Template 3 – Taking overland flow water

(version 1.0)

This template must be completed and submitted with *DA Form 1 – Development application details* for all development applications for operational works involving taking overland flow water.

It is mandatory to complete the details in all applicable parts in this form and provide any supporting information identified on the form as being required to accompany your development application, unless stated otherwise.

Additional pages may be attached if there is insufficient space on this form for any questions.

Note: All terms used within this template have the meaning given under the Planning Act 2016, the Planning Regulation 2017, or the Development Assessment Rules (DA Rules).

1) Are the works existing? *Note: Ensure that the relevant plans that accompany the development application identify the location of existing works and proposed works.*	☐ Yes – provide construction date (if known) ☒ No
2) Will the proposed works replace or amend existing authorised works?	☐ Yes – provide the authorisation number: provide the description of the authorisation: ☒ No
3) What is the purpose of the proposed work? *(tick all applicable boxes)*	☐ Taking water for new stock or domestic purposes ☐ Alterations of existing works ☐ Taking water under a water entitlement under the *Water Act 2000* ☒ Capturing agriculture or industrial effluent ☐ Rehabilitating degraded areas – applicable to Warrego, Paroo, Bulloo and Nebine Water Resource Plan areas only. The following documentation may be required as supporting information for the development application: • A certificate from a professional, qualified in soil science, stating the area concerned is degraded and the works will be an appropriate method for rehabilitating the area • Evidence the works are required under the *Land Act 1994* • Evidence the works have been approved for funding under the Primary Industries Productivity Enhancement Landcare Loans Scheme. ☐ Taking water required by an environmental authority under the *Environmental Protection Act 1994* or a development permit under the *Planning Act 2016* or the repealed *Sustainable Planning Act 2009.* A copy of the relevant environmental authority or development permit may be required as supporting information for the development application.
4) Provide details on the volume of water proposed to be taken or stored	25mm of runoff per runoff event (104ML from 419ha of land)
5) If the development application is supported by an authorisation to take overland flow water *(other than a resource allocation of entitlement)*, what is the nature of the authorisation? *(tick all applicable boxes)*	☐ Development application is not supported by an authorisation to take overflow water. ☐ For stock purposes or domestic purposes under section 20(4) of the *Water Act 2000.* ☐ For limited capacity works under a water-resource plan. ☒ To take water that is contaminated agricultural runoff water or tail water. ☐ To take water required by an environmental authority under the *Environmental Protection Act 1994* or a development permit under the *Planning Act 2016* or the repealed *Sustainable Planning Act 2009.* ☐ To take water using existing notified works or reconfiguration of existing works under a water resource plan.

RMA Engineers

CAPTURE OF CONTAMINATED AGRICULTURAL RUNOFF

Lots 2/RP18242, 2/A34925, 3347/A341649, 2/RP18249, 2/RP7475 Yarranlea Rd, Yarranlea

Date 30 May 2017

Project Number 11448

REPORT CONTROL SHEET

RMA ref. no:	11448
Project name:	Lots 2/RP18242, 2/A34925, 3347/A341649, 2/RP18249, 2/RP7475 Yarranlea Rd, Yarranlea
Report title:	Capture of Contaminated Agricultural Runoff
Report author:	s. 73(2) - Not relevant/ Out of scope

Document control						
Revision	**Author**	**Reviewer**	**Approved for issue**			
			Name	**RPEQ no.**	**Signature**	**Date**
0	s. 73(2) - Not relevant/ Out of scope			2210		

Disclaimer:

This report is a professional opinion based on the information available at the time of writing. It is not intended as a quote, guarantee or warranty and does not cover any latent defects.
This report will comment on the Civil infrastructure to the project and may outline probable costs but the extent of the commission of RMA does not extend to detailed cost feasibility, as such the costs should not be relied on for financing arrangements.
The conclusions in this report should not be read in isolation. We recommend that its contents be reviewed in person with the author so that the assumptions and available information can be discussed in detail to enable the reader to make their own risk assessment in conjunction with information from other sources.

Table of Contents

1. Introduction

1.1 Site Location

The site is located on Yarranlea Rd, Yarranlea, near the intersection with St Helen's Road. The property descriptions are Lots 2/RP18242, 2/A34925, 3347/A341649, 2/RP18249 and 2/RP7475.

SmartMaps of the properties and surrounds are in **Appendix A.** The locality plan is in **Appendix B.**

1.2 Overview

The site is situated on the floodplain of the Upper Condamine River in the Condamine-Balonne catchment on the Pittsworth floodplain.

The property is an existing grain farming property. There is no existing irrigation infrastructure and contaminated runoff currently discharges to downstream properties.

1.3 General topography

The natural fall on the subject property is west and north.

1.4 Proposed Works

The proposed works are to capture the contaminated agricultural runoff from farming operations on the property for re-use. The works include tail drains, low mounds and a sump and pumped storage.

The storage is located clear of the mapped waterway crossing Lot 2/RP18242.

Tail drains and mounds are generally low and are sized to intercept only the first 25mm of run-off from the property. Larger surface flow events will overtop the tail drains and mounds and flow to downstream properties in a similar manner to existing.

Pumping of captured runoff will be managed to minimise impacts on external overland flows.

Sizing of the various components and estimates of annual capture have been determined using a 2D hydraulic model and a daily water balance model.

Details are provided in the following sections.

2. Capture analysis

2.1 Analysis methodology

In order to assess the likely volumes of contaminated runoff generated from the site, and consequential re-use potential, a daily water balance model was set up.

Using historical rainfall records, the water balance model calculates daily run-off from the site, tracks capture, storage and re-use volumes, and assists in determining optimum storage and re-use potential. The model tracks only direct runoff from the site. External runoff is assumed to be passed through.

The model is an Excel spreadsheet and can be supplied for verification on request.

2.2 Catchment

The catchment boundary was adopted as the lot boundaries approximately as indicated in **Figure 1**.

Figure 1: Catchment boundaries

2.3 Rainfall data

Rainfall data adopted in this analysis was obtained from the Bureau of Meteorology for the nearest suitable station (41082 - Pittsworth). The station has data records extending back to 1887, however only records for the last 50 years were used in the analysis.

2.4 Run-off calculations

Rainfall was converted to run-off using the K factor (USDA Model) method outlined in the Water Resources Commission Farm Water Supplies Manual 1992 (Section 1.3).

Catchment parameters adopted in the analyses are detailed in **Table 1** below.

Table 1: Catchment parameters

Catchment area (ha)	Soil group	Hydrologic condition	Fraction impervious	Land use or cover
400	C	Good	0	Crops (Small grain, straight row)

2.5 Losses

The model ignored seepage but included storage evaporation losses using BOM data for the locality and the calculated surface area of the storage each analysis day.

2.6 Capture philosophy

It is understood that the limits for capture of contaminated agricultural runoff relate to individual runoff events and are not annual limits. Capture of 25mm of runoff from a 400ha property equates to a capture volume of 100 ML (per event).

The water balance model considered alternative definitions of “individual runoff event” by regarding rainfall which occurred on consecutive or nearly consecutive days as a single event.

Initial modelling using the historical rainfall records indicated that annual capture volumes were relatively insensitive over the modelled period when the period of dry days delineating runoff events was set to five days or more. For modelling purposes, five dry days was therefore adopted as the delineator of individual rainfall events.

2.7 Re-use of captured runoff

2.7.1 General philosophy

The model tracks capture, storage and re-use volumes for each day in the modelling period.

Captured runoff is pumped from the sump if there is available water and if the storage is not full. Re-use is removed from the storage if there is water available and if there is irrigation demand in accordance with the adopted annual irrigation pattern.

“Typical” annual desired irrigation patterns were applied for each of two types of crop – cotton and wheat. Irrigation demand used complex decision matrices based on antecedent rainfall, crop type and time of year. Details are provided in **Appendix C**.

2.8 Model analyses

Runoff modelling investigated the relationship between storage volume, re-use irrigated area and irrigation reliability for cotton and wheat crop types and for historical data periods from 10 years to 50 years.

The modelling indicated that a storage size of around 200 ML is about the “sweet spot” with capture limited to 100ML from an individual runoff event.

3. Surface flow modelling

3.1 General

To assess surface flow patterns across the site for both the existing situation and with tailwater capture infrastructure in place, a 2D (Tuflow) hydraulic model was set up.

3.2 Model structure

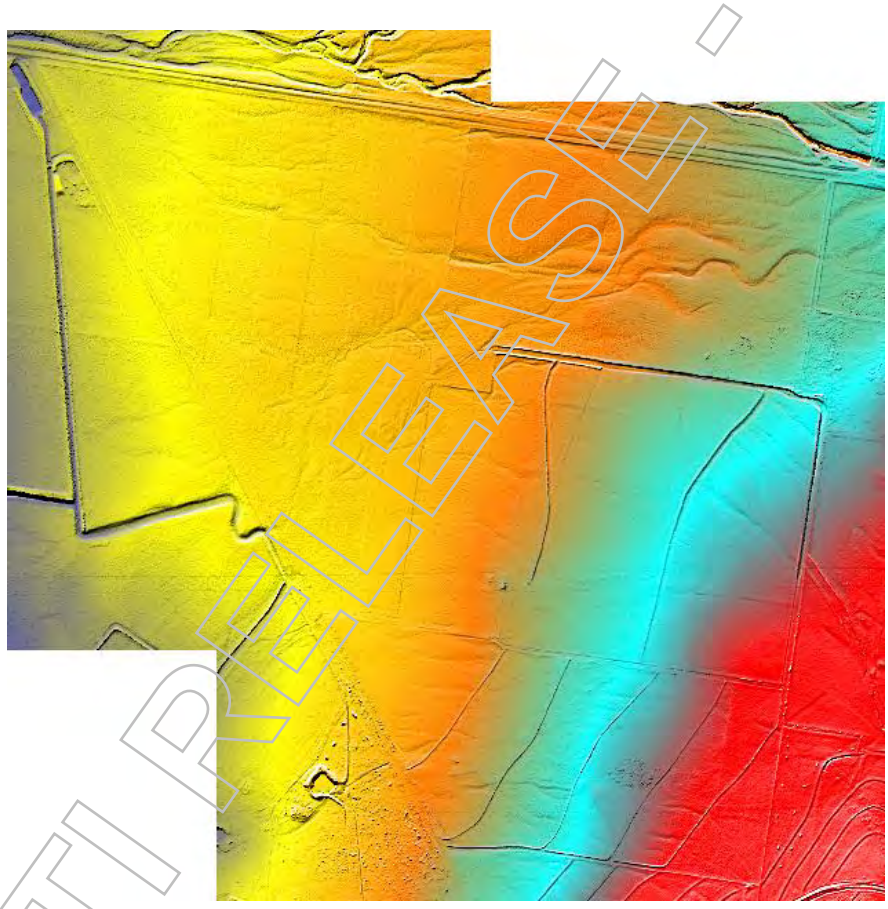
Base topography for the modelling was Lidar survey obtained from the Department of Natural Resources and Mines (2013 survey).

Tailwater capture and storage was modelled in 12D software and added to the base Tuflow model to assess and design those components. The pump link to the storage dam was also included in the model.

A relatively fine 2m grid spacing was adopted and rain was applied as “rain on grid”.

Figure 2 below illustrates the base topography.

Figure 2: 2D hydraulic model topography - existing



3.3 Hydrology

The proposal is to capture only the first 25mm of contaminated surface runoff from the site.

The yield modelling demonstrates that events resulting in runoff up to 25mm can occur, on average, several times a year. These events are therefore smaller and more frequent than the standard design events commonly used for road or urban drainage.

For the surface runoff modelling, a "design event" was chosen using the following process:

- Review the daily water balance model and select events which result in a modelled runoff of 25 – 30mm
- With each event, review six minute pluviograph data available from nearby BOM stations for completeness, discounting any event where complete six minute data is not available

A number of events were considered, but six minute pluviograph data for most was either non-existent or incomplete.

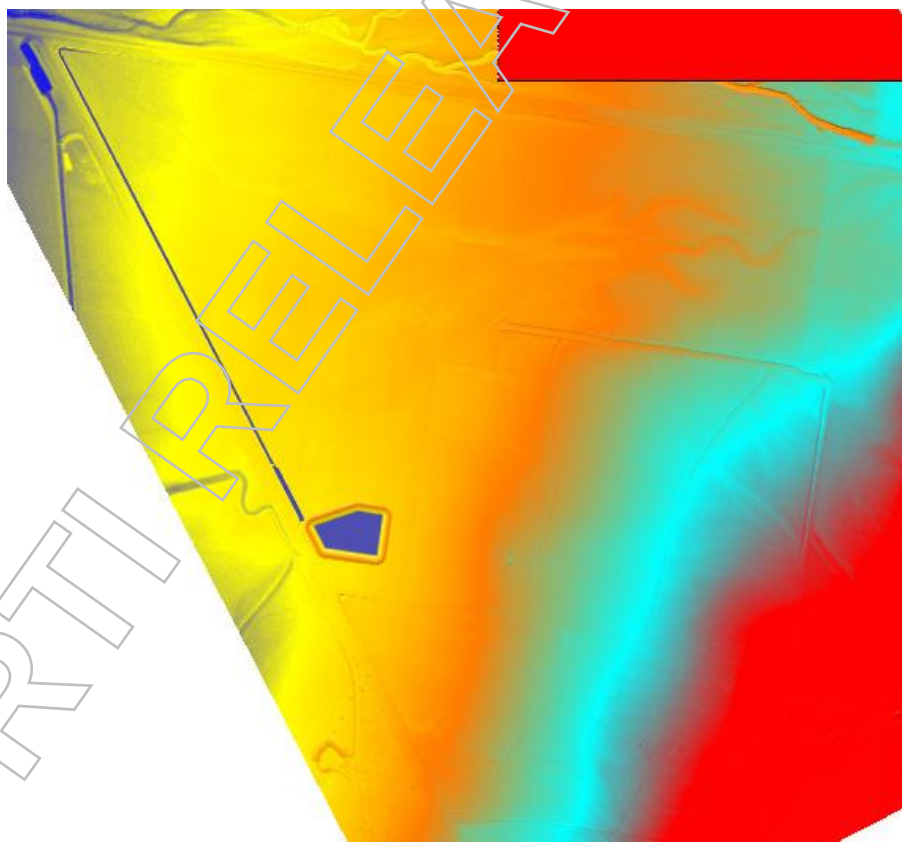
A suitably complete record of rainfall in the period 19 - 20 November 2008 (one of the selected 25mm runoff events) was, however, available from the Clifton recording station. The pattern was adopted as the design pattern.

Initial and continuing losses were applied to the recorded hyetograph such that the net rainfall for the event matched the runoff for the event in the daily balance model.

3.4 Proposed works

Figure 3 below illustrates the model topography with the capture and storage works included.

Figure 3: 2D hydraulic model topography – proposed



3.5 Maximum flow depths

Figure 4 below illustrates the modelled maximum flow depths for the design event with the proposed works.

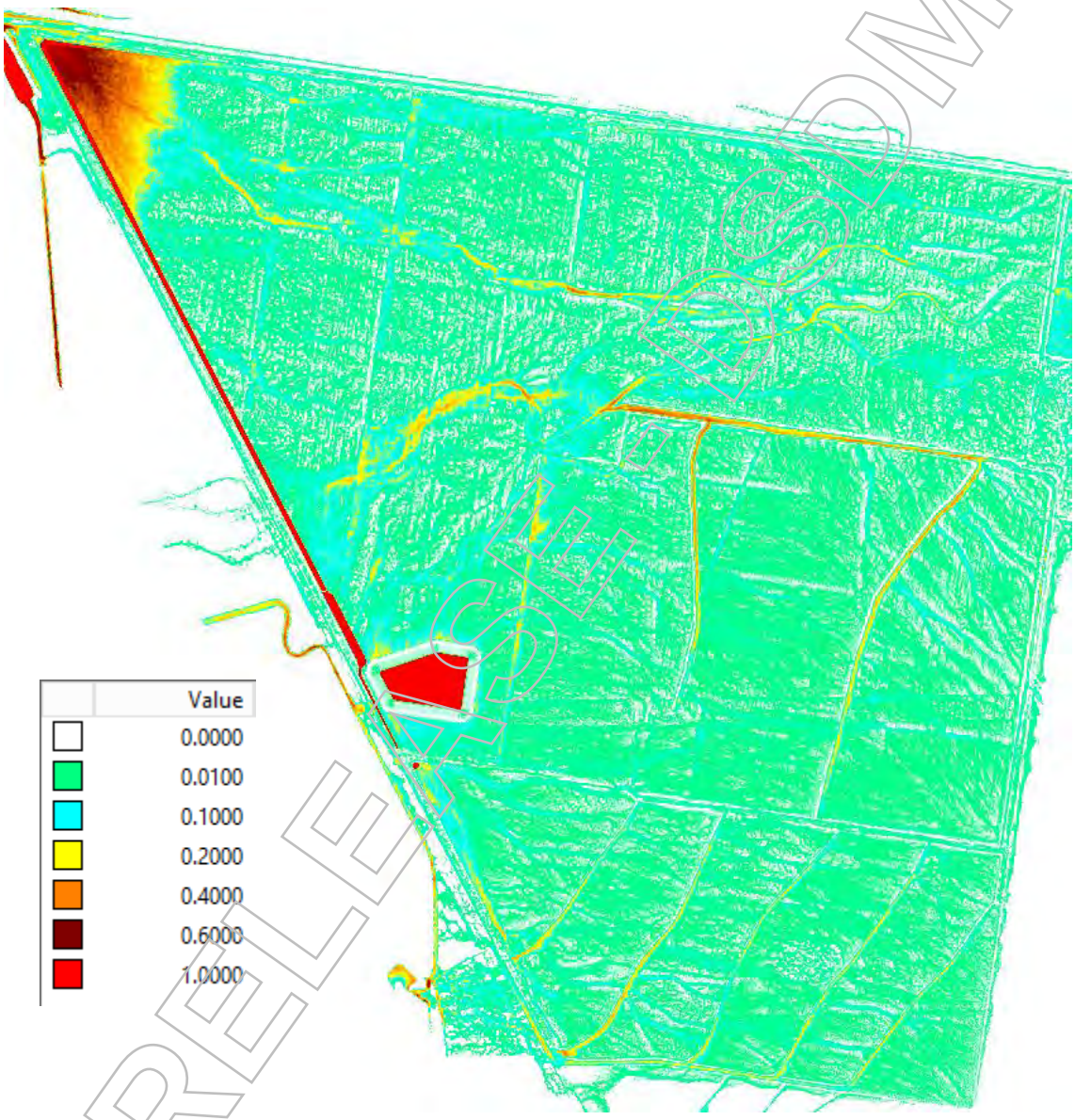


Figure 4: Maximum flow depths – design event

4. Proposed works

4.1 General

The proposed capture works include low mounds, a tailwater drain, pump sump and storage dam. Irrigation works to distribute captured runoff for re-use will also be required, but designs have not been finalised as yet.

Concept details of the proposed works are provided on the drawings in **Appendix D**.

4.2 South of Murlaggan Road

South of Murlaggan Road, the works consist of low mounds (typically 300mm high), and a small sump at the intersection of Murlaggan and Yarranlea Roads. Captured runoff flows from the sump, by gravity, under Murlaggan Road via a small RCBC discharging to a small open drain which flows to the pump sump.

The mound extends along the full frontage of Lot 2/RP7475 and has a neat fill volume of approximately 2000m^3.

4.3 North of Murlaggan Road

4.3.1 General

The main capture and storage infrastructure is located north of Murlaggan Road.

4.3.2 Tailwater drain and mounds

A tailwater drain extends south from the north west corner of Lot 2/RP18242, at the intersection of St Helens and Yarranlea Roads, approximately 1700 m to the sump. The base of the drain is level to minimise its overall depth as the flow direction is against the natural fall of the land.

The neat cut volume of the tailwater drain is approximately 52,500m^3.

The mound extends about 450m east along St Helens Road and about 520m south along Yarranlea Road and has a neat fill volume of approximately 1,500m^3.

4.3.3 Sump and backflow prevention

A pump sump is located across the mapped “waterway”.

The sump is constructed entirely below the existing surface (no embankments). Larger flows will pass directly over the sump in the same manner as existing, without diversion. The neat volume of the sump is approximately 14,200m^3.

The tailwater drain is connected to the sump via a small RCBC with a flap gate. This arrangement will prevent the reverse flow from the sump towards the north which would otherwise occur. Reverse flow in the tailwater drain would substantively change overland flow patterns in larger events.

4.3.4 Dam

The storage dam is located outside the limits of the mapped “waterway” and does not substantively interfere with existing surface flow patterns. The dam is filled by pumping alone and does not gravity capture any surface runoff.

The neat fill volume of the dam embankment (above natural surface level) is 41,500m^3.

4.3.5 Pump

A 26 inch pump with a daily capacity of 80 ML is currently proposed.

4.3.6 Irrigated area and re-use infrastructure

The final location of the area to be irrigated with captured runoff, and details of the distribution infrastructure are yet to be determined.

4.4 Management of capture volumes

The dam has a storage volume of 220 ML at full supply level (700mm freeboard).

When the tailwater drain, mound and sump are full to capacity, the stored volume is estimated to be 57 ML.

To limit capture in any event to 100 ML, the following management strategy is proposed:

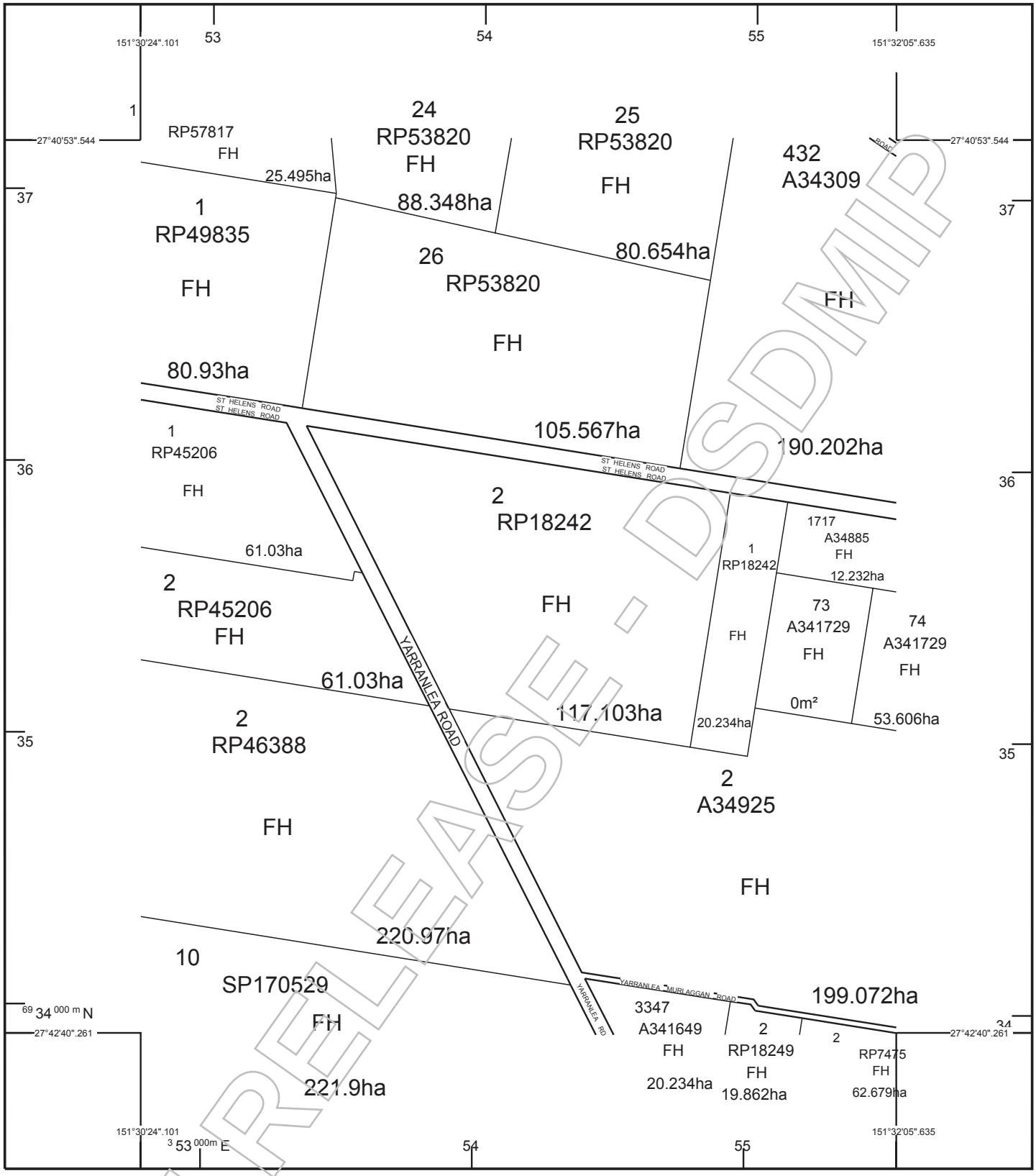
- When runoff commences and the water level in the sump rises, pump to the storage until a total of 43 ML has been pumped (at best, with continuity of flow, a little over 10 hours)
- Cease pumping until runoff ceases
- Pump out the tailwater drain and sump (57 ML).

The total pumped from a runoff event is therefore limited to 100 ML.

5. Conclusion

The proposed works comply with the Water Resource (Condamine and Balonne) Plan 2004 in that only the first 25mm of contaminated runoff is captured. The works and management arrangements will not interfere with overland flow from external catchments.

Appendix A SmartMaps



STANDARD MAP NUMBER
9242-43341

0 400 800 1200 1600 2000 m

HORIZONTAL DATUM:GDA94 ZONE:56 SCALE 1 : 20000

MAP WINDOW POSITION & NEAREST LOCATION

151°31'14".868
27°41'46".903
YARRANLEA
4.43 KM

SUBJECT PARCEL DESCRIPTION

DCDB

Lot/Plan	2/RP18242
Area/Volume	117.103ha
Tenure	FREEHOLD
Local Government	TOOWOOMBA REGIONAL
Locality	YARRANLEA
Segment/Parcel	39703/28

CLIENT SERVICE STANDARDS

PRINTED (dd/mm/yyyy) 15/05/2017

DCDB 13/05/2017 (Lots with an area less than 3000m² are not shown)

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GDA

SmartMap
An External Product of SmartMap Information Services
Based upon an extraction from the Digital Cadastral Data Base

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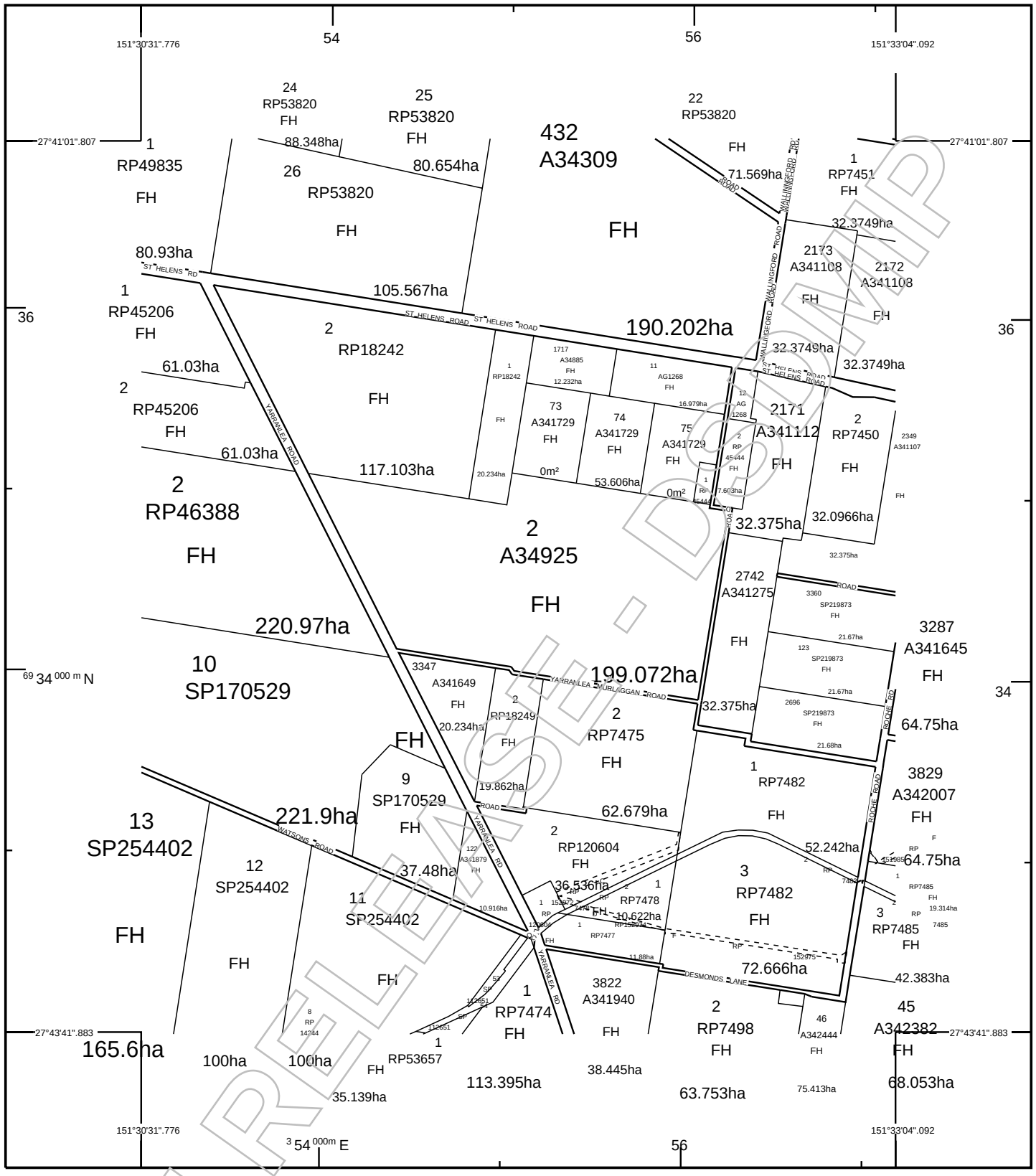

STANDARD MAP NUMBER
9242-43342

0 600 1200 1800 2400 3000 m

HORIZONTAL DATUM:GDA94 ZONE:56 SCALE 1 : 30000

SmartMap

An External Product of
SmartMap Information Services

Based upon an extraction from the
Digital Cadastral Data Base

MAP WINDOW POSITION & NEAREST LOCATION

151°31'47".934
27°42'21".845
YARRANLEA
3.06 KM

SUBJECT PARCEL DESCRIPTION

DCDB

Lot/Plan	2/A34925
Area/Volume	199.072ha
Tenure	FREEHOLD
Local Government	TOOWOOMBA REGIONAL
Locality	YARRANLEA
Segment/Parcel	39703/27

