Design Notes

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Produced by: Jason Keller
File: RN1728 Bulgroo Bore
Location: Toowoomba

RN1728
Bulgroo Bore
Planning Map

Edition: Planning
Version: A
Date: 19/07/2011
Engineer: Jason Keller

A3

1:100,000

0 0.40.81.21.6 2 km

GABSI
Great Artesian Basin Sustainability Initiative

Map Projection: UTM, MGA Zone 55
Map Datum: GDA 1994
Data Sources: Dept. of Environment & Resource Management, Geoscience Australia and Landsat TM imagery
Bores shown on this map are provided as a locational aid only

Australian Government
Department of Agriculture, Fisheries and Forestry

Release

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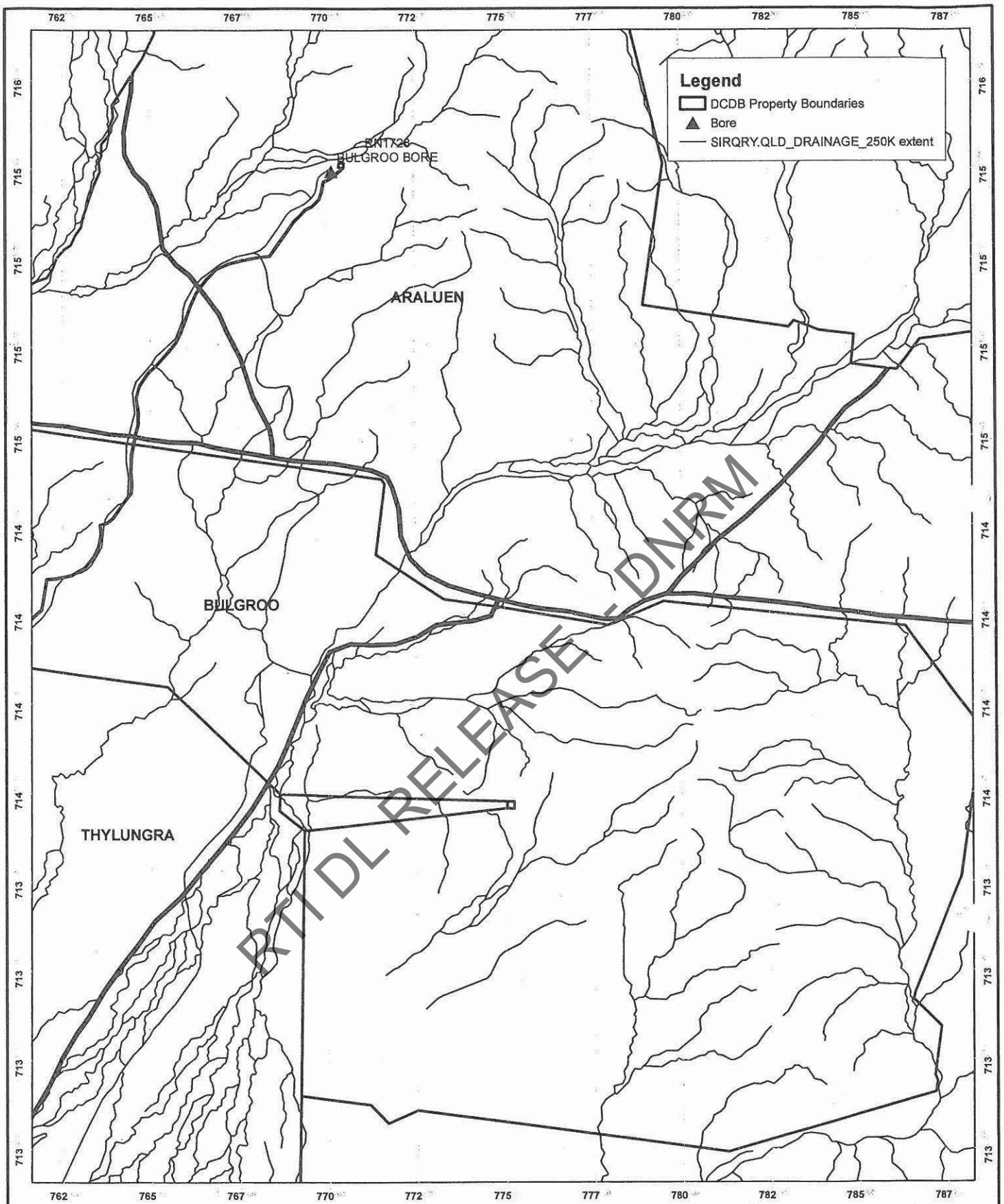

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0 0.40.81.21.6 2 km

GABSI
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Australian Government
Department of Agriculture, Fisheries and Forestry

