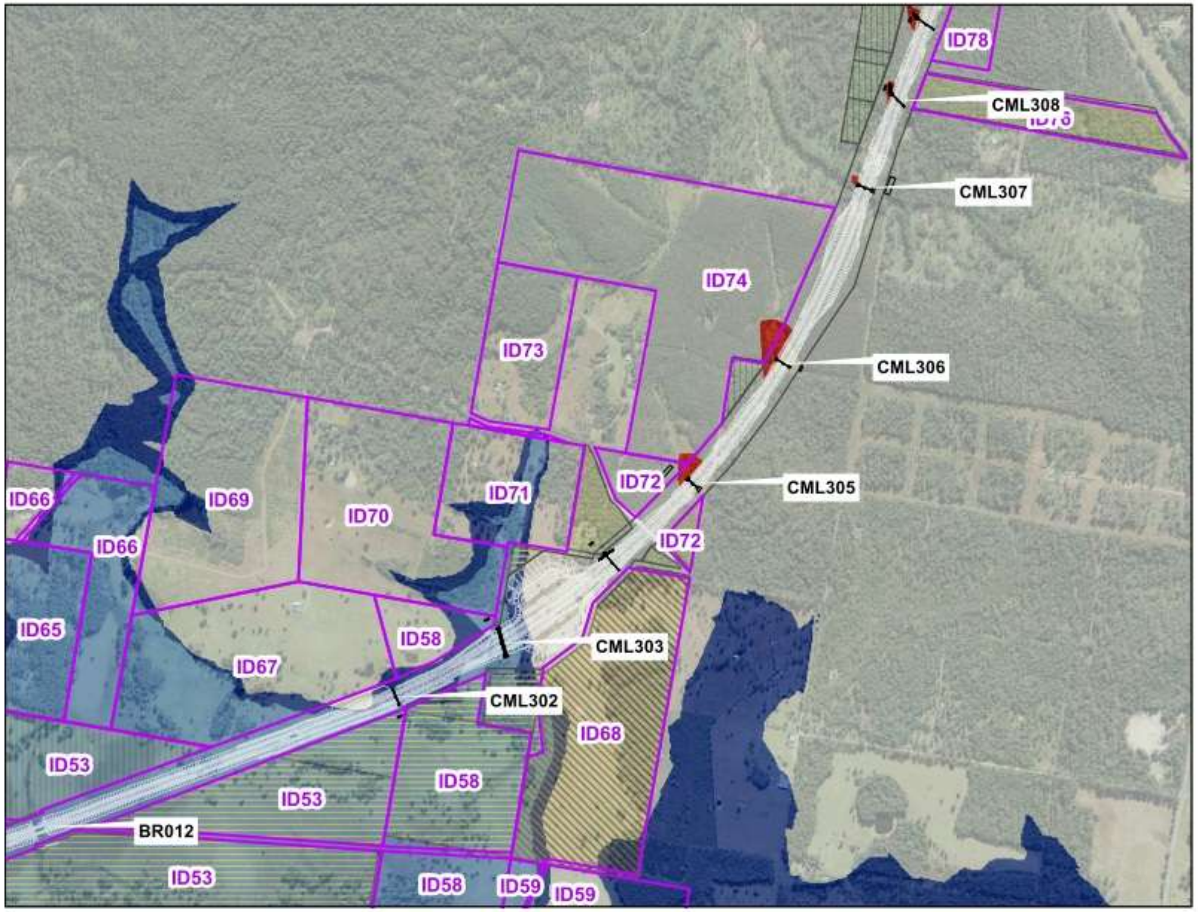

Legend

- Properties *Properties*
- Site Boundary
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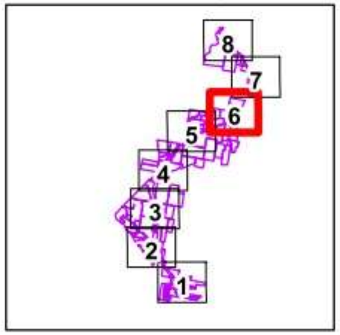

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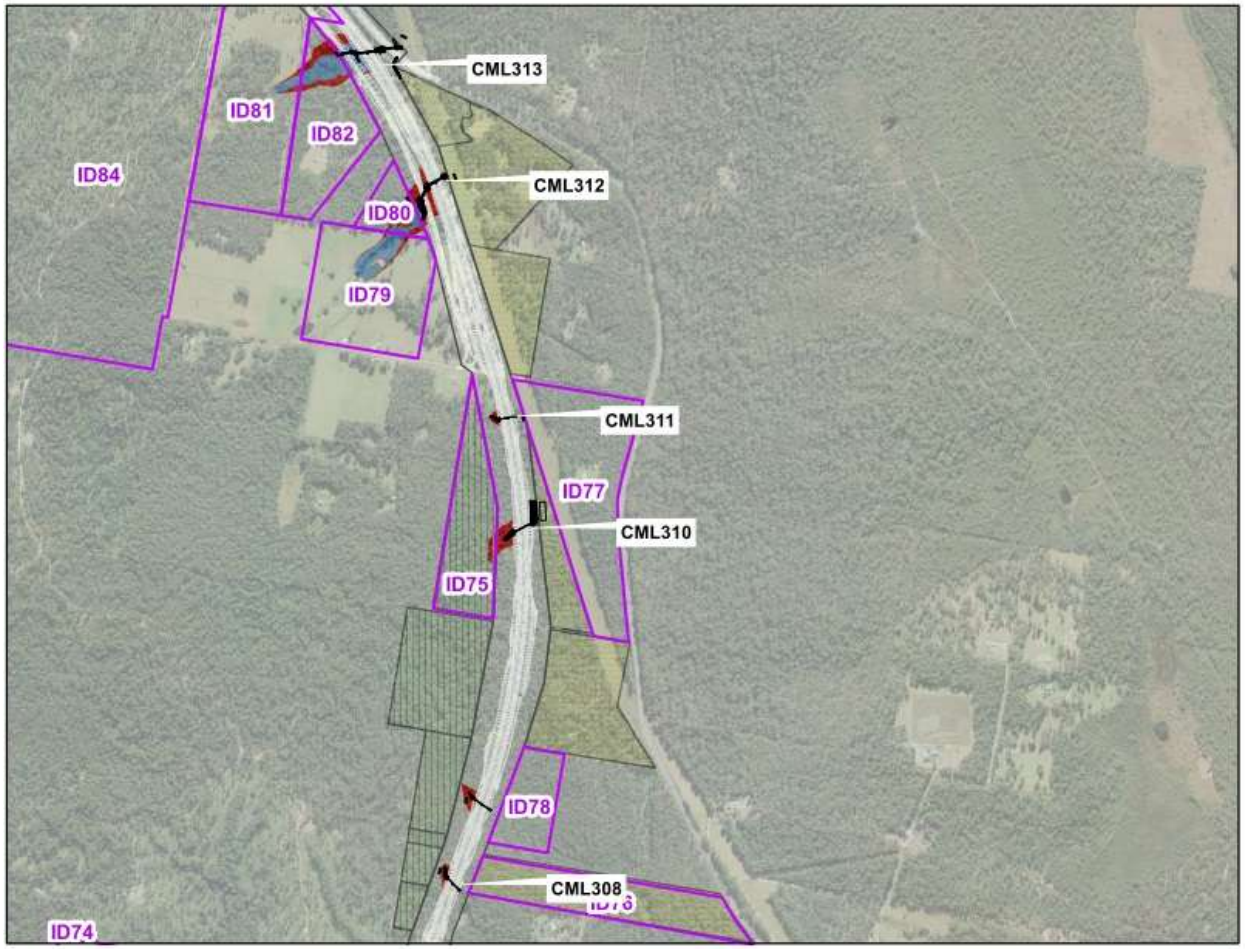

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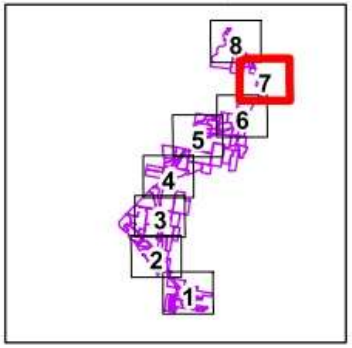

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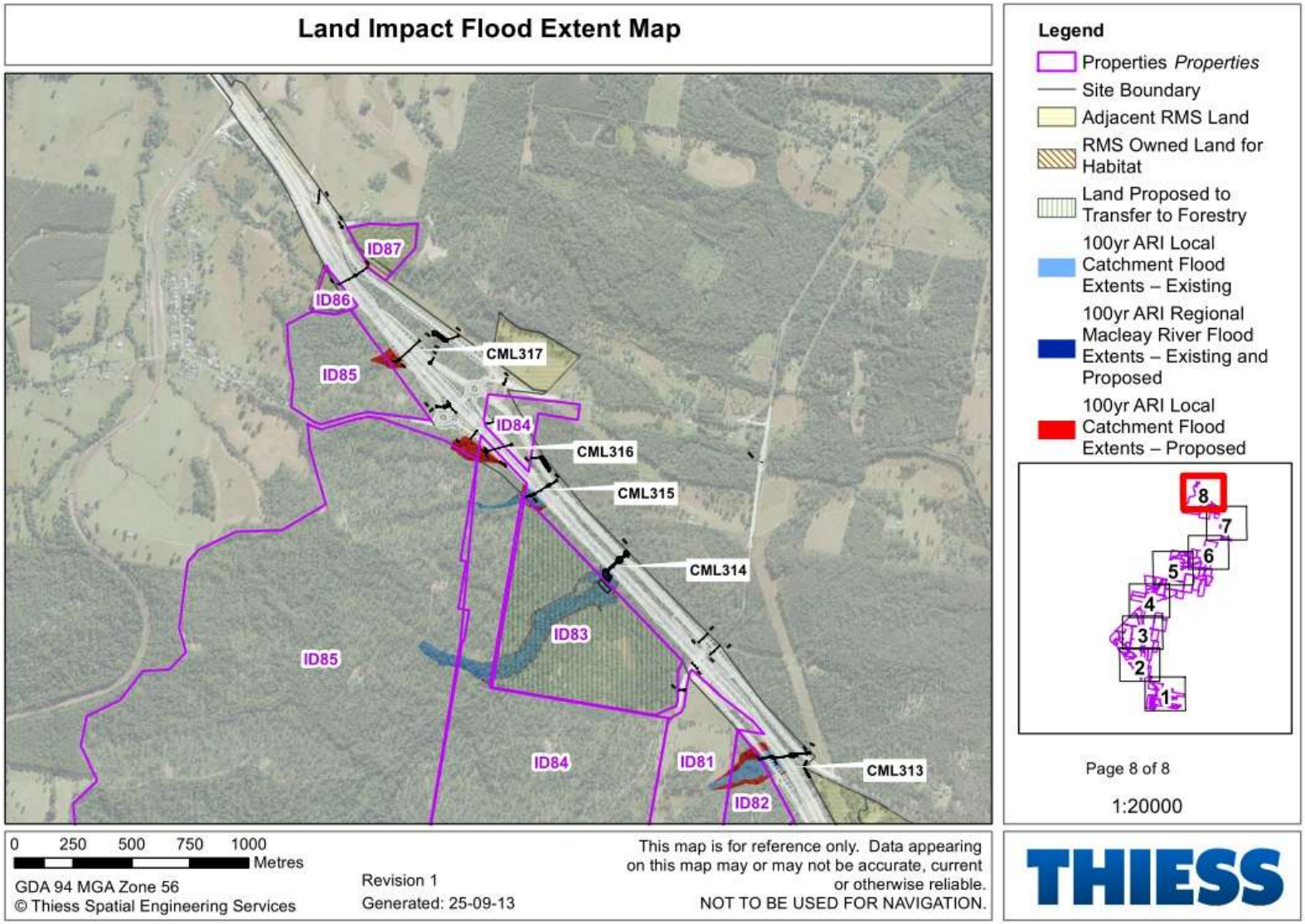
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100yr ARI Regional Macleay River Flood Extents – Existing and Proposed
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APPENDIX B

