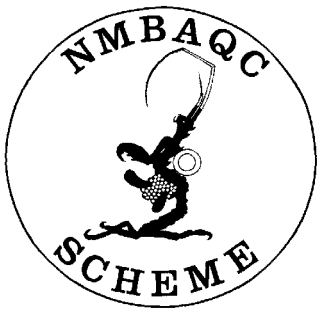

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Particle Size Results – PS43

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Table 1. Summary of the particle size information received from participating laboratories and replicate analysis laboratory for the forty-third particle size distribution – PS43.

Benchmark Data

Sample	Method	% Gravel	% Sand	% Silt	Median ϕ	Mean ϕ	Sediment Description (Post analysis)
PS43 60	NMBAQC	31.72	41.38	26.90	-0.362	0.719	Muddy Sandy Gravel
PS43 61	NMBAQC	32.71	42.76	24.53	-0.415	0.574	Muddy Sandy Gravel
PS43 62	NMBAQC	33.32	42.86	23.82	-0.399	0.575	Muddy Sandy Gravel
PS43 63	NMBAQC	33.47	43.00	23.53	-0.402	0.543	Muddy Sandy Gravel
PS43 64	NMBAQC	30.11	41.71	28.19	-0.369	0.738	Muddy Sandy Gravel
PS43 65	NMBAQC	36.25	42.78	20.97	-0.473	0.358	Muddy Sandy Gravel
PS43 66	NMBAQC	30.45	44.08	25.48	-0.369	0.657	Muddy Sandy Gravel
PS43 67	NMBAQC	29.73	41.52	28.74	-0.344	0.778	Gravelly Muddy Sand
PS43 68	NMBAQC	31.48	39.70	28.82	-0.338	0.783	Muddy Sandy Gravel
PS43 69	NMBAQC	31.43	43.65	24.92	-0.394	0.608	Muddy Sandy Gravel
TUM AVERAGE	NMBAQC	32.07	42.34	25.59	-0.388	0.646	Muddy Sandy Gravel

Participant Data

Lab	Method	% Gravel	% Sand	% Silt	Sediment Description (Post analysis)
LB_1801	NMBAQC	44.24	38.90	16.86	-
LB_1802	NMBAQC	44.64	53.97	1.39	Sandy gravel
LB_1803	NMBAQC	28.90	39.52	31.58	Gravelly muddy sand
LB_1804	NMBAQC	25.84	36.47	37.69	gmS
LB_1806	NMBAQC	35.85	49.52	14.62	-
LB_1809	NMBAQC	24.72	39.73	35.55	Gravelly muddy sand (gmS)
LB_1811	NMBAQC	30.65	34.63	34.72	Muddy Sandy Gravel
LB_1814	OTHER	36.54	38.66	24.80	Muddy Sandy Gravel
LB_1816	NMBAQC	26.54	8.95	64.52	Very poorly sorted very fine sand
LB_1818	NMBAQC	0.00	10.61	89.39	mS (muddy sand)
LB_1830	OTHER	30.02	35.47	34.50	Muddy gravel (mG) to Muddy sandy gravel (msG)

Key to methods

NMBAQC - States following NMBAQC PSA SOP for supporting biological data

OTHER - Following a diferent SOP.

Figure 1. Particle size distribution curves resulting from analysis of ten replicate samples of sediment distributed as PS43 (Benchmark Data).

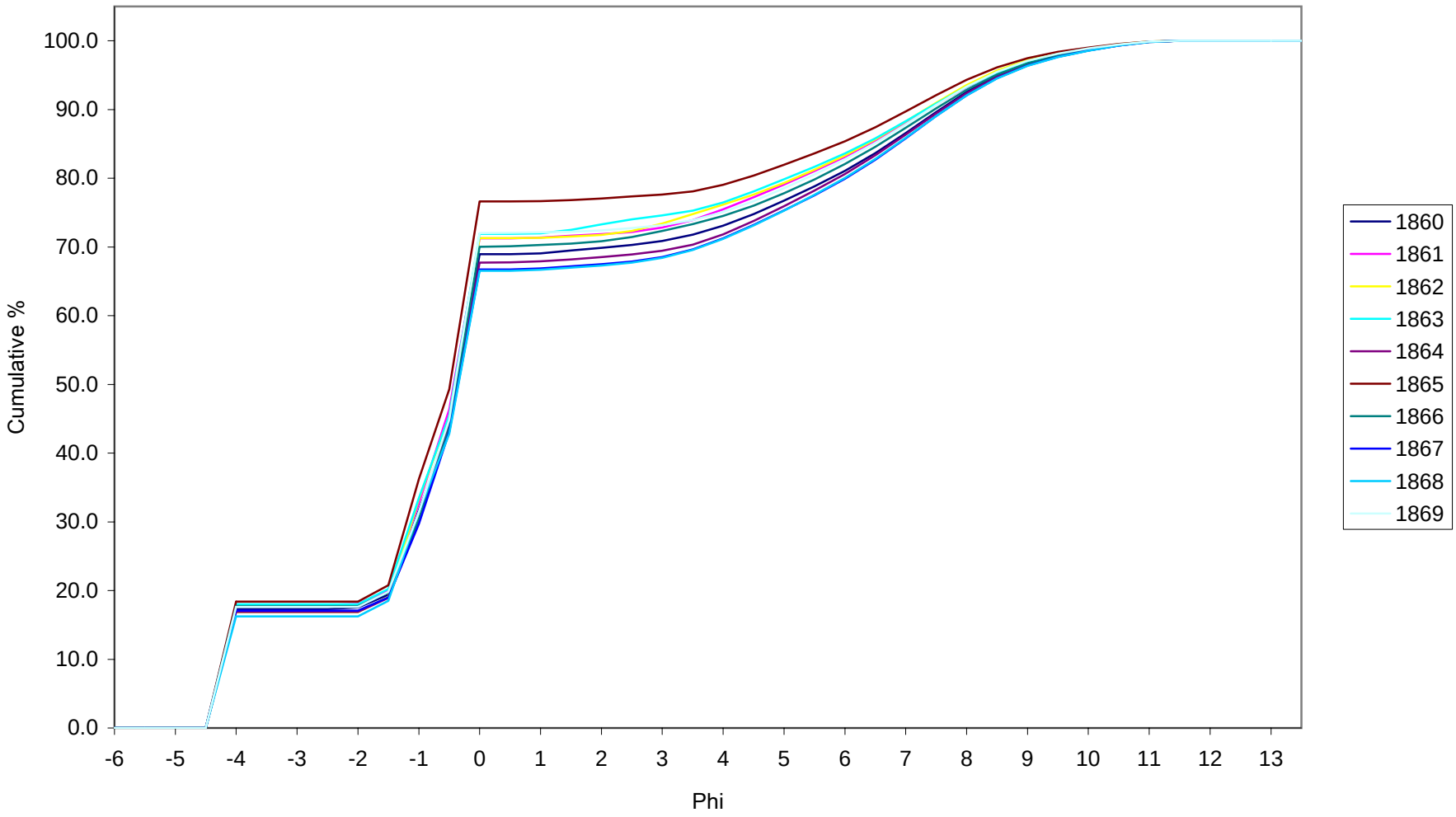


Figure 2. Particle size distribution curves from all participating laboratories for sediment samples from PS43.