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Queensland Government

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Location: Toowoomba

RN1728
Bulgroo Bore
Planning Map

Edition: Planning
Version: A
Date: 19/07/2011
Engineer: Jason Keller

A3

1:250,000

0 1 2 3 4 5 km

GABSI
Great Artesian Basin Sustainability Initiative

Australian Government
Department of Agriculture, Fisheries and Forestry

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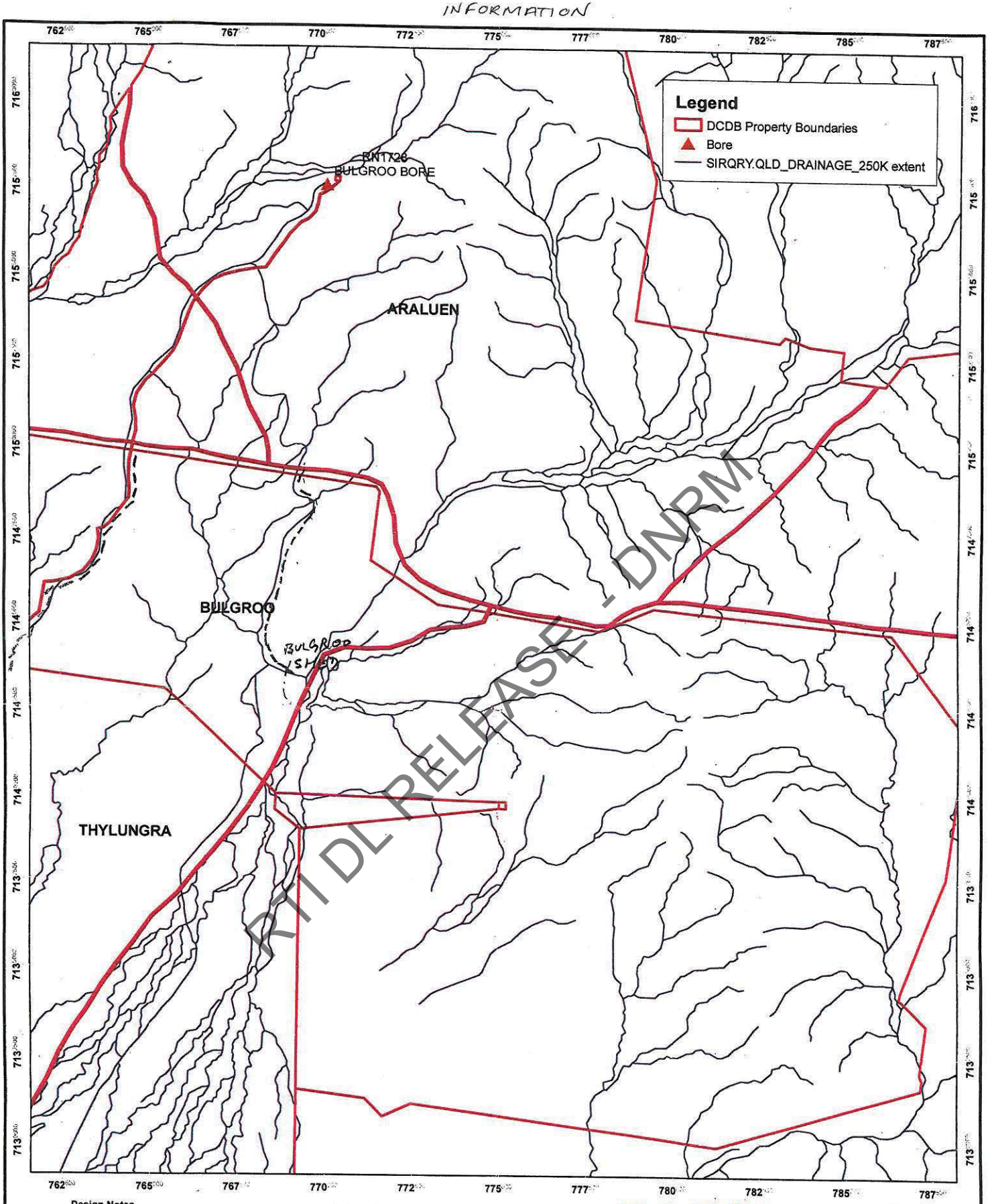
COMPLETE THIS MAP WITH THE REQUESTED INFORMATION



