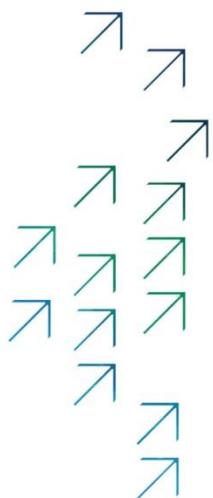




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ROUTINE CORE ANALYSIS FINAL REPORT

of

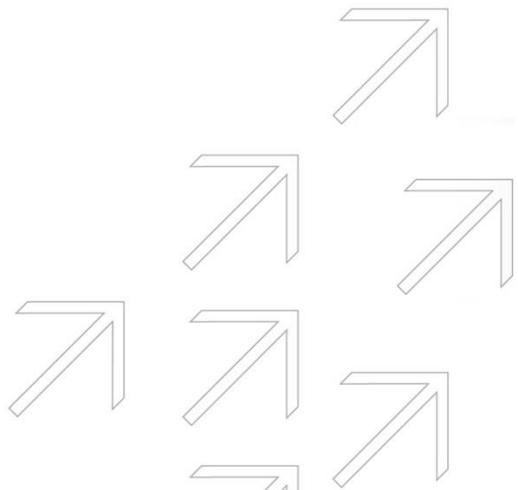
Dunk-1

for

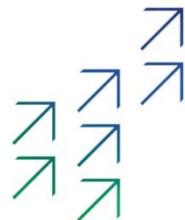
QGC – A BG Group Business

by

WEATHERFORD LABORATORIES (AUSTRALIA) PTY LTD



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Standards**





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15th September 2015

QGC – A BG Group Business
Level 25, 275 George Street
BRISBANE QLD 4000

Attention: Heidi Sutton

FINAL REPORT: AB-74306

CLIENT REFERENCE: Call Off Order 4800048420
Call Off Order 4800048419

LOCALITY: Dunk-1

WORK REQUIRED: Routine Core Analysis

Please direct technical enquiries regarding this work to the signatory below under whose supervision the work was carried out.

KEVIN H. FLYNN
General Manager
SCAL Technical Director

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CHAPTER 1
INTRODUCTION

1. INTRODUCTION

The following final report presents the details of a routine core analysis study performed by Weatherford Laboratories on behalf of QGC – A BG Group Business. The Dunk-1 core was received at Weatherford Laboratories' Brisbane facility on 22nd December 2014.

A routine core analysis study, including sample preparation was undertaken as per instructions received from a QGC representative. This study included the following analyses:

- Core gamma
- Core CT scanning
- Core processing and sample preparation
- Dean-Stark fluid extraction and Deuterium analysis
- Ambient and overburden porosity, permeability and grain density
- Core slabbing
- Core photography
- Plug photography
- Pore fluid extraction and analysis

The following report details the methods and procedures utilised in these analyses. Results are presented in both tabular and graphical formats.

CHAPTER 2
TEST AND CALCULATION PROCEDURES

2. TEST AND CALCULATION PROCEDURES

2.1 Core Gamma

The core was laid out according to depth markings and analysed using gamma-ray spectrometry to measure potassium (K), gamma-equivalent uranium (eU) and gamma-equivalent thorium (eTh). The terms eU and eTh stand for ‘gamma-equivalent’ U and Th respectively and indicate that measurements are made of the gamma-ray emitting daughters of these two isotopes. The gamma-ray energy spectrum of each sample is measured with a 100 x 100 NaI (T1) detector housed in a lead shield. Measurements were made with the core on a conventional conveyor belt at ten minutes per metre to ensure full detection of the spectrum.

2.2 Core CT Scanning

Due to the core being resined into aluminium core barrel liners it was decided to perform CT scanning to view the core in the barrels. The benefits are that we can see any bedding and natural undisturbed fractures, which assists in orienting the core for slabbing. Even when the core is removed from the core barrels it is still difficult to see the core due to the encasing resin.

The principle of CT Scanning and its applications is presented by Hove et al, 1987 and Wellington and Vinegar, 1987.

CT Scanners generate cross-sectional image slices through the sample by revolving an X-ray tube around the sample and obtaining projections at many different angles. Samples were initially scanned with the core orientation markers vertical then rotated through 90° and a second scan performed.

2.3 Core Slabbing

After reviewing the CT scans, the core was aligned and the aluminium barrel was milled open. On completion of core plug drilling and removal of whole core samples the core was slabbed longitudinally into two sections ($\frac{1}{3}:\frac{2}{3}$) using brine as the blade cooling and lubricating medium.

2.4 Sample Preparation

Plugs

A total of fifty-two plugs of 1½" diameter were cut at the well-site by Weatherford Laboratories' personnel using oil as the bit lubricant. These were then preserved in oil and transported to Weatherford Laboratories' Brisbane facility for analysis. After arriving at the laboratory an additional forty-six horizontal and five vertical routine core analysis plugs of 1½" diameter were cut at depths selected by a QGC representative using oil as the bit lubricant. All samples were trimmed to standard length.

Sidewall Cores

Thirty-seven sidewall cores were received by Weatherford Laboratories on 6th January 2015. These were trimmed to right cylinders of maximum length.

2.5 Dean-Stark Residual Fluid Saturation

Selected plugs were placed into Dean-Stark fluid extraction apparatus where they are suspended above a reservoir of boiling toluene. The solvent vapours together with the extracted pore fluids, are condensed at the top of the glassware and the water collected in a calibrated side arm. Oil and toluene are collected in the reservoir and continue boiling so that clean toluene vapour continues extracting pore fluids. The process is continued until the water production ceases.

From the collected water volume and the latter determined helium injection pore volume of the sample, water saturation is calculated as follows.

$$Sw = (Pore Water Volume / Pore Volume) \times 100\%$$

From the wet sample weight (pre-analysis), the dry sample weight (post extraction and oven drying), the extracted water volume, the pore volume and the density of the oil, the oil saturation is calculated as follows:

$$Oil Weight = Sample Wt (wet) - Sample Wt (dry) - Pore Water Wt$$

$$So = \frac{(Weight Oil/\rho_{Oil})}{V_p} \times 100\%$$

The data was then corrected for possible mud invasion. Before coring the mud system was doped with Deuterium Oxide to a concentration of approximately 300 ppm. Mud samples were taken before doping, during circulations (at least 5 full circulations to ensure the tracer is thoroughly mixed) and also at regular depths during coring. The extracted water from Dean-Stark analysis was then tested and based on the concentration of Deuterium in the sample, baseline mud and the mud sample taken at the core plug depth the water saturations were then corrected using the following formula:

$$Sw-Tr = Sw \times \left(1 - \left[\frac{D2O Extract - D2O Baseline}{D2O Mud - D2O Baseline} \right] \right)$$

where	Sw	= uncorrected water saturation (percent)
	$Sw-Tr$	= tracer adjusted water saturation (percent)
	$D2O Extract$	= Deuterium concentration in water extracted (ppm)
	$D2O Baseline$	= Deuterium concentration in mud before doping
	$D2O Mud$	= Deuterium concentration in mud (ppm)
	ρ_{Oil}	= oil density of 0.8 (g/cm^3)

The above correction was not applied where the Deuterium concentration in the sample was less than the base line mud.

2.6 Cleaning and Drying

All plugs and sidewall cores were placed in a modified soxhlet system to remove the pore fluids using a 3:1 chloroform:methanol azeotrope. Cleaning continued until tests for oil (fluorescence under UV lights) and salt (silver nitrate precipitation) showed negative. The clean samples were dried to constant weight in an oven at 60°C and 40% relative humidity. Once dry, the samples were cooled to room temperature in an

airtight chamber. All samples that had undergone Dean-Stark analysis were hot oven dried at 105°C.

2.7 Porosity

The clean and dry samples were sealed in a matrix cup and a known volume of helium at 100 psi reference pressure was introduced to the cup. From the resultant pressure the unknown volume, i.e. the grain volume, was calculated using Boyles Law.

The bulk volume of each sample was determined by Archimedes' Principal. The porosity is calculated as the volume percentage of pore space with respect to the bulk volume.

$$\begin{aligned} P_1 V_1 &= P_2 V_2 \\ \Rightarrow P_1 V_r &= P_2 (V_r + V_c - V_g) \\ V_p &= V_b - V_g \end{aligned}$$

$$\text{Ambient Porosity \%} = \frac{V_p}{V_b} \times 100\%$$

<i>where</i>	P_1	=	initial pressure (psig)
	P_2	=	final pressure (psig)
	V_r	=	reference cell volume (cm^3)
	V_c	=	matrix cup volume (cm^3)
	V_g	=	grain volume (cm^3)
	V_p	=	pore volume (cm^3)
	V_b	=	bulk volume (cm^3)

Porosity (and permeability) at simulated overburden stress was measured by mounting selected samples individually into a thick walled rubber sleeve and then loading the assembly into a hydrostatic cell. With an 'ambient' confining stress of 400psi applied to the sample, helium held at 100psi reference pressure was released into the samples pore space. The new pressure was then recorded. The confining stress was then increased to overburden pressure and the pore pressure noted at equilibrium. Multiple overburden stress measurements were made on the SWC samples. The changes in pore pressure, together with the previously determined parameters in the ambient analyses, allowed the calculation of porosity at overburden conditions, as follows:

$$\text{Overburden Porosity \%} = \frac{V_p - \Delta V_p}{V_b - \Delta V_b} \times 100\%$$

<i>where</i>	V_p	=	ambient pore volume (cm^3)
	V_b	=	ambient bulk volume (cm^3)
	ΔV_p	=	change in pore volume (cm^3)
	ΔV_b	=	change in bulk volume (cm^3)

2.8 Air Permeability

The samples were placed into a Hassler cell with an ambient confining pressure of 400 psi applied. The confining pressure was used to prevent bypassing of air around the sample when the measurement was made. In order to determine permeability, a known air pressure was applied to the upstream face of each sample, creating a flow of air through the core plug. Air permeability was calculated using Darcy's Law through knowledge of the upstream pressure, flow rate, viscosity of air and sample dimensions.

$$Ka = \frac{2000.BP.\mu.q.L}{(P_1^2 - P_2^2).A}$$

where	Ka	=	air permeability (milliDarcy's)
	BP	=	barometric pressure (atmospheres)
	μ	=	gas viscosity (cP)
	q	=	flow rate (cm^3/s) at barometric pressure
	L	=	sample length (cm)
	P_1	=	upstream pressure (atmospheres)
	P_2	=	downstream pressure (atmospheres)
	A	=	sample cross sectional area (cm^2)

Selected samples were mounted into a hydrostatic cell and the confining pressure was then increased to overburden pressure and the above procedure repeated to give permeability at overburden conditions. As for porosity, the SWC samples were tested at multiple confining stresses.

2.9 Apparent Grain Density

The apparent grain density is calculated by dividing the weight of the plug by the grain volume determined from the helium injection porosity measurement.

$$\rho = \frac{Wt}{Vg}$$

where	ρ	=	grain density (g/cm^3)
	Wt	=	weight of sample (g)
	Vg	=	grain volume (cm^3)

2.10 Core Photography

Core photography was carried out on the slabbed core in 5 metre format with a Nikon D700 digital SLR camera under white and ultraviolet light. The photographs have been digitally edited and printed.

2.11 Plug and Sidewall Core Photography

Each plug and sidewall core sample was photographed with a Nikon D700 digital SLR camera under white light. Photographs were taken of the front, back, top and

bottom surfaces then digitally edited and posted to the Weatherford Laboratories web portal.

2.12 Pore Fluid Extraction

A total of eight plug samples were drilled with oil (using procedures as described above) from a selected interval of core for water extraction and analysis to determine salinity. Four samples were initially placed into a centrifuge and spun at 4,000 rpm for 78 hours. As no fluid was extracted the remaining 4 samples were shipped to Weatherford Laboratories in East Grinstead where three samples were centrifuged at 12,500 rpm for 117 hours. The combined water extracted from the samples was between 0.1 and 0.2 cm³. On completion of resistivity analysis the samples underwent analysis to determine the concentrations of the cation and anions.

2.13 Core Distribution

All slabbed core sections, core plugs, sidewall cores and off-cut material is currently stored at Weatherford Laboratories' Brendale facility. Additional samples have been dispatched as detailed below.

Sample Number	Depth (Metres)		Comments
	From	To	
CG1	2892.10	2892.38	Sent to QGC 16 Jan 2015
CG2	2892.38	2892.64	Sent to QGC 16 Jan 2015
CG3	2892.64	2892.85	Sent to QGC 16 Jan 2015
CG4	2893.51	2893.73	Sent to QGC 16 Jan 2015
CG5	2893.73	2894.00	Sent to QGC 16 Jan 2015
RM1	2885.63	2886.00	Sent to FracTech 24 Dec 2014
RM2	2920.30	2920.59	Sent to FracTech 24 Dec 2014

Sample Number	Depth (Metres)	Comments
PT1	2870.70	Sent to QGC 4 Feb 2015
PT2	2872.30	Sent to QGC 4 Feb 2015
PT3	2880.96	Sent to QGC 4 Feb 2015
PT4	2894.32	Sent to QGC 4 Feb 2015
PT5	2894.13	Sent to QGC 4 Feb 2015
PT6	2901.60	Sent to QGC 4 Feb 2015
PT7	2908.41	Sent to QGC 4 Feb 2015
PT8	2915.97	Sent to QGC 4 Feb 2015

APPENDIX I
TEST RESULTS – RCA PLUGS

CORE ANALYSIS REPORT

Client : QGC - A BG Group Business **Date** : 5/03/2015
Well : Dunk-1 **File** : AB-74306
Samples : RCA plugs **Cleaning Method** : Chloro-meth
Drying Method : Humidity Dry

Sample Number	Depth (m)	Dir	Porosity Helium (percent)	Grain Density (g/cm³)	Permeability to Air (mD)	Remarks
1	2870.55	H	3.4	2.70	0.174	calc shl rem
2	2871.51	H	2.0	2.70		irreg, calc shl rem
3	2872.50	H	3.5	2.65		calc shl rem, frac
4	2873.50	H	1.5	2.68	0.0019	irreg, calc shl rem
5	2874.50	H	3.0	2.66	0.086	calc shl rem
6	2876.51	H	3.4	2.68	0.0060	
7	2877.50	H	3.9	2.66	0.0044	
8	2878.50	H	2.2	2.69	0.0032	
9	2880.71	H	5.1	2.68	0.050	lam
10	2881.51	H	5.6	2.65	0.010	
V1	2881.95	V	5.2	2.64	0.0035	
11	2884.68	H	5.0	2.69	0.0063	lam
12	2885.60	H	4.4	2.69	0.0048	
13	2886.91	H	1.2	2.70	0.026	irreg, calc shl rem
14	2888.54	H	4.8	2.66	0.0030	
15	2889.39	H	4.0	2.71	0.0043	
16	2890.54	H	5.0	2.75	0.0082	
V2	2890.74	V	4.6	2.98	0.0007	‡ silt, carb strk, H-frac
17	2894.49	H	2.7	2.58		frac, irreg
18	2895.50	H	6.8	2.65	0.014	
19	2896.30	H	8.9	2.66	0.046	lam
20	2897.40	H	9.9	2.64	0.064	
21	2898.51	H	10.4	2.63	0.032	
22	2899.50	H	8.6	2.63	0.018	
23	2900.49	H	9.0	2.63	0.073	
V3	2900.55	V	6.9	2.63	0.018	
24	2901.50	H	10.8	2.63	0.034	
25	2902.49	H	10.7	2.64	0.028	
26	2903.47	H	9.4	2.64	0.064	
27	2904.50	H	9.2	2.63	0.028	
28	2905.56	H	11.6	2.63	0.031	
29	2906.50	H	9.6	2.64	0.022	
30	2907.50	H	11.9	2.63	0.043	
31	2908.50	H	7.3	2.64	0.047	
32	2909.49	H	7.9	2.64	0.066	
33	2910.44	H	9.1	2.64	0.045	
V4	2910.50	V	8.1	2.63	0.010	
34	2911.45	H	9.9	2.64	0.113	
35	2912.50	H	5.7	2.64	0.024	
36	2913.20	H	10.4	2.64	0.051	
37	2914.30	H	10.9	2.63	0.051	
38	2915.50	H	12.9	2.63	0.062	
39	2916.51	H	11.8	2.63	0.056	

Sample Number	Depth (m)	Dir	Porosity Helium (percent)	Grain Density (g/cm ³)	Permeability to Air (mD)	Remarks
40	2917.50	H	10.2	2.63	0.050	
41	2918.51	H	13.2	2.63	0.040	
42	2919.51	H	9.7	2.64	0.070	
43	2920.20	H	10.3	2.63	0.033	
V5	2921.12	V	8.9	2.63	0.0086	
44	2921.51	H	6.2	2.63	0.064	lam
45	2922.50	H	11.8	2.63	0.037	
46	2923.51	H	10.7	2.64	0.052	

‡ plug not cleaned, dried only

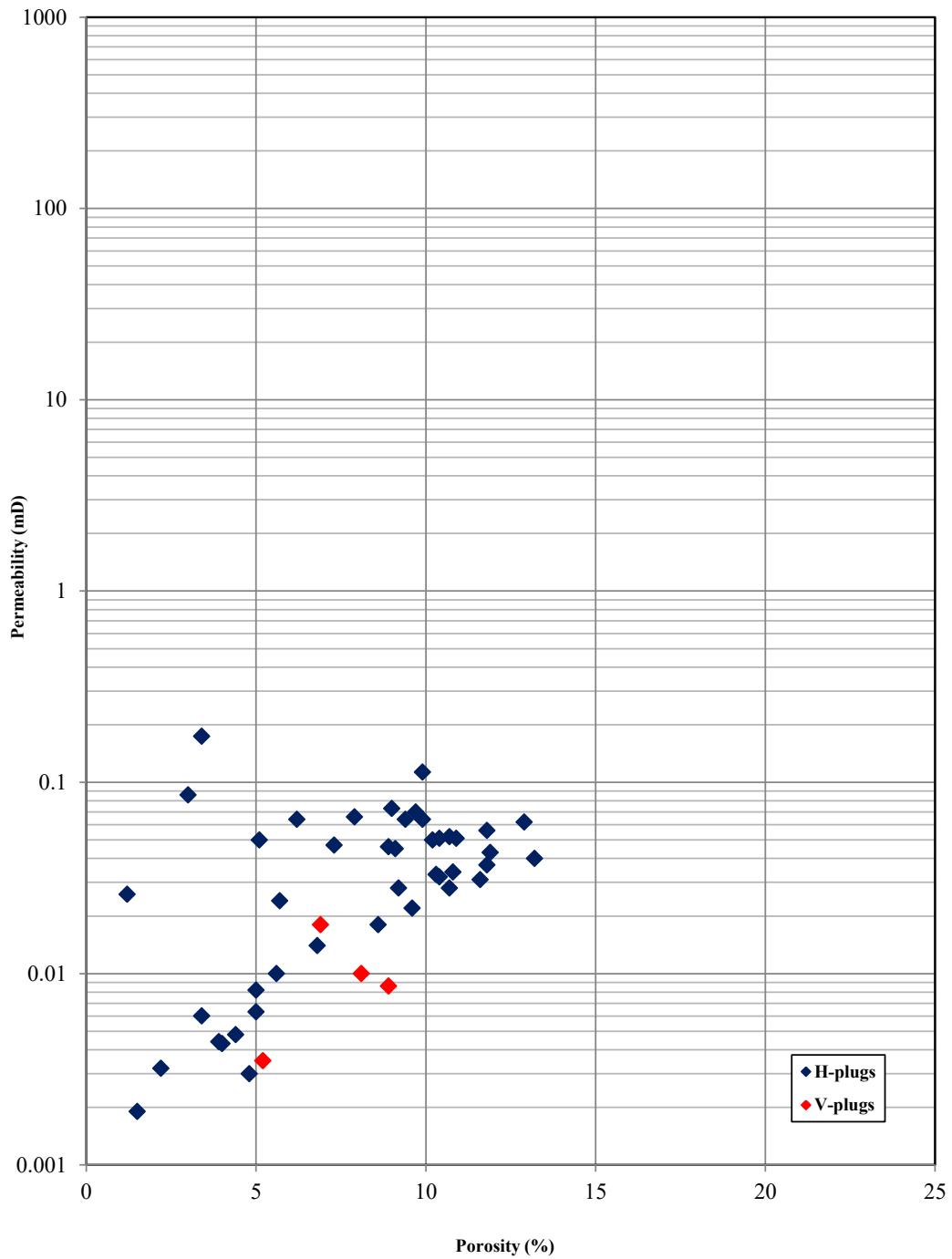
cal shl rem	calcified shell remnants
N.P	no plug
irreg	irreg
carb	carbonaceous
strk	streak
slt	silt
lam	lamination
H-frac	horizontal fracture (not in direction of flow)

POROSITY vs PERMEABILITY
Ambient

Client: QGC - A BG Group Business

Well: Dunk-1

Samples: RCA plugs



APPENDIX II
TEST RESULTS – P-PLUGS

CORE ANALYSIS REPORT

Client : QGC - A BG Group Business

Well : Dunk-1

Samples : P-plugs

Date : 4/02/2015

File : AB-74306

Cleaning Method : Chloro-meth

Drying Method : Oven Dry

Baseline MUD, ppm : 160

Sample Number	Depth (m)	Dir	Porosity Helium (percent)	OB 4000 Porosity (percent)	Grain Density (g/cm ³)	Permeability to Air (mD)	OB 4000 Permeability (mD)	Fluid Saturation			Deuterium Tracer Concentration (ppm)	Remarks
								So (percent)	Sw (percent)	*Tracer Adjusted Sw (percent)		
1_1P	2870.12	H										failed
1_2P	2871.03	H										
1_3P	2872.08	H										
1_4P	2873.06	H										
1_5P	2874.04	H										
1_6P	2875.10	H										
1_7P	2876.05	H										
1_8P	2877.04	H	5.9		2.70		0.0098		81.8	81.8	145.7	
1_9P	2877.85	H										N.P - not full metre section
1_10P	2878.05	H	3.3		2.75		0.0040		48.9	48.5	147.2	
1_11P	2879.05	H										
1_12P	2880.06	H										
1_13P	2881.04	H										
1_14P	2882.05	H										
1_15P	2883.06	H										
1_16P	2884.06	H										
1_17P	2885.06	H										
1_18P	2886.11	H										
1_19P	2887.10	H	1.8		2.71		0.017		48.4	50.5	50.5	‡ irreg
1_20P	2888.12	H	5.0		2.70		0.0063		45.7	49.7	49.7	145.1
1_21P	2889.11	H										
1_22P	2890.10	H										
1_23P	2891.05	H										N.P - carb slt

Sample Number	Depth (m)	Dir	Porosity Helium (percent)	OB 4000 Porosity (percent)	Grain Density (g/cm ³)	Permeability to Air (mD)	OB 4000 Permeability (mD)	Fluid Saturation			Deuterium Tracer Concentration ppm	Remarks
								So (percent)	Sw (percent)	*Tracer Adjusted Sw (percent)		
1_24P	2892.05	H										N.P - carb slt failed
1_25P	2893.17	H										
1_26P	2894.04	H										
1_27P	2895.09	H	5.9		2.67	0.020		47.2	32.6	32.6	146.5	lam
1_28P	2896.07	H	10.6		2.65	0.023		42.6	23.1	23.1	153.1	
1_29P	2896.60	H										N.P - not full metre section
2_1P	2896.71	H										N.P - not full metre section
2_2P	2897.06	H	11.9	11.1	2.65	0.062	0.019	47.1	19.5	19.5	156.7	
2_3P	2898.08	H	11.8		2.65	0.061		40.9	24.2	24.2	150.3	
2_4P	2899.06	H	9.1		2.65	0.070		37.4	25.5	25.5	149.9	
2_5P	2900.05	H	10.8		2.65	0.033		33.3	24.7	24.7	151.8	
2_6P	2901.06	H	8.3	6.8	2.65	0.17	0.02	33.9	30.7	30.7	152.1	carb strk
2_7P	2902.06	H	10.4		2.65	0.088		36.4	27.3	27.3	153.6	
2_8P	2903.04	H	10.9		2.65	0.031		39.4	23.1	23.1	154.5	
2_9P	2904.06	H	11.5		2.65	0.027		36.8	17.3	17.3	151.7	
2_10P	2905.06	H	10.3		2.66	0.047		35.1	24.8	24.8	150.1	
2_11P	2905.40	H										N.P - not full metre section
2_12P	2906.05	H	4.5	3.6	2.66	0.0047	0.0009	23.7	28.0	28.0	147.6	
2_13P	2907.04	H	12.4	11.6	2.65	0.055	0.016	49.0	18.8	18.8	150.2	
2_14P	2908.05	H	10.1		2.65	0.051		46.9	16.8	16.8	152.2	
2_15P	2909.05	H	9.5		2.66	0.10		40.7	26.3	26.3	147.3	lam
2_16P	2910.05	H	11.3	10.7	2.65	0.073	0.016	42.1	21.8	21.8	149.2	lam
2_17P	2911.05	H	12.8		2.65	0.090		52.1	16.5	16.5	152.4	
2_18P	2912.04	H	10.1		2.65	0.085		41.2	24.9	24.9	150.3	
2_19P	2913.05	H	11.2		2.65	0.11		47.9	17.9	17.9	156.4	
2_20P	2914.04	H	13.1	12.5	2.65	0.11	0.02	52.2	15.3	15.3	149.8	
2_21P	2914.55	H										N.P - not full metre section
2_22P	2915.04	H	12.9		2.64	0.15		50.0	19.5	19.5	156.3	
2_23P	2916.04	H	10.8	9.9	2.65	0.044	0.011	41.9	26.7	26.7	150.4	
2_24P	2917.04	H	8.9		2.65	0.019		40.5	18.5	18.5	151.6	
2_25P	2918.04	H	11.2		2.65	0.044		36.0	23.7	23.7	151.6	
2_26P	2919.05	H	11.8	10.8	2.65	0.040	0.015	43.6	21.5	21.5	151.2	

Sample Number	Depth (m)	Dir	Porosity Helium (percent)	OB 4000 Porosity (percent)	Grain Density (g/cm ³)	Permeability to Air (mD)	OB 4000 Permeability (mD)	Fluid Saturation			Deuterium Tracer Concentration ppm	Remarks
								So (percent)	Sw (percent)	*Tracer Adjusted Sw (percent)		
2_27P	2920.05	H	10.7		2.65	0.092		34.3	31.9	31.9	147.8	
2_28P	2921.05	H	9.6		2.65	0.041		40.6	23.1	23.1	149.0	
2_29P	2922.04	H	11.4	10.8	2.65	0.13	0.02	33.8	29.9	29.9	152.0	
2_30P	2923.06	H	9.8		2.65	0.030		43.9	19.3	19.3	149.6	
2_31P	2923.30	H										N.P - not full metre section
2_32P	2924.21	H	10.9	10.3	2.64	0.051	0.014	71.8	21.7	21.7	147.5	

* As Deuterium concentration for all samples < baseline mud concentration, no Sw adjustment has been applied

‡ Insufficient fluid extracted for Deuterium analysis

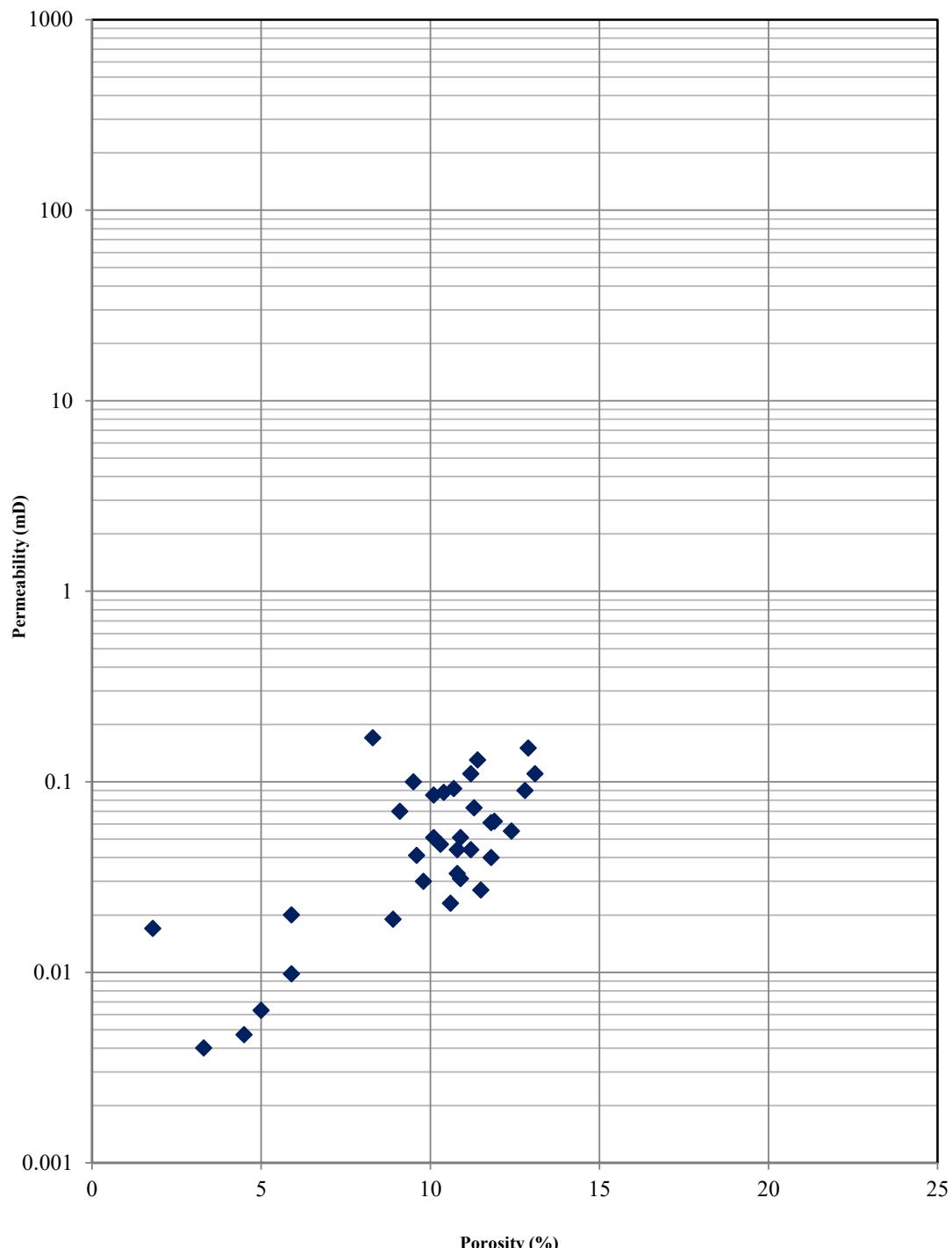
N.P no plug
 irreg irreg
 carb carbonaceous
 strk streak
 silt silt
 lam lamination

POROSITY vs PERMEABILITY
Ambient

Client: QGC - A BG Group Business

Well: Dunk-1

Samples: P-plugs



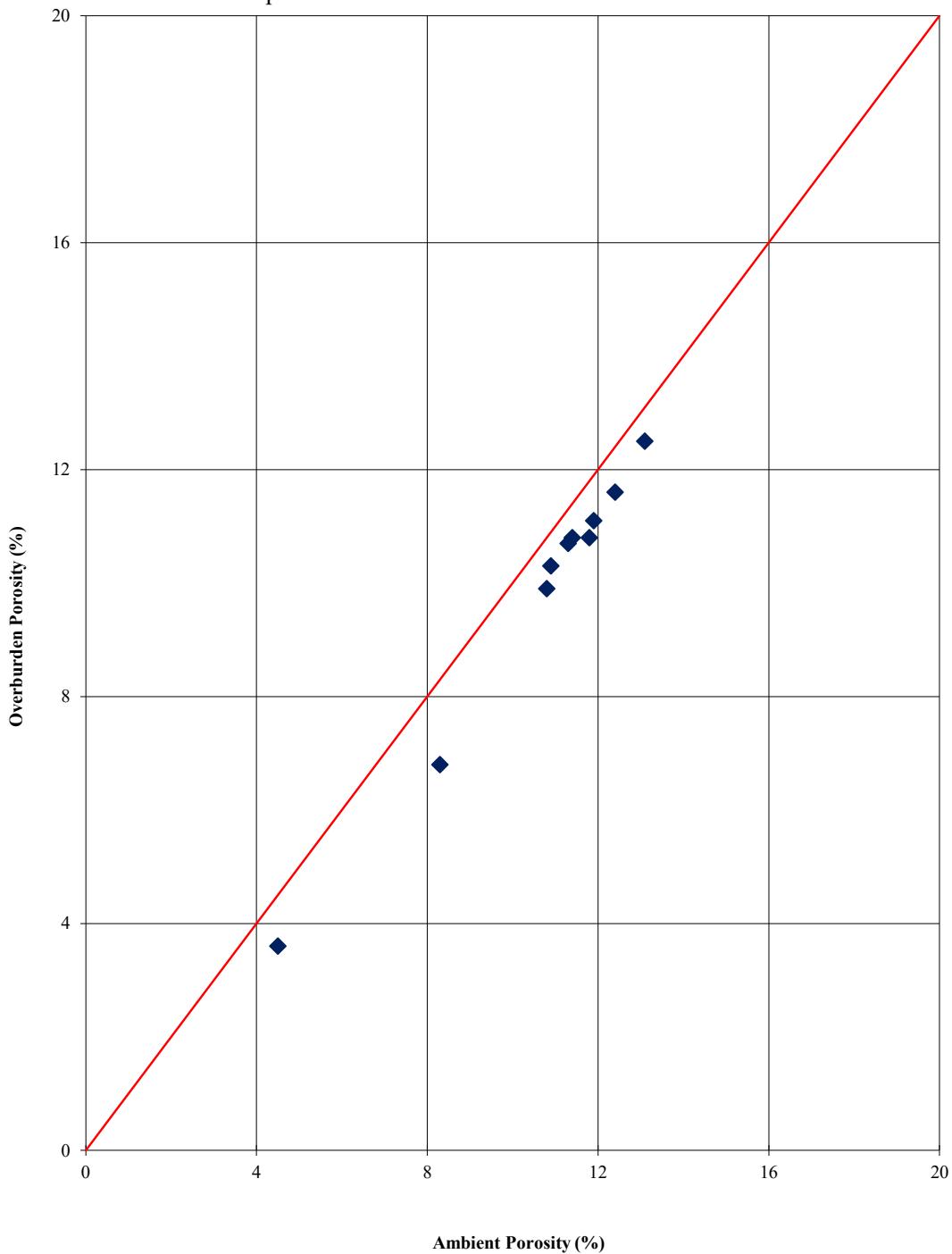
POROSITY PLOT

Client: QGC - A BG Group Business

Well: Dunk-1

Samples: P-plugs

NOBP: 4000 psi



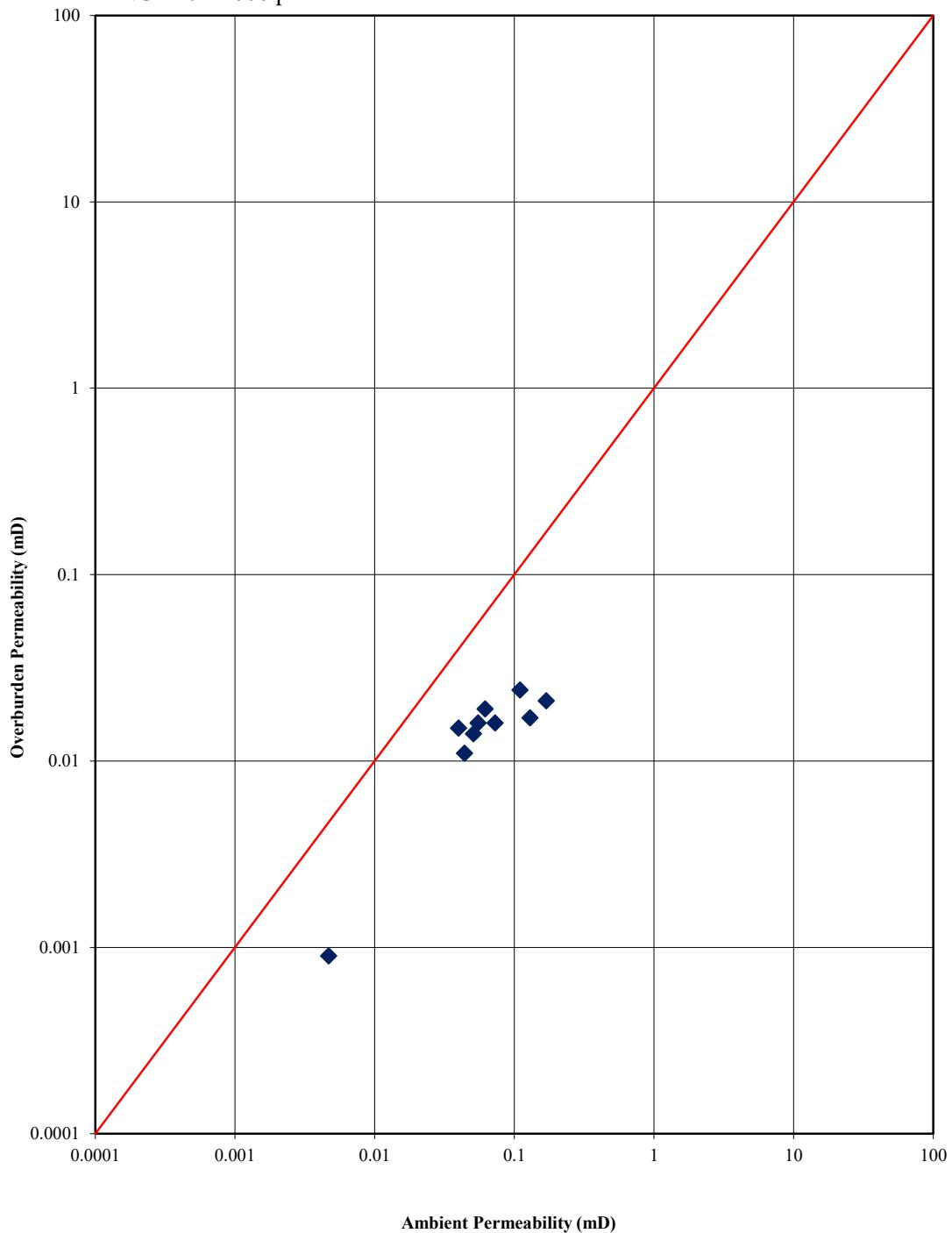
PERMEABILITY PLOT

Client: QGC - A BG Group Business

Well: Dunk-1

Samples: P-plugs

NOBP: 4000 psi



APPENDIX III
TEST RESULTS – SIDEWALL CORES

CORE ANALYSIS REPORT

Sample Number	Depth (metres)	Dir	Ambient Porosity (Percent)	OB 3500 Porosity (percent)	OB 4600 Porosity (percent)	Grain Density (g/cm³)	Ambient Permeability (mD)	OB 3500 Permeability (mD)	OB 4600 Permeability (mD)	Remarks
1	3133.75	SWC	4.9			2.73	0.0059			
2	3126.00	SWC	2.3			2.80				irreg, S.P
3	3120.00	SWC	4.8			2.58	0.098			
4	3116.00	SWC	3.6			2.67	0.0058			
5	3112.78	SWC	1.3			2.76	0.0011			
6	3093.00	SWC	1.4			2.71	0.028			irreg
7	3085.33	SWC	4.4			2.66	0.24			irreg, congl
8	3083.00	SWC	11.4	10.4	10.3	2.67	0.28	0.095	0.069	
9	3081.43	SWC	18.4			2.70				irreg, S.P
10	3076.47	SWC	8.2			2.66	0.15			S.P
11	3075.00	SWC	5.0	4.4	4.3	2.68	0.045	0.0052	0.0022	
12	3061.00	SWC	4.0	3.5	3.4	2.68	0.020	0.0021	0.0013	
13	3046.48	SWC	0.6			2.67	0.0012			
14	3043.10	SWC	0.9			2.64	0.016			irreg
15	3037.50	SWC								no sample recovered
16	3025.00	SWC	2.2			2.65	0.0018			irreg
17	3021.58	SWC	2.0			2.60	0.0017			
18	3008.72	SWC								no sample recovered
19	3007.76	SWC								no sample recovered
20	3006.58	SWC								no sample recovered
21	3005.00	SWC	15.0			2.66				irreg, S.P
22	3008.80	SWC	10.5	9.2	9.1	2.65	0.33	0.052	0.039	

Sample Number	Depth (metres)	Dir	Ambient Porosity (Percent)	OB 3500 Porosity (percent)	OB 4600 Porosity (percent)	Grain Density (g/cm ³)	Ambient Permeability (mD)	OB 3500 Permeability (mD)	OB 4600 Permeability (mD)	Remarks
23	3007.90	SWC	11.9	10.4	10.2	2.66	0.29	0.057	0.048	irreg
24	3006.80	SWC	12.6	10.9	10.7	2.67	0.49	0.068	0.054	irreg
25	3005.20	SWC								rubble, insufficient sample
26	3002.30	SWC								no sample recovered
27	2992.40	SWC	3.4			2.68	0.0036			
28	2975.90	SWC	2.2			2.67	0.011			
29	2970.90	SWC	4.8			2.67	0.0096			
30	2967.80	SWC	6.5			2.67	0.058			
31	2934.95	SWC	8.7	8.4	8.4	2.63	0.018	0.0044	0.0035	
32	2931.50	SWC	11.0	10.2	10.2	2.63	0.069	0.016	0.014	
33	2920.70	SWC	11.7	11.1	11.1	2.63	0.038	0.015	0.0100	
34	2912.30	SWC	9.0	8.3	8.3	2.64	0.023	0.0052	0.0048	
35	2882.50	SWC	2.7			2.73	0.0040			
36	2882.00	SWC	5.1			2.73	0.0036			
37	2868.00	SWC								no sample recovered
38	2864.30	SWC	1.6	1.5	1.5	2.71	0.0005	0.0002	0.0002	
39	2858.00	SWC								no sample recovered
40	2848.00	SWC	3.3			2.63	0.055			frac?, dual lith, lam
41	2818.49	SWC	4.8	4.6	4.6	2.52	0.0010	0.0005	0.0004	
42	2816.57	SWC								no sample recovered
43	2813.00	SWC	8.7	8.5	8.5	2.61	0.0047	0.0036	0.0035	irreg
44	2810.00	SWC								no sample recovered
45	2796.11	SWC								no sample recovered
46	2779.00	SWC								no sample recovered
47	2790.07	SWC								no sample recovered
48	2731.91	SWC								no sample recovered
49	2719.45	SWC								no sample recovered
50	2691.00	SWC								no sample recovered
51	2669.12	SWC	5.6			2.68	0.0045			
52	2650.50	SWC								no sample recovered
53	2582.99	SWC								no sample recovered

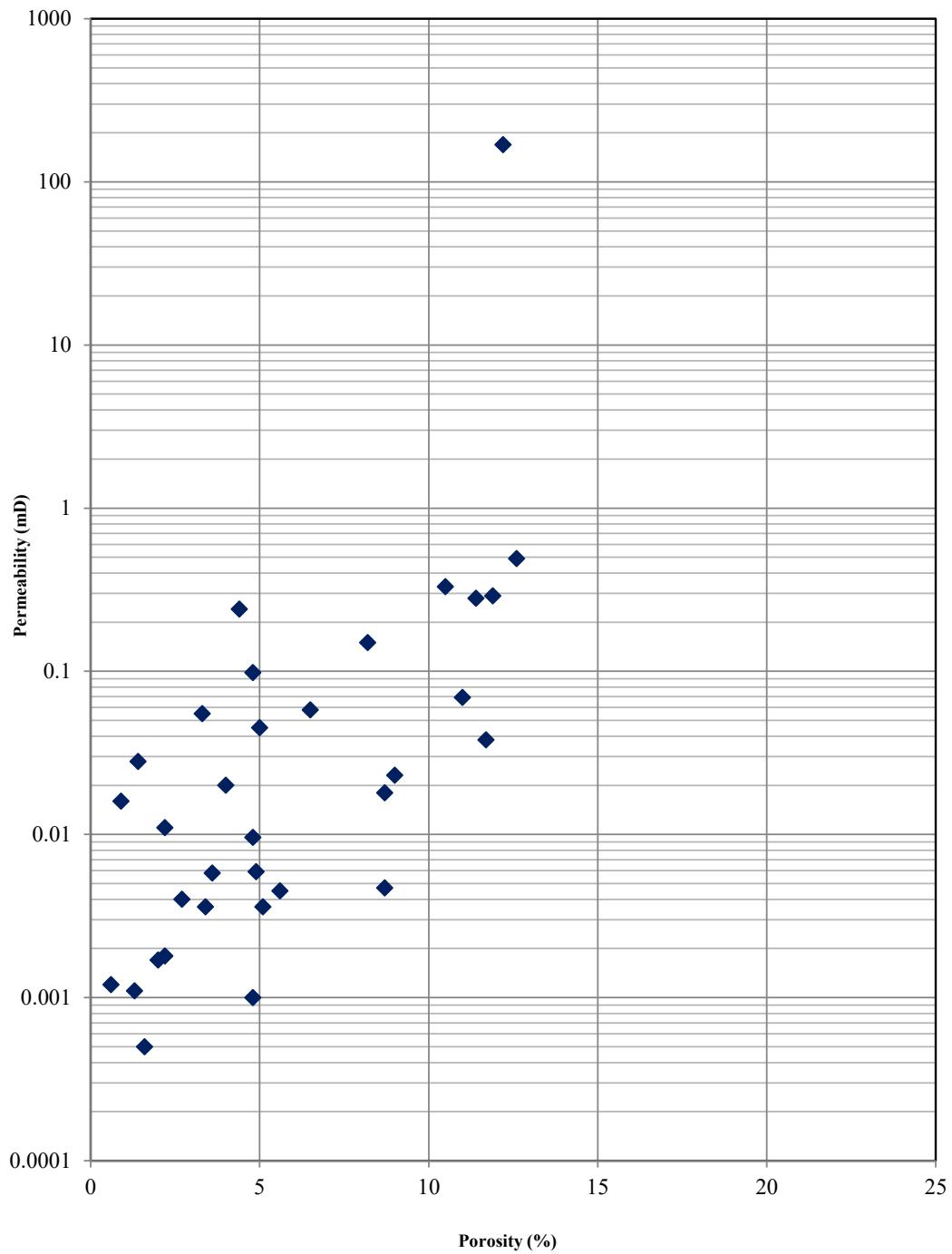
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54	2520.97	SWC								no sample recovered
55	2384.85	SWC	12.2			2.66	169			irreg
				irreg	irregular					
				S.P	short plug (length < diameter)					
				congl	conglomerate					
				frac	fracture					
				dual lith	dual lithology					
				lam	lamination					

POROSITY vs PERMEABILITY
Ambient

Client: QGC - A BG Group Business

Well: Dunk-1

Samples: Sidewall Cores



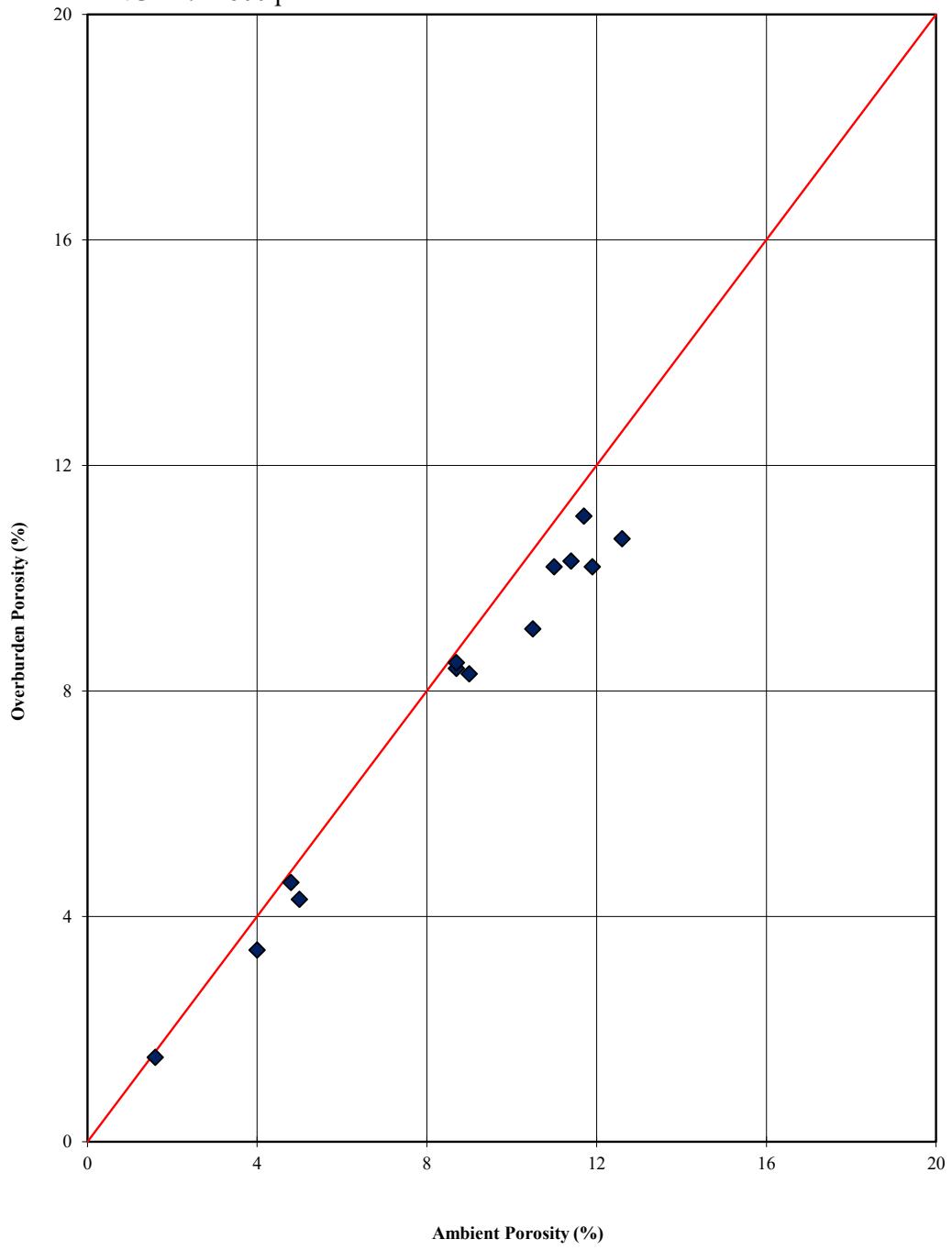
POROSITY PLOT

Client: QGC - A BG Group Business

Well: Dunk-1

Samples: Sidewall Cores

NOBP: 4600 psi



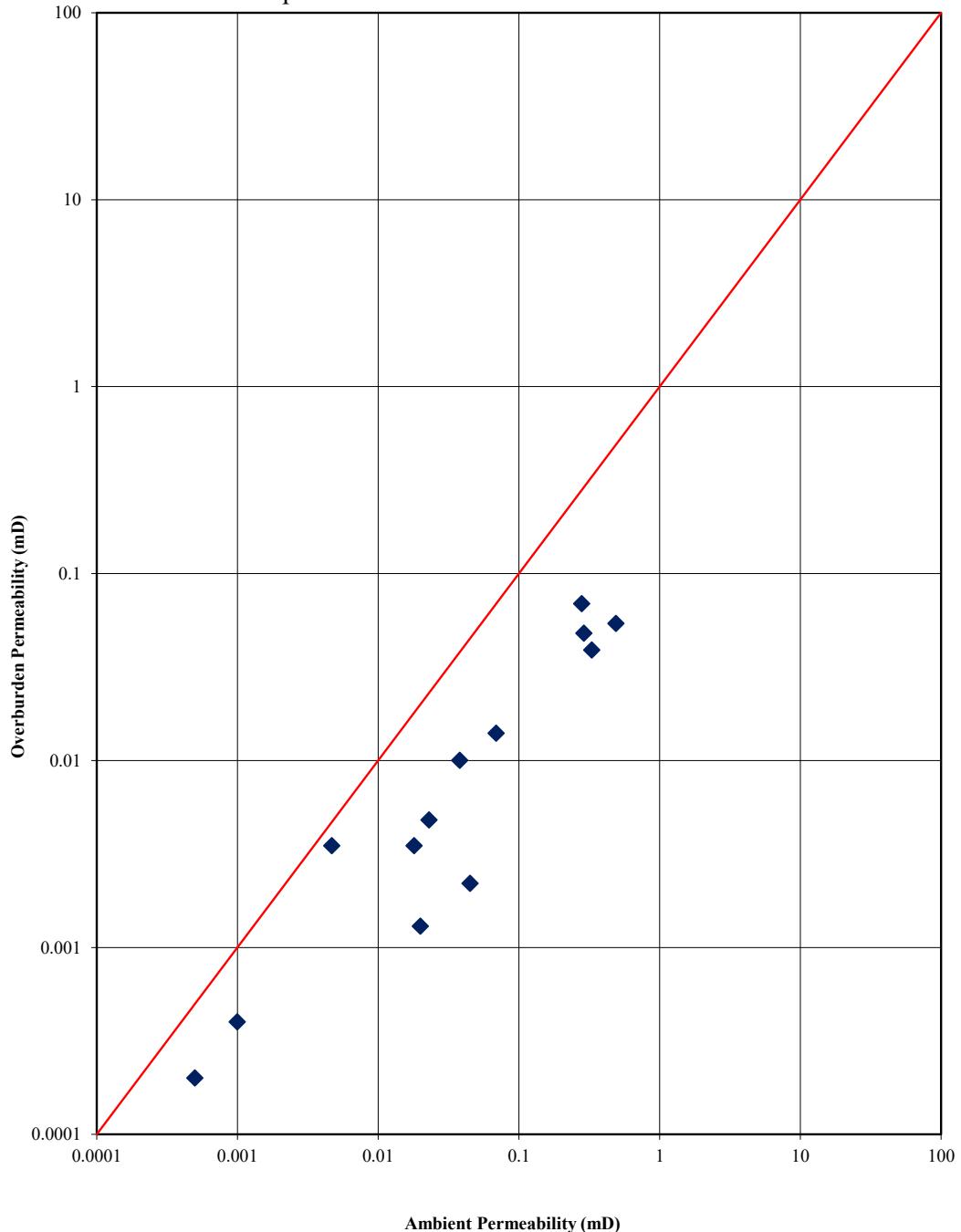
PERMEABILITY PLOT

Client: QGC - A BG Group Business

Well: Dunk-1

Samples: Sidewall Cores

NOBP: 4600 psi



APPENDIX IV
MUD TRACER REPORT

Mud Tracer Report							
Operator:	QGC	Job Number:	AB-74306	Mud Vendor:	Newpark		
Well Name:	Dunk-1	Date Tracers Added:	15/12/2014	Mud Loggers:	WFT-SLS		
Location:	Roma, QLD	Rig:	EW106	Mud Type:	WBM		
Sample Addition Number:	1	System Traced:	Active System	Volume to be Traced (bbls):	1,744		
Water Ratio:	0.84	Oil or Solid Ratio:	0.16	Desired PPM Increase:	150		
Tracer to Be Added:	Deuterium Oxide		Percent Purity of Tracer:		99.8%		
Volume to be Added (L):	35.01	Mass to be Added (kilograms):	38.76				
Circulation Time (min):	197	Rate of addition, ml/minute:	177.71				
Submitted To:	John Pittman (WSG), Eddie Poole (OCR)	Submitted By:	Robert Javadian				
WFT Labs Tracer	Robert Javadian, Ryan Jones, Sam Wilson, Jeremy Deane						
Mud Sample Inventory							
I.D.	Time	Date	Lag Depth	Rig Activity	Mud Sampling Comments	Sample Taker Name	Deuterium (ppm)
1-1	21:00	15/12/14	2,679	Drilling	Pre-Tracer/Baseline	R. Jones	160.4
1-2	0:54	15/12/14	2,704	Drilling	1st Circulation	R. Jones	273.6
1-3	4:11	16/12/14	2,721	Drilling	2nd Circulation	R. Javadian	309.6
1-4	7:28	16/12/14	2,732	Drilling	3rd Circulation	S. Wilson	303.7
1-5	10:45	16/12/14	2,751	Drilling	4th Circulation	J. Deane	304.5
1-6	14:00	16/12/14	2,782	Drilling	5th Circulation	J. Deane	306.2
1-7	6:55	17/12/14	2,870	Circulating	B.U. @ C.P.	R. Javadian	296.7
1-8	16:42	18/12/14	2,870	Circulating	RIH C#1 (Pre Core)	R. Jones	298.1
1-9	21:15	18/12/14	2,870	Reaming to Btm	RIH C#1 (Pre Core)	R. Javadian	287.6
1-10	6:40	19/12/14	2,870	Tagged Btm for Core 1	Cir. Btms Up for Core 1 (Pre Core)	S. Wilson	286.7
1-11	10:36	19/12/14	2,873	Coring	3m Cored	S. Wilson	287.3
1-12	11:28	19/12/14	2,876	Coring	6m Cored	S. Wilson	286.9
1-13	13:12	19/12/14	2,879	Coring	9m Cored	R. Jones	282.1
1-14	16:39	19/12/14	2,882	Coring	12m Cored	R. Jones	284.5
1-15	19:10	19/12/14	2,885	Coring	15m Cored	R. Javadian	283.1
1-16	21:50	19/12/14	2,888	Coring	18m Cored	R. Javadian	283.4
1-17	0:20	20/12/14	2,891	Coring	21m Cored	J. Deane	279.9
1-18	1:40	20/12/14	2,894	Coring	24m Cored	J. Deane	280.1
1-19	2:55	20/12/14	2,897	Circulating	27m Cored	J. Deane	279.9
2-1	9:50	21/12/14	2,897	Circulating	Core 2 (Pre Core)	S. Wilson	281.7
2-2	12:12	21/12/14	2,906	Coring	36m cored	R. Jones	280
2-3	12:41	21/12/14	2,909	Coring	39m Cored	R. Jones	281.5
2-4	13:06	21/12/14	2,912	Coring	42m Cored	R. Jones	279.8
2-5	13:32	21/12/14	2,915	Coring	45m Cored	R. Jones	280.7
2-6	13:59	21/12/14	2,918	Coring	48m Cored	R. Jones	277.6
2-7	14:32	21/12/14	2,921	Circulating	51m Cored	R. Jones	280.8
2-8	15:13	21/12/14	2,924	Circulating	54m Cored	R. Jones	280.2
2-9	15:17	21/12/14	2,924	Circulating	Cir. Btms Up (Post Core)	R. Jones	281.7

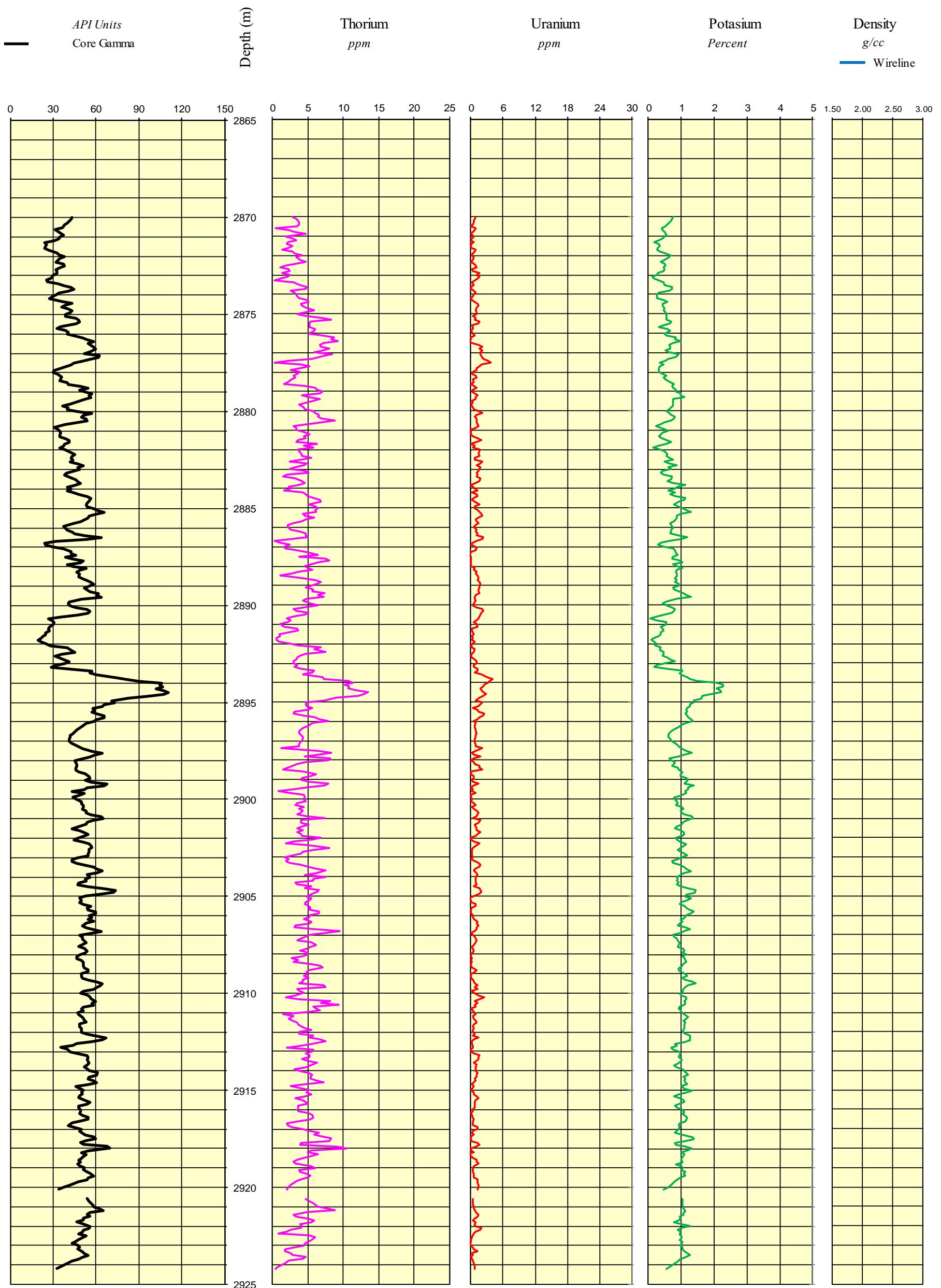
APPENDIX V

CORE PLOT

CORE PLOT

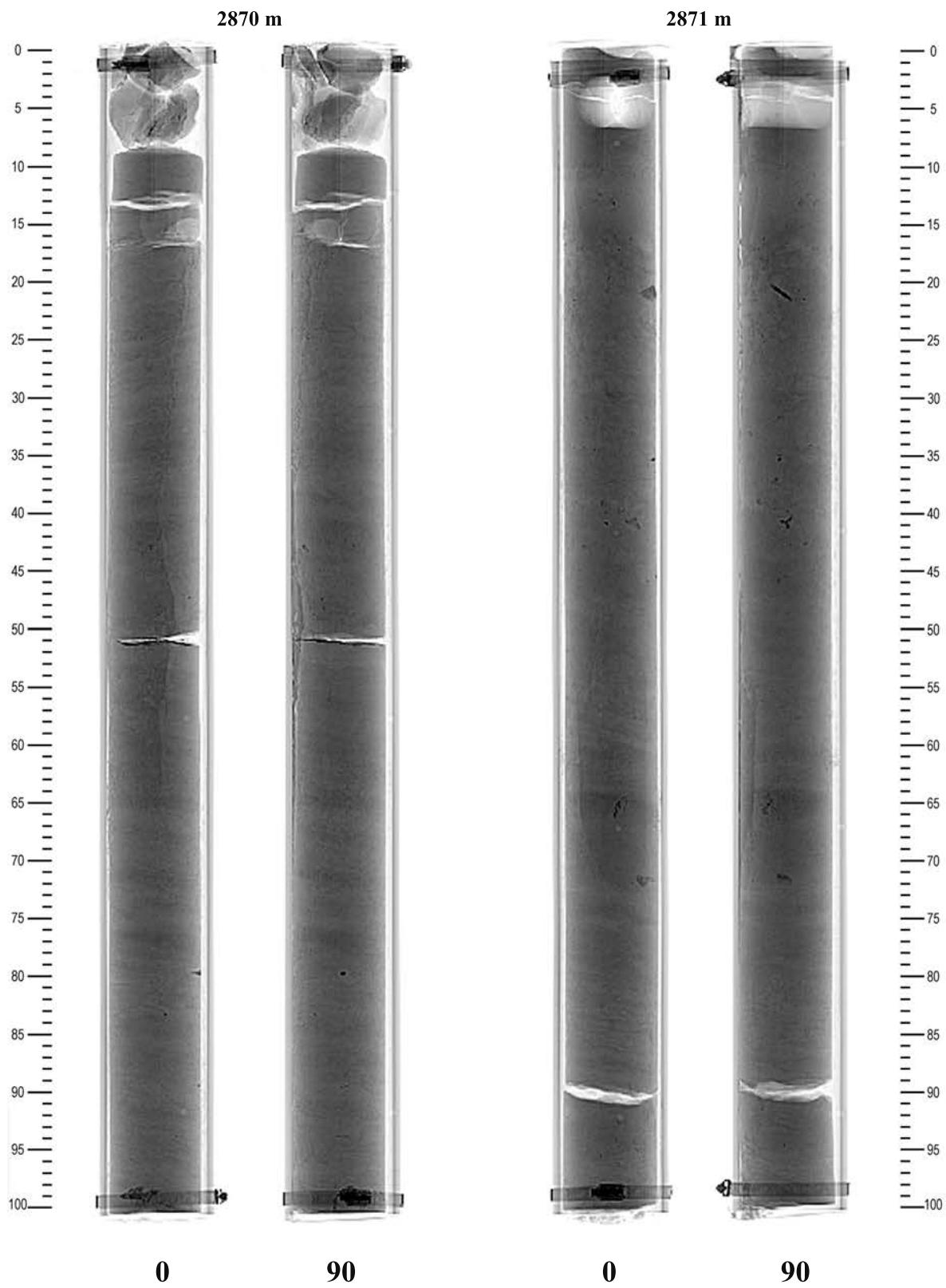
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 Project: DUNK-1
 Project #: AB-74306

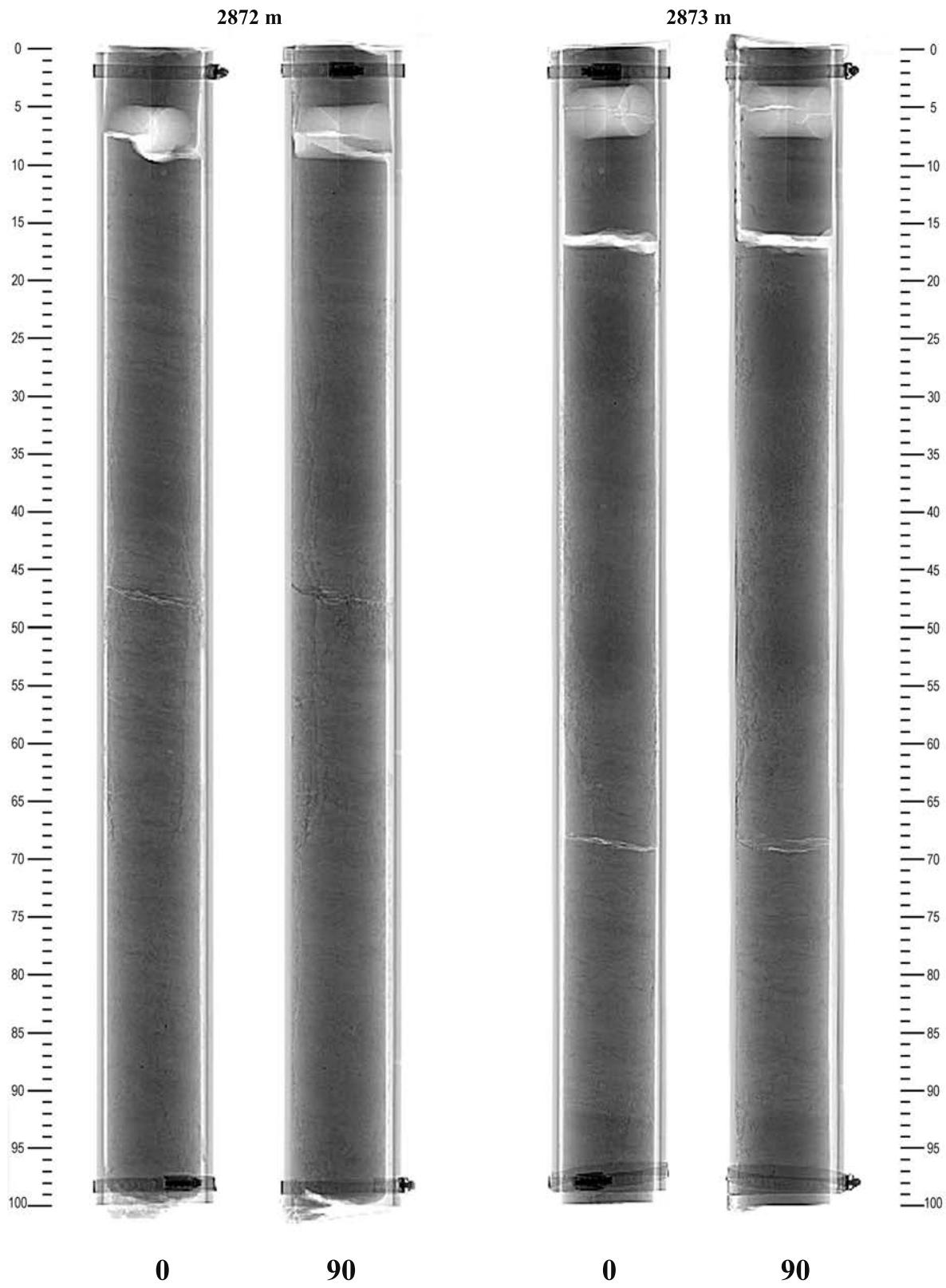
Core #1 2870.00 - 2896.66m
 Core #2 2896.66 - 2924.27m

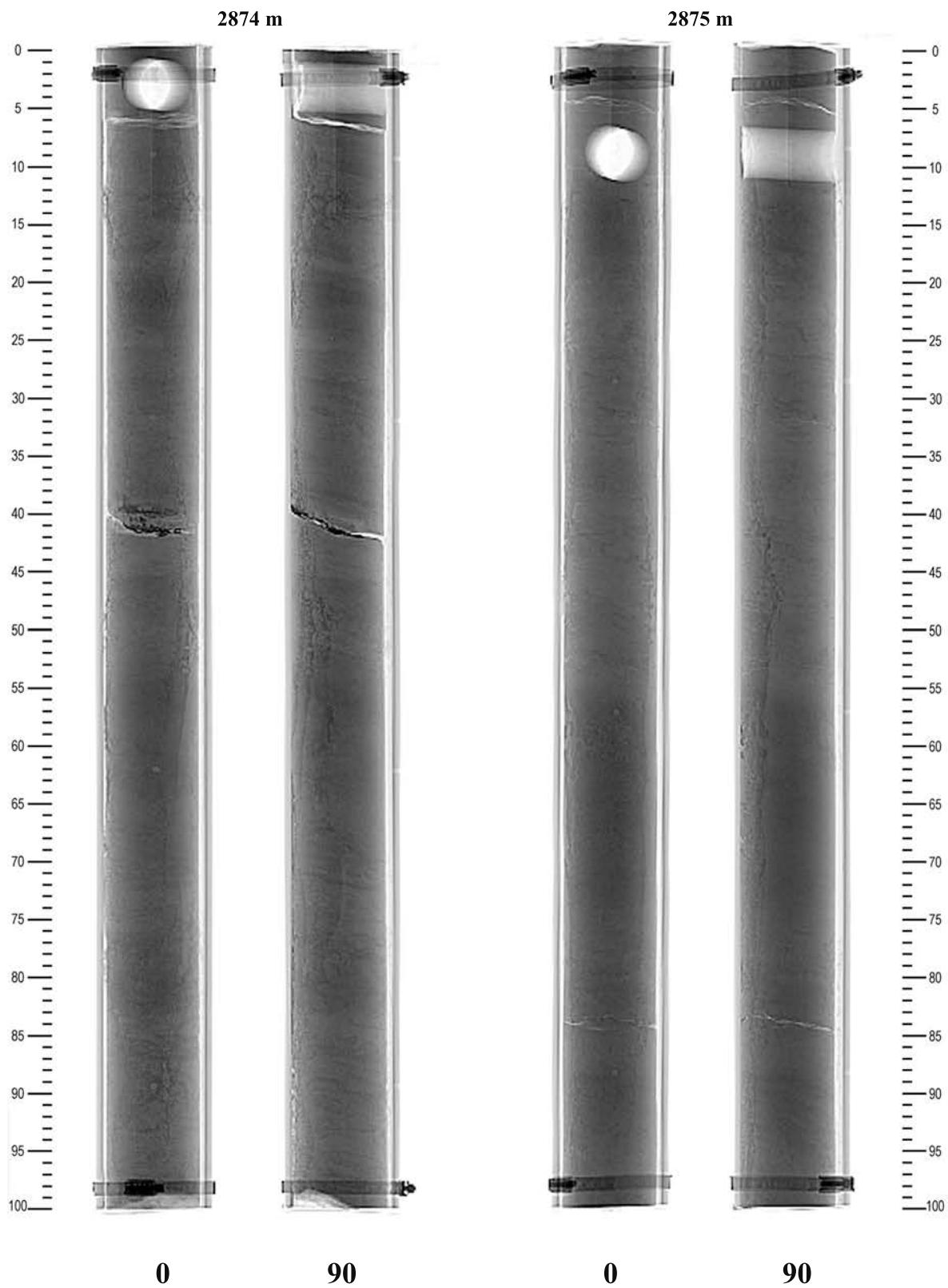


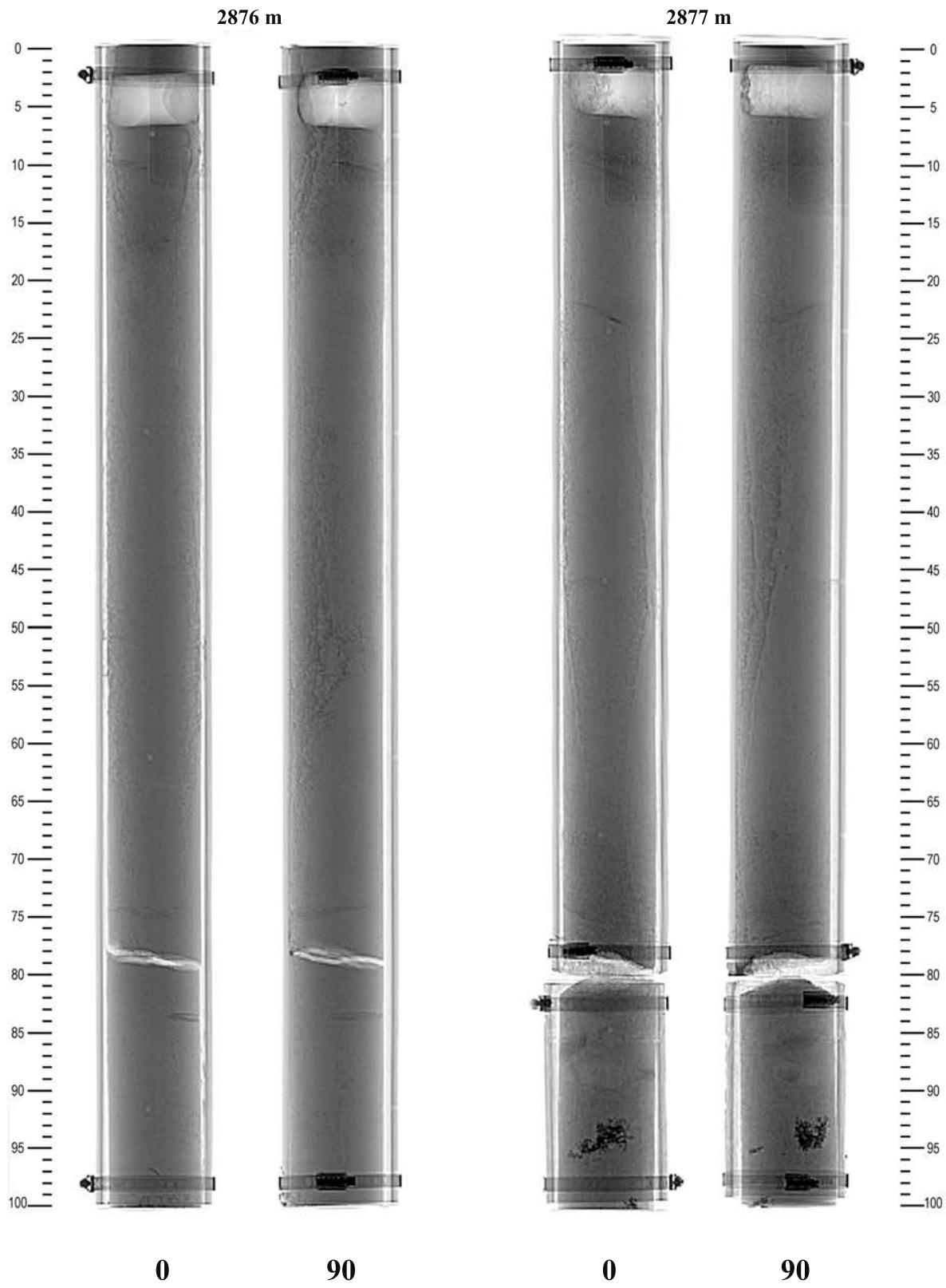
APPENDIX VI

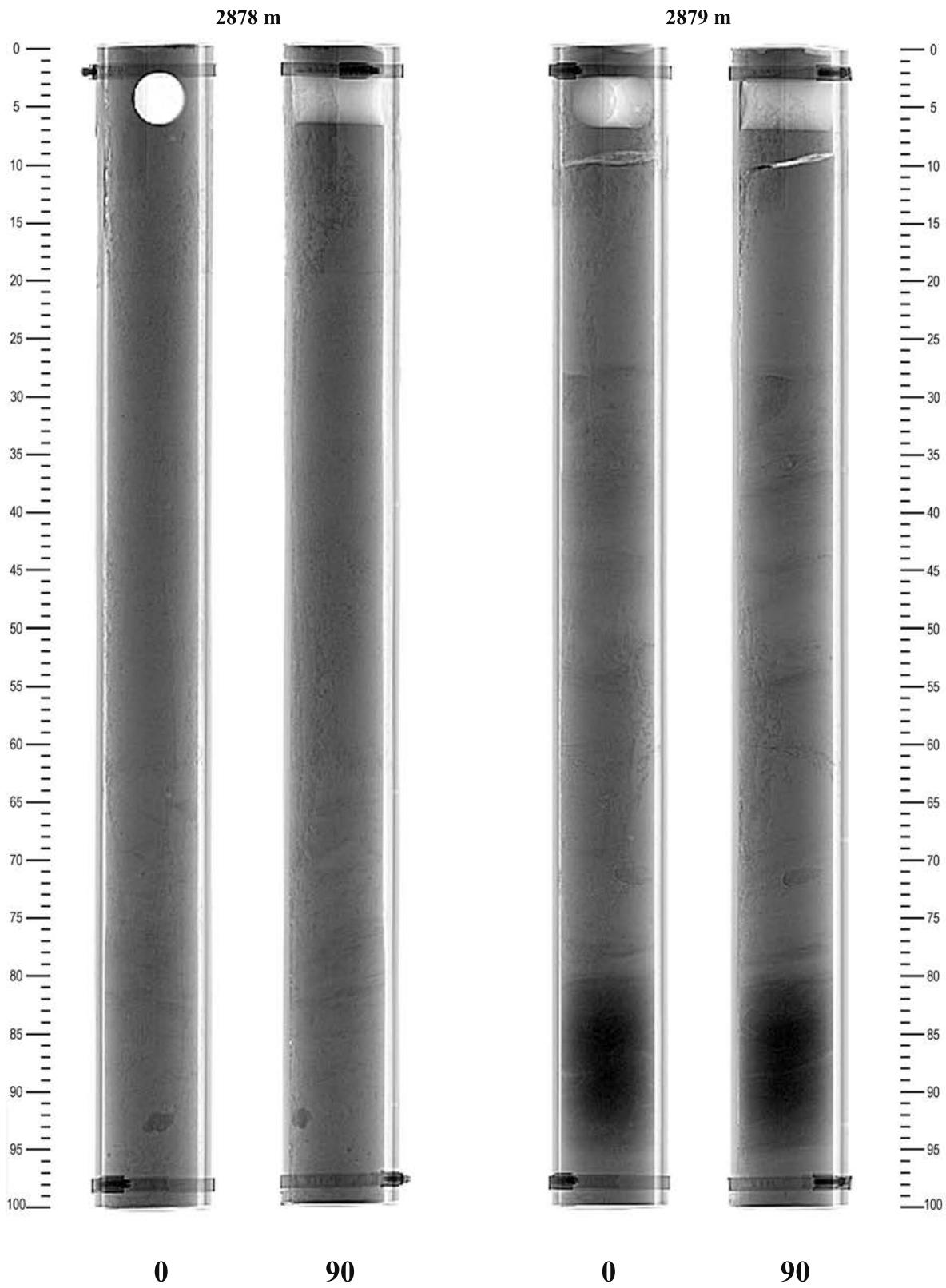
CORE CT SCANS





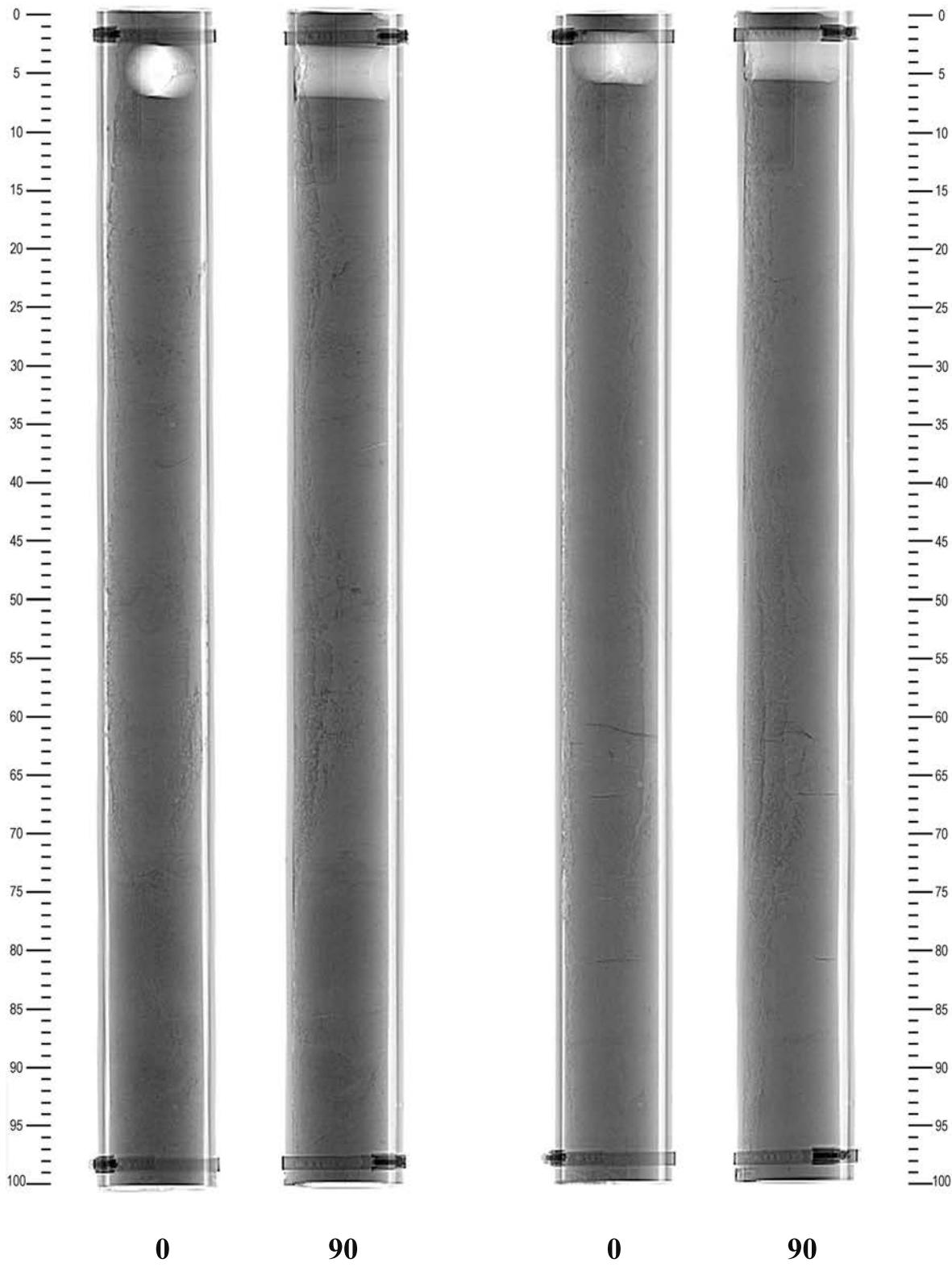


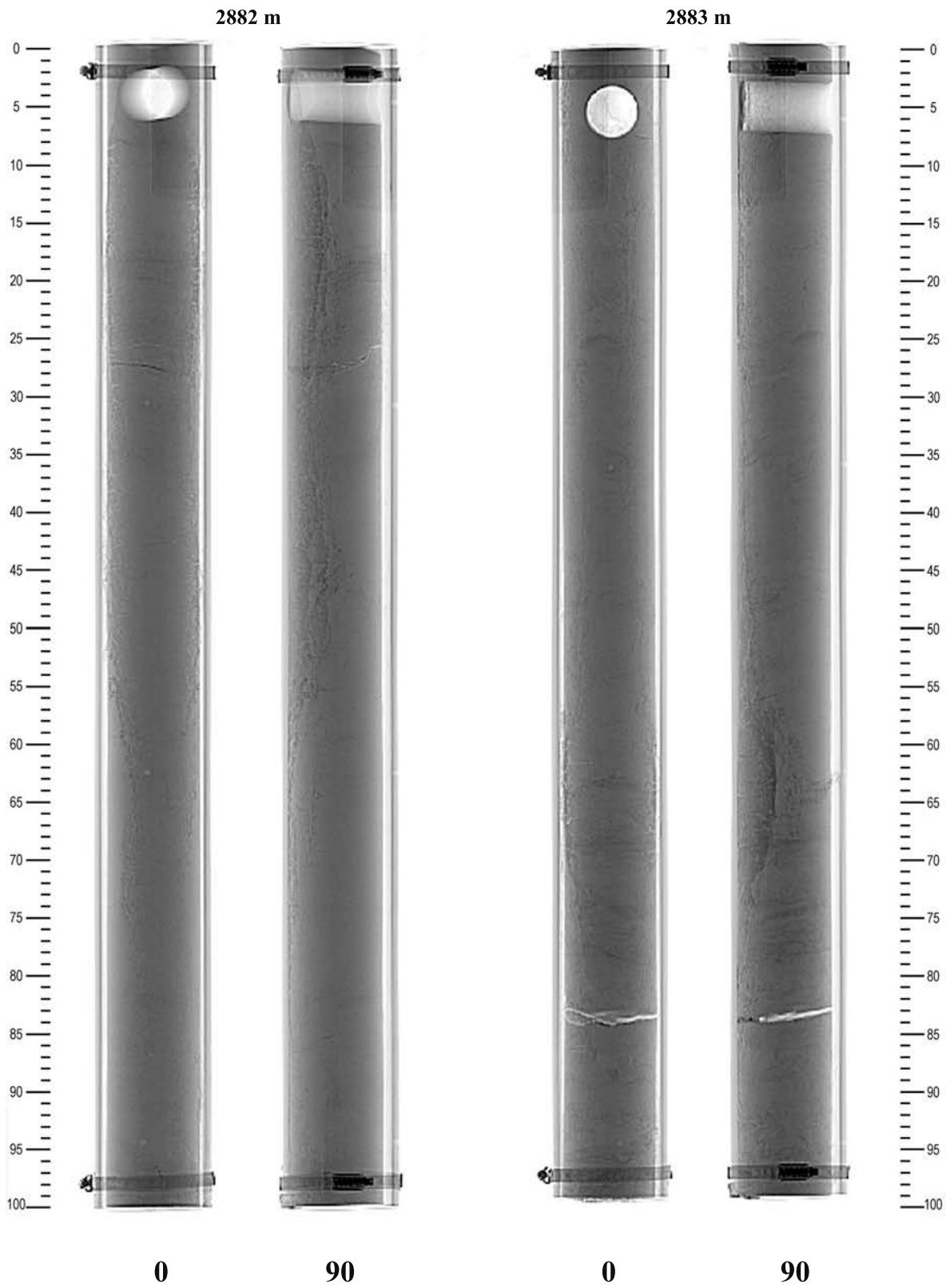




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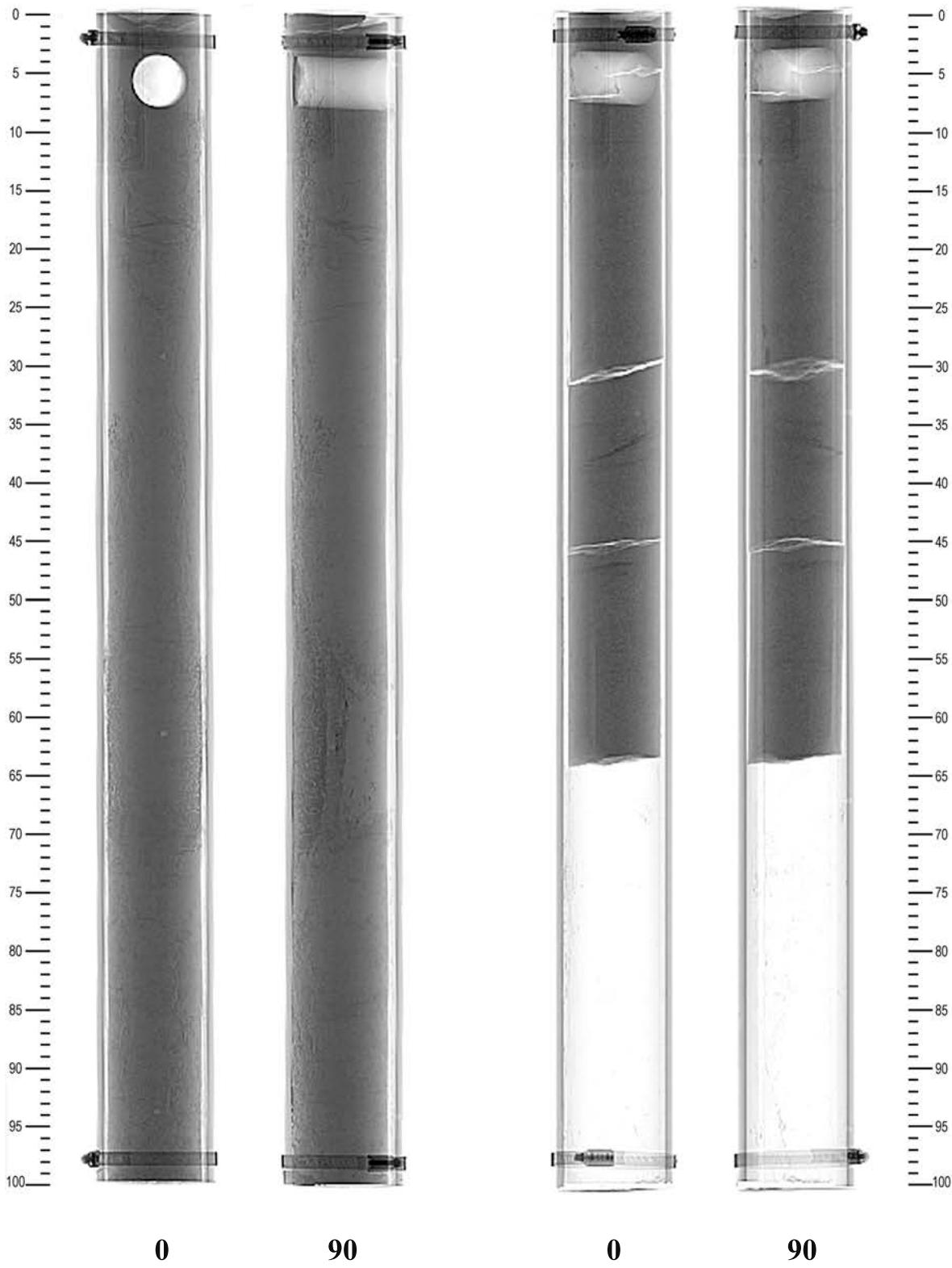
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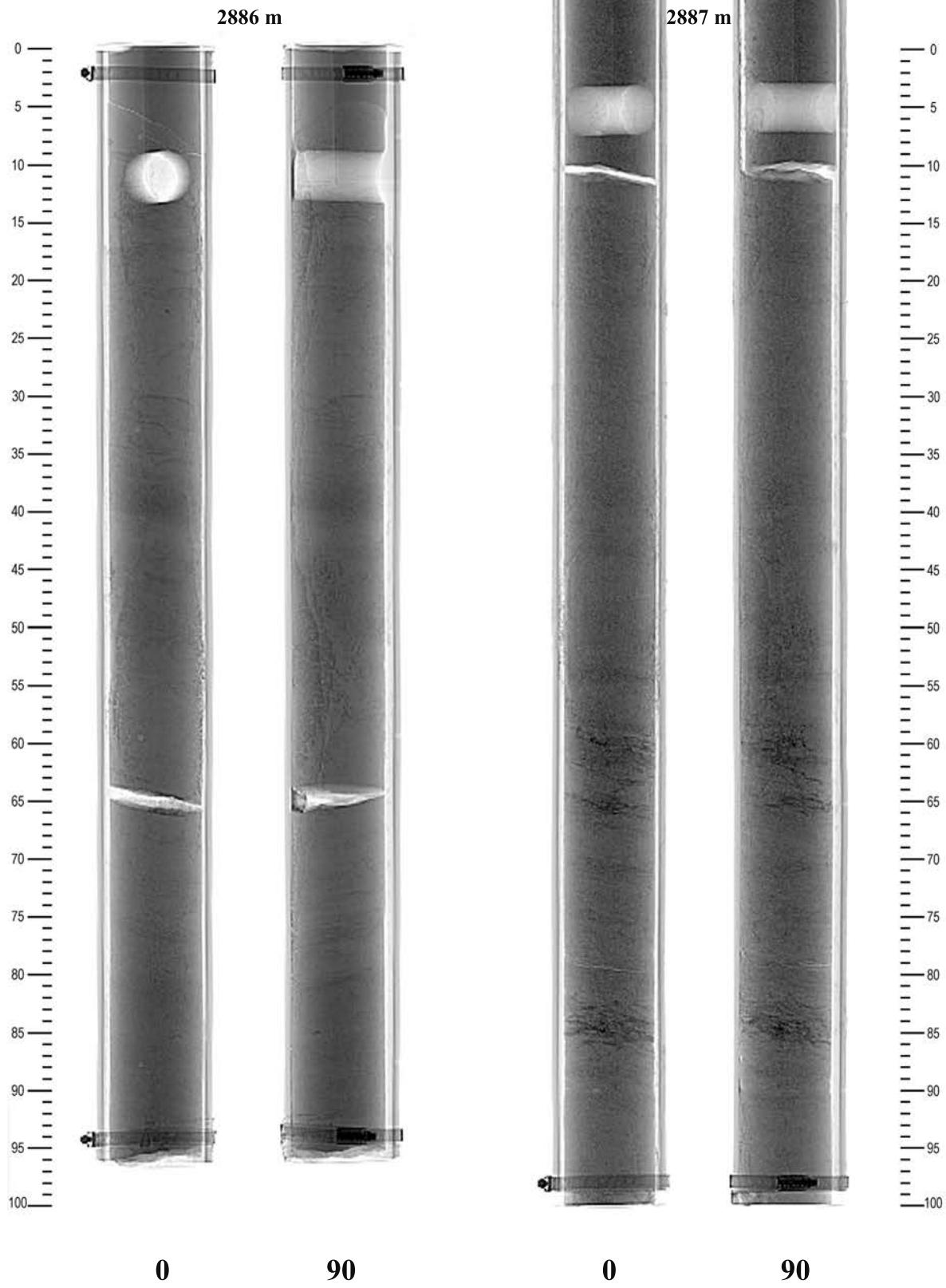




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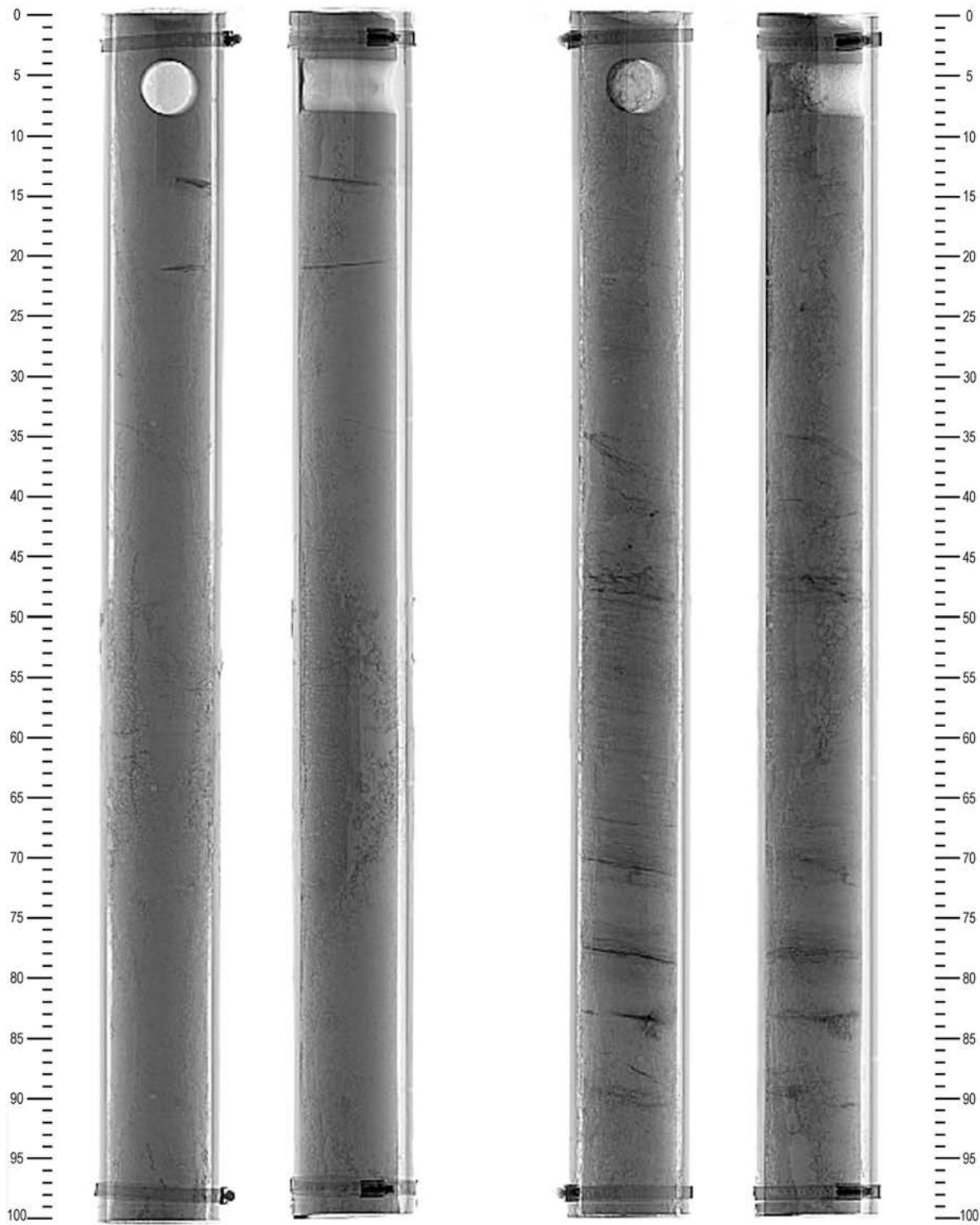
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2888 m

