

The National Marine Biological
Analytical Quality Control Scheme

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Particle Size Results - PS40

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Table 1. Summary of the particle size information received from participating laboratories and replicate analysis laboratory for the fortieth particle size distribution - PS40.

Benchmark Data

Sample	Method	%Gravel	%Sand	%Silt	Median	Mean	Sediment Description (Post analysis)
PS 40 60	L ¹	0.00	15.80	84.20	6.531	6.358	Sandy Mud
PS 40 61	L ¹	0.00	14.55	85.45	6.566	6.422	Sandy Mud
PS 40 62	L ¹	0.00	13.96	86.04	6.566	6.432	Sandy Mud
PS 40 63	L ¹	0.00	13.23	86.77	6.604	6.478	Sandy Mud
PS 40 64	L ¹	0.00	12.72	87.28	6.608	6.493	Sandy Mud
PS 40 65	L ¹	0.00	14.18	85.82	6.555	6.418	Sandy Mud
PS 40 66	L ¹	0.00	12.73	87.27	6.637	6.514	Sandy Mud
PS 40 67	L ¹	0.00	15.73	84.27	6.503	6.353	Sandy Mud
PS 40 68	L ¹	0.00	13.31	86.69	6.590	6.468	Sandy Mud
PS 40 69	L ¹	0.00	9.82	90.18	6.736	6.620	Mud
TUM	L ¹	0.00	13.60	86.40	6.59	6.46	Sandy Mud

Participant Data

Lab	Method	%Gravel	%Sand	%Silt	Sediment Description (Post analysis)
LB1801	L*	0.00	12.89	87.11	Silt
LB1802	L*	0.00	21.01	78.99	Sandy Mud
LB1803	L*	0.00	11.28	88.72	Slightly Sandy Mud
LB1804	L*	0.00	8.00	92.00	Mud
LB1806	L*	0.00	13.84	86.16	Sandy Silt
LB1809	L*	0.00	13.93	86.07	Sandy Mud
LB1811	L*	0.00	11.31	88.69	Sandy Mud
LB1814	WS/DS/L	0.00	9.62	90.38	Mud
LB1816	L*	0.00	12.90	87.10	Medium Silt
LB1818	L*	0.00	15.15	84.85	Muddy Sand
LB1830	L	0.00	13.68	86.32	Sandy Mud

Key to methods:

L¹ - Replicate analysis by Malvern MS 2000+Hydro-G 0.02-2000µm; no blue laser (NMBAQC PSA SOP)

L - Laser analysis

WS - Wet Sieve

DS - Dry Sieve

** - NMBAQC PSA SOP

Table 2. Summary of z-scores for each phi-interval for PS40, including all participating laboratories.

	-6.50 to -6.00	-6.00 to -5.50	-5.50 to -5.00	-5.00 to -4.50	-4.50 to -4.00	-4.00 to -3.50	-3.50 to -3.00	-3.00 to -2.50	-2.50 to -2.00	-2.00 to -1.50	-1.50 to -1.00	-1.00 to -0.50	-0.50 to 0.00	0.00 to 0.50	0.50 to 1.00	1.00 to 1.50	1.50 to 2.00	2.00 to 2.50	2.50 to 3.00	3.00 to 3.50
TUM AVERAGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.43	0.91	1.87	1.32	0.38	-0.20	-0.12
LB1801	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.42	-0.28	0.21	0.58	0.13	-0.30	0.09
LB1802	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.32	2.29	2.01	1.72	1.95	1.68	2.33
LB1803	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.46	-0.61	-0.78	-1.11	-1.06	0.02	0.07
LB1804	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.46	-0.57	-0.59	-0.93	-1.23	-1.48	-1.12
LB1806	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.46	-0.61	-0.74	-0.69	-0.55	-0.03	0.85
LB1809	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.46	-0.42	0.07	0.36	0.30	0.14	0.51
LB1811	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.46	0.09	0.46	0.29	-0.25	-0.65	-0.37
LB1814	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.40	-0.35	-0.45	-0.72	-0.90	-1.54	-1.38
LB1816	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.46	-0.61	-0.78	-1.18	-0.23	1.55	-0.97
LB1818	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.46	-0.61	-0.41	0.90	1.75	0.79	0.38
LB1830	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.70	1.67	1.00	0.78	0.09	-0.18	-0.39

	3.50 to 4.00	4.00 to 4.50	4.50 to 5.00	5.00 to 5.50	5.50 to 6.00	6.00 to 6.50	6.50 to 7.00	7.00 to 7.50	7.50 to 8.00	8.00 to 8.50	8.50 to 9.00	9.00 to 9.50	9.50 to 10.00	10.00 to 10.50	10.50 to 11.00	11.00 to 11.50	11.50 to 12.00	12.00 to 12.50	12.50 to 13.00	13.00 to 13.50
TUM AVERAGE	-0.88	-0.59	-0.57	-0.35	-0.47	-0.56	-0.09	-0.38	-0.25	0.23	0.02	0.43	0.12	0.30	0.69	0.30	-0.33	0.00	0.00	0.00
LB1801	-0.29	-0.23	-0.54	-0.51	-0.77	-0.93	-0.30	-0.37	-0.22	0.36	0.15	0.60	0.16	0.31	0.84	0.69	-0.33	0.00	0.00	0.00
LB1802	1.47	0.69	0.61	0.29	0.26	0.51	0.62	-0.01	2.95	-2.63	-1.77	-1.89	-1.17	-1.04	-1.13	-0.94	-0.33	0.00	0.00	0.00
LB1803	-0.36	0.10	0.06	0.16	-0.07	0.02	0.98	1.12	0.28	0.79	0.13	-0.06	-0.77	-1.01	-1.13	-0.94	-0.33	0.00	0.00	0.00
LB1804	-1.70	-0.87	-0.69	-0.44	-0.47	-0.25	0.68	0.40	0.03	0.64	0.31	0.83	0.31	0.44	0.81	0.43	-0.33	0.00	0.00	0.00
LB1806	1.43	2.43	2.77	2.88	2.84	2.34	1.35	-0.96	-0.91	-1.00	-1.32	-1.89	-1.17	-1.04	-1.13	-0.94	-0.33	0.00	0.00	0.00
LB1809	0.18	0.20	-0.09	-0.06	-0.25	-0.35	0.35	0.36	0.13	0.69	0.17	0.04	-0.70	-1.00	-1.13	-0.94	-0.33	0.00	0.00	0.00
LB1811	-1.20	-0.96	-0.62	0.08	0.39	0.40	0.32	-0.65	-0.42	0.15	0.01	0.50	0.18	0.37	0.78	0.50	-0.33	0.00	0.00	0.00
LB1814	0.26	-1.43	-0.80	-0.34	-0.28	-0.19	0.34	-0.16	-0.19	0.36	0.15	0.67	0.30	0.54	1.46	2.30	2.98	0.00	0.00	0.00
LB1816	0.88	-0.01	0.19	-1.27	0.09	0.88	-2.05	2.37	-0.87	0.45	-0.25	0.90	0.19	-0.25	0.01	-0.34	-0.33	0.00	0.00	0.00
LB1818	0.16	0.53	0.00	-0.33	-0.78	-1.11	-0.88	-0.93	-0.36	0.18	-0.03	0.32	0.05	0.26	0.61	0.18	-0.33	0.00	0.00	0.00
LB1830	-0.80	-0.45	-0.89	-0.45	-0.96	-1.32	-1.40	-1.15	-0.42	-2.63	2.43	-1.89	2.62	2.42	-1.13	-0.94	-0.33	0.00	0.00	0.00

$$z = \frac{X - \mu}{\sigma}$$
 Combines data >11.5phi
 No data provided for these phi-intervals
 Missing data values were entered as zero to calculate z-scores.
 μ and σ calculations exclude the benchmark data (TUM AVERAGE) and missing data values.