FREDERICKTON TO EUNGAI BYPASS IMPACTS - PROPERTY IMPACTS

Impacted Landowners Flood Mitigation Report

Date: 17/10/2013 16:25 Rev 11

SORT: Appendix B

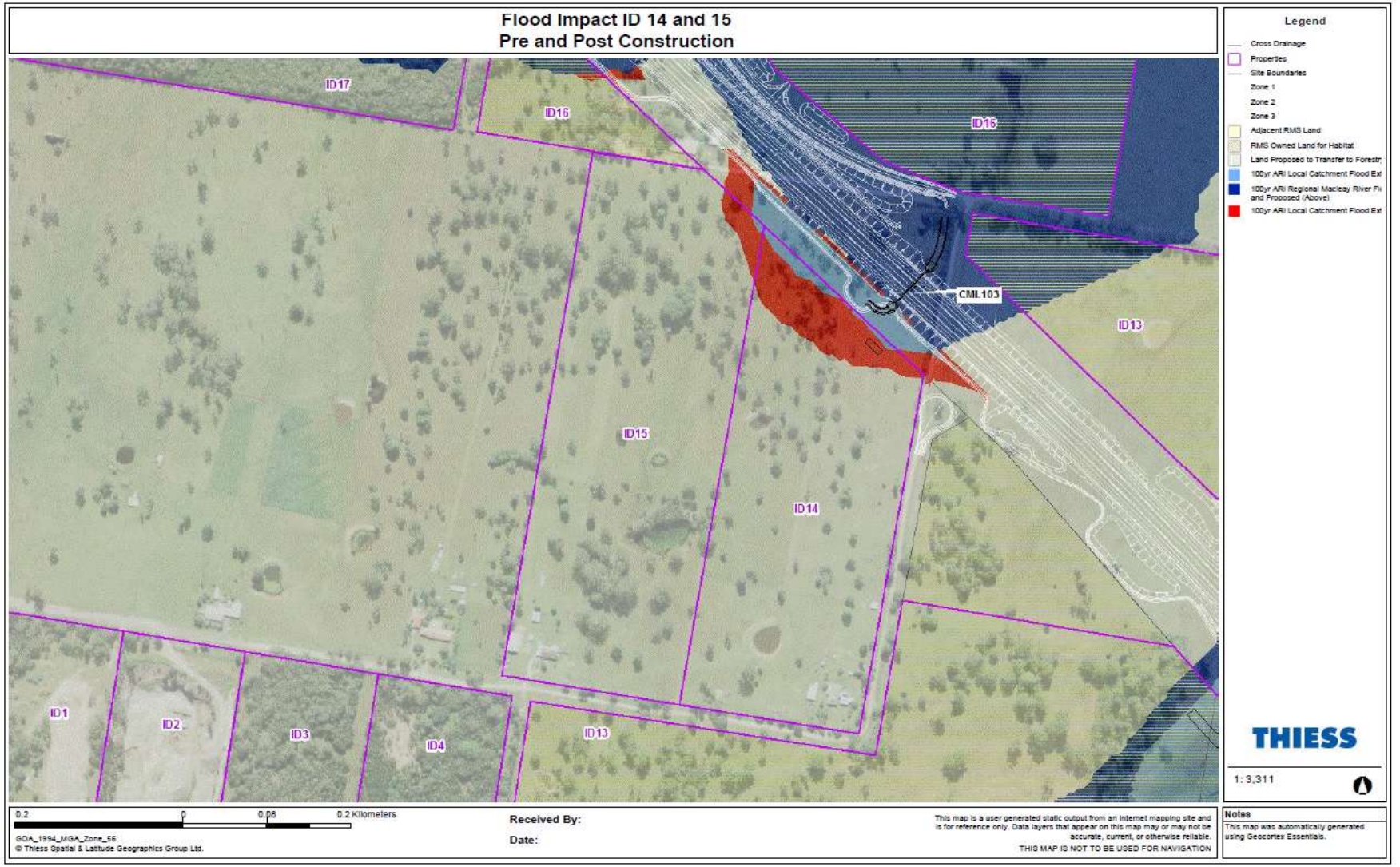
Owner ID	Upstream/ downstream	Owner	DP No.	Lot No.	Ownership	Ownership/ Current Land Use	Existing House in floodplain	Existing 100yr ARI FL (local catchment) at u/s boundary of the works (m AHD)	Proposed 100yr ARI FL (local catchment) at u/s boundary of the works (m AHD)	Afflux at RMS Boundary (m)	Design storm duration (hours)	Main drainage structure ID	Included in 100 Year ARI Macleay River flood extents	Drainage works	Crossing capacity greater than Reference Design	Mitigation works	Notes	Consultation
14	Up	TAYLOR, D.M & K.J	713220	206	Taylor	Rural residential	No	4.56	5.42	0.86	1	CML103	N	Culvert CML103 (1 x 1350mm diameter RCP)	=	Minor impact to rural lands during 100 ARI with flood duration less than 1 hour. Access via Raymonds Lane allowing cattle crossing in and out of floodplain,	DC001	1/10/2013
15	Up	ROSSITER, W.J & J.A	713220	205	Rossiter	Rural residential	No	4.56	5.42	0.86	1	CML103	N	Culvert CML103 (1 x 1350mm diameter RCP)	=	Minor impact to rural lands during 100 ARI with flood duration less than 1 hour. Access via Raymonds Lane allowing cattle crossing in and out of floodplain,	DC001	3/10/2013
72	Up	NSW Forestry	1022011	1	NSW Forestr	Forestry	NA	8.6	9.36	0.76	1	CML305	N	Culvert CML305 (1 x 2400W x 2400H RCBCs)	Y	Afflux disipates within Forestry Land and within the 50m exclusion Zone	DC003 Afflux calculated as upstream depth of flow - conservative	27/9/13 Email
74	up	CRANE	752403	57				8.6 11.9	9.36 13.82	0.76 1.92	1	CML305 CML306	N	Culvert CML305 (1 x 2400W x 2400H RCBCs) Culvert CML306 (1 x 1200mm diameter RCP)	Y		DC003 Afflux calculated as upstream depth of flow - conservative	27/9/13 Email
75	Up	LAND BACK TO FORESTRY	1101344	11	RMS	Forestry	NA	11.3	13.01	1.71	2	CML310	N	Culvert CML310 (1 x 2400W x 2400H RCBC)	Y	Afflux disipates within Land to be handed back to Forestry and within the 50m exclusion Zone	DC003 Afflux calculated as upstream depth of flow - conservative	27/9/13 Email
79	Up	A J STYLES	752403	29	Styles	Rural residential	No	6.8	7.86	1.06	3	CML312	N	Culvert CML312 (2 x 2100mm diameter RCP)	Y	**Timbered creek area impacted by 100 year local ARI flooding with short inudation time of 3hrs. No additional mitigation**	DC003 Afflux calculated as upstream depth of flow - conservative	2/10/2013