2889 m



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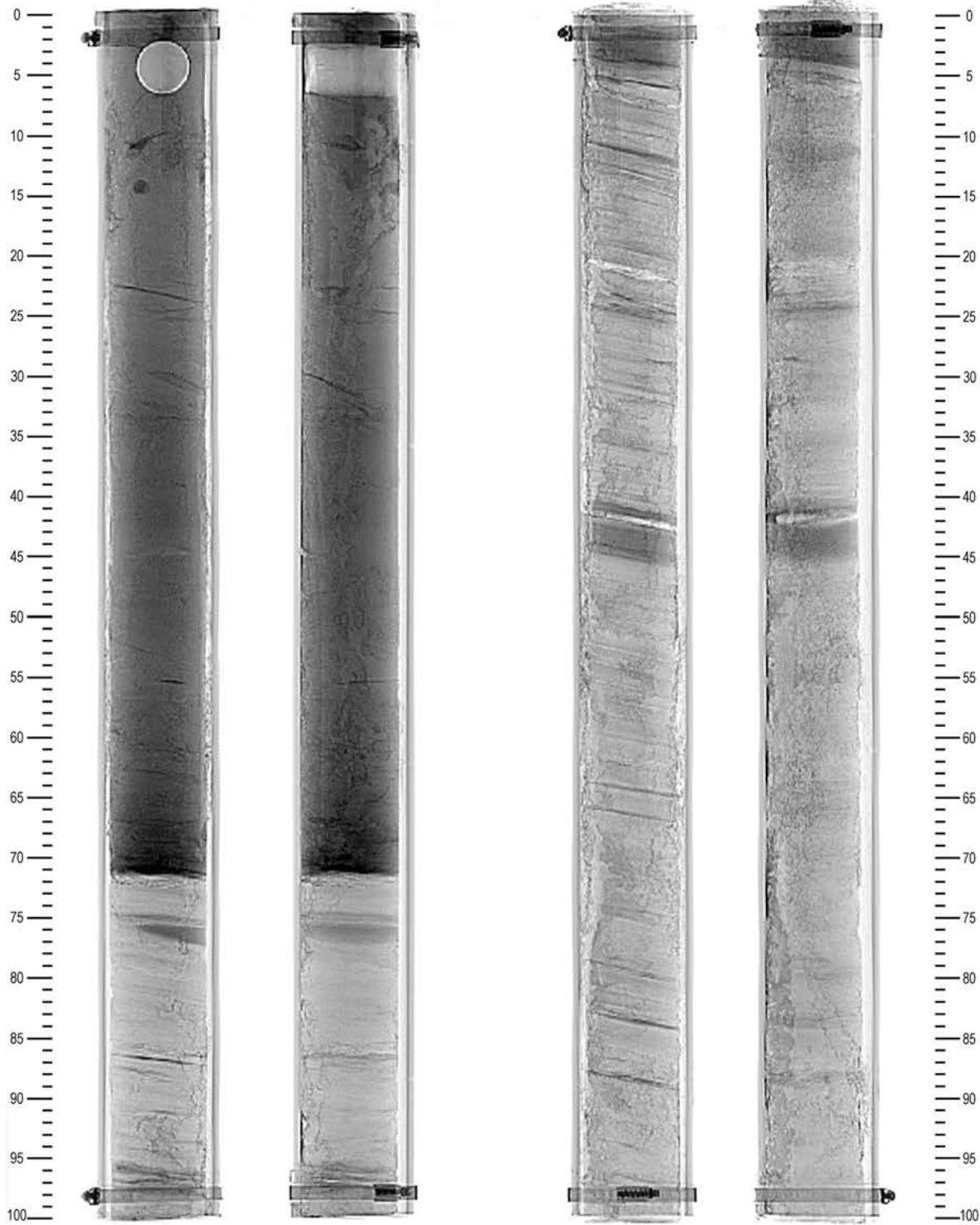
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2890 m

2891 m



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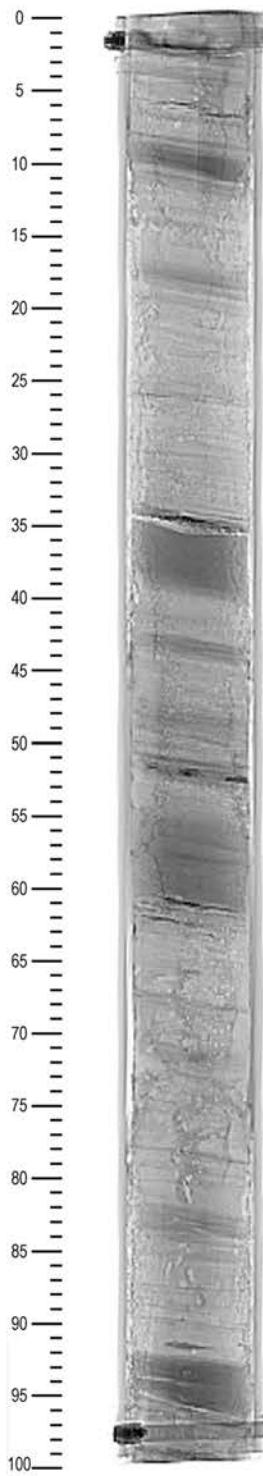
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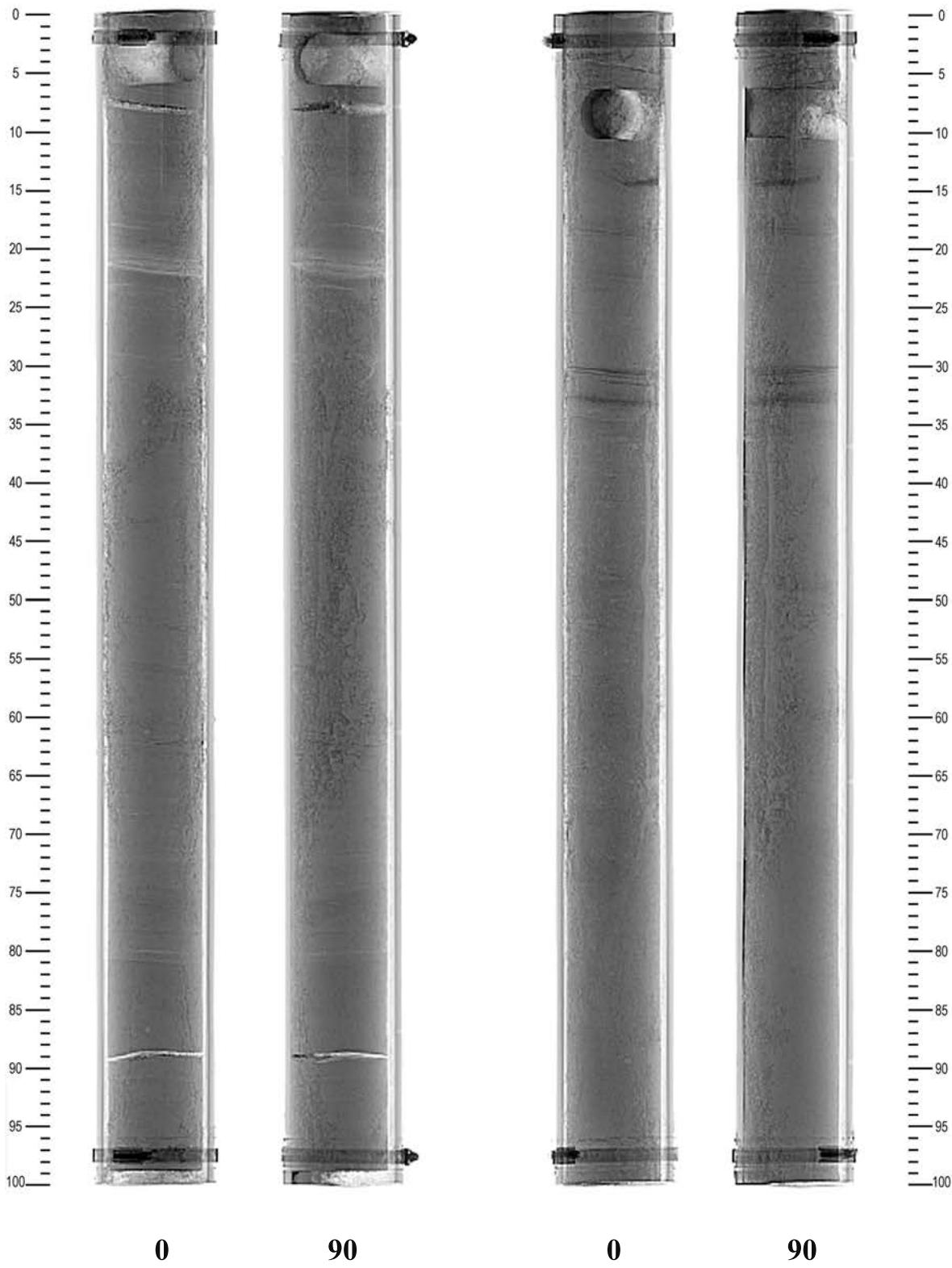
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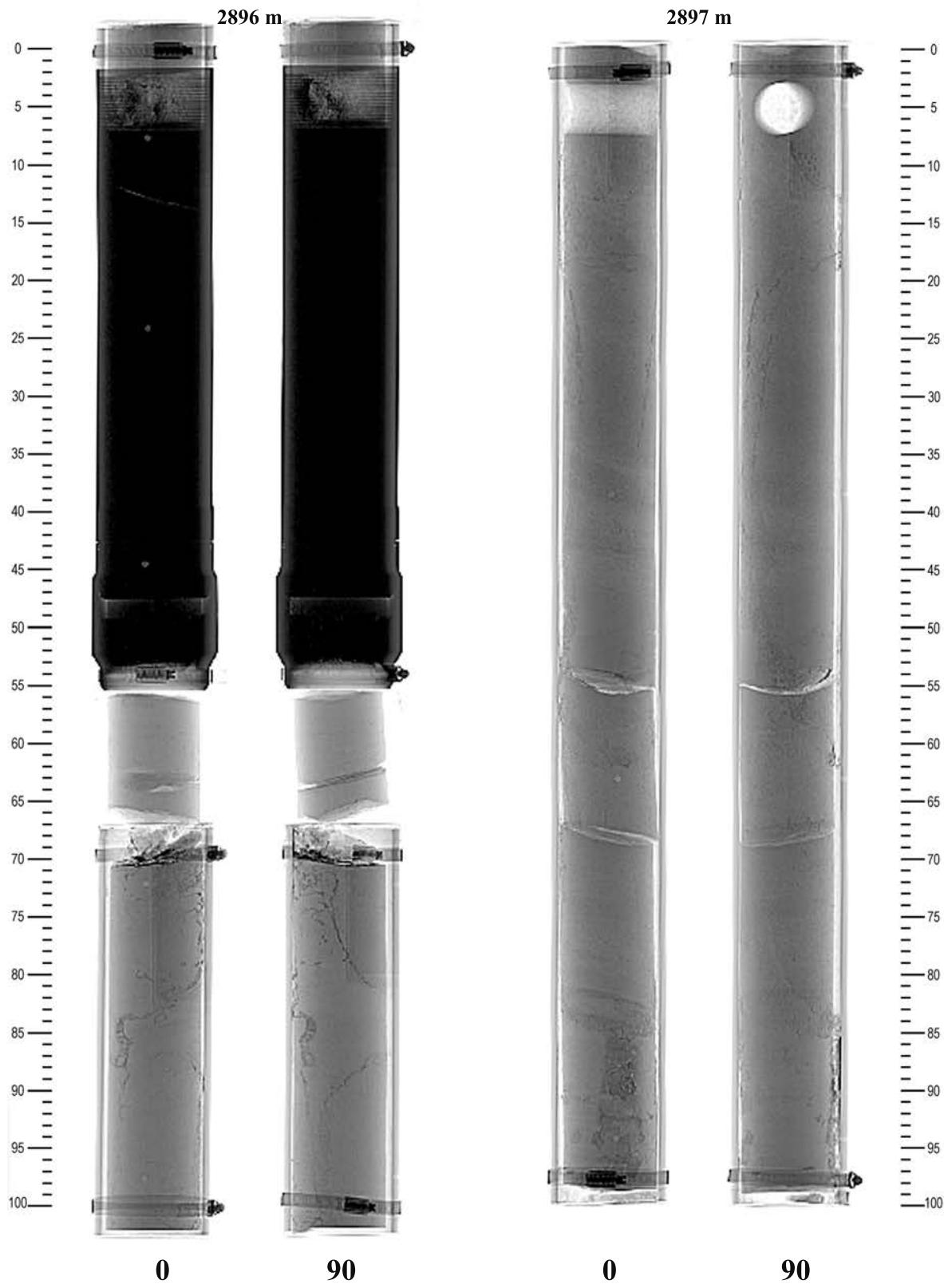
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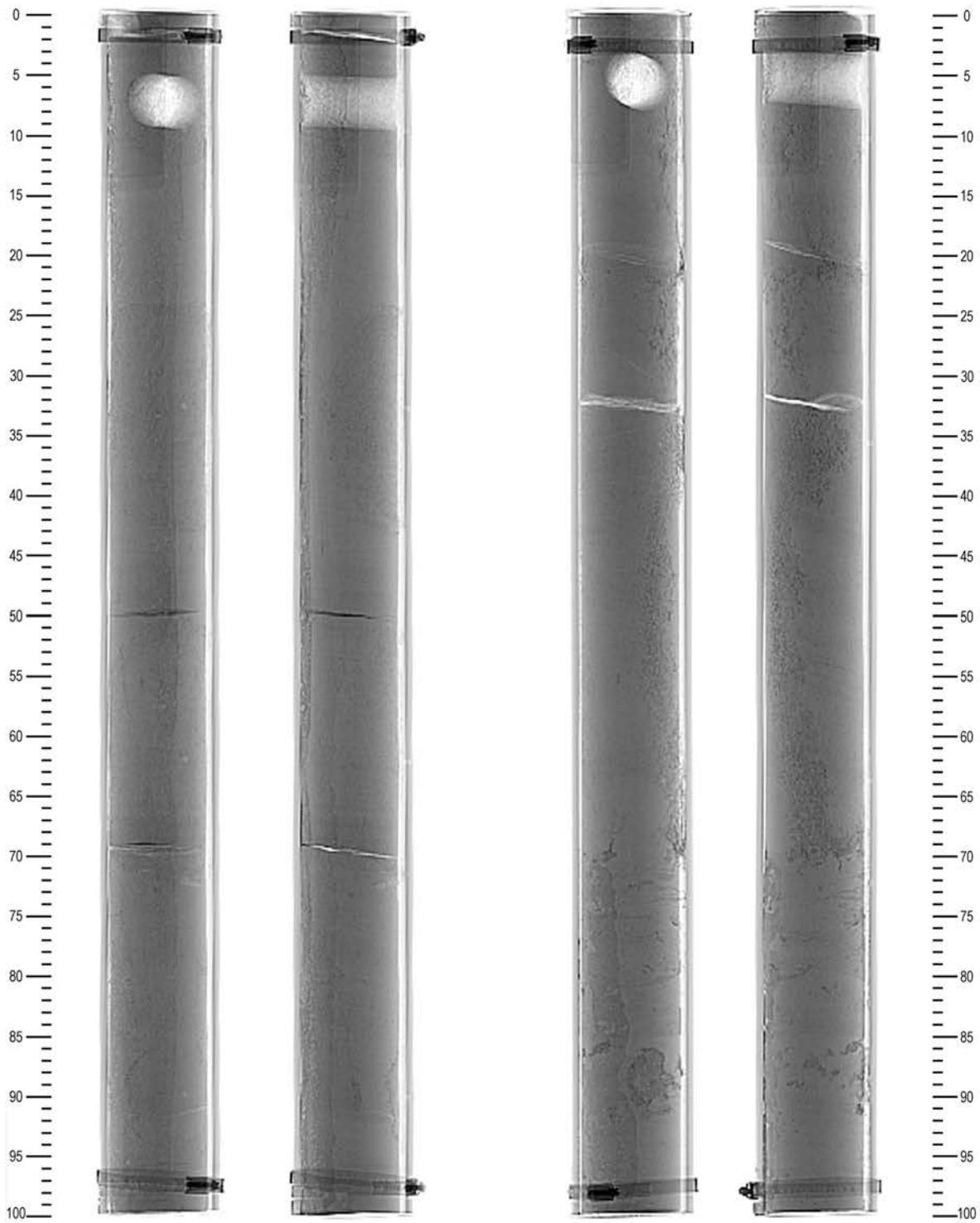
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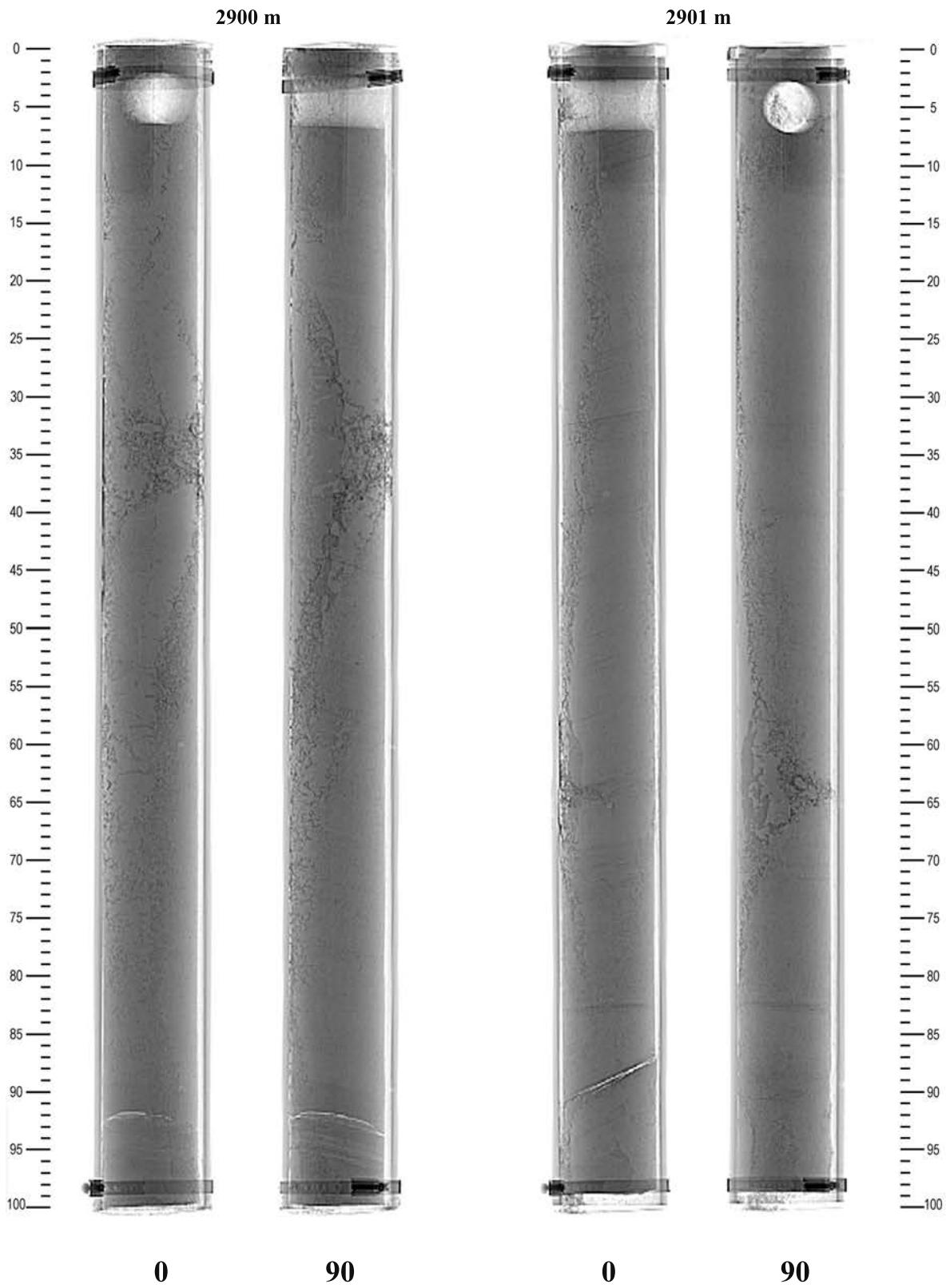


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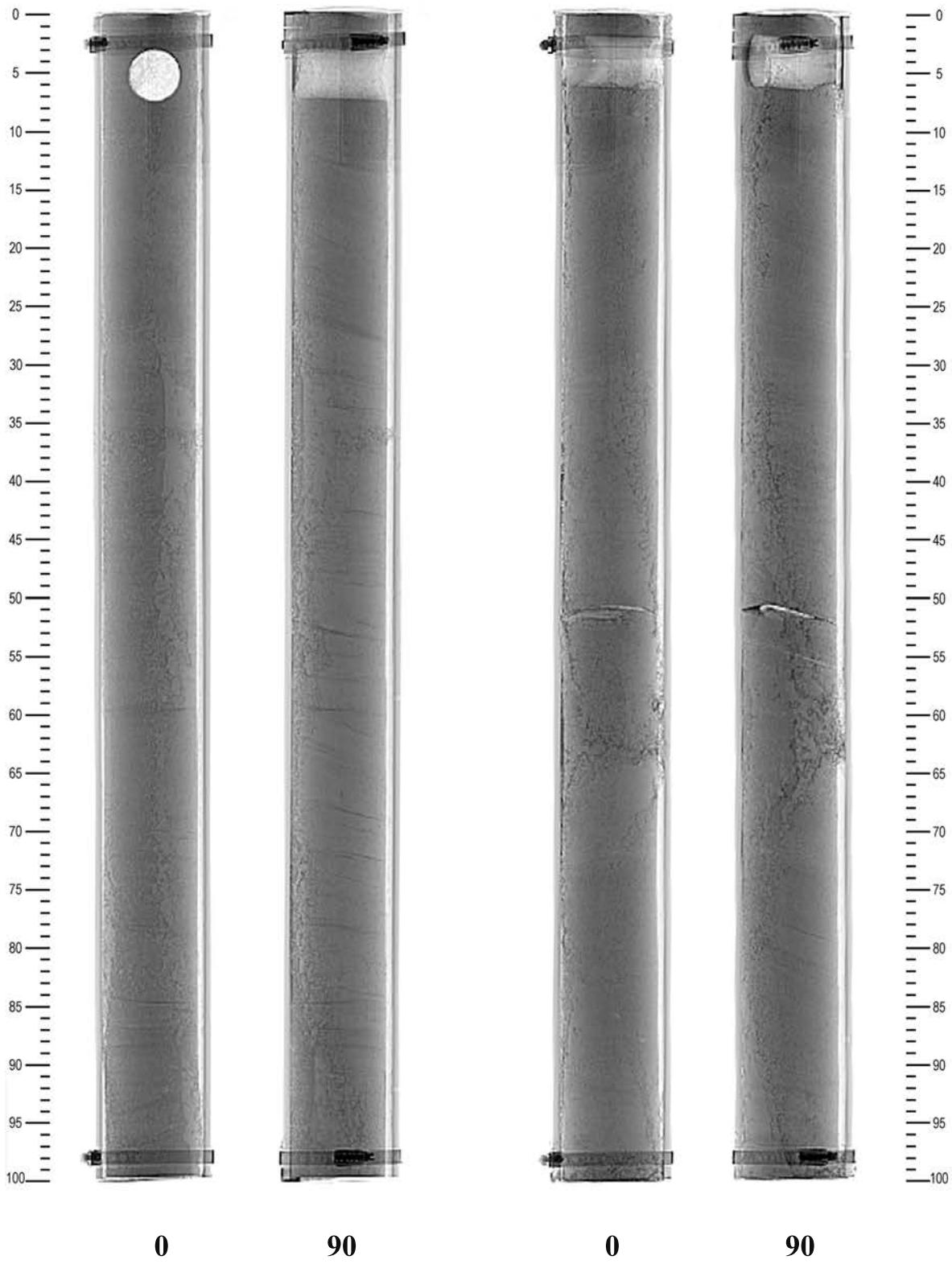
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2903 m



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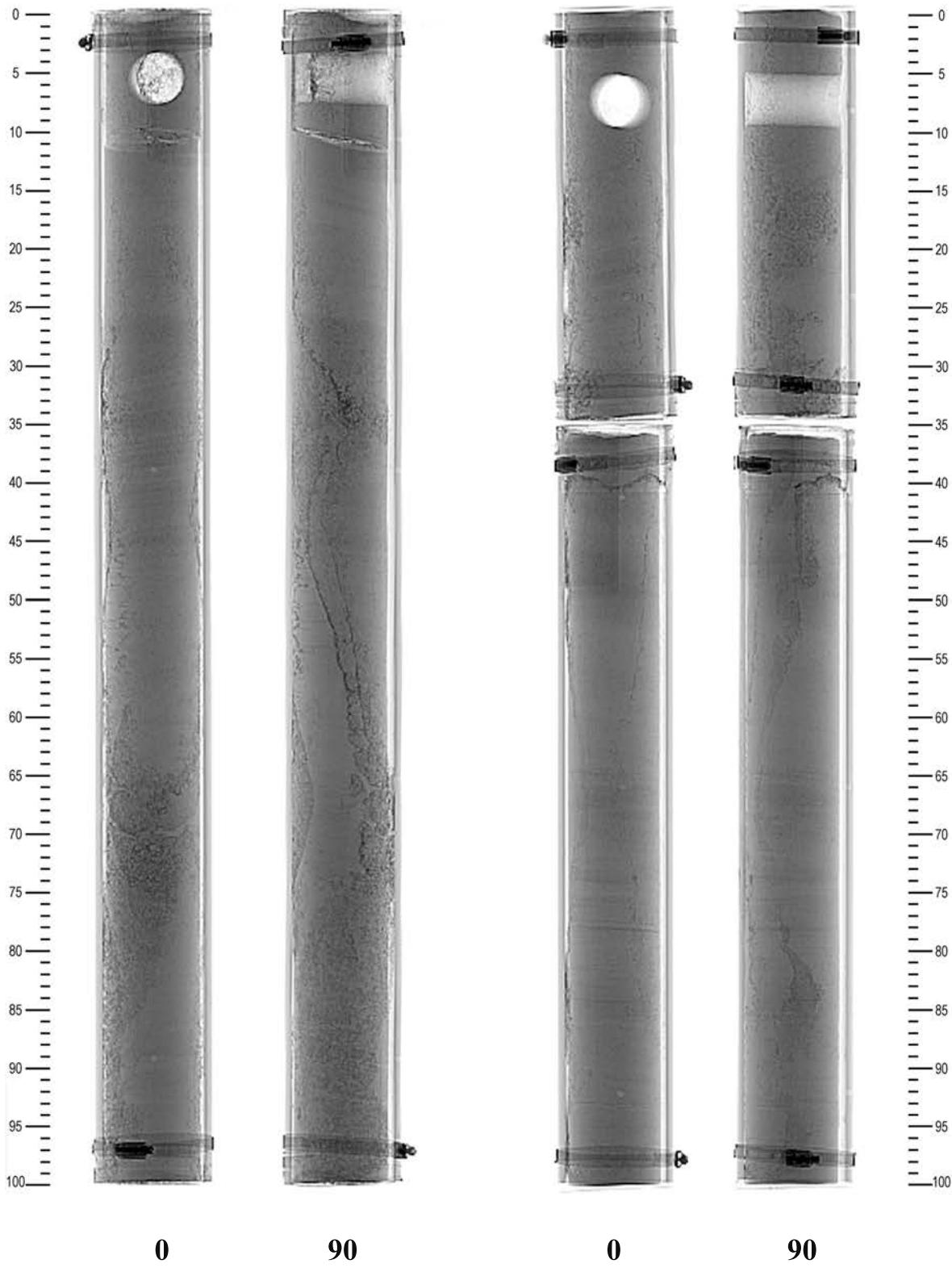
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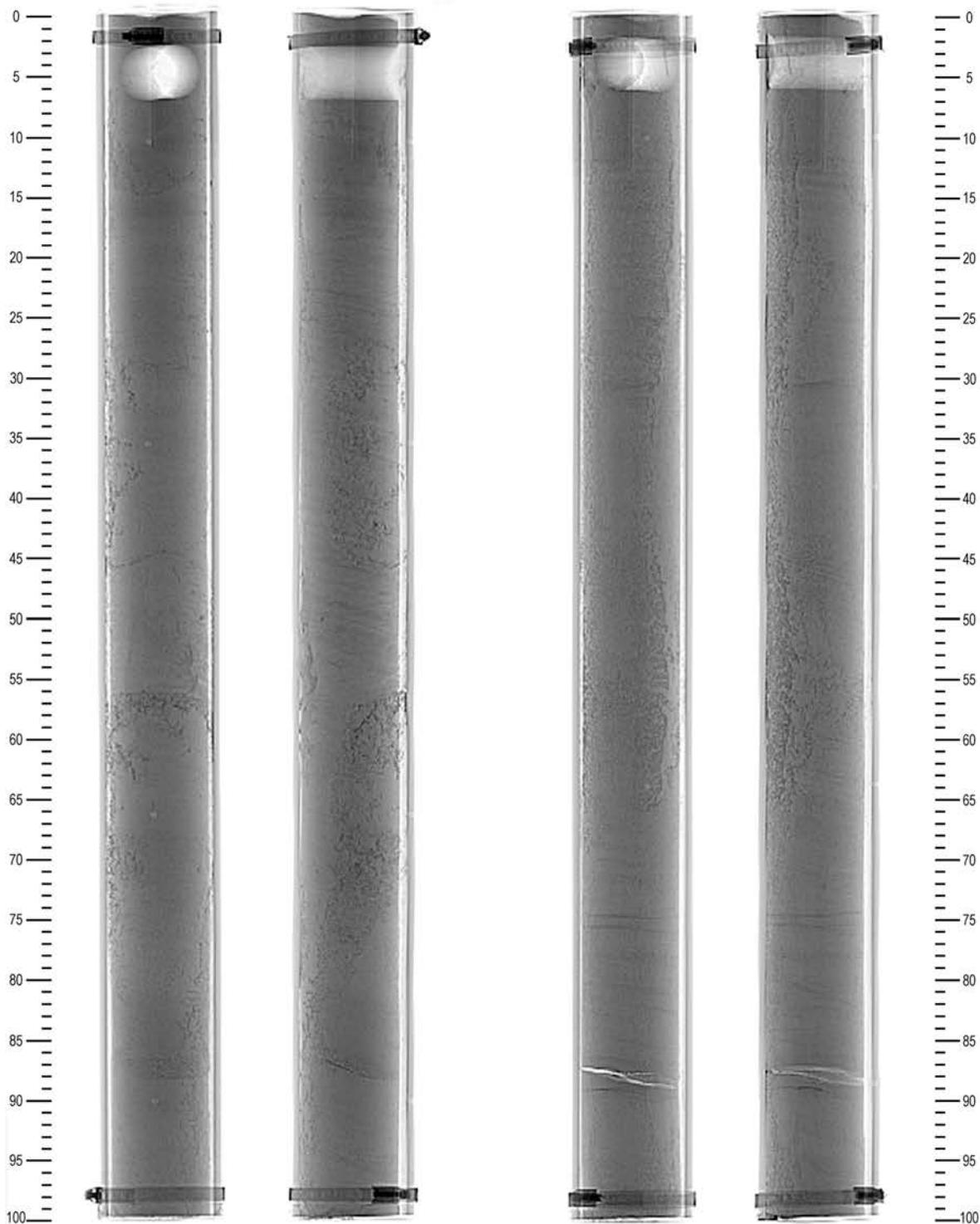
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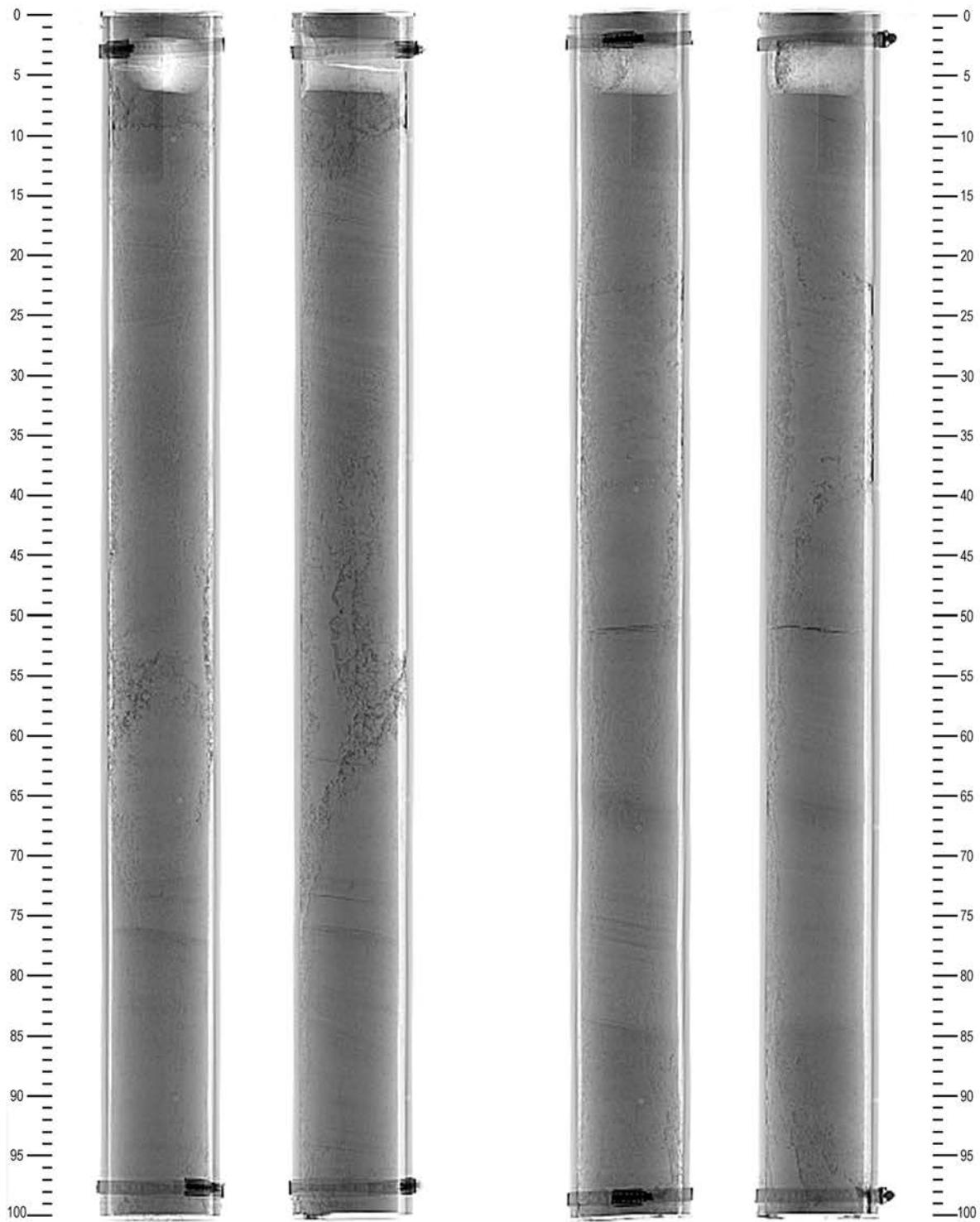
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2909 m



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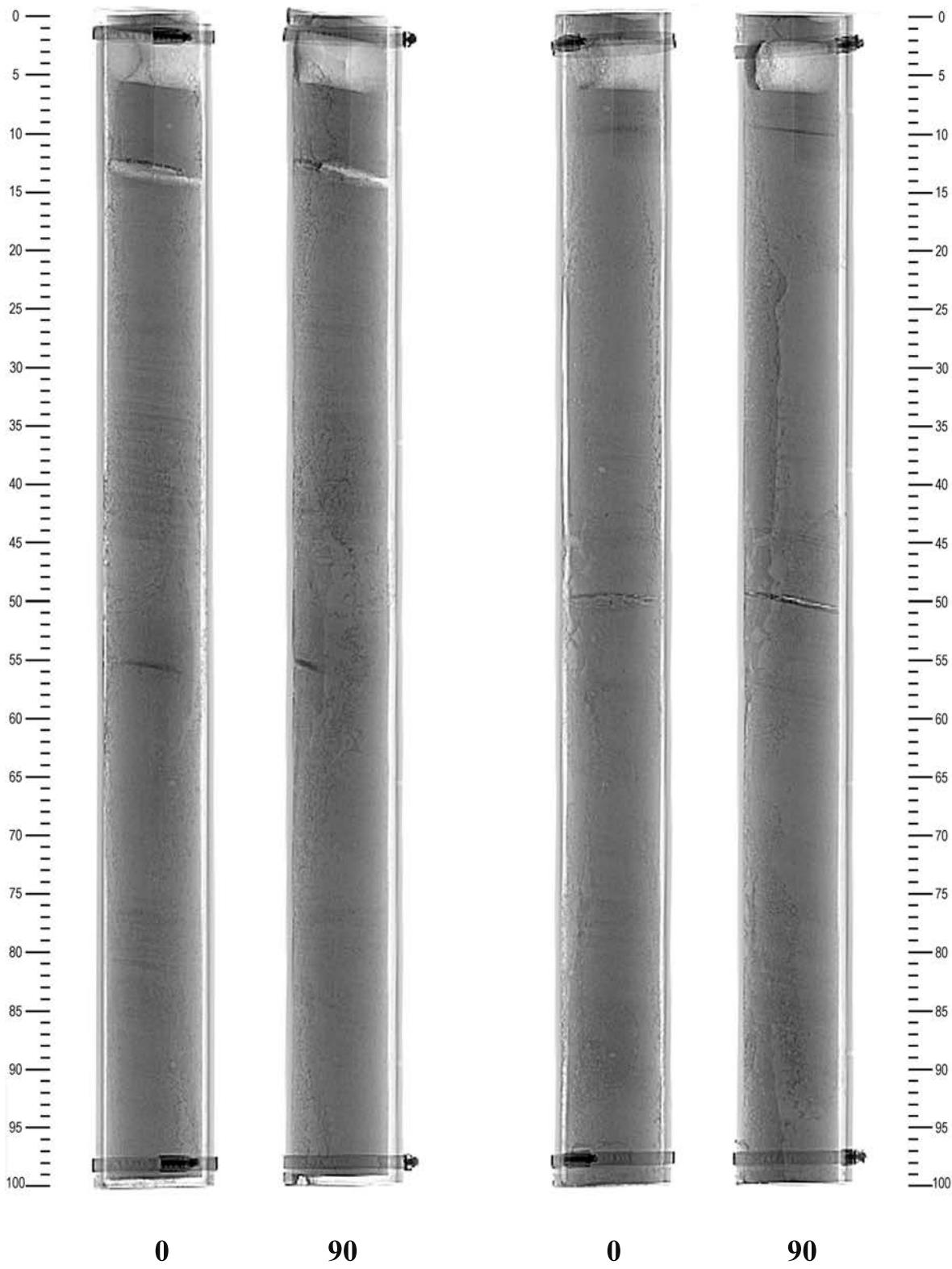
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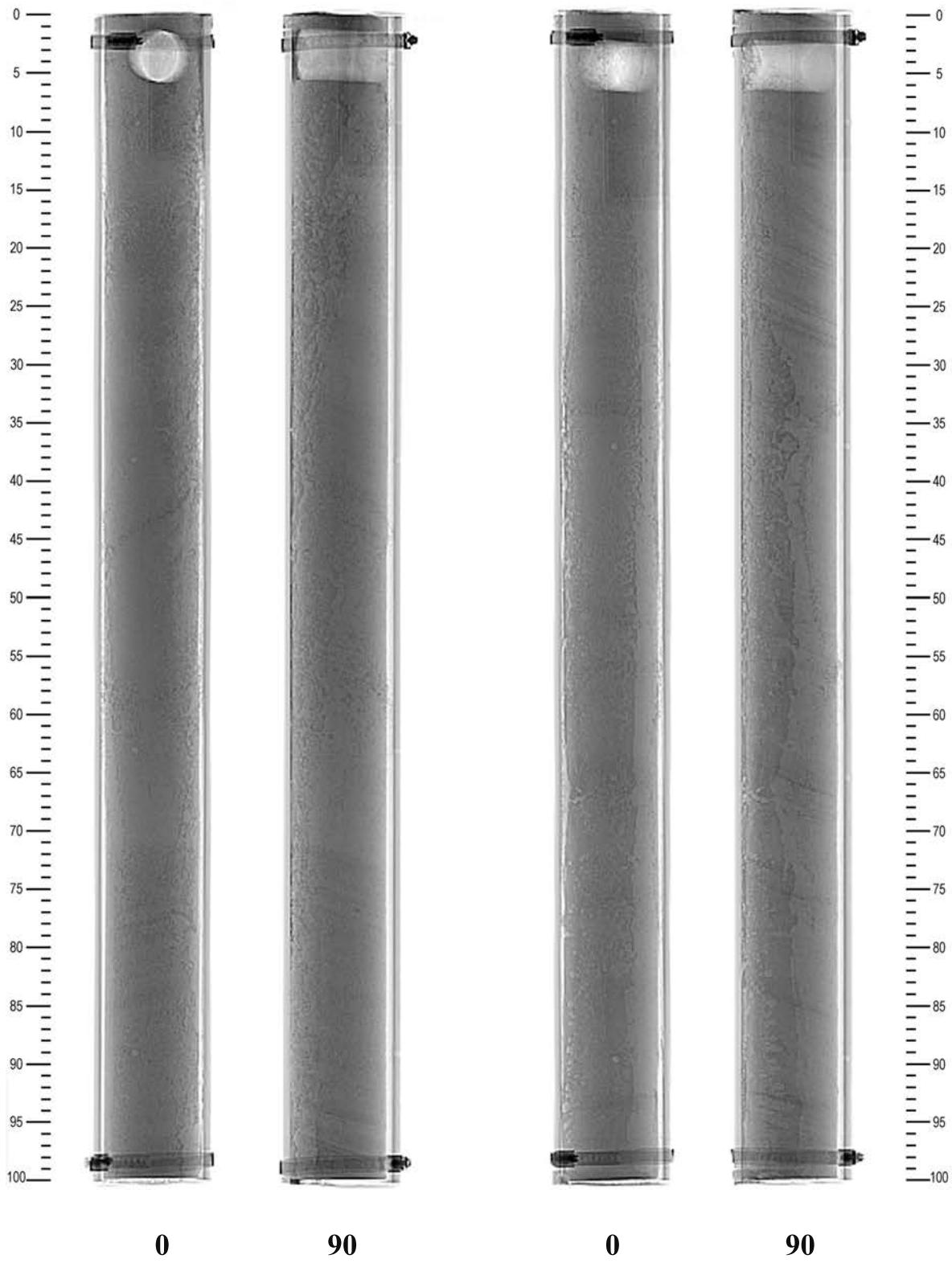
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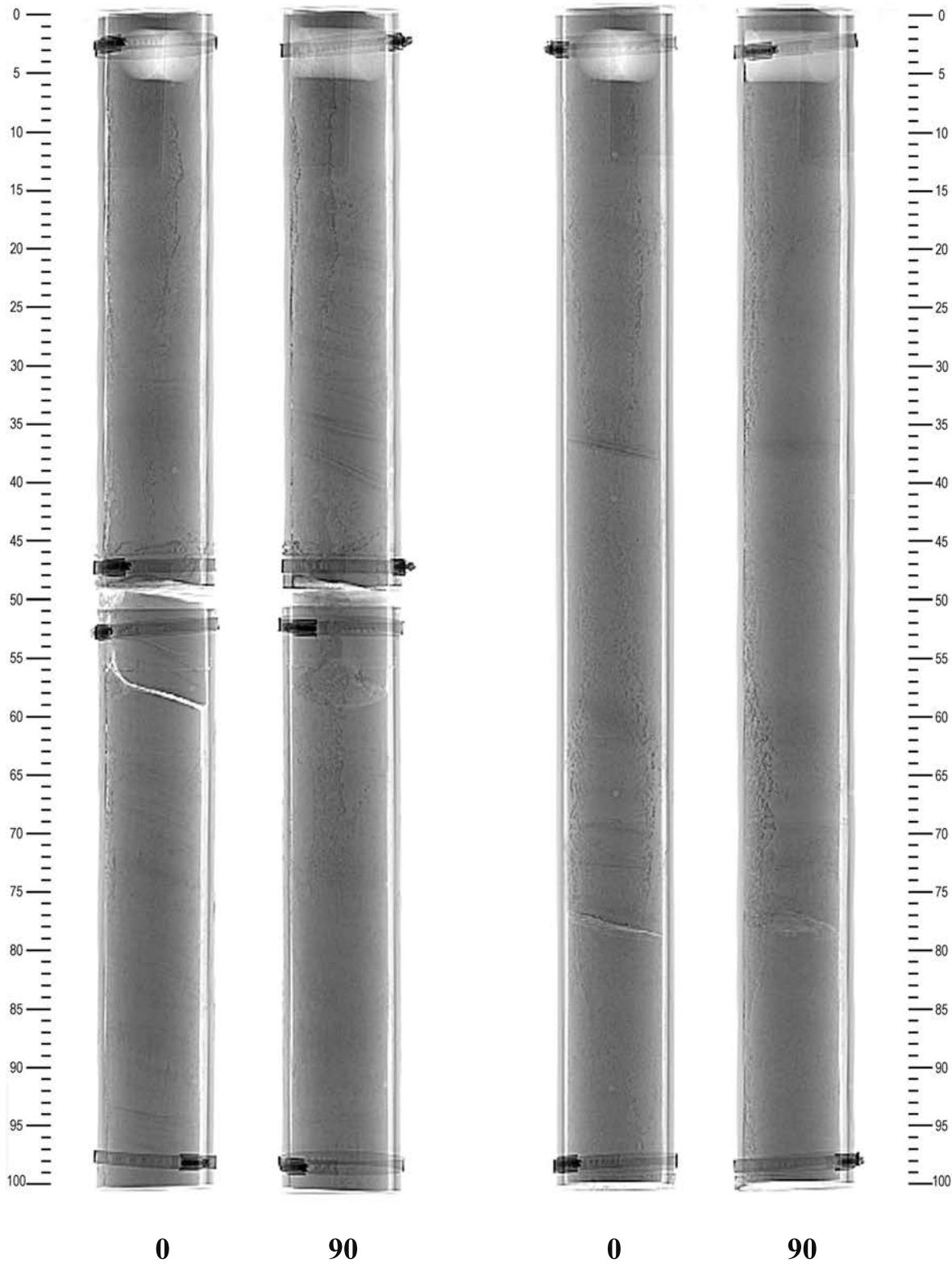
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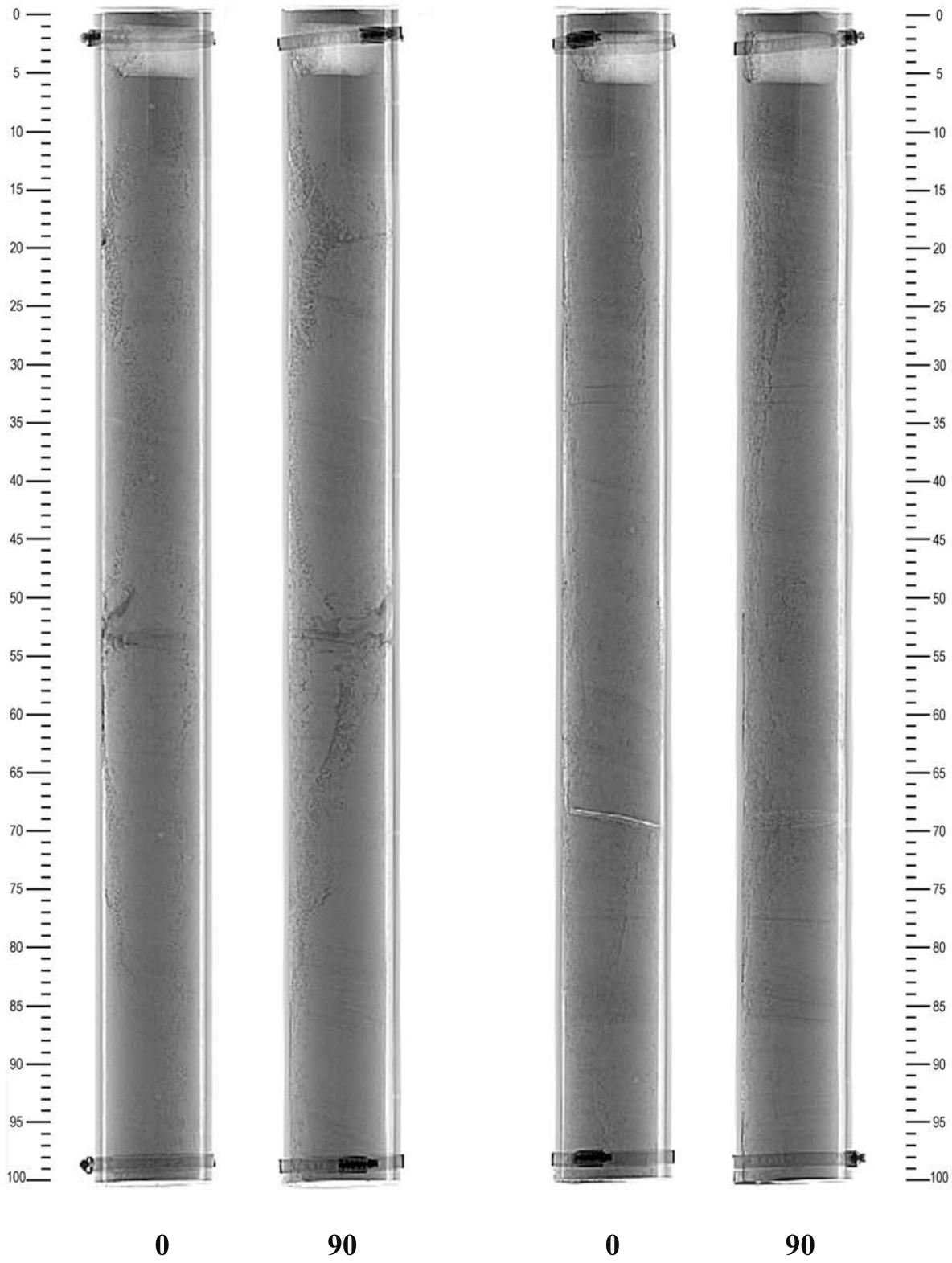
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2916 m

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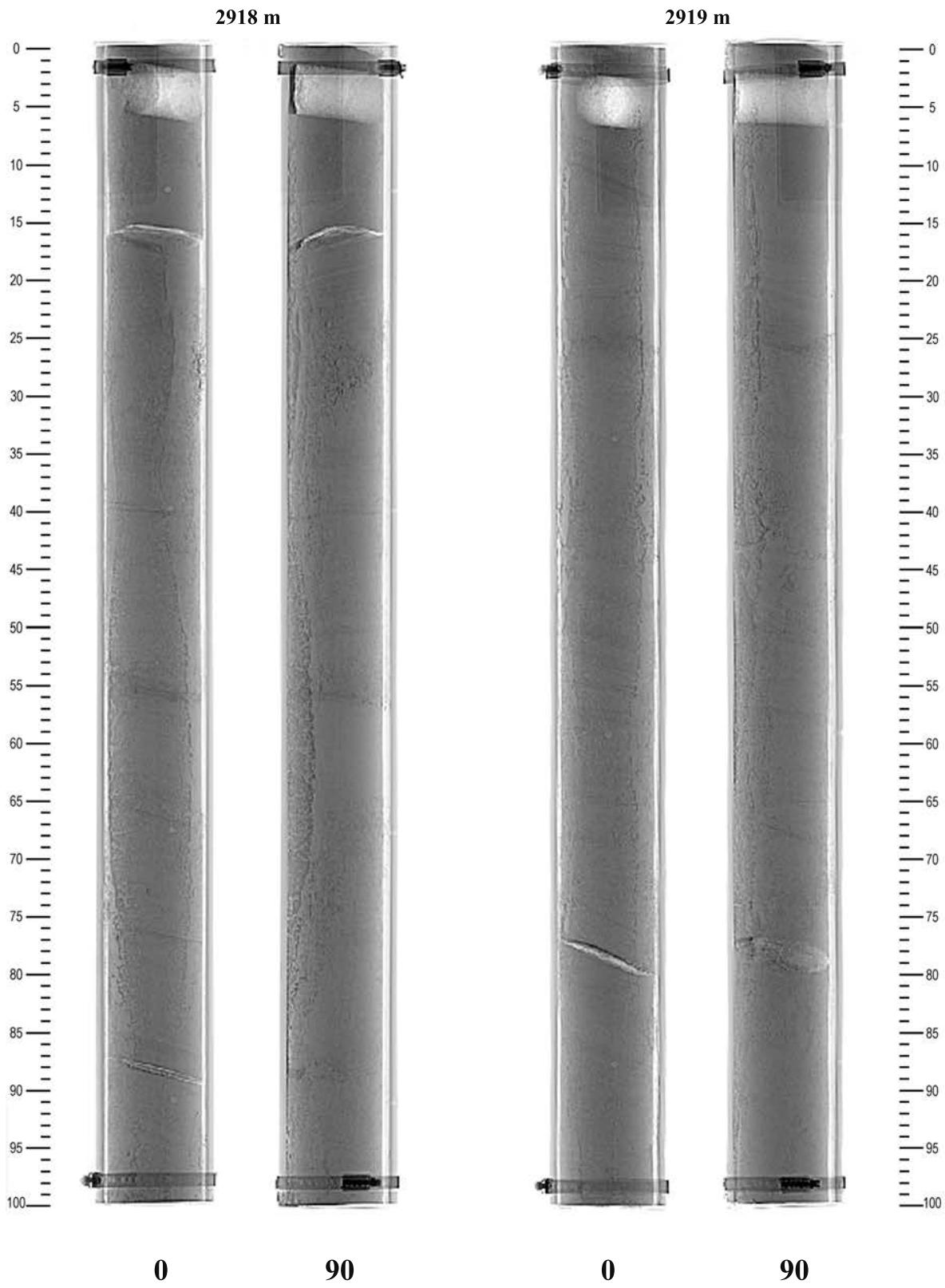


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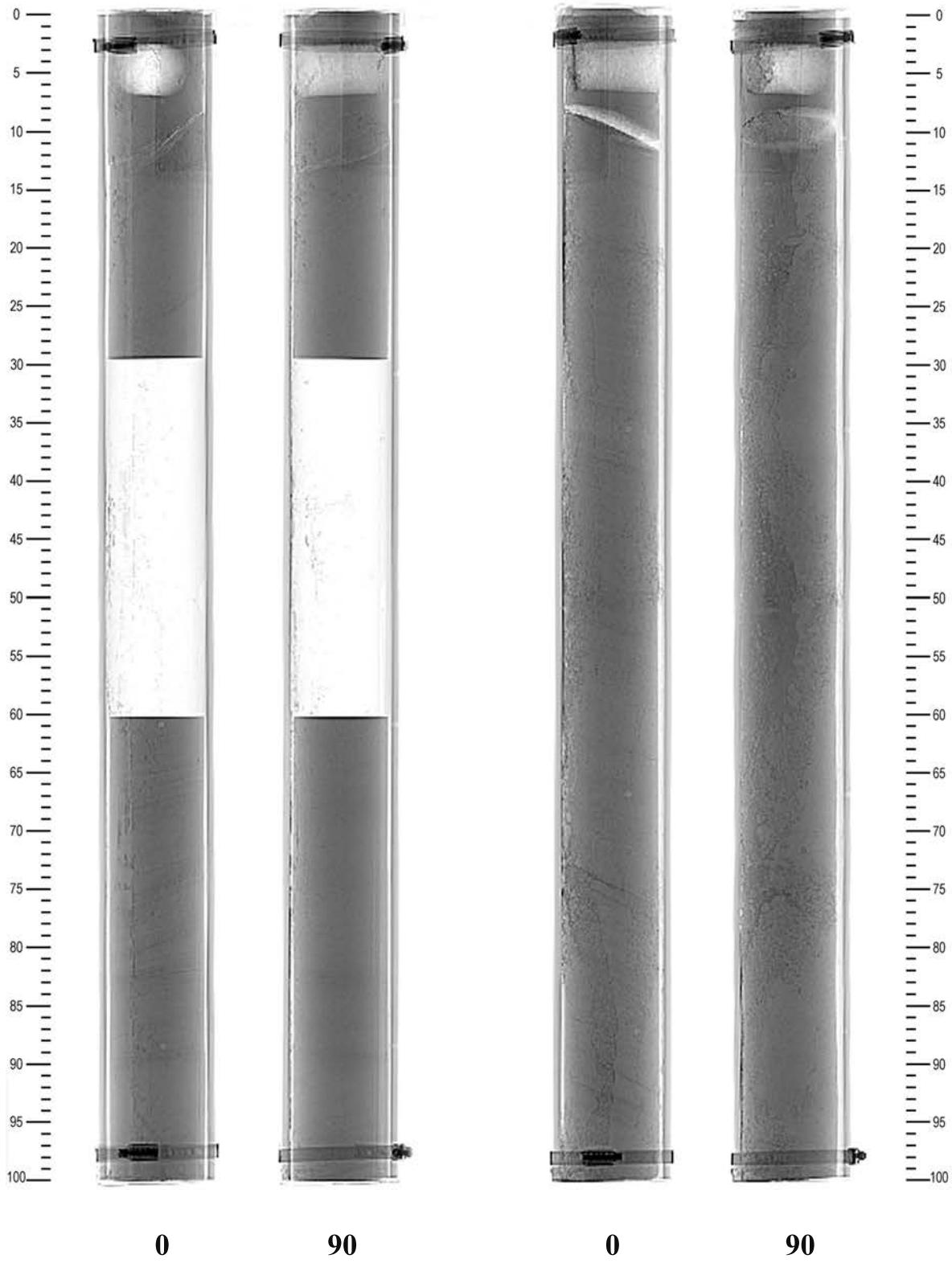
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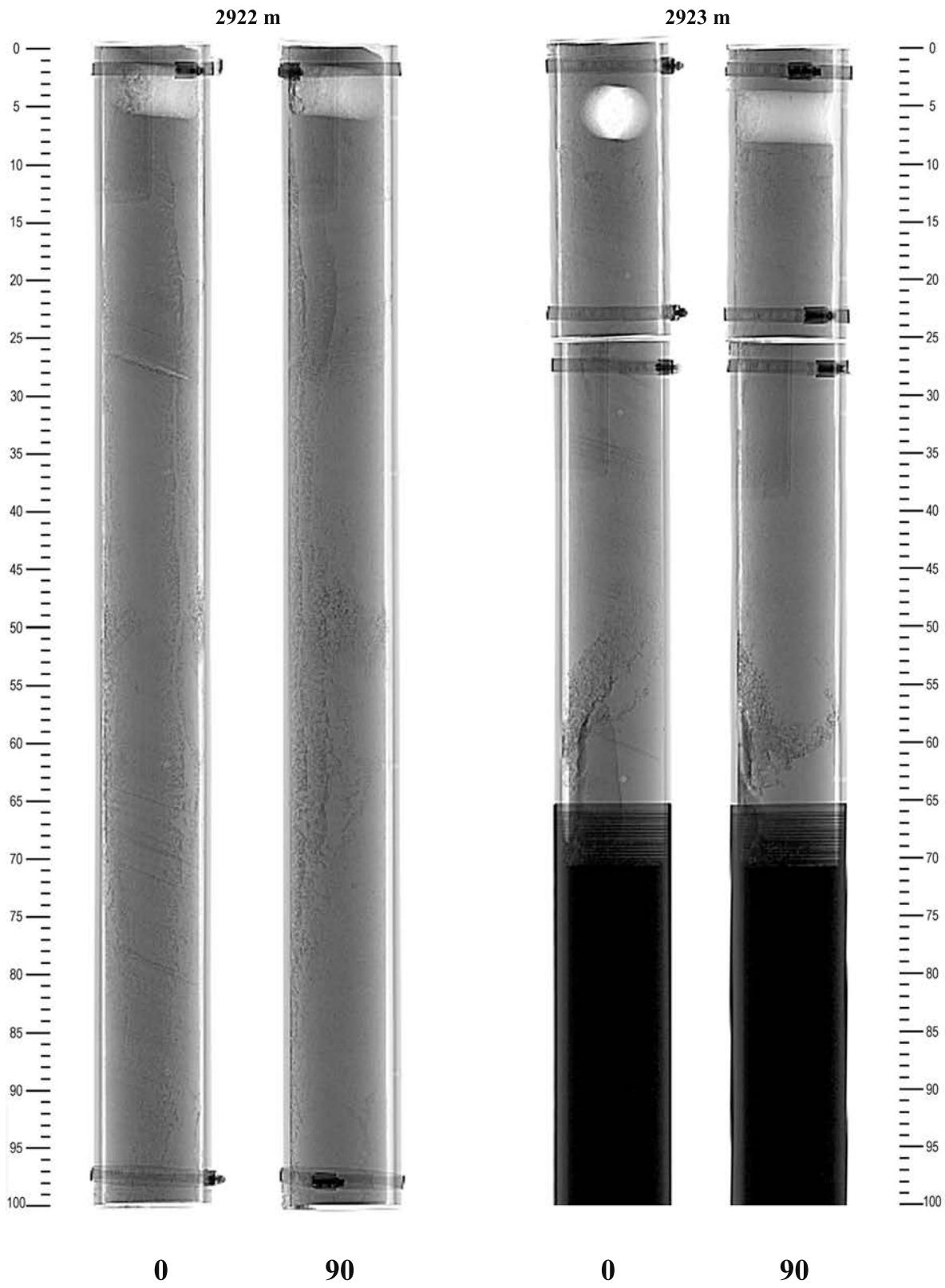
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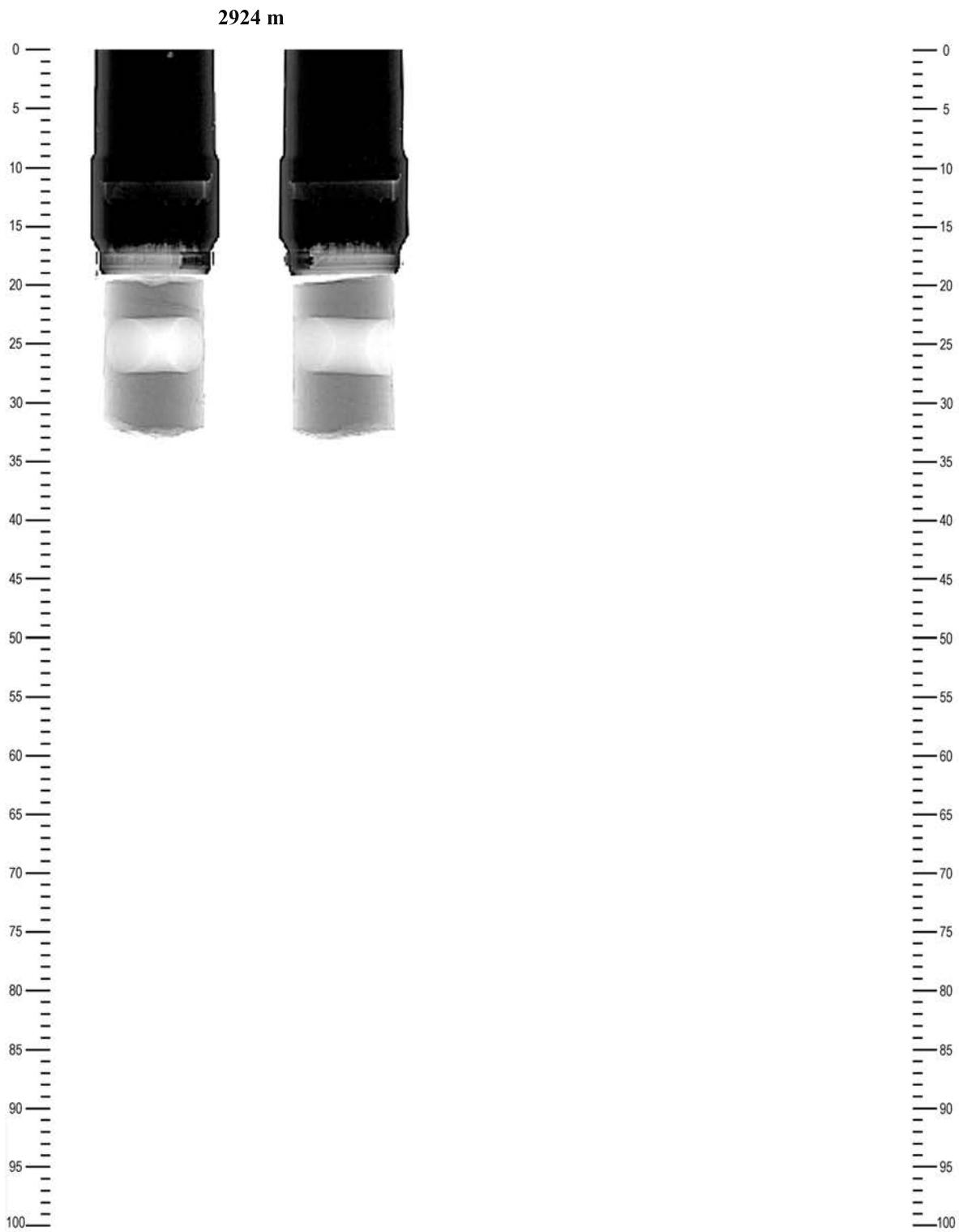


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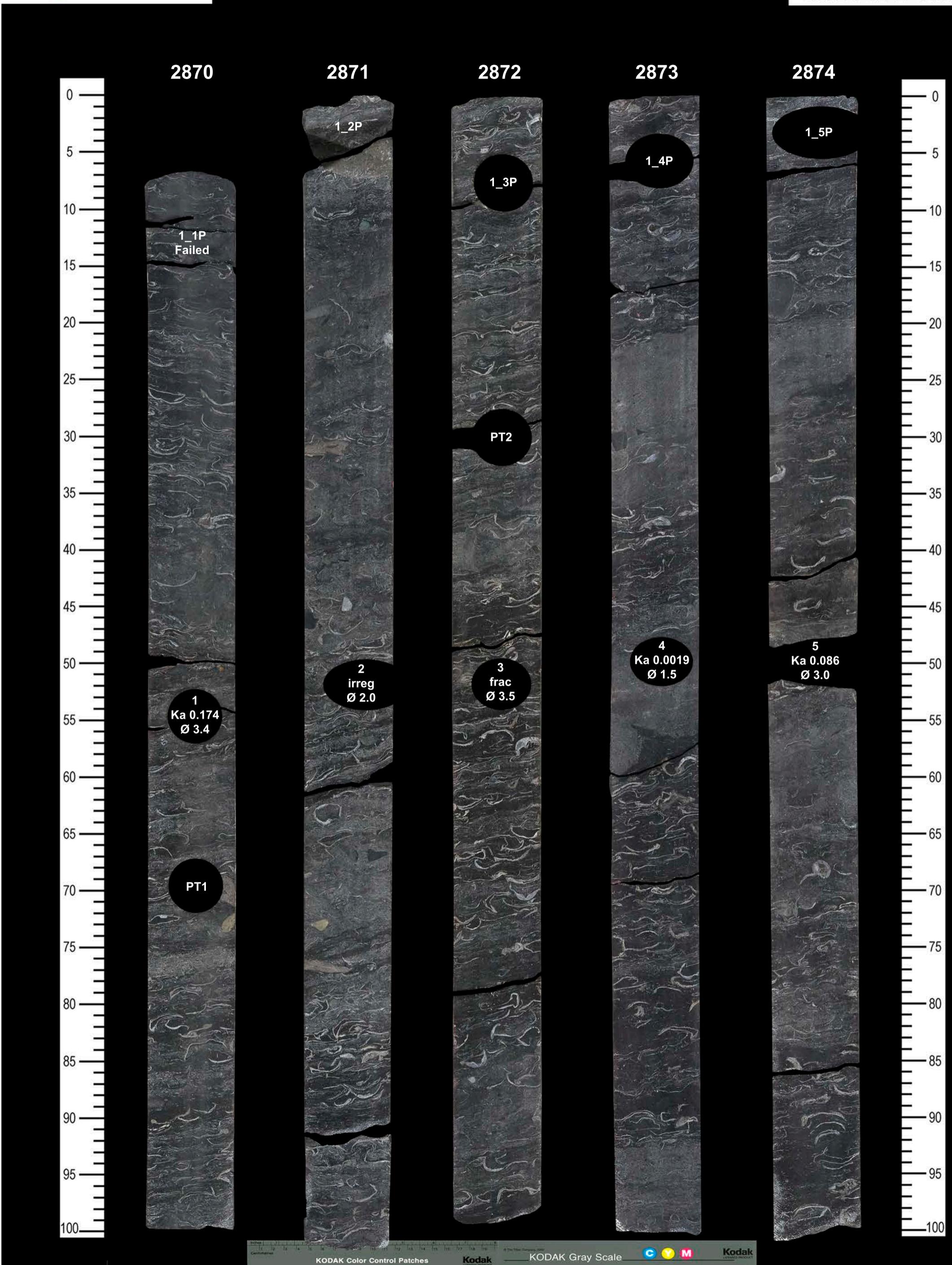




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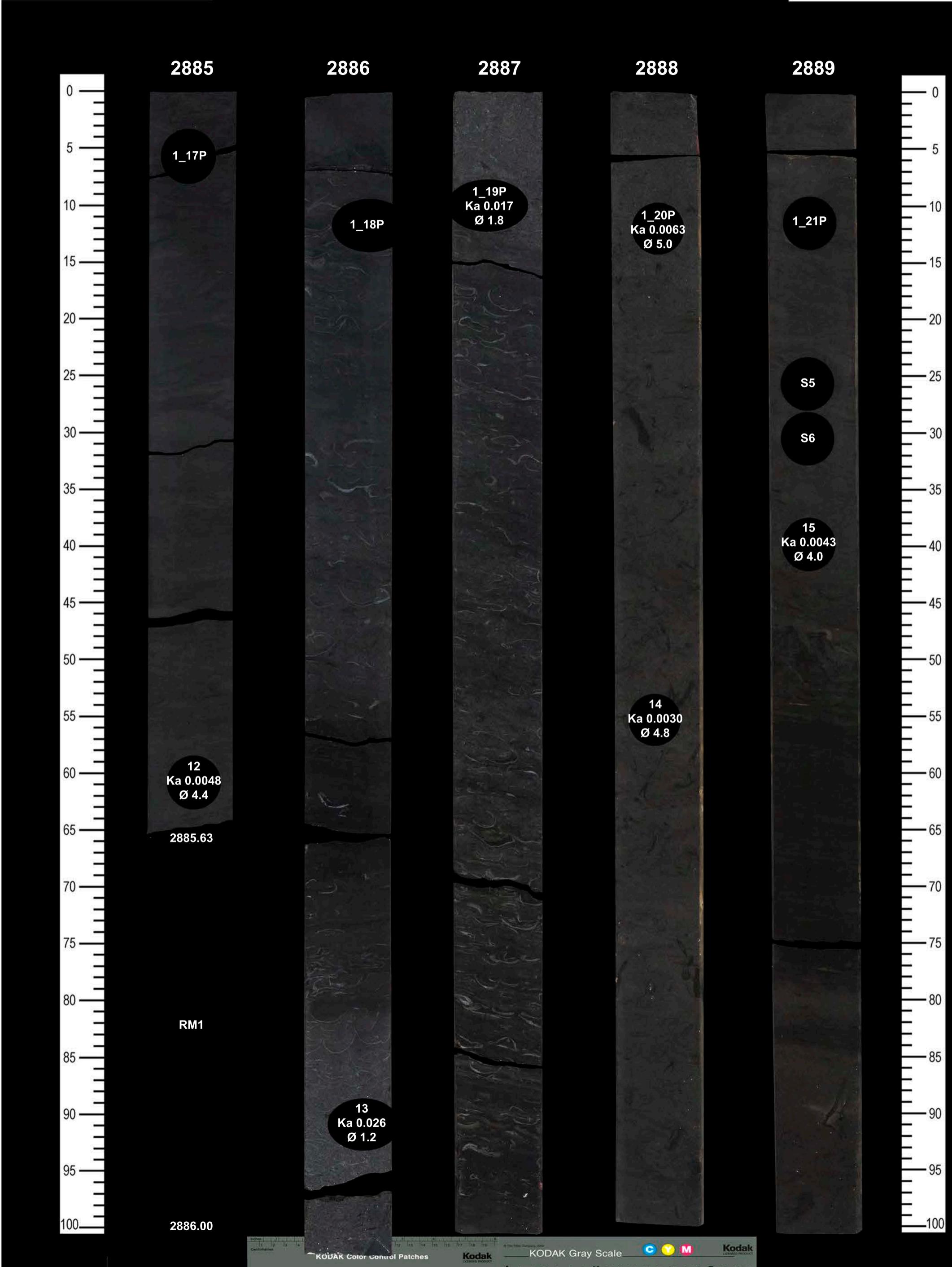
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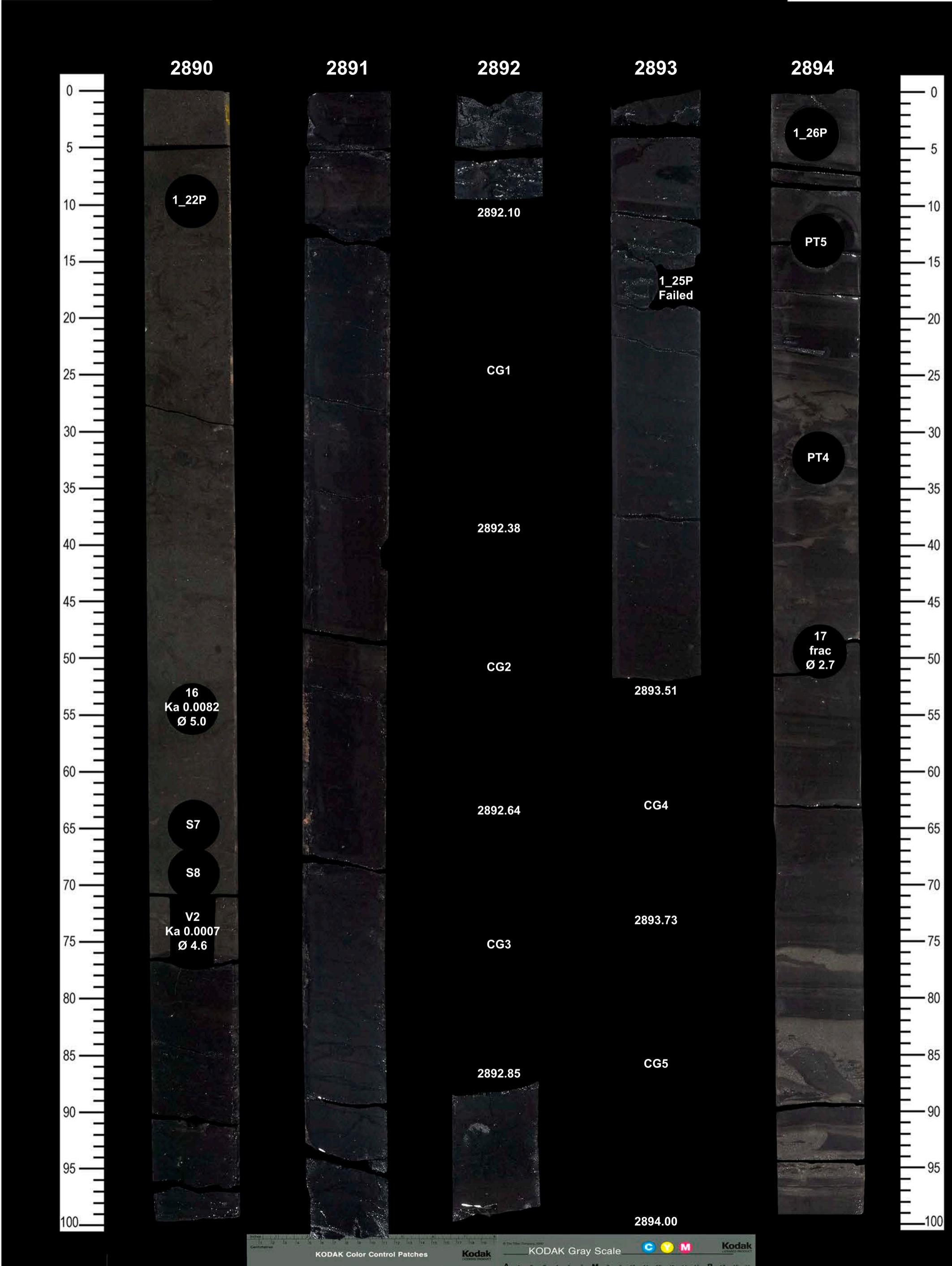
APPENDIX VII
CORE PHOTOGRAPHY

