

EVALUATION OF THE INTERLABORATORY COMPARISON TEST

Sum parameters SP01

Sample dispatch on 31st May 2016

Address: Umweltbundesamt GmbH
Spittelauer Lände 5
1090 Vienna/Austria

Contact: Dr. Sandra Kulcsar

Telephone: +43 (0) 1 31304 4334

E-mail: ringversuche@umweltbundesamt.at

Website: www.umweltbundesamt.at/leistungen
www.imatest.at

Management:
Dipl.-Ing. Monika Denner

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1 Interlaboratory comparison test: Sum parameters SP01

1.1 Participants and time schedule

- Number of registrations: 33
- Number of submitted data records: 33
- Dispatch of samples: 31st May 2016
- Closing date for submission of data: 28th June 2016

To anonymize results, each laboratory was given a laboratory code on a random basis.

1.2 Sampling, sample material and distribution

The following samples were made available

- synthetic water (Sample A)
- ground water (Sample B)

The sampling of ground water was carried out on 29th May 2016. The sample was stored at < 4 °C until further processing.

The samples for the HC-Index (SP01 A KWI and SP01 B KWI) were prepared on 30th May 2016 and stored at < 4 °C.

The samples for the Phenol Index (SP01 A PHE and SP01 B PHE) were prepared at the day of dispatch. For stabilisation they were brought to pH < 4 with phosphoric acid and 1 g/L Copper sulfate pentahydrate was added.

All samples were spiked with the corresponding substances.

The homogenous samples were dispatched on 31st May 2016.

Each participant received:

- HC-Index: 2 samples (each 2000 ml), each filled in 2x 1000 ml glas bottles
- Phenol Index: 2 samples (each 2000 ml), each filled in 2x 1000 ml glas bottles

1.3 Control testing

During filling the bottles, aliquots of each sample were collected randomly for control testing. Testing was performed close to the time of sample dispatch.

In the parameter-oriented evaluation, the results of the control testing are given in the form of arithmetic means of the detected concentrations as check value $\pm U$.

2 Evaluation

The analytical results had to be made available to the organiser not later than 24th May 2016. Any values received at a later date were not considered. A statistical evaluation of interlaboratory comparison data was only carried out if at least 6 valid results per parameter were available.

To evaluate the data, outliers were detected first by using the outlier test method according to Hampel. Values identified as conspicuous by this test method are marked specifically in the parameter-oriented evaluation. Further evaluation was performed in accordance with DIN ISO 5725-2. Results $< LOQ$ or $< LOD$ are not taken into account for calculation.

The adjusted average value (after removal of outliers) for all submitted results was used as a basis for the calculation of recovery rates and z-scores.

z-Score

z-Scores were calculated on the basis of the following formula:

$$z - score = \frac{x_i - \bar{X}}{SD}$$

In this context,

x_i is the measurement value of the participating laboratory.

\bar{X} is the adjusted average value (i.e. after removal of outliers) of the participants' results.

SD is the reproducibility standard deviation, calculated from the participants' results (after removal of outliers) in the relevant test round.

Interpretation of z-Scores in the parameter-oriented evaluation:

- $|z| < 2$ result: good
- $2 < |z| < 3$ result: questionable
- $|z| > 3$ result: not satisfactory

3 Representation and interpretation of measurement results

The parameter oriented report shows the measurement values including uncertainty, recovery rate, calculated z-Score and the outliers in tabular form. The results listed in the table are also represented graphically.

The laboratory oriented report shows the results of the individual laboratories, including the recovery rates and z-Scores.

An annotation of the tables and graphics is given in section 5.

4 Explanatory notes

As explained in section 2, the z-Score is calculated using the reproducibility standard deviation, calculated from the participants' results (after removal of outliers) in the relevant test round. As a consequence it might occur that the z-Score between -2 and 2 covers an extraordinary range, due to a high variance of the results.

The recovery rate is calculated for the individual result based on the target value. Therefore, in the case of a high variance of the results, participants should also consider recovery rates as an indicator for the necessity of internal quality assurance measures.

At this Interlaboratory comparison test the HC-Index in both samples shows a high variance of the results.

If low results were received we recommend to check, if the entire bottle was extracted and/or rinsed with solvent to exclude adsorption effects on the glass wall.

