

## Granulometry, carbonate and glauconite content as stratigraphic tools to distinguish the Kiel Member and lower Antwerpen Member (Berchem Formation) in the City of Antwerp area (Belgium)

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### ABSTRACT

Granulometric, carbonate and glauconite analyses were performed on samples of the Kiel and Antwerpen members (Berchem Formation) in temporary exposures and boreholes in the area of the City of Antwerp. Since the upper part of the Antwerpen Member is only locally preserved from post-depositional erosion, this study focuses on the much more frequently sampled lower part of the Antwerpen Member. The granulometric results show that the Kiel Member and lower part of the Antwerpen Member are both dominated by the fine sand fraction, with an overall finer grain size for the lower Antwerpen Member compared to the Kiel Member. The Kiel Member is relatively enriched in the fine and medium sand fractions, whereas the lower Antwerpen Member is relatively enriched in the very fine sand to silt fraction. Both members show a similar, low clay content. Measurements of clay content are higher in boreholes (on average 3.9–5.2%) than in temporary exposures (less than 1%), which might be explained by the crushing of the glauconite into the clay fraction during drilling. In borehole samples, especially those analysed by sieving, the Antwerpen Member often shows a higher amount of coarse grains than the Kiel Member, which represent shell fragments present in the Antwerpen Member and nearly absent in the Kiel Member. Like the amounts of shells, also the measured carbonate content—measured outside the shell beds—is lower for the Kiel Member than for the lower Antwerpen Member (3% vs 4.2%). The average glauconite content—based on the >63  $\mu\text{m}$  fraction—displays similar, strong fluctuations between 35% and 60% for both members. On top of these fluctuations, a general downward decrease in glauconite content is noticed in the Kiel Member.

### KEYWORDS

granulometry,  
glauconitic sand,  
temporary exposures,  
boreholes,  
Berchem Formation

### Article history

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### Supplementary material

Overview of all the analysed samples that were gathered for this study, with their ID's (DOV ID for the borehole from which the sample was taken and sample ID to identify each sample), coordinates, sample depth (top and base of sampled interval) and interpreted stratigraphy.

When measured, the glauconite and carbonate content is given. The rightmost eight columns are indicative for the granulometry: column titles represent grain sizes in  $\mu\text{m}$  and the values represent the cumulative retained percentages for each individual sample.