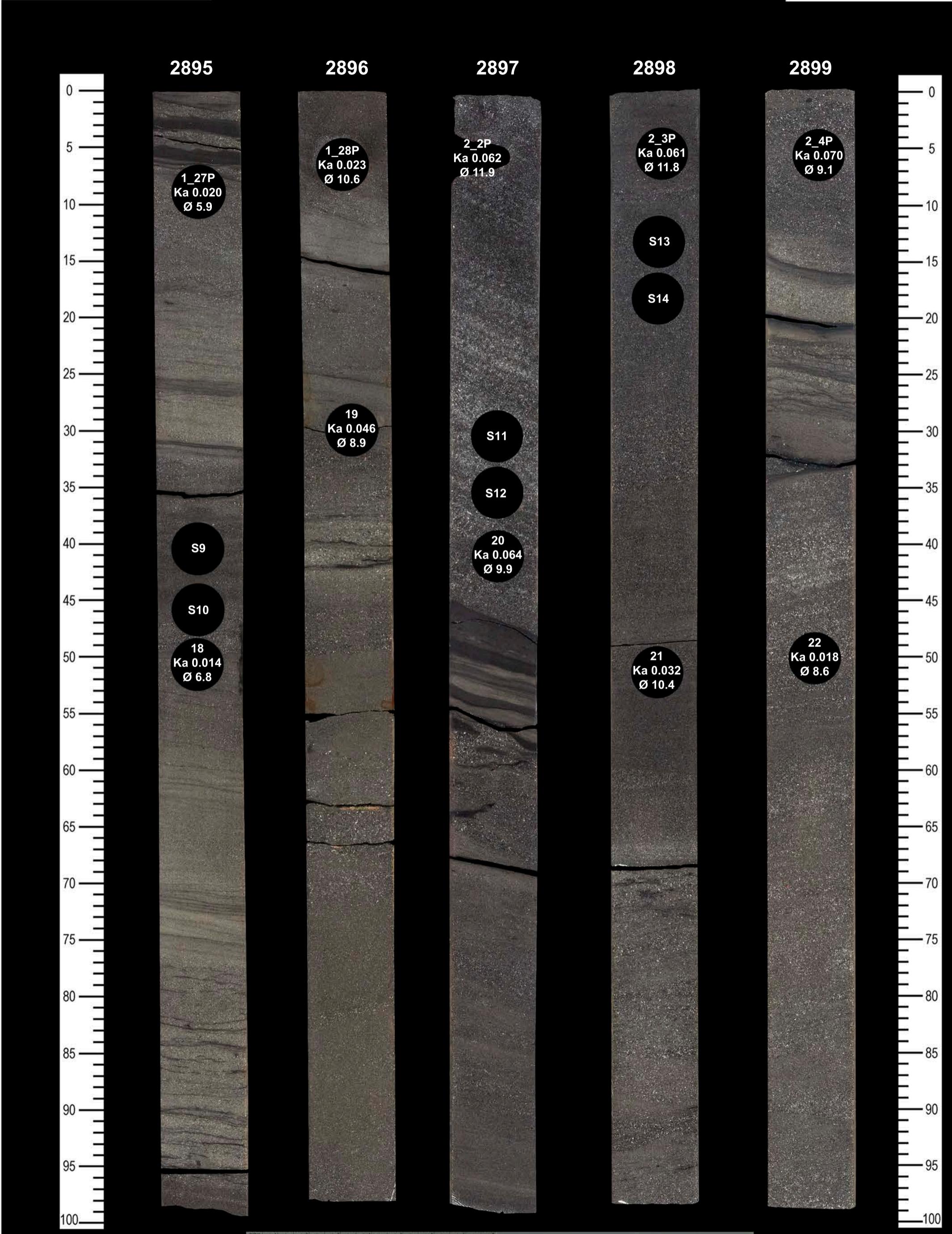


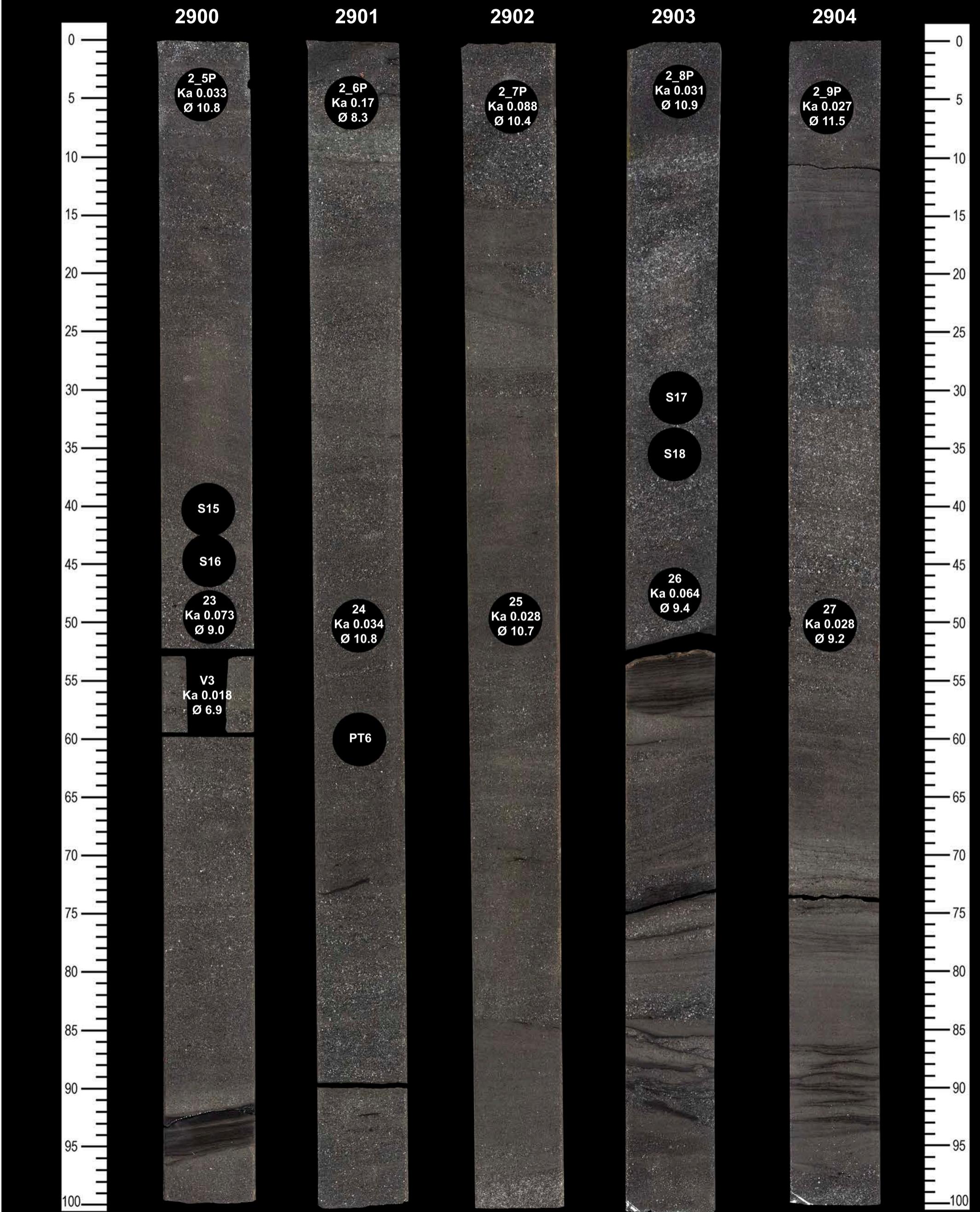


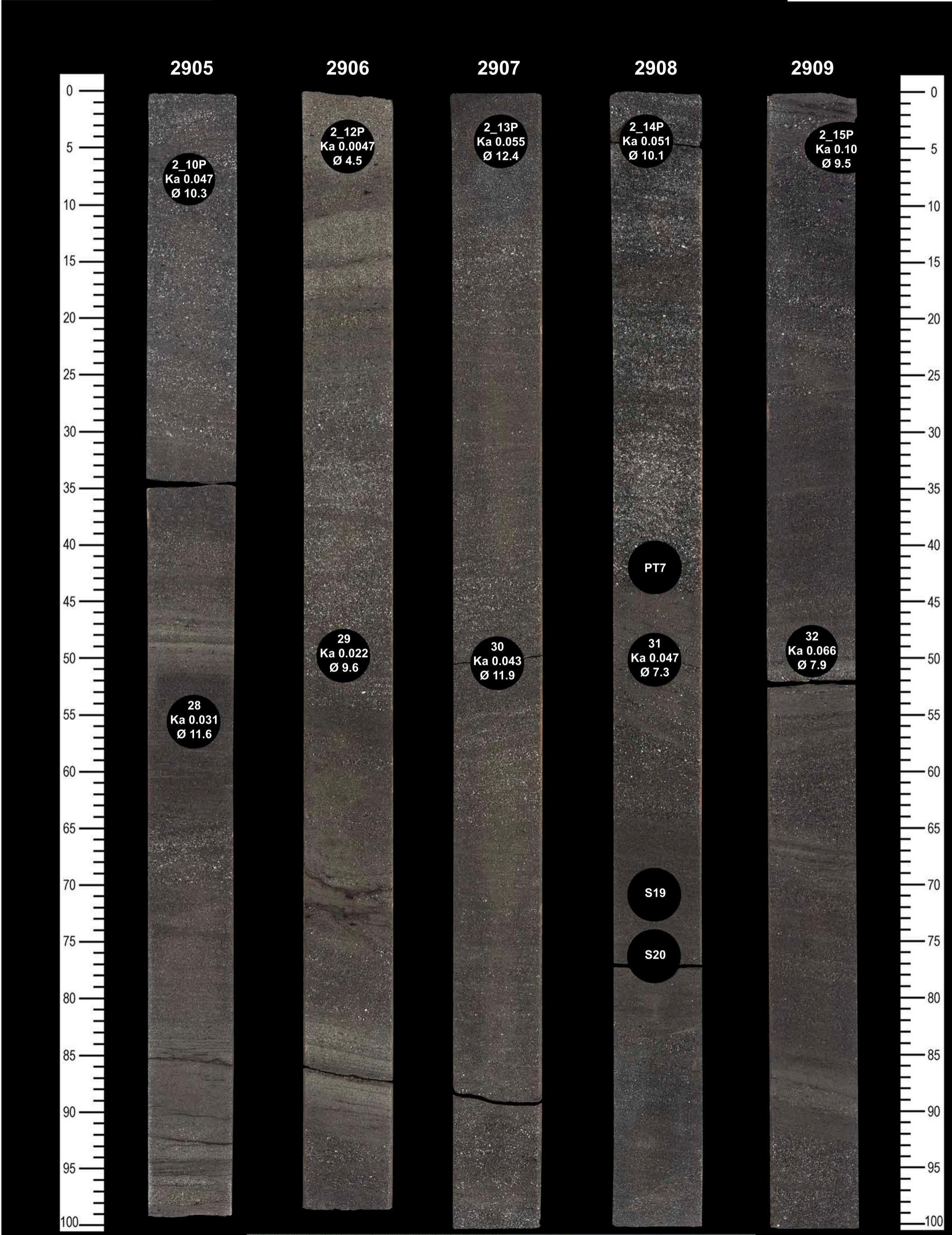


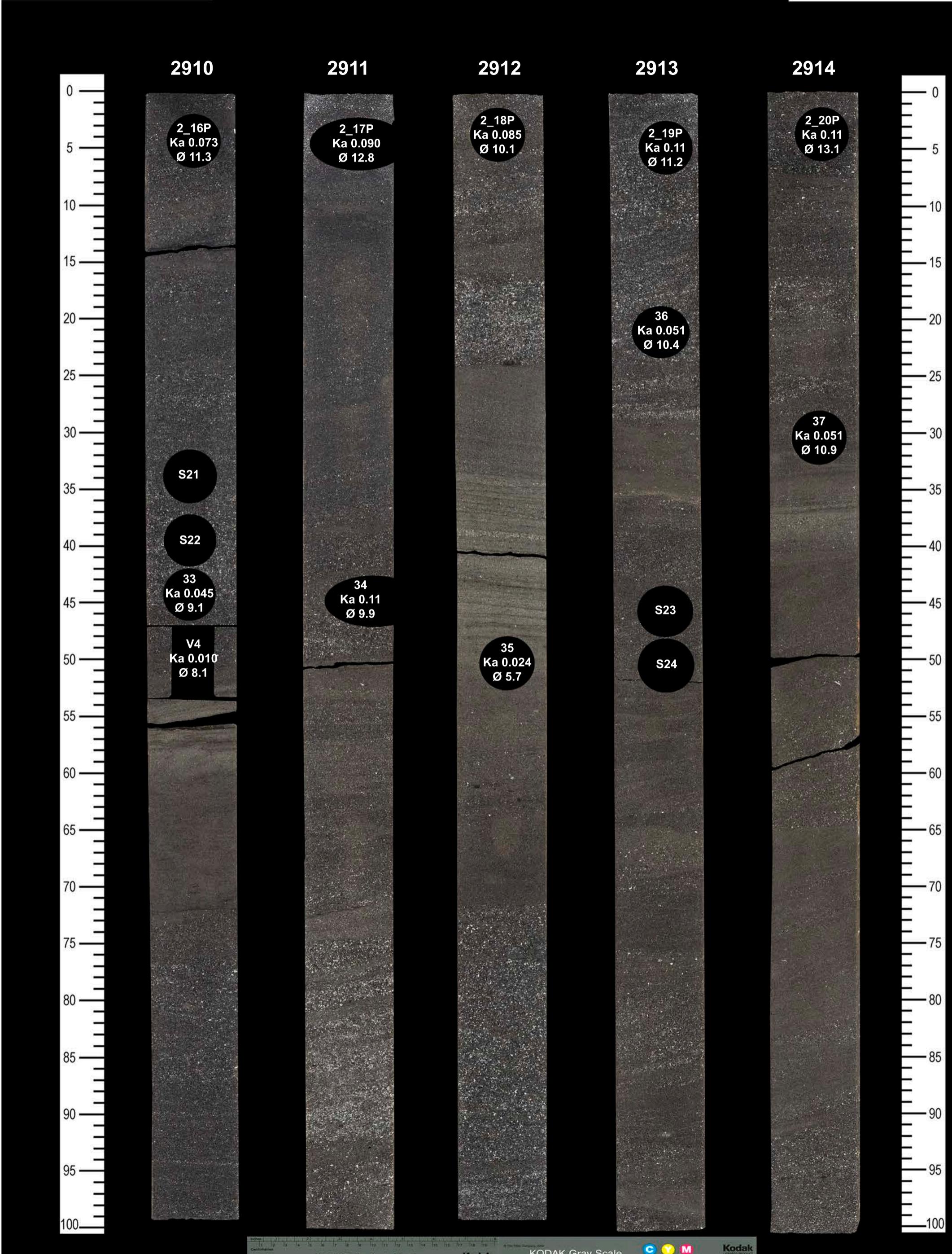


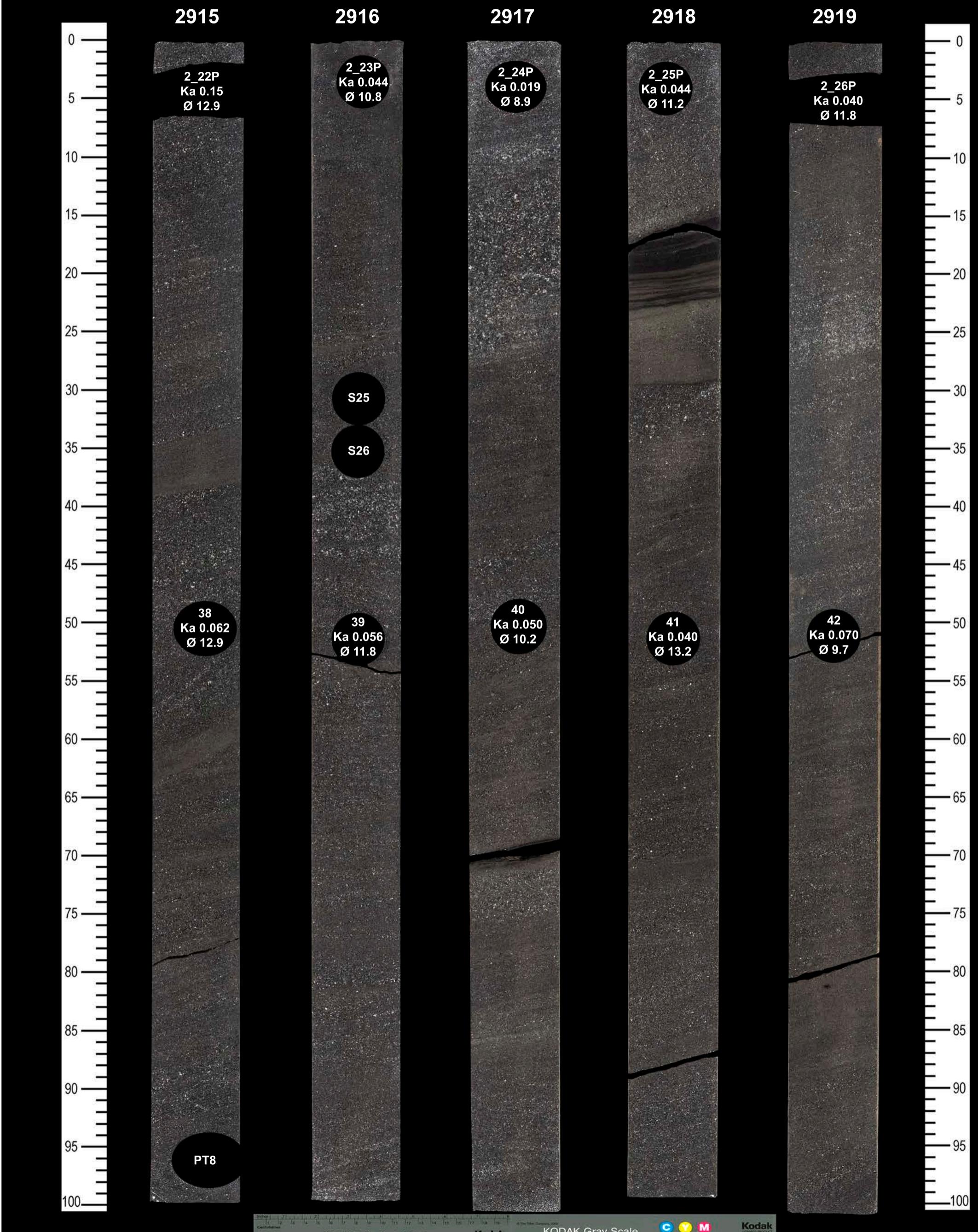


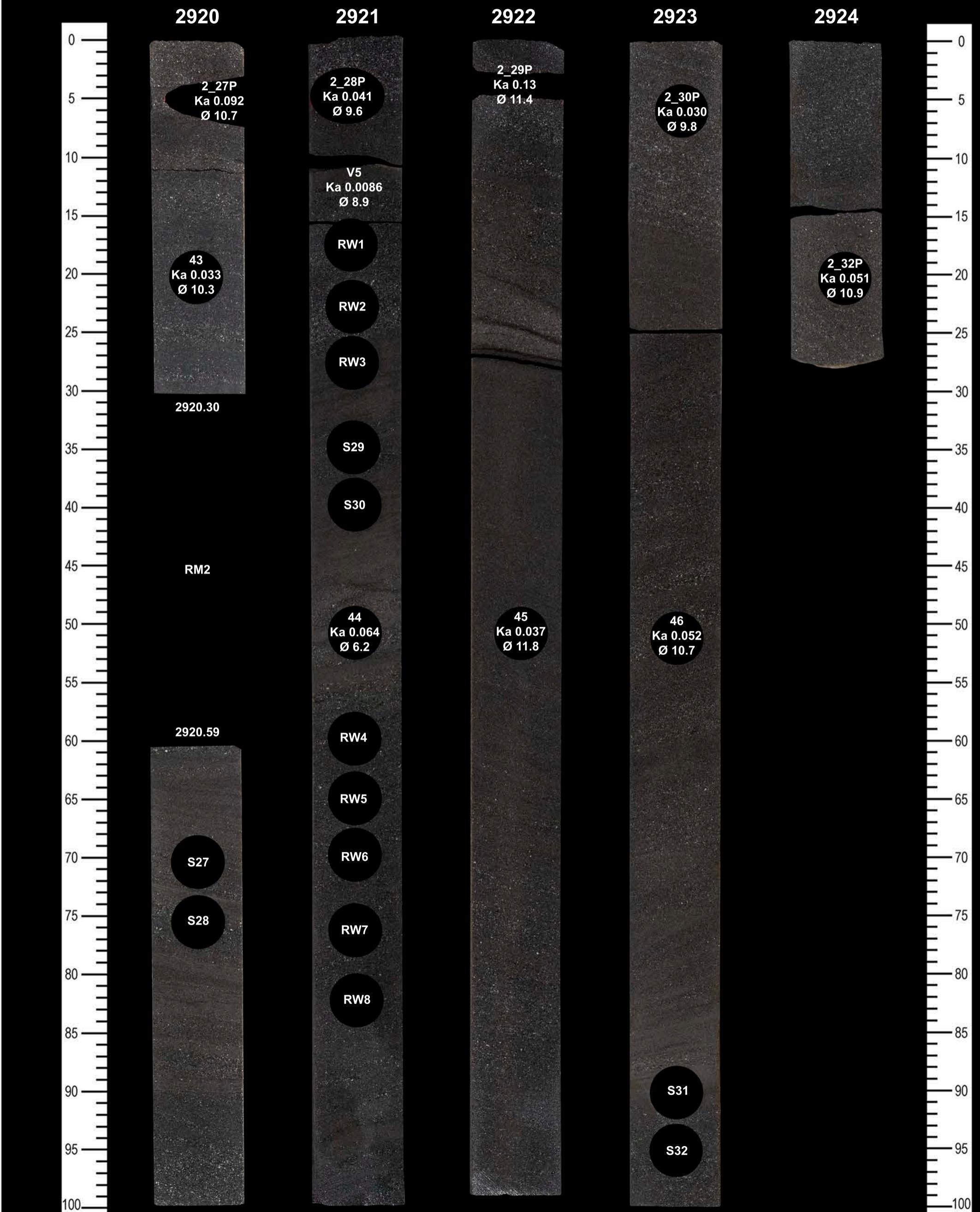












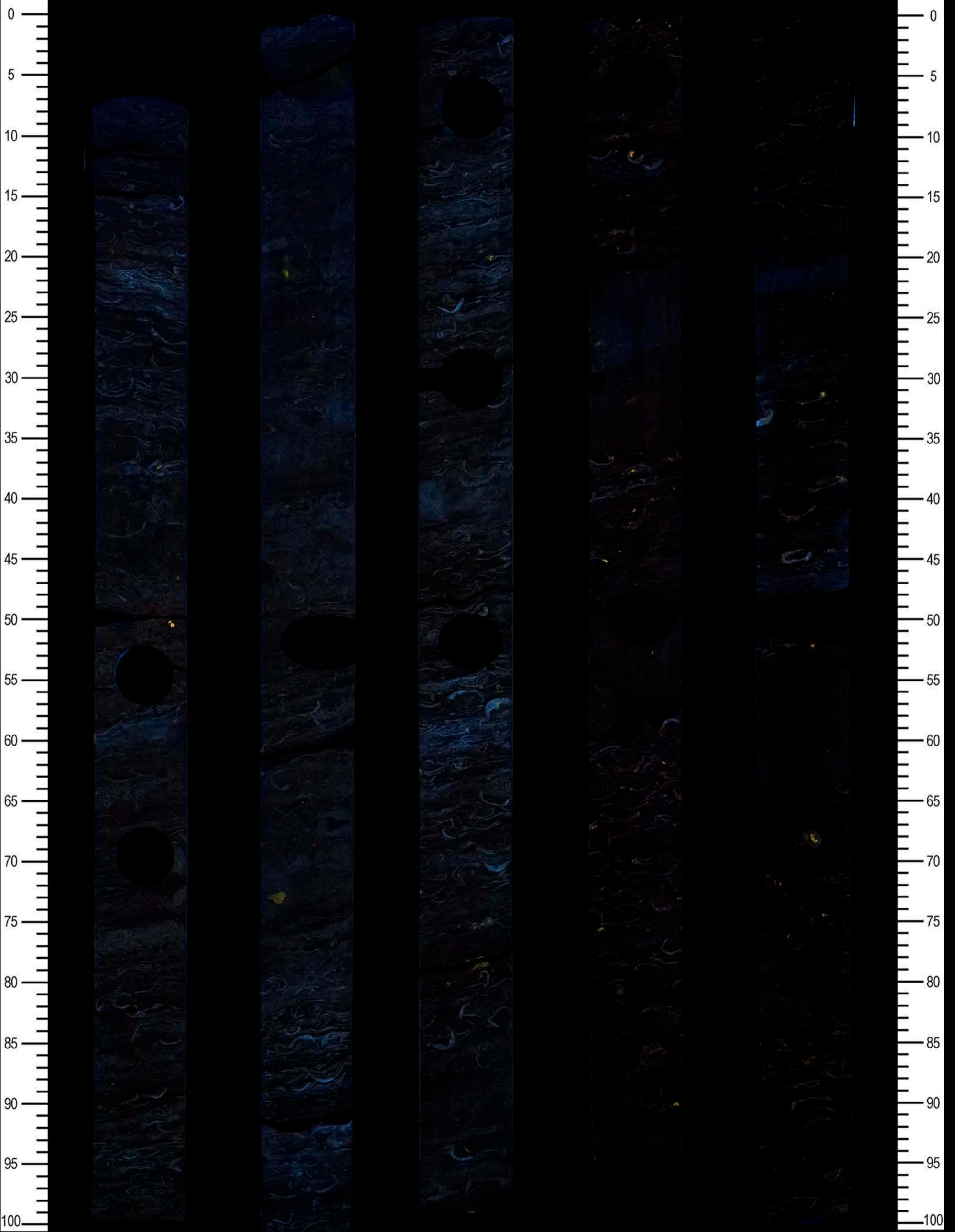
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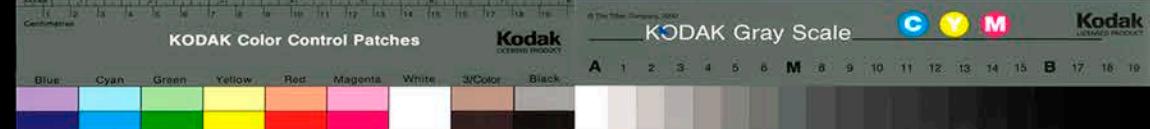
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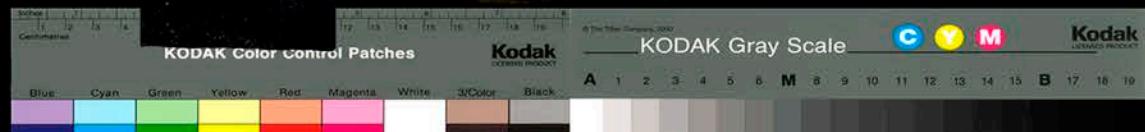
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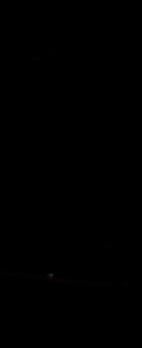
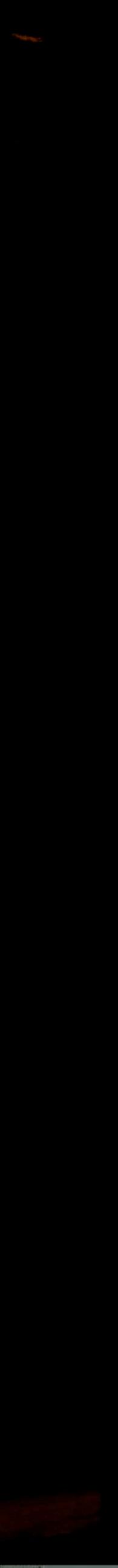
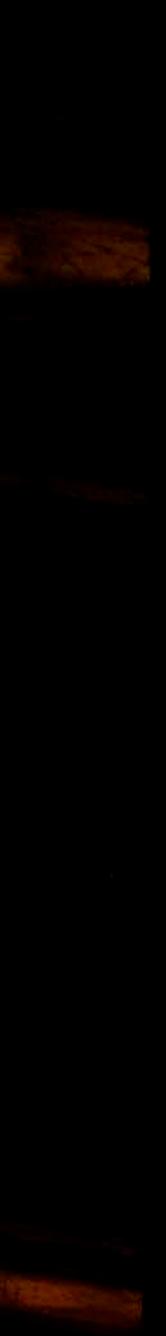
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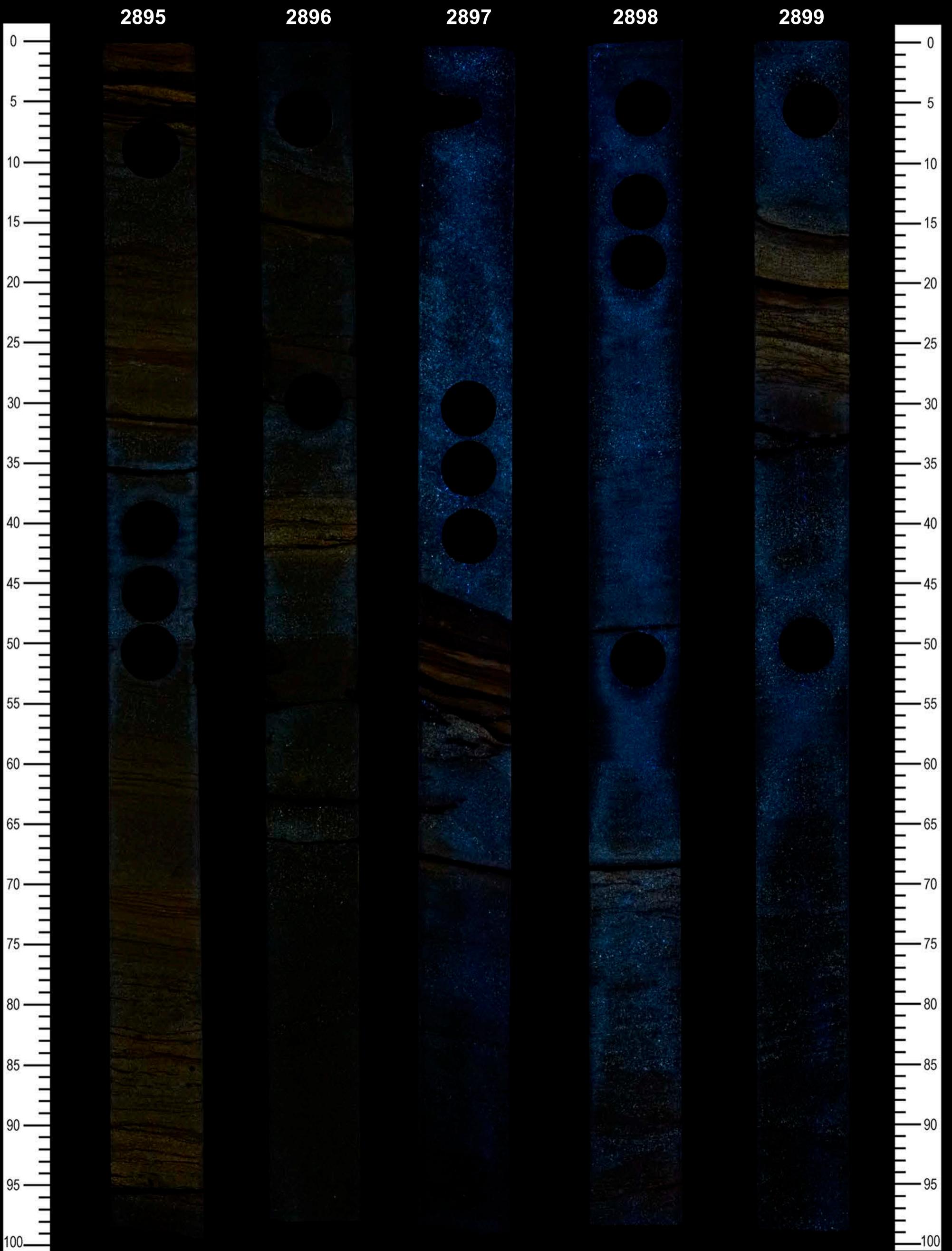
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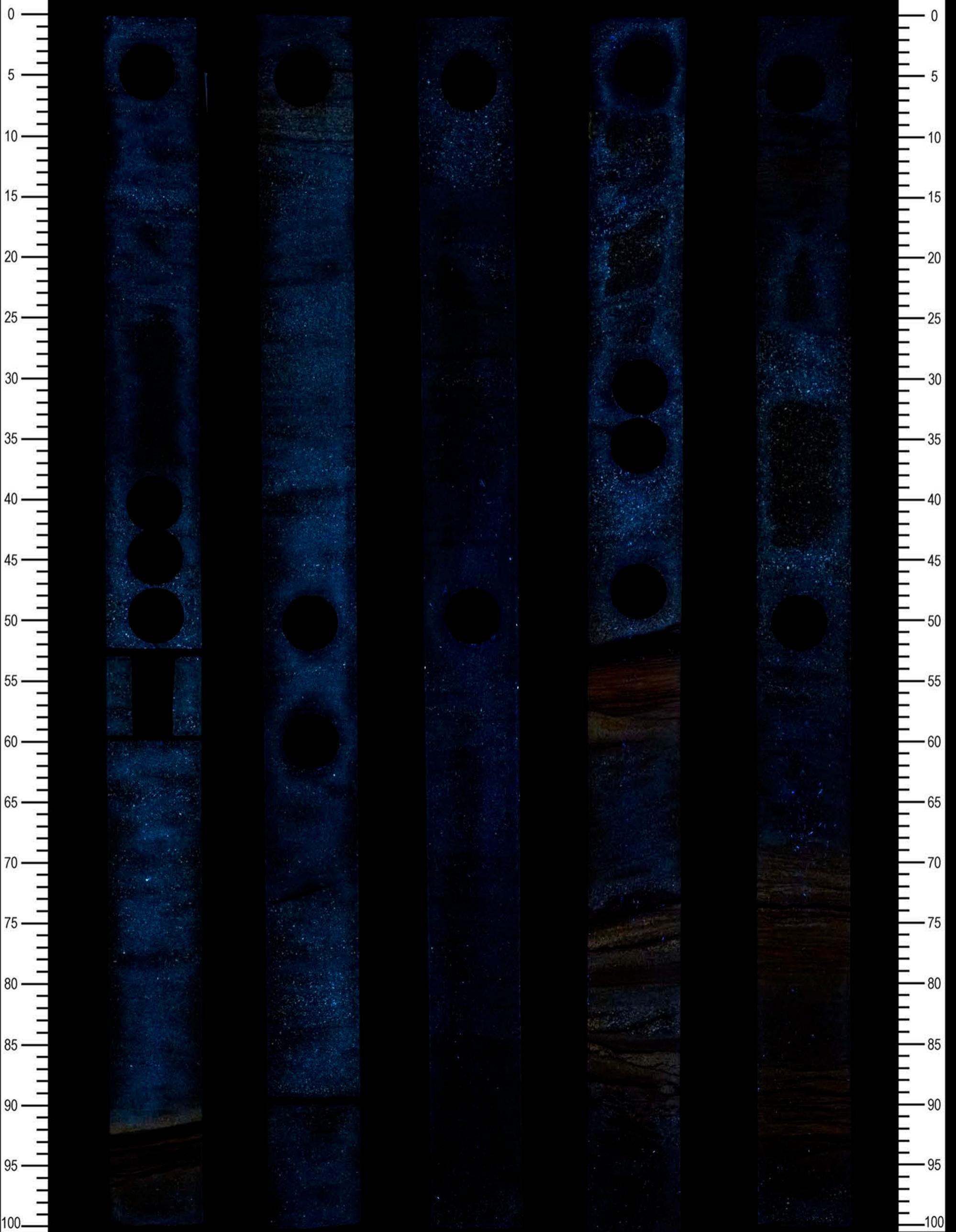
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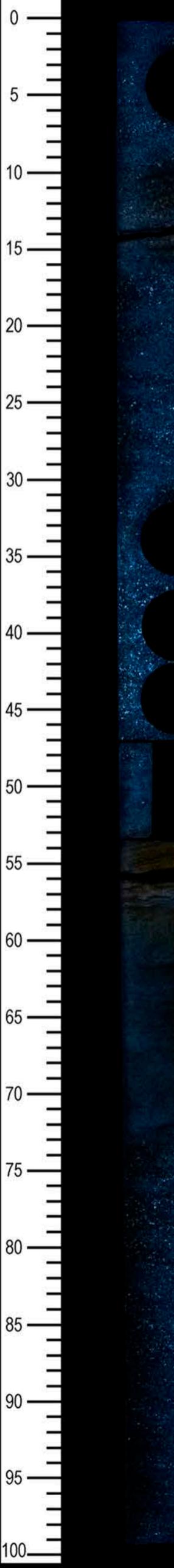
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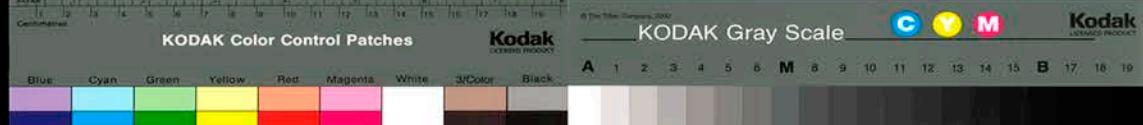
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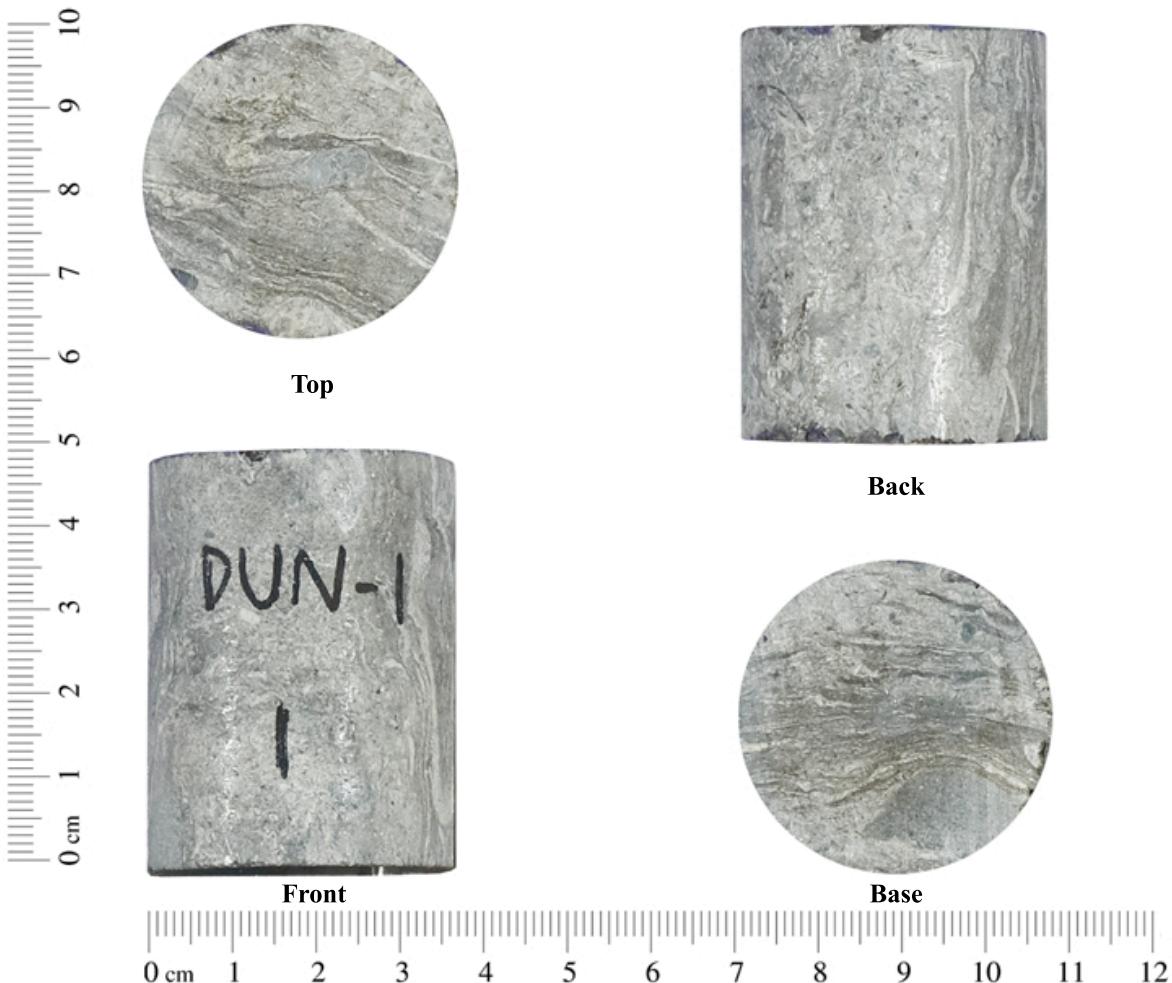
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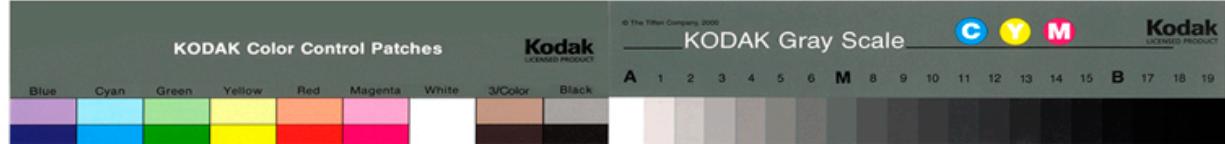
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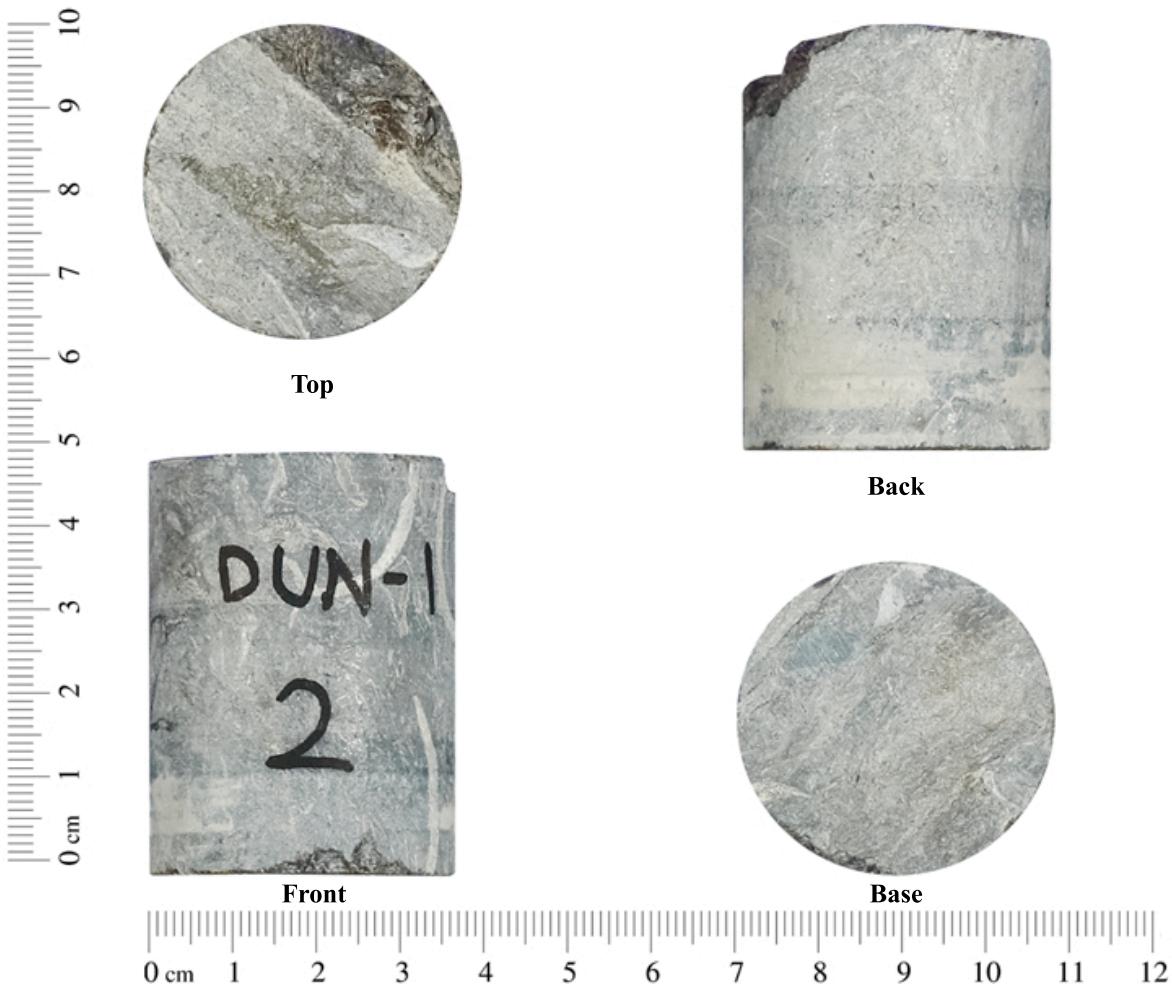


APPENDIX VIII
PLUG PHOTOGRAPHY

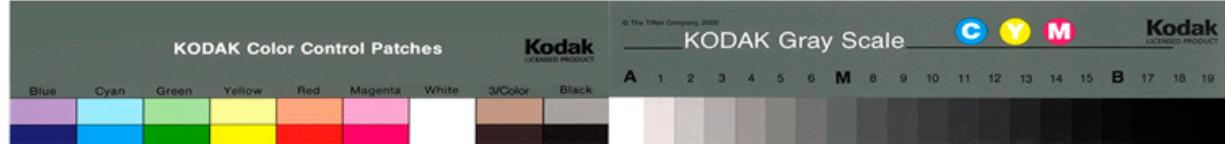


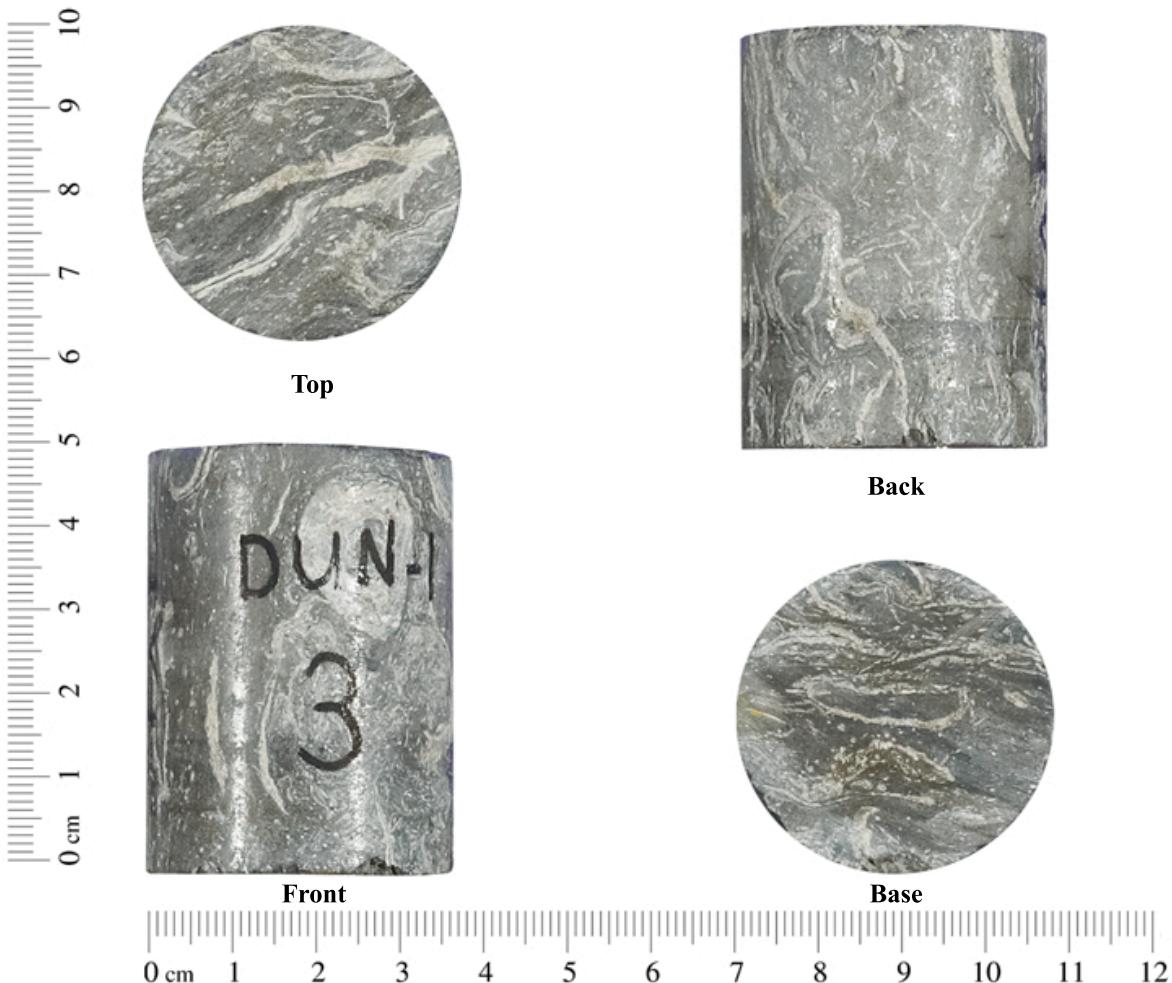
Sample No.:	1
Depth:	2870.55 m
Permeability:	0.174 mD
Porosity:	3.4 %





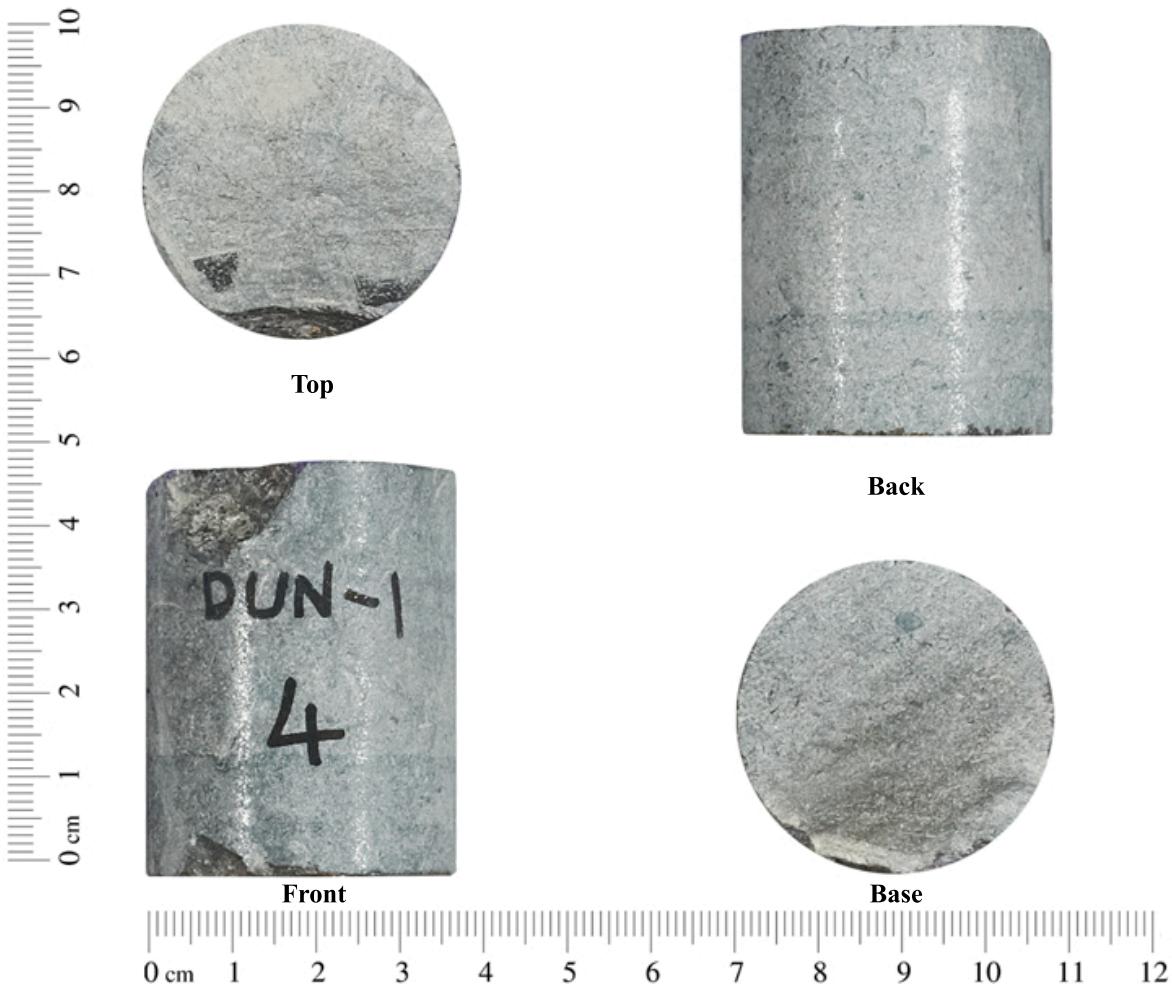
Sample No.:	2
Depth:	2871.51 m
Permeability:	
Porosity:	2.0 %



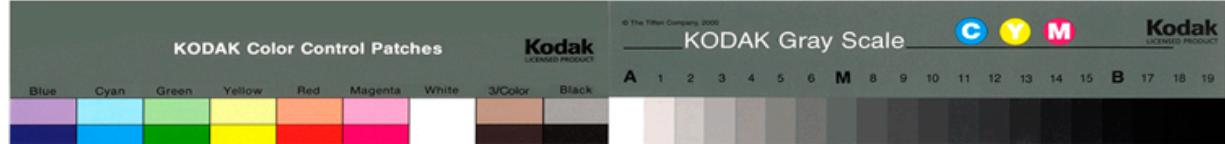


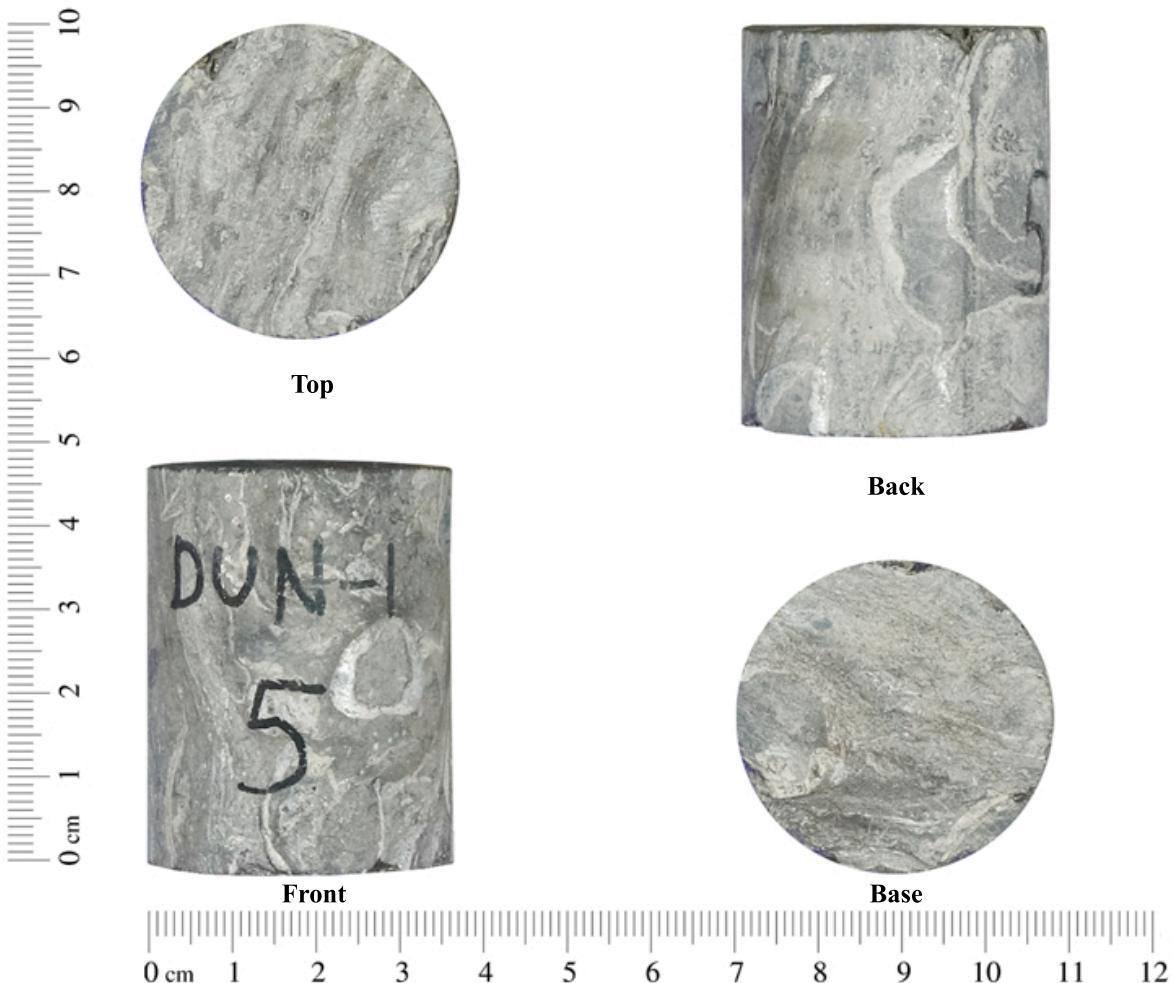
Sample No.:	3
Depth:	2872.50 m
Permeability:	
Porosity:	3.5 %



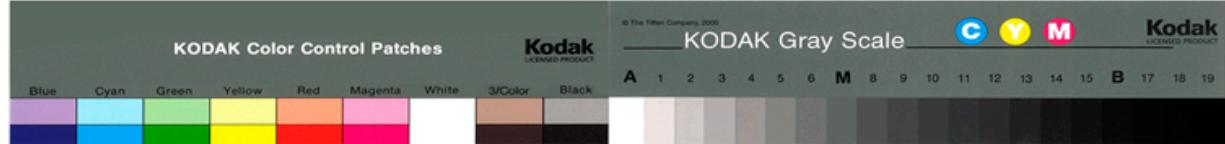


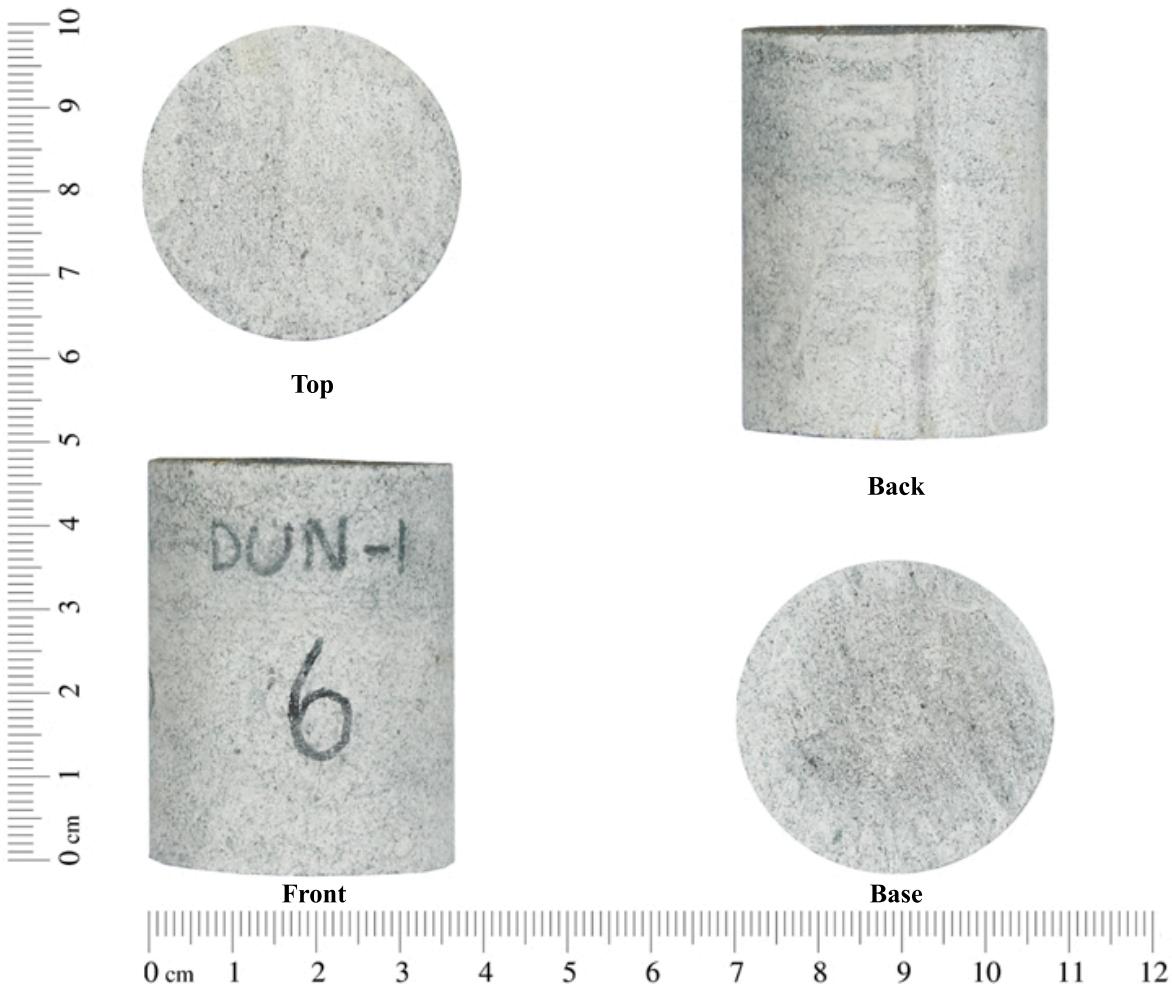
Sample No.:	4
Depth:	2873.50 m
Permeability:	0.0019 mD
Porosity:	1.5 %



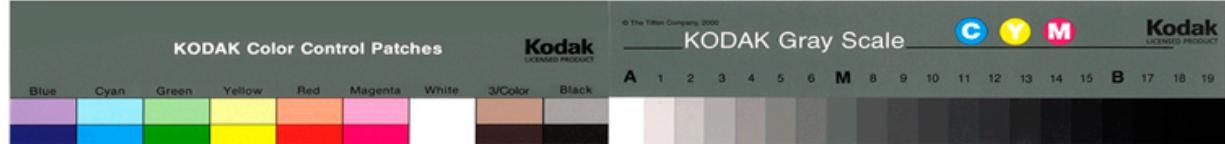


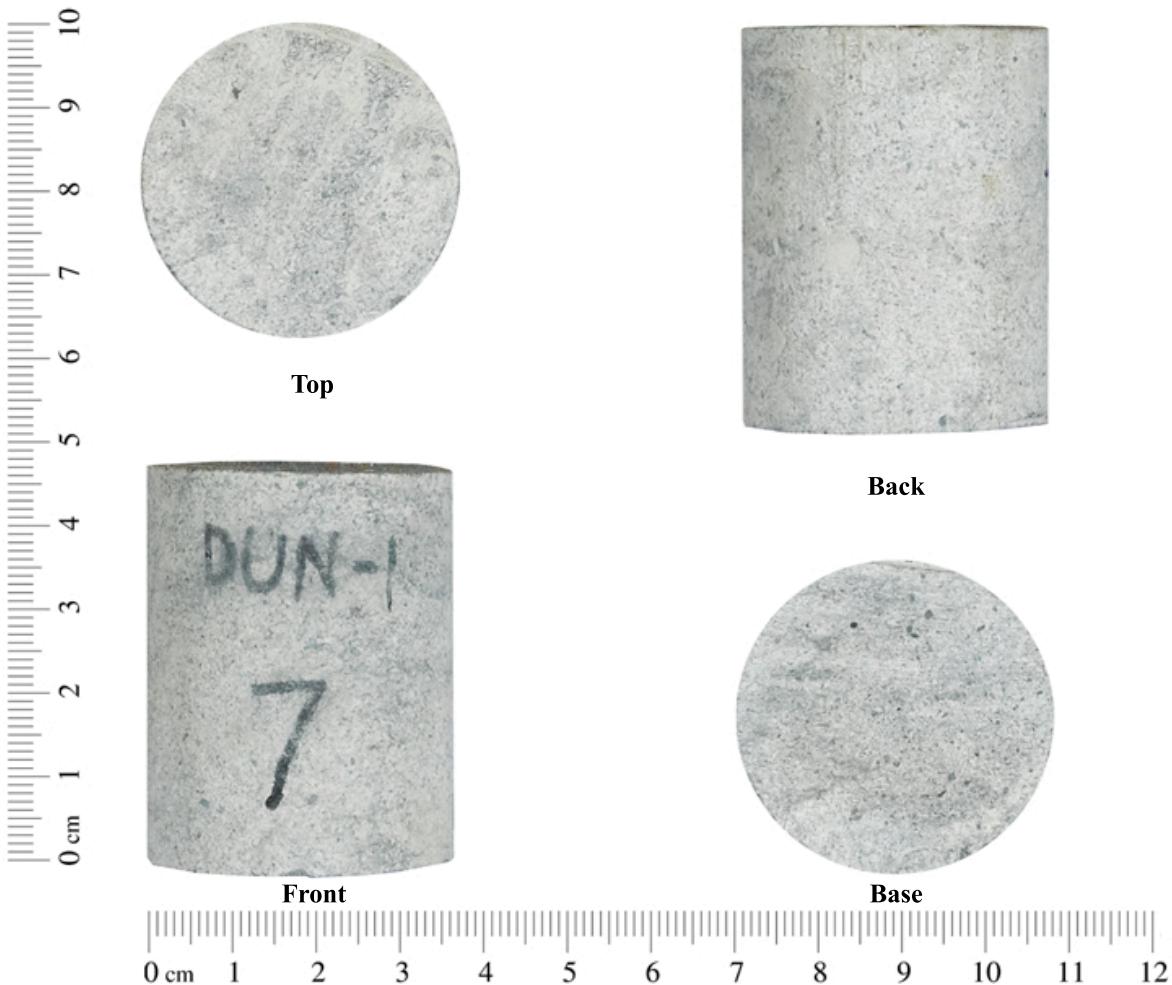
Sample No.:	5
Depth:	2874.50 m
Permeability:	0.086 mD
Porosity:	3.0 %



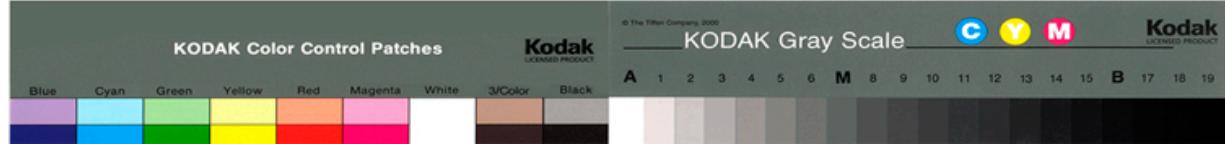


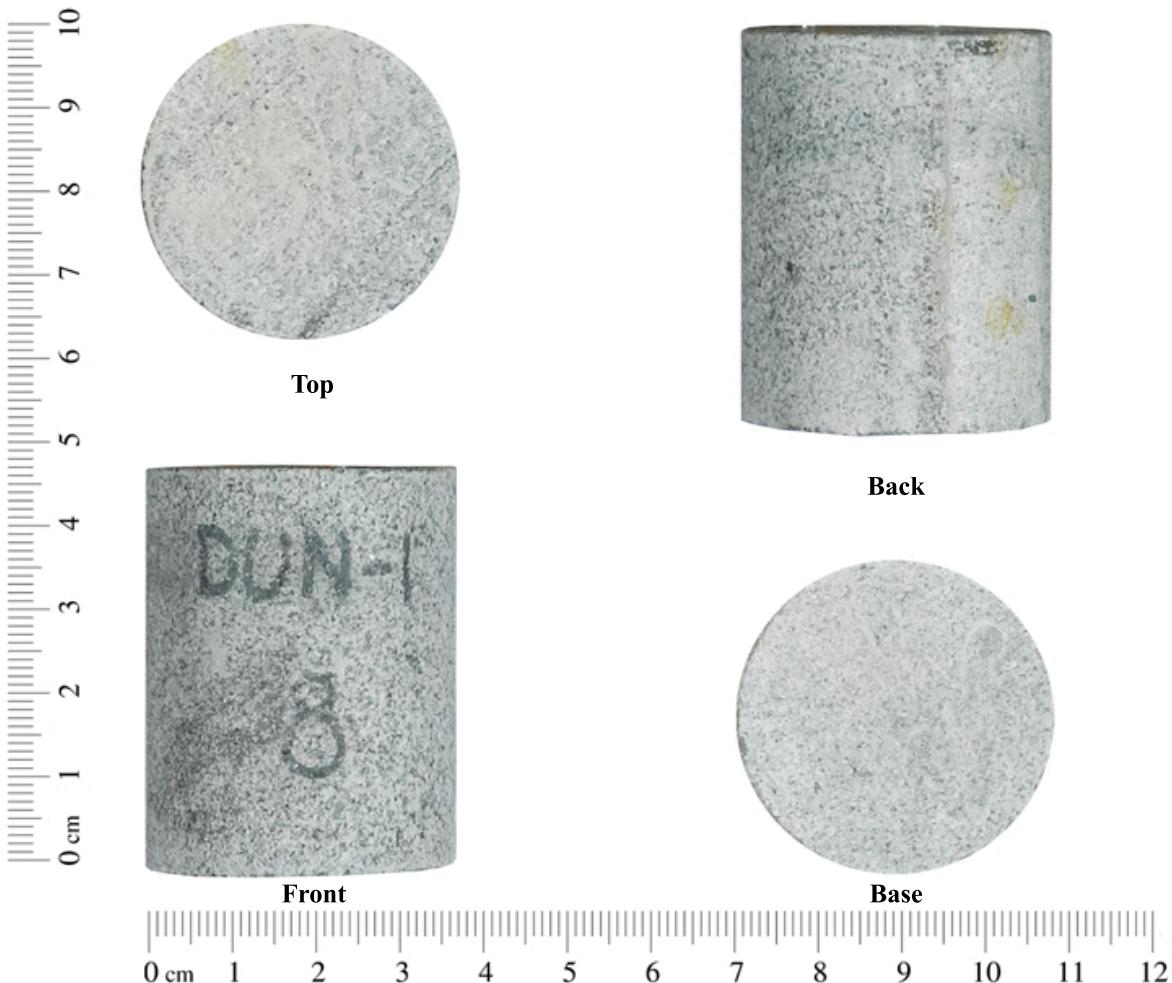
Sample No.:	6
Depth:	2876.51 m
Permeability:	0.0060 mD
Porosity:	3.4 %



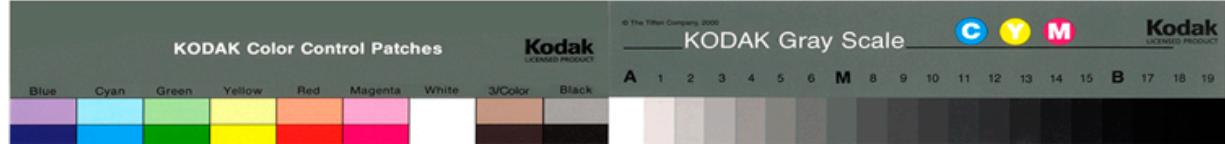


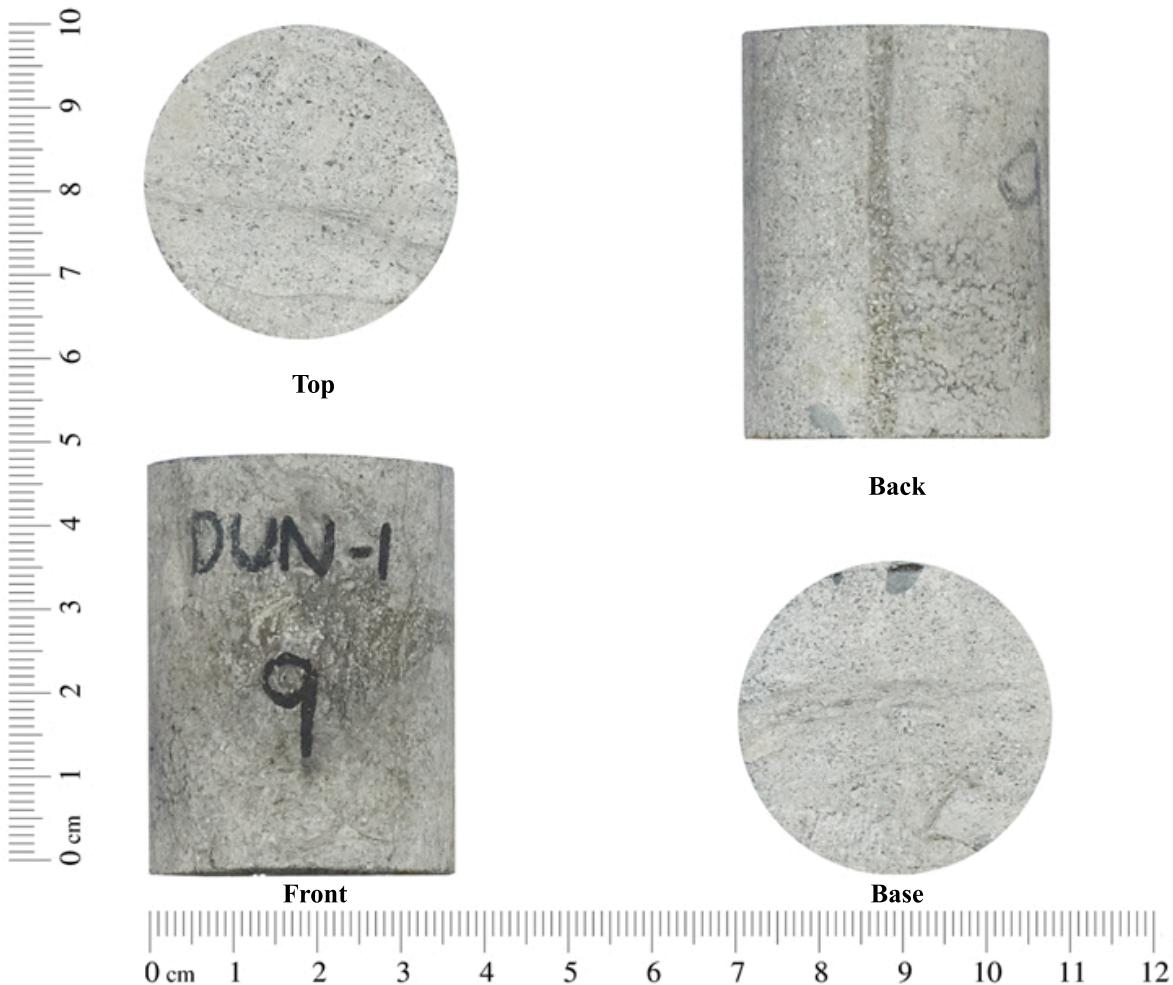
Sample No.:	7
Depth:	2877.50 m
Permeability:	0.0044 mD
Porosity:	3.9 %



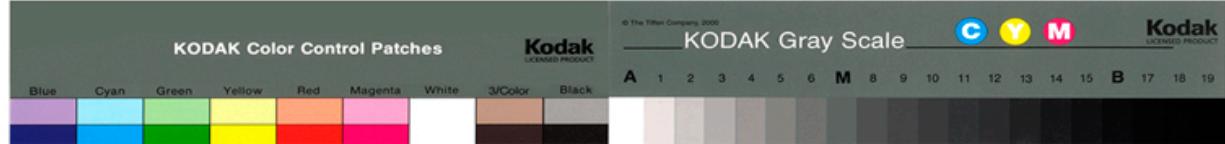


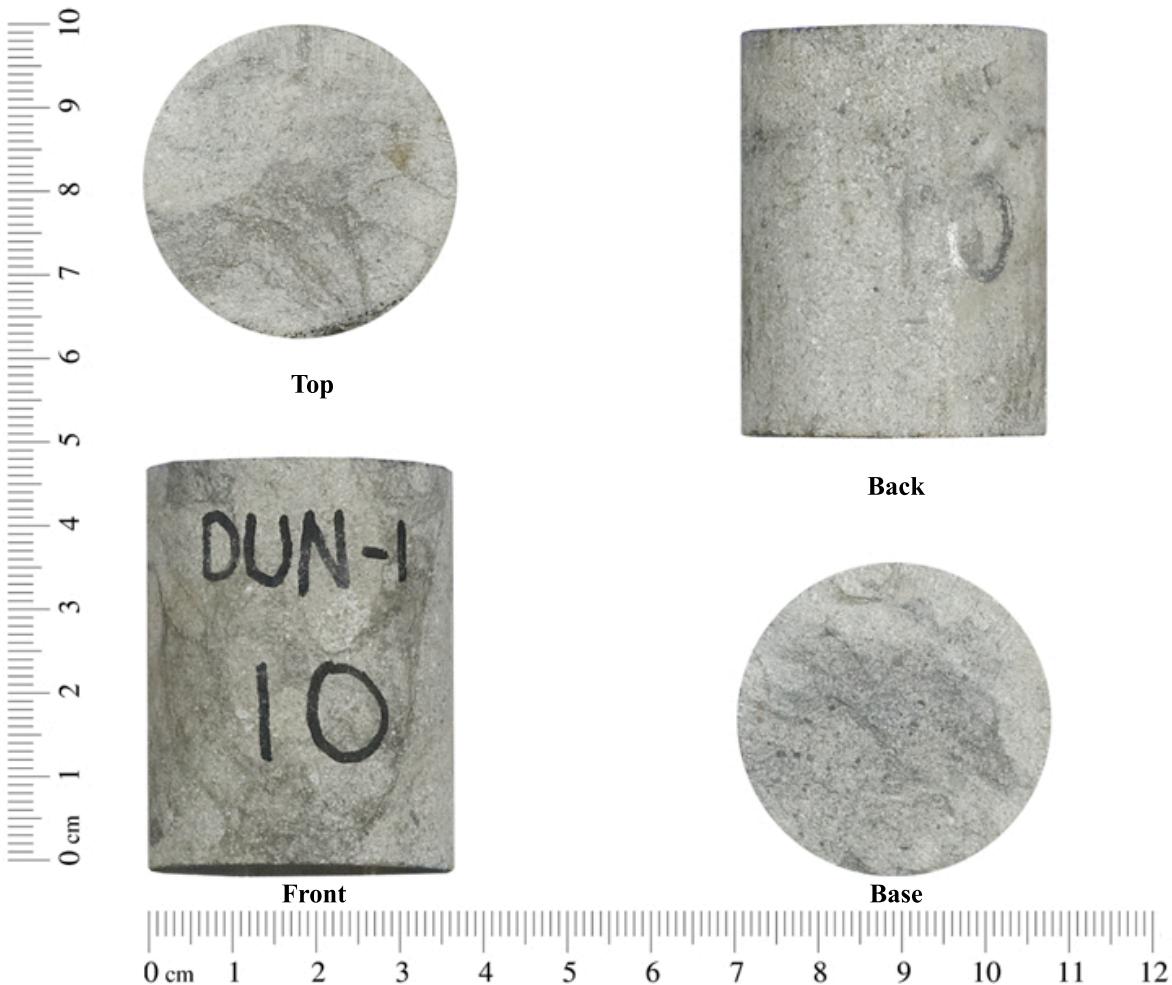
Sample No.:	8
Depth:	2878.50 m
Permeability:	0.0032 mD
Porosity:	2.2 %



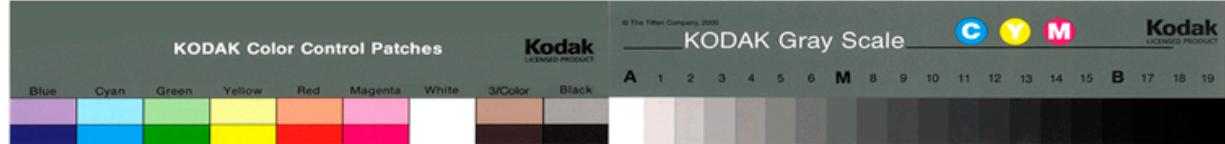


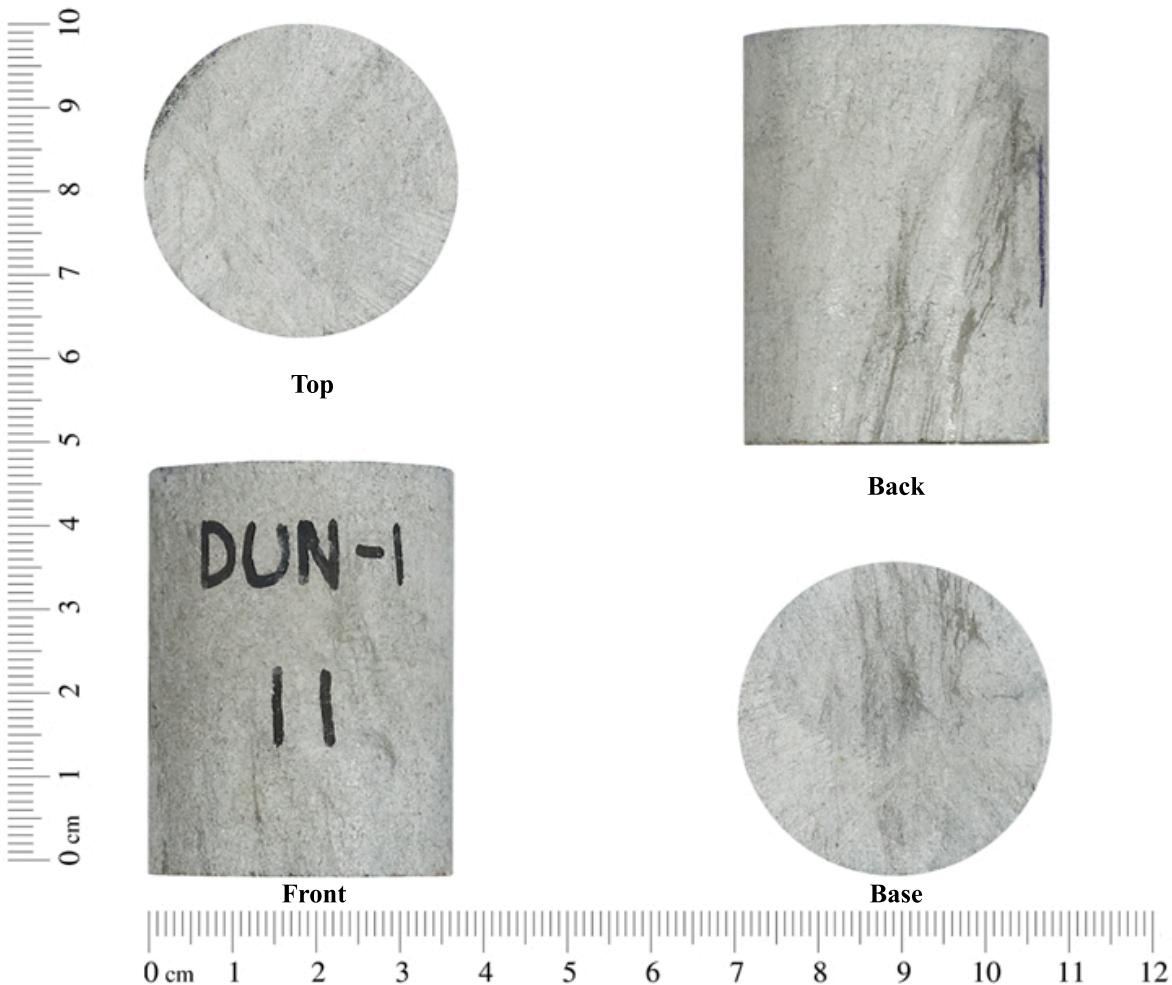
Sample No.:	9
Depth:	2880.71 m
Permeability:	0.050 mD
Porosity:	5.1 %



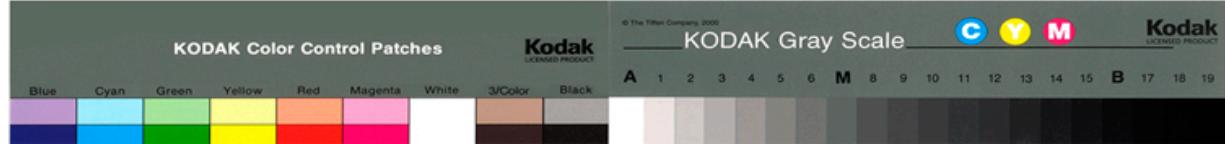


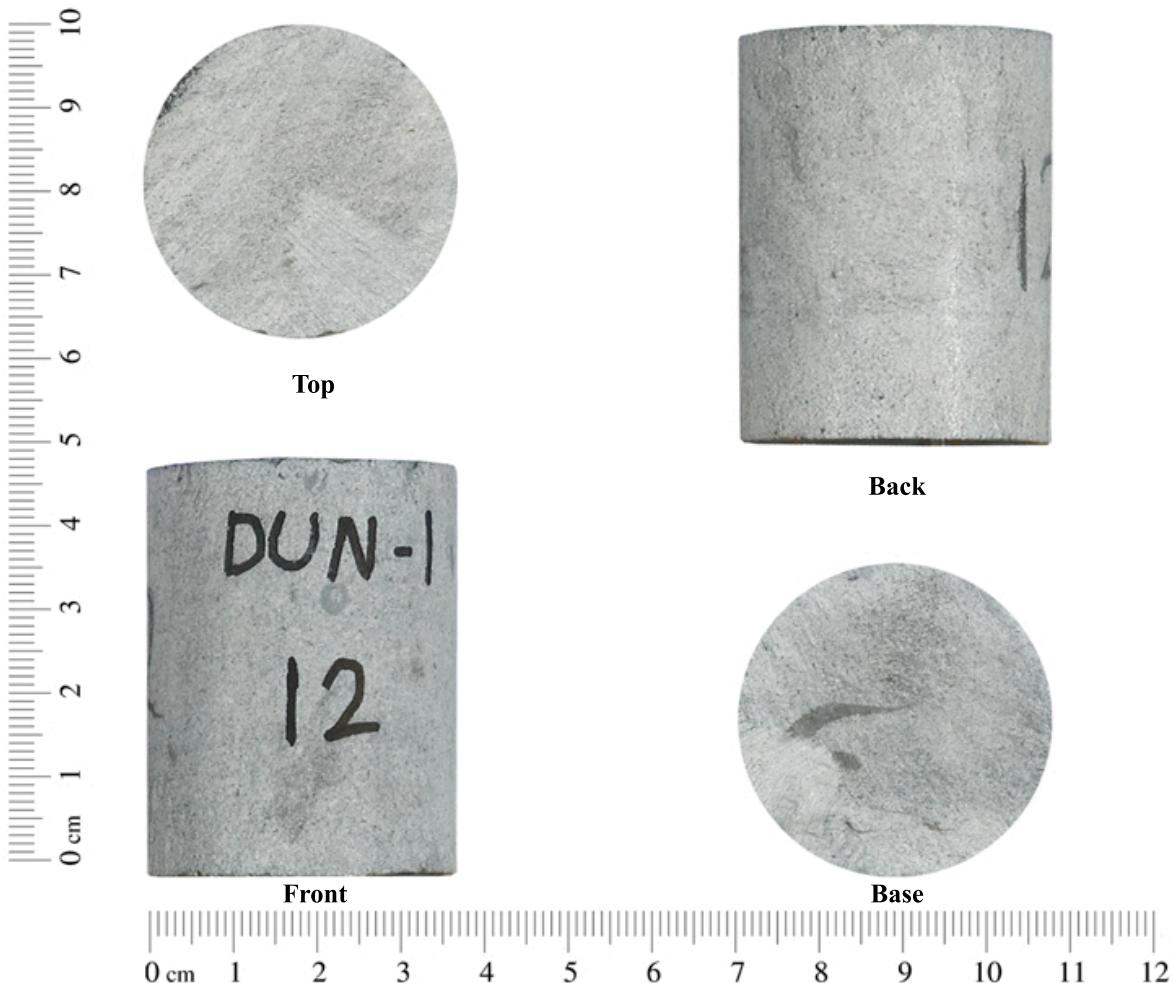
Sample No.:	10
Depth:	2881.51 m
Permeability:	0.010 mD
Porosity:	5.6 %



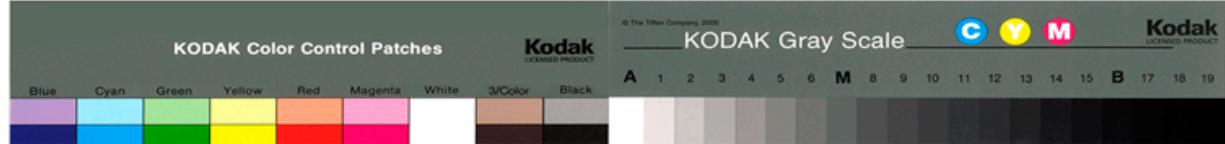


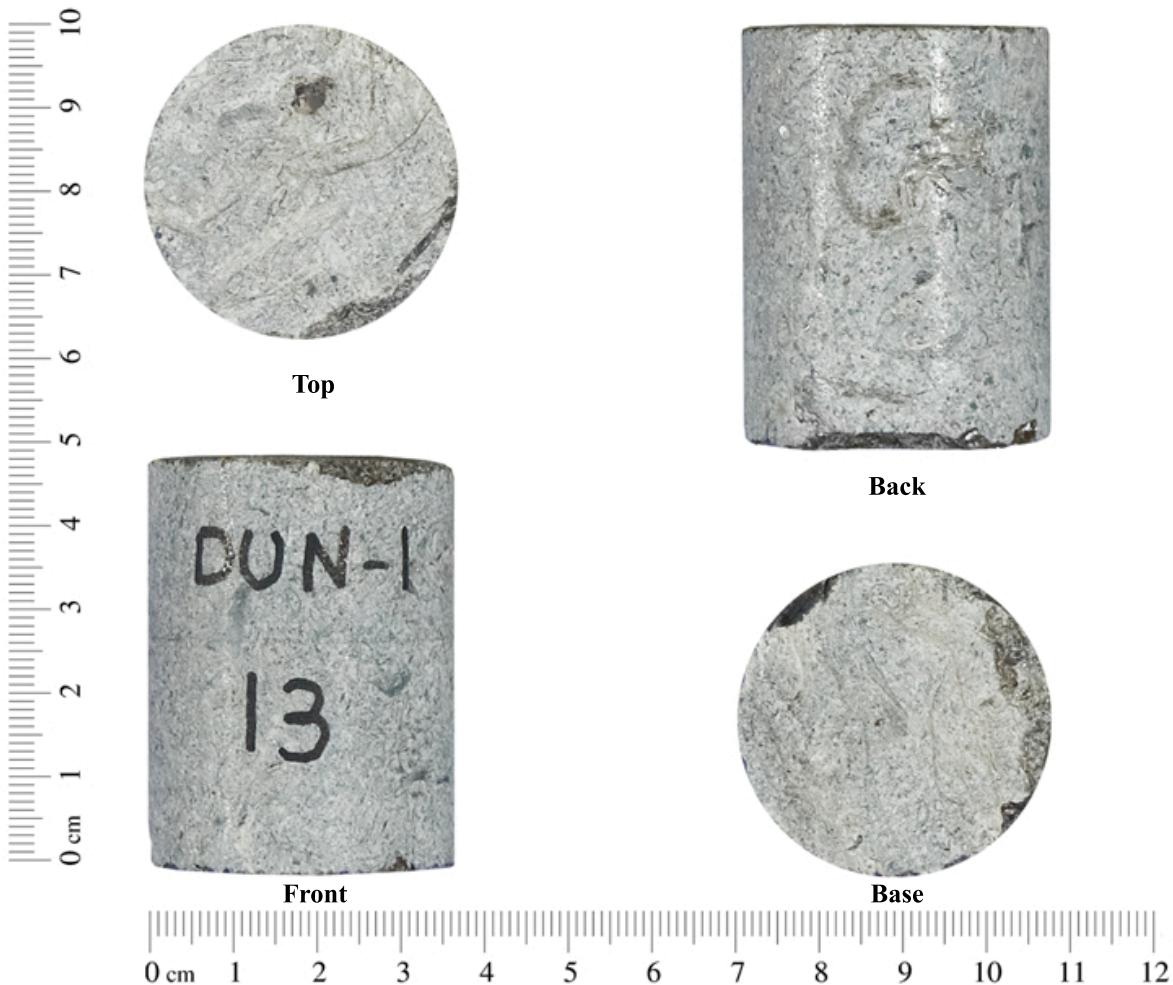
Sample No.:	11
Depth:	2884.68 m
Permeability:	0.0063 mD
Porosity:	5.0 %





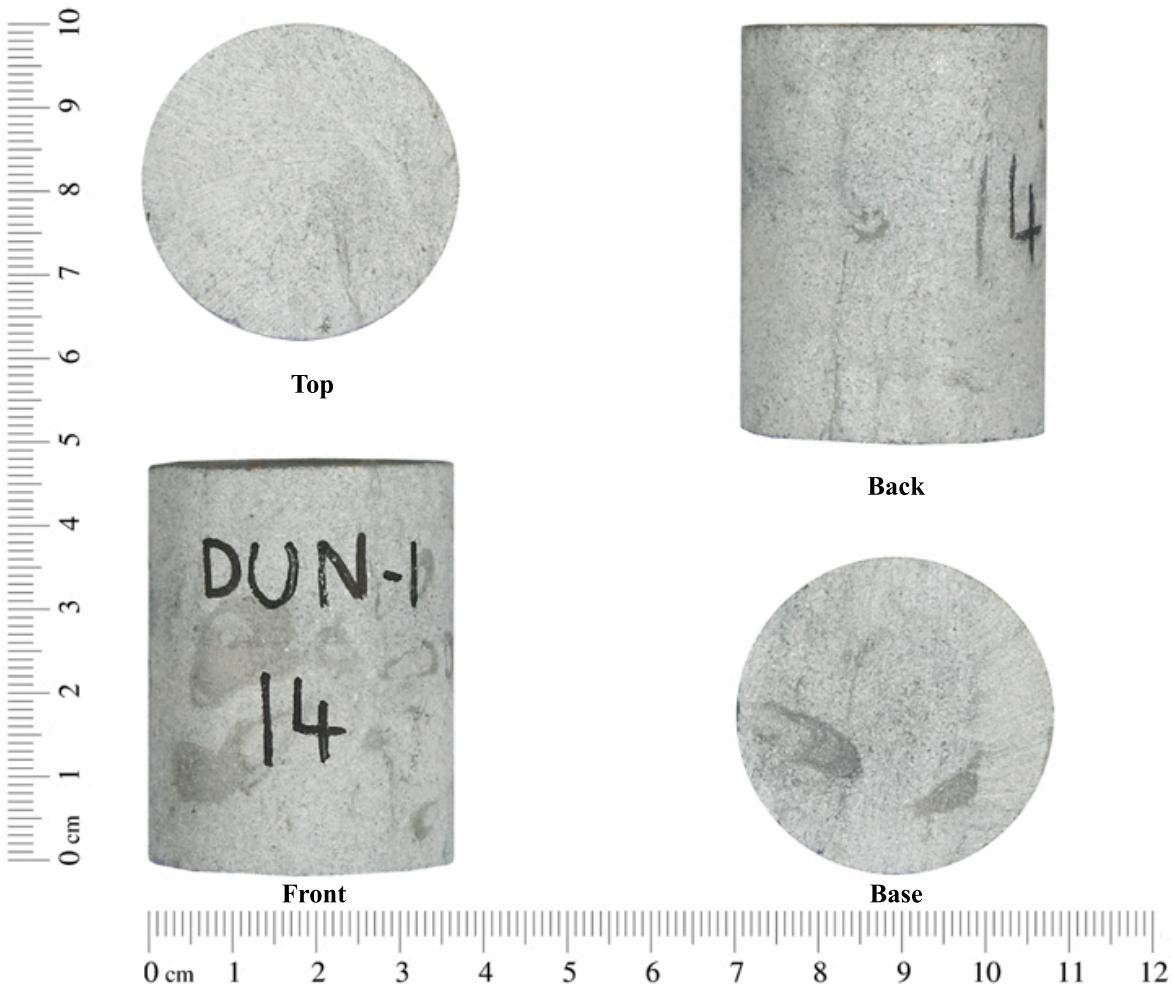
Sample No.:	12
Depth:	2885.60 m
Permeability:	0.0048 mD
Porosity:	4.4 %



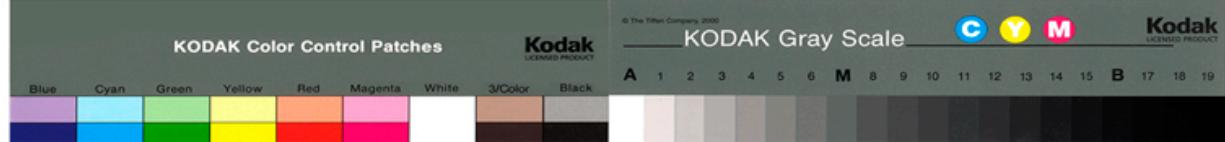


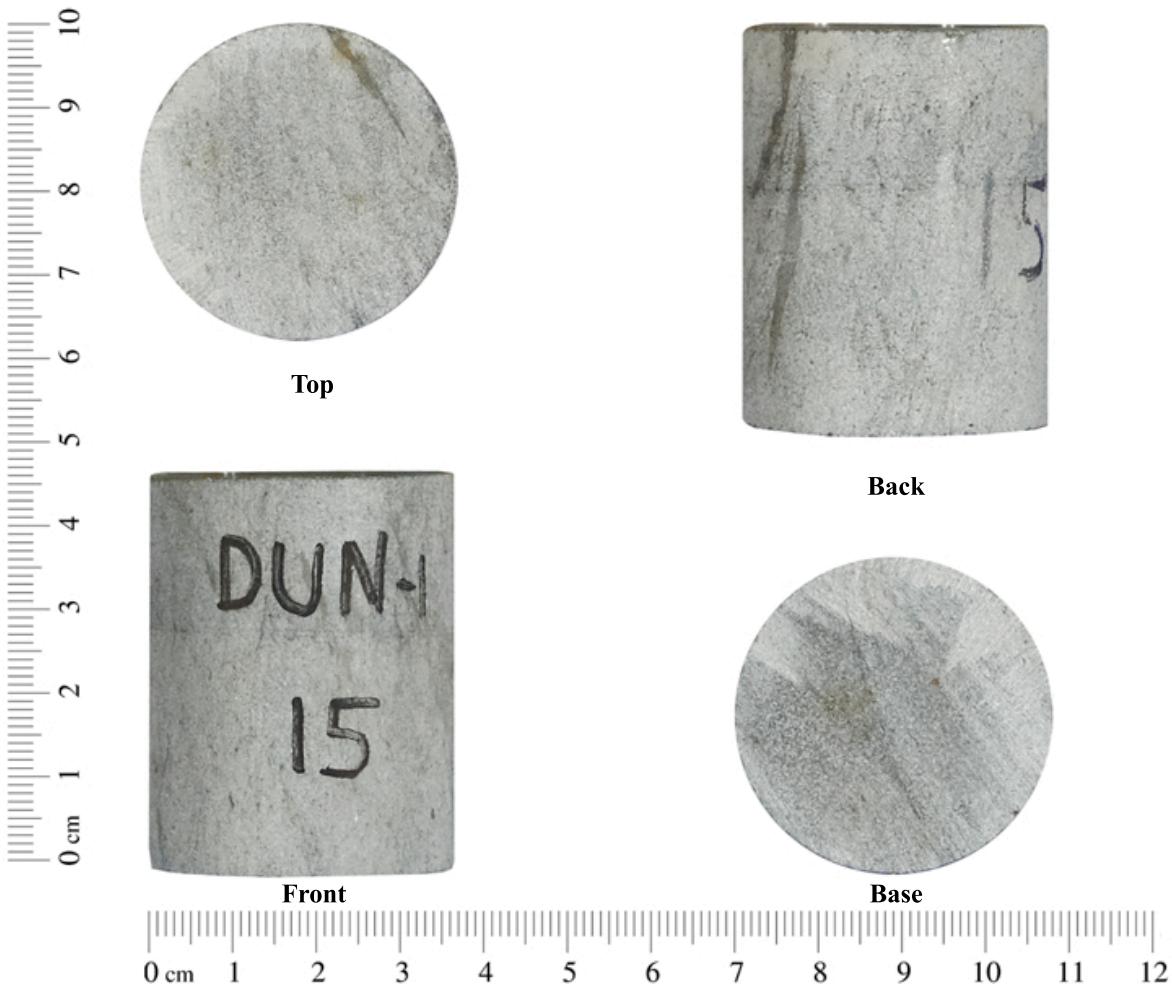
Sample No.:	13
Depth:	2886.91 m
Permeability:	0.026 mD
Porosity:	1.2 %



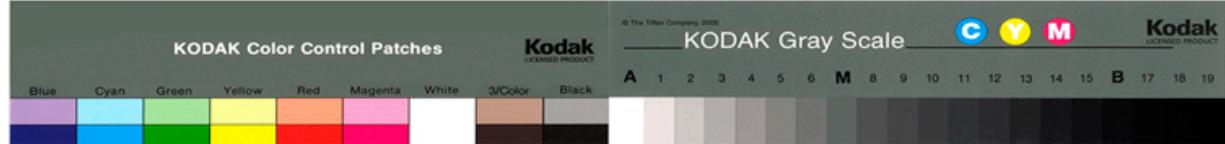


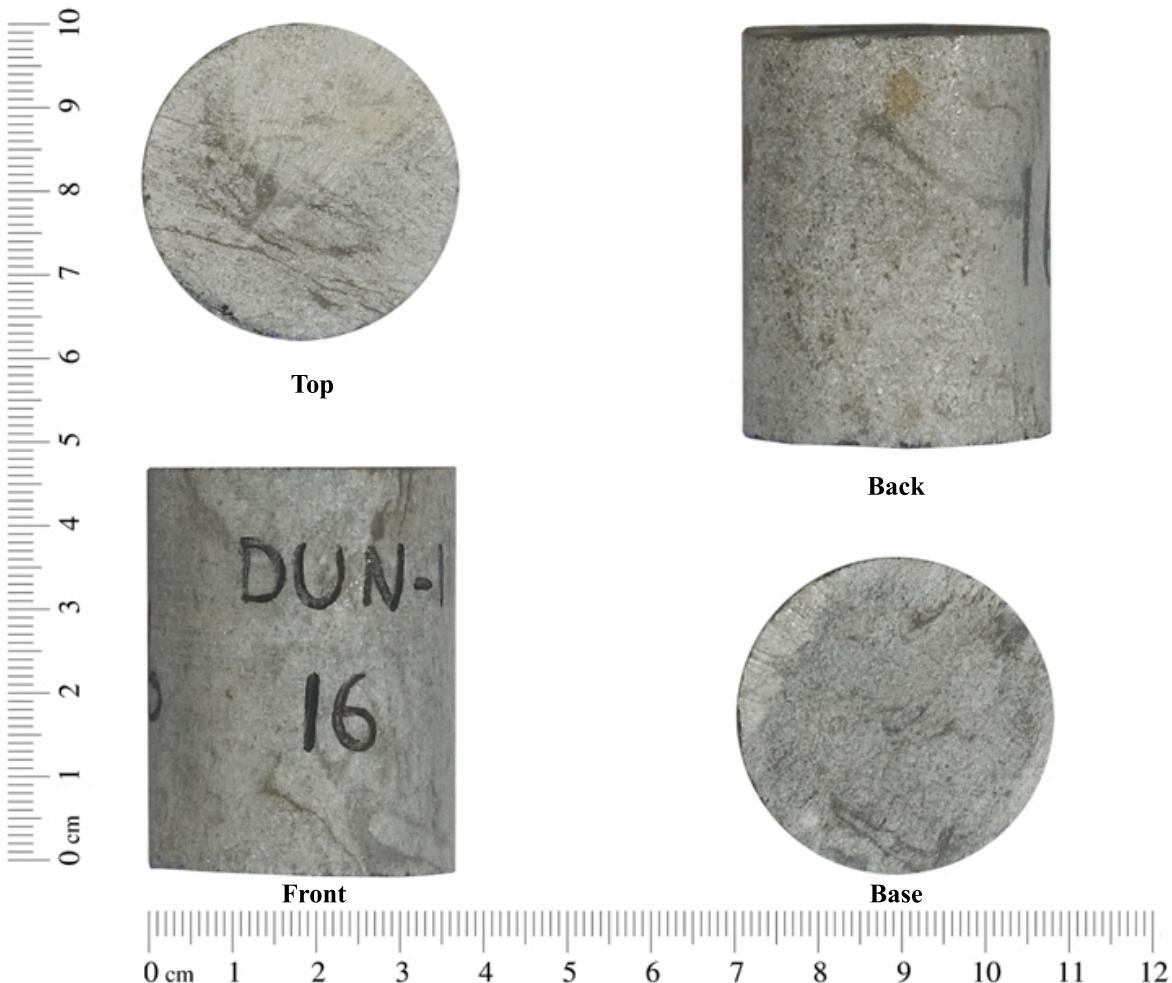
Sample No.:	14
Depth:	2888.54 m
Permeability:	0.0030 mD
Porosity:	4.8 %





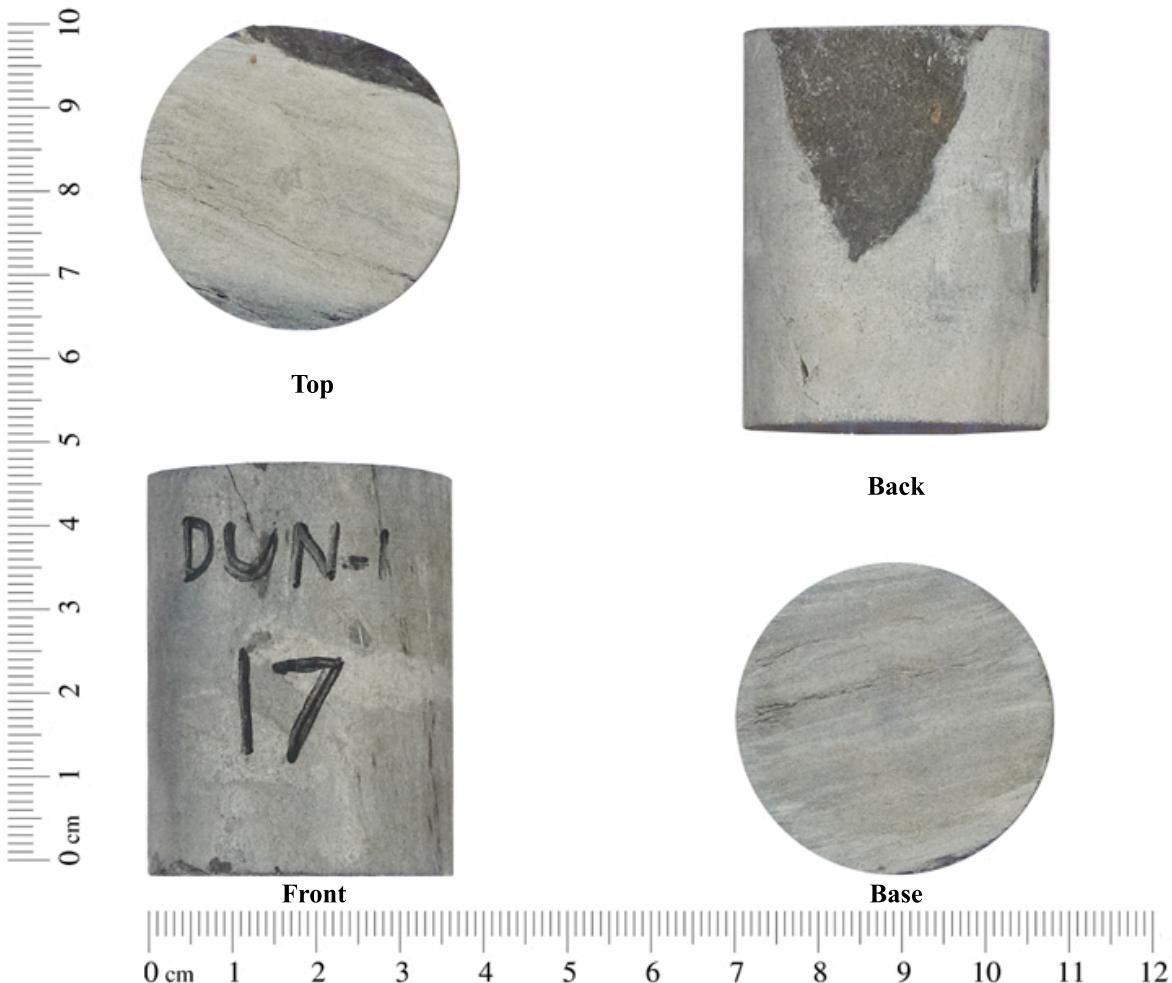
Sample No.:	15
Depth:	2889.39 m
Permeability:	0.0043 mD
Porosity:	4.0 %



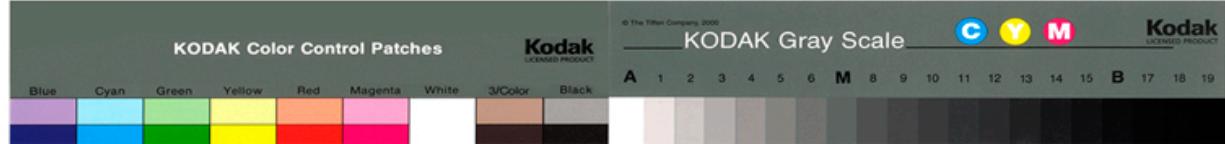


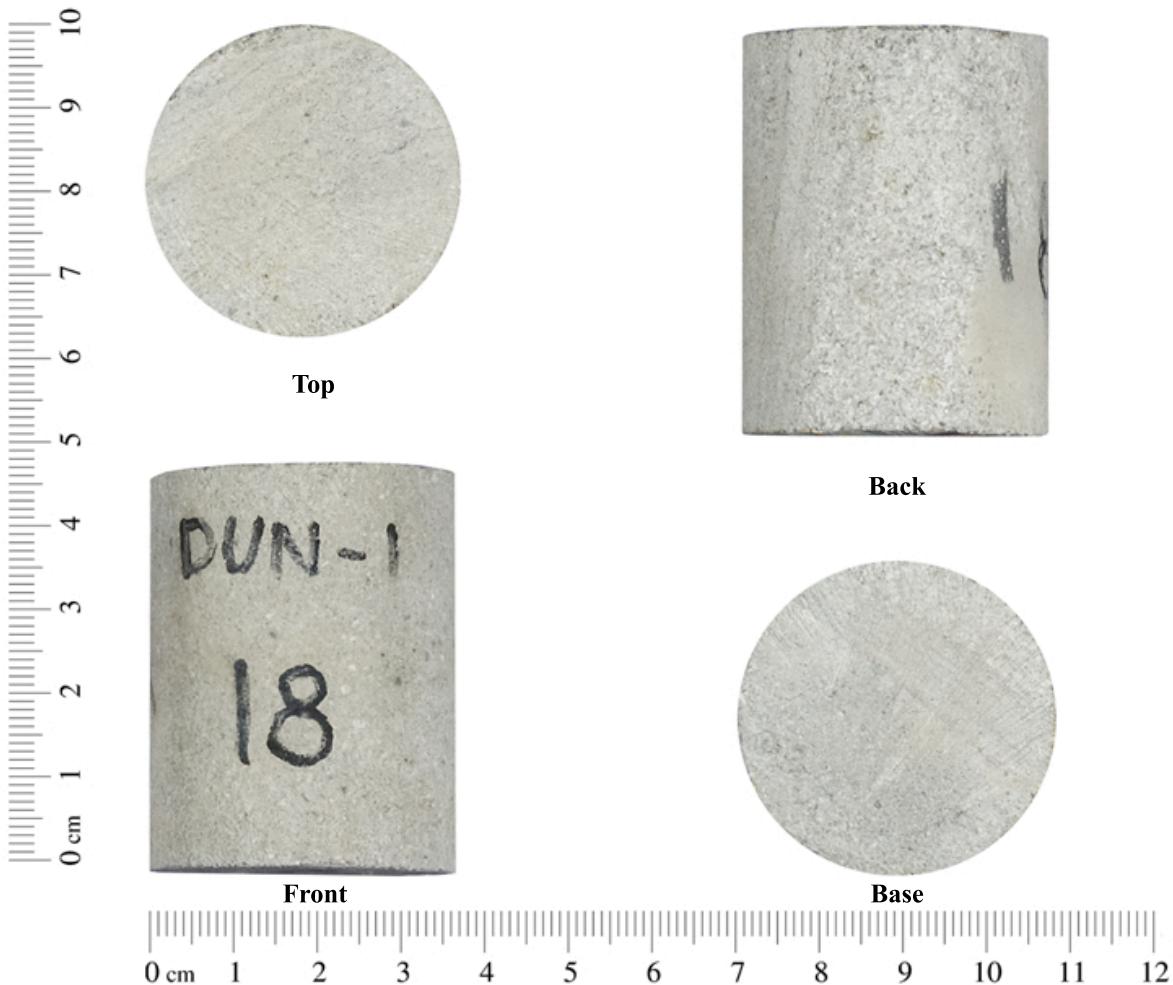
Sample No.:	16
Depth:	2890.54 m
Permeability:	0.0082 mD
Porosity:	5.0 %



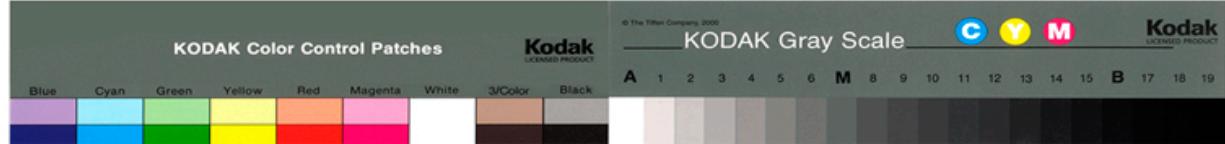


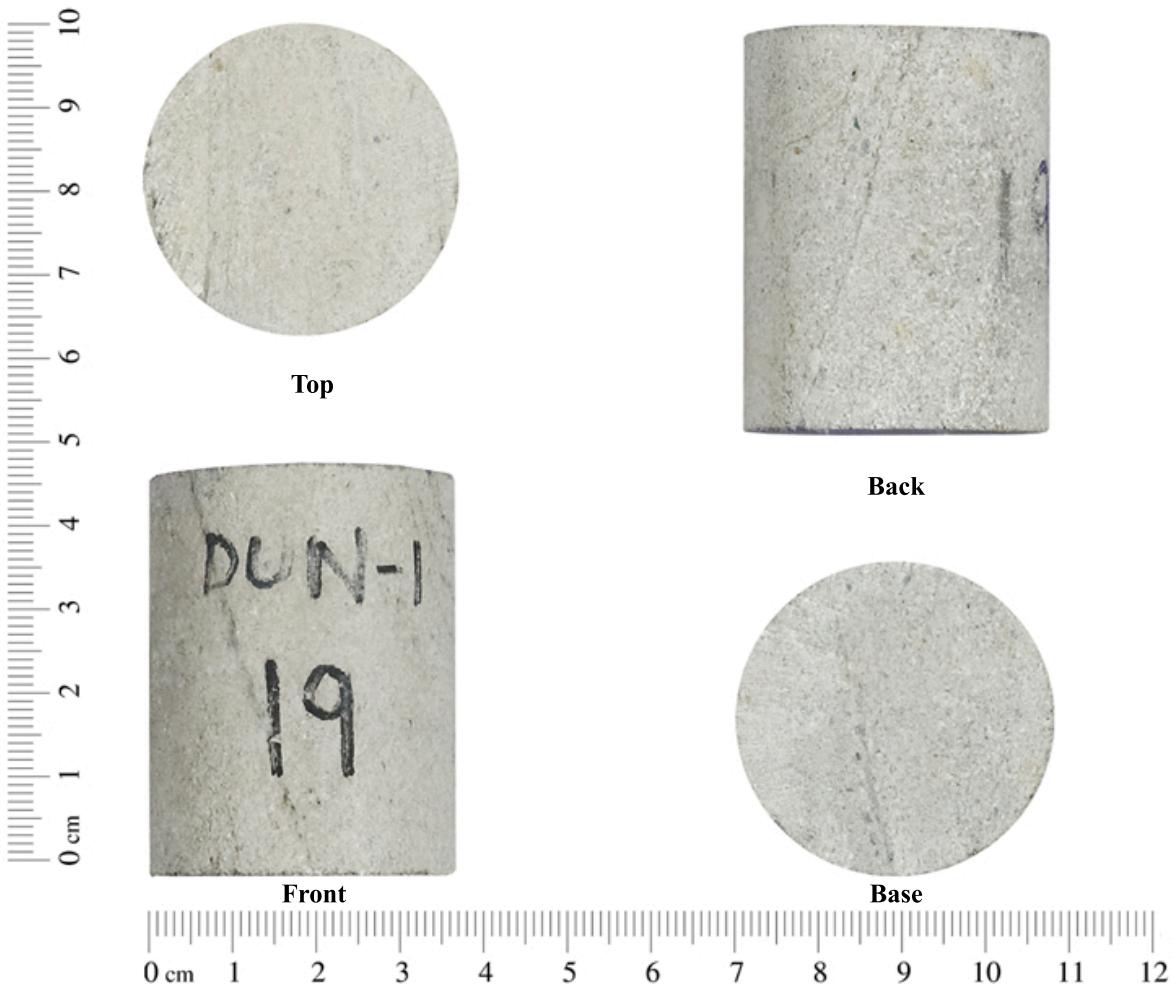
Sample No.:	17
Depth:	2894.49 m
Permeability:	
Porosity:	2.7 %



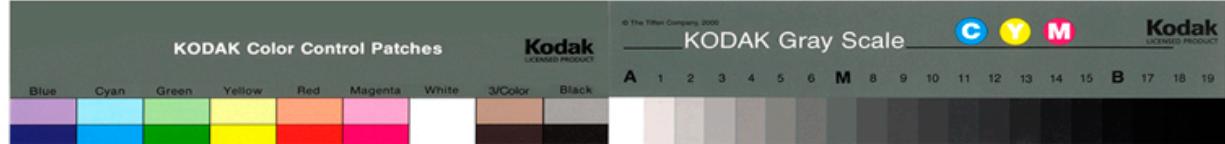


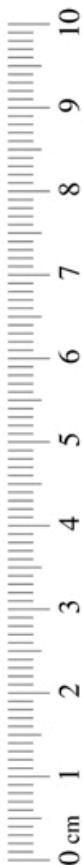
Sample No.:	18
Depth:	2895.50 m
Permeability:	0.014 mD
Porosity:	6.8 %





Sample No.:	19
Depth:	2896.30 m
Permeability:	0.046 mD
Porosity:	8.9 %

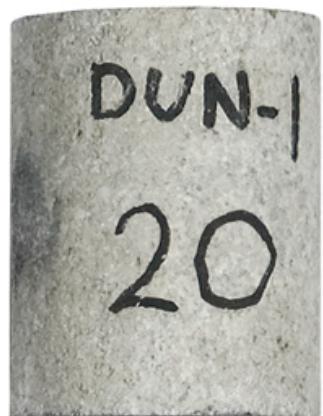




Top



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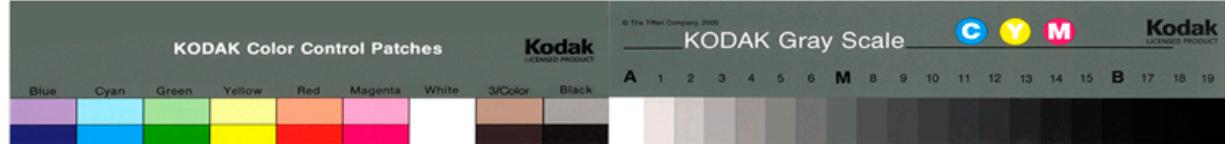
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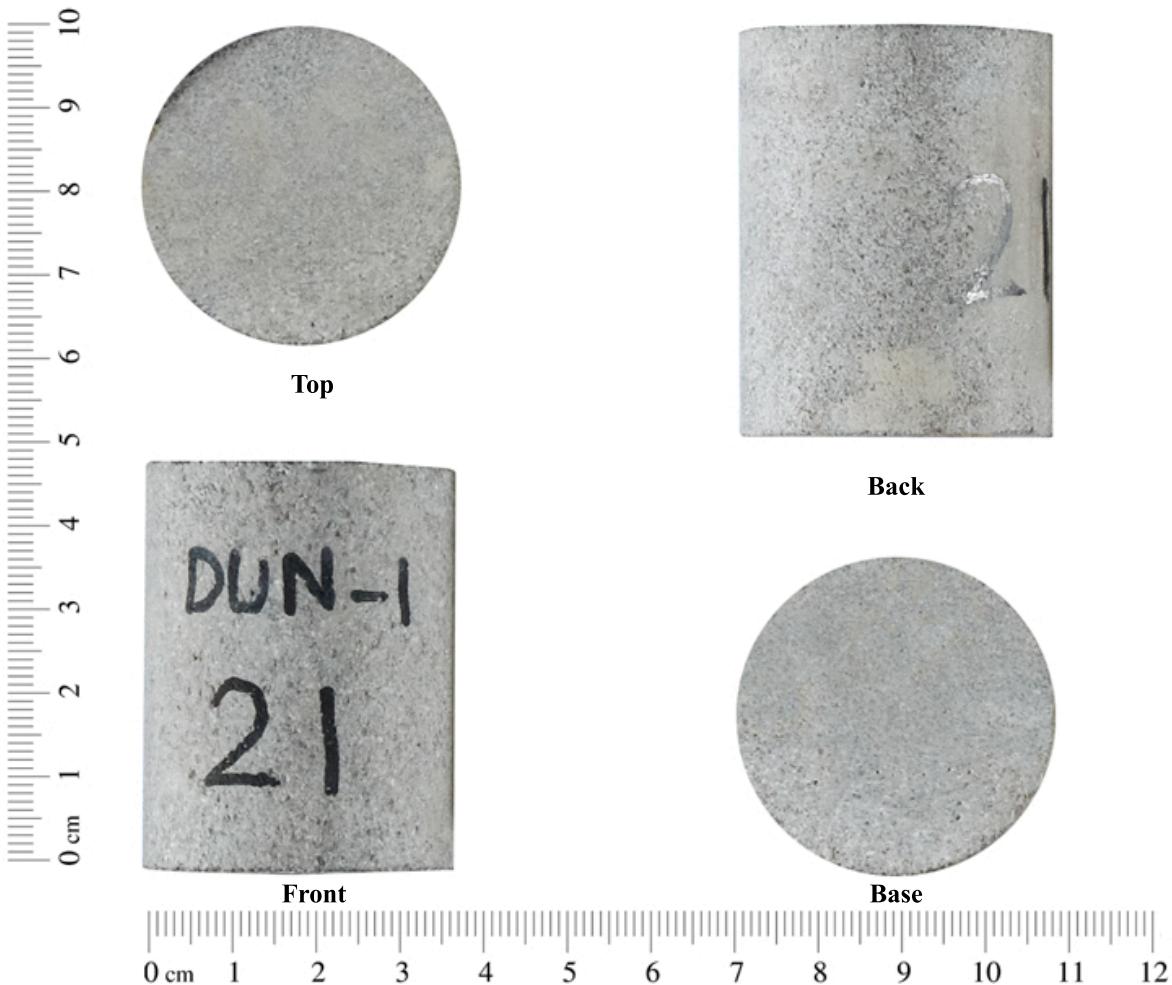


Base

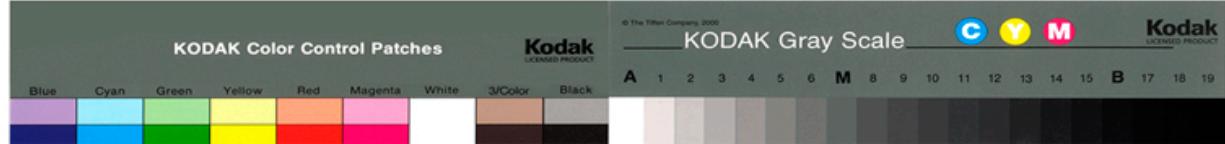


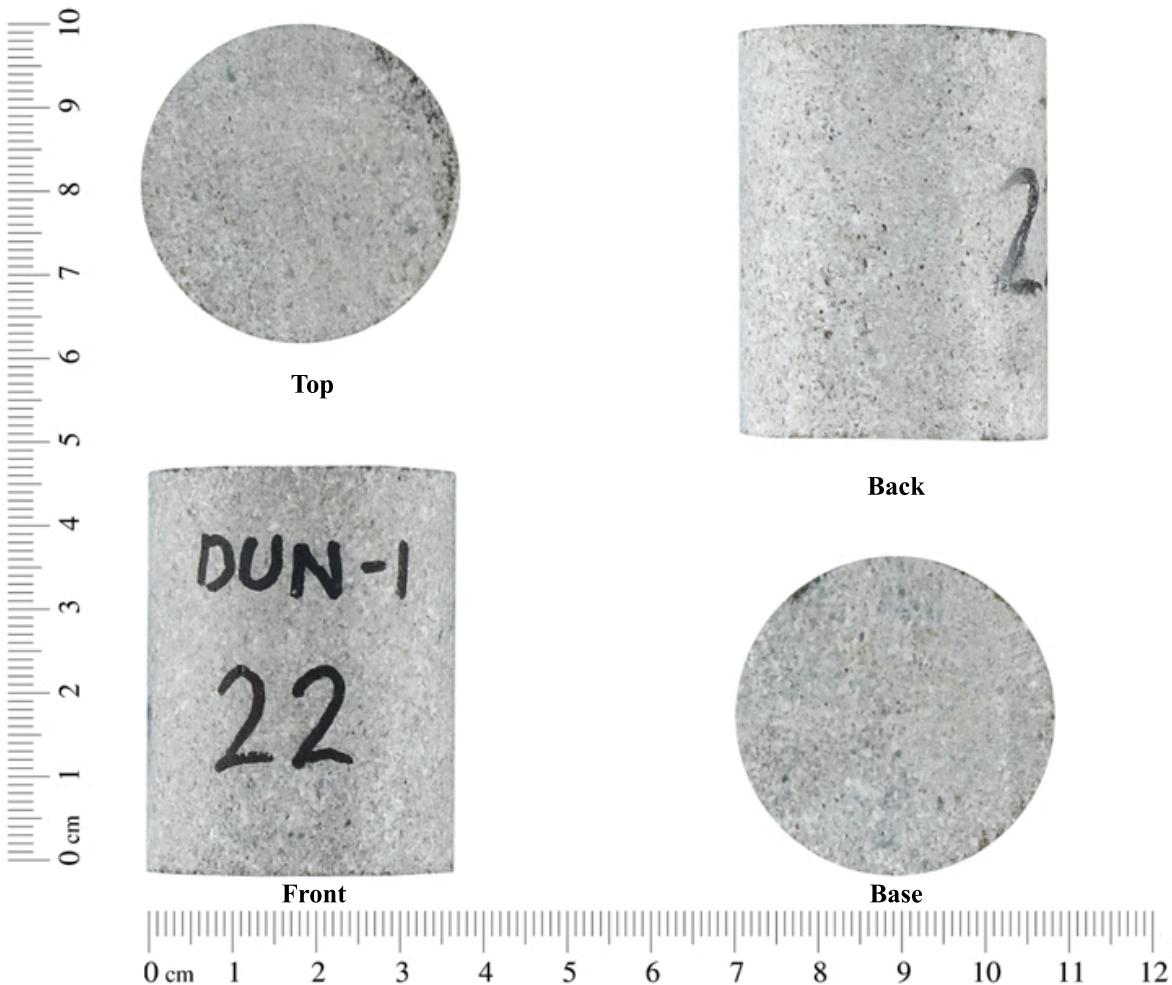
Sample No.:	20
Depth:	2897.40 m
Permeability:	0.064 mD
Porosity:	9.9 %





