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BOREHOLE: BHUA-16

SHEET: 1 OF 12
DRILL RIG: HYDRAPOWER SCOUT Mk5
CONTRACTOR: Twin Hills
LOGGED: ENGEO DATE: 22/7/23
CHECKED: SF DATE: 22/8/23

CLIENT: SMEC COORDS: 659799.0 m 7666573.7 m GDA 2020 MGA Zone 55
PROJECT: Pioneer Burdekin PHES GI SURFACE RL: 873.96 m DATUM: AHD
LOCATION: Dalrymple Heights INCLINATION: -88° DIRECTION: 185°
JOB NO: 23117.000.001 HOLE DIA: 96/100 mm HOLE DEPTH: 55.00 m

Drilling				Sampling		Field Material Description						
REMARKS SUPPORT	PENETRATION RESISTANCE	WATER	LENGTH (mètres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
SSA			0.0	873.96				CL	TOPSOIL: CLAY with sand low plasticity, brown, with fine to coarse grained sand	w ~ PL	St	TOPSOIL
		0.10	CL	CLAY with sand low plasticity, orange mottled pale brown and red, with fine to coarse grained sand						RESIDUAL SOIL		
		873.86										
			0.5									
			1.0									Coring water returns were not recorded.
			1.5									
			2.0								VSt	
			2.5									
			3.0		ECN = 6 SPT 3.00-3.45 m 7, 7, 10 N=17					w ~ PL		
			3.5									
WB			4.0	4.00	U 4.50-5.00 m LL = 84% PI = 38% LS = 13.0% Soil Particle Density (t/m³) = 2.67			MH	Clayey SILT with sand high liquid limit, orange mottled pale brown, with fine to coarse grained sand			
		869.96										
										St		
			4.5									
			5.0									

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ENGEO 2.00 2.2 LIB.GLB Log ENGEO CORED BOREHOLE PIONEER BURDEKIN -MASTERBHT03 REWORK-AUSLAFTOP008.GPJ <<DrawingFile>> 20/11/2024 17:03 10.03.00.09 Datagel Tools



BOREHOLE: BHUA-16

CLIENT: SMEC

PROJECT: Pioneer Burdekin PHES GI

LOCATION: Dalrymple Heights

JOB NO: 23117.000.001

COORDS: 659799.0 m 7666573.7 m GDA 2020 MGA Zone 55

SURFACE RL: 873.96 m DATUM: AHD

INCLINATION: -88° DIRECTION: 185°

HOLE DIA: 96/100 mm HOLE DEPTH: 55.00 m

SHEET: 2 OF 12

DRILL RIG: HYDRAPOWER SCOUT Mk5

CONTRACTOR: Twin Hills

LOGGED: ENGEO DATE: 22/7/23

CHECKED: SF DATE: 22/8/23

Drilling				Sampling		Field Material Description						
METHOD / SUPPORT	PENETRATION RESISTANCE	WATER	LENGTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
WB			5.0					MH	Clayey SILT with sand high liquid limit, orange mottled pale brown, with fine to coarse grained sand	w ~ PL	St	
			5.5									
			6.0		SPT 6.00-6.45 m 3, 3, 9 N=12							
			6.5									
			7.0	7.00 866.97			CL	Silty CLAY low to medium plasticity, yellow brown and dark brown, trace fine to medium grained sand, trace fine to medium grained. gravel	w ~ PL	F		
			7.5		ECN = 6 Soil Particle Density (t/m³) = 2.65 SPT 7.50-7.95 m 2, 2, 2 N=4							
			8.0									
			8.5									
			9.0		SPT 9.00-9.45 m 1, 2, 4 N=6							
			9.5									
		10.0	10.00									

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BOREHOLE: BHUA-16

SHEET: 3 OF 12

CLIENT: SMEC

COORDS: 659799.0 m 7666573.7 m GDA 2020 MGA Zone 55

DRILL RIG: HYDRAPOWER SCOUT Mk5

PROJECT: Pioneer Burdekin PHES GI

SURFACE RL: 873.96 m DATUM: AHD

CONTRACTOR: Twin Hills

LOCATION: Dalrymple Heights

INCLINATION: -88° DIRECTION: 185°

LOGGED: ENGEO

DATE: 22/7/23

JOB NO: 23117.000.001

HOLE DIA: 96/100 mm HOLE DEPTH: 55.00 m

CHECKED: SF

DATE: 22/8/23

Drilling				Sampling		Field Material Description						
METHOD / SUPPORT	PENETRATION RESISTANCE	WATER	LENGTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
WB			10.0	863.97	U 10.00-10.53 m LL = 47% PI = 14% LS = 7.0% Soil Particle Density (t/m³) = 2.29			ML	Clayey SILT with sand low liquid limit, brown, with fine to coarse grained sand			
			10.5							W ~ PL	F	
			11.0	11.00 862.97				CI	CLAY with sand and gravel medium plasticity, brown, with fine grained sand, with fine to coarse grained. gravel			
			11.5		SPT 11.50-11.75 m 7, 50/100mm HB N>50							
			12.0							W ~ PL	H	
			12.5									
			13.0	12.90 861.07	Non plastic, atterburg limits test not possible. SPT 13.00-13.39 m 15, 32, 18/90mm N>50			CL	Sandy Gravelly CLAY low plasticity, grey mottled brown, fine to medium grained gravel, fine to coarse grained sand, trace clay			
			13.5	13.50 860.47					13.50 m: VWP installed 26/07/2023	W ~ PL	H	
			14.0									
			14.5	14.50 859.47	Soil Particle Density (t/m³) = 2.48 SPT 14.50-14.80 m 19, 20/150mm HB			SC-SM	Silty Clayey SAND fine to coarse grained, grey mottled brown, low plasticity fines	W	D - VD	

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BOREHOLE: BHUA-16

CLIENT: SMEC

PROJECT: Pioneer Burdekin PHES GI

LOCATION: Dalrymple Heights

JOB NO: 23117.000.001

COORDS: 659799.0 m 7666573.7 m GDA 2020 MGA Zone 55

SURFACE RL: 873.96 m DATUM: AHD

INCLINATION: -88° DIRECTION: 185°

HOLE DIA: 96/100 mm HOLE DEPTH: 55.00 m

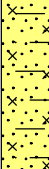
SHEET: 4 OF 12

DRILL RIG: HYDRAPOWER SCOUT Mk5

CONTRACTOR: Twin Hills

LOGGED: ENGEO DATE: 22/7/23

CHECKED: SF DATE: 22/8/23

Drilling				Sampling		Field Material Description					
METHOD / SUPPORT	PENETRATION RESISTANCE	WATER	LENGTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION		MOISTURE CONDITION	STRUCTURE AND ADDITIONAL OBSERVATIONS
WB			15.0				SC-SM	Silty Clayey SAND fine to coarse grained, grey mottled brown, low plasticity fines		W	D - VD
			15.5								
								For Continuation Refer to Sheet 5			
			16.0								
			16.5								
			17.0								
			17.5								
			18.0								
			18.5								
			19.0								
			19.5								
			20.0								

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ENGEO 2.00 2.2 LIB.GLB Log ENGEO CORED BOREHOLE PIONEER BURDEKIN -MASTERBHT03 REWORK-AUSLAFTOP008.GPJ <<DrawingFile>> 20/11/2024 17:03 10.03.00.09 Datagel Tools



BOREHOLE: BHUA-16

SHEET: 5 OF 12
DRILL RIG: HYDRAPOWER SCOUT Mk5
CONTRACTOR: Twin Hills
LOGGED: ENGEO DATE: 22/7/23
CHECKED: SF DATE: 22/8/23

CLIENT: SMEC
PROJECT: Pioneer Burdekin PHES GI
LOCATION: Dalrymple Heights
JOB NO: 23117.000.001

COORDS: 659799.0 m 7666573.7 m GDA 2020 MGA Zone 55
SURFACE RL: 873.96 m DATUM: AHD
INCLINATION: -88° DIRECTION: 185°
HOLE DIA: 96/100 mm HOLE DEPTH: 55.00 m

Drilling					Field Material Description					Defect Information				
METHOD / SUPPORT	WATER	TCR	RQD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH Is _u (MPa) (AS1726:2017)	MEASURED STRENGTH: UCS & I ₅₀ (MPa) (A.0.1)	DEFECT DESCRIPTION	AVERAGE DEFECT SPACING (mm) (ISO14689:2017)		
											Mechanical Discontinuities / non-intact defects shown only. See attached Detailed Defect Log for all recorded discontinuities and defects	EC ₂₀	VC ₆₀	W ₂₀₀
				15.0										
				15.5			Continuation of Sheet 4							
				15.57	858.40		ALTERED MICROGRANITE Fine to medium grained, igneous intrusive Dark grey and grey. Crystalline, subhedral to anhedral. With some fine grained dark grey DOLERITE (?) intrusions <200 mm thick, with stronger alteration at contacts., Weak to moderate pale green-brown propylitic (?) alteration of groundmass, stronger around veinlets / healed defects.	SA						
		100	90	16.0			16.30 m - 16.48 m: DOLERITE dyke (?), fine grained, dark grey, sharp boundaries.				16.31-16.34 m: J, 50°, Pln, Ro, Cn 16.38-16.46 m: J, 55°, Cvd, CA FL			
				16.30	857.67									
				16.5										
				16.83	857.14		16.83 m - 17.05 m: DOLERITE dyke (?), fine grained, dark grey, diffuse boundaries.				16.91-17.12 m: J, 75°, Pln, Ro, CA Std			
		100	100	17.0							17.19-17.50 m: J, 90°, Irr, Ro, CA Ct 17.24-17.30 m: J, 55°, Pln, Ro, Cn			
				17.5										
				17.83	856.14		ALTERED DOLERITE DYKE / SILL Fine grained with few medium grained phenocrysts, igneous plutonic. Dark grey Crystalline, aphanitic groundmass with subhedral to euhedral plagioclase phenocrysts 0.5 mm - 1.5 mm in diameter., Weak pale green-brown propylitic (?) alteration, with moderate alteration halos up to 30 mm around contacts. Sharp upper and lower contacts.	SA						
				18.0										
				18.36	855.61			SA			18.41-18.43 m: FP, 4°, Und, Ro, Fe Std			
		95	95	18.5			ALTERED MICROGRANITE Fine to medium grained, igneous intrusive Dark grey and grey. Crystalline, subhedral to anhedral. With some fine grained dark grey DOLERITE (?) intrusions <200 mm thick, with stronger alteration at contacts., Weak to moderate pale green-brown propylitic (?) alteration of groundmass, stronger around veinlets / healed defects.		I ₅₀ (A)>5.52 I ₅₀ (D)>5.89 UCS=82.0					
				19.0										
				19.12	854.85		ALTERED DOLERITE DYKE / SILL Fine grained with few medium grained phenocrysts, igneous plutonic. Dark grey Crystalline, porphyritic, with subhedral to euhedral plagioclase phenocrysts 0.5 mm - 1.5 mm in diameter., Mostly unaltered groundmass, with some weak pale green-brown propylitic (?) alteration near lower contact. Sharp upper and lower contacts.	SA	I ₅₀ (A)=5.55 UCS=26.8					
				19.5										
		100	60	19.86	854.11		19.86 m - 20.61 m: White to pale pink (calcite (?)) / gypsum (?) / zeolite (?) vein up to 2 mm thick at 70° -				19.86-19.90 m: J, 35°, Pln, Ro, Cn			
				20.0										

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ENGEO 2.00.2.2 L.B.GLB Log ENGEO CORED BOREHOLE PIONEER BURDEKIN -MASTERBHT03 REWORK-AUSLAFTPO08.GPJ <<DrawingFile>> 20/11/2024 17:03 10.03.00.09 Datgel Tools

HQ3



BOREHOLE: BHUA-16

SHEET: 6 OF 12

DRILL RIG: HYDRAPOWER SCOUT Mk5

CONTRACTOR: Twin Hills

LOGGED: ENGEO DATE: 22/7/23

CHECKED: SF DATE: 22/8/23

CLIENT: SMEC

PROJECT: Pioneer Burdekin PHES GI

LOCATION: Dalrymple Heights

JOB NO: 23117.000.001

COORDS: 659799.0 m 7666573.7 m GDA 2020 MGA Zone 55

SURFACE RL: 873.96 m DATUM: AHD

INCLINATION: -88° DIRECTION: 185°

HOLE DIA: 96/100 mm HOLE DEPTH: 55.00 m

Drilling				Field Material Description						Defect Information			
METHOD / SUPPORT	WATER	TCR	RQD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH Is _u (MPa) (AS1726:2017)	MEASURED STRENGTH: UCS & I _{u50} (MPa) (A.D.1)	DEFECT DESCRIPTION	AVERAGE DEFECT SPACING (mm) (ISO14689:2017)	
											Mechanical Discontinuities / non-intact defects shown only. See attached Detailed Defect Log for all recorded discontinuities and defects	EC<25 VC<50 C 200 M 600 W >200 WW	
HQ3				20.0			90°. Gently undulating. ALTERED DOLERITE DYKE / SILL Fine grained with few medium grained phenocrysts, igneous plutonic. Dark grey Crystalline, porphyritic, with subhedral to euhedral plagioclase phenocrysts 0.5 mm - 1.5 mm in diameter., Mostly unaltered groundmass, with some weak pale green-brown propylitic (?) alteration near lower contact. Sharp upper and lower contacts.	SA					
		100	60										
				20.5									
				21.0									
		100	100		21.27 852.70		ALTERED MICROGRANITE Fine to medium grained, igneous intrusive Dark grey and grey. Crystalline, subhedral to anhedral. With some fine grained dark grey DOLERITE (?) intrusions <100 mm thick, with stronger alteration at contacts., Weak to moderate pale green-brown propylitic (?) alteration of groundmass, stronger around veinlets / healed defects.	MA - SA			21.68-21.74 m: J, 45°, Pln, Sm, CA FL 21.80-21.87 m: J, 70°, Pln, Ro, FA FL		
				21.5									
				21.87 852.10			ALTERED ANDESITE DYKE / SILL Fine grained with few medium grained phenocrysts, igneous plutonic. Dark grey Crystalline, porphyritic, with subhedral to euhedral plagioclase phenocrysts 0.5 mm - 1.5 mm in diameter., Weakly altered, becomes moderately altered and pale grey and grey from 22.70 m to 23.20 m.	SA					
		100	100										
				22.0									
				22.49 851.48			22.49 m - 23.23 m: Two very closely spaced white to pale pink (calcite (?)) / gypsum (?) / zeolite (?) veins up to 2.5 mm thick at 70° to 90°, planar to undulating, 30 mm apart.	MA - SA			22.40-23.31 m: Fa, 88°, Pln, Ro, CA, Unknown mineral infill with calcite reddish purple harder than calcite, possibly altered quartz or feldspar		
		100	90										
				22.5									
				23.0									
				23.20 850.78			ALTERED MICRO QUARTZ DIORITE Fine to medium grained, intrusive igneous Pale grey, grey and pale green-grey Crystalline, phaneric intergrowth of predominantly prismatic feldspar crystals and anhedral quartz crystals., Strong propylitic (?) alteration of groundmass. Common micro fractures and thin veins, < 2 mm thick, filled with quartz, epidote, calcite and sphene.	SA			23.19-23.23 m: J, 38°, Pln, Sm, Cn		
		100	100										
				23.5									
				24.0									
		100	90								23.88-23.91 m: J, 30°, Pln, Ro, CA Std		
				24.5									
		100	75										
				25.0							24.91-24.94 m: J, 28°, Pln, Ro, Cn		

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BOREHOLE: BHUA-16

SHEET: 7 OF 12

CLIENT: SMEC
PROJECT: Pioneer Burdekin PHES GI
LOCATION: Dalrymple Heights
JOB NO: 23117.000.001

COORDS: 659799.0 m 7666573.7 m GDA 2020 MGA Zone 55
SURFACE RL: 873.96 m DATUM: AHD
INCLINATION: -88° DIRECTION: 185°
HOLE DIA: 96/100 mm HOLE DEPTH: 55.00 m

DRILL RIG: HYDRAPOWER SCOUT Mk5
CONTRACTOR: Twin Hills
LOGGED: ENGEO DATE: 22/7/23
CHECKED: SF DATE: 22/8/23

Drilling						Field Material Description						Defect Information										
METHOD / SUPPORT	WATER	TCR	RQD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH I_{s0} (MPa) (AS1726:2017)					MEASURED STRENGTH: UCS & I_{p50} (A.D.) (MPa)	DEFECT DESCRIPTION Mechanical Discontinuities / non-intact defects shown only. See attached Detailed Defect Log for all recorded discontinuities and defects	AVERAGE DEFECT SPACING (mm) (ISO14689:2017)						
									VL	0.03	L	0.1	M			0.3	H	1.0	VH	3.0	EH	ES
HQ3		100	75	25.0	25.18 848.80		ALTERED MICRO QUARTZ DIORITE Fine to medium grained, intrusive igneous Pale grey, grey and pale green-grey Crystalline, phaneritic intergrowth of predominantly prismatic feldspar crystals and anhedral quartz crystals., Strong propylitic (?) alteration of groundmass. Common micro fractures and thin veins, < 2 mm thick, filled with quartz, epidote, calcite and sphene. 25.18 m - 25.54 m: Pale green propylitic (?) alteration on intact veinlets, halos up to 10 mm.	SA							UCS=76.0	25.44-25.51 m: J, 65°, Cvd, Ro, CA Std						
				25.5																		
				26.0																		
		100	85	26.5	26.42 26.48 847.50		26.42 m - 26.48 m: Abundant medium to coarse grained plagioclase (?) phenocrysts above faulted (?) contact with altered dyke / sill.	SA														
				26.5			ALTERED DOLERITE / ANDESITE (?) DYKE / SILL Fine grained, igneous intrusive Pale grey-grey Aphanitic., Strongly altered with white calcite (?) / zeolite (?) veins 0.5 mm - 2.0 mm thick, anastomosing.	SA								26.93-26.99 m: J, 55°, Pln, Sm, CA Ct 26.97-27.04 m: J, 30°, Pln, Sm, CA Vr						
				27.0	26.94 847.04			SA														
				27.14	846.84		ALTERED MICROGRANITE Fine to medium grained, igneous intrusive Dark grey. Crystalline, phaneritic. Weak alteration of groundmass, stronger around mechanical defects. Calcite (?) veins, 0.5 mm - 2.5 mm thick, subhorizontal to subvertical, typically intact. 27.14 m - 27.17 m: CLAY, grey, medium to high plasticity, W-PL.	XW / SA														
		100	100	27.5	27.57 846.41		27.24 m - 27.36 m: Abundant medium grained plagioclase (?) phenocrysts, anhedral to subhedral. 27.57 m - 28.00 m: Abundant medium grained plagioclase (?) phenocrysts, subhedral.	SA														
				27.90	846.08		ALTERED ANDESITE / DACITE (?) Fine grained with few medium grained phenocrysts, igneous intrusive. Grey-brown and dark green-grey. Crystalline, porphyritic, with subhedral orthoclase phenocrysts 0.5 mm - 2.0 mm in diameter., Weakly altered. Calcite (?) veinlets, 70° - 85°, intact, undulating to stepped.	SA								28.84-28.91 m: J, 55°, Pln, Sm, CA Vr						
				28.5																		
		100	100	29.0	28.82 845.16		28.82 m - 29.03 m: becomes dark grey and grey-brown, less altered.															
				29.03	844.95			SA														
				29.20	844.78		ALTERED MICROGRANITE Fine to medium grained, igneous intrusive. Dark grey-brown and pale green-grey. Crystalline, subhedral to anhedral. DOLERITE intrusions, dark grey, fine grained, <200 mm thick encountered throughout., Pervasively altered, stronger around contacts and defects. 29.20 m - 29.40 m: DOLERITE dyke (?), fine grained, strongly altered, brecciated, with calcite (?) micro veins and veins up to 2 mm. Faulted with lower contact, with ~ 5 mm displacement of veins (micro-fault). 29.33 m - 29.51 m: With steep calcite (?) veinlets <2 mm thick, and some intensely altered bands up to 30 mm thick.	SA								29.04-29.10 m: J, 70°, Irr, Fe Std 29.28-29.36 m: J, 55°, Pln, Sm, Cn						
				29.33	844.65																	
				29.5																		
	100	100	30.0																			
																						
	100	80																				

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SHEET: 9 OF 12

DRILL RIG: HYDRAPOWER SCOUT Mk5

CONTRACTOR: Twin Hills

LOGGED: ENGEO DATE: 22/7/23

CHECKED: SF DATE: 22/8/23

Defect Information

[illegible]

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BOREHOLE: BHUA-16

SHEET: 10 OF 12

DRILL RIG: HYDRAPOWER SCOUT Mk5

CONTRACTOR: Twin Hills

LOGGED: ENGEO DATE: 22/7/23

CHECKED: SF DATE: 22/8/23

CLIENT: SMEC

PROJECT: Pioneer Burdekin PHES GI

LOCATION: Dalrymple Heights

JOB NO: 23117.000.001

COORDS: 659799.0 m 7666573.7 m GDA 2020 MGA Zone 55

SURFACE RL: 873.96 m DATUM: AHD

INCLINATION: -88° DIRECTION: 185°

HOLE DIA: 96/100 mm HOLE DEPTH: 55.00 m

Drilling					Field Material Description					Defect Information				
METHOD / SUPPORT	WATER	TCR	RQD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH Is _u (MPa) (AS1726:2017)	MEASURED STRENGTH: UCS & I _{u50} (MPa) (A.0.1)	DEFECT DESCRIPTION	AVERAGE DEFECT SPACING (mm) (ISO14689:2017)		
											Mechanical Discontinuities / non-intact defects shown only. See attached Detailed Defect Log for all recorded discontinuities and defects	EC-29	VC-90	C-200
												M-600	W-200	WW
HQ3		100	90	40.0			ALTERED BRECCIATED ANDESITE and RHYOLITE Fine grained, igneous intrusive. Grey, dark red-brown and grey brown. Crystalline, aphanitic., Pervasive propylitic and potassic (?) alteration. Brittle Fault Zone (80°-90°) brecciated throughout, with angular fragments and some stockworked quartz (?) veinlets., Crushed seams throughout, with moderate to very steeply dipping zones of soil strength material up to 20 mm thick. Some polished defect surfaces.	MA			Possible potassic alteration			
				40.5							40.50-40.58 m: J, 70°, Cvd, Ro, Cly Cru, Crushed and veneer of clay 40.63-40.87 m: J, 80°, Irr, Sm, CA Std			
				41.0	41.00 832.99		41.00 m - 43.00 m: Very steep (85°-90°), undulating brecciated seam, with angular fragments up to 20 mm, broken (open) margins, polished, with some clay and calcite (?) infill.				40.85-41.20 m: J, 83°, Pln, Sm, Cly Vr 40.95-40.97 m: J, 40°, Pln, Sm, Vr 41.00-41.30 m: J, 85°, Pln, Sm, Cly Std 41.10-42.05 m: J, 90°, Pln, Sm, Cly Vr, Brecciated, altered contact zone.			
		100	100	41.5										
				42.0							41.88-42.03 m: J, 55°, Pln, Sm, Cly Vr			
				42.5	42.50 831.49		42.50 m: VWP installed 26/07/2023				42.59-42.72 m: J, 55°, Und, Cru 42.77-42.87 m: J, 70°, Pln, Sm, CA Vr			
		100	100	43.0							43.01-43.17 m: V x8, 60°, PR, SM, CA, Cru, Slight alteration and weathering, Qz and Biotite			
				43.5							43.51-43.55 m: J, 42°, Pln, Sm, MnO Std 43.57-43.60 m: J, 34°, Pln, Sm, MnO Vr 43.57-43.64 m: J, 49°, Pln, MnO Vr 43.57-43.60 m: J, 34°, Pln, Sm, MnO Vr 43.57-43.64 m: J, 49°, Pln, MnO Vr 43.80-43.86 m: J, 55°, Pln, Sm, Cly FL 43.86-43.92 m: J, 55°, Pln, Sm, MnO Std			
		100	45	44.0	44.00 829.99		INTENSELY ALTERED MICROGRANITE Fine grained, igneous intrusive. Pale grey and grey-brown Crystalline, mostly aphanitic, in part porphyritic, subhedral phenocrysts. Indistinct flow banding observed under hand lends., Intense, pervasive propylitic and potassic alteration of groundmass. Irregular calcite (?) veinlets (<0.5 mm - 5 mm thick) and healed microfractures encountered throughout.	SA			44.14-44.22 m: J, 70°, Pln, Po, Cn 44.20-44.36 m: J, 85°, Pln, Po, Cn 44.43-44.46 m: J, 40°, Pln, Po, Cn			
				44.5										
		100	100	45.0							44.94-45.06 m: J, 70°, Pln, Sm, Cn			

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It has been prepared for geotechnical purposes only.