CLIENT SERVICE STANDARDS

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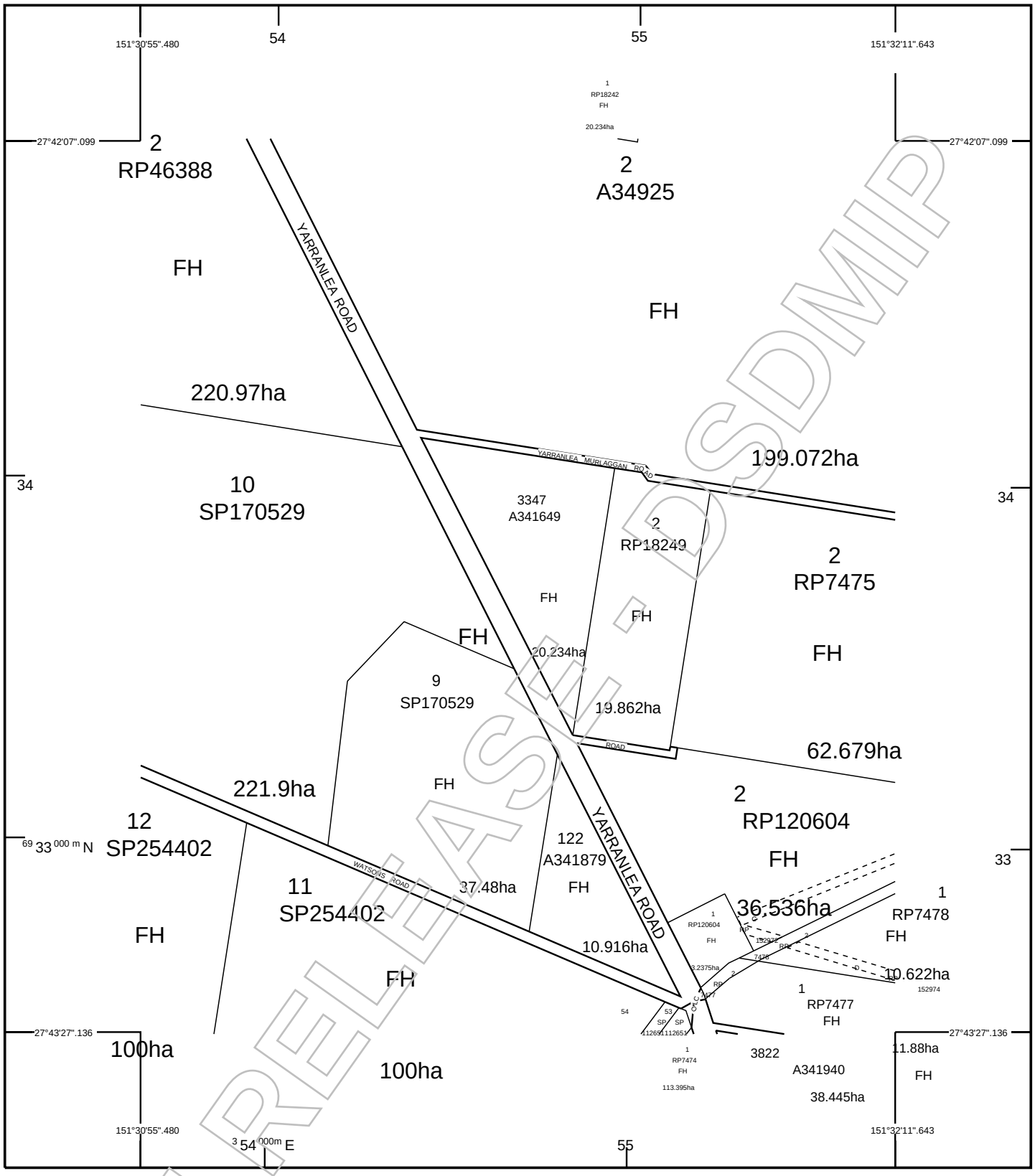
GDA

Queensland Government



STANDARD MAP NUMBER
9242-43342

0 300 600 900 1200 1500 m

HORIZONTAL DATUM:GDA94 ZONE:56 SCALE 1 : 15000

MAP WINDOW POSITION & NEAREST LOCATION

151°31'33".562
27°42'47".118
YARRANLEA
3.05 KM

SUBJECT PARCEL DESCRIPTION

DCDB

Lot/Plan	3347/A341649
Area/Volume	20.234ha
Tenure	FREEHOLD
Local Government	TOOWOOMBA REGIONAL
Locality	YARRANLEA
Segment/Parcel	39703/18

CLIENT SERVICE STANDARDS

PRINTED (dd/mm/yyyy) 15/05/2017

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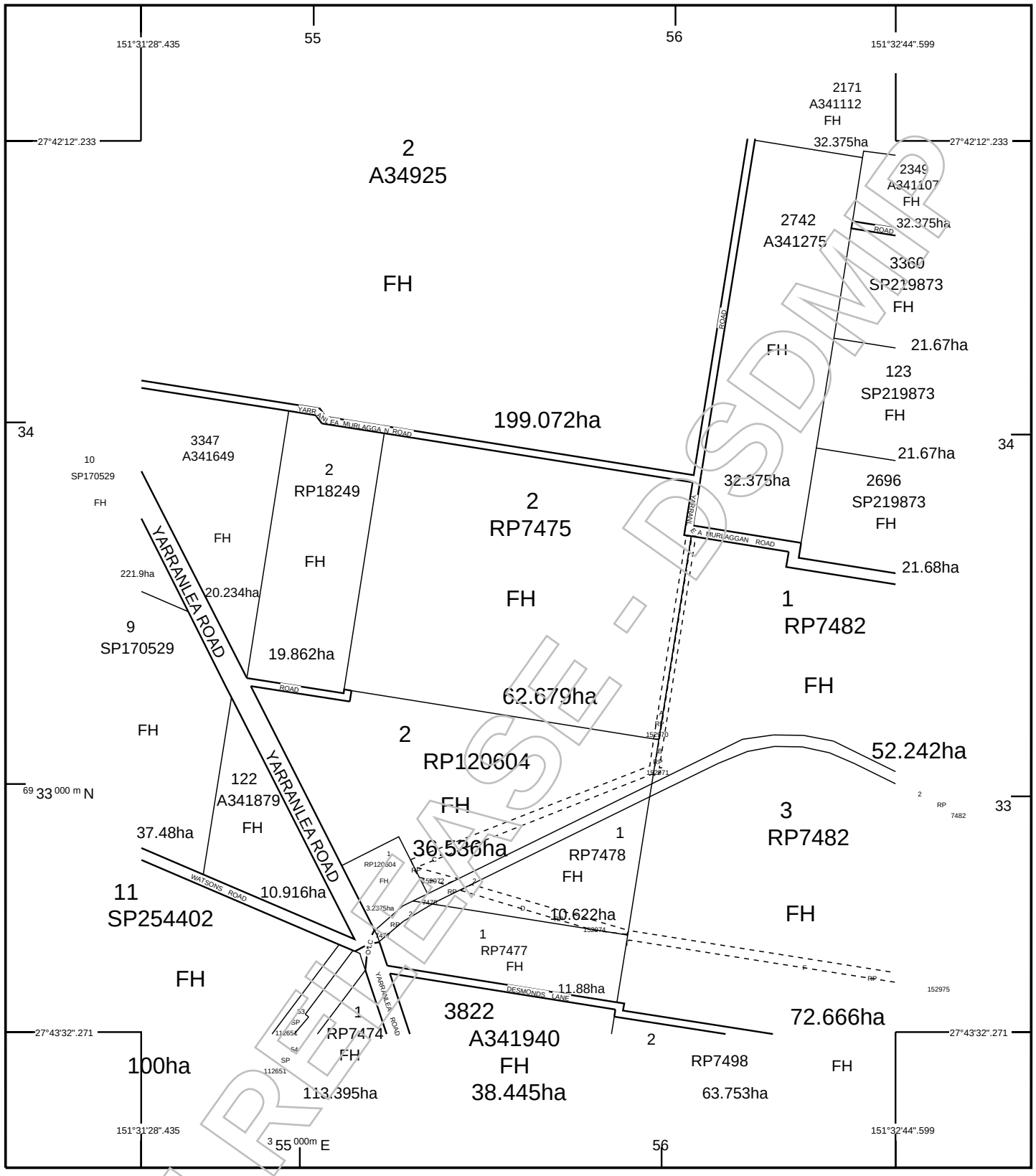

STANDARD MAP NUMBER
9242-43313

0 300 600 900 1200 1500 m

HORIZONTAL DATUM:GDA94 ZONE:56 SCALE 1 : 15000

MAP WINDOW POSITION & NEAREST LOCATION

151°32'06".517
27°42'52".252
YARRANLEA
2.15 KM

SUBJECT PARCEL DESCRIPTION

DCDB

Lot/Plan	2/RP7475
Area/Volume	62.679ha
Tenure	FREEHOLD
Local Government	TOOWOOMBA REGIONAL
Locality	YARRANLEA
Segment/Parcel	39703/16

CLIENT SERVICE STANDARDS

PRINTED (dd/mm/yyyy) 15/05/2017

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Based upon an extraction from the Digital Cadastral Data Base

Queensland Government

Appendix B Locality plan

SITE LAYOUT PLAN

Scale 1:10000(A1)

LEGEND:

- Site Property Boundary
- Adjoining Property Boundary
- Existing Sealed Road
- Existing Unformed Road
- Proposed North Mound
- Proposed North Drain
- Proposed North Sump
- Proposed South Mound
- Proposed Ring Tank
- Lidar Minor Contours
- 414.00 Lidar Major Contours

NOTES:

1. Intervals between contours – 1.0 m Contours are Lidar surface levels.
2. Plans to be plotted in colour to distinguish design elements.

EXISTING SERVICES NOTES:

1. The Contractor is to confirm the location of all services prior to commencing any construction works or ordering any materials.
2. The Contractor is to contact Dial Before You Dig on 1100 prior to commencing any construction works.
3. While all due care is taken by RMA in confirming the location of existing services, it is the Contractor's responsibility to confirm these service locations. In some instances service may be omitted from RMA's drawings.
4. The Contractor is responsible for arranging the locating of all services by the relevant Authorities.
5. A representative for each service provider to be present on site when working within 3.0m of each existing service.
6. The Contractor is to confirm the location & level of all sewer and drainage connection points prior to commencing any construction works or ordering any materials.
7. Should invert levels or location of any sewer or drainage connection points differ to that indicated on RMA's drawings then the Certifying Engineer shall be notified immediately.
8. Any works required to or near an Authorities services shall be carried out to the approval of, under the supervision of and to the standard required by the Authority.

0 100 200 300 400m

1:10000(A1) 1:20000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
0	FOR APPROVAL	26/05/17	NGT	JRB	AEL	AEL

NOTE: FIGURED DIMENSIONS TO TAKE PRECEDENCE OVER SCALED MEASUREMENTS. VERIFY ALL ON SITE DIMENSIONS & LEVELS PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

RMA Engineers
www.rmaeng.com.au

CLIENT

PROJECT: WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

R.P.E.Q.

TITLE: SITE LAYOUT PLAN

PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0101
ISSUE 0

Appendix C Irrigation decision matrices

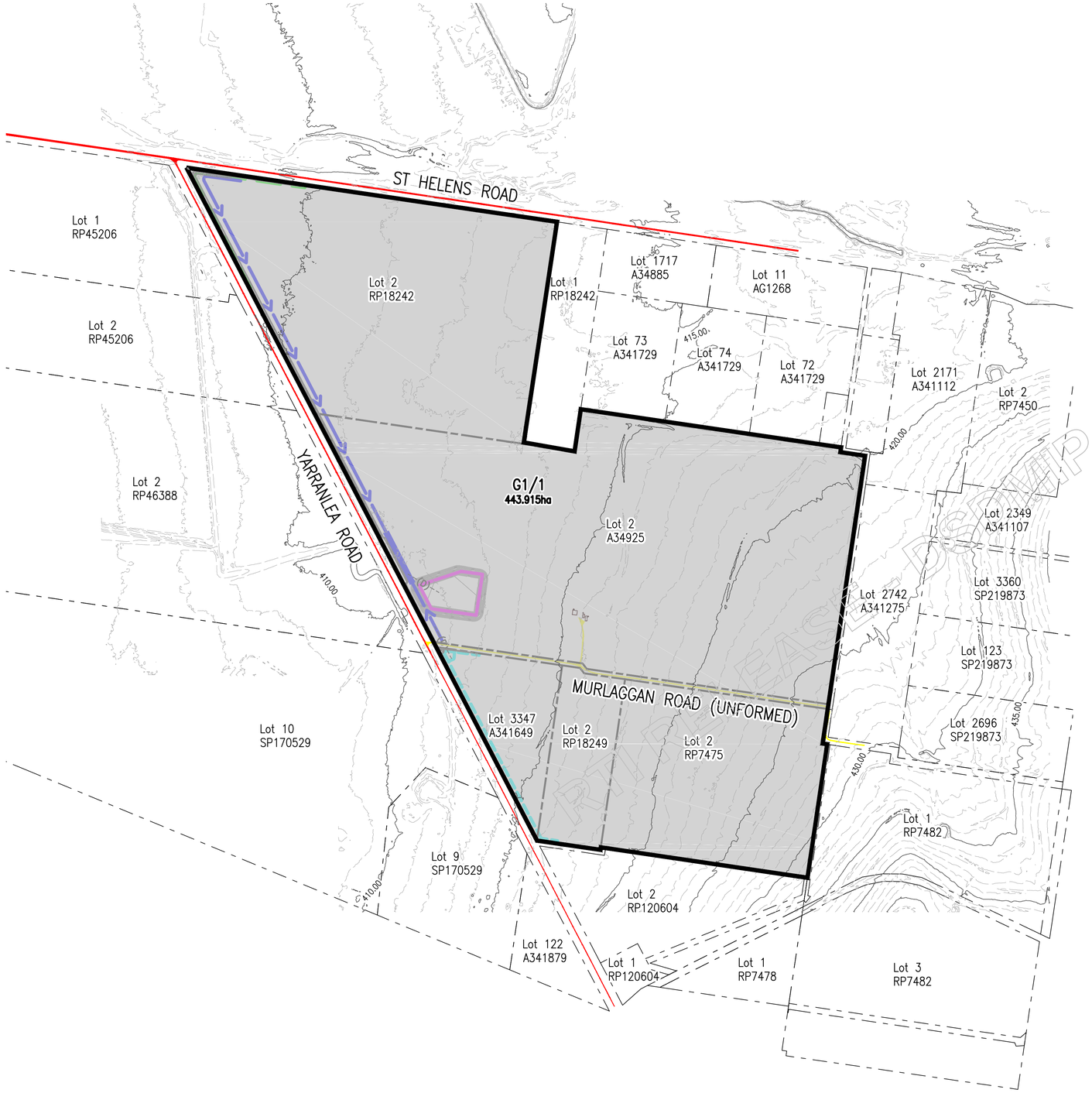
Irrigation decision matrix - Wheat

Month	Irrigation and rainfall in previous 30 days (mm)	Daily application rate	Application days
January	>=0	-	-
February	>=0	-	-
March	>=0	-	-
April	>=0	-	-
May	>=0	-	-
June	>=0	-	-
July	<=5	25	2
	>5 <=25	15	2
	>25	-	-
August	<=5	25	2
	>5 <=25	15	2
	>25 <=50	25	1
	>50	-	-
September	<=50	30	3
	>50 <=1000	30	3
	>100	-	-
October	<=50	30	3
	>50 <=1000	30	3
	>100	-	-
November	>=0	-	-
December	>=0	-	-

Irrigation decision matrix - Cotton

Month	Irrigation and rainfall in previous 30 days (mm)	Daily application rate	Application days
January	<=5	50	2
	>5 <=50	50	2
	>50 <=100	25	1
	>100	-	-
February	<=5	50	2
	>5 <=50	50	2
	>50 <=100	25	1
	>100	-	-
March	>=0	-	-
April	>=0	-	-
May	>=0	-	-
June	>=0	-	-
July	<=5	25	2
	>5 <=25	15	2
	>25	-	-
August	<=5	25	2
	>5 <=25	15	2
	>25 <=50	25	1
	>50	-	-
September	<=50	50	3
	>50	-	-
October	<=5	50	3
	>5 <=50	30	2
	>50 <=70	25	1
	>70	-	-
November	<=5	50	2
	>5 <=50	50	2
	>50	-	-
December	<=5	50	2
	>5 <=50	50	2
	>50 <=100	20	1
	>100	-	

Appendix D Concept plans



SITE CATCHMENT PLAN

Scale 1:10000(A1)

LEGEND:

- Site Property Boundary
- Adjoining Property Boundary
- Existing Sealed Road
- Existing Unformed Road
- G1/1 0.00ha — Catchment and Area
- Catchment Boundary
- Proposed North Mound
- Proposed North Drain
- Proposed North Sump
- Proposed South Mound
- Proposed Ring Tank
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- 414.00 — Lidar Major Contours

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0 100 200 300 400m

1:10000(A1) 1:20000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
0	FOR APPROVAL	26/05/17	NGT	JRB	AEL	AEL

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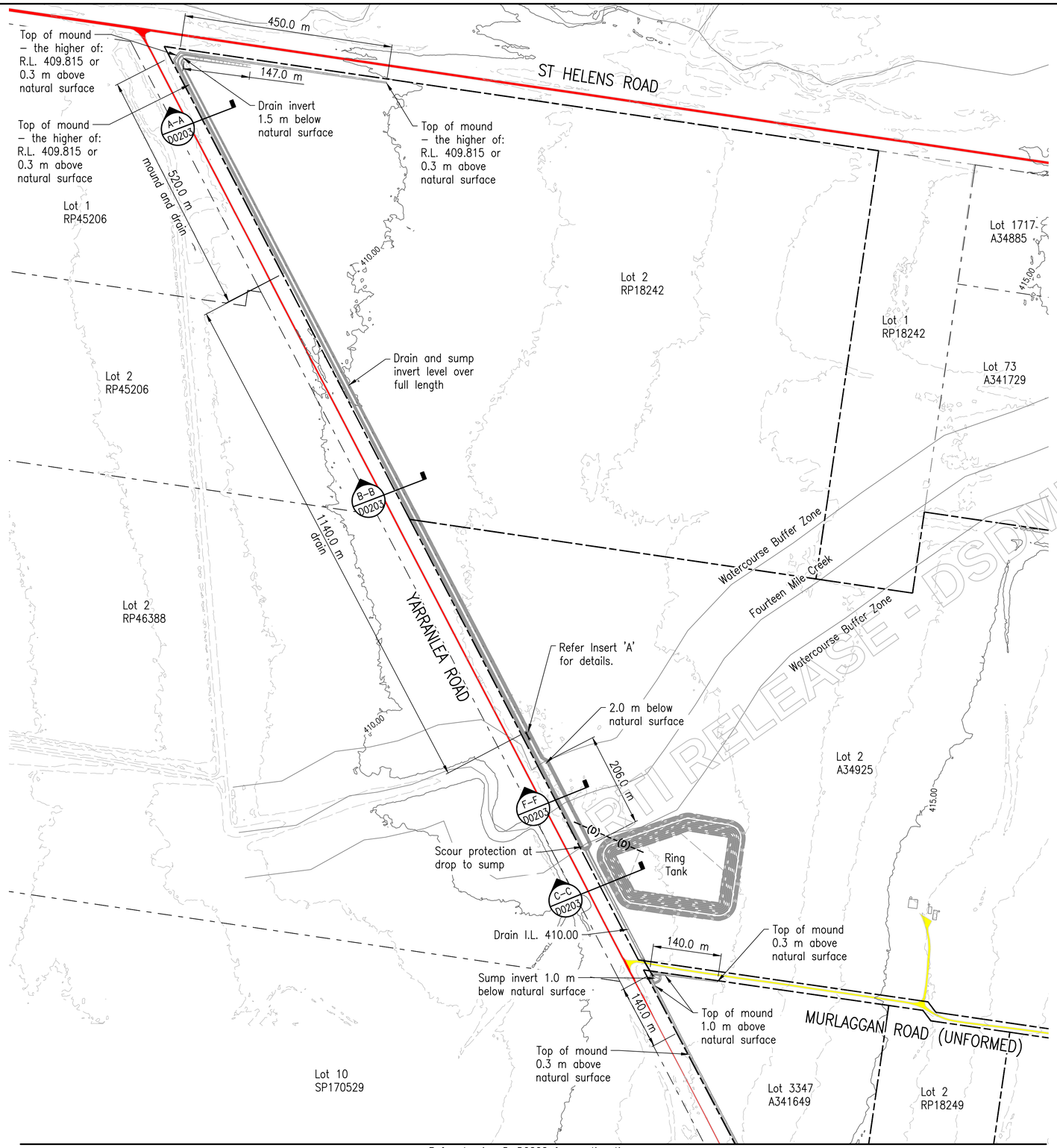
PROJECT
WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

TITLE
SITE CATCHMENT PLAN

R.P.E.Q.

PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0102
ISSUE 0



DRAINAGE NOTES:

(In these notes, the terms 'Superintendent' or 'Supervising Engineer' means the person responsible for site decisions relating to the design intent. That person may or may not be a formal 'Superintendent' as defined in General Conditions of Contract such as AS2124.)

GENERAL

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3. The erosion management of the site, its surroundings, the transportation and deposition of silt is the responsibility of the Contractor.
4. All dimensions are in metres.

PIPES

5. Drainage pipe lines located in roadworks are to be backfilled to box level using approved material with a minimum C.B.R of 15%, placed in layers not exceeding 150mm loose and compacted until dry density is not less than 100% of the material's dry density.
6. For typical trenching detail refer to Toowoomba Regional Council Standard Drawing 101394–001.
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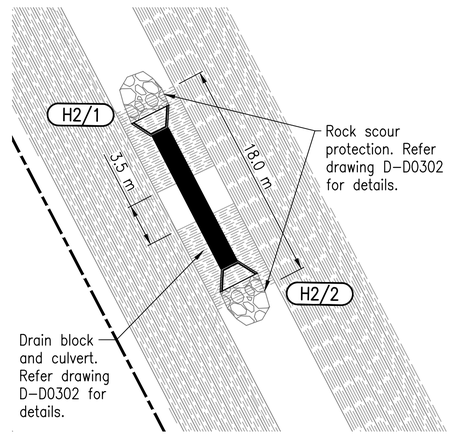
LEGEND:

- Site Property Boundary
- Adjoining Property Boundary
- Existing Sealed Road
- Existing Unformed Road
- H1/2 — Headwall Label
- Lidar Minor Contours
- 414.00 — Lidar Major Contours

NOTES:

1. Intervals between contours – 1.0 m Contours are Lidar surface levels.
2. Plans to be plotted in colour to distinguish design elements.



INSERT 'A'
Scale 1:250 (A1)

EXISTING SERVICES NOTES:

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LAYOUT PLAN – SHEET 1

Scale 1:5000(A1)

0 2 4 6 8 10m
1:250(A1) 1:500(A3)

0 50 100 150 200m
1:5000(A1) 1:10000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
0	FOR APPROVAL	26/05/17	NGT	JRB	AEL	AEL

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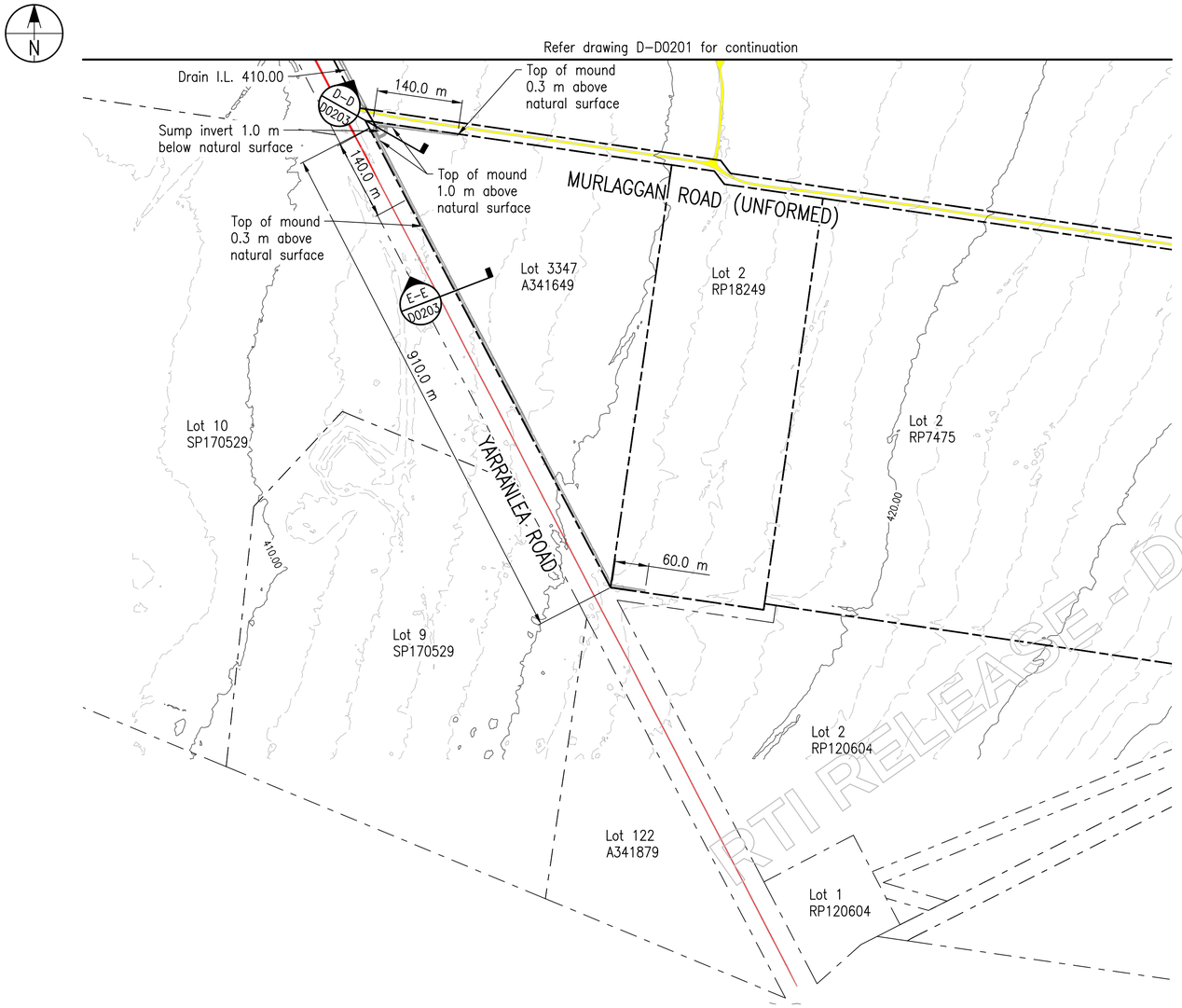
PROJECT
WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

TITLE
LAYOUT PLAN - SHEET 1

R.P.E.Q.

PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0201
ISSUE 0



LAYOUT PLAN – SHEET 2

Scale 1:5000(A1)

LEGEND:

- Site Property Boundary
- Adjoining Property Boundary
- Existing Sealed Road
- Existing Unformed Road
- Lidar Minor Contours
- 414.00 Lidar Major Contours

NOTES:

1. Intervals between contours – 1.0 m Contours are Lidar surface levels.
2. Plans to be plotted in colour to distinguish design elements.

DRAINAGE NOTES:

(In these notes, the terms 'Superintendent' or 'Supervising Engineer' means the person responsible for site decisions relating to the design intent. That person may or may not be a formal 'Superintendent' as defined in General Conditions of Contract such as AS2124.)

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PIPES

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6. For typical trenching detail refer to Toowoomba Regional Council Standard Drawing 101394–001.
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0 50 100 150 200m

1:5000(A1) 1:10000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
0	FOR APPROVAL	26/05/17	NGT	JRB	AEL	AEL

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s. 73(2) - Not relevant/ Out of scope

PROJECT
WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

TITLE
LAYOUT PLAN - SHEET 2

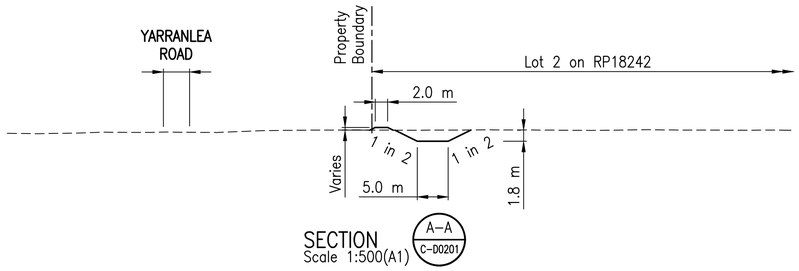
R.P.E.Q.

PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0202
ISSUE 0

LEGEND:

Natural Surface

Design Surface



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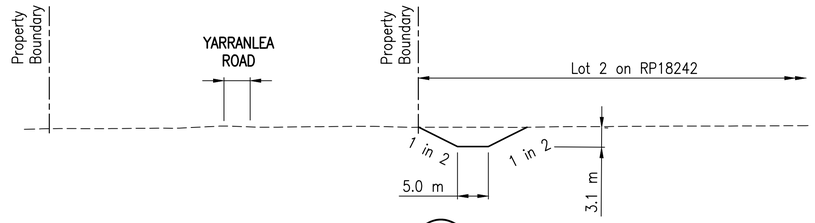

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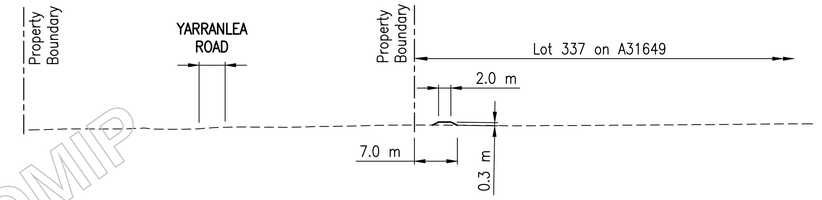

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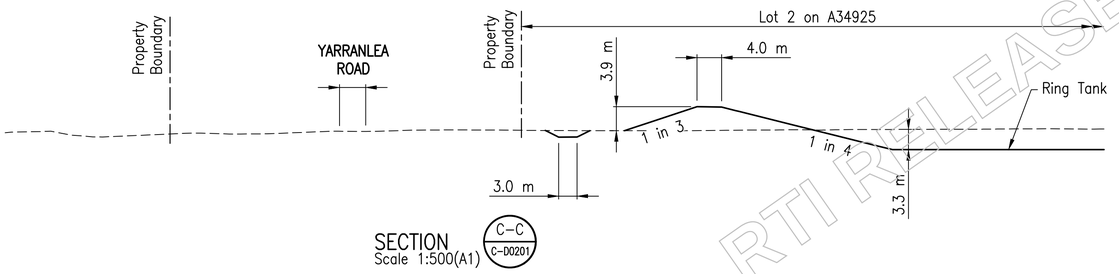

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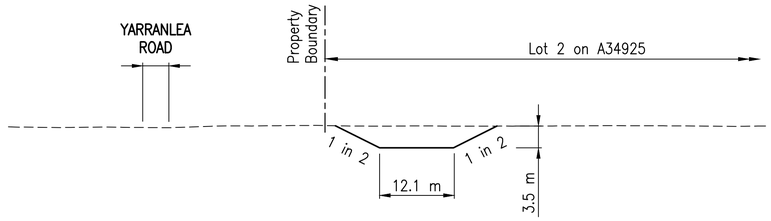

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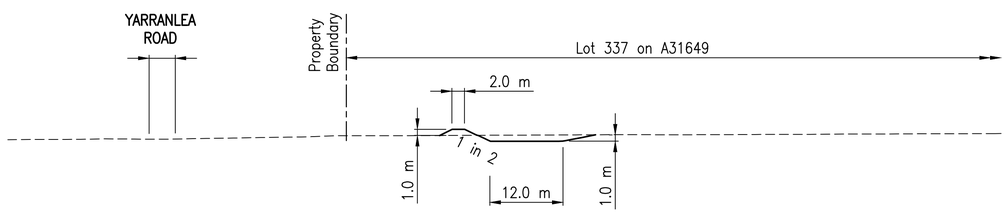

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1:500(A1) 1:1000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
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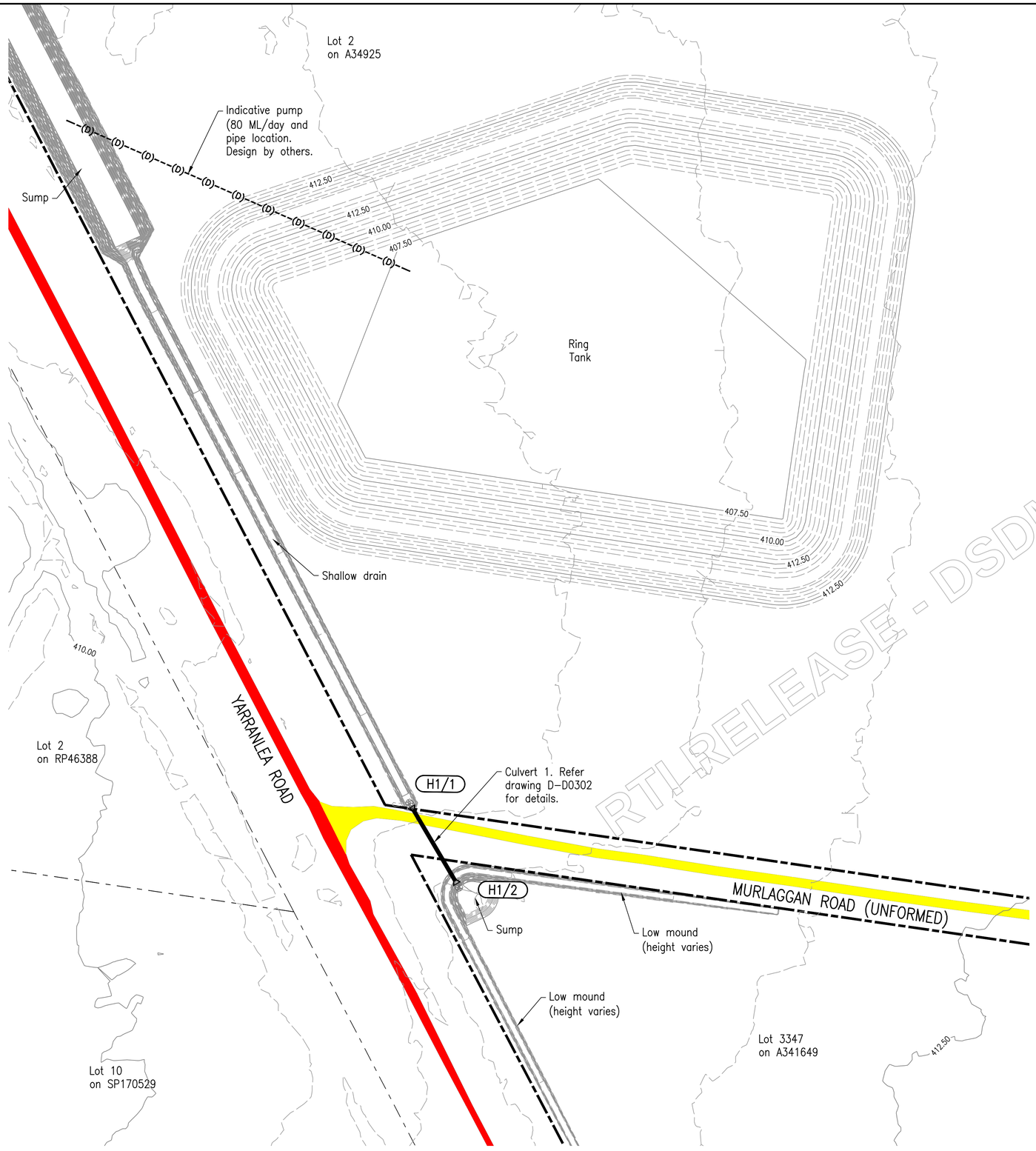
PROJECT
WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

TITLE
SECTIONS

R.P.E.Q.

PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0203
ISSUE 0



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4. All dimensions are in metres.

PIPES

5. This drawing is to be read in conjunction with the stormwater drainage longitudinal sections. Pipe sizes are listed on the longitudinal sections.
6. All stormwater drainage pipes to be class 2 spigot and socket R.R.J R.C.P unless noted otherwise. Alternative products can be used subject to the prior approval of the Superintendent and Council.
7. Stormwater drainage pipe lines located in roadworks are to be backfilled to box level using approved material with a minimum C.B.R of 15%, placed in layers not exceeding 150mm loose and compacted until dry density is not less than 100% of the material's dry density.
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LEGEND:

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- Adjoining Property Boundary
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NOTES:

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DETAIL AT MURLAGGAN ROAD

Scale 1:1000(A1)

0 10 20 30 40m
1:1000(A1) 1:2000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
0	FOR APPROVAL	26/05/17	NGT	JRB	AEL	AEL

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PROJECT: WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

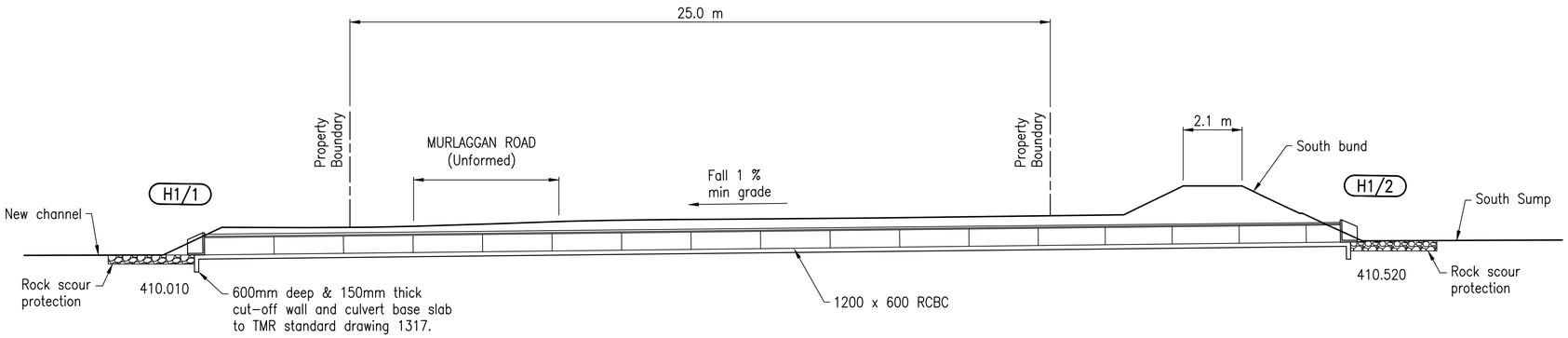
TITLE: DETAIL AT MURLAGGAN ROAD

R.P.E.Q.

PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0301
ISSUE 0

LEGEND:

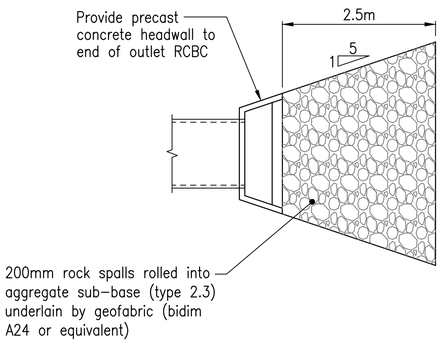
H1/2 Headwall Label



CULVERT 1 CROSS SECTION

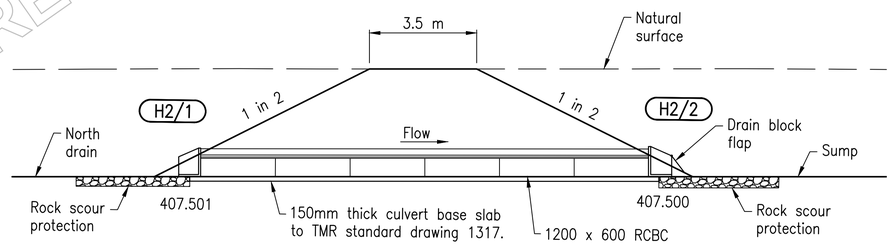
1:500 (A1)

1200 x 600 RCBC (17/1200 x 600)
(16/2.44 1/1.22)
Standard Drawings – 1316, 1317, 1319, 1320, 1359



TYPICAL OUTLET SCOUR PROTECTION

Do not scale



DRAIN BLOCK AND CULVERT CROSS SECTION

1:100 (A1)

1200 x 600 RCBC (6/1200 x 600)
Standard Drawings – 1316, 1317, 1319, 1320, 1359

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0 1 2 3 4m — 1:100(A1) 1:200(A3)

0 5 10 15 20m — 1:500(A1) 1:1000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
0	FOR APPROVAL	26/05/17	NGT	JRB	AEL	AEL

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s. 73(2) - Not relevant/ Out of scope

PROJECT
WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

TITLE
CULVERT DETAILS

R.P.E.Q.

PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0302
ISSUE 0

RMA Engineers

CAPTURE OF CONTAMINATED AGRICULTURAL RUNOFF

Lots 2/RP18242, 2/A34925, 3347/A341649, 2/RP18249, 2/RP7475 Yarranlea Rd, Yarranlea

Date 30 May 2017

Project Number 11448

REPORT CONTROL SHEET

RMA ref. no:	11448
Project name:	Lots 2/RP18242, 2/A34925, 3347/A341649, 2/RP18249, 2/RP7475 Yarranlea Rd, Yarranlea
Report title:	Capture of Contaminated Agricultural Runoff
Report author:	s. 73(2) - Not relevant/ Out of scope

Document control						
Revision	**Author**	**Reviewer**	**Approved for issue**			
			Name	**RPEQ no.**	**Signature**	**Date**
0	s. 73(2) - Not relevant/ Out of scope			2210		

Disclaimer:

This report is a professional opinion based on the information available at the time of writing. It is not intended as a quote, guarantee or warranty and does not cover any latent defects.
This report will comment on the Civil infrastructure to the project and may outline probable costs but the extent of the commission of RMA does not extend to detailed cost feasibility, as such the costs should not be relied on for financing arrangements.
The conclusions in this report should not be read in isolation. We recommend that its contents be reviewed in person with the author so that the assumptions and available information can be discussed in detail to enable the reader to make their own risk assessment in conjunction with information from other sources.

Table of Contents

1. Introduction

1.1 Site Location

The site is located on Yarranlea Rd, Yarranlea, near the intersection with St Helen's Road. The property descriptions are Lots 2/RP18242, 2/A34925, 3347/A341649, 2/RP18249 and 2/RP7475.

SmartMaps of the properties and surrounds are in **Appendix A.** The locality plan is in **Appendix B.**

1.2 Overview

The site is situated on the floodplain of the Upper Condamine River in the Condamine-Balonne catchment on the Pittsworth floodplain.

The property is an existing grain farming property. There is no existing irrigation infrastructure and contaminated runoff currently discharges to downstream properties.

1.3 General topography

The natural fall on the subject property is west and north.

1.4 Proposed Works

The proposed works are to capture the contaminated agricultural runoff from farming operations on the property for re-use. The works include tail drains, low mounds and a sump and pumped storage.

The storage is located clear of the mapped waterway crossing Lot 2/RP18242.

Tail drains and mounds are generally low and are sized to intercept only the first 25mm of run-off from the property. Larger surface flow events will overtop the tail drains and mounds and flow to downstream properties in a similar manner to existing.

Pumping of captured runoff will be managed to minimise impacts on external overland flows.

Sizing of the various components and estimates of annual capture have been determined using a 2D hydraulic model and a daily water balance model.

Details are provided in the following sections.

2. Capture analysis

2.1 Analysis methodology

In order to assess the likely volumes of contaminated runoff generated from the site, and consequential re-use potential, a daily water balance model was set up.

Using historical rainfall records, the water balance model calculates daily run-off from the site, tracks capture, storage and re-use volumes, and assists in determining optimum storage and re-use potential. The model tracks only direct runoff from the site. External runoff is assumed to be passed through.

The model is an Excel spreadsheet and can be supplied for verification on request.

2.2 Catchment

The catchment boundary was adopted as the lot boundaries approximately as indicated in **Figure 1**.

Figure 1: Catchment boundaries

2.3 Rainfall data

Rainfall data adopted in this analysis was obtained from the Bureau of Meteorology for the nearest suitable station (41082 - Pittsworth). The station has data records extending back to 1887, however only records for the last 50 years were used in the analysis.

2.4 Run-off calculations

Rainfall was converted to run-off using the K factor (USDA Model) method outlined in the Water Resources Commission Farm Water Supplies Manual 1992 (Section 1.3).

Catchment parameters adopted in the analyses are detailed in **Table 1** below.

Table 1: Catchment parameters

Catchment area (ha)	Soil group	Hydrologic condition	Fraction impervious	Land use or cover
400	C	Good	0	Crops (Small grain, straight row)

2.5 Losses

The model ignored seepage but included storage evaporation losses using BOM data for the locality and the calculated surface area of the storage each analysis day.

2.6 Capture philosophy

It is understood that the limits for capture of contaminated agricultural runoff relate to individual runoff events and are not annual limits. Capture of 25mm of runoff from a 400ha property equates to a capture volume of 100 ML (per event).

The water balance model considered alternative definitions of “individual runoff event” by regarding rainfall which occurred on consecutive or nearly consecutive days as a single event.

Initial modelling using the historical rainfall records indicated that annual capture volumes were relatively insensitive over the modelled period when the period of dry days delineating runoff events was set to five days or more. For modelling purposes, five dry days was therefore adopted as the delineator of individual rainfall events.

2.7 Re-use of captured runoff

2.7.1 General philosophy

The model tracks capture, storage and re-use volumes for each day in the modelling period.

Captured runoff is pumped from the sump if there is available water and if the storage is not full. Re-use is removed from the storage if there is water available and if there is irrigation demand in accordance with the adopted annual irrigation pattern.

“Typical” annual desired irrigation patterns were applied for each of two types of crop – cotton and wheat. Irrigation demand used complex decision matrices based on antecedent rainfall, crop type and time of year. Details are provided in **Appendix C**.

2.8 Model analyses

Runoff modelling investigated the relationship between storage volume, re-use irrigated area and irrigation reliability for cotton and wheat crop types and for historical data periods from 10 years to 50 years.

The modelling indicated that a storage size of around 200 ML is about the “sweet spot” with capture limited to 100ML from an individual runoff event.

3. Surface flow modelling

3.1 General

To assess surface flow patterns across the site for both the existing situation and with tailwater capture infrastructure in place, a 2D (Tuflow) hydraulic model was set up.

3.2 Model structure

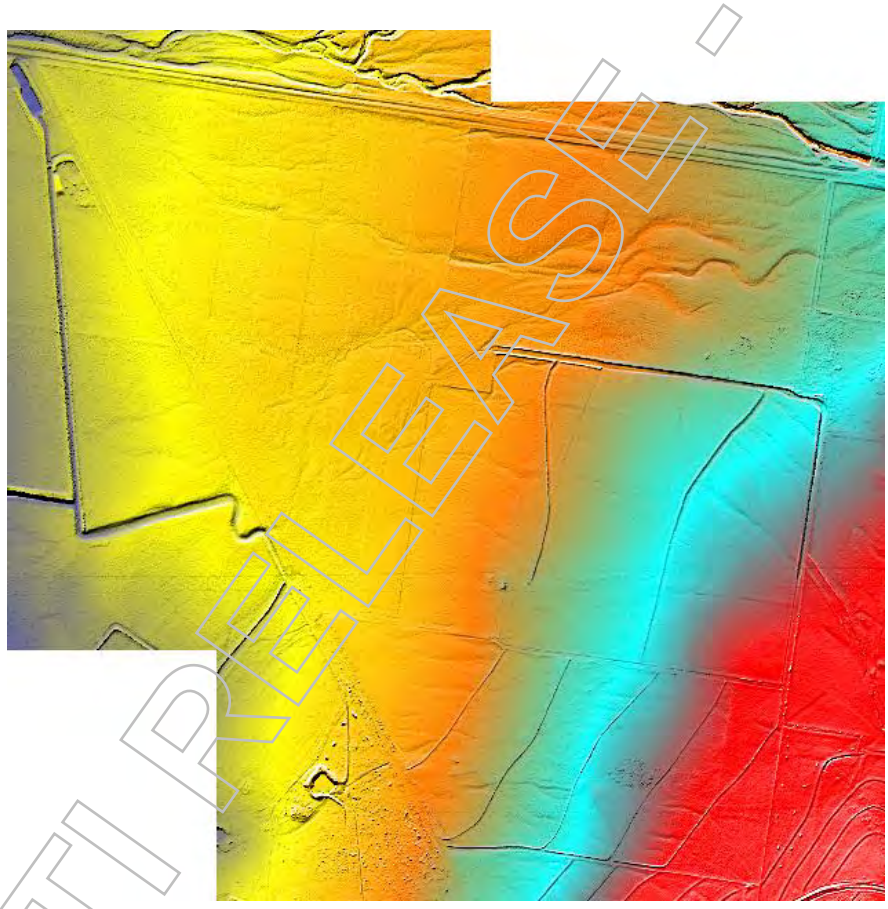
Base topography for the modelling was Lidar survey obtained from the Department of Natural Resources and Mines (2013 survey).

Tailwater capture and storage was modelled in 12D software and added to the base Tuflow model to assess and design those components. The pump link to the storage dam was also included in the model.

A relatively fine 2m grid spacing was adopted and rain was applied as “rain on grid”.

Figure 2 below illustrates the base topography.

Figure 2: 2D hydraulic model topography - existing



3.3 Hydrology

The proposal is to capture only the first 25mm of contaminated surface runoff from the site.

The yield modelling demonstrates that events resulting in runoff up to 25mm can occur, on average, several times a year. These events are therefore smaller and more frequent than the standard design events commonly used for road or urban drainage.

For the surface runoff modelling, a "design event" was chosen using the following process:

- Review the daily water balance model and select events which result in a modelled runoff of 25 – 30mm
- With each event, review six minute pluviograph data available from nearby BOM stations for completeness, discounting any event where complete six minute data is not available

A number of events were considered, but six minute pluviograph data for most was either non-existent or incomplete.

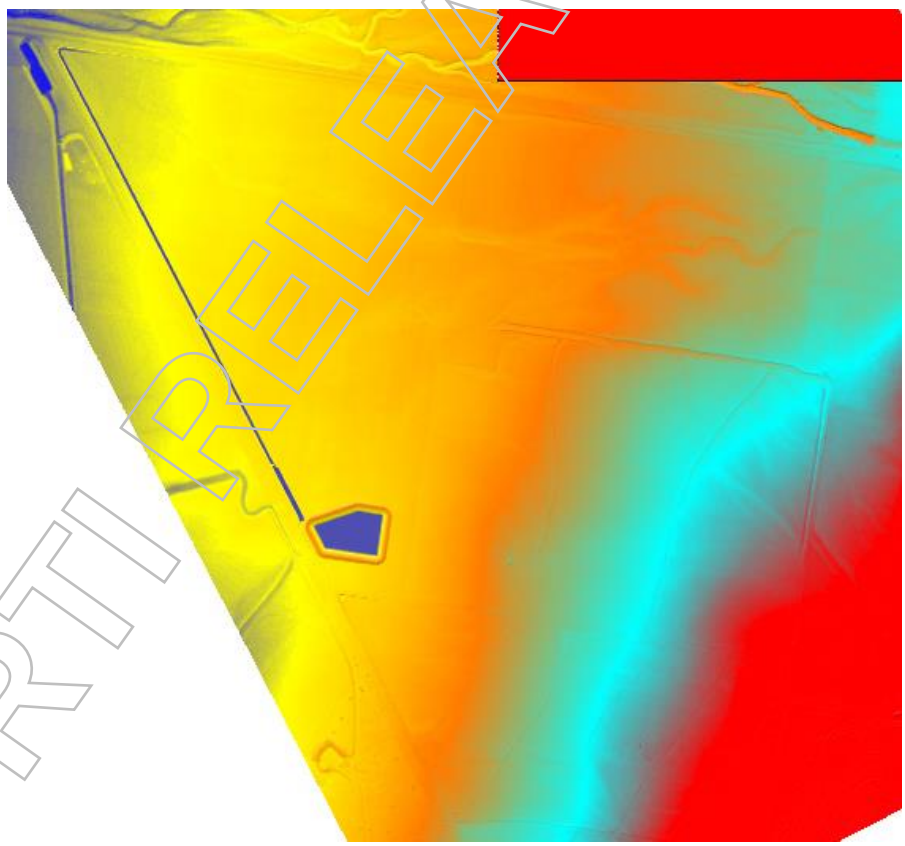
A suitably complete record of rainfall in the period 19 - 20 November 2008 (one of the selected 25mm runoff events) was, however, available from the Clifton recording station. The pattern was adopted as the design pattern.

Initial and continuing losses were applied to the recorded hyetograph such that the net rainfall for the event matched the runoff for the event in the daily balance model.

3.4 Proposed works

Figure 3 below illustrates the model topography with the capture and storage works included.

Figure 3: 2D hydraulic model topography – proposed



3.5 Maximum flow depths

Figure 4 below illustrates the modelled maximum flow depths for the design event with the proposed works.

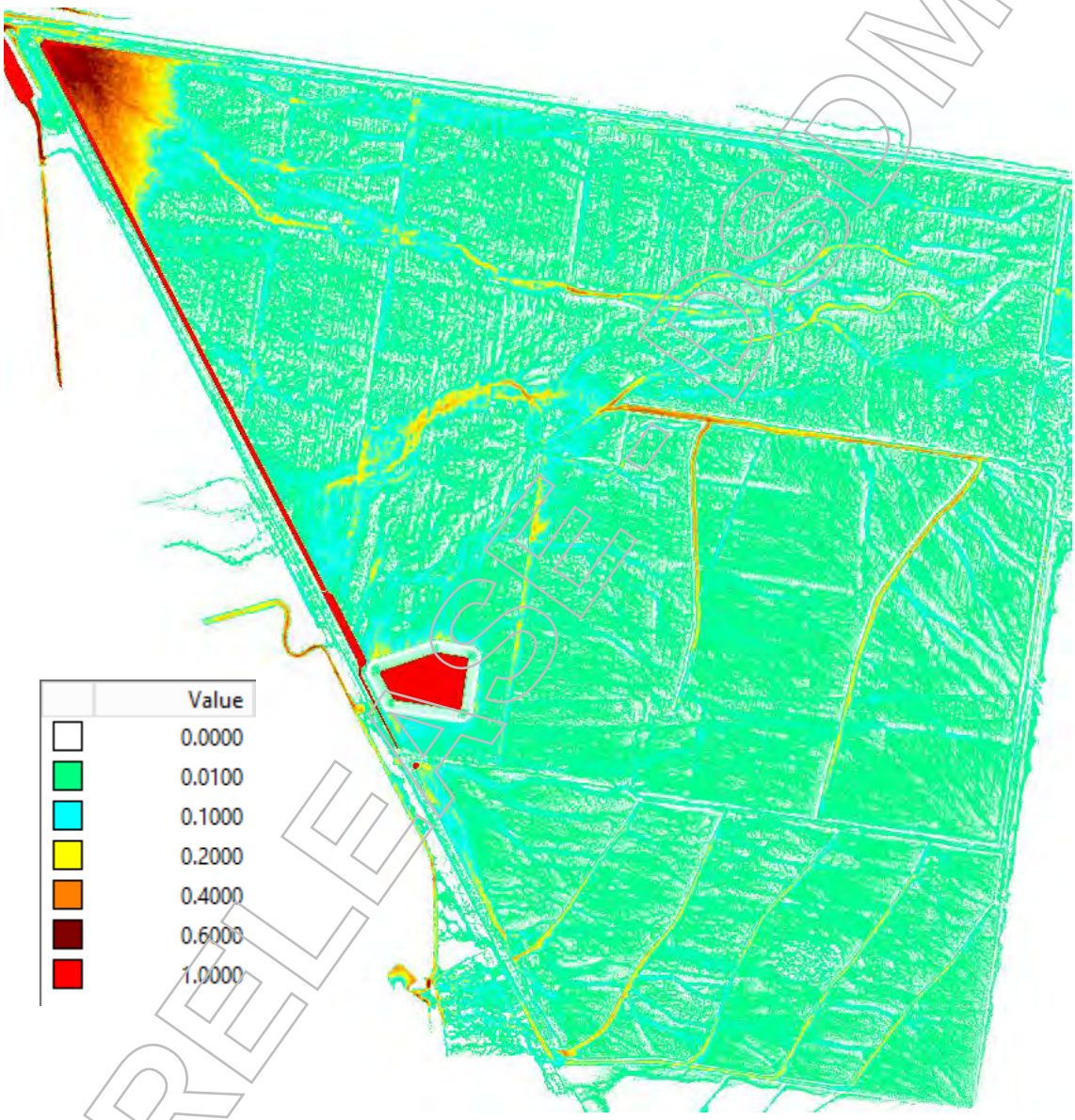


Figure 4: Maximum flow depths – design event

4. Proposed works

4.1 General

The proposed capture works include low mounds, a tailwater drain, pump sump and storage dam. Irrigation works to distribute captured runoff for re-use will also be required, but designs have not been finalised as yet.

Concept details of the proposed works are provided on the drawings in **Appendix D**.

4.2 South of Murlaggan Road

South of Murlaggan Road, the works consist of low mounds (typically 300mm high), and a small sump at the intersection of Murlaggan and Yarranlea Roads. Captured runoff flows from the sump, by gravity, under Murlaggan Road via a small RCBC discharging to a small open drain which flows to the pump sump.

The mound extends along the full frontage of Lot 2/RP7475 and has a neat fill volume of approximately 2000m^3.

4.3 North of Murlaggan Road

4.3.1 General

The main capture and storage infrastructure is located north of Murlaggan Road.

4.3.2 Tailwater drain and mounds

A tailwater drain extends south from the north west corner of Lot 2/RP18242, at the intersection of St Helens and Yarranlea Roads, approximately 1700 m to the sump. The base of the drain is level to minimise its overall depth as the flow direction is against the natural fall of the land.

The neat cut volume of the tailwater drain is approximately 52,500m^3.

The mound extends about 450m east along St Helens Road and about 520m south along Yarranlea Road and has a neat fill volume of approximately 1,500m^3.

4.3.3 Sump and backflow prevention

A pump sump is located across the mapped “waterway”.

The sump is constructed entirely below the existing surface (no embankments). Larger flows will pass directly over the sump in the same manner as existing, without diversion. The neat volume of the sump is approximately 14,200m^3.

The tailwater drain is connected to the sump via a small RCBC with a flap gate. This arrangement will prevent the reverse flow from the sump towards the north which would otherwise occur. Reverse flow in the tailwater drain would substantively change overland flow patterns in larger events.

4.3.4 Dam

The storage dam is located outside the limits of the mapped “waterway” and does not substantively interfere with existing surface flow patterns. The dam is filled by pumping alone and does not gravity capture any surface runoff.

The neat fill volume of the dam embankment (above natural surface level) is 41,500m^3.

4.3.5 Pump

A 26 inch pump with a daily capacity of 80 ML is currently proposed.

4.3.6 Irrigated area and re-use infrastructure

The final location of the area to be irrigated with captured runoff, and details of the distribution infrastructure are yet to be determined.

4.4 Management of capture volumes

The dam has a storage volume of 220 ML at full supply level (700mm freeboard).

When the tailwater drain, mound and sump are full to capacity, the stored volume is estimated to be 57 ML.

To limit capture in any event to 100 ML, the following management strategy is proposed:

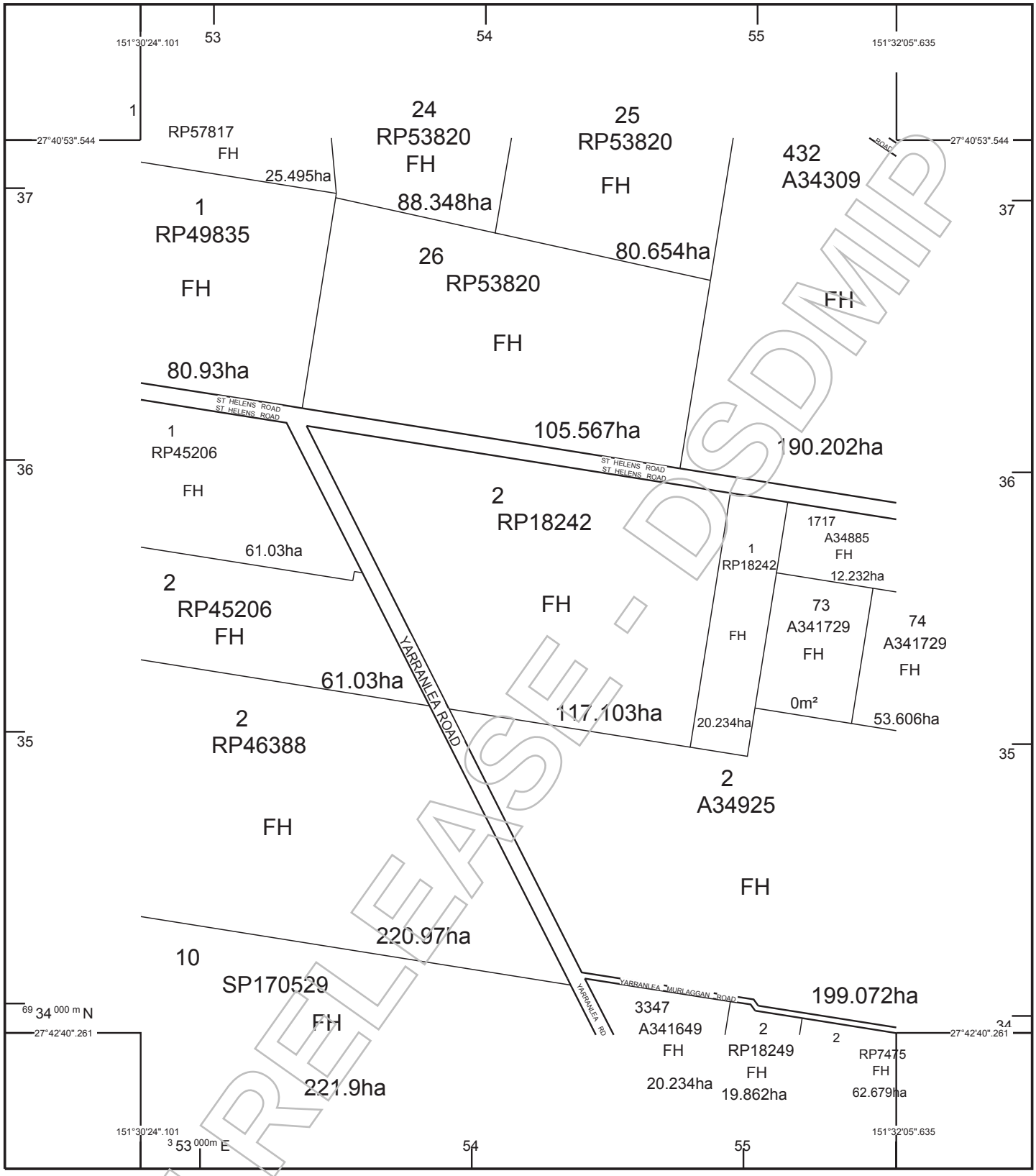
- When runoff commences and the water level in the sump rises, pump to the storage until a total of 43 ML has been pumped (at best, with continuity of flow, a little over 10 hours)
- Cease pumping until runoff ceases
- Pump out the tailwater drain and sump (57 ML).