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Location: Toowoomba

RN1728
Bulgroo Bore
Planning Map

Edition: Planning
Version: A
Date: 19/07/2011
Engineer: Jason Keller

A3

1:100,000

0 1 2 4 6 8 km

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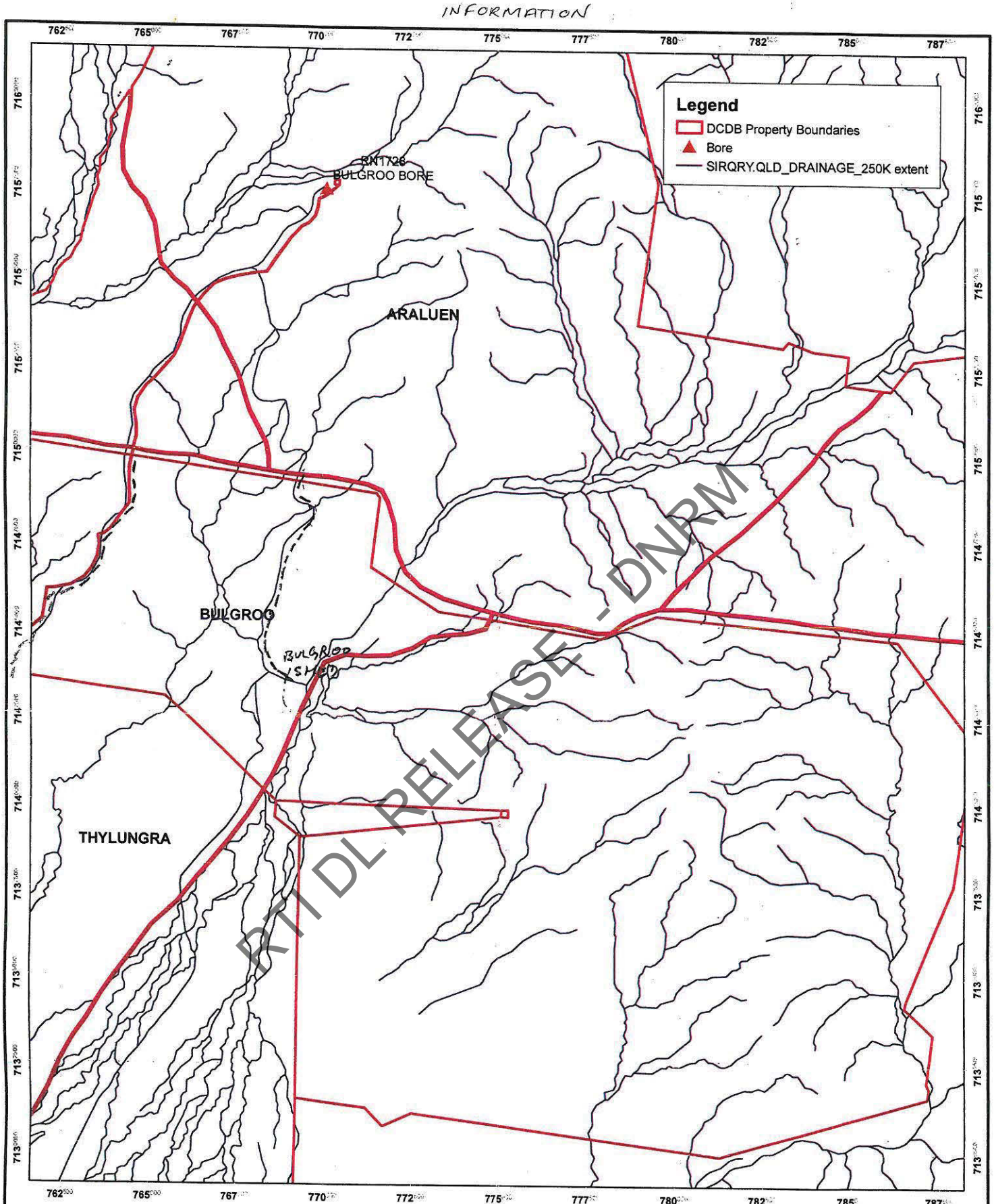

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RN1728
Bulgroo Bore
Planning Map

Edition: Planning
Version: A
Date: 19/07/2011
Engineer: Jason Keller

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Department of Agriculture, Fisheries and Forestry

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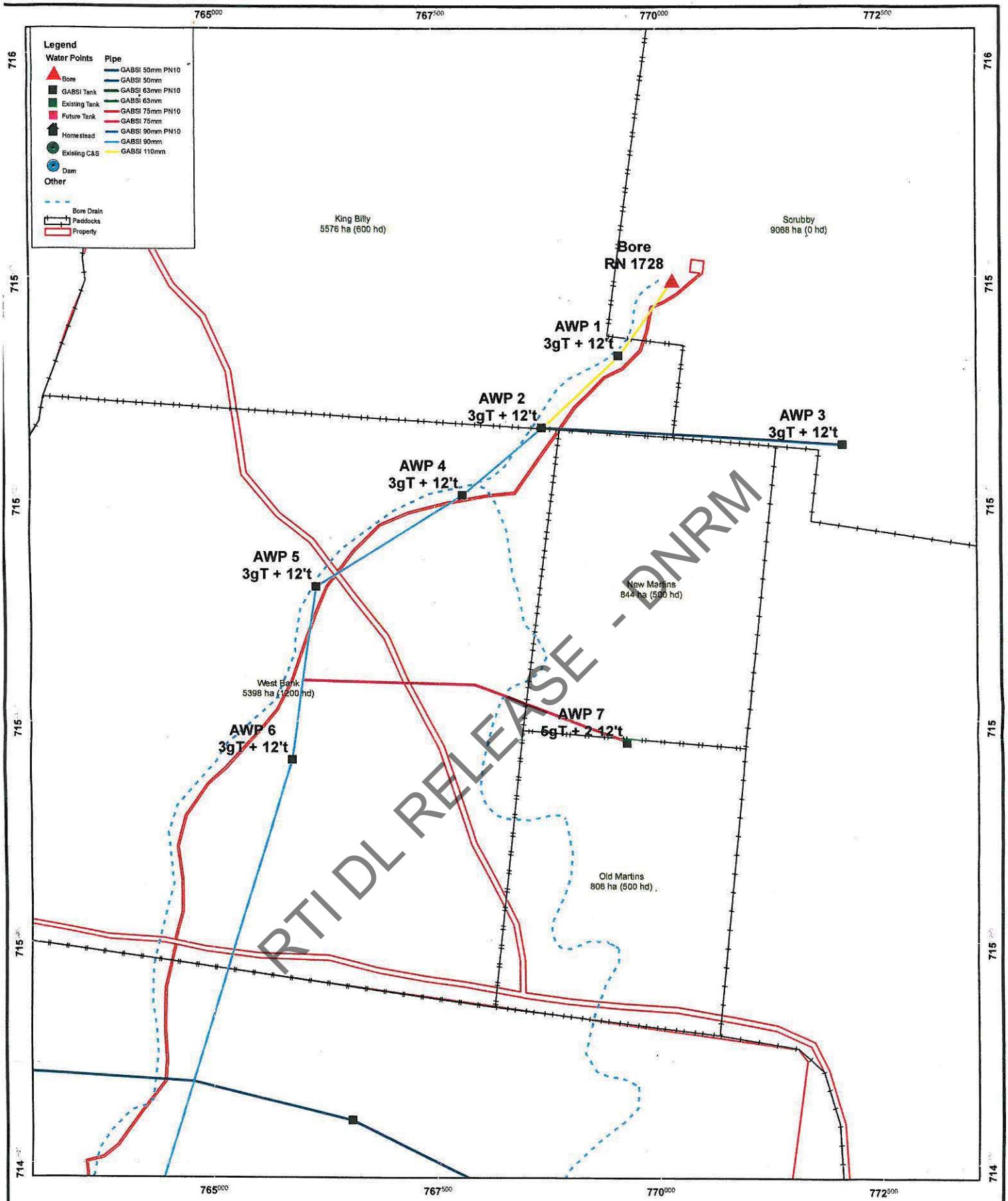