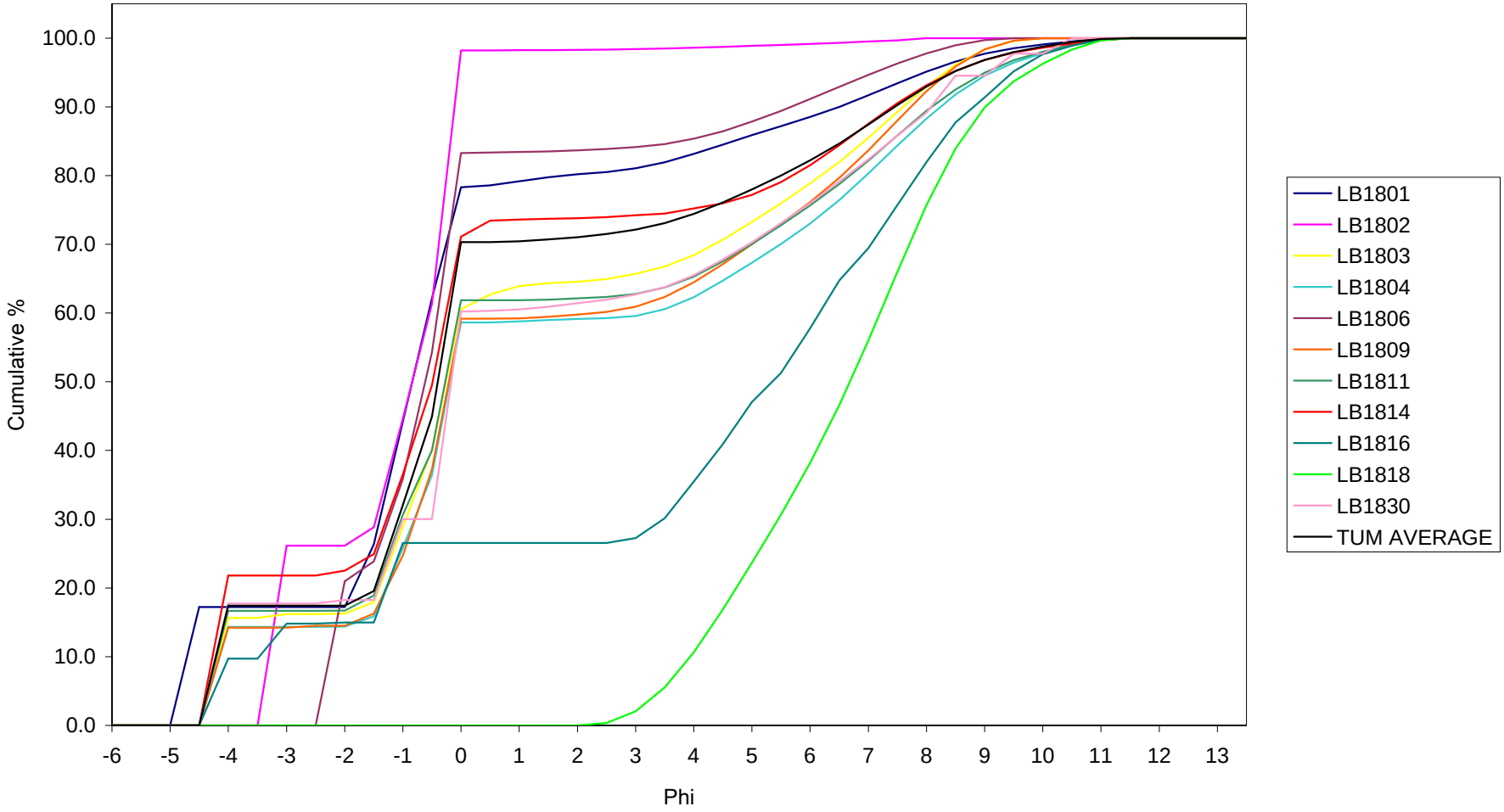


Table 2. Summary of z-scores for each half-phi interval for PS43; data from all participating laboratories included in mean and standard deviation calculations.

	-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	-0.30	0.88	0.00	-0.37	-0.30	-0.32	-0.04	0.32	0.41	0.47	-0.49	-0.30	0.33	1.01	1.20	0.06	-0.26
LB_1801	0.00	0.00	0.00	3.02	-1.19	0.00	-0.37	-0.30	-0.33	2.74	1.51	1.13	-0.34	-0.18	0.94	2.05	1.32	0.61	-0.15	-0.33
LB_1802	0.00	0.00	0.00	-0.30	-1.19	0.00	2.96	-0.30	-0.33	0.19	1.05	0.95	1.48	-0.50	-0.55	-0.85	-0.94	-1.26	-1.23	-1.07
LB_1803	0.00	0.00	0.00	-0.30	0.67	0.00	-0.30	-0.30	-0.31	-0.21	-0.03	0.17	0.04	1.88	2.70	1.13	0.07	0.96	0.36	-0.17
LB_1804	0.00	0.00	0.00	-0.30	0.51	0.00	-0.37	-0.30	-0.32	-0.28	-0.25	0.09	0.19	-0.51	-0.21	0.04	-0.30	-0.84	-0.60	-0.23
LB_1806	0.00	0.00	0.00	-0.30	-1.19	0.00	-0.37	-0.30	3.01	0.25	0.21	1.20	0.79	-0.40	-0.42	-0.61	-0.11	-0.30	-0.71	-0.75
LB_1809	0.00	0.00	0.00	-0.30	0.50	0.00	-0.37	3.02	-0.33	-0.16	-0.58	0.37	0.17	-0.51	-0.47	0.17	0.77	0.95	0.35	0.17
LB_1811	0.00	0.00	0.00	-0.30	0.79	0.00	-0.37	-0.30	-0.32	-0.01	0.16	-0.09	0.16	-0.51	-0.59	-0.54	0.00	-0.16	-0.42	-0.28
LB_1814	0.00	0.00	0.00	-0.30	1.40	0.00	-0.37	-0.30	-0.22	0.08	0.12	0.42	0.14	2.13	-0.13	-0.46	-0.57	-0.56	-0.73	-0.93
LB_1816	0.00	0.00	0.00	-0.30	-0.04	0.00	0.28	-0.30	-0.30	-0.87	0.11	-1.42	-1.76	-0.51	-0.60	-0.97	-1.11	-1.52	0.27	1.58
LB_1818	0.00	0.00	0.00	-0.30	-1.19	0.00	-0.37	-0.30	-0.33	-0.87	-2.46	-1.42	-1.76	-0.51	-0.60	-0.97	-1.11	0.53	2.54	2.15
LB_1830	0.00	0.00	0.00	-0.30	0.92	0.00	-0.37	-0.30	-0.25	-0.87	0.16	-1.42	0.89	-0.39	-0.06	1.01	1.98	1.58	0.33	-0.14
μ	0.0000	0.0000	0.0000	1.5648	10.0115	0.0000	2.8874	0.0258	2.0519	2.2003	11.0709	9.9651	20.0252	0.4497	0.2261	0.1956	0.1822	0.2506	0.6033	1.2190
σ	0.0000	0.0000	0.0000	5.1897	8.4403	0.0000	7.8643	0.0857	6.2864	2.5399	4.4929	7.0387	11.4001	0.8819	0.3775	0.2024	0.1647	0.1644	0.4368	1.0445

	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	-0.40	-0.40	-0.42	-0.40	-0.44	-0.43	-0.33	-0.37	-0.40	-0.51	-0.25	-0.46	-0.09	-0.17	0.08	-0.01	-0.30	0.00	0.00	0.00
LB_1801	-0.48	-0.57	-0.68	-0.80	-0.84	-0.85	-0.80	-0.80	-0.80	-0.83	-0.55	-0.71	-0.35	-0.42	-0.15	-0.01	-0.30	0.00	0.00	0.00
LB_1802	-1.12	-1.24	-1.29	-1.46	-1.40	-1.40	-1.44	-1.41	-1.33	-1.45	-1.21	-1.31	-0.94	-0.98	-0.89	-0.98	-0.30	0.00	0.00	0.00
LB_1803	-0.20	-0.10	-0.08	0.00	-0.13	-0.13	-0.02	-0.01	-0.02	-0.10	0.08	-0.39	-0.52	-0.94	-0.89	-0.98	-0.30	0.00	0.00	0.00
LB_1804	-0.15	-0.03	-0.06	-0.01	-0.07	-0.02	0.14	0.09	0.08	0.04	0.37	0.14	0.53	0.40	0.78	0.95	-0.30	0.00	0.00	0.00
LB_1806	-0.73	-0.75	-0.66	-0.66	-0.67	-0.72	-0.76	-0.84	-0.89	-0.95	-0.76	-1.10	-0.94	-0.98	-0.89	-0.98	-0.30	0.00	0.00	0.00
LB_1809	0.07	0.12	0.08	0.14	0.01	0.03	0.20	0.19	0.21	0.09	0.23	-0.36	-0.56	-0.96	-0.89	-0.98	-0.30	0.00	0.00	0.00
LB_1811	-0.26	-0.10	-0.11	-0.01	-0.11	-0.14	-0.06	-0.06	-0.05	-0.14	0.20	0.06	0.37	0.29	0.60	0.95	-0.30	0.00	0.00	0.00
LB_1814	-0.77	-0.90	-0.74	-0.51	-0.32	-0.23	-0.17	-0.32	-0.43	-0.55	-0.31	-0.51	-0.16	-0.25	0.15	0.96	3.02	0.00	0.00	0.00
LB_1816	1.98	1.60	1.68	0.84	1.58	1.50	0.50	0.93	1.00	1.00	0.91	1.53	1.73	0.51	1.07	0.59	-0.30	0.00	0.00	0.00
LB_1818	1.82	2.04	2.01	2.41	2.06	2.11	2.52	2.37	2.36	2.06	2.24	1.56	1.78	1.53	1.98	1.45	-0.30	0.00	0.00	0.00
LB_1830	-0.16	-0.07	-0.14	0.06	-0.11	-0.15	-0.11	-0.15	-0.15	0.84	-1.21	1.11	-0.94	1.78	-0.89	-0.98	-0.30	0.00	0.00	0.00
μ	2.0140	2.4423	2.7353	2.7295	3.1277	3.4758	3.5335	3.8345	3.7141	3.4028	2.0895	1.7377	0.8826	0.7958	0.4117	0.1408	0.0030	0.0000	0.0000	0.0000
σ	1.6903	1.8716	2.0105	1.7741	2.1278	2.3581	2.3321	2.5960	2.5511	2.3415	1.7282	1.3254	0.9361	0.8157	0.4647	0.1437	0.0100	0.0000	0.0000	0.0000

z-score >1.96 or <-1.96

Figure 3. Summary of z-score for the Benchmark Data (TUM AVERAGE); when data from all participating laboratories are included in mean and standard deviation calculations.