SHEET: 11 OF 12

DRILL RIG: HYDRAPOWER SCOUT Mk5

CONTRACTOR: Twin Hills

LOGGED: ENGEO DATE: 22/7/23

CHECKED: SF DATE: 22/8/23

CLIENT: SMEC

PROJECT: Pioneer Burdekin PHES GI

LOCATION: Dalrymple Heights

JOB NO: 23117.000.001

COORDS: 659799.0 m 7666573.7 m GDA 2020 MGA Zone 55

SURFACE RL: 873.96 m DATUM: AHD

INCLINATION: -88° DIRECTION: 185°

HOLE DIA: 96/100 mm HOLE DEPTH: 55.00 m

Drilling						Field Material Description						Defect Information					
METHOD / SUPPORT	WATER	TCR	ROD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH I ₅₀ (MPa) (AS1726:2017)					MEASURED STRENGTH: UCS & I ₅₀ σ ₁ (A.D.L) (MPa)	DEFECT DESCRIPTION Mechanical Discontinuities / non-intact defects shown only. See attached De- tailed Defect Log for all recorded discon- tinuities and defects	AVERAGE DEFECT SPACING (mm) (ISO14689:2017)	
									V _{0.05}	L _{0.1}	M _{1.0}	H _{3.0}	VH _{5.0}				EC _{0.05}
HQ3																	
		100	100	45.0			INTENSELY ALTERED MICROGRANITE Fine grained, igneous intrusive. Pale grey and grey-brown Crystalline, mostly aphanitic, in part porphyritic, subhedral phenocrysts. Indistinct flow banding observed under hand lends., Intense, pervasive propylitic and potassic alteration of groundmass. Irregular calcite (?) veinlets (<0.5 mm - 5 mm thick) and healed microfractures encountered throughout.	SA						45.01-45.03 m: J, 24°, Po, Cn			
				45.5			45.19-45.24 m: J, 70°, Pln, Po, Cn							45.42-45.44 m: J, 46°, Cvd, Po, Cn			
		100	100	46.0			45.71-45.79 m: J, 55°, Pln, Sm, CA Vr							46.12-46.14 m: J, 25°, Pln, Sm, Cn			
				46.5	46.50 827.49		46.50 m - 46.75 m: Very closely spaced, 1 - 5 mm thick calcite (?) veins at 5°- 35°, mostly intact.							46.35-46.43 m: J, 62°, Cvd, Sm, CA Cn			
				47.0			47.21-47.26 m: J, 40°, Pln, Po, CA Vr										
		100	100	47.5			I ₅₀ (A)=2.64 I ₅₀ (D)>5.89										
				48.0	48.30 825.69		48.30 m - 48.70 m: Some remnant microgranite texture evident.										
		100	100	48.5													
				49.0													
				49.5	49.43 824.56		49.43 m - 49.66 m: Soft, medium to high plasticity clay along stepped and undulating, smooth defects (two sub-parallel joints at ~60°). Pale brown and strongly altered between the two sub-parallel joints.	XW					49.20-49.25 m: J, 40°, Pln, Po, Std				
		100	85	50.0	50.00												
										SA						49.47-49.50 m: J, 42°, Pln, Sm, Vr 49.55-49.65 m: J, 70°, Pln, Sm, Vr	

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BOREHOLE: BHUA-16

CLIENT: SMEC
PROJECT: Pioneer Burdekin PHES GI
LOCATION: Dalrymple Heights
JOB NO: 23117.000.001

COORDS: 659799.0 m 7666573.7 m GDA 2020 MGA Zone 55
SURFACE RL: 873.96 m DATUM: AHD
INCLINATION: -88° DIRECTION: 185°
HOLE DIA: 96/100 mm HOLE DEPTH: 55.00 m

SHEET: 12 OF 12
DRILL RIG: HYDRAPOWER SCOUT Mk5
CONTRACTOR: Twin Hills
LOGGED: ENGEO DATE: 22/7/23
CHECKED: SF DATE: 22/8/23

Drilling					Field Material Description					Defect Information				
METHOD / SUPPORT	WATER	TCR	RQD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH Is _u (MPa) (AS1728:2017)	MEASURED STRENGTH: UCS & Is ₅₀ (A.D.U.) (MPa)	DEFECT DESCRIPTION	AVERAGE DEFECT SPACING (mm) (ISO14689:2017)		
											Mechanical Discontinuities / non-intact defects shown only. See attached Detailed Defect Log for all recorded discontinuities and defects	EC ₂₀	VC ₆₀	C ₂₀₀
												M ₆₀₀	W ₂₀₀₀	WW
HQ3				50.0	823.99		INTENSELY ALTERED MICROGRANITE Described as per 44.00 m.	SA			50.20-50.27 m: J, 60°, Pln, Sm, CA Cn			
		100	85		50.46									
				50.5	823.53		ALTERED MICROGRANITE Fine to medium grained, igneous intrusive. Grey and dark grey. Crystalline, phaneritic, subhedral to anhedral crystals generally equigranular. Minor crystal segregation of mafic and felsic observed., Weak to moderate, pale grey-green propylitic (?) alteration of groundmass, stronger at defects. Many calcite (?) veins, < 15 mm thick, at ~5°- 60°, planar to irregular, intact.	SA		Is ₅₀ (A)=2.92	50.65-50.67 m: J, 50°, Cvd, Ro, Cn			
				51.0							51.30-51.35 m: J, 47°, Cvd, Sm, CA Std			
		100	95								51.49-51.51 m: J, 25°, Ro, CA Std			
				51.5						UCS=55.5				
										Is ₅₀ (A)>6.09				
		100	100		52.0						51.97-52.06 m: J, 60°, Pln, Sm, Cn			
				52.5										
											53.28-53.29 m: J, 60°, Und, Sm, CA Cn			
				53.0										
		100	100											
				53.5										
				54.0										
		100	100		54.5									
				55.0	55.00		END OF BOREHOLE @ 55.00 m TARGET DEPTH VIBRATING WIRE PIEZOMETER INSTALLED. TOP SENSOR AT 13.50 M and BOTTOM SENSOR AT 42.50 M Bearing is approximate only.							

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JOB No.:	30032772
Client:	Queensland Hydro
Site:	Pioneer-Burdekin

Borehole ID:	BHUA-16
Termination Depth:	55.00

Depth (m)			Type	Angle (°)	Roughness	Shape	Infill	Weathering	Nature	Comments
From	To	Midpoint								
15.53	15.58	15.555	Joint	27	Rough	Undulating	MnO	Slightly Weathered	Stained	
15.56	15.8	15.68	Vein	74		Curved	Quartz	Fresh	Hairline	
15.68	15.73	15.705	Vein	50		Curved	Quartz	Fresh	Healed	
15.7	15.72	15.71	Joint	45		Curved	Quartz	Fresh	Healed	
15.73	15.74	15.735	Break	20	Rough	Irregular		Fresh	Clean	
15.74	15.82	15.78	Vein	55		Undulating	Chlorite	Fresh	Hairline	
15.79	15.83	15.81	Vein	44		Curved	Quartz	Fresh	Hairline	
15.84	15.97	15.905	Vein	80		Planar	Chlorite	Fresh	Hairline	
15.88	15.94	15.91	Vein	70		Undulating	Quartz	Fresh	Hairline	
15.92	16.08	16	Vein	85		Curved	Quartz	Fresh	Hairline	
16	16.13	16.065	Vein	60		Curved	Calcite	Fresh	Healed	
16.17	16.44	16.305	Vein	85		Curved	Quartz	Fresh	Hairline	
16.31	16.34	16.325	Joint	50	Rough	Planar		Fresh	Clean	
16.38	16.46	16.42	Joint	55		Curved	Calcite	Fresh	Infilled	
16.45	16.49	16.47	Vein	60		Curved	Calcite	Fresh	Healed	
16.57	16.62	16.595	Vein	60		Undulating	Quartz	Fresh	Healed	
16.6	16.67	16.635	Vein	70		Planar	Chlorite	Fresh	Healed	
16.91	17.12	17.015	Joint	75	Rough	Planar	Calcite	Fresh	Stained	
17.07	17.26	17.165	Vein	90		Curved	Quartz	Fresh	Clean	
17.12	17.19	17.155	Vein	58		Planar	Calcite	Fresh	Hairline	
17.16	17.26	17.21	Vein	85		Undulating	Calcite	Fresh	Healed	
17.17	17.32	17.245	Vein	90		Undulating	Calcite	Fresh	Healed	
17.19	17.5	17.345	Joint	90	Rough	Irregular	Calcite	Fresh	Coated	
17.23	17.26	17.245	Vein	30		Curved	Calcite	Fresh	Hairline	
17.24	17.3	17.27	Joint	55	Rough	Planar		Fresh	Clean	
17.37	17.46	17.415	Joint	70		Irregular		Fresh	Hairline	
17.51	17.55	17.53	Vein	35		Curved	MnO		Hairline	
17.64	17.75	17.695	Vein	85		Planar	Calcite	Fresh	Hairline	
17.8	17.81	17.805	Vein	6		Curved	Calcite	Fresh	Hairline	
18.28	18.4	18.34	Vein	65		Undulating	Calcite	Fresh	Healed	
18.41	18.43	18.42	Parting	4	Rough	Undulating	FeO	Slightly Weathered	Clean	
18.42	18.75	18.585	Vein	84		Curved	Calcite	Fresh	Healed	
18.5	18.73	18.615	Vein	82		Curved	Calcite	Fresh	Healed	
18.77	18.82	18.795	Vein	65		Planar	Calcite	Fresh	Hairline	
18.97	19.12	19.045	Vein	85		Curved	Calcite	Fresh	Hairline	
19.05	19.07	19.06	Vein	20		Curved	Calcite	Fresh	Hairline	
19.33	19.48	19.405	Vein	72		Undulating	Calcite	Fresh	Hairline	
19.84	19.86	19.85	Vein	40		Irregular	Calcite	Fresh	Healed	
19.86	19.9	19.88	Joint	35	Rough	Planar		Fresh	Clean	
19.9	20.08	19.99	Vein	70		Irregular	Calcite	Fresh	Healed	
19.9	20.58	20.24	Vein	85	Rough	Irregular	Calcite	Slightly Weathered	Healed	Occasional hairline vein offshots from main vein
20.35	20.94	20.645	Vein	88	Rough	Irregular	Calcite	Fresh	Healed	Occasional hairline vein offshots from main vein
20.52	20.67	20.595	Vein	75		Undulating	Calcite	Fresh	Healed	
20.65	20.69	20.67	Vein	38		Curved	Calcite	Fresh	Hairline	
21.21	21.27	21.24	Vein	60		Curved	Calcite	Fresh	Hairline	
21.26	21.27	21.265	Vein	40		Curved	Calcite	Fresh	Hairline	
21.34	21.37	21.355	Vein	20		Undulating	Calcite	Slightly Altered	Hairline	
21.38	21.44	21.41	Vein	75		Undulating	Calcite	Fresh	Hairline	
21.44	21.57	21.505	Vein	80		Curved	Calcite	Fresh	Hairline	
21.53	21.58	21.555	Vein	54		Curved	Calcite	Fresh	Hairline	
21.62	21.7	21.66	Vein	60		Curved	Calcite	Fresh	Hairline	
21.68	21.74	21.71	Joint	45	Smooth	Planar	Calcite	Slightly Altered	Infilled	
21.74	21.78	21.76	Joint	40	Smooth	Curved		Slightly Altered	Hairline	Potassic alteration
21.76	21.8	21.78	Vein	60		Curved	Calcite	Slightly Altered	Hairline	
21.8	21.87	21.835	Joint	70	Rough	Planar	Apatite	Slightly Altered	Filled	
21.88	21.92	21.9	Vein	35		Curved	Calcite	Slightly Altered	Hairline	
21.92	21.96	21.94	Vein	70		Curved	Calcite	Fresh	Hairline	

Depth (m)			Type	Angle (°)	Roughness	Shape	Infill	Weathering	Nature	Comments
From	To	Midpoint								
21.93	22.06	21.995	Vein	80		Planar	Calcite	Fresh	Hairline	Unknown mineral infill with calcite reddish purple harder than calcite, possibly altered quartz or feldspar
22.1	22.15	22.125	Vein	75		Undulating	Calcite	Fresh	Hairline	
22.12	22.35	22.235	Vein	78		Planar	Calcite	Fresh	Hairline	
22.13	22.3	22.215	Vein	84		Planar	Calcite	Fresh	Hairline	
22.14	22.22	22.18	Vein	50		Curved	Calcite	Fresh	Hairline	
22.14	22.3	22.22	Vein	84		Planar	Calcite	Fresh	Hairline	
22.24	22.38	22.31	Vein	73	Smooth	Planar	Calcite	Fresh	Veneer	
22.35	22.4	22.375	Vein	43		Planar	Calcite	Fresh	Hairline	
22.4	23.31	22.855	Fault	88	Rough	Planar	Calcite	Moderately Altered (DA)	Displaced	
22.47	22.57	22.52	Vein	80		Curved	Calcite	Fresh	Hairline	
23.19	23.23	23.21	Joint	38	Smooth	Planar		Slightly Altered	Clean	
23.33	23.4	23.365	Vein	57		Curved	Calcite	Fresh	Healed	
23.39	23.39	23.39	Vein	4		Planar	Calcite	Fresh	Healed	
23.41	23.42	23.415	Vein	4		Planar	Calcite	Fresh	Healed	
23.42	23.5	23.46	Vein	85		Curved	Calcite	Fresh	Healed	
23.49	23.51	23.5	Vein	35		Curved	Calcite	Fresh	Hairline	
23.6	23.64	23.62	Vein	35		Irregular	Calcite	Fresh	Healed	
23.64	23.68	23.66	Vein	55	Rough	Planar	Calcite	Fresh	Coated	
23.69	23.72	23.705	Vein	35		Undulating	Calcite	Fresh	Hairline	
23.75	23.76	23.755	Vein	10		Planar	Calcite	Fresh	Hairline	
23.88	23.91	23.895	Joint	30	Rough	Planar	Calcite	Slightly Weathered	Stained	
23.9	23.93	23.915	Vein	35		Planar	Calcite	Fresh	Healed	
23.93	23.99	23.96	Vein	44	Rough	Planar	Calcite	Fresh	Healed	
24.04	24.15	24.095	Group Set	50	Smooth	Planar	Calcite	Fresh	Hairline	3 x veins
24.05	24.11	24.08	Vein	75		Curved	Calcite	Fresh	Healed	
24.16	24.2	24.18	Vein	70		Curved	Calcite	Fresh	Hairline	
24.2	24.62	24.41	Vein	80	Smooth	Planar	Calcite	Fresh	Healed	
24.22	24.42	24.32	Vein	80		Undulating	Unknown	Moderately Altered (DA)	Hairline	
24.26	24.35	24.305	Vein	80		Curved	Calcite	Slightly Altered	Hairline	
24.42	24.62	24.52	Vein	80	Smooth	Planar	Calcite	Moderately Altered (DA)	Healed	
24.55	24.57	24.56	Vein	20		Curved	Calcite	Fresh	Healed	
24.57	24.59	24.58	Vein	20	Rough	Curved	Calcite	Slightly Weathered	Stained	
24.61	24.67	24.64	Vein	68		Curved	Calcite	Fresh	Hairline	
24.63	24.68	24.655	Vein	68	Rough	Planar	Calcite	Slightly Weathered	Healed	
24.91	24.94	24.925	Joint	28	Rough	Planar		Fresh	Clean	
24.95	25.11	25.03	Vein	85		Curved	Calcite	Fresh	Healed	
25.18	25.33	25.255	Vein	65		Planar	Calcite	Fresh	Healed	
25.19	25.21	25.2	Vein	40	Rough	Planar	Calcite	Fresh	Healed	
25.31	25.41	25.36	Vein	70		Undulating	Calcite	Fresh	Healed	
25.36	25.39	25.375	Vein	48		Curved	Calcite	Fresh	Healed	
25.4	24.46	24.93	Vein	60		Curved	Calcite	Fresh	Healed	
25.44	25.51	25.475	Joint	65	Rough	Curved	Calcite	Fresh	Stained	
25.56	25.56	25.56	Joint	10		Planar	Calcite	Slightly Weathered	Healed	
25.58	25.68	25.63	Vein	78		Undulating	Quartz	Fresh	Healed	
25.7	25.73	25.715	Vein	40		Curved	Quartz	Fresh	Hairline	
25.71	25.78	25.745	Vein	65		Undulating	Calcite	Fresh	Hairline	
25.73	25.74	25.735	Vein	20		Curved	Quartz	Fresh	Hairline	
25.78	25.82	25.8	Vein	50		Planar	Calcite	Fresh	Hairline	
25.81	25.94	25.875	Vein	50		Curved	Unknown	Slightly Altered	Hairline	
25.83	25.90	25.87	Vein	80		Irregular	Calcite	Fresh	Hairline	
25.84	25.88	25.86	Vein	50		Undulating	Calcite	Slightly Altered	Healed	
25.96	25.97	25.97	Vein	25		Curved	Calcite	Fresh	Healed	
25.96	25.97	25.97	Vein	45		Curved	Calcite	Fresh	Hairline	
26.02	26.15	26.09	Vein	78		Curved	Calcite	Fresh	Hairline	
26.10	26.20	26.15	Vein	70		Curved	Calcite	Fresh	Healed	
26.16	26.23	26.20	Vein	55		Curved	Calcite	Fresh	Hairline	
26.31	26.50	26.41	Vein	70	Smooth	Planar	Calcite	Fresh	Hairline	
26.32	26.36	26.34	Vein	50		Curved	Unknown	Slightly Altered	Healed	
26.36	26.60	26.48	Vein	70		Irregular	Unknown	Slightly Altered	Intact	
26.47	26.60	26.54	Vein	70	Rough	Planar	Calcite	Slightly Altered	Coated	

Depth (m)			Type	Angle (°)	Roughness	Shape	Infill	Weathering	Nature	Comments
From	To	Midpoint								
26.65	26.68	26.67	Vein	60	Rough	Planar	Calcite	Fresh	Stained	Fe SN
26.68	26.71	26.70	Vein	60	Rough	Curved		Fresh	Clean	
26.75	26.79	26.77	Vein	38	Smooth		Calcite	Fresh	Stained	
26.82	26.86	26.84	Joint	30		Planar	Calcite	Slightly Altered	Hairline	
26.84	26.88	26.86	Joint	34		Planar	Calcite	Slightly Altered	Healed	
26.84	26.94	26.89	Vein	70		Irregular	Quartz	Slightly Altered	Intact	
26.91	26.97	26.94	Vein	45		Curved	Unknown	Slightly Altered	Intact	
26.93	26.99	26.96	Joint	55	Smooth	Planar	Calcite	Slightly Weathered	Coated	
26.97	27.04	27.01	Joint	30	Smooth	Planar	Calcite	Slightly Altered	Veneer	
27.06	27.13	27.10	Vein	74		Curved	Calcite	Fresh	Hairline	
27.14	27.17	27.16	Seam - Infilled	20	Smooth	Planar		Residual Soil	Filled	
27.24	27.31	27.28	Vein	76		Curved	Calcite	Slightly Altered	Infilled	
27.32	27.36	27.34	Vein	50		Curved	Quartz	Slightly Altered	Healed	
27.44	27.46	27.45	Vein	32		Curved	Quartz	Fresh	Hairline	
27.46	27.68	27.57	Vein	80		Undulating	Quartz	Fresh	Hairline	
27.68	27.86	27.77	Vein	80		Undulating	Calcite	Fresh	Infilled	
27.83	27.92	27.88	Vein	65		Planar	Calcite	Fresh	Hairline	
27.88	28.25	28.07	Vein	85		Irregular	Calcite	Slightly Altered	Infilled	
28.05	28.06	28.06	Vein	35		Curved	Calcite	Fresh	Hairline	
28.12	28.13	28.13	Vein	32		Curved	Calcite	Fresh	Healed	
28.29	28.50	28.40	Vein	60		Irregular	Calcite	Slightly Altered	Intact	
28.44	28.64	28.54	Vein	82		Undulating	Calcite	Slightly Altered	Intact	
28.67	28.78	28.73	Vein	80		Irregular	Calcite	Fresh	Hairline	
28.76	28.85	28.81	Vein	65		Curved	Calcite	Slightly Altered	Intact	
28.84	28.91	28.88	Joint	55	Smooth	Planar	Calcite	Slightly Weathered	Veneer	
28.85	28.96	28.91	Vein	70		Planar	Calcite	Slightly Altered	Intact	
28.96	28.97	28.97	Vein	20		Irregular	Calcite	Fresh	Hairline	
29.04	29.10	29.07	Joint	70		Irregular	FeO	Slightly Weathered	Stained	
29.13	29.24	29.19	Vein	80		Undulating	Calcite	Fresh	Hairline	
29.18	29.21	29.20	Vein	45		Planar	Calcite	Fresh	Healed	
29.23	29.32	29.28	Vein	74		Curved	Calcite	Slightly Weathered	Stained	
29.25	29.27	29.26	Vein	16		Curved	FeO	Slightly Weathered	Stained	
29.28	29.36	29.32	Joint	55	Smooth	Planar		Fresh	Clean	
29.31	29.36	29.34	Vein	65		Planar	Calcite	Slightly Altered	Intact	
29.33	29.40	29.37	Vein	65		Planar	Quartz	Slightly Weathered	Intact	
29.35	29.53	29.44	Vein	80		Irregular	Quartz	Fresh	Intact	
29.36	29.41	29.39	Vein	50		Curved	Calcite	Slightly Weathered	Hairline	
29.51	29.87	29.69	Vein	80		Irregular	Calcite	Slightly Altered	Hairline	
29.74	29.77	29.76	Vein	35		Planar	FeO	Slightly Weathered	Stained	
29.75	29.79	29.77	Vein	35		Planar	FeO	Slightly Weathered	Stained	
29.86	29.92	29.89	Vein	54	Smooth	Undulating	Calcite	Fresh	Veneer	
29.87	29.90	29.89	Vein	30	Smooth	Undulating	Calcite	Fresh	Veneer	
30.06	30.14	30.10	Joint	65	Smooth	Planar		Fresh	Clean	
30.10	30.11	30.11	Joint	20	Smooth	Planar		Fresh	Clean	
30.18	30.23	30.21	Vein	64		Undulating	Calcite	Fresh	Intact	
30.25		30.25	Seam - Crushed	5	Rough	Undulating		Highly Altered (DA)	Stained	
30.30	30.43	30.37	Vein	90		Undulating	Calcite	Fresh	Intact	
30.32	30.64	30.48	Vein	85		Irregular	Calcite	Fresh	Intact	
30.39	30.45	30.42	Vein	60		Undulating	Calcite	Fresh	Intact	
30.44	30.52	30.48	Vein	60		Curved	Calcite	Fresh	Intact	
30.52	30.65	30.59	Joint	80		Curved	Calcite	Slightly Weathered	Healed	
30.54	30.61	30.58	Vein	60		Undulating	Calcite	Fresh	Hairline	
30.55	30.62	30.59	Vein	60		Planar	Quartz	Fresh	Hairline	
30.65	30.66	30.66	Vein	7		Planar	Quartz	Fresh	Intact	
30.65	30.75	30.70	Vein	76		Planar	Quartz	Fresh	Intact	
30.65	30.73	30.69	Vein	76		Planar	Quartz	Fresh	Intact	
30.69	30.77	30.73	Vein	58		Undulating	Quartz	Fresh	Healed	
30.70	30.74	30.72	Vein	22		Undulating	Quartz	Fresh		V x4, 90°, Pln, Qz, HL
30.79	30.92	30.86	Vein	90		Planar	Quartz	Slightly Weathered	Hairline	
30.86	30.98	30.92	Vein	90		Undulating	Quartz	Slightly Weathered	Hairline	
30.89	31.06	30.98	Joint	47	Rough	Undulating		Slightly Weathered	Stained	

Depth (m)			Type	Angle (°)	Roughness	Shape	Infill	Weathering	Nature	Comments
From	To	Midpoint								
31.17	31.28	31.23	Joint	72		Planar	FeO	Slightly Weathered	Stained	
31.27	31.40	31.34	Vein	78		Irregular	Quartz	Slightly Weathered	Intact	
31.36	31.44	31.40	Joint	60	Smooth	Undulating	FeO	Slightly Weathered	Veneer	
31.38	31.46	31.42	Vein	75		Irregular	Calcite	Fresh	Clean	
31.40	31.50	31.45	Vein	60		Curved	Quartz	Slightly Altered	Healed	
31.46	31.44	31.45	Joint	60	Smooth	Undulating	FeO	Slightly Weathered	Veneer	
31.54	31.58	31.56	Vein	70		Planar	Calcite	Slightly Weathered	Hairline	
31.55	31.64	31.60	Vein	80		Irregular	Quartz	Fresh	Intact	
31.62	31.68	31.65	Joint	55	Rough	Planar	MnO	Slightly Weathered	Stained	
31.66	31.68	31.67	Joint	55	Rough	Planar	MnO	Slightly Weathered	Stained	
31.73	31.79	31.76	Joint	55	Smooth	Planar	FeO	Slightly Weathered	Veneer	
31.76	31.83	31.80	Joint	75	Smooth	Planar	FeO	Fresh	Veneer	
31.81	31.88	31.85	Vein	70		Undulating	Calcite	Slightly Altered	Infilled	
32.07	32.64	32.36	Vein	80	Rough	Irregular	Calcite	Slightly Weathered	Intact	
32.41	32.43	32.42	Vein	38	Smooth	Planar		Slightly Weathered	Stained	
32.45	32.54	32.50	Vein	75		Irregular	Calcite	Fresh	Hairline	
32.55	32.65	32.60	Vein	65		Curved	Calcite	Fresh	Hairline	
33.27	33.29	33.28	Vein	30		Curved	Calcite	Fresh	Hairline	
33.38	33.38	33.38	Vein	5		Undulating	Calcite	Fresh	Clean	
33.55	33.70	33.63	Vein	85		Undulating	Calcite	Fresh	Hairline	
33.57	33.57	33.57	Vein	5		Undulating	Calcite	Fresh	Hairline	
33.70	33.82	33.76	Vein	70		Irregular	FeO	Slightly Weathered	Stained	
33.82	33.82	33.82	Vein	5		Planar	FeO	Slightly Weathered	Stained	
33.94	33.96	33.95	Joint	25	Smooth	Planar	FeO	Slightly Weathered	Stained	
34.06	34.09	34.08	Vein	27		Planar	Calcite	Fresh	Intact	
34.06	34.21	34.14	Vein	70	Smooth	Planar		Fresh	Clean	
34.37	34.42	34.40	Vein	46		Planar	Calcite	Slightly Weathered	Intact	
34.40	34.50	34.45	Vein	65		Planar	Calcite	Fresh	Hairline	
34.41	34.50	34.46	Vein	65		Planar	Calcite	Slightly Altered	Stained	
34.45	34.45	34.45	Break	0	Rough	Irregular	MnO	Slightly Altered	Stained	
34.68	34.72	34.70	Vein	35	Smooth	Planar	Calcite	Slightly Weathered	Clean	
34.74	34.76	34.75	Vein	60	Smooth	Planar	Calcite	Slightly Weathered	Veneer	
34.81	34.88	34.85	Vein	65		Undulating	Calcite	Fresh	Hairline	
34.84	34.86	34.85	Vein	25		Planar	FeO	Slightly Weathered	Stained	
34.94	34.96	34.95	Joint	55	Smooth	Planar		Fresh	Clean	
35.00	35.38	35.19	Vein	87		Curved	MnO	Slightly Weathered	Stained	
35.08	35.13	35.11	Joint	46	Smooth	Planar		Fresh	Clean	
35.15	35.18	35.17	Vein	45		Curved	Calcite	Fresh	Stained	
35.15	35.20	35.18	Vein	45		Undulating	Calcite	Fresh	Hairline	
35.26	35.31	35.29	Parting	46		Planar		Fresh	Infilled	
35.40	35.54	35.47	Vein	74		Undulating	Calcite	Fresh	Hairline	
35.56	35.59	35.58	Vein	35	Rough	Curved	Calcite	Slightly Weathered	Stained	
35.59	36.00	35.80	Vein	85		Irregular	FeO	Slightly Weathered	Intact	
35.75	35.76	35.76	Joint	20	Smooth	Curved		Slightly Weathered	Filled	
35.81	35.82	35.82	Break	10	Rough	Undulating		Fresh	Clean	
36.04	36.05	36.05	Vein	20	Rough	Undulating	Calcite	Fresh	Stained	
36.13	36.20	36.17	Vein	65		Curved	Calcite	Fresh	Hairline	
36.15	35.57	35.86	Vein	80		Planar	MnO	Fresh	Intact	
36.28	36.33	36.31	Vein	70		Curved	Calcite	Fresh	Hairline	
36.32	36.41	36.37	Joint	65		Planar	Calcite	Fresh	Clean	
36.39	36.52	36.46	Vein	75		Curved	Calcite	Fresh	Hairline	
36.45	36.62	36.54	Vein	85		Planar	Calcite	Fresh	Intact	
36.63	36.64	36.64	Vein	25		Undulating		Slightly Weathered	Filled	
36.65	36.91	36.78	Vein	80		Stepped	Unknown	Fresh	Intact	
36.66	36.82	36.74	Vein	78		Curved	Calcite	Fresh	Intact	
36.71	36.80	36.76	Vein	70		Undulating	Quartz	Apatite Alteration	Intact	
36.91	36.93	36.92	Vein	70		Curved	Calcite	Fresh	Intact	
36.95	37.03	36.99	Joint	53	Smooth	Planar	Calcite	Slightly Weathered	Veneer	
37.04	37.18	37.11	Joint	75	Rough	Planar	Calcite	Fresh	Veneer	
37.05	37.06	37.06	Joint	20	Smooth	Planar		Fresh	Clean	
37.17	37.25	37.21	Joint	70	Rough	Planar	Calcite	Fresh	Veneer	