5 Annotations on tables and charts

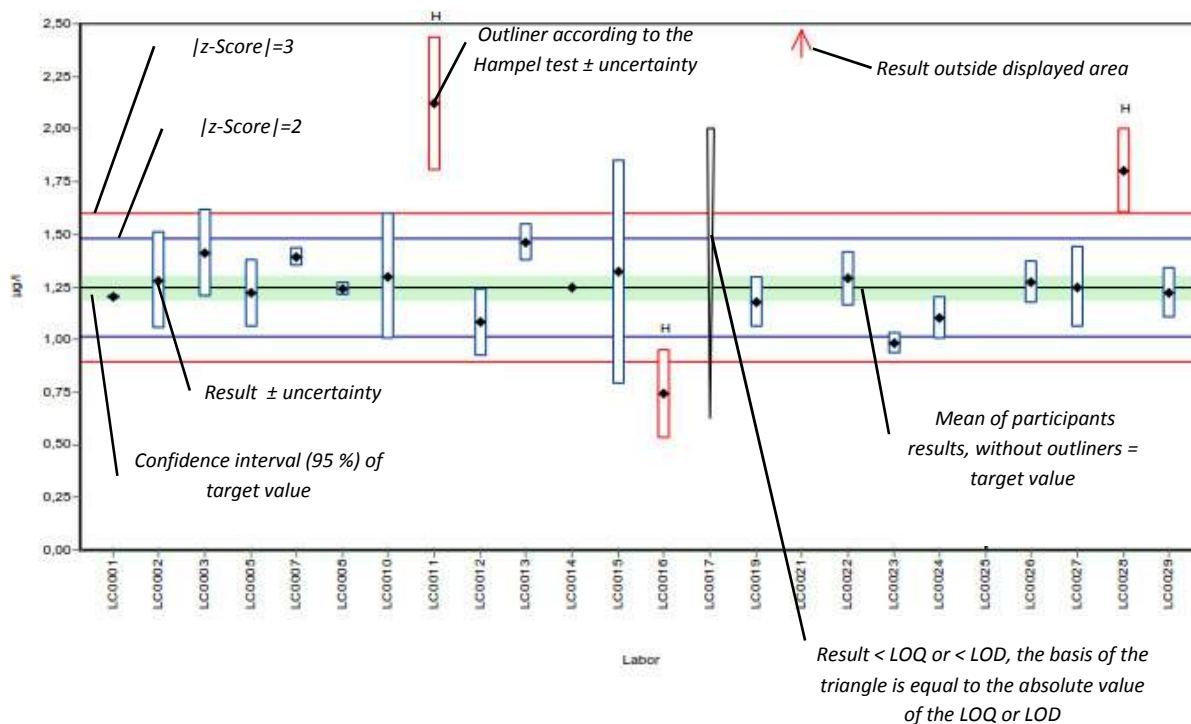
5.1 Information and abbreviations in tables

Parameter	Analyte identifier
Sample	Sample identifier
Unit	Given unit for result and uncertainty (e.g. µg/l)
Mean	Mean of the participants results, without outliers (3 significant digits)
CI (99 %)	99% confidence interval (3 significant digits)
Minimum	Minimum of all submitted results, after removal of outliers (3 significant digits)
Maximum	Maximum of all submitted results, after removal of outliers (3 significant digits)
SD	Reproducibility standard deviation, calculated from the participants results, after removal of outliers (3 significant digits)
RSD %	Reproducibility standard deviation, calculated from the participants results relative to the target value, given in %, after removal of outliers (2 significant digits)
Check value ± U	Mean of check value ± measurement uncertainty (3 significant digits)
Labcode	Laboratory identifier (anonymized)
Result	Result as indicated by participant (max. 5 decimal places)
± U	Results uncertainty as indicated by participant (max. 5 decimal places)
LOQ	Limit of quantification
LOD	Limit of detection
Recovery	Recovery rate in % based on target value (3 significant digits, max. one decimal place given)
z-Score	Deviation of result based on target value depicted as a multiple of the criteria (3 significant digits, max. 2 decimal places given)
-	<i>No data available</i>
Comments	Comment on the respective result (e.g. H, FN, FP)
H	Outlier according to Hampel-Test
FN	False negative – for a result < LOQ or result < LOD: The absolute value of the LOQ or LOD fulfils the condition of an outlier according to the Hampel test.
FP	False positive – for parameters where no target value is available because of a too low analyte content (n < 6):

