Appendix B – Figures

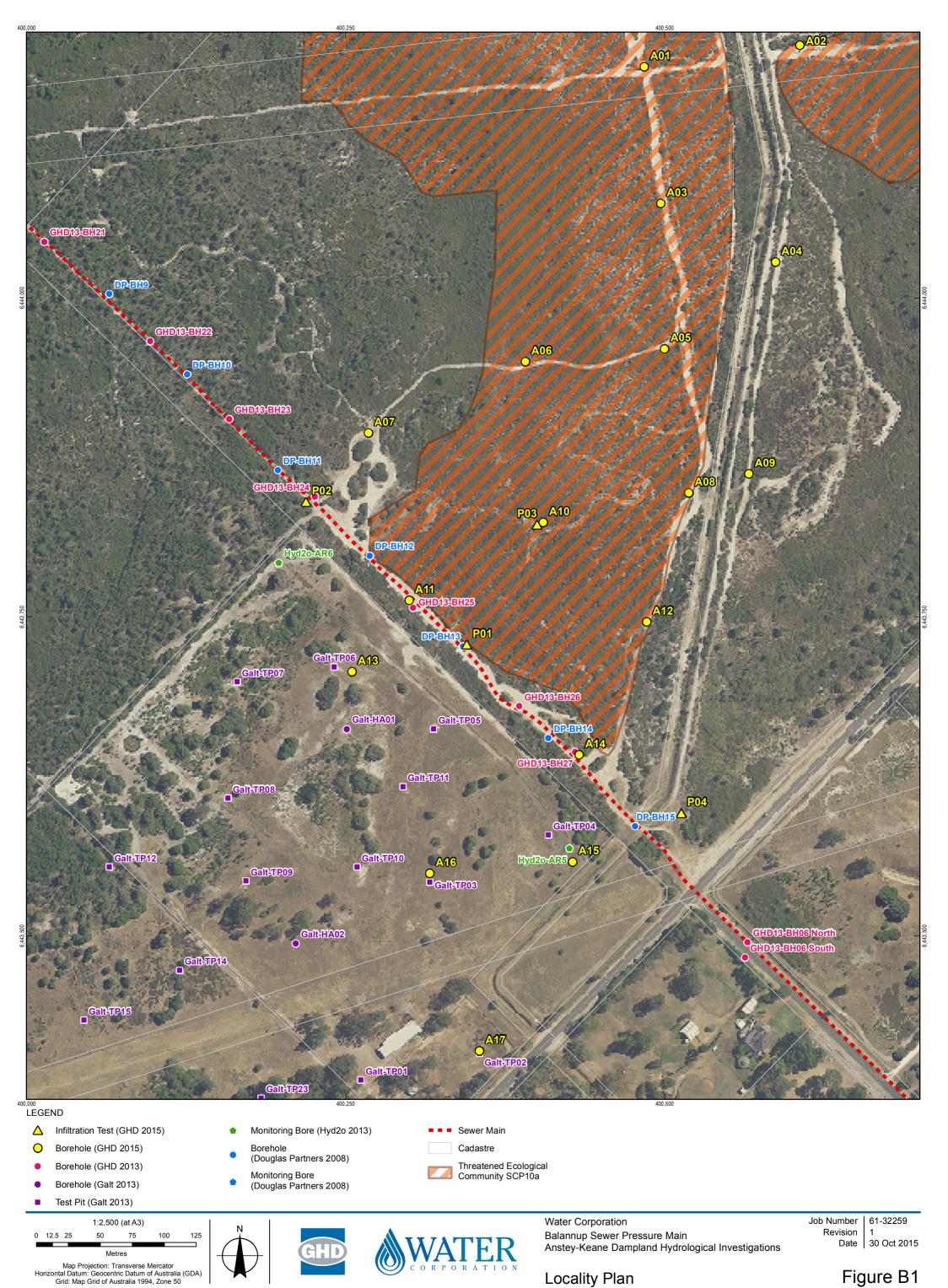
Figure B1: Locality Plan

Figure B2: Surface Catchments and Drainage

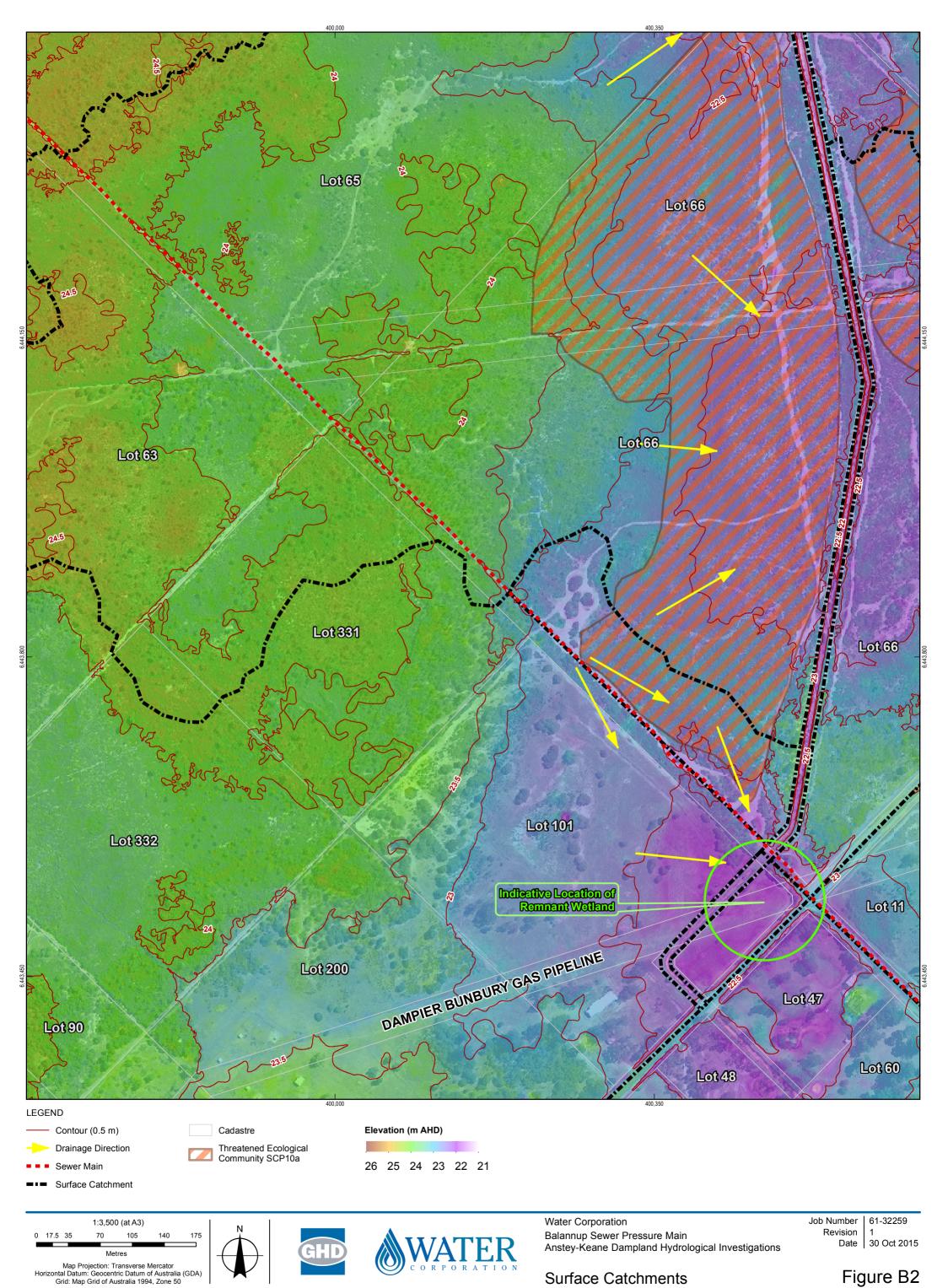
Figure B3: Top of Clayey Sand

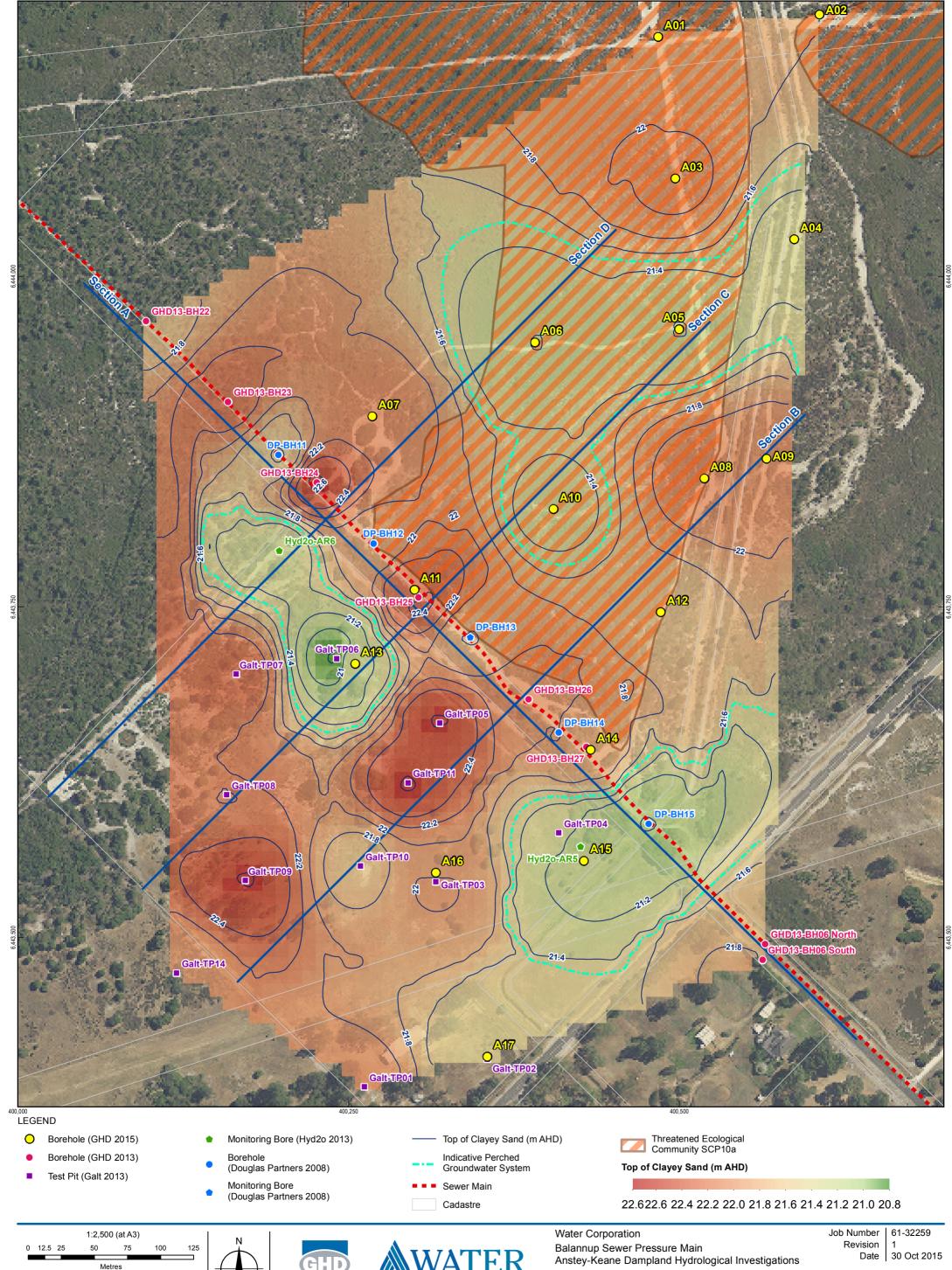
Figure B4: Thickness of Clayey Sand

Figure B5: Limit of Oxidation Extents



N:AUI/Perth/Projects\61\32259\GIS\Maps\MXD\6132259\GIS\Maps\MXD\6132259\GIS\Maps\MXD\6132