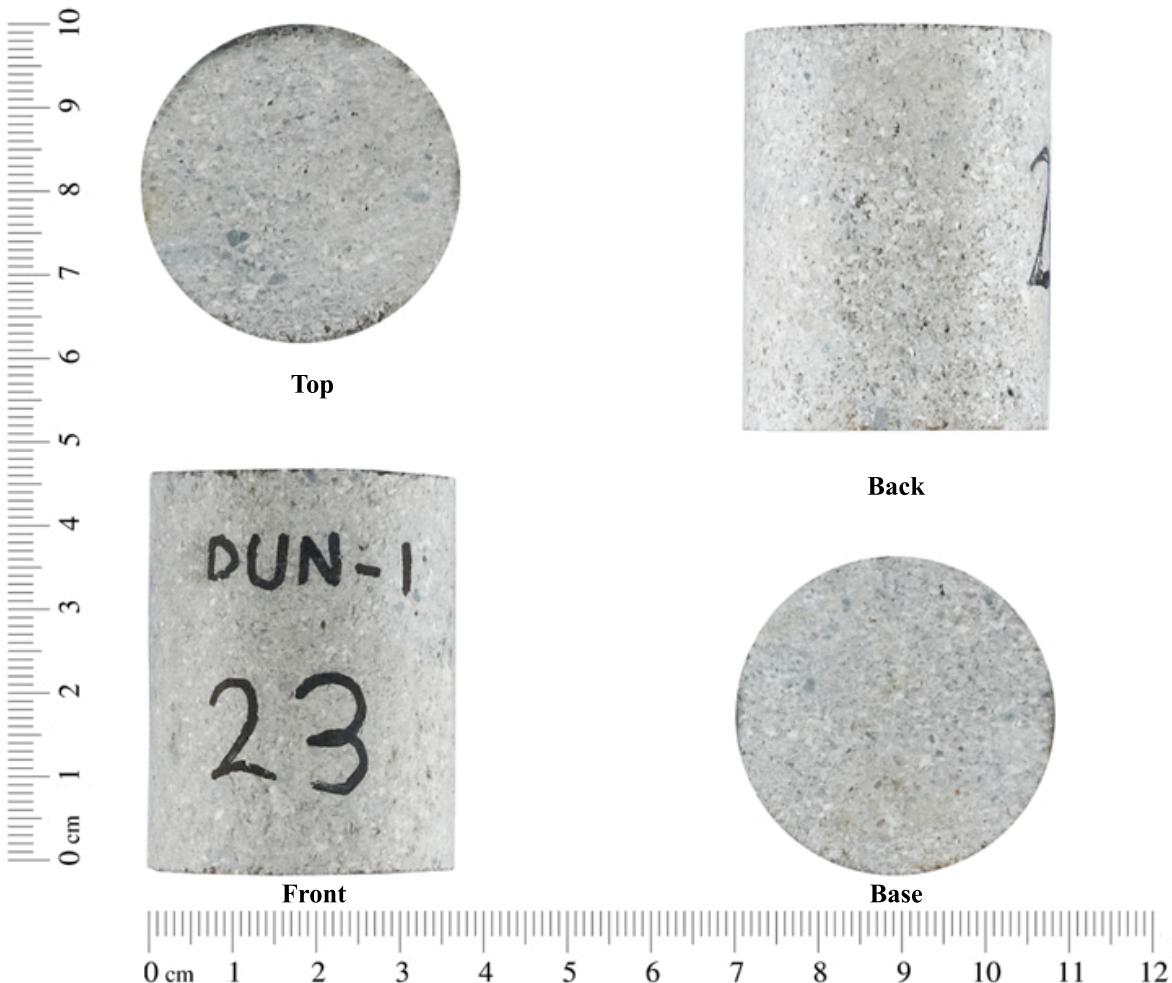
Sample No.:	21
Depth:	2898.51 m
Permeability:	0.032 mD
Porosity:	10.4 %





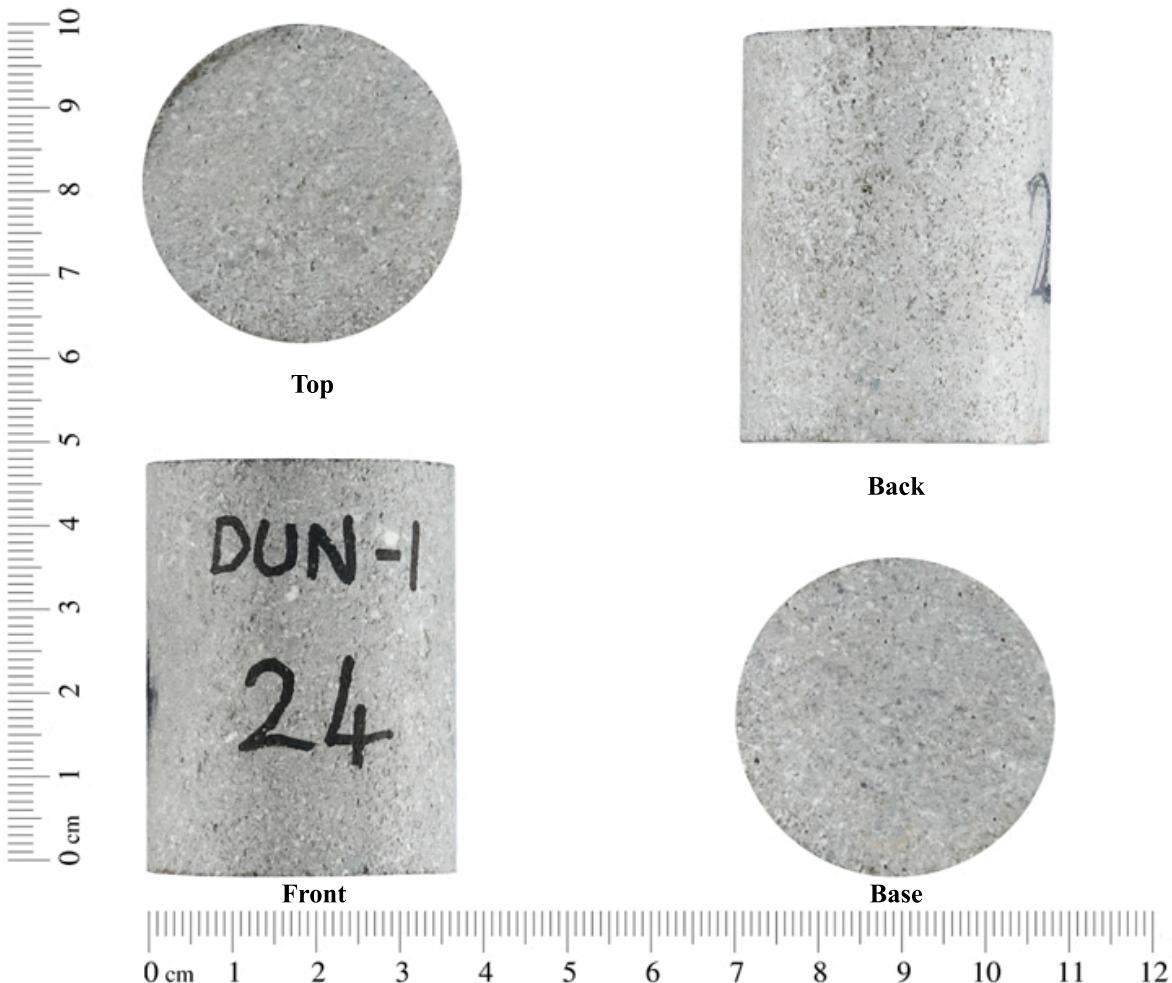
Sample No.:	22
Depth:	2899.50 m
Permeability:	0.018 mD
Porosity:	8.6 %



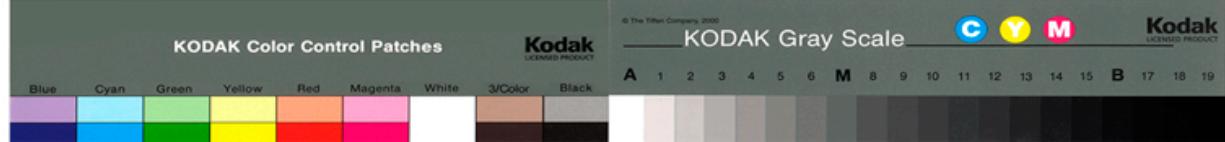


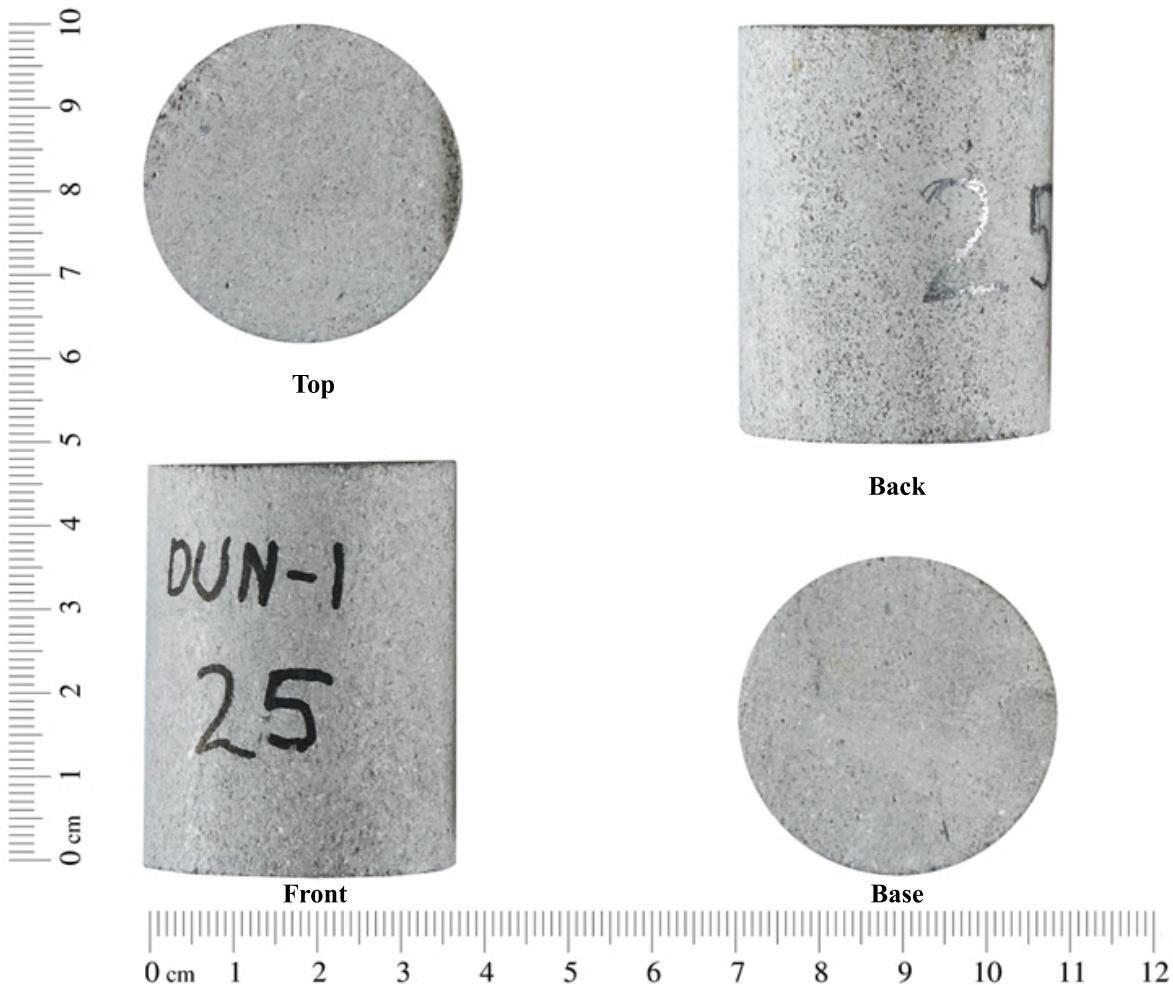
Sample No.:	23
Depth:	2900.49 m
Permeability:	0.073 mD
Porosity:	9.0 %





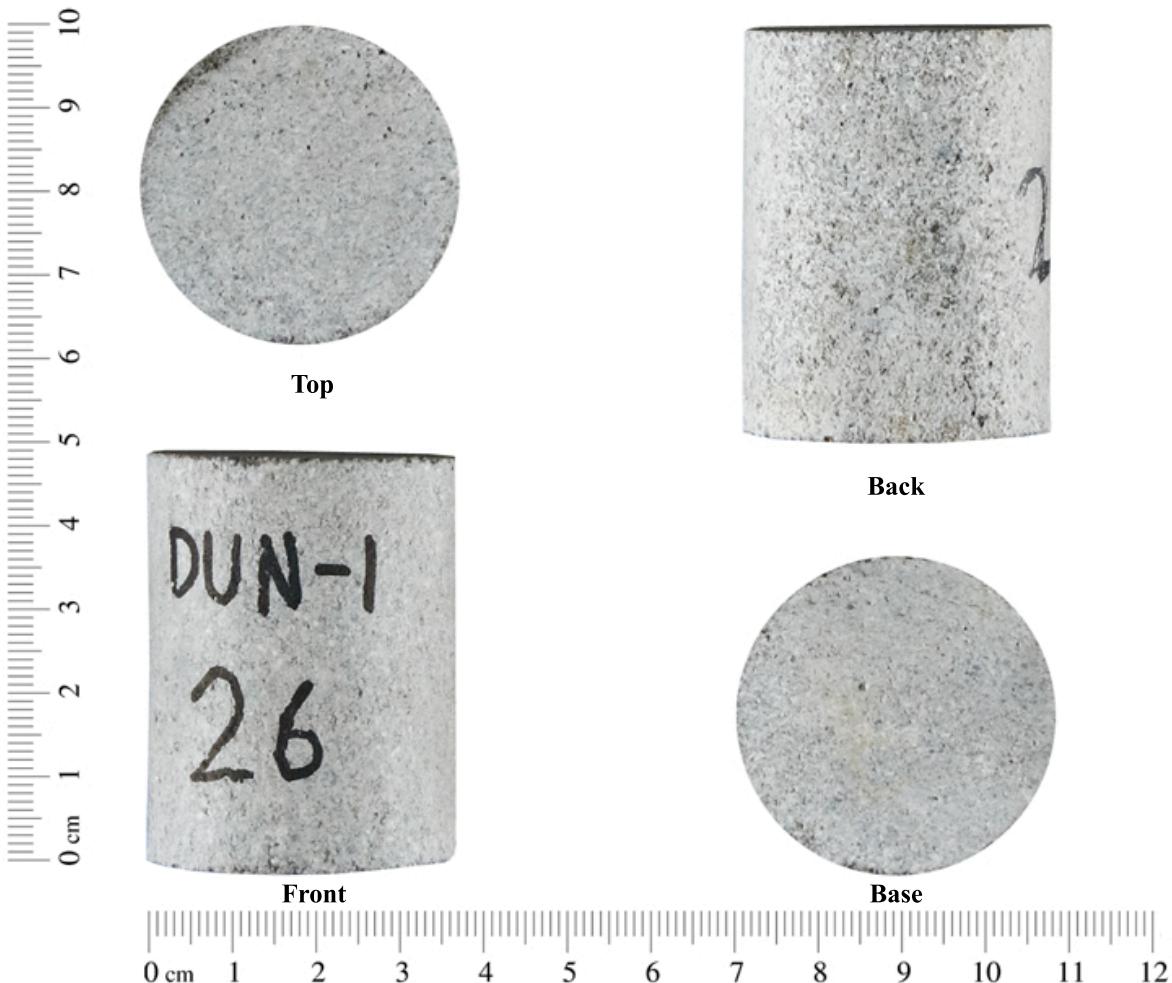
Sample No.:	24
Depth:	2901.50 m
Permeability:	0.034 mD
Porosity:	10.8 %



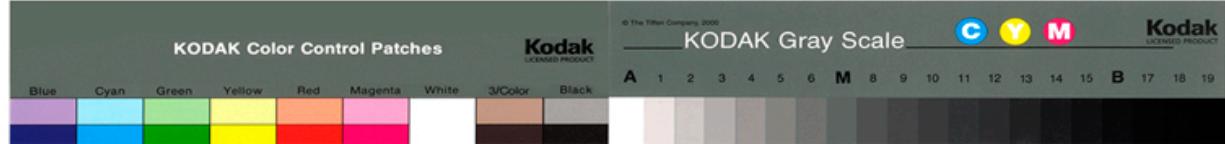


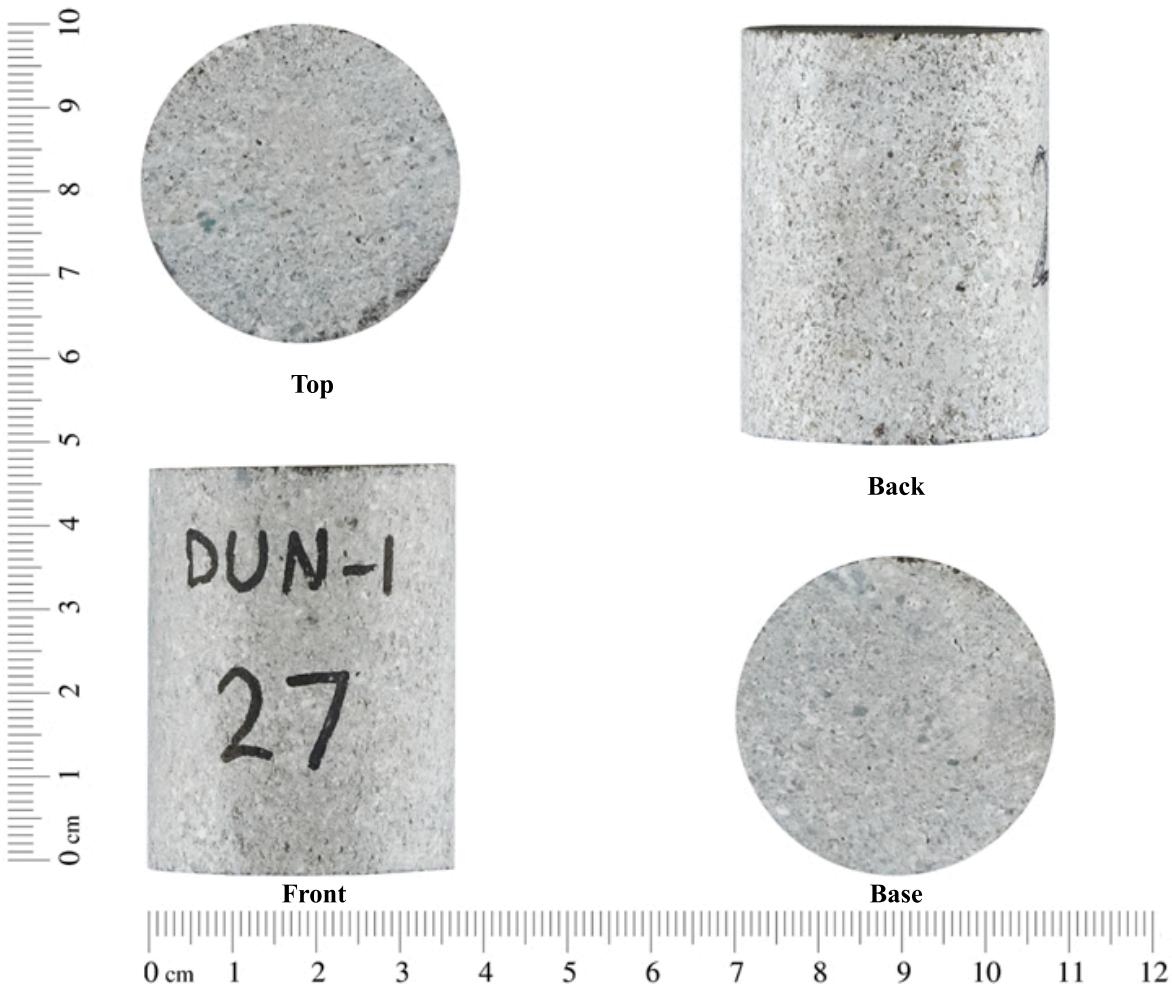
Sample No.:	25
Depth:	2902.49 m
Permeability:	0.028 mD
Porosity:	10.7 %



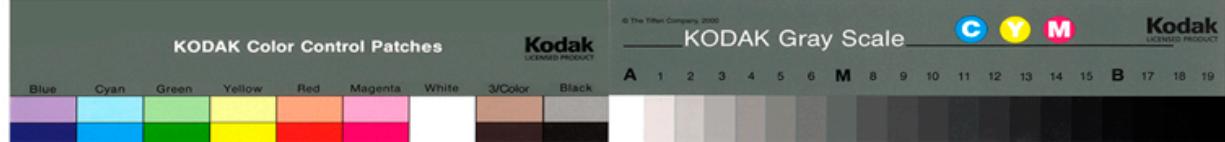


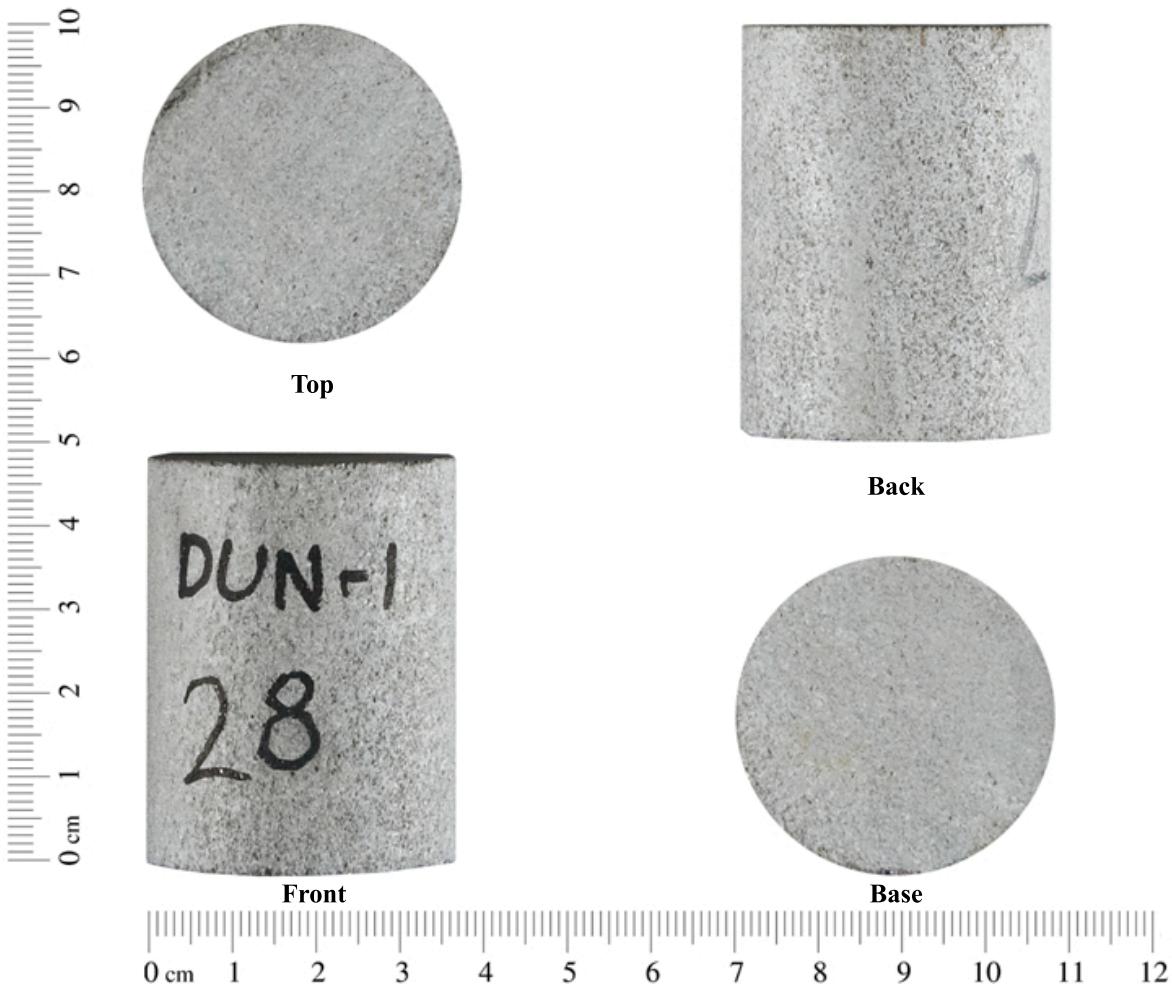
Sample No.:	26
Depth:	2903.47 m
Permeability:	0.064 mD
Porosity:	9.4 %



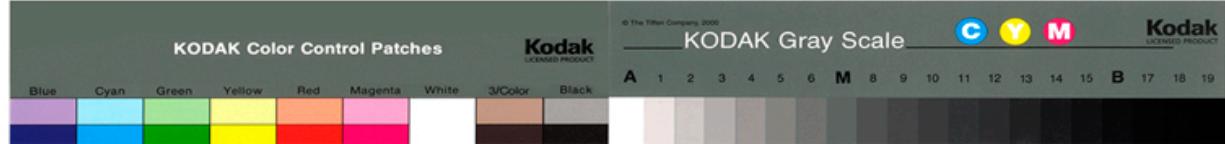


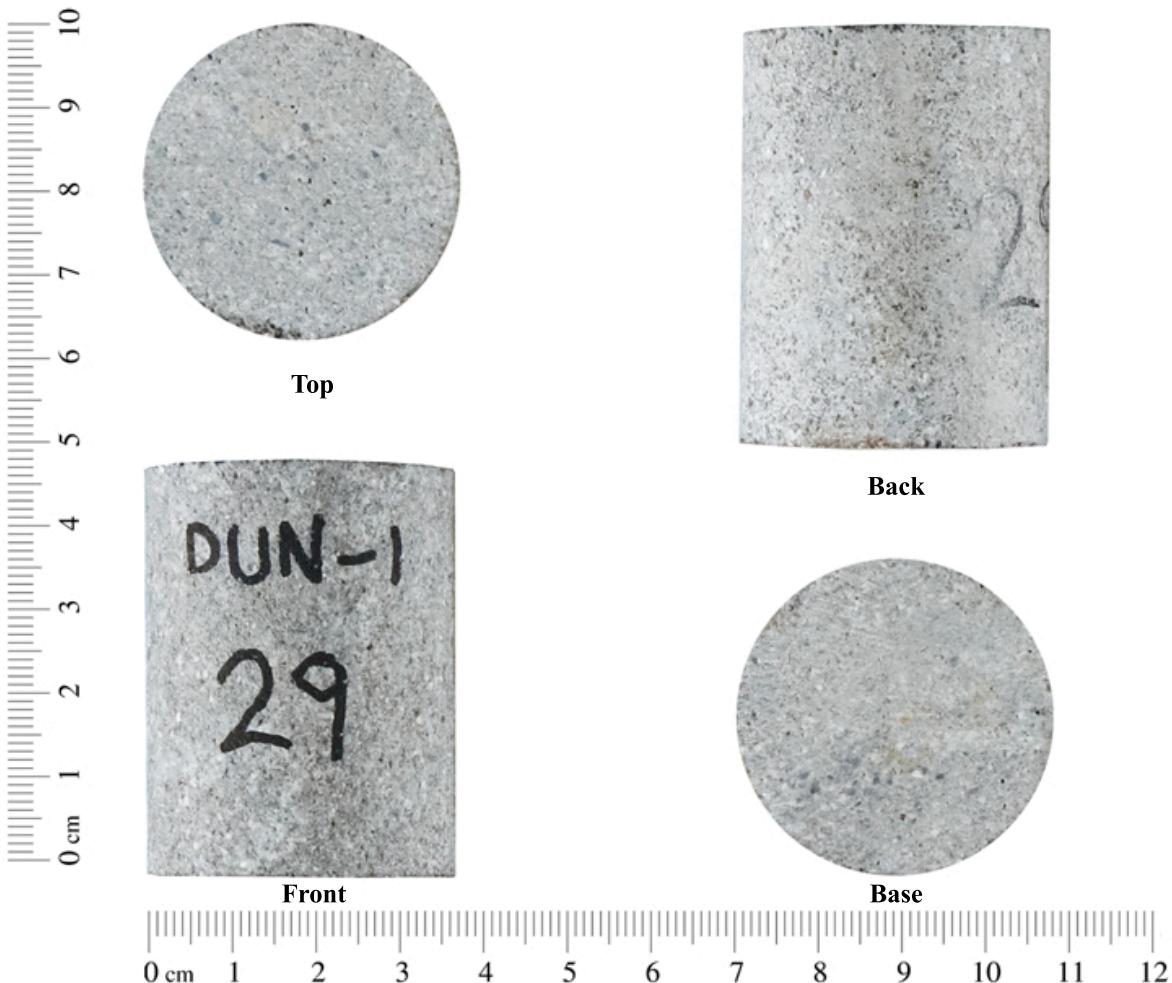
Sample No.:	27
Depth:	2904.50 m
Permeability:	0.028 mD
Porosity:	9.2 %



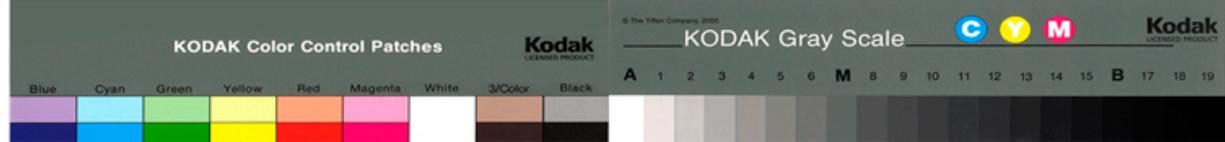


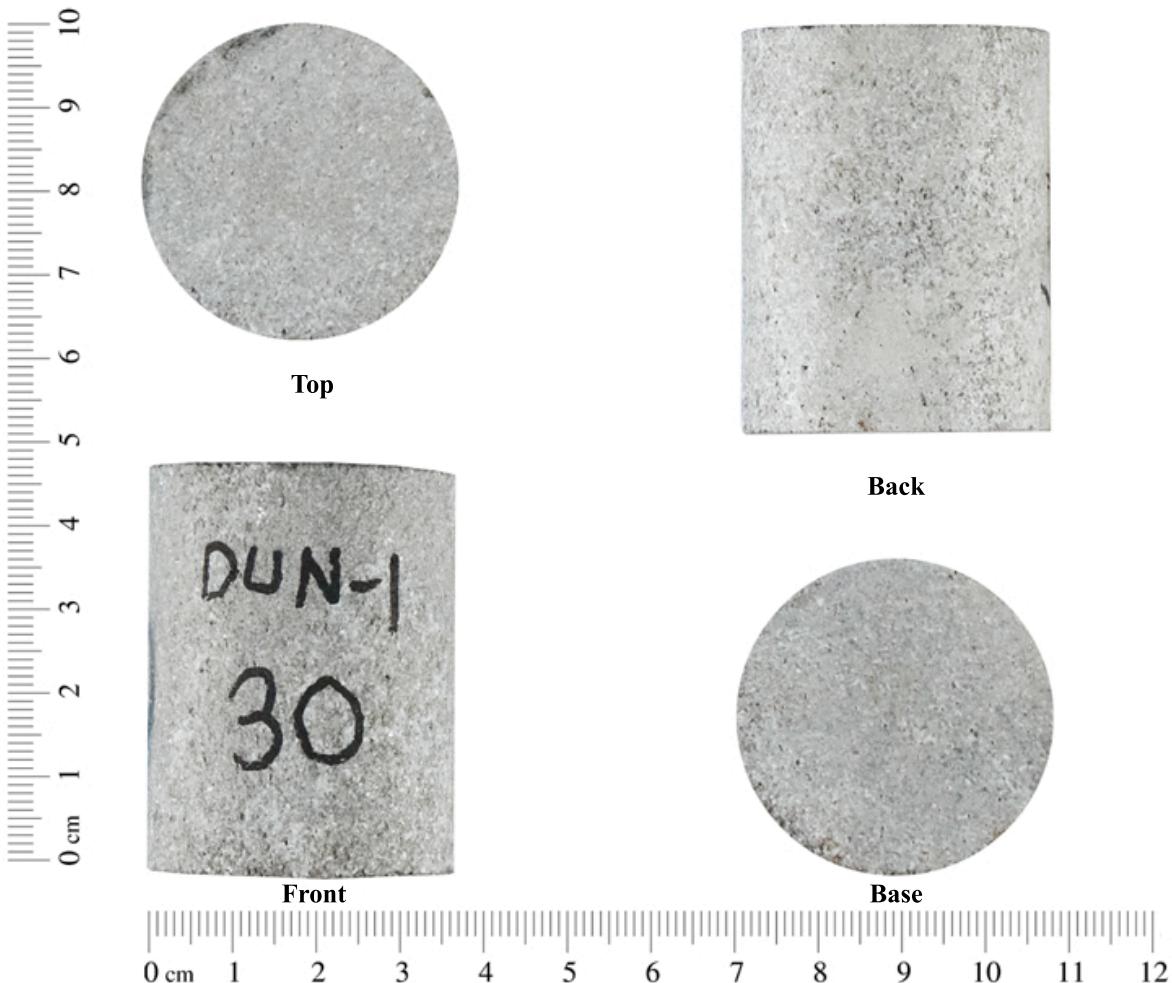
Sample No.:	28
Depth:	2905.56 m
Permeability:	0.031 mD
Porosity:	11.6 %





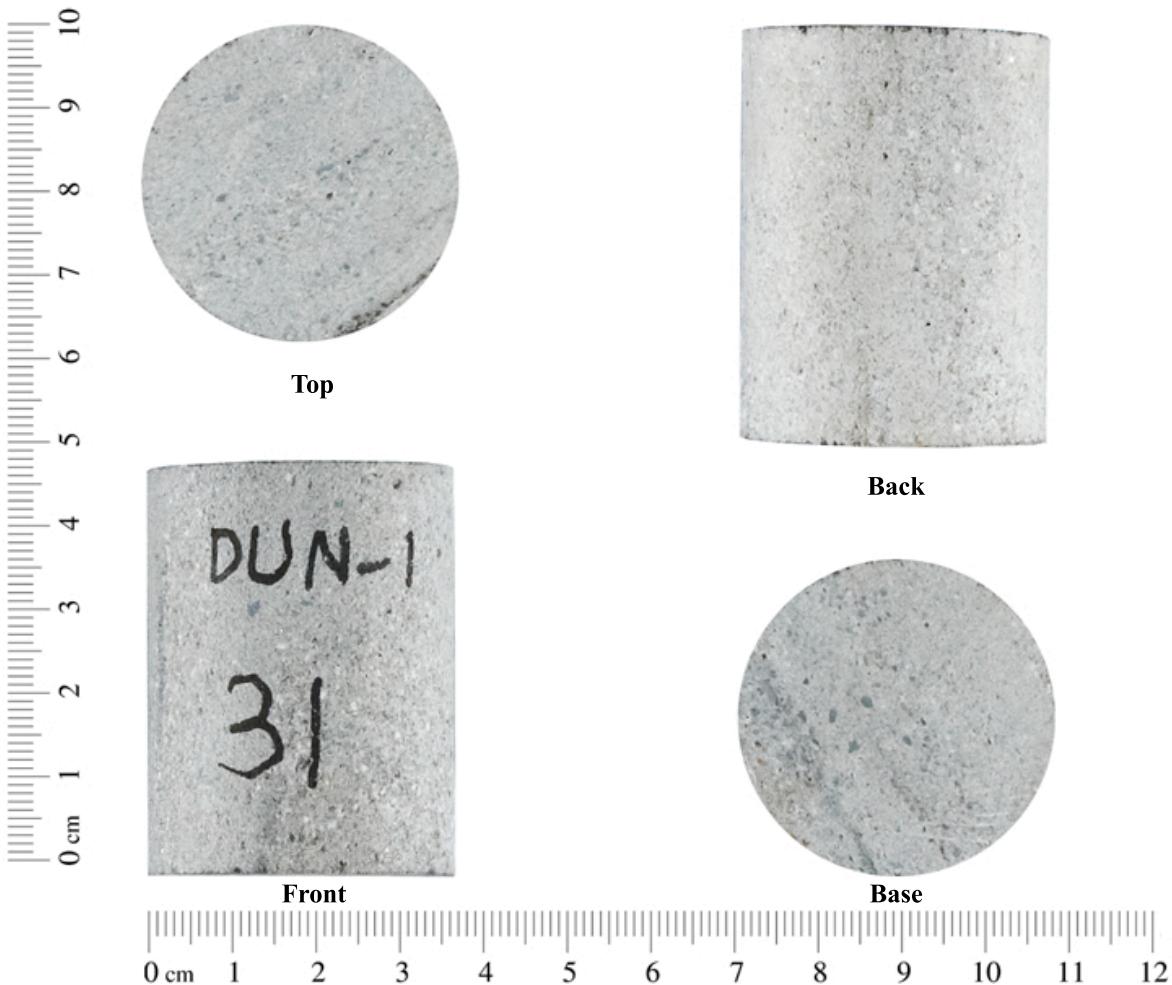
Sample No.:	29
Depth:	2906.50 m
Permeability:	0.022 mD
Porosity:	9.6 %





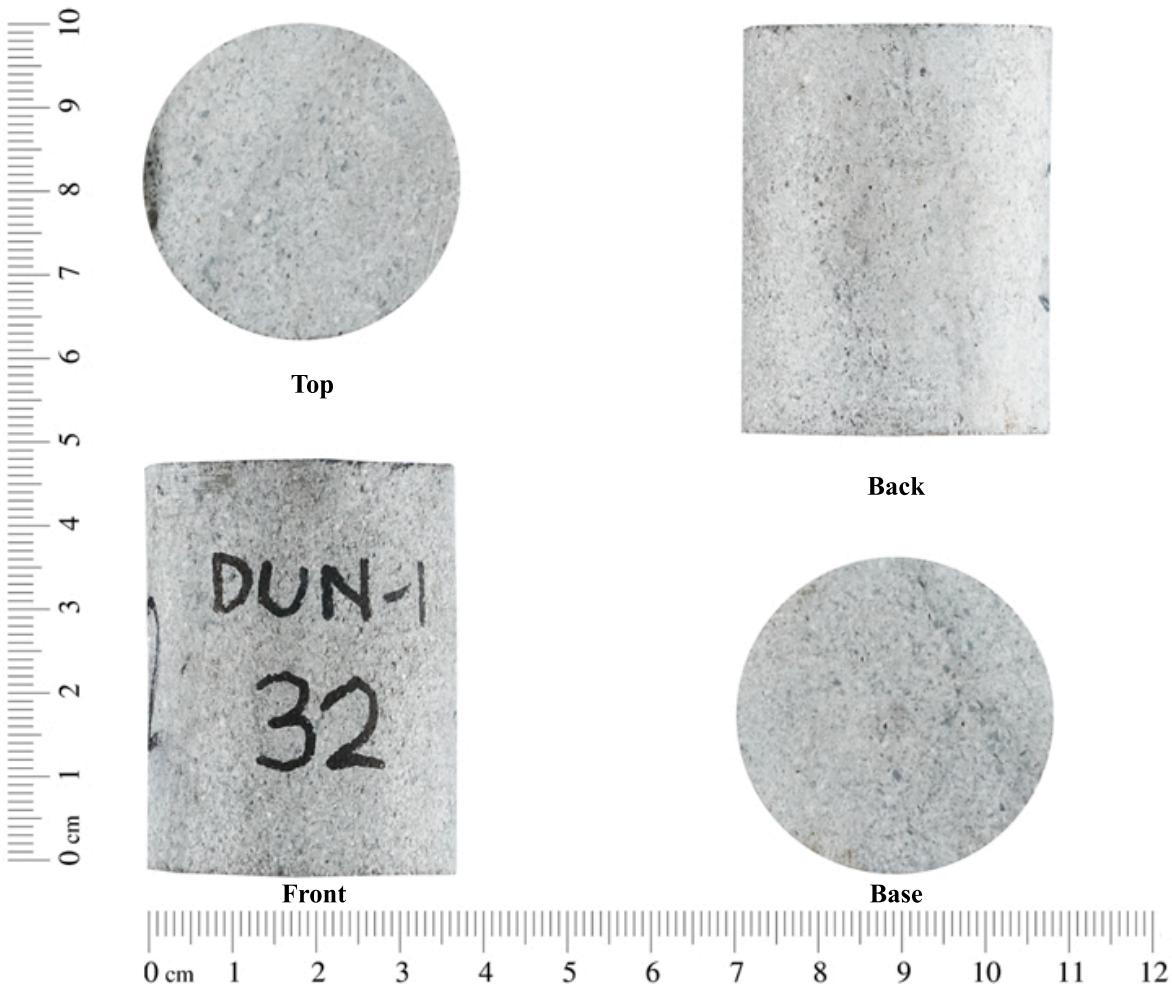
Sample No.:	30
Depth:	2907.50 m
Permeability:	0.043 mD
Porosity:	11.9 %



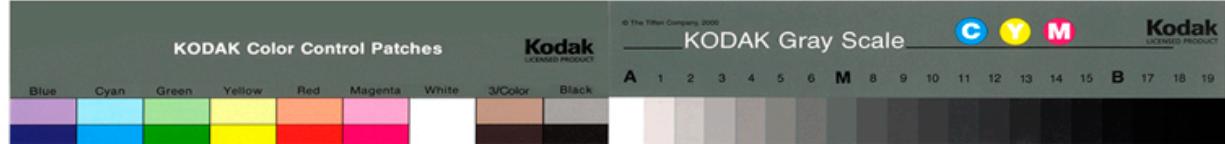


Sample No.:	31
Depth:	2908.50 m
Permeability:	0.047 mD
Porosity:	7.3 %



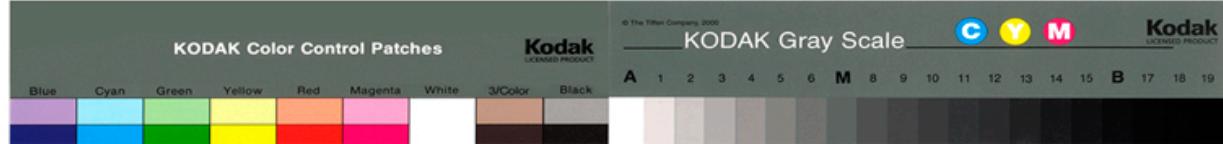


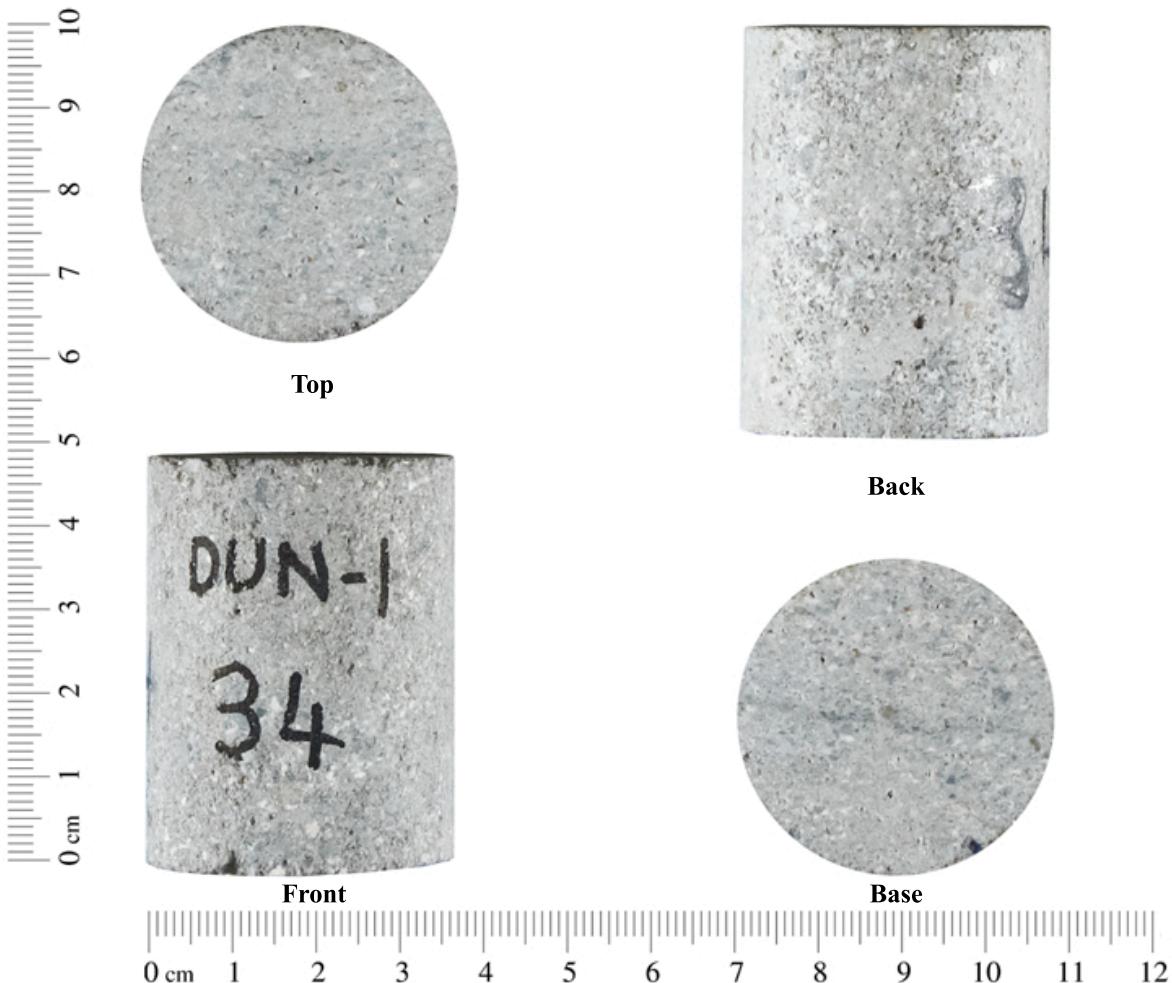
Sample No.:	32
Depth:	2909.49 m
Permeability:	0.066 mD
Porosity:	7.9 %





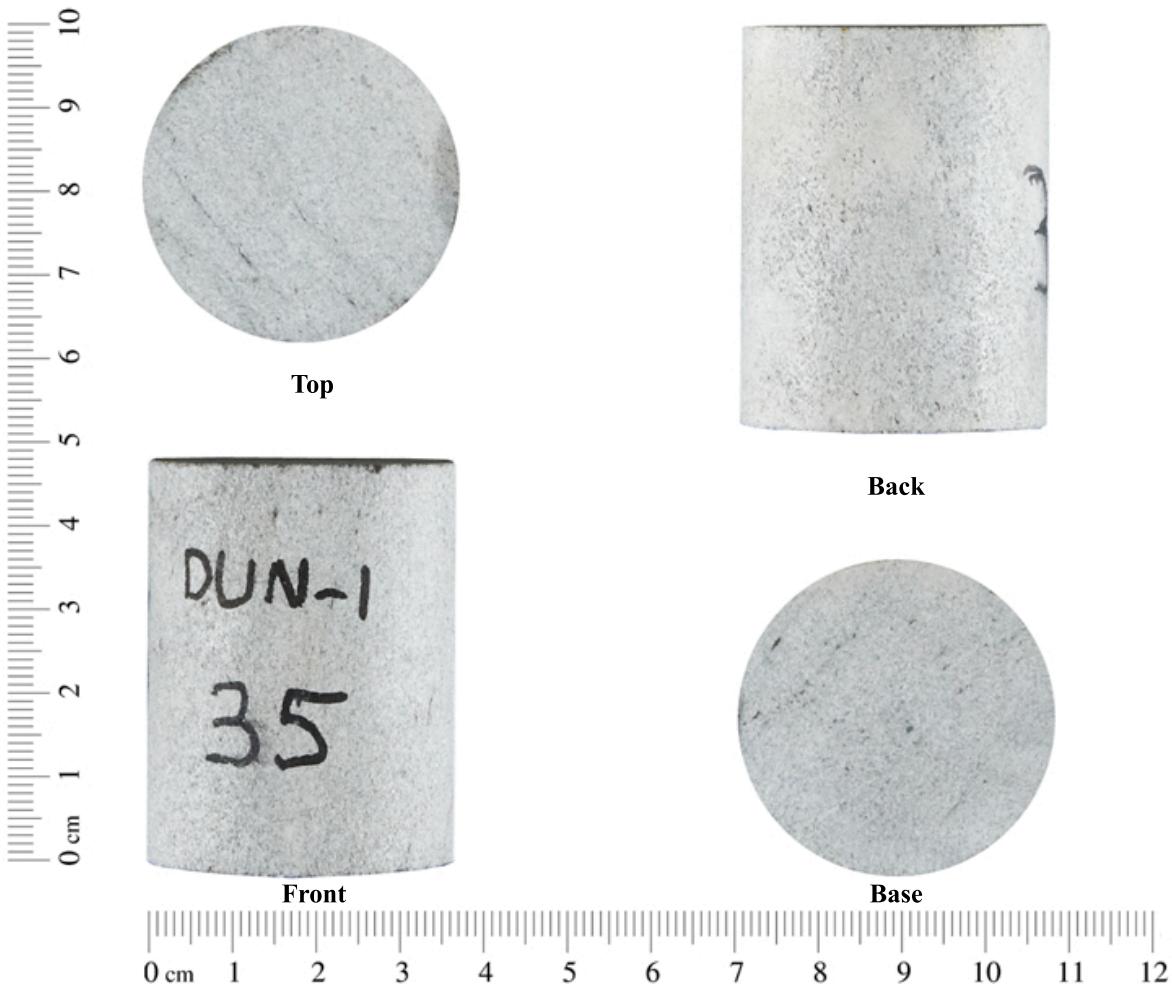
Sample No.:	33
Depth:	2910.44 m
Permeability:	0.045 mD
Porosity:	9.1 %





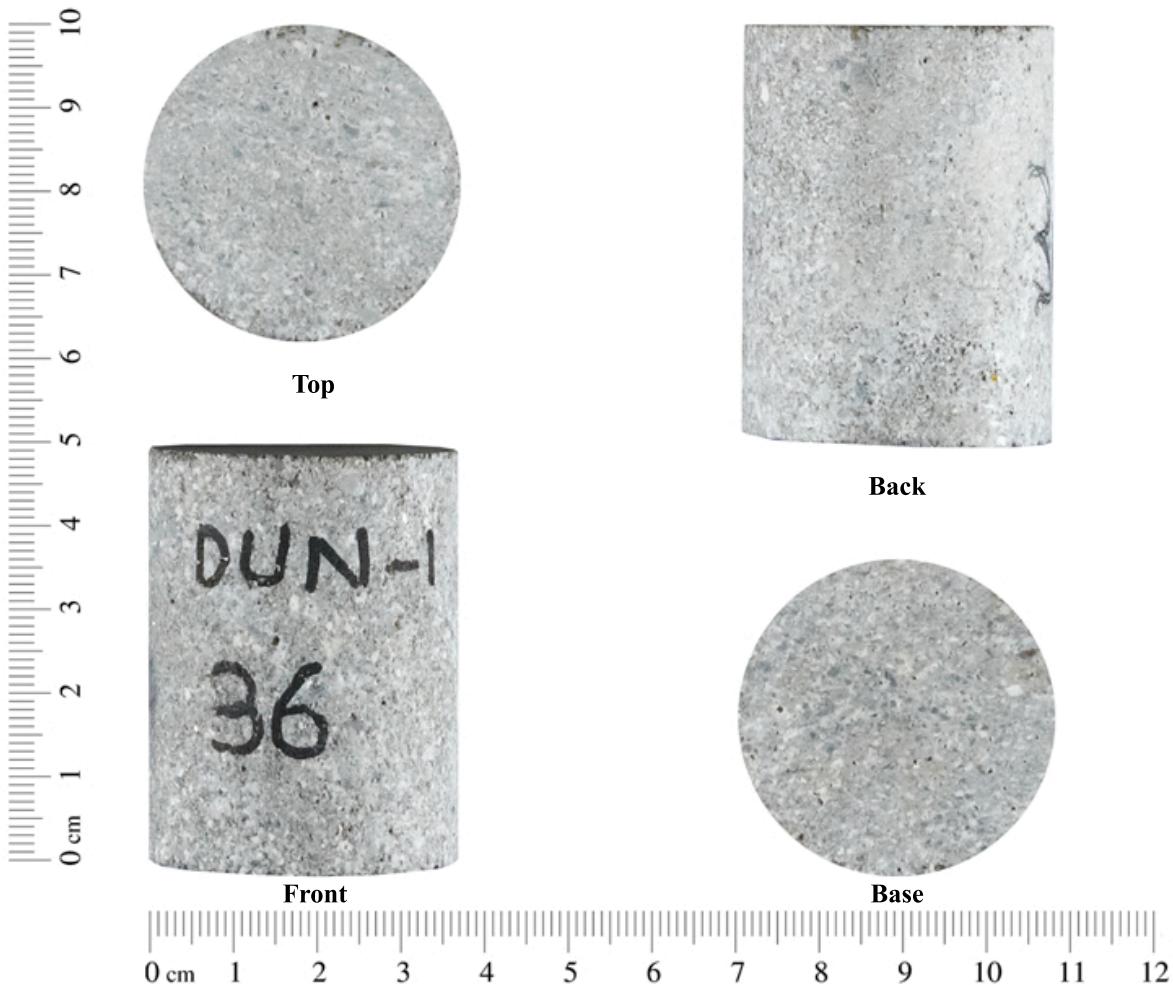
Sample No.:	34
Depth:	2911.45 m
Permeability:	0.113 mD
Porosity:	9.9 %



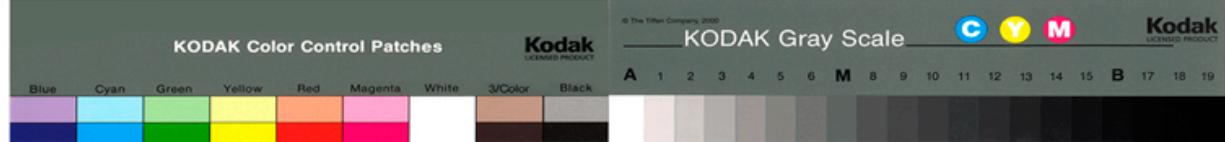


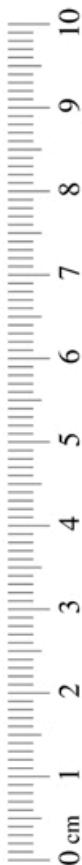
Sample No.:	35
Depth:	2912.50 m
Permeability:	0.024 mD
Porosity:	5.7 %





Sample No.:	36
Depth:	2913.20 m
Permeability:	0.051 mD
Porosity:	10.4 %

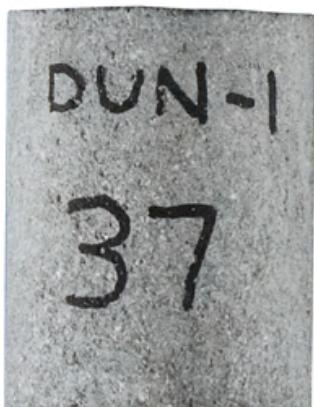




Top



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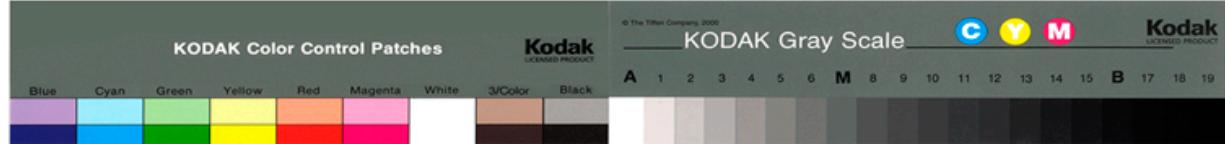
Front

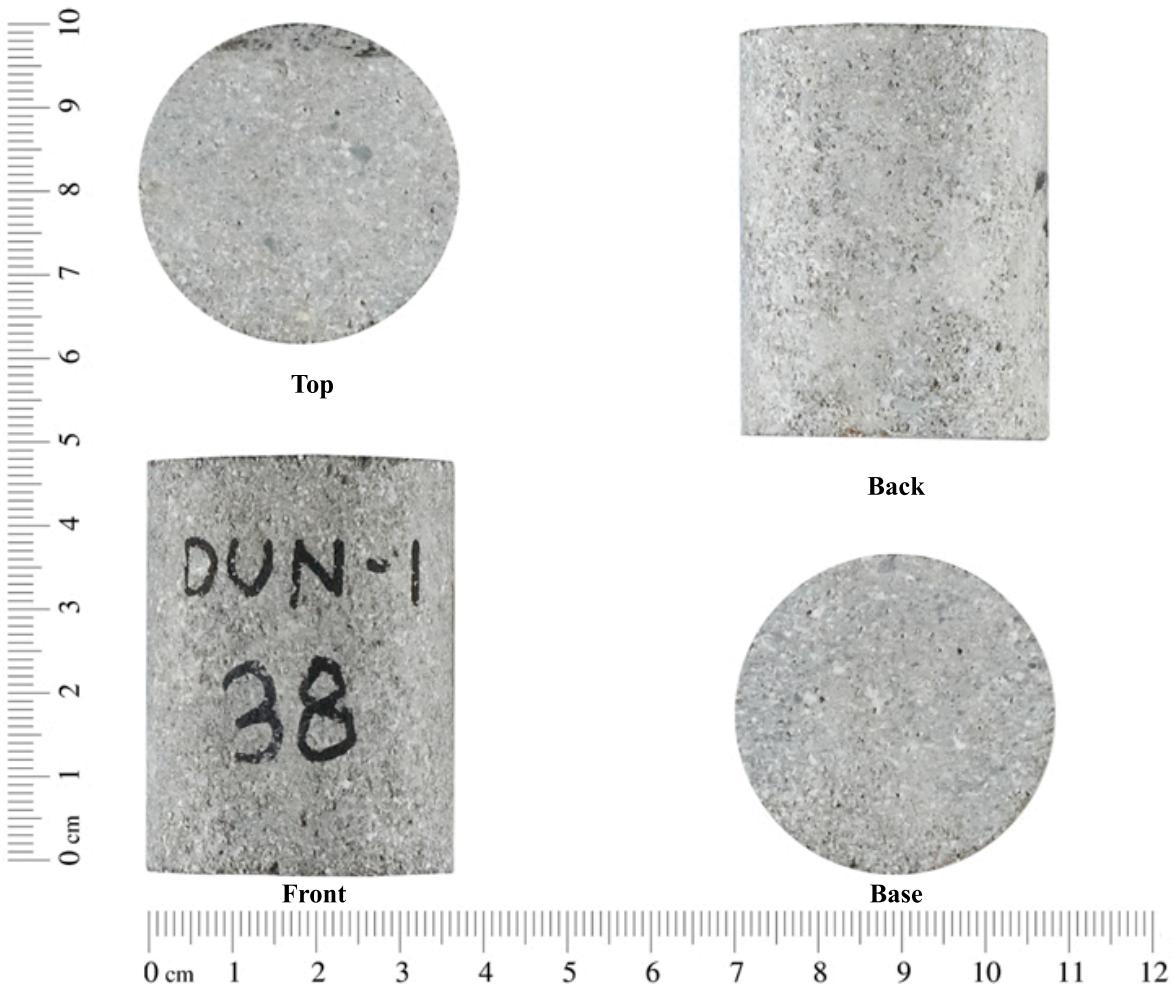


Base



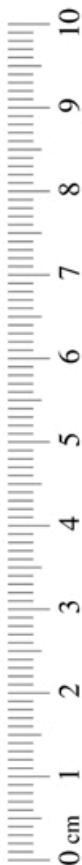
Sample No.:	37
Depth:	2914.30 m
Permeability:	0.051 mD
Porosity:	10.9 %





Sample No.:	38
Depth:	2915.50 m
Permeability:	0.062 mD
Porosity:	12.9 %





Top



Back



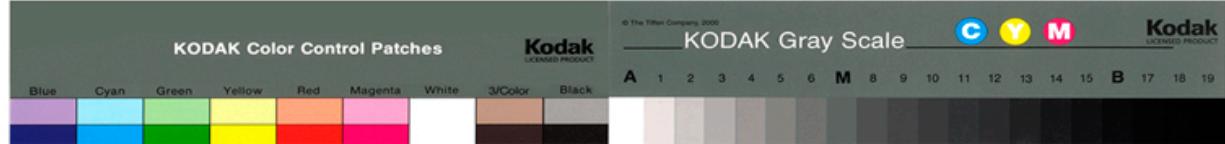
Front

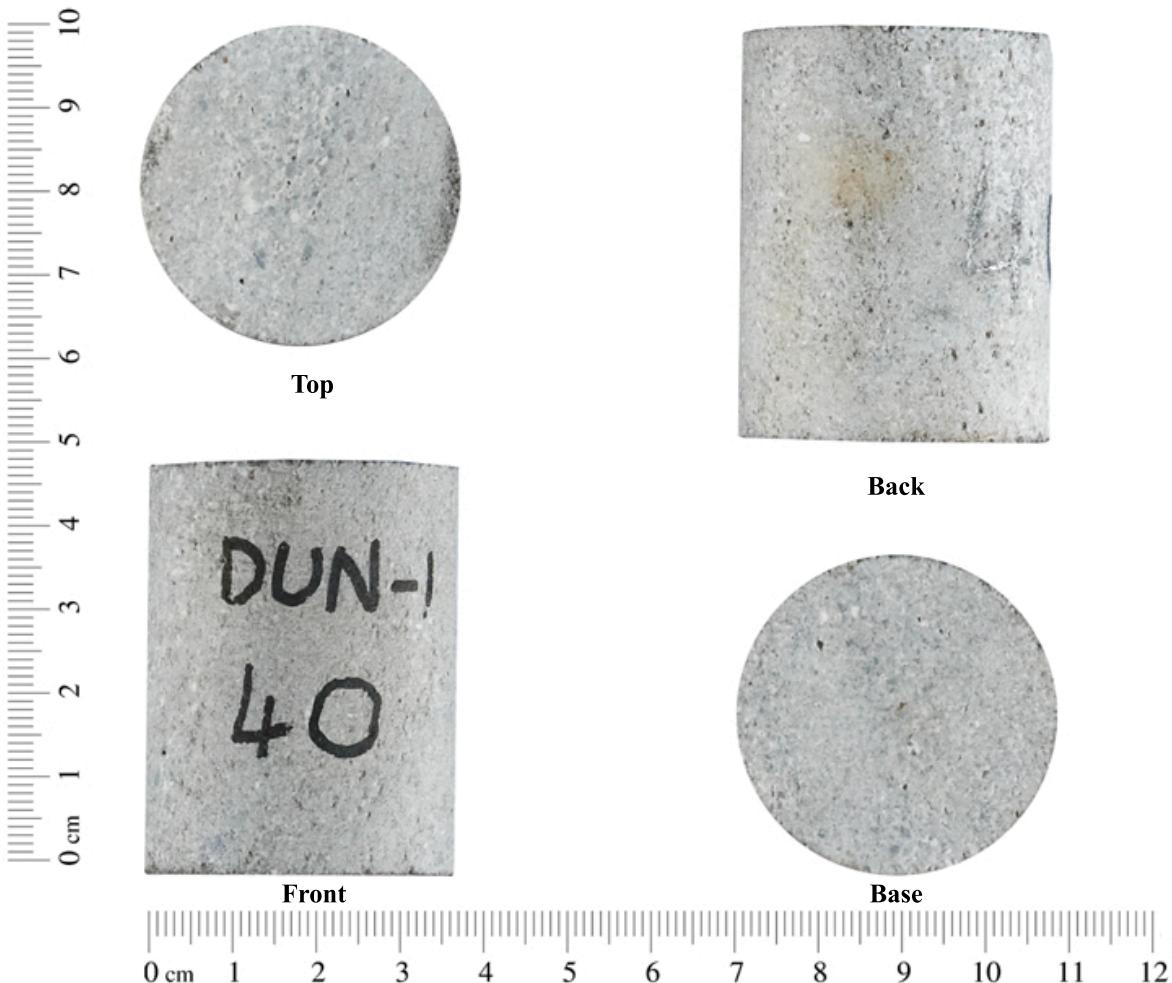


Base



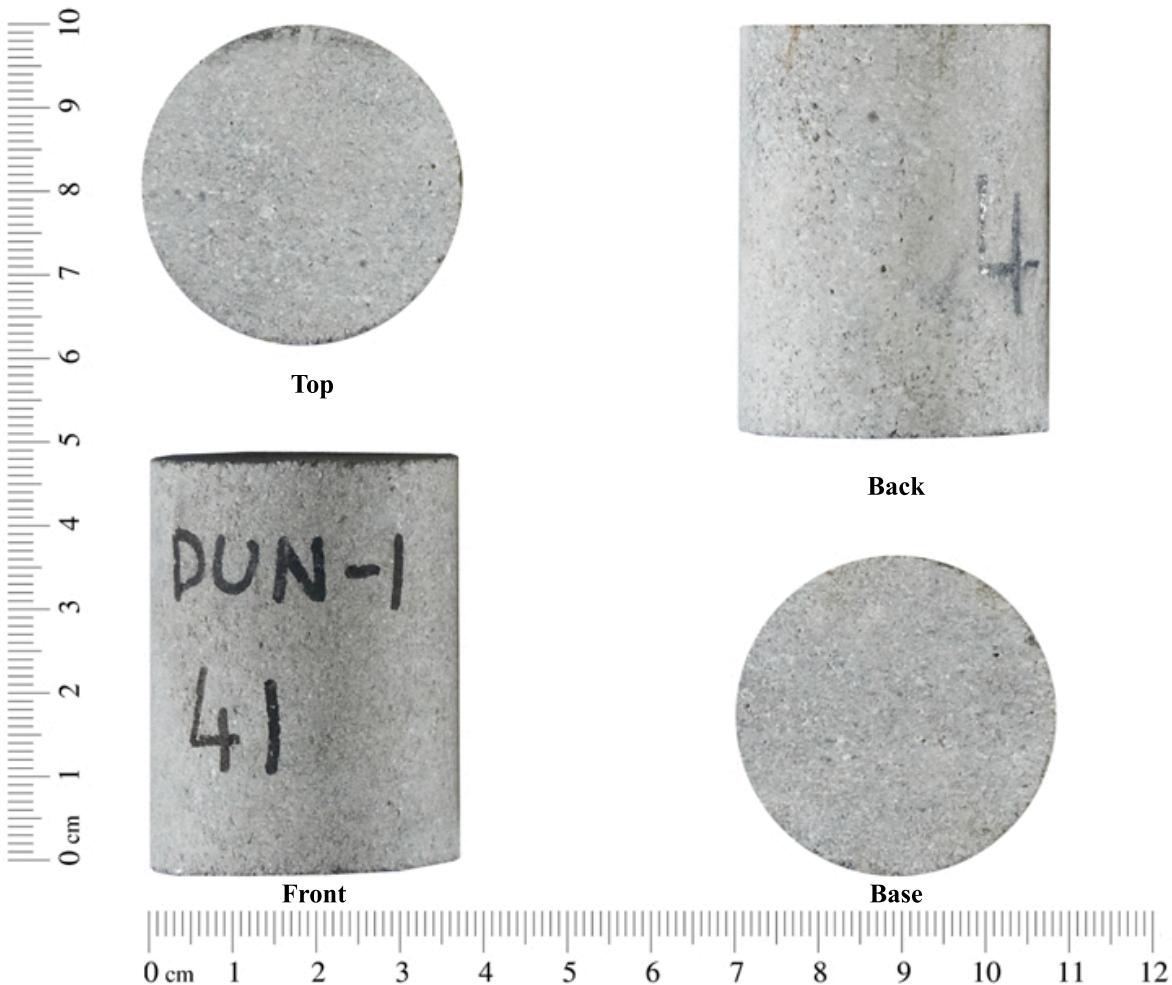
Sample No.:	39
Depth:	2916.51 m
Permeability:	0.056 mD
Porosity:	11.8 %



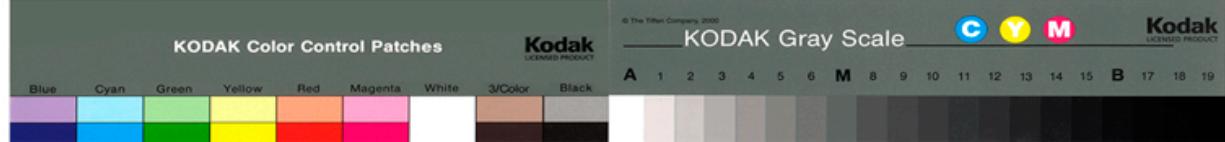


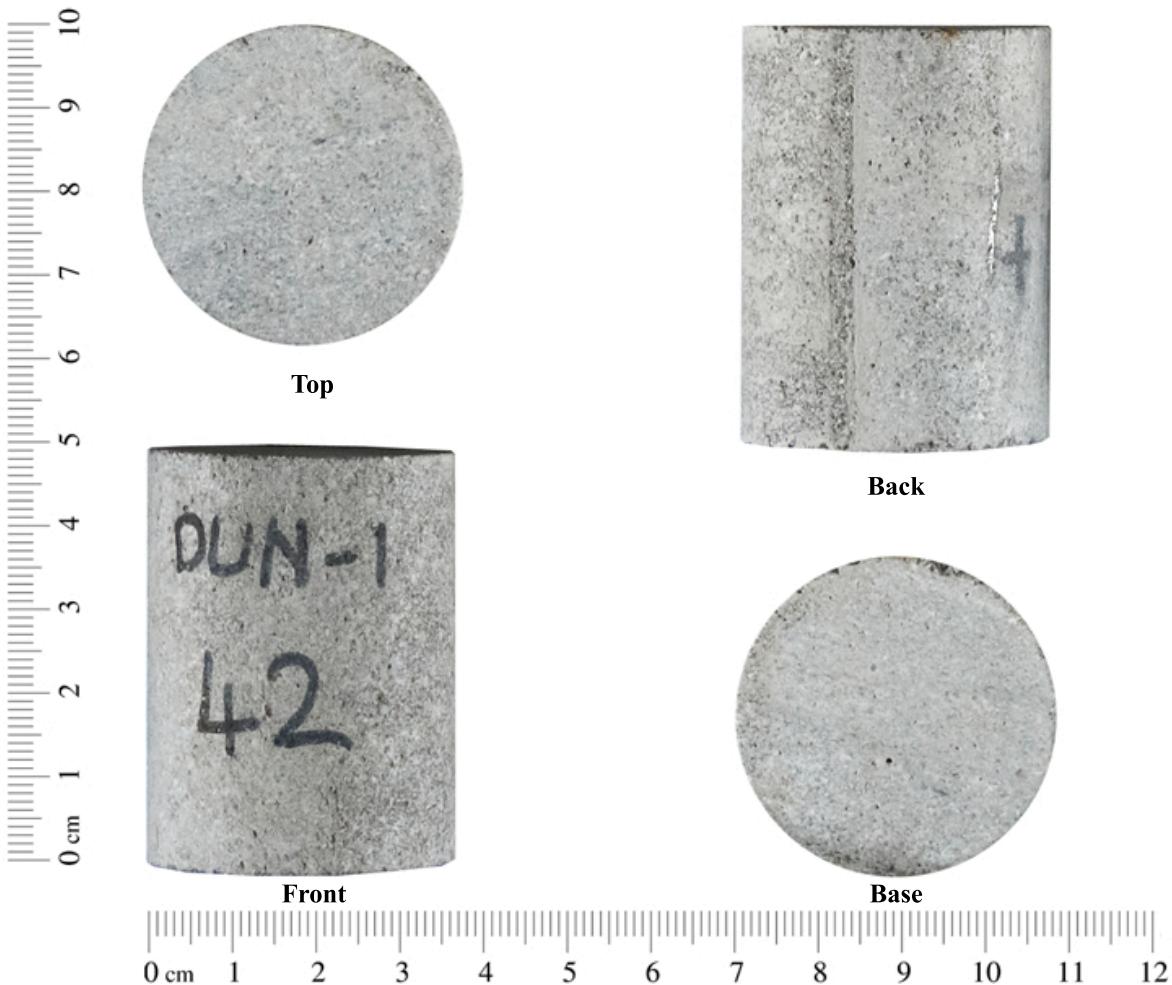
Sample No.:	40
Depth:	2917.50 m
Permeability:	0.050 mD
Porosity:	10.2 %



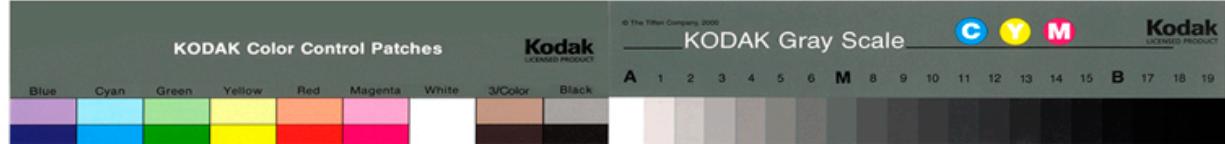


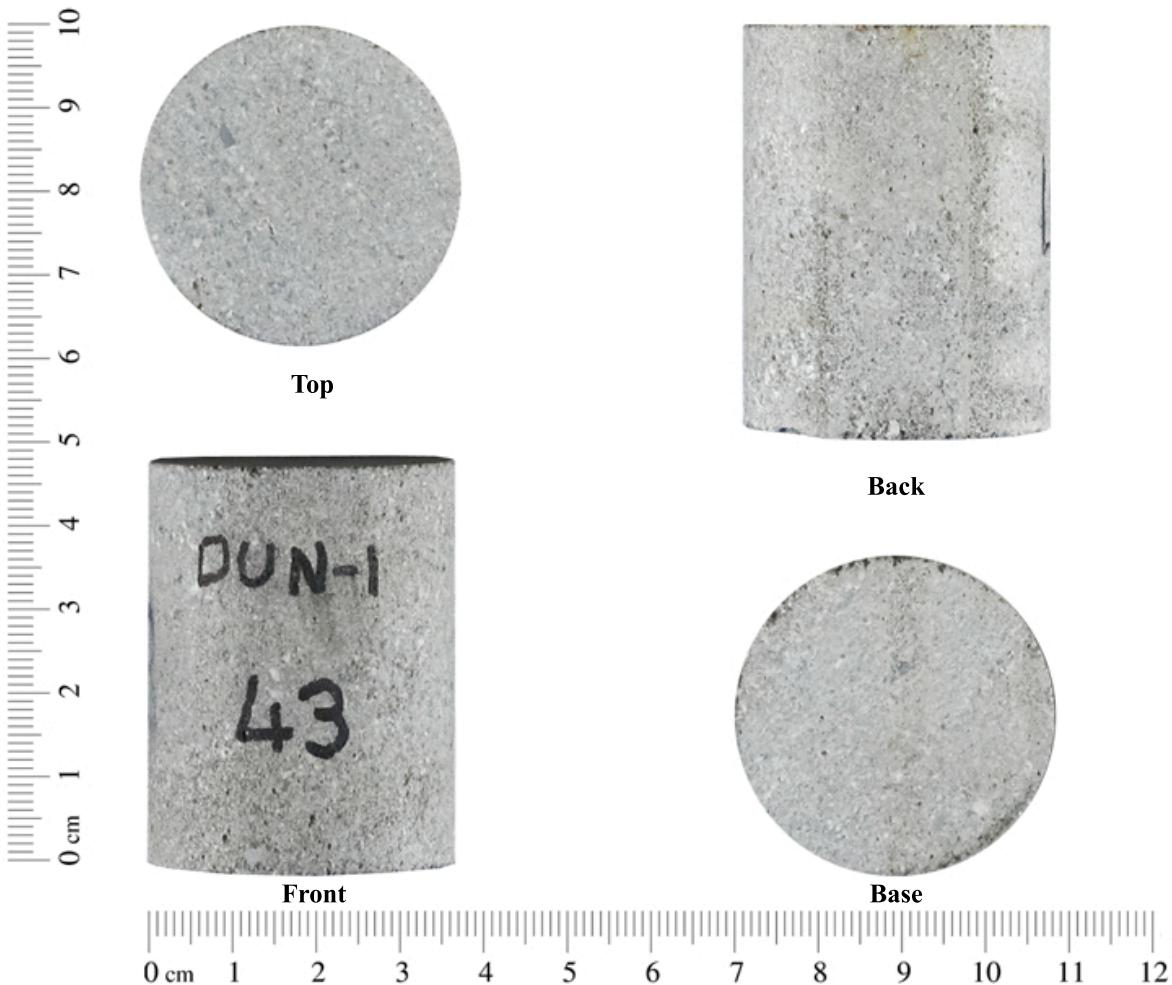
Sample No.:	41
Depth:	2918.51 m
Permeability:	0.040 mD
Porosity:	13.2 %



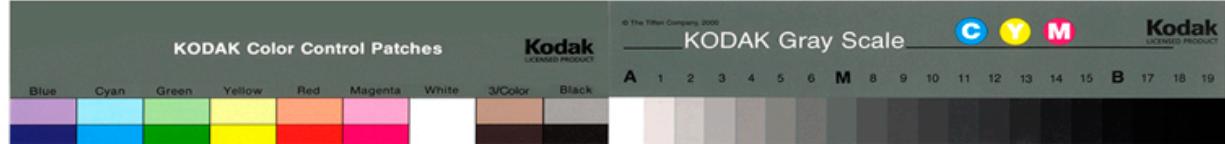


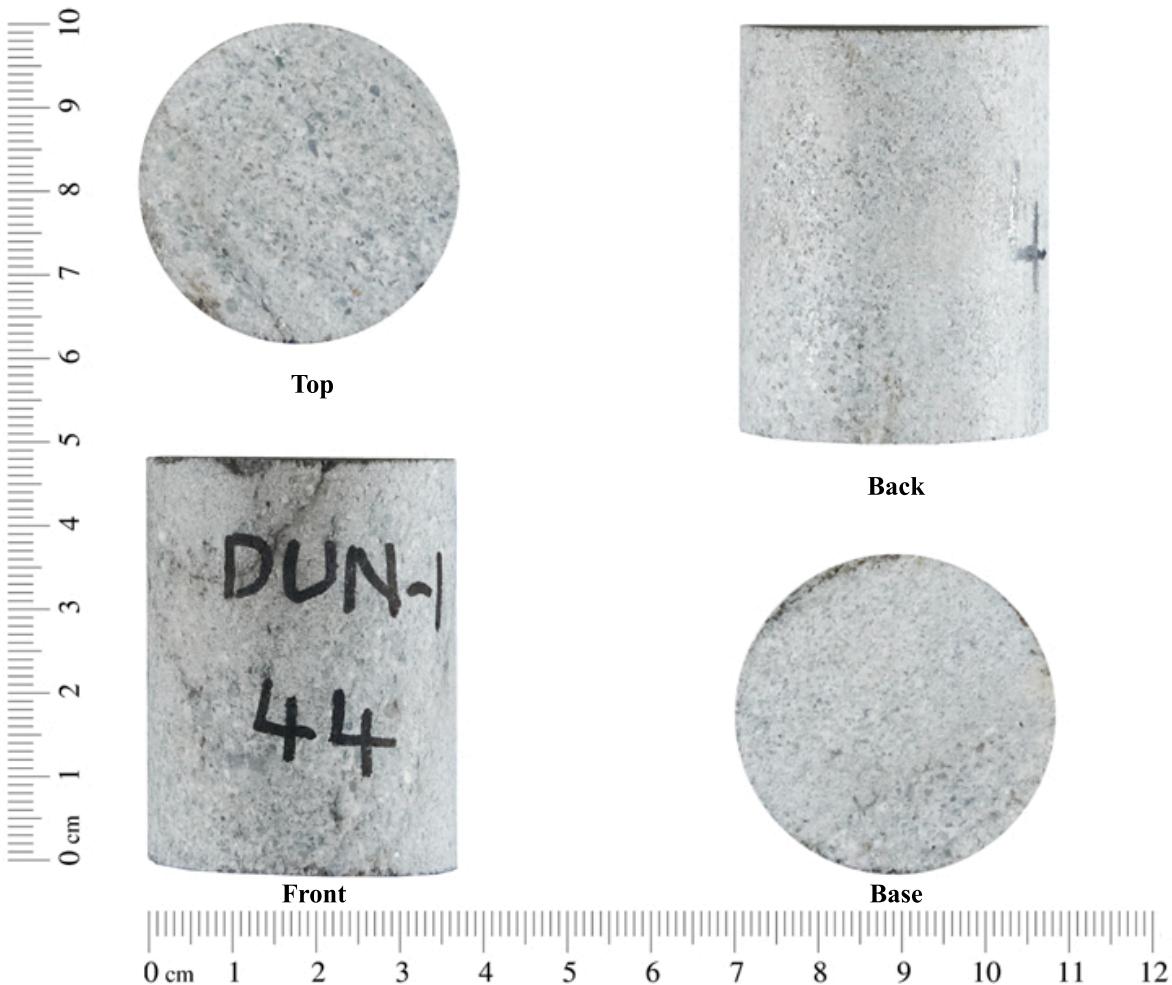
Sample No.:	42
Depth:	2919.51 m
Permeability:	0.070 mD
Porosity:	9.7 %



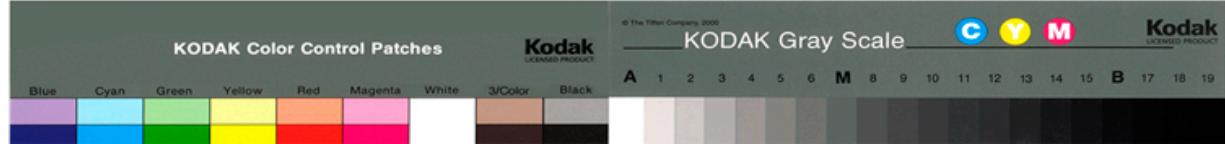


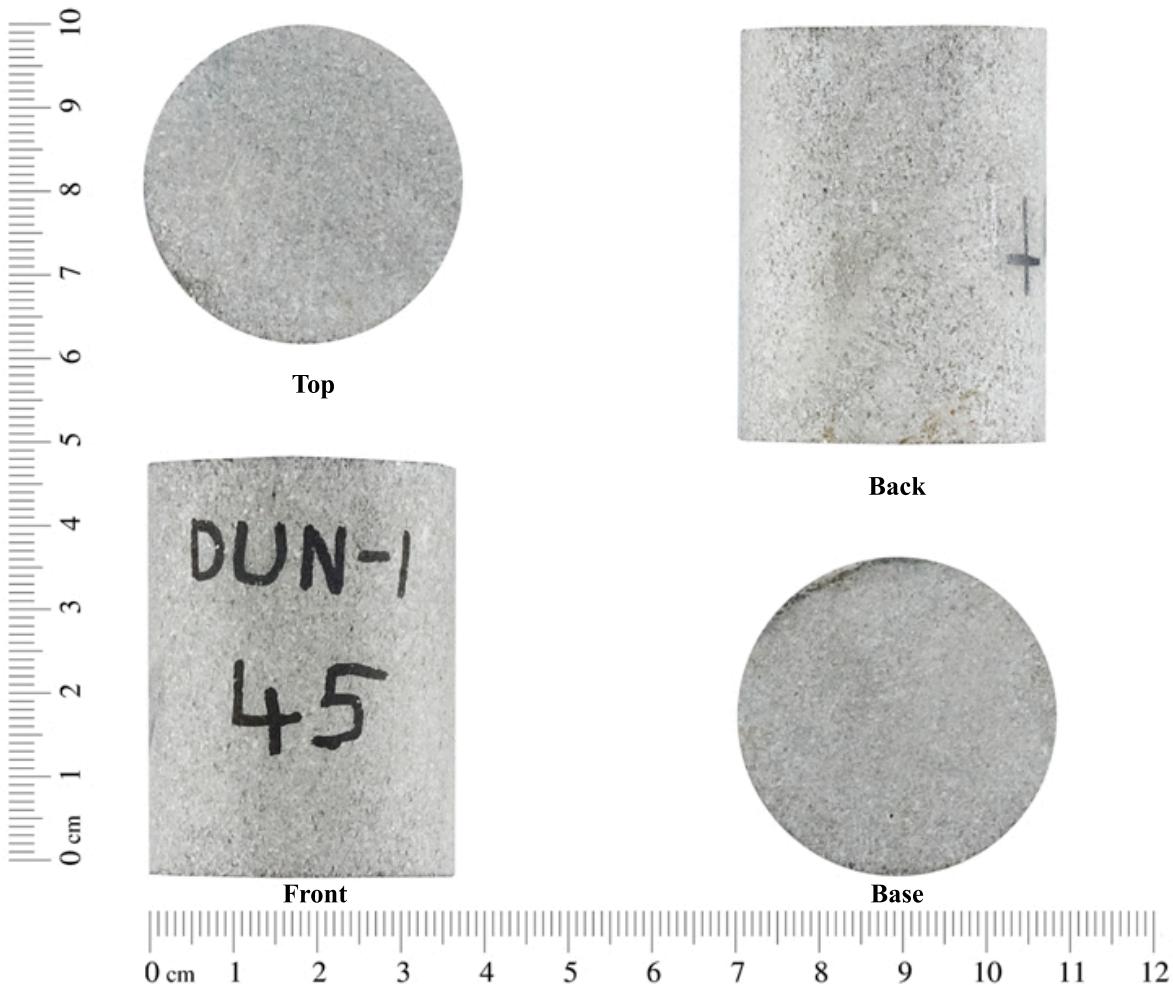
Sample No.:	43
Depth:	2920.20 m
Permeability:	0.033 mD
Porosity:	10.3 %



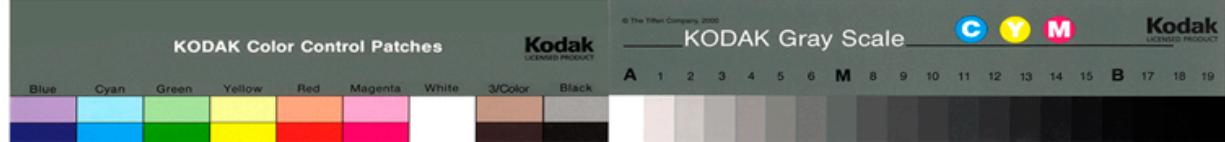


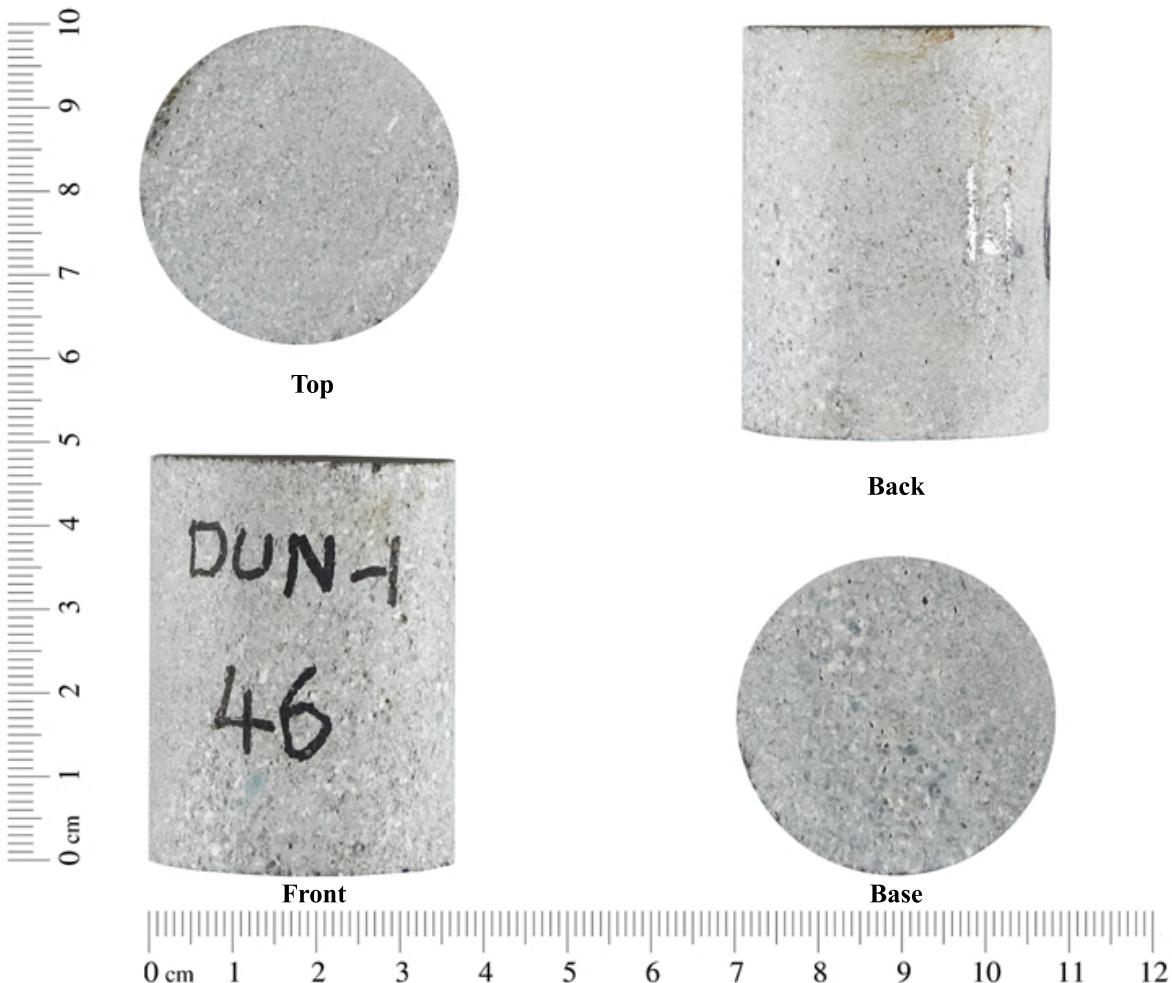
Sample No.:	44
Depth:	2921.51 m
Permeability:	0.064 mD
Porosity:	6.2 %



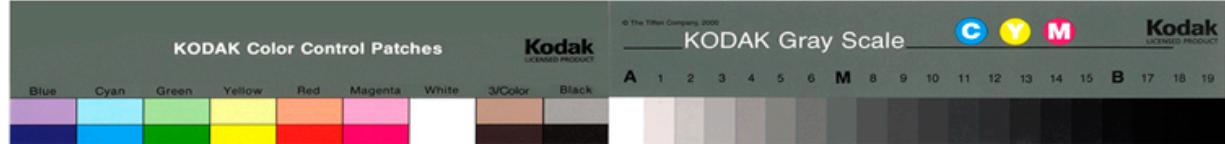


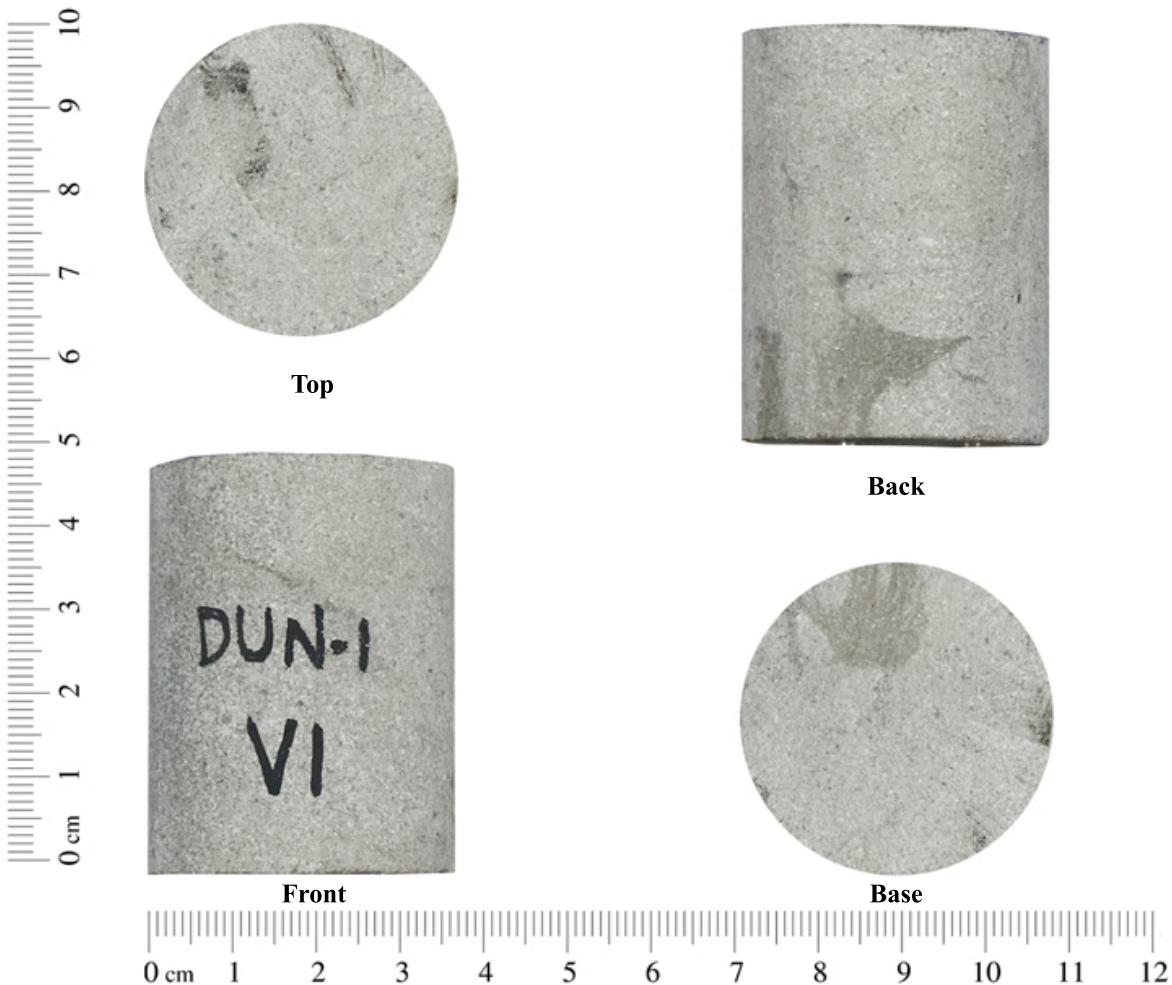
Sample No.:	45
Depth:	2922.50 m
Permeability:	0.037 mD
Porosity:	11.8 %



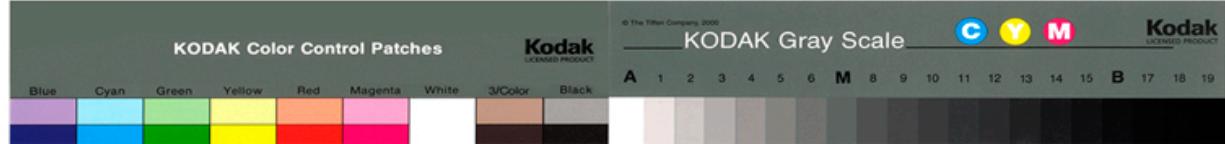


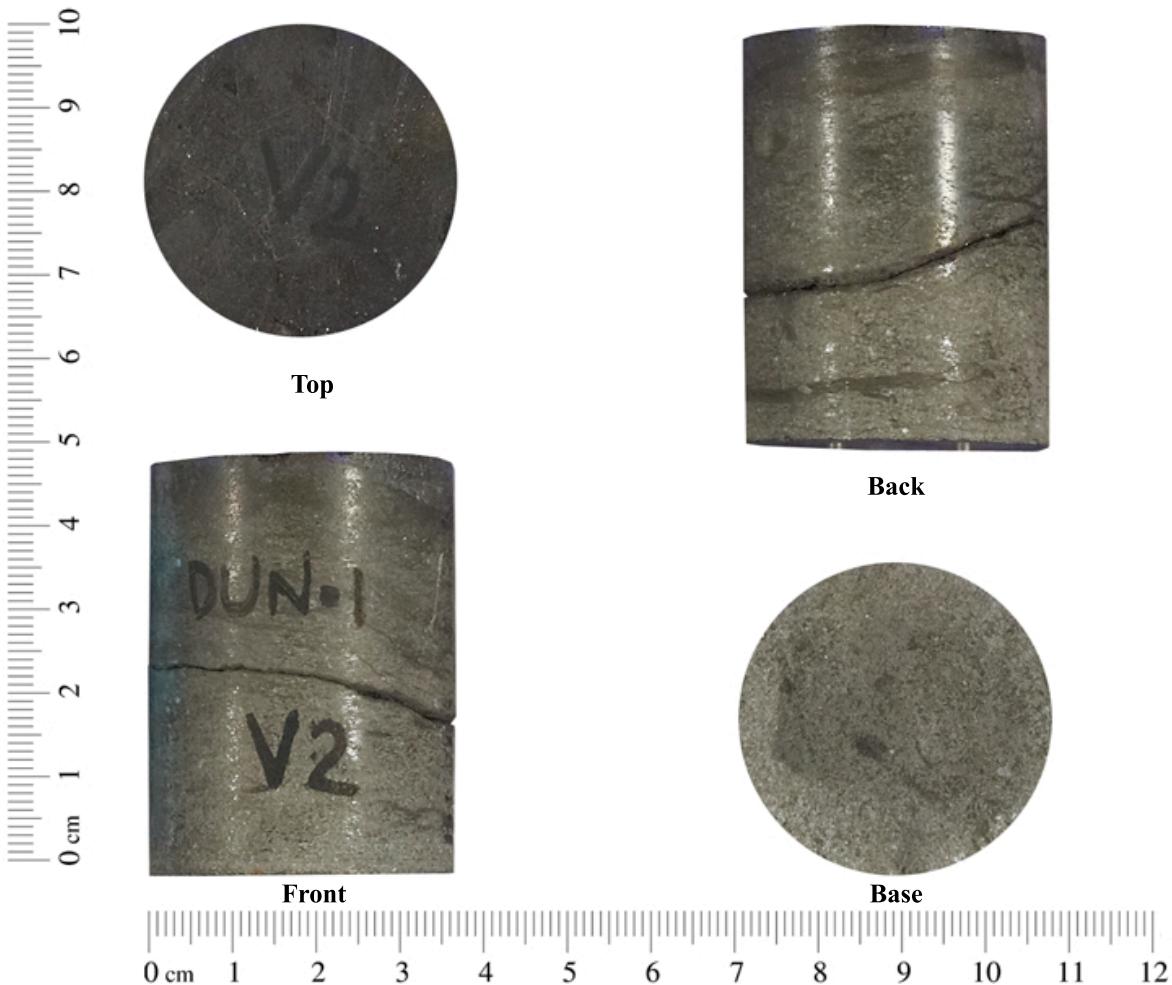
Sample No.:	46
Depth:	2923.51 m
Permeability:	0.052 mD
Porosity:	10.7 %