Depth (m)			Type	Angle (°)	Roughness	Shape	Infill	Weathering	Nature	Comments
From	To	Midpoint								
37.20	37.33	37.27	Joint	70	Smooth	Planar		Slightly Weathered	Clean	
37.44	37.49	37.47	Vein	55		Curved	Calcite	Fresh	Intact	
37.57	37.63	37.60	Vein	60		Curved	Calcite	Fresh	Hairline	
37.64	37.71	37.68	Vein	75		Curved	Quartz	Fresh	Hairline	
37.78	37.79	37.79	Vein	20	Rough	Undulating		Slightly Weathered	Clean	
37.90	38.06	37.98	Vein	80	Smooth	Planar	Calcite	Fresh	Veneer	
38.00	38.22	38.11	Joint	85		Curved		Moderately Altered (DA)	Intact	
38.02	38.30	38.16	Joint	85		Curved		Moderately Altered (DA)	Intact	
38.06	38.10	38.08	Vein	20		Curved	Calcite	Slightly Weathered	Stained	
38.20	38.28	38.24	Brecciated Zone	50		Undulating	Quartz	Moderately Altered (DA)	Displaced	Lithics of quartz and granite and biotite, alteration occurred
38.67	38.69	38.68	Vein	40		Planar	Calcite	Slightly Weathered	Stained	
38.74	38.80	38.77	Vein	25		Undulating	Calcite	Slightly Weathered	Hairline	
38.78	38.83	38.81	Vein	55		Planar	Calcite	Slightly Weathered	Intact	
38.94	39.04	38.99	Joint	60	Rough	Planar	Quartz	Slightly Altered	Infilled	
39.00	39.19	39.10	Joint	80		Curved	Quartz	Slightly Altered	Healed	Multiple hairline veins surrounding joint
39.06	39.50	39.28	Vein	90		Irregular	Quartz	Fresh	Intact	
39.08	39.11	39.10	Vein	49		Undulating	Quartz	Slightly Weathered	Hairline	
39.09	39.33	39.21	Vein	85		Irregular	Quartz	Fresh	Infilled	Changes angles between 85 and 30. Blocky texture
39.22	39.25	39.24	Vein	55		Curved	Calcite	Fresh	Intact	
39.24	39.32	39.28	Vein	58		Irregular	Chlorite	Fresh	Healed	
39.28	39.36	39.32	Vein	60		Curved	Quartz	Fresh	Crushed	
39.33	39.38	39.36	Vein	50	Rough	Undulating	Calcite	Fresh	Coated	
39.40	39.45	39.43	Vein	50		Irregular	Calcite	Fresh	Intact	
39.45	39.48	39.47	Joint	48	Smooth	Curved		Slightly Weathered	Veneer	
39.49	39.52	39.51	Joint	45		Undulating	Calcite	Slightly Weathered	Infilled	
39.60	39.75	39.68	Vein	75		Irregular	Quartz	Moderately Altered (DA)	Intact	Also a contact
39.68	39.69	39.69	Vein	15		Undulating		Slightly Weathered	Intact	
39.82	39.94	39.88	Vein	75		Irregular		Moderately Altered (DA)	Intact	
39.93	39.98	39.96	Joint	45	Rough	Undulating	FeO	Moderately Altered (DA)	Stained	Possible potassic alteration
40.00	40.10	40.05	Vein	75		Planar	Calcite	Fresh	Hairline	
40.00	40.13	40.07	Vein	75		Planar	Calcite	Fresh	Hairline	
40.00	40.20	40.10	Vein	90		Undulating	Quartz	Slightly Altered	Hairline	
40.16	40.36	40.26	Vein	85		Undulating	Quartz	Slightly Altered	Intact	
40.17	40.32	40.25	Vein	82		Curved	Quartz	Slightly Altered	Intact	
40.50	40.58	40.54	Joint	70	Rough	Curved	Clay	Slightly Altered	Crushed	Crushed and veneer of clay
40.63	40.87	40.75	Joint	80	Smooth	Irregular	Calcite	Moderately Altered (DA)	Stained	
40.65	40.72	40.69	Vein	65		Irregular	Quartz	Slightly Weathered	Intact	
40.77	40.80	40.79	Vein	35	Rough	Undulating	Calcite	Slightly Weathered	Clean	
40.85	41.20	41.03	Joint	83	Smooth	Planar	Clay	Moderately Altered (DA)	Veneer	
40.95	40.97	40.96	Joint	40	Smooth	Planar		Slightly Weathered	Veneer	
41.00	41.30	41.15	Joint	85	Smooth	Planar	Clay	Slightly Altered	Stained	
41.10	42.05	41.58	Joint	90	Smooth	Planar	Clay	Slightly Altered	Veneer	Brecciated, altered contact zone.
41.27	41.55	41.41	Vein	90		Undulating	Quartz	Fresh	Infilled	
41.85	41.88	41.87	Vein	30	Smooth	Curved		Slightly Weathered	Stained	
41.88	42.03	41.96	Joint	55	Smooth	Planar	Clay	Slightly Altered	Veneer	
42.03	42.11	42.07	Vein	40		Curved	Calcite	Slightly Weathered	Hairline	
42.10	42.54	42.32	Vein	85	Polished	Planar	Clay	Moderately Weathered (DW)	Filled	Altered too
42.30	42.35	42.33	Vein	55		Undulating	Quartz	Slightly Weathered	Intact	
42.35	42.47	42.41	Joint	80		Planar	Quartz	Slightly Weathered	Intact	
42.39	42.40	42.40	Vein	15		Undulating	Quartz	Fresh	Hairline	
42.47	42.76	42.62	Vein	80		Planar	Quartz	Slightly Altered	Healed	
42.59	42.72	42.66	Joint	55		Undulating		Moderately Altered (DA)	Crushed	
42.74	42.93	42.84	Joint	55		Curved	Quartz	Slightly Weathered	Intact	
42.77	42.87	42.82	Joint	70	Smooth	Planar	Calcite	Slightly Altered	Veneer	
43.01	43.17	43.09	Vein	60	Smooth	Planar	Calcite	Moderately Altered (DA)	Crushed	V x8, 60°, PR, SM, CA, Cru, Slight alteration and weathering, Qz and Biotite
43.23	43.32	43.28	Vein	55	Smooth	Planar	Calcite	Fresh	Hairline	
43.35	43.43	43.39	Vein	70	Smooth	Planar	FeO	Moderately Weathered (DW)	Intact	
43.51	43.55	43.53	Joint	42	Smooth	Planar	MnO	Moderately Weathered (DW)	Stained	
43.57	43.60	43.59	Joint	34	Smooth	Planar	MnO	Moderately Altered (DA)	Veneer	
43.57	43.64	43.61	Joint	49		Planar	MnO	Moderately Weathered (DW)	Veneer	
43.80	43.86	43.83	Joint	55	Smooth	Planar	Clay	Moderately Weathered (DW)	Filled	

Depth (m)			Type	Angle (°)	Roughness	Shape	Infill	Weathering	Nature	Comments
From	To	Midpoint								
43.86	43.92	43.89	Joint	55	Smooth	Planar	MnO	Moderately Weathered (DW)	Filled	V x10, 45°, IR, CA, FL
44.01	44.09	44.05	Joint	35		Stepped		Slightly Weathered	Intact	
44.07	44.31	44.19	Vein	86	Polished	Planar	Calcite	Fresh	Intact	
44.14	44.22	44.18	Joint	70	Polished	Planar		Fresh	Clean	
44.20	44.36	44.28	Joint	85	Polished	Planar		Fresh	Clean	
44.36	44.38	44.37	Joint	40		Curved		Fresh	Hairline	
44.43	44.46	44.45	Joint	40	Polished	Planar		Fresh	Clean	
44.58	44.62	44.60	Vein	50		Planar	Calcite	Fresh	Hairline	
44.60	44.80	44.70	Vein	80		Irregular		Fresh	Hairline	
44.84	44.90	44.87	Vein	75		Planar		Slightly Weathered	Hairline	
44.94	45.06	45.00	Joint	70	Smooth	Planar		Fresh	Clean	
45.01	45.03	45.02	Joint	24	Polished	Planar		Fresh	Clean	
45.07	45.14	45.11	Vein	69		Curved	Calcite	Fresh	Hairline	
45.19	45.24	45.22	Joint	70	Polished	Curved		Fresh	Clean	
45.42	45.44	45.43	Joint	46	Polished	Planar		Fresh	Clean	
45.52	45.57	45.55	Vein	70	Smooth	Undulating	Calcite	Fresh	Veneer	
45.66	45.67	45.67	Vein	42		Curved	Calcite	Fresh	Intact	
45.71	45.79	45.75	Joint	55	Smooth	Planar	Calcite	Fresh	Veneer	
45.87	45.89	45.88	Vein	30		Undulating	Quartz	Fresh	Hairline	
45.96	45.98	45.97	Vein	44	Smooth	Curved	Calcite	Fresh	Stained	
45.97	45.99	45.98	Vein	40		Curved	Calcite	Fresh	Intact	
46.12	46.14	46.13	Joint	25	Smooth	Curved		Fresh	Clean	
46.15	46.16	46.16	Vein	14		Curved	Calcite	Fresh	Hairline	
46.18	46.26	46.22	Vein	62		Undulating	Calcite	Fresh	Hairline	
46.35	46.43	46.39	Joint	62	Smooth	Planar	Calcite	Fresh	Clean	
46.47	46.51	46.49	Vein	50		Planar	Calcite	Fresh	Intact	
46.47	46.55	46.51	Vein	50		Curved	Calcite	Fresh	Clean	
46.54	46.57	46.56	Vein	45		Curved	Calcite	Fresh	Intact	
46.57	46.77	46.67	Group Set	45		Irregular	Calcite	Fresh	Infilled	
46.98	47.04	47.01	Vein	35		Undulating	Calcite	Fresh	Infilled	
47.07	47.43	47.25	Vein	85	Rough	Planar	Calcite	Slightly Altered	Healed	
47.21	47.27	47.24	Vein	60	Smooth	Planar	Calcite	Slightly Altered	Healed	
47.21	47.26	47.24	Joint	40	Polished	Planar	Calcite	Slightly Altered	Veneer	
47.28	47.41	47.35	Vein	80		Planar		Slightly Altered	Intact	
47.37	47.40	47.39	Vein	15		Curved	Calcite	Slightly Altered	Intact	
47.43	47.54	47.49	Vein	55		Planar	Calcite	Fresh	Intact	
47.44	47.49	47.47	Vein	55		Curved	Calcite	Fresh	Hairline	
47.55	47.58	47.57	Vein	20		Planar	Calcite	Fresh	Hairline	
47.69	47.73	47.71	Vein	42	Smooth	Curved	Calcite	Fresh	Healed	
47.83	47.88	47.86	Vein	52		Undulating	Calcite	Fresh	Clean	
47.97	48.22	48.10	Vein	88		Planar	Calcite	Fresh	Hairline	
48.16	48.42	48.29	Vein	78		Planar	Calcite	Fresh	Intact	
48.16	48.41	48.29	Vein	78		Planar	Calcite	Fresh	Infilled	
48.26	48.51	48.39	Joint	85		Planar	Calcite	Slightly Altered	Healed	
48.45	48.62	48.54	Vein	85		Undulating	Calcite	Slightly Weathered	Clean	
48.68	48.72	48.70	Vein	40		Curved	Calcite	Fresh	Healed	
48.76	48.80	48.78	Joint	54		Planar		Fresh	Intact	
48.78	48.82	48.80	Vein	50		Undulating	Calcite	Fresh	Healed	
48.96	49.14	49.05	Joint	75		Planar	Calcite	Fresh	Healed	
49.20	49.25	49.23	Joint	40	Polished	Planar		Fresh	Stained	
49.30	49.40	49.35	Vein	80		Planar	Calcite	Slightly Altered	Coated	
49.47	49.50	49.49	Joint	42	Smooth	Planar		Slightly Weathered	Veneer	
49.55	49.65	49.60	Joint	70	Smooth	Planar		Slightly Weathered	Veneer	
49.66	49.75	49.71	Vein	65		Curved	Calcite	Fresh	Healed	
49.75	49.85	49.80	Joint	65		Undulating	Calcite	Fresh	Hairline	
49.87	49.92	49.90	Joint	55		Curved	Calcite	Fresh	Hairline	
49.89	49.93	49.91	Vein	60		Undulating	Calcite	Fresh	Hairline	
49.96	50.13	50.05	Vein	70		Undulating	Calcite	Fresh	Veneer	
50.07	50.15	50.11	Vein	59		Curved	Calcite	Fresh	Hairline	
50.19	50.43	50.31	Vein	80		Planar	Calcite	Fresh	Hairline	
50.20	50.27	50.24	Joint	60	Smooth	Curved	Calcite	Fresh	Clean	

Depth (m)			Type	Angle (°)	Roughness	Shape	Infill	Weathering	Nature	Comments
From	To	Midpoint								
50.30	50.42	50.36	Vein	60	Rough	Curved	Calcite	Fresh	Hairline	
50.36	50.42	50.39	Joint	50		Planar		Fresh	Healed	
50.44	50.53	50.49	Joint	60		Planar	Calcite	Fresh	Hairline	
50.49	50.54	50.52	Vein	62		Undulating	Calcite	Fresh	Hairline	
50.65	50.67	50.66	Joint	50		Curved		Fresh	Clean	
50.69	50.70	50.70	Vein	5		Irregular	Quartz	Slightly Altered	Infilled	
50.70	50.73	50.72	Vein	60		Curved	Calcite	Slightly Altered	Hairline	
50.72	50.74	50.73	Vein	30		Irregular	Calcite	Slightly Altered	Infilled	
50.83	50.92	50.88	Vein	60		Planar	Calcite	Fresh	Hairline	
50.86	50.87	50.87	Vein	3		Irregular	Calcite	Slightly Altered	Infilled	
50.90	50.93	50.92	Vein	30	Smooth	Undulating	Calcite	Fresh	Hairline	
50.97	50.97	50.97	Vein	4		Curved	Calcite	Fresh	Hairline	
51.04	51.07	51.06	Vein	60		Curved	Quartz	Fresh	Healed	
51.10	51.26	51.18	Vein	80		Irregular	Quartz	Fresh	Hairline	
51.15	51.25	51.20	Vein	65		Planar	Quartz	Fresh	Hairline	
51.23	51.31	51.27	Vein	70		Planar	Calcite	Fresh	Hairline	
51.30	51.35	51.33	Joint	47		Planar	Calcite	Slightly Weathered	Stained	
51.39	51.44	51.42	Vein	45		Planar	Calcite	Fresh	Infilled	
51.41	51.45	51.43	Vein	35		Planar	Calcite	Fresh	Hairline	
51.49	51.51	51.50	Joint	25		Undulating	Calcite	Slightly Weathered	Stained	
51.59	51.60	51.60	Vein	20	Rough	Curved	Calcite	Fresh	Healed	
51.62	51.65	51.64	Vein	32		Curved	Calcite	Fresh	Hairline	
51.67	51.77	51.72	Vein	50		Planar	Calcite	Fresh	Hairline	
51.80	51.81	51.81	Vein	24		Curved	Calcite	Fresh	Healed	
51.84	51.84	51.84	Vein	17		Planar	Calcite	Fresh	Hairline	
51.87	51.90	51.89	Vein	44		Planar	Calcite	Fresh	Hairline	
51.88	51.92	51.90	Vein	44		Undulating	Calcite	Fresh	Hairline	
51.97	52.06	52.02	Joint	60		Planar		Slightly Weathered	Clean	
52.30	52.69	52.50	Dyke	80		Irregular	Volcanic intrusion	Fresh		
52.31	52.32	52.32	Vein	30		Irregular	Quartz	Fresh	Intact	
52.32	52.33	52.33	Vein	30	Smooth	Undulating	Quartz	Fresh	Intact	
52.77	52.78	52.78	Vein	16		Curved	Quartz	Fresh	Intact	
52.78	52.84	52.81	Vein	64		Irregular	Quartz	Fresh	Intact	
52.86	52.88	52.87	Vein	45		Planar	Calcite	Fresh	Hairline	
52.88	52.90	52.89	Vein	25		Curved	Calcite	Fresh	Intact	
53.03	53.07	53.05	Vein	40		Curved	Calcite	Fresh	Infilled	
53.03	53.15	53.09	Vein	60		Irregular	Calcite	Fresh	Intact	
53.17	53.18	53.18	Vein	20		Undulating	Calcite	Fresh	Intact	
53.17	53.22	53.20	Vein	50		Curved	Calcite	Fresh	Intact	
53.28	53.29	53.29	Joint	60		Planar	Calcite	Slightly Altered	Clean	
53.29	53.33	53.31	Vein	55	Smooth	Undulating	Calcite	Fresh	Intact	
53.32	53.35	53.34	Vein	55		Curved	Calcite	Fresh	Healed	
53.33	53.38	53.36	Vein	52		Planar	Calcite	Fresh	Intact	
53.42	53.45	53.44	Vein	50		Curved	Calcite	Fresh	Clean	
53.57	53.58	53.58	Vein	25		Curved	Calcite	Fresh	Intact	
53.64	53.68	53.66	Vein	40		Curved	Calcite	Fresh	Intact	
53.68	53.70	53.69	Vein	10		Planar	Quartz	Fresh	Infilled	
53.75	54.00	53.88	Vein	80		Irregular	Quartz	Fresh	Intact	
53.89	53.90	53.90	Vein	10		Curved	Calcite	Fresh	Intact	
53.96	53.98	53.97	Vein	30		Curved	Calcite	Fresh	Healed	
54.03	54.06	54.05	Vein	30	Smooth	Planar	Calcite	Fresh	Intact	
54.06	54.12	54.09	Vein	55		Undulating	Calcite	Fresh	Intact	
54.14	54.19	54.17	Vein	30		Planar	Calcite	Fresh	Intact	
54.18	54.32	54.25	Vein	75		Irregular	Calcite	Fresh	Intact	
54.31	54.36	54.34	Vein	30		Irregular	Calcite	Fresh	Intact	
54.35	54.39	54.37	Vein	30		Curved	Calcite	Fresh	Intact	
54.49	54.51	54.50	Vein	25		Planar	Calcite	Fresh	Intact	
54.55	54.63	54.59	Vein	70		Curved	Calcite	Fresh	Intact	
54.66	54.69	54.68	Vein	50		Curved	Calcite	Fresh	Intact	
54.69	54.73	54.71	Vein	30		Planar	Calcite	Fresh	Intact	
54.94	55.00	54.97	Vein	55		Curved	Calcite	Fresh	Intact	

Borehole No.: BHUA-16	Depth Range: 15.57 – 19.0m	Box: 1 / 10
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JOB NO: 30032772

BOREHOLE ID: BHUA-16

DEPTH: 15.57-19.0

DATE: 14-12-23

PROJECT: Pioneer-Burdekin

CORE TRAY NO: Box 1



CHALK MARKS DENOTE HANDLING OR DRILLING BREAKS





	Geotechnical Investigation Borehole Photos	Client: SMEC		
		Project: Pioneer-Burdekin PHES	Drawn: RC	Page No.1/10
		Project No. 23117.000.001	Checked: SF	Size: A4
		Date Drilled:18/06/2023	Revision: 0	Scale: N/A

	Geotechnical Investigation Borehole Photos	Client: SMEC		Page No.2/10	
		Project: Pioneer-Burdekin PHES		Drawn: RC	Size: A4
		Project No. 23117.000.001		Checked: SF	Scale: N/A
		Date Drilled:18/06/2023		Revision: 0	

	Geotechnical Investigation Borehole Photos	Client: SMEC		Page No.4/10	
		Project: Pioneer-Burdekin PHES		Drawn: RC	Size: A4
		Project No. 23117.000.001		Checked: SF	Scale: N/A
		Date Drilled:18/06/2023		Revision: 0	

Borehole No.: BHUA-16	Depth Range: 31.0 – 35.0m	Box: 5 / 10
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JOB NO: 30032772

PROJECT: Pioneer-Burdekin

BOREHOLE ID: BHUA-16

DEPTH: 31.0-35.0

DATE: 14-12-23

CORE TRAY NO: Box 5

✗ CHALK MARKS DENOTE HANDLING OR DRILLING BREAKS

0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

31 EOR 31.33

32 EOR

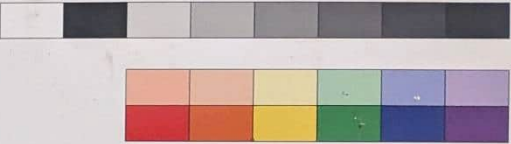
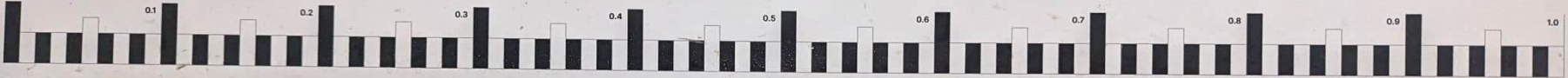
33 SAMPLE 33.00 33.31 EOR 33.63

34 EOR 34.33

	Geotechnical Investigation Borehole Photos	Client: SMEC		Drawn: RC	Page No.5/10
		Project: Pioneer-Burdekin PHES			
		Project No. 23117.000.001		Checked: SF	Size: A4
		Date Drilled:18/06/2023		Revision: 0	Scale: N/A

Borehole No.: BHUA-16		Depth Range: 35.0 – 39.0m		Box: 6 / 10	
JOB NO: 30032772 BOREHOLE ID: BHUA-16 DEPTH: 35.0-39.0 DATE: 14-12-23 PROJECT: Pioneer-Burdekin CORE TRAY NO: Box 6 CHALK MARKS DENOTE HANDLING OR DRILLING BREAKS 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0					
					
	Geotechnical Investigation Borehole Photos	Client: SMEC			
		Project: Pioneer-Burdekin PHES		Drawn: RC	Page No.6/10
		Project No. 23117.000.001		Checked: SF	Size: A4
		Date Drilled:18/06/2023		Revision: 0	Scale: N/A

Borehole No.: BHUA-16		Depth Range: 39.0 – 43.0m		Box: 7 / 10	
JOB NO: 30032772 BOREHOLE ID: BHUA-16 DEPTH: 39.0-43.0 DATE: 14-12-23 PROJECT: Pioneer-Burdekin CORE TRAY NO: Box 7 CHALK MARKS DENOTE HANDLING OR DRILLING BREAKS					
	Geotechnical Investigation Borehole Photos	Client: SMEC			
		Project: Pioneer-Burdekin PHES		Drawn: RC	Page No.7/10
		Project No. 23117.000.001		Checked: SF	Size: A4
		Date Drilled:18/06/2023		Revision: 0	Scale: N/A

Borehole No.: BHUA-16		Depth Range: 43.0.0 – 47.0m		Box: 8 / 10	
JOB NO: 30032772		PROJECT: Pioneer-Burdekin			
BOREHOLE ID: BHUA-16		CORE TRAY NO: Box 8			
DEPTH: 43.0-47.0					
DATE: 14-12-23					
					
					
	Geotechnical Investigation Borehole Photos	Client: SMEC			
		Project: Pioneer-Burdekin PHES		Drawn: RC	Page No. 8/10
		Project No. 23117.000.001		Checked: SF	Size: A4
		Date Drilled: 18/06/2023		Revision: 0	Scale: N/A