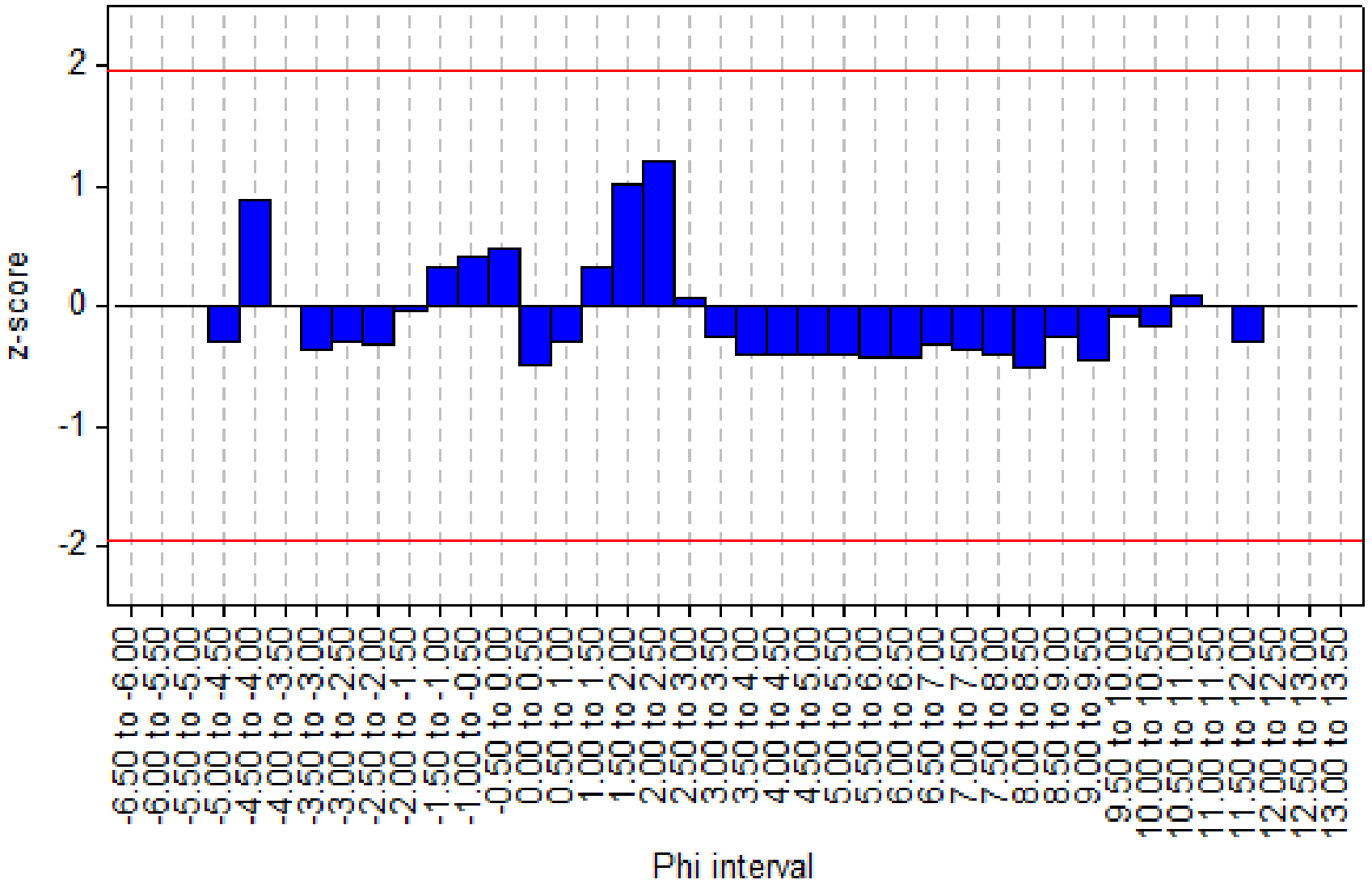
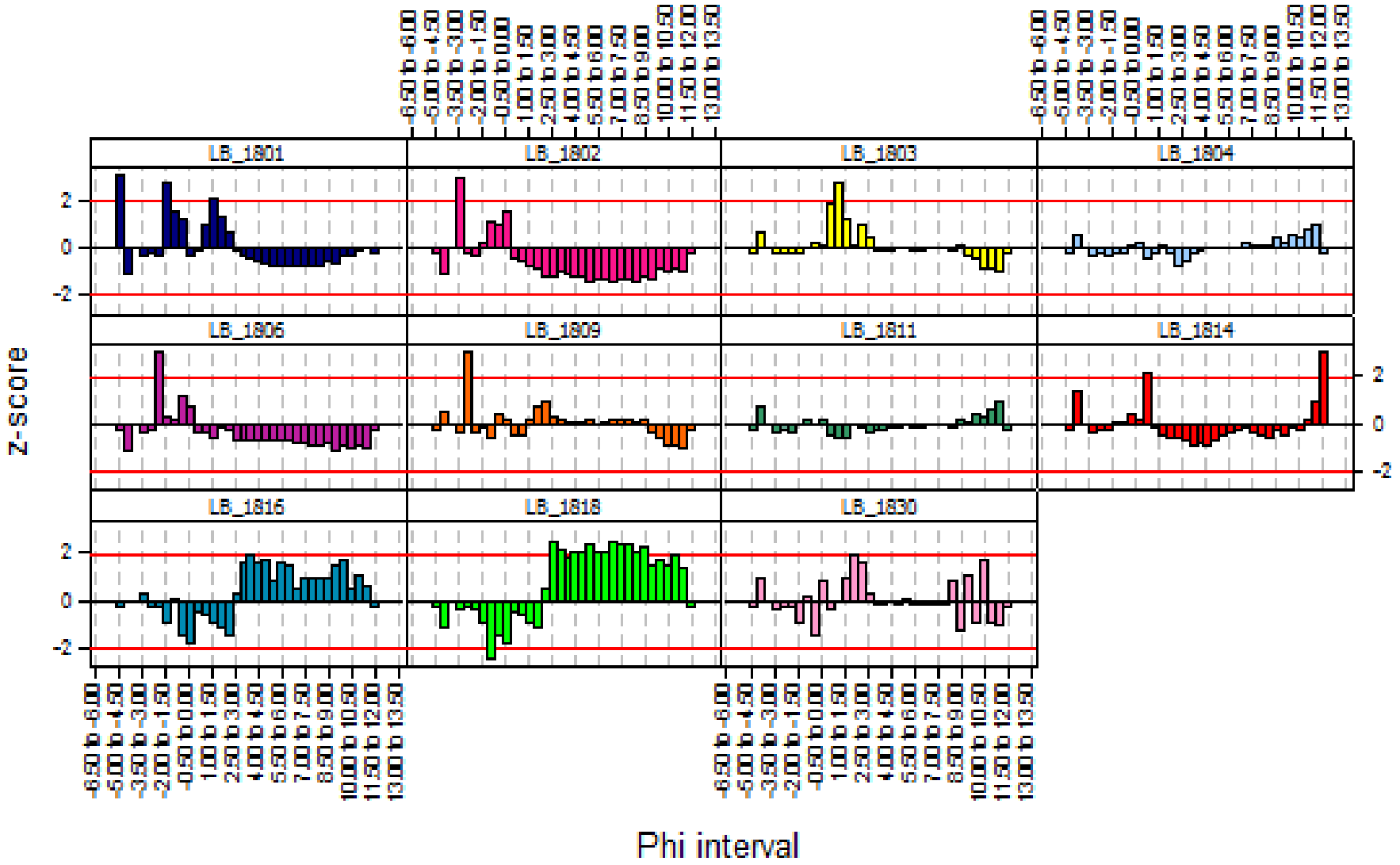


Figure 4. Summary of z-scores for each half phi interval; when data from all laboratories are included in mean and standard deviation calculations.