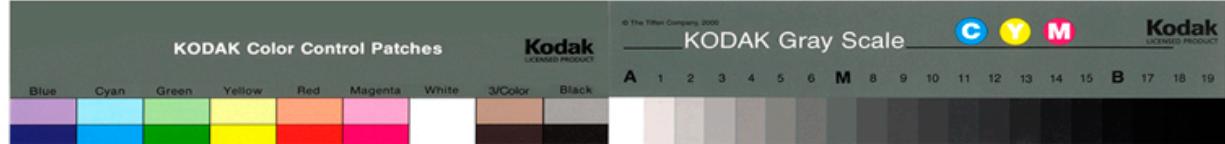


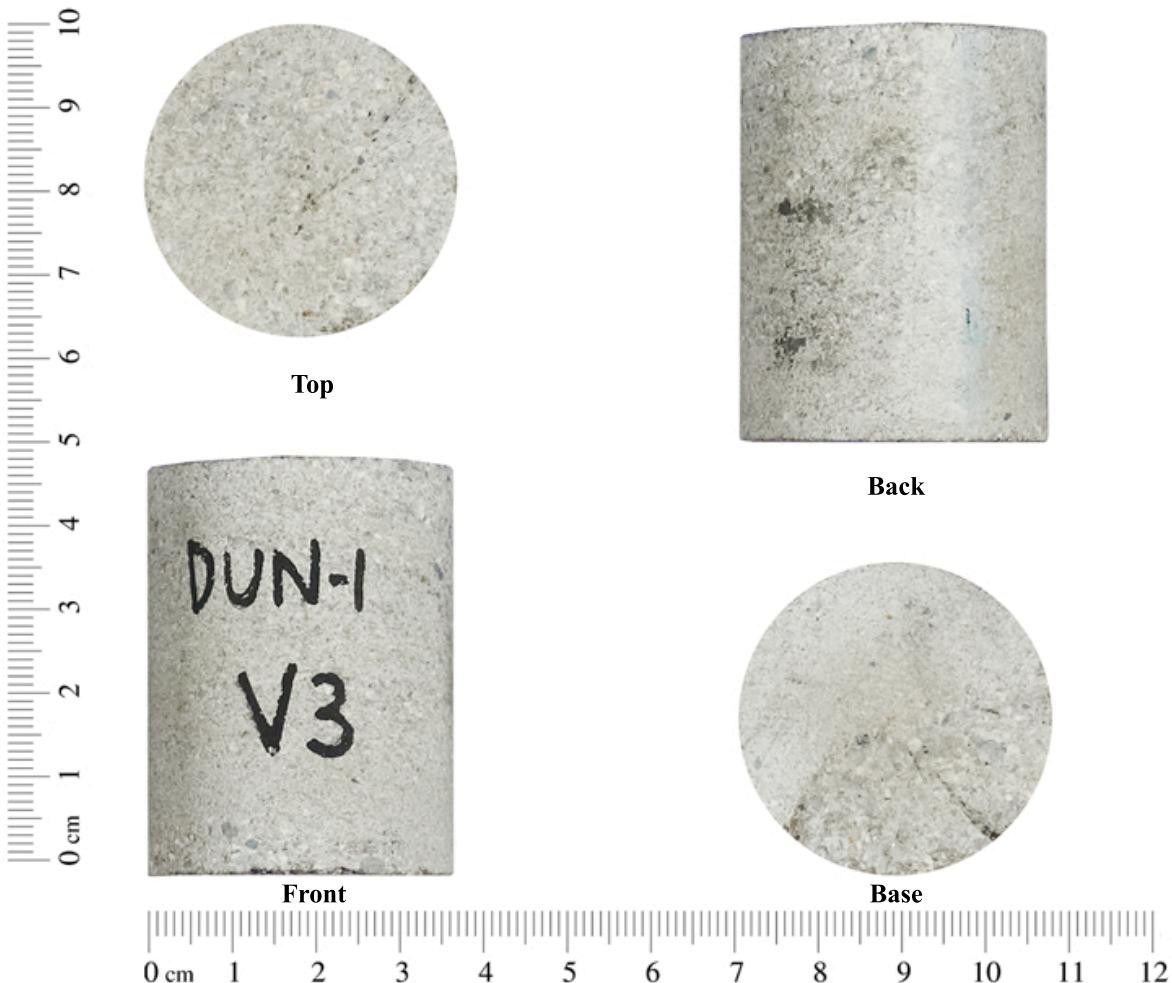
Sample No.:	V1
Depth:	2881.95 m
Permeability:	
Porosity:	





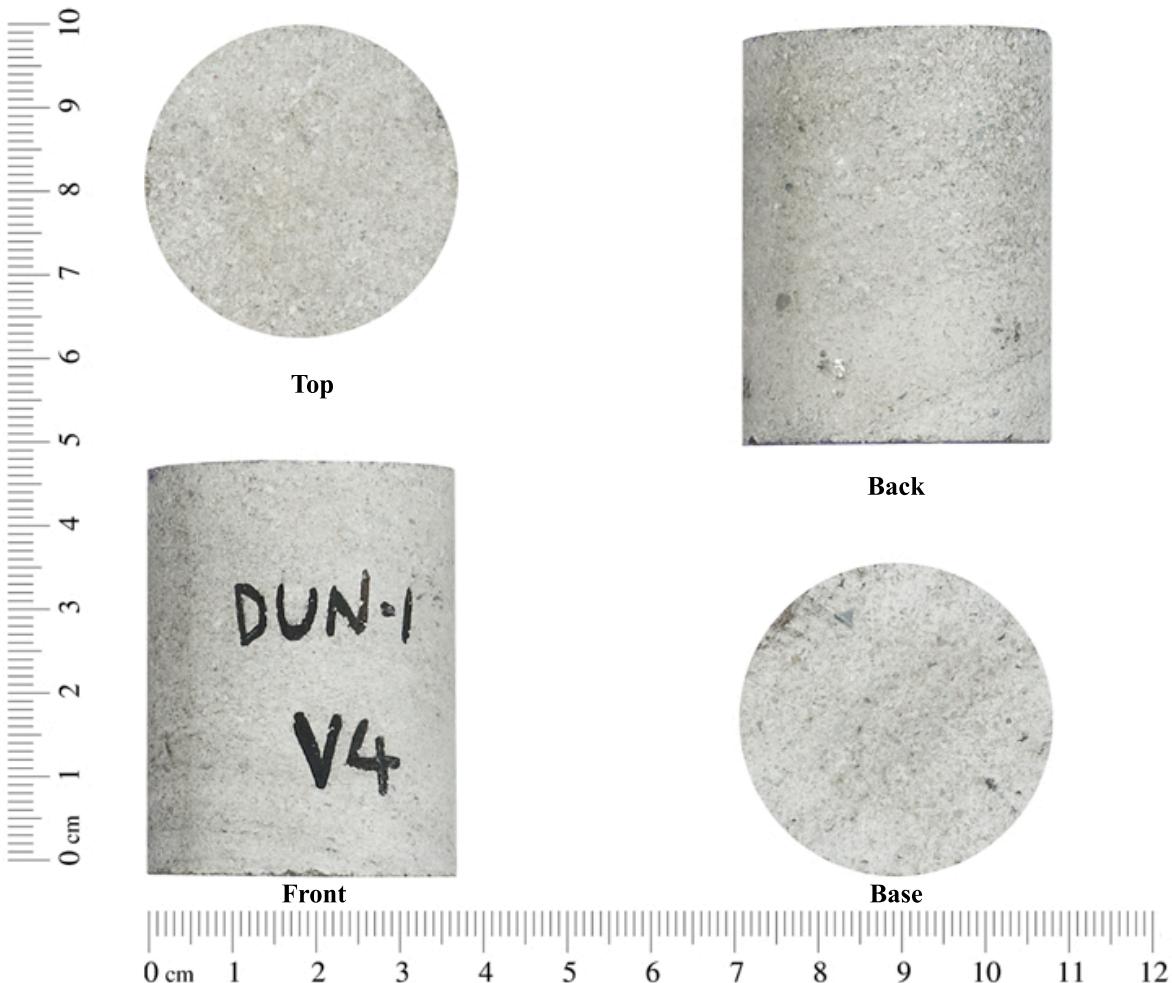
Sample No.:	V2
Depth:	2890.74 m
Permeability:	
Porosity:	



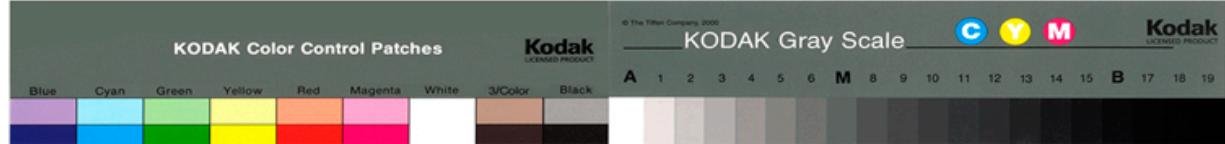


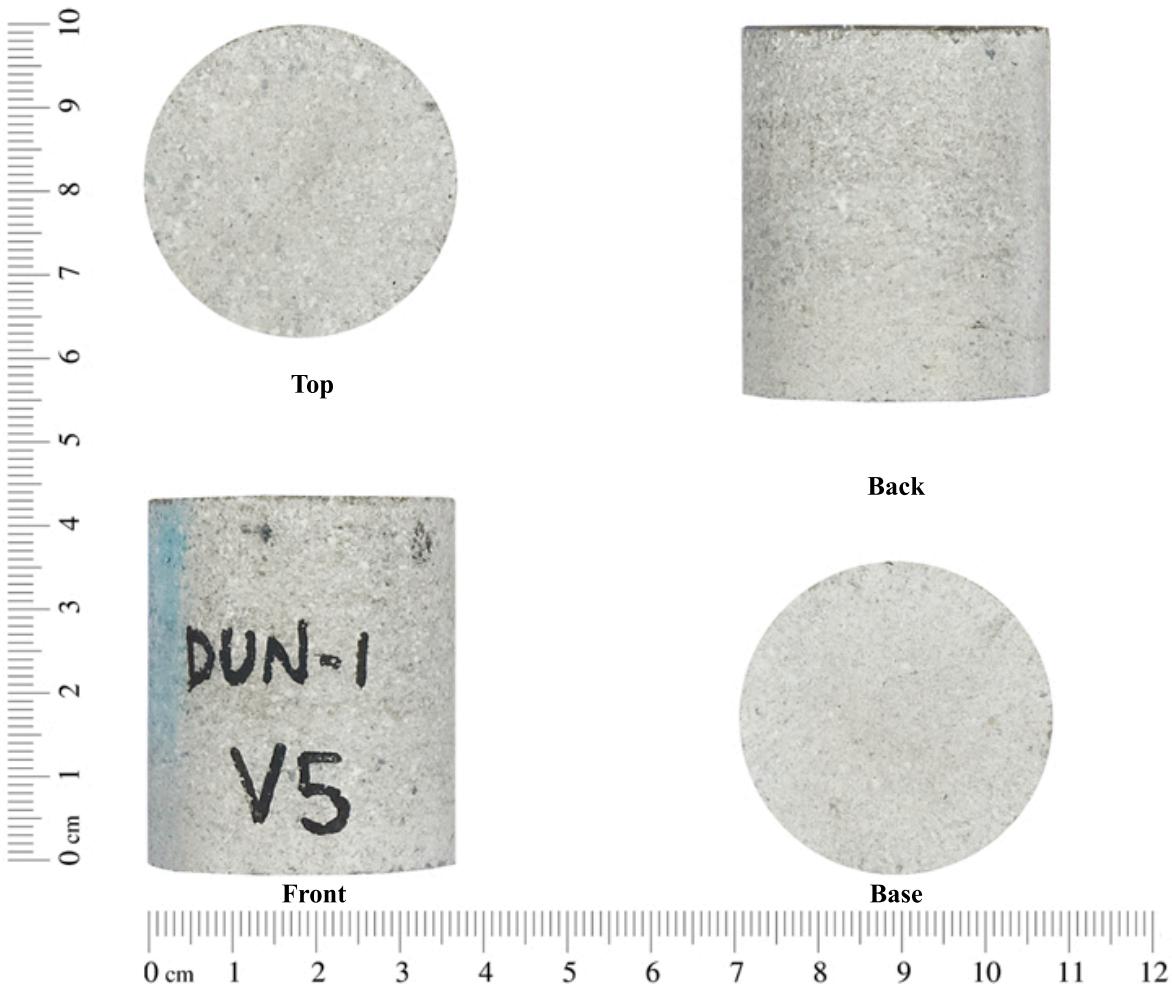
Sample No.:	V3
Depth:	2900.55 m
Permeability:	
Porosity:	



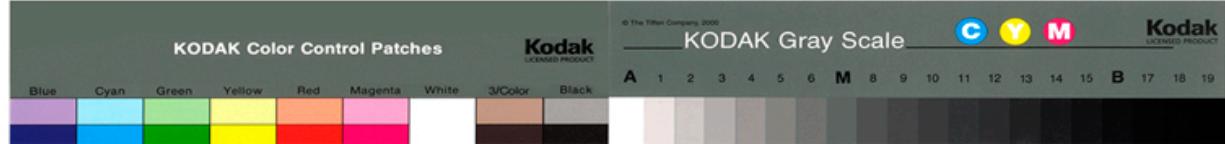


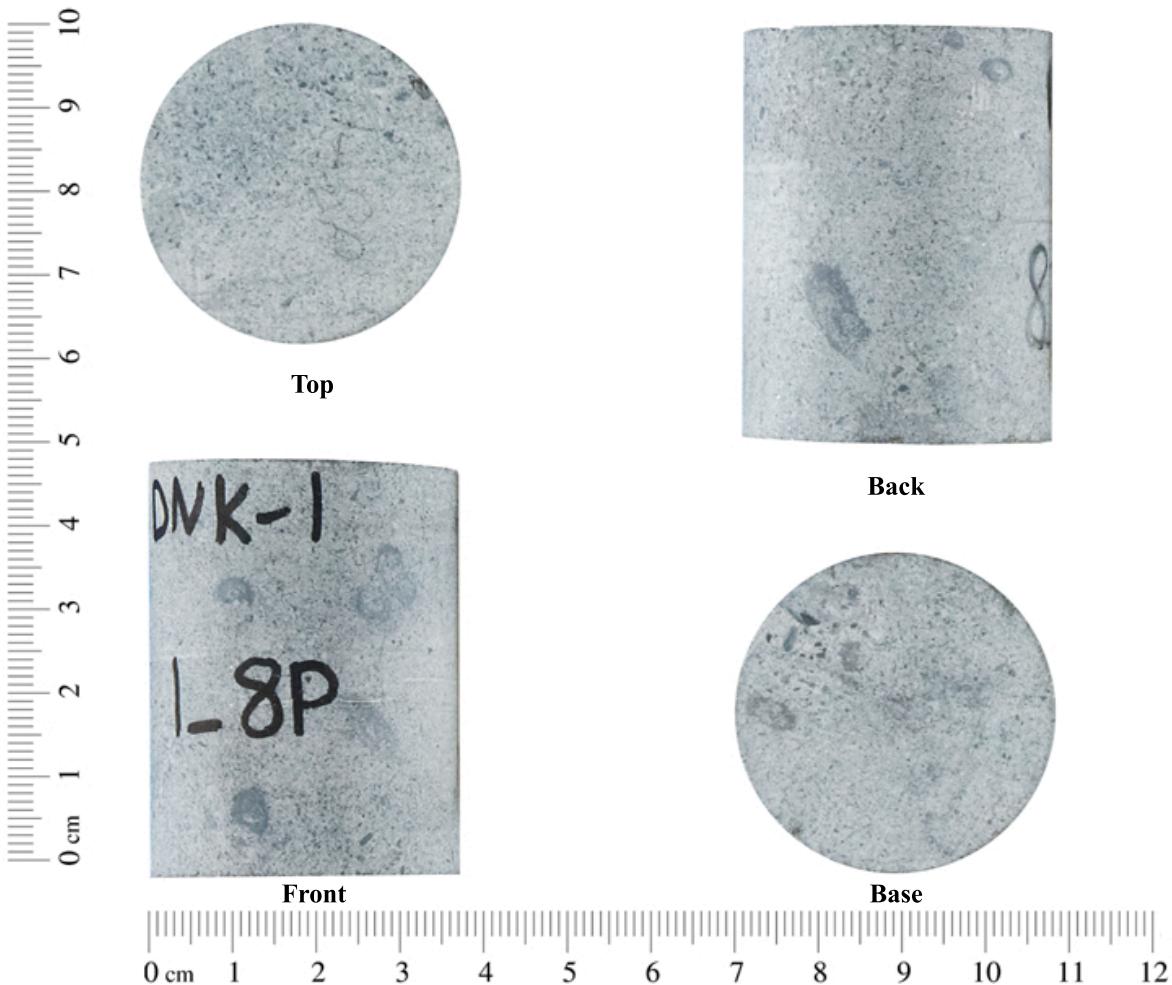
Sample No.:	V4
Depth:	2910.50 m
Permeability:	
Porosity:	



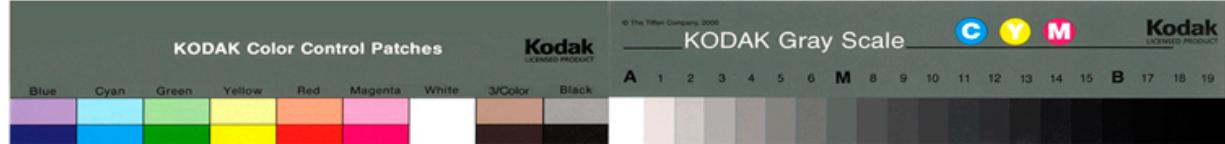


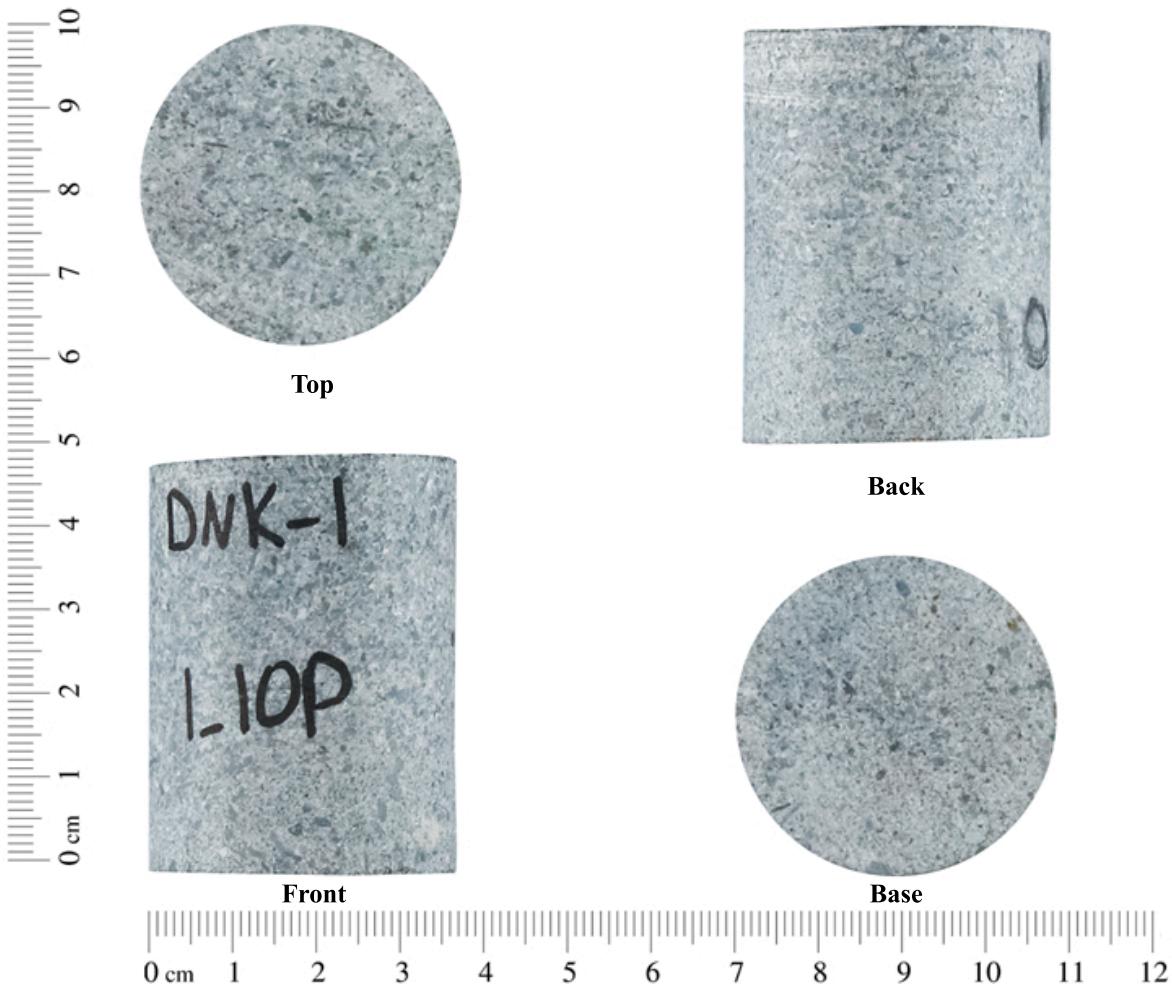
Sample No.:	V5
Depth:	2921.12 m
Permeability:	
Porosity:	



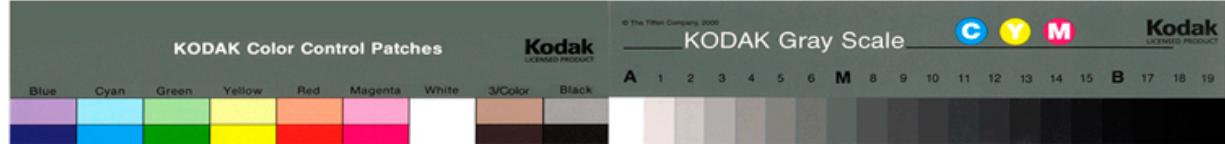


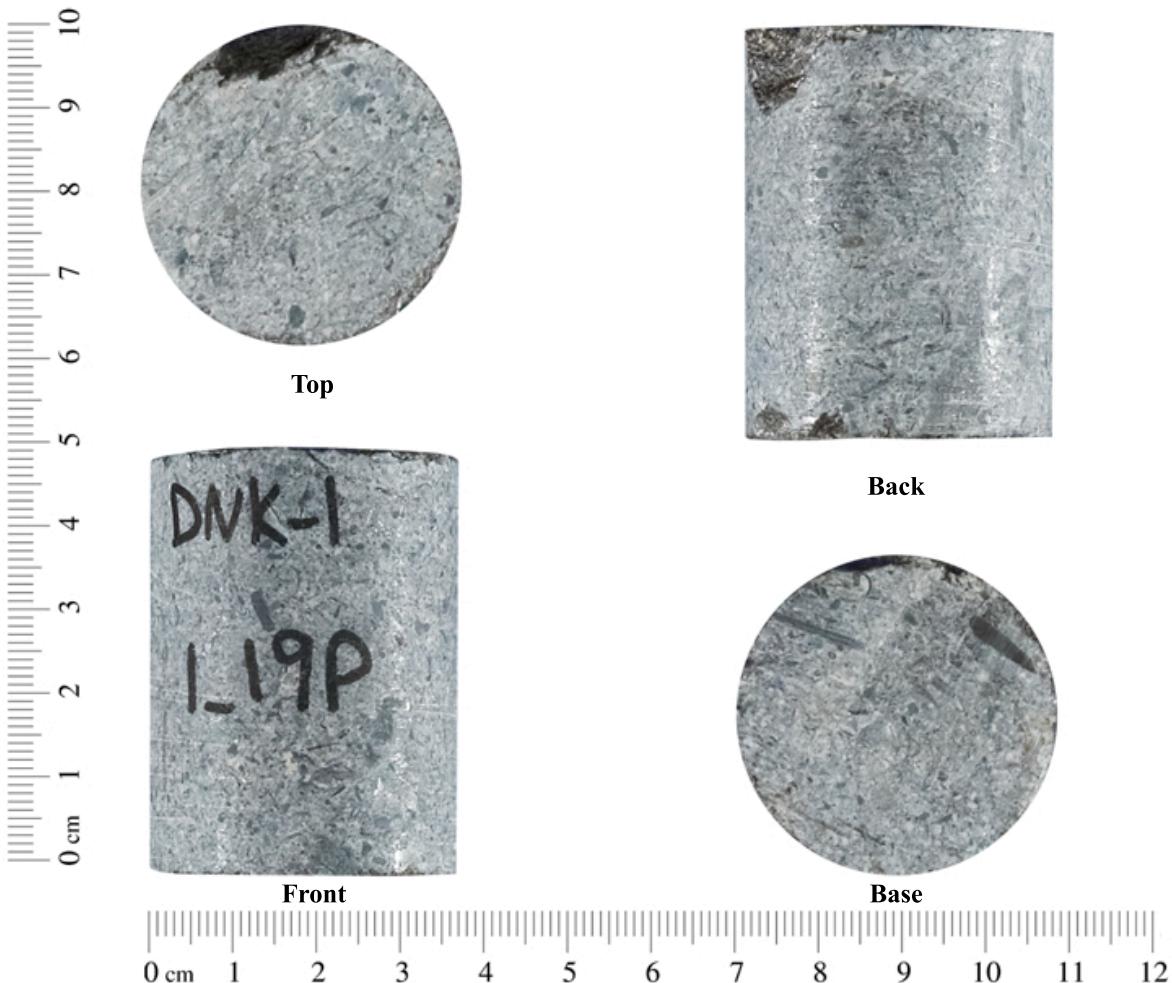
Sample No.:	1_8P
Depth:	2877.04 m
Permeability:	0.0098 mD
Porosity:	5.9 %



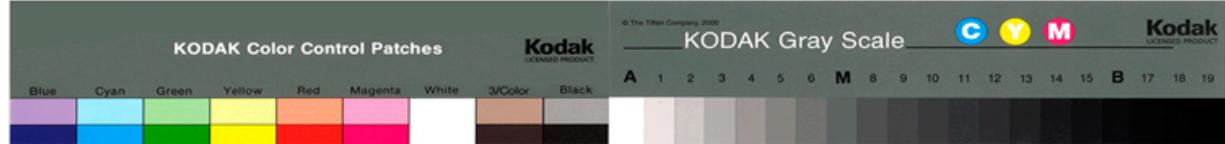


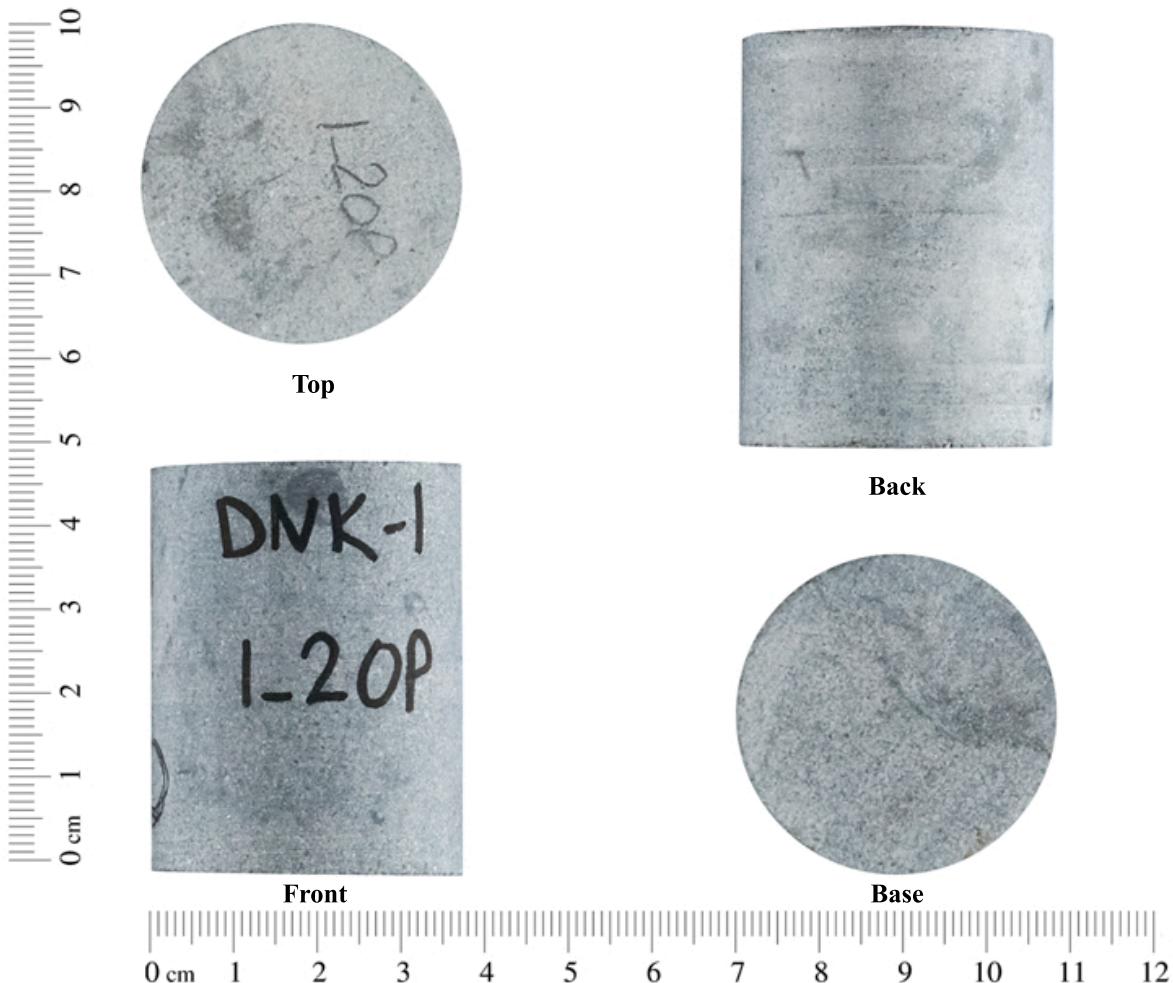
Sample No.:	1_10P
Depth:	2878.05 m
Permeability:	0.0040 mD
Porosity:	3.3 %



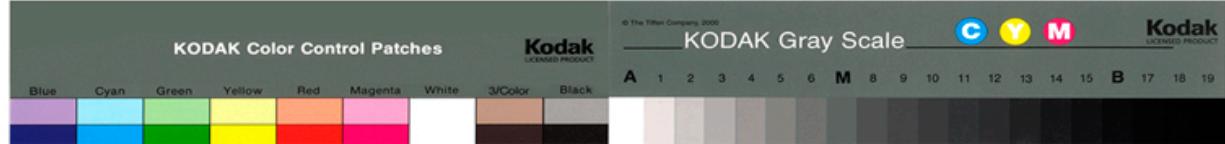


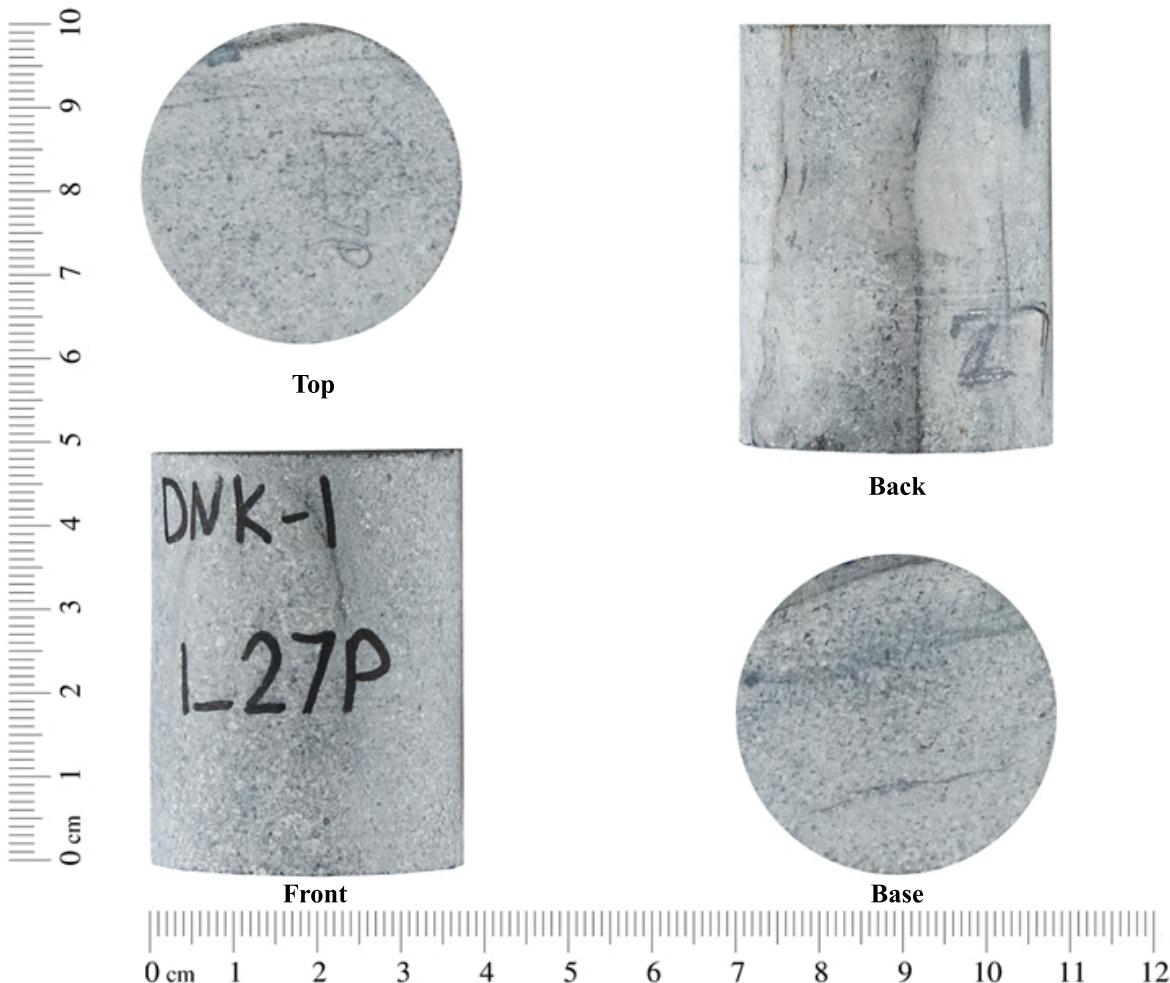
Sample No.:	1_19P
Depth:	2887.10 m
Permeability:	0.017 mD
Porosity:	1.8 %



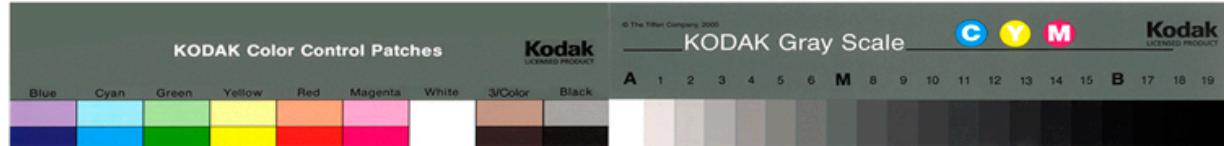


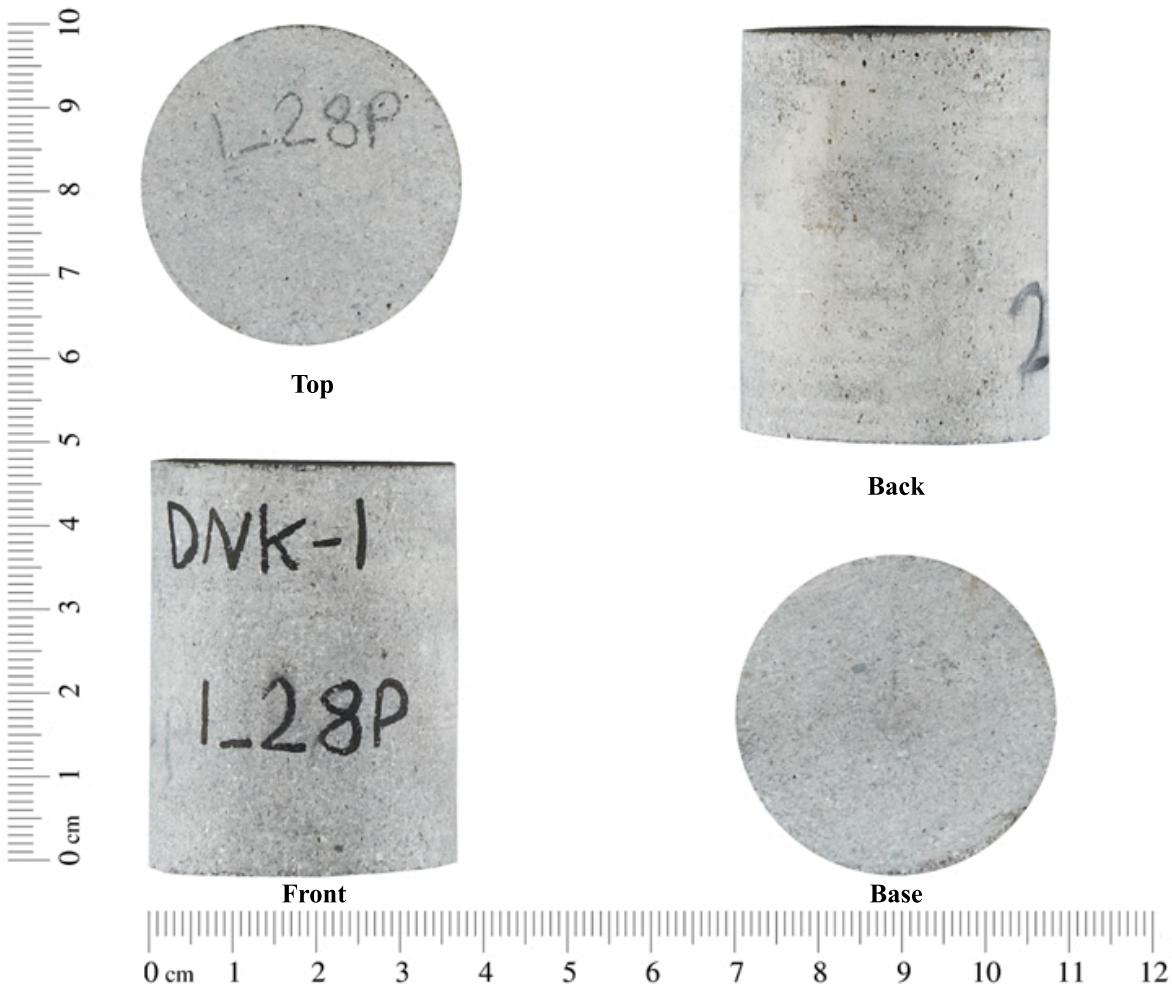
Sample No.:	1_20P
Depth:	2888.12 m
Permeability:	0.0063 mD
Porosity:	5.0 %



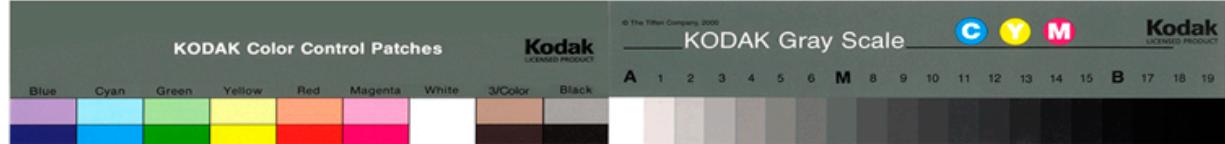


Sample No.:	1_27P
Depth:	2895.09 m
Permeability:	0.020 mD
Porosity:	5.9 %



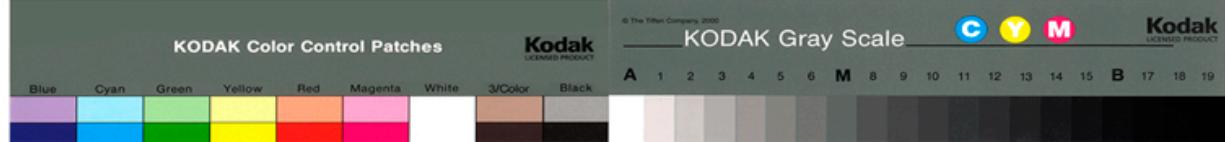


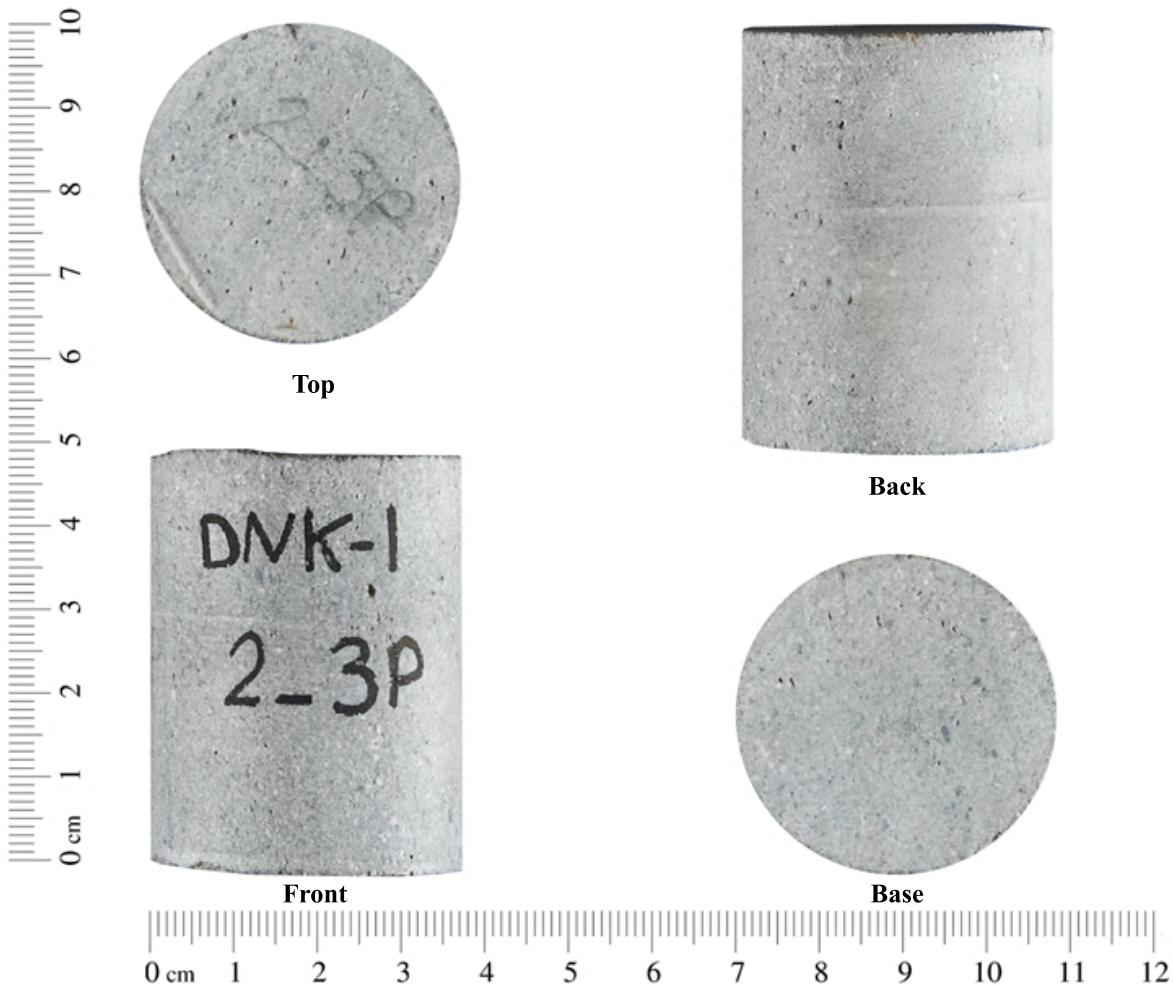
Sample No.:	1_28P
Depth:	2896.07 m
Permeability:	0.023 mD
Porosity:	10.6 %



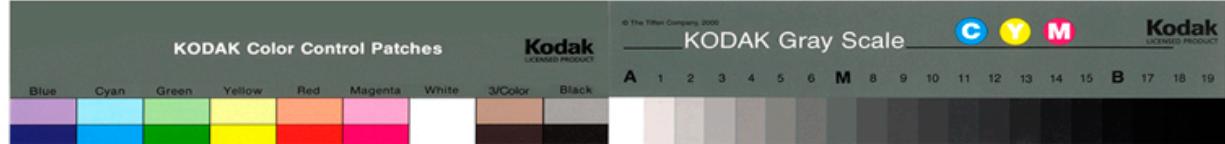


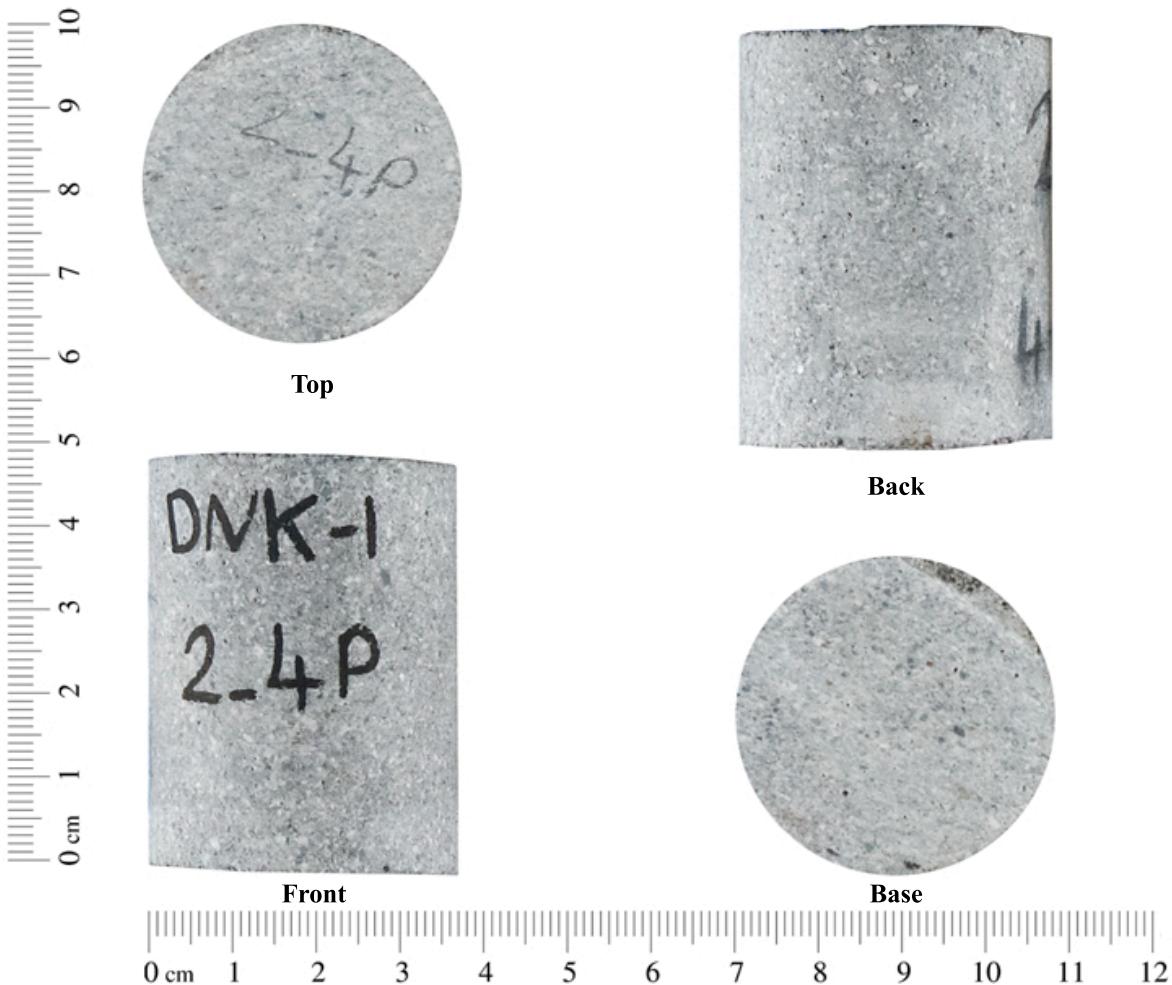
Sample No.:	2_2P
Depth:	2897.06 m
Permeability:	0.062 mD
Porosity:	11.9 %



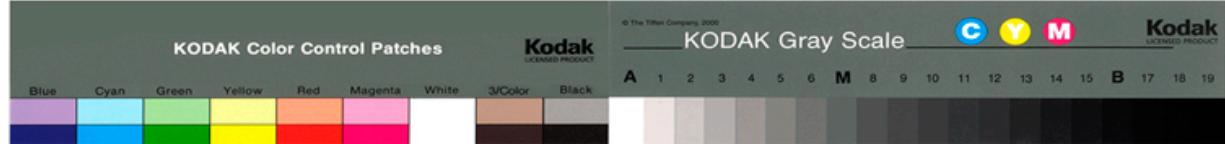


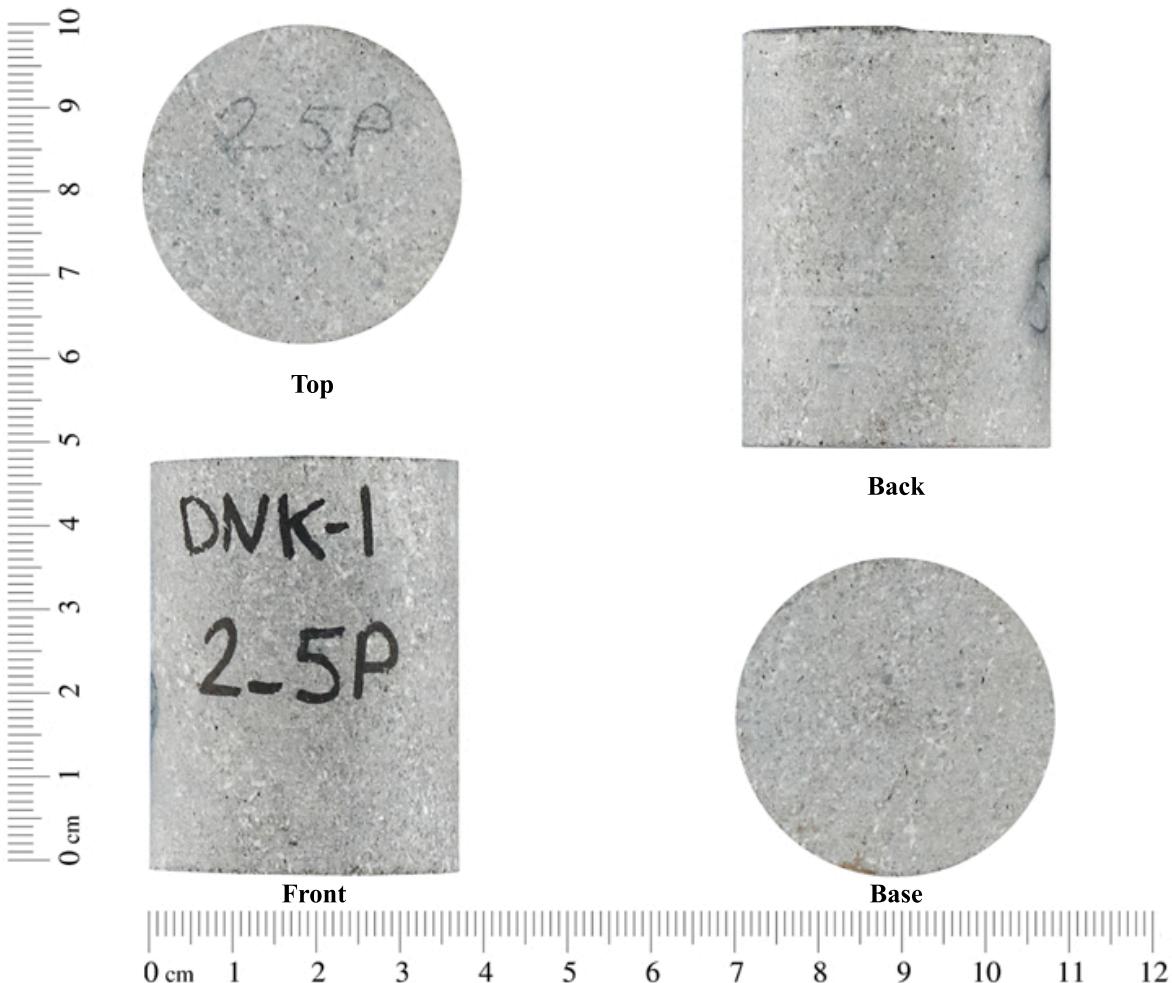
Sample No.:	2_3P
Depth:	2898.08 m
Permeability:	0.061 mD
Porosity:	11.8 %



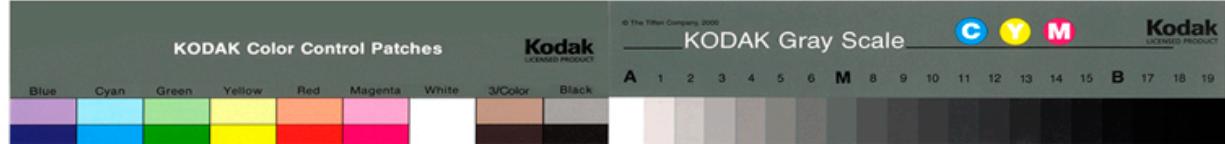


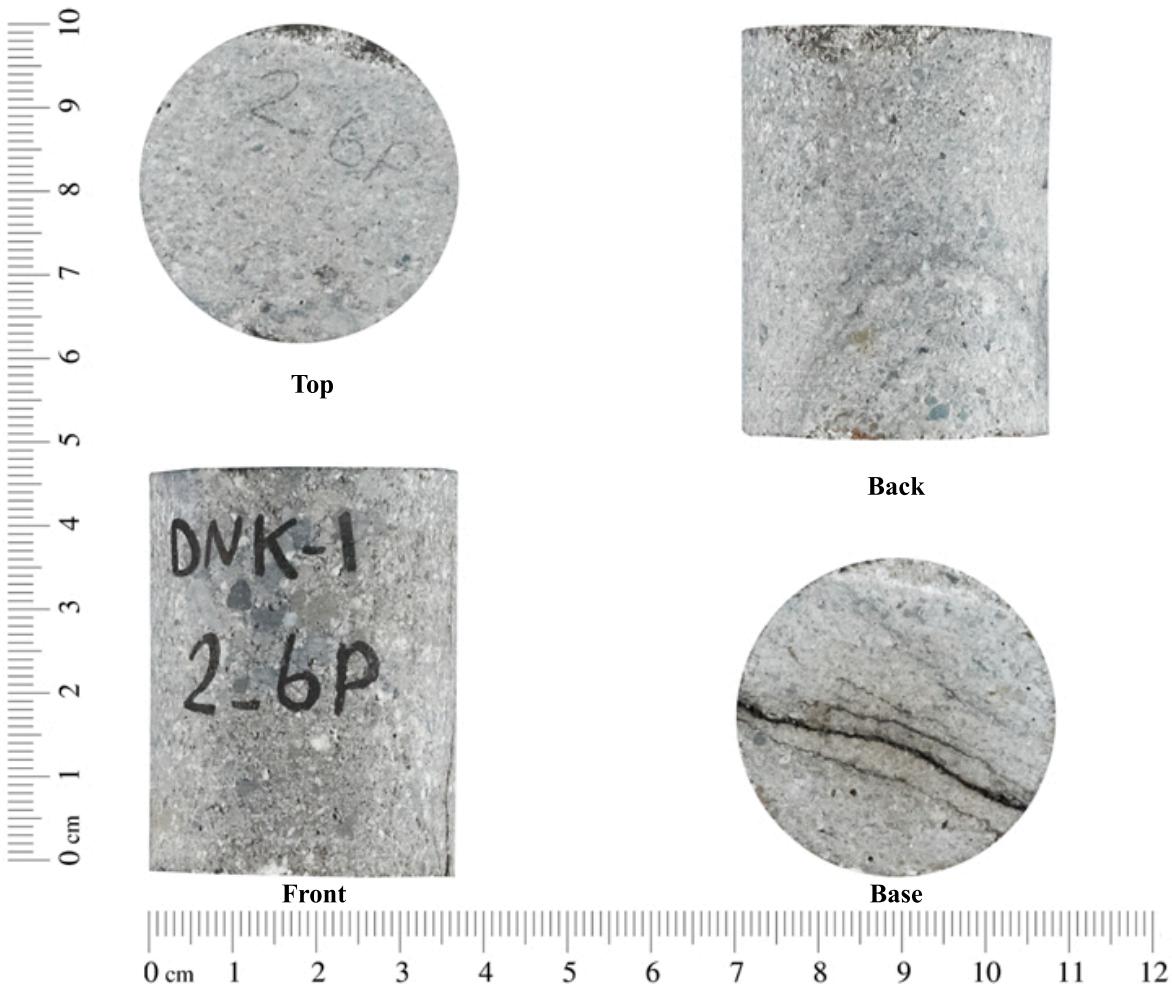
Sample No.:	2_4P
Depth:	2899.06 m
Permeability:	0.070 mD
Porosity:	9.1 %



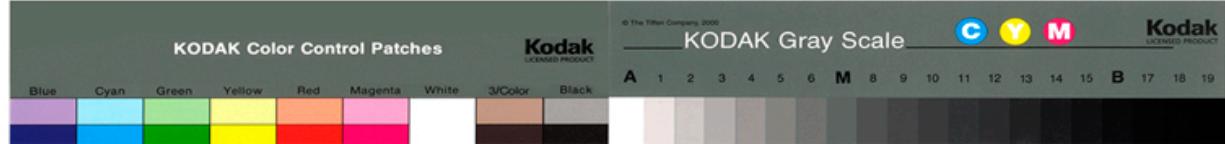


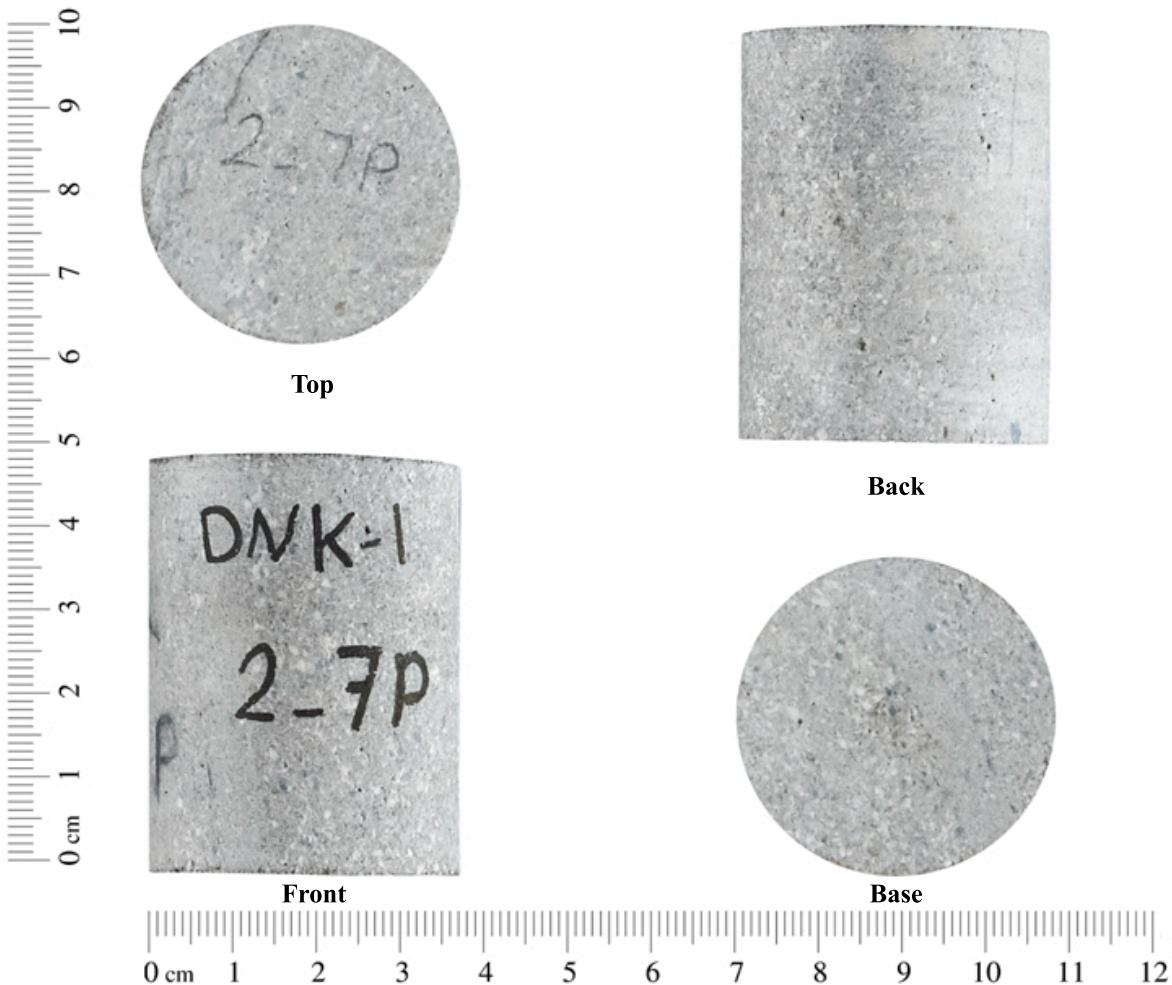
Sample No.:	2_5P
Depth:	2900.05 m
Permeability:	0.033 mD
Porosity:	10.8 %





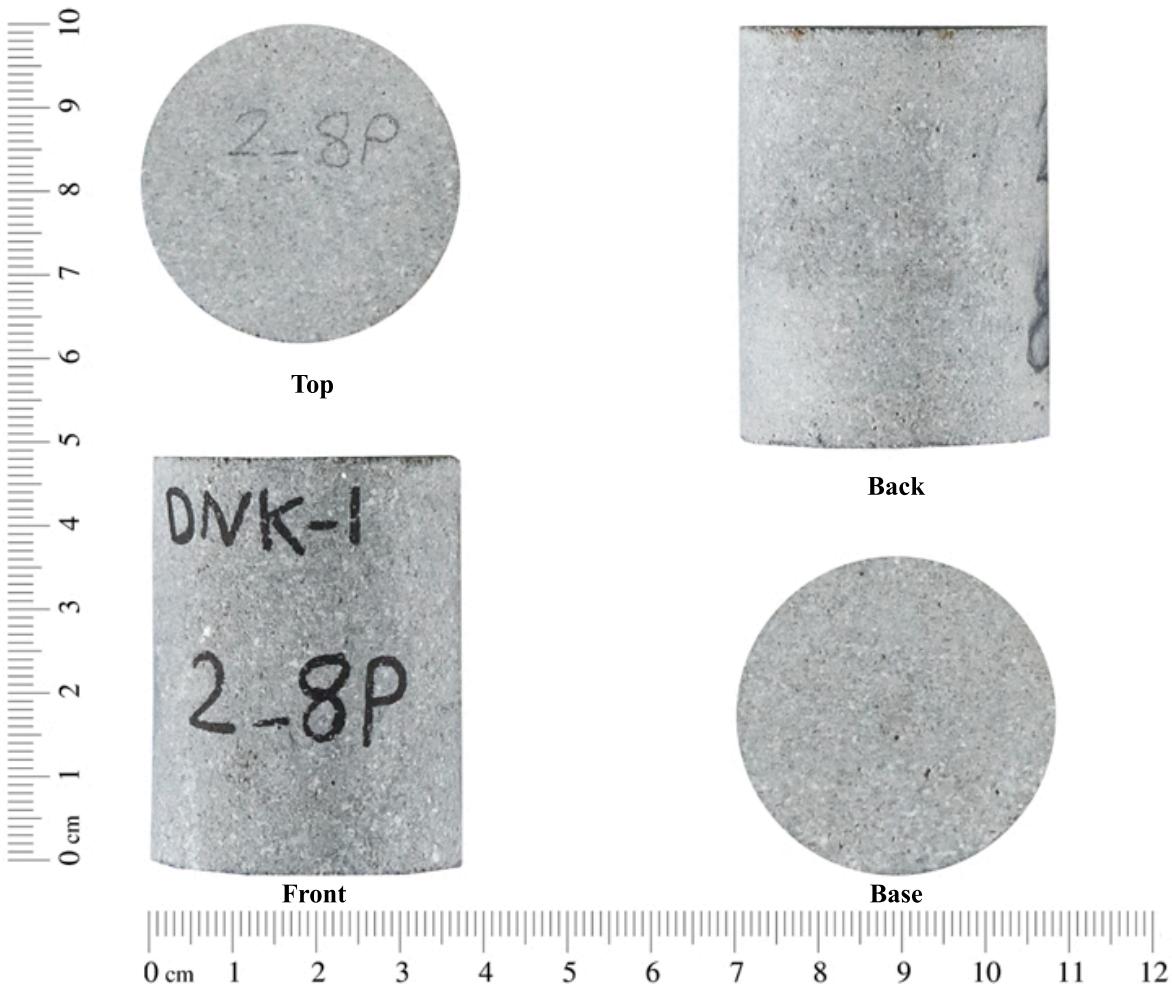
Sample No.:	2_6P
Depth:	2901.06 m
Permeability:	0.17 mD
Porosity:	8.3 %



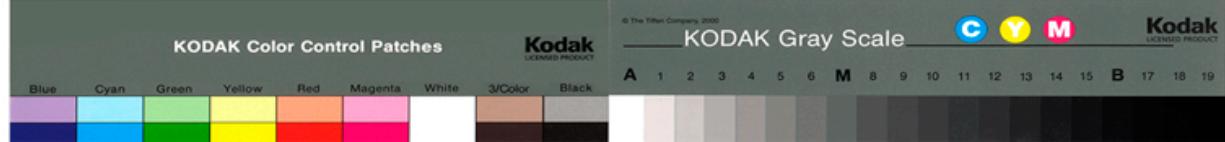


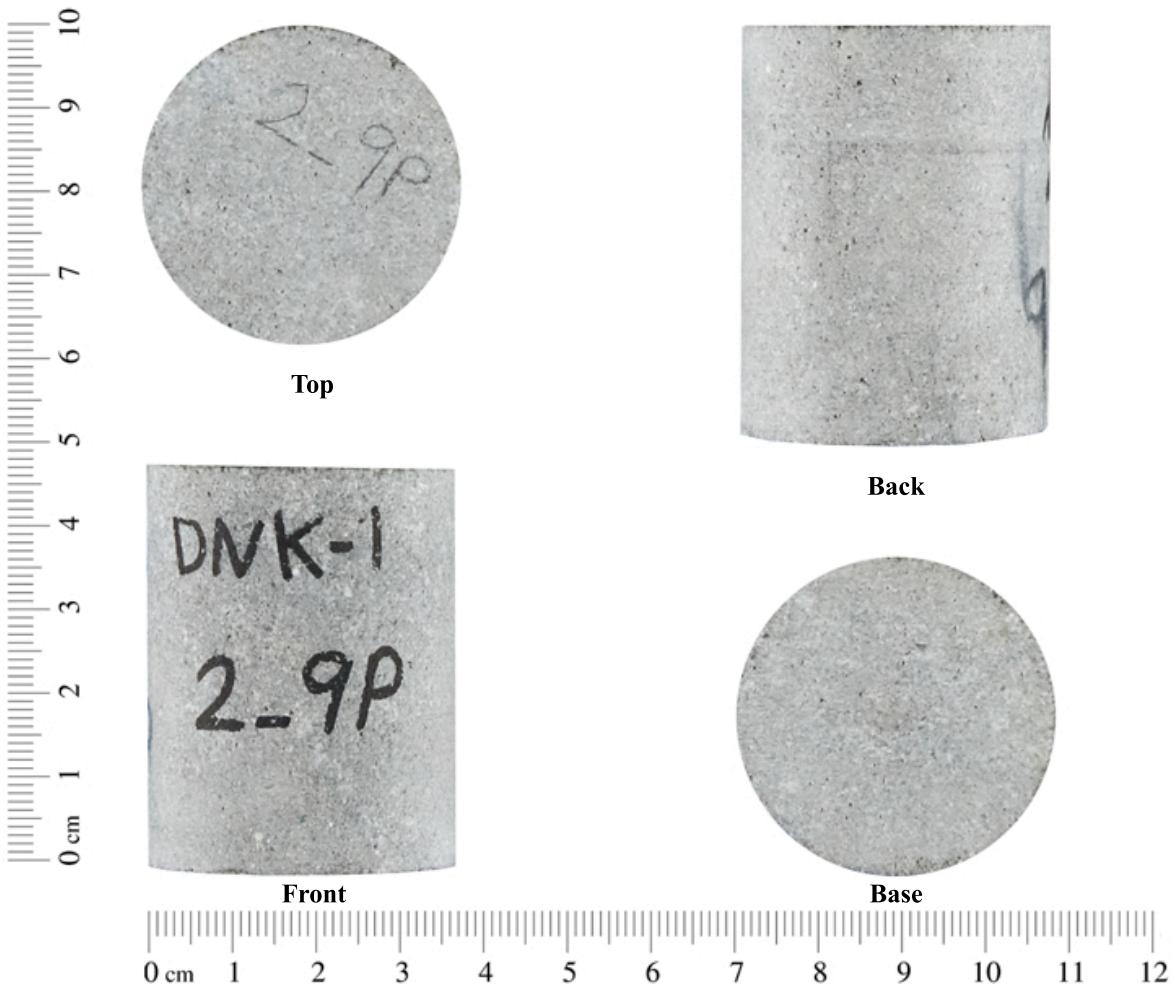
Sample No.:	2_7P
Depth:	2902.06 m
Permeability:	0.088 mD
Porosity:	10.4 %



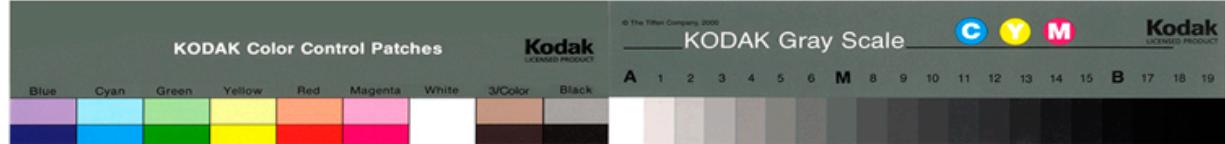


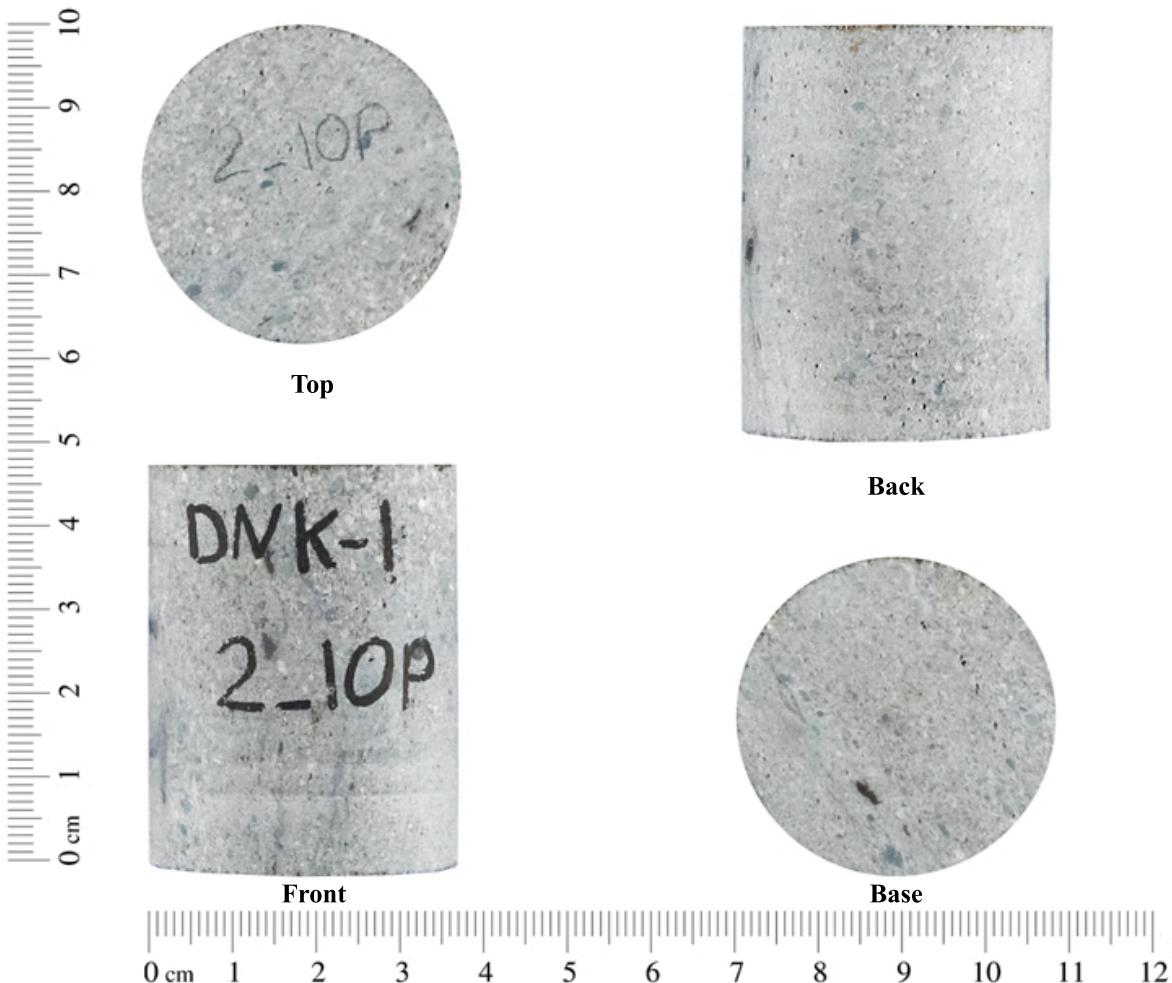
Sample No.:	2_8P
Depth:	2903.04 m
Permeability:	0.031 mD
Porosity:	10.9 %



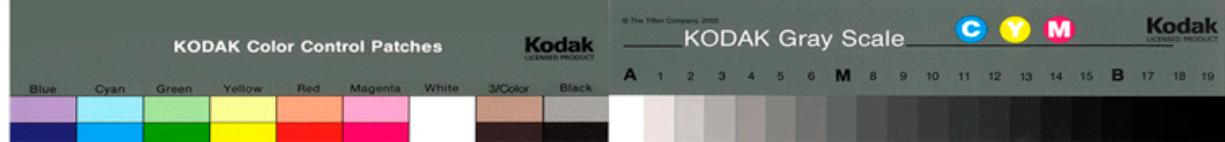


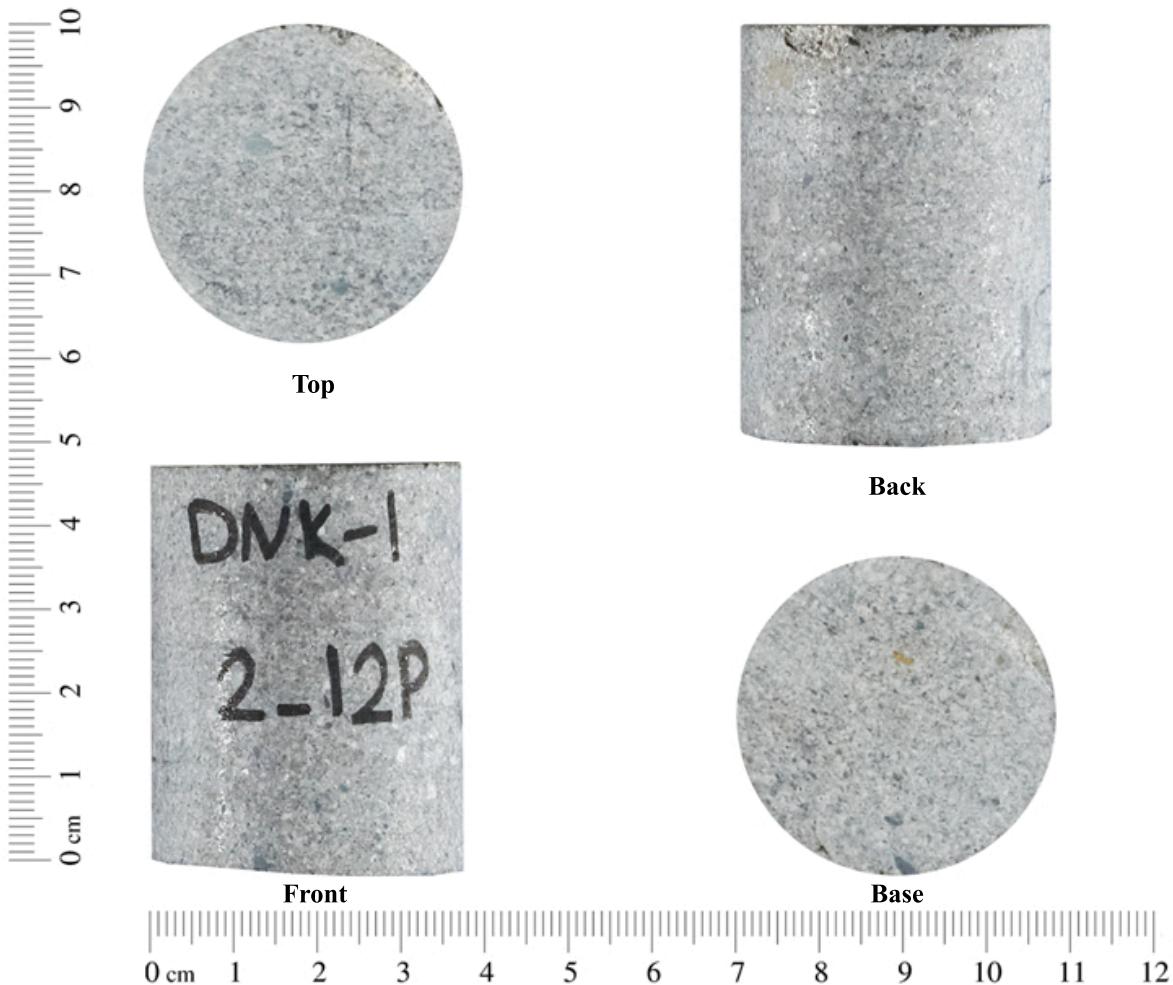
Sample No.:	2_9P
Depth:	2904.06 m
Permeability:	0.027 mD
Porosity:	11.5 %



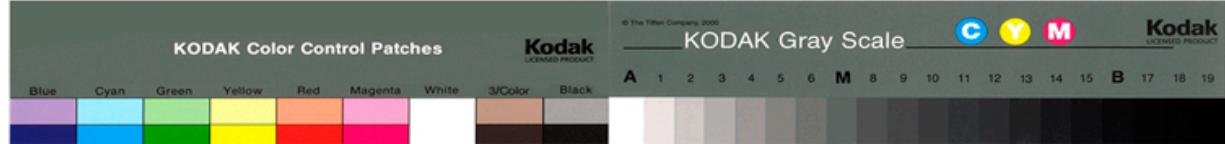


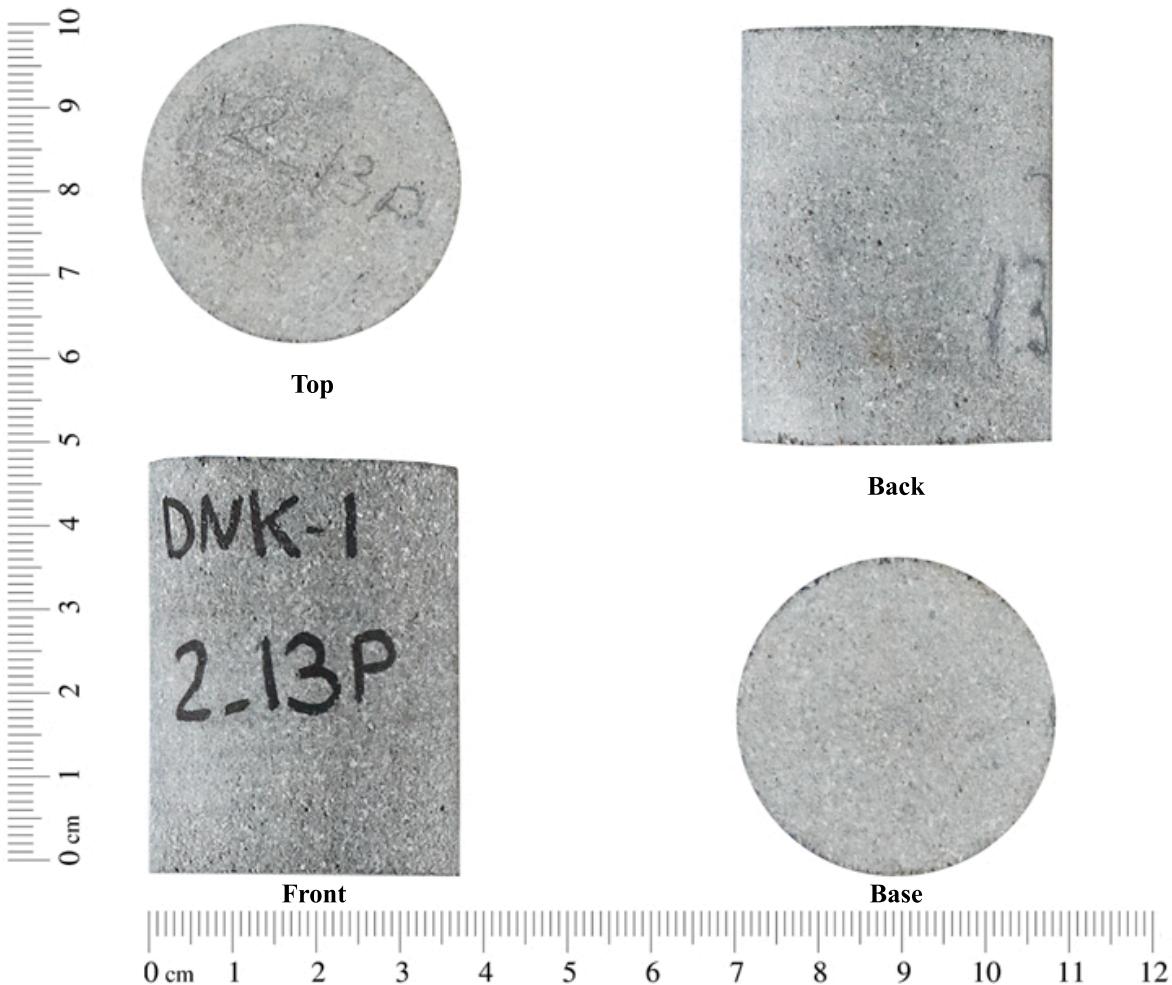
Sample No.:	2_10P
Depth:	2905.06 m
Permeability:	0.047 mD
Porosity:	10.3 %





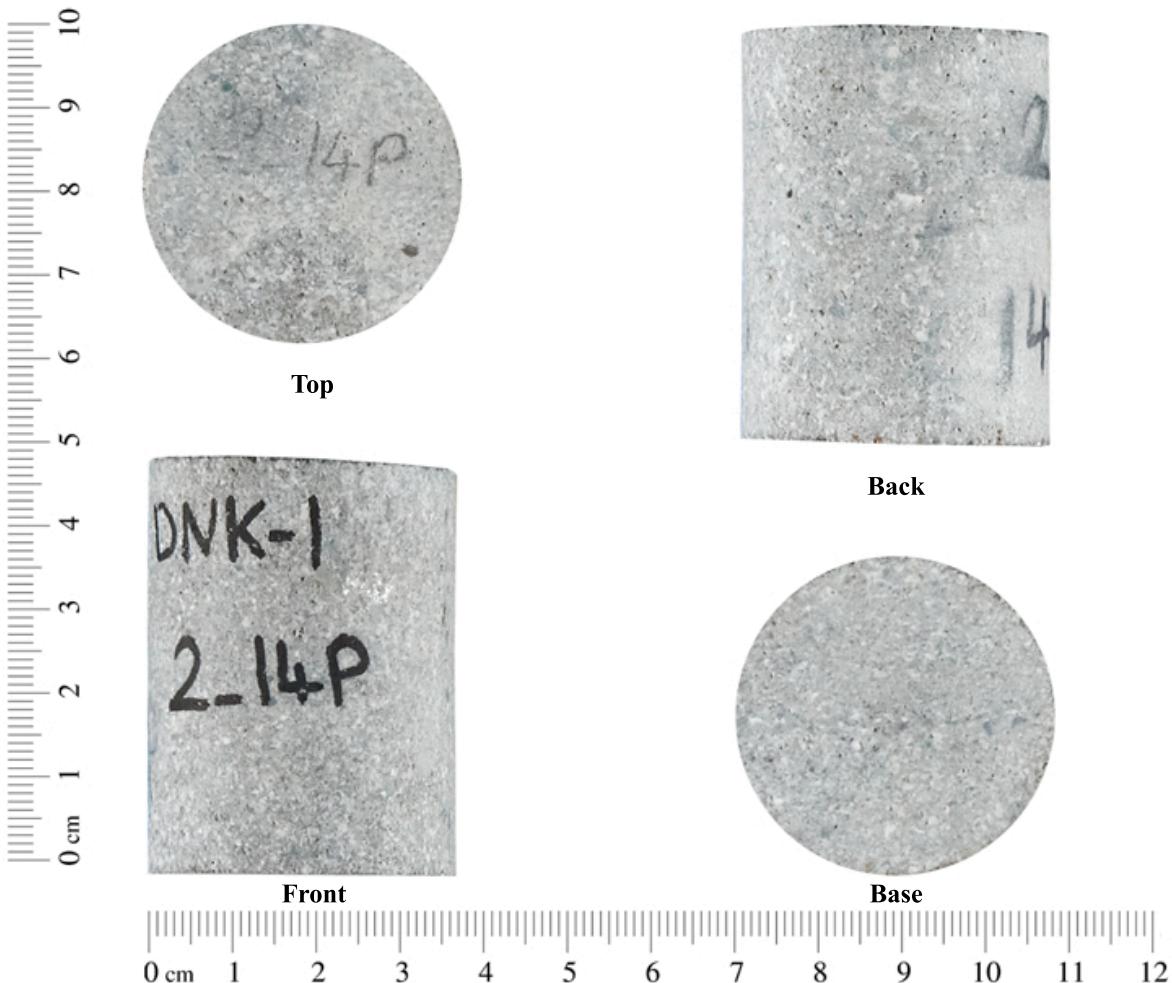
Sample No.:	2_12P
Depth:	2906.05 m
Permeability:	0.0047 mD
Porosity:	4.5 %



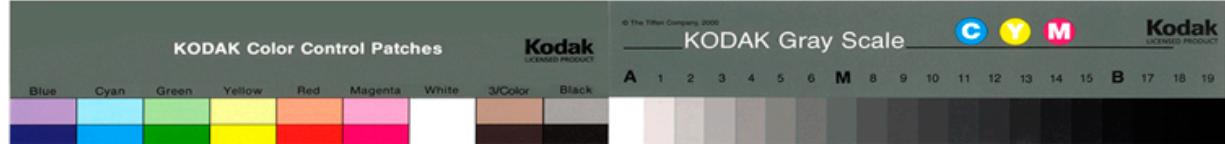


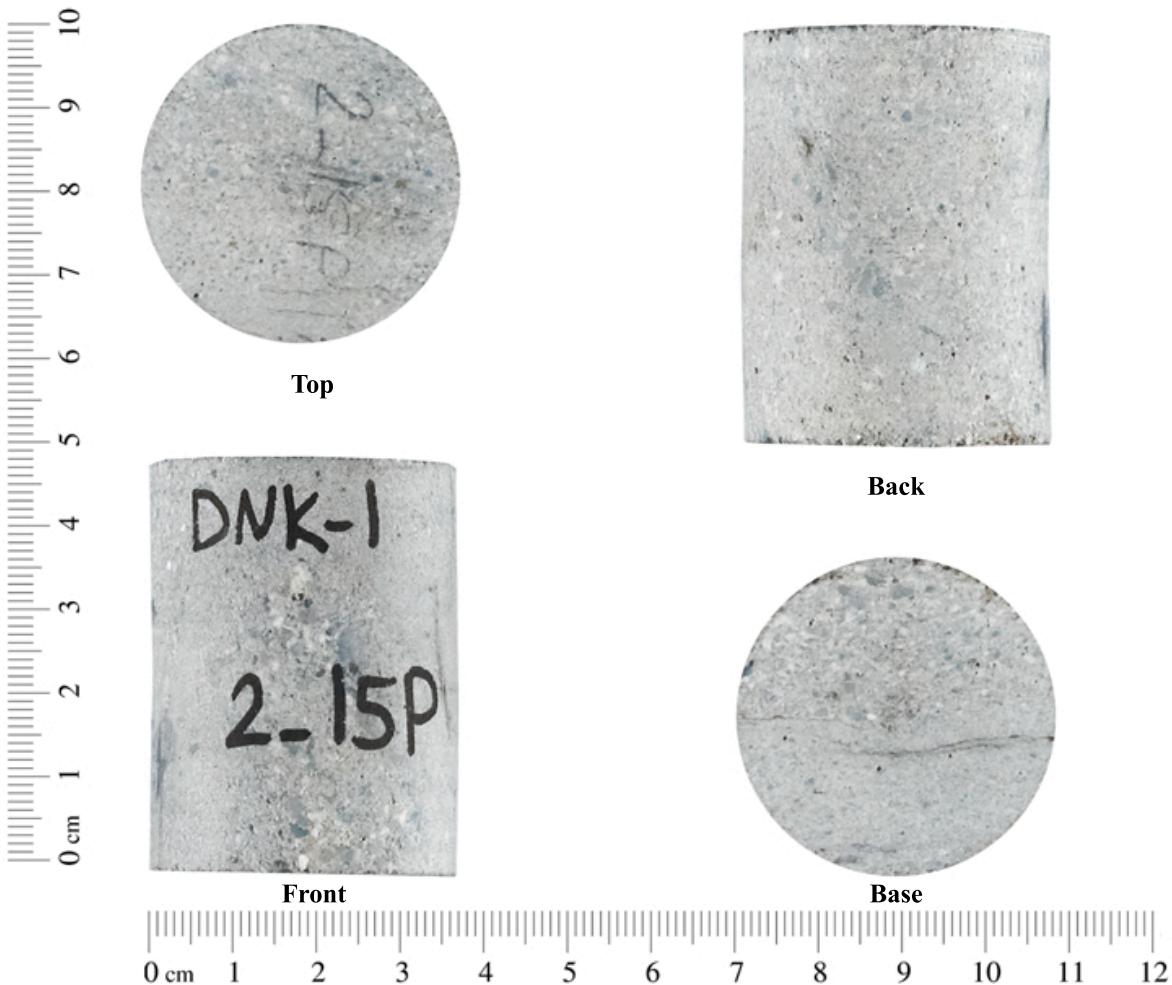
Sample No.:	2_13P
Depth:	2907.04 m
Permeability:	0.055 mD
Porosity:	12.4 %



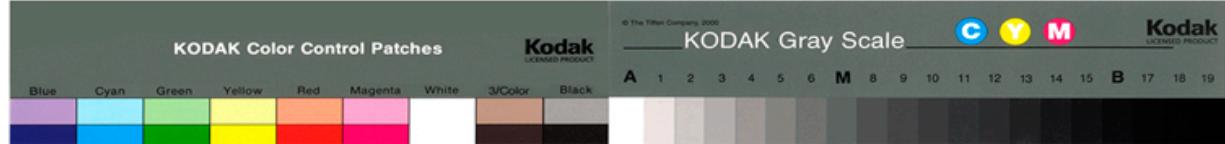


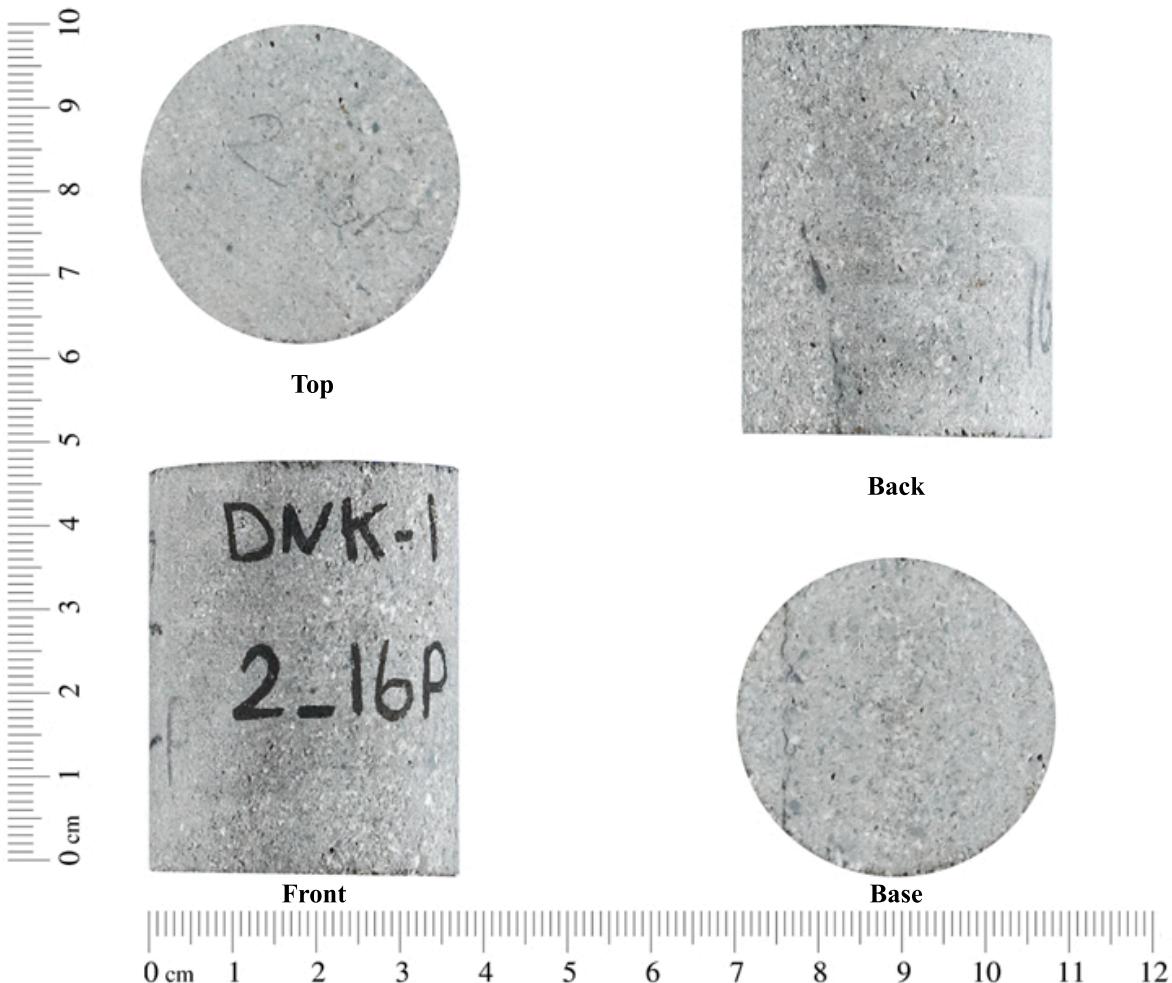
Sample No.:	2_14P
Depth:	2908.05 m
Permeability:	0.051 mD
Porosity:	10.1 %





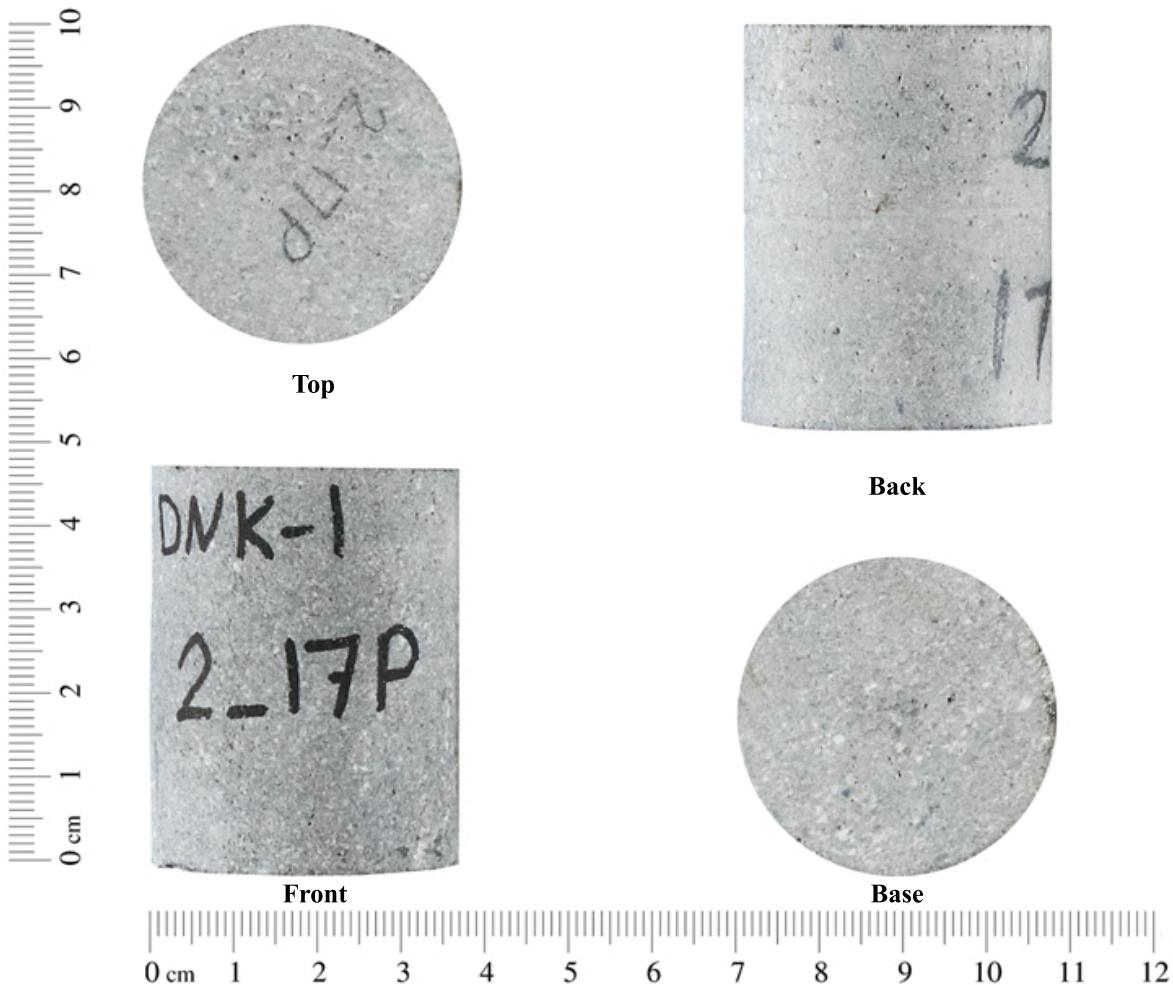
Sample No.:	2_15P
Depth:	2909.05 m
Permeability:	0.10 mD
Porosity:	9.5 %



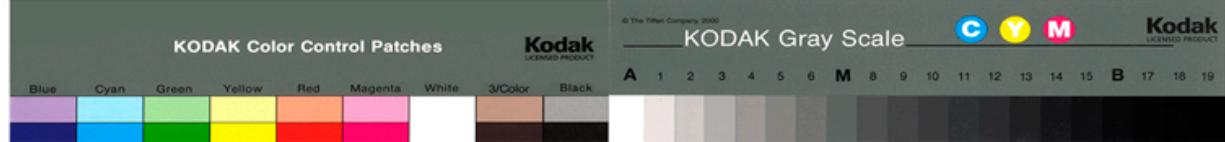


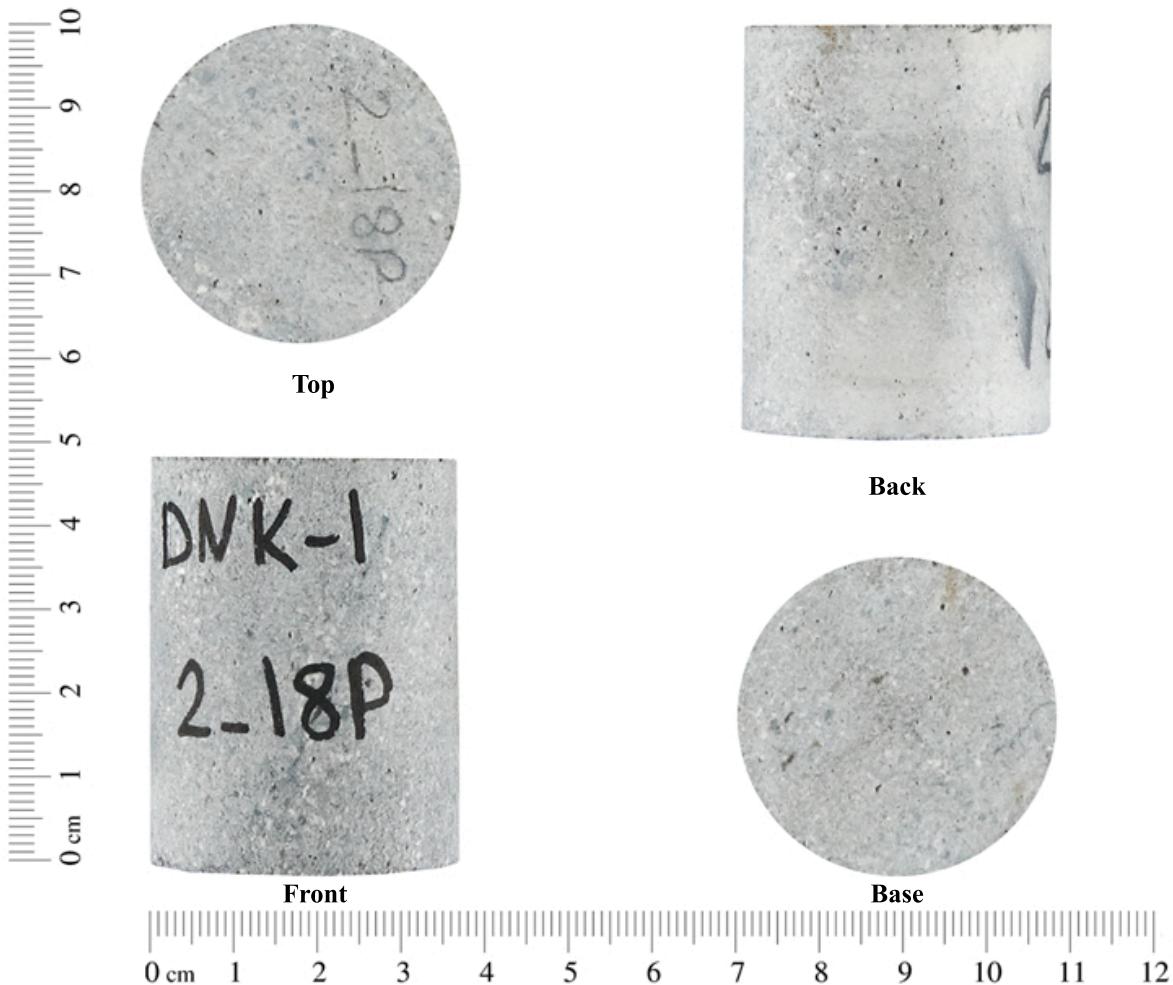
Sample No.:	2_16P
Depth:	2910.05 m
Permeability:	0.073 mD
Porosity:	11.3 %