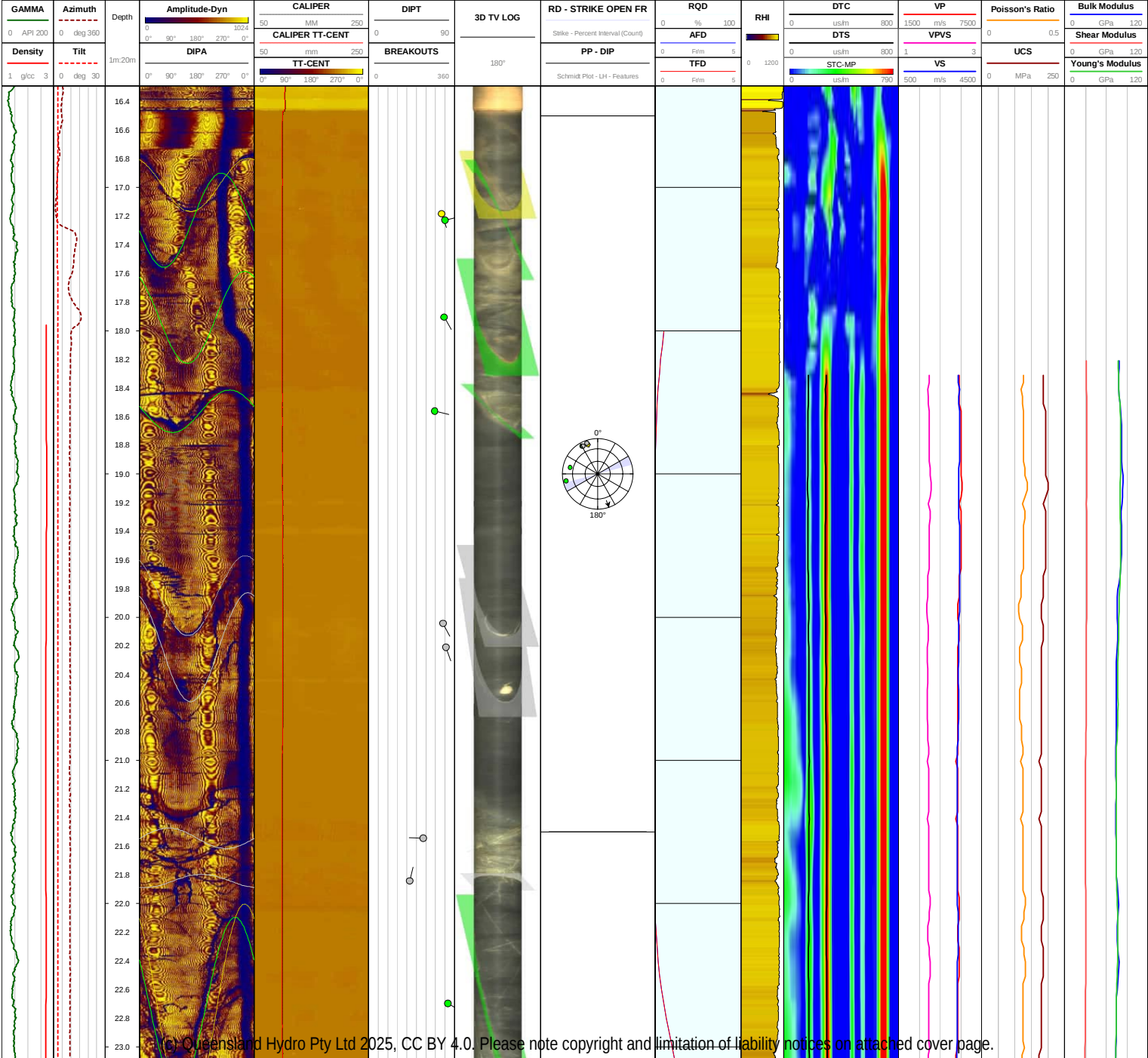
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		Project: Pioneer-Burdekin PHES		Drawn: RC	Size: A4
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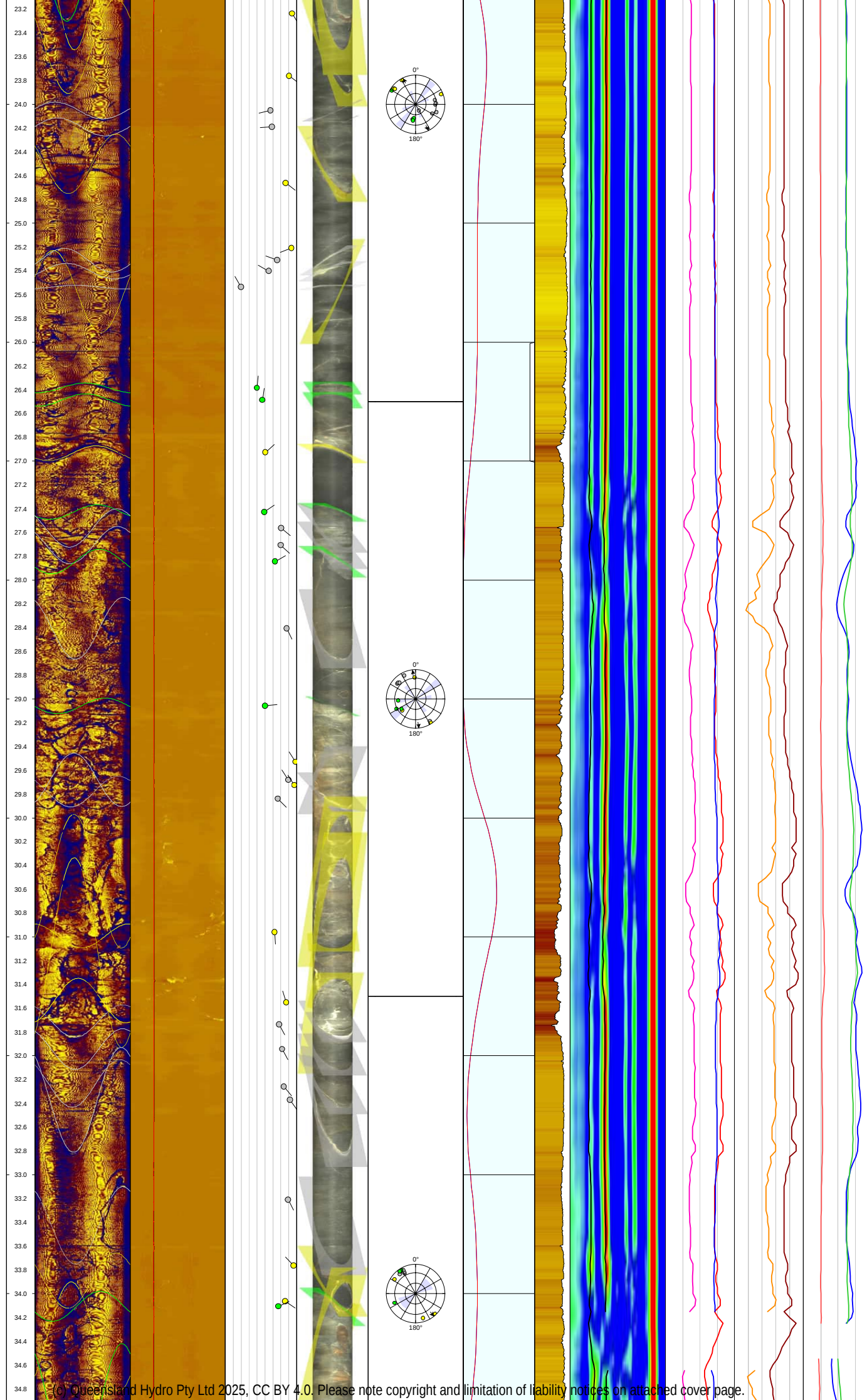
Borehole No.: BHUA-16		Depth Range: 51.0.0 – 55.0m		Box: 10 / 10	
JOB NO: 30032772		PROJECT: Pioneer-Burdekin			
BOREHOLE ID: BHUA-16		CORE TRAY NO: Box 10			
DEPTH: 51.0 – 54.0					
DATE: 14-12-23					
		Geotechnical Investigation Borehole Photos	Client: SMEC		
			Project: Pioneer-Burdekin PHES		Drawn: RC
			Project No. 23117.000.001		Checked: SF
			Date Drilled: 18/06/2023		Revision: 0
				Page No. 10/10	Size: A4
					Scale: N/A

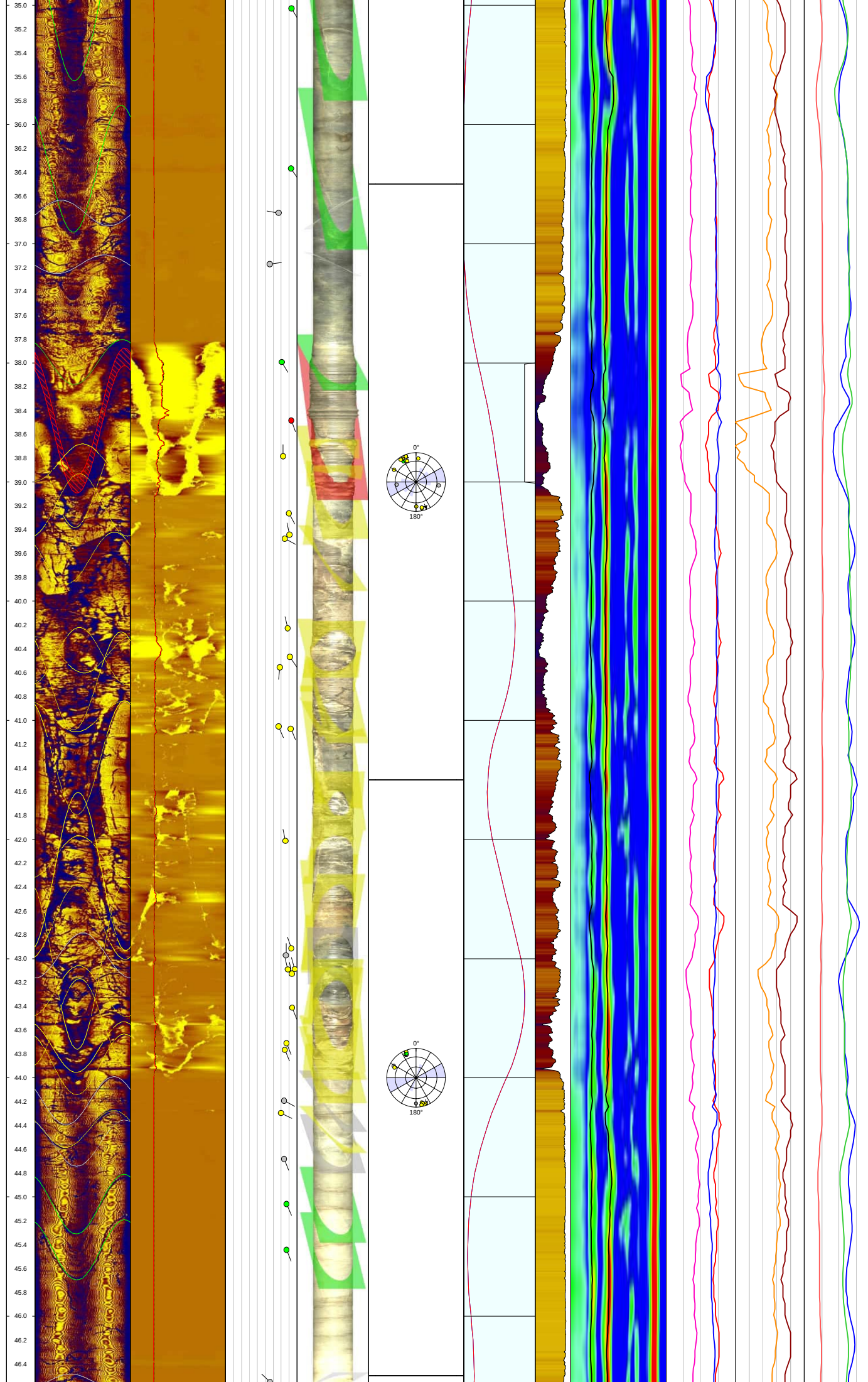
				COMPOSITE LOG BOREHOLE TELEVIEWER AND FULL WAVEFORM SONIC LOGS AND ADVANCED ANALYSIS				Epiroc			
Hole NameBHUA_16 FieldEUNGELLA Log Date24/07/23 LocationPIONEER-BURDEKIN			Drill Depth55.00m Bit Size9.6CM Casing TypePVC Casing Depth16.74m			Grid Name Collar Easting659812m Collar Northing7666574m Reduced Level			Logging UnitSV013 EngineerJRT Client RepresentativeROB CANE Service TypeTeleviewer Interpretation		
TELEVIEWER LOGS		STRUCTURAL LOGS		FEATURES & TADPOLES							
AmplitudeATV Amplitude Image TT-CENTCentralised ATV Travel Time Image 3D TV LOG3D Televiewer Image Caliper TT-CENTAcoustic Travel Time Caliper OTV PictureOptical Televiewer Image		DIPADip Feature Picks (Sinusoid Presentation) DIPTDip Feature Picks (Tadpole Presentation) RD - STRIKERose Diagram - Strike Open Fract. (Arrows represent Mean Vector) PP - DIPolar Projection - Dip (Schmidt) (Lower Hemisphere)		Open Fracture Partially Open Fracture Foliation/Banding/Bedding Healed Fracture/Vein							
FULL WAVEFORM SONIC LOG & MECHANICAL PROPERTIES											
STC-MPMonopole Slowness-Time-Coherence Projection DTCCompressional wave slowness DTSShear wave slowness VPCompressional wave velocity VSShear wave velocity VPVSCompressional to Shear wave velocity ratio UCSUniaxial (Unconfined) Compressive Strength Poisson's RatioIndicator of material elastic deformation Young's ModulusMaterial length change by applied stress Bulk ModulusChange in material volume by applied stress Shear ModulusTransverse material displacement by applied stress		PP - DIP									
		STRUCTURAL ANALYSIS LOGS		COMMENTS							
		RQDRock Quality Designation (Partial) Open Apparent Fracture Density AFD(Partial) Open Apparent Fracture Density TFD(Partial) Open True Fracture Density RHIRock Hardness Index		Image and azimuth data are presented oriented to True north. The magnetic declination correction is +8.12 degrees.							
				Rock Quality Designation (RQD) is the (Sum of length of image interval sections of more than 10 cm length unaffected by open fractures, faults & breakouts) divided by the (Total length of the interval) times (100%). RQD has been calculated for one meter intervals.							
		GEOPHYSICAL AND VERTICALITY LOGS									
		DensityDensity Log GAMMANatural Gamma Ray TiltHole Inclination (0 = Vertical Down) AzimuthHole Azimuth CALIPERMechanical Caliper		The STC-MP track was produced by processing the RX1-1A (60 cm), RX2-1A (80 cm), RX3-1A (100 cm) and RX4-1A (120 cm) receiver data after applying a moving average filter, stacking and a frequency filter. Uniaxial Compressive Strength (UCS) was calculated using an exponential trendline between DTC and UCS (McNally, 1987): $UCS = 1200 * \exp(-0.036 * DTC)$, with UCS in MPa and DTC in $\mu s/m$ units. Poisson's Ratio was calculated from DTC & DTS. Young's, Bulk & Shear Modulus were calculated from DTC, DTS & Density estimated as $\rho = 0.31.Vp \exp(1/4)$							

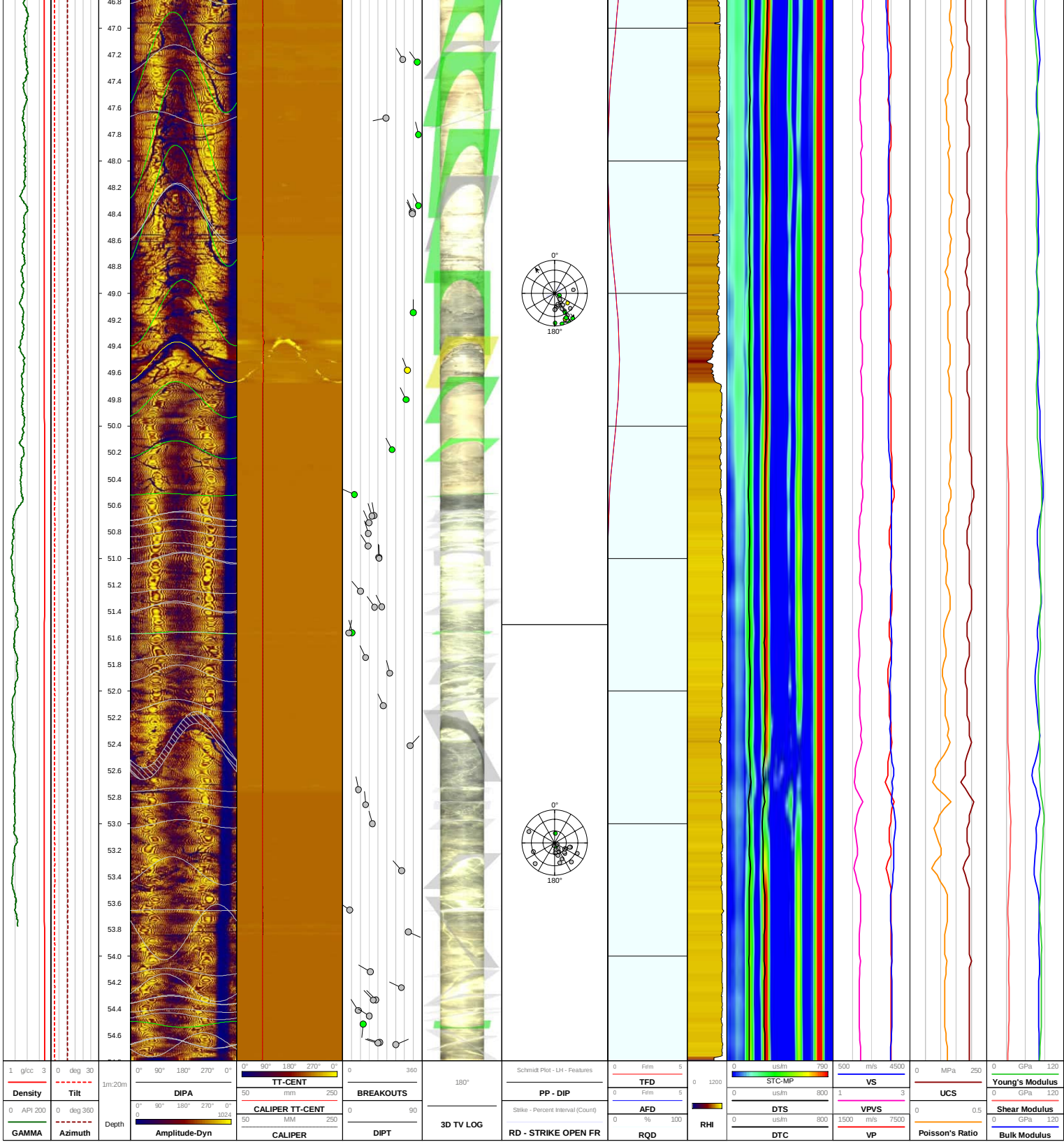
IMPORTANT NOTE

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BHUA_16 Televiewer Structures

Feature Depth	Depth	Azimuth	Dip	Aperture	Visible Azimuth Ranges	Type	Features
m	m	deg	deg	mm	deg		
17.18	16.98	161.31	76.52	0	140.78-181.28	2	Partially Open Fracture
17.23	17.23	77.13	80.16	0		4	Foliation/Banding/Bedding
17.91	17.91	150.31	79.33	0		4	Foliation/Banding/Bedding
18.56	18.56	103.22	69.19	0		4	Foliation/Banding/Bedding
20.04	19.85	152.41	77.98	0	109.21-201.91	5	Healed Fracture/Vein
20.21	20.21	160.47	80.85	0		5	Healed Fracture/Vein
21.54	21.54	271.88	57.18	0		5	Healed Fracture/Vein
21.84	21.84	12.12	43.23	0		5	Healed Fracture/Vein
22.7	22.7	120.44	82.96	0		4	Foliation/Banding/Bedding
23.24	22.77	150.04	84.39	0	115.31-152.21	2	Partially Open Fracture
23.76	23.51	126.27	80.5	0	80.18-133.28	2	Partially Open Fracture
24.05	24.05	257.4	56.96	0		5	Healed Fracture/Vein
24.19	24.19	267.26	58.69	0		5	Healed Fracture/Vein
24.66	24.5	126.26	76.35	0	74.82-107.22	2	Partially Open Fracture
25.21	25.57	248.78	83.28	0	40.73-112.73	2	Partially Open Fracture
25.31	25.31	290.74	65.48	0		5	Healed Fracture/Vein
25.4	25.4	299.15	54.9	0		5	Healed Fracture/Vein
25.54	25.54	330.47	19.87	0		5	Healed Fracture/Vein
26.38	26.38	6.78	40	0		4	Foliation/Banding/Bedding
26.49	26.49	9.78	46.65	0		4	Foliation/Banding/Bedding
26.93	26.93	49.14	50.39	0	95.50-314.20	2	Partially Open Fracture
27.43	27.43	54.55	49.31	0		4	Foliation/Banding/Bedding
27.56	27.56	129.79	70.49	0		5	Healed Fracture/Vein
27.71	27.71	132.64	69.96	0		5	Healed Fracture/Vein
27.84	27.84	61.9	62.61	0		4	Foliation/Banding/Bedding
28.41	28.41	153.85	77.28	0		5	Healed Fracture/Vein
29.06	29.06	83.93	50.17	0		4	Foliation/Banding/Bedding
29.53	31.13	328.2	88.44	0	106.15-174.55	2	Partially Open Fracture
29.68	29.68	327.03	79.38	0		5	Healed Fracture/Vein
29.72	30.53	327.07	86.87	0	107.02-143.02	2	Partially Open Fracture
29.84	29.78	135.26	66.44	0	74.11-222.61	5	Healed Fracture/Vein
30.96	30.99	176.95	62.08	0	247.63-11.83	2	Partially Open Fracture
31.55	31.54	342.81	76.66	0	237.20-195.80	2	Partially Open Fracture
31.74	31.71	151.5	67.8	0	44.57-273.17	5	Healed Fracture/Vein
31.94	31.94	151.58	71.74	0		5	Healed Fracture/Vein
32.26	32.23	140.85	73.77	0	29.01-272.91	5	Healed Fracture/Vein
32.37	32.37	145.83	81.52	0		5	Healed Fracture/Vein
33.21	33.43	152.25	79.24	0	288.19-22.69	5	Healed Fracture/Vein
33.76	34.36	316.57	85.98	0	89.04-168.24	2	Partially Open Fracture
34.06	33.89	124.44	75.57	0	86.45-131.45	2	Partially Open Fracture
34.11	34.11	66.02	66.99	0		4	Foliation/Banding/Bedding
35.03	35.03	149.11	83.16	0		4	Foliation/Banding/Bedding
36.37	36.37	145.05	82.63	0		4	Foliation/Banding/Bedding
36.74	36.74	279.42	66.96	0		5	Healed Fracture/Vein
37.17	37.17	81.68	55.67	0		5	Healed Fracture/Vein
37.99	37.99	149.1	70.84	0		4	Foliation/Banding/Bedding
38.48	38.48	158.52	82.74	15.4		1	Open Fracture
38.78	38.84	359.18	72.49	0	66.88-243.28	2	Partially Open Fracture

Feature Depth	Depth	Azimuth	Dip	Aperture	Visible Azimuth Ranges	Type	Features
m	m	deg	deg	mm	deg		
39.26	39	150	79.69	0	107.28-174.78	2	Partially Open Fracture
39.44	39.19	347.64	80.77	0	317.43-40.23	2	Partially Open Fracture
39.48	39.64	119.14	74.71	0	263.62-341.92	2	Partially Open Fracture
40.23	40.46	347.04	78.32	0	122.05-192.25	2	Partially Open Fracture
40.47	40.67	145.26	80.88	0	250.31-15.41	2	Partially Open Fracture
40.56	40.45	185.25	68.55	0	124.94-223.04	2	Partially Open Fracture
41.05	40.97	156.73	66.75	0	127.42-221.02	2	Partially Open Fracture
41.07	41.31	158.27	82.17	0	270.15-49.65	2	Partially Open Fracture
42.01	42.14	346.73	75.64	0	96.80-215.60	2	Partially Open Fracture
42.91	42.69	339.93	82.68	0	282.43-61.03	2	Partially Open Fracture
42.97	42.97	0.15	76.28	0		5	Healed Fracture/Vein
43.09	42.27	342.43	87.29	0	308.62-285.22	2	Partially Open Fracture
43.09	43.27	345.29	78.5	0	104.09-203.99	2	Partially Open Fracture
43.13	43.53	348.24	83.61	0	127.61-195.11	2	Partially Open Fracture
43.41	43.06	159.2	84.13	0	95.50-211.60	2	Partially Open Fracture
43.71	43.89	157.4	76.81	0	299.94-29.94	2	Partially Open Fracture
43.77	43.74	155.92	74.7	0	293.71-258.61	2	Partially Open Fracture
44.19	44.19	118.02	73.9	0		5	Healed Fracture/Vein
44.3	44.43	115.83	69.9	0	277.08-314.88	2	Partially Open Fracture
44.68	44.55	157.78	73.68	0	102.02-205.52	5	Healed Fracture/Vein
45.06	45.06	156.23	76.72	0		4	Foliation/Banding/Bedding
45.44	45.44	158.15	76.95	0		4	Foliation/Banding/Bedding
46.55	46.55	314.2	56.04	0		5	Healed Fracture/Vein
46.66	46.67	307.05	41.38	0	151.95-240.15	2	Partially Open Fracture
46.76	46.76	330.42	51.66	0		5	Healed Fracture/Vein
47.24	47.24	329.35	67.97	0		5	Healed Fracture/Vein
47.26	47.26	323.99	84.56	0		4	Foliation/Banding/Bedding
47.68	47.68	259.04	49.22	0		5	Healed Fracture/Vein
47.8	47.8	345.93	85.91	0		4	Foliation/Banding/Bedding
48.34	48.34	333.46	85.69	0		4	Foliation/Banding/Bedding
48.39	48.39	338	79.01	0		5	Healed Fracture/Vein
48.4	48.4	334.85	79.25	0		5	Healed Fracture/Vein
49.15	49.15	358.97	79.95	0		4	Foliation/Banding/Bedding
49.58	49.52	337.78	73.58	0	265.13-232.73	2	Partially Open Fracture
49.8	49.8	334.25	71.97	0		4	Foliation/Banding/Bedding
50.18	50.18	331.66	56.03	0		4	Foliation/Banding/Bedding
50.52	50.52	294.29	13.43	0		4	Foliation/Banding/Bedding
50.68	50.68	352.44	35.6	0		5	Healed Fracture/Vein
50.68	50.68	342.32	33.37	0		5	Healed Fracture/Vein
50.73	50.73	336.49	30.09	0		5	Healed Fracture/Vein
50.81	50.81	343.46	29.04	0		5	Healed Fracture/Vein
50.91	50.91	327.43	28.8	0		5	Healed Fracture/Vein
50.99	50.99	357.41	41.23	0		5	Healed Fracture/Vein
51	51	358.53	41.52	0		5	Healed Fracture/Vein
51.25	51.25	318.61	20.5	0		5	Healed Fracture/Vein
51.37	51.37	333.26	44.5	0		5	Healed Fracture/Vein
51.37	51.37	324.98	36.16	0		5	Healed Fracture/Vein
51.56	51.56	345.84	10.91	0		4	Foliation/Banding/Bedding
51.56	51.56	10.84	7.12	0		5	Healed Fracture/Vein