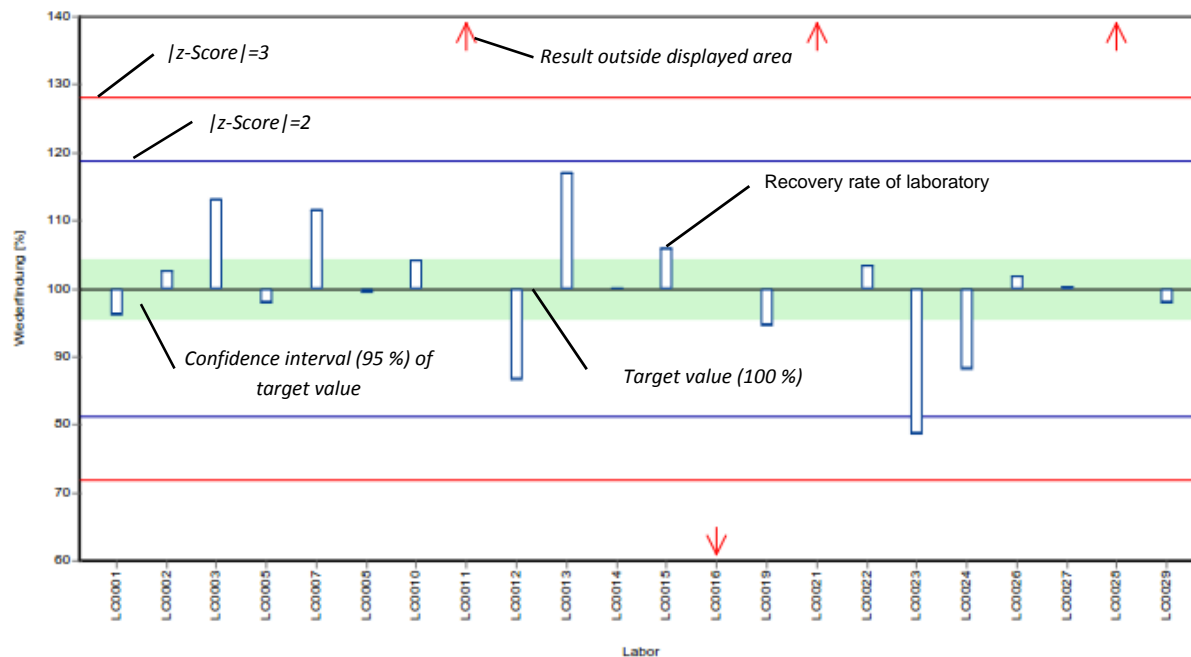
	Result that exceeds the median of the absolute values of the transmitted LOQs or LODs by more than 100 %.
Standard deviation	Reproducibility standard deviation, calculated from the participants results (3 significant digits)
Rel. standard deviation	Reproducibility standard deviation, calculated from the participants results relative to the target value, given in %, (3 significant digits)
n	Number of results
Target value	Mean of the participants results, without outliers (3 significant digits)
Criteria	Criteria for z-Score calculation. The given value matches the reproducibility standard deviation, calculated from the participants' results, after removal of outliers (3 significant digits).