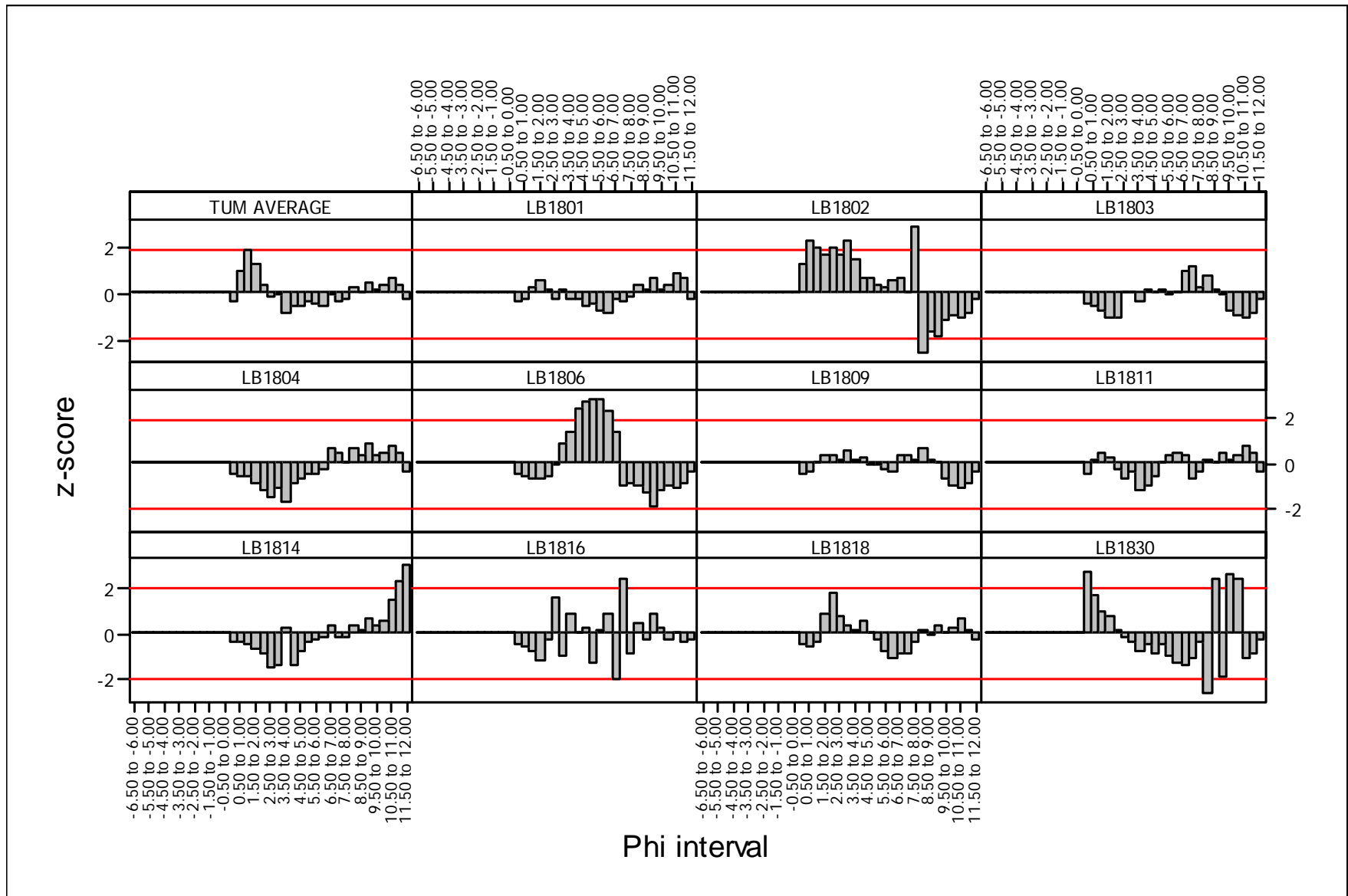


Figure 4a. Summary of z-scores for all participating laboratories and benchmark average (TUM AVERAGE); arranged by Lab Code. Reference lines (in red) are shown at (1.96).