Impacted Landowners Flood Mitigation Report

Date: 17/10/2013 16:33 Rev 11

SORT: Appendix B

Owner ID	Upstream/ downstream	Owner	DP No.	Lot No.	Ownership	Ownership/ Current Land Use	Existing House in floodplain	Existing 100yr ARI FL (local catchment) at u/s boundary of the works (m AHD)	Proposed 100yr ARI FL (local catchment) at u/s boundary of the works (m AHD)	Afflux at RMS Boundary (m)	Design storm duration (hours)	Main drainage structure ID	Included in 100 Year ARI Macleay River flood extents	Drainage works	Crossing capacity greater than Reference Design	Mitigation works	Notes	Consultation
82	Up	FERGUSON	705912	304	Ferguson	Rural residential	No	6.49	8.59	2.10	2	CML313	N	Culvert CML312 (2 x 1200mm diameter RCP)	Y	**Timbered creek area impacted by 100 year local ARI flooding with short inudation time of 2hrs. No additional mitigation**	DC003 Afflux calculated as upstream depth of flow - conservative	Declined
83	Up	LAND BACK TO FORESTRY	829401	21	NSW Forestr	Rural residential	NA	6.09 9.90	6.38 10.41	0.29 0.51	4 1	CML314 CML315	N	Culvert CML314 (3 x 2400W x 2400H RCBCs) Culvert CML315 (1 x 1200mm diameter RCP)	= Y	Afllux disipates within Forestry Land and within the 50m exclusion Zone	DC003 Afflux calculated as upstream depth of flow - conservative	27/9/13 Email
84	Up	Crane	752403	48 / 68	NSW Forestr	Forestry	NA	6.09 9.90 11.7	6.38 10.41 12.36	0.29 0.51 0.66	4 1 1	CML314 CML315 CML316	N	Culvert CML314 (3 x 2400W x 2400H RCBCs) Culvert CML315 (1 x 1200mm diameter RCP) Culvert CML316 (1 x 1500mm diameter RCP)	= Y Y	Afllux disipates within Forestry Land and within the 50m exclusion Zone	DC003 Afflux calculated as upstream depth of flow - conservative	27/9/13 Email
85	Up	NSW Forestry			NSW Forestr	Forestry	NA	6.09 11.7	6.38 12.36	0.29 0.66	4 1	CML314 CML316	N	Culvert CML314 (3 x 2400W x 2400H RCBCs) Culvert CML316 (1 x 1500mm diameter RCP)	= Y	Afllux disipates within Forestry Land and within the 50m exclusion Zone	DC003 Afflux calculated as upstream depth of flow - conservative	27/9/13 Email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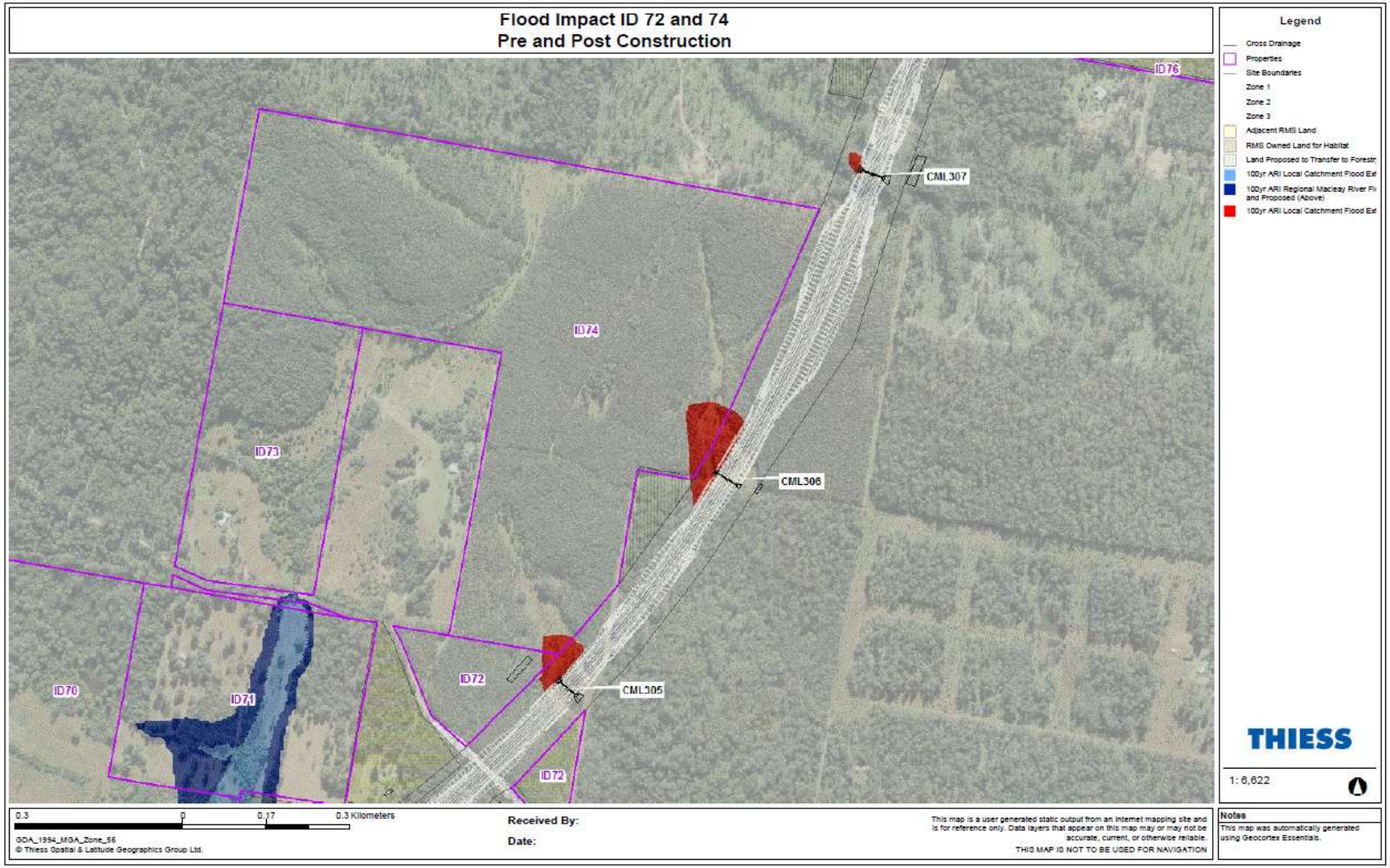