The total pumped from a runoff event is therefore limited to 100 ML.

5. Conclusion

The proposed works comply with the Water Resource (Condamine and Balonne) Plan 2004 in that only the first 25mm of contaminated runoff is captured. The works and management arrangements will not interfere with overland flow from external catchments.

Appendix A SmartMaps



STANDARD MAP NUMBER
9242-43341

0 400 800 1200 1600 2000 m

HORIZONTAL DATUM:GDA94 ZONE:56 SCALE 1 : 20000

MAP WINDOW POSITION & NEAREST LOCATION

151°31'14".868
27°41'46".903
YARRANLEA
4.43 KM

SUBJECT PARCEL DESCRIPTION

DCDB

Lot/Plan	2/RP18242
Area/Volume	117.103ha
Tenure	FREEHOLD
Local Government	TOOWOOMBA REGIONAL
Locality	YARRANLEA
Segment/Parcel	39703/28

CLIENT SERVICE STANDARDS

PRINTED (dd/mm/yyyy) 15/05/2017

DCDB 13/05/2017 (Lots with an area less than 3000m² are not shown)

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For further information on SmartMap products visit http://nrw.qld.gov.au/property/mapping/blinmap

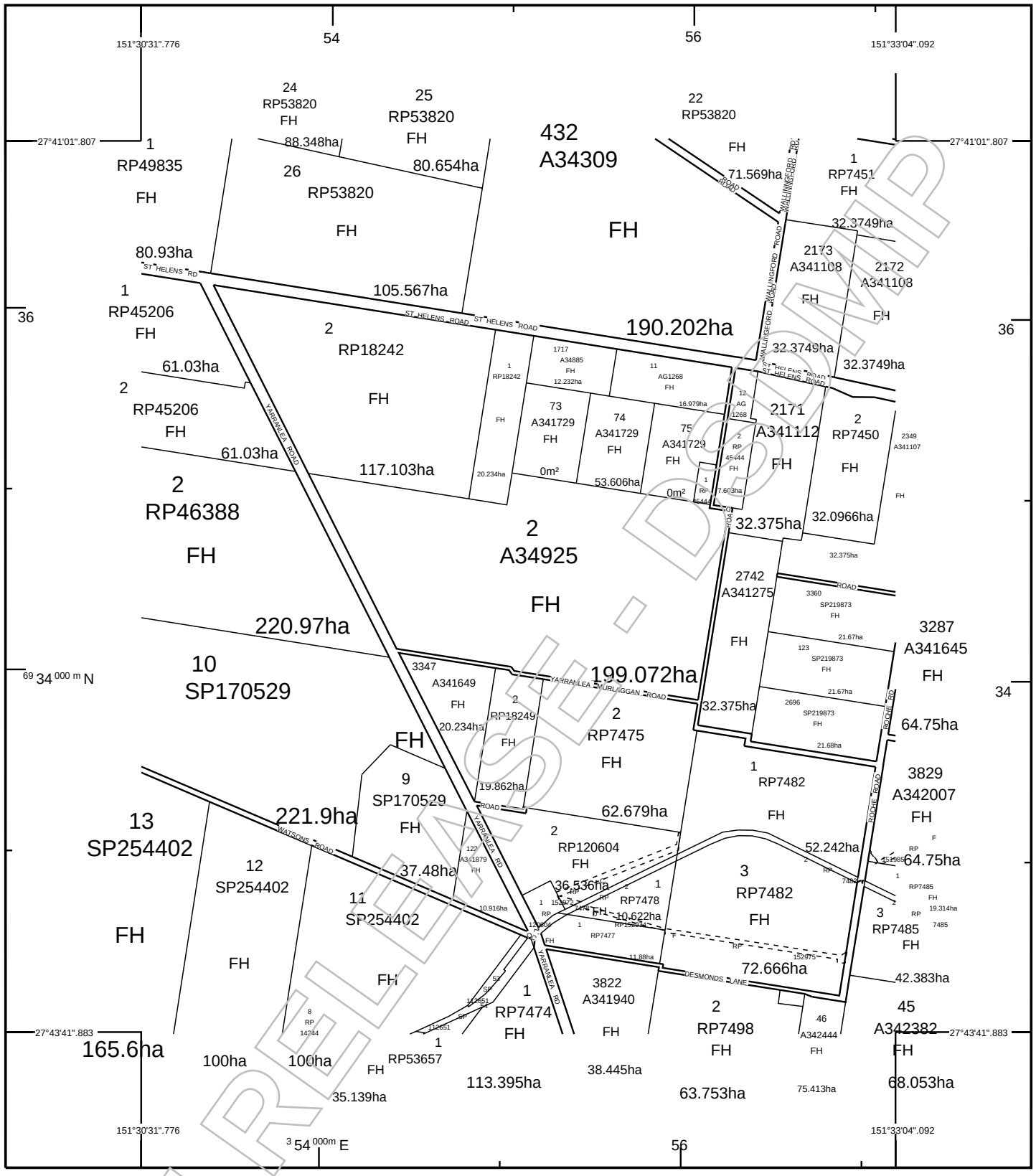
GDA

SmartMap

An External Product of SmartMap Information Services

Based upon an extraction from the Digital Cadastral Data Base

Queensland Government



STANDARD MAP NUMBER
9242-43342

0 600 1200 1800 2400 3000 m

HORIZONTAL DATUM:GDA94 ZONE:56 SCALE 1 : 30000

SmartMap

An External Product of
SmartMap Information Services

Based upon an extraction from the
Digital Cadastral Data Base

MAP WINDOW POSITION & NEAREST LOCATION

151°31'47".934
27°42'21".845
YARRANLEA
3.06 KM

SUBJECT PARCEL DESCRIPTION

DCDB

Lot/Plan	2/A34925
Area/Volume	199.072ha
Tenure	FREEHOLD
Local Government	TOOWOOMBA REGIONAL
Locality	YARRANLEA
Segment/Parcel	39703/27

CLIENT SERVICE STANDARDS

PRINTED (dd/mm/yyyy) 15/05/2017

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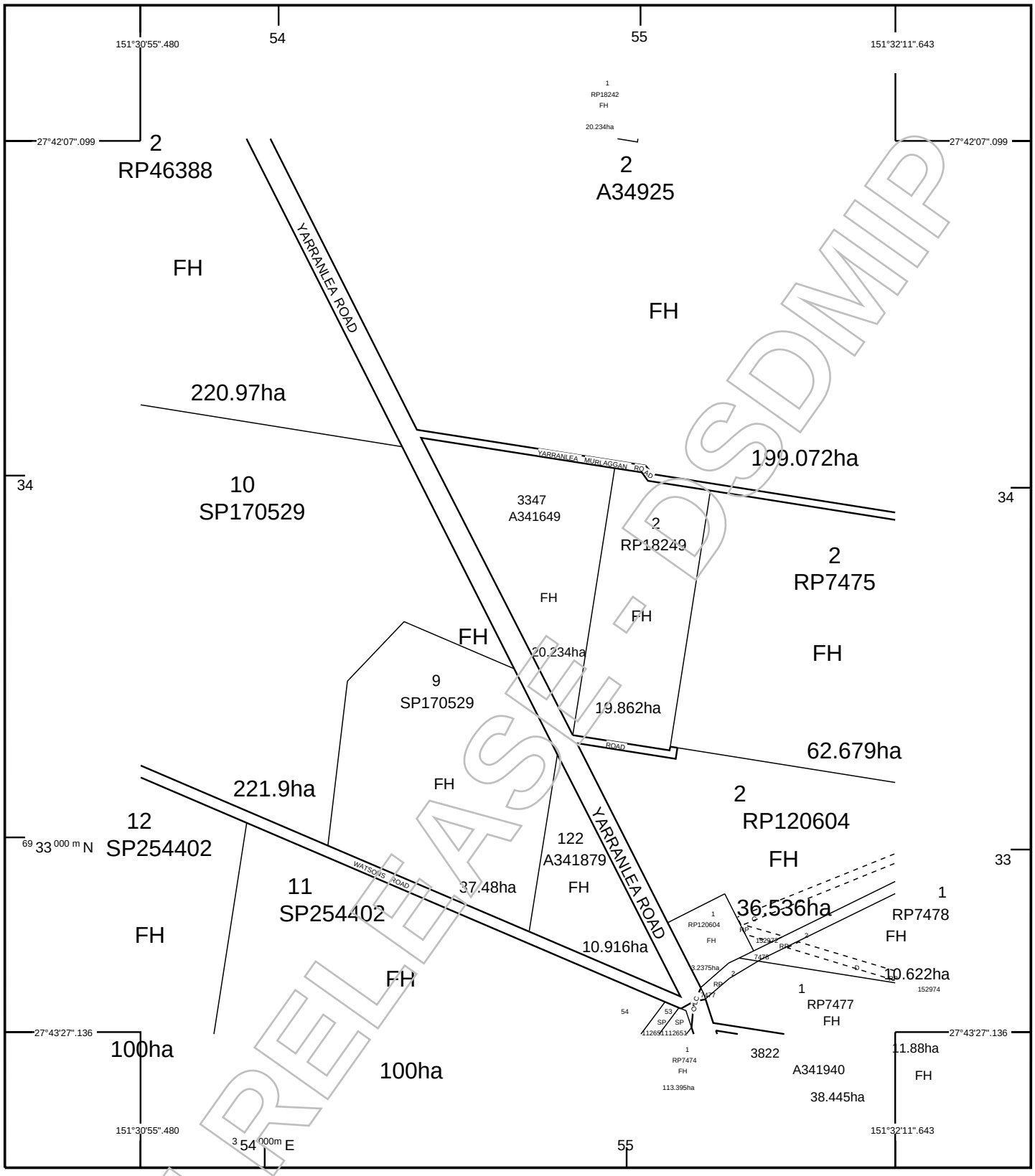
GDA

Queensland Government



STANDARD MAP NUMBER
9242-43342

0 300 600 900 1200 1500 m

HORIZONTAL DATUM:GDA94 ZONE:56 SCALE 1 : 15000

MAP WINDOW POSITION & NEAREST LOCATION

151°31'33".562
27°42'47".118
YARRANLEA
3.05 KM

SUBJECT PARCEL DESCRIPTION

DCDB

Lot/Plan	3347/A341649
Area/Volume	20.234ha
Tenure	FREEHOLD
Local Government	TOOWOOMBA REGIONAL
Locality	YARRANLEA
Segment/Parcel	39703/18

CLIENT SERVICE STANDARDS

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SmartMap

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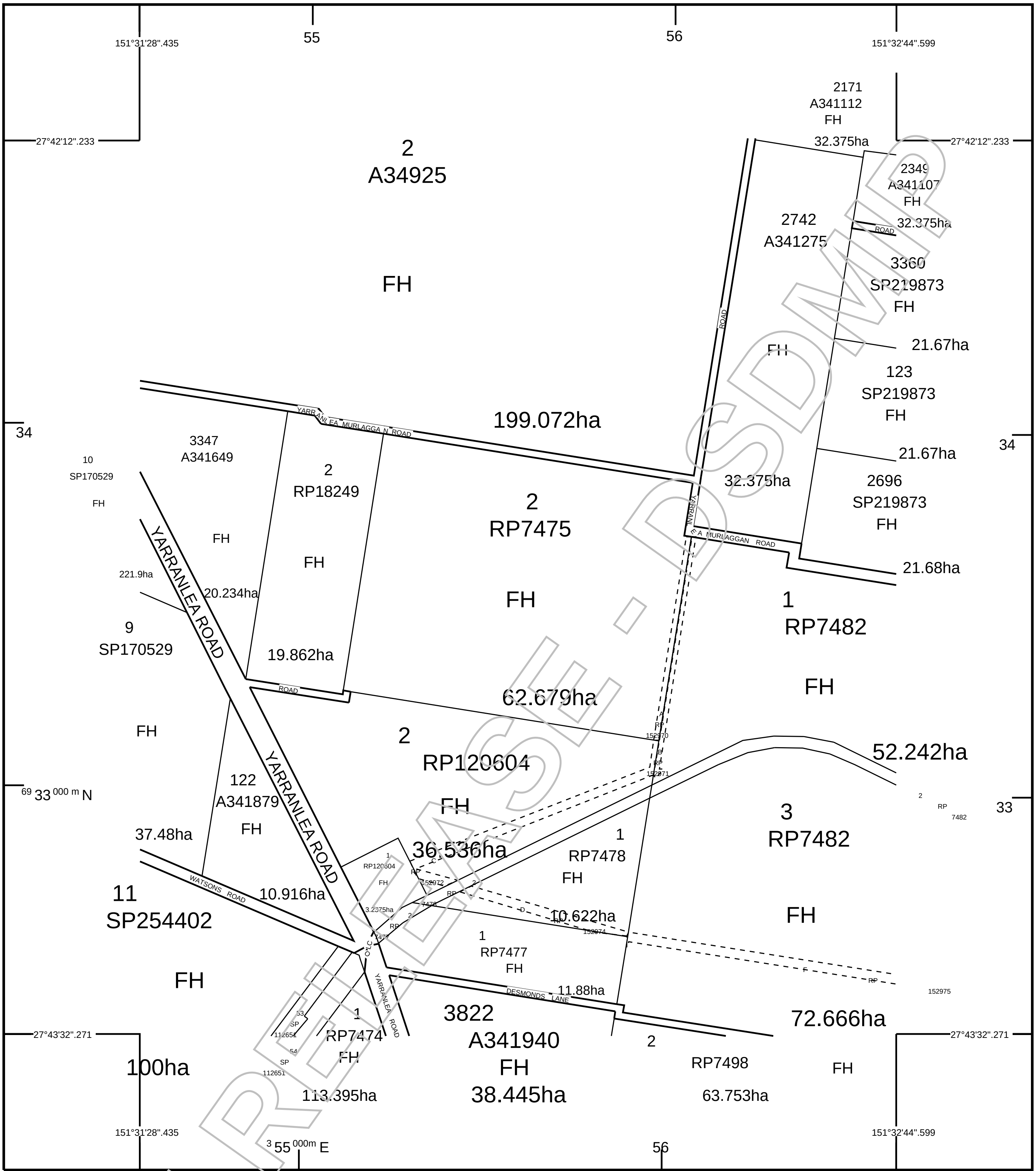
Based upon an extraction from the
Digital Cadastral Data Base

Queensland Government



STANDARD MAP NUMBER
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HORIZONTAL DATUM:GDA94 ZONE:56 SCALE 1 : 15000

SmartMap

An External Product of
SmartMap Information Services

Based upon an extraction from the
Digital Cadastral Data Base

MAP WINDOW POSITION & NEAREST LOCATION

151°32'06".517
27°42'52".252
YARRANLEA
2.15 KM

SUBJECT PARCEL DESCRIPTION

DCDB

Lot/Plan	2/RP7475
Area/Volume	62.679ha
Tenure	FREEHOLD
Local Government	TOOWOOMBA REGIONAL
Locality	YARRANLEA
Segment/Parcel	39703/16

CLIENT SERVICE STANDARDS

PRINTED (dd/mm/yyyy) 15/05/2017

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GDA

Queensland Government

Appendix B Locality plan

SITE LAYOUT PLAN

Scale 1:10000(A1)

LEGEND:

- Site Property Boundary
- Adjoining Property Boundary
- Existing Sealed Road
- Existing Unformed Road
- Proposed North Mound
- Proposed North Drain
- Proposed North Sump
- Proposed South Mound
- Proposed Ring Tank
- Lidar Minor Contours
- 414.00 Lidar Major Contours

NOTES:

1. Intervals between contours – 1.0 m Contours are Lidar surface levels.
2. Plans to be plotted in colour to distinguish design elements.

EXISTING SERVICES NOTES:

1. The Contractor is to confirm the location of all services prior to commencing any construction works or ordering any materials.
2. The Contractor is to contact Dial Before You Dig on 1100 prior to commencing any construction works.
3. While all due care is taken by RMA in confirming the location of existing services, it is the Contractor's responsibility to confirm these service locations. In some instances service may be omitted from RMA's drawings.
4. The Contractor is responsible for arranging the locating of all services by the relevant Authorities.
5. A representative for each service provider to be present on site when working within 3.0m of each existing service.
6. The Contractor is to confirm the location & level of all sewer and drainage connection points prior to commencing any construction works or ordering any materials.
7. Should invert levels or location of any sewer or drainage connection points differ to that indicated on RMA's drawings then the Certifying Engineer shall be notified immediately.
8. Any works required to or near an Authorities services shall be carried out to the approval of, under the supervision of and to the standard required by the Authority.

0 100 200 300 400m

1:10000(A1) 1:20000(A3)

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PROJECT
WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

TITLE
SITE LAYOUT PLAN

R.P.E.Q.

PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0101
ISSUE 0

Appendix C Irrigation decision matrices

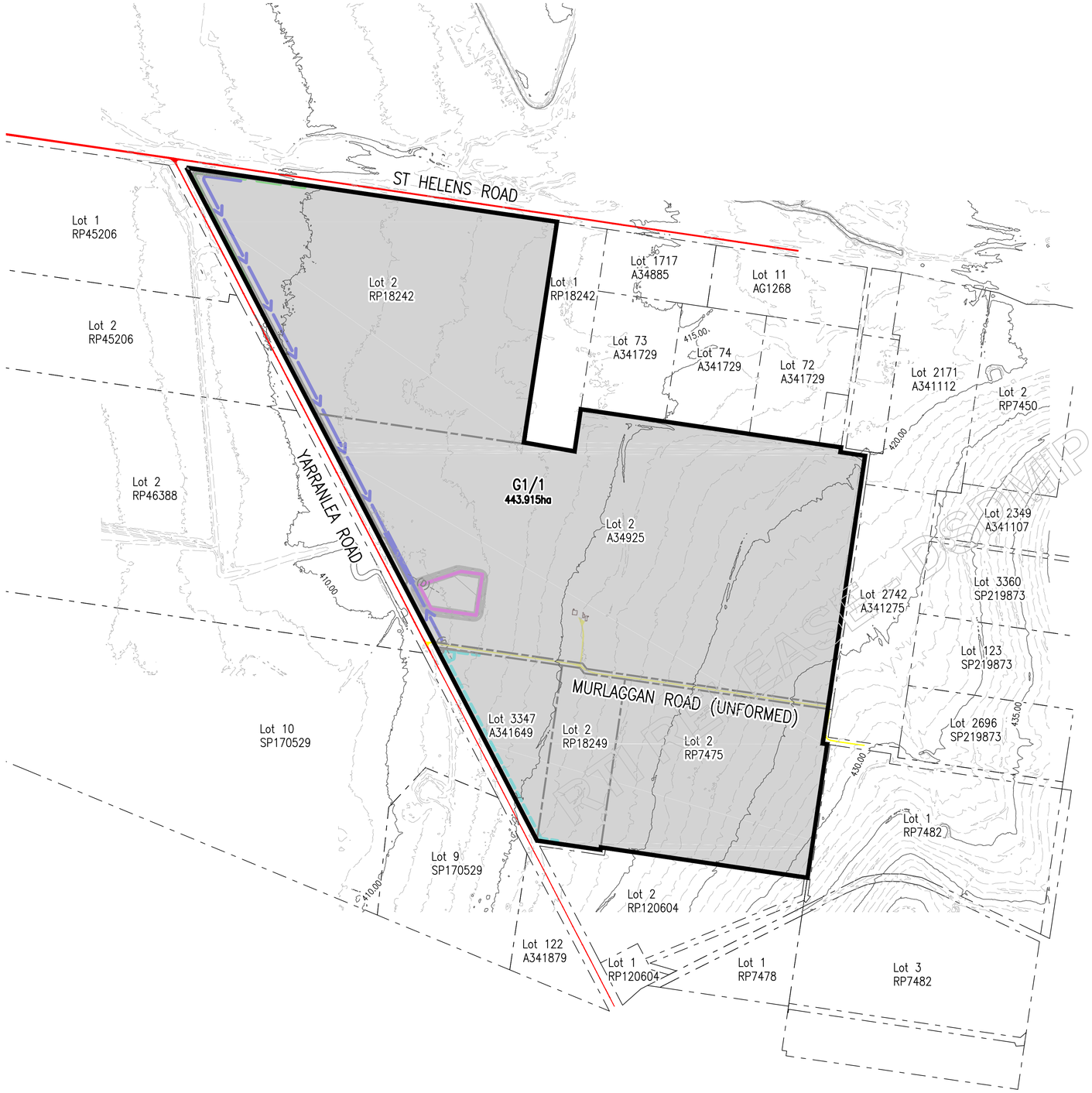
Irrigation decision matrix - Wheat

Month	Irrigation and rainfall in previous 30 days (mm)	Daily application rate	Application days
January	>=0	-	-
February	>=0	-	-
March	>=0	-	-
April	>=0	-	-
May	>=0	-	-
June	>=0	-	-
July	<=5	25	2
	>5 <=25	15	2
	>25	-	-
August	<=5	25	2
	>5 <=25	15	2
	>25 <=50	25	1
	>50	-	-
September	<=50	30	3
	>50 <=1000	30	3
	>100	-	-
October	<=50	30	3
	>50 <=1000	30	3
	>100	-	-
November	>=0	-	-
December	>=0	-	-

Irrigation decision matrix - Cotton

Month	Irrigation and rainfall in previous 30 days (mm)	Daily application rate	Application days
January	<=5	50	2
	>5 <=50	50	2
	>50 <=100	25	1
	>100	-	-
February	<=5	50	2
	>5 <=50	50	2
	>50 <=100	25	1
	>100	-	-
March	>=0	-	-
April	>=0	-	-
May	>=0	-	-
June	>=0	-	-
July	<=5	25	2
	>5 <=25	15	2
	>25	-	-
August	<=5	25	2
	>5 <=25	15	2
	>25 <=50	25	1
	>50	-	-
September	<=50	50	3
	>50	-	-
October	<=5	50	3
	>5 <=50	30	2
	>50 <=70	25	1
	>70	-	-
November	<=5	50	2
	>5 <=50	50	2
	>50	-	-
December	<=5	50	2
	>5 <=50	50	2
	>50 <=100	20	1
	>100	-	

Appendix D Concept plans



SITE CATCHMENT PLAN

Scale 1:10000(A1)

LEGEND:

- Site Property Boundary
- Adjoining Property Boundary
- Existing Sealed Road
- Existing Unformed Road
- G1/1 0.00ha — Catchment and Area
- Catchment Boundary
- Proposed North Mound
- Proposed North Drain
- Proposed North Sump
- Proposed South Mound
- Proposed Ring Tank
- Lidar Minor Contours
- 414.00 — Lidar Major Contours

NOTES:

1. Intervals between contours – 1.0 m Contours are Lidar surface levels.
2. Plans to be plotted in colour to distinguish design elements.

EXISTING SERVICES NOTES:

1. The Contractor is to confirm the location of all services prior to commencing any construction works or ordering any materials.
2. The Contractor is to contact Dial Before You Dig on 1100 prior to commencing any construction works.
3. While all due care is taken by RMA in confirming the location of existing services, it is the Contractor's responsibility to confirm these service locations. In some instances service may be omitted from RMA's drawings.
4. The Contractor is responsible for arranging the locating of all services by the relevant Authorities.
5. A representative for each service provider to be present on site when working within 3.0m of each existing service.
6. The Contractor is to confirm the location & level of all sewer and drainage connection points prior to commencing any construction works or ordering any materials.
7. Should invert levels or location of any sewer or drainage connection points differ to that indicated on RMA's drawings then the Certifying Engineer shall be notified immediately.
8. Any works required to or near an Authorities services shall be carried out to the approval of, under the supervision of and to the standard required by the Authority.

0 100 200 300 400m

1:10000(A1) 1:20000(A3)

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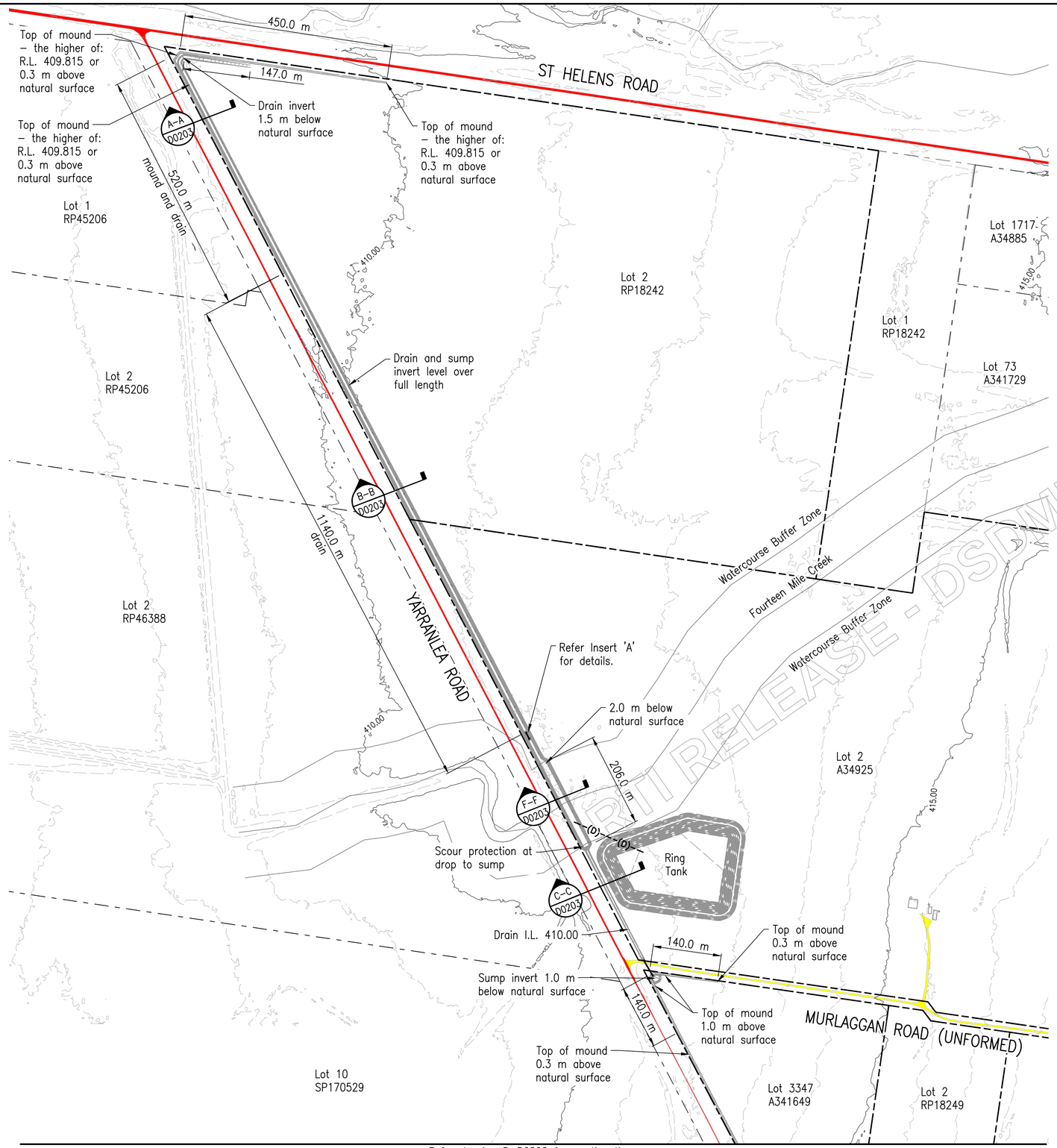
PROJECT
WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

TITLE
SITE CATCHMENT PLAN

R.P.E.Q.

PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0102
ISSUE 0



DRAINAGE NOTES:

(In these notes, the terms 'Superintendent' or 'Supervising Engineer' means the person responsible for site decisions relating to the design intent. That person may or may not be a formal 'Superintendent' as defined in General Conditions of Contract such as AS2124.)

GENERAL

1. It is the Contractor's responsibility to obtain the location of all existing services prior to excavation. The Contractor shall coordinate the works with any relevant Authorities and shall be responsible for the protection and reinstatement of any of the existing services which may be uncovered or damaged in the course of the works.
2. Levels and gradients at junctions with existing works may be varied as required to achieve satisfactory connections – subject to the prior approval of the Superintendent.
3. The erosion management of the site, its surroundings, the transportation and deposition of silt is the responsibility of the Contractor.
4. All dimensions are in metres.

PIPES

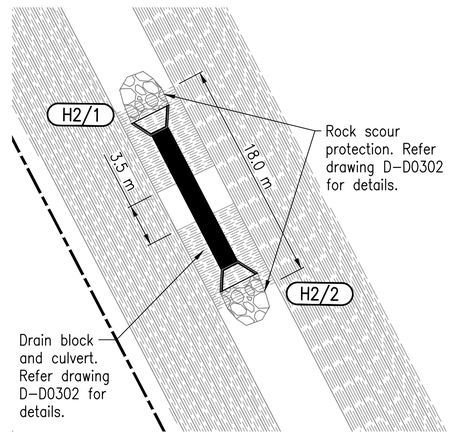
5. Drainage pipe lines located in roadworks are to be backfilled to box level using approved material with a minimum C.B.R of 15%, placed in layers not exceeding 150mm loose and compacted until dry density is not less than 100% of the material's dry density.
6. For typical trenching detail refer to Toowoomba Regional Council Standard Drawing 101394–001.
7. The Contractor shall commission a suitably qualified Surveyor to maintain accurate records of levels and locations of services to fully comply with the local authorities "as constructed" information requirements.
8. The Contractor shall be responsible for ensuring minimal sediment enters the new and existing stormwater drainage network. All new stormwater lines shall be cleaned of all sediment and debris prior to an 'on maintenance' inspection.