**Borehole data**

DOV ID	DOV sample ID	X-coordinate	Y-coordinate	Height (m TAW)	Depth top of the sample	Depth base of the sample	Stratigraphic interpretation	Carbonate content	Glauconite content	2 µm	63 µm	125 µm	200 µm	250 µm	500 µm	1000 µm	2000 µm
1445-GEO-18/132-B2b	0121-07245001	154047	216278	4.13	20.50	21.00	Antwerpen	4.4	67.0		73.2	65.0	34.0	16.0	2.0	0.0	0.0
1445-GEO-18/132-B2b	0121-07245002	154047	216278	4.13	27.00	27.50	Kiel	3.9	48.3		85.5	77.0	19.0	6.0	0.0	0.0	0.0
1445-GEO-18/132-B5b	0121-07245006	153964	215708	5.65	18.50	19.00	Antwerpen	5.2	44.5		70.8	62.0	32.0	18.0	3.0	1.0	1.0
1445-GEO-18/132-B5b	0121-07245007	153964	215708	5.65	24.50	25.00	Kiel	3.2	47.2		90.8	84.0	28.0	9.0	1.0	0.0	0.0
1445-GEO-18/132-B5b		153964	215708	5.65	19.00	19.44	Antwerpen		39.2								
1445-GEO-18/132-B5b		153964	215708	5.65	22.00	22.38	Kiel		44.6								
1445-GEO-18/132-B5b		153964	215708	5.65	24.50	24.92	Kiel		46.0								
GEO-00/123-BAM4	3	151453	210541	6.81	7.50	7.70	Kiel	2.2			90.5	86.7	70.8	60.5	13.9	7.1	4.5
GEO-00/123-BAM4	4	151453	210541	6.81	7.70	7.86	Kiel	1.4		91.9	88.1	63.9	21.8	10.6	1.3		
GEO-00/127-BNB11	4	152547	211421	6.52	9.00	9.43	Kiel	1.8			95.1	86.3	39.0	15.0	0.9	0.4	0.1
GEO-00/127-BNB14	4	152523	211569	6.81	10.00	10.20	Kiel	59.5			95.9	87.4	65.4	57.1	40.5	24.5	16.2
GEO-00/127-BNB14	5	152523	211569	6.81	10.20	10.40	Kiel	2.1			93.0	82.1	38.1	15.5			
GEO-04/169-BA-B1	N5	154141	214013	5.20	13.50	14.00	Antwerpen	9.2		89.8	84.6	78.1	46.5	25.7	2.4	1.3	0.8
GEO-04/169-BA-B1	N6	154141	214013	5.20	16.50	17.00	Kiel	6.5			92.3	86.1	53.0	29.2	1.6	0.5	0.3
GEO-04/169-BA-B1	N8	154141	214013	5.20	23.50	24.00	Kiel	10.1		95.1	86.1	64.7	25.4	14.3	2.7	0.5	
GEO-04/169-BGr-B1	N5	154068	214990	3.76	15.20	15.50	Antwerpen	5.9		89.2	82.3	75.0	45.4	25.5	2.1	0.9	0.5
GEO-04/169-BGr-B1	N7	154068	214990	3.76	21.50	22.00	Kiel	4.6		96.1	90.0	71.6	19.8	5.4	0.4	0.2	0.1
GEO-04/169-BRo-B1	N5	152549	214646	6.61	16.50	17.50	Kiel	4.0			94.1	82.4	29.2	8.3	0.9	0.5	0.3
GEO-04/169-BRo-B1	N7	152549	214646	6.61	23.00	23.50	Kiel	4.8			91.2	78.3	32.4	12.3	0.2		
GEO-04/169-Bstr-B1	N5	153627	214521	5.51	14.50	15.00	Antwerpen	4.2		90.6	84.6	78.5	50.6	29.9	1.4	0.3	
GEO-05/162-BA-B2	N5	154140	214271	5.46	15.00	15.50	Kiel	4.0		93.2	86.8	82.1	44.1	18.9	1.6	0.5	0.0
GEO-05/162-BA-B2	N7	154140	214271	5.46	21.00	21.50	Kiel	2.2			93.6	87.6	41.6	15.3	0.4	0.1	0.0
GEO-05/162-BA-B2	N8	154140	214271	5.46	24.00	24.50	Kiel	4.5		97.8	88.1	75.0	18.1	4.6	0.9	0.5	0.0
GEO-05/162-BA-B3	N4	154559	213856	5.60	12.00	12.50	Antwerpen	1.8		98.6	84.6	77.7	38.7	15.2	1.1	0.1	0.0