259\GIS\Maps\MXD\6132259\GIS\Maps\MXD\6132259\GIS\Maps\MXD\6132259\GIS\Maps\MXD\6132259\GIS\Maps\MXD\6132259\GIS\Maps\MXD\6132259\GIS\Maps\MXD\6132259\GIS\Maps\MXD\6132259\GIS\Maps\MXD\6132259\GIS\Maps\MXD\6132259\GIS\Maps\MxD\6132259\



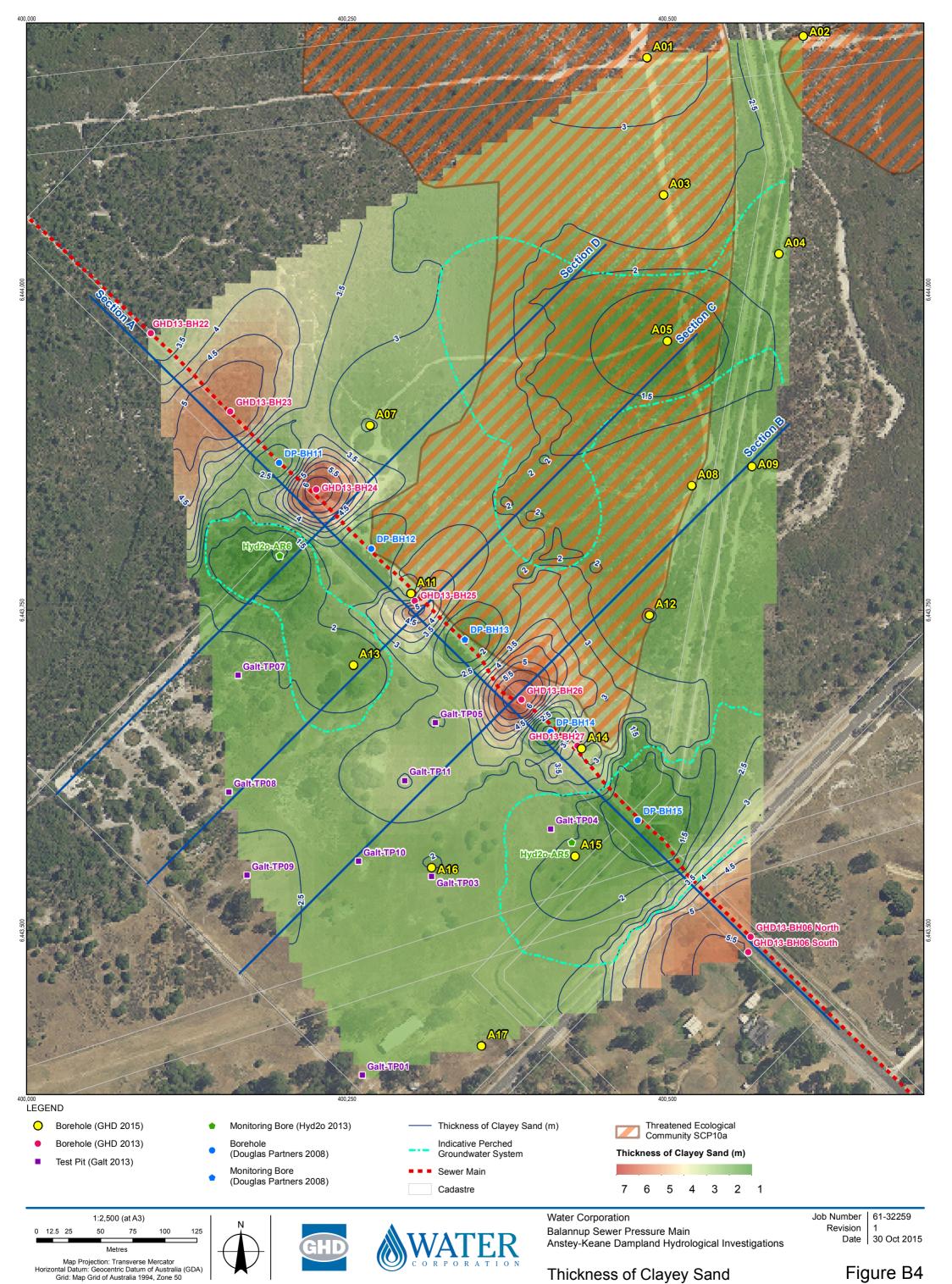


Top of Clayey Sand

Date 30 Oct 2015

Map Projection: Transverse Mercator Horizontal Datum: Geocentric Datum of Australia (GDA)