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Produced by: Jason Keller
File: RN1728 Bulgroo Bore
Location: Toowoomba

RN1728
Bulgroo Bore - Araluen
Prelim Map

Edition: Preliminary
Version: A
Date: 17/11/2011
Engineer: Jason Keller

A3

1:40,000

0 0.2 0.4 0.6 0.8 1 km

GABSI
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PIPELINE DESIGN CHECKLIST

Great Artesian Basin Sustainability Initiative

Scheme & RN: *RN1728 Bulgroo*
Design Type: *Piping Prelim*
Engineer: *Jason Keller*
Signature
Date: *17/11/2011*

Checklist of design information provided by Engineer for design check	Yes/No
PDF Maps of scheme provided - Subsidised & Full designs	*Yes*
Water point notes provided - Even Grazing & Holding Paddock	*EG*
Survey data provided	*Yes*
Recent dynamic bore test provided	*est*
WaterCad file provided with scenarios only for subsidised, full, and holding paddocks designs	*Yes*
Location of WaterCad file: W:\Works & Planning\Warrego Jobs\Bulgroo RN 1728\Design Check\WaterCAD	

	Engineer	Projects Engineer	RPEQ
PDF Scheme Maps	**Yes/No**	**Yes/No**	**Yes/No**
Winter bore drain is mapped correctly?	Yes	Y	
2km drain buffer shown?	na	na	
Paddocks mapped and named correctly?	Yes	Y	
Pipe indicating diameter and class shown?	Yes	Y	
Watering points show tank sizes?	Yes	Y	
Private & future works are clearly distingished?	na	na	
Vegetation overlay of RE data?	Yes	Y	
Pipe layout is optimal taking into account RE data?	Yes	Y	
Costing	**Yes/No**	**Yes/No**	**Yes/No**
Cost estimates have been developed using up to date unit prices?	Yes		
All subsidised works comply with GABSI policy & guidelines?	Yes		
Shared infrastructure has been costed?	Yes		
All private upgrades have been charged?	na		
Water Point Notes	**Yes/No**	**Yes/No**	**Yes/No**
All watering point locations have been surveyed accurately?	some	some	
Water demands for even grazing has been obtained from l'holder?	yes	Y	
Water demand for holding paddocks has been obtained from l'holder?	yes	Y	
Correct peak daily demand for stock/domestic supply has been applied?	yes	Y	
All paddocks have 2 day (gravity) or 4 day (pumped) storage?	yes	N	
WaterCAD Design	**Yes/No**	**Yes/No**	**Yes/No**
Bore Curve is based upon recent dynamic test?	est	Rehab.	
Any pumps have been sized efficiently and correctly?	na	na	
Valve, pump, reservoir elevations from survey points?	DEM	✓	
Junction elevations from survey points?	DEM	✓	
Tank elevations from survey points?	DEM	Y	
Tank volumes match water point notes?	yes	No	
Pipe size is optimised?	yes	Y	
Pipe pressures do not exceed manufacturer specs & temp derating?	yes	Y	
Design is optimised to fill in 24th hour?	yes	Y	
Hazen - Williams coefficient is 120?	yes	Y	
Negative pressures have been eliminated?	yes	N	
System is balanced - no spikes in discharge?	yes	Y	
Projects Engineer Approval		**Yes/No**	
Design is approved for RPEQ certification		N	
Projects Engineer Name		Andrew Piper	
Date of approval		17/11/11	

Comments: -ve pressures in main line - may not fill when removed. Note Tank volume variences.

RPEQ Certification	Yes/No
Design is certified to meet industry best practice	
RPEQ Name	
RPEQ No.	
Date of certification	

Comments:

Release

Department of Environment & Resource Management
GENERAL DESIGN NOTE

TO: **A. Piper, Projects Engineer**

FROM: **J. Keller, Design Engineer**

SUBJECT: **"Bulgroo" Proposed Preliminary Design**

BACKGROUND & OVERVIEW OF MODEL OPERATION

Using estimated bore performance of 20m head and 7L/s provided.

Design Scenarios

- Even Grazing; and
- GABSI.

Even Grazing - *This scenario uses stocking numbers provided by the landholders of the scheme in 2011. Araluen runs sheep and Bulgroo and Thylungra – cattle. Araluen has a total of 2,700 DSE, Bulgroo 200 head cattle and Thylungra 2,150 head cattle.*

GABSI - *Replaces the bore drain with pipe using stock numbers for the paddocks provided by the landholders and spread evenly over the area serviced by the drain.*

Additional Notes - *The piping design comprises of 110 mm, 90 mm, 75 mm & 50 mm PN8 PE100 (Araluen and Bulgroo) and 90 mm, 75 mm, 63 mm and 50 mm PN10 PE100 (Thylungra) metric pipe due to the elevation drop.*

Where there were named dams in paddocks stock numbers were distributed to these points as well.