GEO-05/162-BA-B3	N5	154559	213856	5.60	15.50	16.00	Kiel	1.9			91.4	85.6	40.9	16.4	4.9	0.3	0.0
GEO-05/162-BL-B1	N4	154844	213518	5.02	12.00	12.50	Antwerpen	2.6			98.7	97.6	71.3	49.9	3.7	0.2	0.0
GEO-05/162-BL-B1	N6	154844	213518	5.02	18.00	18.50	Kiel	1.2			94.3	88.4	41.6	13.8	0.3	0.0	0.0
GEO-06/152-B12	N6	152353	213885	7.66	14.00	14.50	Kiel	21.0		95.2	87.6	69.0	23.0	9.8	2.0	1.0	0.8
GEO-06/152-B12	N7	152353	213885	7.66	16.00	16.50	Kiel	5.7			95.3	89.1	46.9	14.9	0.8		
GEO-06/152-B19	N6	152573	213891	6.33	13.50	14.00	Kiel	18.9			90.1	77.1	35.0	13.3	1.5	0.7	0.5
GEO-06/152-B19	N7	152573	213891	6.33	14.50	15.00	Kiel	3.9			94.0	88.9	49.1	15.3	0.3		
GEO-06/152-B5	N6	152424	213936	6.23	15.00	15.50	Kiel	3.4			94.2	88.5	46.0	13.1	0.2		
GEO-06/156-B1	N2A	153187	211864	8.13	7.00	7.25	Antwerpen	9.6		87.8	61.0	41.1	18.8	12.4	7.5	6.2	4.5
GEO-06/156-B1	N2B	153187	211864	8.13	7.25	7.51	Antwerpen	3.3		86.5	77.3	70.0	37.3	14.1	0.7		
GEO-06/156-B1	N3	153187	211864	8.13	12.00	12.50	Kiel	2.8			90.8	81.4	25.5	7.5	0.4		
GEO-06/156-B1	N5	153187	211864	8.13	18.00	18.38	Kiel	2.7			93.9	83.3	32.7	6.6	0.2		
GEO-06/156-B2	N3	153276	212109	8.29	9.00	9.53	Antwerpen	4.6		85.6	71.1	62.5	31.0	11.2	0.8	0.2	
GEO-06/156-B2	N4	153276	212109	8.29	12.50	13.04	Kiel	1.7		90.0	85.7	76.3	24.4	6.9	0.4		
GEO-06/156-B2	N5	153276	212109	8.29	15.50	16.02	Kiel	3.3			95.2	89.4	51.1	17.0	1.3		
GEO-06/156-B2	N6	153276	212109	8.29	18.00	18.53	Kiel	1.6			94.3	85.9	38.3	7.2	0.3	0.0	
GEO-06/156-B4	N4	153260	212631	7.00	9.00	9.50	Antwerpen	5.0		90.1	81.9	75.6	43.6	18.9	1.1	0.1	
GEO-07/155-B11	N4	155813	212114	4.76	11.00	11.42	Antwerpen	10.4		93.9	80.5	71.2	38.5	15.9	0.9	0.0	0.0
GEO-07/155-B17	N4	155869	211834	7.27	13.00	13.48	Antwerpen	6.7		90.6	80.7	73.7	40.8	18.3	2.7	1.4	0.7
GEO-07/155-B17	N5	155869	211834	7.27	15.00	15.54	Kiel	2.4			93.4	85.5	30.9	9.6	0.8	0.3	0.2
GEO-11/013-B127	N3	152144	212989	6.94	16.00	16.50	Kiel	2.4			92.2	78.6	25.0	7.3	0.3	0.0	
GEO-11/013-B199	N3	152022	212678	7.07	18.00	18.50	Kiel	4.8			95.7	84.5	67.7	20.2	6.6	0.3	0.1
GEO-11/063-B15	G35	153285	214514	5.54	15.50	15.50	Antwerpen		51.5	99.7	89.7	79.2	45.9	25.3	12.9	11.8	10.8
GEO-11/063-B15	G38	153285	214514	5.54	17.00	17.00	Kiel		55.5		96.9	90.7	39.5	11.2	0.7	0.2	0.1
GEO-11/063-B15	G42	153285	214514	5.54	19.00	19.00	Kiel		48.9		93.6	88.2	46.6	16.0	0.9	0.5	0.4
GEO-11/063-B15	N4	153285	214514	5.54	19.50	19.50	Kiel	2.7			97.4	93.3	50.7	15.2	0.2	0.0	
GEO-11/063-B18	N3	153725	214530	5.53	15.00	15.50	Antwerpen	3.9		93.2	87.2	81.1	46.1	18.9	0.9	0.1	0.0
GEO-11/063-B18	N4	153725	214530	5.53	19.00	19.40	Kiel	2.8			90.6	83.0	43.5	12.7	0.3	0.0	