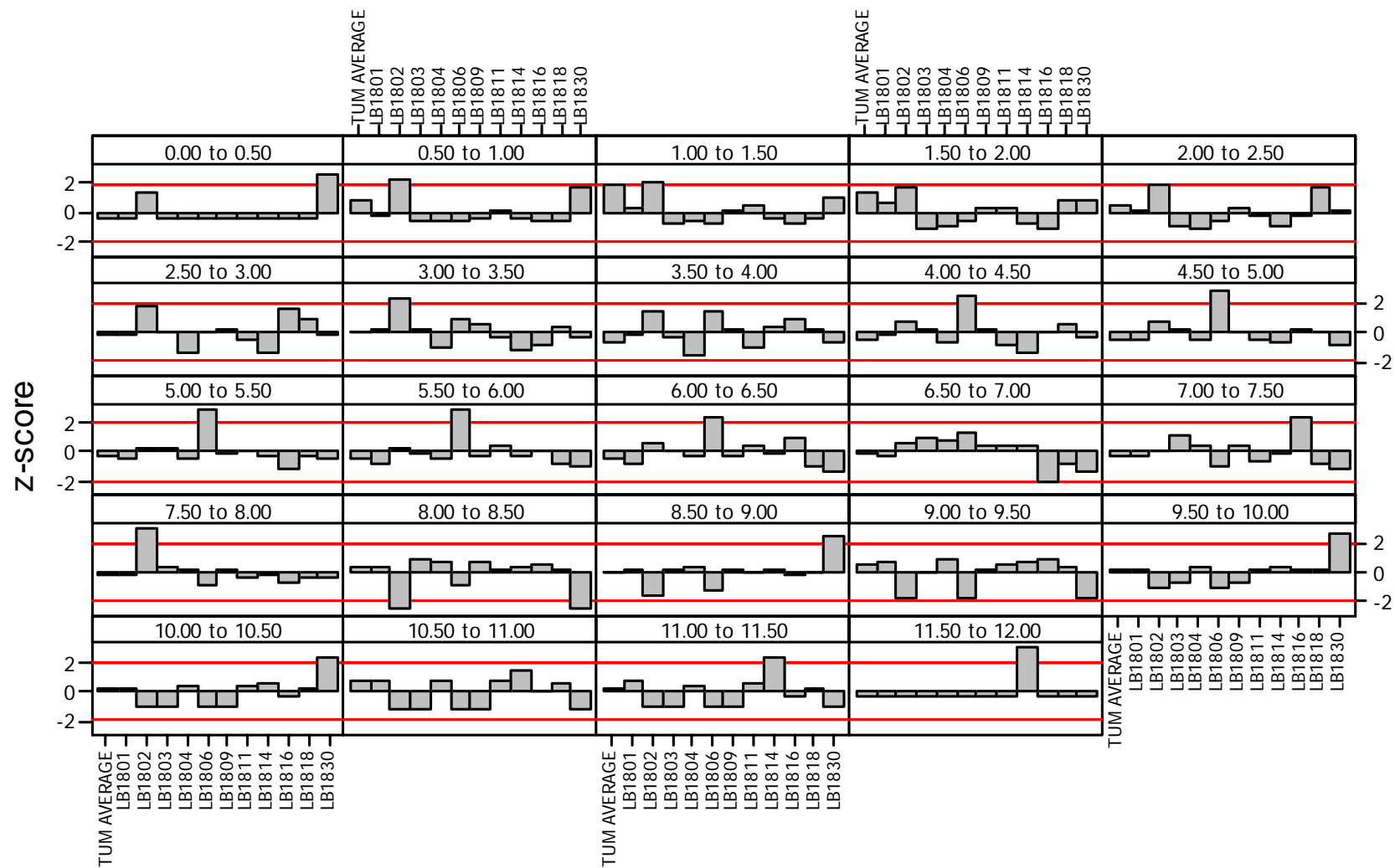


Figure 4b. Summary of z-scores for all participating laboratories and benchmark average (TUM AVERAGE); arranged by phi interval. Reference lines (in red) are shown at (1.96).

Table 3. Summary of z-scores for each phi-interval for PS40, including all participating laboratories following the NMBAQC PSA SOP.

	-6.50 to -6.00	-6.00 to -5.50	-5.50 to -5.00	-5.00 to -4.50	-4.50 to -4.00	-4.00 to -3.50	-3.50 to -3.00	-3.00 to -2.50	-2.50 to -2.00	-2.00 to -1.50	-1.50 to -1.00	-1.00 to -0.50	-0.50 to 0.00	0.00 to 0.50	0.50 to 1.00	1.00 to 1.50	1.50 to 2.00	2.00 to 2.50	2.50 to 3.00	3.00 to 3.50
TUM AVERAGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.31	1.12	1.84	1.26	0.28	-0.40	-0.32
LB1801	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.29	-0.14	0.26	0.56	0.04	-0.50	-0.11
LB1802	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.81	2.56	1.97	1.65	1.76	1.55	2.18
LB1803	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.36	-0.49	-0.68	-1.05	-1.09	-0.18	-0.13
LB1804	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.36	-0.45	-0.51	-0.89	-1.25	-1.73	-1.34
LB1806	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.36	-0.49	-0.65	-0.65	-0.60	-0.23	0.67
LB1809	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.36	-0.28	0.13	0.35	0.20	-0.05	0.32
LB1811	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.36	0.25	0.50	0.28	-0.32	-0.87	-0.58
LB1816	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.36	-0.49	-0.68	-1.12	-0.31	1.40	-1.19
LB1818	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.36	-0.49	-0.34	0.86	1.57	0.62	0.19

	3.50 to 4.00	4.00 to 4.50	4.50 to 5.00	5.00 to 5.50	5.50 to 6.00	6.00 to 6.50	6.50 to 7.00	7.00 to 7.50	7.50 to 8.00	8.00 to 8.50	8.50 to 9.00	9.00 to 9.50	9.50 to 10.00	10.00 to 10.50	10.50 to 11.00	11.00 to 11.50	11.50 to 12.00	12.00 to 12.50	12.50 to 13.00	13.00 to 13.50
TUM AVERAGE	-0.87	-0.82	-0.74	-0.40	-0.58	-0.72	-0.21	-0.51	-0.29	0.26	0.43	0.49	0.74	0.92	0.91	0.80	0.00	0.00	0.00	0.00
LB1801	-0.33	-0.45	-0.71	-0.55	-0.87	-1.08	-0.42	-0.50	-0.26	0.38	0.63	0.66	0.80	0.94	1.07	1.37	0.00	0.00	0.00	0.00
LB1802	1.31	0.49	0.41	0.19	0.12	0.34	0.50	-0.15	2.63	-2.47	-2.11	-1.77	-1.41	-1.05	-1.03	-0.99	0.00	0.00	0.00	0.00
LB1803	-0.39	-0.12	-0.13	0.07	-0.19	-0.15	0.87	0.94	0.19	0.79	0.59	0.01	-0.73	-1.01	-1.03	-0.99	0.00	0.00	0.00	0.00
LB1804	-1.65	-1.11	-0.85	-0.49	-0.58	-0.41	0.57	0.24	-0.04	0.65	0.85	0.87	1.05	1.13	1.04	0.99	0.00	0.00	0.00	0.00
LB1806	1.27	2.27	2.52	2.56	2.57	2.15	1.24	-1.07	-0.89	-0.91	-1.47	-1.77	-1.41	-1.05	-1.03	-0.99	0.00	0.00	0.00	0.00
LB1809	0.11	0.00	-0.27	-0.14	-0.37	-0.52	0.24	0.20	0.06	0.70	0.66	0.11	-0.62	-0.99	-1.03	-0.99	0.00	0.00	0.00	0.00
LB1811	-1.18	-1.19	-0.79	0.00	0.24	0.23	0.21	-0.77	-0.45	0.18	0.42	0.55	0.85	1.04	1.01	1.09	0.00	0.00	0.00	0.00
LB1816	0.76	-0.22	0.00	-1.25	-0.05	0.70	-2.19	2.16	-0.86	0.47	0.06	0.94	0.85	0.12	0.19	-0.12	0.00	0.00	0.00	0.00
LB1818	0.09	0.33	-0.19	-0.38	-0.87	-1.26	-1.01	-1.05	-0.39	0.21	0.37	0.38	0.63	0.87	0.83	0.63	0.00	0.00	0.00	0.00

$$z = \frac{X - \mu}{\sigma}$$

μ and σ calculations exclude the benchmark data (TUM AVERAGE).