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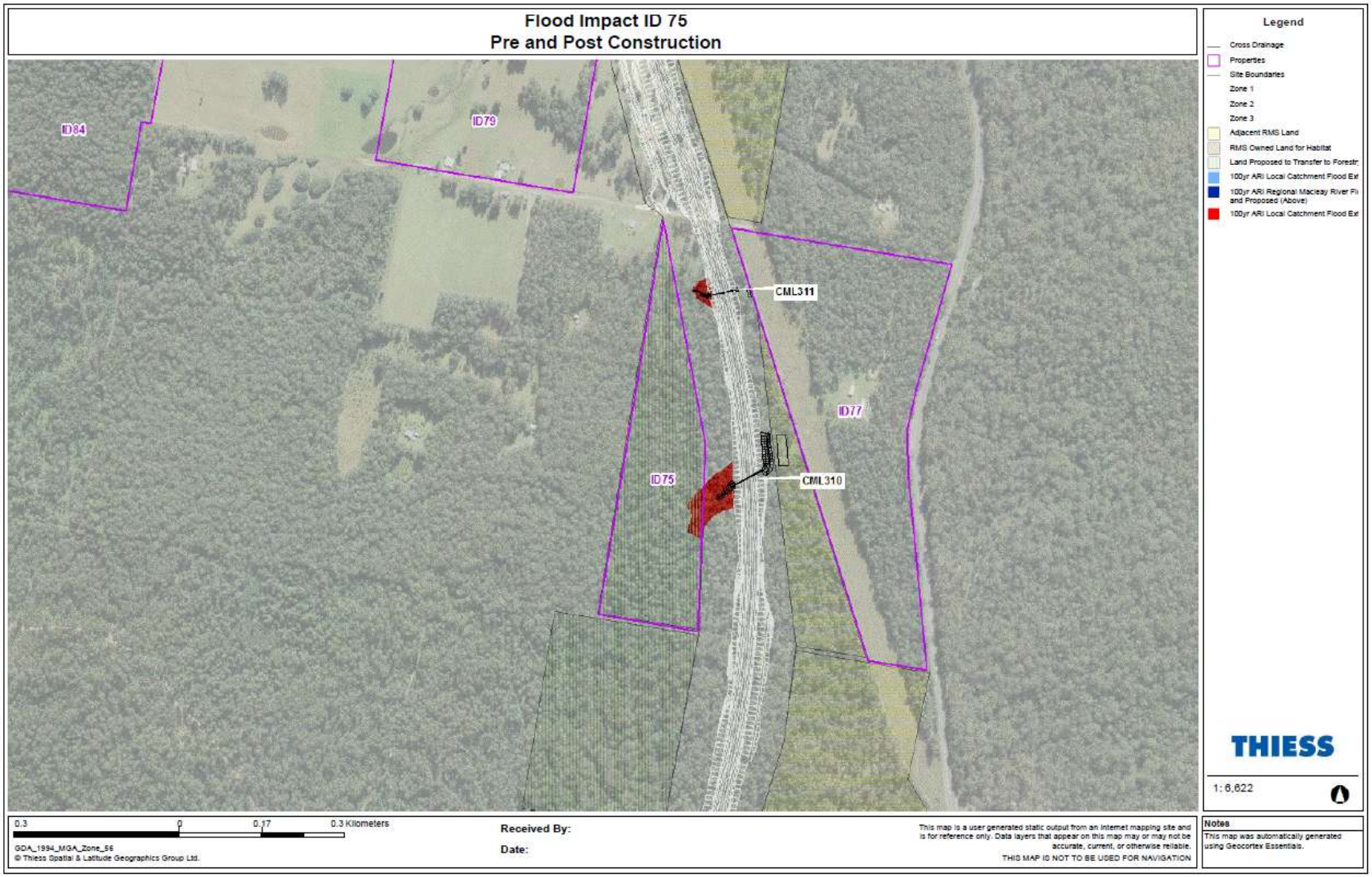
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Zone 2
Zone 3
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RMS Owned Land for Habitat
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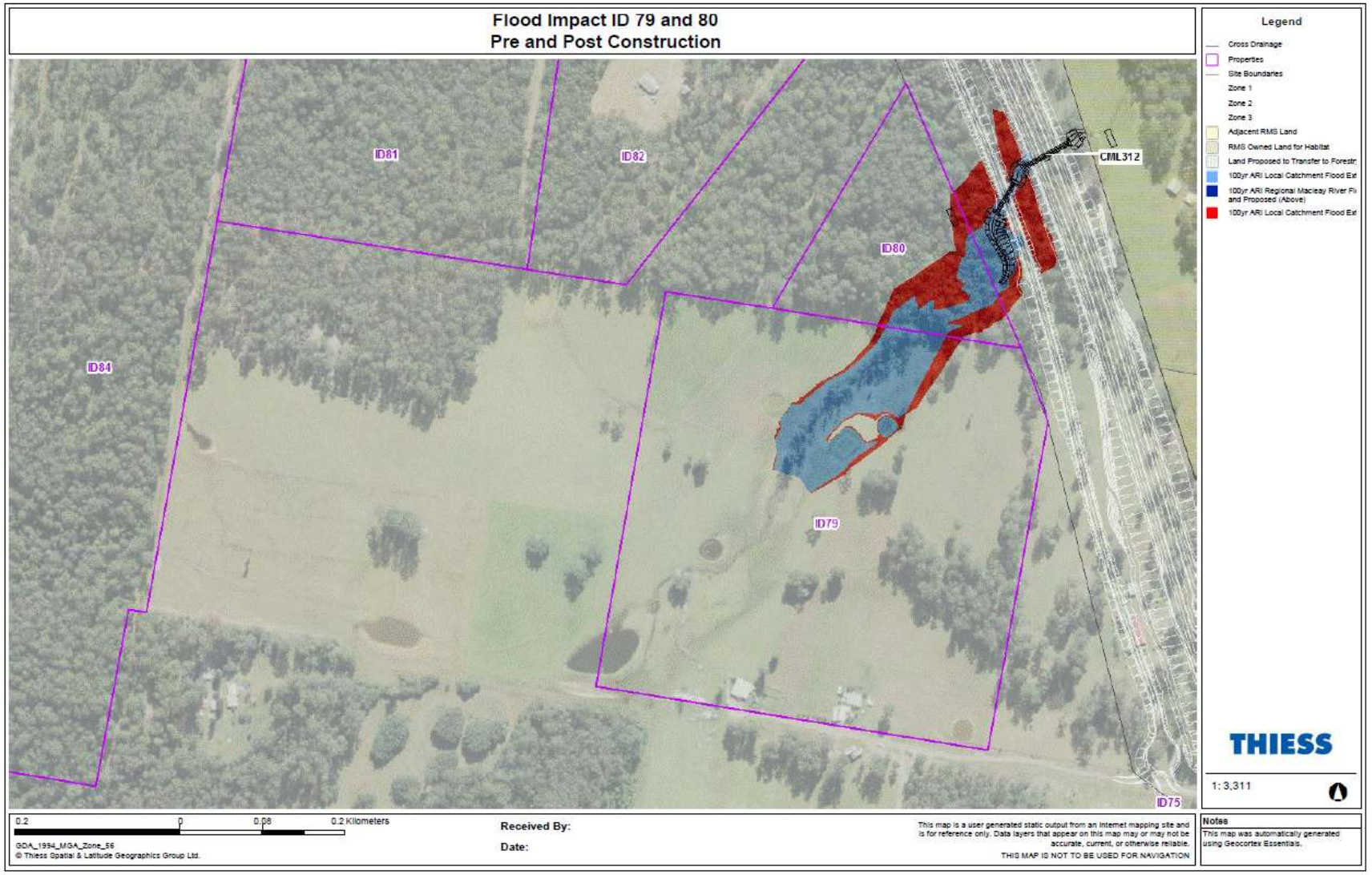
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CML312
Legend
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Land Proposed to Transfer to Forestr
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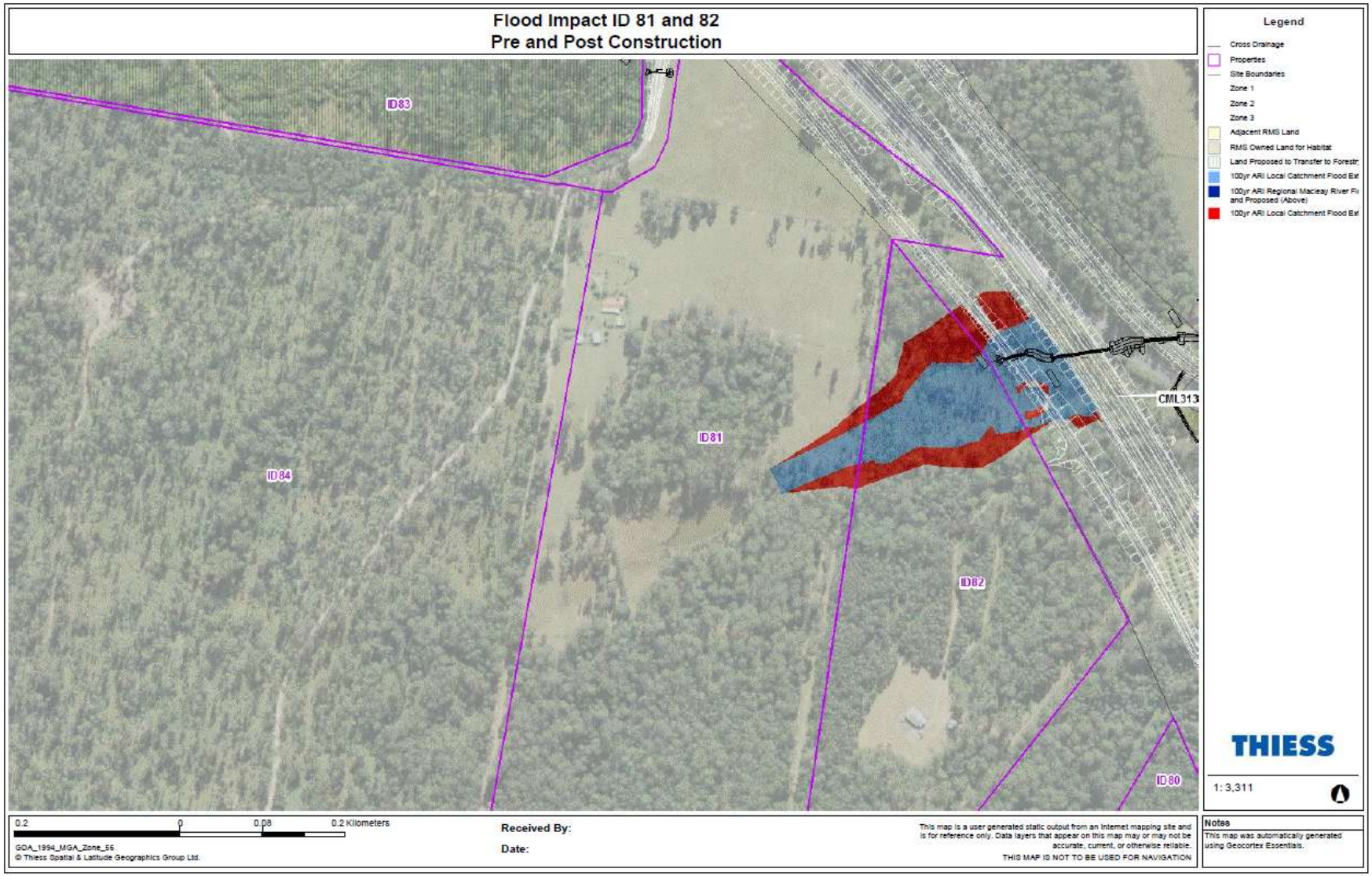
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Properties
Site Boundaries
Zone 1
Zone 2
Zone 3
Adjacent RMS Land
RMS Owned Land for Habitat
Land Proposed to Transfer to Forestr
100yr ARI Local Catchment Flood Ext
100yr ARI Regional Macleay River Fl
and Proposed (Above)
100yr ARI Local Catchment Flood Ext
THIESS
1: 3,311
0.2
0
0.08
0.2 Kilometers
GDA_1994_MGA_Zone_56
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Received By:
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Notes
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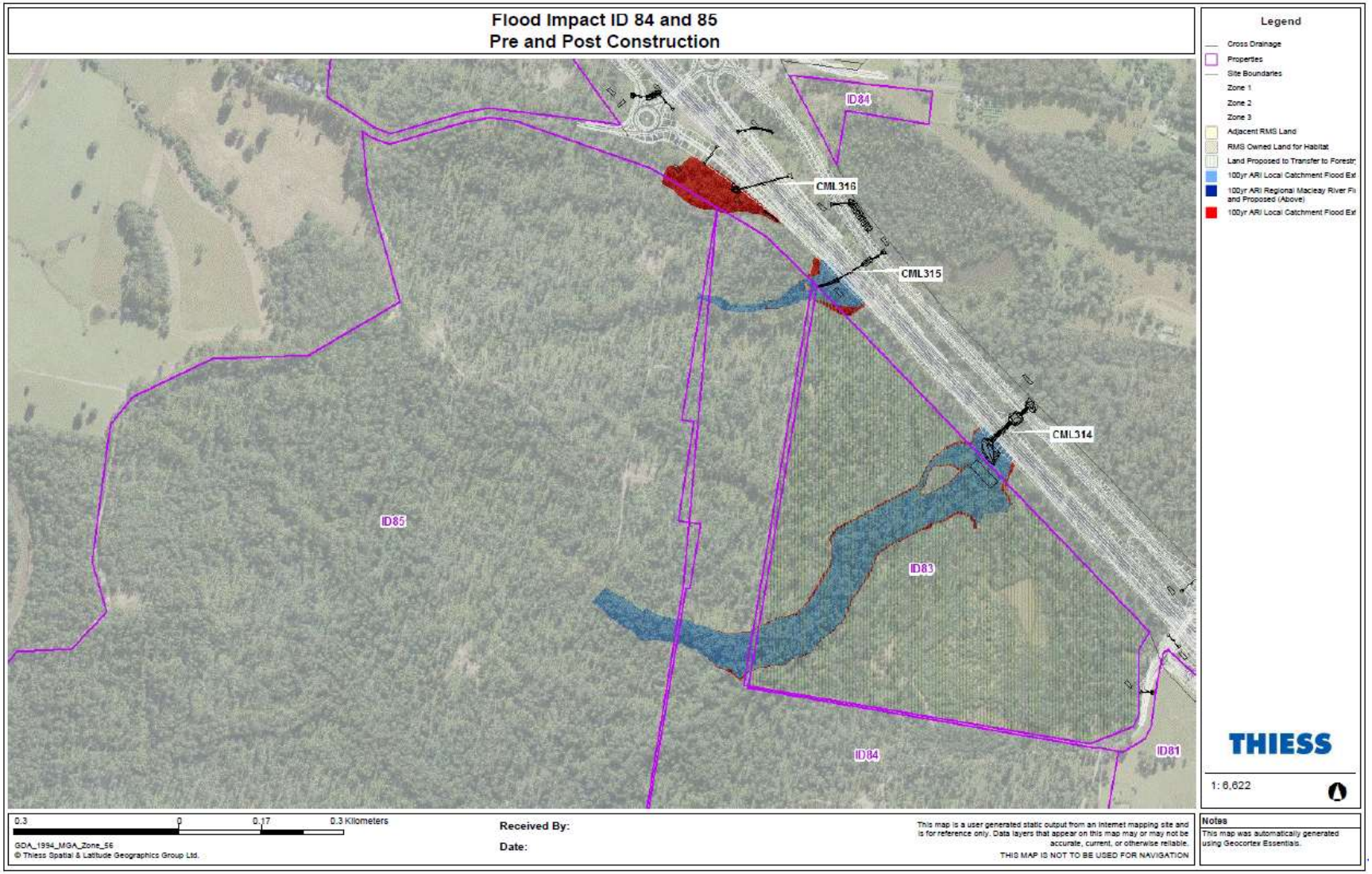
Flood Impact ID 84 and 85
Pre and Post Construction
Legend
Cross Drainage
Properties
Site Boundaries
Zone 1
Zone 2
Zone 3
Adjacent RMS Land
RMS Owned Land for Habitat
Land Proposed to Transfer to Forestr
100yr ARI Local Catchment Flood Ext
100yr ARI Regional Macleay River Fl
and Proposed (Above)
100yr ARI Local Catchment Flood Ext
ID84
CML316
CML315
CML314
ID85
ID83
ID84
ID81
THIESS
1: 6,622
0.3
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0.17
0.3 Kilometers
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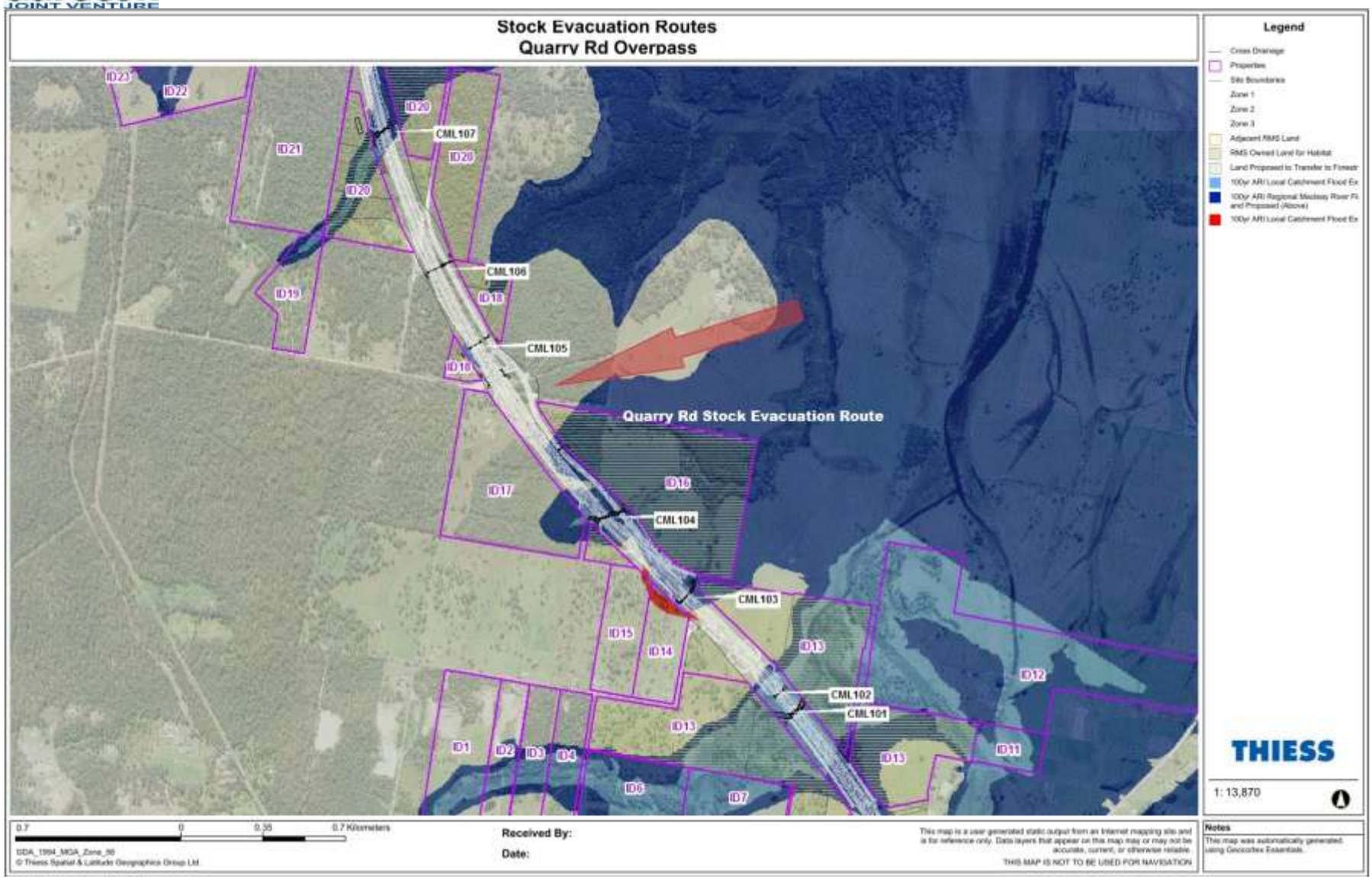
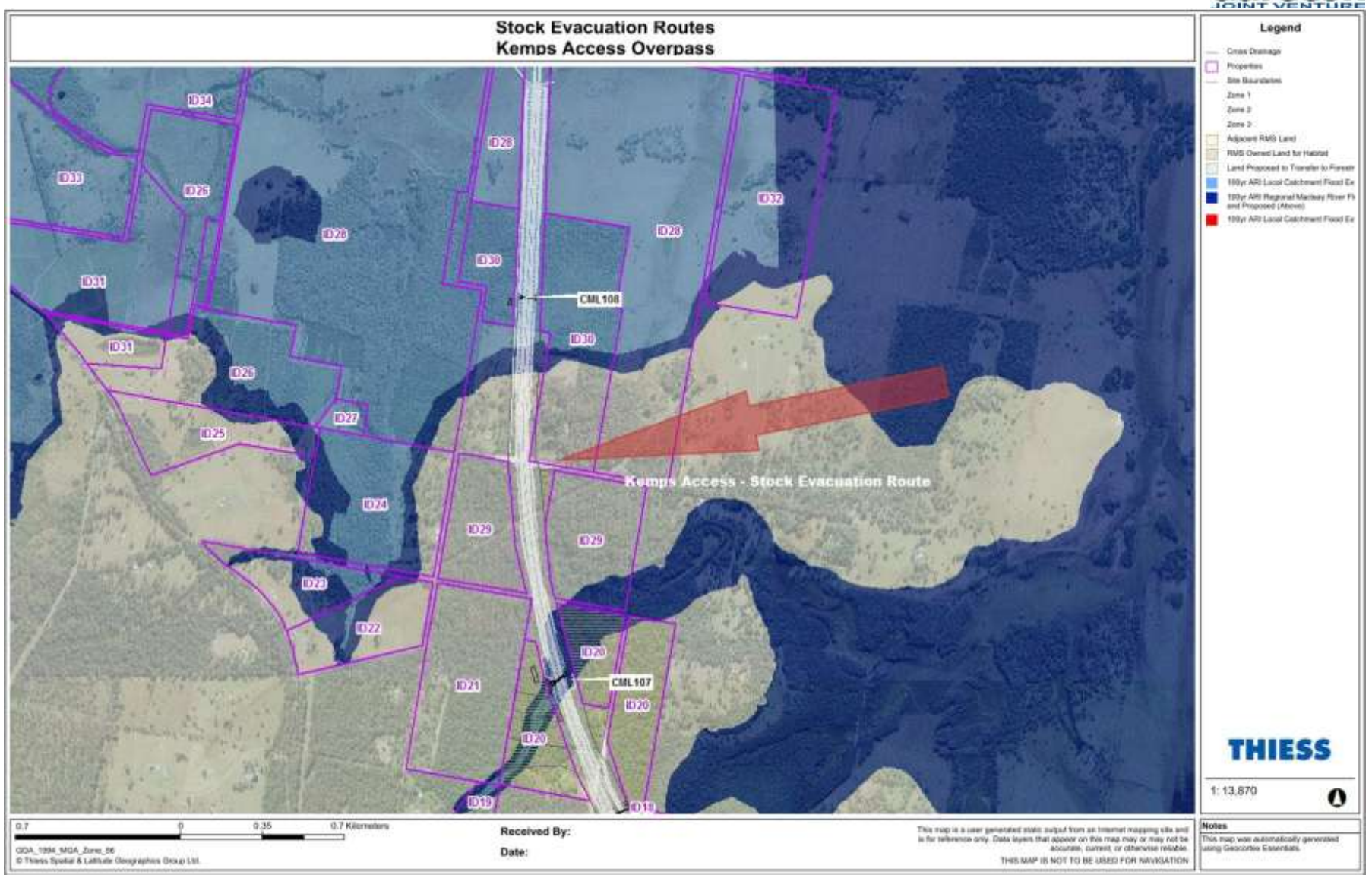
APPENDIX C