Feature Depth	Depth	Azimuth	Dip	Aperture	Visible Azimuth Ranges	Type	Features
m	m	deg	deg	mm	deg		
51.75	51.75	335.33	26.05	0		5	Healed Fracture/Vein
51.87	51.87	344.82	53.48	0		5	Healed Fracture/Vein
52.11	52.11	334.89	46.31	0		5	Healed Fracture/Vein
52.41	52.41	42.97	76.4	20.65		5	Healed Fracture/Vein
52.74	52.74	349.98	18.03	0		5	Healed Fracture/Vein
52.86	52.86	354.39	26.11	0		5	Healed Fracture/Vein
53	53	345.02	34.01	0		5	Healed Fracture/Vein
53.36	53.36	319.35	66.98	0		5	Healed Fracture/Vein
53.65	53.65	305.05	7.96	0		5	Healed Fracture/Vein
53.82	53.82	113.31	74.46	0		5	Healed Fracture/Vein
54.12	54.12	299.48	31.55	0		5	Healed Fracture/Vein
54.24	54.24	295.76	66.66	0		5	Healed Fracture/Vein
54.33	54.33	316.06	37.94	0		5	Healed Fracture/Vein
54.33	54.33	315.26	34.77	0		5	Healed Fracture/Vein
54.41	54.41	327.84	17.6	0		5	Healed Fracture/Vein
54.45	54.45	303.02	30.18	0		5	Healed Fracture/Vein
54.51	54.51	185.2	23.55	0		4	Foliation/Banding/Bedding
54.65	54.65	286.46	41.89	0		5	Healed Fracture/Vein
54.66	54.66	287.85	40.07	0		5	Healed Fracture/Vein
54.67	54.67	66.63	60.15	0		5	Healed Fracture/Vein

BHUA_16

SMEC - Pioneer-Burdekin

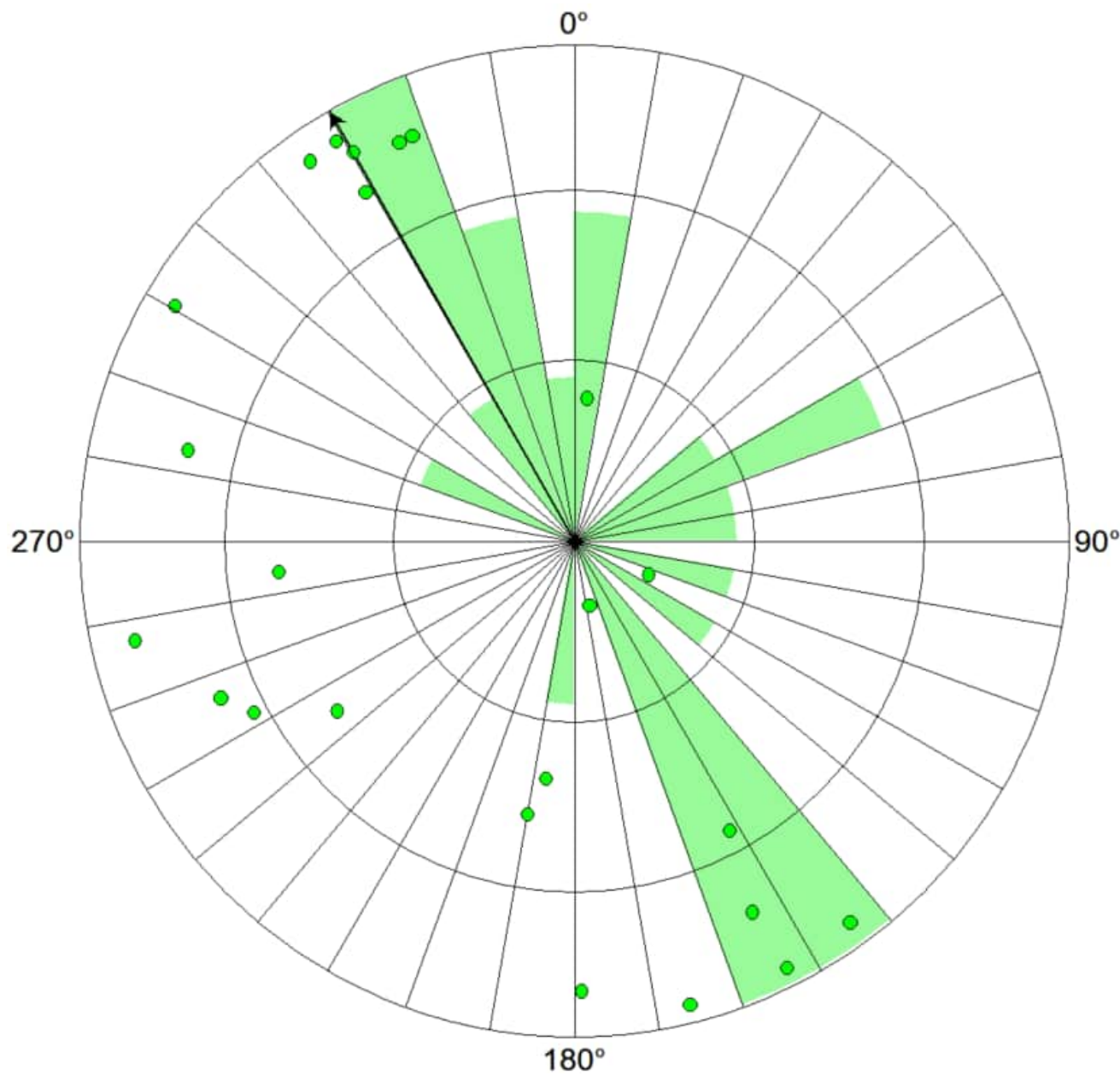
**Acoustic and Optical Televiewer image log Schmidt
Stereonet evaluation for interpreted log interval**

Log Date: 24 July 2023

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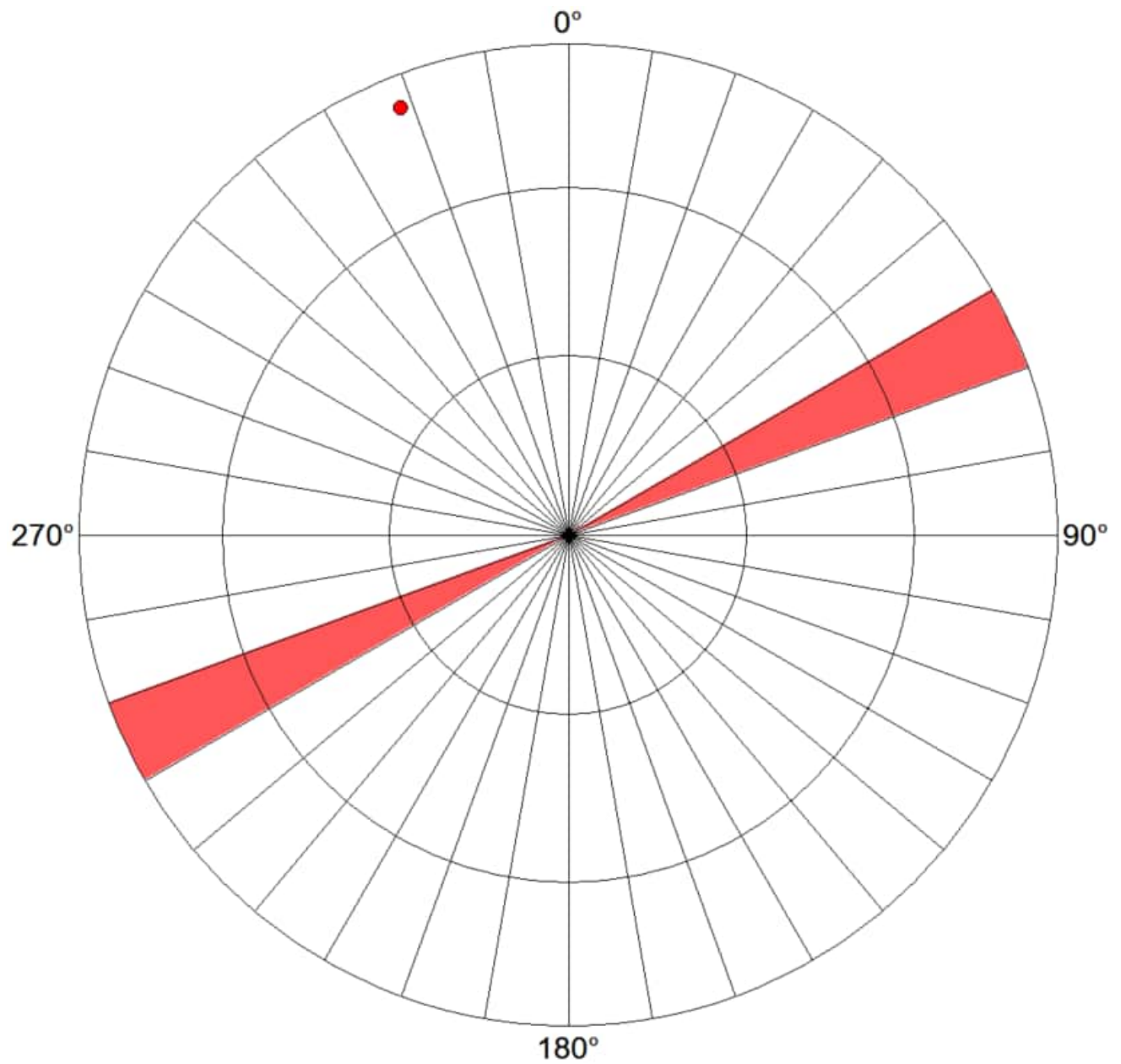
FOLIATIONS – 16.5 TO 54.8 M



	Counts	Dip [deg]	Azimuth [deg]	Strike [deg]
Mean	24	88.13	330.25	60.25 - 240.25

Foliations: Scattered dip azimuth directions with a preference in the SSE and NNW dip azimuth directions

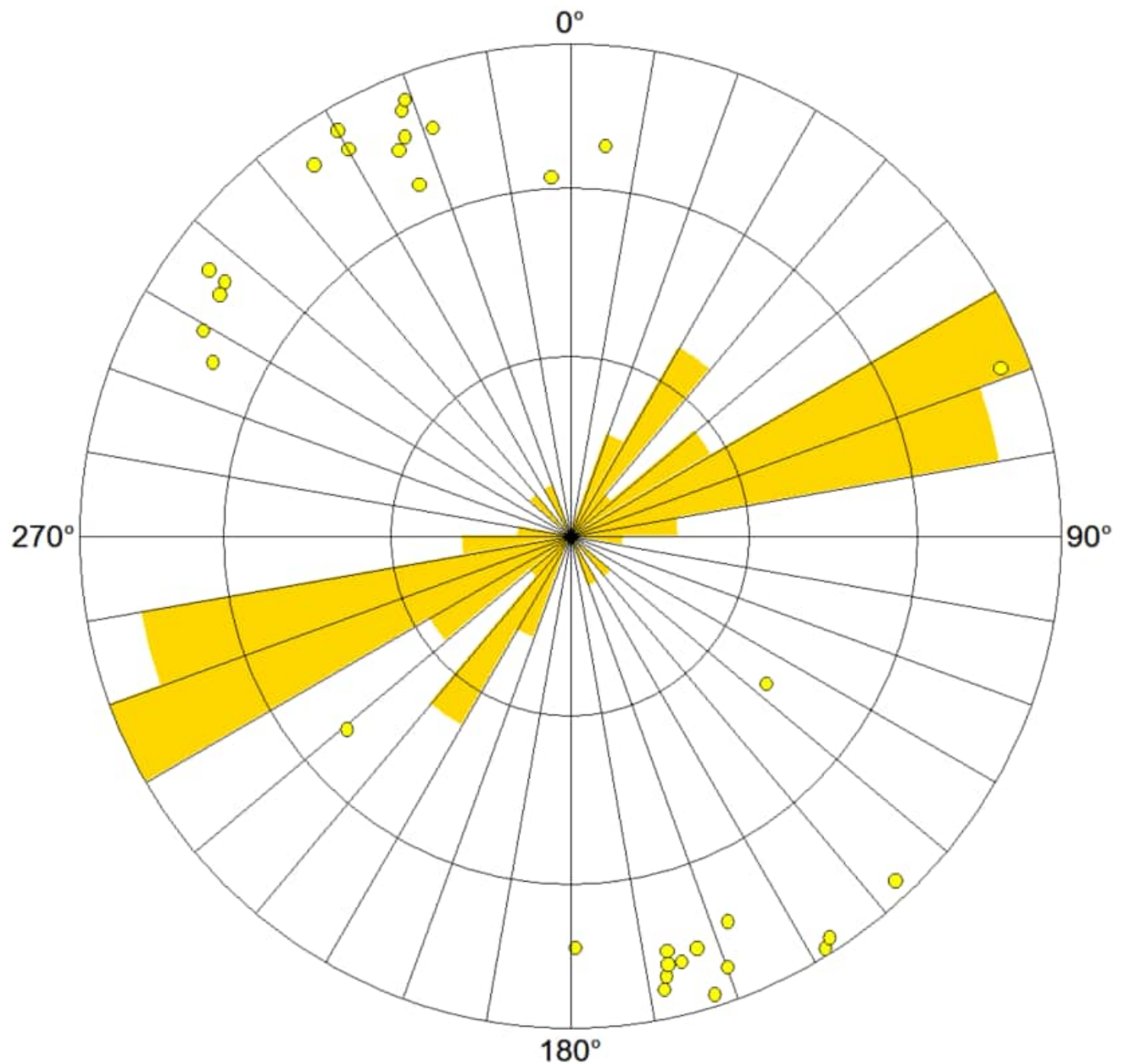
OPEN FRACTURES – 16.5 TO 54.8 M



	Counts	Dip [deg]	Azimuth [deg]	Strike [deg]
Mean	1	82.74	158.52	68.52 - 248.52

Open Fractures: ENE to WSW strike direction (caution: just one pick)

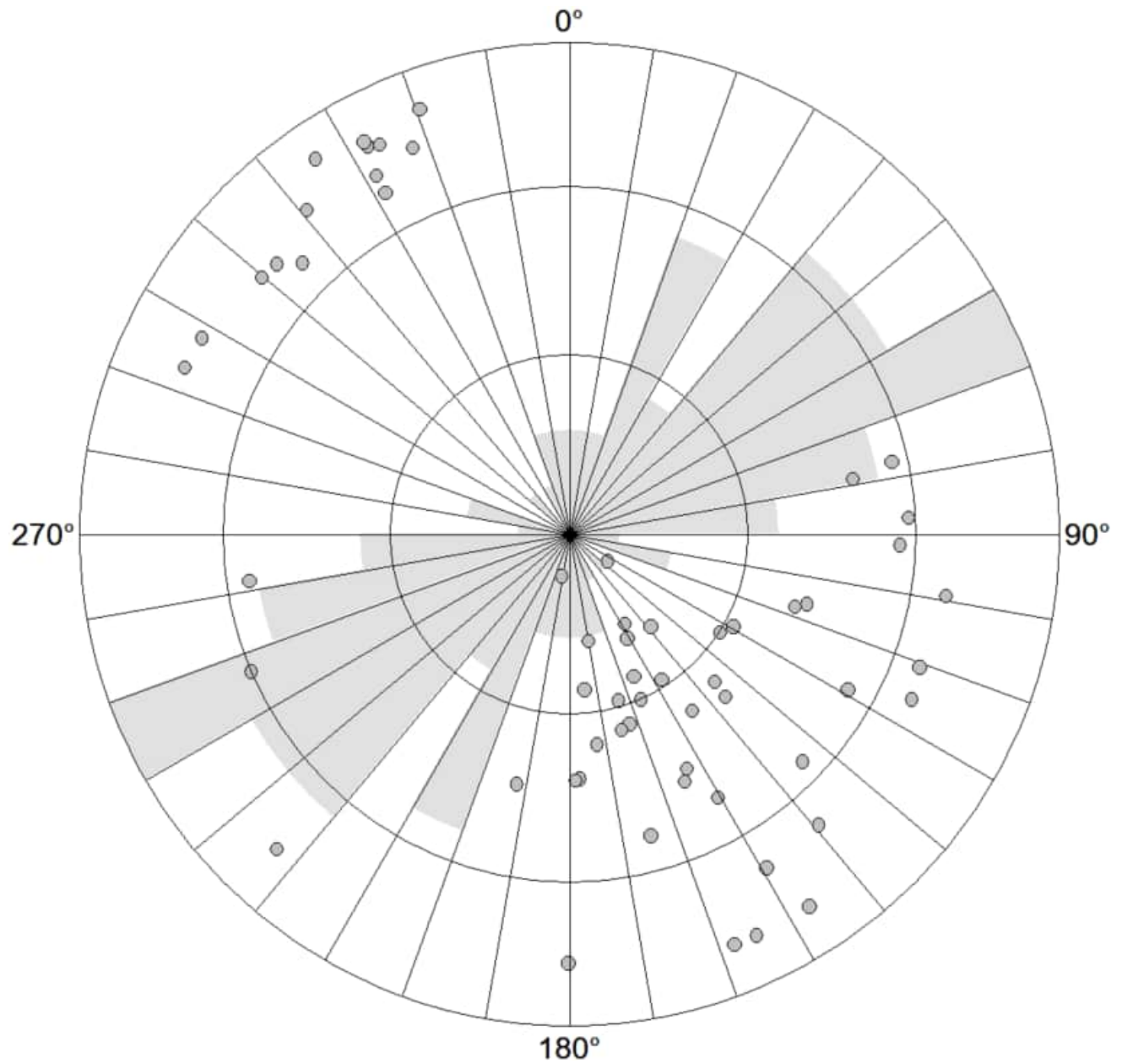
PARTIAL OPEN FRACTURES – 16.5 TO 54.8 M



	Counts	Dip [deg]	Azimuth [deg]	Strike [deg]
Mean	32	87.79	153.86	63.86 - 243.86

Partial Open Fractures: Scattered strike directions with a preference in the ENE to WSW strike direction

HEALED FRACTURES AND VEINS – 16.5 TO 54.8 M



	Counts	Dip [deg]	Azimuth [deg]	Strike [deg]
Mean	60	50.49	322.58	52.58 - 232.58

Healed Fractures and Veins: Scattered strike directions with a preference in the ENE to WSW strike direction