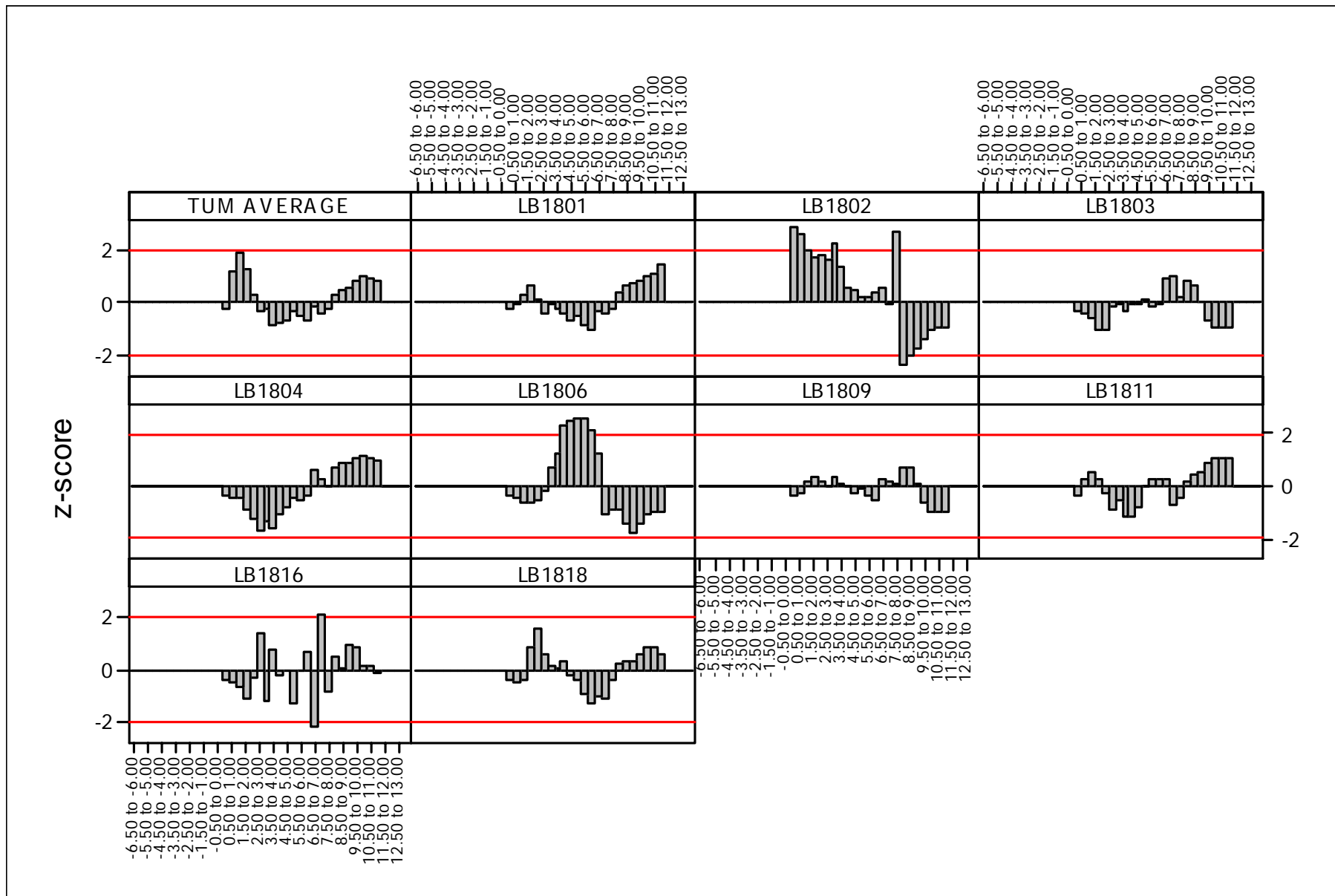


Figure 5a. Summary of z-scores for all participating laboratories following the NMBAQC PSA SOP and benchmark average (TUM AVERAGE); arranged by Lab Code. Reference lines (in red) are shown at (1.96).

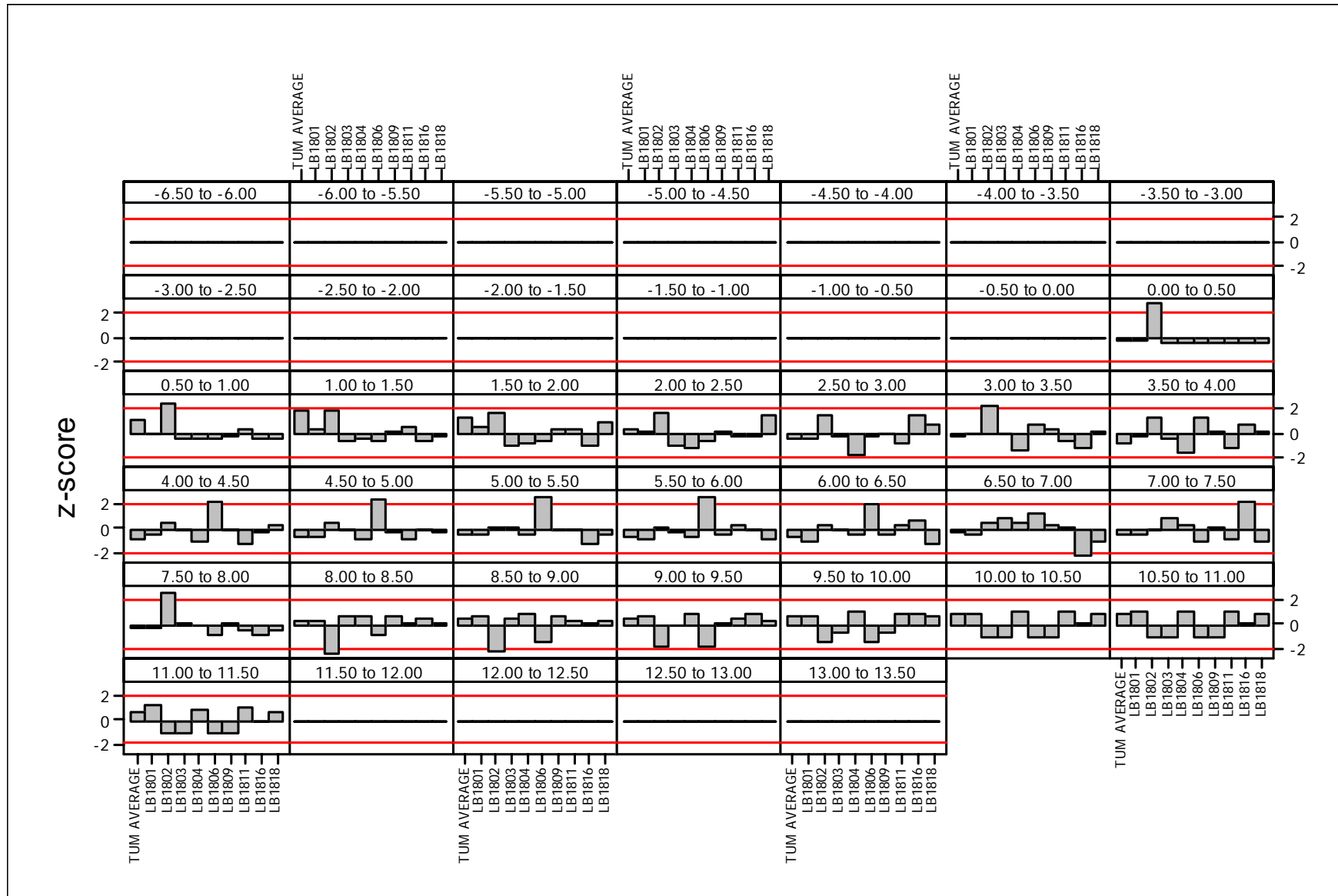


Figure 5b. Summary of z-scores for all participating laboratories following the NMBAQC PSA SOP and benchmark average (TUM AVERAGE); arranged by phi interval. Reference lines (in red) are shown at (1.96).