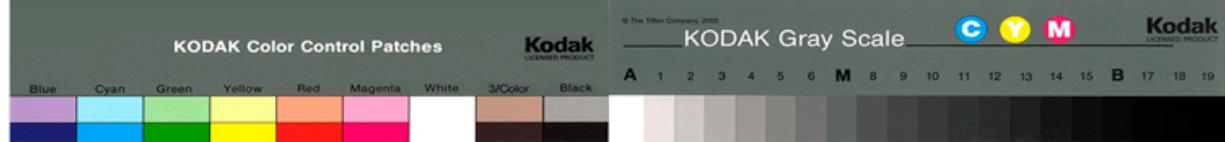


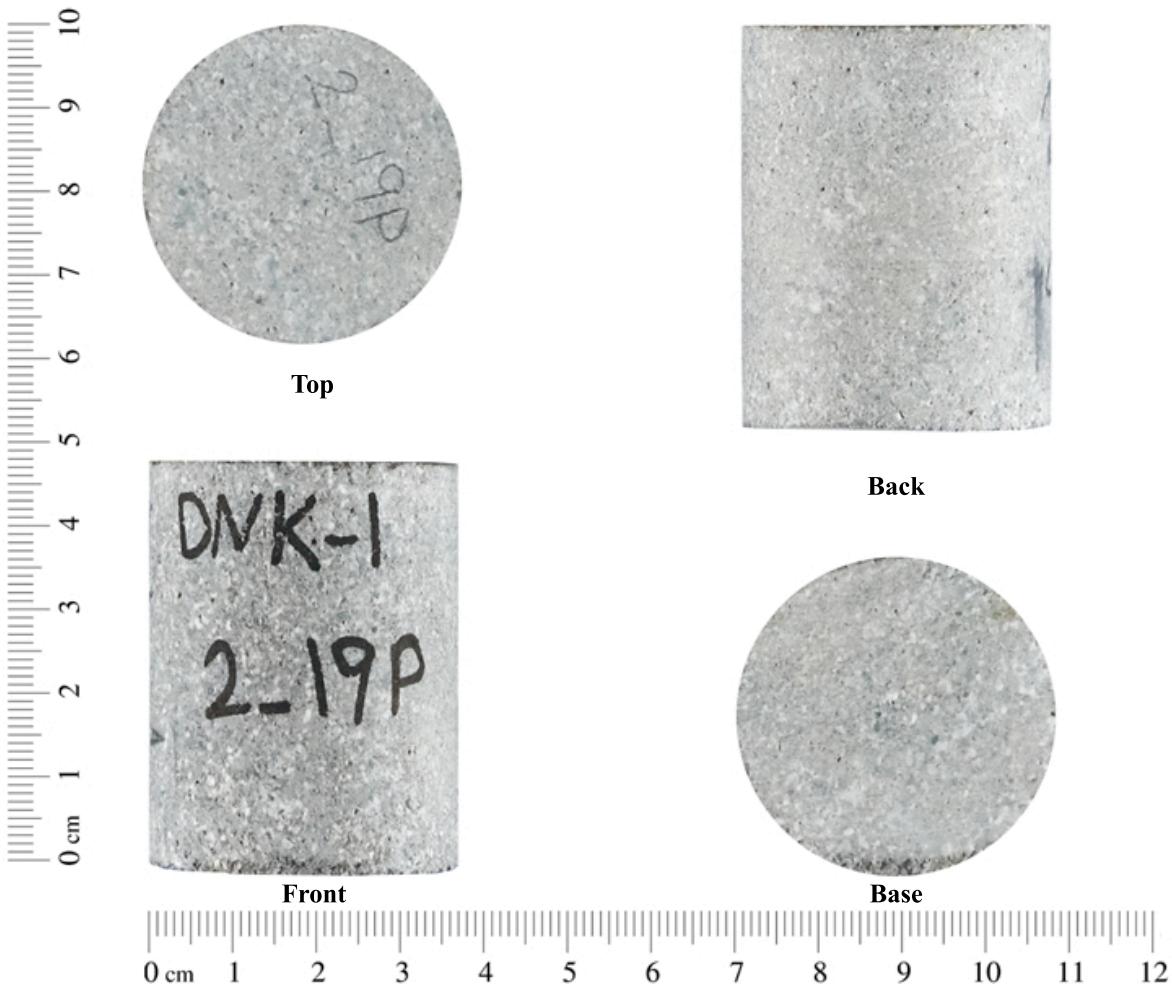
Sample No.:	2_17P
Depth:	2911.05 m
Permeability:	0.090 mD
Porosity:	12.8 %





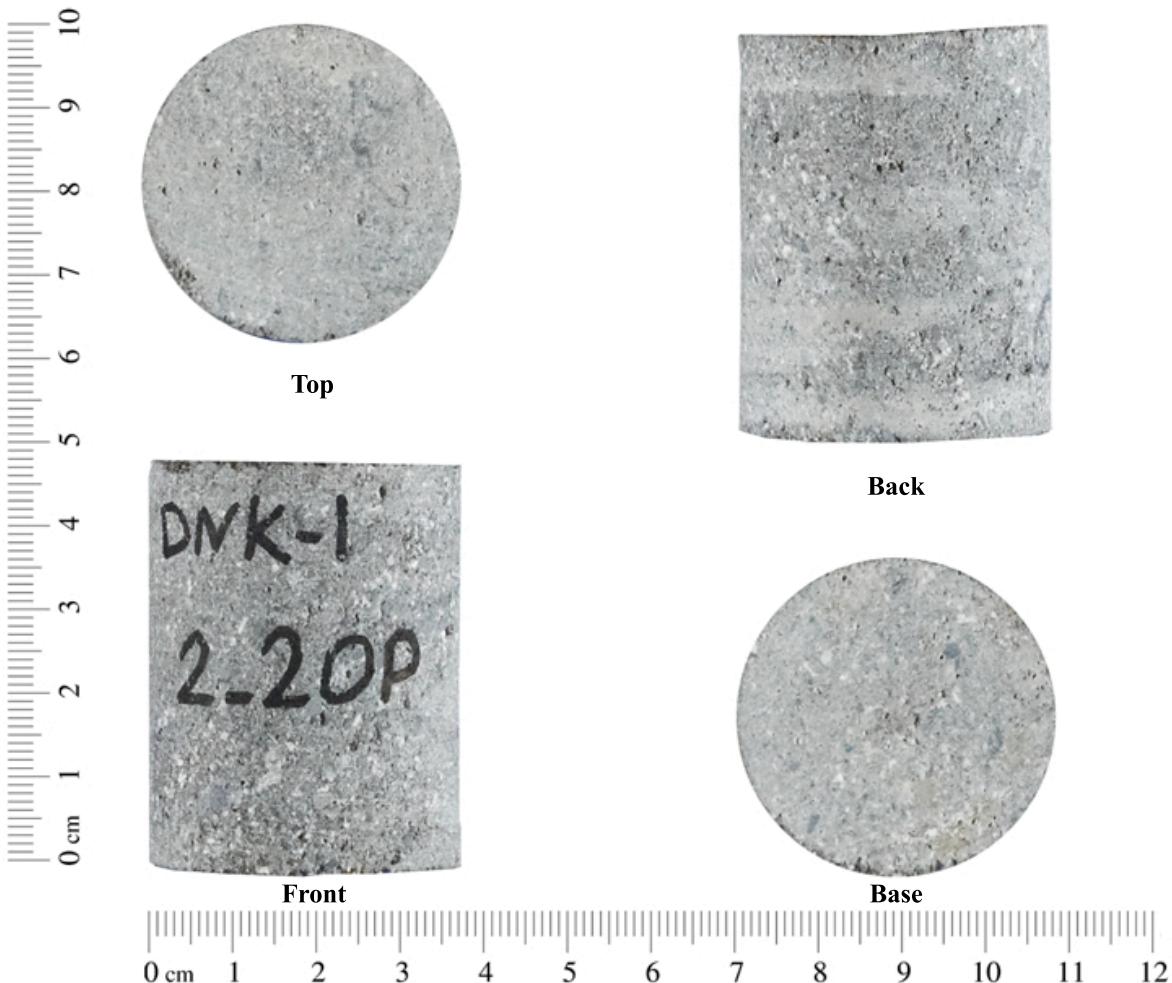
Sample No.:	2_18P
Depth:	2912.04 m
Permeability:	0.085 mD
Porosity:	10.1 %



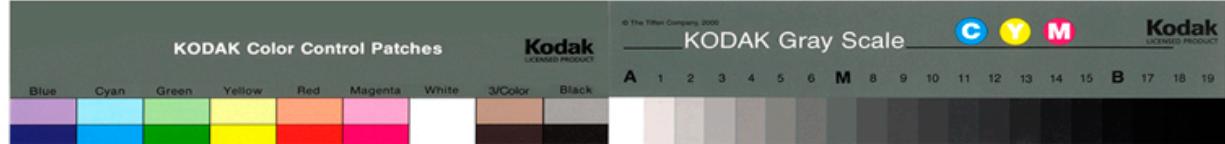


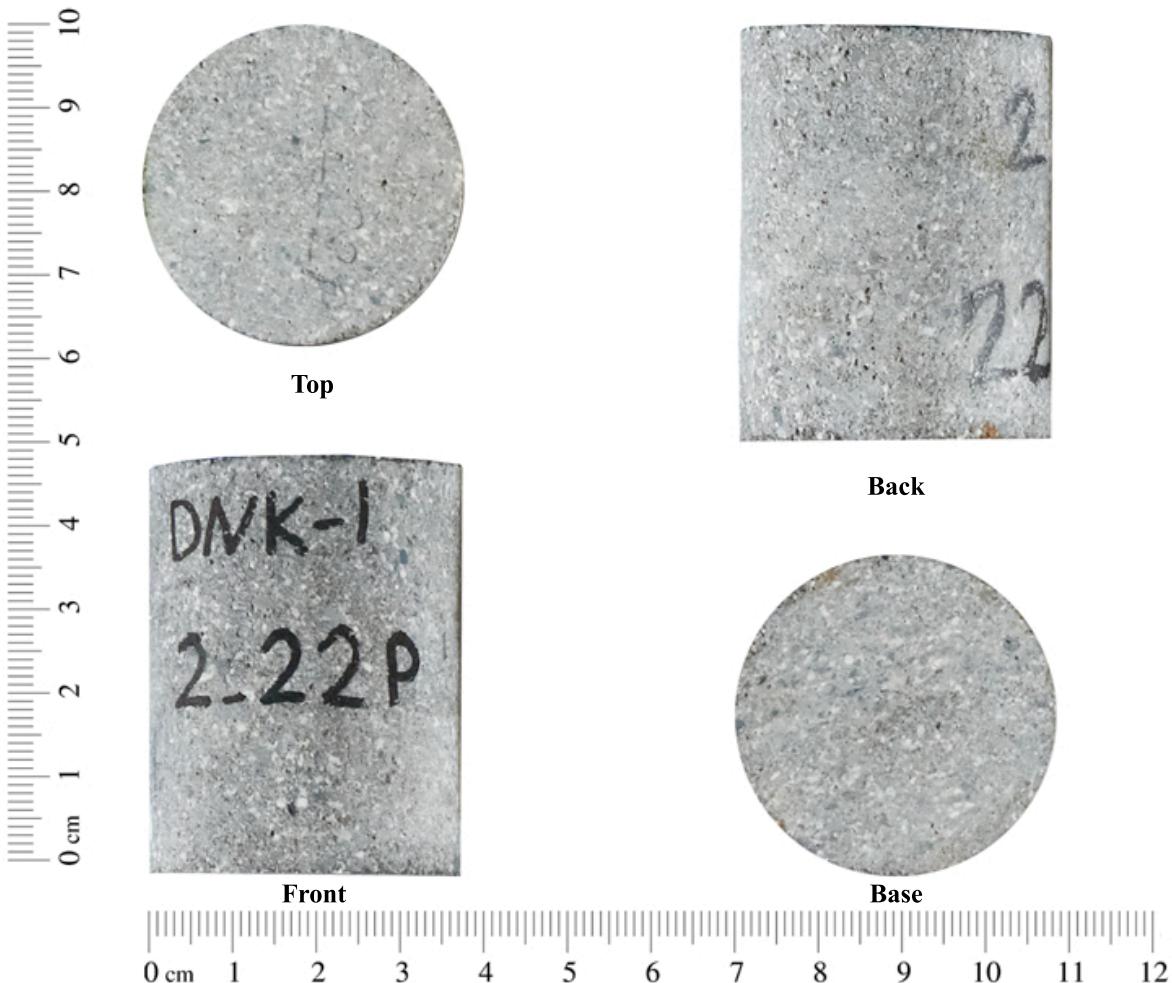
Sample No.:	2_19P
Depth:	2913.05 m
Permeability:	0.11 mD
Porosity:	11.2 %



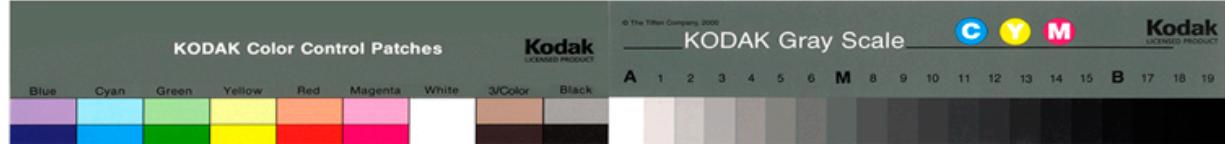


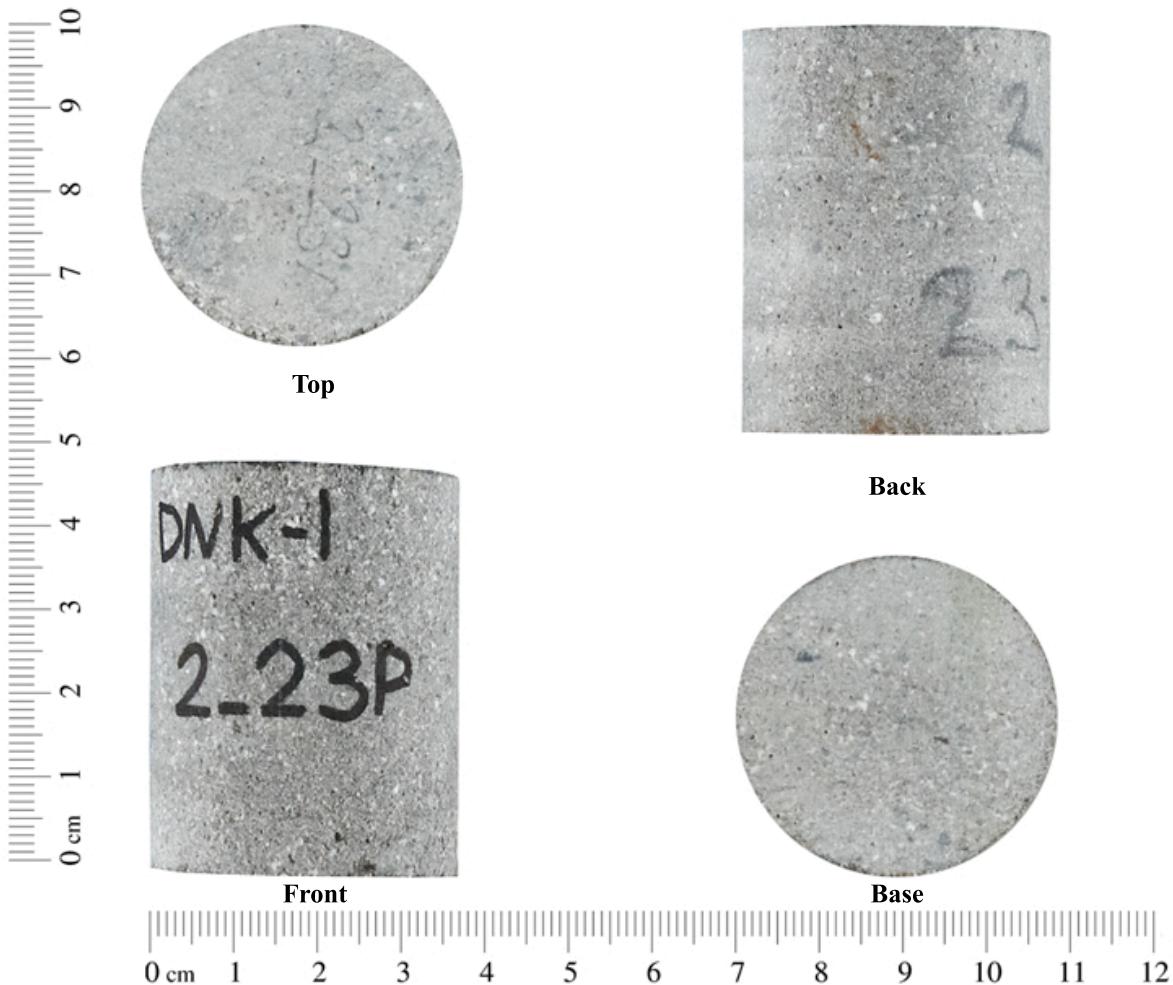
Sample No.:	2_20P
Depth:	2914.04 m
Permeability:	0.11 mD
Porosity:	13.1 %



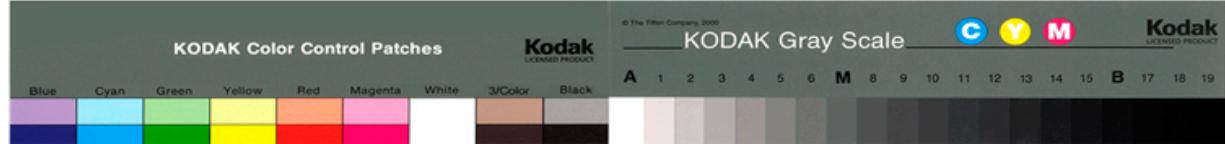


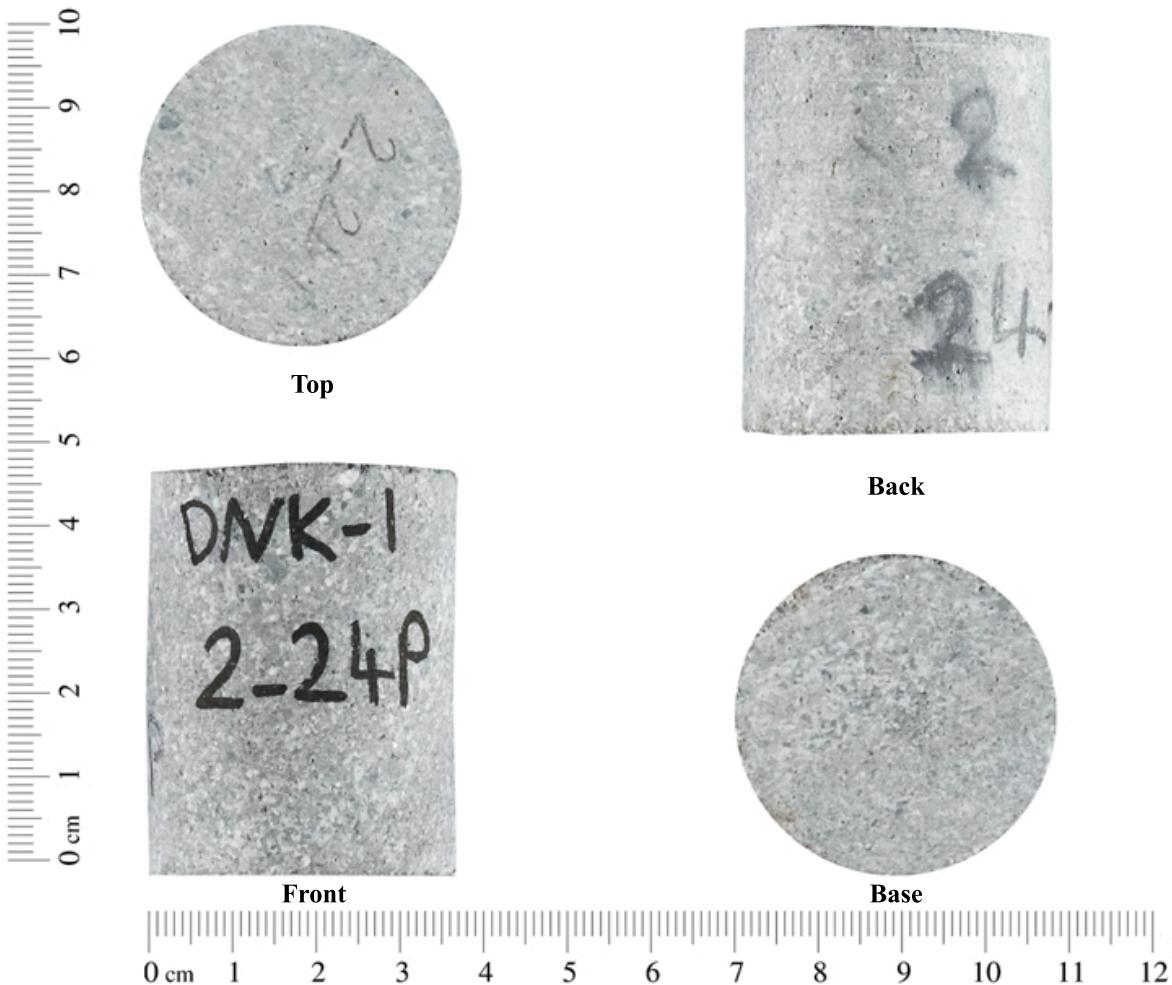
Sample No.:	2_22P
Depth:	2915.04 m
Permeability:	0.15 mD
Porosity:	12.9 %



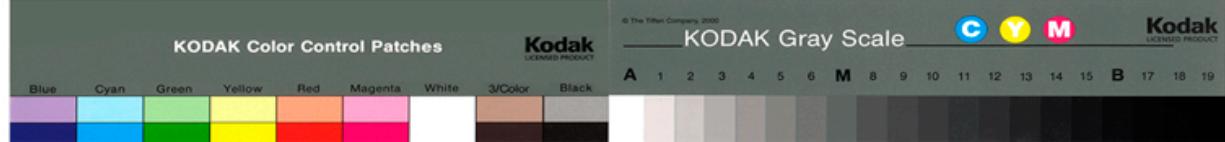


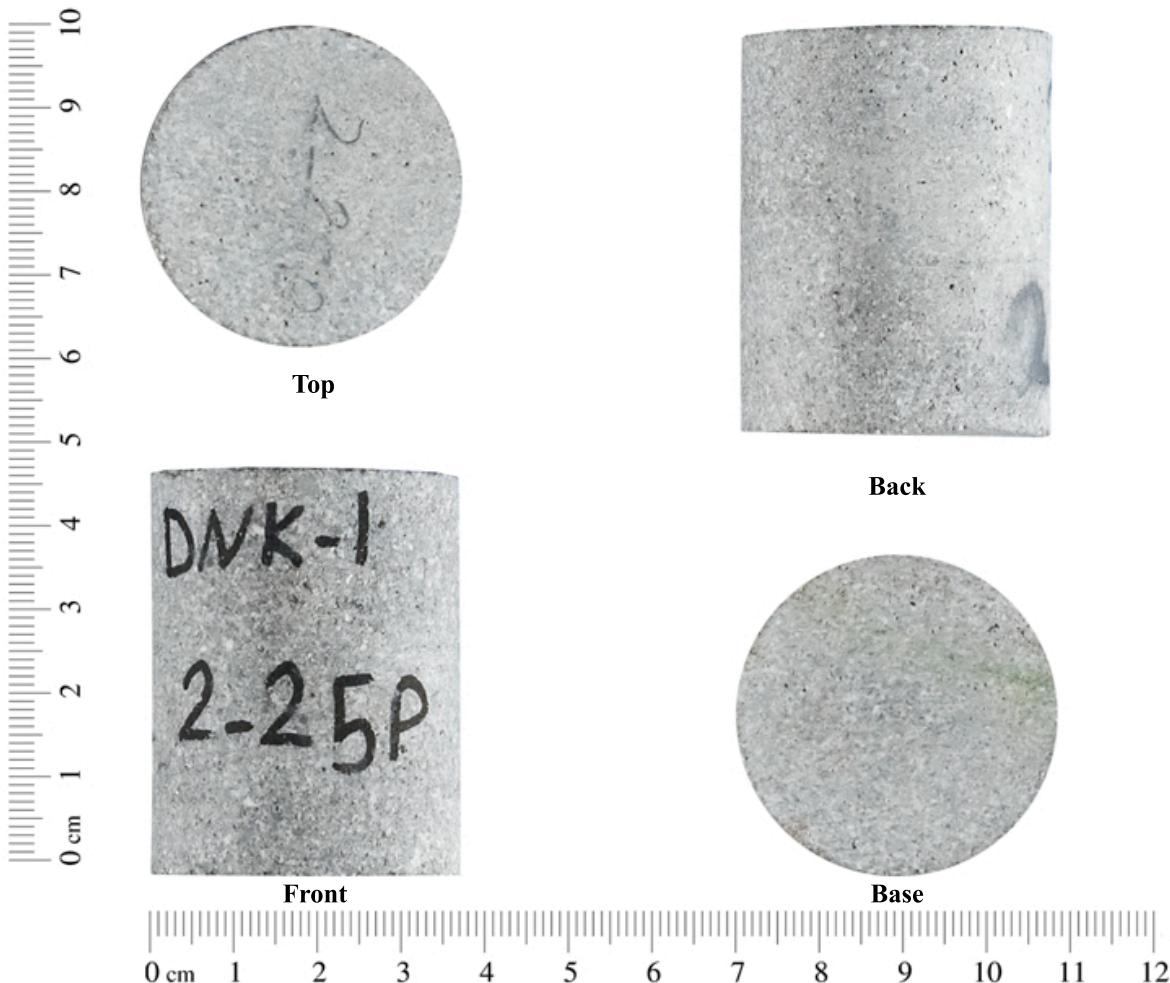
Sample No.:	2_23P
Depth:	2916.04 m
Permeability:	0.044 mD
Porosity:	10.8 %





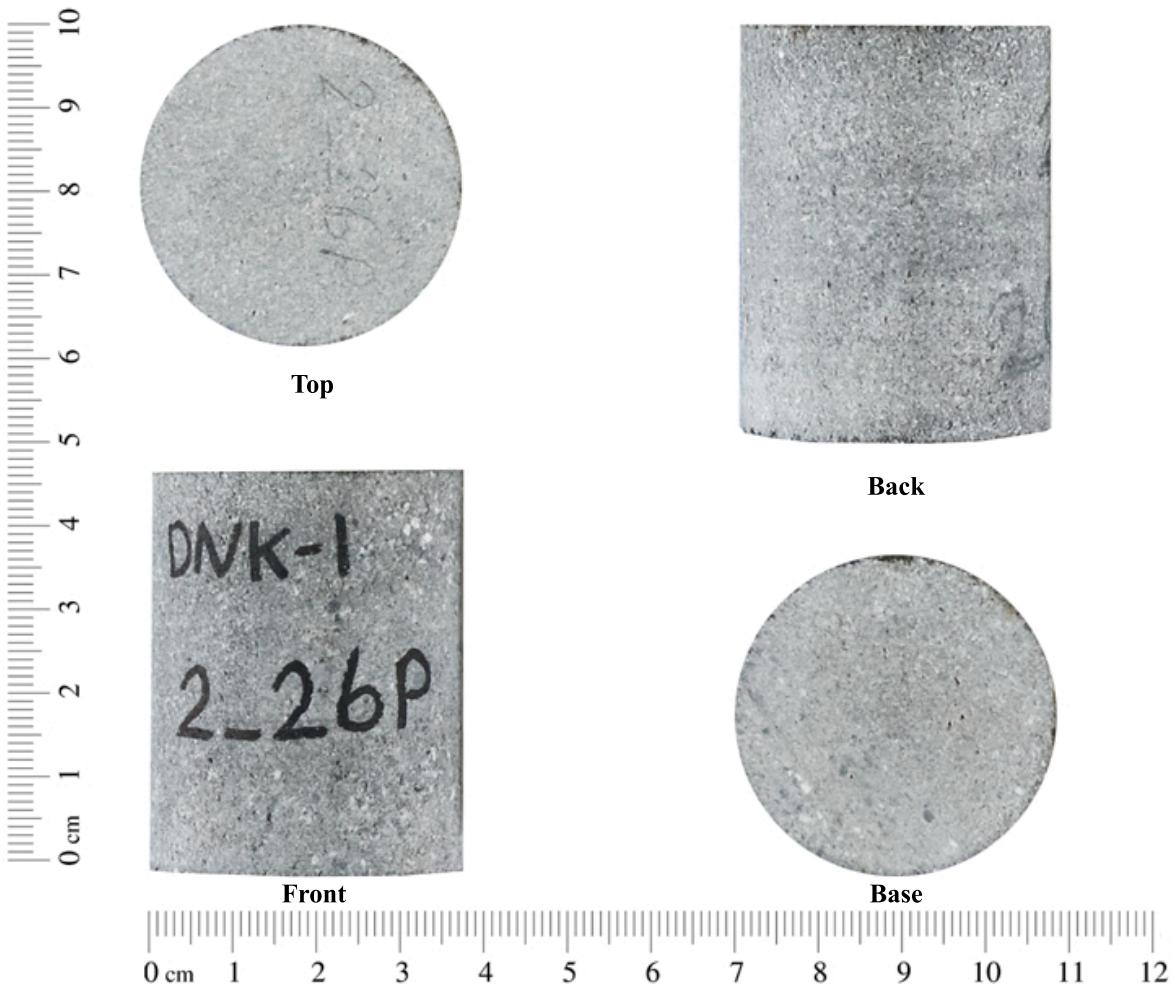
Sample No.:	2_24P
Depth:	2917.04 m
Permeability:	0.019 mD
Porosity:	8.9 %



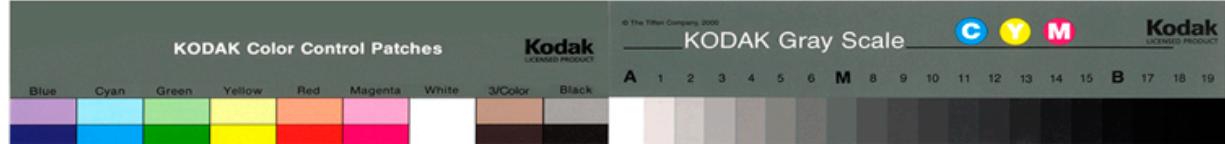


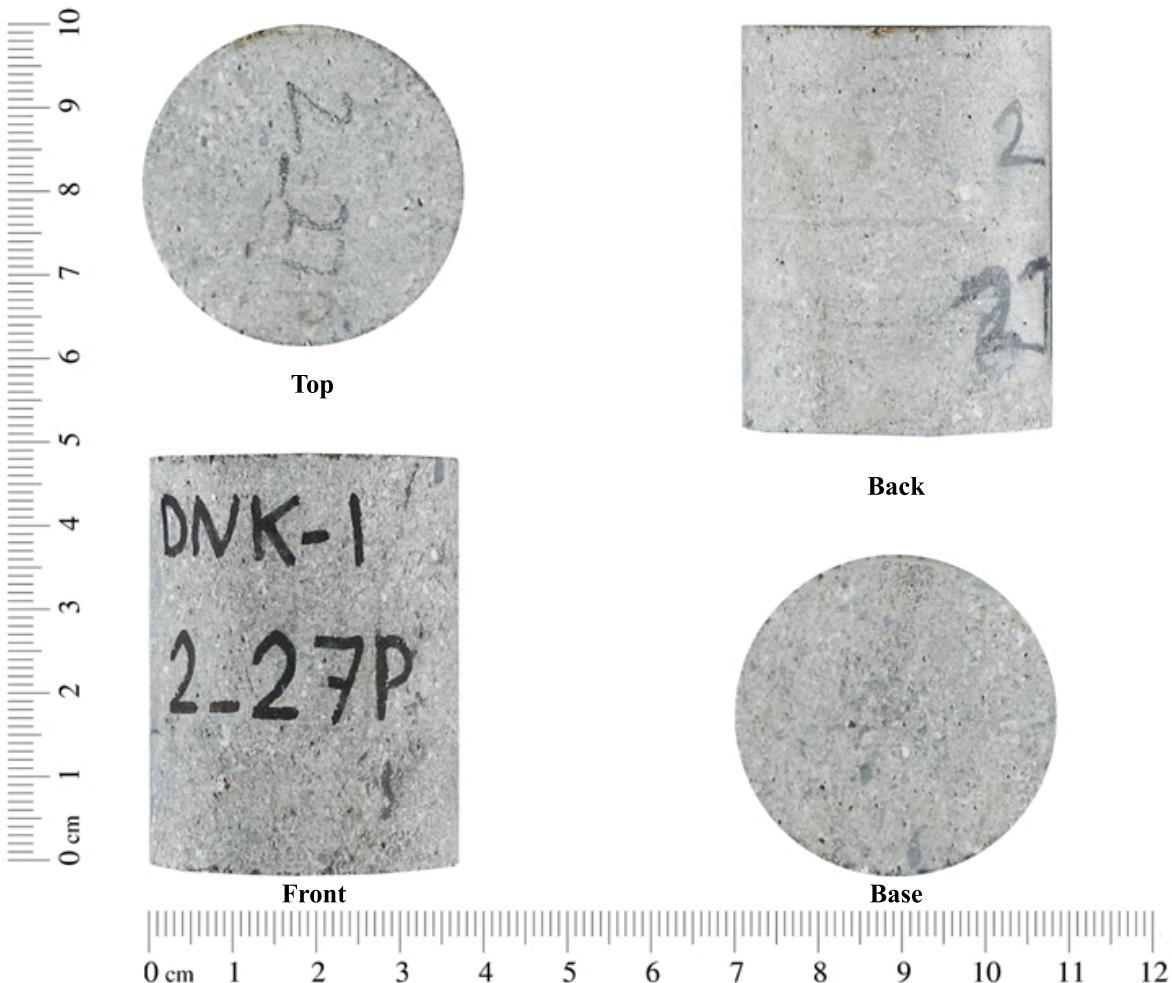
Sample No.:	2_25P
Depth:	2918.04 m
Permeability:	0.044 mD
Porosity:	11.2 %



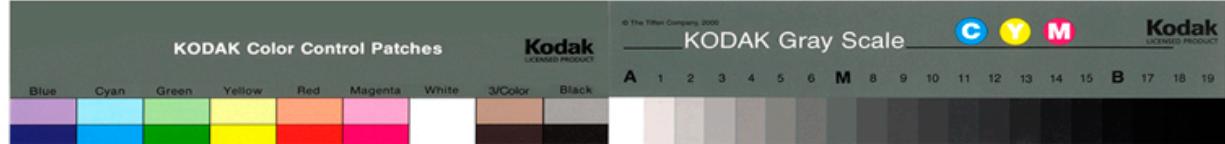


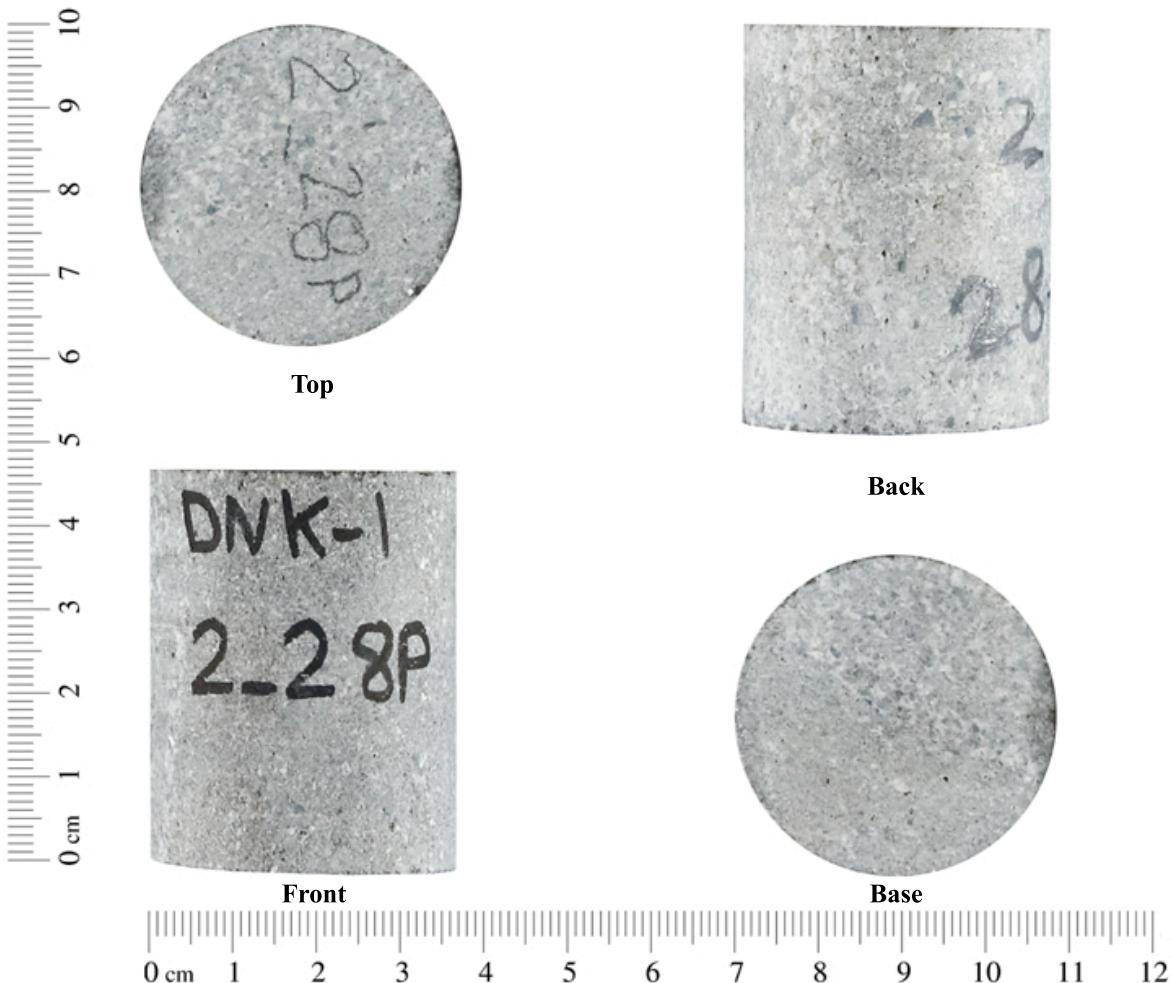
Sample No.:	2_26P
Depth:	2919.05 m
Permeability:	0.040 mD
Porosity:	11.8 %



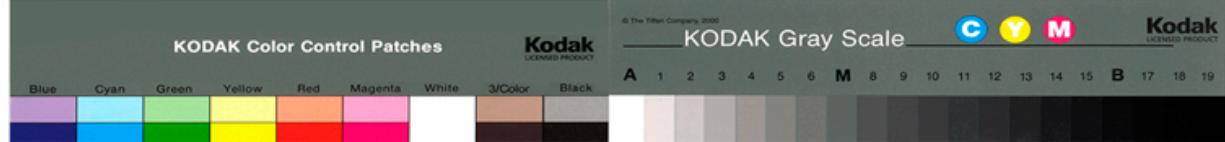


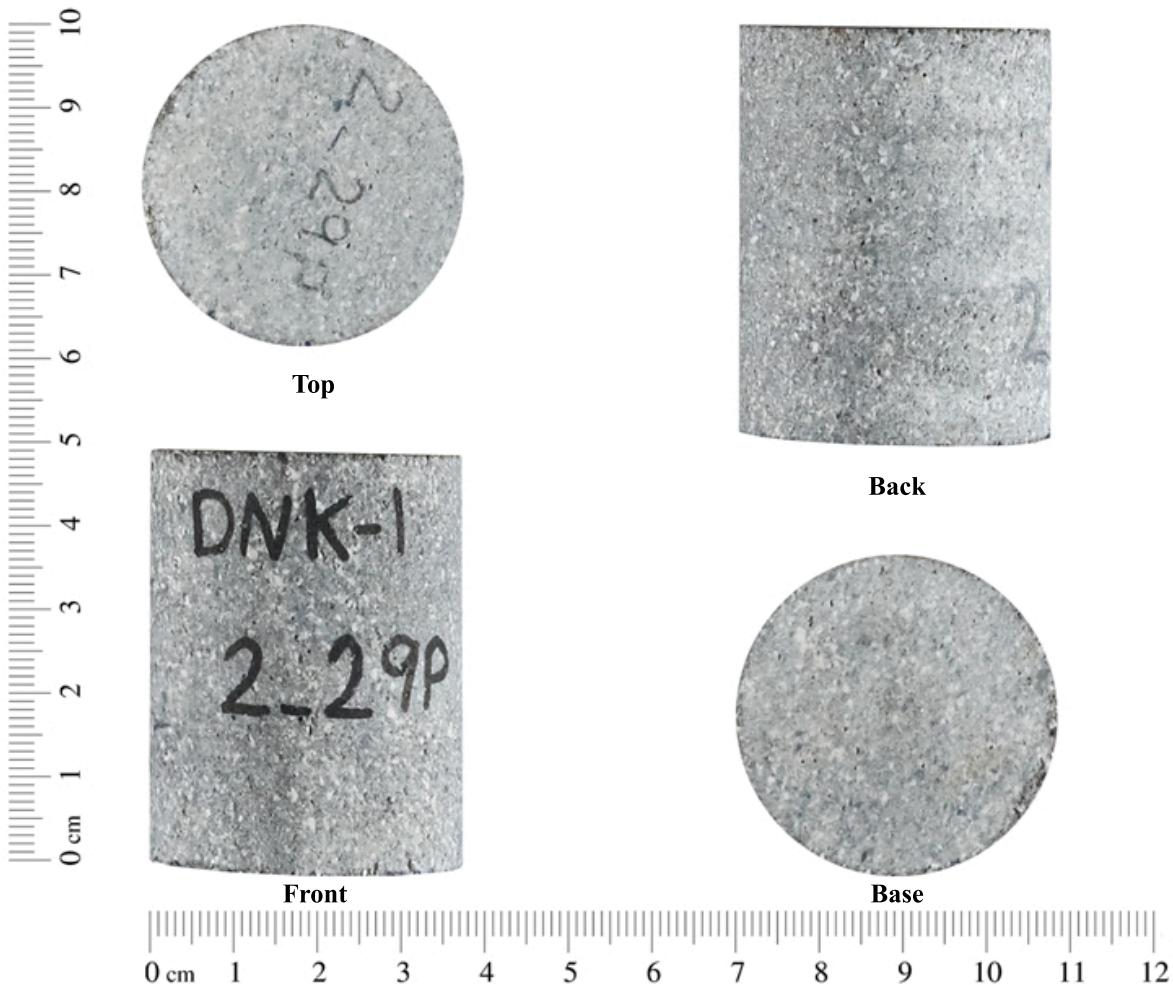
Sample No.:	2_27P
Depth:	2920.05 m
Permeability:	0.092 mD
Porosity:	10.7 %



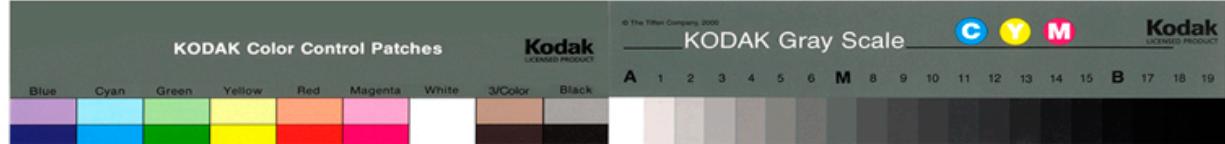


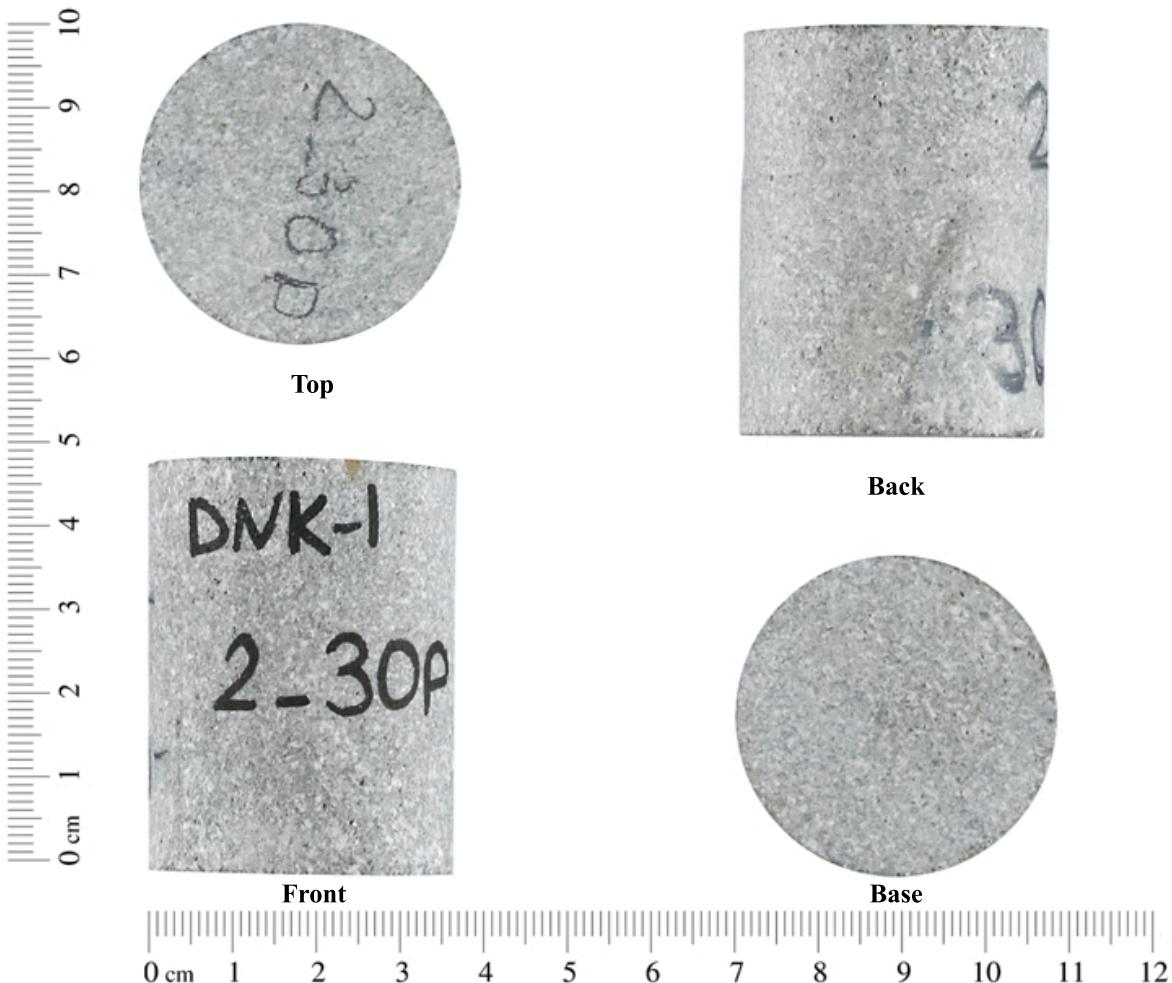
Sample No.:	2_28P
Depth:	2921.05 m
Permeability:	0.041 mD
Porosity:	9.6 %



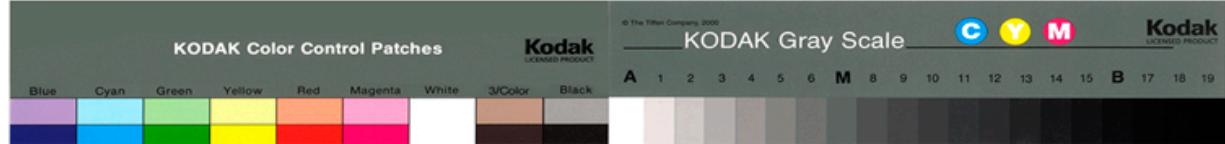


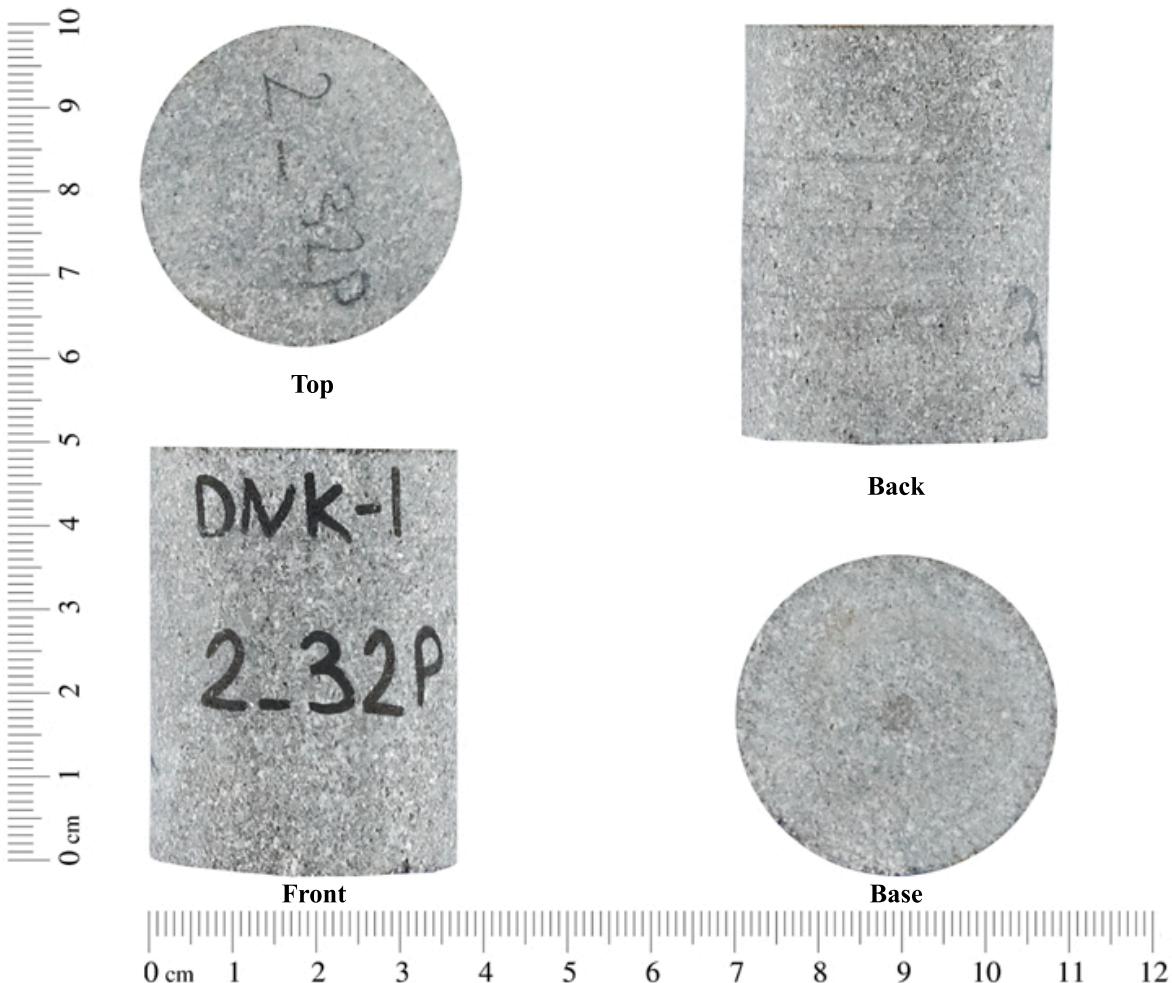
Sample No.:	2_29P
Depth:	2922.04 m
Permeability:	0.13 mD
Porosity:	11.4 %



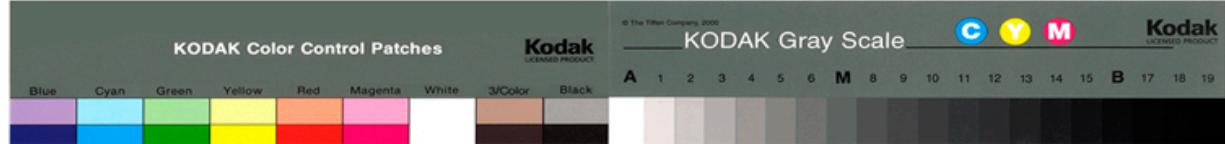


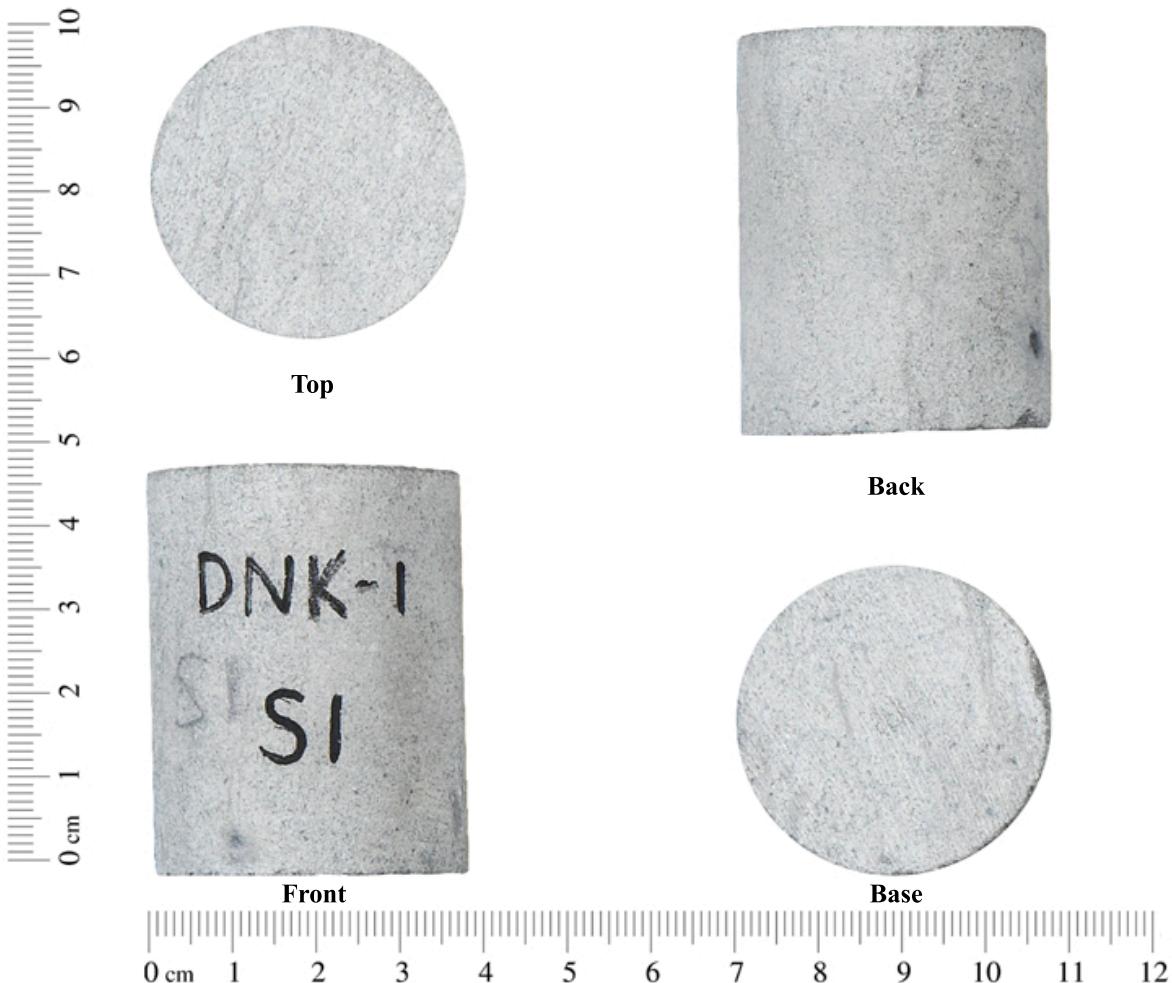
Sample No.:	2_30P
Depth:	2923.06 m
Permeability:	0.030 mD
Porosity:	9.8 %



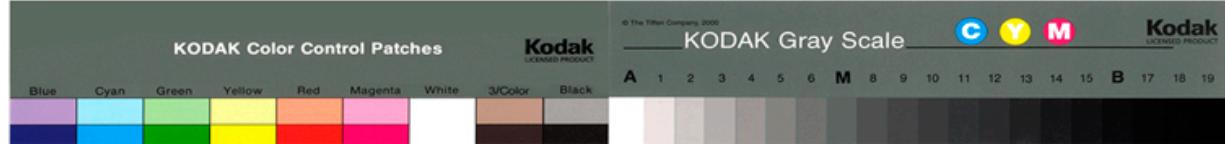


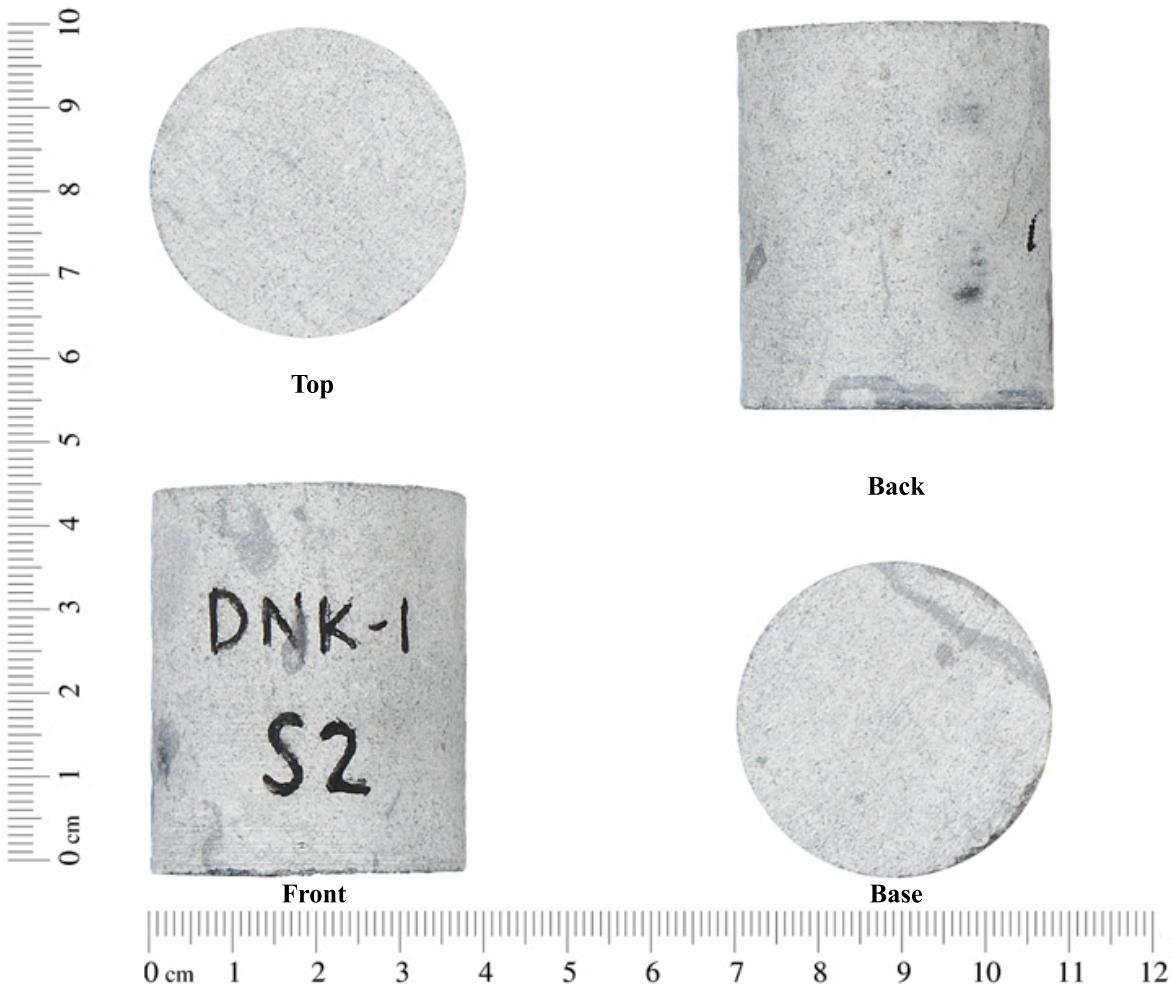
Sample No.:	2_32P
Depth:	2924.21 m
Permeability:	0.051 mD
Porosity:	10.9 %



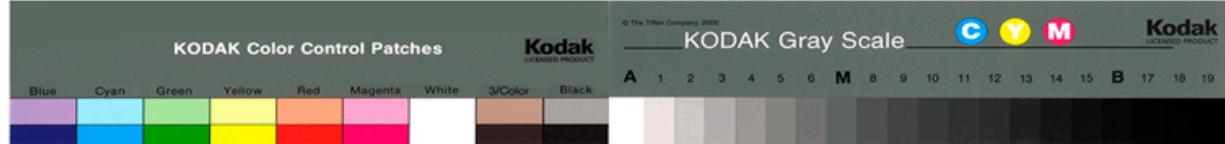


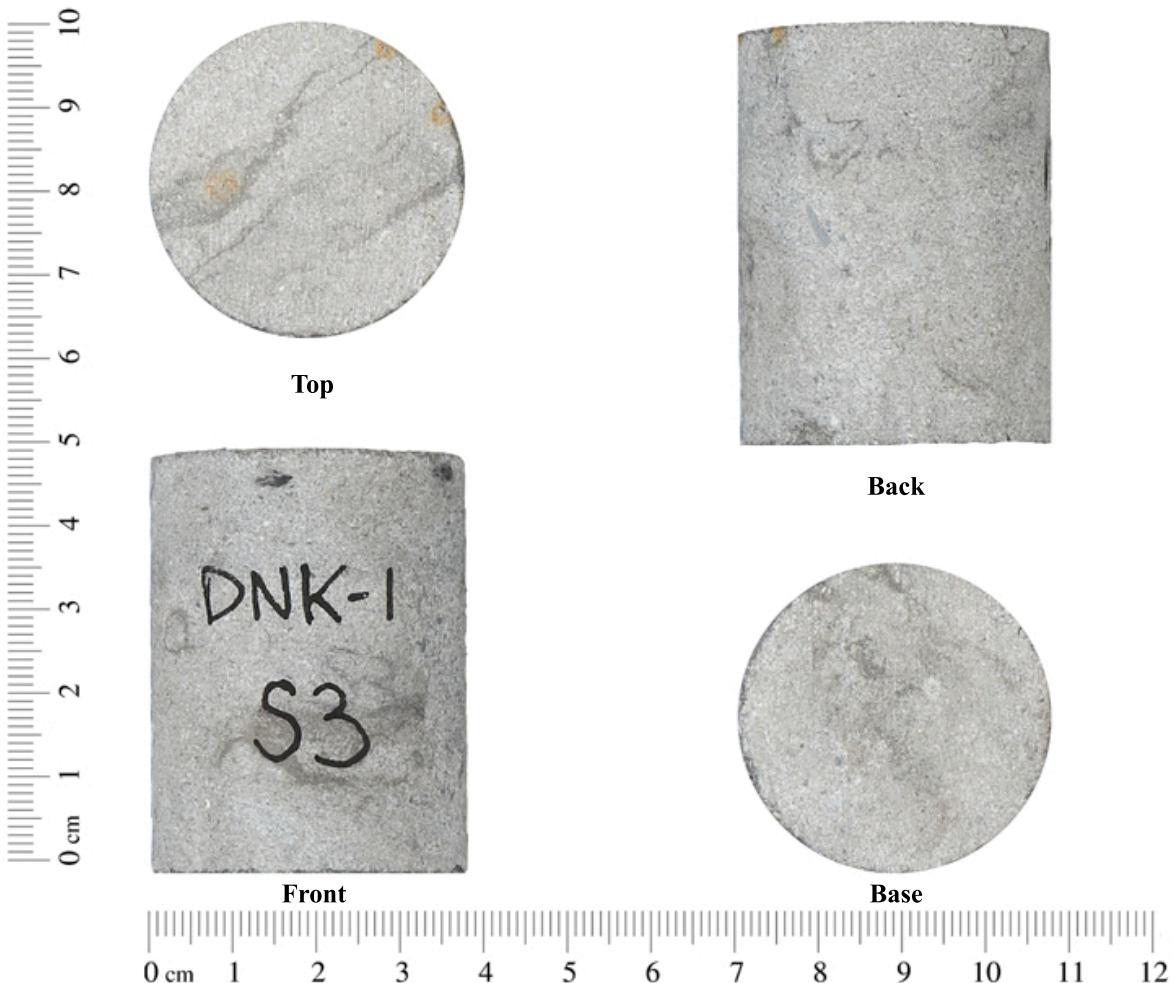
Sample No.:	S1
Depth:	2876.60 m
Permeability:	0.015 mD
Porosity:	4.2 %



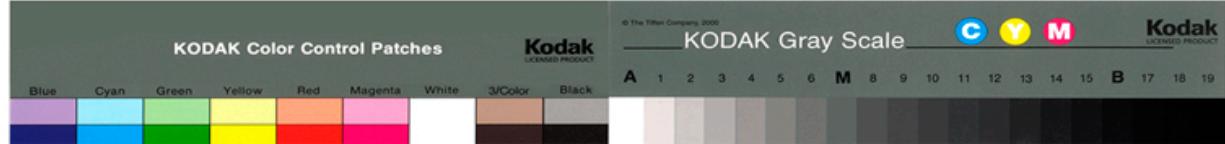


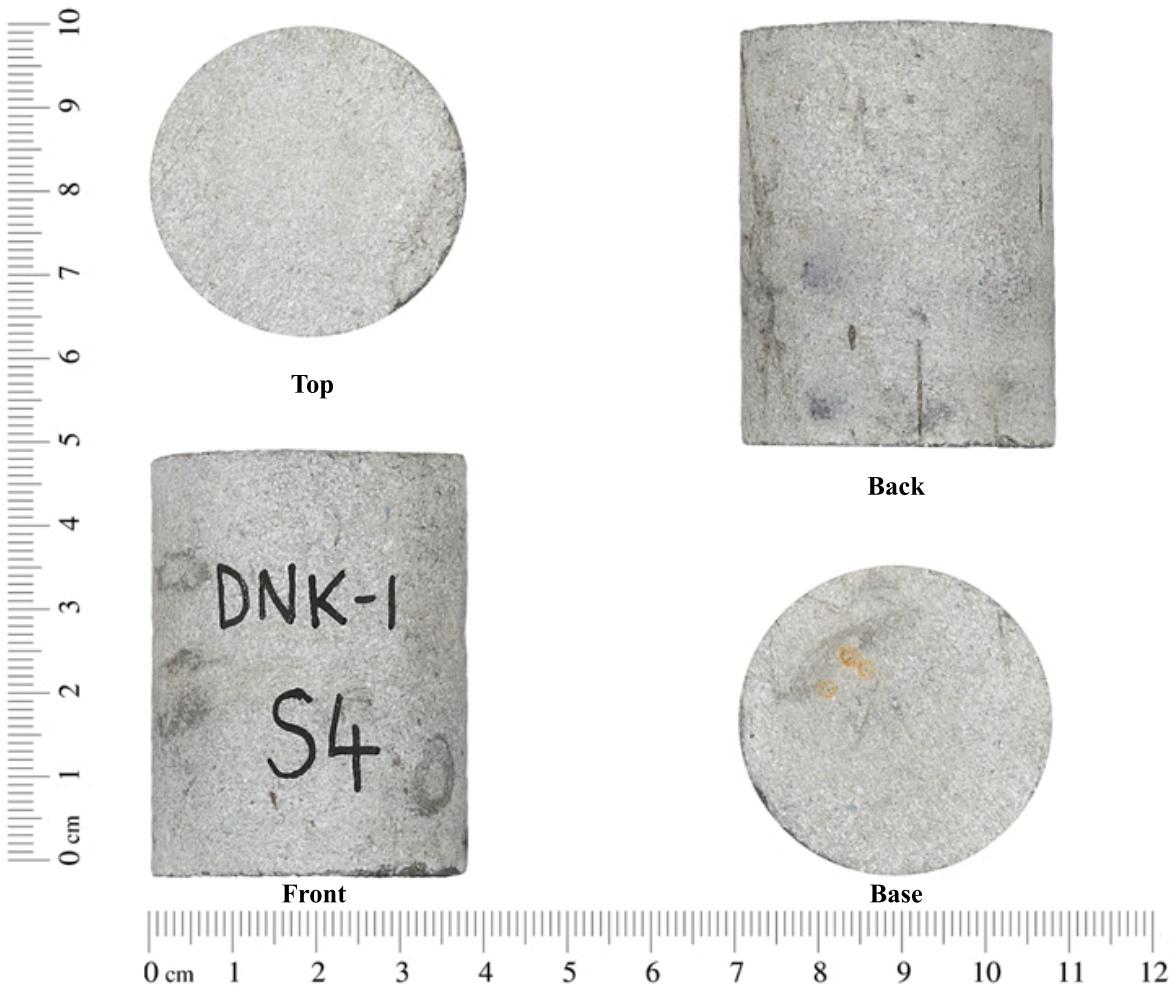
Sample No.:	S2
Depth:	2876.69 m
Permeability:	0.0062 mD
Porosity:	4.0 %





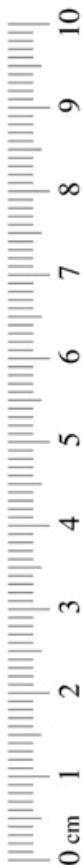
Sample No.:	S3
Depth:	2881.41 m
Permeability:	0.0028 mD
Porosity:	4.8 %





Sample No.:	S4
Depth:	2881.46 m
Permeability:	0.0031 mD
Porosity:	4.6 %





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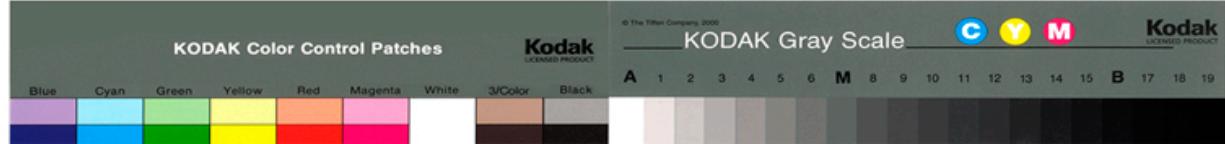
Front

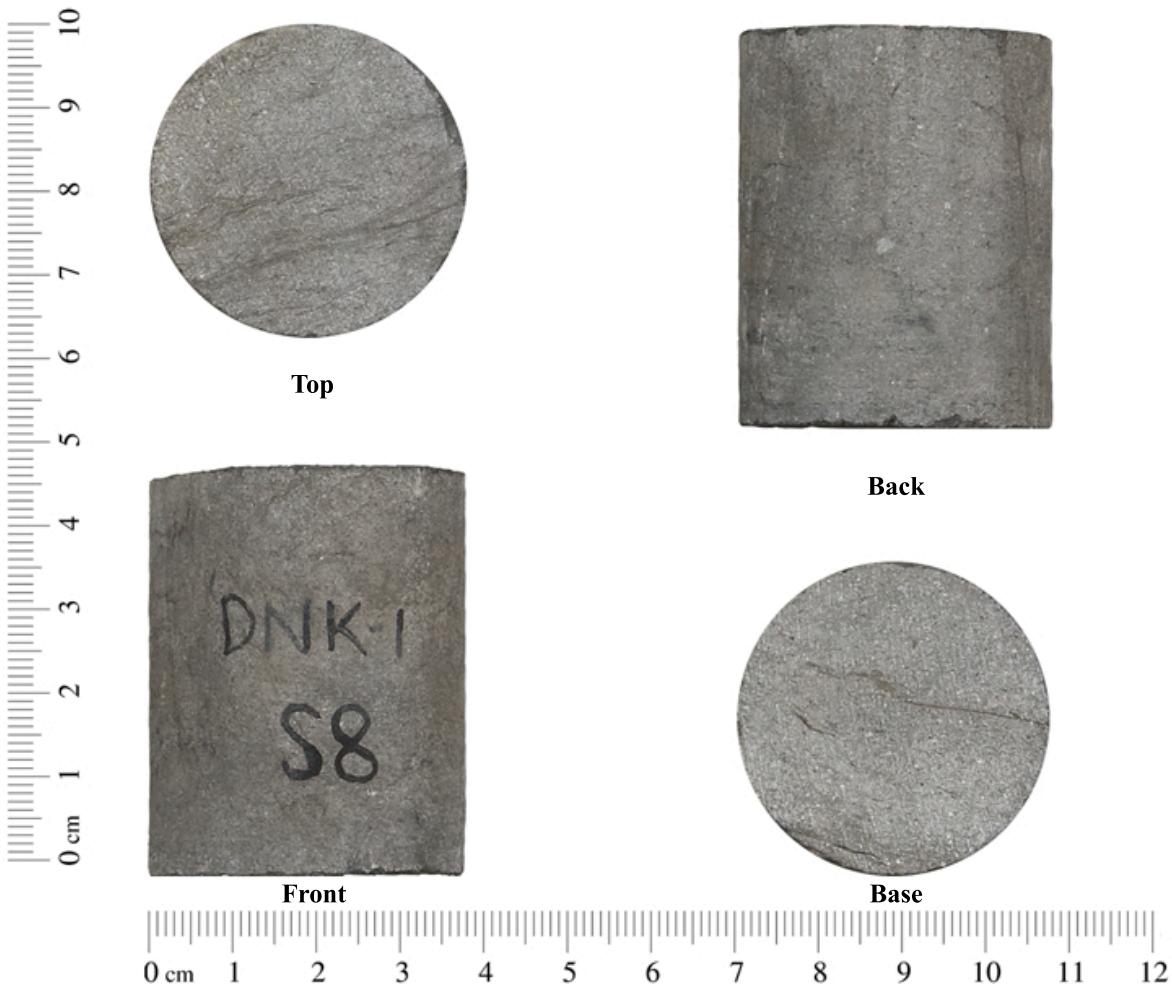


Base

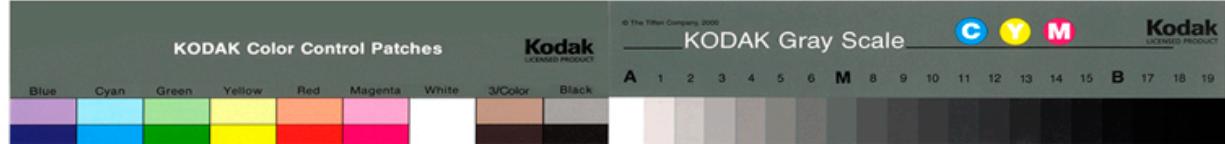


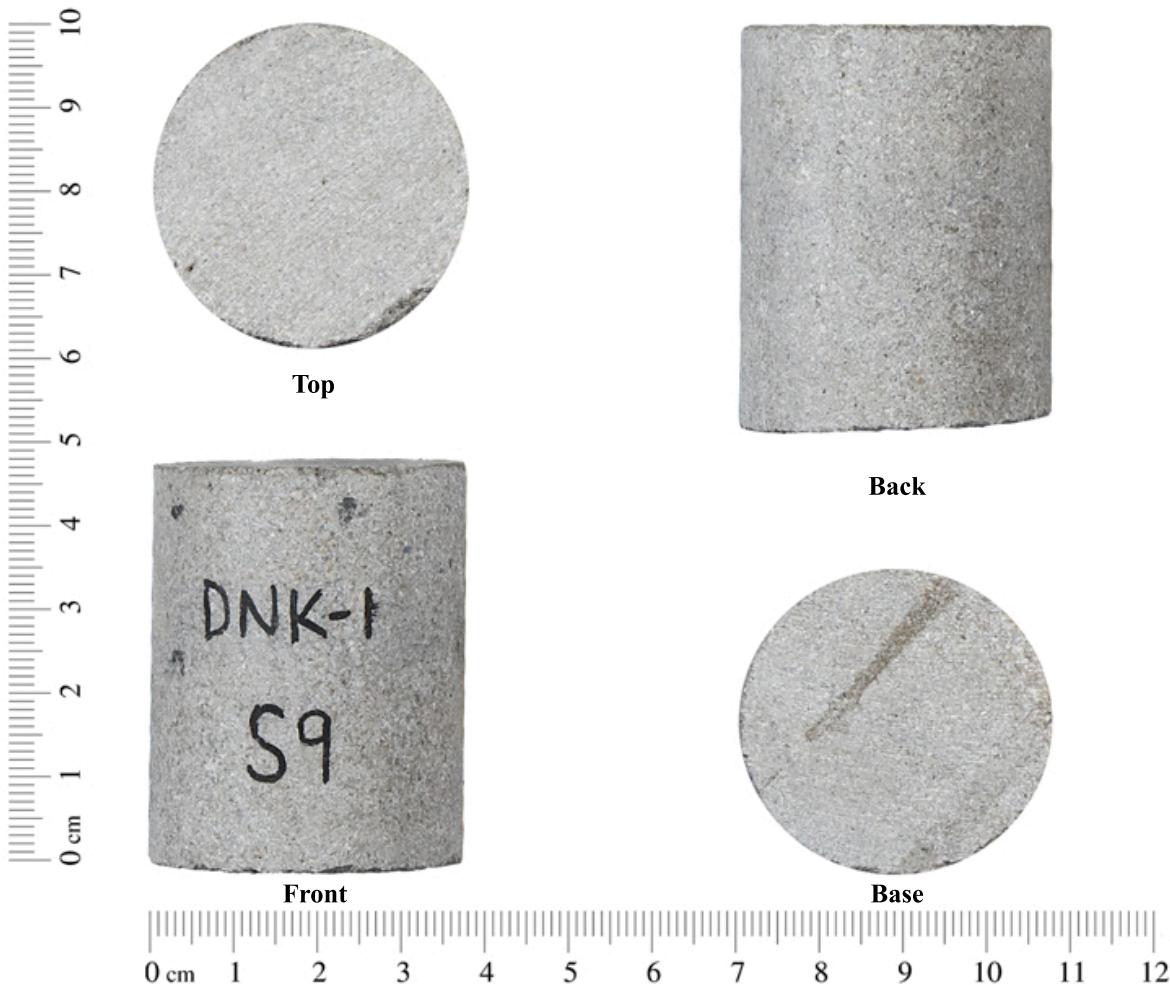
Sample No.:	S7
Depth:	2890.59 m
Permeability:	0.023 mD
Porosity:	4.9 %



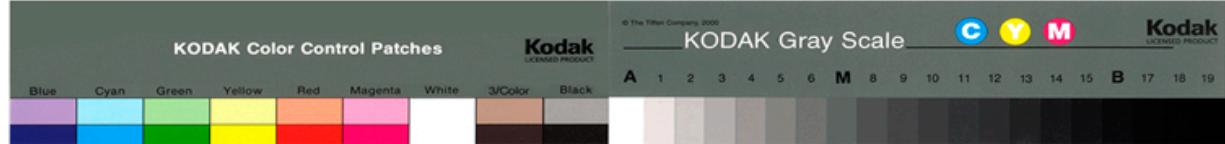


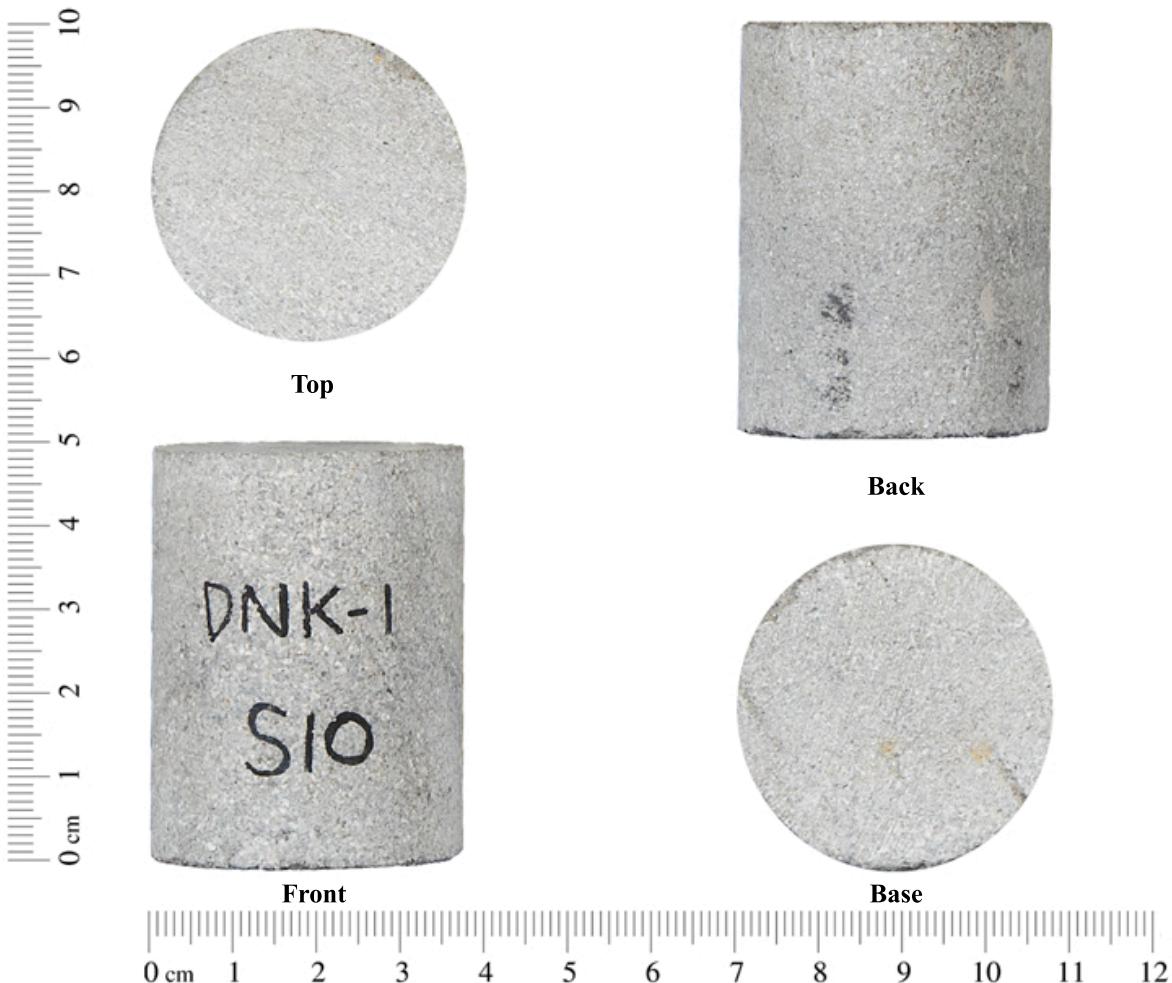
Sample No.:	S8
Depth:	2890.64 m
Permeability:	0.012 mD
Porosity:	4.6 %



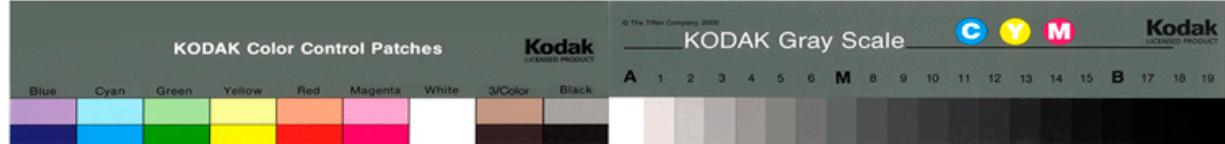


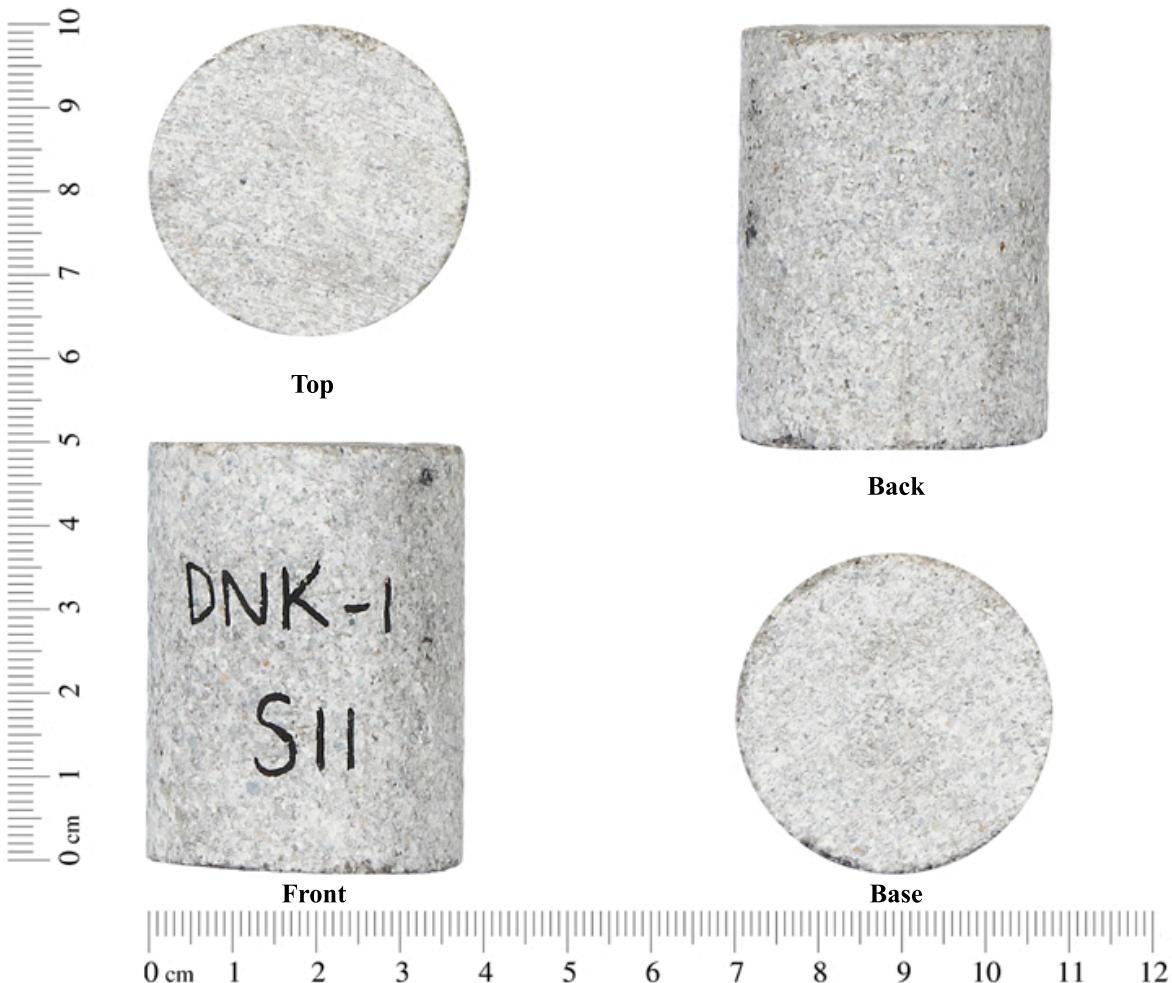
Sample No.:	S9
Depth:	2895.40 m
Permeability:	0.0083 mD
Porosity:	7.9 %



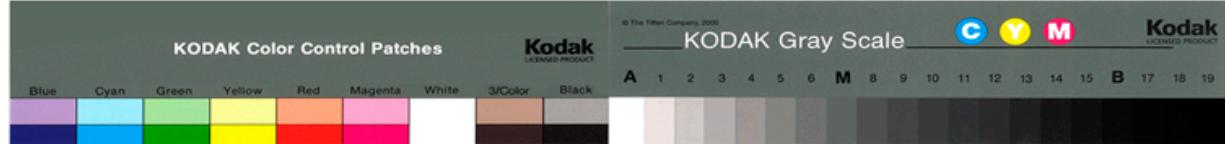


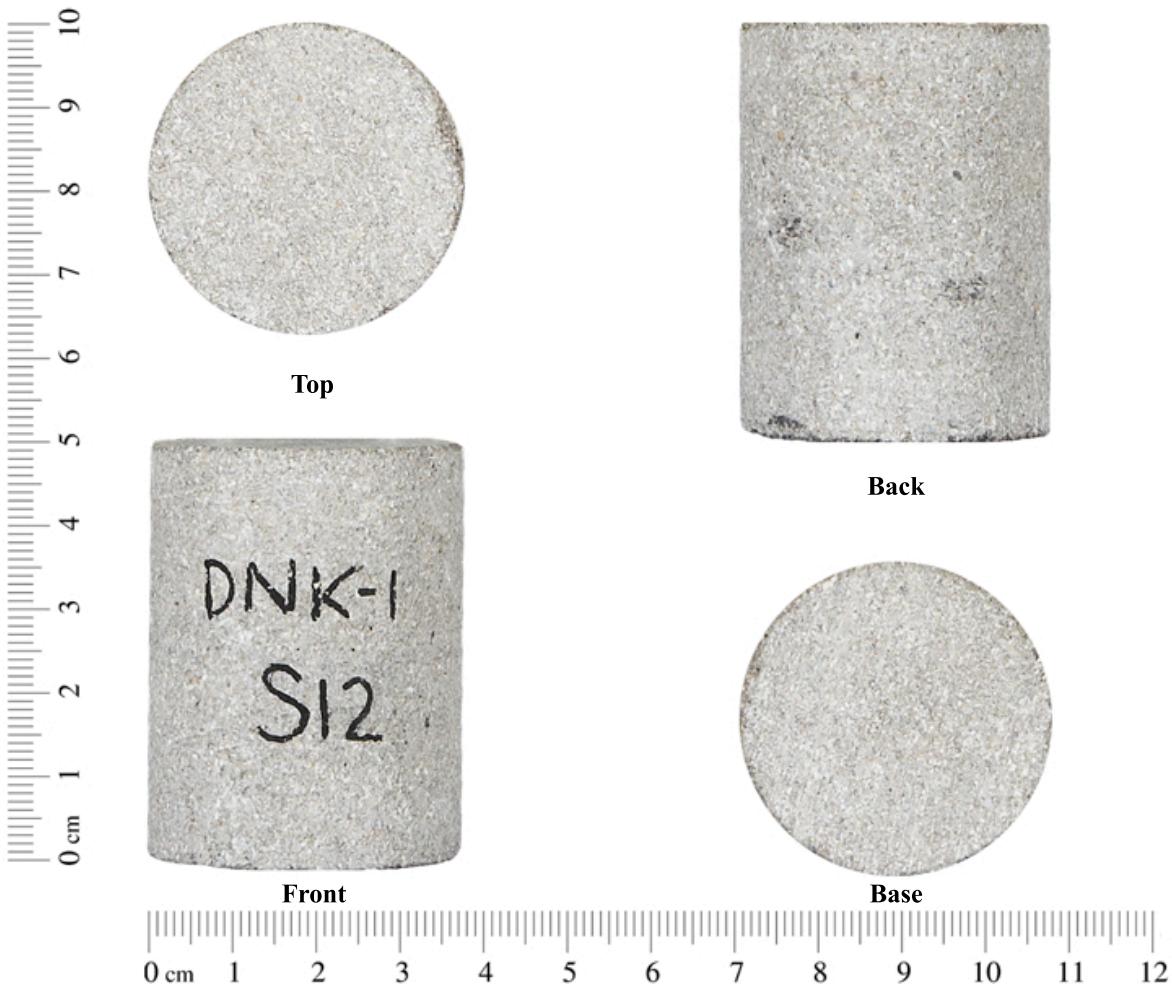
Sample No.:	S10
Depth:	2895.45 m
Permeability:	0.0084 mD
Porosity:	7.2 %





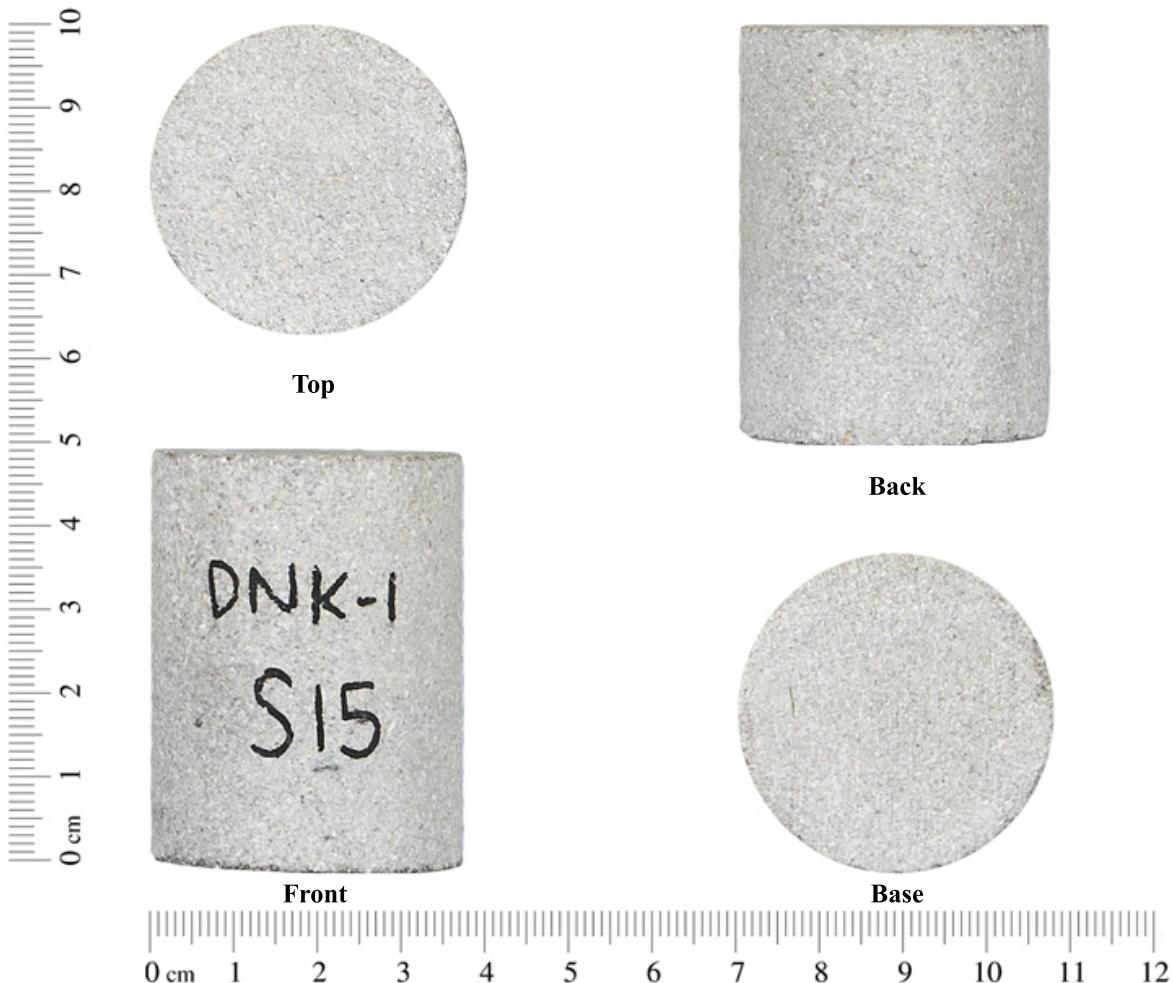
Sample No.:	S11
Depth:	2897.30 m
Permeability:	0.014 mD
Porosity:	5.7 %





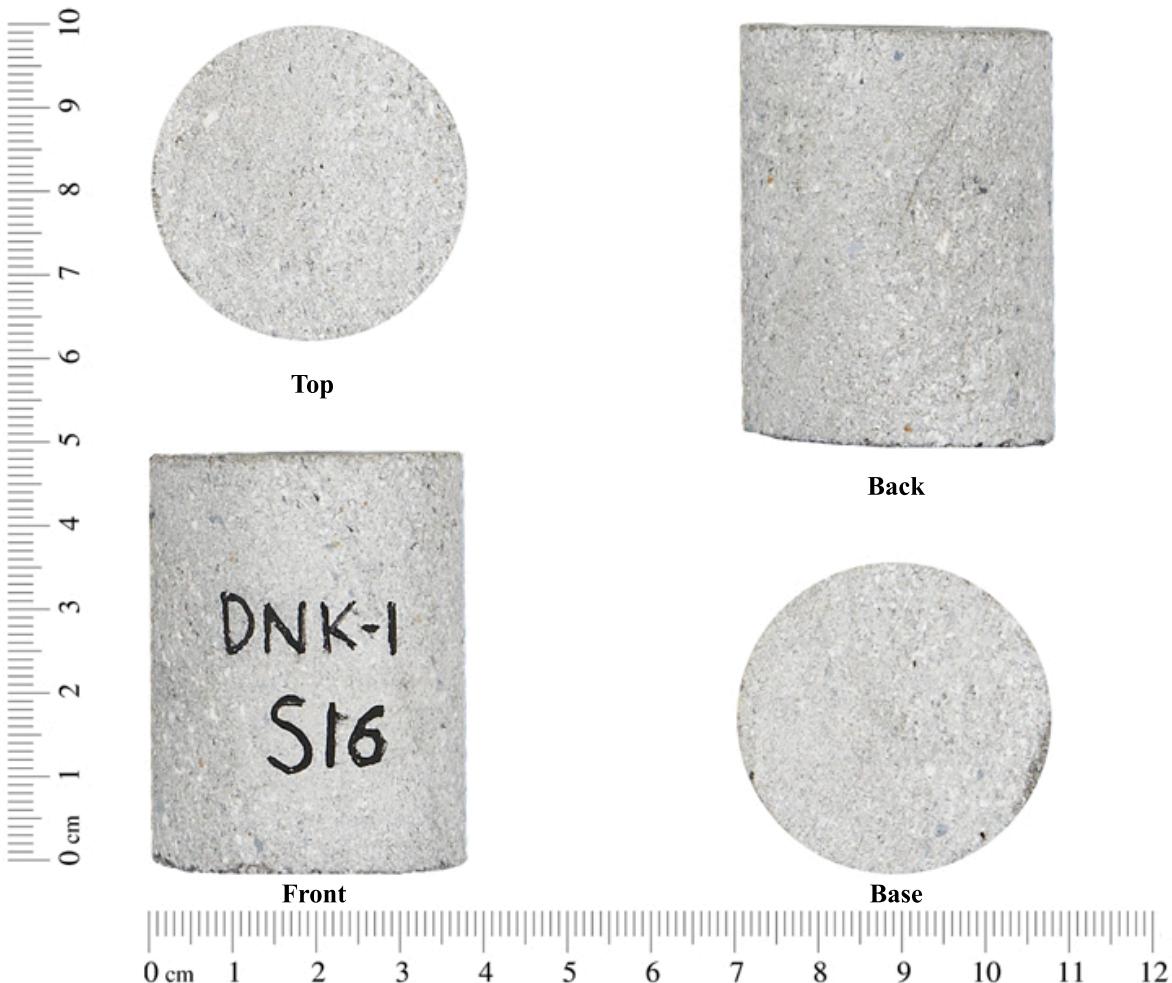
Sample No.:	S12
Depth:	2897.35 m
Permeability:	0.061 mD
Porosity:	12.1 %