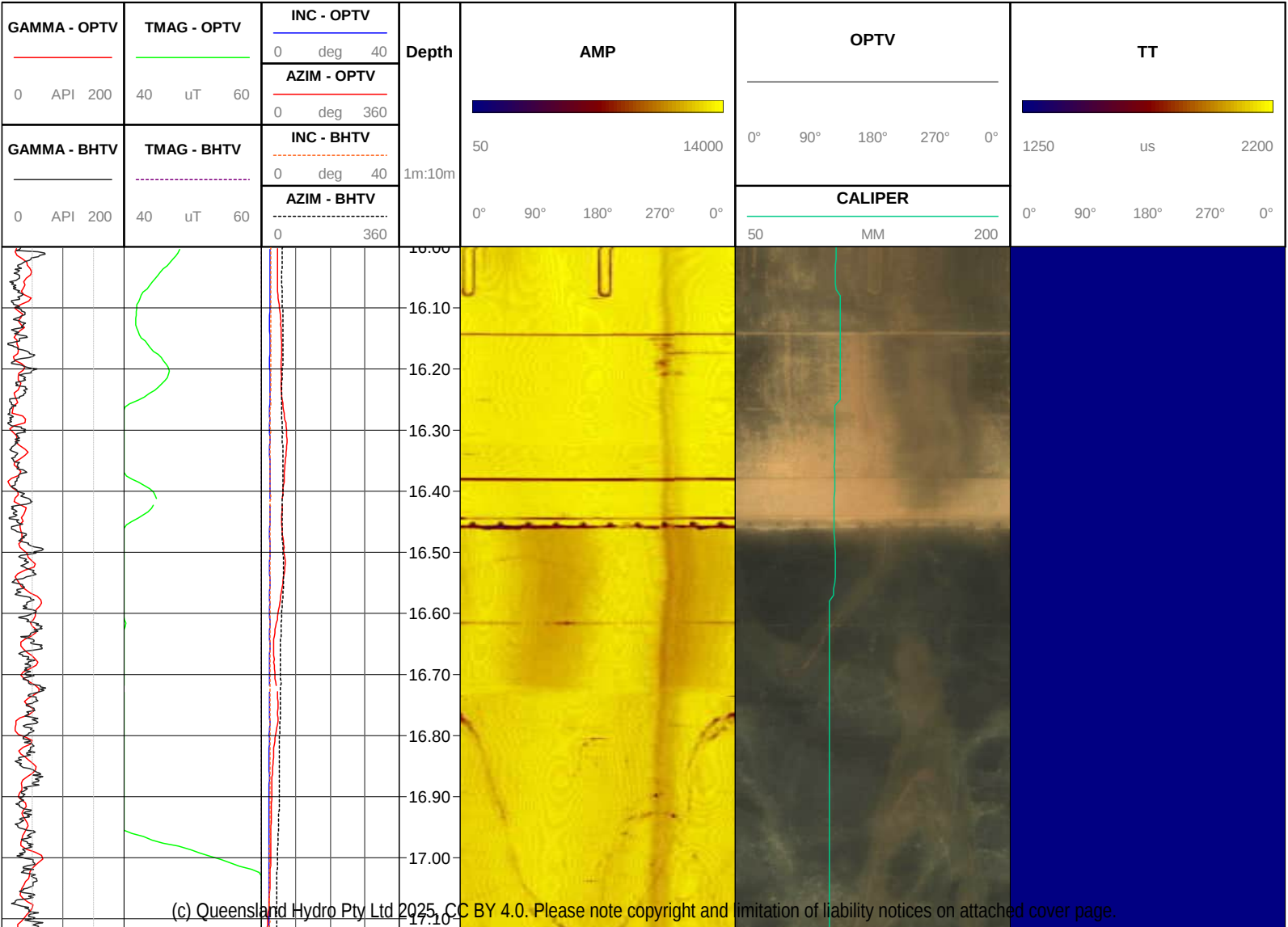
OPTV & BHTV LOG

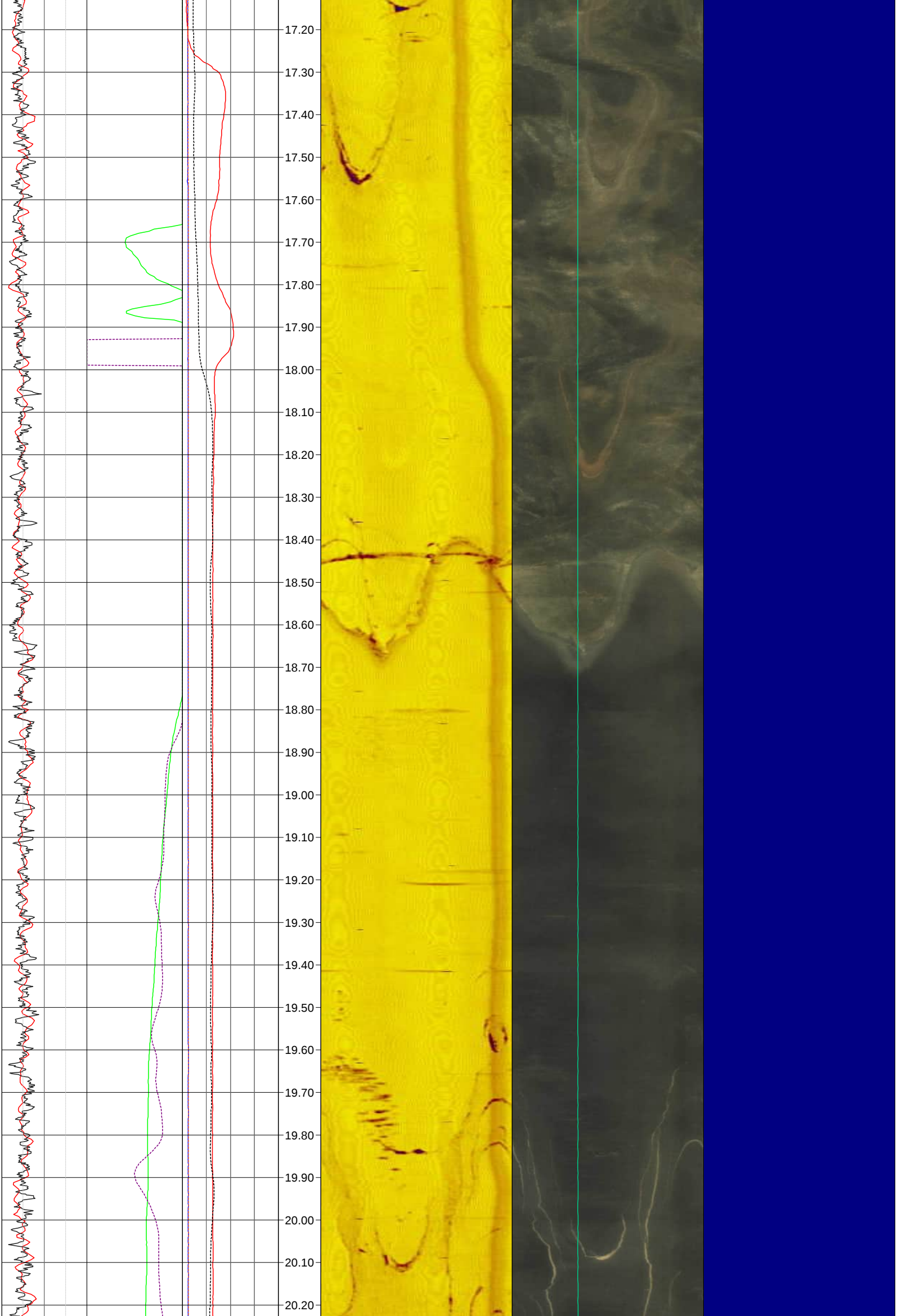
BHUA_16

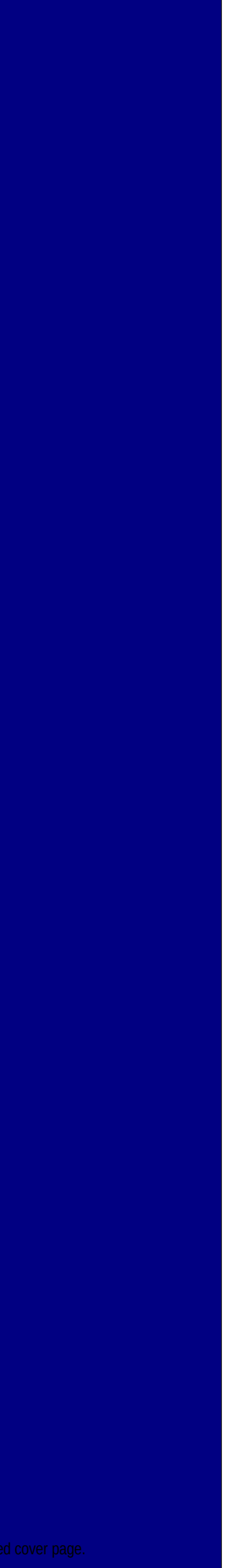
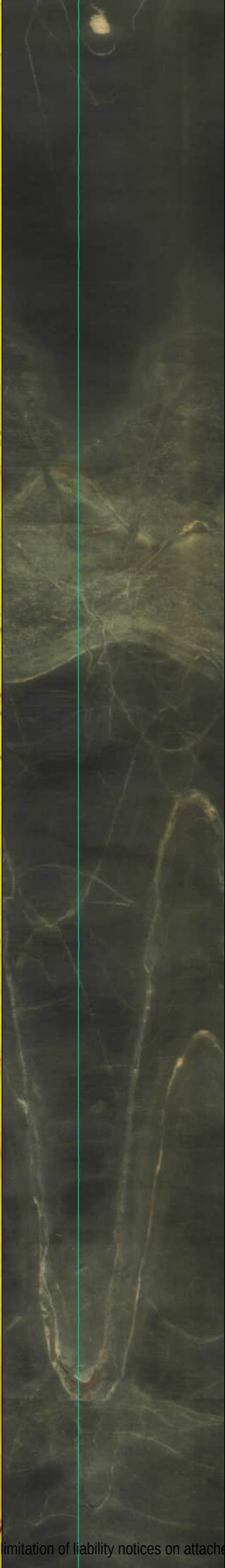
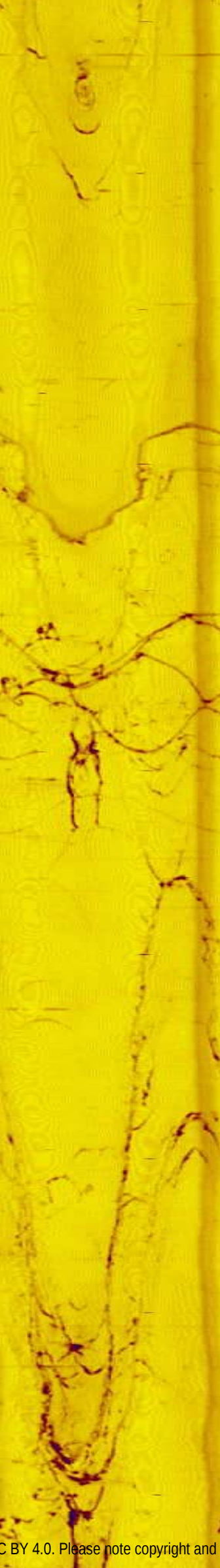
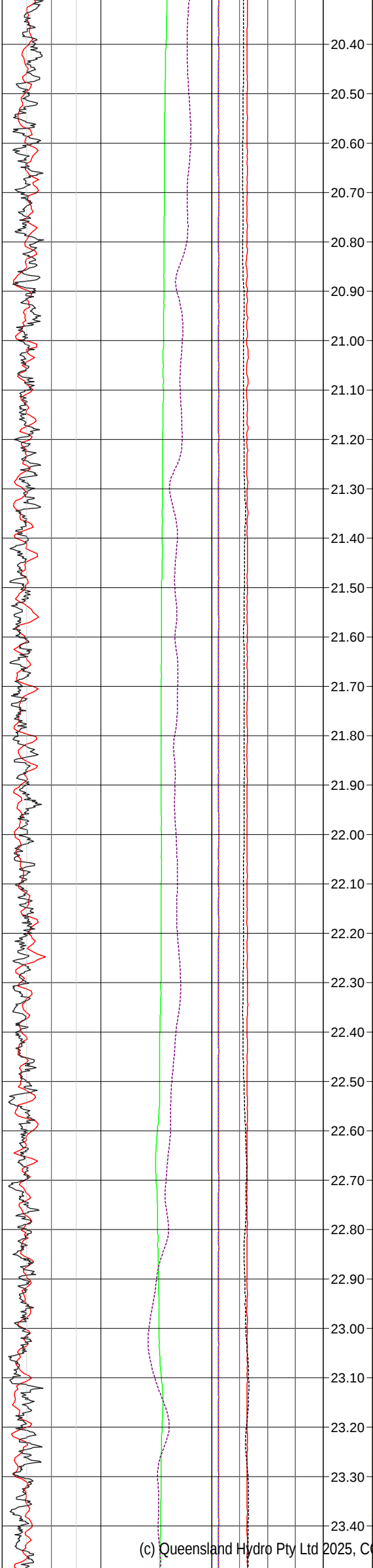
WELL	BHUA_16	DRILL DEPTH	55m	DATE	24/07/2023
FIELD	EUNGELLA	BIT SIZE	96mm	CLIENT REP	ROB CANE
LOCATION	PIONEER-BURDEKIN	CASING WEIGHT	STEEL	ENGINEER	JRT
UWI	SV013	CASING SIZE	110mm	EASTING	659812
COUNTRY	AUSTRALIA	CASING BOTTOM	16m	NORTHING	7666574

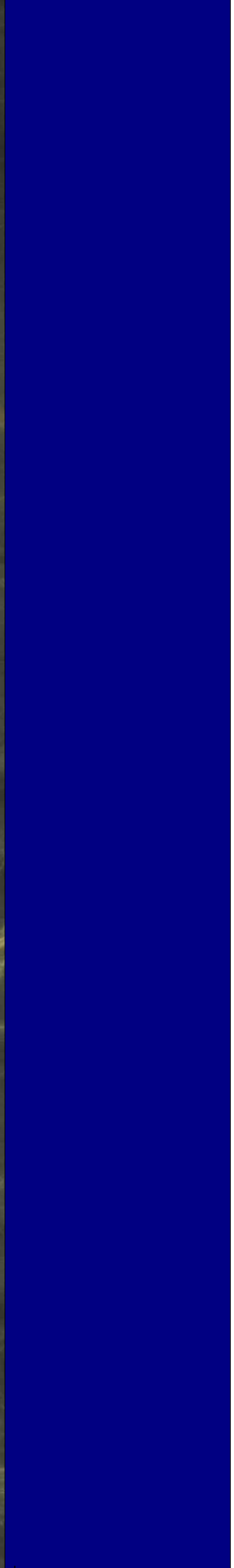
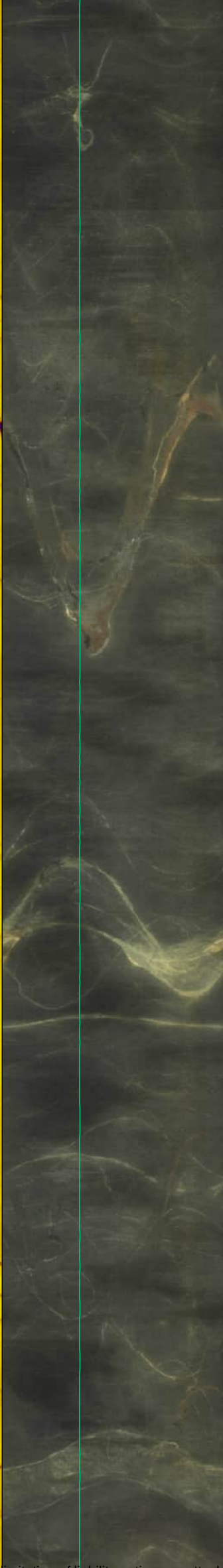
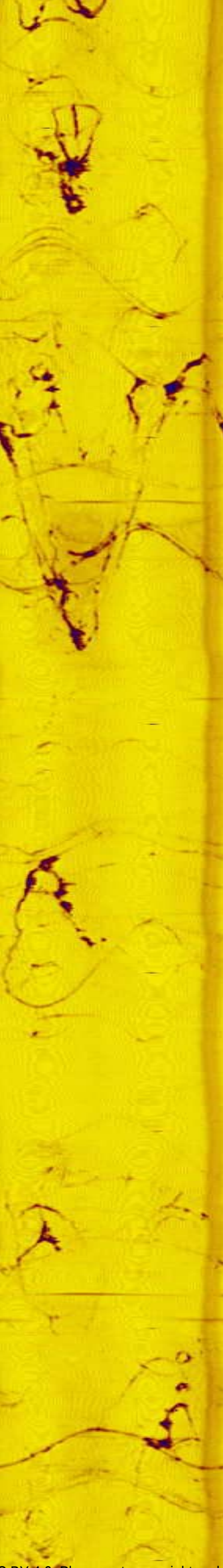
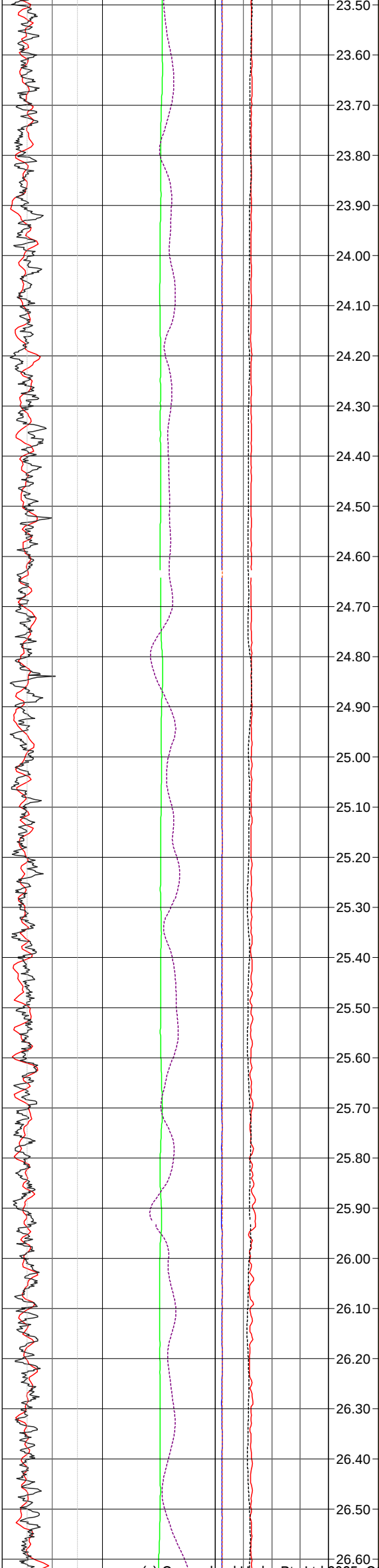
TELEVIEWER LOGS			COMMENTS		
GAMMA	Televiewer Gamma RayINC	Borehole Inclination (0 deg = Vertical Down)	Vis = 5 - All image log data is oriented to true north. The applied magnetic declination correction is 8.12 degrees.		
OPTV	OPTV RGB Image	AZIM Borehole Magnetic Azimuth			
AMP	BHTV Amplitude	HGDELTA Potential Field			
TT	BHTV Travel Time	TMAG Televiewer Magnetic Field			

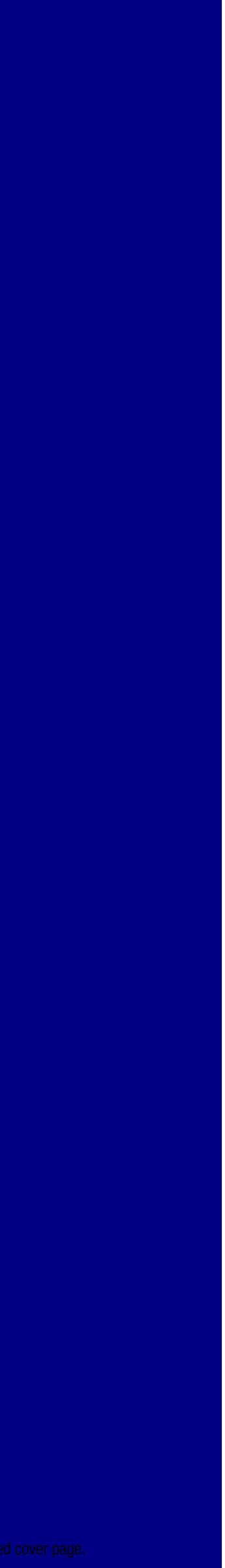
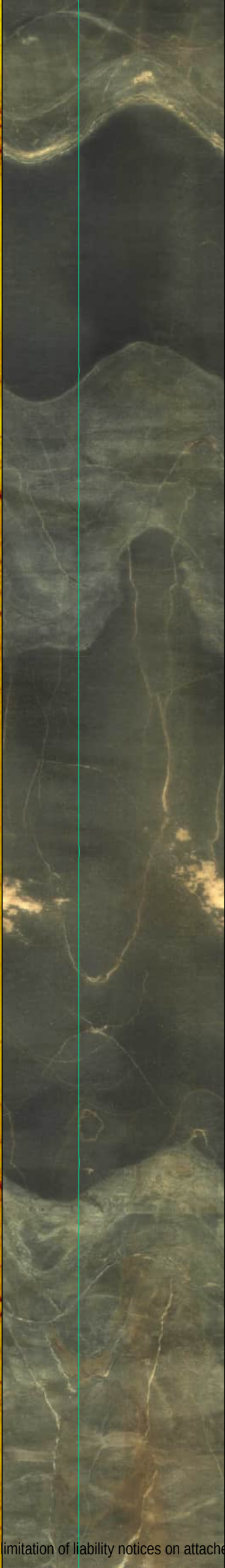
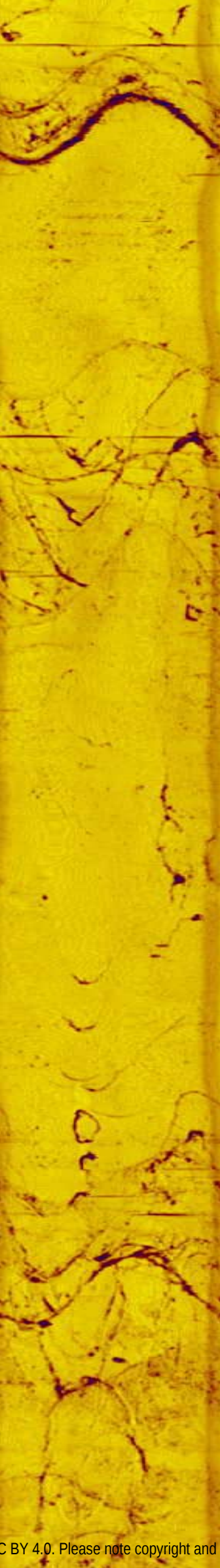
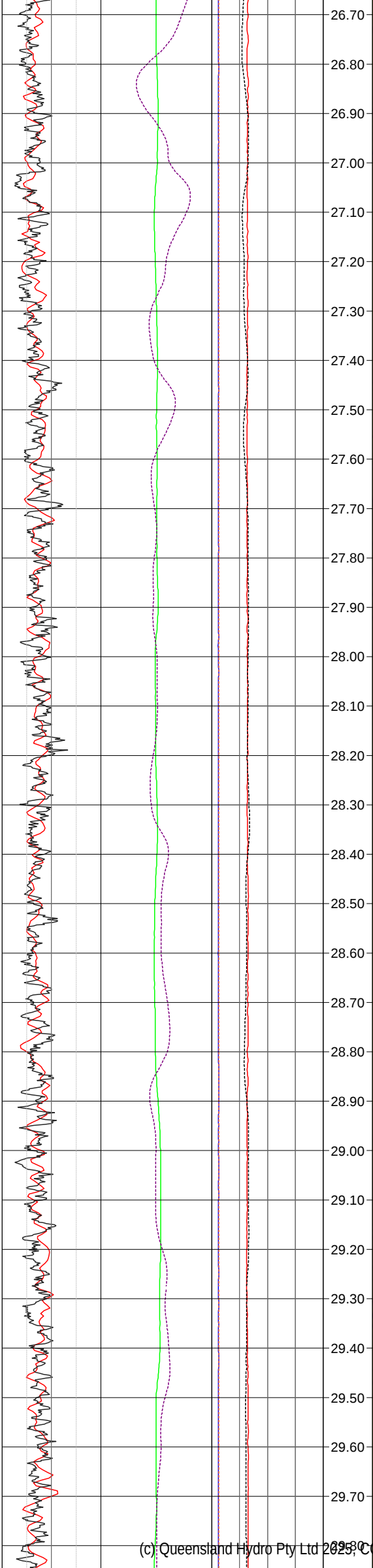
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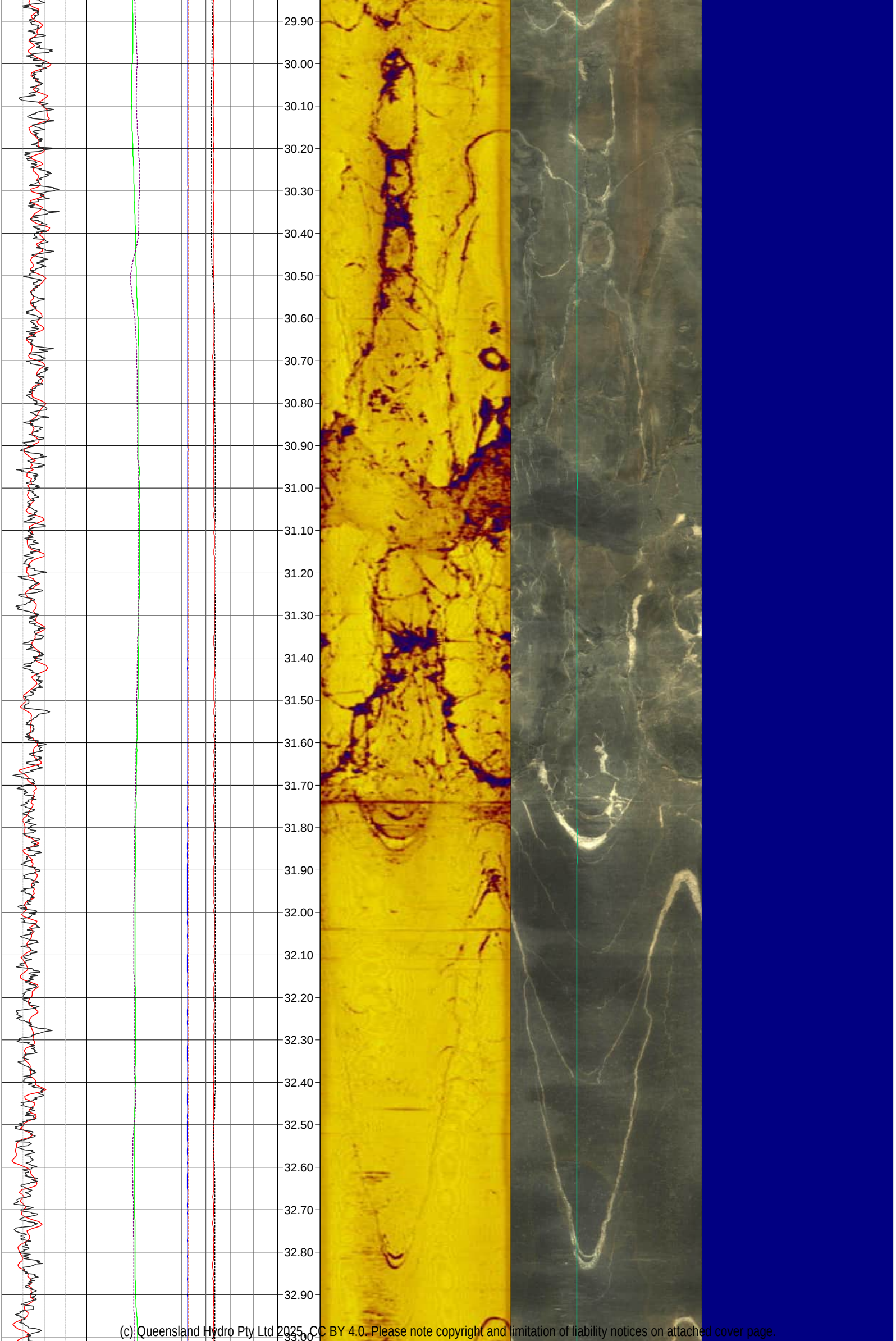


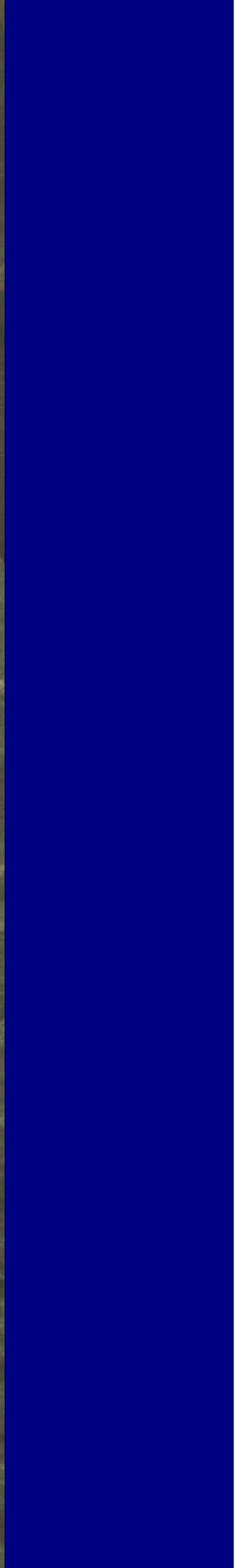
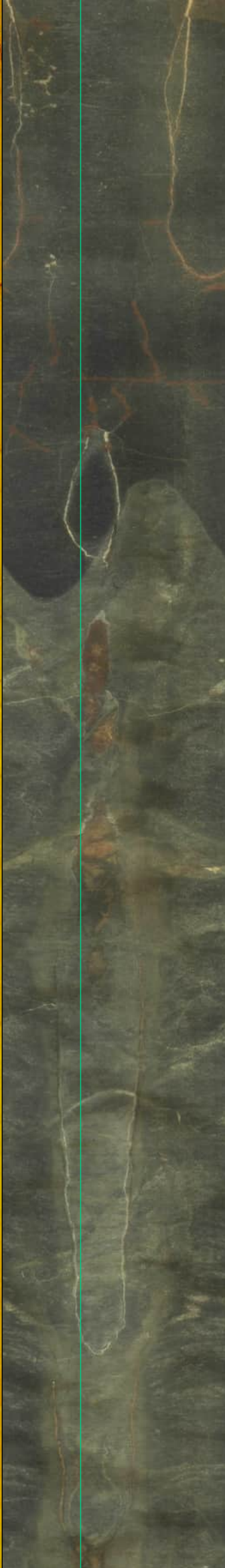
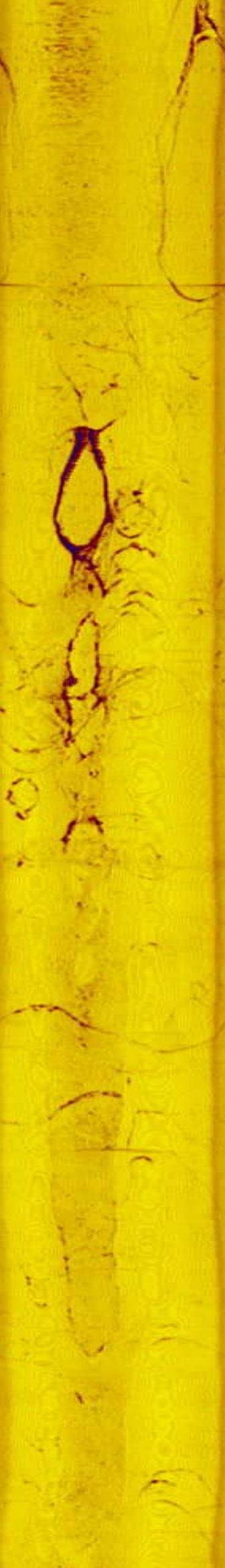
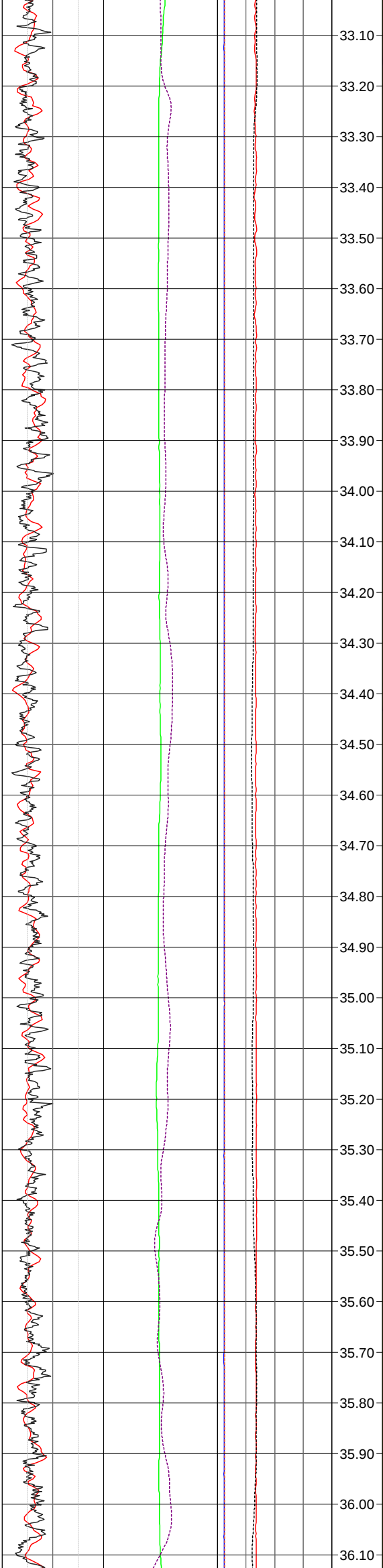