Appendices

Appendix 1.

Exercise Code:	PS40
LabCode:	LB1801
Sample Code:	PS401801

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	Volume/Weight (mark as "0" for not analysed or no material)
-6.50 to -6.00; 63 mm	0.0000
-6.00 to -5.50; 45 mm	0.0000
-5.50 to -5.00; 31.5 mm	0.0000
-5.00 to -4.50; 22.4 mm	0.0000
-4.50 to -4.00; 16 mm	0.0000
-4.00 to -3.50; 11.2 mm	0.0000
-3.50 to -3.00; 8 mm	0.0000
-3.00 to -2.50; 5.6 mm	0.0000
-2.50 to -2.00; 4 mm	0.0000
-2.00 to -1.50; 2.8 mm	0.0000
-1.50 to -1.00; 2 mm	0.0000
-1.00 to -0.50; 1.4 mm	0.0000
-0.50 to 0.00; 1 mm	0.0000
0.00 to 0.50; (707 µm)	0.0078
0.50 to 1.00; (500 µm)	0.0778
1.00 to 1.50; (353.6 µm)	0.3300
1.50 to 2.00; (250 µm)	0.6922
2.00 to 2.50; (176.8 µm)	1.1089
2.50 to 3.00; (125 µm)	1.9656
3.00 to 3.50; (88.39 µm)	3.5100
3.50 to 4.00; (62.5 µm)	5.1967
4.00 to 4.50; (44.19 µm)	6.2389
4.50 to 5.00; (31.25 µm)	6.5311
5.00 to 5.50; (22.097 µm)	6.5956
5.50 to 6.00; (15.625 µm)	6.9344
6.00 to 6.50; (11.049 µm)	7.7722
6.50 to 7.00; (7.813 µm)	8.8233
7.00 to 7.50; (5.524 µm)	9.3656
7.50 to 8.00; (3.906 µm)	9.0011
8.00 to 8.50; (2.762 µm)	7.8678
8.50 to 9.00; (1.953 µm)	6.1644
9.00 to 9.50; (1.381 µm)	4.2422
9.50 to 10.00; (0.977 µm)	2.8956
10.00 to 10.50; (0.691 µm)	2.3111
10.50 to 11.00; (0.488 µm)	1.7111
11.00 to 11.50; (0.345 µm)	0.6600
11.50 to 12.00; (0.244 µm)	0.0000
12.00 to 12.50; (0.173 µm)	0.0000
12.50 to 13.00; (0.122 µm)	0.0000
13.00 to 13.50; (0.086 µm)	0.0000

Appendix 1.

Exercise Code:	PS40
LabCode:	LB1802
Sample Code:	PS401802

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	Volume/Weight (mark as "0" for not analysed or no material)
-6.50 to -6.00; 63 mm	0.0000
-6.00 to -5.50; 45 mm	0.0000
-5.50 to -5.00; 31.5 mm	0.0000
-5.00 to -4.50; 22.4 mm	0.0000
-4.50 to -4.00; 16 mm	0.0000
-4.00 to -3.50; 11.2 mm	0.0000
-3.50 to -3.00; 8 mm	0.0000
-3.00 to -2.50; 5.6 mm	0.0000
-2.50 to -2.00; 4 mm	0.0000
-2.00 to -1.50; 2.8 mm	0.0000
-1.50 to -1.00; 2 mm	0.0000
-1.00 to -0.50; 1.4 mm	0.0000
-0.50 to 0.00; 1 mm	0.0000
0.00 to 0.50; (707 µm)	0.3412
0.50 to 1.00; (500 µm)	0.6948
1.00 to 1.50; (353.6 µm)	0.9262
1.50 to 2.00; (250 µm)	1.1442
2.00 to 2.50; (176.8 µm)	2.1927
2.50 to 3.00; (125 µm)	3.4971
3.00 to 3.50; (88.39 µm)	5.6399
3.50 to 4.00; (62.5 µm)	6.5588
4.00 to 4.50; (44.19 µm)	7.1413
4.50 to 5.00; (31.25 µm)	7.9951
5.00 to 5.50; (22.097 µm)	7.8341
5.50 to 6.00; (15.625 µm)	8.3682
6.00 to 6.50; (11.049 µm)	9.3232
6.50 to 7.00; (7.813 µm)	9.5860
7.00 to 7.50; (5.524 µm)	9.7552
7.50 to 8.00; (3.906 µm)	18.9115
8.00 to 8.50; (2.762 µm)	0.0000
8.50 to 9.00; (1.953 µm)	0.0000
9.00 to 9.50; (1.381 µm)	0.0000
9.50 to 10.00; (0.977 µm)	0.0000
10.00 to 10.50; (0.691 µm)	0.0000
10.50 to 11.00; (0.488 µm)	0.0000
11.00 to 11.50; (0.345 µm)	0.0000
11.50 to 12.00; (0.244 µm)	0.0000
12.00 to 12.50; (0.173 µm)	0.0000
12.50 to 13.00; (0.122 µm)	0.0000
13.00 to 13.50; (0.086 µm)	0.0000

Appendix 1.

Exercise Code:	PS40
LabCode:	LB1803
Sample Code:	PS401803

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	Volume/Weight (mark as "0" for not analysed or no material)
-6.50 to -6.00; 63 mm	0.0000
-6.00 to -5.50; 45 mm	0.0000
-5.50 to -5.00; 31.5 mm	0.0000
-5.00 to -4.50; 22.4 mm	0.0000
-4.50 to -4.00; 16 mm	0.0000
-4.00 to -3.50; 11.2 mm	0.0000
-3.50 to -3.00; 8 mm	0.0000
-3.00 to -2.50; 5.6 mm	0.0000
-2.50 to -2.00; 4 mm	0.0000
-2.00 to -1.50; 2.8 mm	0.0000
-1.50 to -1.00; 2 mm	0.0000
-1.00 to -0.50; 1.4 mm	0.0000
-0.50 to 0.00; 1 mm	0.0000
0.00 to 0.50; (707 µm)	0.0000
0.50 to 1.00; (500 µm)	0.0000
1.00 to 1.50; (353.6 µm)	0.0000
1.50 to 2.00; (250 µm)	0.0313
2.00 to 2.50; (176.8 µm)	0.4043
2.50 to 3.00; (125 µm)	2.2100
3.00 to 3.50; (88.39 µm)	3.4920
3.50 to 4.00; (62.5 µm)	5.1470
4.00 to 4.50; (44.19 µm)	6.5587
4.50 to 5.00; (31.25 µm)	7.2940
5.00 to 5.50; (22.097 µm)	7.6310
5.50 to 6.00; (15.625 µm)	7.9137
6.00 to 6.50; (11.049 µm)	8.7914
6.50 to 7.00; (7.813 µm)	9.8857
7.00 to 7.50; (5.524 µm)	10.9560
7.50 to 8.00; (3.906 µm)	10.5524
8.00 to 8.50; (2.762 µm)	9.0077
8.50 to 9.00; (1.953 µm)	6.0857
9.00 to 9.50; (1.381 µm)	3.1077
9.50 to 10.00; (0.977 µm)	0.8863
10.00 to 10.50; (0.691 µm)	0.0450
10.50 to 11.00; (0.488 µm)	0.0000
11.00 to 11.50; (0.345 µm)	0.0000
11.50 to 12.00; (0.244 µm)	0.0000
12.00 to 12.50; (0.173 µm)	0.0000
12.50 to 13.00; (0.122 µm)	0.0000
13.00 to 13.50; (0.086 µm)	0.0000