FREDERICKTON TO EUNGAI BYPASS IMPACTS - STOCK EVACUATION ROUTES


Stock Evacuation Routes
Quarry Rd Overpass
Legend
Quarry Rd Stock Evacuation Route
CML107
CML106
CML105
CML104
CML103
CML102
CML101
ID23
ID22
ID21
ID20
ID19
ID18
ID17
ID16
ID15
ID14
ID13
ID12
ID11
ID1
ID2
ID3
ID4
ID6
ID7
THIESS
1: 13,870
Received By:
Date:
Notes


Stock Evacuation Routes
Kemps Access Overpass
Legend
Cross Drainage
Properties
Site Boundaries
Zone 1
Zone 2
Zone 3
Adjacent RMS Land
RMS Owned Land for Habitat
Land Proposed to Transfer to Forestr
100yr ARI Local Catchment Flood Ex
100yr ARI Regional Macleay River Fl
and Proposed (Above)
100yr ARI Local Catchment Flood Ex
ID34
ID33
ID26
ID28
ID28
ID32
ID28
ID30
ID31
CML108
ID30
ID31
ID26
ID27
ID25
Kemps Access - Stock Evacuation Route
ID24
ID29
ID29
ID23
ID22
ID20
ID21
CML107
ID20
ID20
ID19
ID19
THIESS
1: 13,870
0.7
0
0.35
0.7 Kilometers
GDA_1994_MGA_Zone_56
© Thiess Spatial & Latitude Geographics Group Ltd.
Received By:
Date:
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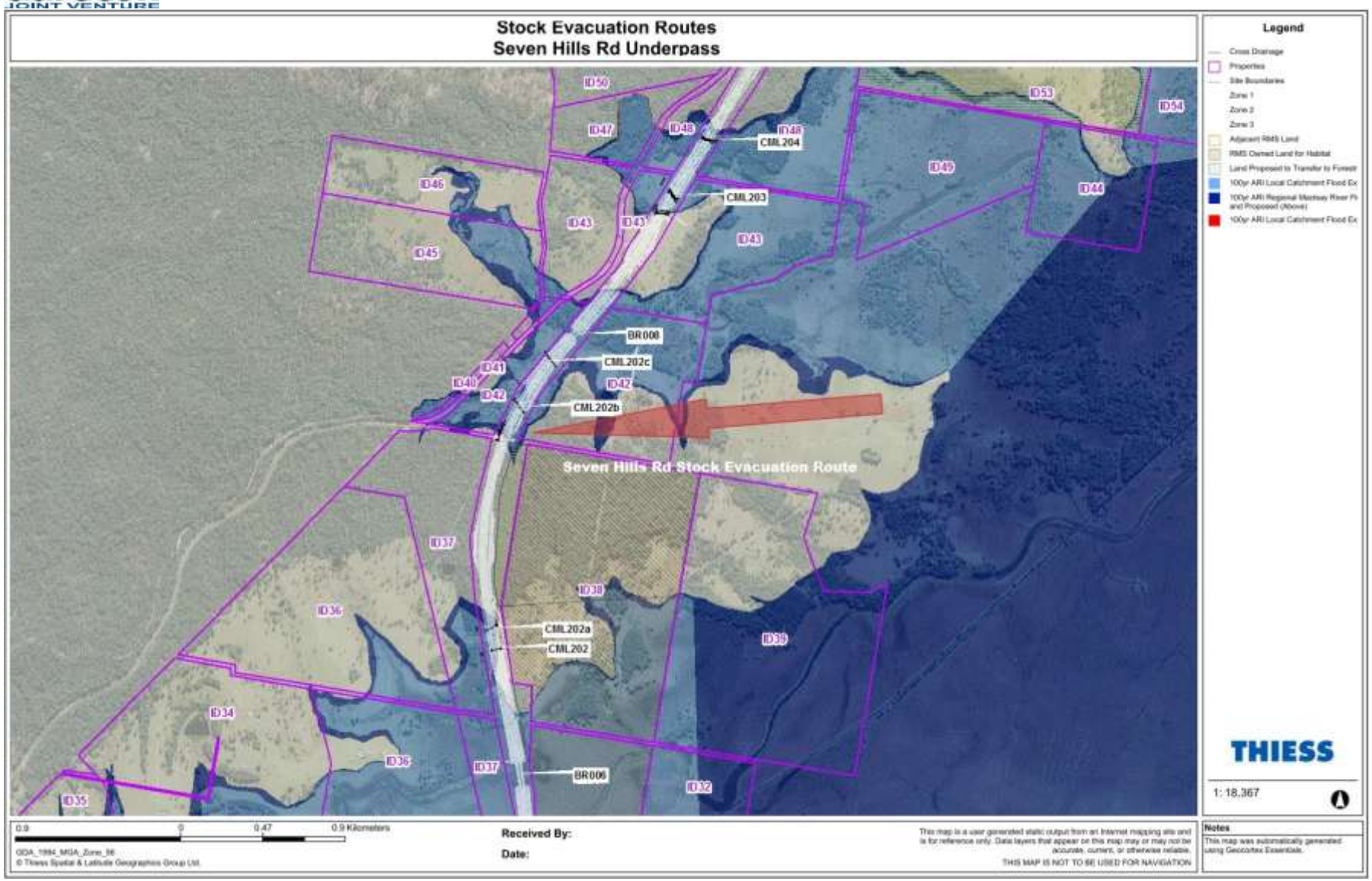
Stock Evacuation Routes
Seven Hills Rd Underpass
Legend
Cross Drainage
Properties
Site Boundaries
Zone 1
Zone 2
Zone 3
Adjacent RMS Land
RMS Owned Land for Habitat
Land Proposed to Transfer to Forestr
100yr ARI Local Catchment Flood Ex
100yr ARI Regional Macleay River Fl
and Proposed (Above)
100yr ARI Local Catchment Flood Ex
ID50
ID47
ID48
ID46
CML204
ID53
ID54
ID49
ID44
CML203
ID46
ID43
ID43
ID43
ID45
BR008
CML202c
ID41
ID40
ID42
ID42
CML202b
Seven Hills Rd Stock Evacuation Route
ID37
ID38
ID36
CML202a
CML202
ID39
ID34
ID36
ID37
BR006
ID32
ID35
0.9
0
0.47
0.9 Kilometers
GDA_1994_MGA_Zone_56
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Received By:
Date:
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THIESS
1: 18,367
Notes
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APPENDIX D

