APPENDIX 8-2

BOREHOLE LOGS

Petersen Drilling Services Ltd. on behalf of HES — Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
			RO		0.00	24.00		0000		100	grey											0.00	0.00
0.00	Soft to firm dark gravelly PEAT																						
0.40	Soft dark brown PEAT																						
3.50	Soft grey silty CLAY																						
13.20	Weak very highly weathered LIMESTONE very fractured with clay infill karst																						

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
1040			
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1520			

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	140.00	0.00	15.70					Sim. Casing			
RO	154.00	0.00	15.70				DTH Button Bit		115	Air	No
RO	120.00	15.70	24.00				DTH Button Bit			Air	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)
1115	13.50	13.50	Fast	1.80	0.00	0.00	0.00	N/S

Backfill (m)

Type	From (m)	To (m)
Collapse	24.00	23.50

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1040		CAT Scanned: Yes
1040		Permit Completed: Yes
		General; Mobilisation to site
1515	0030	Dayworks: Airlift development of well

SPT I.D. Number	PD1	Calibration Date	01/02/2021
SPT Rod Type	2 3/8 Regular	SPT Energy Ratio	0.00
Drilling Crew Details			CSCS No
Support Operative	John Whyte		
Lead Driller	Stephan Petersen		
Site category	Green		
Project Engineer			
Lead Driller's signature			

Project Title

Clonebern WH

Weather	Variable	Project No	21/21
Date	09/06/2021	Day	Wednesday
Rig type	Knebel HY79	Borehole Number	
Inclination		Orientation	BH 1
Sheet	1 of 1	Completed	Y

Petersen Drilling Services Ltd. on behalf of HES — Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
0.00	Soft to firm dark brown gravelly PEAT		RO		0.00	24.50		0000		100	grey											0.00	2.20
0.50	Soft dark brown PEAT																						
3.20	Very soft silty sandy CLAY																						
13.30	Soft to firm grey CLAY possible highly weathered rock																						
15.30	Medium strong becoming Strong dark grey LIMESTONE with occasional weathered joints																						

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
1250			
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1705			

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	140.00	0.00	17.00					Sim. Casing			
RO	154.00	0.00	17.00				DTH Button Bit		115	Air	No
RO	120.00	17.00	24.50				DTH Button Bit			Air	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)
1400	15.50	15.50	Fast	2.10	0.00	0.00	0.00	N/S

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1250		CAT Scanned: Yes
1250		Permit Completed: Yes
1640	0030	Dayworks: Airlift development of well

SPT I.D. Number	PD1	Calibration Date	01/02/2021
SPT Rod Type	2 3/8 Regular	SPT Energy Ratio	0.00
Drilling Crew Details		CSCS No	
Support Operative	John Whyte		
Lead Driller	Stephan Petersen		
Site category	Green		
Project Engineer			
Lead Driller's signature			

Project Title

Clonebern WH

Weather	Variable	Project No	21/21
Date	10/06/2021	Day	Thursday
Rig type	Knebel HY79	Borehole Number	
Inclination		Orientation	BH 2
Sheet	1 of 1	Completed	Y

Petersen Drilling Services Ltd. on behalf of HES — Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
			RO		0.00	25.00		0000		100	grey											0.00	0.00
0.00	Soft to firm dark brown PEAT																						
1.00	Soft to firm grey silty sandy gravelly CLAY																						
3.50	Firm to stiff grey sandy gravelly SILT with occasional cobble																						
16.50	Very weak very weathered dark grey clayey LIMESTONE																						
19.80	Medium strong dark grey LIMESTONE with occasional fractures																						

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0830			
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1305			

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	140.00	0.00	19.80					Sim. Casing			
RO	154.00	0.00	19.80				DTH Button Bit		115	Air	No
RO	120.00	19.80	25.00				DTH Button Bit			Air	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)
0930	3.50	3.50	Slow	0.00	0.00	0.00	0.00	5.00
1135	16.50	16.50	Medium	0.00	0.00	0.00	0.00	N/S

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0830		CAT Scanned: Yes
0830		Permit Completed: Yes
1235	0030	Dayworks: Airlift development of well