Appendix 1.

Exercise Code:	PS40
LabCode:	LB1804
Sample Code:	PS401804

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	Volume/Weight (mark as "0" for not analysed or no material)
-6.50 to -6.00; 63 mm	0.0000
-6.00 to -5.50; 45 mm	0.0000
-5.50 to -5.00; 31.5 mm	0.0000
-5.00 to -4.50; 22.4 mm	0.0000
-4.50 to -4.00; 16 mm	0.0000
-4.00 to -3.50; 11.2 mm	0.0000
-3.50 to -3.00; 8 mm	0.0000
-3.00 to -2.50; 5.6 mm	0.0000
-2.50 to -2.00; 4 mm	0.0000
-2.00 to -1.50; 2.8 mm	0.0000
-1.50 to -1.00; 2 mm	0.0000
-1.00 to -0.50; 1.4 mm	0.0000
-0.50 to 0.00; 1 mm	0.0000
0.00 to 0.50; (707 µm)	0.0000
0.50 to 1.00; (500 µm)	0.0089
1.00 to 1.50; (353.6 µm)	0.0622
1.50 to 2.00; (250 µm)	0.0989
2.00 to 2.50; (176.8 µm)	0.3022
2.50 to 3.00; (125 µm)	1.0478
3.00 to 3.50; (88.39 µm)	2.3656
3.50 to 4.00; (62.5 µm)	4.1100
4.00 to 4.50; (44.19 µm)	5.6111
4.50 to 5.00; (31.25 µm)	6.3478
5.00 to 5.50; (22.097 µm)	6.6989
5.50 to 6.00; (15.625 µm)	7.3489
6.00 to 6.50; (11.049 µm)	8.5011
6.50 to 7.00; (7.813 µm)	9.6400
7.00 to 7.50; (5.524 µm)	10.1867
7.50 to 8.00; (3.906 µm)	9.7767
8.00 to 8.50; (2.762 µm)	8.6178
8.50 to 9.00; (1.953 µm)	6.6667
9.00 to 9.50; (1.381 µm)	4.6189
9.50 to 10.00; (0.977 µm)	3.2144
10.00 to 10.50; (0.691 µm)	2.5400
10.50 to 11.00; (0.488 µm)	1.6811
11.00 to 11.50; (0.345 µm)	0.5544
11.50 to 12.00; (0.244 µm)	0.0000
12.00 to 12.50; (0.173 µm)	0.0000
12.50 to 13.00; (0.122 µm)	0.0000
13.00 to 13.50; (0.086 µm)	0.0000

Appendix 1.

Exercise Code:	PS40
LabCode:	LB1806
Sample Code:	PS401806

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	Volume/Weight (mark as "0" for not analysed or no material)
-6.50 to -6.00; 63 mm	0.0000
-6.00 to -5.50; 45 mm	0.0000
-5.50 to -5.00; 31.5 mm	0.0000
-5.00 to -4.50; 22.4 mm	0.0000
-4.50 to -4.00; 16 mm	0.0000
-4.00 to -3.50; 11.2 mm	0.0000
-3.50 to -3.00; 8 mm	0.0000
-3.00 to -2.50; 5.6 mm	0.0000
-2.50 to -2.00; 4 mm	0.0000
-2.00 to -1.50; 2.8 mm	0.0000
-1.50 to -1.00; 2 mm	0.0000
-1.00 to -0.50; 1.4 mm	0.0000
-0.50 to 0.00; 1 mm	0.0000
0.00 to 0.50; (707 µm)	0.0000
0.50 to 1.00; (500 µm)	0.0000
1.00 to 1.50; (353.6 µm)	0.0122
1.50 to 2.00; (250 µm)	0.1956
2.00 to 2.50; (176.8 µm)	0.7078
2.50 to 3.00; (125 µm)	2.1678
3.00 to 3.50; (88.39 µm)	4.2356
3.50 to 4.00; (62.5 µm)	6.5256
4.00 to 4.50; (44.19 µm)	8.8356
4.50 to 5.00; (31.25 µm)	10.7400
5.00 to 5.50; (22.097 µm)	11.8189
5.50 to 6.00; (15.625 µm)	11.9389
6.00 to 6.50; (11.049 µm)	11.3000
6.50 to 7.00; (7.813 µm)	10.1944
7.00 to 7.50; (5.524 µm)	8.7411
7.50 to 8.00; (3.906 µm)	6.8533
8.00 to 8.50; (2.762 µm)	4.3022
8.50 to 9.00; (1.953 µm)	1.4322
9.00 to 9.50; (1.381 µm)	0.0000
9.50 to 10.00; (0.977 µm)	0.0000
10.00 to 10.50; (0.691 µm)	0.0000
10.50 to 11.00; (0.488 µm)	0.0000
11.00 to 11.50; (0.345 µm)	0.0000
11.50 to 12.00; (0.244 µm)	0.0000
12.00 to 12.50; (0.173 µm)	0.0000
12.50 to 13.00; (0.122 µm)	0.0000
13.00 to 13.50; (0.086 µm)	0.0000

Appendix 1.

