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BOREHOLE: BHLR-12

Project: Pioneer-Burdekin PHES
Location: Netherdale/Dalrymple Heights
Client: Queensland Hydro
Job No.: PS138693

Position: Lower Reservoir
Coords: 657859.8 m E 7662657.0 m N MGA2020-55
Surface RL: 238.8 m AHD
Contractor: Twin Hills Engineering & Drilling Drill Rig: D&B - 8DTM
Inclination: -90° Direction: 000°

Sheet 1 of 4
Date Started: 12/4/2024
Date Completed: 15/4/2024
Logged: TH

Drilling				Sampling		Field Material Description							
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION		MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	E	F	Groundwater Not Observed	0	238.77			SM	TOPSOIL Silty SAND: fine to coarse grained, poorly graded, dark grey to dark brown, silt is high plasticity; trace medium plasticity clay; with rootlets, organic odour.	W	L - MD	TOPSOIL	
				238.57		SC	Clayey SAND: fine to medium grained, poorly graded, dark grey to dark brown, clay is medium plasticity; organic odour.			COLLUVIAL SOIL			
				0.50									
				238.27	SPT 0.50-0.95 m 3,3,4 N=7 0.50-0.88 m		MH	SILT: medium to high plasticity, black to brown, with low plasticity clay; trace fine to medium grained sand.					
				1									
				1.50									
				237.27									
				2.00									
				2	236.77	SPT 2.00-2.45 m 2,4,8 N=12 2.00-2.42 m		SM	Silty SAND: fine to medium grained, pale brown and pale orange, with fine grained gravel; with low plasticity clay.	M	L - MD		
				3	3.00			CI-CH	Sandy CLAY: medium to high plasticity, brown to dark brown, sand is fine to coarse grained; trace fine grained sub-angular gravel.			RESIDUAL SOIL	
WB	VH			4	235.77	SPT 3.50-3.95 m 5,10,15 N=25 3.50-3.92 m							
				4.50									
				234.27									
				5	233.77	SPT 5.00-5.45 m 25,27,32 HB N=59 5.00-5.35 m		SP	SAND: fine to coarse grained, white, grey and brown.				
				5.45									
				233.32									
				6									
				6.50									
				232.27	SPT 6.50-6.80 m 12,31 HB 6.50-6.80 m		SW	Gravelly SAND: fine to medium grained, pale brown, orange, black, white, gravel is fine to medium to coarse grained.					
				6.70									
				7									
				8									
				9									

Comments

Checked GEM
Date 2/12/2024



Sheet 2 OF 4

Date Started: 12/4/2024

Date Completed: 15/4/2024

Logged: TH

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BOREHOLE: BHLR-12

Project: Pioneer-Burdekin PHES

Position: Lower Reservoir

Sheet 3 OF 4

Location: Netherdale/Dalrymple Heights

Coords: 657859.8 m E 7662657.0 m N MGA2020-55

Client: Queensland Hydro

Surface RL: 238.8 m AHD

Date Started: 12/4/2024

Job No.: PS138693

Contractor: Twin Hills Engineering & Drilling Drill Rig: D&B - 8DTM

Date Completed: 15/4/2024

Inclination: -90° Direction: 000°

Logged: TH

Drilling						Field Material Description				Defect Information			
METHOD	WATER	TCR	RQD	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations (Core partings shown - refer to Detailed Defect Descriptions table for all logged features)	AVERAGE DEFECT SPACING (mm)		
				10	228.67		NO CORE 0.55m (10.10-10.65)	SW		10.10-10.65: Core loss, likely residual soil comprising sand 10.10: J, 15°, Fe VN, UN, RF			
				10.65	228.12								
		63	0	11	227.77		GRANITE: medium to coarse grained, white black and green grey, crystalline, massive.	XW		10.65-10.68: EW, 0 - 15°, sand, gravel, RF 10.78: J, 0°, sand, gravel, RF 10.88-10.90: J x2, 0 - 10°, Fe SN, UN, RF 10.95: J, 15°, Fe SN, UN, RF, terminates on high angle joint at 11.38-11.62m			
				11.00	227.42		Sandy GRAVEL: fine to coarse, sub-rounded to sub-angular, pale brown and pink-grey, sand is fine to coarse grained; with low plasticity silt.	HW					
				11.35	227.00		GRANITE: medium to coarse grained, white black and green grey, crystalline, massive.	RS					
				11.62	227.00		NO CORE 0.15m (11.62-11.77)	HW		11.38-11.62: J, 80°, PR, SM, infilled with sand and gravel			
				12			GRANITE: medium to coarse grained, mottled white, black, crystalline, massive.	MW		11.80: J, 40°, Fe SN, UN, RF 11.83: J, 15°, Fe SN, PR, RF 12.00-12.08: J, 85°, PR, qz			
			90	83				SW		12.28: J, 45°, wh-or mi, CU, RF 12.32: J x2, 25°, PR, SM			
				13				MW		12.65: J, 10°, PR, RF, qz 12.72-12.76: J x7, 5°, PR, RF 12.88-12.92: J x3, 5°, PR, RF			
				14				SW					
			100	100				FR		14.19: J, 5°, PR, RF			
				15									
			100	100									
				16									
			100	100									
				17									
			100	100									
				18						18.15: J, 0°, UN, RF			
			100	100									
				19									
			100	100									
				20									
Comments										Checked	GEM		
										Date	2/12/2024		