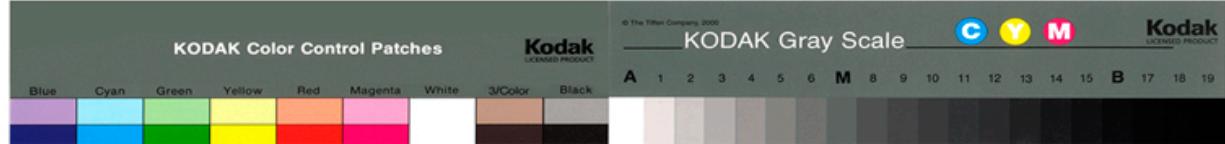


Sample No.:	S15
Depth:	2900.40 m
Permeability:	0.031 mD
Porosity:	9.3 %



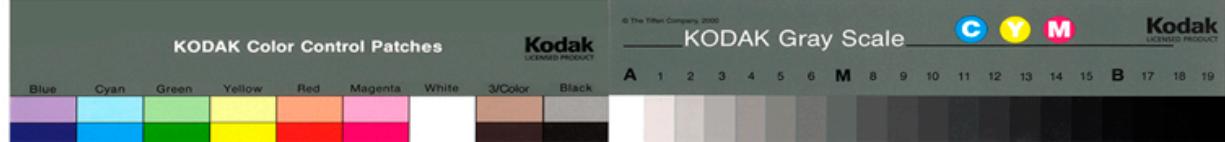


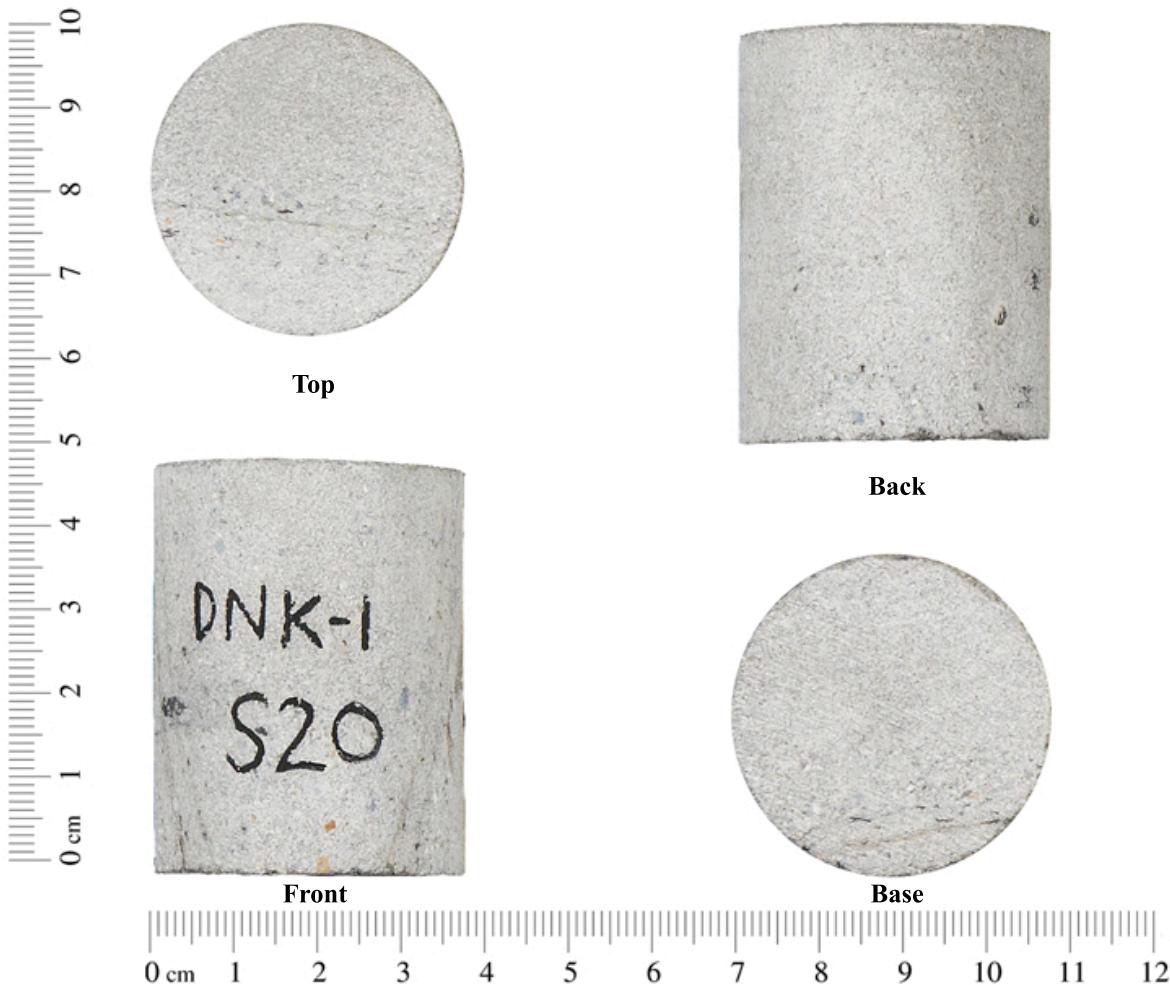
Sample No.:	S16
Depth:	2900.45 m
Permeability:	0.045 mD
Porosity:	8.3 %



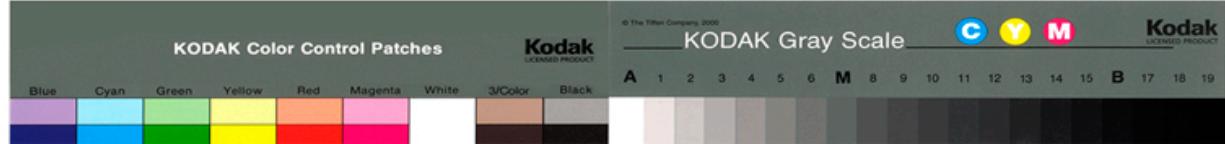


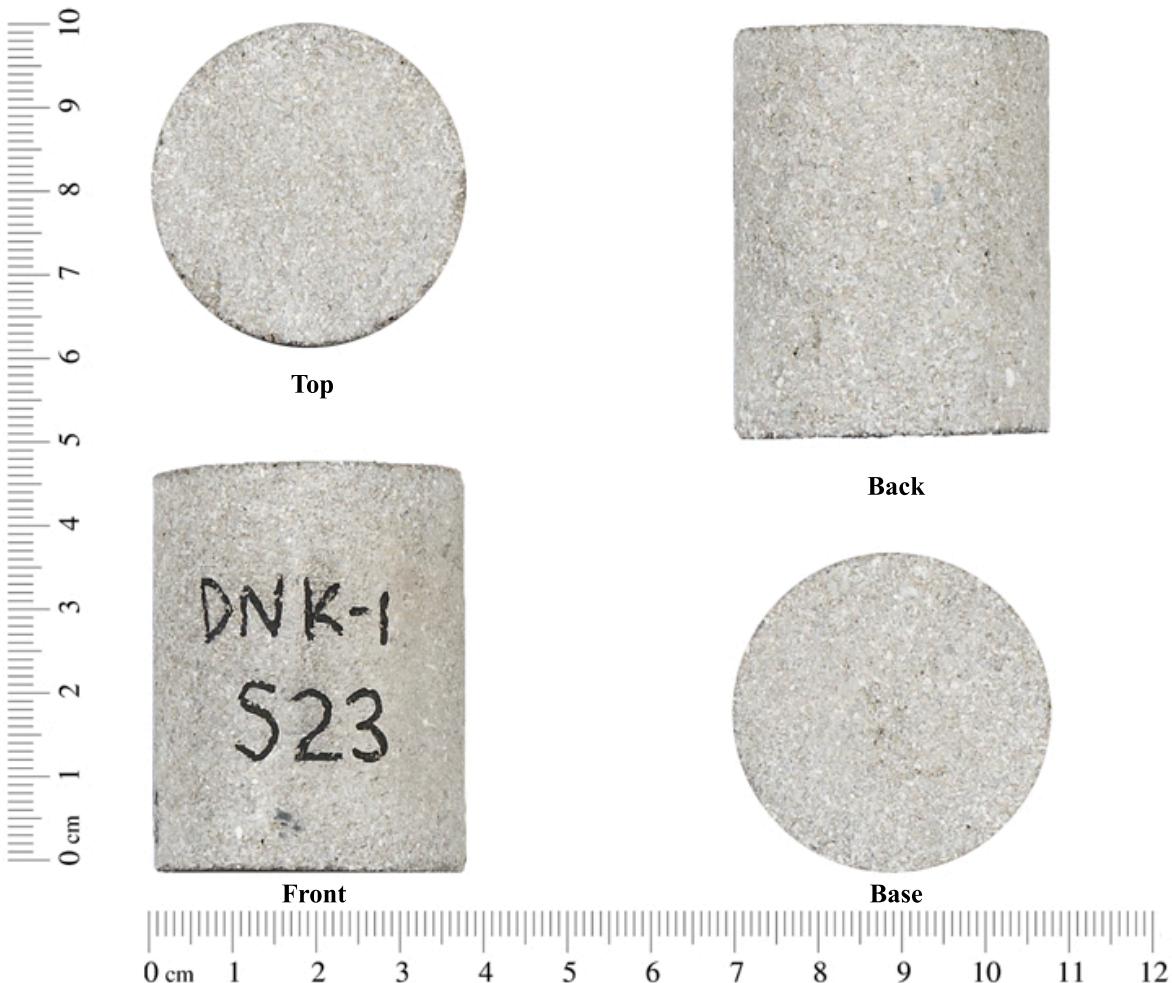
Sample No.:	S19
Depth:	2908.70 m
Permeability:	0.026 mD
Porosity:	10.4 %



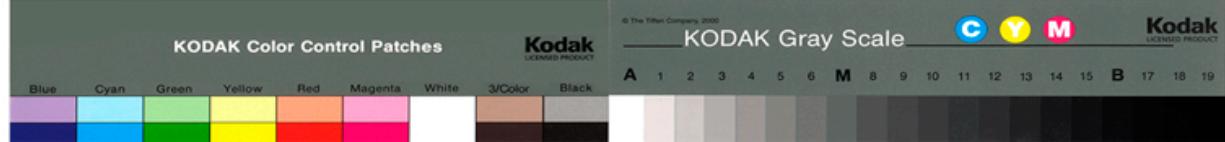


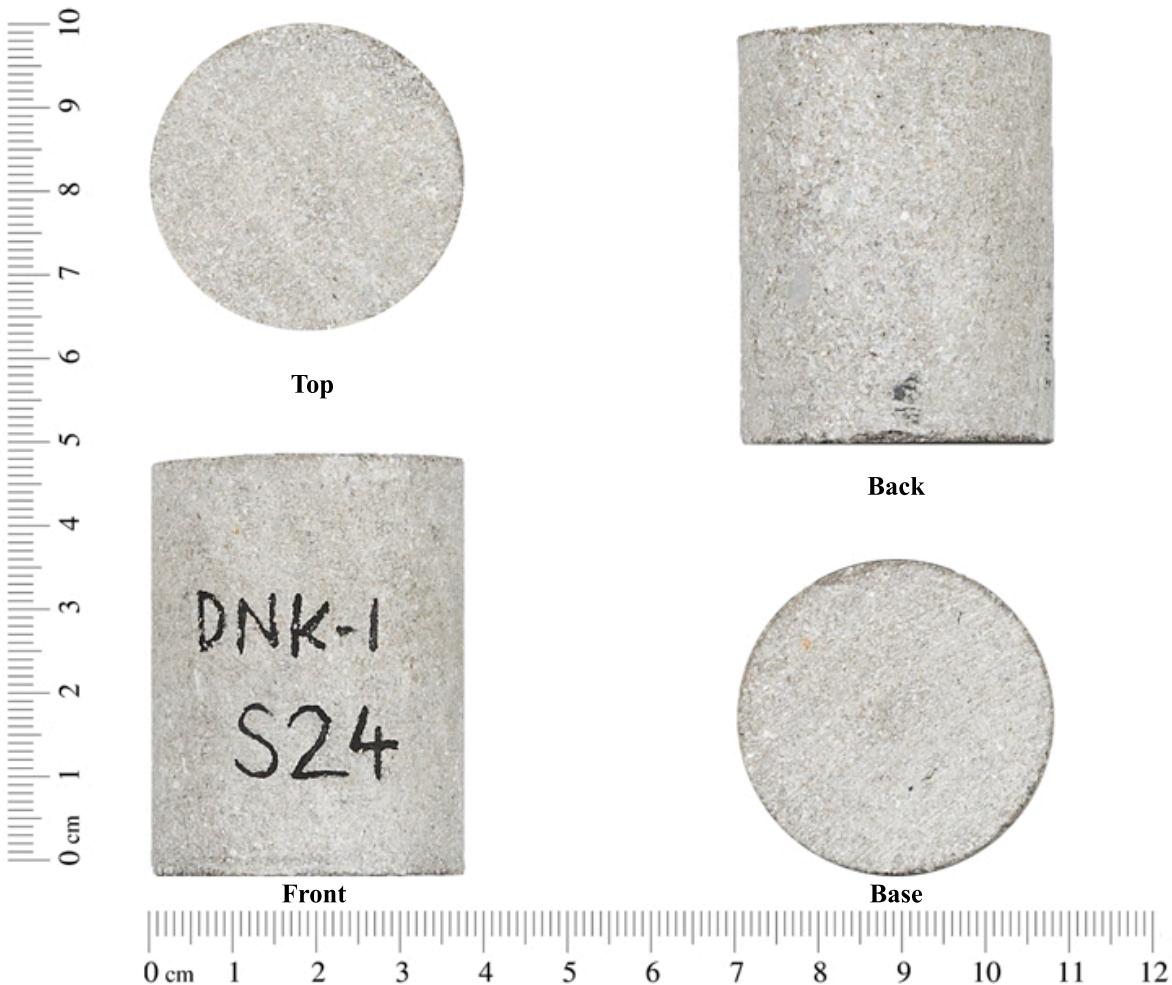
Sample No.:	S20
Depth:	2908.75 m
Permeability:	0.040 mD
Porosity:	8.6 %



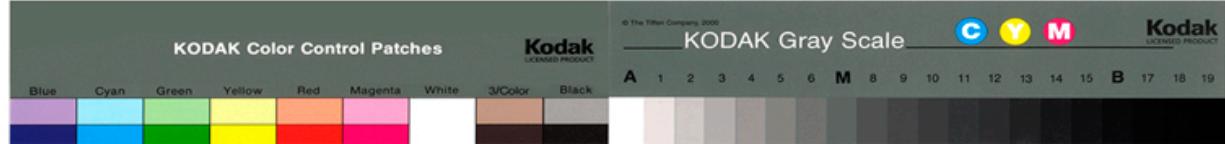


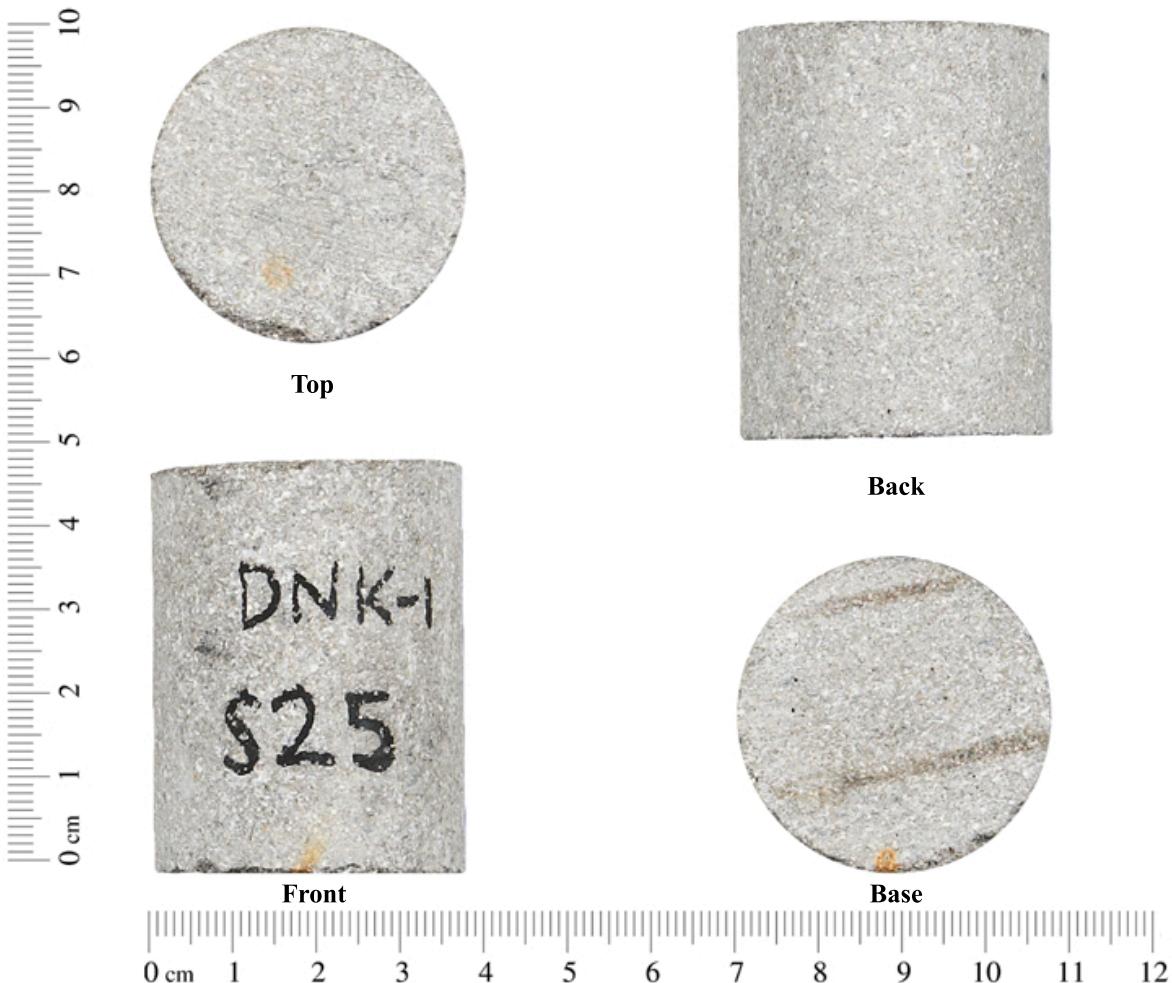
Sample No.:	S23
Depth:	2913.45 m
Permeability:	0.045 mD
Porosity:	13.7 %



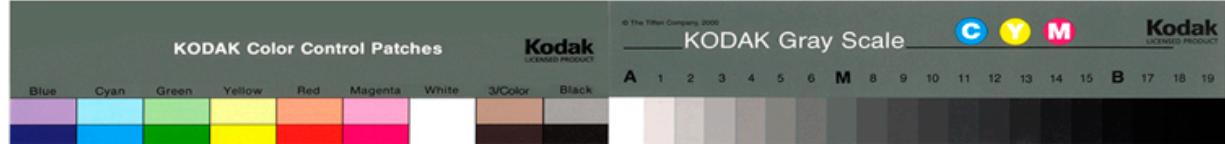


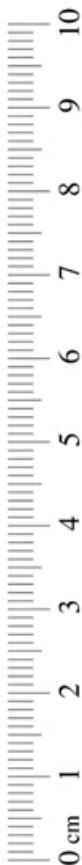
Sample No.:	S24
Depth:	2913.50 m
Permeability:	0.044 mD
Porosity:	12.8 %





Sample No.:	S25
Depth:	2916.30 m
Permeability:	0.048 mD
Porosity:	12.1 %





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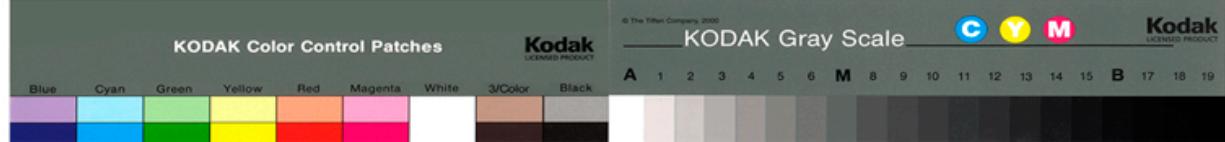
Front

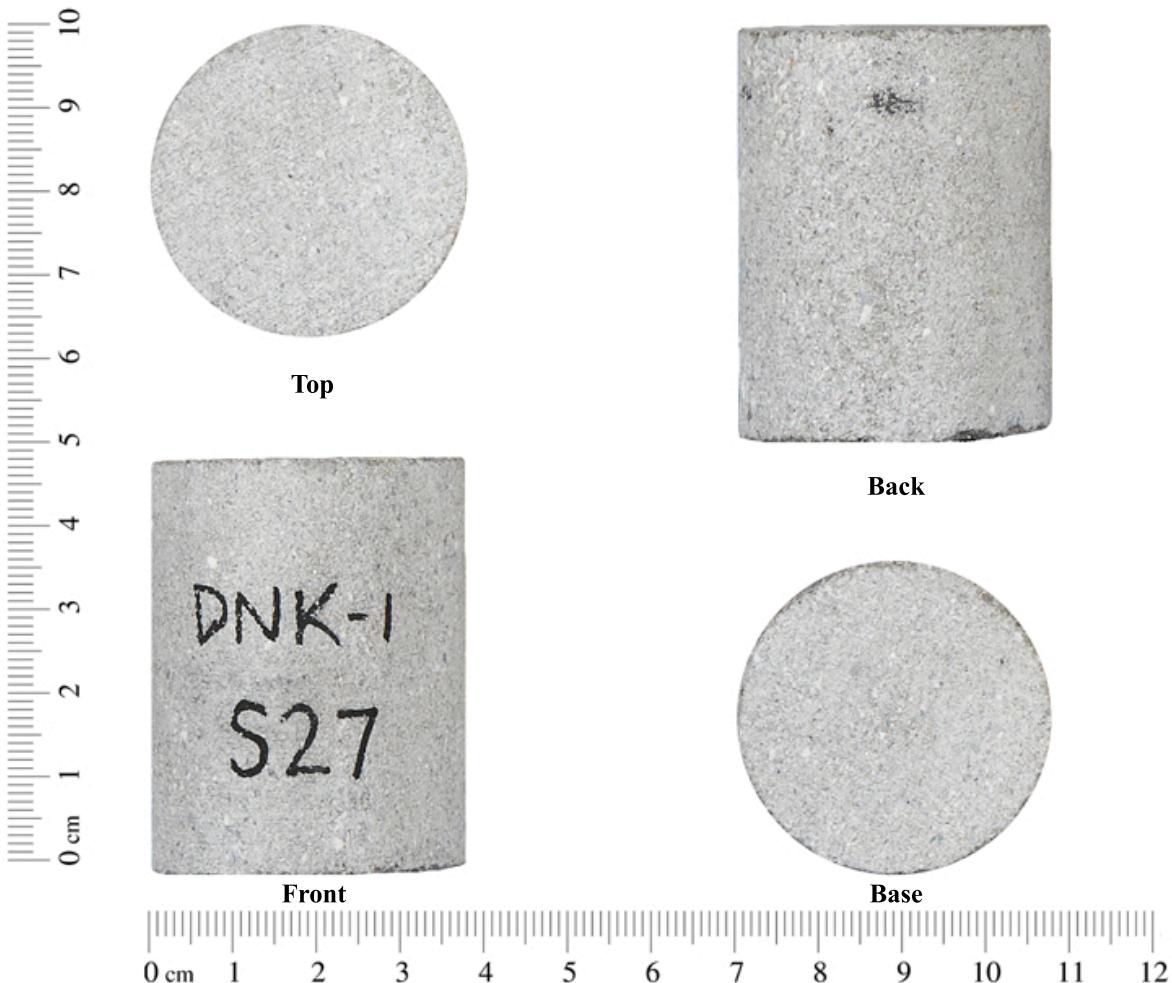


Base

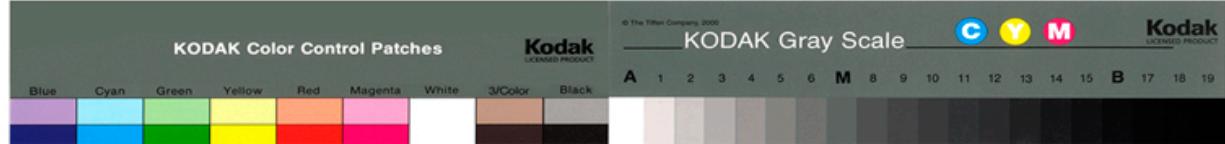


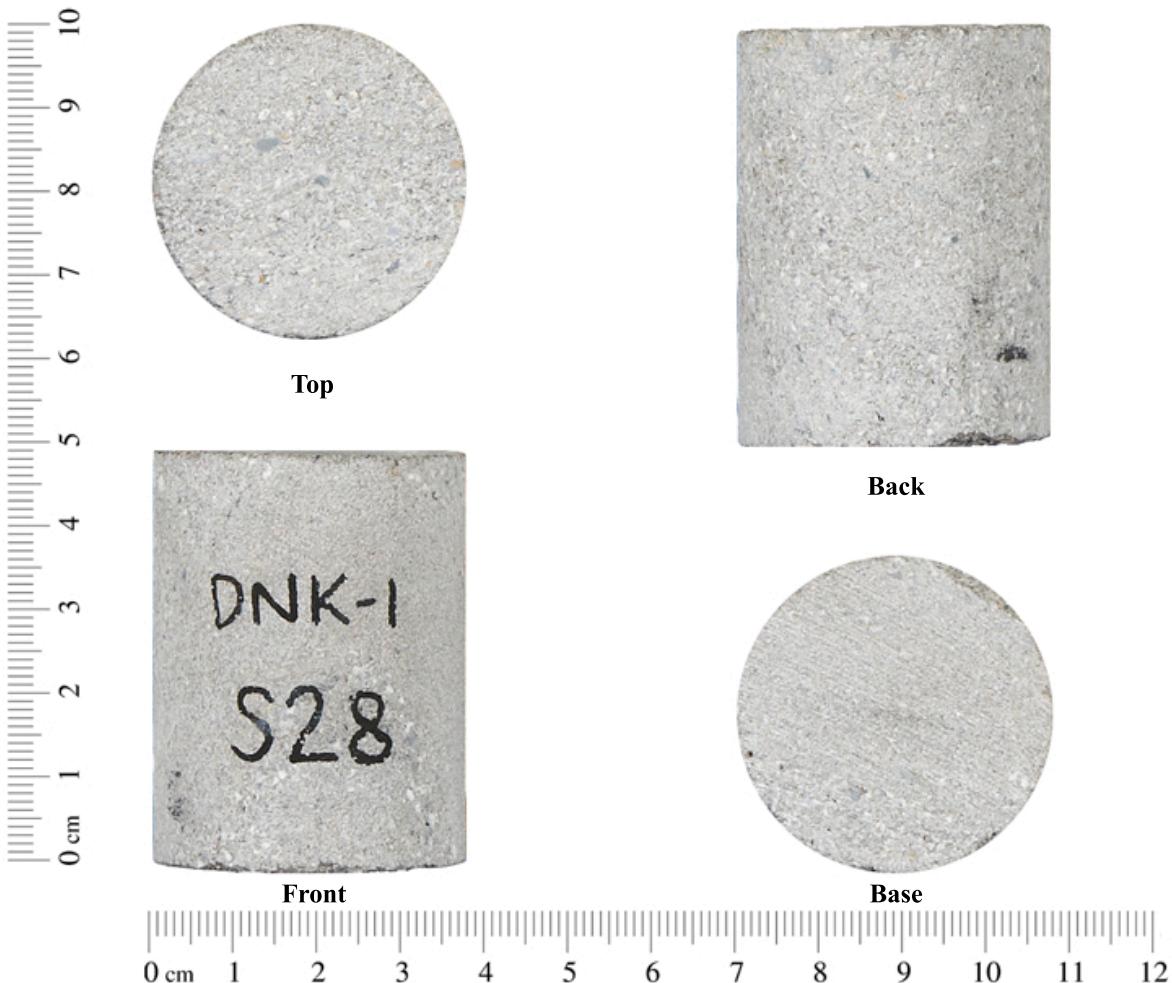
Sample No.:	S26
Depth:	2916.35 m
Permeability:	0.063 mD
Porosity:	10.4 %



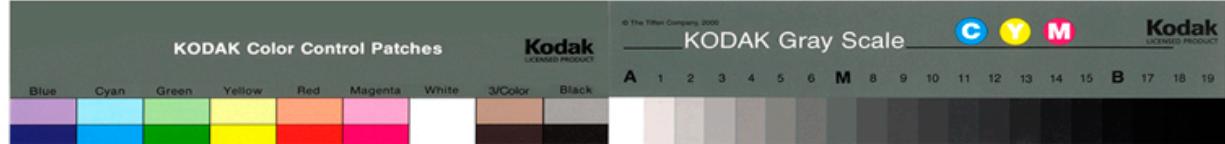


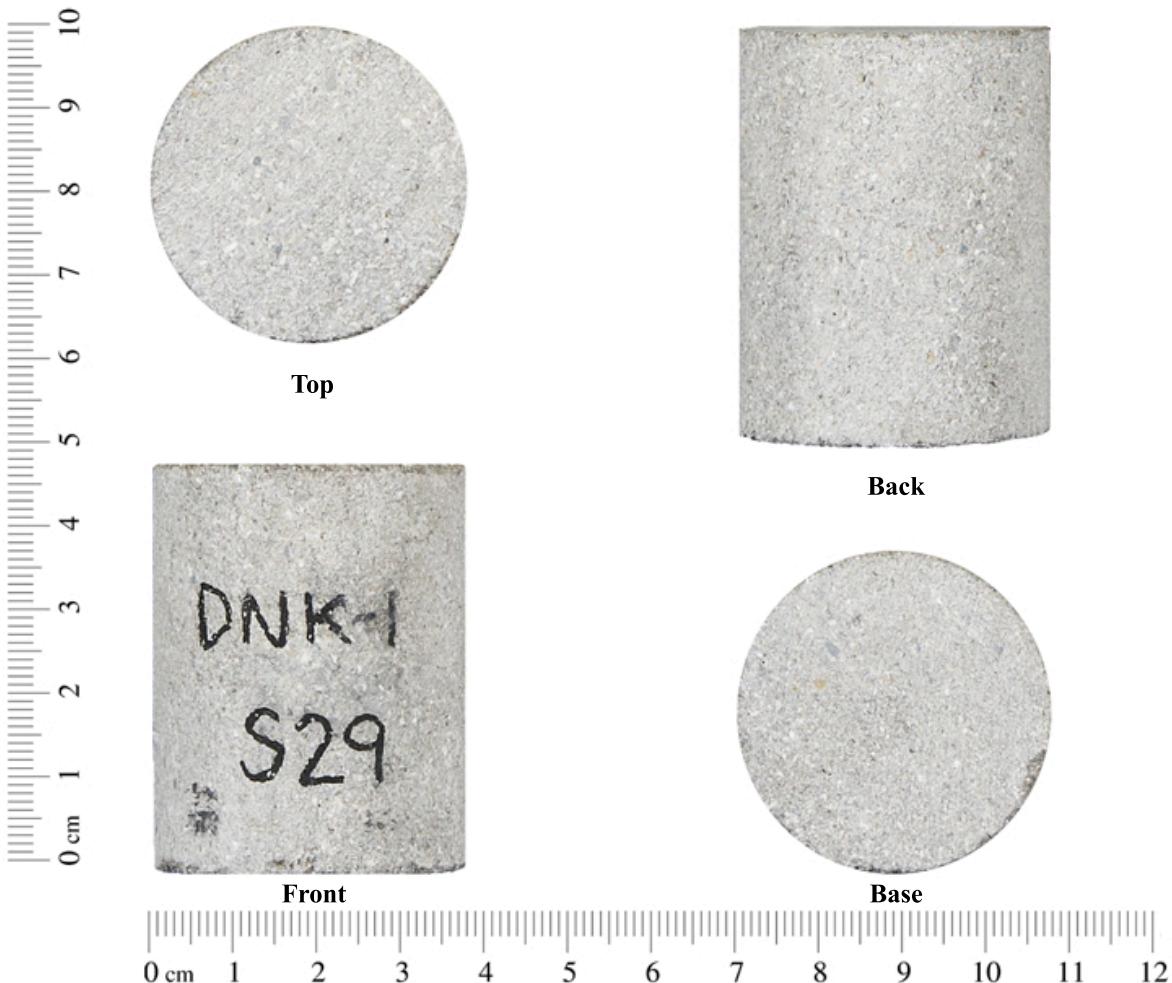
Sample No.:	S27
Depth:	2920.70 m
Permeability:	0.026 mD
Porosity:	8.7 %



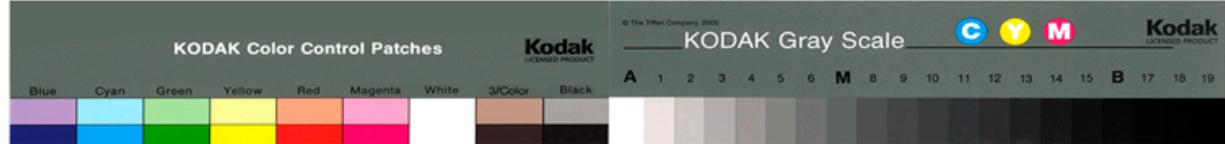


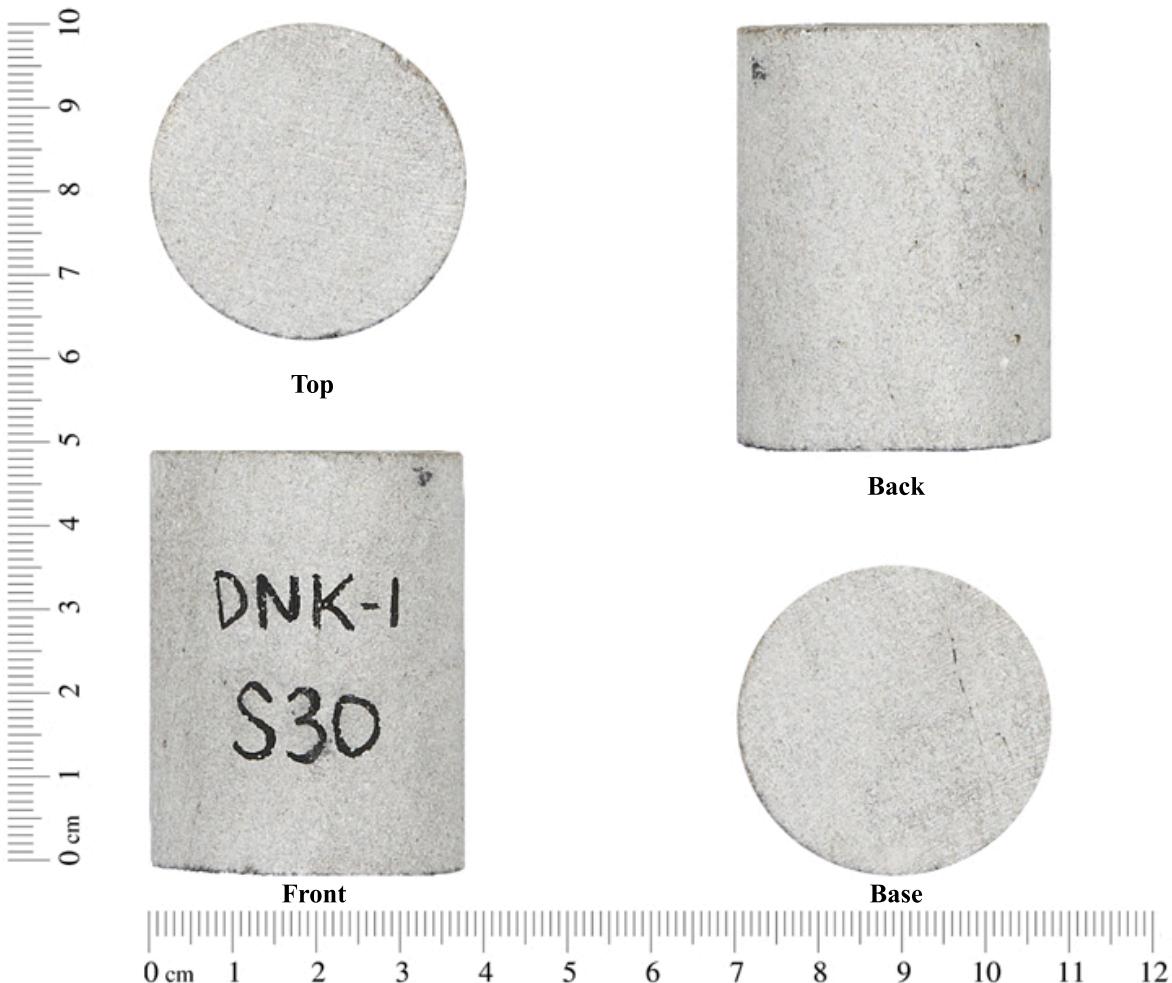
Sample No.:	S28
Depth:	2920.76 m
Permeability:	0.029 mD
Porosity:	8.8 %



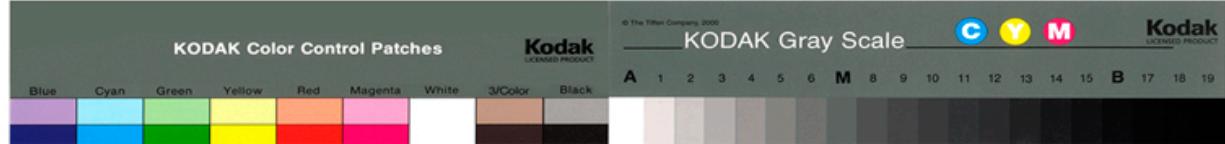


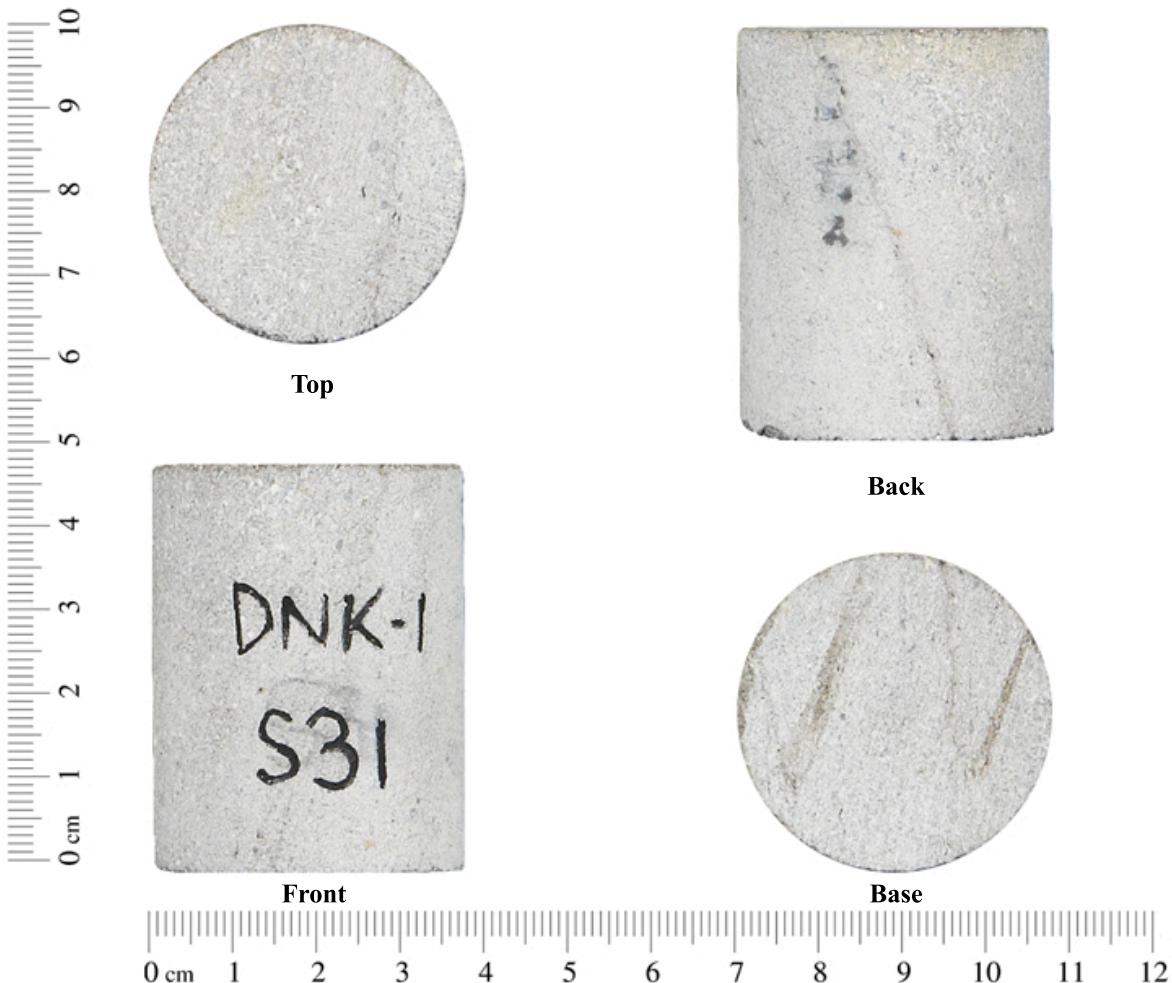
Sample No.:	S29
Depth:	2921.35 m
Permeability:	0.034 mD
Porosity:	9.8 %



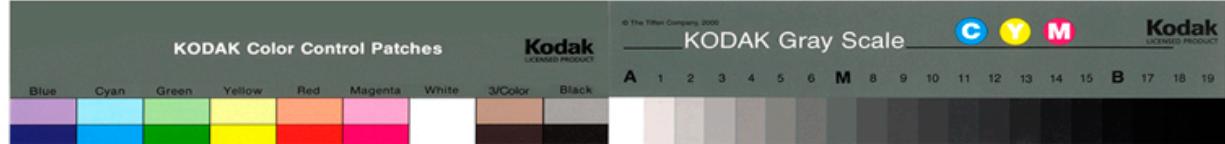


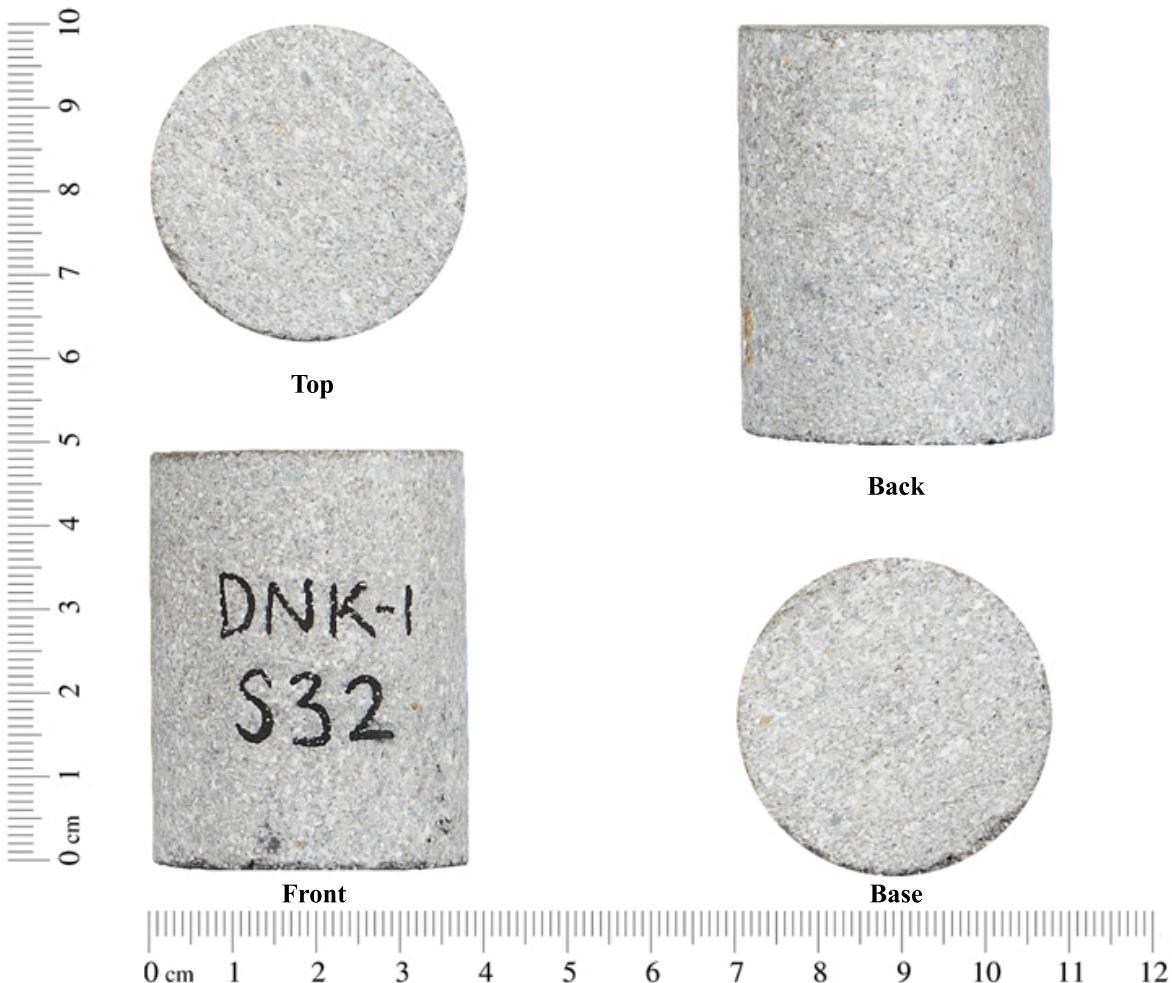
Sample No.:	S30
Depth:	2921.40 m
Permeability:	0.022 mD
Porosity:	8.3 %



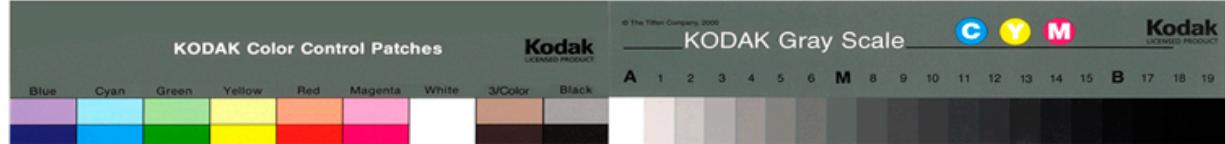


Sample No.:	S31
Depth:	2923.90 m
Permeability:	0.028 mD
Porosity:	6.9 %

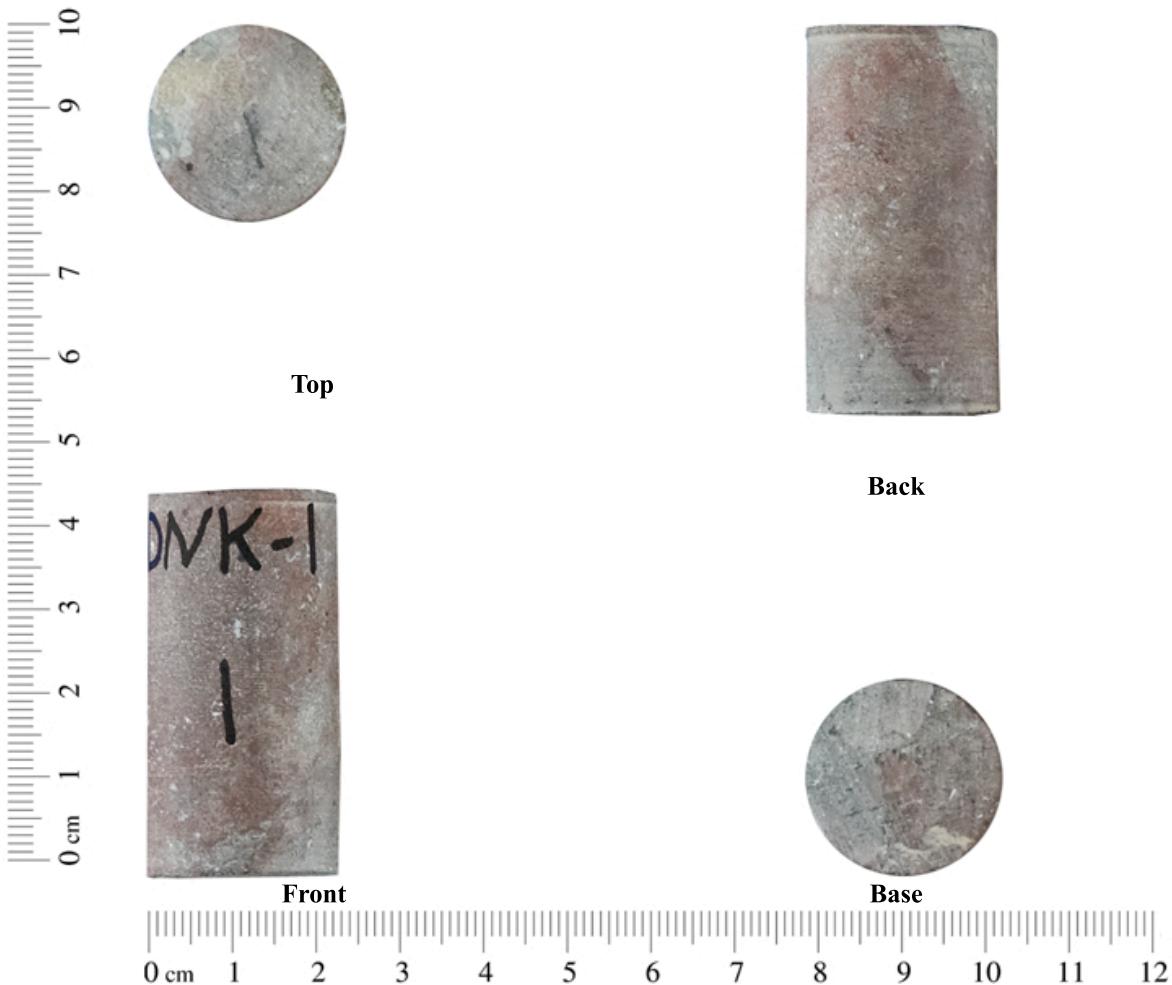




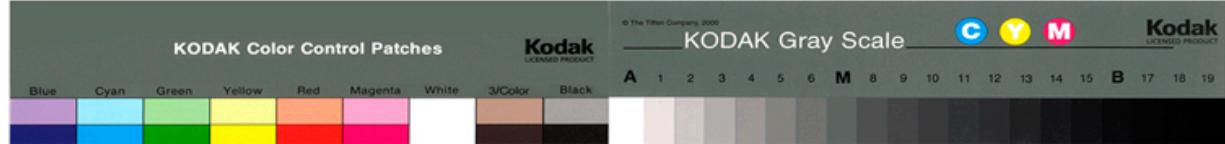
Sample No.:	S32
Depth:	2923.95 m
Permeability:	0.042 mD
Porosity:	9.4 %

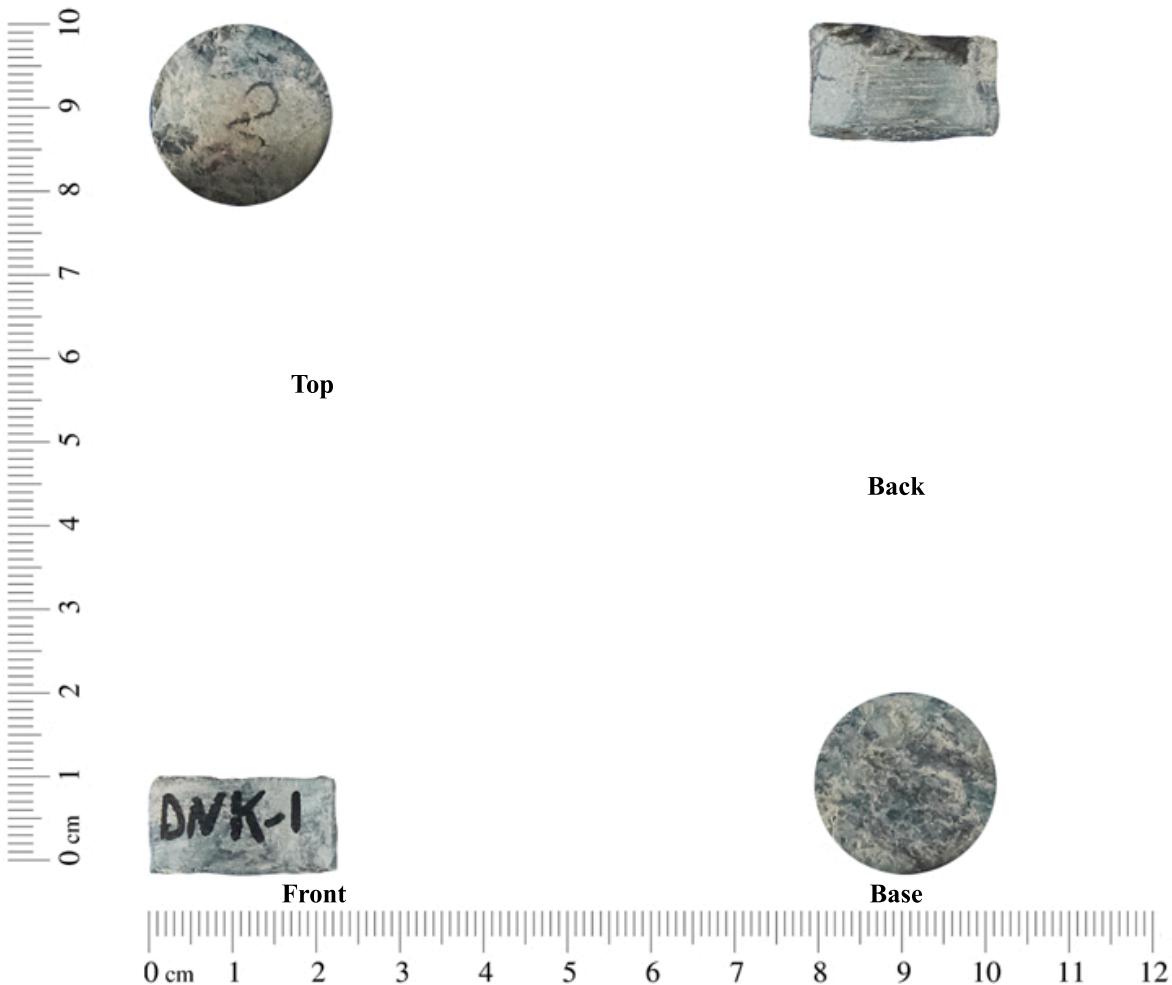


APPENDIX IX
SIDEWALL CORE PHOTOGRAPHY

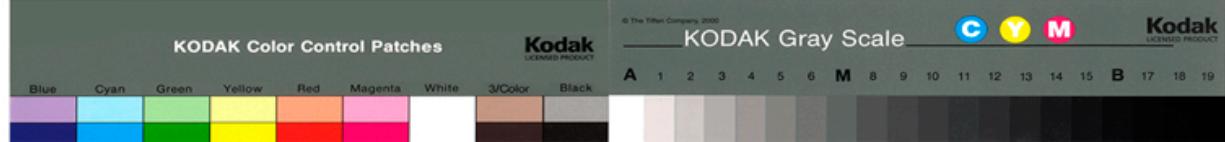


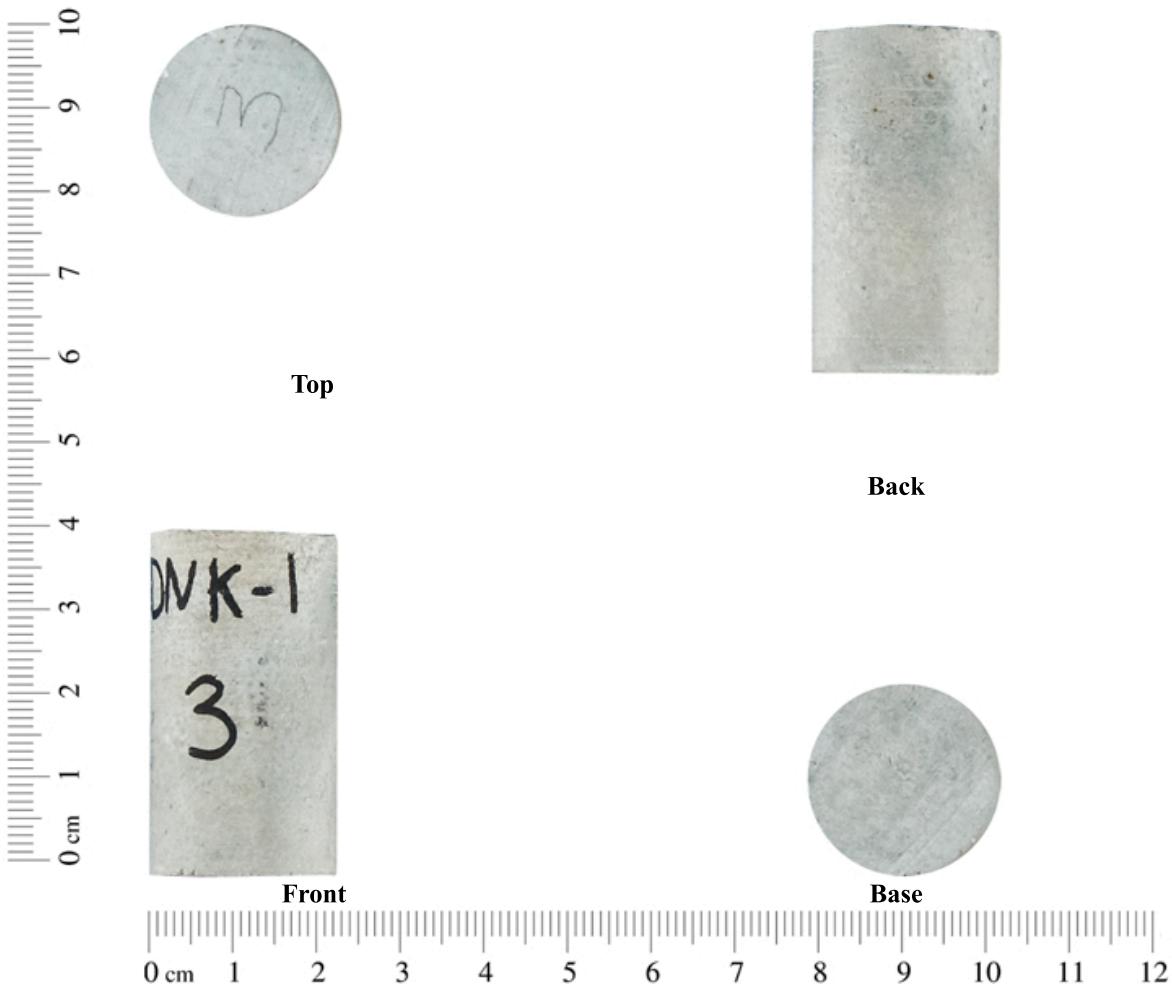
Sample No.:	1
Depth:	3133.75 m
Permeability:	0.0059 mD
Porosity:	4.9 %



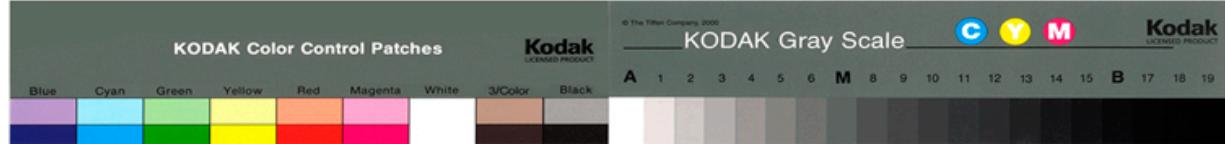


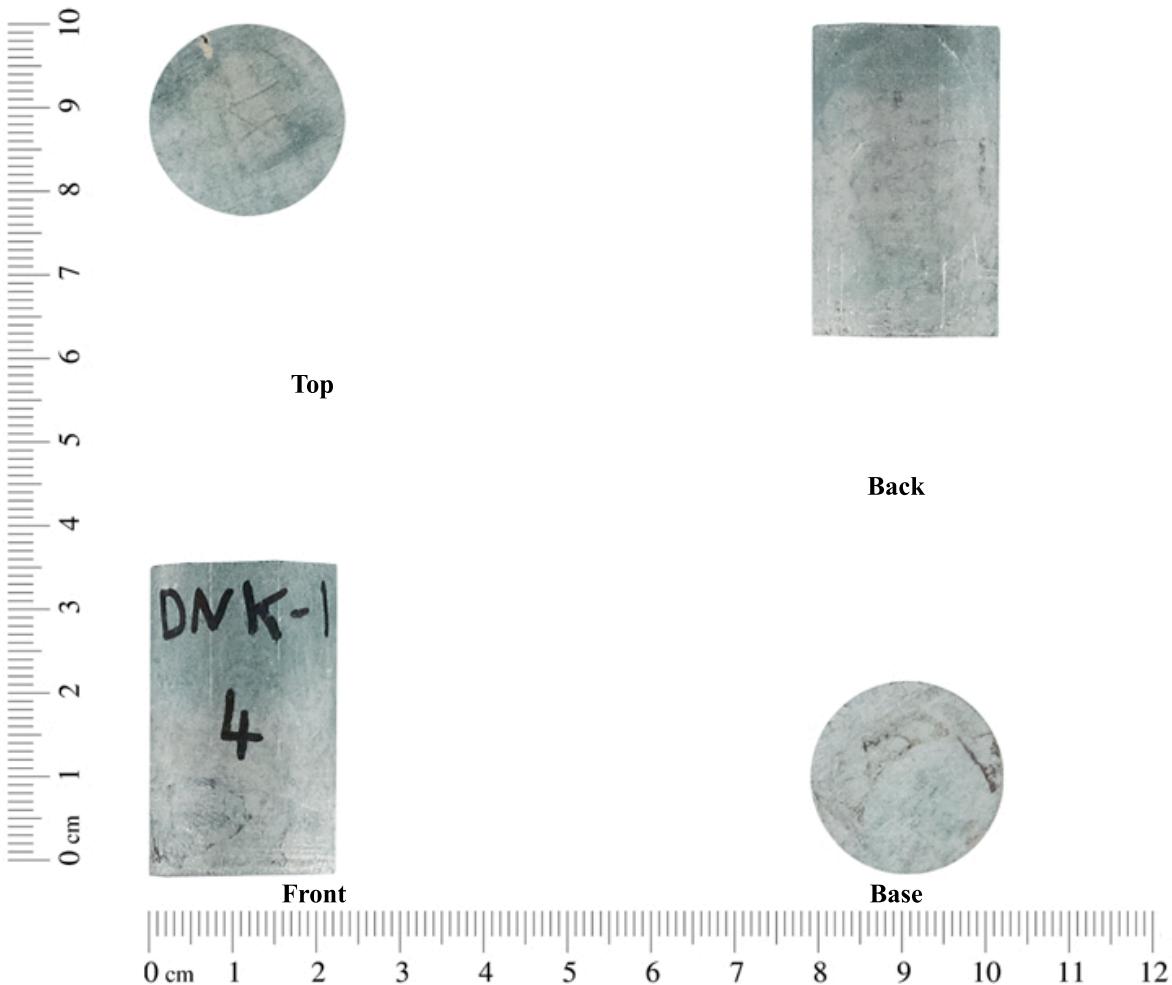
Sample No.:	2
Depth:	3126.00 m
Permeability:	
Porosity:	2.3 %



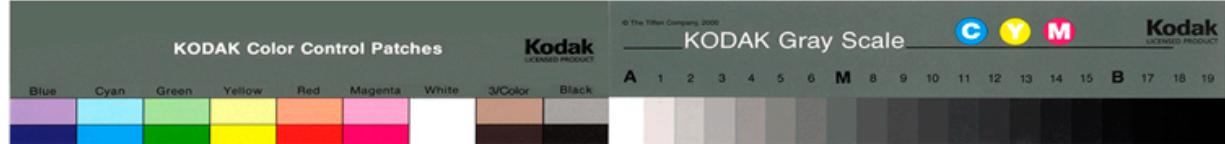


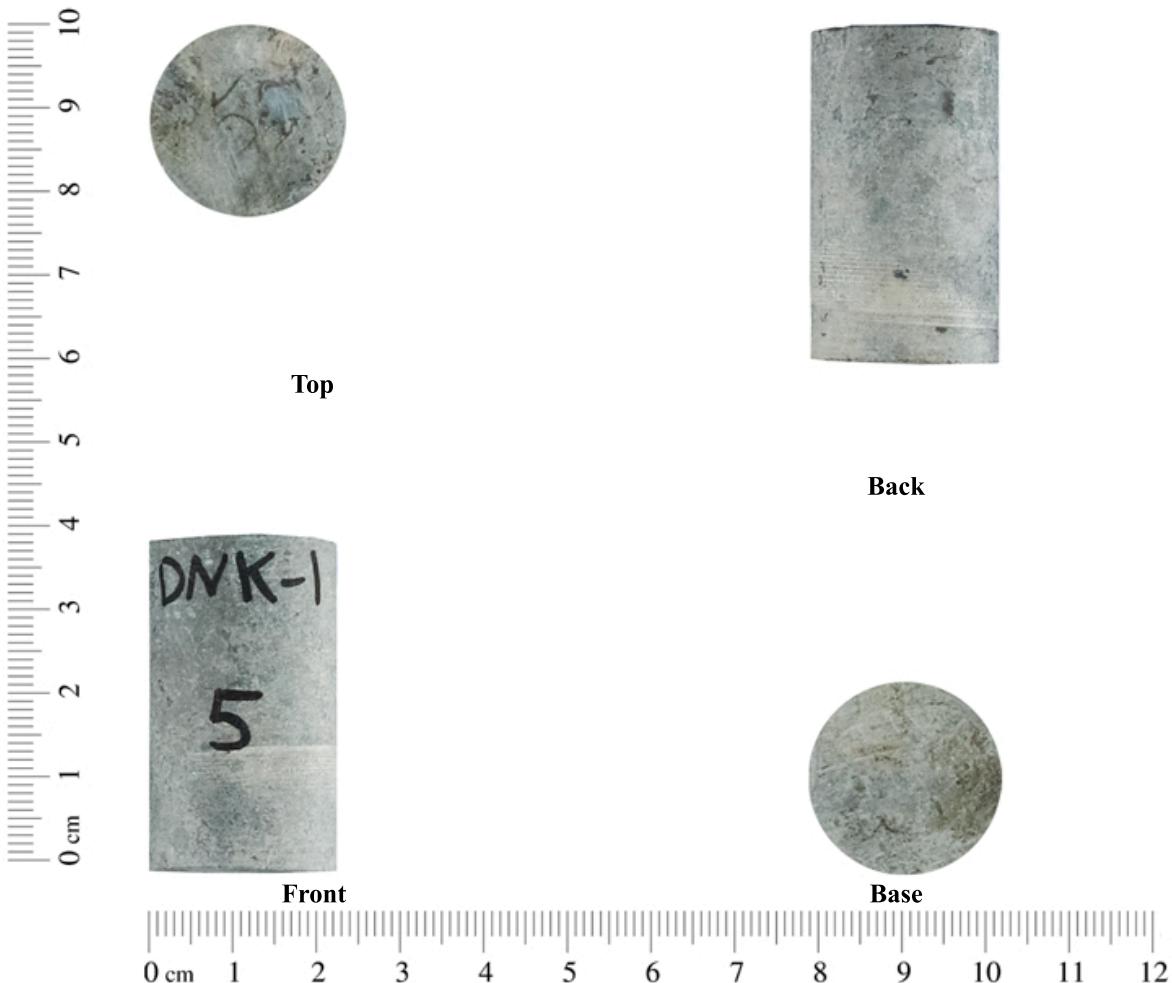
Sample No.:	3
Depth:	3120.00 m
Permeability:	0.098 mD
Porosity:	4.8 %



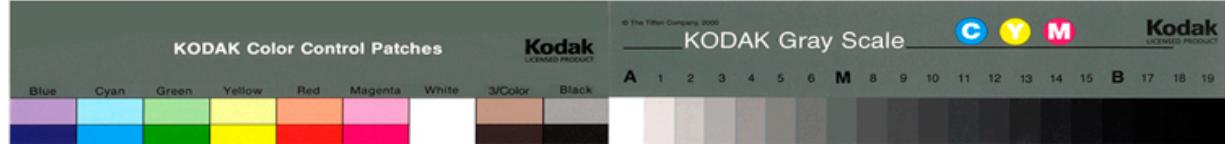


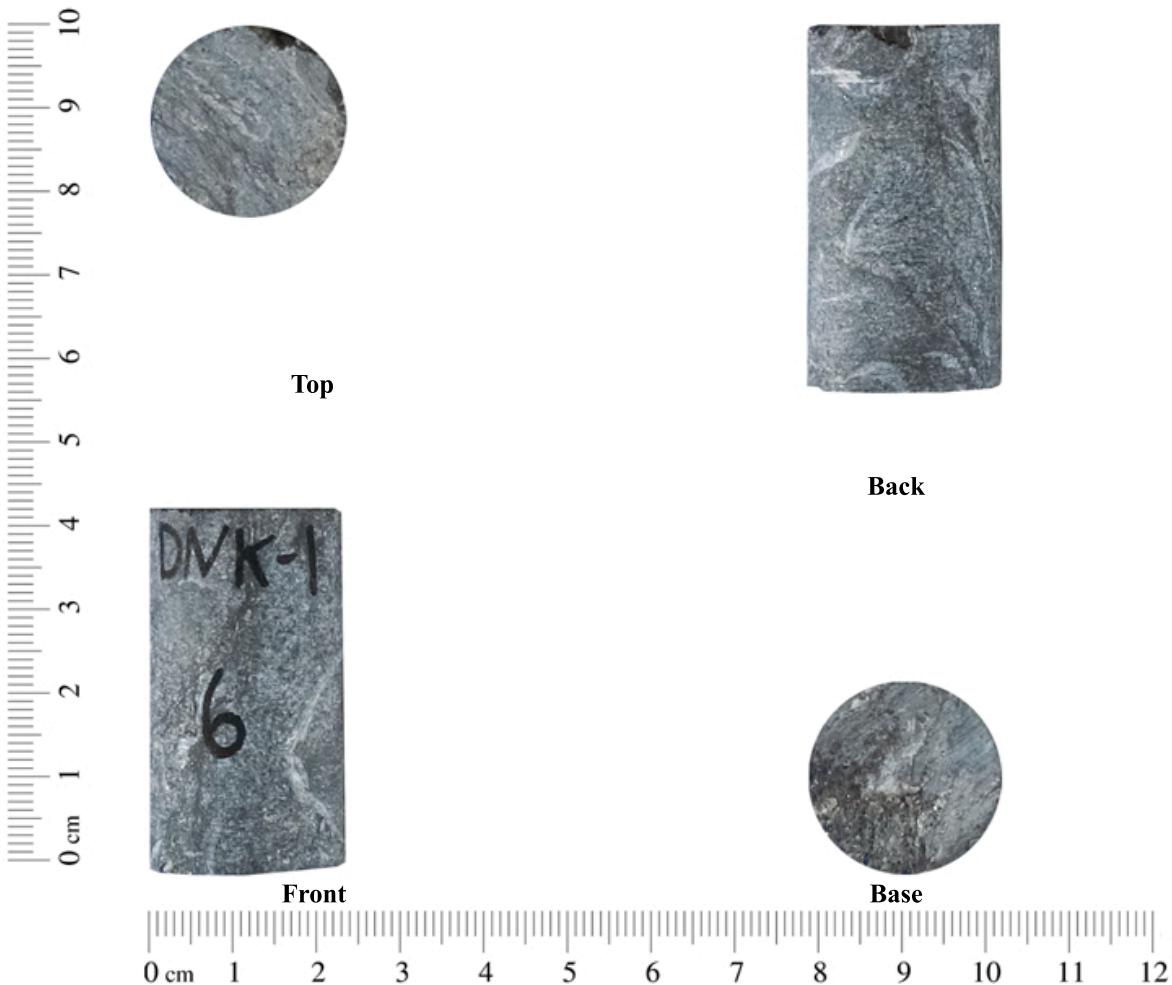
Sample No.:	4
Depth:	3116.00 m
Permeability:	0.0058 mD
Porosity:	3.6 %





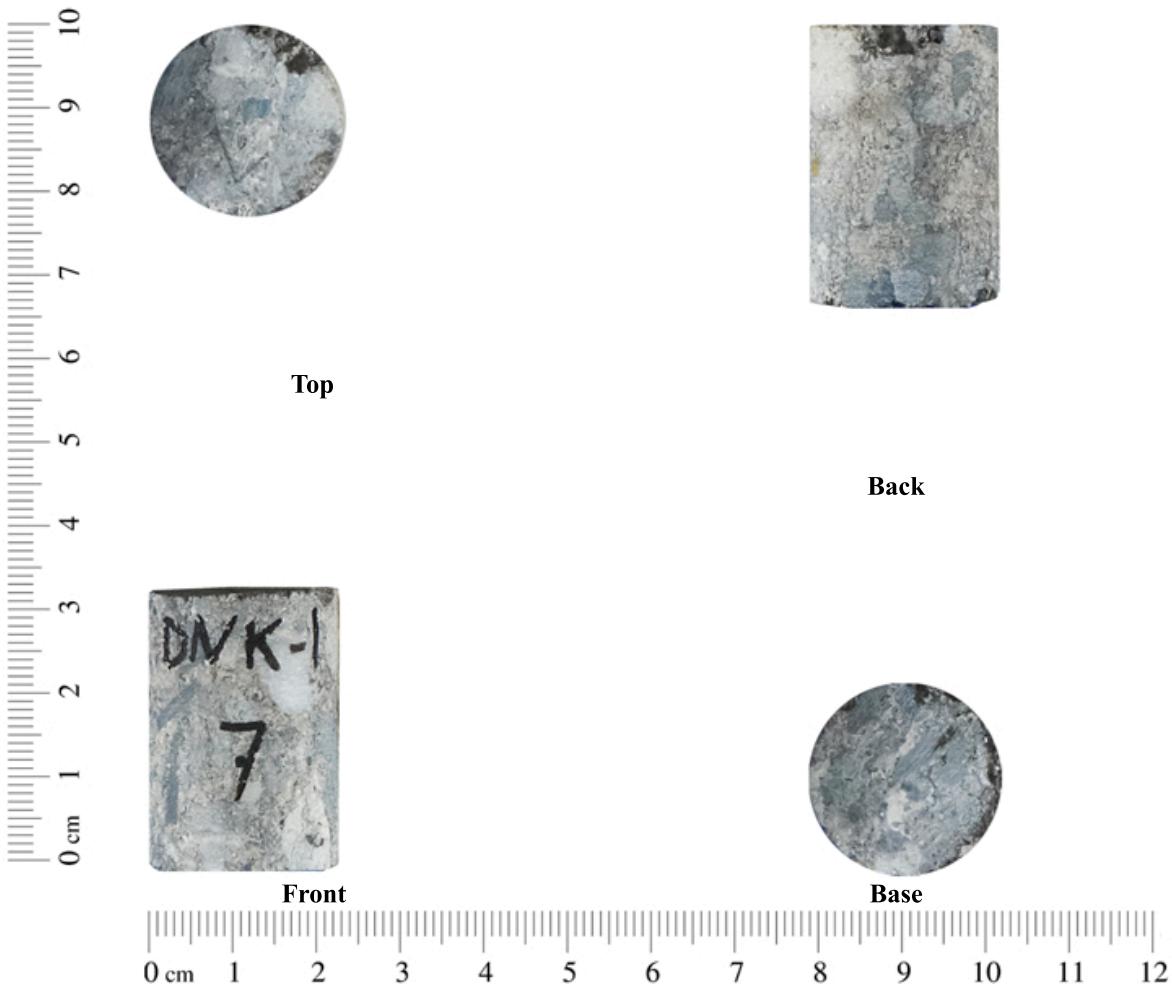
Sample No.:	5
Depth:	3112.78 m
Permeability:	0.0011 mD
Porosity:	1.3 %





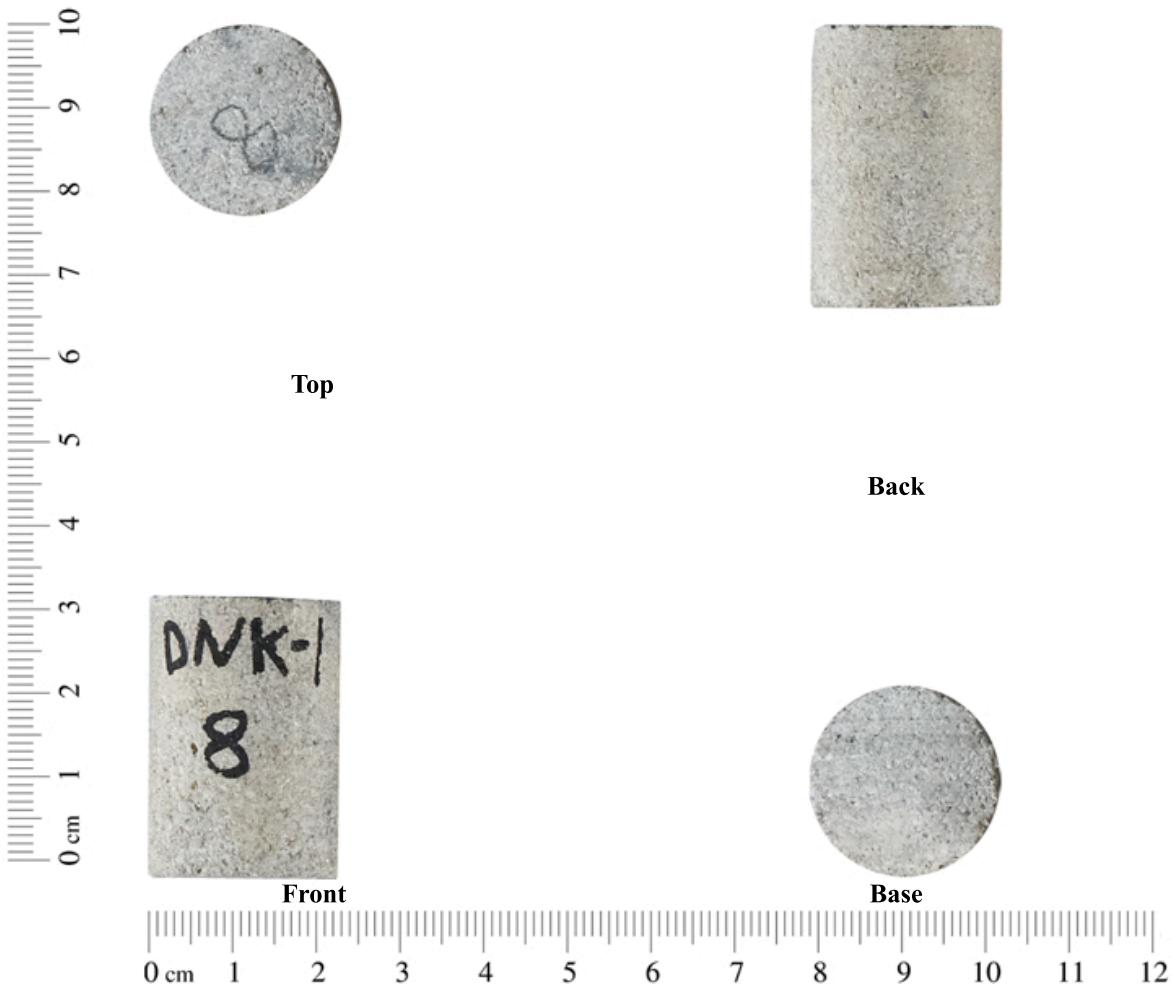
Sample No.:	6
Depth:	3093.00 m
Permeability:	0.028 mD
Porosity:	1.4 %





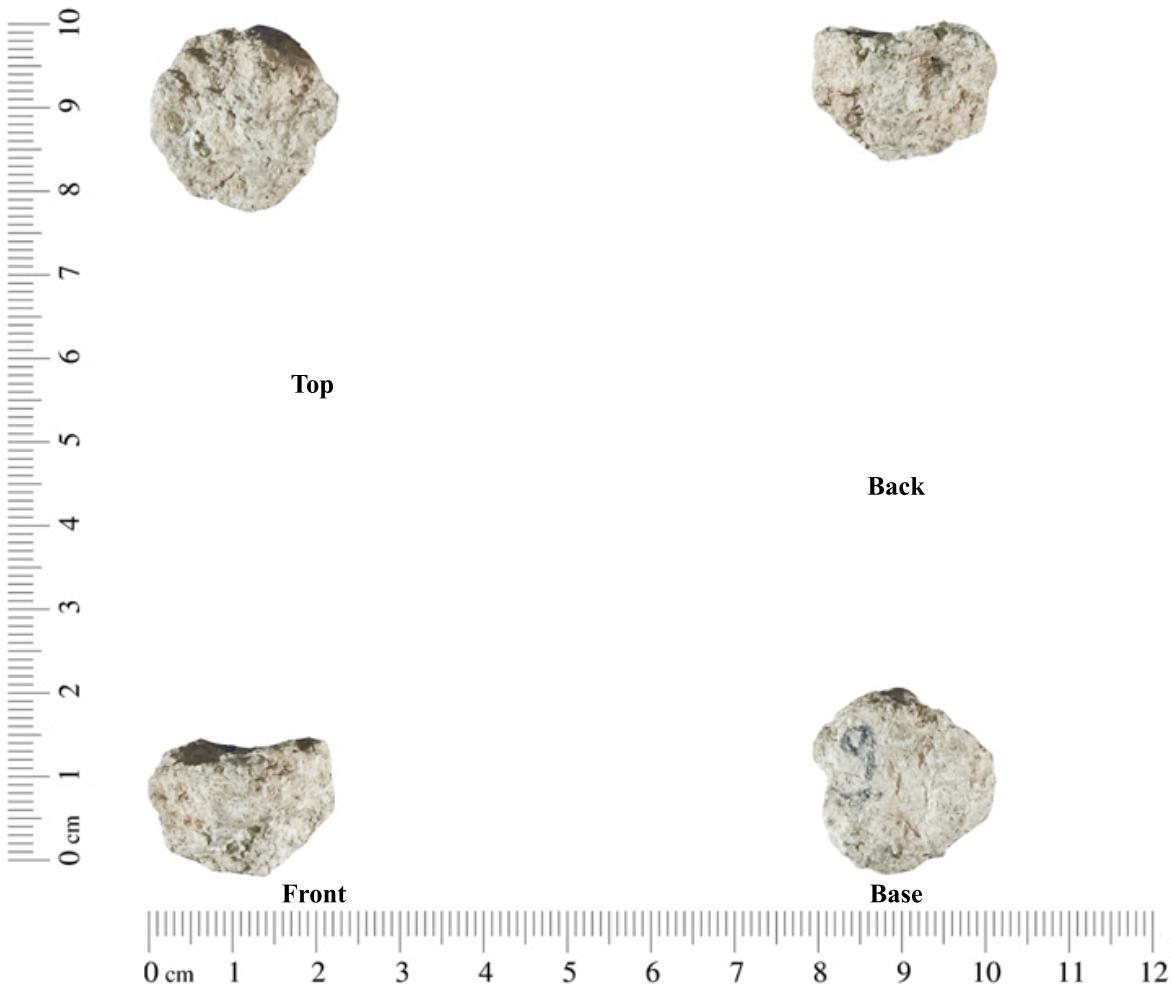
Sample No.:	7
Depth:	3085.33 m
Permeability:	0.24 mD
Porosity:	4.4 %



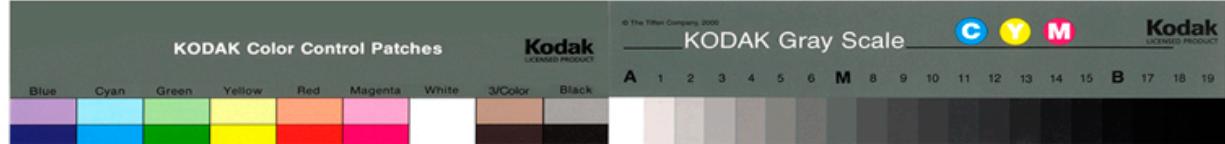


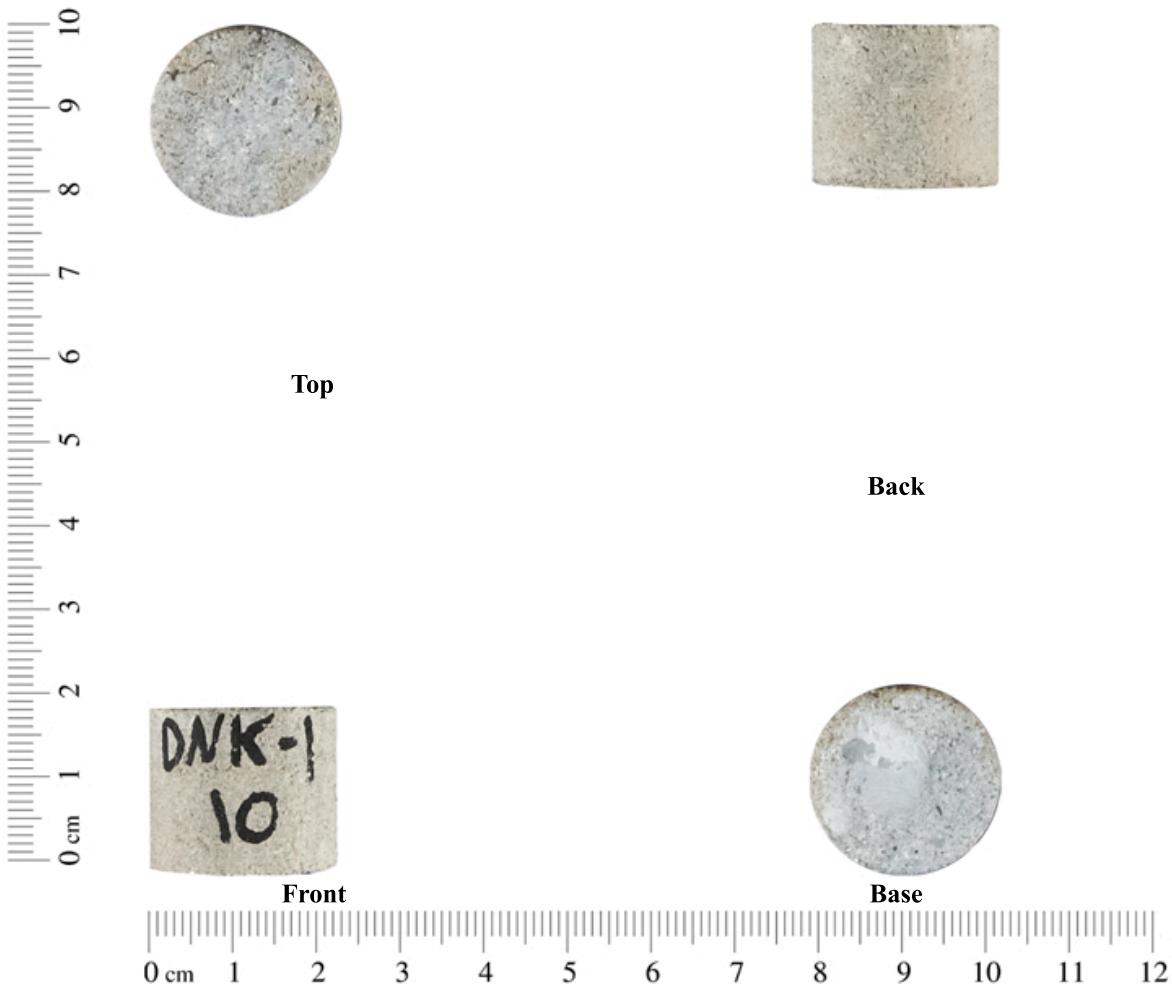
Sample No.:	8
Depth:	3083.00 m
Permeability:	0.28 mD
Porosity:	11.4 %





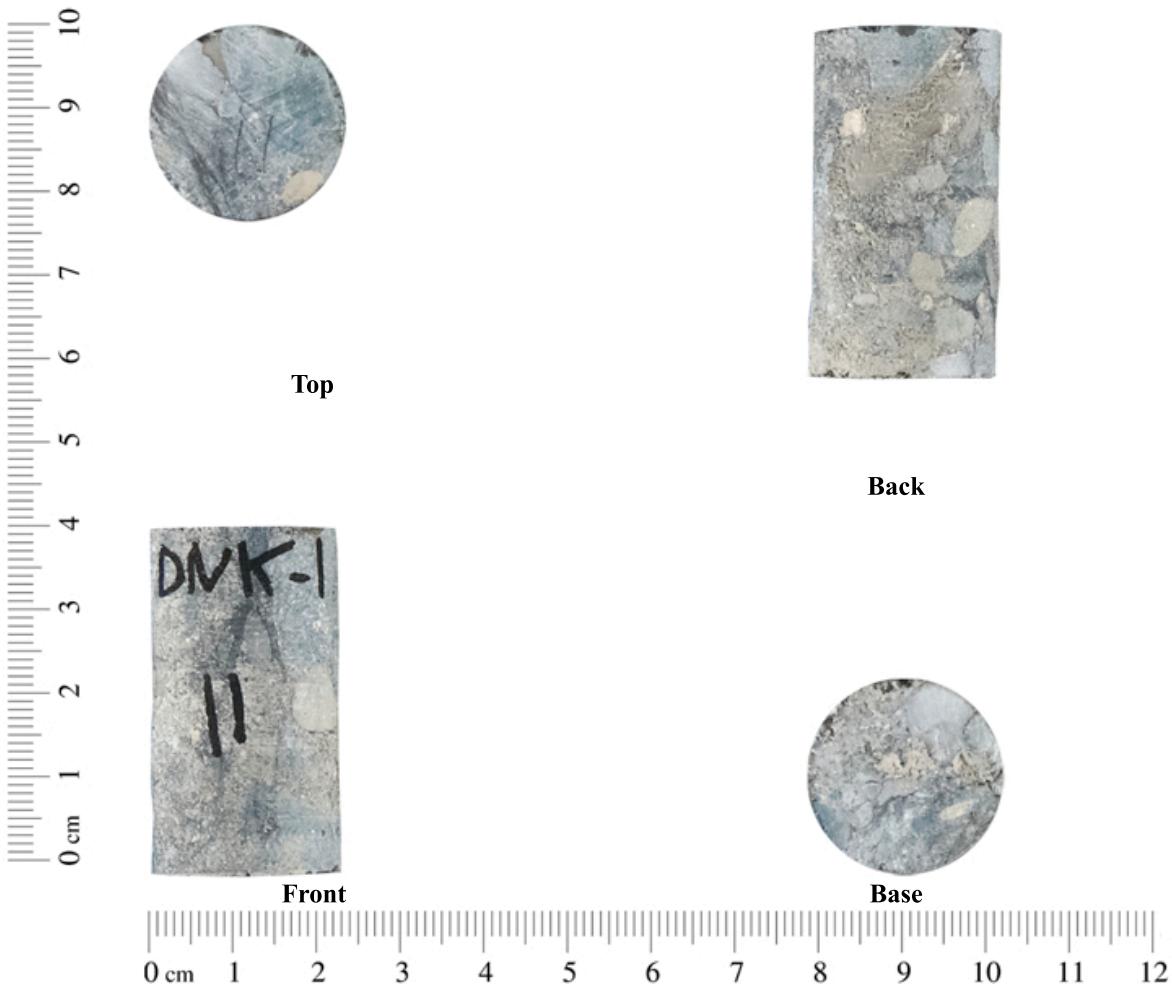
Sample No.:	9
Depth:	3081.43 m
Permeability:	
Porosity:	18.4 %



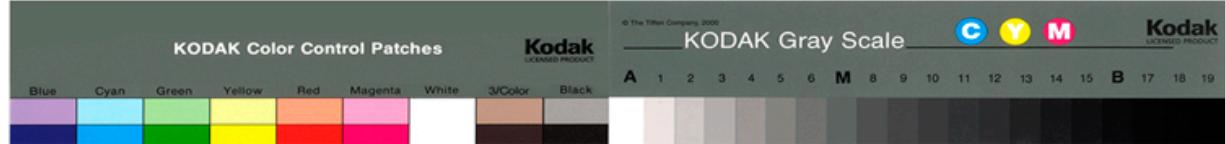


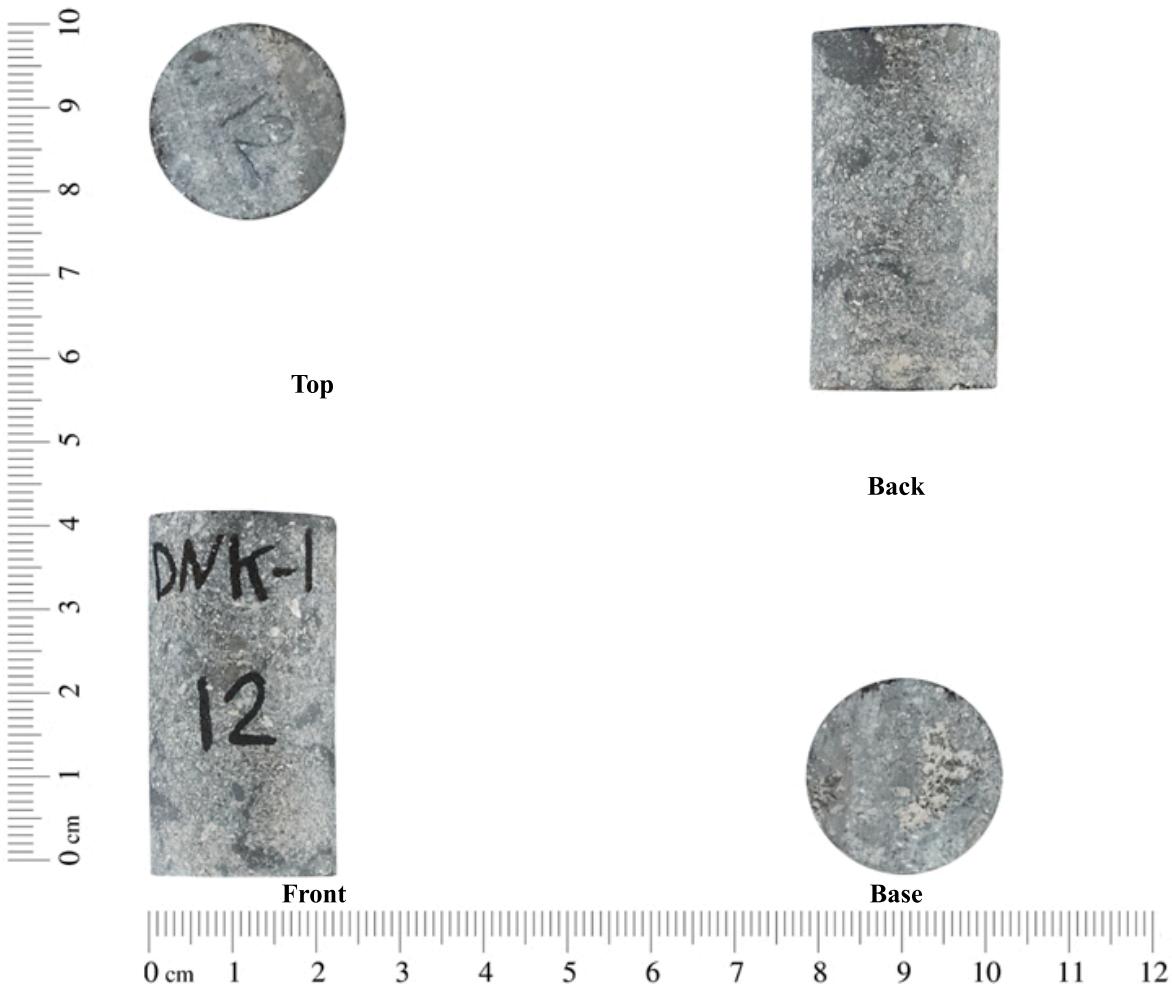
Sample No.:	10
Depth:	3076.47 m
Permeability:	0.15 mD
Porosity:	8.2 %





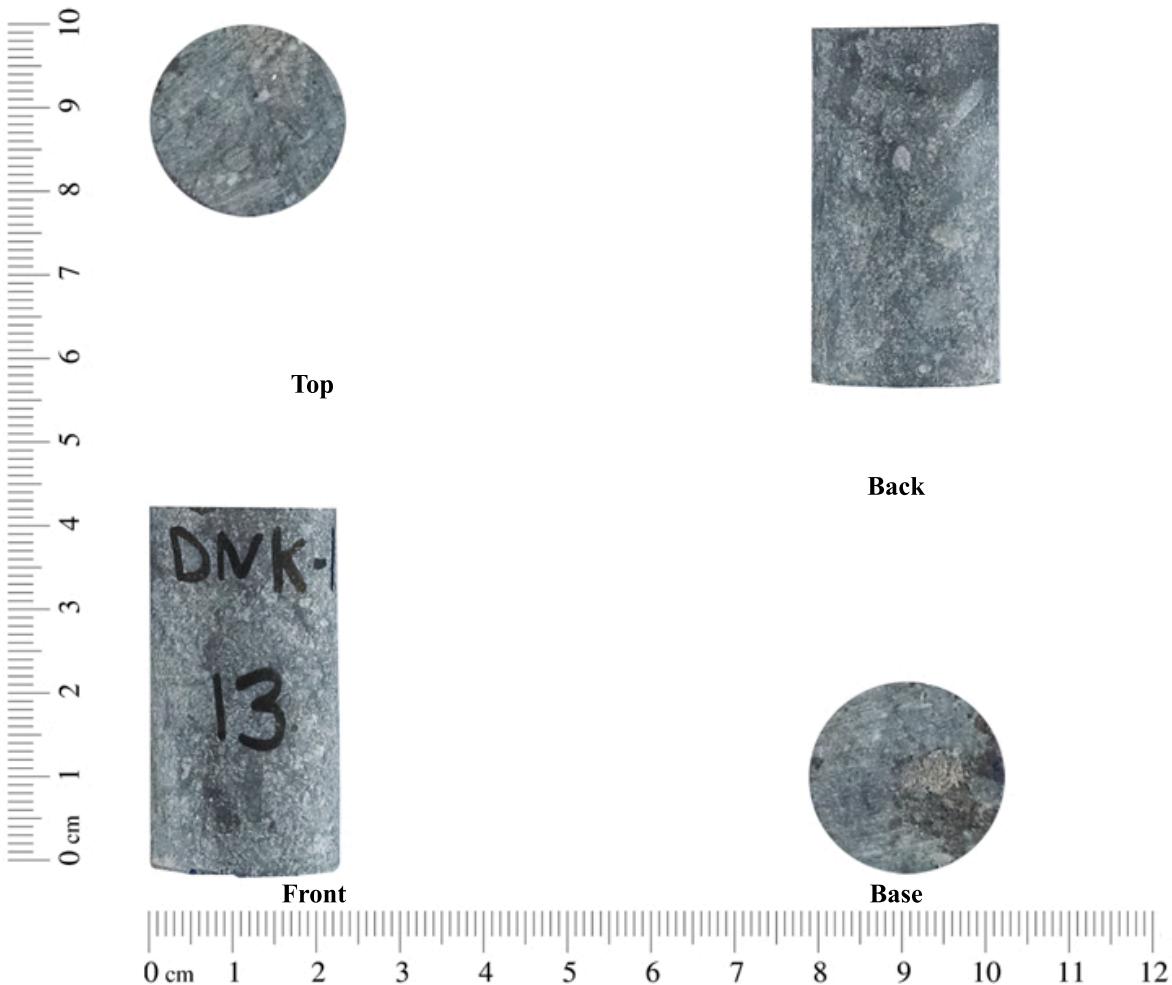
Sample No.:	11
Depth:	3075.00 m
Permeability:	0.045 mD
Porosity:	5.0 %





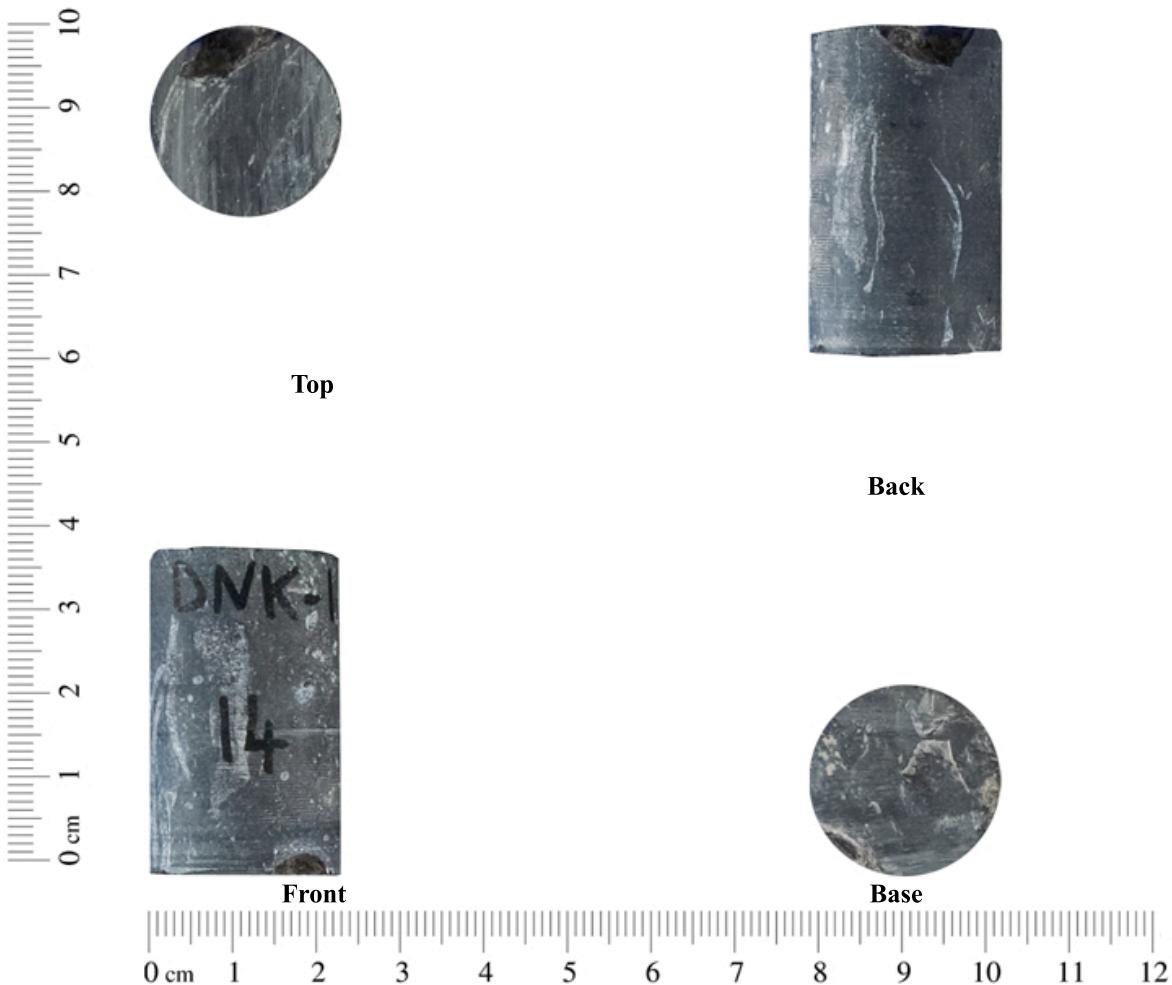
Sample No.:	12
Depth:	3061.00 m
Permeability:	0.020 mD
Porosity:	4.0 %