SPT I.D. Number	PD1	Calibration Date	01/02/2021
SPT Rod Type	2 3/8 Regular	SPT Energy Ratio	0.00
Drilling Crew Details		CSCS No	
Support Operative	John Whyte		
Lead Driller	Stephan Petersen		
Site category	Green		
Project Engineer			
Lead Driller's signature			

Project Title

Clonebern WH

Weather	Variable	Project No	21/21
Date	11/06/2021	Day	Friday
Rig type	Knebel HY79	Borehole Number	
Inclination		Orientation	BH 3
Sheet	1 of 1	Completed	Y

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Petersen Drilling Services Ltd. on behalf of HES — Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
0.00	peaty TOPSOIL																						
0.80	Medium dense grey silty SAND AND GRAVEL with occasional cobbles and boulders																						
3.20	Firm to stiff very sandy gravelly grey SILT occasional cobble																						
11.30	Stiff dark grey CLAY possible highly weathered mudstone																						
14.60	Strong grey LIMESTONE																						

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
1305			
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1535	15.70	Dry	15.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	140.00	0.00	15.70					Sim. Casing			
RO	154.00	0.00	15.70				DTH Button Bit		115	Air	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1305		CAT Scanned: Yes
1305		Permit Completed: Yes

SPT I.D. Number	PD1	Calibration Date	01/02/2021
SPT Rod Type	2 3/8 Regular	SPT Energy Ratio	0.00
Drilling Crew Details			CSCS No
Support Operative	John Whyte		
Lead Driller	Stephan Petersen		
Site category	Green		
Project Engineer			
Lead Driller's signature			

Project Title

Clonebern WH

Weather	Fine	Project No	21/21
Date	11/06/2021	Day	Friday
Rig type	Knebel HY79	Borehole Number	
Inclination		Orientation	BH 4
Sheet	1 of 2	Completed	Y

Petersen Drilling Services Ltd. on behalf of HES — Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
			RO		0.00	30.00		0000		100	grey											0.00	Dry

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
1015	15.70	12.50	15.70
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1625			

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RO	120.00	15.70	30.00				DTH Button Bit			Air	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks

SPT I.D. Number	PD1	Calibration Date	01/02/2021
SPT Rod Type	2 3/8 Regular	SPT Energy Ratio	0.00
Drilling Crew Details			CSCS No
Support Operative	John Whyte		
Lead Driller	Stephan Petersen		
Site category	Green		
Project Engineer			
Lead Driller's signature			

Project Title

Clonebern WH

Weather	Variable	Project No	21/21
Date	14/06/2021	Day	Monday
Rig type	Knebel HY79	Borehole Number	
Inclination		Orientation	BH 4
Sheet	2 of 2	Completed	Y

AGS

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Petersen Drilling Services Ltd. on behalf of HES — Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
0.00	Firm brown TOPSOIL		RO		0.00	11.00		0000		100	grey											0.00	Dry
0.30	Loose light brown very silty slightly gravelly SAND																						
2.90	Stiff brown very sandy gravelly CLAY high limestone cobble content																						
6.00	Weak brownish grey weathered LIMESTONE																						
7.60	Strong dark grey LIMESTONE occasional fractures																						

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0910			
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1320			

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	140.00	0.00	8.00					Sim. Casing			
RO	154.00	0.00	8.00				DTH Button Bit		115	Air	No
RO	120.00	8.00	11.00				DTH Button Bit			Air	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)
1040	2.50	2.50	Very Slow	0.00	0.00	0.00	0.00	3.50
1055	7.60	7.60	Slow	0.00	0.00	0.00	0.00	N/S

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0910		CAT Scanned: Yes
0910		Permit Completed: Yes
1120	0030	Dayworks: Airlift development of well

SPT I.D. Number	PD1	Calibration Date	01/02/2021
SPT Rod Type	2 3/8 Regular	SPT Energy Ratio	0.00
Drilling Crew Details		CSCS No	
Support Operative	John Whyte		
Lead Driller	Stephan Petersen		
Site category	Green		
Project Engineer			
Lead Driller's signature			

Project Title

Clonebern WH

Weather	Variable	Project No	21/21
Date	19/05/2022	Day	Thursday
Rig type	Knebel HY79	Borehole Number	
Inclination		Orientation	BH 5
Sheet	1 of 1	Completed	Y

AGS

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