BOREHOLE: BHLR-12

Project:	Pioneer-Burdekin PHES	Position:	Lower Reservoir	Sheet	4 OF 4
Location:	Netherdale/Dalrymple Heights	Coords:	657859.8 m E 7662657.0 m N MGA2020-55	Date Started:	12/4/2024
Client:	Queensland Hydro	Surface RL:	238.8 m AHD	Date Completed:	15/4/2024
Job No.:	PS138693	Contractor:	Twin Hills Engineering & Drilling Drill Rig: D&B - 8DTM	Logged:	TH
		Inclination:	-90° Direction: 000°		

Drilling						Field Material Description				Defect Information		
METHOD	WATER	TCR	RQD	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations (Core partings shown - refer to Detailed Defect Descriptions table for all logged features)	AVERAGE DEFECT SPACING (mm)	
								VL-2 J M H VH EH	VL-2 J M H VH EH		0 100 200 300 1000 3000	
HQ3	Groundwater Not Observed	100	100	20			GRANITE: medium to coarse grained, mottled white, black, crystalline, massive.	SW FR		19.90-20.23: J, 75°, PR, SM		
		100	100	21						20.92: J, 50°, UN, RF		
		100	100	22						21.62: J, 0°, UN, RF		
		100	100	23								
		100	100	24								
				25	25.00 213.77		Hole Terminated at 25.00 m Target depth. Standpipe Piezometer Installed.					
				26								
				27								
				28								
				29								
				30								

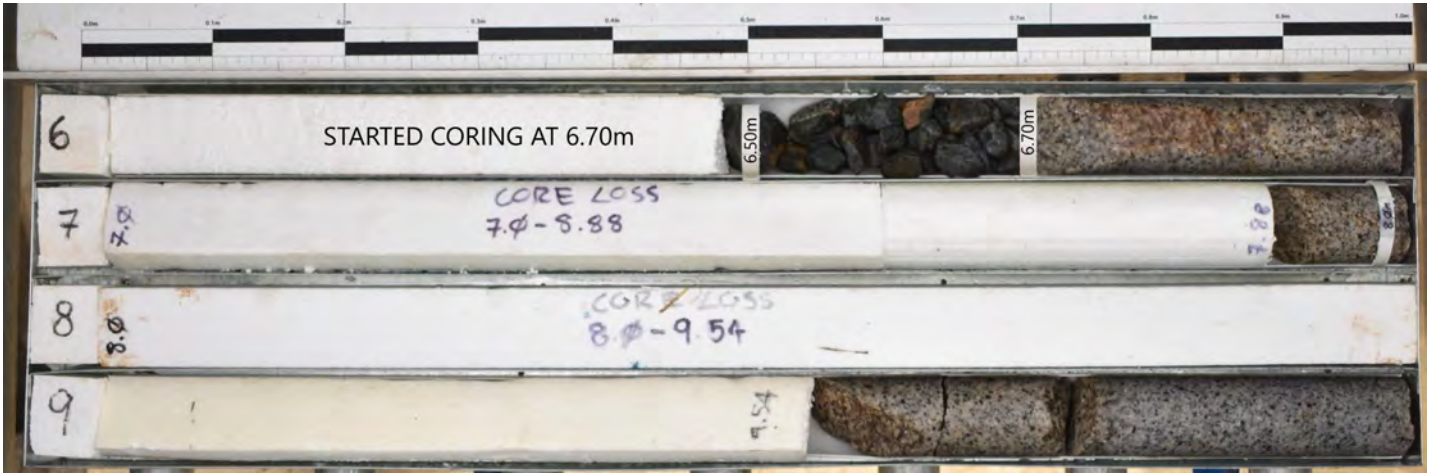
Comments	Checked	GEM
	Date	2/12/2024

PEPHES LIB_REV0.GLB Log IS AU CORED BOREHOLE 3 BHLR-12-241202.GPJ <<DrawingFile>> 2/12/2024 18:43 10.03.00.09 D:\git\Lab and In Situ Tool - DGD [Lib: WSP 5.07.2 2023-10-30 Proj: WSP 5.04.1 2023-06-14