Exercise Code:	PS40
LabCode:	LB1809
Sample Code:	PS401809

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	Volume/Weight (mark as "0" for not analysed or no material)
-6.50 to -6.00; 63 mm	0.0000
-6.00 to -5.50; 45 mm	0.0000
-5.50 to -5.00; 31.5 mm	0.0000
-5.00 to -4.50; 22.4 mm	0.0000
-4.50 to -4.00; 16 mm	0.0000
-4.00 to -3.50; 11.2 mm	0.0000
-3.50 to -3.00; 8 mm	0.0000
-3.00 to -2.50; 5.6 mm	0.0000
-2.50 to -2.00; 4 mm	0.0000
-2.00 to -1.50; 2.8 mm	0.0000
-1.50 to -1.00; 2 mm	0.0000
-1.00 to -0.50; 1.4 mm	0.0000
-0.50 to 0.00; 1 mm	0.0000
0.00 to 0.50; (707 µm)	0.0000
0.50 to 1.00; (500 µm)	0.0463
1.00 to 1.50; (353.6 µm)	0.2835
1.50 to 2.00; (250 µm)	0.6088
2.00 to 2.50; (176.8 µm)	1.2116
2.50 to 3.00; (125 µm)	2.3033
3.00 to 3.50; (88.39 µm)	3.9142
3.50 to 4.00; (62.5 µm)	5.5599
4.00 to 4.50; (44.19 µm)	6.6650
4.50 to 5.00; (31.25 µm)	7.1113
5.00 to 5.50; (22.097 µm)	7.2906
5.50 to 6.00; (15.625 µm)	7.6525
6.00 to 6.50; (11.049 µm)	8.3893
6.50 to 7.00; (7.813 µm)	9.3675
7.00 to 7.50; (5.524 µm)	10.1444
7.50 to 8.00; (3.906 µm)	10.0885
8.00 to 8.50; (2.762 µm)	8.7463
8.50 to 9.00; (1.953 µm)	6.2307
9.00 to 9.50; (1.381 µm)	3.2863
9.50 to 10.00; (0.977 µm)	1.0361
10.00 to 10.50; (0.691 µm)	0.0638
10.50 to 11.00; (0.488 µm)	0.0000
11.00 to 11.50; (0.345 µm)	0.0000
11.50 to 12.00; (0.244 µm)	0.0000
12.00 to 12.50; (0.173 µm)	0.0000
12.50 to 13.00; (0.122 µm)	0.0000
13.00 to 13.50; (0.086 µm)	0.0000

Appendix 1.

Exercise Code:	PS40
LabCode:	LB1811
Sample Code:	PS401811

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	Volume/Weight (mark as "0" for not analysed or no material)
-6.50 to -6.00; 63 mm	0.0000
-6.00 to -5.50; 45 mm	0.0000
-5.50 to -5.00; 31.5 mm	0.0000
-5.00 to -4.50; 22.4 mm	0.0000
-4.50 to -4.00; 16 mm	0.0000
-4.00 to -3.50; 11.2 mm	0.0000
-3.50 to -3.00; 8 mm	0.0000
-3.00 to -2.50; 5.6 mm	0.0000
-2.50 to -2.00; 4 mm	0.0000
-2.00 to -1.50; 2.8 mm	0.0000
-1.50 to -1.00; 2 mm	0.0000
-1.00 to -0.50; 1.4 mm	0.0000
-0.50 to 0.00; 1 mm	0.0000
0.00 to 0.50; (707 µm)	0.0000
0.50 to 1.00; (500 µm)	0.1679
1.00 to 1.50; (353.6 µm)	0.4128
1.50 to 2.00; (250 µm)	0.5783
2.00 to 2.50; (176.8 µm)	0.8836
2.50 to 3.00; (125 µm)	1.6941
3.00 to 3.50; (88.39 µm)	3.0763
3.50 to 4.00; (62.5 µm)	4.4942
4.00 to 4.50; (44.19 µm)	5.5269
4.50 to 5.00; (31.25 µm)	6.4311
5.00 to 5.50; (22.097 µm)	7.5132
5.50 to 6.00; (15.625 µm)	8.5458
6.00 to 6.50; (11.049 µm)	9.2023
6.50 to 7.00; (7.813 µm)	9.3404
7.00 to 7.50; (5.524 µm)	9.0682
7.50 to 8.00; (3.906 µm)	8.3666
8.00 to 8.50; (2.762 µm)	7.3111
8.50 to 9.00; (1.953 µm)	5.7064
9.00 to 9.50; (1.381 µm)	4.0598
9.50 to 10.00; (0.977 µm)	2.9499
10.00 to 10.50; (0.691 µm)	2.4279
10.50 to 11.00; (0.488 µm)	1.6609
11.00 to 11.50; (0.345 µm)	0.5824
11.50 to 12.00; (0.244 µm)	0.0000
12.00 to 12.50; (0.173 µm)	0.0000
12.50 to 13.00; (0.122 µm)	0.0000
13.00 to 13.50; (0.086 µm)	0.0000

Appendix 1.

Exercise Code:	PS40
LabCode:	LB1814
Sample Code:	PS401814

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	Volume/Weight (mark as "0" for not analysed or no material)
-6.50 to -6.00; 63 mm	0.0000
-6.00 to -5.50; 45 mm	0.0000
-5.50 to -5.00; 31.5 mm	0.0000
-5.00 to -4.50; 22.4 mm	0.0000
-4.50 to -4.00; 16 mm	0.0000
-4.00 to -3.50; 11.2 mm	0.0000
-3.50 to -3.00; 8 mm	0.0000
-3.00 to -2.50; 5.6 mm	0.0000
-2.50 to -2.00; 4 mm	0.0000
-2.00 to -1.50; 2.8 mm	0.0000
-1.50 to -1.00; 2 mm	0.0000
-1.00 to -0.50; 1.4 mm	0.0000
-0.50 to 0.00; 1 mm	0.0000
0.00 to 0.50; (707 µm)	0.0103
0.50 to 1.00; (500 µm)	0.0615
1.00 to 1.50; (353.6 µm)	0.1089
1.50 to 2.00; (250 µm)	0.1832
2.00 to 2.50; (176.8 µm)	0.5010
2.50 to 3.00; (125 µm)	1.0067
3.00 to 3.50; (88.39 µm)	2.1227
3.50 to 4.00; (62.5 µm)	5.6227
4.00 to 4.50; (44.19 µm)	5.0687
4.50 to 5.00; (31.25 µm)	6.1983
5.00 to 5.50; (22.097 µm)	6.8532
5.50 to 6.00; (15.625 µm)	7.6221
6.00 to 6.50; (11.049 µm)	8.5713
6.50 to 7.00; (7.813 µm)	9.3591
7.00 to 7.50; (5.524 µm)	9.5964
7.50 to 8.00; (3.906 µm)	9.0934
8.00 to 8.50; (2.762 µm)	7.8784
8.50 to 9.00; (1.953 µm)	6.1698
9.00 to 9.50; (1.381 µm)	4.3473
9.50 to 10.00; (0.977 µm)	3.1893
10.00 to 10.50; (0.691 µm)	2.7147
10.50 to 11.00; (0.488 µm)	2.2496
11.00 to 11.50; (0.345 µm)	1.3099
>11.50; (<0.345 µm)	0.1614

Appendix 1.