PRVs are in use in both designs to keep pressure under 800kPa at the bottom of the scheme.

Prices for PN10 pipe are based on PN8 plus $0.50 per m. I have asked for more accurate costs to come from PPI.

Subsidy is based on $7000 per km of drain. Subsidised design is a lot less than this.

Thylungra - Bulgroo Bore RN1728 Proposed Water Point Notes

Water Point	Northing m	Easting m	Height m	DSE @ 8.5 L/d	CATTLE @ 60L/d	Paddock	Water Required (L/day)	2 Day Storage for WP (gal)	Tank (gal) 9000	5000	8000	10000	Troughs (with Aprons) Size	Material/Type	QTY	Notes
TWP 01	7,140,392	762,310	197.2		60	Gunnawarra	✓ 3,600	1,600	1				12'	Concrete Rectangular	1	
TWP 02	7,137,646	761,900	192.9		167	Langleys/Gunnawarra	✓ 10,020	4,453		1			12'	Concrete Rectangular	2	*1/2 Gunnawarra 1/3 Langleys*
TWP 03	7,134,735	761,382	190.0		66	Langleys	✓ 3,960	1,760	1				12'	Concrete Rectangular	1	*1/3 Langleys*
TWP 04	7,131,521	762,822	187.9		216	Langleys/Farm 30,240	✓ 12,960	5,760			1		12'	Concrete Rectangular	2	*1/2 Farm 1/3 Langleys*
TWP 05	7,126,100	759,033	180.0		150	Farm	✓ 9,000	4,000		1			12'	Concrete Rectangular	1	*1/2 Farm*
TWP 06	7,125,968	762,092	183.3		166	Lanes 10020	✓ 9,960	4,427		1			12'	Concrete Rectangular	1	*1/3 500 hd (2 dams in paddock)*
TWP 07	7,121,961	755,942	178.6		500	Sugarbag/Raby	✓ 30,000	13,333	1			1	12'	Concrete Rectangular	2	
TWP 08	7,120,548	758,064	177.4		100	Norah	✓ 6,000	2,667	1				12'	Concrete Rectangular	1	*1/2 Norah*
TWP 09	7,119,811	761,221	178.0		100	Black Duck	✓ 6,000	2,667	1				12'	Concrete Rectangular	1	*1/3 300 head (2 dams in paddock)*
TWP 10	7,115,939	756,776	173.3		100	Norah	✓ 6,000	2,667	1				12'	Concrete Rectangular	1	*1/2 Norah*
TWP 11	7,112,273	756,099	170.0		150	Heifer	✓ 9,000	4,000		1			12'	Concrete Rectangular	1	
TWP 12	7,110,299	751,232	170.0		175	Biffnoo	✓ 10,500	4,667		1			12'	Concrete Rectangular	1	
TWP 13	7,111,713	760,867	172.5		200	Colborough	✓ 12,000	5,333		1			12'	Concrete Rectangular	1	
TWP Baxters	7,137,436	759,700	191.9			Baxters Outstation	4000	1,778	1							*domestic*
			Stock Total :	0	2,150		133,000	*Tank Qty =*	7	6	1	1			*Trough Qty =*	16
															Tank Total =	15

I / WE _____ HEREBY AGREE TO THE MATERIALS LISTED & WATER ALLOCATIONS AS STATED ABOVE FOR WORKS DESIGNED UNDER THE GABSI SCHEME.

SIGNED: _____ DATE: _____ . WITNESS: _____ DATE: _____ .

Araluen - Bulgroo Bore RN1728 Proposed Water Point Notes

Water Point	Northing m	Easting m	Height m	DSE @ 8.5 L/d	CATTLE @ 60L/d	Paddock	Water Required (L/day)	2 Day Storage for WP (gal)	Tank (gal) 3000	5000	8000	10000	Troughs (with Aprons) Size	Material/Type	QTY	Notes
WP 01	7,156,615	769,570	237.5	600		King Billy Bore	5,100	2,267	1				12'	Concrete Rectangular	1	*holding area*
WP 02	7,155,805	768,713	232.5	600		King Billy	✓ 5,100	2,267	1				12'	Concrete Rectangular	1	
WP 03	7,155,612	772,077	241.2	300		Scrubby	✓ 2,550	1,133	1				12'	Concrete Rectangular	1	*estimated stock on point*
WP 04	7,155,047	767,818	229.1	400		West Bank	✓ 3,400	1,511	1				12'	Concrete Rectangular	1	
WP 05	7,154,021	766,167	222.9	400		West Bank	✓ 3,400	1,511	1				12'	Concrete Rectangular	1	
WP 06	7,152,058	765,885	219.1	########		West Bank	✓ 3,400	1,511	1				12'	Concrete Rectangular	1	
WP 07	7,152,250	769,654	227.8	1,000		Old/New Martins	8,500	3,778		1			12'	Concrete Rectangular	2	*holding (stock from other paddocks)*
														Concrete Rectangular		
														Concrete Rectangular		
														Concrete Rectangular		
														Concrete Rectangular		
														Concrete Rectangular		
														Concrete Rectangular		
														Concrete Rectangular		
			Stock Total :	3,700	0		31,450	*Tank Qty =*	6	1	0	0		*Trough Qty =*	8	
														Tank Total =	7	