GEO-11/063-B20	G37	152953	214733	6.47	16.00	16.50	Antwerpen		50.9	94.0	84.5	41.1	17.9	6.4	4.5	3.2
GEO-11/063-B20	G44	152953	214733	6.47	20.00	20.50	Kiel		48.4	94.8	88.7	44.0	23.3	19.1	7.1	1.1
GEO-11/063-B20	N4	152953	214733	6.47	19.50	20.00	Kiel	2.5		97.7	92.1	30.8	7.7	0.6	0.0	
GEO-11/063-B6	G30	154114	214184	5.33	12.50	13.00	Antwerpen		40.6	90.4	74.5	64.0	29.0	10.0	0.7	0.1
GEO-11/063-B6	G32	154114	214184	5.33	14.00	14.50	Antwerpen		54.8	89.3	73.2	64.8	34.8	14.5	1.5	0.4
GEO-11/063-B6	G38	154114	214184	5.33	17.00	17.50	Kiel		41.3	92.5	77.9	64.8	36.6	14.3	0.5	0.0
GEO-11/063-B6	G41	154114	214184	5.33	19.00	19.50	Kiel		41.1	88.0	76.5	65.0	35.4	11.7	0.3	0.0
GEO-11/063-B6	N3	154114	214184	5.33	13.50	14.00	Antwerpen	21.9		94.8	88.2	81.9	52.2	26.7	1.5	0.0
GEO-11/063-B6	N4	154114	214184	5.33	17.50	18.00	Kiel	2.7			95.6	91.2	57.2	22.6	0.5	0.0
GEO-11/063-BNO-9	N3	151986	214684	6.34	21.50	22.00	Kiel	2.4			96.6	89.0	44.6	11.1	0.2	0.1
GEO-11/065-B10W	N3	153177	214639	0.59	9.57	10.07	Antwerpen	2.7			95.5	93.3	53.9	18.3	0.7	0.1
GEO-11/065-B10W	N4	153177	214639	0.59	11.57	12.07	Kiel	2.3			92.8	85.1	34.5	7.6	0.4	0.0
GEO-11/065-B15W	N1	152647	214753	-7.48	4.90	5.40	Kiel	2.9			97.2	90.6	42.8	11.2	0.4	0.2
GEO-11/065-B15W	N2	152647	214753	-7.48	6.90	7.40	Kiel	2.8			96.8	90.2	42.6	10.5	0.4	0.2
GEO-11/065-B15W	N3	152647	214753	-7.48	8.90	9.40	Kiel	3.4			96.0	87.9	41.6	11.6	0.1	0.0
GEO-11/065-B20W	N1	152420	214755	-7.79	5.14	5.64	Kiel	2.6			97.4	93.8	57.5	19.7	0.2	0.1
GEO-11/065-B20W	N2	152420	214755	-7.79	7.14	7.64	Kiel	2.4			97.3	88.7	42.8	13.7	0.2	0.0
GEO-11/065-B20W	N3	152420	214755	-7.79	9.14	9.64	Kiel	4.1			92.0	78.8	28.8	9.0	0.3	0.0
GEO-11/065-B5W	N3	153502	214547	-0.01	9.55	10.05	Antwerpen	4.3			92.8	87.5	41.9	11.8	0.7	0.0
GEO-11/065-B5W	N4	153502	214547	-0.01	12.05	12.60	Antwerpen	3.2			98.8	95.3	37.5	9.0	0.6	0.0
GEO-12/115-B10	0121-07245016	154068	214994	4.21	13.50	14.00	Antwerpen	28.3	13.0		82.9	72.0	44.0	36.0	26.0	23.0
GEO-12/115-B10	0121-07245017	154068	214994	4.21	15.00	15.50	Antwerpen	5.4	44.9		71.6	63.0	34.0	16.0	2.0	1.0
GEO-12/115-B10	0121-07245018	154068	214994	4.21	16.00	16.50	Antwerpen	4.5	39.9		74.4	65.0	31.0	12.0	1.0	0.0
GEO-12/115-B10	0121-07245019	154068	214994	4.21	18.50	19.00	Kiel	4.5	45.3		71.4	60.0	16.0	6.0	1.0	0.0
GEO-12/115-B10	0121-07245020	154068	214994	4.21	20.50	21.00	Kiel	4.5	10.8		78.9	65.0	10.0	4.0	0.0	0.0
GEO-12/115-B10	N4A	154068	214994	4.21	14.50	14.60	Antwerpen			87.2	87.0	82.3	51.3	26.8	2.2	0.5
GEO-12/115-B10	N4B	154068	214994	4.21	14.60	15.00	Antwerpen			88.6	86.7	81.8	52.0	27.9	2.4	0.5
GEO-12/115-B10	N5	154068	214994	4.21	18.00	18.50	Kiel				98.1	95.0	41.2	11.7	1.3	0.1