FREDERICKTON TO EUNGAI BYPASS IMPACTS - DEPARTMENT OF PLANNING & INFRASTRUCTURE

Table 5.1 DoPI Comments

Reference	Reference Review Comments	Response
1	**The department notes that, while the report asserts no at-residence impacts, the report also states that minimal impacts on rural property and cattle movement are considered likely. Those residence affected, however, are not detailed. Further details should be provided regarding:** ○ **Whether any parts of properties would experience increased afflux (i.e. Over the project objectives following detailed design** ○ **The locations of any such affected residences.**	The predicted impacts of flooding have been assessed and the impacts are consistent with the predicted minimal impacts from the Environmental assessment for the Kempsey to Eungai Project. Mapping of flooding that occurs during the 1:100 ARI events is attached in Appendix B. As shown on the maps the properties do not experience increased afflux over that predicted in the Environmental Assessment.
2	**This report should detail measures for any property affected (with reference to the stage-wide mitigation measures provided in Table 4-3)**	Stage-wide mitigation measures include farm access crossings, general stock evacuation routes, and alternate access routes as required in the Kempsey to Eungai Environmental Assessment. Measures on the Saul and Whalen properties include farm access crossing and alternative access routes. Details of these are contained within Section 3.4 of the report, and the agreed property adjustment plans are included in Appendix E of the report.
3	**Locations of scour protection measures should be identified**	There was no scour protection required for the Frederickton to Eungai Project as part of the flood mitigation measures. For further details refer to section 3.5 of the report.
4	**Greater certainty should be provided as to:** ○ **Level of consultation with agencies regarding mitigation measures** ○ **Commitment to consultation with agencies regarding scour protection.**	Mitigation measure have been discussed with Council, SES and members of the Project ERG (EPA) during project development and relate mainly to stock evacuation and access across the project for affected landholders. No mitigation measures require scour protection, however general scour protection for drainage elements within the road corridor are to be provided as per normal engineering practice. The scour protection measures for drainage elements are reviewed in detail by EPA and Fisheries as part of the design development process. Further details are within Section 3.2 and 3.3 of the report
5	**Please advise whether issues have been raised regarding flooding during consultation; if so how have these been addressed?**	No additional issues have been raised following consultation. During consultation meetings, property owners considered that the afflux impacts on their properties was minimal and of no consequence to them. Refer to section 3.3 of the report.
6	**Further details should be provided as to how operational and maintenance responsibilities for mitigation measures (including raised alternate access route and scour protection) will be apportioned.**	Mitigation measures such as farm access underpasses and alternate access routes are contained within the road corridor, and therefore will be maintained by RMS in the operational phase of the project. There are no mitigation measures on private property that require maintenance. Refer to section 3.6 of the report for full details.
7	**Document cross reference should be updated**	The cross-referencing within the report has been completed.

APPENDIX E

FREDERICKTON TO EUNGAI BYPASS IMPACTS – CORRESPONDENCE AND OTHER CONSULTATION DETAILS

FW: Consultation on the hydrological impacts on forestry land due to the Frederickton to Eungai to Pacific Highway upgrade

From: * john.mckechnie@rms.nsw.gov.au

Sent: Wednesday, 16 October 2013 3:48 PM

To: Edwards, Greg, TPL ;

Cc:

Info:

Mail Message

Message

Greg, attached is response from Forests NSW

Regards John

From: Jude Parr [mailto:Jude.Parr@fcnsw.com.au]
Sent: Wednesday, 16 October 2013 3:31 PM
To: MCKECHNIE John A
Subject: RE: Consultation on the hydrological impacts on forestry land due to the Frederickton to Eungai to Pacific Highway upgrade

John

I confirm my verbal advice that Forestry Corporation is aware of the proposed afflux impacts and believe there should be no significant impact on the forest estate, and we do not require a face to face meeting to

further explain the impacts.

Jude Parr | Land Administration Officer Forestry Corporation of NSW | Central Region

Maher Street | PO Box 168 | Wauchope NSW 2447
T: 02 65869718 | F: 02 65852422| M: 0409882922

E: jude.parr@fcnsw.com.au | W: www.forestrycorporation.com.au

Note change of email address

From: MCKECHNIE John A [mailto:John.McKECHNIE@rms.nsw.gov.au] **Sent:** Wednesday, 16 October 2013 2:17 PM
To: Jude Parr
Cc: MOORE Jeffrey
Subject: Consultation on the hydrological impacts on forestry land due to the Frederickton to Eungai to Pacific Highway upgrade

Jude, can you confirm our recent discussion that Forestry is happy with the level of consultation that has been carried out to explain the hydrological impacts of the Pacific Highway upgrade from Frederickton to Eungai on Forestry lands.

This consultation has included:

- Emails from Thiess that have explained the impacts and included maps that show the afflux affect on Forests property.
- Phone discussions that have also explained the impacts.

Can you also confirm your verbal advice that you are aware and comfortable with the proposed afflux impacts, and you do not require a face to face meeting to further explain the impacts.

Regards

John McKechnie
RMS Assistant
Representative-
Frederickton to Eungai

Pacific Highway Upgrade Programme

Roads and Maritime Services

38 Inches Road

Verges Ck via Kempsey NSW 2440

T 02 88 746661 M 0409917223 **F**

john.mckechnie@rms.nsw.gov.au

Other Consultations:

Kempsey Sire Council

Date: 11th October

Present:

KSC: Robert Scott, Trevor Dickson, Bruce Potts

Thiess: Greg Edwards, Monica Porte

RMS: Cameron Peace

Consultation:

Overview discussion of the impacts of the Project with respect to the Macleay River 100 ARI, Local Catchments 100ARI

Correspondence Issued : 22nd October 2013

Response: Pending

Summary of Impact

- No additional Impact above the Environmental Assessment
- Flood Impact effected by the local catchment only
    - Reference to Appendix A for overall Flood impacts
    - Reference to Appendix B for Stock Evacuation routes
    - Reference Appendix E for Property Adjustment plans for stock movement for Saul and Whalan -Collombatti Flood Plan
- Egress for Forestry Tracks to the west available
- Minor local flooding impacts in the north. All Landowners satisfied that no houses impacted
- Impact shown on maps is for the 1:100 yr.(last storm event Feb 2013 was a 1:13Yr)
- Smaller storms will have a smaller afflux impact

Issues raised:

- Council satisfied that no additional impacts pending from project works
- Nil issues raised

State Emergency Services

Date: 22nd October 2013

Present:

SES: Tony Day

Thiess: Greg Edwards, Monica Porte

RMS: John McKechnie

Consultation:

Overview discussion of the impacts of the Project with respect to the Macleay River 100 ARI, Local Catchments 100ARI