5.2 Graphical presentation of results

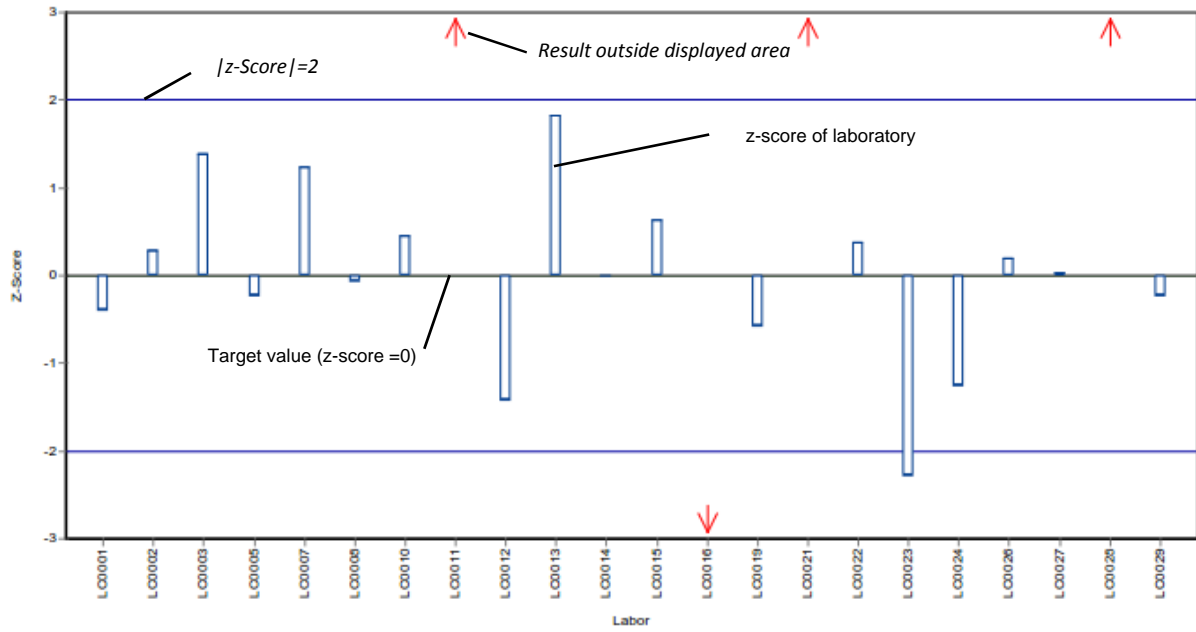
Example chart: Results



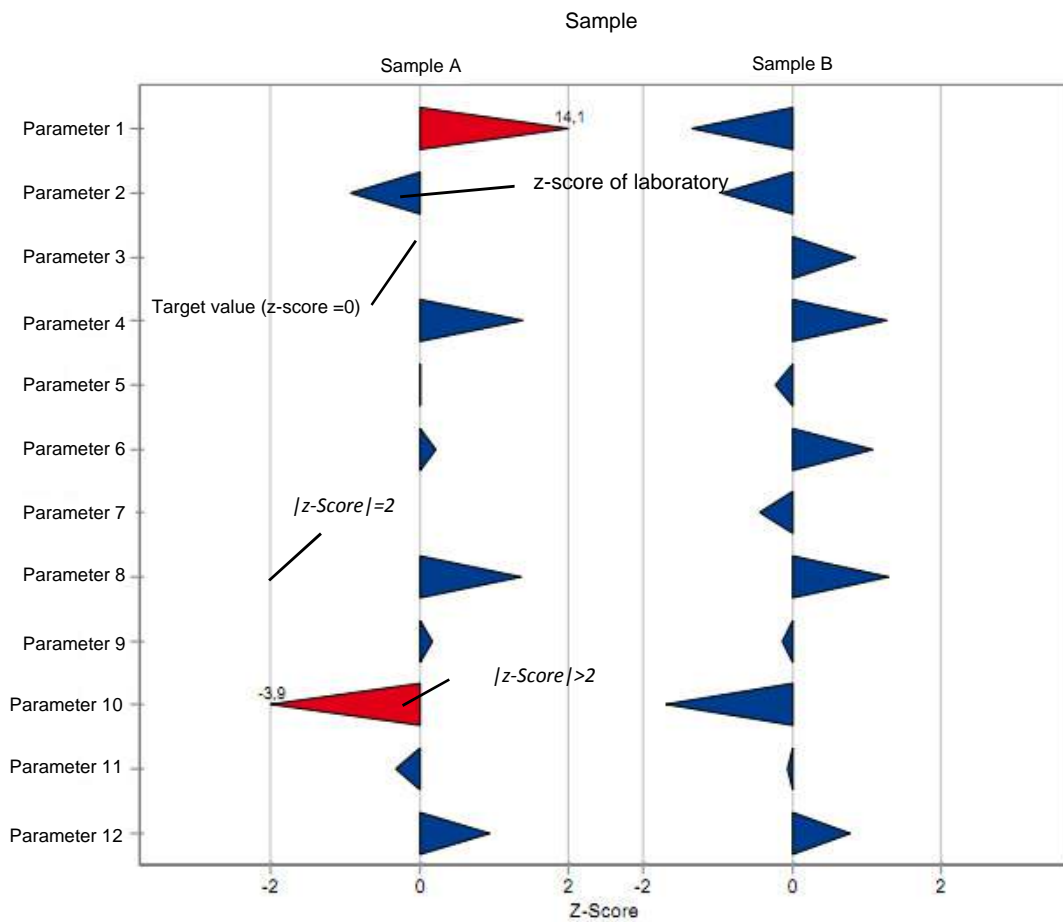
Example chart: Recovery



Example chart: z-score



Example chart: z-score - laboratory oriented report



Summary of results, after removal of outliers: Sum parameters SP01

6 Summary of results, after removal of outliers

Parameter	Sample	Unit	Number of results for calculation	Number of outliers	Mean	± CI (99%)	Minimum	Maximum	SD	RSD %
HC-Index	SP01 A -	mg/l	29	2	1.79	± 0.31	0.8	2.72	0.557	31
	SP01 B -	mg/l	29	2	0.583	± 0.125	0.241	0.9	0.224	38
Phenol index	SP01 A -	mg/l	22	2	0.105	± 0.00382	0.095	0.12	0.00596	5.7
	SP01 B .	mg/l	20	4	0.0338	± 0.0028	0.022	0.0408	0.00417	12

7 Parameter oriented report

HC-Index.....	13
Phenol Index.....	23

Parameter oriented report

SP01 A - HC-index

HC-Index

Unit	mg/l
Mean ± CI (99%)	1.79 ± 0.31
Minimum - Maximum	0.8 - 2.72
Control test value ± U	2.52 ± 0.456