GEO-12/115-B2	VPO2020_87	154849	213512	4.98	17.80	17.80	Kiel		45.7	99.5	97.2	94.7	71.8	48.6	3.0	0.1
GEO-12/115-B2	VPO2020_88	154849	213512	4.98	14.80	14.80	Kiel			98.6	88.2	84.2	62.5	39.9	2.4	0.0
GEO-12/115-B2	VPO2020_89	154849	213512	4.98	12.50	12.50	Antwerpen	9.1	37.3		96.7	75.5	69.5	52.3	36.5	5.6
GEO-12/115-B2	VPO2020_96	154849	213512	4.98	17.50	18.00	Kiel			99.4	96.7	93.7	70.4	47.1	3.1	0.0
GEO-12/115-B3	0121-07245010	154818	213550	5.14	11.50	12.00	Antwerpen		33.3		94.3	90.0	51.0	30.0	5.0	3.0
GEO-12/115-B3	N3	154818	213550	5.14	12.50	13.00	Antwerpen			91.7	82.5	74.9	41.2	19.7	5.0	3.7
GEO-12/115-B3	N4	154818	213550	5.14	16.00	16.50	Kiel				96.5	92.0	35.4	10.0	0.7	0.1
GEO-12/115-B3	N6	154818	213550	5.14	18.50	19.00	Kiel				95.6	89.3	40.9	12.4	0.2	0.0
GEO-12/115-B3	VPO2020_102	154818	213550	5.14	18.00	18.50	Kiel			98.9	96.0	92.4	67.8	44.1	3.0	0.5
GEO-12/115-B3	VPO2020_103	154818	213550	5.14	17.50	18.00	Kiel			99.1	97.2	94.6	72.4	48.7	3.4	0.0
GEO-12/115-B3	VPO2020_104	154818	213550	5.14	15.00	15.50	Kiel			91.3	74.2	67.0	40.4	21.6	1.7	0.0
GEO-12/115-B3	VPO2020_105	154818	213550	5.14	14.50	15.00	Kiel			95.5	71.9	62.3	39.8	23.3	2.0	0.5
GEO-12/115-B3	VPO2020_106	154818	213550	5.14	13.00	13.50	Antwerpen			93.9	64.0	55.2	39.6	26.5	3.8	0.6
GEO-12/115-B3	VPO2020_107	154818	213550	5.14	12.00	12.50	Antwerpen			90.4	66.3	60.2	43.5	29.0	4.4	0.6
GEO-12/115-B7	0121-07245012	154048	214352	6.05	13.50	14.00	Antwerpen		24.7		69.5	59.0	24.0	11.0	2.0	1.0
GEO-12/115-B7	0121-07245013	154048	214352	6.05	15.50	16.00	Antwerpen	5.5	43.5		78.0	70.0	37.0	17.0	2.0	1.0
GEO-12/115-B7	0121-07245014	154048	214352	6.05	21.00	21.50	Kiel	2.5	27.2		71.4	57.0	20.0	7.0	0.0	0.0
GEO-12/115-B7	N3	154048	214352	6.05	15.00	15.50	Antwerpen	17.4		91.5	84.1	78.1	49.7	26.7	2.9	0.7
GEO-12/115-B7	N4	154048	214352	6.05	19.50	20.00	Kiel				98.6	95.9	62.1	27.0	0.5	0.0
GEO-12/115-B7	N5	154048	214352	6.05	22.00	22.50	Kiel				96.8	86.2	35.9	13.1	0.3	0.0
GEO-12/115-B7	VPO2020_134	154048	214352	6.05	22.50	23.00	Kiel			90.1	76.4	67.3	37.0	20.7	2.2	0.2
GEO-12/115-B7	VPO2020_135	154048	214352	6.05	20.00	20.50	Kiel			88.1	64.4	55.6	38.4	24.9	2.2	0.1
GEO-12/115-B7	VPO2020_136	154048	214352	6.05	19.00	19.50	Kiel			89.4	74.8	68.5	51.0	34.1	2.6	0.4
GEO-12/115-B7	VPO2020_137	154048	214352	6.05	15.50	16.00	Antwerpen			92.4	66.7	59.2	43.8	30.0	3.6	0.1
GEO-12/115-B7	VPO2020_138	154048	214352	6.05	14.50	15.00	Antwerpen			93.7	70.8	64.1	45.5	29.6	3.6	0.7
GEO-12/115-B7	VPO2020_139	154048	214352	6.05	14.00	14.50	Antwerpen			92.7	66.3	57.7	39.2	24.9	3.3	0.9
GEO-12/115-B7	VPO2020_140	154048	214352	6.05	13.50	14.00	Antwerpen			95.1	76.4	66.1	41.6	26.5	5.3	1.9