Results of SIMPROF testing on PSA Ring test PS43 data

Data was entered into PRIMER v. 6.1.13 in half-phi intervals; any missing data was entered as zero. The data did not need to be transformed as all data was on a similar percentage scale. A Euclidean distance matrix was created from the data; The Euclidean distance between two samples (labs) *j* and *k,* is defined algebraically as $d_{jk} = \sqrt{\sum_{i=1}^{p}(y_{ij} - y_{ik})^2}$.

From this distance matrix cluster analysis was carried out including a SIMPROF test at a 5% significance level. The red SIMPROF lines on the dendrogram indicate labs that cannot be distinguished from each other at the 5% significance level; the black lines indicate labs that can be distinguished from each other. The results are presented as a cluster dendrogram (Figure 5) and non-metric Multi-Dimensional Scaling (MDS) diagrams (Figures 6) below. It is important to note that, although the MDS plot is bounded by a box, the box does not represent either axes or scale. Two samples with a high similarity index will appear close together while those less similar will appear further apart. The 'correct' configuration of sample points will be multidimensional and the plot represents the best 2-dimensional solution to the problem. The technique should be viewed as complementary to cluster analysis, offering a different perspective of the same information.

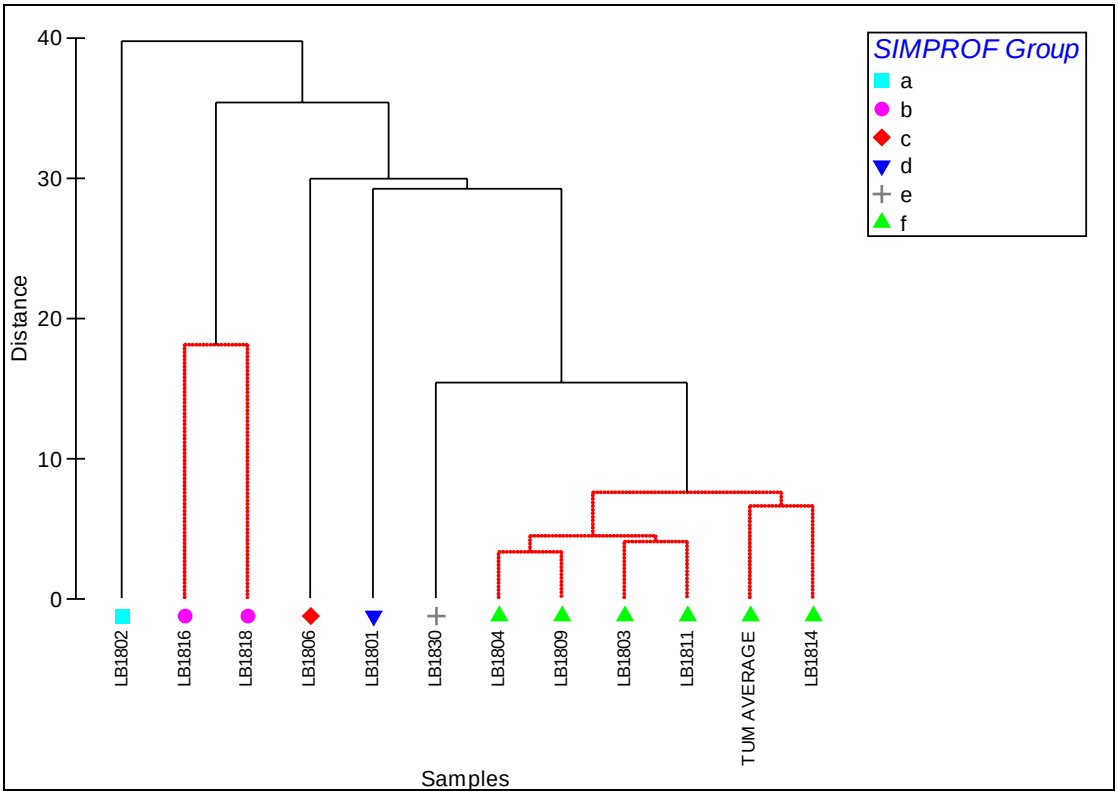


Figure 5.Cluster dendrogram of PS43 including all labs, with the benchmark replicates (TUM AVERAGE) averaged.

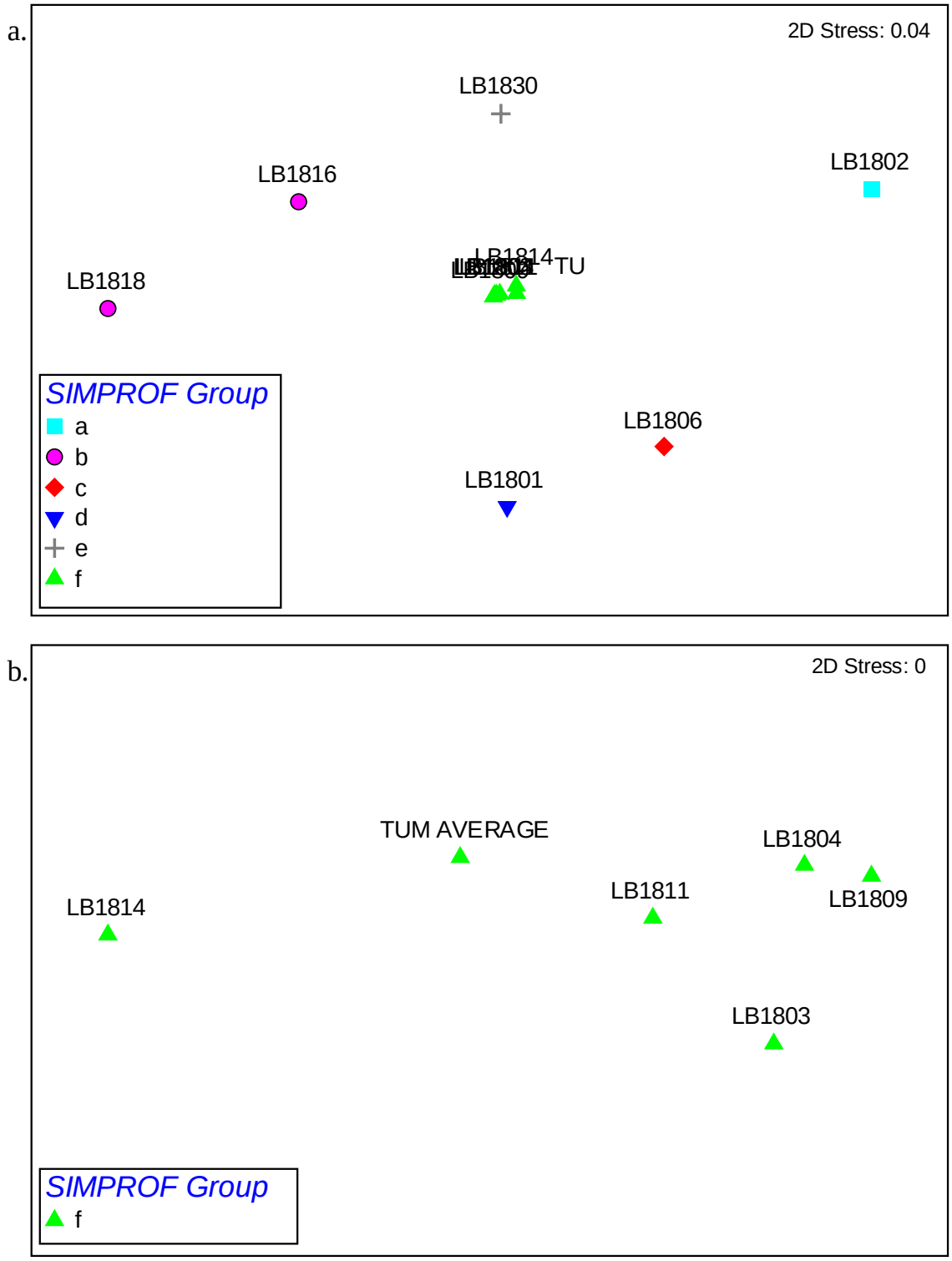


Figure 6. MDS plots of PS43 with the benchmark replicates (TUM AVERAGE) averaged; (a) including all labs and (b) sub-set of cluster group F.

The cluster analysis separates the labs into 6 SIMPROF cluster groups, four of these groups compromise a single lab.

Cluster group A is formed of a single lab (LB1802), the MDS plot in figure 6a shows that it is placed to the right, away from the main cluster of samples in the middle and very far away

from LB1818. The cumulative percentage curves in figure 2 show that the stone that most labs recorded at -4.5ϕ has been recorded one phi out at -3.5ϕ by LB1802. LB1802 also recorded the highest percentage of greater than 1mm.

Cluster group B comprised of two labs, LB1816 and LB1818. LB1818 only ran laser analysis on the sample and so did not record any particles greater than 1mm. LB1816 stated they followed the NMBAQC PSA SOP but in the comments state that the sample was wet sieved through a 2mm sieve rather than a 1mm. This would explain the plateau in their cumulative percentage curve (figure 2) between -1 and 0 phi (2000-1000μm). LB1816 also recorded the second lowest percentage of greater than 1mm sediment.