Exercise Code:	PS40
LabCode:	LB1816
Sample Code:	PS401816

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	Volume/Weight (mark as "0" for not analysed or no material)
-6.50 to -6.00; 63 mm	0.0000
-6.00 to -5.50; 45 mm	0.0000
-5.50 to -5.00; 31.5 mm	0.0000
-5.00 to -4.50; 22.4 mm	0.0000
-4.50 to -4.00; 16 mm	0.0000
-4.00 to -3.50; 11.2 mm	0.0000
-3.50 to -3.00; 8 mm	0.0000
-3.00 to -2.50; 5.6 mm	0.0000
-2.50 to -2.00; 4 mm	0.0000
-2.00 to -1.50; 2.8 mm	0.0000
-1.50 to -1.00; 2 mm	0.0000
-1.00 to -0.50; 1.4 mm	0.0000
-0.50 to 0.00; 1 mm	0.0000
0.00 to 0.50; (707 µm)	0.0000
0.50 to 1.00; (500 µm)	0.0000
1.00 to 1.50; (353.6 µm)	0.0000
1.50 to 2.00; (250 µm)	0.0015
2.00 to 2.50; (176.8 µm)	0.8939
2.50 to 3.00; (125 µm)	3.3900
3.00 to 3.50; (88.39 µm)	2.5100
3.50 to 4.00; (62.5 µm)	6.1000
4.00 to 4.50; (44.19 µm)	6.4600
4.50 to 5.00; (31.25 µm)	7.4600
5.00 to 5.50; (22.097 µm)	5.4300
5.50 to 6.00; (15.625 µm)	8.1300
6.00 to 6.50; (11.049 µm)	9.7200
6.50 to 7.00; (7.813 µm)	7.3600
7.00 to 7.50; (5.524 µm)	12.2900
7.50 to 8.00; (3.906 µm)	6.9700
8.00 to 8.50; (2.762 µm)	8.1100
8.50 to 9.00; (1.953 µm)	4.8800
9.00 to 9.50; (1.381 µm)	4.7400
9.50 to 10.00; (0.977 µm)	2.9600
10.00 to 10.50; (0.691 µm)	1.3600
10.50 to 11.00; (0.488 µm)	0.9900
11.00 to 11.50; (0.345 µm)	0.2450
11.50 to 12.00; (0.244 µm)	0.0000
12.00 to 12.50; (0.173 µm)	0.0000
12.50 to 13.00; (0.122 µm)	0.0000
13.00 to 13.50; (0.086 µm)	0.0000

Appendix 1.

Exercise Code:	PS40
LabCode:	LB1818
Sample Code:	PS401818

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	Volume/Weight (mark as "0" for not analysed or no material)
-6.50 to -6.00; 63 mm	0.0000
-6.00 to -5.50; 45 mm	0.0000
-5.50 to -5.00; 31.5 mm	0.0000
-5.00 to -4.50; 22.4 mm	0.0000
-4.50 to -4.00; 16 mm	0.0000
-4.00 to -3.50; 11.2 mm	0.0000
-3.50 to -3.00; 8 mm	0.0000
-3.00 to -2.50; 5.6 mm	0.0000
-2.50 to -2.00; 4 mm	0.0000
-2.00 to -1.50; 2.8 mm	0.0000
-1.50 to -1.00; 2 mm	0.0000
-1.00 to -0.50; 1.4 mm	0.0000
-0.50 to 0.00; 1 mm	0.0000
0.00 to 0.50; (707 µm)	0.0000
0.50 to 1.00; (500 µm)	0.0001
1.00 to 1.50; (353.6 µm)	0.1209
1.50 to 2.00; (250 µm)	0.8193
2.00 to 2.50; (176.8 µm)	2.0728
2.50 to 3.00; (125 µm)	2.8029
3.00 to 3.50; (88.39 µm)	3.7896
3.50 to 4.00; (62.5 µm)	5.5489
4.00 to 4.50; (44.19 µm)	6.9841
4.50 to 5.00; (31.25 µm)	7.2149
5.00 to 5.50; (22.097 µm)	6.8746
5.50 to 6.00; (15.625 µm)	6.9278
6.00 to 6.50; (11.049 µm)	7.5750
6.50 to 7.00; (7.813 µm)	8.3349
7.00 to 7.50; (5.524 µm)	8.7683
7.50 to 8.00; (3.906 µm)	8.5578
8.00 to 8.50; (2.762 µm)	7.3957
8.50 to 9.00; (1.953 µm)	5.5896
9.00 to 9.50; (1.381 µm)	3.7526
9.50 to 10.00; (0.977 µm)	2.6668
10.00 to 10.50; (0.691 µm)	2.2363
10.50 to 11.00; (0.488 µm)	1.5144
11.00 to 11.50; (0.345 µm)	0.4533
11.50 to 12.00; (0.244 µm)	0.0000
12.00 to 12.50; (0.173 µm)	0.0000
12.50 to 13.00; (0.122 µm)	0.0000
13.00 to 13.50; (0.086 µm)	0.0000

Appendix 1.

Exercise Code:	PS40
LabCode:	LB1830
Sample Code:	PS401830

Phi interval (explicit) + sieve mesh (theoretical sieves shown in brackets)	Volume/Weight (mark as "0" for not analysed or no material)
-6.50 to -6.00; 63 mm	0.0000
-6.00 to -5.50; 45 mm	0.0000
-5.50 to -5.00; 31.5 mm	0.0000
-5.00 to -4.50; 22.4 mm	0.0000
-4.50 to -4.00; 16 mm	0.0000
-4.00 to -3.50; 11.2 mm	0.0000
-3.50 to -3.00; 8 mm	0.0000
-3.00 to -2.50; 5.6 mm	0.0000
-2.50 to -2.00; 4 mm	0.0000
-2.00 to -1.50; 2.8 mm	0.0000
-1.50 to -1.00; 2 mm	0.0000
-1.00 to -0.50; 1.4 mm	0.0000
-0.50 to 0.00; 1 mm	0.0000
0.00 to 0.50; (707 µm)	0.6073
0.50 to 1.00; (500 µm)	0.5466
1.00 to 1.50; (353.6 µm)	0.5893
1.50 to 2.00; (250 µm)	0.7724
2.00 to 2.50; (176.8 µm)	1.0837
2.50 to 3.00; (125 µm)	2.0571
3.00 to 3.50; (88.39 µm)	3.0614
3.50 to 4.00; (62.5 µm)	4.8039
4.00 to 4.50; (44.19 µm)	6.0290
4.50 to 5.00; (31.25 µm)	6.0917
5.00 to 5.50; (22.097 µm)	6.6923
5.50 to 6.00; (15.625 µm)	6.6747
6.00 to 6.50; (11.049 µm)	7.3454
6.50 to 7.00; (7.813 µm)	7.9073
7.00 to 7.50; (5.524 µm)	8.5363
7.50 to 8.00; (3.906 µm)	8.3669
8.00 to 8.50; (2.762 µm)	
8.50 to 9.00; (1.953 µm)	13.4729
9.00 to 9.50; (1.381 µm)	
9.50 to 10.00; (0.977 µm)	8.2389
10.00 to 10.50; (0.691 µm)	5.9442
10.50 to 11.00; (0.488 µm)	
11.00 to 11.50; (0.345 µm)	
11.50 to 12.00; (0.244 µm)	
12.00 to 12.50; (0.173 µm)	
12.50 to 13.00; (0.122 µm)	
13.00 to 13.50; (0.086 µm)	