GEO-12/115-B8	0121-07245027	153872	214436	5.34	16.00	17.00	Kiel	5.2	50.2		94.8	92.0	38.0	13.0	2.0	1.0	0.0
GEO-12/115-B8	0121-07245028	153872	214436	5.34	21.00	22.00	Kiel	3.5	35.0		97.4	88.0	34.0	12.0	0.0	0.0	0.0
GEO-12/115-B8	VPO2020_120	153872	214436	5.34	19.50	19.50	Kiel	0.2	37.6	99.2	96.2	90.5	55.5	31.9	1.3	0.0	0.0
GEO-12/115-B8	VPO2020_121	153872	214436	5.34	14.80	14.80	Antwerpen	1.8	55.8	97.5	81.6	76.9	64.6	49.4	4.9	0.0	0.0
GEO-12/115-B8	VPO2020_122	153872	214436	5.34	13.80	13.80	Antwerpen	1.9	50.8	97.8	84.6	80.3	67.1	52.3	8.8	2.0	0.0
GEO-13/060-B106	N4	154361	213928	5.43	12.00	12.50	Antwerpen	6.6		84.7	83.0	78.4	41.4	17.2	3.1	1.7	0.5
GEO-13/060-B106	N5	154361	213928	5.43	19.00	19.40	Kiel	1.5			91.8	84.5	47.4	16.0	0.3	0.0	0.0
GEO-13/060-B178	N4	153947	215349	7.41	22.50	23.00	Kiel	2.7		95.3	89.3	81.8	41.4	14.0	0.8	0.0	
GEO-13/060-B205	N4	153874	214467	5.47	20.00	20.50	Kiel	2.4			98.1	92.2	45.2	13.1	0.2	0.0	0.0
GEO-13/060-B55	N3	152059	214642	6.11	19.00	19.50	Kiel	1.3			98.3	94.5	57.2	19.0	0.5	0.3	0.1
GEO-13/060-B70	N4	153255	214524	5.59	18.00	18.50	Kiel	1.9			98.4	95.2	55.1	18.6	0.3	0.0	
GEO-13/060-B73	N4	153564	214442	5.58	16.00	16.50	Kiel	3.1			97.6	94.3	41.3	10.5	0.8	0.1	0.0
GEO-13/060-B73	N5	153564	214442	5.58	22.00	22.45	Kiel	3.5		92.8	85.7	69.3	16.3	4.5	0.7	0.3	0.1
GEO-13/079-B1	G17	152453	213879	6.26	18.00	18.50	Kiel	3.4		84.5	66.3	55.6	23.1	5.0	0.1	0.0	
GEO-13/079-B1	G4	152453	213879	6.26	11.50	12.00	Kiel	9.7		94.0	75.3	52.2	8.2	4.9	1.8	1.2	0.7
GEO-13/079-B2	G17	152501	213879	6.08	18.00	18.50	Kiel	3.9		79.9	62.3	52.2	18.9	3.2	0.0		
GEO-13/079-B3	G8	152535	213879	6.18	13.50	14.00	Kiel	6.5		75.9	69.6	61.5	30.1	15.8	5.5	2.3	0.8
GEO-14/021-B6	G23	155183	213899	4.91	12.50	13.00	Antwerpen	4.2		89.7	68.3	57.2	24.6	8.6	2.2	1.5	1.2
GEO-14/129-B1	N8A	152534	213959	6.54	16.00	16.30	Kiel	1.8		96.0	82.3	71.0	34.7	7.7	0.2	0.0	0.0
GEO-14/129-B1	N8B	152534	213959	6.54	16.30	16.37	Kiel	1.6			93.3	84.6	44.0	11.1	0.2	0.0	0.0
GEO-14/129-B3	N6	152462	213955	6.34	15.50	15.90	Kiel	3.7		96.0	88.9	80.1	42.6	13.5	2.1	0.9	0.1
GEO-15/022-B4	N1	152198	213115	6.96	16.50	17.00	Kiel	2.4			93.7	77.8	24.1	6.2	0.2	0.0	0.0
GEO-15/022-B4	N2	152198	213115	6.96	19.50	20.00	Kiel	2.4		93.8	88.8	65.4	17.6	5.5	0.1	0.0	0.0
GEO-15/048-B11	N7	151794	213375	8.16	20.50	20.88	Kiel	1.5			90.5	79.2	33.5	8.3	0.2	0.0	0.0
GEO-15/048-B6	N6	151769	213366	7.84	18.50	18.87	Kiel	3.0			90.5	78.3	33.3	9.1	0.4	0.2	0.0
GEO-98/180-B1	p44	151974	214408	8.39	22.00	22.00	Kiel				15.8	14.4	8.3	3.2	0.0	0.0	