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Bulgroo - Bulgroo Bore RN1728 Proposed Water Point Notes

Water Point	Northing m	Easting m	Height m	DSE @ 8.5 L/d	CATTLE @ 60L/d	Paddock	Water Required (L/day)	2 Day Storage for WP (gal)	Tank (gal) 3000	5000	8000	10000	Troughs (with Aprons) Size	Material/Type	QTY	Notes
BWP 01	7,148,591	762,097	211.1		40		✓ 2,400	1,067	1				12'	Concrete Rectangular	1	
BWP 02	7,147,986	766,543	210.0		40		✓ 2,400	1,067	1				12'	Concrete Rectangular	1	
BWP 03	7,146,279	769,981	217.7		40		✓ 2,400	1,067	1				12'	Concrete Rectangular	1	
BWP 04	7,144,750	762,597	210.0		40		✓ 2,400	1,067	1				12'	Concrete Rectangular	1	
BWP 05	7,144,276	766,760	210.0		40		✓ 2,400	1,067	1				12'	Concrete Rectangular	1	
BWP House	7,144,696	771,157	210.0				-	-								

Stock Total : 0 200 — 12,000 — *Tank Qty =* 5 0 0 0 — *Trough Qty =* 5

Tank Total = 5

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Cost Estimate of Piping Works for Bulgroo Bore RN 1728

The following table shows a summary of the costs associated with the design to service "Bulgroo". The table outlines the estimated contributions required for the initial deposit, the total landholder contribution and the total cost of the project, excluding installation. Costs are estimated from material and freight for previous works, including GST, and will be revised following receipt of quotes.

NB: *The modelling of the scheme was based on a bore pressure of 20m and a flow rate of 7L/s. In the event the bore characteristics are different to this once redrilled the following figures will change*

A. Estimated Total Cost of Subsidised Works (Excluding Installation)	$86,000
B. Landholder's Estimated Cash Contribution to Subsidised Works (25% A.)	$21,500
C. Estimated Cost of Unsubsidised Works	$0
D. Landholders Estimated Total Cash Contribution (B + C)	**$21,500**
i. Advance Payment (1/2B +C)	**$10,750**
ii. Estimated Second Payment (Itemised account once materials delivered)	**$10,750**

Bulgroo - Bulgroo Bore RN1728 Proposed Water Point Notes

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BWP 04	7,144,750	762,597	210.0		40		2,400	1,067	1				12'	Concrete Rectangular	1	
BWP 05	7,144,276	766,780	210.0		40		2,400	1,067	1				12'	Concrete Rectangular	1	
BWP House	7,144,696	771,157	210.0				-	-								
			Stock Total :	0	200		12,000	*Tank Qty =*	5	0	0	0	*Trough Qty =*		5	
													Tank Total =		5	

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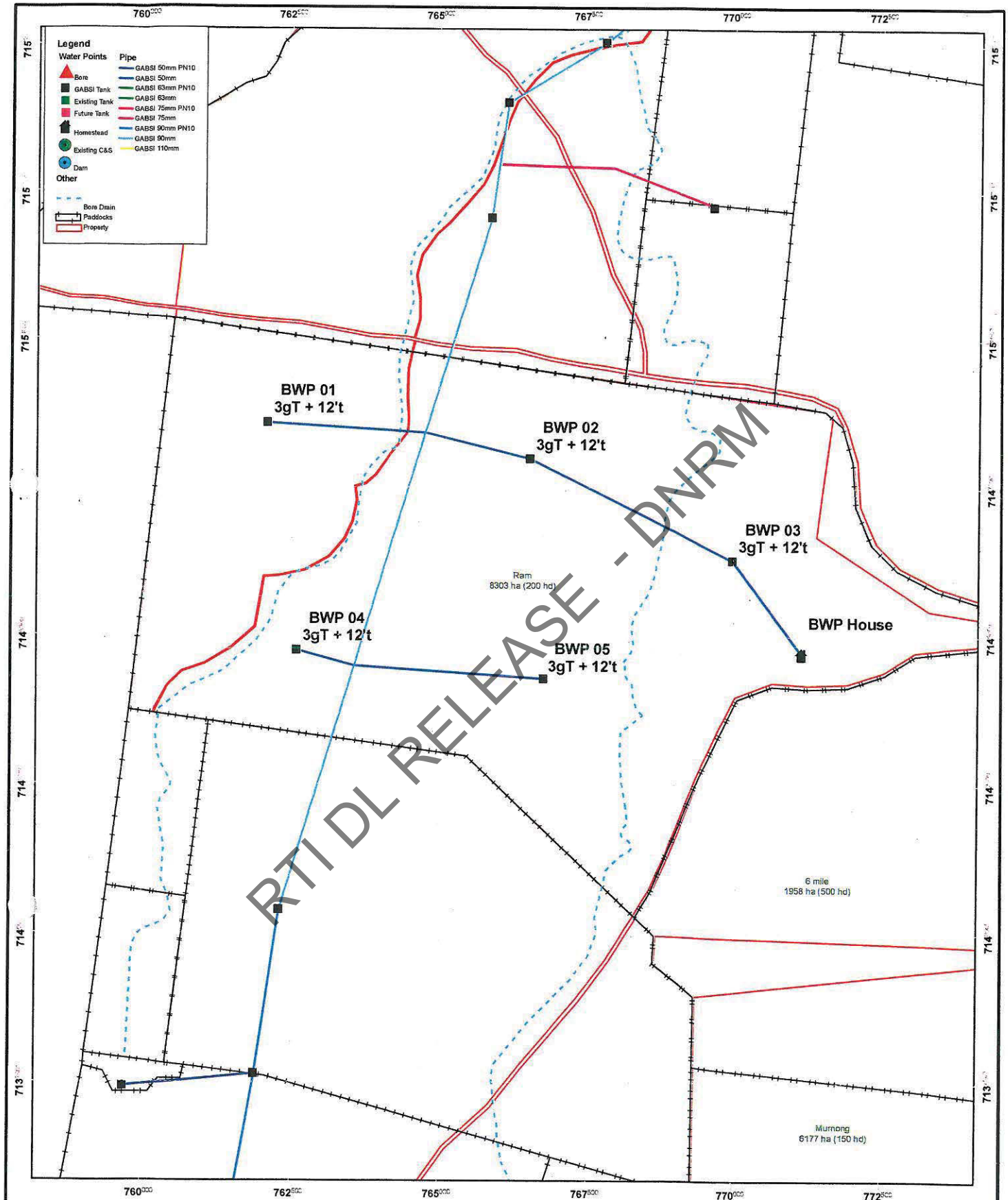