Correspondence issued : 22nd October 2013

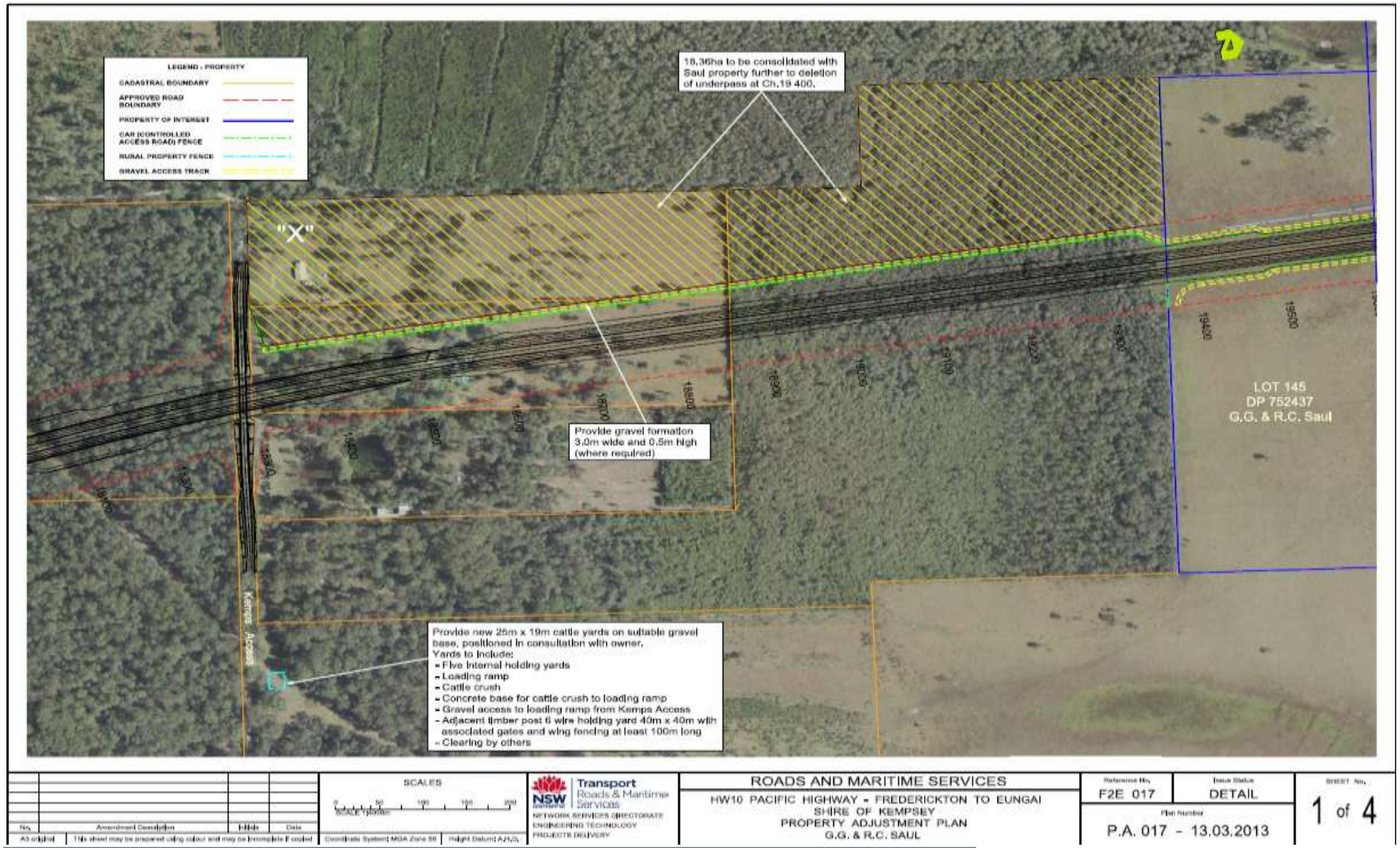
Response: Pending

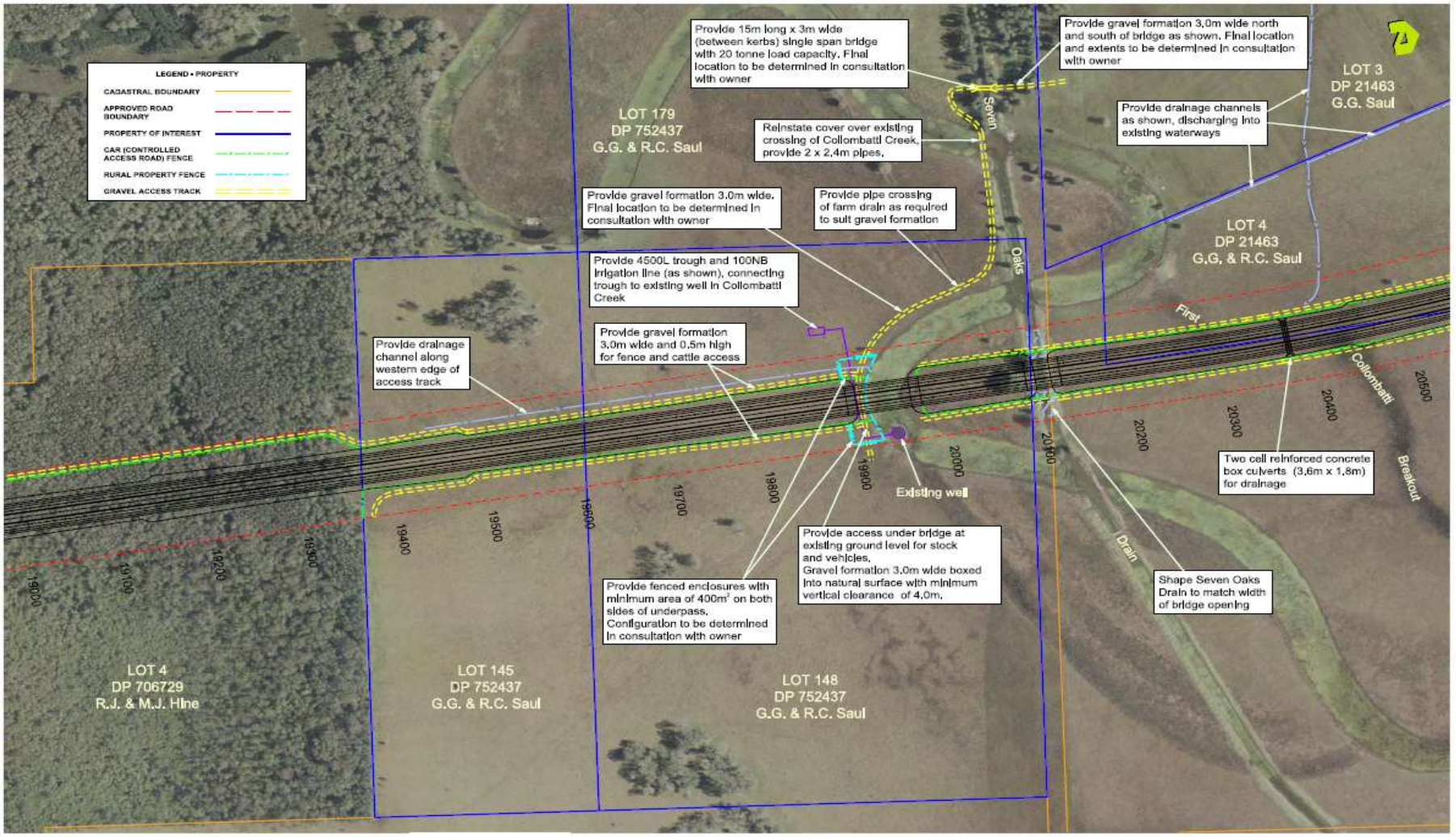
Summary of Impact

- No additional Impact above the Environmental Assessment
- Flood Impact effected by the local catchment only
    - Reference to Appendix A for overall Flood impacts
    - Reference to Appendix B for Stock Evacuation routes
    - Reference Appendix E for Property Adjustment plans for stock movement for Saul and Whalan -Collombatti Flood Plan
- Egress for Forestry Tracks to the west available
- Minor local flooding impacts in the north. All Landowners satisfied that no houses impacted
- Impact shown on maps is for the 1:100 yr.(last storm event Feb 2013 was a 1:13Yr)
- Smaller storms will have a smaller afflux impact

Issues raised:

- SES satisfied that no additional impacts pending from project works and that SES would only be doing minor resupply works to this area.
- Nil issues raised


LEGEND - PROPERTY
CADASTRAL BOUNDARY
APPROVED ROAD BOUNDARY
PROPERTY OF INTEREST
CAR (CONTROLLED ACCESS ROAD) FENCE
RURAL PROPERTY FENCE
GRAVEL ACCESS TRACK
18.36ha to be consolidated with Saul property further to deletion of underpass at Ch.19 400.
"X"
Provide gravel formation 3.0m wide and 0.5m high (where required)
LOT 145
DP 752437
G.G. & R.C. Saul
Kemps Access
Provide new 25m x 19m cattle yards on suitable gravel base, positioned in consultation with owner.
Yards to include:
- Five internal holding yards
- Loading ramp
- Cattle crush
- Concrete base for cattle crush to loading ramp
- Gravel access to loading ramp from Kemps Access
- Adjacent timber post & wire holding yard 40m x 40m with associated gates and wing fencing at least 100m long
- Clearing by others
SCALES
Transport Roads & Maritime Services
NSW Government
NETWORK SERVICES DIRECTORATE
ENGINEERING TECHNOLOGY
PROJECTS DELIVERY
ROADS AND MARITIME SERVICES
HW10 PACIFIC HIGHWAY - FREDERICKTON TO EUNGAI
SHIRE OF KEMPSEY
PROPERTY ADJUSTMENT PLAN
G.G. & R.C. SAUL
F2E 017
DETAIL
P.A. 017 - 13.03.2013
1 of 4



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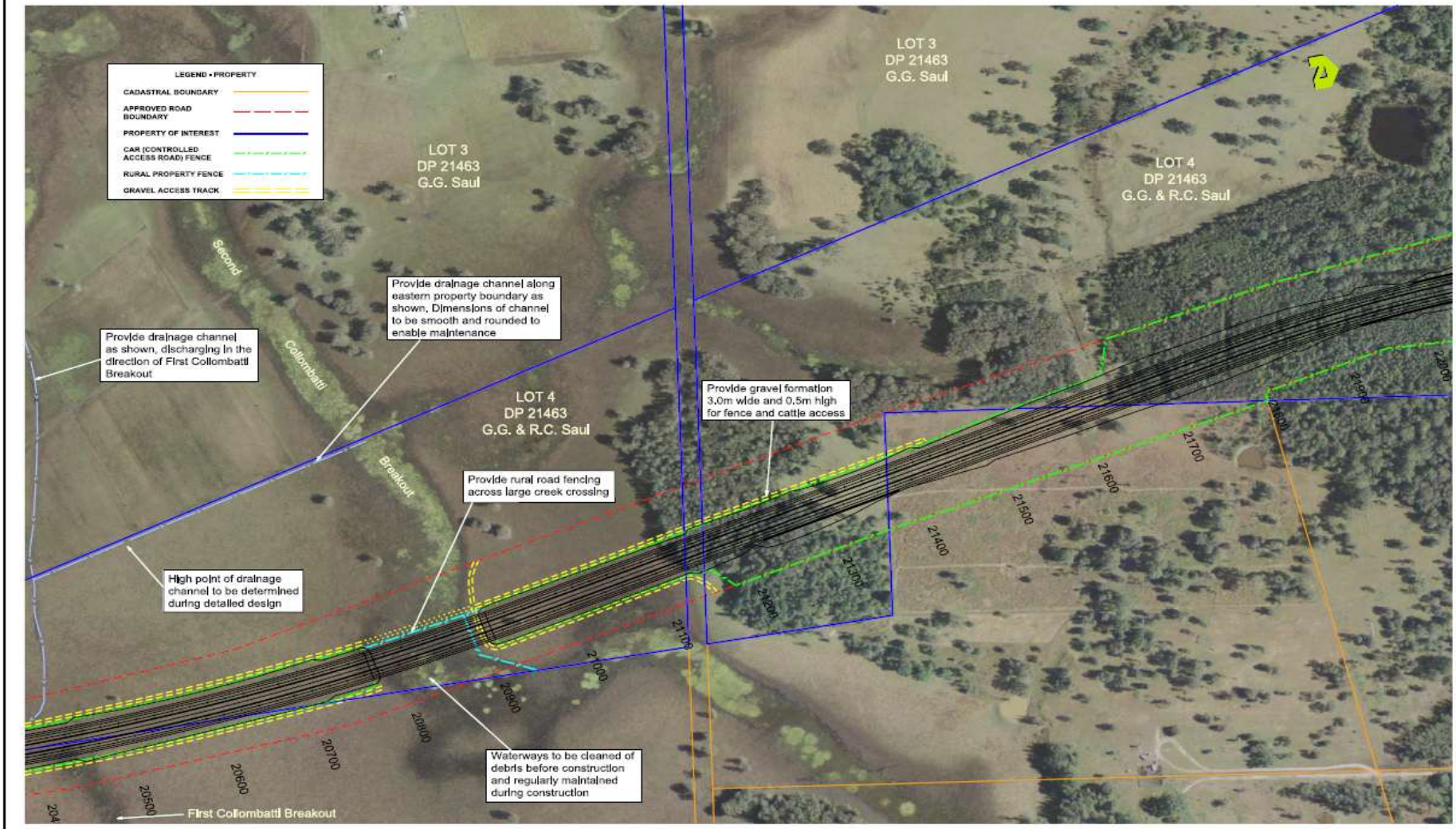
No.	Amendment Description	Initials	Date		
AS original	This sheet may be prepared using colour and may be incomplete if copied			Coordinate System: MGA Zone 56	Height Datum: AHD