Pioneer Burdekin Pumped Hydro Energy Storage: Tranche 2 – BHLR - 12 Defects List

PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHLR-12	6.70				CO		45			CN	PR	RF					
BHLR-12	6.70	6.88			J		80		Fe		UN	RF					
BHLR-12	6.88	6.96			hJ		80		Fe		UN						
BHLR-12	9.60				J		50		Fe	SN	PR	RF					
BHLR-12	9.63				J		10		Fe	SN	PR	RF					
BHLR-12	9.73				J		15		Fe	SN	UN	RF					
BHLR-12	10.10				J		15		Fe	VN	UN	RF					
BHLR-12	10.65	10.68			EW		0	15	sand, gravel			RF					
BHLR-12	10.78				J		0		sand, gravel			RF					
BHLR-12	10.88	10.90			J	x2	0	10	Fe	SN	UN	RF					
BHLR-12	10.95				J		15		Fe	SN	UN	RF					terminates on high angle joint at 11.38-11.62m
BHLR-12	11.38	11.62			J		80				PR	SM					infilled with sand and gravel
BHLR-12	11.80				J		40		Fe	SN	UN	RF					
BHLR-12	11.83				J		15		Fe	SN	PR	RF					
BHLR-12	11.83	12.40			hJ	x2	70	90	wh mi		UN						5mm wh alt halo
BHLR-12	12.00	12.08			J		85				PR						qz
BHLR-12	12.28				J		45		wh-or mi		CU	RF					
BHLR-12	12.32				J	x2	25				PR	SM					
BHLR-12	12.41				hJ	x3	65		wh-or mi		PR						
BHLR-12	12.48				hJ		35		wh-or mi		PR						
BHLR-12	12.56				hJ		75		wh-or mi		PR						
BHLR-12	12.60				hJ		75		wh-or mi		PR						
BHLR-12	12.65				J		10				PR	RF					qz
BHLR-12	12.70	13.07			hJ	x2	90		wh-or mi		UN						5-20mm alt halo
BHLR-12	12.72	12.76			J	x7	5				PR	RF					
BHLR-12	12.88	12.92			J	x3	5				PR	RF					
BHLR-12	13.45	15.12			hJ		90		wh-or mi		UN						5mm alt halo, major defect
BHLR-12	14.14				hJ		70				PR						
BHLR-12	14.19				J		5				PR	RF					
BHLR-12	14.39				hJ		60				PR						
BHLR-12	14.60				hJ		25				PR						
BHLR-12	14.80				hJ		25				PR						
BHLR-12	15.35				hJ		60		wh-or mi		CU						
BHLR-12	15.37	15.63			hJ		75		br-or mi		PR						up to 20mm alt halo
BHLR-12	15.78	16.00			hJ		70		br-or mi		PR						10mm alt halo
BHLR-12	16.43				hJ		75		wh-or mi		PR						
BHLR-12	17.15				hJ		80				PR						
BHLR-12	18.15				J		0				UN	RF					
BHLR-12	18.21				hJ		65		wh-or mi		PR						
BHLR-12	18.27				hJ		35		wh-or mi		PR						
BHLR-12	18.35				hJ		90		wh-or mi		PR						
BHLR-12	18.82				hJ		90		wh-or mi		PR						
BHLR-12	18.83				hJ		35		wh-or mi		PR						
BHLR-12	18.90	19.25			hJ		80		bk mi		PR						5mm wh mi alt halo
BHLR-12	19.26				hJ		85		wh-or mi		PR						
BHLR-12	19.46				hJ		30		wh-or mi		PR						
BHLR-12	19.50				hJ		60		wh-or mi		PR						
BHLR-12	19.54				hJ		35										
BHLR-12	19.90	20.23			J		75				PR	SM					
BHLR-12	20.67				hJ		30				PR						
BHLR-12	20.92				J		50				UN	RF					
BHLR-12	20.92	22.02			V		85	90	gy mi		PR						<5mm wh mi alt halo
BHLR-12	21.62				J		0				UN	RF					
BHLR-12	21.76				hJ		50		gy mi		PR						
BHLR-12	23.05	24.35			V		85	90	gy mi		UN						<5mm wh mi alt halo
BHLR-12	23.76				hJ		40		dk gy mi		PR						
BHLR-12	24.47				hJ		70				PR						
BHLR-12	24.88				hJ		20				PR						



PointID : BHLR-12 Depth Range: 6.00 - 10.00 m



PointID : BHLR-12 Depth Range: 10.00 - 14.00 m



TITLE
Queensland Hydro
Netherdale/Dalrymple Heights
Pioneer-Burdekin PHES
Core photo - BHLR-12

DRAWN	RC	DATE	14/11/2024
CHECKED	GEM	DATE	18/11/2024
SCALE	Not To Scale		A4
PROJECT No	PS138693		FIGURE No 1/3

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PointID : BHLR-12 Depth Range: 14.00 - 18.00 m



PointID : BHLR-12 Depth Range: 18.00 - 22.00 m

	TITLE Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core photo - BHLR-12	DRAWN RC	DATE 14/11/2024
		CHECKED GEM	DATE 18/11/2024
		SCALE Not To Scale	A4
		PROJECT No PS138693	FIGURE No 2/3



PointID : BHLR-12 Depth Range: 22.00 - 25.00 m

	TITLE Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core photo - BHLR-12	DRAWN RC	DATE 14/11/2024
		CHECKED GEM	DATE 18/11/2024
		SCALE Not To Scale	A4
		PROJECT No PS138693	FIGURE No 3/3