LEGEND:

- Site Property Boundary
- Adjoining Property Boundary
- Existing Sealed Road
- Existing Unformed Road
- H1/2 — Headwall Label
- Lidar Minor Contours
- 414.00 — Lidar Major Contours

NOTES:

1. Intervals between contours – 1.0 m Contours are Lidar surface levels.
2. Plans to be plotted in colour to distinguish design elements.



INSERT 'A'
Scale 1:250 (A1)

EXISTING SERVICES NOTES:

1. The Contractor is to confirm the location of all services prior to commencing any construction works or ordering any materials.
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LAYOUT PLAN – SHEET 1

Scale 1:5000(A1)

0 2 4 6 8 10m
1:250(A1) 1:500(A3)

0 50 100 150 200m
1:5000(A1) 1:10000(A3)

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NOTE: FIGURED DIMENSIONS TO TAKE PRECEDENCE OVER SCALED MEASUREMENTS. VERIFY ALL ON SITE DIMENSIONS & LEVELS PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

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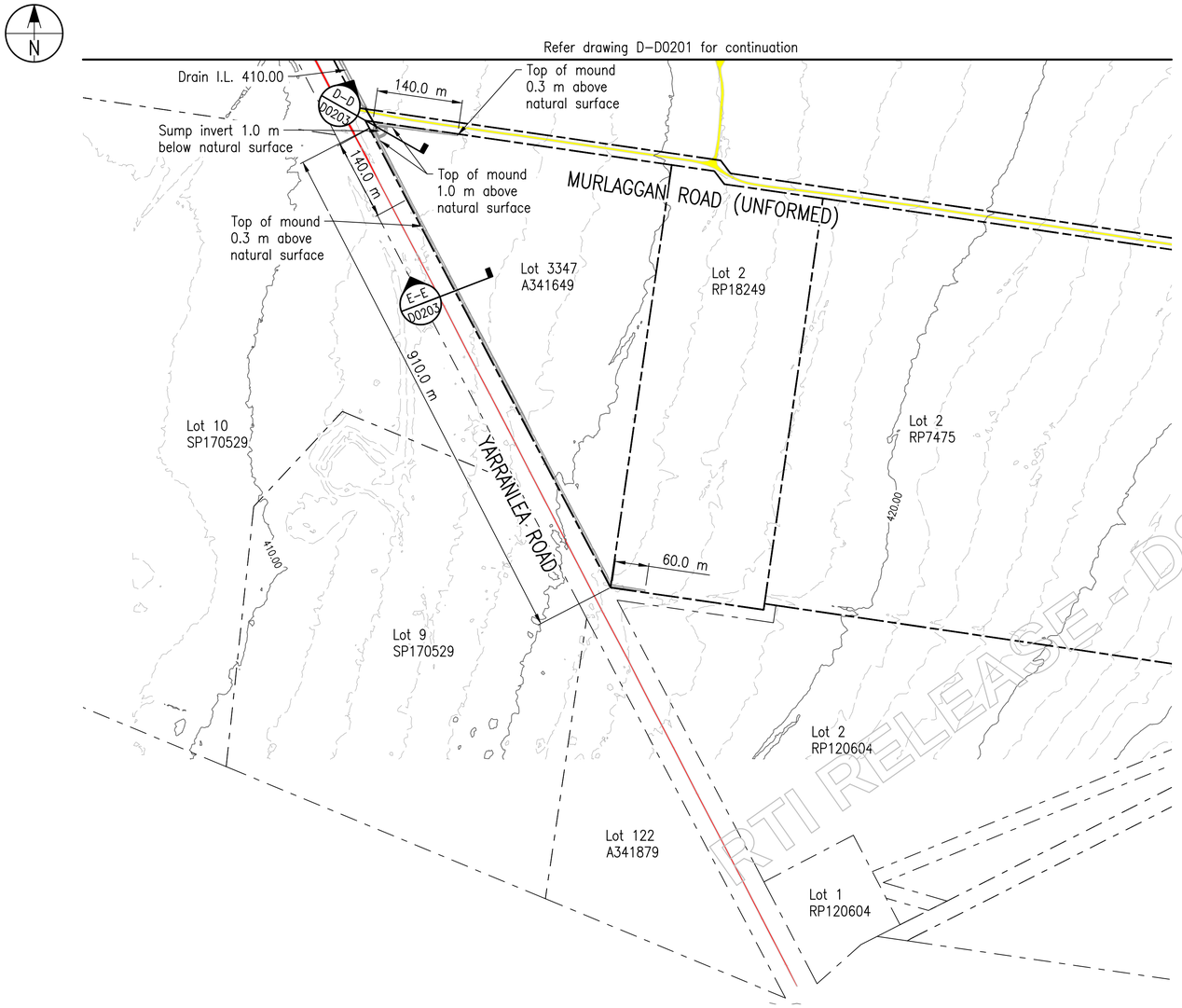
PROJECT
WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

TITLE
LAYOUT PLAN - SHEET 1

R.P.E.Q.

PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0201
ISSUE 0



LAYOUT PLAN – SHEET 2

Scale 1:5000(A1)

LEGEND:

- Site Property Boundary
- Adjoining Property Boundary
- Existing Sealed Road
- Existing Unformed Road
- Lidar Minor Contours
- 414.00 Lidar Major Contours

NOTES:

1. Intervals between contours – 1.0 m Contours are Lidar surface levels.
2. Plans to be plotted in colour to distinguish design elements.

DRAINAGE NOTES:

(In these notes, the terms 'Superintendent' or 'Supervising Engineer' means the person responsible for site decisions relating to the design intent. That person may or may not be a formal 'Superintendent' as defined in General Conditions of Contract such as AS2124.)

GENERAL

1. It is the Contractor's responsibility to obtain the location of all existing services prior to excavation. The Contractor shall coordinate the works with any relevant Authorities and shall be responsible for the protection and reinstatement of any of the existing services which may be uncovered or damaged in the course of the works.
2. Levels and gradients at junctions with existing works may be varied as required to achieve satisfactory connections – subject to the prior approval of the Superintendent.
3. The erosion management of the site, its surroundings, the transportation and deposition of silt is the responsibility of the Contractor.
4. All dimensions are in metres.

PIPES

5. Drainage pipe lines located in roadworks are to be backfilled to box level using approved material with a minimum C.B.R of 15%, placed in layers not exceeding 150mm loose and compacted until dry density is not less than 100% of the material's dry density.
6. For typical trenching detail refer to Toowoomba Regional Council Standard Drawing 101394–001.
7. The Contractor shall commission a suitably qualified Surveyor to maintain accurate records of levels and locations of services to fully comply with the local authorities "as constructed" information requirements.
8. The Contractor shall be responsible for ensuring minimal sediment enters the new and existing stormwater drainage network. All new stormwater lines shall be cleaned of all sediment and debris prior to an 'on maintenance' inspection.

EXISTING SERVICES NOTES:

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0 50 100 150 200m

1:5000(A1) 1:10000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
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NOTE: FIGURED DIMENSIONS TO TAKE PRECEDENCE OVER SCALED MEASUREMENTS. VERIFY ALL ON SITE DIMENSIONS & LEVELS PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

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PROJECT
WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

TITLE
LAYOUT PLAN - SHEET 2

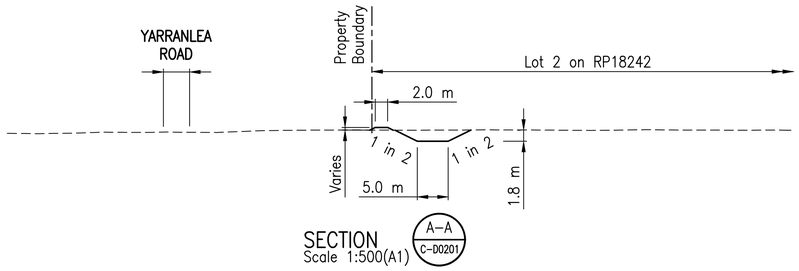
R.P.E.Q.

PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0202
ISSUE 0

LEGEND:

Natural Surface

Design Surface



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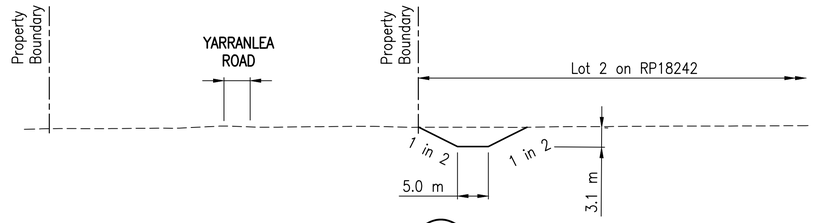

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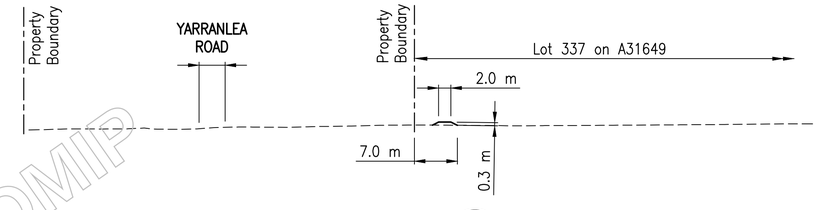

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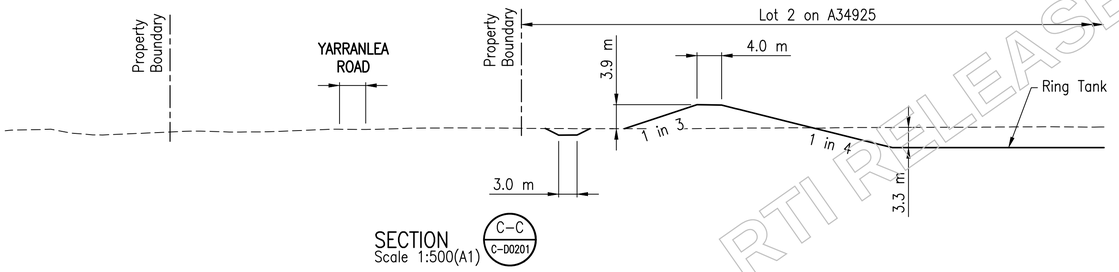

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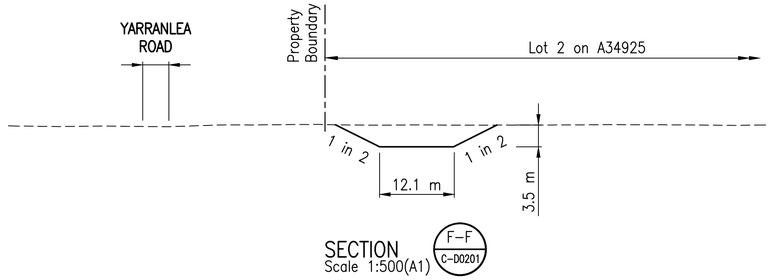

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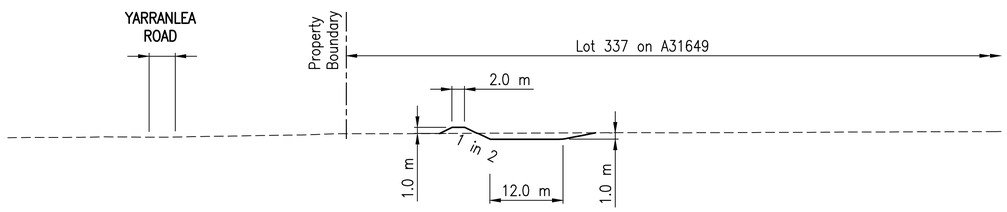

SECTION D–D (C–D0202)
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1:500(A1) 1:1000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
0	FOR APPROVAL	26/05/17	NGT	JRB	AEL	AEL

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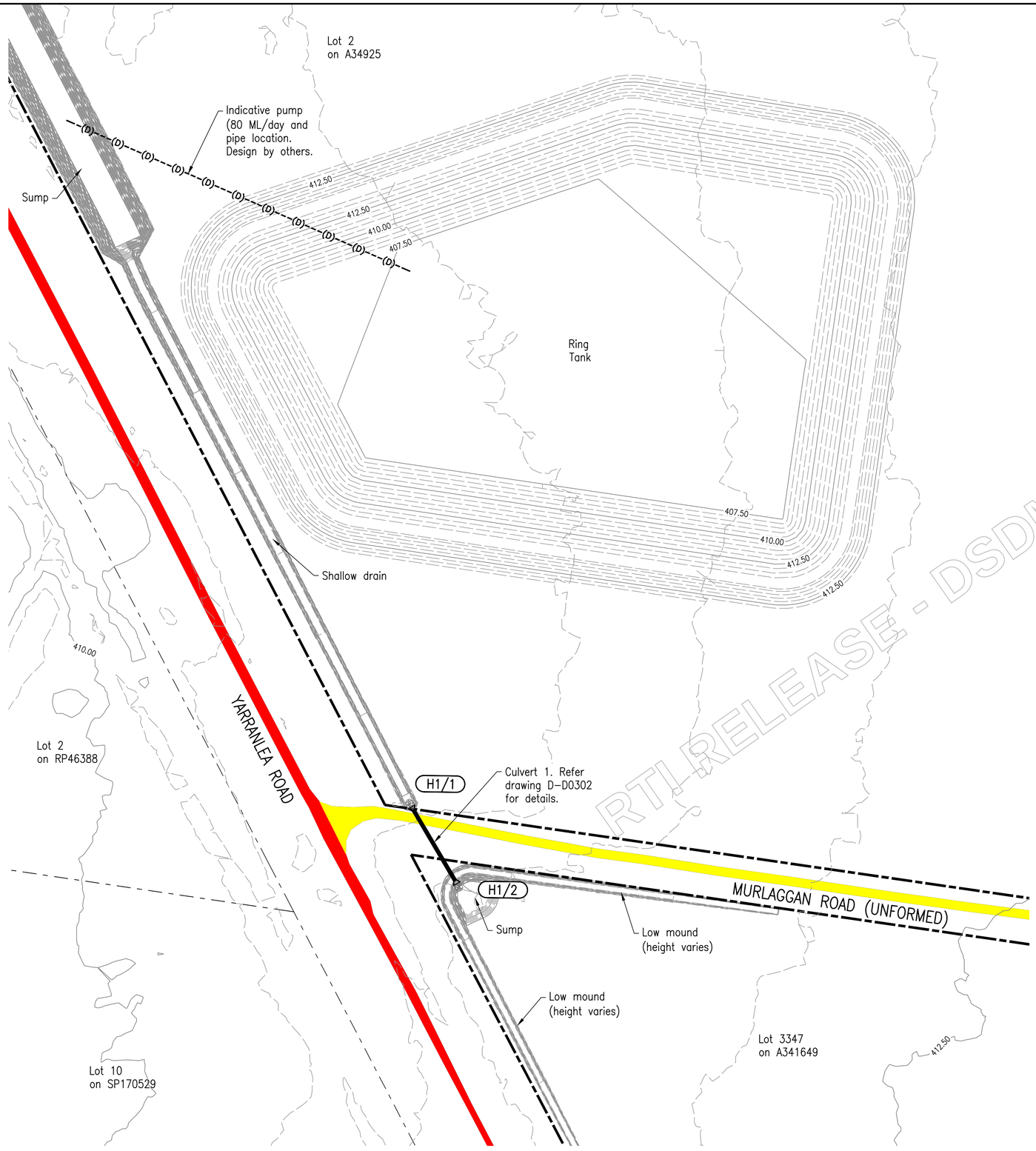
PROJECT
WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

TITLE
SECTIONS

R.P.E.Q.

PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0203
ISSUE 0



DETAIL AT MURLAGGAN ROAD

Scale 1:1000(A1)

DRAINAGE NOTES:

(In these notes, the terms 'Superintendent' or 'Supervising Engineer' means the person responsible for site decisions relating to the design intent. That person may or may not be a formal 'Superintendent' as defined in General Conditions of Contract such as AS2124.)

GENERAL

1. It is the Contractor's responsibility to obtain the location of all existing services prior to excavation. The Contractor shall coordinate the works with any relevant Authorities and shall be responsible for the protection and reinstatement of any of the existing services which may be uncovered or damaged in the course of the works.
2. Levels and gradients at junctions with existing works may be varied as required to achieve satisfactory connections – subject to the prior approval of the Superintendent.
3. The erosion management of the site, its surroundings, the transportation and deposition of silt is the responsibility of the Contractor.
4. All dimensions are in metres.

PIPES

5. This drawing is to be read in conjunction with the stormwater drainage longitudinal sections. Pipe sizes are listed on the longitudinal sections.
6. All stormwater drainage pipes to be class 2 spigot and socket R.R.J R.C.P unless noted otherwise. Alternative products can be used subject to the prior approval of the Superintendent and Council.
7. Stormwater drainage pipe lines located in roadworks are to be backfilled to box level using approved material with a minimum C.B.R of 15%, placed in layers not exceeding 150mm loose and compacted until dry density is not less than 100% of the material's dry density.
8. For typical trenching detail refer to Toowoomba Regional Council Standard Drawing 101394–001.
9. The Contractor shall commission a suitably qualified Surveyor to maintain accurate records of levels and locations of services to fully comply with the local authorities "as constructed" information requirements.
10. The Contractor shall be responsible for ensuring minimal sediment enters the new and existing stormwater drainage network. All new stormwater lines shall be cleaned of all sediment and debris prior to an 'on maintenance' inspection.

LEGEND:

- Site Boundary
- Adjoining Property Boundary
- Existing Sealed Road
- Existing Unformed Road
- H1/2 — Headwall Label
- Lidar Minor Contours
- 414.00 — Lidar Major Contours

NOTES:

1. Intervals between contours – 0.5 m
   Contours are Lidar surface levels.
2. Plan to be plotted in colour to distinguish design elements.

EXISTING SERVICES NOTES:

1. The Contractor is to confirm the location of all services prior to commencing any construction works or ordering any materials.
2. The Contractor is to contact Dial Before You Dig on 1100 prior to commencing any construction works.
3. While all due care is taken by RMA in confirming the location of existing services, it is the Contractor's responsibility to confirm these service locations. In some instances service may be omitted from RMA's drawings.
4. The Contractor is responsible for arranging the locating of all services by the relevant Authorities.
5. A representative for each service provider to be present on site when working within 3.0m of each existing service.
6. The Contractor is to confirm the location & level of all sewer and drainage connection points prior to commencing any construction works or ordering any materials.
7. Should invert levels or location of any sewer or drainage connection points differ to that indicated on RMA's drawings then the Certifying Engineer shall be notified immediately.
8. Any works required to or near an Authorities services shall be carried out to the approval of, under the supervision of and to the standard required by the Authority.

0 10 20 30 40m
1:1000(A1) 1:2000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
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PROJECT
WORKS TO CAPTURE
CONTAMINATED AGRICULTURAL RUNOFF

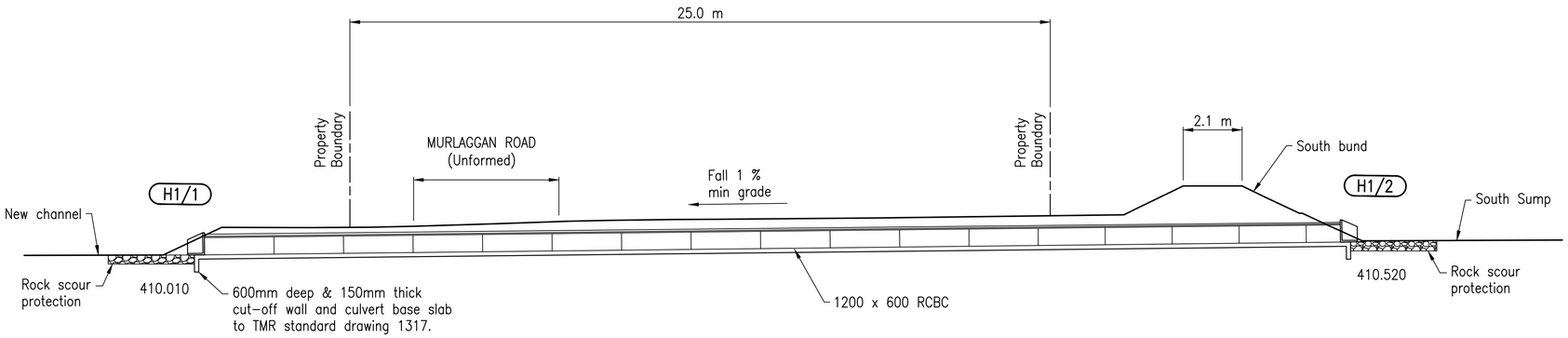
TITLE
DETAIL AT MURLAGGAN ROAD

R.P.E.Q.

PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0301
ISSUE 0

LEGEND:

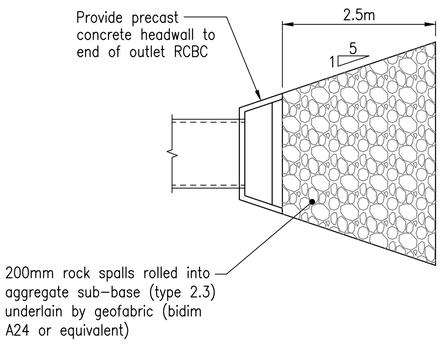
H1/2 Headwall Label



CULVERT 1 CROSS SECTION

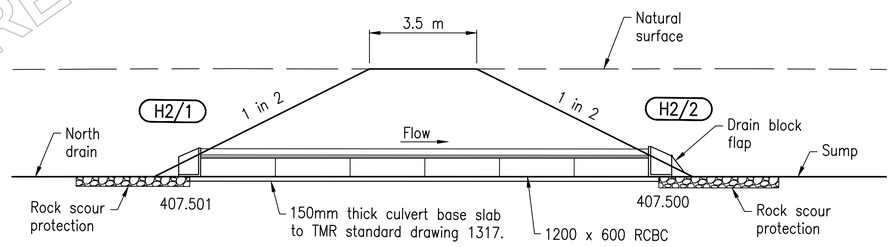
1:500 (A1)

1200 x 600 RCBC (17/1200 x 600)
(16/2.44 1/1.22)
Standard Drawings – 1316, 1317, 1319, 1320, 1359



TYPICAL OUTLET SCOUR PROTECTION

Do not scale



DRAIN BLOCK AND CULVERT CROSS SECTION

1:100 (A1)

1200 x 600 RCBC (6/1200 x 600)
Standard Drawings – 1316, 1317, 1319, 1320, 1359

EXISTING SERVICES NOTES:

1. The Contractor is to confirm the location of all services prior to commencing any construction works or ordering any materials.
2. The Contractor is to contact Dial Before You Dig on 1100 prior to commencing any construction works.
3. While all due care is taken by RMA in confirming the location of existing services, it is the Contractor's responsibility to confirm these service locations. In some instances service may be omitted from RMA's drawings.
4. The Contractor is responsible for arranging the locating of all services by the relevant Authorities.
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0 1 2 3 4m — 1:100(A1) 1:200(A3)
0 5 10 15 20m — 1:500(A1) 1:1000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
0	FOR APPROVAL	26/05/17	NGT	JRB	AEL	AEL

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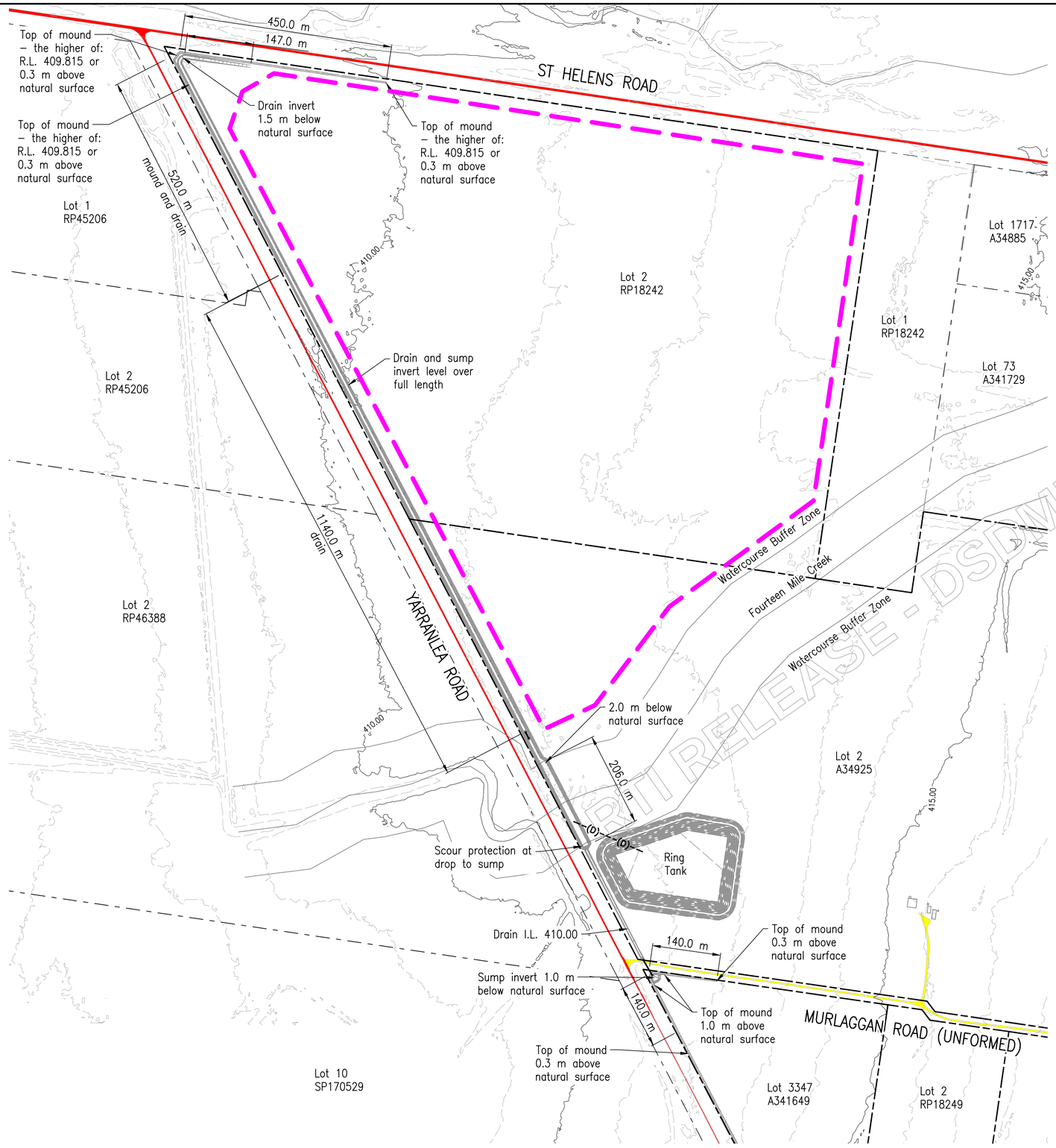
PROJECT
WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

TITLE
CULVERT DETAILS

R.P.E.Q.

PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0302
ISSUE 0



POSSIBLE IRRIGATED AREA LAYOUT

Scale 1:5000(A1)

DRAINAGE NOTES:

(In these notes, the terms 'Superintendent' or 'Supervising Engineer' means the person responsible for site decisions relating to the design intent. That person may or may not be a formal 'Superintendent' as defined in General Conditions of Contract such as AS2124.)

GENERAL

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3. The erosion management of the site, its surroundings, the transportation and deposition of silt is the responsibility of the Contractor.
4. All dimensions are in metres.

PIPES

5. Drainage pipe lines located in roadworks are to be backfilled to box level using approved material with a minimum C.B.R of 15%, placed in layers not exceeding 150mm loose and compacted until dry density is not less than 100% of the material's dry density.
6. For typical trenching detail refer to Toowoomba Regional Council Standard Drawing 101394–001.
7. The Contractor shall commission a suitably qualified Surveyor to maintain accurate records of levels and locations of services to fully comply with the local authorities "as constructed" information requirements.
8. The Contractor shall be responsible for ensuring minimal sediment enters the new and existing stormwater drainage network. All new stormwater lines shall be cleaned of all sediment and debris prior to an 'on maintenance' inspection.

LEGEND:

- Site Property Boundary
- Adjoining Property Boundary
- Existing Sealed Road
- Existing Unformed Road
- H1/2 — Headwall Label
- Approximate Irrigated Area
- Lidar Minor Contours
- 414.00 — Lidar Major Contours

NOTES:

1. Intervals between contours – 1.0 m Contours are Lidar surface levels.
2. Plans to be plotted in colour to distinguish design elements.

NOTE:

Approximate area to be irrigated. Details to be confirmed.

EXISTING SERVICES NOTES:

1. The Contractor is to confirm the location of all services prior to commencing any construction works or ordering any materials.
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0 50 100 150 200m

1:5000(A1) 1:10000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
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PROJECT
WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

TITLE
POSSIBLE IRRIGATED AREA LAYOUT

R.P.E.Q.

PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0204
ISSUE 0

RMA Engineers

CAPTURE OF CONTAMINATED AGRICULTURAL RUNOFF

Lots 2/RP18242, 2/A34925, 3347/A341649, 2/RP18249, 2/RP7475 Yarranlea Rd, Yarranlea

Date 17 August 2017

Project Number 11448

REPORT CONTROL SHEET

RMA ref. no:	11448
Project name:	Lots 2/RP18242, 2/A34925, 3347/A341649, 2/RP18249, 2/RP7475 Yarranlea Rd, Yarranlea
Report title:	Capture of Contaminated Agricultural Runoff
Report author:	Tony Loveday

Document control						
Revision	**Author**	**Reviewer**	**Approved for issue**			
			Name	**RPEQ no.**	**Signature**	**Date**
0	Tony Loveday		Tony Loveday	2210		
1	Tony Loveday		Tony Loveday	2210		17/08/2017

Disclaimer:

This report is a professional opinion based on the information available at the time of writing. It is not intended as a quote, guarantee or warranty and does not cover any latent defects.
This report will comment on the Civil infrastructure to the project and may outline probable costs but the extent of the commission of RMA does not extend to detailed cost feasibility, as such the costs should not be relied on for financing arrangements.
The conclusions in this report should not be read in isolation. We recommend that its contents be reviewed in person with the author so that the assumptions and available information can be discussed in detail to enable the reader to make their own risk assessment in conjunction with information from other sources.

Table of Contents

1. Introduction

1.1 Site Location

The site is located on Yarranlea Rd, Yarranlea, near the intersection with St Helen's Road. The property descriptions are Lots 2/RP18242, 2/A34925, 3347/A341649, 2/RP18249 and 2/RP7475.

SmartMaps of the properties and surrounds are in **Appendix A.** The locality plan is in **Appendix B.**

1.2 Overview

The site is situated on the floodplain of the Upper Condamine River in the Condamine-Balonne catchment on the Pittsworth floodplain.

The property is an existing grain farming property. There is no existing irrigation infrastructure and contaminated runoff currently discharges to downstream properties.