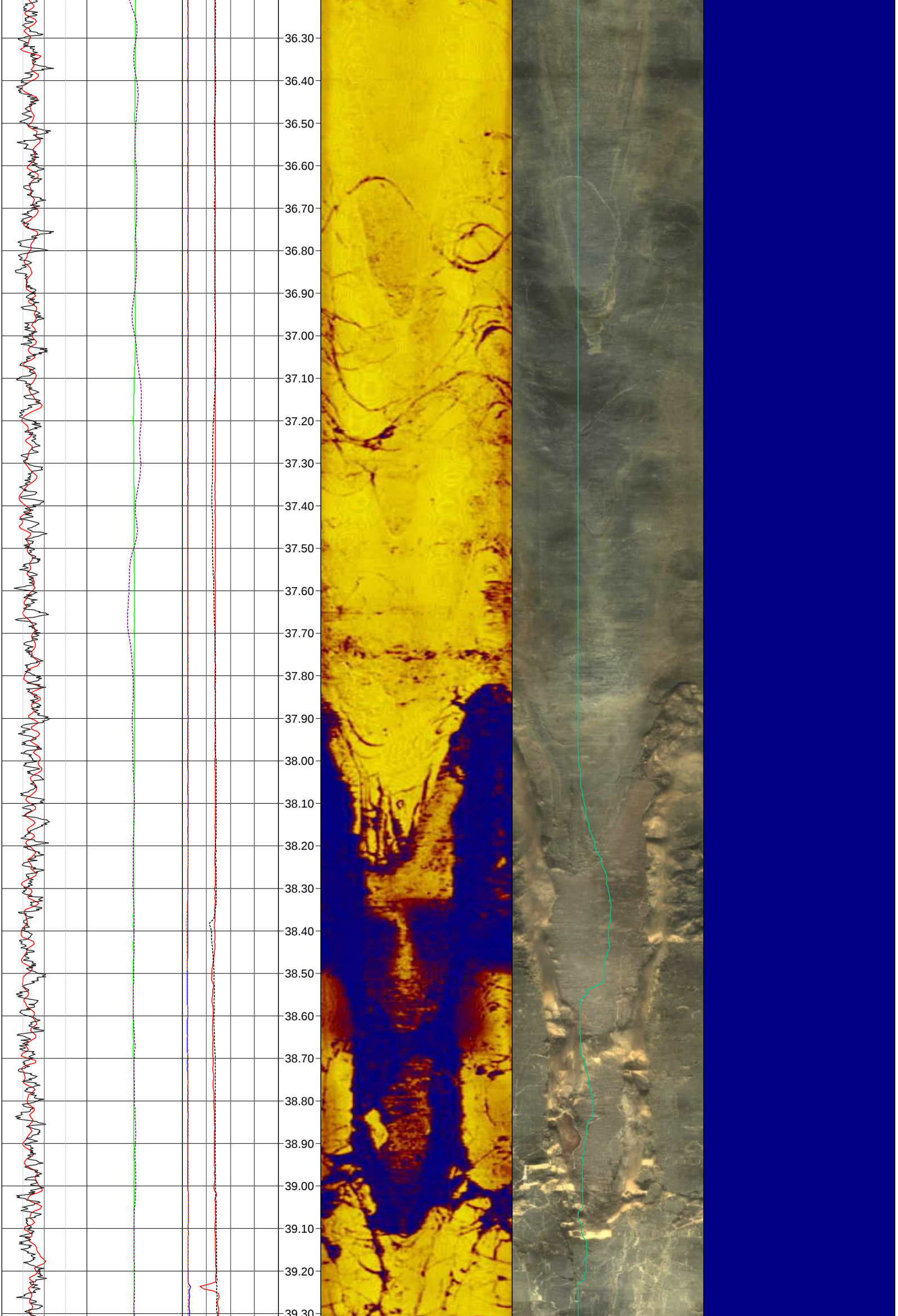


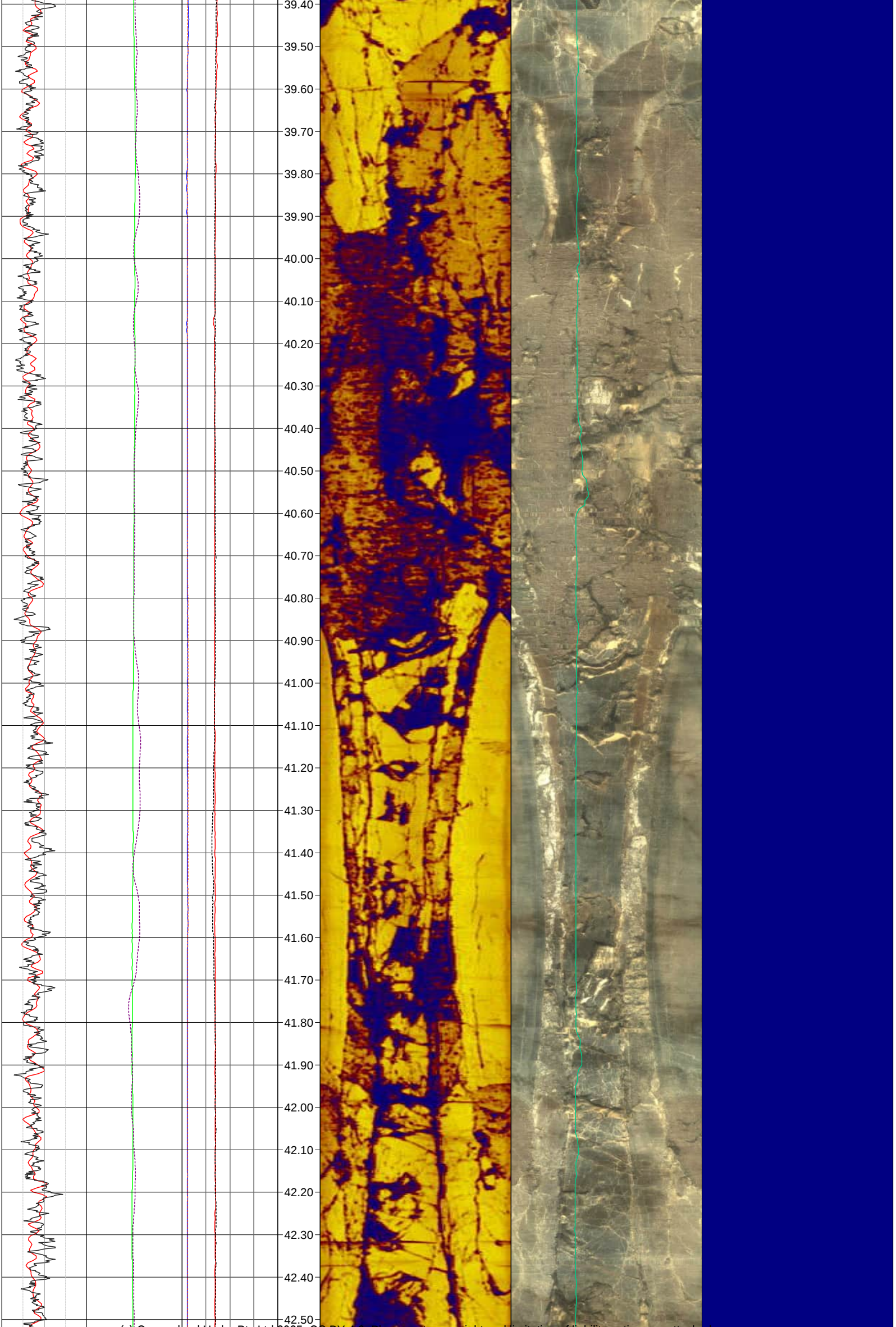


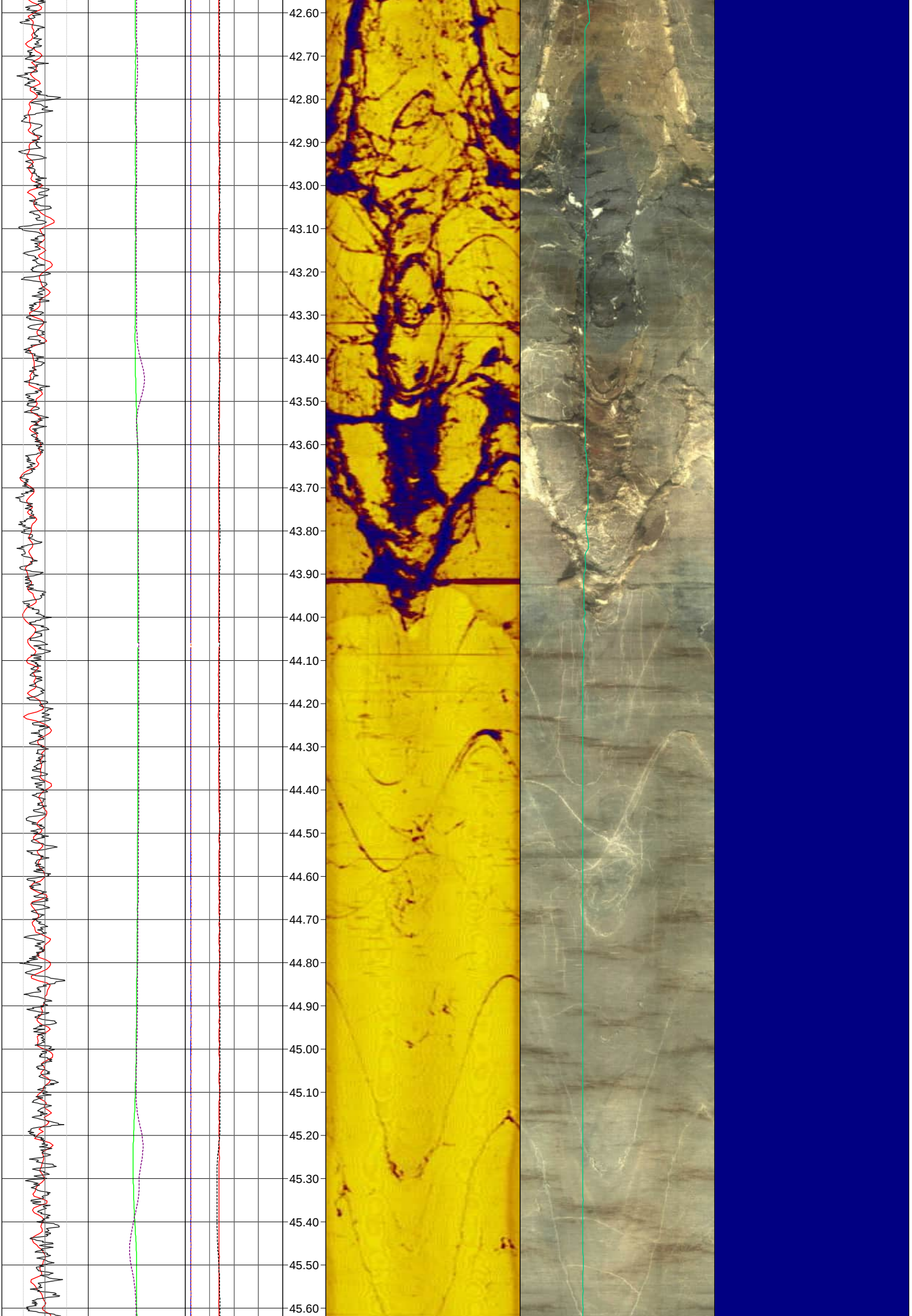


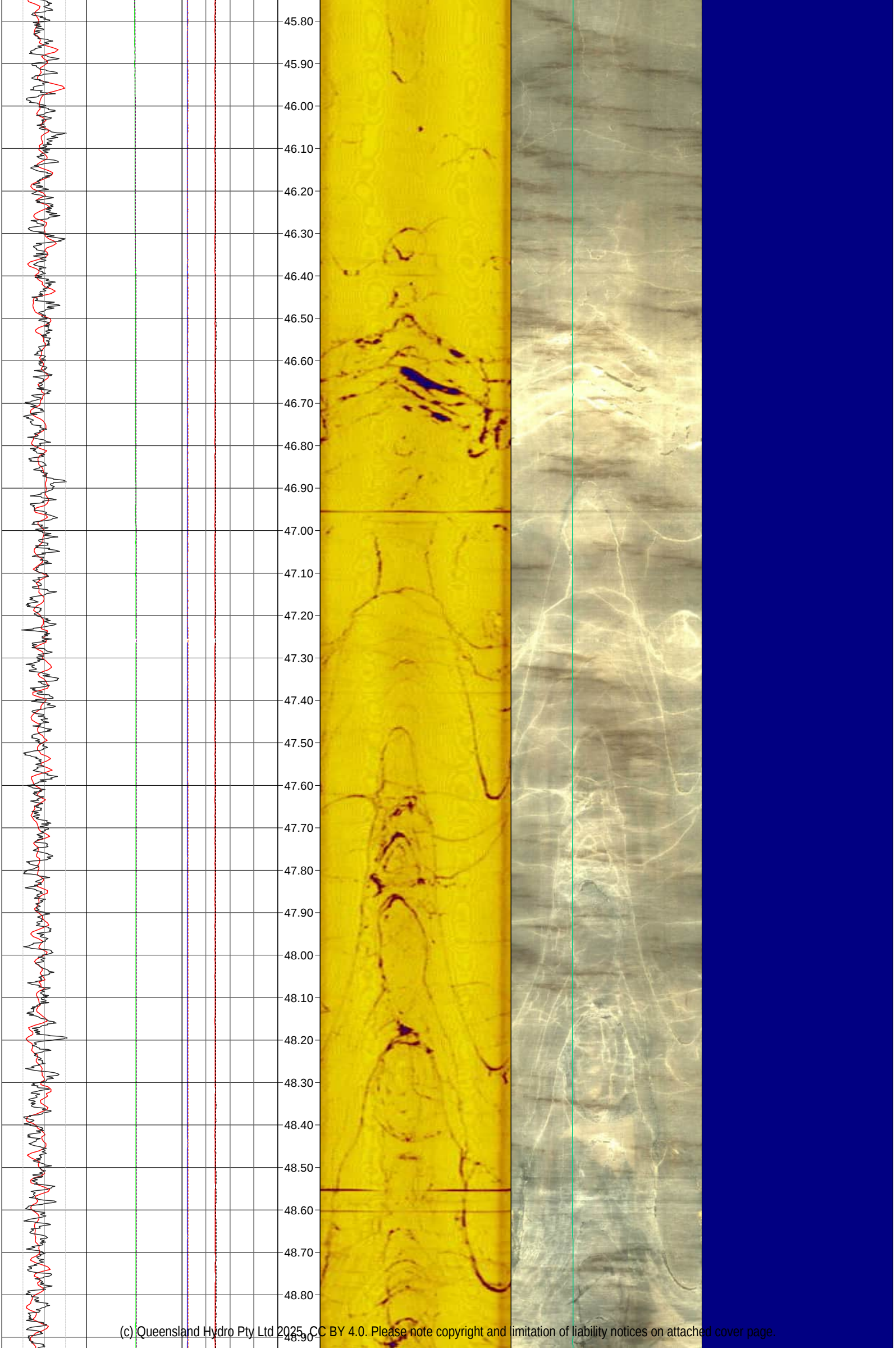


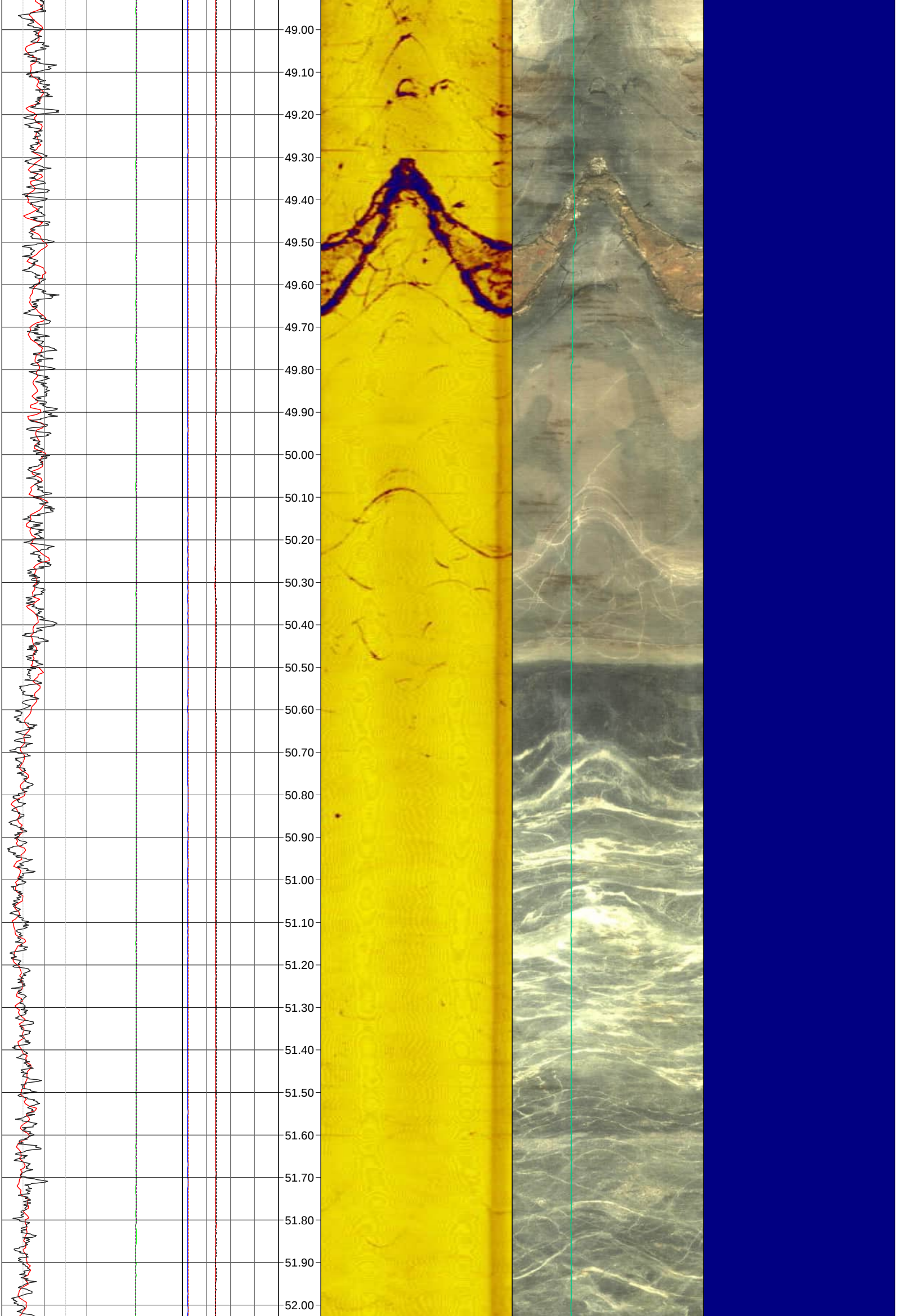


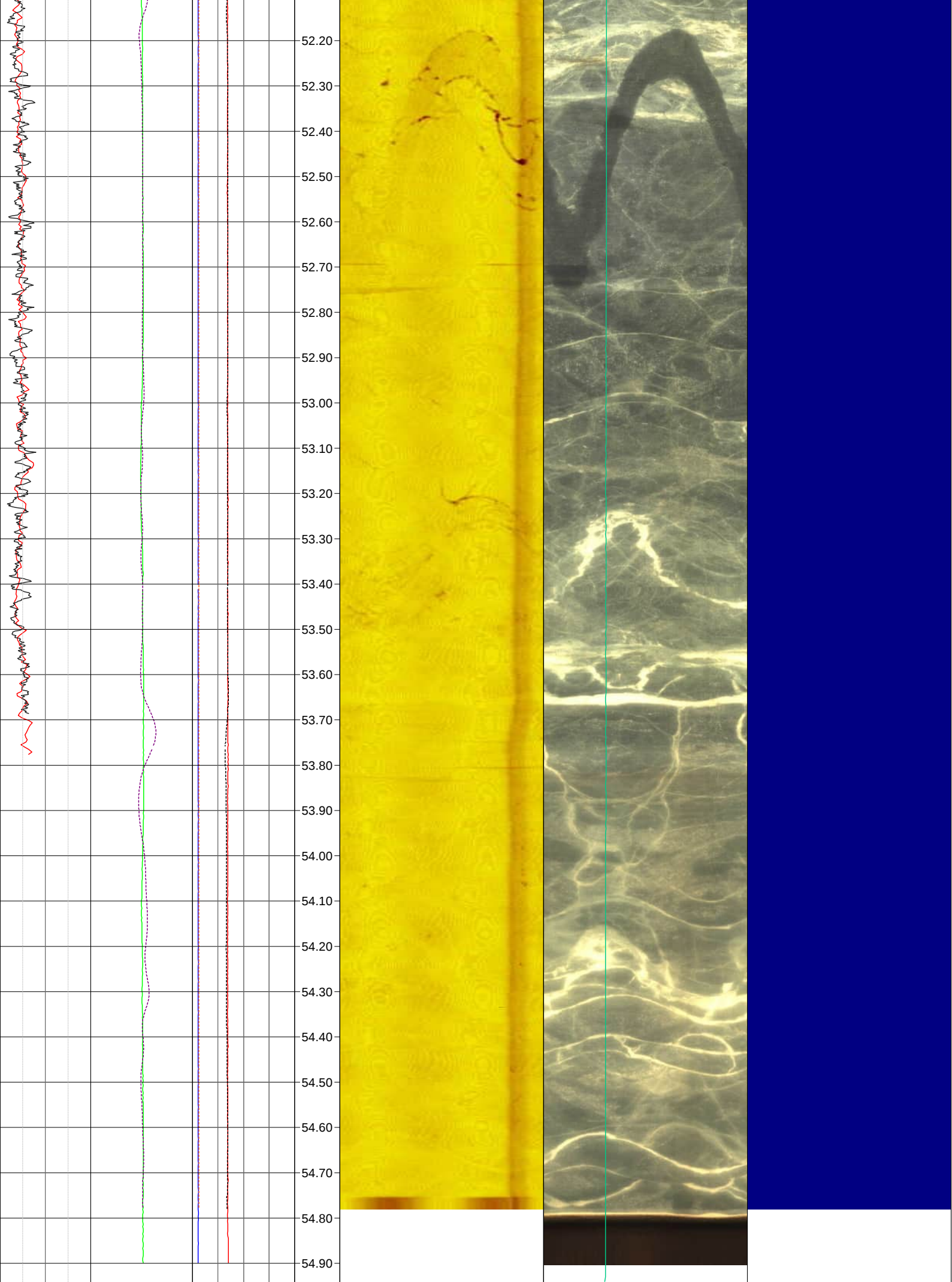












0 API 200	40 uT 60	0 360	1m:10m	0° 90° 180° 270° 0°	50 MM 200	0° 90° 180° 270° 0°
GAMMA - BHTV	TMAG - BHTV	AZIM - BHTV		CALIPER		
		0 deg 40		50 14000	1250 us 2200	
0 API 200	40 uT 60	0 360	Depth	AMP	OPTV	TT
		0 deg 40				

GAMMA - OPTV	TMAG - OPTV	INC - OPTV			ST TV	
WELL BHUA_16			LOCATION PIONEER-BURDEKIN			DATE 24/07/2023
FIELD EUNGELLA			DRILL DEPTH 55m			ENGINEER JRT

MULTI-RES LOG

BHUA_16

COMPANY WELL	SMEC BHUA_16	FIELD LOCATION	PIONEER_BURDEKIN EUNGELLA	STATE COUNTRY	QLD AUSTRALIA
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LOCATION: EUNGELLA FIELD: PIONEER_BURDEKIN STATE: QLD WELL: BHUA_16 COMPANY: SMEC	LOG MEASURED FROM		GL	ELEVATIONS:		OTHER SERVICES:	
	DRILLING MEASURED FROM		GL	KB		1.	
	PERMANENT DATUM			DF		2.	
	PERMANENT DATUM ELEVATION			GL		3.	
	LICENSE	SECTION	TOWNSHIP	RANGE	MAGNETIC DECLINATION		
					8.12deg		

DATE	24-07-2023			RECORDED BY	DTH		
TIME	11-32			WITNESSED BY			
RUN NUMBER	1			LOGGING UNIT	V013		
DEPTH-DRILLER	364m			RIG NUMBER			
DEPTH-LOGGER	54.94m			TOOL TYPE	9057A		
BIT SIZE	96mm			TOOL SERIAL NO.	361		
CASING TYPE	STEEL			EASTING	659812		
CASING ID	100mm			NORTHING	7666574		
CASING BOTTOM	16.0m			SAMPLE INT.	.01m		
FLUID TYPE	WATER			LOG DIRECTION	U		
TRUCK CAL NO.	0.09787			FEET OR METER	M		
WATER LEVEL				SOURCE TYPE		SOURCE ID	