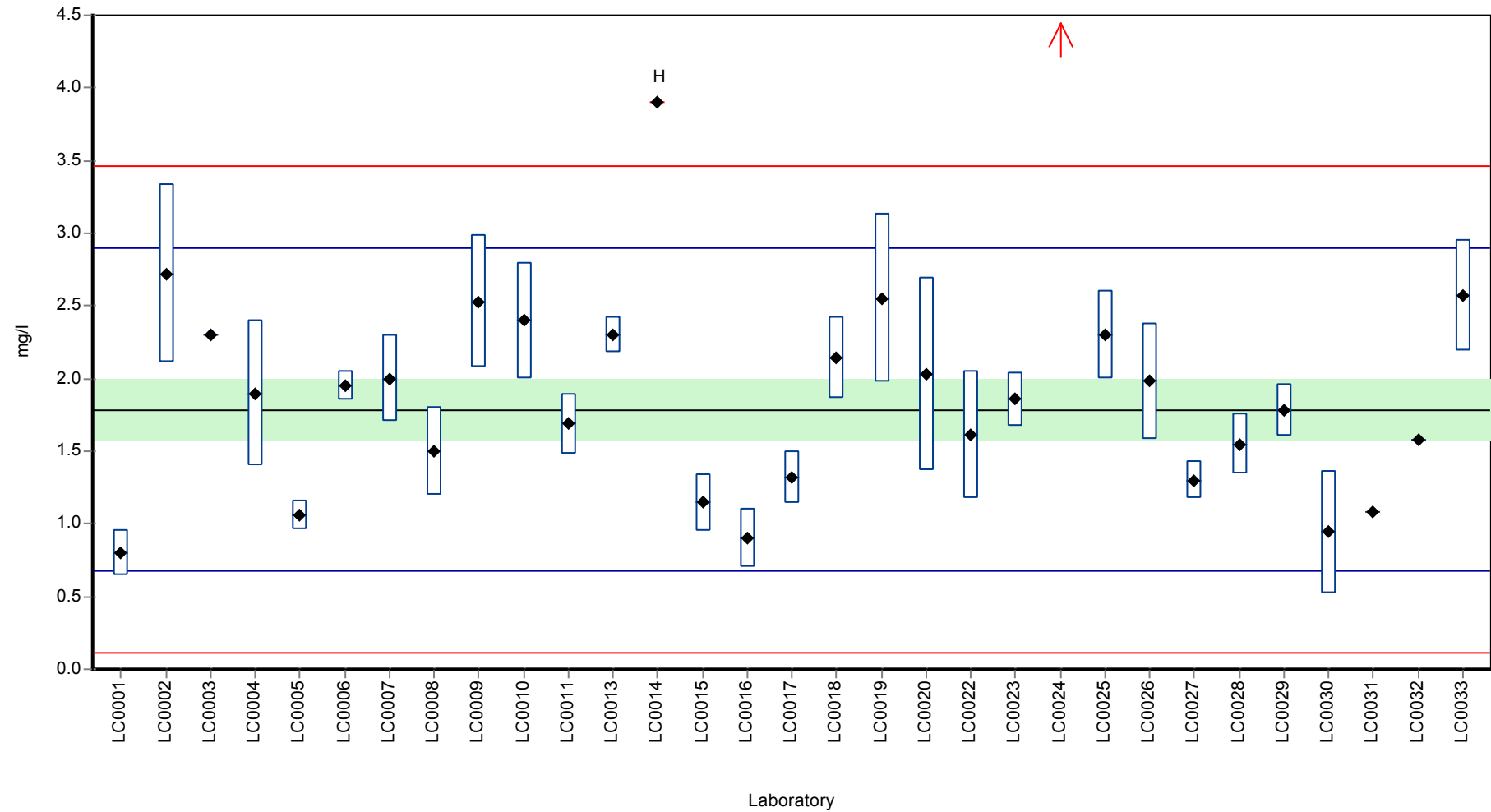
Labcode	Result	± U	Recovery [%]	z-score	Comments
LC0001	0.8	0.16	44.8	-1.77	
LC0002	2.7231	0.618	152	1.68	
LC0003	2.3	-	129	0.92	
LC0004	1.9	0.5	106	0.2	
LC0005	1.06	0.1	59.3	-1.3	
LC0006	1.955	0.1	109	0.3	
LC0007	2	0.3	112	0.38	
LC0008	1.5	0.3	84	-0.51	
LC0009	2.53	0.46	142	1.34	
LC0010	2.4	0.4	134	1.1	
LC0011	1.69	0.21	94.6	-0.17	
LC0012	-	-	-	-	
LC0013	2.3	0.12	129	0.92	
LC0014	3.9	-	218	3.79	H
LC0015	1.148	0.195	64.3	-1.15	
LC0016	0.9	0.2	50.4	-1.59	
LC0017	1.32	0.18	73.9	-0.84	
LC0018	2.145	0.28	120	0.64	
LC0019	2.55	0.58	143	1.37	
LC0020	2.03	0.66	114	0.44	
LC0021	-	-	-	-	
LC0022	1.61	0.44	90.1	-0.32	
LC0023	1.8553	0.19	104	0.12	
LC0024	5.9	-	330	7.38	H
LC0025	2.3	0.3	129	0.92	
LC0026	1.98	0.396	111	0.35	
LC0027	1.3	0.13	72.8	-0.87	
LC0028	1.55	0.21	86.8	-0.42	
LC0029	1.78	0.18	99.7	-0.01	
LC0030	0.945	0.425	52.9	-1.51	
LC0031	1.08	-	60.5	-1.27	
LC0032	1.576	-	88.2	-0.38	
LC0033	2.57	0.38	144	1.41	