1.3 General topography

The natural fall on the subject property is west and north.

1.4 Proposed Works

The proposed works are to capture the contaminated agricultural runoff from farming operations on the property for re-use. The works include tail drains, sumps and a pumped storage.

All of the works are located clear of the mapped waterway crossing Lot 2/RP18242.

Tail drains and sumps are all cut below natural ground and have no sides raised above existing natural surface. They are sized to intercept only the first 25mm of run-off from the property.

CAR rules require that the proposal traps only runoff from the site itself. Accordingly, a low mound is located between the southern side of the mapped waterway and the tail drain leading to Sump 2/3. This is to keep waterway flows (which largely derive from an external catchment) out of the tail drain.

Drains and sumps are sized to store a volume equivalent to 25mm times the property area. Once that volume has been trapped, all additional surface flow overtops and flows naturally to downstream properties in a similar manner to existing.

Small pumps are installed to transfer captured runoff to the main storage once rain event runoff has ceased.

Sizing of the various components and estimates of annual capture have been determined using a 2D hydraulic model and a daily water balance model.

Details are provided in the following sections.

2. Capture analysis

2.1 Analysis methodology

In order to assess the likely volumes of contaminated runoff generated from the site, and consequential re-use potential, a daily water balance model was set up.

Using historical rainfall records, the water balance model calculates daily run-off from the site, tracks capture, storage and re-use volumes, and assists in determining optimum storage and re-use potential. The model tracks only direct runoff from the site. External runoff is assumed to be passed through.

The model is an Excel spreadsheet and can be supplied for verification on request.

2.2 Catchment

The catchment boundary was adopted as the lot boundaries approximately as indicated in **Figure 1**.

Figure 1: Catchment boundaries

2.3 Rainfall data

Rainfall data adopted in this analysis was obtained from the Bureau of Meteorology for the nearest suitable station (41082 - Pittsworth). The station has data records extending back to 1887, however only records for the last 50 years were used in the analysis.

2.4 Run-off calculations

Rainfall was converted to run-off using the K factor (USDA Model) method outlined in the Water Resources Commission Farm Water Supplies Manual 1992 (Section 1.3).

Catchment parameters adopted in the analyses are detailed in **Table 1** below.

Table 1: Catchment parameters

Catchment area (ha)	Soil group	Hydrologic condition	Fraction impervious	Land use or cover
400	C	Good	0	Crops (Small grain, straight row)

2.5 Losses

The model ignored seepage but included storage evaporation losses using BOM data for the locality and the calculated surface area of the storage each analysis day.

2.6 Capture philosophy

It is understood that the limits for capture of contaminated agricultural runoff relate to individual runoff events and are not annual limits. Capture of 25mm of runoff from a 400ha property equates to a capture volume of 100 ML (per event). Those figures were used in the initial modelling, however the actual property area and capture volume are 418.95ha and 104.7ML respectively.

The water balance model considered alternative definitions of “individual runoff event” by regarding rainfall which occurred on consecutive or nearly consecutive days as a single event.

Initial modelling using the historical rainfall records indicated that annual capture volumes were relatively insensitive over the modelled period when the period of dry days delineating runoff events was set to five days or more. For modelling purposes, five dry days was therefore adopted as the delineator of individual rainfall events.

2.7 Re-use of captured runoff

2.7.1 General philosophy

The model tracks capture, storage and re-use volumes for each day in the modelling period.

Captured runoff is pumped from the sump if there is available water and if the storage is not full. Re-use is removed from the storage if there is water available and if there is irrigation demand in accordance with the adopted annual irrigation pattern.

“Typical” annual desired irrigation patterns were applied for each of two types of crop – cotton and wheat. Irrigation demand used complex decision matrices based on antecedent rainfall, crop type and time of year. Details are provided in **Appendix C**.

2.8 Model analyses

Runoff modelling investigated the relationship between storage volume, re-use irrigated area and irrigation reliability for cotton and wheat crop types and for historical data periods from 10 years to 50 years.

The modelling indicated that a storage size of around 200 ML is about the “sweet spot” with capture limited to 100ML from an individual runoff event.

3. Surface flow modelling

3.1 General

To assess surface flow patterns across the site for both the existing situation and with tailwater capture infrastructure in place, a 2D (Tuflow) hydraulic model was set up.

3.2 Model structure

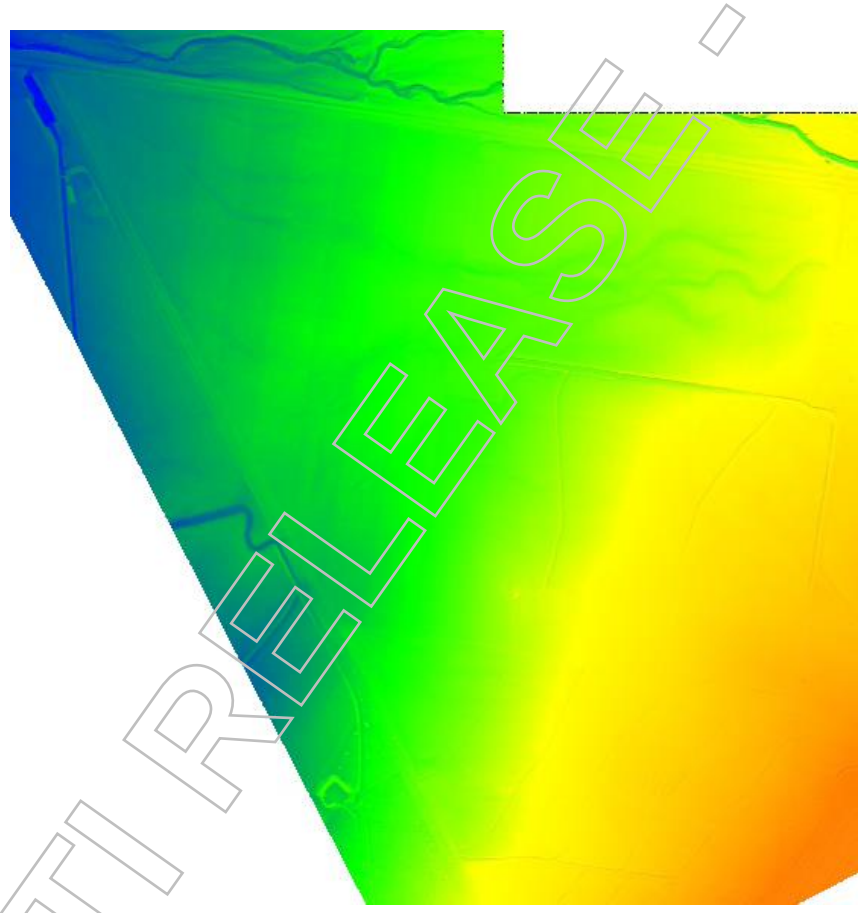
Base topography for the modelling was Lidar survey obtained from the Department of Natural Resources and Mines (2013 survey).

Tailwater capture and storage was modelled in 12D software and added to the base Tuflow model to assess and design those components. The pump link to the storage dam was also included in the model.

A relatively fine 2m grid spacing was adopted and rain was applied as “rain on grid”.

Figure 2 below illustrates the base topography.

Figure 2: 2D hydraulic model topography - existing



3.3 Hydrology

The proposal is to capture only the first 25mm of contaminated surface runoff from the site.

The yield modelling demonstrates that events resulting in runoff up to 25mm can occur, on average, several times a year. These events are therefore smaller and more frequent than the standard design events commonly used for road or urban drainage.

For the surface runoff modelling, a “design event” was chosen using the following process:

- Review the daily water balance model and select events which result in a modelled runoff of 25 – 30mm
- With each event, review six minute pluviograph data available from nearby BOM stations for completeness, discounting any event where complete six minute data is not available

A number of events were considered, but six minute pluviograph data for most was either non-existent or incomplete.

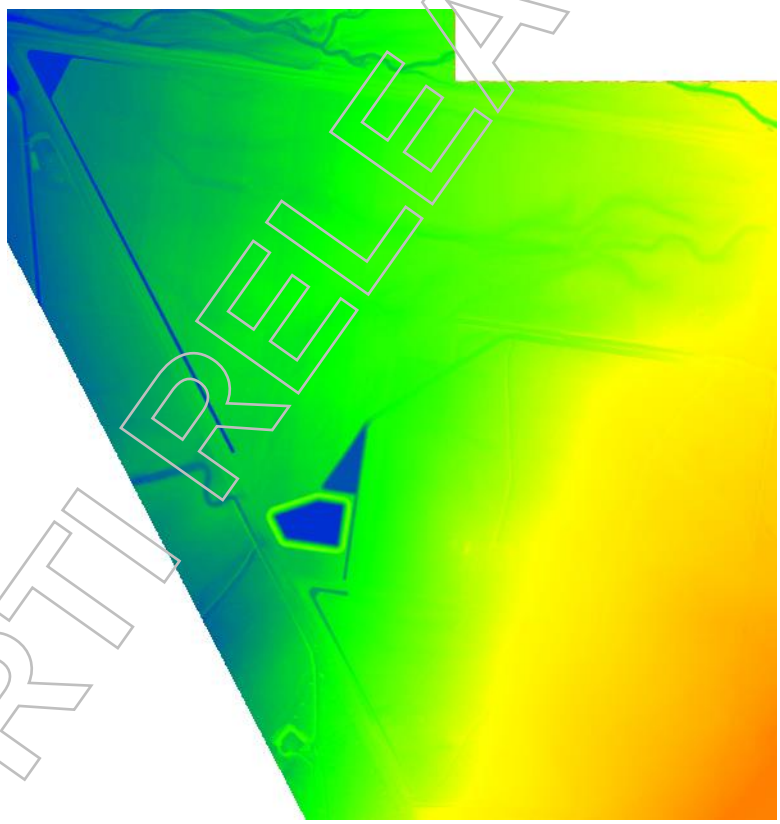
A suitably complete record of rainfall in the period 19 - 20 November 2008 (one of the selected 25mm runoff events) was, however, available from the Clifton recording station. The pattern was adopted as the design pattern.

Initial and continuing losses were applied to the recorded hyetograph such that the net rainfall for the event matched the runoff for the event in the daily balance model.

3.4 Proposed works

Figure 3 below illustrates the model topography with the capture and storage works included.

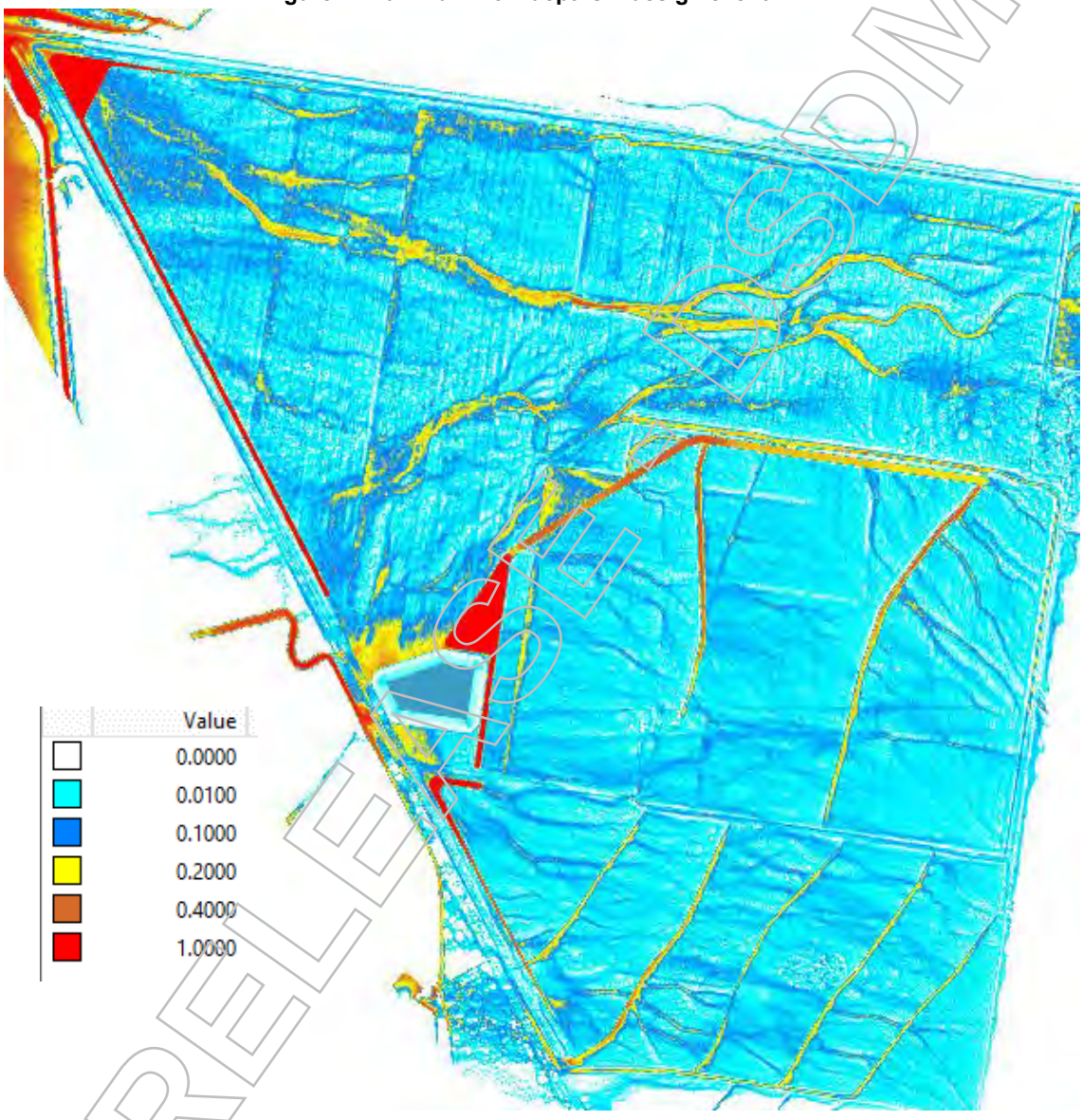
Figure 3: 2D hydraulic model topography – proposed



3.5 Maximum flow depths

Figure 4 below illustrates the modelled maximum flow depths for the design event with the proposed works.

Figure 4: Maximum flow depths – design event



4. Proposed works

4.1 General

The proposed capture works include tailwater drains, sumps, transfer pumps and a storage dam. Irrigation works to distribute captured runoff for re-use will also be required, but designs have not been finalised as yet.

To avoid interfering with surface flows in the mapped waterway, separate components of the works are located either side of the waterway. Stored volumes each side are pro-rated to the respective property areas.

Concept details of the proposed works are provided on the drawings in **Appendix D**.

4.2 South of Murlaggan Road

South of Murlaggan Road, the works consist of taildrains, a small sump at the intersection of Murlaggan and Yarranlea Roads and a culvert under Murlaggan Road which connects the drains to Sump 2/3.

The drain adjacent to the southern edge of the mapped waterway extends about 1480m generally east from Sump 2/3.

The drain along Yarranlea Road extends south about 780m from the Murlaggan Road intersection.

The stored volume in Sump 2/3 and connecting drains is controlled by the lowest edge of Sump 2/3 (RL 411.35m). This is the natural low point in the property adjacent to the mapped waterway at the western corner of Sump 2/3.

The total stored volume in Sump 2/3 and adjoining drains (at the point of spill out) is 62,483m^3.

4.3 North of Murlaggan Road

4.3.1 General

The main capture and storage infrastructure is located north of Murlaggan Road.

4.3.2 Tailwater drain and Sump 1

Sump 1 is constructed at the intersection of St Helens and Yarranlea Roads.

A tailwater drain extends south from Sump 1, approximately 1750 m. It terminates at the northern edge of the mapped waterway corridor. The base of the drain is level to minimise its overall depth as the flow direction is against the natural fall of the land.

The drain extends about 450m east from Sump 1, along St Helens Road.

The stored volume in the sump and drains is controlled by the lowest edge of Sump 1 (RL 408.9m) which is the natural low point in the property at the intersection of St Helens and Yarranlea Roads.

The total stored volume in Sump 1 and adjoining drains (at the point of spill out) is 40,781m^3.

4.3.3 Dam

The storage dam is located outside the limits of the mapped waterway and does not substantively interfere with existing surface flow patterns. The dam is filled by pumping alone and does not gravity capture any surface runoff.

The neat fill volume of the dam embankment (above natural surface level) is 41,500m^3.

4.3.4 Pumps

Whilst design details are yet to be finalised, it is currently anticipated that two 10 inch transfer pumps, each with a daily capacity of approximately 10 ML will be installed, one pumping from the southern end of the Sump 1 drain, and the other pumping from Sump 2/3.

The approximate daily transfer capacity is 20 ML. Transferring the captured runoff to the main storage, after the runoff event ceases, will take about 5 days.

4.3.5 Irrigated area and re-use infrastructure

The anticipated location of the area to be irrigated with captured runoff is indicated in the attached plans. Details of the actual area and distribution infrastructure are yet to be determined.

4.4 Management of capture volumes

The sump and drain arrangements have been located and designed such that the total volume stored (once runoff ceases) is equivalent to the volume allowed under the CAR rules. Storage volumes are limited by natural spillout at the lowest edges of the sumps.

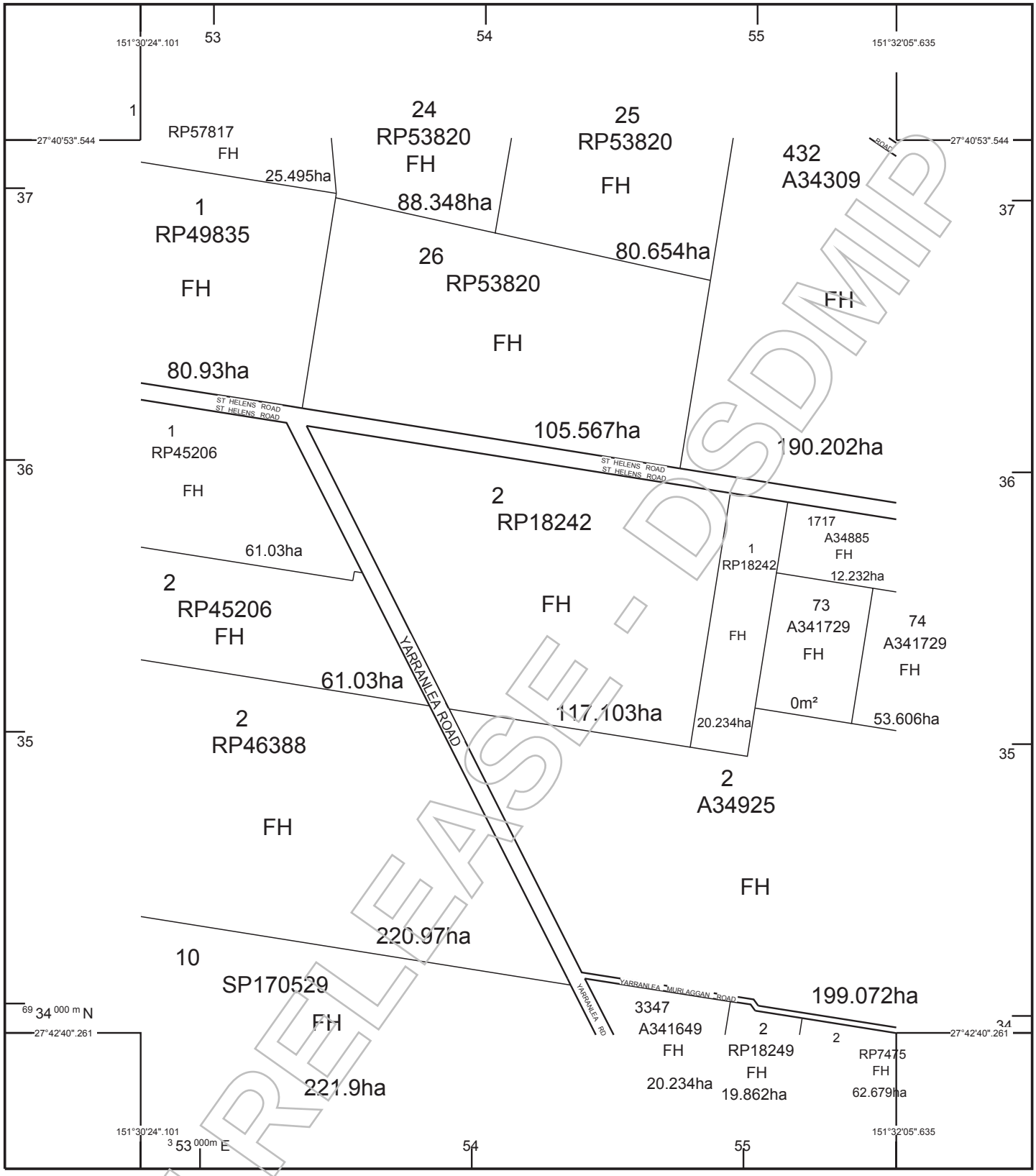
Pumping of trapped water will not commence until flows from the runoff has ceased. Transfer pumps are relatively small.

The arrangement therefore naturally limits the total capture from any runoff event to that allowed by the CAR rules.

5. Conclusion

The proposed works comply with the Water Resource (Condamine and Balonne) Plan 2004 in that only the first 25mm of contaminated runoff is captured. The works and management arrangements will not interfere with overland flow from external catchments.

Appendix A SmartMaps



STANDARD MAP NUMBER
9242-43341

0 400 800 1200 1600 2000 m

HORIZONTAL DATUM:GDA94 ZONE:56 SCALE 1 : 20000

MAP WINDOW POSITION & NEAREST LOCATION

151°31'14".868
27°41'46".903
YARRANLEA
4.43 KM

SUBJECT PARCEL DESCRIPTION

DCDB

Lot/Plan	2/RP18242
Area/Volume	117.103ha
Tenure	FREEHOLD
Local Government	TOOWOOMBA REGIONAL
Locality	YARRANLEA
Segment/Parcel	39703/28

CLIENT SERVICE STANDARDS

PRINTED (dd/mm/yyyy) 15/05/2017

DCDB 13/05/2017 (Lots with an area less than 3000m² are not shown)

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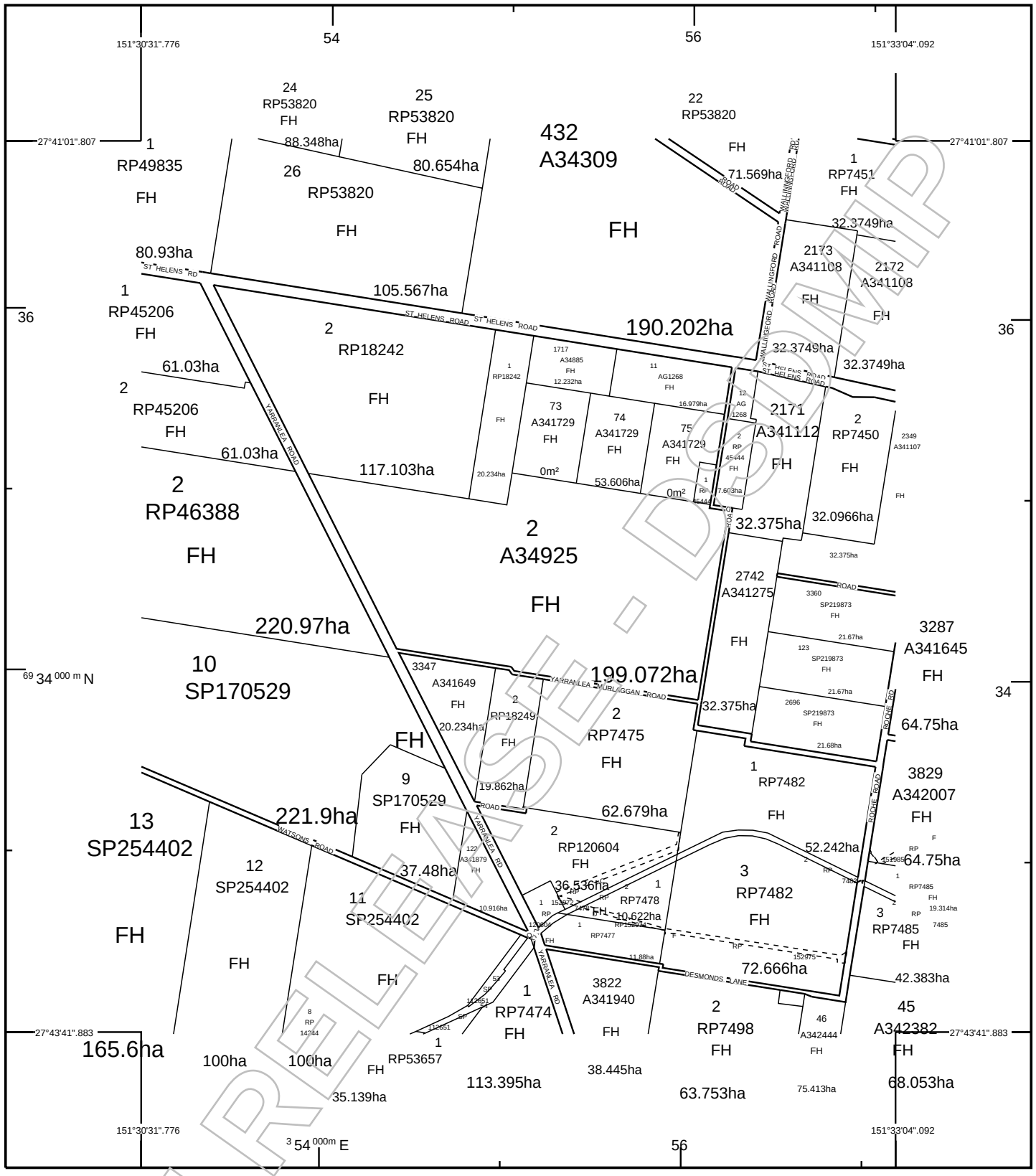
For further information on SmartMap products visit http://nrw.qld.gov.au/property/mapping/blinmap

GDA

SmartMap
An External Product of SmartMap Information Services
Based upon an extraction from the Digital Cadastral Data Base

Queensland Government



STANDARD MAP NUMBER
9242-43342

HORIZONTAL DATUM:GDA94 ZONE:56 SCALE 1 : 30000

MAP WINDOW POSITION & NEAREST LOCATION

151°31'47".934
27°42'21".845
YARRANLEA
3.06 KM

SUBJECT PARCEL DESCRIPTION

DCDB

Lot/Plan	2/A34925
Area/Volume	199.072ha
Tenure	FREEHOLD
Local Government	TOOWOOMBA REGIONAL
Locality	YARRANLEA
Segment/Parcel	39703/27

CLIENT SERVICE STANDARDS

PRINTED (dd/mm/yyyy) 15/05/2017

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SmartMap

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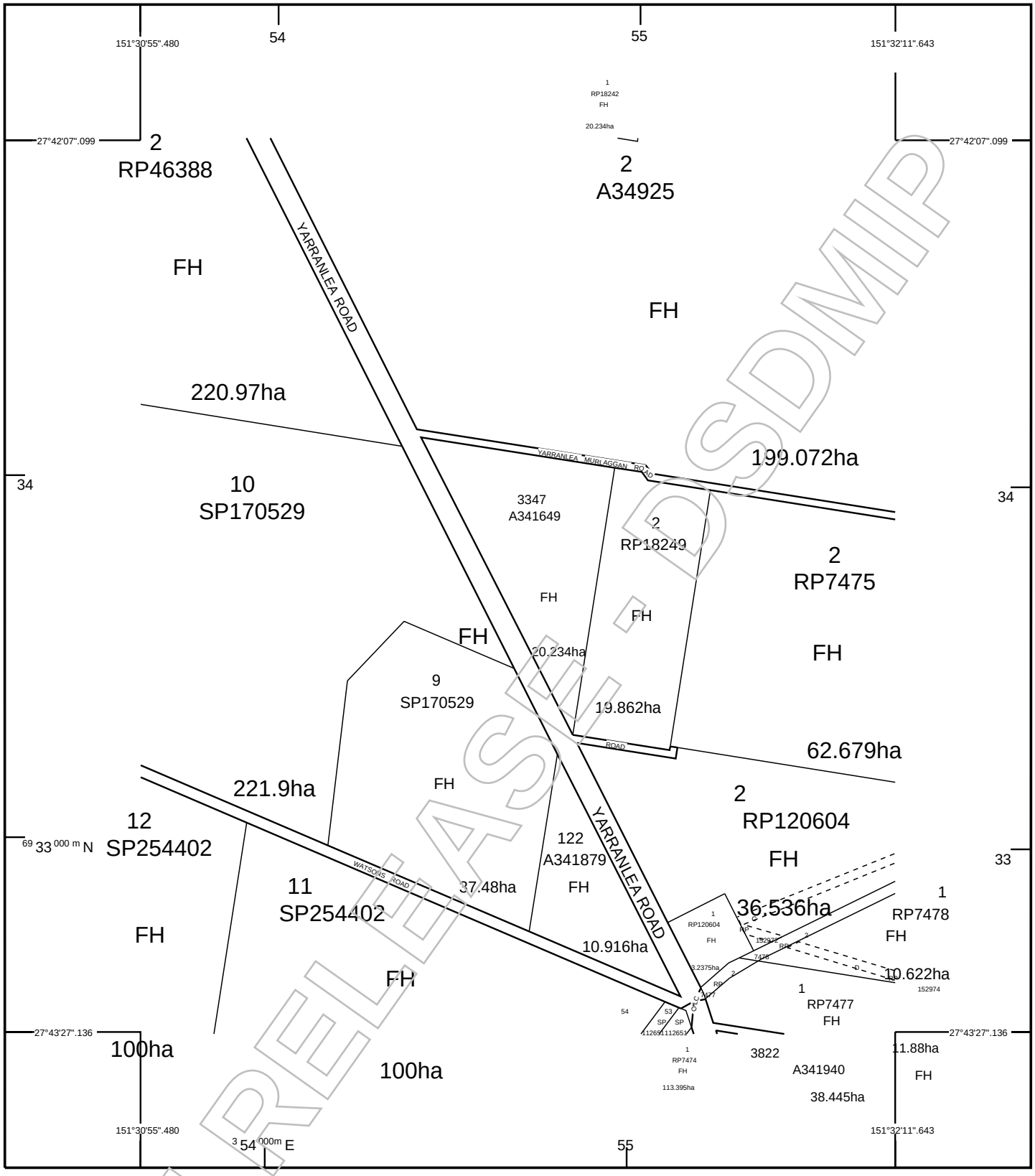
Queensland Government

GDA



STANDARD MAP NUMBER
9242-43342

0 300 600 900 1200 1500 m

HORIZONTAL DATUM:GDA94 ZONE:56 SCALE 1 : 15000

SmartMap

An External Product of
SmartMap Information Services

Based upon an extraction from the
Digital Cadastral Data Base

MAP WINDOW POSITION & NEAREST LOCATION

151°31'33".562
27°42'47".118
YARRANLEA
3.05 KM

SUBJECT PARCEL DESCRIPTION

DCDB

Lot/Plan	3347/A341649
Area/Volume	20.234ha
Tenure	FREEHOLD
Local Government	TOOWOOMBA REGIONAL
Locality	YARRANLEA
Segment/Parcel	39703/18