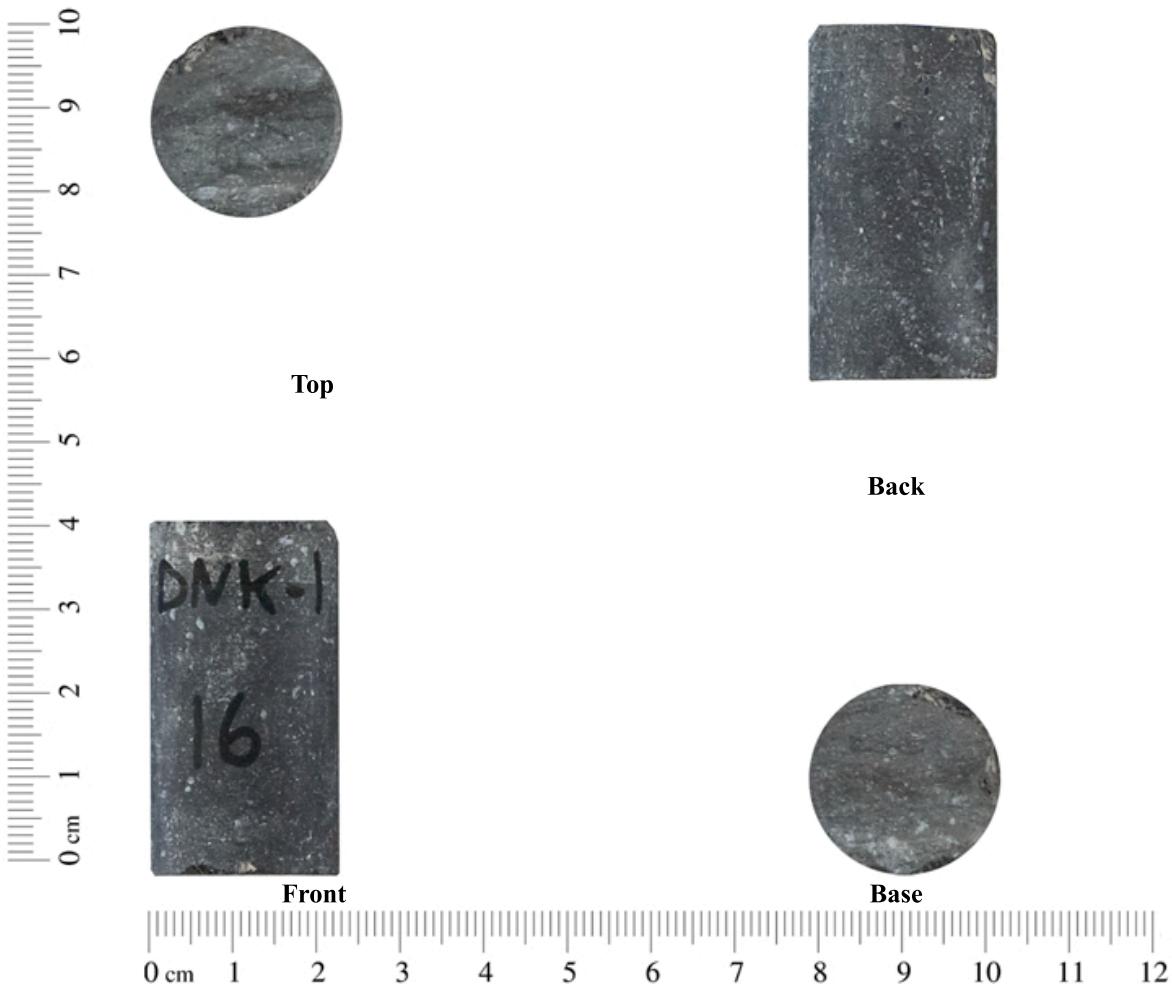
Sample No.:	13
Depth:	3046.48 m
Permeability:	0.0012 mD
Porosity:	0.6 %



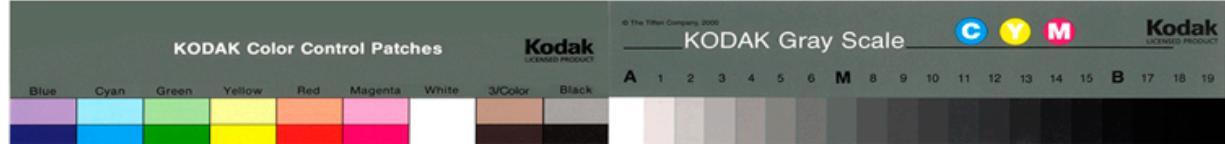


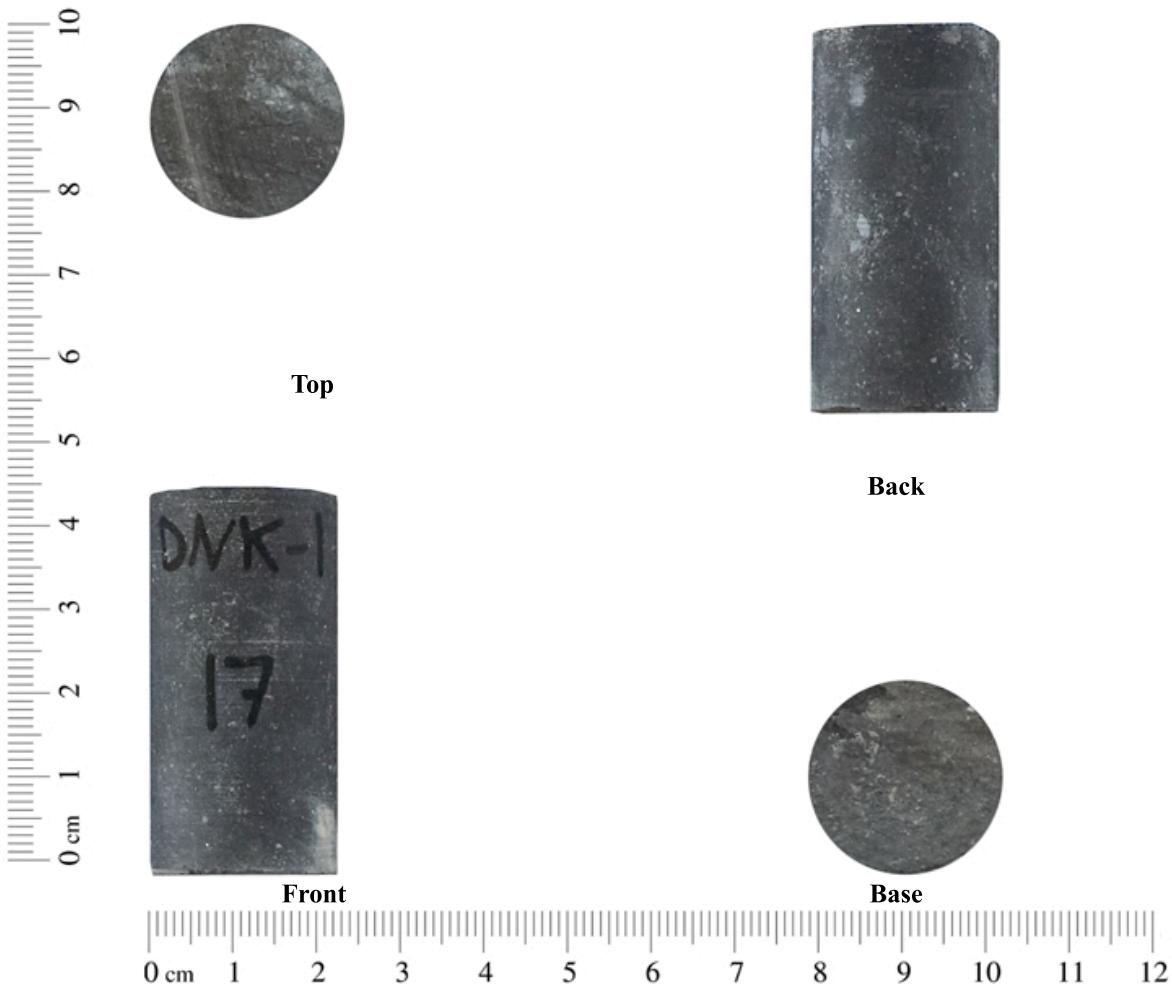
Sample No.:	14
Depth:	3043.10 m
Permeability:	0.016 mD
Porosity:	0.9 %



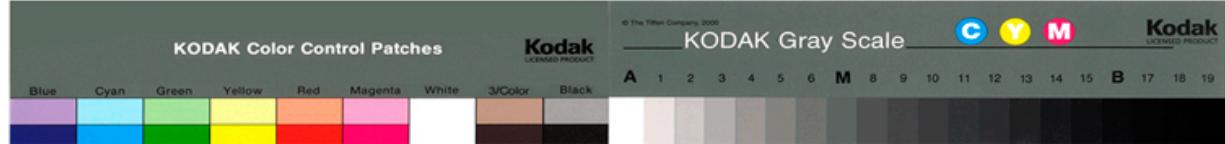


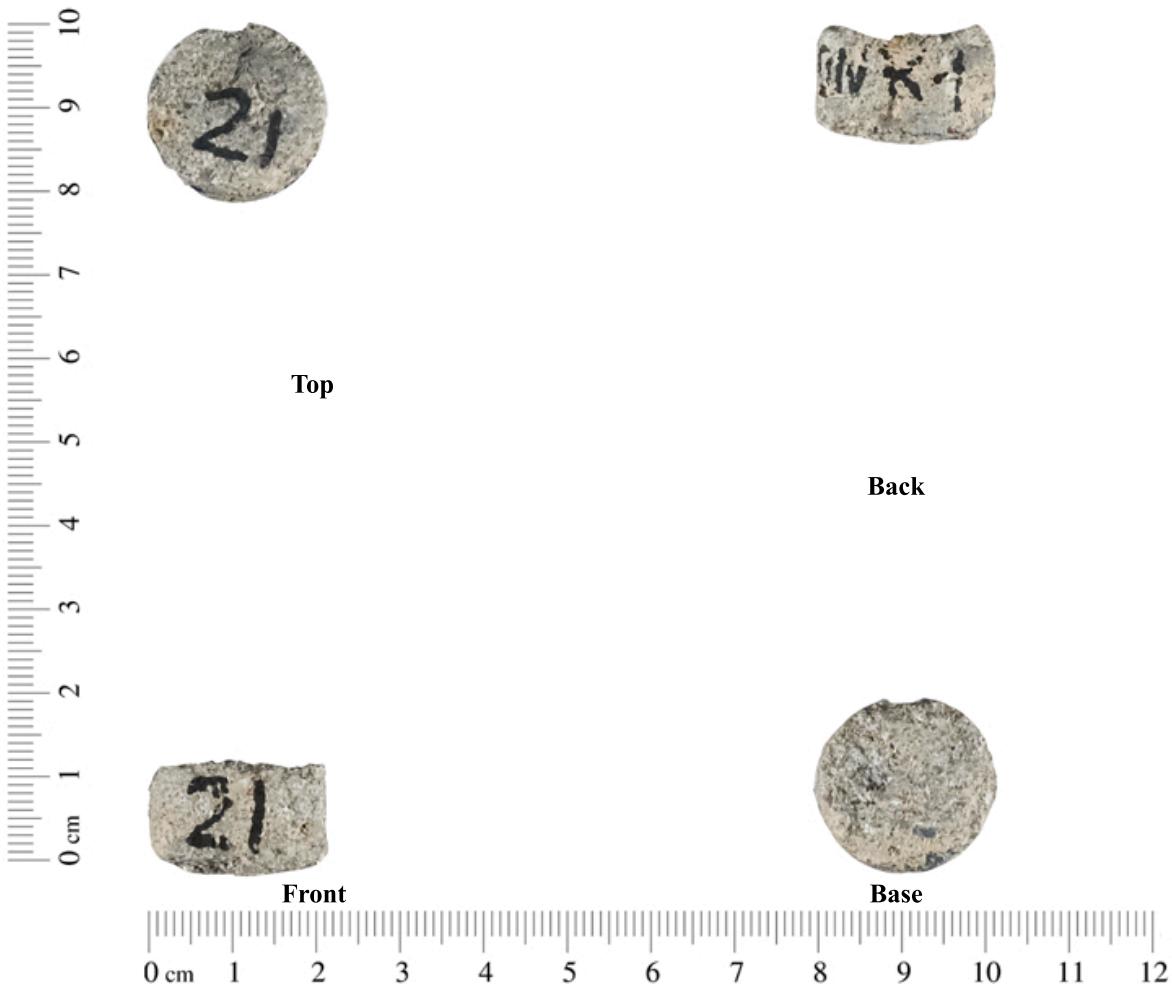
Sample No.:	16
Depth:	3025.00 m
Permeability:	0.0018 mD
Porosity:	2.2 %



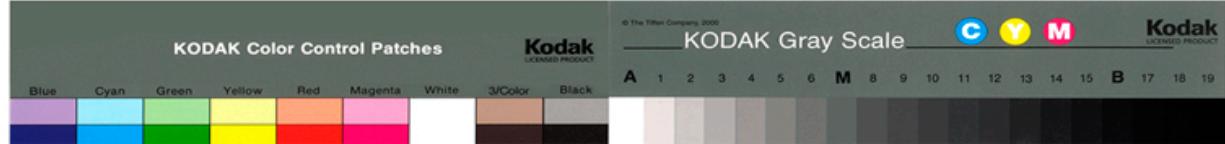


Sample No.:	17
Depth:	3021.58 m
Permeability:	0.0017 mD
Porosity:	2.0 %





Sample No.:	21
Depth:	3005.00 m
Permeability:	
Porosity:	15.0 %





Sample No.:	22
Depth:	3008.80 m
Permeability:	0.33 mD
Porosity:	10.5 %



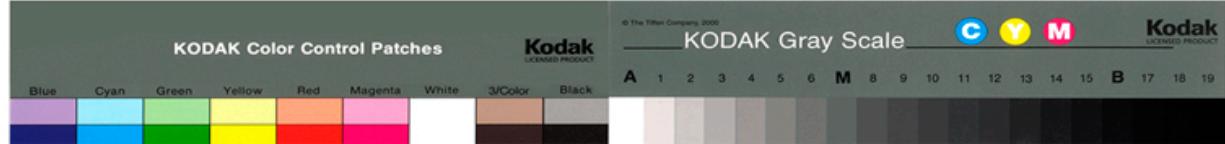


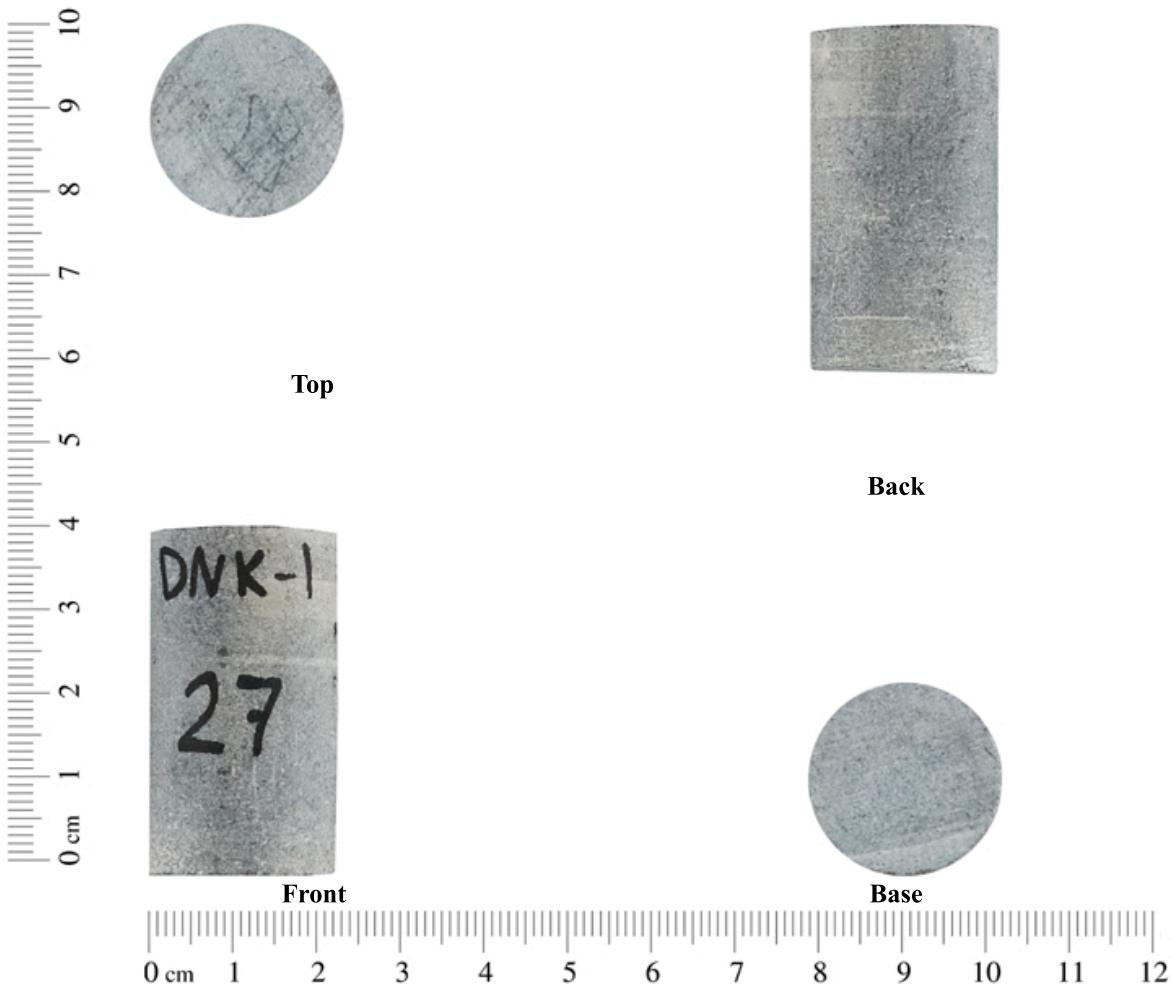
Sample No.:	23
Depth:	3007.90 m
Permeability:	0.29 mD
Porosity:	11.9 %



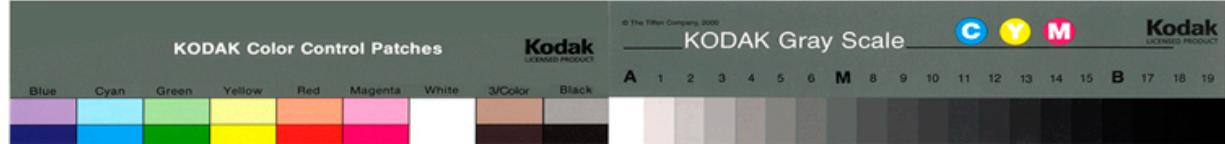


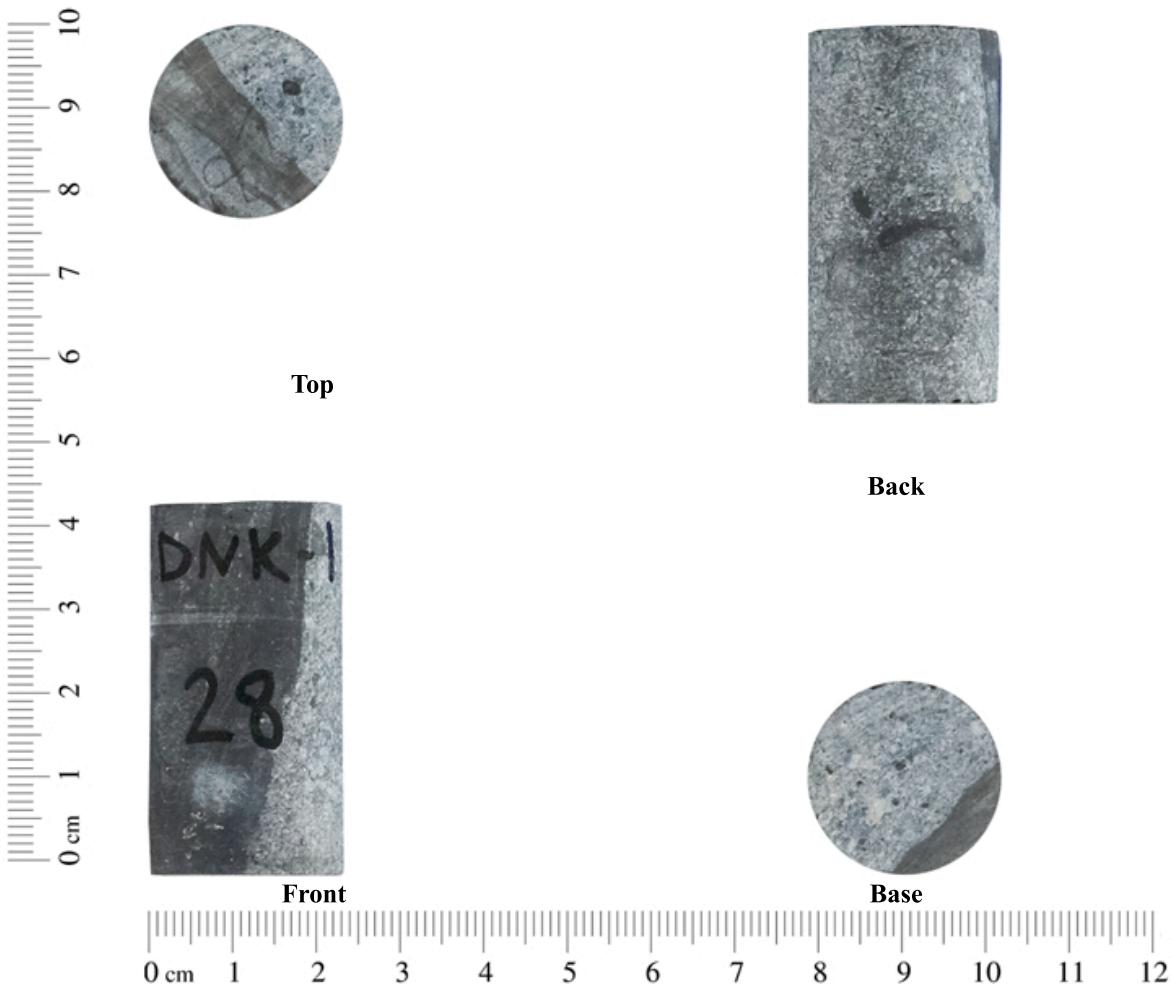
Sample No.:	24
Depth:	3006.80 m
Permeability:	0.49 mD
Porosity:	12.6 %





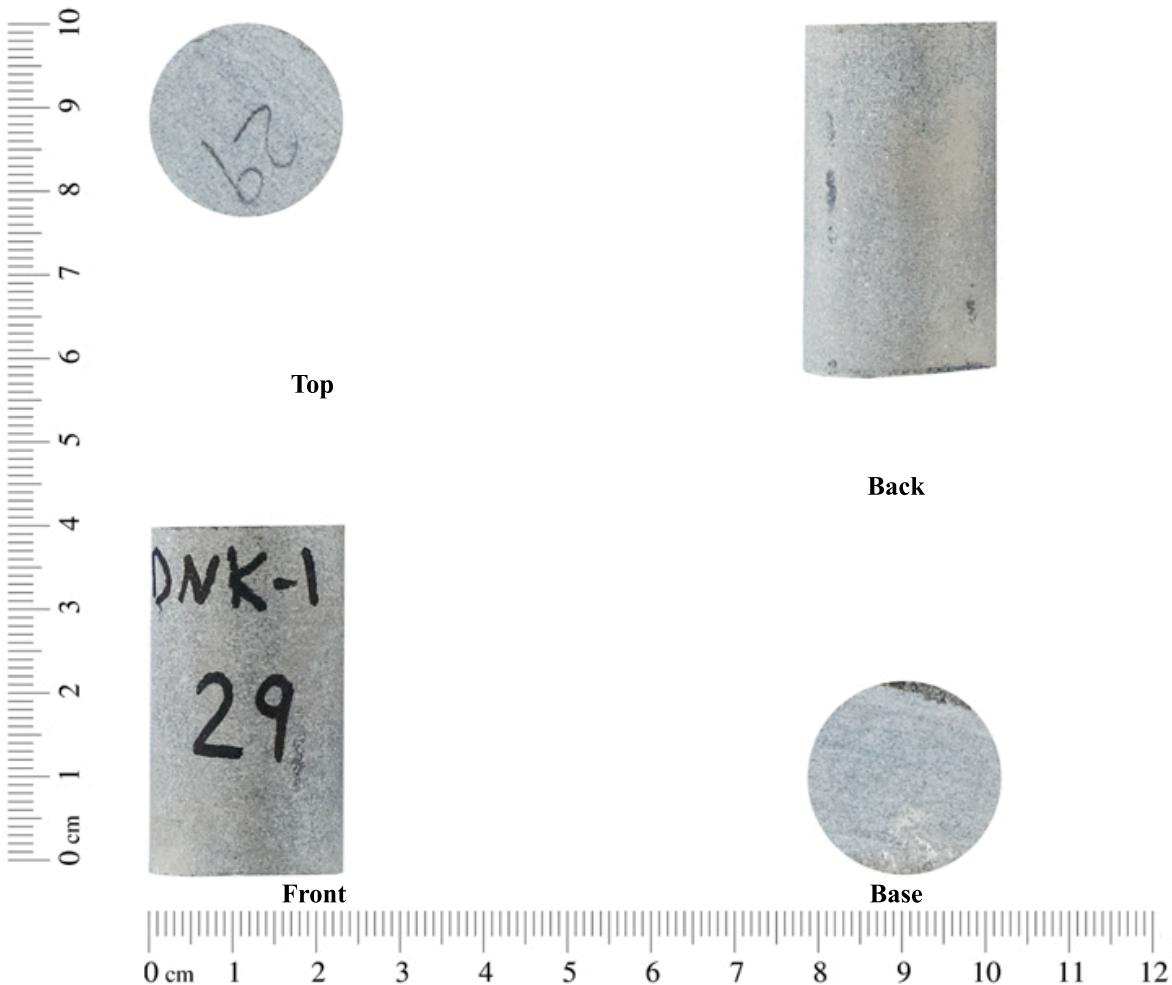
Sample No.:	27
Depth:	2992.40 m
Permeability:	0.0036 mD
Porosity:	3.4 %



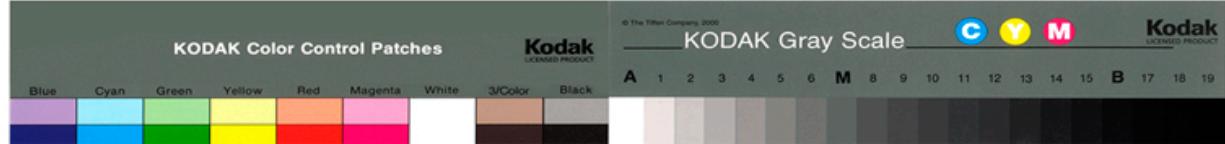


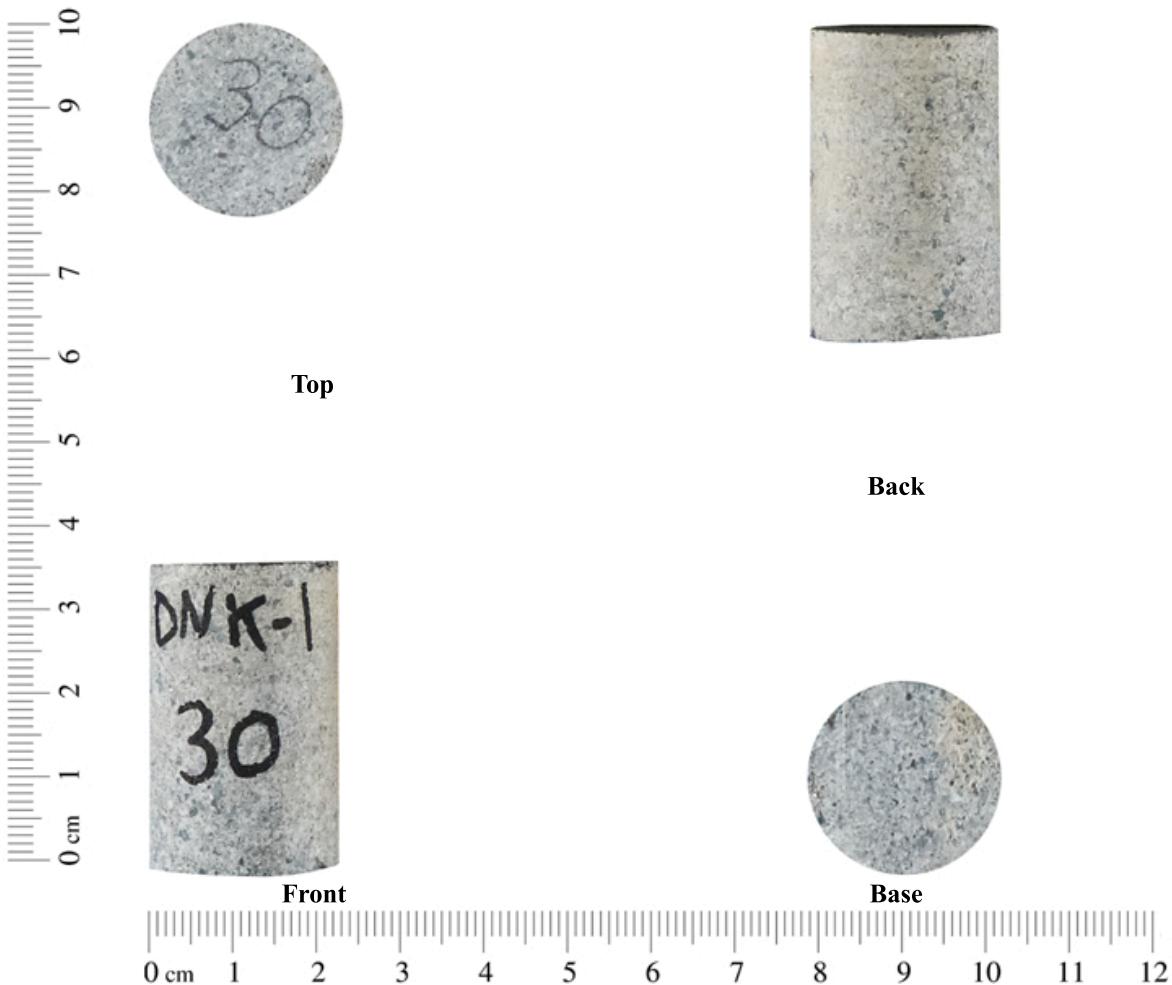
Sample No.:	28
Depth:	2975.90 m
Permeability:	0.011 mD
Porosity:	2.2 %



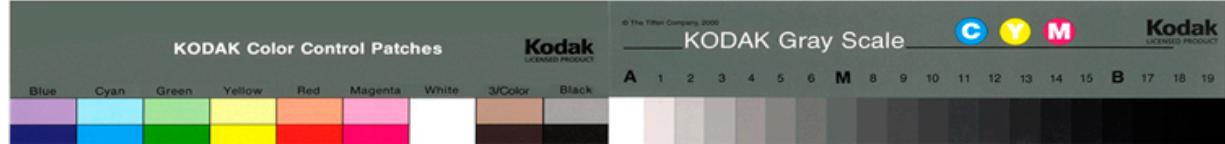


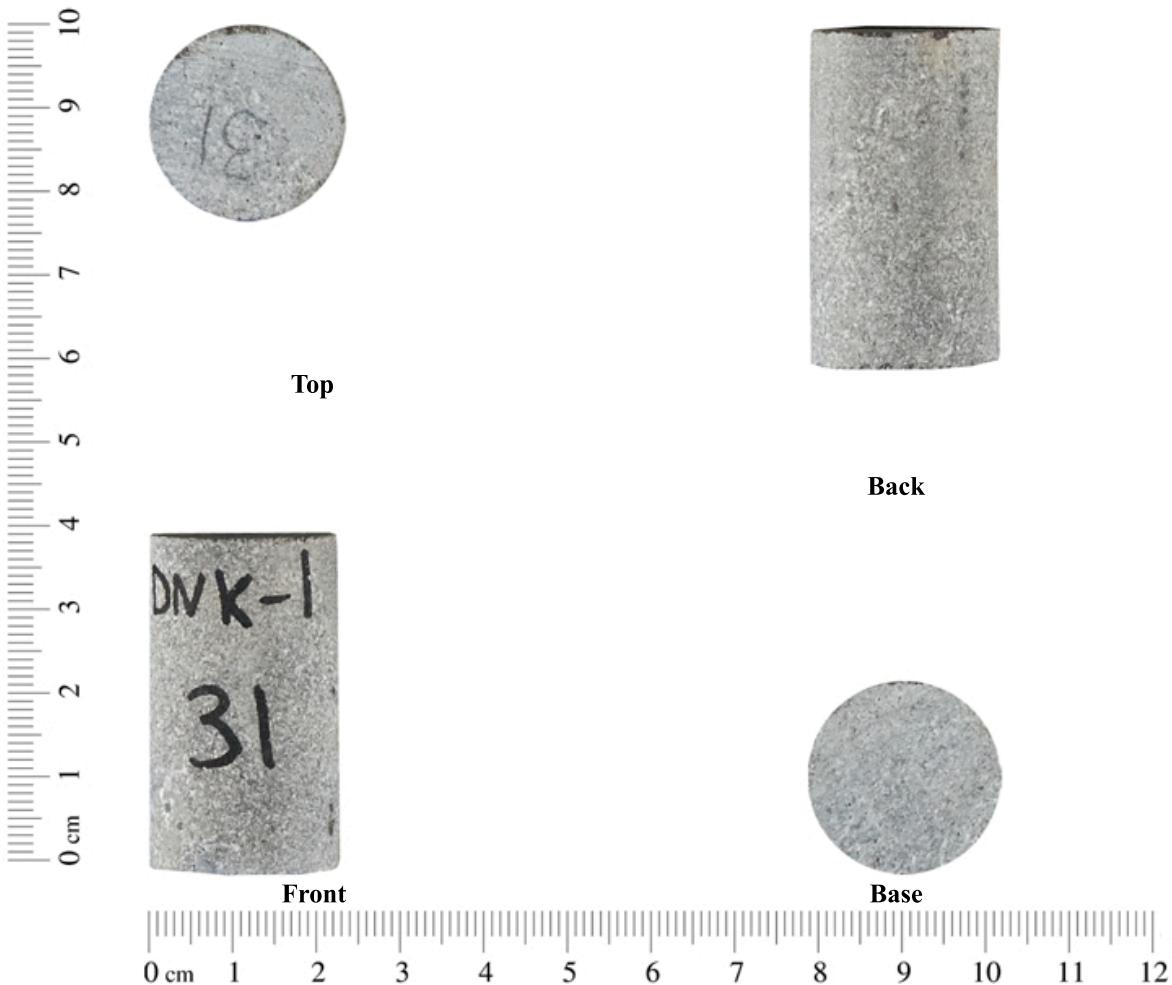
Sample No.:	29
Depth:	2970.90 m
Permeability:	0.0096 mD
Porosity:	4.8 %





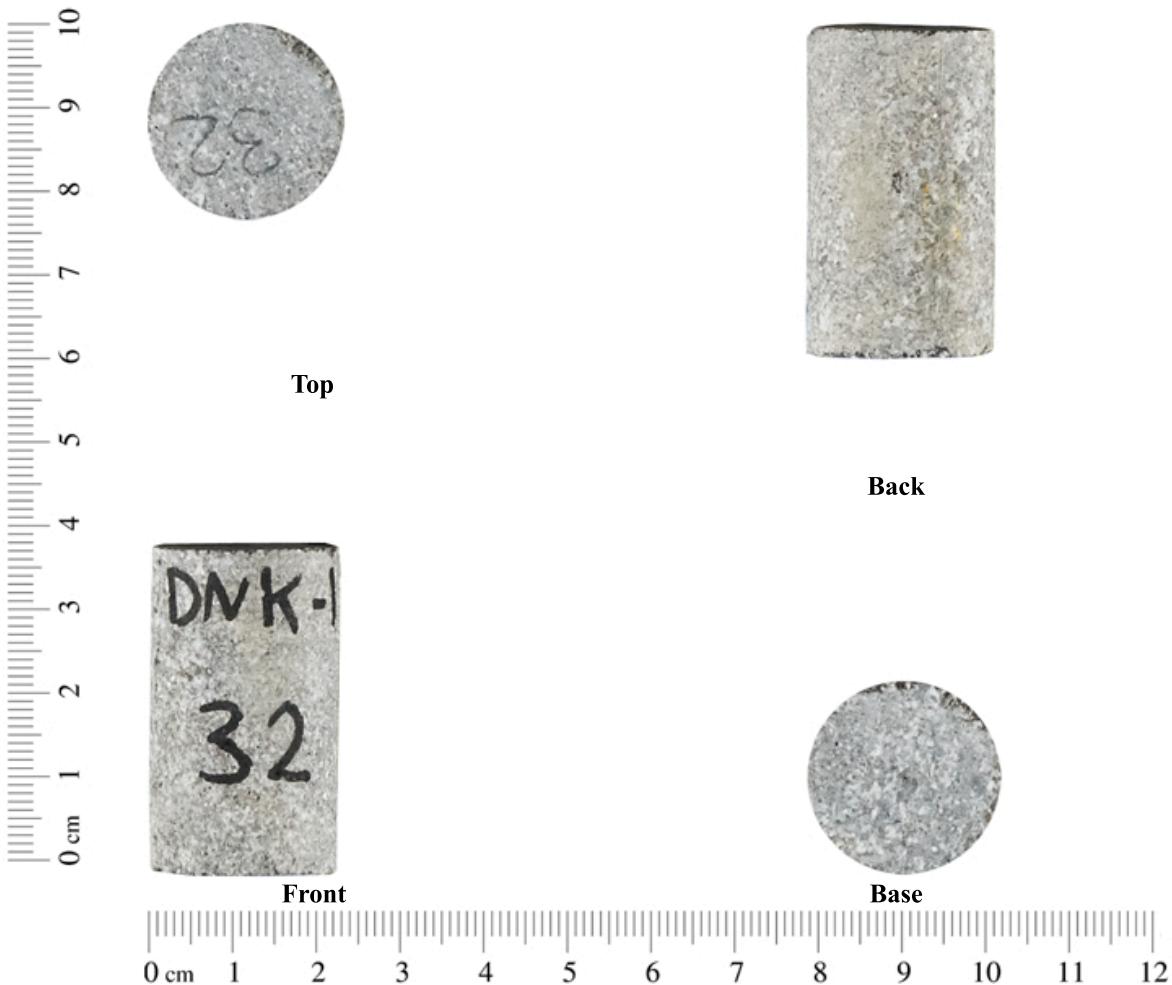
Sample No.:	30
Depth:	2967.80 m
Permeability:	0.058 mD
Porosity:	6.5 %



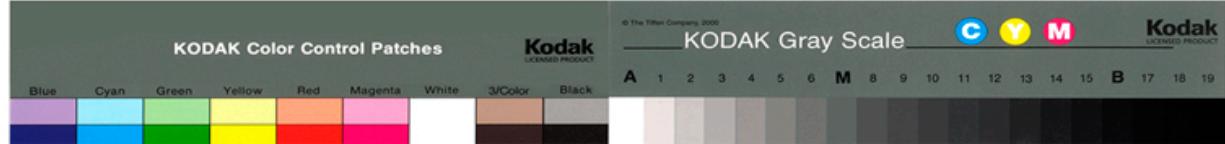


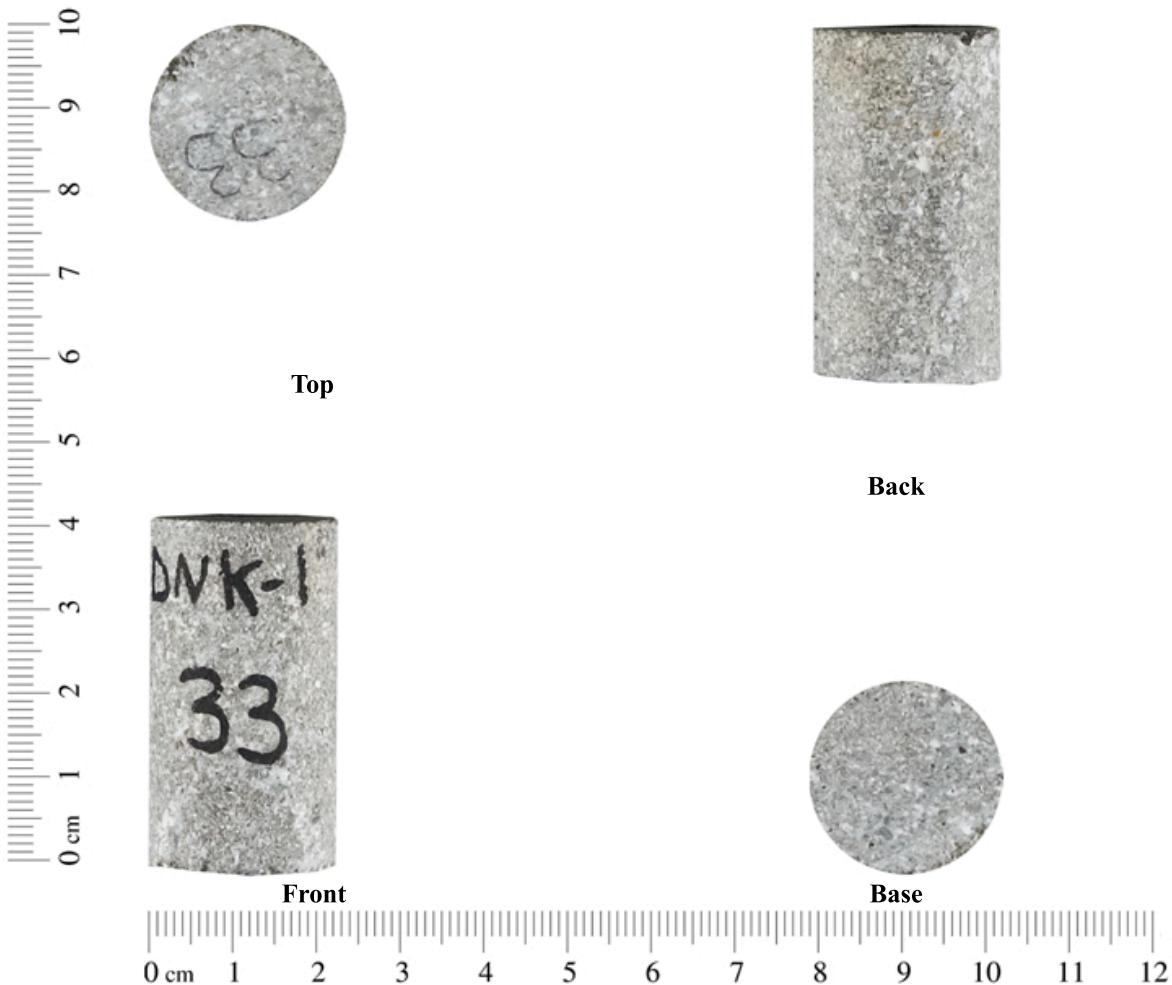
Sample No.:	31
Depth:	2934.95 m
Permeability:	0.018 mD
Porosity:	8.7 %



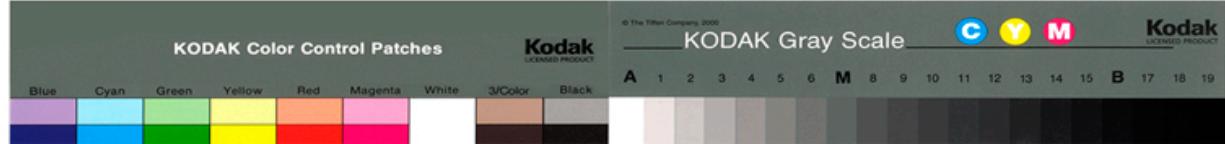


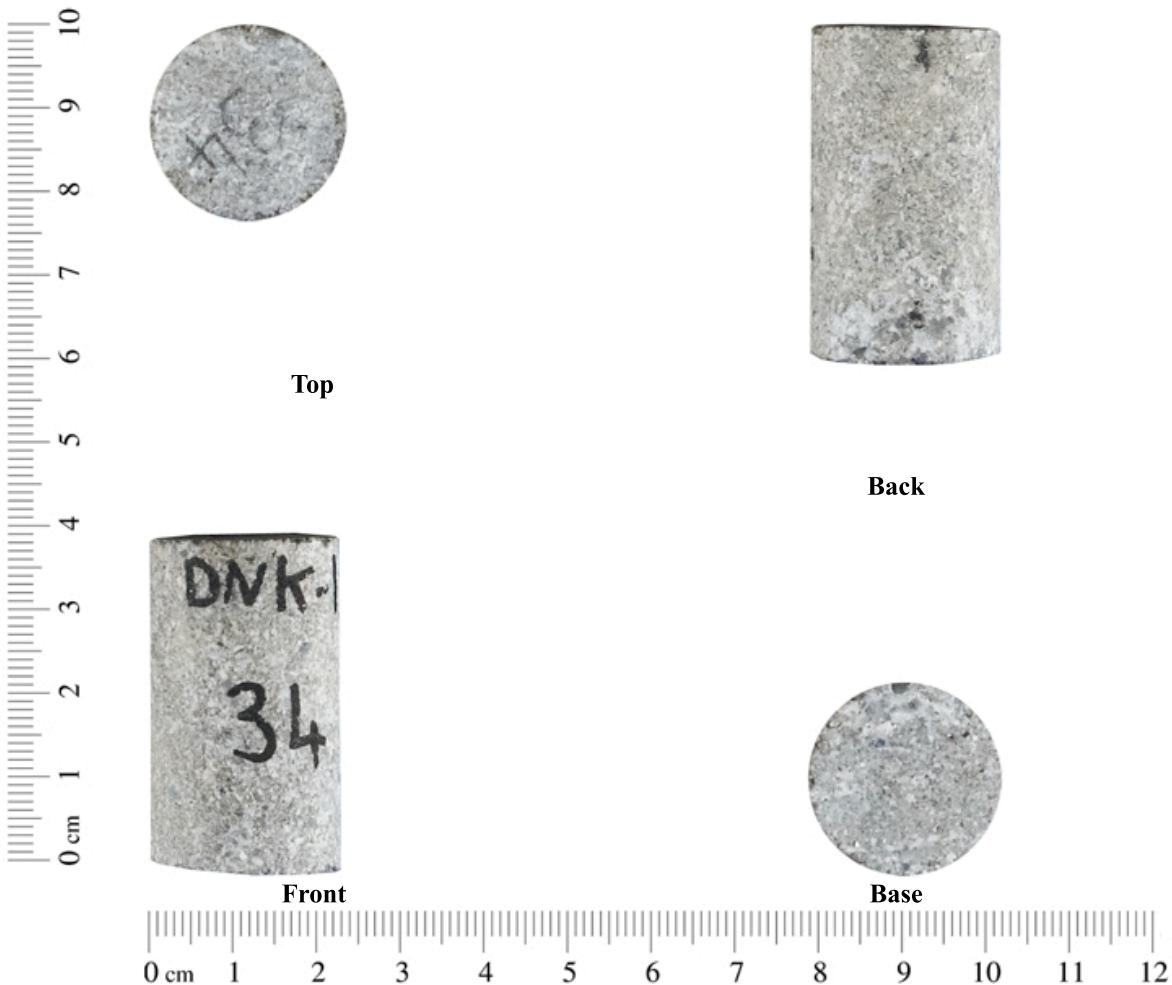
Sample No.:	32
Depth:	2931.50 m
Permeability:	0.069 mD
Porosity:	11.0 %





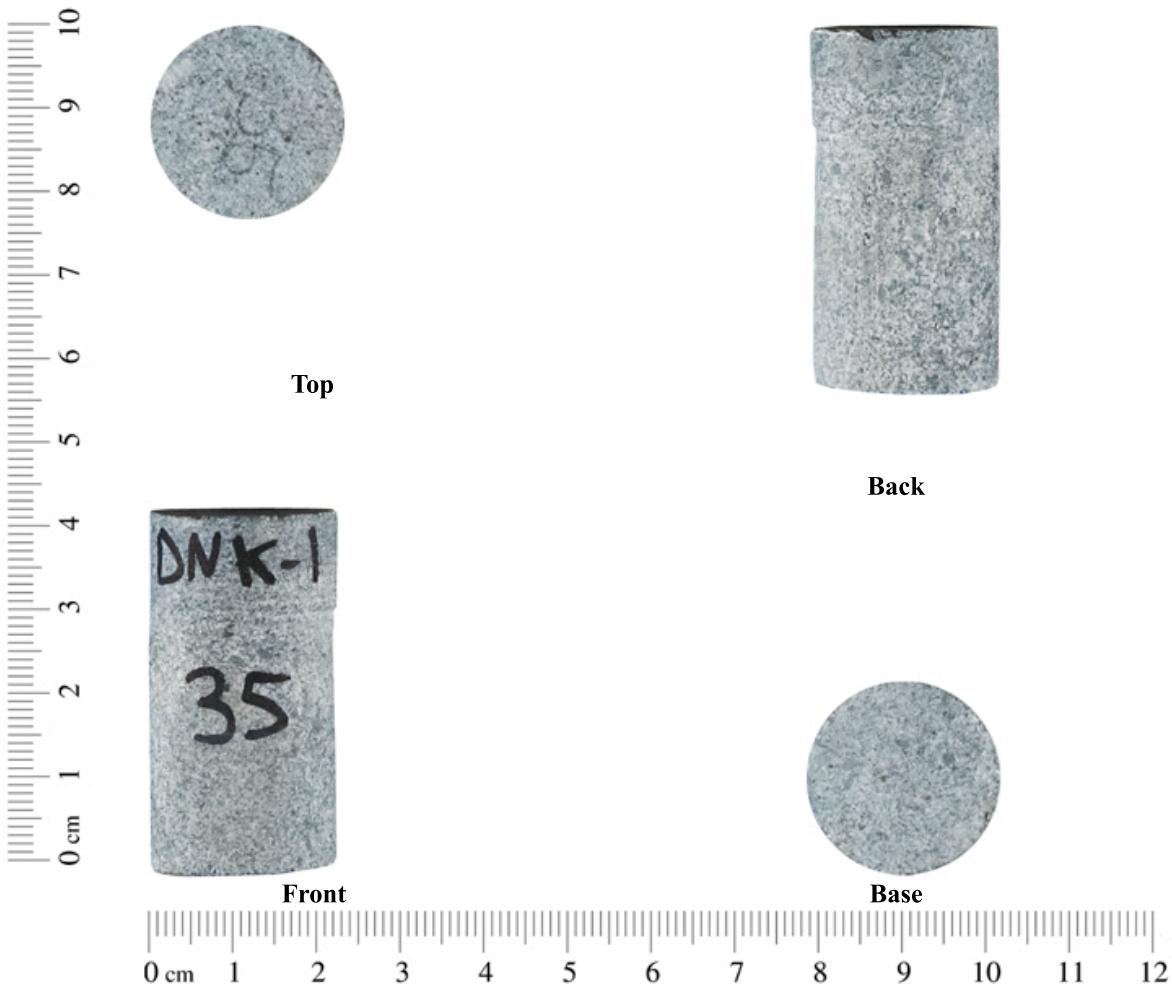
Sample No.:	33
Depth:	2920.70 m
Permeability:	0.038 mD
Porosity:	11.7 %



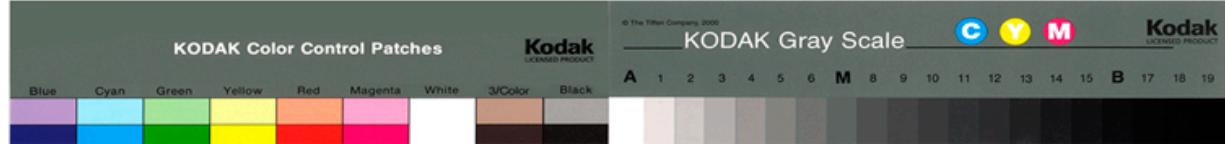


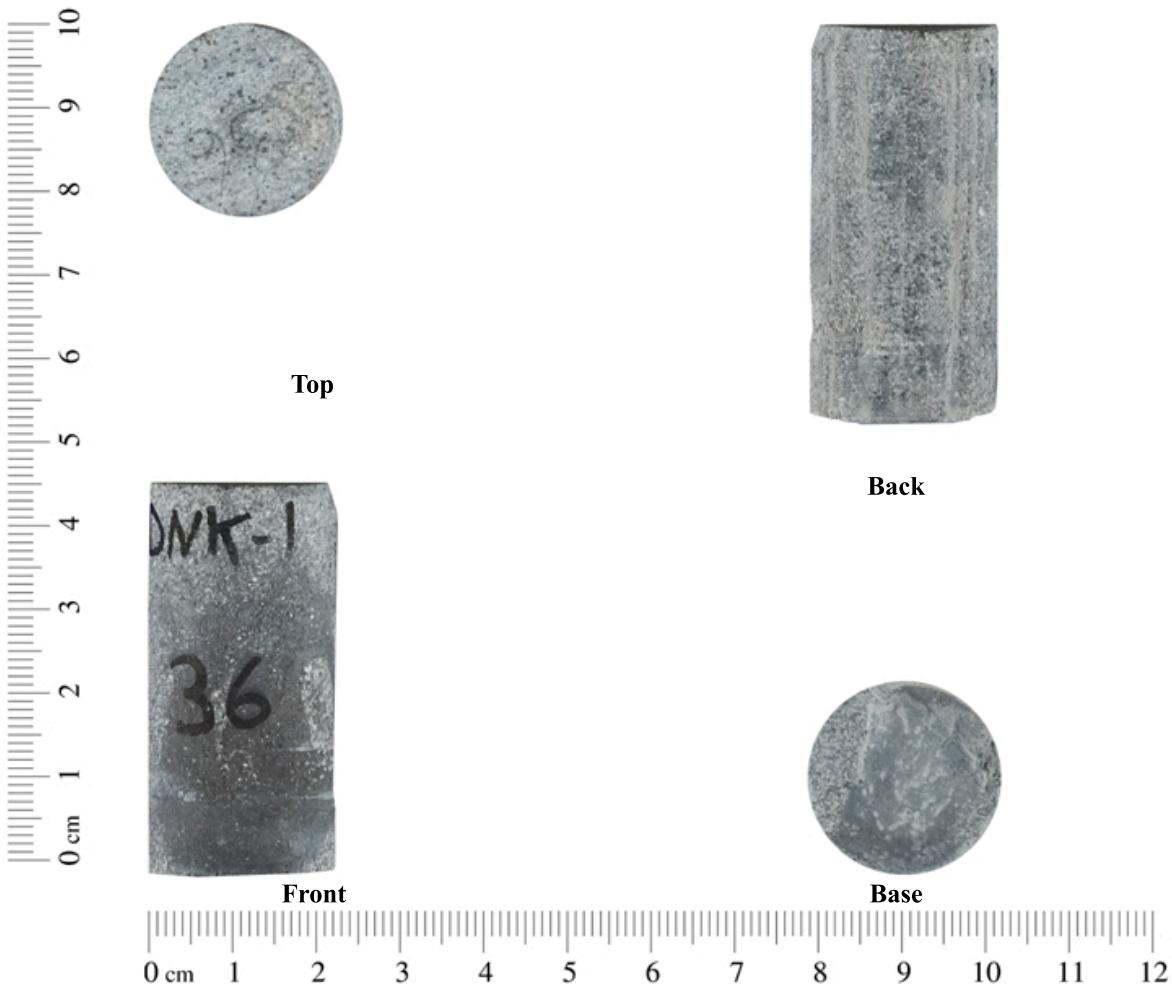
Sample No.:	34
Depth:	2912.30 m
Permeability:	0.023 mD
Porosity:	9.0 %



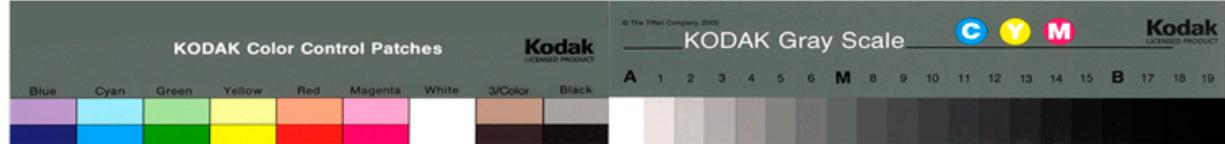


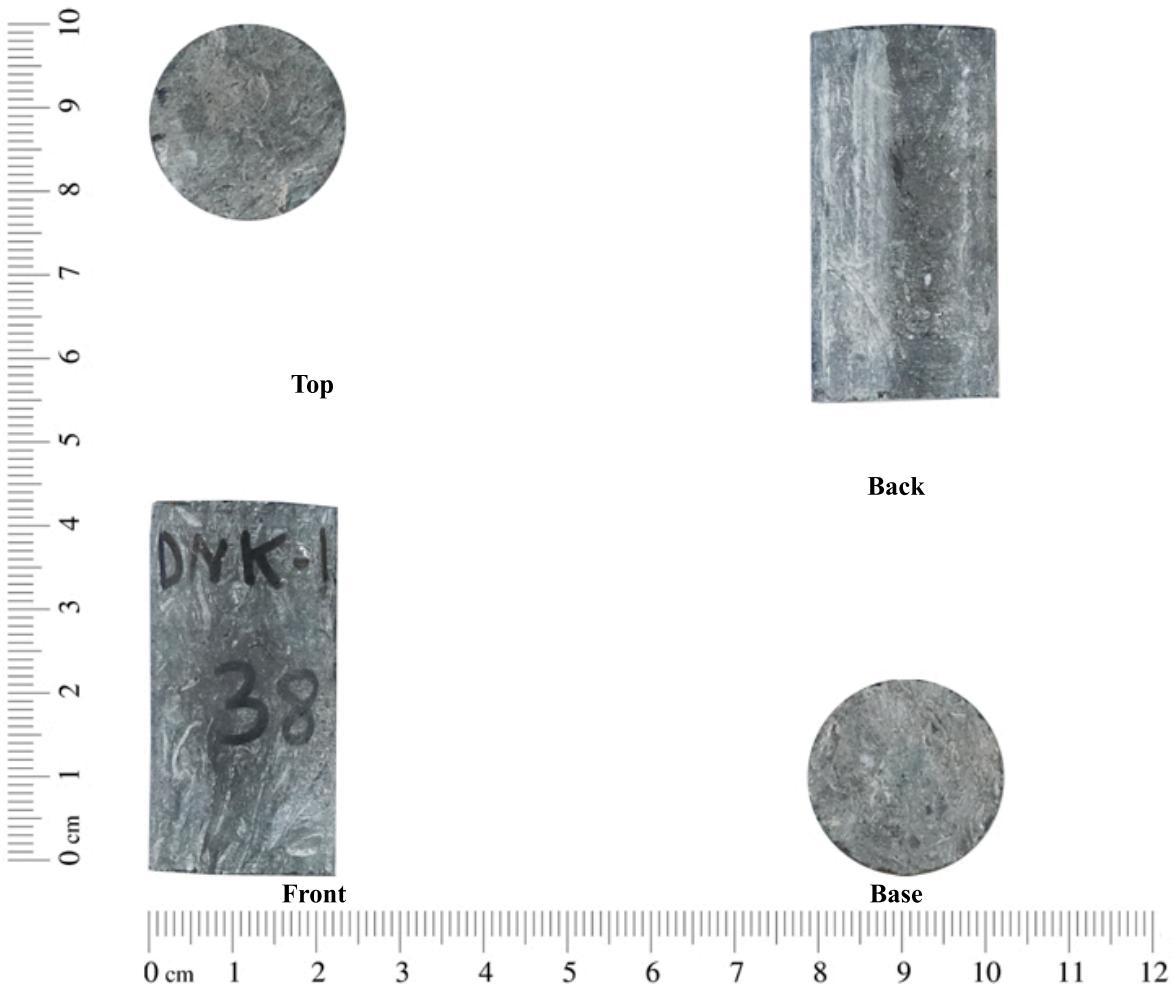
Sample No.:	35
Depth:	2882.50 m
Permeability:	0.0040 mD
Porosity:	2.7 %



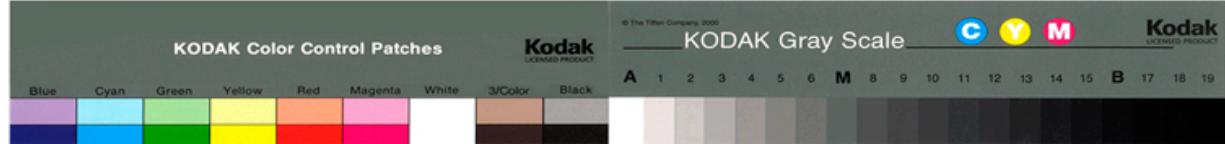


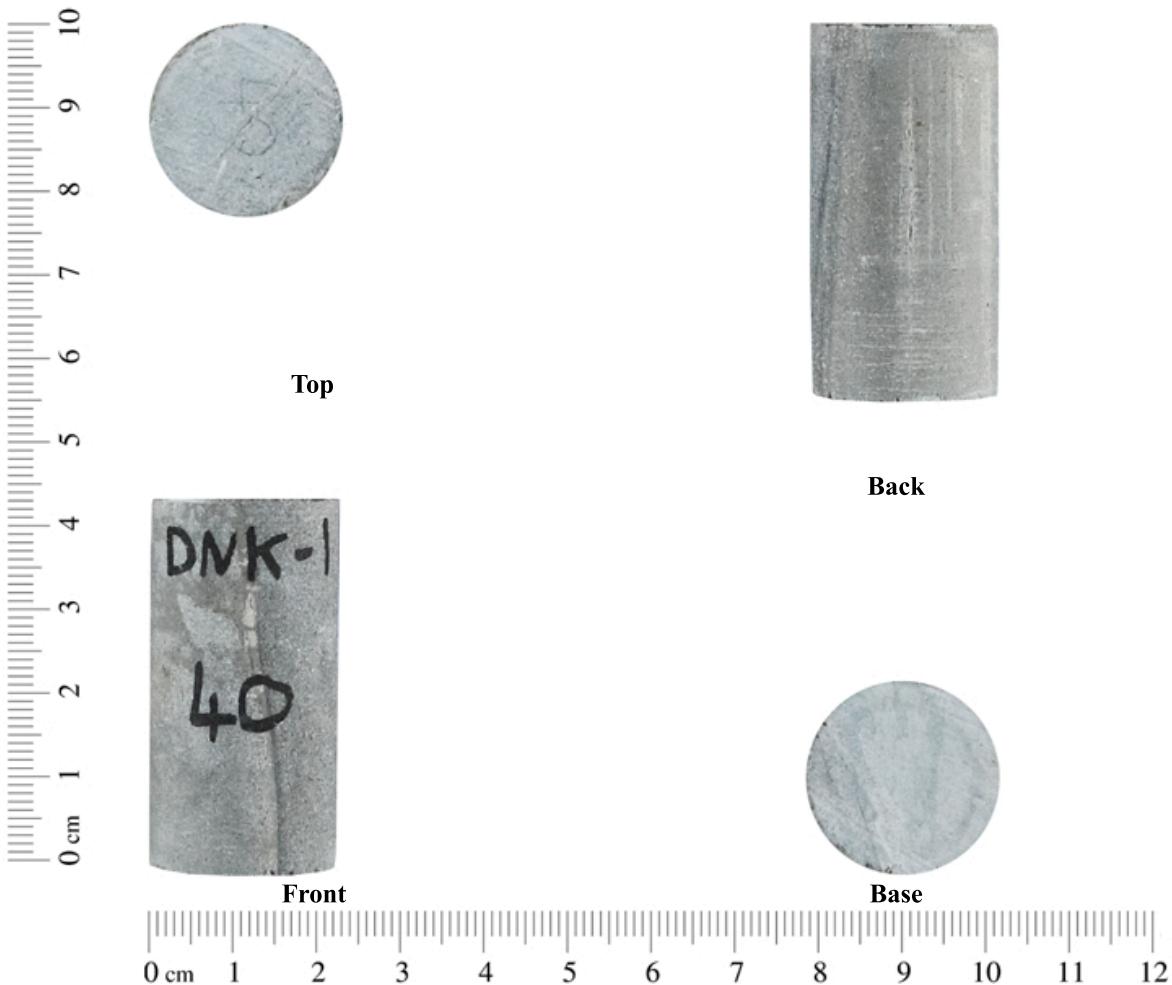
Sample No.:	36
Depth:	2882.00 m
Permeability:	0.0036 mD
Porosity:	5.1 %



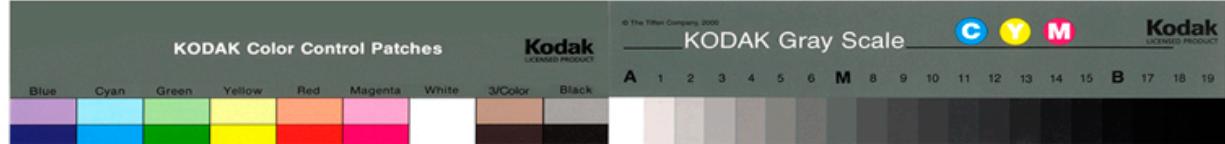


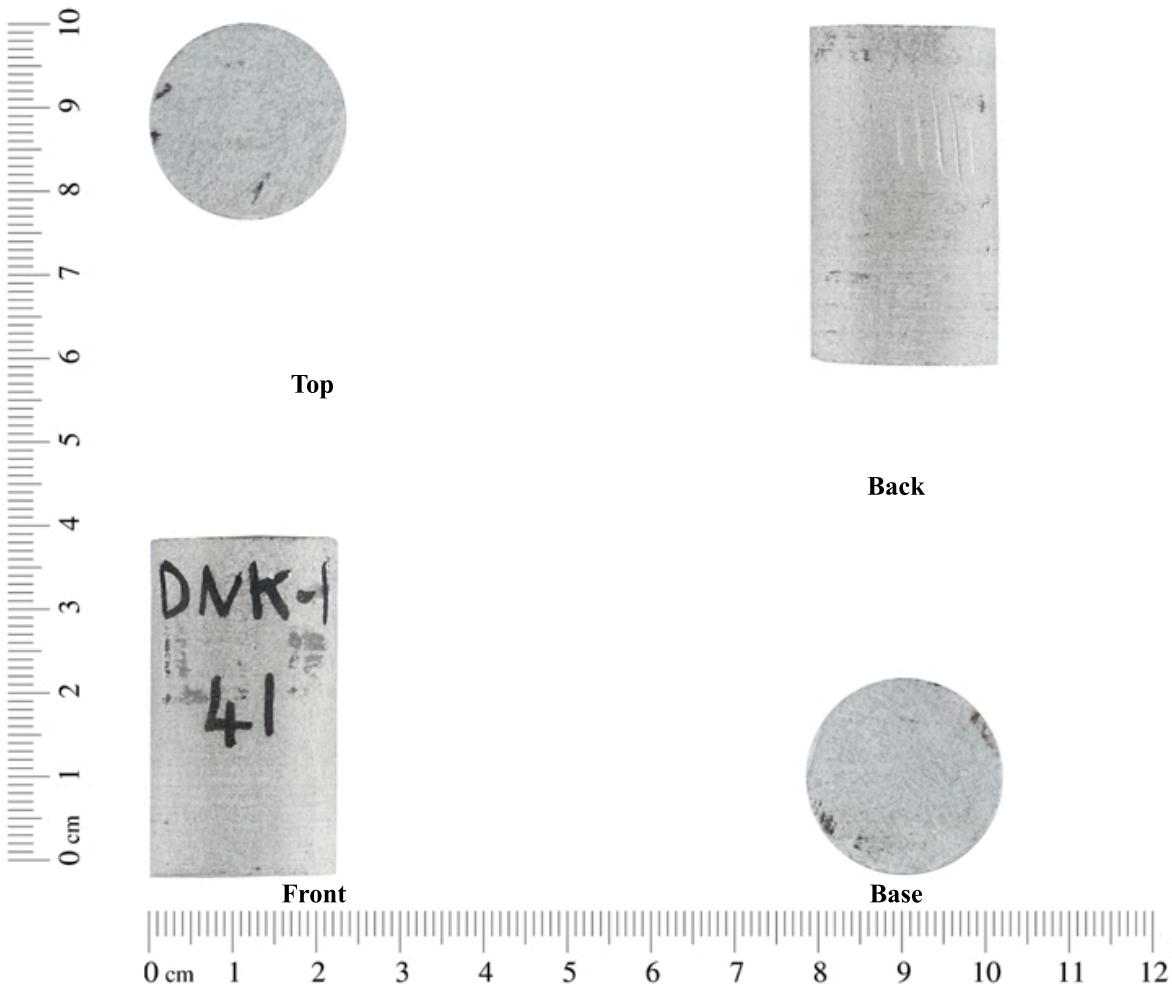
Sample No.:	38
Depth:	2864.30 m
Permeability:	0.0005 mD
Porosity:	1.6 %



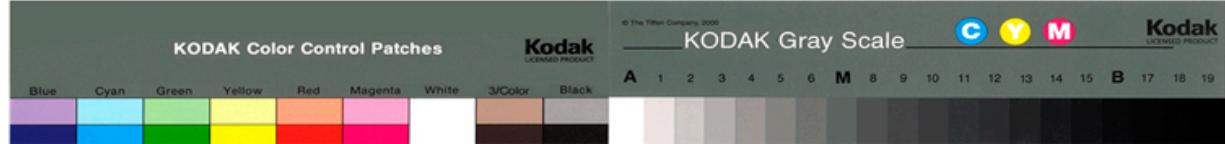


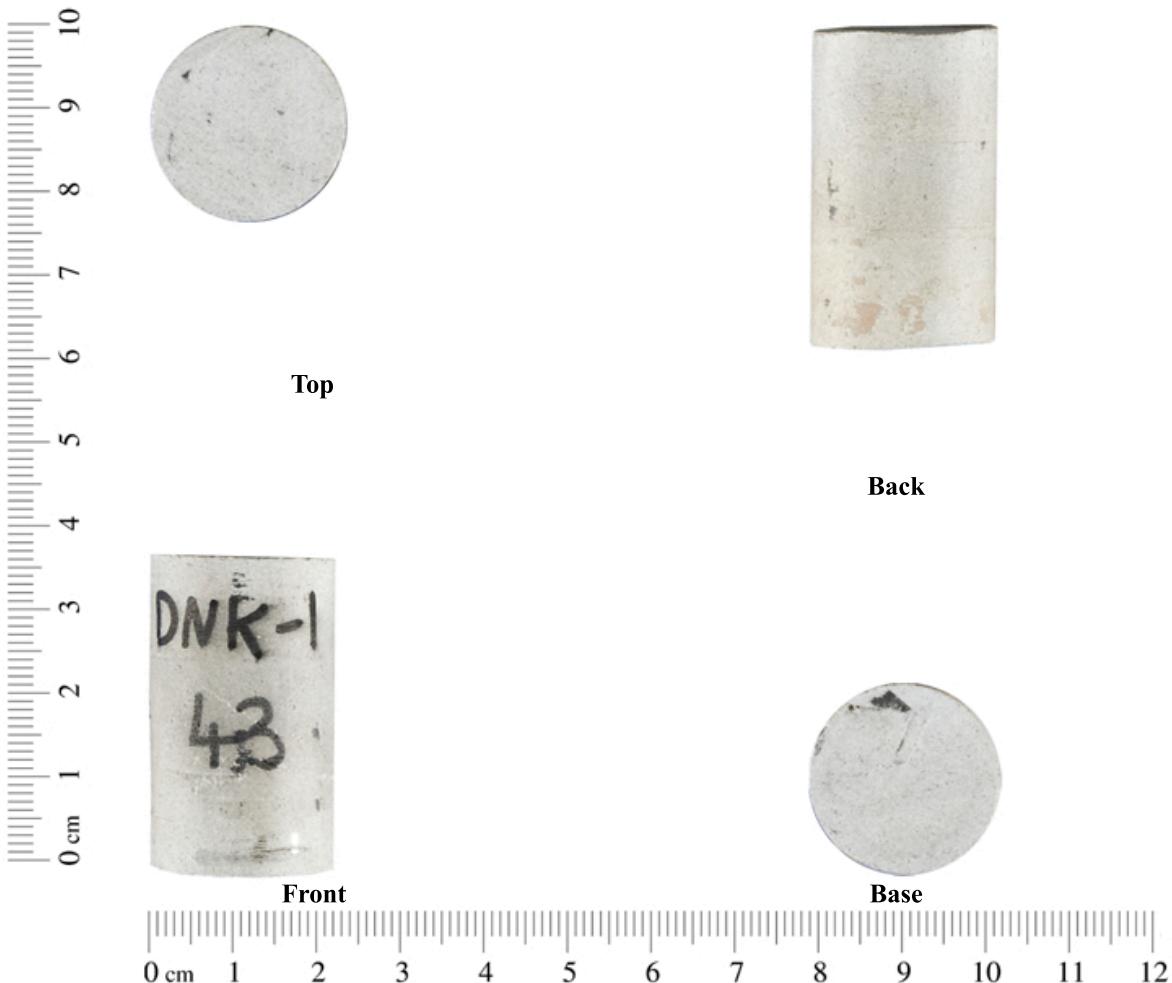
Sample No.:	40
Depth:	2848.00 m
Permeability:	0.055 mD
Porosity:	3.3 %



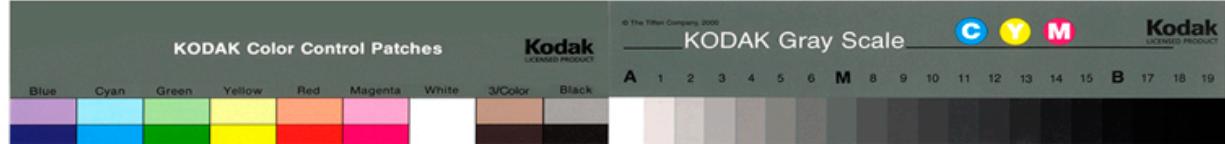


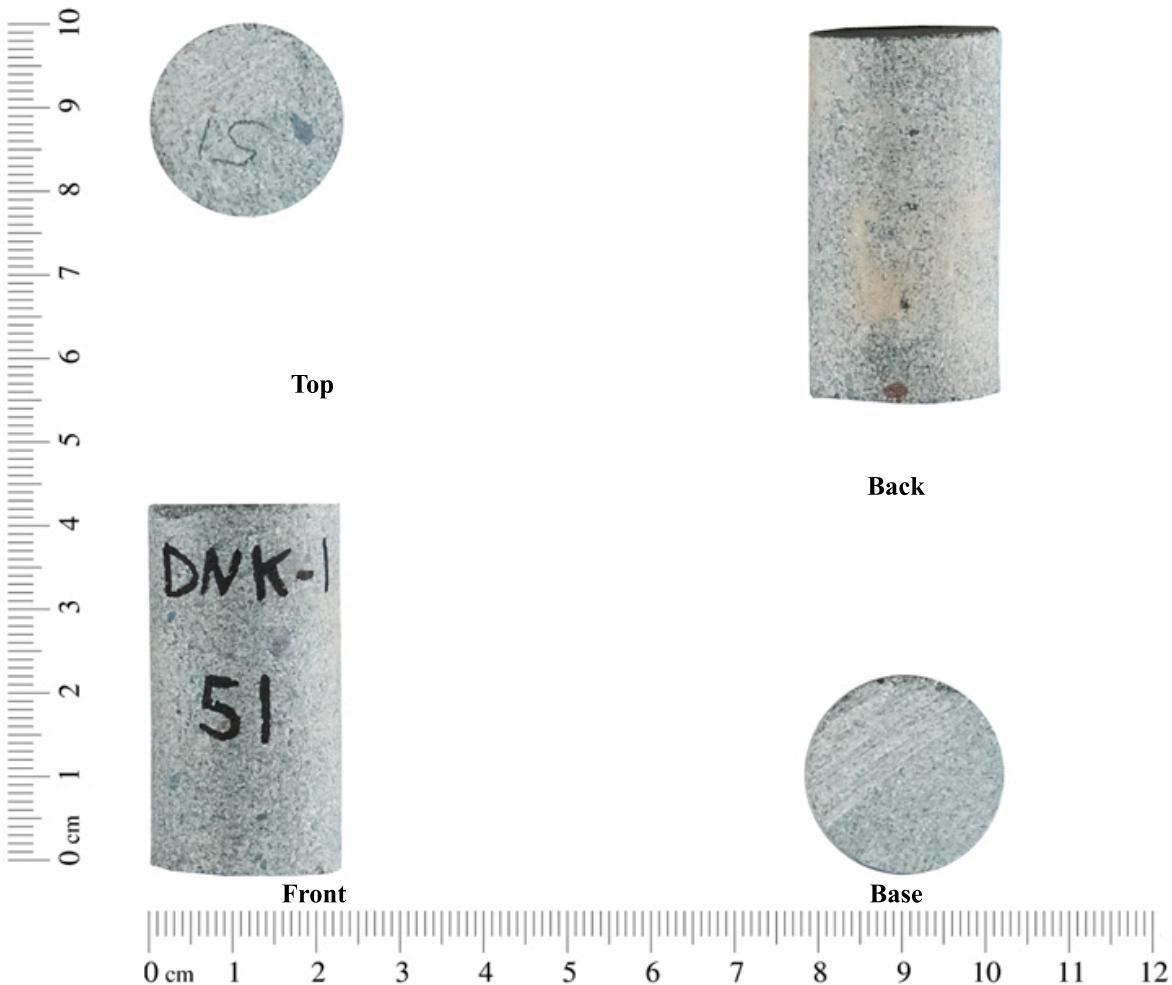
Sample No.:	41
Depth:	2818.49 m
Permeability:	0.0010 mD
Porosity:	4.8 %



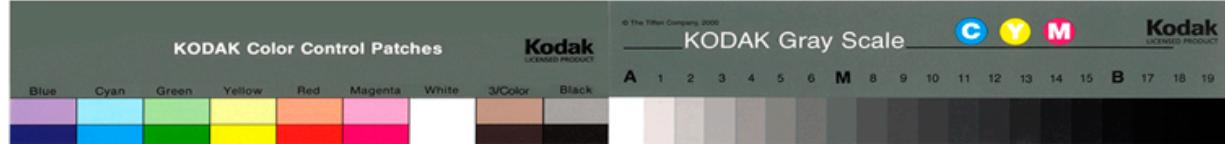


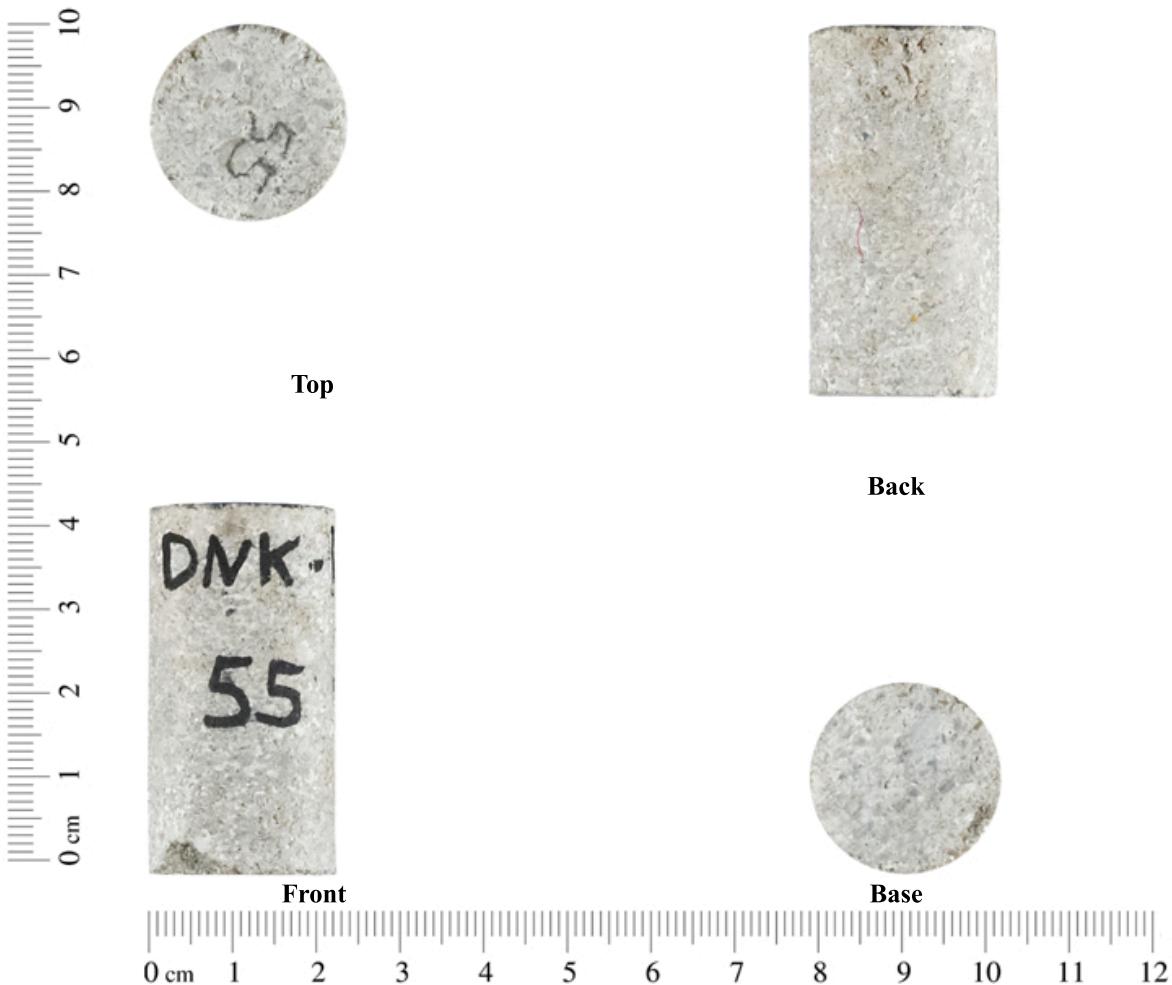
Sample No.:	43
Depth:	2813.00 m
Permeability:	0.0047 mD
Porosity:	8.7 %





Sample No.:	51
Depth:	2669.12 m
Permeability:	0.0045 mD
Porosity:	5.6 %





Sample No.:	55
Depth:	2384.85 m
Permeability:	169 mD
Porosity:	12.2 %



APPENDIX X
PORE FLUID EXTRACTION

FLUID EXTRACTION AND ANALYSIS

Client QGC - A BG Group Business

Well Dunk-1

Condition Fresh-State

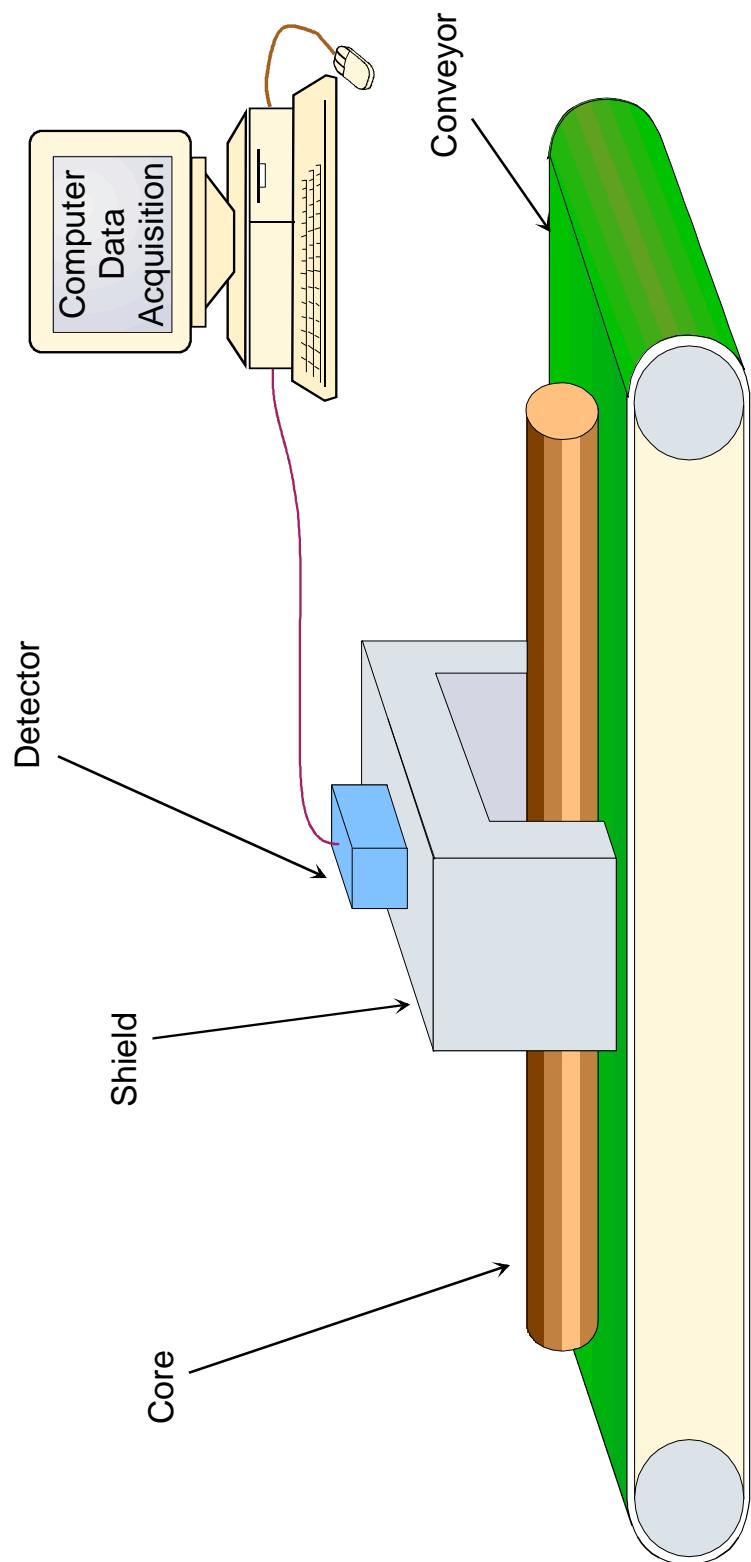
Method Air-Brine Centrifuge Fluid Extraction and Collection

Sample Number	Depth (metres)	Fluid Extracted	Fluid Extracted	Phase		Temperature (°C)	Resistivity @ Temp	Resistivity @ 20°C	QC Resistivity @ 20°C
		(78 hours) (4000 rpm)	(117 hours) (12,500 rpm)	Resistance (ohm)	Angle		(ohm.m)	(ohm.m)	(ohm.m)
R1	2921.18	0.0							
R2	2921.23	0.0							
R3	2921.28	0.0							
R4	2921.60	0.0							
R5, R6, R7	2921.65 - 2921.77	†	0.1 to 0.2	32.26	0.86	20.8	0.1648	0.1680	0.1668
R8	2921.83	Not analysed							

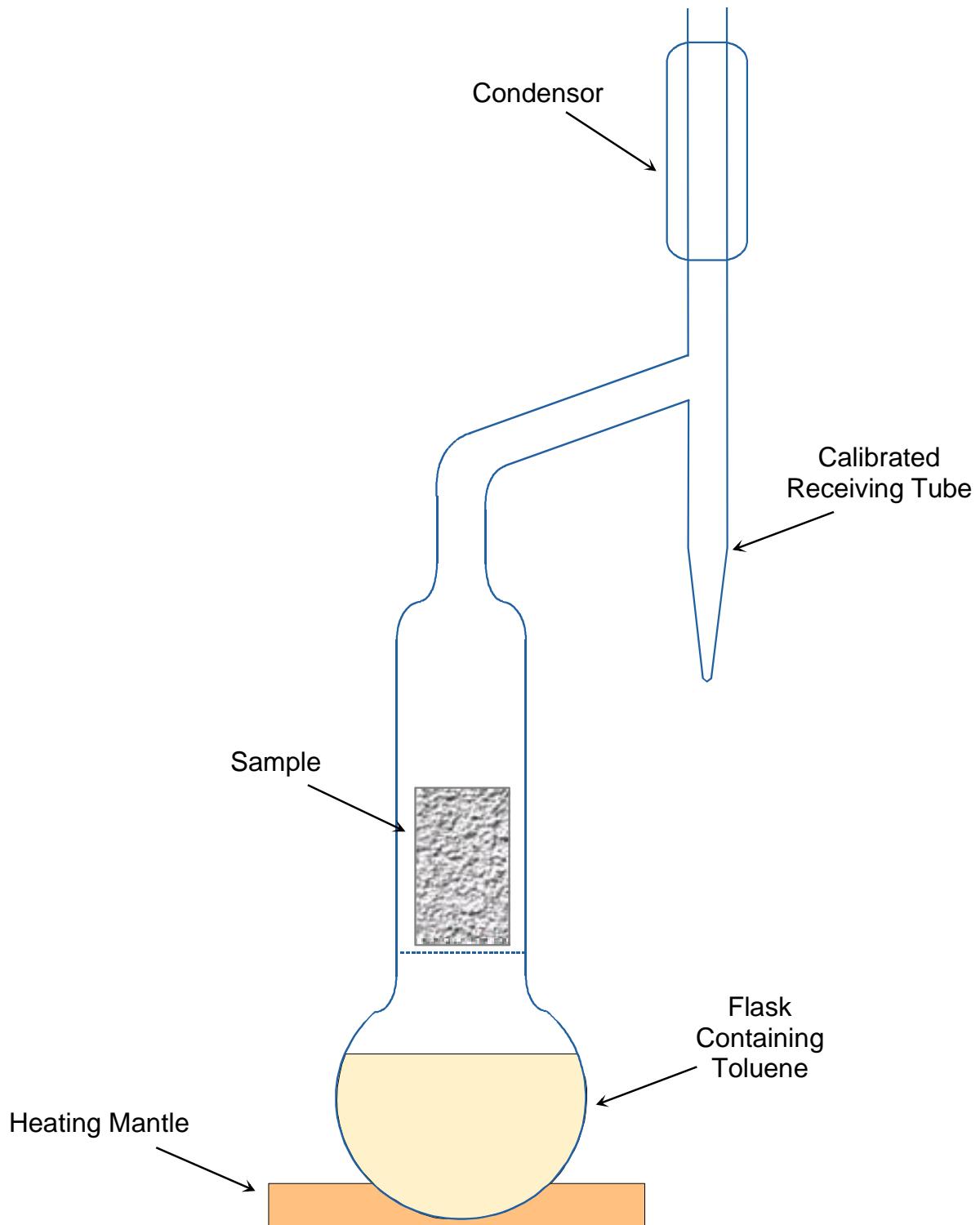
† Fluid volumes have been combined to achieve minimal volume for analysis

APPENDIX XI
EQUIPMENT SCHEMATICS

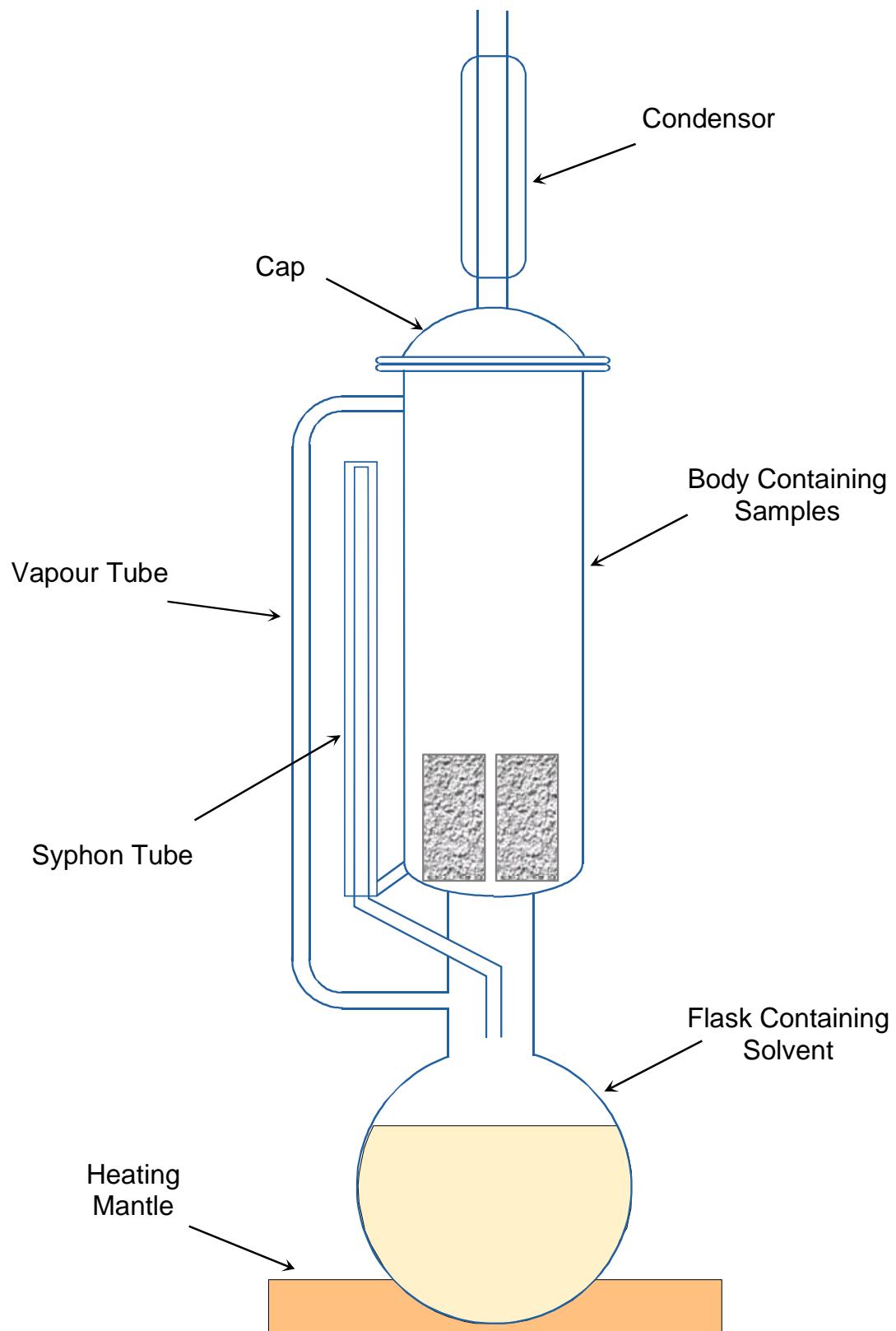
CONTINUOUS CORE GAMMA SCHEMATIC



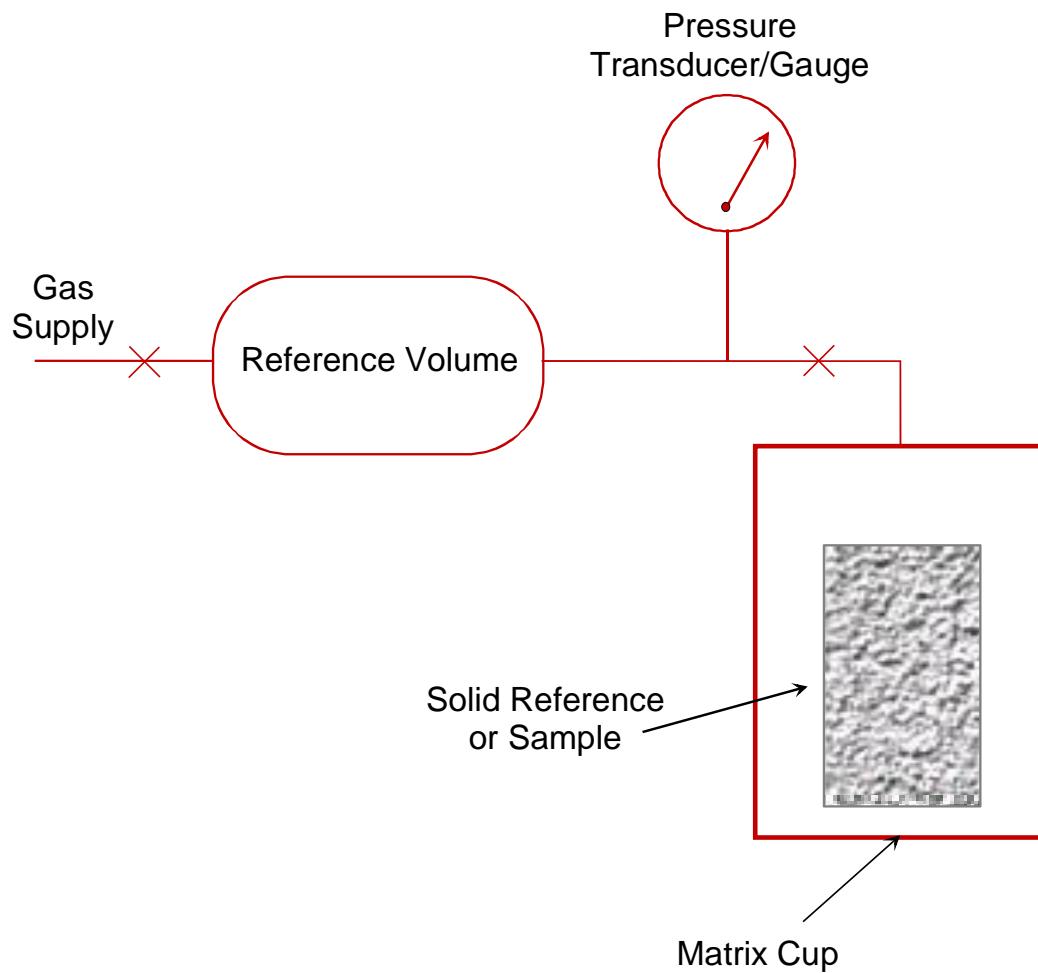
DEAN-STARK APPARATUS



SOXHLET CLEANING APPARATUS

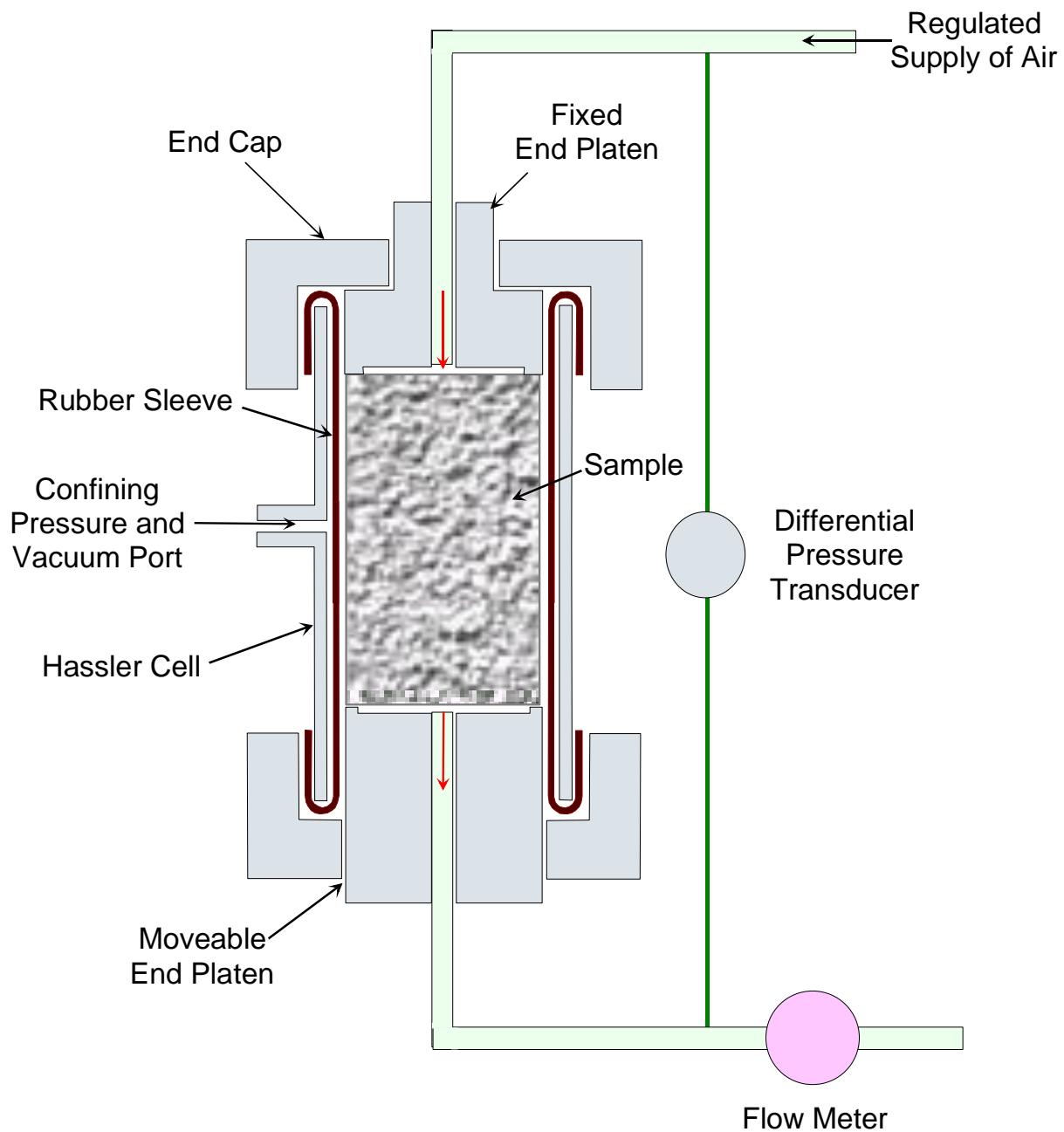


POROSIMETER SCHEMATIC



$$P_1 \cdot V_1 \text{ (reference)} = P_2 \cdot V_2 \text{ (sample)}$$

GAS PERMEAMETER SCHEMATIC (Hassler)



GAS PERMEAMETER SCHEMATIC (Hydrostatic)