Characteristics of parameter

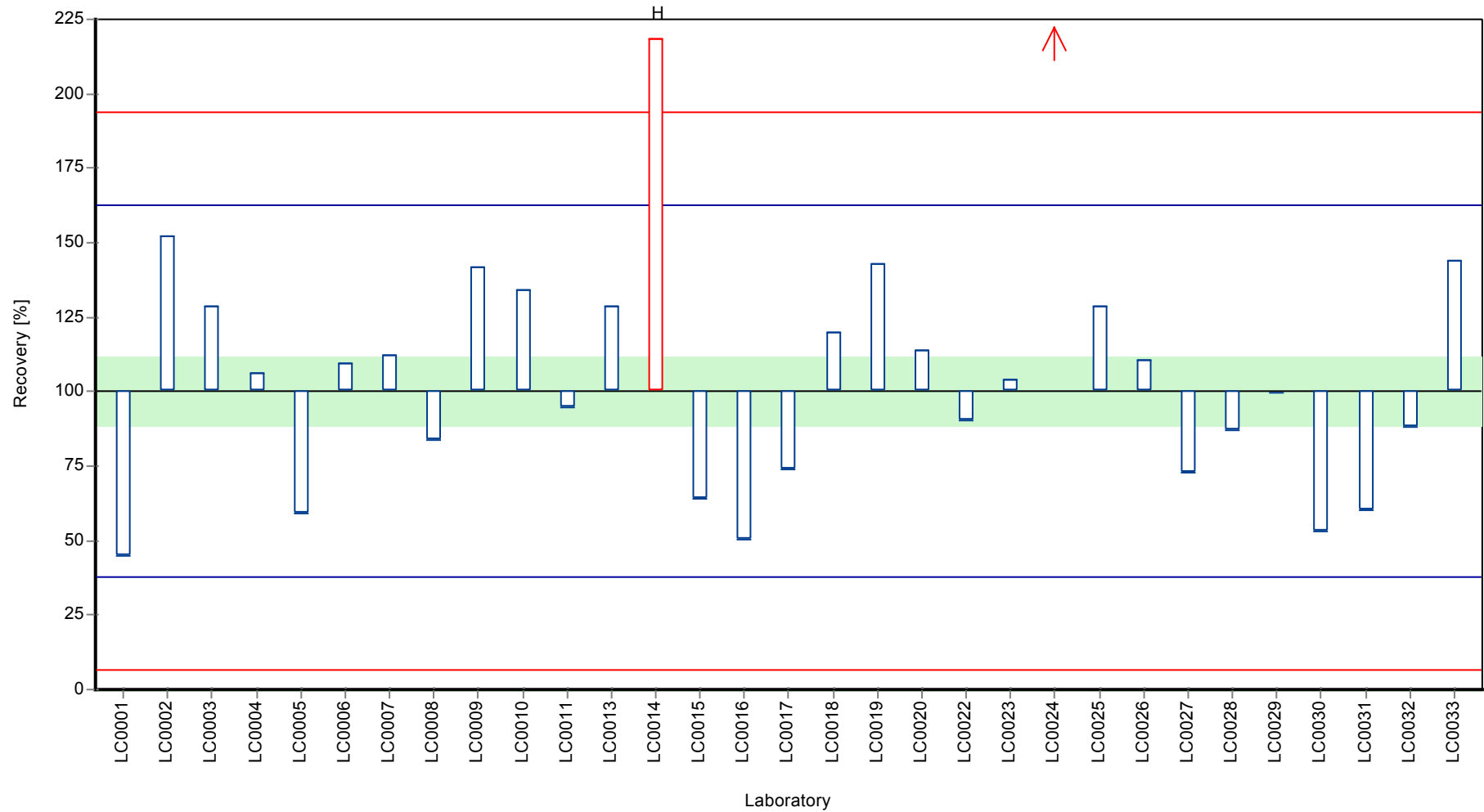
	all results	without outliers	Unit
Mean ± CI (99%)	1.99 ± 0.528	1.79 ± 0.31	mg/l
Minimum	0.8	0.8	mg/l
Maximum	5.9	2.72	mg/l
Standard deviation	0.98	0.557	mg/l
rel. Standard deviation	49.3	31.2	%
n	31	29	-