CLIENT SERVICE STANDARDS

PRINTED (dd/mm/yyyy) 15/05/2017

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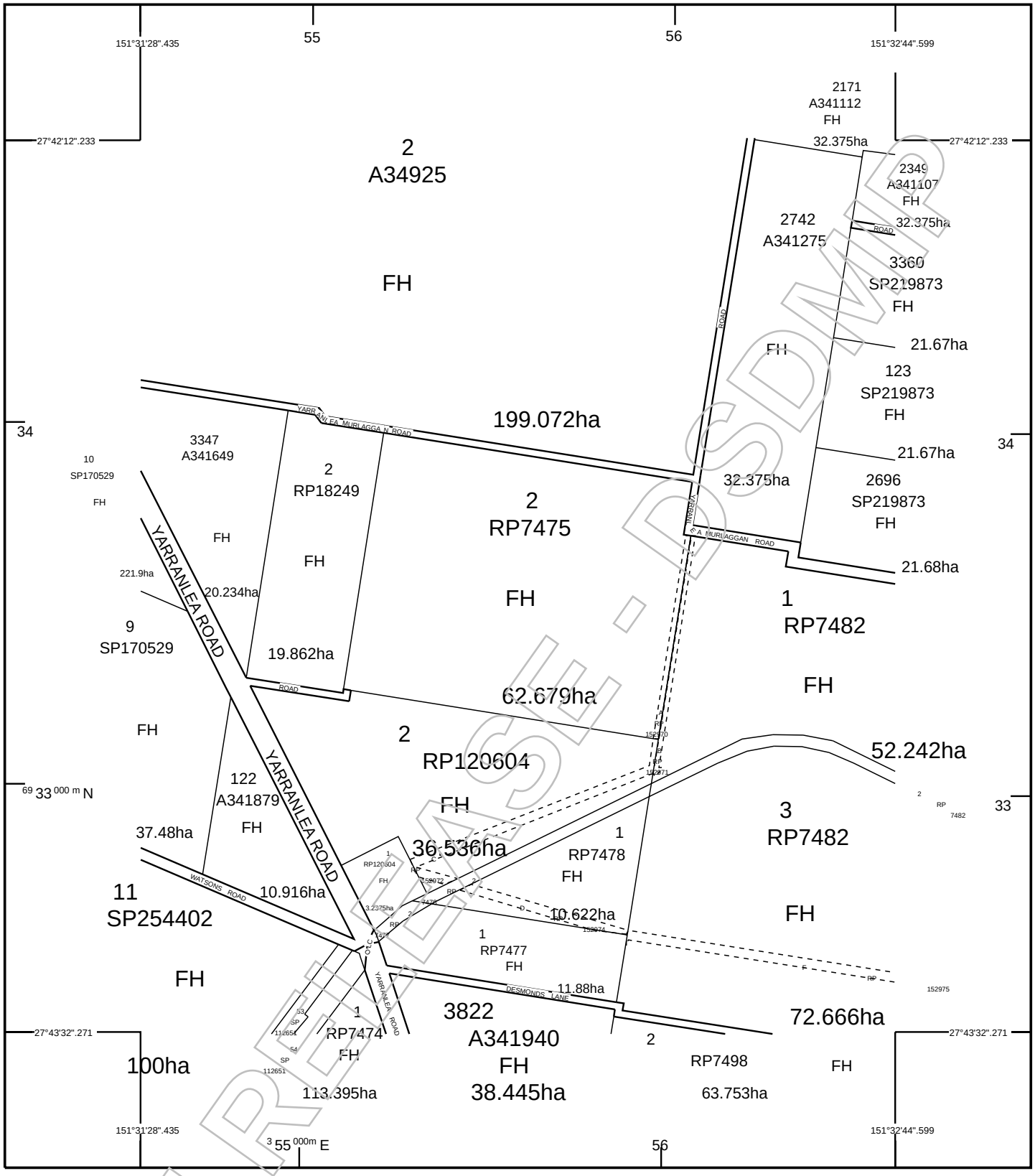
For further information on SmartMap products visit http://nrw.qld.gov.au/property/mapping/blinmap

GDA

Queensland Government



STANDARD MAP NUMBER
9242-43313

0 300 600 900 1200 1500 m

HORIZONTAL DATUM:GDA94 ZONE:56 SCALE 1 : 15000

MAP WINDOW POSITION & NEAREST LOCATION

151°32'06".517
27°42'52".252
YARRANLEA
2.15 KM

SUBJECT PARCEL DESCRIPTION

DCDB

Lot/Plan	2/RP7475
Area/Volume	62.679ha
Tenure	FREEHOLD
Local Government	TOOWOOMBA REGIONAL
Locality	YARRANLEA
Segment/Parcel	39703/16

CLIENT SERVICE STANDARDS

PRINTED (dd/mm/yyyy) 15/05/2017

DCDB 13/05/2017 (Lots with an area less than 1500m² are not shown)

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GDA

SmartMap

An External Product of
SmartMap Information Services

Based upon an extraction from the
Digital Cadastral Data Base

Queensland Government

Appendix B Locality plan

SITE LAYOUT PLAN

Scale 1:10000(A1)

LEGEND:

- Site Property Boundary
- Adjoining Property Boundary
- Existing Sealed Road
- Existing Unformed Road
- Sump 1 Drain and Retention Zone
- Sump 2/3 Drain and Retention Zone
- Ring Tank
- --(D)---(D)-- Drainage Pipe
- Finished Lidar Minor Contours
- 414.00 Finished Lidar Major Contours

NOTES:

1. Intervals between contours – 0.5m Contours are finished Lidar surface levels.
2. Plans to be plotted in colour to distinguish design elements.

EXISTING SERVICES NOTES:

1. The Contractor is to confirm the location of all services prior to commencing any construction works or ordering any materials.
2. The Contractor is to contact Dial Before You Dig on 1100 prior to commencing any construction works.
3. The project site, Yarranlea and St Helens Road reserves are known to contain existing services not shown on the plans. It is the Contractor's responsibility to confirm these service locations.
4. The Contractor is responsible for arranging the locating of all services by the relevant Authorities.
5. A representative for each service provider to be present on site when working within 3.0m of each existing service.
6. The Contractor is to confirm the location & level of all drainage connection points prior to commencing any construction works or ordering any materials.
7. Should invert levels or location of any drainage connection points differ to that indicated on RMA's drawings then the Certifying Engineer shall be notified immediately.
8. Any works required to or near an Authorities services shall be carried out to the approval of, under the supervision of and to the standard required by the Authority.

0 100 200 300 400m

1:10000(A1) 1:20000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
2	REVISE CONTAMINATED RUNOFF CAPTURE STRATEGY	09/08/17	NGT	JJW	JJW	AEL
1	CHANGE TO CULVERT TYPE	14/06/17	NGT	JRB	AEL	AEL
0	FOR APPROVAL	26/05/17	NGT	JRB	AEL	AEL

NOTE: FIGURED DIMENSIONS TO TAKE PRECEDENCE OVER SCALED MEASUREMENTS. VERIFY ALL ON SITE DIMENSIONS & LEVELS PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

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PROJECT
WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

TITLE
SITE LAYOUT PLAN

R.P.E.Q.

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PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0101
ISSUE 2

Appendix C Irrigation decision matrices

Irrigation decision matrix - Wheat

Month	Irrigation and rainfall in previous 30 days (mm)	Daily application rate	Application days
January	>=0	-	-
February	>=0	-	-
March	>=0	-	-
April	>=0	-	-
May	>=0	-	-
June	>=0	-	-
July	<=5	25	2
	>5 <=25	15	2
	>25	-	-
August	<=5	25	2
	>5 <=25	15	2
	>25 <=50	25	1
	>50	-	-
September	<=50	30	3
	>50 <=1000	30	3
	>100	-	-
October	<=50	30	3
	>50 <=1000	30	3
	>100	-	-
November	>=0	-	-
December	>=0	-	-

Irrigation decision matrix - Cotton

Month	Irrigation and rainfall in previous 30 days (mm)	Daily application rate	Application days
January	<=5	50	2
	>5 <=50	50	2
	>50 <=100	25	1
	>100	-	-
February	<=5	50	2
	>5 <=50	50	2
	>50 <=100	25	1
	>100	-	-
March	>=0	-	-
April	>=0	-	-
May	>=0	-	-
June	>=0	-	-
July	<=5	25	2
	>5 <=25	15	2
	>25	-	-
August	<=5	25	2
	>5 <=25	15	2
	>25 <=50	25	1
	>50	-	-
September	<=50	50	3
	>50	-	-
October	<=5	50	3
	>5 <=50	30	2
	>50 <=70	25	1
	>70	-	-
November	<=5	50	2
	>5 <=50	50	2
	>50	-	-
December	<=5	50	2
	>5 <=50	50	2
	>50 <=100	20	1
	>100	-	

Appendix D Concept plans

SITE CATCHMENT PLAN

Scale 1:10000(A1)

LEGEND:

- Site Property Boundary
- Adjoining Property Boundary
- Existing Sealed Road
- Existing Unformed Road
- SUMP 1 / 0.0ha — Catchment and Area
- Catchment Boundary
- Sump 1 Drain and Retention Zone
- Sump 2/3 Drain and Retention Zone
- Ring Tank
- Finished Lidar Minor Contours
- 414.00 — Finished Lidar Major Contours

NOTES:

1. Intervals between contours – 1.0m
   Contours are finished Lidar surface levels.
2. Plans to be plotted in colour to distinguish design elements.

EXISTING SERVICES NOTES:

1. The Contractor is to confirm the location of all services prior to commencing any construction works or ordering any materials.
2. The Contractor is to contact Dial Before You Dig on 1100 prior to commencing any construction works.
3. The project site, Yarranlea and St Helens Road reserves are known to contain existing services not shown on the plans. It is the Contractor's responsibility to confirm these service locations.
4. The Contractor is responsible for arranging the locating of all services by the relevant Authorities.
5. A representative for each service provider to be present on site when working within 3.0m of each existing service.
6. The Contractor is to confirm the location & level of all drainage connection points prior to commencing any construction works or ordering any materials.
7. Should invert levels or location of any drainage connection points differ to that indicated on RMA's drawings then the Certifying Engineer shall be notified immediately.
8. Any works required to or near an Authorities services shall be carried out to the approval of, under the supervision of and to the standard required by the Authority.

0 100 200 300 400m

1:10000(A1) 1:20000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
2	REVISE CONTAMINATED RUNOFF CAPTURE STRATEGY	09/08/17	NGT	JJW	JJW	AEL
1	CHANGE TO CULVERT TYPE	14/06/17	NGT	JRB	AEL	AEL
0	FOR APPROVAL	26/05/17	NGT	JRB	AEL	AEL

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PROJECT
WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

TITLE
SITE CATCHMENT PLAN

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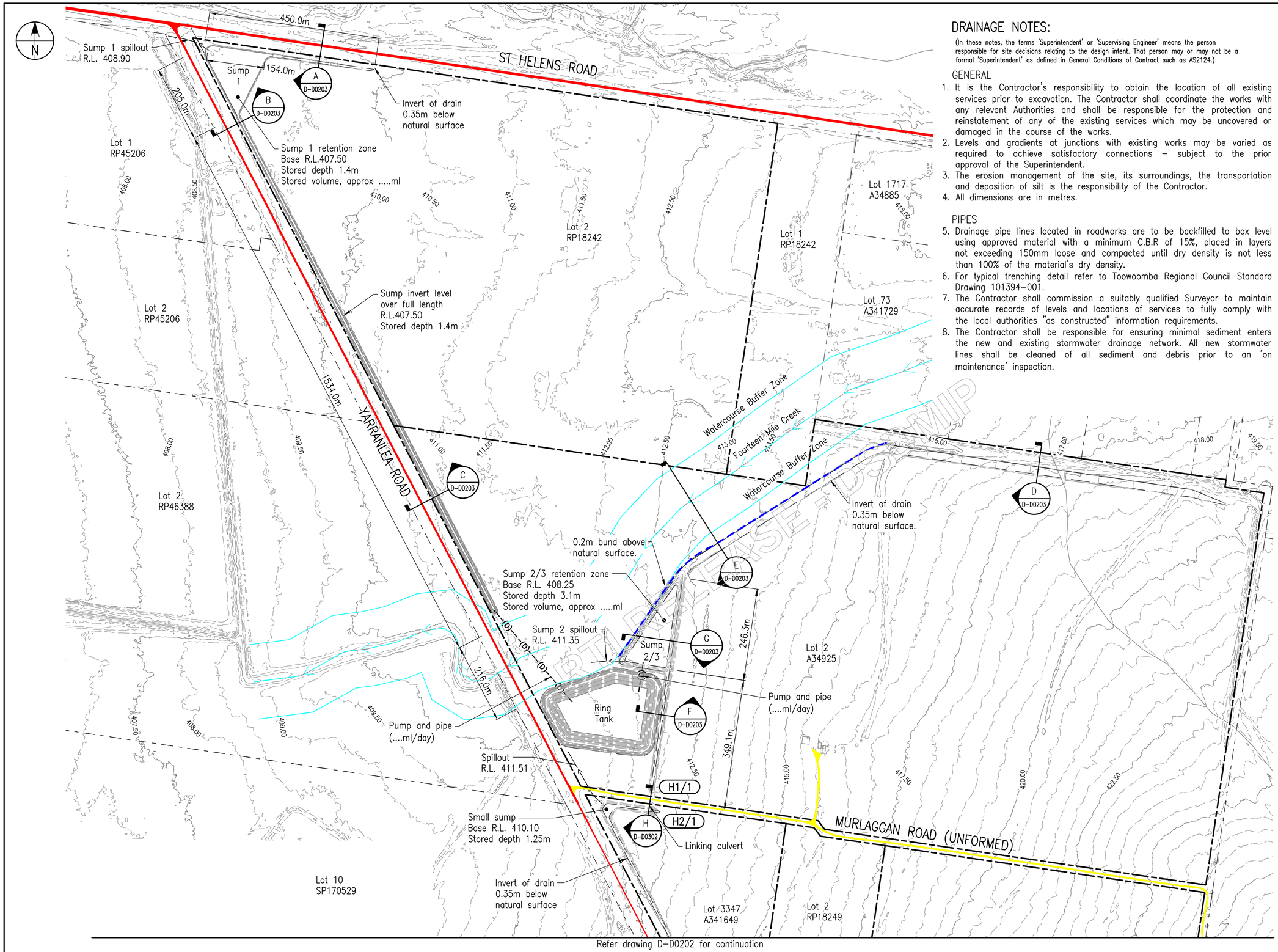
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0102
ISSUE 2



Refer drawing D-D0202 for continuation

DRAINAGE NOTES:

(In these notes, the terms 'Superintendent' or 'Supervising Engineer' means the person responsible for site decisions relating to the design intent. That person may or may not be a formal 'Superintendent' as defined in General Conditions of Contract such as AS2124.)

GENERAL

1. It is the Contractor's responsibility to obtain the location of all existing services prior to excavation. The Contractor shall coordinate the works with any relevant Authorities and shall be responsible for the protection and reinstatement of any of the existing services which may be uncovered or damaged in the course of the works.
2. Levels and gradients at junctions with existing works may be varied as required to achieve satisfactory connections – subject to the prior approval of the Superintendent.
3. The erosion management of the site, its surroundings, the transportation and deposition of silt is the responsibility of the Contractor.
4. All dimensions are in metres.

PIPES

5. Drainage pipe lines located in roadworks are to be backfilled to box level using approved material with a minimum C.B.R of 15%, placed in layers not exceeding 150mm loose and compacted until dry density is not less than 100% of the material's dry density.
6. For typical trenching detail refer to Toowoomba Regional Council Standard Drawing 101394-001.
7. The Contractor shall commission a suitably qualified Surveyor to maintain accurate records of levels and locations of services to fully comply with the local authorities "as constructed" information requirements.
8. The Contractor shall be responsible for ensuring minimal sediment enters the new and existing stormwater drainage network. All new stormwater lines shall be cleaned of all sediment and debris prior to an 'on maintenance' inspection.

LEGEND:

- Site Property Boundary
- Adjoining Property Boundary
- Existing Sealed Road
- Existing Unformed Road
- H1/1 — Headwall Label
- 200mm High Bund
- Finished Lidar Minor Contours
- 414.00 — Finished Lidar Major Contours

NOTES:

1. Intervals between contours – 0.5m
   Contours are finished Lidar surface levels.
2. Plans to be plotted in colour to distinguish design elements.

EXISTING SERVICES NOTES:

1. The Contractor is to confirm the location of all services prior to commencing any construction works or ordering any materials.
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CONTAMINATED WATER MANAGEMENT LAYOUT PLAN – 1

Scale 1:5000(A1)

0 50 100 150 200m
1:5000(A1) 1:10000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
2	REVISE CONTAMINATED RUNOFF CAPTURE STRATEGY	09/08/17	NGT	JJW	JJW	AEL
1	CHANGE TO CULVERT TYPE	14/06/17	NGT	JRB	AEL	AEL
0	FOR APPROVAL	26/05/17	NGT	JRB	AEL	AEL

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WORKS TO CAPTURE
CONTAMINATED AGRICULTURAL RUNOFF

TITLE
CONTAMINATED WATER MANAGEMENT LAYOUT PLAN - 1

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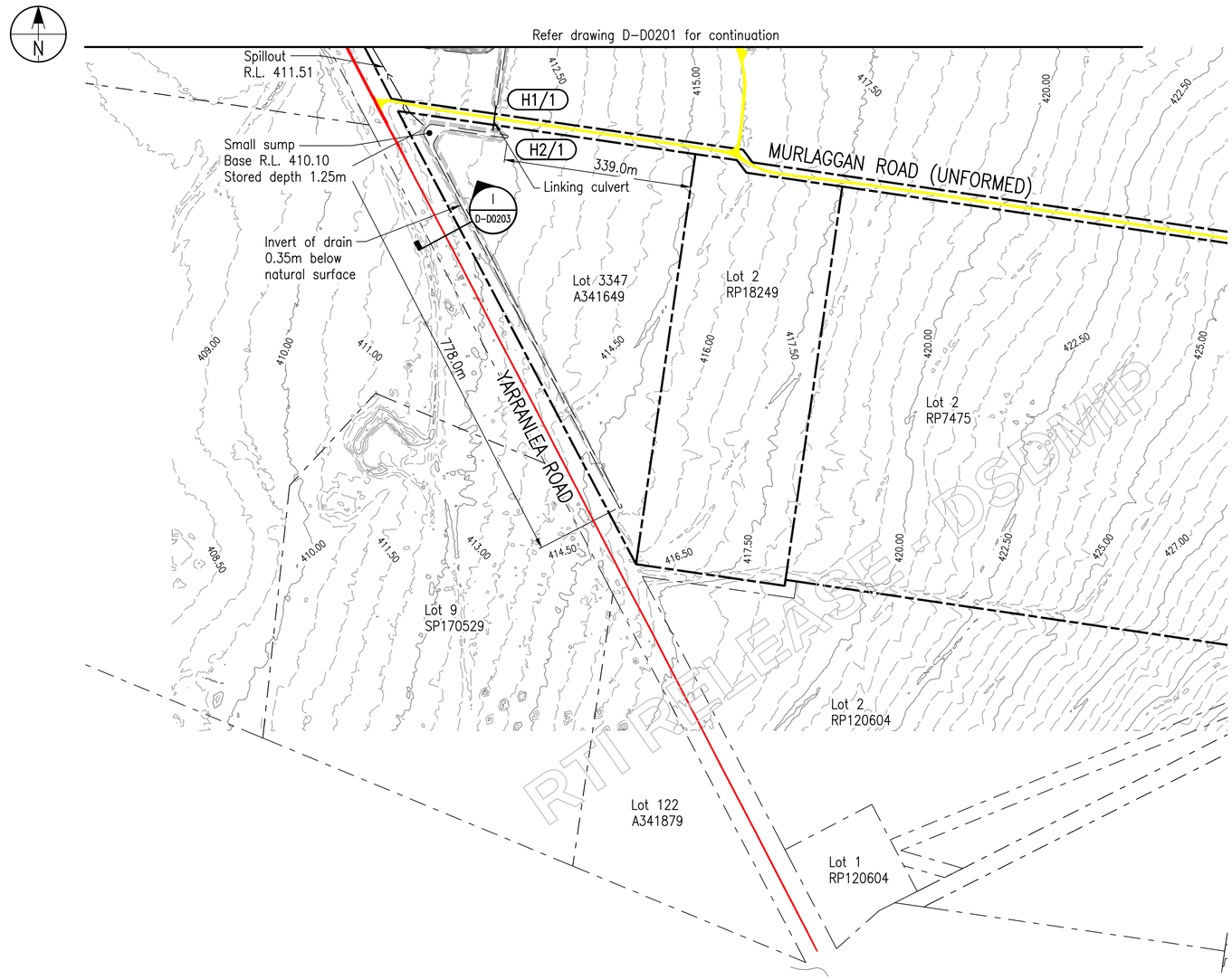
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0201
ISSUE 2



CONTAMINATED WATER MANAGEMENT LAYOUT PLAN – 2

Scale 1:5000(A1)

LEGEND:

- Site Property Boundary
- Adjoining Property Boundary
- Existing Sealed Road
- Existing Unformed Road
- H1/1 — Headwall Label
- Finished Lidar Minor Contours
- 414.00 — Finished Lidar Major Contours

NOTES:

1. Intervals between contours – 0.5m
   Contours are finished Lidar surface levels.
2. Plans to be plotted in colour to distinguish design elements.
3. Refer drawing D–D0201 for drainage notes.

NOTE:

Scour protection to be provided at spill out points, where drains drop into sumps and elsewhere if scour zones develop.

EXISTING SERVICES NOTES:

1. The Contractor is to confirm the location of all services prior to commencing any construction works or ordering any materials.
2. The Contractor is to contact Dial Before You Dig on 1100 prior to commencing any construction works.
3. The project site, Yarranlea and St Helens Road reserves are known to contain existing services not shown on the plans. It is the Contractor's responsibility to confirm these service locations.
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0 50 100 150 200m

1:5000(A1) 1:10000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
2	REVISE CONTAMINATED RUNOFF CAPTURE STRATEGY	09/08/17	NGT	JJW	JJW	AEL
1	CHANGE TO CULVERT TYPE	14/06/17	NGT	JRB	AEL	AEL
0	FOR APPROVAL	26/05/17	NGT	JRB	AEL	AEL

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PROJECT
WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

TITLE
CONTAMINATED WATER MANAGEMENT LAYOUT PLAN - 2

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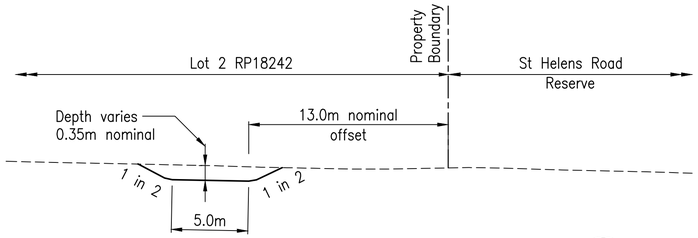
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. **D-D0202**
ISSUE **2**

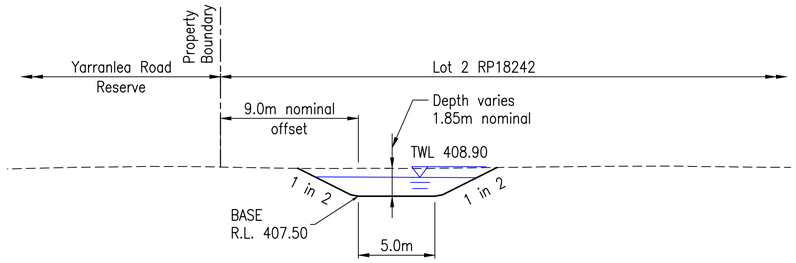
LEGEND:

Natural Surface

Design Surface



SUMP 1 LOW FLOW DIVERSION DRAIN SECTION (A / D-D0201)
Scale 1:200(A1)



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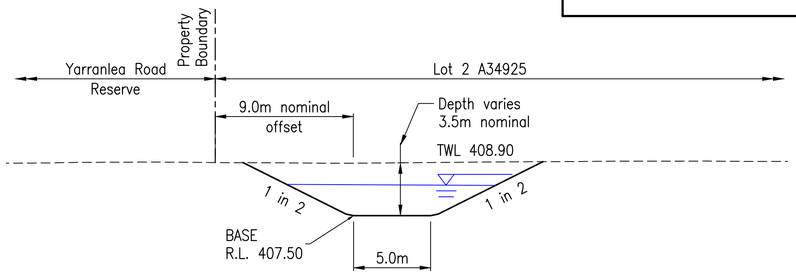
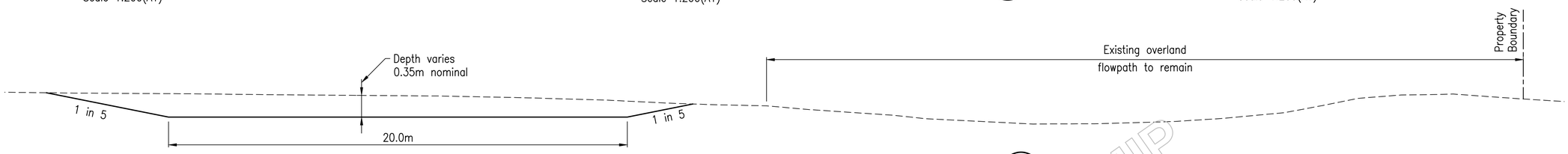
Scale 1:200(A1)



SUMP 1 LOW FLOW DIVERSION DRAIN SECTION (C / D-D0201)
Scale 1:200(A1)



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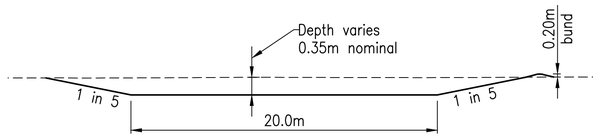
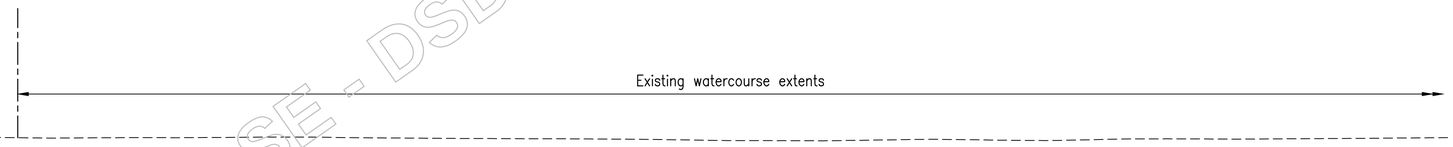
Scale 1:100(A1)





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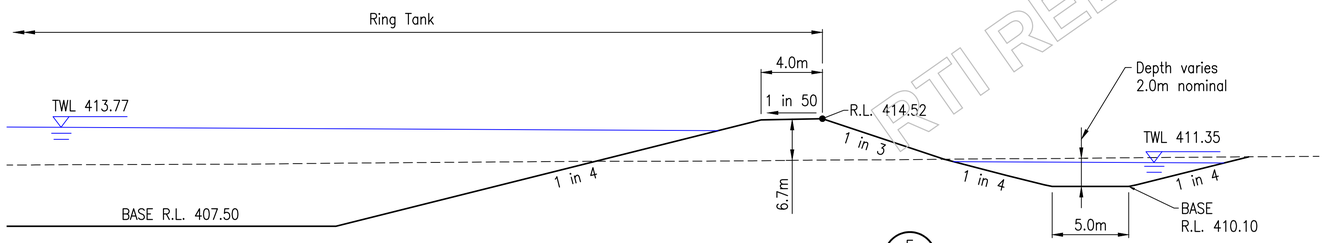
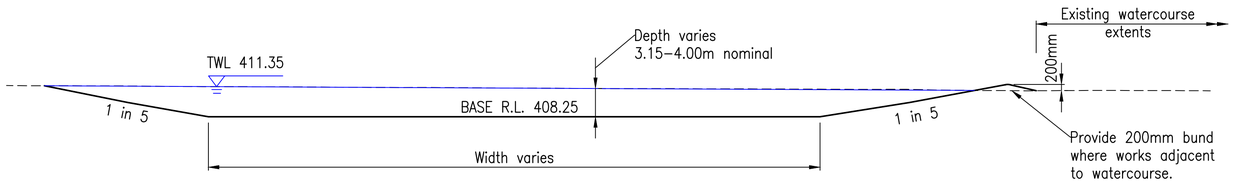
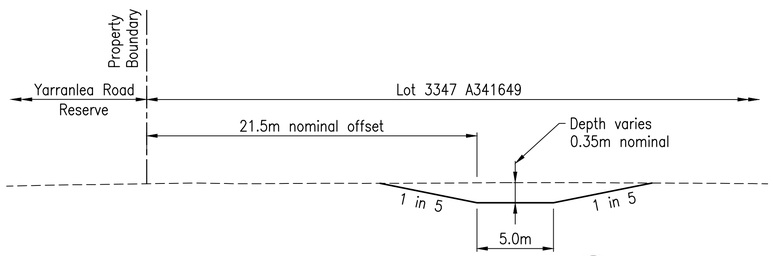
Scale 1:200(A1)



SUMP 2/3 LOW FLOW DIVERSION DRAIN SECTION (F / D-D0201)
Scale 1:200 (A1)



SUMP 2/3 RETENTION AREA SECTION (G / D-D0201)
Scale 1:100(A1)



SUMP 2/3 LOW FLOW DIVERSION DRAIN SECTION (I / D-D0202)
Scale 1:200(A1)

0 1 2 3 4m
1:100(A1) 1:200(A3)

0 2 4 6 8m
1:200(A1) 1:400(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
2	REVISE CONTAMINATED RUNOFF CAPTURE STRATEGY	09/08/17	NGT	JJW	JJW	AEL
1	CHANGE TO CULVERT TYPE	14/06/17	NGT	JRB	AEL	AEL
0	FOR APPROVAL	26/05/17	NGT	JRB	AEL	AEL

NOTE: FIGURED DIMENSIONS TO TAKE PRECEDENCE OVER SCALED MEASUREMENTS. VERIFY ALL ON SITE DIMENSIONS & LEVELS PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

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CLIENT
s. 73(2) - Not relevant/ Out of scope

PROJECT
WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

TITLE
SECTIONS

R.P.E.Q.
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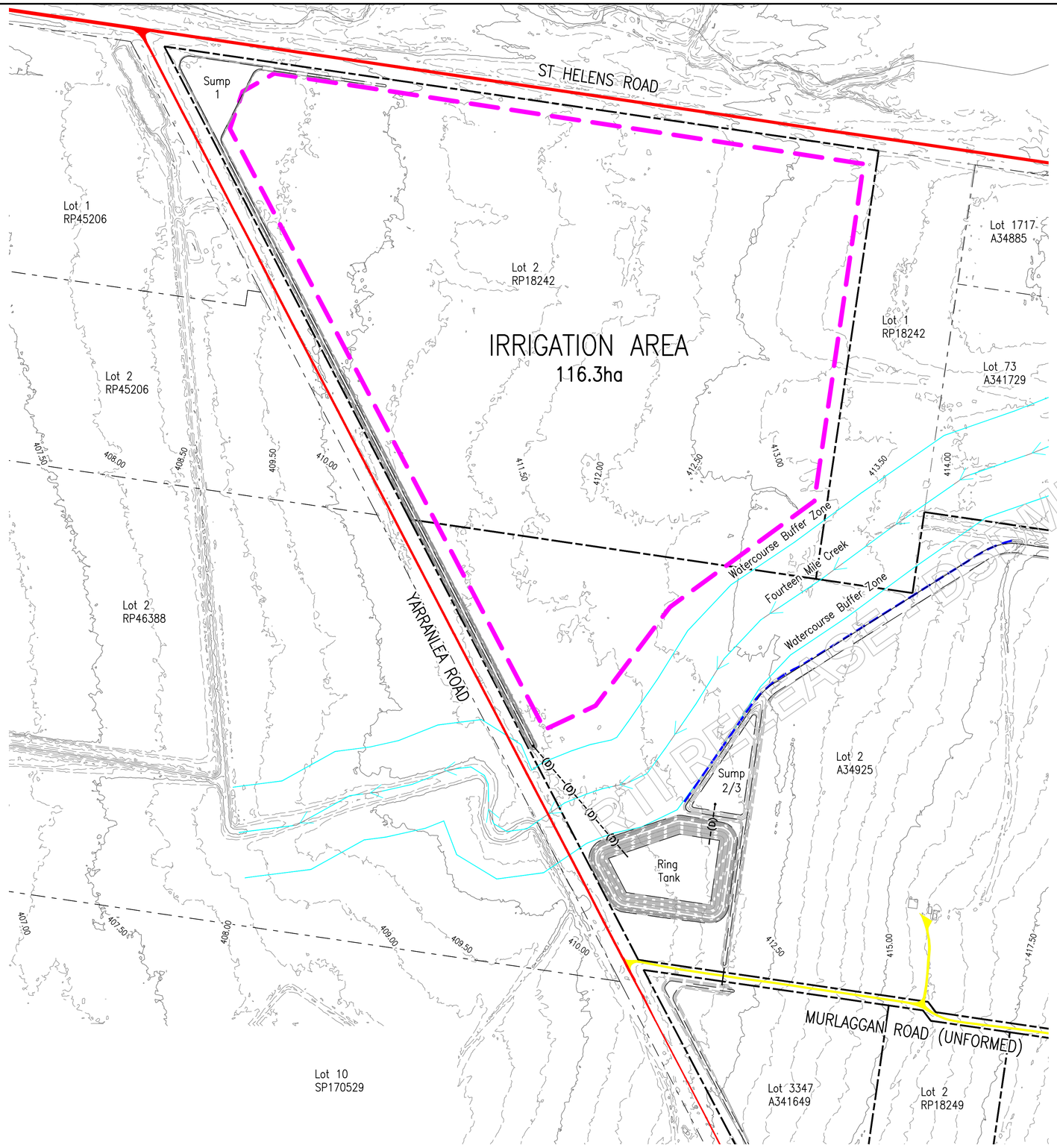
PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0203
ISSUE 2



LEGEND:

- Site Property Boundary
- Adjoining Property Boundary
- Existing Sealed Road
- Existing Unformed Road
- Approximate Irrigation Area
- 200mm High Bund
- IRRIGATION AREA 0.0ha — Irrigation Catchment Area
- --(D)---(D)-- Drainage Pipe
- Finished Lidar Minor Contours
- 414.00 Finished Lidar Major Contours

NOTES:

1. Intervals between contours – 0.5m Contours are finished Lidar surface levels.
2. Plans to be plotted in colour to distinguish design elements.
3. Refer drawing D–D0201 for drainage notes.
4. Refer drawing D–D0201–0202 for contaminated water management details.