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File: RN1728 Bulgroo Bore
Location: Toowoomba

RN1728
Bulgroo Bore - Bulgroo
Prelim Map

Edition: Preliminary
Version: A
Date: 17/11/2011
Engineer: Jason Keller

A3

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0 0.3 0.6 0.9 1.2 1.5 km

GABSI
Great Artesian Basin Sustainability Initiative

Map Projection: UTM, MGA Zone 55
Map Datum: GDA 1994
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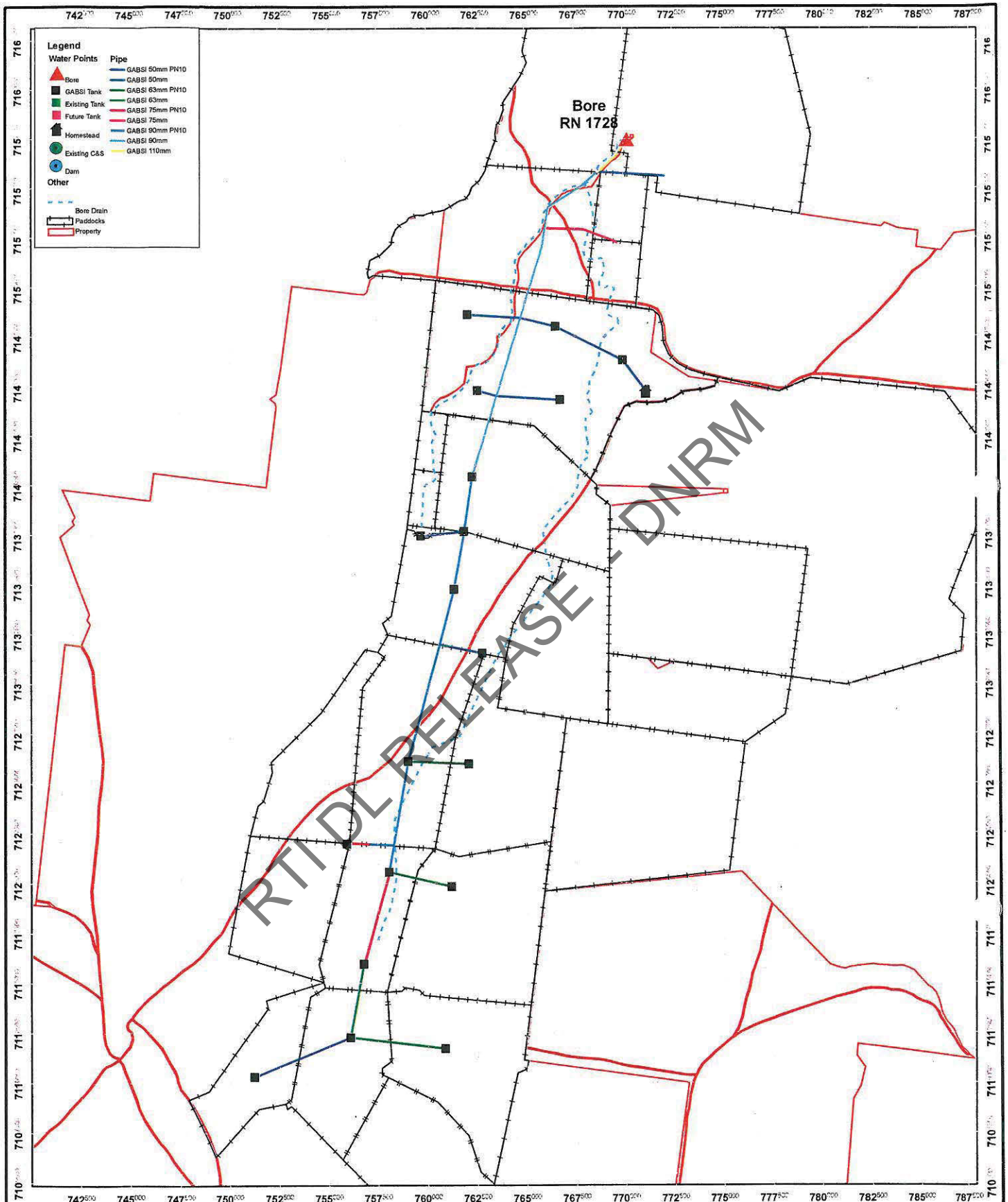