Grid: Map Grid of Australia 1994, Zone 50



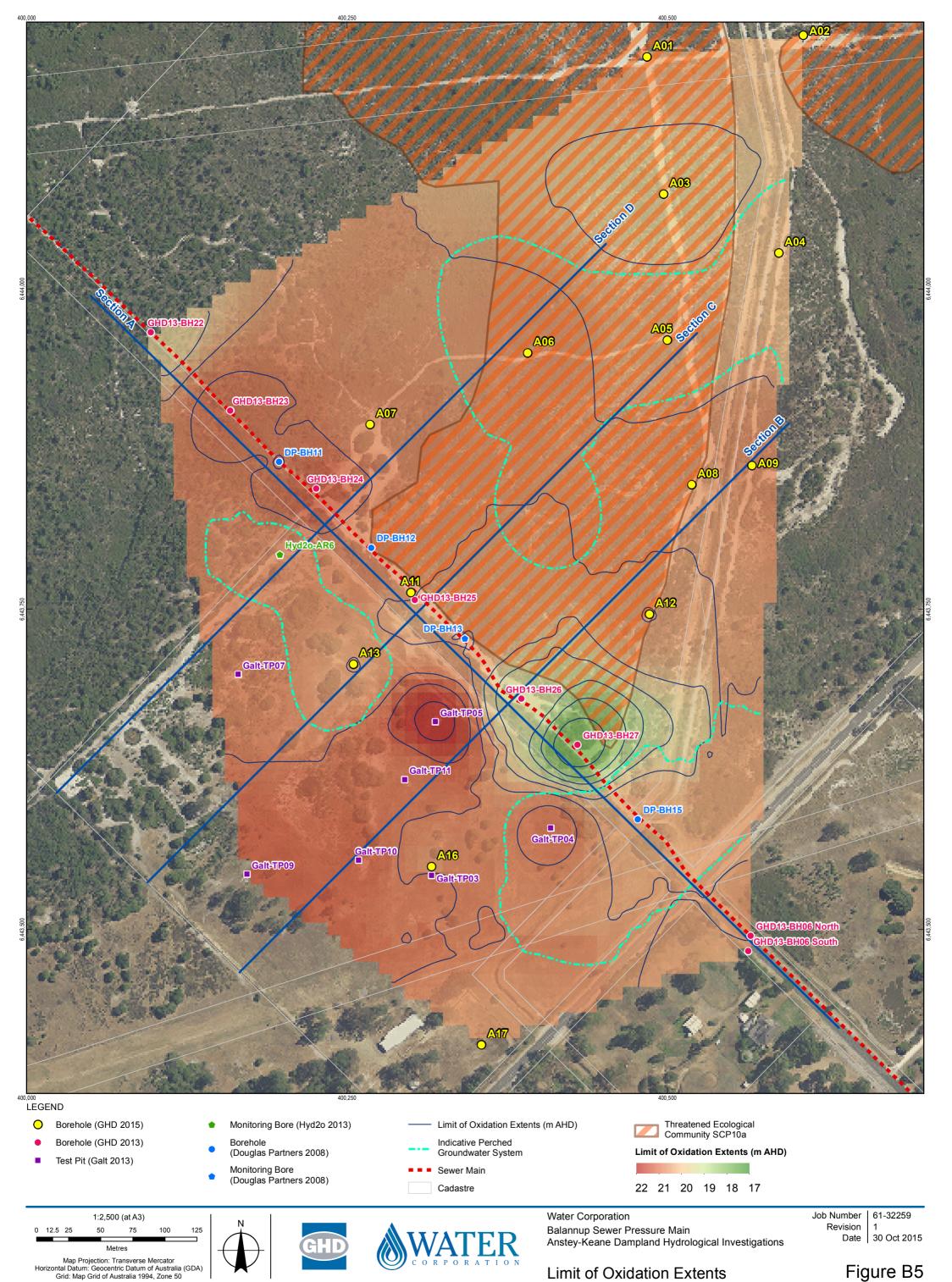
Rid: Map Grid of Australia 1994, Zone 50 I Clayey Sand FIGURE D4

N:AU/Perth/Projects/161\32259(GIS\Maps\MXD\6132259_W001_FigB_Rev1.mxd

239 Adelaide Tce Perth WA 6004 Australia T 61 8 6222 8222 F 61 8 6222 8555 E permail@ghd.com

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Data source: GHD: Borehole (GHD 2015)- 20150903, Borehole (GHD 2013)- 20150717, Rentolicative Perched Groundwater System - 20151030, Sewer Main - 20151009, Thickness of Clayey Sand - 20151014; Water Corporation: Threatened Ecological Community SCP10a - 20151014; Landgate: Cadastre - 20150706, Metro Central Mosaic (Feb 2015) - 201500825. Created by: Ihyoong



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Appendix C – Borehole logs



Job No.:



WELL CONSTRUCTION BORE LOG

Well No.:

A01 Sheet 1 of 2

Client: Water Corporation Coordinates: E 400 484, N 6444 181

Project: Balannup / Keane Road Pressure Main

Additional Geotechnical Investigation

6132259

Ground Surface Elevation: +22.5m AHD Total Depth: 9.0m

Commenced: 29-Jul-15 Completed: 29-Jul-15

Contractor: Direct Push Probe Driller: Direct Push Probing Pty Ltd

T Whitnall 29-Jul-15 Rig Type & Mounting: Tracked mounted Geoprobe 6620DT Inclination: Vertical Logged: Flushing Fluid: Processed: SB Olivares 01-Dec-15 Hole Diameter (mm): 120 Casing Size: N/A

н	ole	Di	ame	eter	(mn	n):	120				Casing Size: N/A					Checked:	 Olivare	55 01-00	
٦				rogr vatio	ess/ ons		. <u>`</u>	Ţ				ition		,					٦
Scale (m)			Casing Depth (m)	Fluid Depth (m)			Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	Strata Description	ure Condition	Consistency/ Relative Density	Sample Type & Depth	Sample No.	Sample/ Test Records & Comments		Vell ponents	Depth Scale (m)
Depth	-	Date	Casing	Fluid De	Drilling	Water	Depth	Geolo	Graph		(type; colour; fines plasticity or particle characteristics; minor components; structure and/or origin)	Š	+	Samp & Dep	Samp			Wollo	Depth
-										SP	SAND Grey, fine to medium grained, trace rootlets. BASSENDEAN SAND?	M - W	to L?		B1			Wells installed at separate locations (within 1m	
ŀ							0.6				Pale brown.	W		0.35	B2			of each other)	-
ŀ							[+21.93] 0.8 [+21.68]			SP / SC	SAND / CLAYEY SAND Grey to pale grey, sand is fine to medium grained, with some clay. \GUILDFORD FORMATION //	М		0.55	В3				-
-1							[+21.00]			SC	CLAYEY SAND Pale brown, mottled orange, sand is		St	1.00	B4				1-
ŧ											fine to medium grained, trace gravel sized subrounded ferricrete nodules. GUILDFORD FORMATION			1.15	B5				-
ŀ															В6				-
ŀ														1.75	B7				-
-2														2.00					2-
Ŀ							2.3			SP	2.15 to 2.25m: Green. SAND	W	MD?	2.25	B8				-
-					Push Probing		2.6 [+19.93]				Green grey, fine to medium grained, with trace clay, slight organic odour. GUILDFORD FORMATION			2.50	B9				-
- - - -3 -					Push		[+19.93]			SC	CLAYEY SAND Green, sand is fine to medium grained, trace pockets of black organic material up to 10mm. GUILDFORD FORMATION 2.7m: Large pockets of organic material, 50mm long (root?).	M - W	St	2.75	B10			Base of shallow well	3-
-														3.75	B11				- - - -
4 - 5							3.8 [+18.68]			SP	SAND Brown, fine to medium grained, with trace clay, organic odour, trace pockets of black organic materials up to 10mm. GUILDFORD FORMATION	W	MD?		B12				4- 4- - -
-5																			5-



Project:



WELL CONSTRUCTION BORE LOG

Well No.:

A01

Sheet 2 of 2

Client: Water Corporation

Balannup / Keane Road Pressure Main

Additional Geotechnical Investigation

Job No.: 6132259

Coordinates: E 400 484, N 6444 181

Ground Surface Elevation: +22.5m AHD Total Depth: 9.0m

Commenced: 29-Jul-15 Completed: 29-Jul-15

Contractor: Direct Push Probe Driller: Direct Push Probing Pty Ltd

Rig Type & Mounting: Tracked mounted Geoprobe 6620DT Inclination: Vertical Logged: T Whitnall 29-Jul-15
Flushing Fluid: none Processed: SB Olivares 01-Dec-15
Hole Diameter (mm): 120 Casing Size: N/A Checked:

(F	Dail Ob	ly Pr serv	ogro atio	ess/ ons		ev.]	ij			0	dition	<u>‡</u>					<u> </u>	æ
Depth Scale (m)	Date	Casing Depth (m)	Fluid Depth (m)	Drilling Method	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	Strata Description (type; colour; fines plasticity or particle characteristics; minor components; structure and/or origin)	Moisture Condition	Consistency/ Relative Density	Sample Type & Depth	Sample No.	Sample/ Test Records & Comments	1	Well nponents	Depth Scale (m)
- - - - - - - - - - - - - - - -				Push Probing					SP SP	SAND Brown, fine to medium grained, with trace clay, organic odour, trace pockets of black organic materials up to 10mm. GUILDFORD FORMATION 5.1 to 5.2m: CLAYEY SAND layer.	w	MD?		B12				6
Series of States				P. P		7.3 [+15.23] 8.8 [+13.68] 9.0 [+13.48]		X	SM	SILTY SAND Dark brown, sand is fine grained, trace organic odour. Below 7.9m: Becoming green and fine to medium grained. SAND Green grey, with trace clay, organic odour, trace fine to coarse subrounded quartz/ chert gravel. Termination Depth = 9.00m (Target Depth)	W	St MD - D	7.50	B15			Base of deep well	8
10																		- - - - - 10 -





Inclination: Vertical

Borehole No.:

A02

Sheet 1 of 1

27-Jul-15

T Whitnall

Client: Water Corporation Coordinates: E 400 606, N 6444 198

Project: Balannup / Keane Road Pressure Main

Rig Type & Mounting: Tracked mounted Geoprobe 6620DT

Additional Geotechnical Investigation

Job No.: 6132259

Ground Surface Elevation: +22.6m AHD Total Depth: 3.0m

Commenced: 27-Jul-15 Completed: 27-Jul-15

_					-			nounte	a Ge		ui-15
	ıshir le Di	_				none 120				Cooling Circs N/A	ec-15
		ly Pr		_	.,. 		Ι	1			\top
Depth Scale (m)	Date	Casing Depth (m)	Fluid Depth (m)	Drilling Method s	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	Strata Description (type; colour; fines plasticity or particle characteristics minor components; structure and/or origin) Working Constitution Of Sample Type Sample Type Pebth On Sample Type Sampl	Depth Scale (m)
-									SP	SAND Pale white/grey, fine to medium grained, trace rootlets to 0.7m, no odour. BASSENDEAN SAND M - VL - V	
- - - - -1 -				ping		0.8	1		SC	0.75m: Trace black, fine to medium grained gravel size rounded freeicrete nodules. CLAYEY SAND Light brown mottled orange, sand is fine to coarse grained. GUILDFORD FORMATION M- St W DENV 1.00 B4 Groundwater (0.9m): Temp: 15.4°C Sal: 198 ppm pH: 9.8 Cond: 420 uS 1.0m: PP = 3.25 1.2m: PP = 3.5	1-
- - - - -2 -				Push Probing						1.5m: PP = 3.0 1.75 1.75 1.75 1.75m: PP > 4.5 2.00 PP = 3.0 2.25: PP = 3.75	2-
- - - -										2.35m: Light green, becoming green, sand is fine to medium grained, organic (peaty?) odour noted. More clayey. St. VSt	
- -3 - -						3.0 [+19.60]	Ī	<i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>		Termination Depth = 3.00m (Target Depth)	3
- - - - - - - - - - - -											4-
- - - - -5											5.





Borehole No.:

A03

Sheet 1 of 1

Total Depth: 3.0m

Client: Water Corporation Coordinates: E 400 497, N 6444 074

Project: Balannup / Keane Road Pressure Main Ground Surface Elevation: +22.3m AHD

Additional Geotechnical Investigation Commenced: 29-Jul-15 Completed: 29-Jul-15

Job No.: 6132259 Contractor: Direct Push Probe Driller: Direct Push Probing Pty Ltd

Rig Type & Mounting: Tracked mounted Geoprobe 6620DT Inclination: Vertical Logged: T Whitnall 29-Jul-15

Flushing Fluid: none

Processed: SB Olivares 01-Dec-15

Но	le Di	iame	eter	(mm	1): 1	120				Casing Size: N/A				-	ecked:	SB Olivares	01-De	
Scale (m)	Dail Ob	ly Pr serv (m) upde	/atic	ns		Depth (m)/ [Elev.]	Geological Unit	c Log	ication	Strata Description	re Condition	Consistency/ Relative Density	Type h	No.		ple/ Test Recor & Comments	ds	Depth Scale (m)
Depth 8	Date	Casing Depth (m)	Fluid Depth (m)	Drilling Method	Water	Depth (Geolog	Graphic Log	Classification	(type; colour; fines plasticity or particle characteristics minor components; structure and/or origin)	Mois		Sample Type & Depth	Sample No.				Depth 8
-						0.2			SP SC	SAND Pale grey brown, fine to medium grained. BASSENDEAN SAND	M - VW SM	VL - L F - St	0.20	B1 B2				
- - -										CLAYEY SAND Brown grey, fine to medium grained, with some clay. GUILDFORD FORMATION		Ö.	0.30	В3				
										0.7m: Pale yellow brown, with trace orange mottled, with trace gravel sized ferricrete nodules, subrounded.	M - W	0.	0.70	B4				
-1													1.00	B5				1-
				Push Probing									1.25	В6				
				Push F									1.50	В7				
-2						2.1 [+20.20]								В8				2
•						[+20.20]			SP	SAND Pale brown, sand is fine to medium grained, with some clay. GUILDFORD FORMATION	W	MD	2.05	B9				
· ·						2.6 [+19.65]			SP / SC	√2.55m: Green. SAND / CLAYEY SAND	w		2.60	B11				
-3						3.0 [+19.25]				Grey green, fine to medium grained, with trace clay, slight organic odour, with trace pockets of organic material up to 10mm. GUILDFORD FORMATION			2.75	B12				3
						[110.20]				Termination Depth = 3.00m (Target Depth)								
-																		
-																		
-4 -																		4-
- -																		
- -																		
-5																		5-



Client:



Water Corporation

BOREHOLE LOG

Borehole No.:

A04 Sheet 1 of 1

Coordinates: E 400 587, N 6444 028 Project: Balannup / Keane Road Pressure Main Ground Surface Elevation: +22.3m AHD Total Depth: 3.0m

> Additional Geotechnical Investigation Commenced: 27-Jul-15 Completed: 27-Jul-15

Job No.: 6132259 Contractor: Direct Push Probe Driller: Direct Push Probing Pty Ltd

27-Jul-15 T Whitnall Rig Type & Mounting: Tracked mounted Geoprobe 6620DT Inclination: Vertical Logged: Flushing Fluid: Processed: SB Olivares 01-Dec-15 Casing Size: N/A

ı	Hol	le Di	ame	eter	(mm	1): 1	120				Casing Size: N/A				Cr	necked:			
Ī		Dail Ob	ser	ogro atio	ess/ ns		Elev.]	Juit		u	Strata Description	ndition	// //	e		Sam	ple/ Test Recor	ds	(m)
	Depth Scale (m)	Date	Casing Depth (m)	Fluid Depth (m)	Drilling Method	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	(type; colour; fines plasticity or particle characteristics minor components; structure and/or origin)	Moisture Condition	Consistency/	Sample Type & Depth	Sample No.		& Comments		Depth Scale (m)
										SP	SAND Pale grey, fine to medium grained, trace rootlets. BASSENDEAN SAND	M	VL L	0.00	B1				
											0.7 to 0.9m: Pale brown with trace clay.			0.50	B2 B3				- - - -
	·1						0.9 [+21.35]			SP	SAND Very pale brown, with trace/some clay. GUILDFORD FORMATION		L - MD	1.00	B4 B5		soil wet but no ater encountered.		- 1- - -
					Push Probing		1.3 [+20.95]	-		SC	CLAYEY SAND Very light brown mottled orange, fine to medium grained. GUILDFORD FORMATION		F - St	70	B6				- - -
	·2				ш.						1.8m: Light brown grading to light green at bottom.			1.75	B8				- - 2-
											2.25m: Green, slight organic (peaty?) odour, grading more clayey with depth.		St	2.25	B9	2.4m: PF	P = 4.25		- - -
											Below 2.5m: Becoming brown colour.			2.50	B11	2.6m: PF 2.8m: PF			-
	.3						3.0 [+19.25]				From 2.98: Dark grey/brown, fine to medium grained sand with some silt, organic odour. Termination Depth = 3.00m (Target Depth)				B12	Groundw Temp: 2 Sal: 255 pH: 9 Cond: 57 tds: 323	ppm	n):	3-
GENERAL LOG 6132259 - BALANNUP.GPJ GHDLIB.GDT 1/12/15	·4																		- - - 4- - -
GENERAL LOG 6132259	·5																		- - - - 5-



Project:



WELL CONSTRUCTION BORE LOG

Well No.:

A05

Sheet 1 of 3

Client: Water Corporation

Balannup / Keane Road Pressure Main

Additional Geotechnical Investigation

Job No.: 6132259

Coordinates: E 400 500, N 6443 960

Ground Surface Elevation: +22.5m AHD Total Depth: 12.0m

Commenced: 28-Jul-15 Completed: 28-Jul-15

Contractor: Direct Push Probe Driller: Direct Push Probing Pty Ltd

Rig Type & Mounting: Tracked mounted Geoprobe 6620DT Inclination: Vertical Logged: T Whitnall 28-Jul-15
Flushing Fluid: none Processed: SB Olivares 01-Dec-15
Hole Diameter (mm): 120 Casing Size: N/A Checked: Checked:

Ê	Dail Ob	ly Pr serv	ogr atio	ess/ ons		lev.]	ojt (_	Strata Description	dition	ķ				Onwards/Test		NA/- II	æ (i
Depth Scale (m)	Date	Casing Depth (m)	Fluid Depth (m)	Drilling Method	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	(type; colour; fines plasticity or particle characteristics; minor components; structure and/or origin)	Moisture Condition	Consistency/ Relative Density	Sample Type	& Deptin	Sample No.	Sample/ Test Records & Comments	c	Well nponents	Depth Scale (m)
-									SP	SAND Pale grey, fine to medium grained, trace rootlets. BASSENDEAN SAND Grey.	М	VL- L?	0.2	20	B1 B2			Wells installed at separate locations (within 1m of each	-
- - -										Pale brown.	W		0.4		В3			other)	- - -
- - -1 -													0.7	00	B4 B5				- 1-
- - -						1.3 [+21.25]			SP	Below 1.15m: Becoming \grey/brown. \int SAND Pale brown, sand is fine to medium	D - M	MD	1.3	25	во			Base of	-
- - -						1.8 [+20.75]			SC	grained, with some clay. GUILDFORD FORMATION CLAYEY SAND Pale brown, fine to medium grained.		St	1.5	75	B7 B8	1.8m: PP = 3.5		shallow well	-
-2 - -										GUILDFORD FORMATION Green, slight organic odour.			2.0	1	В9	2.15m: PP > 4.5			2-
- -				Push Probing		2.5 [+20.00]			SP	SAND Brown, fine to medium grained, trace	W	MD?	2.5	50	310	2.5m: PP = 2.5			-
- - -3										clay, organic odour. GUILDFORD FORMATION 2.9 to 3.25m: Green, more clayey.			2.1		312				3-
- - - -										3.25 to 4.1m: Sample liquified.			3.5		012				- - -
IDLIB.GDI 1/12															313				-
GENERAL LOG 6132259 - BALANNUP, GPJ GHDLIB, GDJ 7/12/15													3.5	25					4-
3 6132259 - BAL										Brown, fine to coarse grained sand, with some clay, local CLAYEY SAND zones.	M - W			E	314				- - - -
GENERAL LOG													4.7		315				- 5-





WELL CONSTRUCTION BORE LOG

Well No.:

A05

Sheet 2 of 3

Total Depth: 12.0m

Client: Water Corporation

Coordinates: E 400 500, **N** 6443 960

Project: Balannup / Keane Road Pressure Main

Ground Surface Elevation: +22.5m AHD

Commenced: 28-Jul-15 Completed: 28-Jul-15

Additional Geotechnical Investigation **Job No.:** 6132259

Contractor: Direct Push Probe Driller: Direct Push Probing Pty Ltd

Rig Type & Mounting: Tracked mounted Geoprobe 6620DT

Inclination: Vertical

Logged: T Whitnall 28-Jul-15

Flushing Fluid: none

Processed:	SB Olivares	01-Dec-15

Н	ole D	iame	eter	(mm	1): 1	120				Casing Size: N/A					Checked:		
Ê		ly Pi oser	rogre	ess/ ons		lev.]	it			Ctuata Decemention	dition	itv					Ê
Depth Scale (m)	Date	Casing Depth (m)	Fluid Depth (m)	Drilling Method	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	Strata Description (type; colour; fines plasticity or particle characteristics; minor components; structure and/or origin)	Moisture Condition	Consistency/ Relative Density	Sample Type & Depth	Sample No.	Sample/ Test Records & Comments	Well Compone	stus Depth Scale (m)
-67						74			SP	SAND Brown, fine to medium grained, trace clay, organic odour. GUILDFORD FORMATION	W	MD?		B15			6
1/12/15				Push Probing		7.1 [+15.40]		* * * * * * * * * * * * * * * * * * *	SP/SM	pockets up to 20mm of black material (trace organics). GUILDFORD FORMATION			7.50	B18		1 1111	8
GENERAL LOG 6132259 - BALANNUP.GPJ GHDLIB.GDT 1/12/15						[+13.85]			SP	SAND Light grey, fine to medium grained. GUILDFORD FORMATION Below 9.8m: Brown.	W	MD?					9



Project:



WELL CONSTRUCTION BORE LOG

Well No.:

A05

Sheet 3 of 3

Client: Water Corporation

Ground Surface Elevation: +22.5m AHD

Coordinates: E 400 500, N 6443 960

Total Depth: 12.0m

Balannup / Keane Road Pressure Main Additional Geotechnical Investigation

Commenced: 28-Jul-15 Completed: 28-Jul-15

Job No.: 6132259

Contractor: Direct Push Probe Driller: Direct Push Probing Pty Ltd

T Whitnall 28-Jul-15 Rig Type & Mounting: Tracked mounted Geoprobe 6620DT Inclination: Vertical Logged: Flushing Fluid: Processed: SB Olivares 01-Dec-15 Hole Diameter (mm): 120 Casing Size: N/A Checked:

		ly Proserv		-	-		Ι			Casing Size: N/A	<u>ا</u>				Checked:			
Depth Scale (m)	Date	Casing Depth (m)	Fluid Depth (m)		Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	Strata Description (type; colour; fines plasticity or particle characteristics; minor components; structure and/or origin)	Moisture Condition	Consistency/ Relative Density	Sample Type & Depth	Sample No.	Sample/ Test Records & Comments	Well Compone	ents	Depth Scale (m)
11				Push Probing					SP	SAND Light grey, fine to medium grained. GUILDFORD FORMATION Light grey.	W	MD?				Bas		11
12						12.0				Brown. Termination Depth = 12.00m (Target Depth)						Bas	11	12
13																		1;
·14																		14
15																		1





Borehole No.: **A06**

Sheet 1 of 1

Client: Water Corporation Coordinates: E 400 391, N 6443 950

Project: Balannup / Keane Road Pressure Main Ground Surface Elevation: +22.6m AHD Total Depth: 3.0m

Additional Geotechnical Investigation Commenced: 29-Jul-15 Completed: 29-Jul-15

Job No.: 6132259 Contractor: Direct Push Probe Driller: Direct Push Probing Pty Ltd

Rig Type & Mounting: Tracked mounted Geoprobe 6620DT Inclination: Vertical Logged: T Whitnall 29-Jul-15
Flushing Fluid: none Processed: SB Olivares 01-Dec-15

		iame	eter			10ne 120				Casing Size: N/A					-	ecked:	SB Olivares	01-De	C-15
٦	Dai Ol	ly Pi	ogr atio	ess/ ons		.v.]	يا				lition		≥						٦
Scale (m)		_				m)/ [Ele	ical Uni	; Log	cation	Strata Description	e Cond	ency/	Densi	Type	No.		ole/ Test Reco	rds	cale (n
Depth S	Date	Casing Depth (m)	Fluid Depth (m)	Drilling Method	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	(type; colour; fines plasticity or particle characteristics minor components; structure and/or origin)	Mois	Consistency/	_	Sample Type & Depth	Sample No.				Depth Scale (m)
									SP	SAND Grey, fine to medium grained, trace rootlets. BASSENDEAN SAND	M	VL L1	?	0.00	B1				
										White.				ч	B2				
-														0.50	В3				
-										0.7 to 1.05m: Orange brown.	D - M			0.70	B4				
- 1														1.05					1
-														1.25	B5 B6				
-				Push Probing						1.4m: Pale brown, clay content increases.				1.40					
-				Push		1.7			SC	CLAYEY SAND		S		1.70	B7				
-										Pale brown, sand is fine to medium grained, with some clay.		ľ			B8				
-2 -						2.1 [+20.55]	Ī	/.: _{./} . /	SP	GUILDFORD FORMATION 1.95m: Green, slight organic odour. SAND	M - W	ME)?	2.05	B9				2
- -										Grey, green, fine to medium grained, with trace clay, with trace black pockets of organic material up to 10mm, organic odour. GUILDFORD FORMATION				1	B10				
-										2.05 to 2.25m: Brown.				₹	B11				
-										Grading more clayey.				2.75	B12				
-3 -						3.0 [+19.60]				Termination Depth = 3.00m (Target Depth)			_{	<u> </u>					3
-																			
-																			
-																			
-																			
-4 - -																			4
- - - - - - - - - - - - - - -																			
-																			
-																			
- -5																			5





WELL CONSTRUCTION BORE LOG

Inclination: Vertical

Well No.:

A07 Sheet 1 of 1

29-Jul-15

T Whitnall

Client: Water Corporation Coordinates: E 400 267, N 6443 891

Project: Balannup / Keane Road Pressure Main

Rig Type & Mounting: Tracked mounted Geoprobe 6620DT

Additional Geotechnical Investigation

Job No.: 6132259

Ground Surface Elevation: +22.6m AHD Total Depth: 3.0m

Commenced: 29-Jul-15 Completed: 29-Jul-15

	ıshir					none			, , , ,		-				Processed:	SB Oliva	ires	01-De	c-15
Но	le Di			_	·	120				Casing Size: N/A	_	1	1		Checked:				
Depth Scale (m)	Date Date	Casing Depth (m)	Fluid Depth (m)		Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	Strata Description (type; colour; fines plasticity or particle characteristics; minor components; structure and/or origin)	Moisture Condition	Consistency/ Relative Density	Sample Type & Depth	Sample No.	Sample/ Test Records & Comments	Con	Well npone	nts	Depth Scale (m)
-						0.3 [+22.40] 0.5			SM	SILTY SAND Dark grey, sand is fine to medium grained, trace organics, trace rootlets. TOPSOIL / BASSENDEAN SAND	M M - W	VL - L?	0.00	B1 B2					
- - -						[+22.20]			SC	SAND Orange, becoming dark grey at base, sand is fine to medium grained, trace rootlets. BASSENDEAN SAND CLAYEY SAND	D- M	St	0.45	B3					
-1 -1 -										Pale brown/orange, trace orange mottling, sand is fine to medium grained, with some clay. GUILDFORD FORMATION 0.45 to 0.6m, dark brown. 0.6m: 30mm layer with some gravel			1.00	B4 B5			Base well	of	1
 - - -				Push Probing		1.8				o.on. Sommayer with some gravel sized orange ferricrete nodules. O.85 to 0.95m: Layer with some gravel sized orange ferricrete nodules.			1.50	B6 B7					
- -2 - -						[+20.90]			SP	SAND Brown, fine to medium grained, trace clay. GUILDFORD FORMATION 1.9m: Pale grey, organic odour, with trace pockets of black organic material up to 20mm.	W	MD?	1.75	B8 B9					2
- - - -						2.8 [+19.90]			SC	CLAYEY SAND Green brown, sand is fine to medium	D - M	St	2.50	B11					
-3 - - - -						3.0 [+19.65]		<u>. ''' '' '' .</u>		grained. \GUILDFORD FORMATION Termination Depth = 3.00m (Target Depth)									3.
EINEKAL LOG 8132295 - BALANNUP. GPJ GHULIB.GUI 1/12/19																			4
O 132239 - DALAINIO																			
5																			5





Inclination: Vertical

Borehole No.:

80A

Sheet 1 of 1

28-Jul-15

T Whitnall

Client: Water Corporation

Rig Type & Mounting: Tracked mounted Geoprobe 6620DT

Project: Balannup / Keane Road Pressure Main

Additional Geotechnical Investigation

Job No.: 6132259 Coordinates: E 400 519, N 6443 847

Ground Surface Elevation: +22.4m AHD Total Depth: 3.0m

Commenced: 28-Jul-15 Completed: 28-Jul-15

_	ı ıyı ıshir				_	ı racı none		mounte	ea Ge	oprobe 6620D1 Inclination: Vertical				\vdash	ocessed:	SB Olivares	28-Jul 01-De	
	le Di	_								Casing Size: N/A				-	ecked:	OD Olivares	01.00	,0 10
Depth Scale (m)	Date Date	Casing Depth (m)	Pluid Depth (m)	Drilling Method	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	Strata Description (type; colour; fines plasticity or particle characteristics minor components; structure and/or origin)	Moisture Condition	Consistency/ Relative Density	Sample Type & Depth	Sample No.		ole/ Test Recor & Comments	ds	Depth Scale (m)
	0			Push Probing	×	0.2 [+22.15]			SP SC	SAND Pale grey, fine to medium grained. BASSENDEAN SAND CLAYEY SAND Light brown, fine to medium grained, trace pockets of black organic material up to 10mm, possibly charcoal/ash. GUILDFORD FORMATION 0.75 to 1.2m: Less clayey At 1.2m: 5mm thick orange bands. From 1.2m: Pale brown mottled orange, becoming more clayey. From 1.8m: With trace green mottling and trace pockets of black organic material up to 10mm. SAND Green, fine to medium grained, with some clay, slight organic odour. GUILDFORD FORMATION 2.5m: Grey, with trace clay, organic (peaty?) odour.	M	MD St	0.50 0.20 0.75 0.75 1.00 1.75 2.00 2.25	B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12	Groundw Temp: 13 Sal: 62 p pH: 9.4 Cond: 15 tds: 82 0.4m: PF 0.75m: P 1.15m: P 1.35m: P	pm 6uS P = 0.75 P = 2.5 P = 2.5 P = 2.25	n):	1
-3 						3.0				Termination Depth = 3.00m (Target Depth)								- 3
- - - -5																		í





Inclination: Vertical

Borehole No.:

A09

Sheet 1 of 1

27-Jul-15

T Whitnall

Client: Water Corporation Coordinates: E 400 566, N 6443 862

Project: Balannup / Keane Road Pressure Main

Rig Type & Mounting: Tracked mounted Geoprobe 6620DT

Additional Geotechnical Investigation

Job No.: 6132259

Ground Surface Elevation: +22.3m AHD Total Depth: 3.0m

Commenced: 27-Jul-15 Completed: 27-Jul-15

_		ıg F			-	none	.cu	mounto	.u 00	probe 6620D1 Inclination: Vertical					ocessed:	SB Olivares	01-De	
		iame		•	1): ′	120				Casing Size: N/A				Ch	ecked:			_
Depth Scale (m)	Dail Ob	Casing Depth (m) as A	Fluid Depth (m)	Drilling Method Suc	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	Strata Description (type; colour; fines plasticity or particle characteristics minor components; structure and/or origin)	Moisture Condition	Consistency/ Relative Density	Sample Type & Depth	Sample No.	_	ole/ Test Recor & Comments	ds	
									SP	SAND Pale grey, fine to medium grained, trace	W	VL - L?	0.00	B1	Groundw	ater sample (0.2r	n):	Ī
						0.2 [+22.10] 0.5 [+21.70]		× * * // //	SC SM SC	rootlets. BASSENDEAN SAND CLAYEY SAND Grey, sand is fine to medium grained, trace rootlets. GUILDFORD FORMATION SILTY SAND Pale grey, sand is fine grained.	М		0.20	B2	Temp: 19 Sal: 50.1 pH: 10.3 Cond: 10 tds: 60.3 0.3m: PF	ppm 8.70uS = 2.5	,	
1										GUILDFORD FORMATION CLAYEY SAND Pale brown mottled orage, sand is fine to			X	B4	0.0	0		
										medium grained. GUILDFORD FORMATION 1.0 to 1.35m: Medium grained gravel sized			1.00 1.35 1.55 1.75	B5	1.15m: P	P = 1.5		
				Push Probing						subrounded ferricrete nodule. 1.35m: Brown.			1.35	В6	1.4m: PF	9 = 1.5		
				Pus						1.55m: Green, slight organic odour.			1.75	В7	1.65m: P	P = 3.5		
2										Below 1.9m: With trace black organic pockets up to 5mm.			2.00	B8	1.9m: PF	= 2.75		
													2.25	B9 B10	2.2m: PF	= 4.0		
						2.4 [+19.90]			SP	SAND Brown, sand is fine to medium grained, with some clay, organic odour. GUILDFORD FORMATION 2.53m: 20mm clayey sand layer	M	MD?	2.40	B11				
3						[+19.30]				Termination Depth = 3.00m (Target Depth)			<u> </u>					
4																		
•																		
5																		



Hand Auger

HAND AUGER LOG

Location No.:

A10

Sheet 1 of 1

31-Jul-15

T Whitnall

Client: Water Corporation

Project: Balannup / Keane Road Pressure Main

Additional Geotechnical Investigation

Job No.: 6132259

Equipment:

Coordinates: E 400 405, N 6443 824

Ground Surface Elevation: +22.6m AHD Total Depth: 1.4m

Logged:

Commenced: 31-Jul-15 Completed: 31-Jul-15

Equipment Operator: T Whitnall

Но	le Dia	amet	er (m	ı m) : 1	00							Processed: SB Olivares 01-Dec-1 Checked: 01-Dec-1
Depth Scale (m)	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	Strata Description (type; colour; fines plasticity or particle characteristics; minor components)	Moisture Condition	Consistency/ Relative Density	Sample Type	& Depth	Sample No.	Sample/ Test Records & Comments
-					SP	SAND Pale brown, fine to medium grained. BASSENDEAN SAND	М	VL- L	A	0.00	B1	
-										0.30 0.30 0.50 0.50	B2	
										0.80 0.80	B3	
1										1.00 1.00	B4 B5	
		1.30 1.35 [+21.3]			sc	CLAYEY SAND	l w	F-St		1.25 1.25 1.30	B6 - B7	
- - - - - - - -		[-2.5]				Pale orange, sand is fie to medium grained. GUILDFORD FORMATION Termination Depth = 1.35m (Water/ Collapsing)						
-3												
-5												



Project:



WELL CONSTRUCTION BORE LOG

Inclination: Vertical

Well No.:

A11

T Whitnall

Sheet 1 of 1

29-Jul-15

Client: Water Corporation

Rig Type & Mounting: Tracked mounted Geoprobe 6620DT

Balannup / Keane Road Pressure Main

Additional Geotechnical Investigation

Job No.: 6132259 Coordinates: E 400 300, N 6443 761

Ground Surface Elevation: +22.5m AHD Total Depth: 3.0m

Commenced: 29-Jul-15 Completed: 29-Jul-15

	Dail	y Pr	ogr	ess/	_					Casing Size: N/A	ion				Checked:			Τ
th Scale (n	Date	Casing Depth (m)	Fluid Depth (m)	Drilling Method	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	Strata Description (type; colour; fines plasticity or particle characteristics; minor components; structure and/or origin)	Moisture Condition	Consistency/ Relative Density	Sample Type & Depth	Sample No.	Sample/ Test Records & Comments	Cor	Well mponents	100
				Push Probing		0.2 [+22.35] 2.4 [+20.10] 2.8 [+19.70] 3.0 [+19.50]			SP SC	SAND Pale grey, fine to medium grained. BASSENDEAN SAND CLAYEY SAND Pale brown, sand is fine to medium grained. GUILDFORD FORMATION At 0.25m: grey layer (ash?) ~20mm thick. At 0.6m: layer with some quartz gravel 20mm thick. Below 0.6m, with trace quartz gravel. Below 0.9m: with trace orange mottles. Below 1.35m: brown. 1.75m: Green, fine to medium grained, organic odour. GUILDFORD FORMATION CLAYEY SAND / SAND Dark brown, with some clay, organic odour. GUILDFORD FORMATION Termination Depth = 3.00m (Target Depth)	W	L St	0.00 0.15 0.50 0.75 1.00 1.25 1.75 2.00 2.26 2.40	B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12			Base of well	
-4																		





Inclination: Vertical

Borehole No.:

A12

Sheet 1 of 1

T Whitnall

28-Jul-15

Client: Water Corporation

Project: Balannup / Keane Road Pressure Main

Rig Type & Mounting: Tracked mounted Geoprobe 6620DT

Additional Geotechnical Investigation

Job No.: 6132259 Coordinates: E 400 486, N 6443 746

Ground Surface Elevation: +22.7m AHD Total Depth: 3.0m

Commenced: 28-Jul-15 Completed: 28-Jul-15

		ng F iame				none 120				Casing Size: N/A					\vdash	ocessed: ecked:	SB Olivares	01-De	c-15
Depth Scale (m)	Dai Ok	Casing Depth (m)	Fluid Depth (m)	Drilling Method	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	Strata Description (type; colour; fines plasticity or particle characteristics minor components; structure and/or origin)	Moisture Condition	Consistency/ Relative Density	Sample Type	& Depth	Sample No.	_	ole/ Test Recor & Comments	ds	Depth Scale (m)
-									SP	SAND pale grey, fine to medium grained. BASSENDEAN SAND 0.0 to 0.4m: Trace rootlets. 0.2 to 0.4m: Grey.	D-M	VL - L?		0.25	B1 B2 B3	No groun	dwater 0.0 to 1.5	m	-
- -1 -						1.0 [+21.70]		×	SM	SILTY SAND Dark brown, fine to medium grained, possibly with trace orgaincs.	M D-M	St		1.00	B4 B5				1- 1-
-				Push Probing		1.3 [+21.45]			SC	GUILDFORD FORMATION Below 1.1m, becoming cemented to low strength. CLAYEY SAND Pale brown mottled orange, sand is fine to		St	ν V	1.25	B5 B6 1.45m: PP = 2.5 B7 1.75m: PP > 4.5			- - -	
- - -2										medium grained, with some clay, with trace gravel sized ferricrete nodules, clay content increases with depth. GUILDFORD FORMATION 1.25 to 1.35m: with some ferricrete nodules.				1.75 2.00	B8	1.75m: P 1.95m: P 2.1m: PP	P > 4.5		2-
-										Below 2.2m: becoming green, with trace pockets of black organic material up to 10mm organic odour noted.				2.25	B10				-
- - -						3.0								2.75	B11	2.7m: PP 2.9m: PP			3-
GDT 1/12/15						[*16.70]				Termination Depth = 3.00m (Target Depth)									-
GENERAL LOG 6132259 - BALANNUP.GPJ GHDLIB.GDT 1/12/15 G																			4-
GENERAL LOG 6132259 																			5-





Inclination: Vertical

Borehole No.:

A13

Sheet 1 of 1

31-Jul-15

T Whitnall

Client: Water Corporation

Project: Balannup / Keane Road Pressure Main

Rig Type & Mounting: Tracked mounted Geoprobe 6620DT

Additional Geotechnical Investigation

Job No.: 6132259 Coordinates: E 400 255, N 6443 707

Ground Surface Elevation: +22.6m AHD Total Depth: 3.0m

Commenced: 31-Jul-15 Completed: 31-Jul-15

_		ng Fl			-	none	.cu i	nounte	u oc	pprobe 6620D1 Inclination: Vertical				_	ocessed:	SB Olivares	01-De	
Hol	e Di	iame	eter	(mm	1): 1	120				Casing Size: N/A				Ch	ecked:			_
Depth Scale (m)	Date dO	Casing Depth (m)	Fluid Depth (m)	Drilling Method suc		Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	Strata Description (type; colour; fines plasticity or particle characteristics; minor components; structure and/or origin)	Moisture Condition	Consistency/ Relative Density	Sample Type & Depth	Sample No.		ole/ Test Recor & Comments	ds	Donth Scale (m)
- - - - - - 1						[+22.50]			SP SP	SAND Dark grey, sand is fine to medium grained, with trace rootlets and moss at surface, with trace organics. TOPSOIL SAND Light brown, fine to medium grained. BASSENDEAN SAND 0.1 to 0.6m, light grey.	W		0.25	B1 B2 B3 B4	Temp: 17 Sal: 223	rater Sample: (1m 7.4°C ppm	1)	
-2				Push Probing		1.4 [+21.25]			SC	Below 1.25m, mottled orange. CLAYEY SAND Light brown, fine to medium grained, with trace orange mottling. GUILDFORD FORMATION 2.7m: Green, slight organic odour.	M		1.35	B6 B7 B8	pH: 8.48 Cond: 51 tds: 283 1.45m: P 1.6m: PF	9uS P = 2.5 P = 2.25		
						<u>2.7</u> [+19.90]			SP	SAND Green, grey, fine to medium grained, with			2.25	B10 B11	2.2m: PF 2.4m: PF 2.6m: PF	? > 4.5		
3						3.0				trace clay. GUILDFORD FORMATION Termination Depth = 3.00m (Target Depth)			<u> </u>	512				
4																		
5																		





Borehole No.:

A14

Sheet 1 of 1

Client: Water Corporation Coordinates: E 400 433, N 6443 642

Project: Balannup / Keane Road Pressure Main Ground Surface Elevation: +22.3m AHD Total Depth: 3.0m

Additional Geotechnical Investigation Commenced: 27-Jul-15 Completed: 27-Jul-15

Job No.: 6132259 Contractor: Direct Push Probe Driller: Direct Push Probing Pty Ltd

Rig Type & Mounting	: Tracked mounted Geoprobe 6620DT	Inclination: Vertical	Logged:	T Whitnall	27-Jul-15
Flushing Fluid:	none		Processed:	SB Olivares	01-Dec-15
Hole Diameter (mm):	120	Casing Size: N/A	a		

H	lole	Di	ame	eter	(mn	n):	120				Casing Size: N/A				Cr	ecked:	OB Olivaroo		
٦		Dail Ob	y Pr ser\	ogr /atio	ess/ ons		. <u>`</u>	Ţ				ition							(ر
h Scalo (m)	Scale (II		Casing Depth (m)	Fluid Depth (m)	Drilling Method	_	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	Strata Description (type; colour; fines plasticity or particle characteristics	Moisture Condition	Consistency/ Relative Density	Sample Type & Depth	Sample No.		ole/ Test Record & Comments	ds	Depth Scale (m)
d th	ldan	Date	Casing	Fluid [Drilling	Water	Dept	Geol	Grap	Class	minor components; structure and/or origin)	Mois	Cons Relat	Samı & De	Sam				Dept
-										SP	SAND Pale grey, fine to medium grained, trace rootlets. BASSENDEAN SAND	W	L- MD	0.00	B1				
F							0.4			SC	0.25m: Grey, with trace clay. CLAYEY SAND	D-M		8	B2				-
ŀ											Pale brown, fine to medium grained, with some clay. GUILDFORD FORMATION			0.40 0.75 1.00 1.25 1.50	В3	0.53m: P	P = 1.5		·
-														0.75	B4	0.8m: PP	' = 1.5		- - 1-
F'														1.00	B5	1.05m: P 1.2m: PP			'- - -
-					obing									1.25	В6				-
ŧ					Push Probing									1.50	B7	1.6m: PP	' = 1.0		-
ŀ														1.75	B8	1.85m: P			-
-2 -	2						2.2							KX	В9	2.0m: PP	2 = 3.0		2-
							[+20.10]			SP	SAND Grey becoming dark brown, fine to medium grained, with trace clay, organic odour. GUILDFORD FORMATION	W	MD	2.25	B10				-
ļ														2.75	B11				- -
- -3	, -						3.0				Termination Depth = 3.00m (Target Depth)				B12	Groundw	ater sample (3m):	:	3-
2/15											Termination Deptil = 3.00m (Target Deptil)					Temp: 19 Sal: 7.05 pH: 7.7 - Cond: 14 tds: 7.46	9.3°C ppm		-
JLIB.GDI 17.1																			-
145 - 4 - 4 - 4	۱																		4-
- BALANNU																			-
G 6132255																			-
GENERAL LOG 6132259 - BALANNUP. GPJ GHDLIB. GDT 1/12/15	5																		- 5-