Graphical presentation of results

Results



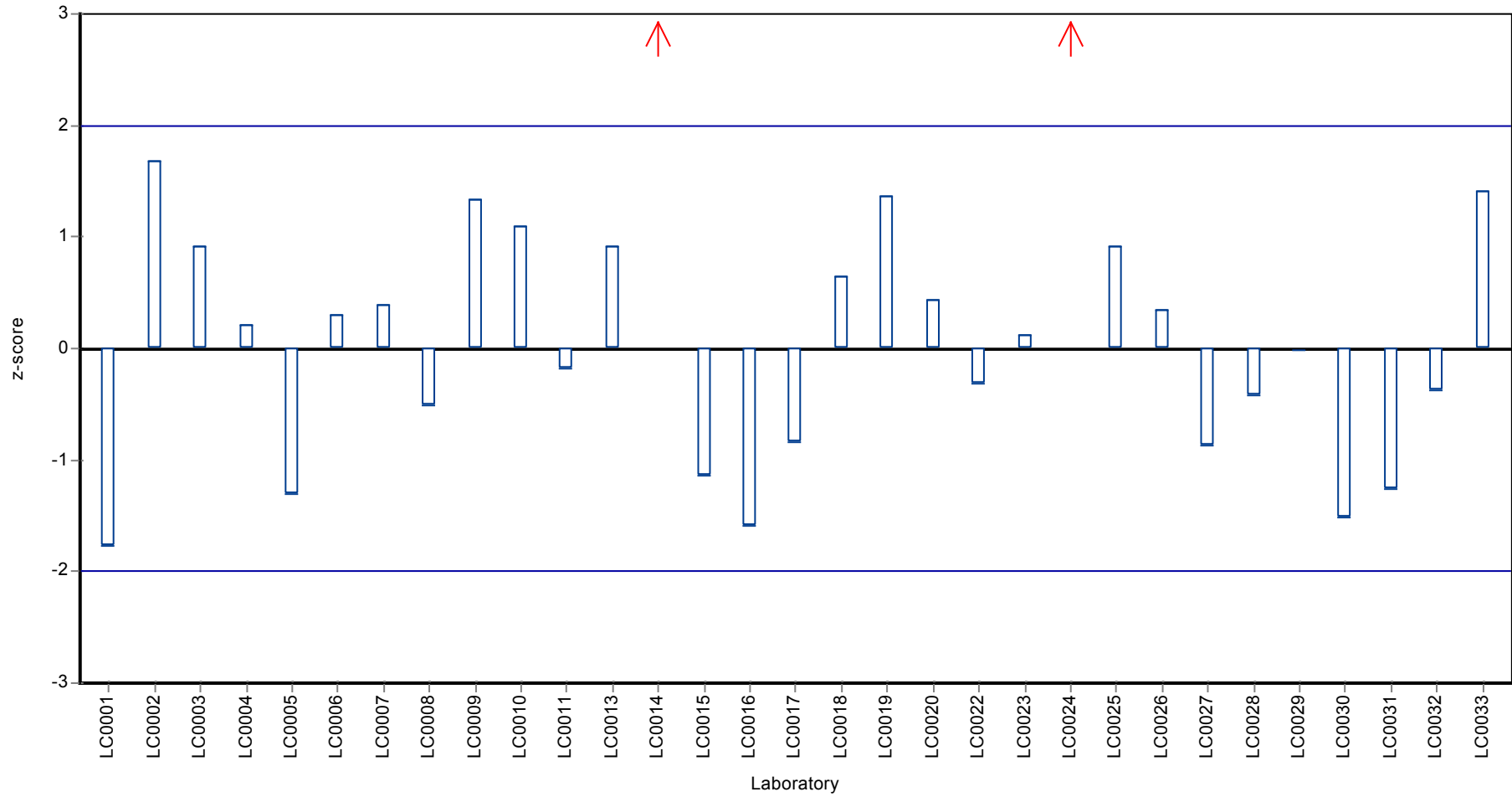
Recovery rate



Parameter oriented report Sum parameters SP01

Sample: SP01AKWI, Parameter: HC-Index

Z-score



Parameter oriented report

SP01 B - HC-index

HC-Index

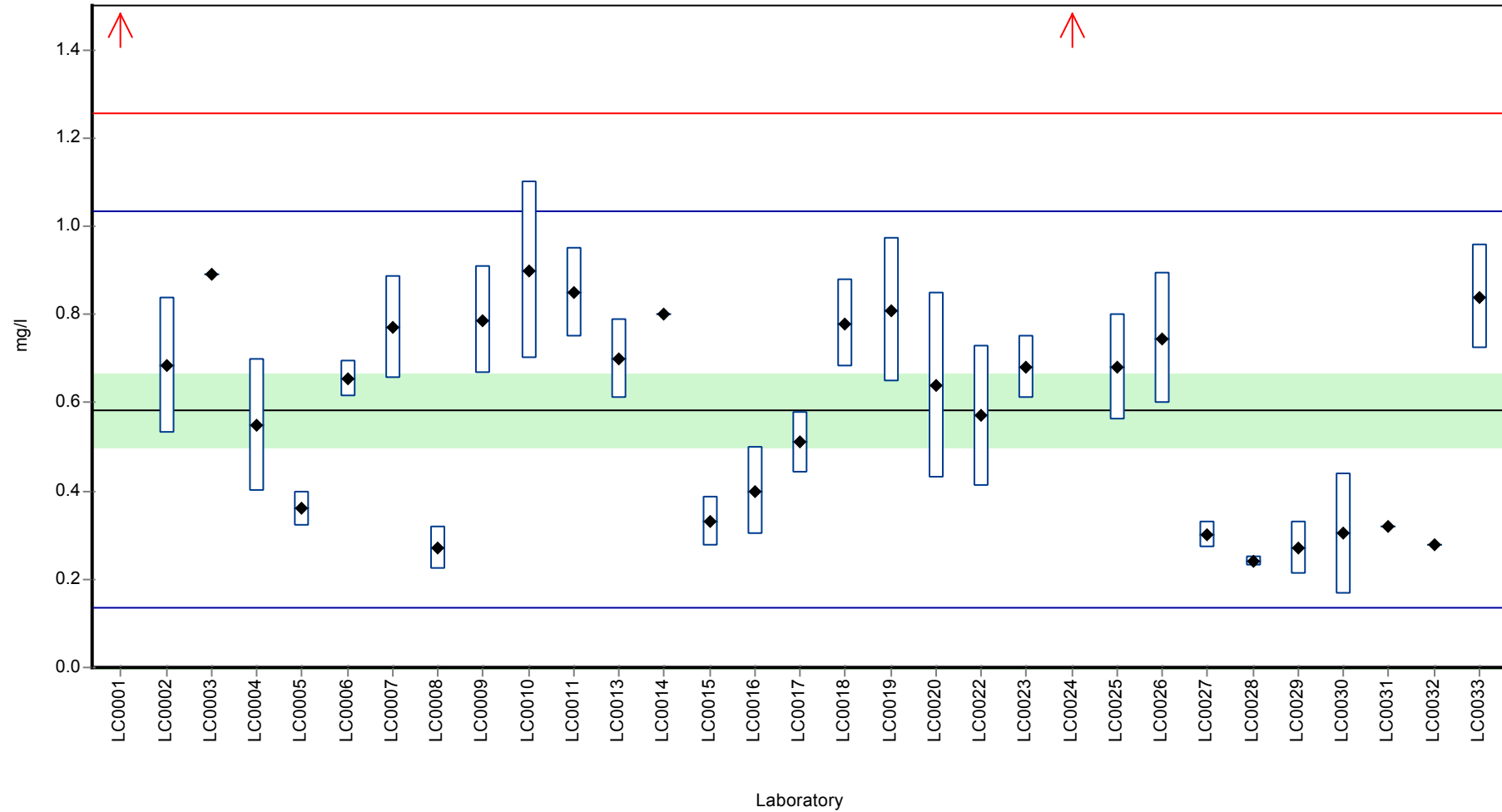
Unit	mg/l
Mean ± CI (99%)	0.583 ± 0.125
Minimum - Maximum	0.241 - 0.9
Control test value ± U	0.786 ± 0.0901

Labcode	Result	± U	Recovery [%]	z-score	Comments
LC0001	1.9	0.38	326	5.87	H
LC0002	0.6849	0.155	117	0.45	
LC0003	0.89	-	153	1.37	
LC0004	0.55	0.15	94.3	-0.15	
LC0005	0.36	0.04	61.7	-0.99	
LC0006	0.654	0.04	112	0.32	
LC0007	0.77	0.116	132	0.83	
LC0008	0.27	0.05	46.3	-1.4	