Cluster group C comprised of one lab, LB1806. The cumulative percentage curve in figure 2 shows that LB1806 produced the second highest percentage of sediment greater than 1mm. LB1806 did not analyse any sediment larger than -2.5ϕ (5600μm), therefore the stone at -4.5ϕ has been displaced to -2.5ϕ.

Cluster group D comprised of LB1801. This lab had the third highest percentage of sediment greater than 1mm and the stone that the majority of labs recorded at -4.5ϕ, they recorded at-5.0ϕ.

Cluster group E was formed of one lab, LB1830. This lab was relatively similar to cluster group F but recorded the greater than 1mm at one phi intervals rather than half-phi intervals.

Cluster group F comprised of five participating laboratories (LB1804, LB1809, LB1803, LB1811 and LB1814) and the Benchmark Data (TUM AVERAGE). All these laboratories recorded the stone at -4.5ϕ. Four of the labs (LB1803, LB1804, LB1809 and LB1811) had very similar percentages of sediment greater than 1mm, ranging from 58.54% to 61.86%. LB1814 and the Benchmark Data had slightly higher percentages the sediment greater than 1mm at 71.09 and 70.30, respectively.

Appendices

Appendix 1. Final Summary Data sheets as supplied by participating laboratories (arranged by Lab Code).

Exercise Code:	**PS43**
LabCode:	**LB1801**
Sample Code:	**PS431801**

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	**20.4600**
-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	**10.8800**
-1.50 to -1.00; 2 mm	**21.2500**
-1.00 to -0.50; 1.4 mm	**21.2900**
-0.50 to 0.00; 1 mm	**19.1800**
0.00 to 0.50; (707 µm)	0.3506
0.50 to 1.00; (500 µm)	0.6916
1.00 to 1.50; (353.6 µm)	0.7266
1.50 to 2.00; (250 µm)	0.4748
2.00 to 2.50; (176.8 µm)	0.4179
2.50 to 3.00; (125 µm)	0.6405
3.00 to 3.50; (88.39 µm)	1.0393
3.50 to 4.00; (62.5 µm)	1.4237
4.00 to 4.50; (44.19 µm)	1.6284
4.50 to 5.00; (31.25 µm)	1.6307
5.00 to 5.50; (22.097 µm)	1.5632
5.50 to 6.00; (15.625 µm)	1.5842
6.00 to 6.50; (11.049 µm)	1.7566
6.50 to 7.00; (7.813 µm)	1.9845
7.00 to 7.50; (5.524 µm)	2.0959
7.50 to 8.00; (3.906 µm)	2.0012
8.00 to 8.50; (2.762 µm)	1.7356
8.50 to 9.00; (1.953 µm)	1.3555
9.00 to 9.50; (1.381 µm)	0.9417
9.50 to 10.00; (0.977 µm)	0.6570
10.00 to 10.50; (0.691 µm)	0.5357
10.50 to 11.00; (0.488 µm)	0.4075
11.00 to 11.50; (0.345 µm)	0.1652
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. Final Summary Data sheets as supplied by participating laboratories (arranged by Lab Code).

Exercise Code:	**PS43**
LabCode:	**LB1802**
Sample Code:	**PS431802**

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	**21.8800**
-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	**2.2400**
-1.50 to -1.00; 2 mm	**13.2200**
-1.00 to -0.50; 1.4 mm	**13.9500**
-0.50 to 0.00; 1 mm	**30.8600**
0.00 to 0.50; (707 µm)	0.0098
0.50 to 1.00; (500 µm)	0.0143
1.00 to 1.50; (353.6 µm)	0.0197
1.50 to 2.00; (250 µm)	0.0229
2.00 to 2.50; (176.8 µm)	0.0370
2.50 to 3.00; (125 µm)	0.0542
3.00 to 3.50; (88.39 µm)	0.0852
3.50 to 4.00; (62.5 µm)	0.0976
4.00 to 4.50; (44.19 µm)	0.1049
4.50 to 5.00; (31.25 µm)	0.1170
5.00 to 5.50; (22.097 µm)	0.1153
5.50 to 6.00; (15.625 µm)	0.1246
6.00 to 6.50; (11.049 µm)	0.1398
6.50 to 7.00; (7.813 µm)	0.1435
7.00 to 7.50; (5.524 µm)	0.1447
7.50 to 8.00; (3.906 µm)	0.2753
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. Final Summary Data sheets as supplied by participating laboratories (arranged by Lab Code).

Exercise Code:	**PS43**
LabCode:	**LB1803**
Sample Code:	**PS431803**

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	**0.00**
-6.00 to -5.50; 45 mm	**0.00**
-5.50 to -5.00; 31.5 mm	**0.00**
-5.00 to -4.50; 22.4 mm	**0.00**
-4.50 to -4.00; 16 mm	**21.53**
-4.00 to -3.50; 11.2 mm	**0.00**
-3.50 to -3.00; 8 mm	**0.72**
-3.00 to -2.50; 5.6 mm	**0.00**
-2.50 to -2.00; 4 mm	**0.13**
-2.00 to -1.50; 2.8 mm	**2.29**
-1.50 to -1.00; 2 mm	**15.06**
-1.00 to -0.50; 1.4 mm	**15.36**
-0.50 to 0.00; 1 mm	**28.16**
0.00 to 0.50; (707 µm)	2.90
0.50 to 1.00; (500 µm)	1.71
1.00 to 1.50; (353.6 µm)	0.58
1.50 to 2.00; (250 µm)	0.27
2.00 to 2.50; (176.8 µm)	0.56
2.50 to 3.00; (125 µm)	1.05
3.00 to 3.50; (88.39 µm)	1.43
3.50 to 4.00; (62.5 µm)	2.30
4.00 to 4.50; (44.19 µm)	3.11
4.50 to 5.00; (31.25 µm)	3.53
5.00 to 5.50; (22.097 µm)	3.75
5.50 to 6.00; (15.625 µm)	3.93
6.00 to 6.50; (11.049 µm)	4.34
6.50 to 7.00; (7.813 µm)	4.80
7.00 to 7.50; (5.524 µm)	5.24
7.50 to 8.00; (3.906 µm)	5.03
8.00 to 8.50; (2.762 µm)	4.36
8.50 to 9.00; (1.953 µm)	3.06
9.00 to 9.50; (1.381 µm)	1.68
9.50 to 10.00; (0.977 µm)	0.55
10.00 to 10.50; (0.691 µm)	0.04
10.50 to 11.00; (0.488 µm)	0.00
11.00 to 11.50; (0.345 µm)	0.00
11.50 to 12.00; (0.244 µm)	0.00
12.00 to 12.50; (0.173 µm)	0.00
12.50 to 13.00; (0.122 µm)	0.00
13.00 to 13.50; (0.086 µm)	0.00

Appendix 1. Final Summary Data sheets as supplied by participating laboratories (arranged by Lab Code).

Exercise Code:	**PS43**
LabCode:	**LB1804**
Sample Code:	**PS431804**

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	**20.2400**
-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	**0.0900**
-2.00 to -1.50; 2.8 mm	**2.1100**
-1.50 to -1.00; 2 mm	**14.0600**
-1.00 to -0.50; 1.4 mm	**14.9400**
-0.50 to 0.00; 1 mm	**31.4000**
0.00 to 0.50; (707 µm)	0.0000
0.50 to 1.00; (500 µm)	0.2065
1.00 to 1.50; (353.6 µm)	0.2876
1.50 to 2.00; (250 µm)	0.1870
2.00 to 2.50; (176.8 µm)	0.1584
2.50 to 3.00; (125 µm)	0.4850
3.00 to 3.50; (88.39 µm)	1.3764
3.50 to 4.00; (62.5 µm)	2.4839
4.00 to 4.50; (44.19 µm)	3.3649
4.50 to 5.00; (31.25 µm)	3.6986
5.00 to 5.50; (22.097 µm)	3.8350
5.50 to 6.00; (15.625 µm)	4.2018
6.00 to 6.50; (11.049 µm)	4.8445
6.50 to 7.00; (7.813 µm)	5.4639
7.00 to 7.50; (5.524 µm)	5.7644
7.50 to 8.00; (3.906 µm)	5.5515
8.00 to 8.50; (2.762 µm)	4.9231
8.50 to 9.00; (1.953 µm)	3.8505
9.00 to 9.50; (1.381 µm)	2.7202
9.50 to 10.00; (0.977 µm)	1.9496
10.00 to 10.50; (0.691 µm)	1.5899
10.50 to 11.00; (0.488 µm)	1.0913
11.00 to 11.50; (0.345 µm)	0.3921
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. Final Summary Data sheets as supplied by participating laboratories (arranged by Lab Code).