WELL CONSTRUCTION BORE LOG

Inclination: Vertical

Well No.:

A15 Sheet 1 of 1

31-Jul-15

T Whitnall

Client: Water Corporation

Project: Balannup / Keane Road Pressure Main

Rig Type & Mounting: Tracked mounted Geoprobe 6620DT

Additional Geotechnical Investigation

Job No.: 6132259 Coordinates: E 400 422, N 6443 557

Ground Surface Elevation: +22.1m AHD Total Depth: 4.5m

Commenced: 31-Jul-15 Completed: 31-Jul-15

Flo	ıshir Ie Di	ıg F	uid:		r	one	.00 1	nounc	<i>,</i>	Casing Size: N/A						Processed:	SB O	livares	01-De	
	Dail	y Pr	ogra	ess/	,						tion					Checked:				
Depth Scale (m)	Date	Casing Depth (m)	Fluid Depth (m)	Drilling Method	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	Strata Description (type; colour; fines plasticity or particle characteristics; minor components; structure and/or origin)	Moisture Condition	Consistency/ Relative Density	Sample Type & Depth	Sample No.		Sample/ Test Records & Comments	(Well Compon		Depth Scale (m)
GENERAL LOG 6132259-BALANNUP.GPJ GHDLIB.GDT 1/12/15	Da	Ca	FIL	Push Probing Dr	M M	0.2 [+21.89] 0.9 [+21.19]		[]	SM SP SC	SAND Dark grey, fine to medium grained, with trace organics, trace rootlets. TOPSOIL SAND Pale grey, sand is fine to medium grained, trace clay with depth. BASSENDEAN SAND CLAYEY SAND Pale grey, sand is fine to medium grained, with some clay. GUILDFORD FORMATION 1.4m: Brown, locally very weakly cemented. Below 1.6m: pale brown. SAND Pale brown, with trace clay. GUILDFORD FORMATION 3.7m: Slight increase in clay content.	W M M	St MD	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	B1 B2 B3 B4 B5 B6 B7 B810 B111 B12 B13	1.2 1.4 1.5 2.2 2.5	oundwater mple (0.2m): mp: 21.9°C l: 72.8 ppm : 6.4 nd: 162.90uS : 897 m: PP = 1.5 m: PP = 1.75 5m: PP = 3.0 m: PP = 3.0 5m: PP = 3.25 5m: PP = 3.25 sm: PP = 3.5				2
SENERAL LOG 6132259 - B/						4.5 [+17.59]				Termination Depth = 4.50m (Target Depth)										5-





Borehole No.: **A16**

Sheet 1 of 1

Client: Water Corporation Coordinates: E 400 316, N 6443 549

Project: Balannup / Keane Road Pressure Main Ground Surface Elevation: +22.6m AHD Total Depth: 3.0m

Additional Geotechnical Investigation Commenced: 31-Jul-15 Completed: 31-Jul-15

Job No.: 6132259 Contractor: Direct Push Probe Driller: Direct Push Probing Pty Ltd

Rig Type & Mounting: Tracked mounted Geoprobe 6620DT Inclination: Vertical Logged: T Whitnall 31-Jul-15

Flushing Fluid: none Processed: SB Olivares 01-Dec-15

Hole Diameter (mm): 120

	usnii ole D	iame				10ne 120				Casing Size: N/A				-	rocessed: hecked:	SB Olivares	01-De	U-15
	Dai	ly Pr	ogr	ess/		<u> </u>					ioi			ľ				
Scale (m)	Ol	serv (m) yada				Depth (m)/ [Elev.]	Geological Unit	c Log	Classification	Strata Description	Moisture Condition	Consistency/ Relative Density	Type h	No.		ole/ Test Recor & Comments	ds	Depth Scale (m)
Depth (Date	Casing Depth (m)	Fluid Depth (m)	Drilling Method	Water	Depth (Geolog	Graphic Log		(type; colour; fines plasticity or particle characteristics minor components; structure and/or origin)		Consis Relativ	Sample T & Depth	Sample No.				Depth (
ŀ						[+22.45]		\^^^^ 	SP	SAND Dark grey, sand is fine to medium grained, trace organics, trace rootlets, moss and grass at surface.	W	L- MD	0.25	B1	_			
ŀ						0.6 [+22.00]			sc	TOPSOIL SAND Light brown, fine to medium grained. BASSENDEAN SAND	М	F-St	0.55	B2	-			
ŀ										CLAYEY SAND Light brown, trace orange mottled, sand is fine to medium grained.			\bowtie	B3 B4	0.65m: P	P = 0.75		
-1 -										GUILDFORD FÖRMATION			1.00	B5	1.0m: PF			1
E				Push Probing									1.25	В6	1.45m: P			
ŧ				Push F						1.55m: Grey brown, trace orange mottle, becoming more clayey.		St	\sim	В7	- 1.75m: P	P = 1.25		
-2										2.0m: Grey, green, grading more sandy,			2.00	B8	1.9m: PF			2-
ŀ										slight organic odour.			2.25	B9	2.15m: P 2.35m: P			
-						2.5 [+20.05]			SP	SAND Grey, green, fine to medium grained, trace clay.	W	MD		B11				
- - -3						3.0 [+19.55]				GUILDFORD FORMATION Below 2.7m: dark brown, trace organics. 2.9m: Pale grey, slight organic odour.			2.85	B12				3
-						,,				Termination Depth = 3.00m (Target Depth)					Groundw Temp: 20 Sal: 4.38 pH: 7.5 Cond: 7.2	ppm	:	
2 - 1 - -																		
- - -4																		4
4 1 1 1 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5																		
-																		
- - -																		
-5																		5





Borehole No.:

A17

Sheet 1 of 1

Total Depth: 3.0m

Client: Water Corporation Coordinates: E 400 355, N 6443 410

Project: Balannup / Keane Road Pressure Main Ground Surface Elevation: +22.4m AHD

Additional Geotechnical Investigation

Commenced: 31-Jul-15 Completed: 31-Jul-15

Job No.: 6132259 Contractor: Direct Push Probe Driller: Direct Push Probing Pty Ltd

T Whitnall 31-Jul-15 Rig Type & Mounting: Tracked mounted Geoprobe 6620DT Inclination: Vertical Logged: Flushing Fluid: Processed: SB Olivares 01-Dec-15 Hole Diameter (mm): 120 Casing Size: N/A Checked:

(m)		ly Pr serv				lev.]	it		_	Strate Decementary	Condition	ξ				ecked:	Ê
Depth Scale (Date	Casing Depth (m)	Fluid Depth (m)	Drilling Method	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	Strata Description (type; colour; fines plasticity or particle characteristics minor components; structure and/or origin)	Moisture Con	Consistency/ Relative Density	Sample Tyne	& Depth	Sample No.	Sample/ Test Records & Comments	Depth Scale (m)
						0.2 [+22.25]		\^^^^ \^^^ 	SP SP	SAND Dark grey, fine to medium grained, trace organics, trace rootlets, grass at surface.	W	L- MD		0.00	B1		
E .						0.6 [+21.80]				SAND Pale brown, fine to medium grained. BASSENDEAN SAND Below 0.45m, brown.					B2		
-						[+21.80]		×	SM	SILTY SAND Grey, sand is fine to medium grained, locally very weakly cemented. GUILDFORD FORMATION	D-M	MD		0.60	B3 B4	0.8m: PP = 3.75	
-1 -						1.1 [+21.35]		×	SC / CL	CLAYEY SAND / SANDY CLAY Pale brown mottled orange.				1.05	B5		1
ŀ				Probing		1.5 [+20.90]			O.L.	GUILDFORD FORMATION		F		1.25	В6	1.25m: PP = 4.25 1.4m: PP = 2.5	
ļ				Push		,			СН	SANDY CLAY Greey grey, high plasticity, fine to medium grained sand. GUILDFORD FORMATION		F		1.75	В7	1.7m: PP = 1.0	
- -2 -														2.00	B8 B9	2.0m: PP = 1.25	2
-						2.3 [+20.15]			SC	CLAYEY SAND Green grey, medium to high plasticity, fine to medium grained sand.				2.25	B10	2.25m: PP = 0.25	
- - -										GUILDFÖRD FORMATION 2.5m: Grey brown, trace organics, organic odour.				2.50	B11	2.5m: PP = 1.0 2.7m: PP = 4.0	
- -3					<u>V</u>	3.0 [+19.40]				2.85m: Grading more sandy.	W			2.85	B12		3
- - - -						[110.40]				Termination Depth = 3.00m (Target Depth)						Groundwater rose to ~1.5m Groundwater sample (3m): Temp: 20.5°C Sal: 2.16 ppm Cond: 4.60uS tds: 2.45	
4 																	4
- - - - - - -5																	5