## Outcrop data

DOV ID	DOV sample ID	X-coordinate	Y-coordinate	Height (m TAW)	Depth top of the sample	Depth base of the sample	Stratigraphic interpretation	Carbonate content	Glauconite content	2 µm	63 µm	125 µm	200 µm	250 µm	500 µm	1000 µm	2000 µm
TO-20150701	PX5	154639	209875	8.00	5.70	6.10	Antwerpen	4.0	38.3	99.7	86.9	72.2	47.9	31.7	0.9	0.0	
TO-20150701	PX4	154639	209875	8.00	6.10	6.30	Antwerpen	0.6	37.3	99.9	90.2	76.0	48.8	31.4	0.8	0.0	
TO-20150701	PX3	154639	209875	8.00	6.30	6.60	Kiel	<0.1	46.9	100.0	98.3	88.7	54.4	32.5	0.4	0.0	
TO-20150701	PX2	154639	209875	8.00	6.60	7.00	Kiel	<0.1	37.0	100.0	97.6	88.8	55.8	34.2	0.5	0.0	
TO-20190417	AR12	153864	210678	7.34	5.50	5.70	Antwerpen	5.0	34.1	99.7	90.3	76.9	48.8	31.0	0.6	0.0	
TO-20190417	AR10	153864	210678	7.34	5.90	6.00	Antwerpen	1.2	44.0	99.4	84.6	71.5	46.7	30.1	0.6	0.0	
TO-20190417	AR8	153864	210678	7.34	6.50	6.60	Kiel	1.0	46.5	99.6	93.1	84.5	54.6	34.3	0.6	0.0	
TO-20190417	AR4	153864	210678	7.34	8.50	8.70	Kiel	4.1	45.6	99.8	96.4	85.6	53.4	33.3	0.7	0.0	
TO-20220706-1	RU11	152872	211875	7.30	6.00	6.00	Antwerpen		33.3	98.8	77.2	66.8	42.1	25.8	0.2	0.0	0.0
TO-20220706-1	RU9	152872	211875	7.30	6.33	6.33	Antwerpen			98.8	78.4	68.5	43.5	27.1	0.3	0.0	0.0
TO-20220706-1	RU7	152872	211875	7.30	6.54	6.54	Antwerpen		39.1	98.4	74.7	64.7	38.9	22.8	0.1	0.0	0.0
TO-20220706-1	RU4	152872	211875	7.30	7.20	7.20	Kiel		58.4								
TO-20220706-1	RU1	152872	211875	7.30	7.75	7.75	Kiel		60.3	99.9	96.7	91.7	64.3	42.8	1.0	0.0	0.0
TO-20220706-1	RUC	152872	211875	7.30	8.28	8.28	Kiel			99.9	95.6	90.9	64.6	43.7	1.1	0.0	0.0
TO-20220706-1	RUA	152872	211875	7.30	9.32	9.32	Kiel		50.4	99.9	96.4	87.4	54.3	33.1	0.4	0.0	0.0
TO-20191211	TW2	154707	210945	6.30	9.40	9.45	Kiel	2.2	42.9	99.8	97.2	88.4	57.7	37.1	1.0	0.0	