Exercise Code:	**PS43**
LabCode:	**LB1806**
Sample Code:	**PS431806**

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	**21.9700**
-2.00 to -1.50; 2.8 mm	**2.9800**
-1.50 to -1.00; 2 mm	**12.5700**
-1.00 to -0.50; 1.4 mm	**19.2800**
-0.50 to 0.00; 1 mm	**30.3400**
0.00 to 0.50; (707 µm)	0.0975
0.50 to 1.00; (500 µm)	0.0695
1.00 to 1.50; (353.6 µm)	0.0747
1.50 to 2.00; (250 µm)	0.1716
2.00 to 2.50; (176.8 µm)	0.2102
2.50 to 3.00; (125 µm)	0.3047
3.00 to 3.50; (88.39 µm)	0.4612
3.50 to 4.00; (62.5 µm)	0.8190
4.00 to 4.50; (44.19 µm)	1.0934
4.50 to 5.00; (31.25 µm)	1.4840
5.00 to 5.50; (22.097 µm)	1.6381
5.50 to 6.00; (15.625 µm)	1.7922
6.00 to 6.50; (11.049 µm)	1.8669
6.50 to 7.00; (7.813 µm)	1.8459
7.00 to 7.50; (5.524 µm)	1.7338
7.50 to 8.00; (3.906 µm)	1.5219
8.00 to 8.50; (2.762 µm)	1.2347
8.50 to 9.00; (1.953 µm)	0.8050
9.00 to 9.50; (1.381 µm)	0.2878
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. Final Summary Data sheets as supplied by participating laboratories (arranged by Lab Code).

Exercise Code:	**PS43**
LabCode:	**LB1809**
Sample Code:	**PS431809**

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	**20.0000**
-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	**0.4000**
-2.50 to -2.00; 4 mm	**0.0000**
-2.00 to -1.50; 2.8 mm	**2.5200**
-1.50 to -1.00; 2 mm	**11.8900**
-1.00 to -0.50; 1.4 mm	**17.6700**
-0.50 to 0.00; 1 mm	**30.8500**
0.00 to 0.50; (707 µm)	0.0000
0.50 to 1.00; (500 µm)	0.0678
1.00 to 1.50; (353.6 µm)	0.3234
1.50 to 2.00; (250 µm)	0.4342
2.00 to 2.50; (176.8 µm)	0.5729
2.50 to 3.00; (125 µm)	1.0627
3.00 to 3.50; (88.39 µm)	1.9663
3.50 to 4.00; (62.5 µm)	2.9963
4.00 to 4.50; (44.19 µm)	3.7442
4.50 to 5.00; (31.25 µm)	4.0658
5.00 to 5.50; (22.097 µm)	4.1907
5.50 to 6.00; (15.625 µm)	4.4464
6.00 to 6.50; (11.049 µm)	4.9780
6.50 to 7.00; (7.813 µm)	5.6466
7.00 to 7.50; (5.524 µm)	6.1106
7.50 to 8.00; (3.906 µm)	5.9877
8.00 to 8.50; (2.762 µm)	5.0756
8.50 to 9.00; (1.953 µm)	3.5125
9.00 to 9.50; (1.381 µm)	1.7758
9.50 to 10.00; (0.977 µm)	0.5045
10.00 to 10.50; (0.691 µm)	0.0181
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. Final Summary Data sheets as supplied by participating laboratories (arranged by Lab Code).

Exercise Code:	**PS43**
LabCode:	**LB1811**
Sample Code:	**PS431811**

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	**21.9200**
-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	**0.0600**
-2.00 to -1.50; 2.8 mm	**2.8500**
-1.50 to -1.00; 2 mm	**15.4800**
-1.00 to -0.50; 1.4 mm	**12.3000**
-0.50 to 0.00; 1 mm	**28.7400**
0.00 to 0.50; (707 µm)	0.0000
0.50 to 1.00; (500 µm)	0.0027
1.00 to 1.50; (353.6 µm)	0.1143
1.50 to 2.00; (250 µm)	0.2397
2.00 to 2.50; (176.8 µm)	0.2959
2.50 to 3.00; (125 µm)	0.5501
3.00 to 3.50; (88.39 µm)	1.2215
3.50 to 4.00; (62.5 µm)	2.0792
4.00 to 4.50; (44.19 µm)	2.9548
4.50 to 5.00; (31.25 µm)	3.3019
5.00 to 5.50; (22.097 µm)	3.5584
5.50 to 6.00; (15.625 µm)	3.7942
6.00 to 6.50; (11.049 µm)	4.1448
6.50 to 7.00; (7.813 µm)	4.4564
7.00 to 7.50; (5.524 µm)	4.8306
7.50 to 8.00; (3.906 µm)	4.7271
8.00 to 8.50; (2.762 µm)	4.0455
8.50 to 9.00; (1.953 µm)	3.2135
9.00 to 9.50; (1.381 µm)	2.3842
9.50 to 10.00; (0.977 µm)	1.6126
10.00 to 10.50; (0.691 µm)	1.3608
10.50 to 11.00; (0.488 µm)	0.9065
11.00 to 11.50; (0.345 µm)	0.3655
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. Final Summary Data sheets as supplied by participating laboratories (arranged by Lab Code).

Exercise Code:	**PS43**
LabCode:	**LB1814**
Sample Code:	**PS431814**

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	**0.00**
-6.00 to -5.50; 45 mm	**0.00**
-5.50 to -5.00; 31.5 mm	**0.00**
-5.00 to -4.50; 22.4 mm	**0.00**
-4.50 to -4.00; 16 mm	**21.81**
-4.00 to -3.50; 11.2 mm	**0.00**
-3.50 to -3.00; 8 mm	**0.00**
-3.00 to -2.50; 5.6 mm	**0.00**
-2.50 to -2.00; 4 mm	**0.70**
-2.00 to -1.50; 2.8 mm	**2.41**
-1.50 to -1.00; 2 mm	**11.63**
-1.00 to -0.50; 1.4 mm	**12.96**
-0.50 to 0.00; 1 mm	**21.60**
0.00 to 0.50; (707 µm)	2.33
0.50 to 1.00; (500 µm)	0.18
1.00 to 1.50; (353.6 µm)	0.10
1.50 to 2.00; (250 µm)	0.09
2.00 to 2.50; (176.8 µm)	0.16
2.50 to 3.00; (125 µm)	0.28
3.00 to 3.50; (88.39 µm)	0.25
3.50 to 4.00; (62.5 µm)	0.72
4.00 to 4.50; (44.19 µm)	0.77
4.50 to 5.00; (31.25 µm)	1.24
5.00 to 5.50; (22.097 µm)	1.82
5.50 to 6.00; (15.625 µm)	2.45
6.00 to 6.50; (11.049 µm)	2.94
6.50 to 7.00; (7.813 µm)	3.13
7.00 to 7.50; (5.524 µm)	2.99
7.50 to 8.00; (3.906 µm)	2.61
8.00 to 8.50; (2.762 µm)	2.10
8.50 to 9.00; (1.953 µm)	1.56
9.00 to 9.50; (1.381 µm)	1.06
9.50 to 10.00; (0.977 µm)	0.73
10.00 to 10.50; (0.691 µm)	0.59
10.50 to 11.00; (0.488 µm)	0.48
11.00 to 11.50; (0.345 µm)	0.28
>11.50; (0.244 µm)	0.03

Appendix 1. Final Summary Data sheets as supplied by participating laboratories (arranged by Lab Code).

Exercise Code:	**PS43**
LabCode:	**LB1816**
Sample Code:	**PS431816**

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	**14.1200**
-4.00 to -3.50; 11.2 mm	**0.0000**
-3.50 to -3.00; 8 mm	**7.3900**
-3.00 to -2.50; 5.6 mm	**0.0000**
-2.50 to -2.00; 4 mm	**0.2600**
-2.00 to -1.50; 2.8 mm	**0.0000**
-1.50 to -1.00; 2 mm	**16.8100**
-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)	0.0000
2.00 to 2.50; (176.8 µm)	0.0007
2.50 to 3.00; (125 µm)	1.0455
3.00 to 3.50; (88.39 µm)	4.1755
3.50 to 4.00; (62.5 µm)	7.7850
4.00 to 4.50; (44.19 µm)	7.9131
4.50 to 5.00; (31.25 µm)	8.8742
5.00 to 5.50; (22.097 µm)	6.1404
5.50 to 6.00; (15.625 µm)	9.4296
6.00 to 6.50; (11.049 µm)	10.1984
6.50 to 7.00; (7.813 µm)	6.8239
7.00 to 7.50; (5.524 µm)	9.0985
7.50 to 8.00; (3.906 µm)	9.1199
8.00 to 8.50; (2.762 µm)	8.3510
8.50 to 9.00; (1.953 µm)	5.3181
9.00 to 9.50; (1.381 µm)	5.4676
9.50 to 10.00; (0.977 µm)	3.6415
10.00 to 10.50; (0.691 µm)	1.7620
10.50 to 11.00; (0.488 µm)	1.3242
11.00 to 11.50; (0.345 µm)	0.3278
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. Final Summary Data sheets as supplied by participating laboratories (arranged by Lab Code).