NOTE:

Approximate area to be irrigated. Details to be confirmed.

EXISTING SERVICES NOTES:

1. The Contractor is to confirm the location of all services prior to commencing any construction works or ordering any materials.
2. The Contractor is to contact Dial Before You Dig on 1100 prior to commencing any construction works.
3. The project site, Yarranlea and St Helens Road reserves are known to contain existing services not shown on the plans. It is the Contractor's responsibility to confirm these service locations.
4. The Contractor is responsible for arranging the locating of all services by the relevant Authorities.
5. A representative for each service provider to be present on site when working within 3.0m of each existing service.
6. The Contractor is to confirm the location & level of all drainage connection points prior to commencing any construction works or ordering any materials.
7. Should invert levels or location of any drainage connection points differ to that indicated on RMA's drawings then the Certifying Engineer shall be notified immediately.
8. Any works required to or near an Authorities services shall be carried out to the approval of, under the supervision of and to the standard required by the Authority.

POSSIBLE IRRIGATED AREA LAYOUT

Scale 1:5000(A1)

0 50 100 150 200m
1:5000(A1) 1:10000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
2	REVISE CONTAMINATED RUNOFF CAPTURE STRATEGY	09/08/17	NGT	JJW	JJW	AEL
1	CHANGE TO CULVERT TYPE	14/06/17	NGT	JRB	AEL	AEL
0	FOR APPROVAL	01/06/17	NGT	JRB	AEL	AEL

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S. 73(2) - Not relevant/ Out of scope

PROJECT
WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

TITLE
POSSIBLE IRRIGATED AREA LAYOUT

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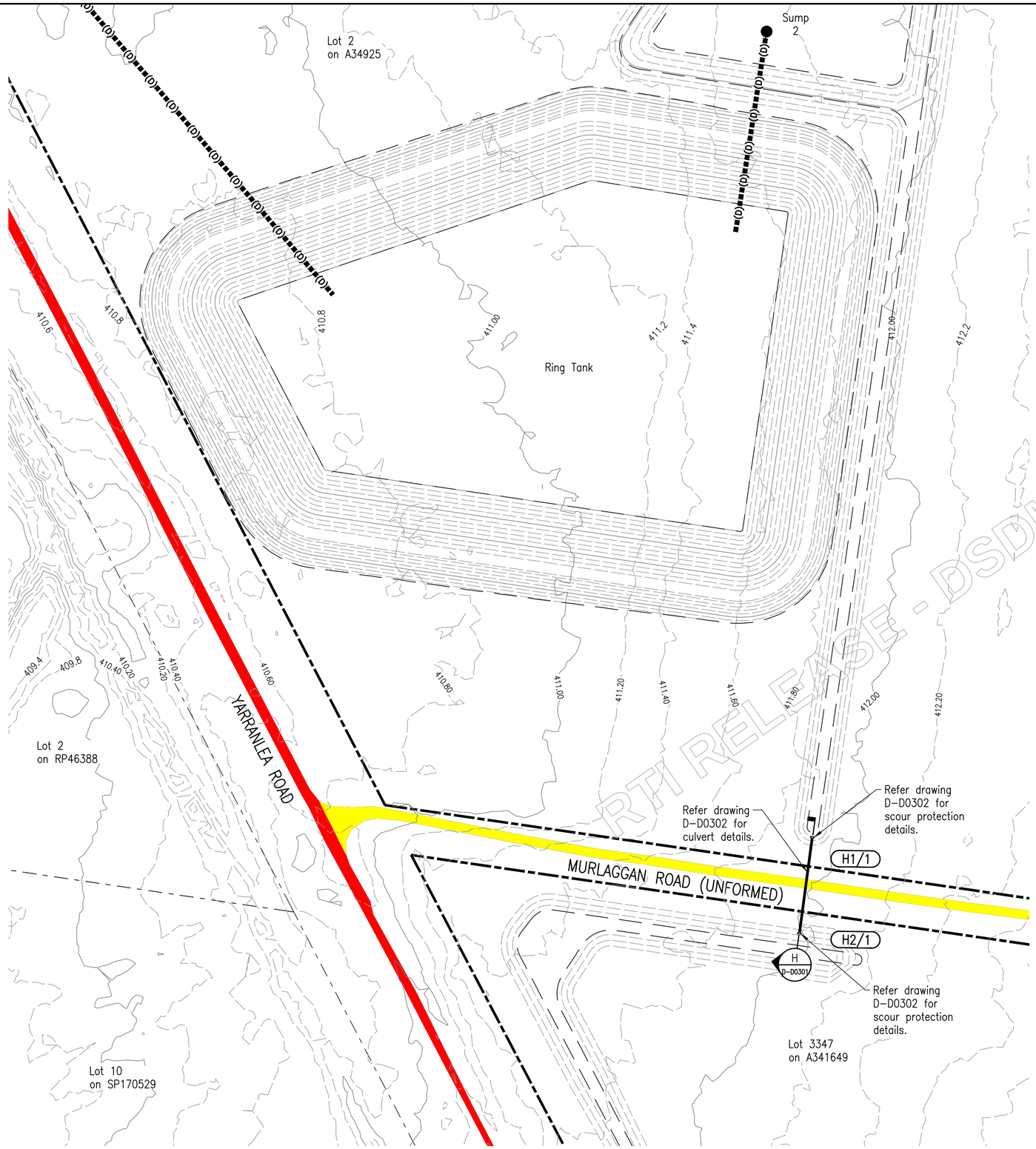
PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0204
ISSUE 2



DETAIL AT MURLAGGAN ROAD

Scale 1:1000(A1)

DRAINAGE NOTES:

(In these notes, the terms 'Superintendent' or 'Supervising Engineer' means the person responsible for site decisions relating to the design intent. That person may or may not be a formal 'Superintendent' as defined in General Conditions of Contract such as AS2124.)

GENERAL

1. It is the Contractor's responsibility to obtain the location of all existing services prior to excavation. The Contractor shall coordinate the works with any relevant Authorities and shall be responsible for the protection and reinstatement of any of the existing services which may be uncovered or damaged in the course of the works.
2. Levels and gradients at junctions with existing works may be varied as required to achieve satisfactory connections – subject to the prior approval of the Superintendent.
3. The erosion management of the site, its surroundings, the transportation and deposition of silt is the responsibility of the Contractor.
4. All dimensions are in metres.

PIPES

5. This drawing is to be read in conjunction with the stormwater drainage longitudinal sections. Pipe sizes are listed on the longitudinal sections.
6. All stormwater drainage pipes to be class 2 spigot and socket R.R.J R.C.P unless noted otherwise. Alternative products can be used subject to the prior approval of the Superintendent and Council.
7. Stormwater drainage pipe lines located in roadworks are to be backfilled to box level using approved material with a minimum C.B.R of 15%, placed in layers not exceeding 150mm loose and compacted until dry density is not less than 100% of the material's dry density.
8. For typical trenching detail refer to Toowoomba Regional Council Standard Drawing 101394–001.
9. The Contractor shall commission a suitably qualified Surveyor to maintain accurate records of levels and locations of services to fully comply with the local authorities "as constructed" information requirements.
10. The Contractor shall be responsible for ensuring minimal sediment enters the new and existing stormwater drainage network. All new stormwater lines shall be cleaned of all sediment and debris prior to an 'on maintenance' inspection.

LEGEND:

- Site Boundary
- Adjoining Property Boundary
- Existing Sealed Road
- Existing Unformed Road
- H1/1 — Headwall Label
- Drainage Pipe
- Drainage Pipe and Pump
- Finished Lidar Minor Contours
- 414.00 — Finished Lidar Major Contours

NOTES:

1. Intervals between contours – 0.2m
   Contours are finished Lidar surface levels.
2. Plan to be plotted in colour to distinguish design elements.

NOTE:

Scour protection to be provided at spill out points, where drains drop into sumps and elsewhere if scour zones develop.

EXISTING SERVICES NOTES:

1. The Contractor is to confirm the location of all services prior to commencing any construction works or ordering any materials.
2. The Contractor is to contact Dial Before You Dig on 1100 prior to commencing any construction works.
3. The project site, Yarranlea and St Helens Road reserves are known to contain existing services not shown on the plans. It is the Contractor's responsibility to confirm these service locations.
4. The Contractor is responsible for arranging the locating of all services by the relevant Authorities.
5. A representative for each service provider to be present on site when working within 3.0m of each existing service.
6. The Contractor is to confirm the location & level of all drainage connection points prior to commencing any construction works or ordering any materials.
7. Should invert levels or location of any drainage connection points differ to that indicated on RMA's drawings then the Certifying Engineer shall be notified immediately.
8. Any works required to or near an Authorities services shall be carried out to the approval of, under the supervision of and to the standard required by the Authority.

0 10 20 30 40m

1:1000(A1) 1:2000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
2	REVISE CONTAMINATED RUNOFF CAPTURE STRATEGY	09/08/17	NGT	JJW	JJW	AEL
1	CHANGE TO CULVERT TYPE	14/06/17	NGT	JRB	AEL	AEL
0	FOR APPROVAL	26/05/17	NGT	JRB	AEL	AEL

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CLIENT
s. 73(2) - Not relevant/ Out of scope

PROJECT
WORKS TO CAPTURE
CONTAMINATED AGRICULTURAL RUNOFF

TITLE
DETAIL AT MURLAGGAN ROAD

R.P.E.Q.

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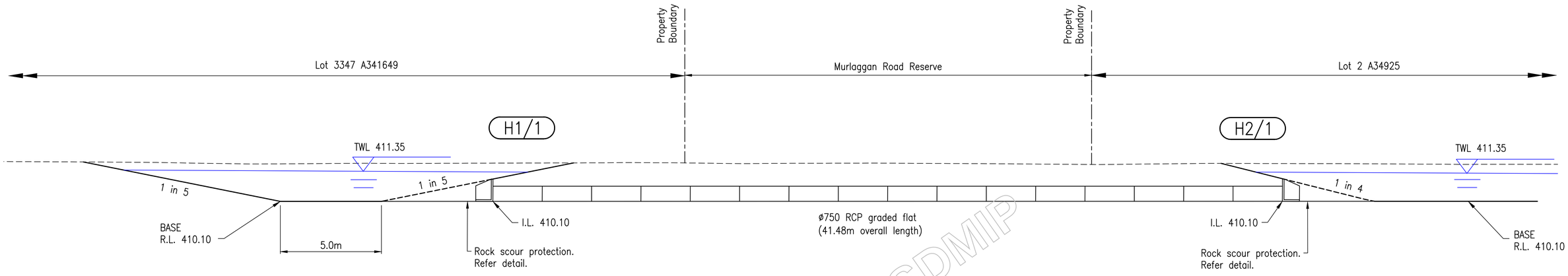
PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0301
ISSUE 2

LEGEND:

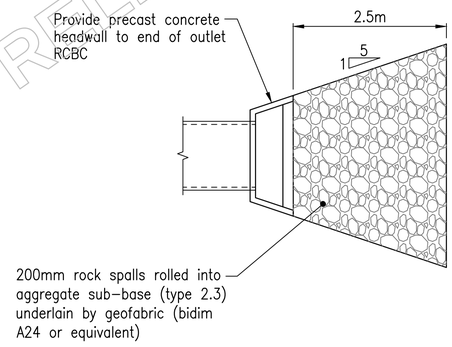
H1/1 Headwall Label

Design Surface

Natural Surface



MURLAGGAN ROAD LINKING CULVERT CROSS SECTION (H C-D0201)
1:100 (A1)



TYPICAL OUTLET SCOUR PROTECTION
Do not scale

EXISTING SERVICES NOTES:

1. The Contractor is to confirm the location of all services prior to commencing any construction works or ordering any materials.
2. The Contractor is to contact Dial Before You Dig on 1100 prior to commencing any construction works.
3. The project site, Yarranlea and St Helens Road reserves are known to contain existing services not shown on the plans. It is the Contractor's responsibility to confirm these service locations.
4. The Contractor is responsible for arranging the locating of all services by the relevant Authorities.
5. A representative for each service provider to be present on site when working within 3.0m of each existing service.
6. The Contractor is to confirm the location & level of all drainage connection points prior to commencing any construction works or ordering any materials.
7. Should invert levels or location of any drainage connection points differ to that indicated on RMA's drawings then the Certifying Engineer shall be notified immediately.
8. Any works required to or near an Authorities services shall be carried out to the approval of, under the supervision of and to the standard required by the Authority.

0 1 2 3 4m
1:100(A1) 1:200(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
2	REVISE CONTAMINATED RUNOFF CAPTURE STRATEGY	09/08/17	NGT	JJW	JJW	AEL
1	CHANGE TO CULVERT TYPE	14/06/17	NGT	JRB	AEL	AEL
0	FOR APPROVAL	26/05/17	NGT	JRB	AEL	AEL

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CLIENT
s. 73(2) - Not relevant/ Out of scope

PROJECT
WORKS TO CAPTURE CONTAMINATED AGRICULTURAL RUNOFF

TITLE
CULVERT DETAILS

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PROJECT NO. 11448(NRM)
COUNCIL RAL/MCU NO.
COUNCIL OW NO.
DRAWING NO. D-D0302
ISSUE 2

Schedule – Additional Premises

3) Location of the premises *(complete 3.1) or 3.2), and 3.3) as applicable)*

***Note**: Provide details below and attach a site plan for any or all premises part of the development application. For further information, see DA Forms Guide: Relevant plans.*

3.1) Street address and lot on plan

☒ Street address **AND** lot on plan (*all lots must be listed*), ***or***

☐ Street address **AND** lot on plan for an adjoining or adjacent property of the premises *(appropriate for development in water but adjoining or adjacent to land e.g. jetty, pontoon; all lots must be listed).*

a)	Unit No.	Street No.	Street Name and Type	Suburb
		538	Yarranlea Road	Yarranlea
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
		3347	A341649	Toowoomba
b)	Unit No.	Street No.	Street Name and Type	Suburb
		538	Murlaggan Road	Yarranlea
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
		2	RP18249	Toowoomba
b)	Unit No.	Street No.	Street Name and Type	Suburb
		538	Murlaggan Road	Yarranlea
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
		2	RP7475	Toowoomba

DA Form 1 – Development application details

Approved form (version 1.0 effective 3 July 2017) made under section 282 of the Planning Act 2016.

This form **must** be used to make a development application **involving code assessment or impact assessment**, except when applying for development involving building work.

For a development application involving **building work only**, use *DA Form 2 – Building work details*.

For a development application involving **building work associated with any other type of assessable development**, use this form (*DA Form 1*) **and** parts 4 to 6 of *DA Form 2 – Building work details*.

Unless stated otherwise, all parts of this form **must** be completed in full and all required supporting information **must** accompany the development application.

One or more additional pages may be attached as a schedule to this development application if there is insufficient space on the form to include all the necessary information.

This form and any other form relevant to the development application must be used to make a development application relating to strategic port land and Brisbane core port land under the *Transport Infrastructure Act 1994*, and airport land under the *Airport Assets (Restructuring and Disposal) Act 2008.* For the purpose of assessing a development application relating to strategic port land and Brisbane core port land, any reference to a planning scheme is taken to mean a land use plan for the strategic port land, Brisbane port land use plan for Brisbane core port land, or a land use plan for airport land.

Note: *All terms used in this form have the meaning given under the Planning Act 2016, the Planning Regulation 2017, or the Development Assessment Rules (DA Rules).*

PART 1 – APPLICANT DETAILS

Applicant name(s) *(individual or company full name)*	
Contact name *(only applicable for companies)*	
Postal address *(P.O. Box or street address)*	
Suburb	
State	
Postcode	
Country	
Contact number	
Email address *(non-mandatory)*	
Mobile number *(non-mandatory)*	
Fax number *(non-mandatory)*	
Applicant's reference number(s) *(if applicable)*	11448

2) Owner's consent
2.1) Is written consent of the owner required for this development application?
☐ Yes – the written consent of the owner(s) is attached to this development application ☒ No – proceed to 3)

PART 2 – LOCATION DETAILS

3) Location of the premises *(complete 3.1) or 3.2), and 3.3) as applicable)*

***Note**: Provide details below and attach a site plan for any or all premises part of the development application. For further information, see DA Forms Guide: Relevant plans.*

3.1) Street address and lot on plan

☐ Street address **AND** lot on plan (*all lots must be listed*), ***or***

☐ Street address **AND** lot on plan for an adjoining or adjacent property of the premises *(appropriate for development in water but adjoining or adjacent to land e.g. jetty, pontoon; all lots must be listed).*

a)	Unit No.	Street No.	Street Name and Type	Suburb
		752	Murlaggan Road	Yarraniea
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
		2	RP18242	Toowoomba
b)	Unit No.	Street No.	Street Name and Type	Suburb
		752	Murlaggan Road	Yarraniea
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
		2	A34925	Toowoomba

3.2) Coordinates of premises *(appropriate for development in remote areas, over part of a lot or in water not adjoining or adjacent to land e.g. channel dredging in Moreton Bay)*

***Note**: Place each set of coordinates in a separate row. Only one set of coordinates is required for this part.*

☐ Coordinates of premises by longitude and latitude

Longitude(s)	Latitude(s)	Datum	Local Government Area(s) *(if applicable)*
		☐ WGS84 ☐ GDA94 ☐ Other:	

☐ Coordinates of premises by easting and northing

Easting(s)	Northing(s)	Zone Ref.	Datum	Local Government Area(s) *(if applicable)*
		☐ 54 ☐ 55 ☐ 56	☐ WGS84 ☐ GDA94 ☐ Other:	

3.3) Additional premises

☒ Additional premises are relevant to this development application and their details have been attached in a schedule to this application

☐ Not required

4) Identify any of the following that apply to the premises and provide any relevant details

☒ In or adjacent to a water body or watercourse or in or above an aquifer

Name of water body, watercourse or aquifer:	Fourteen Mile Creek

☐ On strategic port land under the *Transport Infrastructure Act 1994*

Lot on plan description of strategic port land:	
Name of port authority for the lot:	

☐ In a tidal area

Name of local government for the tidal area *(if applicable)*:	
Name of port authority for tidal area *(if applicable)*:	

☐ On airport land under the *Airport Assets (Restructuring and Disposal) Act 2008*

Name of airport:	

☐ Listed on the Environmental Management Register (EMR) under the *Environmental Protection Act 1994*

EMR site identification:	

☐ Listed on the Contaminated Land Register (CLR) under the *Environmental Protection Act 1994*

CLR site identification:

5) Are there any existing easements over the premises?

Note: Easement uses vary throughout Queensland and are to be identified correctly and accurately. For further information on easements and how they may affect the proposed development, see DA Forms Guide.

☐ Yes – All easement locations, types and dimensions are included in plans submitted with this development application

☒ No

PART 3 – DEVELOPMENT DETAILS

Section 1 – Aspects of development

6.1) Provide details about the first development aspect

a) What is the type of development? *(tick only one box)*

☐ Material change of use ☐ Reconfiguring a lot ☒ Operational work ☐ Building work

b) What is the approval type? *(tick only one box)*

☒ Development permit ☐ Preliminary approval ☐ Preliminary approval that includes a variation approval

c) What is the level of assessment?

☒ Code assessment ☐ Impact assessment *(requires public notification)*

d) Provide a brief description of the proposal *(e.g. 6 unit apartment building defined as multi-unit dwelling, reconfiguration of 1 lot into 3 lots)*:

Sumps, drains, storage dam and pumps to collect Contaminated Agricultural Runoff

e) Relevant plans

***Note**: Relevant plans are required to be submitted for all aspects of this development application. For further information, see DA Forms guide: Relevant plans.*

☒ Relevant plans of the proposed development are attached to the development application

6.2) Provide details about the second development aspect

a) What is the type of development? *(tick only one box)*

☐ Material change of use ☐ Reconfiguring a lot ☐ Operational work ☐ Building work

b) What is the approval type? *(tick only one box)*

☐ Development permit ☐ Preliminary approval ☐ Preliminary approval that includes a variation approval

c) What is the level of assessment?

☐ Code assessment ☐ Impact assessment *(requires public notification)*

d) Provide a brief description of the proposal *(e.g. 6 unit apartment building defined as multi-unit dwelling, reconfiguration of 1 lot into 3 lots)*

e) Relevant plans

***Note**: Relevant plans are required to be submitted for all aspects of this development application. For further information, see DA Forms Guide: Relevant plans.*

☐ Relevant plans of the proposed development are attached to the development application

6.3) Additional aspects of development

☐ Additional aspects of development are relevant to this development application and the details for these aspects that would be required under Part 3 Section 1 of this form have been attached to this development application

☐ Not required

Section 2 – Further development details

7) Does the proposed development application involve any of the following?	
Material change of use	☐ Yes – complete division 1 if assessable against a local planning instrument
Reconfiguring a lot	☐ Yes – complete division 2
Operational work	☒ Yes – complete division 3
Building work	☐ Yes – complete *DA Form 2 – Building work details*

Division 1 – Material change of use

***Note**: This division is only required to be completed if any part of the development application involves a material change of use assessable against a local planning instrument.*

8.1) Describe the proposed material change of use			
Provide a general description of the proposed use	Provide the planning scheme definition *(include each definition in a new row)*	Number of dwelling units *(if applicable)*	Gross floor area (m^2) *(if applicable)*

8.2) Does the proposed use involve the use of existing buildings on the premises?		
☐ Yes		
☐ No		

Division 2 – Reconfiguring a lot

***Note**: This division is only required to be completed if any part of the development application involves reconfiguring a lot.*

9.1) What is the total number of existing lots making up the premises?

9.2) What is the nature of the lot reconfiguration? *(tick all applicable boxes)*	
☐ Subdivision *(complete 10))*	☐ Dividing land into parts by agreement *(complete 11))*
☐ Boundary realignment *(complete 12))*	☐ Creating or changing an easement giving access to a lot from a construction road *(complete 13))*

10) Subdivision 10.1) For this development, how many lots are being created and what is the intended use of those lots:				
Intended use of lots created	Residential	Commercial	Industrial	Other, please specify:
Number of lots created				

10.2) Will the subdivision be staged?	
☐ Yes – provide additional details below ☐ No	
How many stages will the works include?	
What stage(s) will this development application apply to?	

11) Dividing land into parts by agreement – how many parts are being created and what is the intended use of the parts?				
Intended use of parts created	Residential	Commercial	Industrial	Other, please specify:
Number of parts created				

12) Boundary realignment

12.1) What are the current and proposed areas for each lot comprising the premises?

Current lot		Proposed lot	
Lot on plan description	Area (m^2)	Lot on plan description	Area (m^2)

12.2) What is the reason for the boundary realignment?

13) What are the dimensions and nature of any existing easements being changed and/or any proposed easement? *(attach schedule if there are more than two easements)*

Existing or proposed?	Width (m)	Length (m)	Purpose of the easement? *(e.g. pedestrian access)*	Identify the land/lot(s) benefitted by the easement

Division 3 – Operational work

***Note**: This division is only required to be completed if any part of the development application involves operational work.*

14.1) What is the nature of the operational work?

- ☐ Road work
- ☐ Stormwater
- ☐ Water infrastructure
- ☐ Drainage work
- ☐ Earthworks
- ☐ Sewage infrastructure
- ☐ Landscaping
- ☐ Signage
- ☐ Clearing vegetation
- ☒ Other – please specify: Works to collect Contaminated Agricultural Runoff

14.2) Is the operational work necessary to facilitate the creation of new lots? *(e.g. subdivision)*

- ☐ Yes – specify number of new lots:
- ☒ No

14.3) What is the monetary value of the proposed operational work? *(include GST, materials and labour)*

$200000

PART 4 – ASSESSMENT MANAGER DETAILS

15) Identify the assessment manager(s) who will be assessing this development application

DILGP

16) Has the local government agreed to apply a superseded planning scheme for this development application?

- ☐ Yes – a copy of the decision notice is attached to this development application
- ☐ Local government is taken to have agreed to the superseded planning scheme request – relevant documents attached
- ☒ No

PART 5 – REFERRAL DETAILS

17) Do any aspects of the proposed development require referral for any referral requirements?

***Note**: A development application will require referral if prescribed by the* Planning Regulation 2017.

☒ No, there are no referral requirements relevant to any development aspects identified in this development application – proceed to Part 6

Matters requiring referral to the **chief executive of the Planning Regulation 2017:**

- ☐ Clearing native vegetation
- ☐ Contaminated land *(unexploded ordnance)*

- ☐ Environmentally relevant activities (ERA) *(only if the ERA have not been devolved to a local government)*
- ☐ Fisheries – aquaculture
- ☐ Fisheries – declared fish habitat area
- ☐ Fisheries – marine plants
- ☐ Fisheries – waterway barrier works
- ☐ Hazardous chemical facilities
- ☐ Queensland heritage place *(on or near a Queensland heritage place)*
- ☐ Infrastructure – designated premises
- ☐ Infrastructure – state transport infrastructure
- ☐ Infrastructure – state transport corridors and future state transport corridors
- ☐ Infrastructure – state-controlled transport tunnels and future state-controlled transport tunnels
- ☐ Infrastructure – state-controlled roads
- ☐ Land within Port of Brisbane's port limits
- ☐ SEQ development area
- ☐ SEQ regional landscape and rural production area or SEQ Rural living area – community activity
- ☐ SEQ regional landscape and rural production area or SEQ Rural living area – indoor recreation
- ☐ SEQ regional landscape and rural production area or SEQ Rural living area – residential development
- ☐ SEQ regional landscape and rural production area or SEQ Rural living area – urban activity
- ☐ Tidal works or works in a coastal management district
- ☐ Urban design
- ☐ Water-related development – taking or interfering with water
- ☐ Water-related development – removing quarry material *(from a watercourse or lake)*
- ☐ Water-related development – referable dams
- ☐ Water-related development – construction of new levees or modification of existing levees *(category 2 or 3 levees only)*
- ☐ Wetland protection area

Matters requiring referral to the **local government:**

- ☐ Airport land
- ☐ Environmentally relevant activities (ERA) *(only if the ERA have been devolved to local government)*
- ☐ Local heritage places

Matters requiring referral to the **chief executive of the distribution entity or transmission entity:**

- ☐ Electricity infrastructure

Matters requiring referral to:

- The **chief executive of the holder of the licence**, if not an individual
- The **holder of the licence**, if the holder of the licence is an individual

- ☐ Oil and gas infrastructure

Matters requiring referral to **the Brisbane City Council:**

- ☐ Brisbane core port land

Matters requiring referral to the **Minister under the Transport Infrastructure Act 1994:**

- ☐ Brisbane core port land
- ☐ Strategic port land

Matters requiring referral to the **relevant port operator:**

- ☐ Brisbane core port land (below high-water mark and within port limits)

Matters requiring referral to the **chief executive of the relevant port authority:**

- ☐ Land within limits of another port

Matters requiring referral to the **Gold Coast Waterways Authority:**

- ☐ Tidal works, or development in a coastal management district in Gold Coast waters

Matters requiring referral to the **Queensland Fire and Emergency Service:**

- ☐ Tidal works, or development in a coastal management district