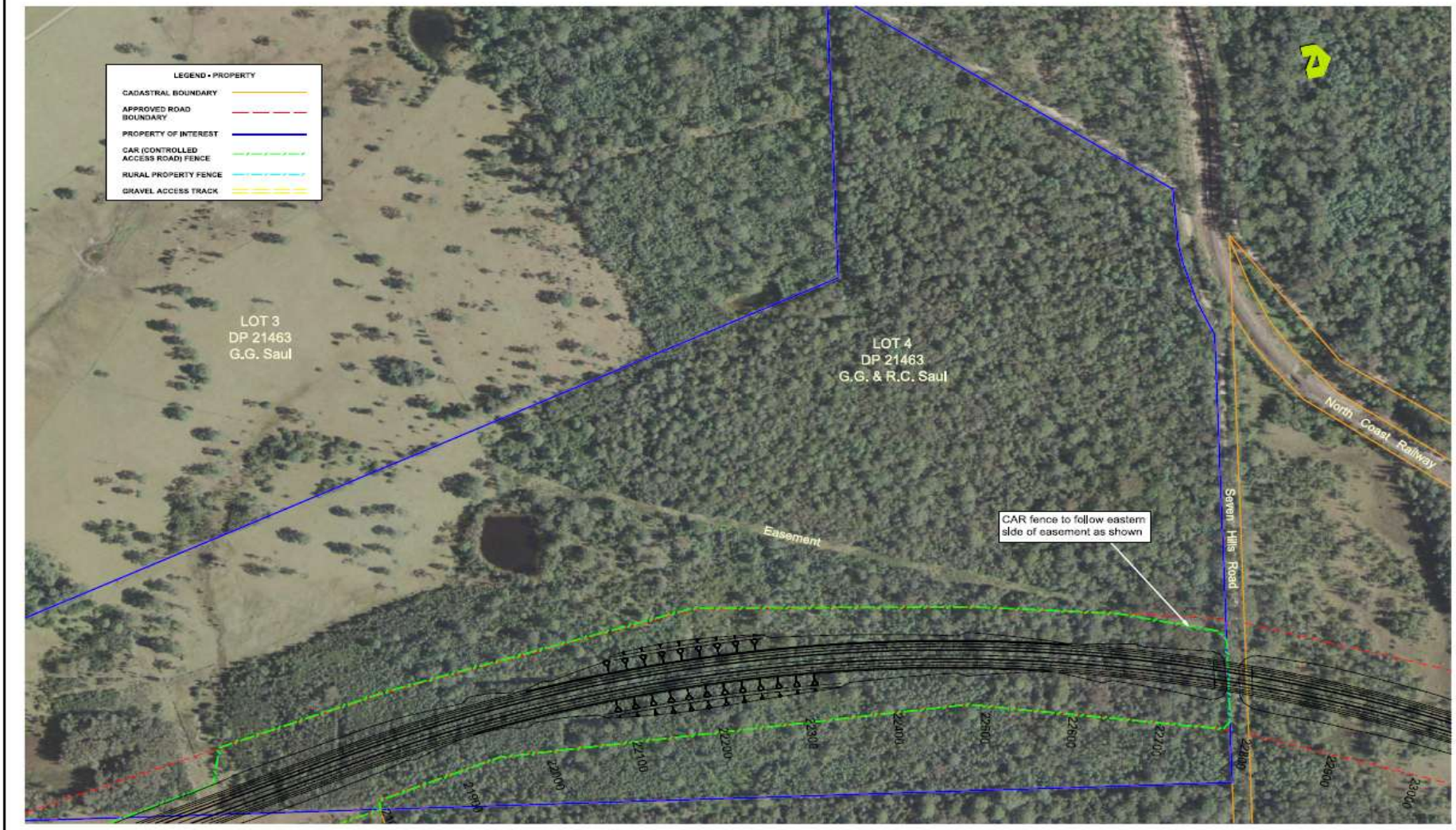
ROADS AND MARITIME SERVICES

HW10 PACIFIC HIGHWAY - FREDERICKTON TO EUNGAI
SHIRE OF KEMPSEY
PROPERTY ADJUSTMENT PLAN
G.G. & R.C. SAUL

Reference No.	Issue Status	SHEET No.
F2E 017	DETAIL	2 of 4
Plan Number: P.A. 017 - 13.03.2013		



Project: Pacific Highway Upgrade Frederickton to Eungai
Document Title: Hydrological Mitigation Report
Document Number: F2E-00G-RPT-FS000-0004
Date: 22 October 2013



No.	Amendment Description	Initials	Date

AS original | This sheet may be prepared using colour and may be incomplete if copied

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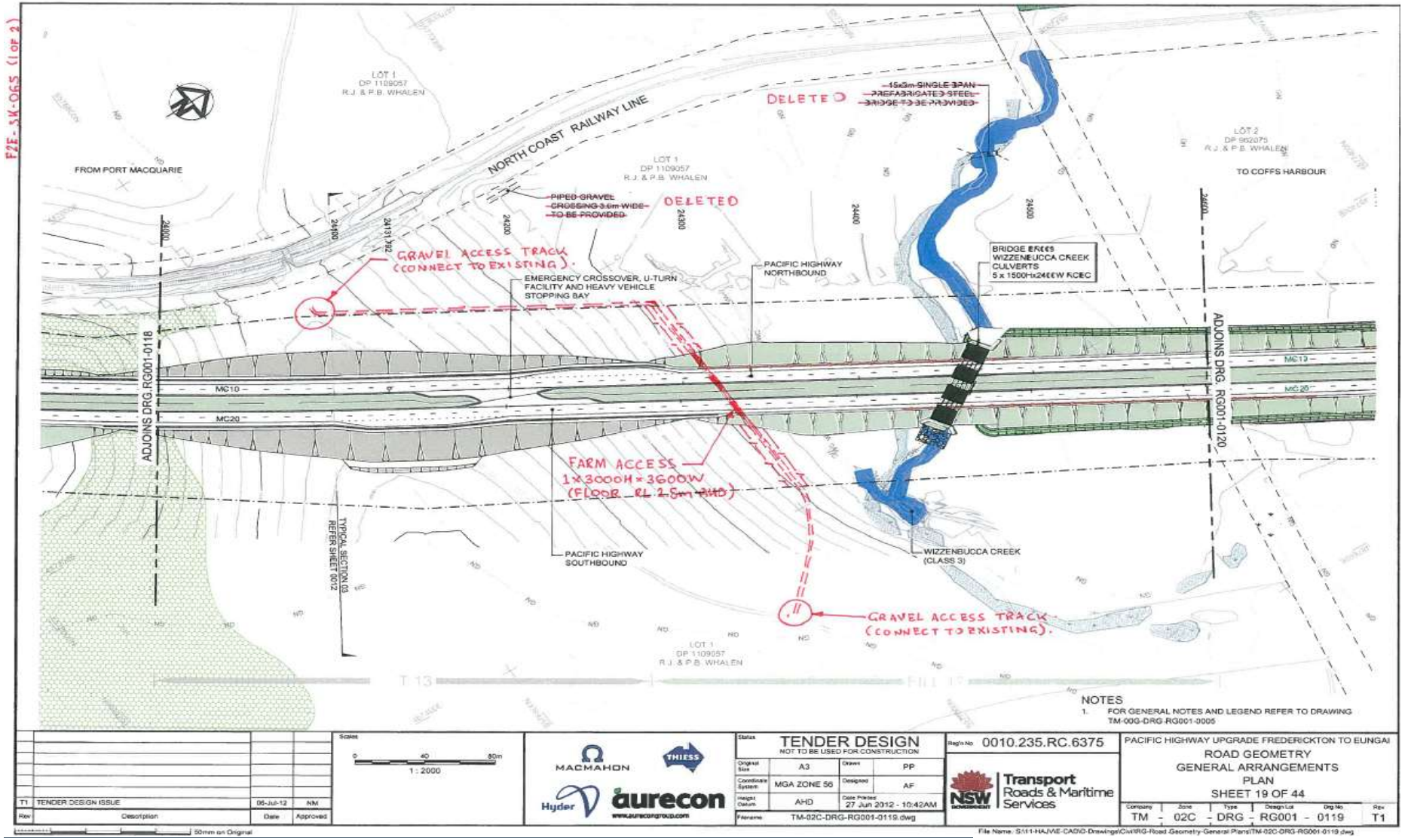
Coordinate System: MGA Zone 56 | Height Datum: AHD

Transport Roads & Maritime Services
NSW Government
NETWORK SERVICES DIRECTORATE
ENGINEERING TECHNOLOGY
PROJECTS DELIVERY

ROADS AND MARITIME SERVICES
HW10 PACIFIC HIGHWAY - FREDERICKTON TO EUNGAI
SHIRE OF KEMPSEY
PROPERTY ADJUSTMENT PLAN
G.G. & R.C. SAUL

Reference No. F2E 017
Issue Status DETAIL
Plan Number P.A. 017 - 13.03.2013
SHEET No. 4 of 4



Project: Pacific Highway Upgrade Frederickton to Eungai
Document Title: Hydrological Mitigation Report
Document Number: F2E-00G-RPT-FS000-0004
Date: 22 October 2013