LOGGER COMMENTS:

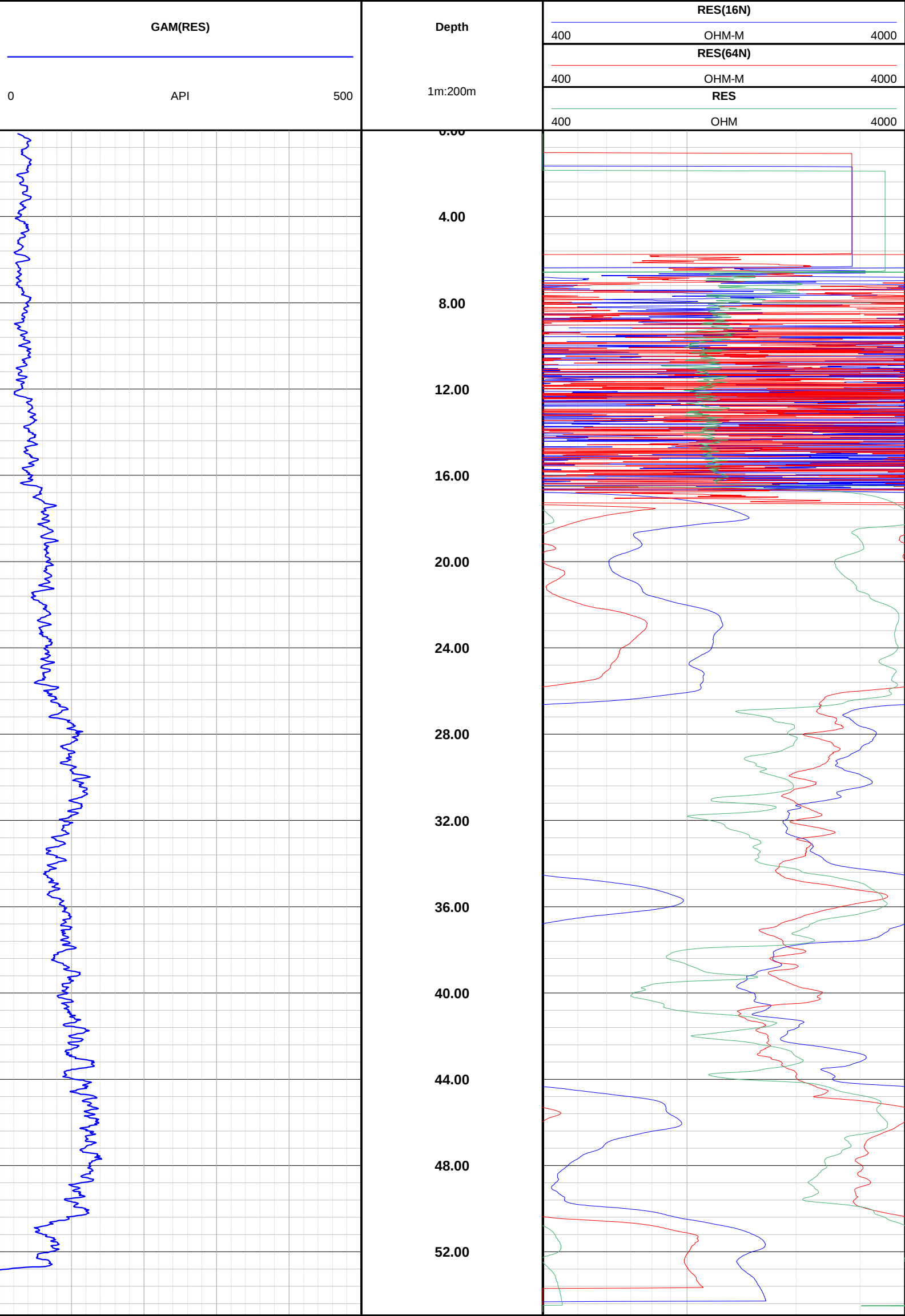
1.

2.

3.

MNEMONICS	
GAM(RES)	NATURAL GAMMA FROM MULTI-RES TOOL
RES(16N)	16" NORMAL RESISTIVITY
RES(64N)	64" NORMAL RESISTIVITY
RES	SINGLE POINT RESISTIVITY

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0	AP1	300	1m:200m	RES	400	OHM-M	4000
				RES(64N)			
GAM(RES)				Depth	400	OHM-M	4000
					RES(16N)		

DEPTH SCALE 1:200

	3-ARM LOG BHUA_16
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COMPANY WELL	SMEC BHUA_16	FIELD LOCATION	PIONEER-BURDEKIN EUNGELLA	STATE COUNTRY	QLD AUSTRALIA
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LOCATION: EUNGELLA FIELD: PIONEER-BURDEKIN STATE: QLD WELL: BHUA_16 COMPANY: SMEC	LOG MEASURED FROM		GL	ELEVATIONS:		OTHER SERVICES:			
	DRILLING MEASURED FROM		GL	KB		1.			
	PERMANENT DATUM			DF		2.			
	PERMANENT DATUM ELEVATION			GL		3.			
	LICENSE		SECTION		TOWNSHIP		RANGE		MAGNETIC DECLINATION
									8.12deg

DATE	24-07-2023			RECORDED BY	DTH		
TIME	11-32			WITNESSED BY			
RUN NUMBER	1			LOGGING UNIT	V013		
DEPTH-DRILLER	364m			RIG NUMBER			
DEPTH-LOGGER	54.94m			TOOL TYPE	6074A		
BIT SIZE	96mm			TOOL SERIAL NO.	2796		
CASING TYPE	STEEL			EASTING	659812		
CASING ID	100mm			NORTHING	7666574		
CASING BOTTOM	16.0m			SAMPLE INT.	.01m		
FLUID TYPE	WATER			LOG DIRECTION	U		
TRUCK CAL NO.	0.09787			FEET OR METER	M		
WATER LEVEL				SOURCE TYPE		SOURCE ID	

LOGGER COMMENTS:

1.

2.

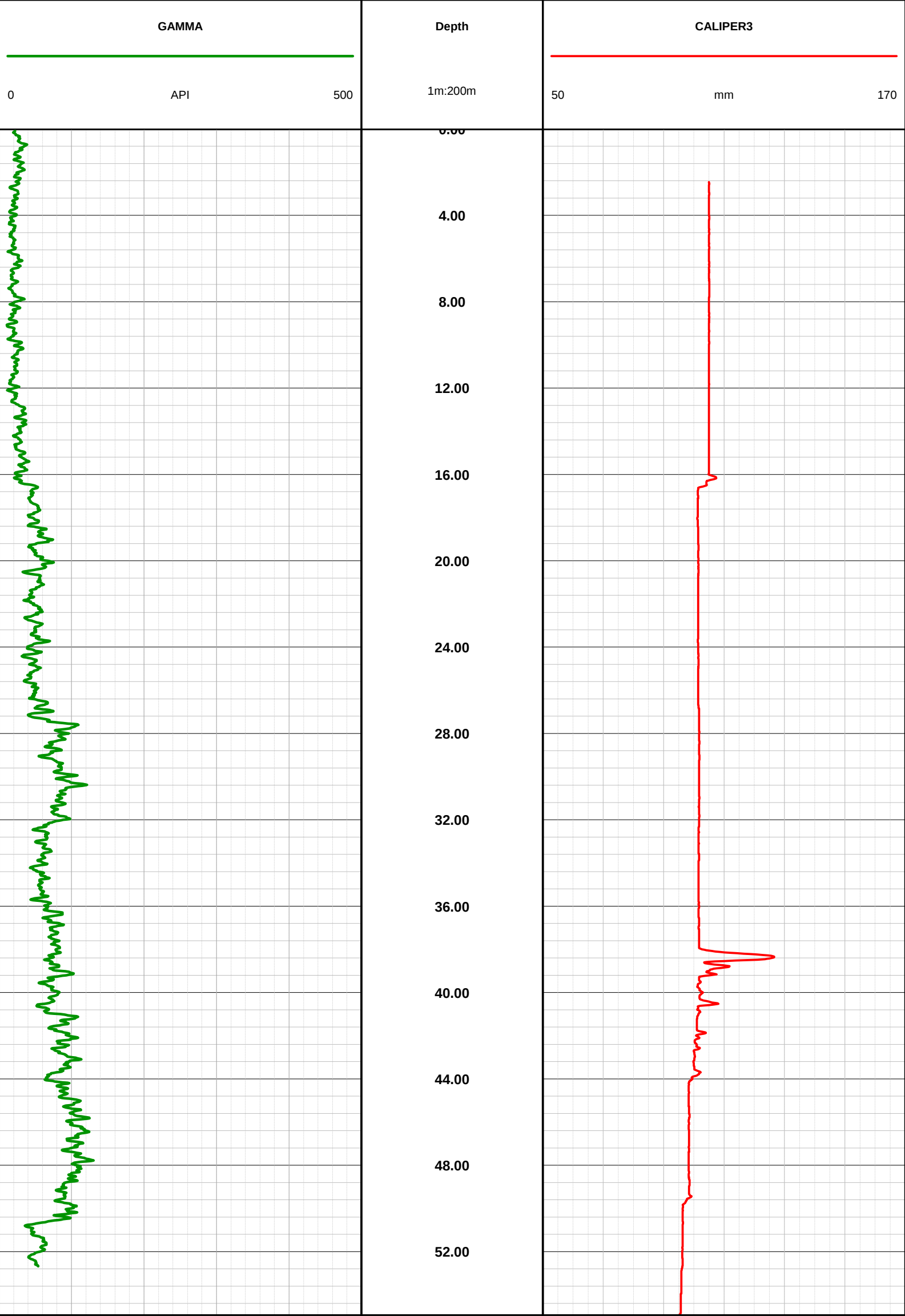
3.

MNEMONICS

GAMMA CALIPER3	NATURAL GAMMA FROM 3-ARM TOOL MECHANICAL CALIPER FROM 3-ARM CALIPER
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DEPTH SCALE 1:200



GAMMA	Depth	CALIPER3
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DEPTH SCALE 1:200

				VERTICALITY ANALYSIS BHUA_16							
COMPANY WELL		SMEC BHUA_16		FIELD LOCATION		EUNGELLA PIONEER- BURDEKIN		STATE COUNTRY		QLD AUSTRALIA	
PIONEER- LOCATION: BURDEKIN FIELD: EUNGELLA STATE: QLD WELL: BHUA_16 COMPANY: SMEC		PERMANENT DATUM GL PERMANENT DATUM ELEVATION LOG MEASURED FROM GL DRILLING MEASURED FROM GL				ELEVATIONS: KB DF GL		REMARKS: 1.			
		LICENSE D	SECTION	TOWNSHIP	RANGE	MAG DECL. 8.12deg					
		DATE	24-07-2023				RECORDED BY	JRT			
TIME	13-25				WITNESSED BY						
RUN NUMBER	1				LOGGING UNIT	V013					
DEPTH-DRILLER	55.0m				RIG NUMBER						
DEPTH-LOGGER	54.79m				TOOL TYPE	9057A					
BIT SIZE	96mm				TOOL SERIAL NO.	361					
CASING TYPE	STEEL				EASTING	659812					
CASING OD	101mm				NORTHING	7666574					
CASING BOTTOM	16.50m				SAMPLE INT.	.01m					
FLUID TYPE	0				LOG DIRECTION	U					
TRUCK CAL NO.	0.09787				FEET OR METER	M					
WATER LEVEL	7.0m				SOURCE TYPE		SOURCE ID				

DEVIATION LIST			
MNEMONIC DESCRIPTORS			
SANGB	SAMPLE ANGLE BEARING	NORTH	BOREHOLE NORTH DEVIATION
SANG	SAMPLE SLANT ANGLE (0 DEG = VERTICAL DOWN)	CDIST	DEVIATED CLOSURE DISTANCE
TVD	TRUE VERTICAL DEPTH	CANGB	DEVIATED CLOSURE ANGLE BEARING
EAST	BOREHOLE EAST DEVIATION		
ALL CO-ORDINATES ARE PRESENTED ORIENTED TO TRUE NORTH		MAGNETIC DECLINATION	8.12deg

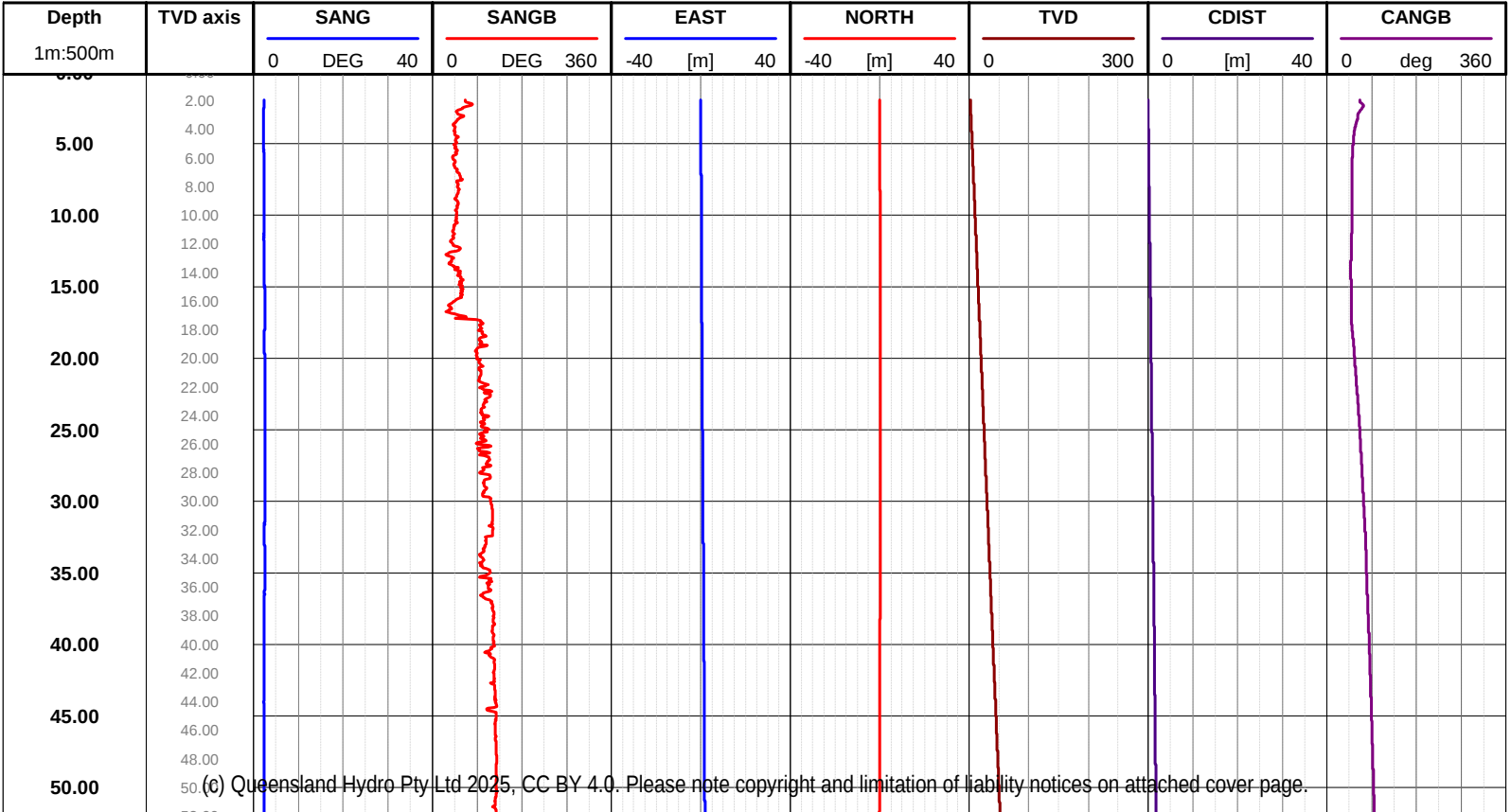
Depth	SANGB	SANG	EAST	NORTH	CDIST	CANGB	TVD
m	DEG	DEG	[m]	[m]	[m]	deg	
0.00	-999.25	-999.25	-999.25	-999.25	-999.25	-999.25	-999.25
1.00	-999.25	-999.25	-999.25	-999.25	-999.25	-999.25	-999.25
2.00	66.1912	2.35138	0.000375956	0.000164266	0.000410276	66.3981	1.99999
3.00	53.1028	2.28712	0.0356007	0.0185429	0.0401403	62.4868	2.99917
4.00	44.74	2.26133	0.0656863	0.0441379	0.0791381	56.1009	3.99838
5.00	46.04	2.2994	0.0946115	0.0714286	0.118547	52.9484	4.99759
6.00	38.8702	2.32976	0.123486	0.0996507	0.158679	51.0971	5.99677
7.00	49.5571	2.3266	0.152408	0.128205	0.19916	49.9295	6.99594
8.00	51.0339	2.3566	0.185177	0.152339	0.239787	50.557	7.99511
9.00	49.334	2.3518	0.216611	0.178575	0.28073	50.4977	8.99427
10.00	47.9321	2.33355	0.247713	0.205002	0.32154	50.3895	9.99344
11.00	43.2846	2.32721	0.277232	0.233029	0.362161	49.9511	10.9926
12.00	40.5507	2.33924	0.303729	0.263662	0.402205	49.0393	11.9918
13.00	43.6926	2.36845	0.331035	0.293692	0.442537	48.4208	12.9909
14.00	53.6941	2.41634	0.359092	0.323779	0.483508	47.9603	13.9901
15.00	59.2413	2.46749	0.394504	0.347361	0.525636	48.6361	14.9892
16.00	45.8319	2.51334	0.43087	0.371221	0.56873	49.2531	15.9882
17.00	51.2791	2.5054	0.457362	0.406052	0.611603	48.4009	16.9873
18.00	55.0000	2.46500	0.480000	0.430000	0.640000	47.0000	17.9863

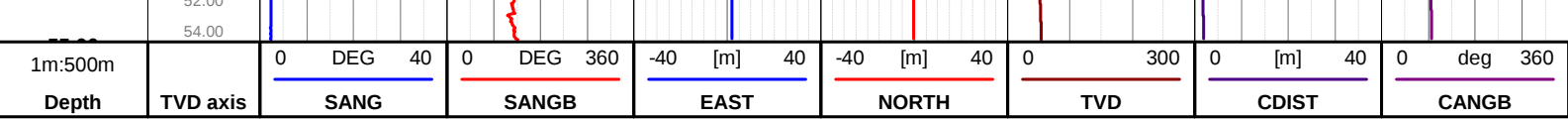
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19.00	95.7377	2.45539	0.541192	0.402166	0.67426	53.3836	18.9854
20.00	90.0589	2.50536	0.583943	0.400374	0.708018	55.5639	19.9844
21.00	97.2526	2.51637	0.627511	0.396365	0.74221	57.7216	20.9835
22.00	99.1231	2.52433	0.670801	0.389732	0.7758	59.8436	21.9825
23.00	106.918	2.51137	0.712046	0.37559	0.805032	62.1892	22.9816
24.00	105.396	2.49899	0.75484	0.366846	0.839261	64.0806	23.9806
25.00	109.982	2.49899	0.796945	0.356262	0.872952	65.9137	24.9796
26.00	88.023	2.52554	0.839615	0.348248	0.908971	67.4728	25.9787
27.00	113.02	2.54717	0.88182	0.337759	0.944292	69.0419	26.9777
28.00	96.4503	2.52843	0.923497	0.323857	0.978637	70.675	27.9767
29.00	106.556	2.53777	0.965371	0.310865	1.01419	72.1506	28.9758
30.00	117.109	2.55026	1.00735	0.297296	1.0503	73.5572	29.9748
31.00	120.476	2.52355	1.0457	0.275355	1.08135	75.2477	30.9738
32.00	121.429	2.42268	1.08305	0.253545	1.11233	76.8242	31.9729
33.00	108.126	2.45659	1.12183	0.236581	1.1465	78.0914	32.972
34.00	101.112	2.54031	1.16478	0.22774	1.18683	78.937	33.971
35.00	116.385	2.53976	1.20742	0.217058	1.22677	79.8088	34.97
36.00	113.438	2.49251	1.2481	0.201318	1.26423	80.8371	35.969
37.00	118.971	2.437	1.28861	0.187619	1.3022	81.7161	36.9681
38.00	122.722	2.45207	1.32496	0.165631	1.33527	82.8745	37.9672
39.00	119.999	2.41732	1.36063	0.142841	1.36811	84.007	38.9663
40.00	122.585	2.34895	1.39556	0.120695	1.40077	85.0571	39.9655
41.00	123.272	2.38377	1.4322	0.102088	1.43583	85.9228	40.9646
42.00	123.579	2.3861	1.46646	0.0783486	1.46855	86.9418	41.9637
43.00	125.403	2.33485	1.50069	0.0555518	1.50172	87.88	42.9629
44.00	127.166	2.31958	1.53366	0.0313084	1.53398	88.8305	43.9621
45.00	128.4	2.3604	1.56751	0.0087785	1.56754	89.6791	44.9612
46.00	126.437	2.35479	1.60041	-0.015884	1.60049	90.5686	45.9604
47.00	127.824	2.33545	1.63306	-0.0406283	1.63357	91.4251	46.9595
48.00	129.026	2.33583	1.66491	-0.0660425	1.66622	92.2716	47.9587
49.00	128.034	2.34563	1.69688	-0.0915117	1.69935	93.0869	48.9579
50.00	128.289	2.38054	1.729	-0.117044	1.73295	93.8727	49.957
51.00	126.485	2.37913	1.76187	-0.142528	1.76762	94.6249	50.9562
52.00	129.884	2.34781	1.79474	-0.167404	1.80253	95.3289	51.9553
53.00	115.554	2.34229	1.82746	-0.192074	1.83753	96	52.9545
54.00	130.025	2.35357	1.86082	-0.215708	1.87328	96.6123	53.9536

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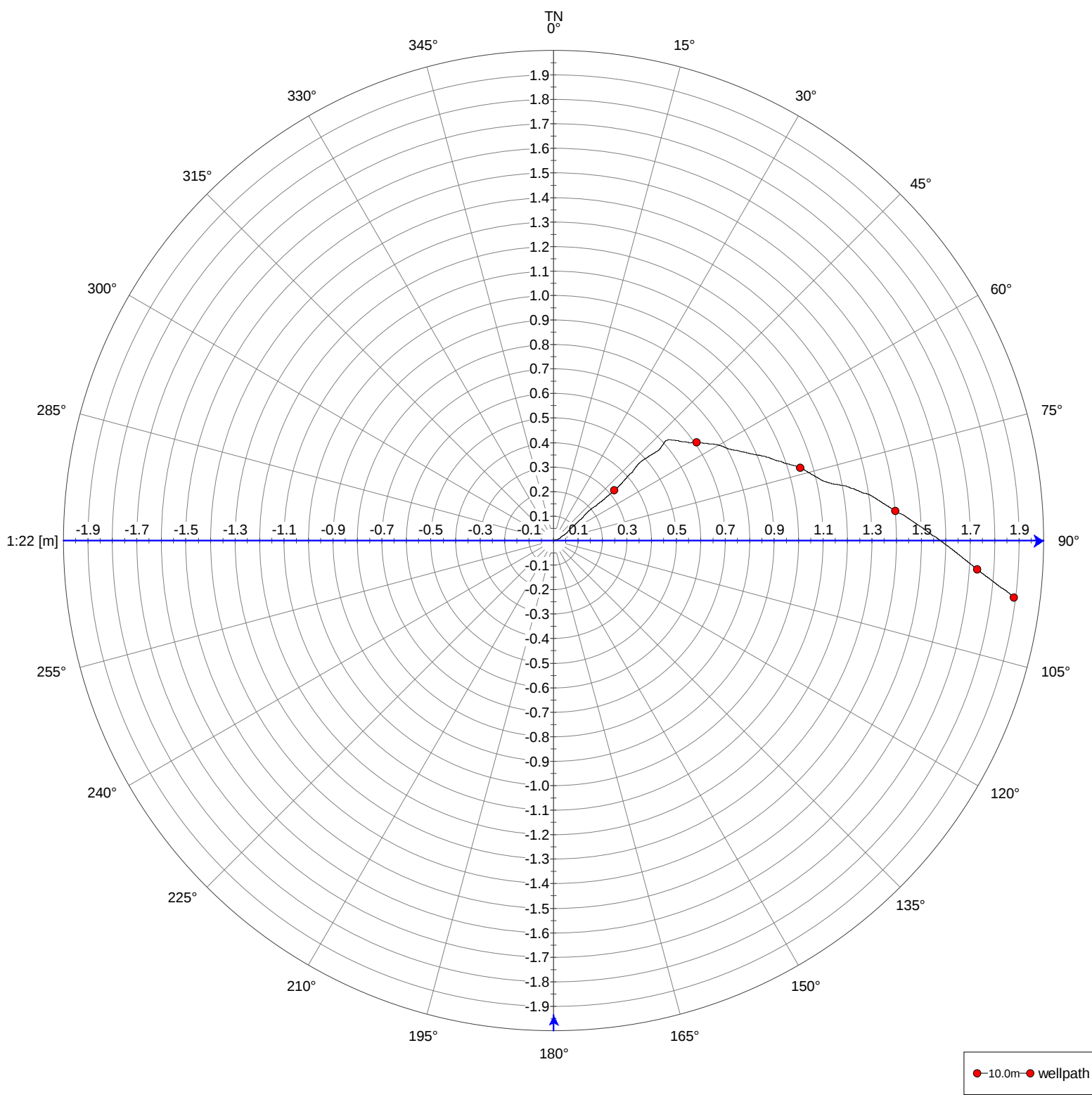




NOTES ON VERTICALITY PLOTS

- 1. The following verticality plots are scaled automatically to obtain the best visual effect within the default page size.
- 2. All co-ordinates are presented oriented to True North.

DEVIATION PLOT



Depth [m] 1:250
Horiz [m] 1:25

wellpath 