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RN1728
Bulgroo Bore
Prelim Map

Edition: Preliminary
Version: A
Date: 17/11/2011
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12-509 A3 1:180,000 0 1 2 3 4 5 km

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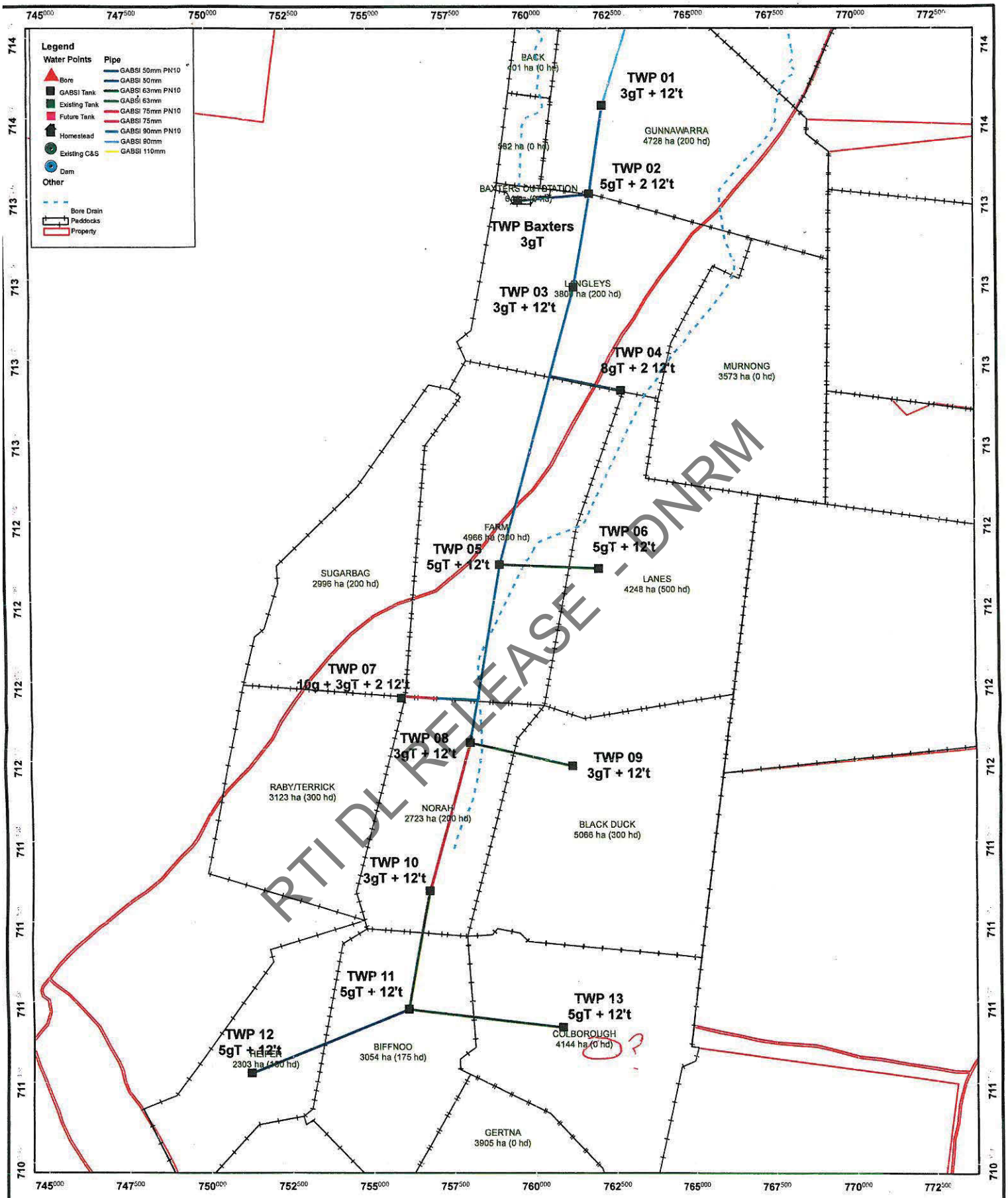

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- Pipelines are to be laid to a minimum depth of 600 mm in cracking clays (black soil), and 450 mm in all other places.
- Tank and trough hookups, and the installation of valves and gauges are to be completed as per the current GABSI Hookup Drawings.
- All works are to be installed in accordance with the specifications outlined in the GABSI Works Agreements.

Produced by: Jason Keller
File: RN1728 Bulgroo Bore
Location: Toowoomba

RN1728
Bulgroo Bore - Thylungra
Prelim Map

Edition: Preliminary
Version: A
Date: 17/11/2011
Engineer: Jason Keller

A3

1:110,000

0 0.9 1.8 2.7 3.6 4.5 km

GABSI
Great Artesian Basin Sustainability Initiative

Australian Government
Department of Agriculture, Fisheries and Forestry

Map Projection: UTM, MGA Zone 55
Map Datum: GDA 1994
Data Sources: Dept. of Environment & Resource Management, Geoscience Australia and Landsat TM imagery

Queensland Government