Exercise Code:	**PS43**
LabCode:	**LB1818**
Sample Code:	**PS431818**

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)	0.0000
2.00 to 2.50; (176.8 µm)	0.3379
2.50 to 3.00; (125 µm)	1.7117
3.00 to 3.50; (88.39 µm)	3.4627
3.50 to 4.00; (62.5 µm)	5.0959
4.00 to 4.50; (44.19 µm)	6.2638
4.50 to 5.00; (31.25 µm)	6.7742
5.00 to 5.50; (22.097 µm)	7.0040
5.50 to 6.00; (15.625 µm)	7.5124
6.00 to 6.50; (11.049 µm)	8.4421
6.50 to 7.00; (7.813 µm)	9.4107
7.00 to 7.50; (5.524 µm)	9.9883
7.50 to 8.00; (3.906 µm)	9.7253
8.00 to 8.50; (2.762 µm)	8.2237
8.50 to 9.00; (1.953 µm)	5.9672
9.00 to 9.50; (1.381 µm)	3.7999
9.50 to 10.00; (0.977 µm)	2.5528
10.00 to 10.50; (0.691 µm)	2.0468
10.50 to 11.00; (0.488 µm)	1.3314
11.00 to 11.50; (0.345 µm)	0.3492
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. Final Summary Data sheets as supplied by participating laboratories (arranged by Lab Code).

Exercise Code:	**PS43**
LabCode:	**LB1830**
Sample Code:	**PS431830**

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	**21.4000**
-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	**0.6000**
-2.00 to -1.50; 2.8 mm	**0.0000**
-1.50 to -1.00; 2 mm	**14.2000**
-1.00 to -0.50; 1.4 mm	**0.0000**
-0.50 to 0.00; 1 mm	**36.4000**
0.00 to 0.50; (707 µm)	0.1252
0.50 to 1.00; (500 µm)	0.2446
1.00 to 1.50; (353.6 µm)	0.4815
1.50 to 2.00; (250 µm)	0.6125
2.00 to 2.50; (176.8 µm)	0.6153
2.50 to 3.00; (125 µm)	0.9038
3.00 to 3.50; (88.39 µm)	1.2910
3.50 to 4.00; (62.5 µm)	2.1019
4.00 to 4.50; (44.19 µm)	2.7790
4.50 to 5.00; (31.25 µm)	2.9646
5.00 to 5.50; (22.097 µm)	3.4149
5.50 to 6.00; (15.625 µm)	3.4767
6.00 to 6.50; (11.049 µm)	3.7770
6.50 to 7.00; (7.813 µm)	3.9438
7.00 to 7.50; (5.524 µm)	4.1494
7.50 to 8.00; (3.906 µm)	4.0279
8.00 to 8.50; (2.762 µm)	6.4887
8.50 to 9.00; (1.953 µm)	0.0000
9.00 to 9.50; (1.381 µm)	3.8704
9.50 to 10.00; (0.977 µm)	0.0000
10.00 to 10.50; (0.691 µm)	2.7141
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 2. Z-score calculations when data from all participating laboratories are included in mean and standard deviation calculations.

	-6.50 to -6.00	-6.00 to -5.50	-5.50 to -5.00	-5.00 to -4.50	z-score	-4.50 to -4.00	z-score	-4.00 to -3.50	-3.50 to -3.00	z-score	-3.00 to -2.50	z-score	-2.50 to -2.00	z-score	-2.00 to -1.50	z-score	-1.50 to -1.00	z-score	-1.00 to -0.50	z-score
TUM AVERAGE	0.0000	0.0000	0.0000	0.0000	-0.30	17.4078	0.88	0.0000	0.0000	-0.37	0.0000	-0.30	0.0326	-0.32	2.1068	-0.04	12.5187	0.32	12.8321	0.41
LB_1801	0.0000	0.0000	0.0000	17.2124	3.02	0.0000	-1.19	0.0000	0.0000	-0.37	0.0000	-0.30	0.0000	-0.33	9.1530	2.74	17.8770	1.51	17.9107	1.13
LB_1802	0.0000	0.0000	0.0000	0.0000	-0.30	0.0000	-1.19	0.0000	26.1548	2.96	0.0000	-0.30	0.0000	-0.33	2.6776	0.19	15.8029	1.05	16.6755	0.95
LB_1803	0.0000	0.0000	0.0000	0.0000	-0.30	15.6627	0.67	0.0000	0.5238	-0.30	0.0000	-0.30	0.0946	-0.31	1.6659	-0.21	10.9559	-0.03	11.1742	0.17
LB_1804	0.0000	0.0000	0.0000	0.0000	-0.30	14.3276	0.51	0.0000	0.0000	-0.37	0.0000	-0.30	0.0637	-0.32	1.4936	-0.28	9.9528	-0.25	10.5758	0.09
LB_1806	0.0000	0.0000	0.0000	0.0000	-0.30	0.0000	-1.19	0.0000	0.0000	-0.37	0.0000	-0.30	20.9934	3.01	2.8475	0.25	12.0112	0.21	18.4229	1.20
LB_1809	0.0000	0.0000	0.0000	0.0000	-0.30	14.2035	0.50	0.0000	0.0000	-0.37	0.2841	3.02	0.0000	-0.33	1.7896	-0.16	8.4440	-0.58	12.5488	0.37
LB_1811	0.0000	0.0000	0.0000	0.0000	-0.30	16.6679	0.79	0.0000	0.0000	-0.37	0.0000	-0.30	0.0456	-0.32	2.1671	-0.01	11.7710	0.16	9.3529	-0.09
LB_1814	0.0000	0.0000	0.0000	0.0000	-0.30	21.8052	1.40	0.0000	0.0000	-0.37	0.0000	-0.30	0.6967	-0.22	2.4090	0.08	11.6262	0.12	12.9552	0.42
LB_1816	0.0000	0.0000	0.0000	0.0000	-0.30	9.7127	-0.04	0.0000	5.0833	0.28	0.0000	-0.30	0.1788	-0.30	0.0000	-0.87	11.5630	0.11	0.0000	-1.42
LB_1818	0.0000	0.0000	0.0000	0.0000	-0.30	0.0000	-1.19	0.0000	0.0000	-0.37	0.0000	-0.30	0.0000	-0.33	0.0000	-0.87	0.0000	-2.46	0.0000	-1.42
LB_1830	0.0000	0.0000	0.0000	0.0000	-0.30	17.7473	0.92	0.0000	0.0000	-0.37	0.0000	-0.30	0.4976	-0.25	0.0000	-0.87	11.7762	0.16	0.0000	-1.42
μ	0.0000	0.0000	0.0000	1.5648		10.0115		0.0000	2.8874		0.0258		2.0519		2.2003		11.0709		9.9651	
σ	0.0000	0.0000	0.0000	5.1897		8.4403		0.0000	7.8643		0.0857		6.2864		2.5399		4.4929		7.0387	

	-0.50 to 0.00	z-score	0.00 to 0.50	z-score	0.50 to 1.00	z-score	1.00 to 1.50	z-score	1.50 to 2.00	z-score	2.00 to 2.50	z-score	2.50 to 3.00	z-score	3.00 to 3.50	z-score	3.50 to 4.00	z-score	4.00 to 4.50	z-score
TUM AVERAGE	25.4037	0.47	0.0168	-0.49	0.1132	-0.30	0.2630	0.33	0.3482	1.01	0.4487	1.20	0.6277	0.06	0.9470	-0.26	1.3434	-0.40	1.6874	-0.40
LB_1801	16.1356	-0.34	0.2949	-0.18	0.5818	0.94	0.6112	2.05	0.3994	1.32	0.3515	0.61	0.5388	-0.15	0.8743	-0.33	1.1977	-0.48	1.3699	-0.57
LB_1802	36.8893	1.48	0.0117	-0.50	0.0171	-0.55	0.0236	-0.85	0.0274	-0.94	0.0442	-1.26	0.0648	-1.23	0.1019	-1.07	0.1167	-1.12	0.1254	-1.24
LB_1803	20.4860	0.04	2.1116	1.88	1.2440	2.70	0.4235	1.13	0.1930	0.07	0.4083	0.96	0.7621	0.36	1.0382	-0.17	1.6756	-0.20	2.2601	-0.10
LB_1804	22.2276	0.19	0.0000	-0.51	0.1461	-0.21	0.2036	0.04	0.1324	-0.30	0.1121	-0.84	0.3433	-0.60	0.9743	-0.23	1.7583	-0.15	2.3820	-0.03
LB_1806	28.9913	0.79	0.0932	-0.40	0.0664	-0.42	0.0714	-0.61	0.1640	-0.11	0.2008	-0.30	0.2912	-0.71	0.4407	-0.75	0.7826	-0.73	1.0448	-0.75
LB_1809	21.9090	0.17	0.0000	-0.51	0.0481	-0.47	0.2296	0.17	0.3084	0.77	0.4068	0.95	0.7547	0.35	1.3964	0.17	2.1279	0.07	2.6590	0.12
LB_1811	21.8538	0.16	0.0000	-0.51	0.0020	-0.59	0.0869	-0.54	0.1822	0.00	0.2250	-0.16	0.4183	-0.42	0.9288	-0.28	1.5811	-0.26	2.2468	-0.10
LB_1814	21.5980	0.14	2.3317	2.13	0.1782	-0.13	0.1020	-0.46	0.0891	-0.57	0.1589	-0.56	0.2823	-0.73	0.2491	-0.93	0.7203	-0.77	0.7661	-0.90
LB_1816	0.0000	-1.76	0.0000	-0.51	0.0000	-0.60	0.0000	-0.97	0.0000	-1.11	0.0005	-1.52	0.7191	0.27	2.8722	1.58	5.3550	1.98	5.4432	1.60
LB_1818	0.0000	-1.76	0.0000	-0.51	0.0000	-0.60	0.0000	-0.97	0.0000	-1.11	0.3379	0.53	1.7117	2.54	3.4627	2.15	5.0959	1.82	6.2638	2.04
LB_1830	30.1869	0.89	0.1038	-0.39	0.2028	-0.06	0.3993	1.01	0.5080	1.98	0.5102	1.58	0.7495	0.33	1.0706	-0.14	1.7431	-0.16	2.3046	-0.07
μ	20.0252		0.4497		0.2261		0.1956		0.1822		0.2506		0.6033		1.2190		2.0140		2.4423	
σ	11.4001		0.8819		0.3775		0.2024		0.1647		0.1644		0.4368		1.0445		1.6903		1.8716	

z-score >1.96 or <-1.96

All values equal zero

Appendix 2. Z-score calculations when data from all participating laboratories are included in mean and standard deviation calculations.

	4.50 to 5.00	z-score	5.00 to 5.50	z-score	5.50 to 6.00	z-score	6.00 to 6.50	z-score	6.50 to 7.00	z-score	7.00 to 7.50	z-score	7.50 to 8.00	z-score	8.00 to 8.50	z-score	8.50 to 9.00	z-score	9.00 to 9.50	z-score
TUM AVERAGE	1.8911	-0.42	2.0156	-0.40	2.1893	-0.44	2.4660	-0.43	2.7543	-0.33	2.8697	-0.37	2.6864	-0.40	2.2185	-0.51	1.6507	-0.25	1.1241	-0.46
LB_1801	1.3719	-0.68	1.3150	-0.80	1.3328	-0.84	1.4778	-0.85	1.6695	-0.80	1.7633	-0.80	1.6836	-0.80	1.4601	-0.83	1.1404	-0.55	0.7922	-0.71
LB_1802	0.1398	-1.29	0.1378	-1.46	0.1489	-1.40	0.1671	-1.40	0.1716	-1.44	0.1729	-1.41	0.3291	-1.33	0.0000	-1.45	0.0000	-1.21	0.0000	-1.31
LB_1803	2.5649	-0.08	2.7276	0.00	2.8593	-0.13	3.1578	-0.13	3.4906	-0.02	3.8125	-0.01	3.6621	-0.02	3.1724	-0.10	2.2255	0.08	1.2220	-0.39
LB_1804	2.6182	-0.06	2.7147	-0.01	2.9744	-0.07	3.4293	-0.02	3.8678	0.14	4.0806	0.09	3.9298	0.08	3.4849	0.04	2.7257	0.37	1.9256	0.14
LB_1806	1.4180	-0.66	1.5653	-0.66	1.7125	-0.67	1.7839	-0.72	1.7638	-0.76	1.6567	-0.84	1.4543	-0.89	1.1798	-0.95	0.7692	-0.76	0.2750	-1.10
LB_1809	2.8875	0.08	2.9761	0.14	3.1577	0.01	3.5352	0.03	4.0101	0.20	4.3396	0.19	4.2523	0.21	3.6046	0.09	2.4945	0.23	1.2611	-0.36
LB_1811	2.5107	-0.11	2.7058	-0.01	2.8851	-0.11	3.1517	-0.14	3.3886	-0.06	3.6732	-0.06	3.5945	-0.05	3.0762	-0.14	2.4435	0.20	1.8130	0.06
LB_1814	1.2402	-0.74	1.8218	-0.51	2.4521	-0.32	2.9415	-0.23	3.1312	-0.17	2.9928	-0.32	2.6110	-0.43	2.1037	-0.55	1.5605	-0.31	1.0557	-0.51
LB_1816	6.1043	1.68	4.2238	0.84	6.4863	1.58	7.0152	1.50	4.6939	0.50	6.2586	0.93	6.2732	1.00	5.7444	1.00	3.6582	0.91	3.7610	1.53
LB_1818	6.7742	2.01	7.0040	2.41	7.5124	2.06	8.4421	2.11	9.4107	2.52	9.9883	2.37	9.7253	2.36	8.2237	2.06	5.9672	2.24	3.7999	1.56
LB_1830	2.4586	-0.14	2.8320	0.06	2.8832	-0.11	3.1323	-0.15	3.2707	-0.11	3.4412	-0.15	3.3404	-0.15	5.3811	0.84	0.0000	-1.21	3.2097	1.11
μ	2.7353		2.7295		3.1277		3.4758		3.5335		3.8345		3.7141		3.4028		2.0895		1.7377	
σ	2.0105		1.7741		2.1278		2.3581		2.3321		2.5960		2.5511		2.3415		1.7282		1.3254	

	9.50 to 10.00	z-score	10.00 to 10.50	z-score	10.50 to 11.00	z-score	11.00 to 11.50	z-score	11.50 to 12.00	z-score	12.00 to 12.50	12.50 to 13.00	13.00 to 13.50
TUM AVERAGE	0.7975	-0.09	0.6533	-0.17	0.4466	0.08	0.1400	-0.01	0.0000	-0.30	0.0000	0.0000	0.0000
LB_1801	0.5527	-0.35	0.4507	-0.42	0.3428	-0.15	0.1390	-0.01	0.0000	-0.30	0.0000	0.0000	0.0000
LB_1802	0.0000	-0.94	0.0000	-0.98	0.0000	-0.89	0.0000	-0.98	0.0000	-0.30	0.0000	0.0000	0.0000
LB_1803	0.4005	-0.52	0.0256	-0.94	0.0000	-0.89	0.0000	-0.98	0.0000	-0.30	0.0000	0.0000	0.0000
LB_1804	1.3801	0.53	1.1255	0.40	0.7725	0.78	0.2776	0.95	0.0000	-0.30	0.0000	0.0000	0.0000
LB_1806	0.0000	-0.94	0.0000	-0.98	0.0000	-0.89	0.0000	-0.98	0.0000	-0.30	0.0000	0.0000	0.0000
LB_1809	0.3583	-0.56	0.0129	-0.96	0.0000	-0.89	0.0000	-0.98	0.0000	-0.30	0.0000	0.0000	0.0000
LB_1811	1.2262	0.37	1.0348	0.29	0.6893	0.60	0.2779	0.95	0.0000	-0.30	0.0000	0.0000	0.0000
LB_1814	0.7328	-0.16	0.5945	-0.25	0.4817	0.15	0.2793	0.96	0.0333	3.02	0.0000	0.0000	0.0000
LB_1816	2.5049	1.73	1.2120	0.51	0.9109	1.07	0.2255	0.59	0.0000	-0.30	0.0000	0.0000	0.0000
LB_1818	2.5528	1.78	2.0468	1.53	1.3314	1.98	0.3492	1.45	0.0000	-0.30	0.0000	0.0000	0.0000
LB_1830	0.0000	-0.94	2.2508	1.78	0.0000	-0.89	0.0000	-0.98	0.0000	-0.30	0.0000	0.0000	0.0000
μ	0.8826		0.7958		0.4117		0.1408		0.0030		0.0000	0.0000	0.0000
σ	0.9361		0.8157		0.4647		0.1437		0.0100		0.0000	0.0000	0.0000

z-score >1.96 or <-1.96

All values equal zero