LC0009	0.786	0.122	135	0.9	
LC0010	0.9	0.2	154	1.41	
LC0011	0.85	0.1	146	1.19	
LC0012	-	-	-	-	
LC0013	0.7	0.09	120	0.52	
LC0014	0.8	-	137	0.97	
LC0015	0.332	0.056	56.9	-1.12	
LC0016	0.4	0.1	68.6	-0.82	
LC0017	0.51	0.07	87.4	-0.33	
LC0018	0.78	0.1	134	0.88	
LC0019	0.81	0.165	139	1.01	
LC0020	0.64	0.21	110	0.25	
LC0021	-	-	-	-	
LC0022	0.57	0.16	97.7	-0.06	
LC0023	0.6806	0.07	117	0.43	
LC0024	3.2	-	549	11.7	H
LC0025	0.68	0.12	117	0.43	
LC0026	0.746	0.149	128	0.72	
LC0027	0.3	0.03	51.4	-1.26	
LC0028	0.241	0.01	41.3	-1.53	
LC0029	0.27	0.06	46.3	-1.4	
LC0030	0.304	0.137	52.1	-1.24	
LC0031	0.32	-	54.9	-1.17	
LC0032	0.277	-	47.5	-1.36	
LC0033	0.84	0.12	144	1.14	

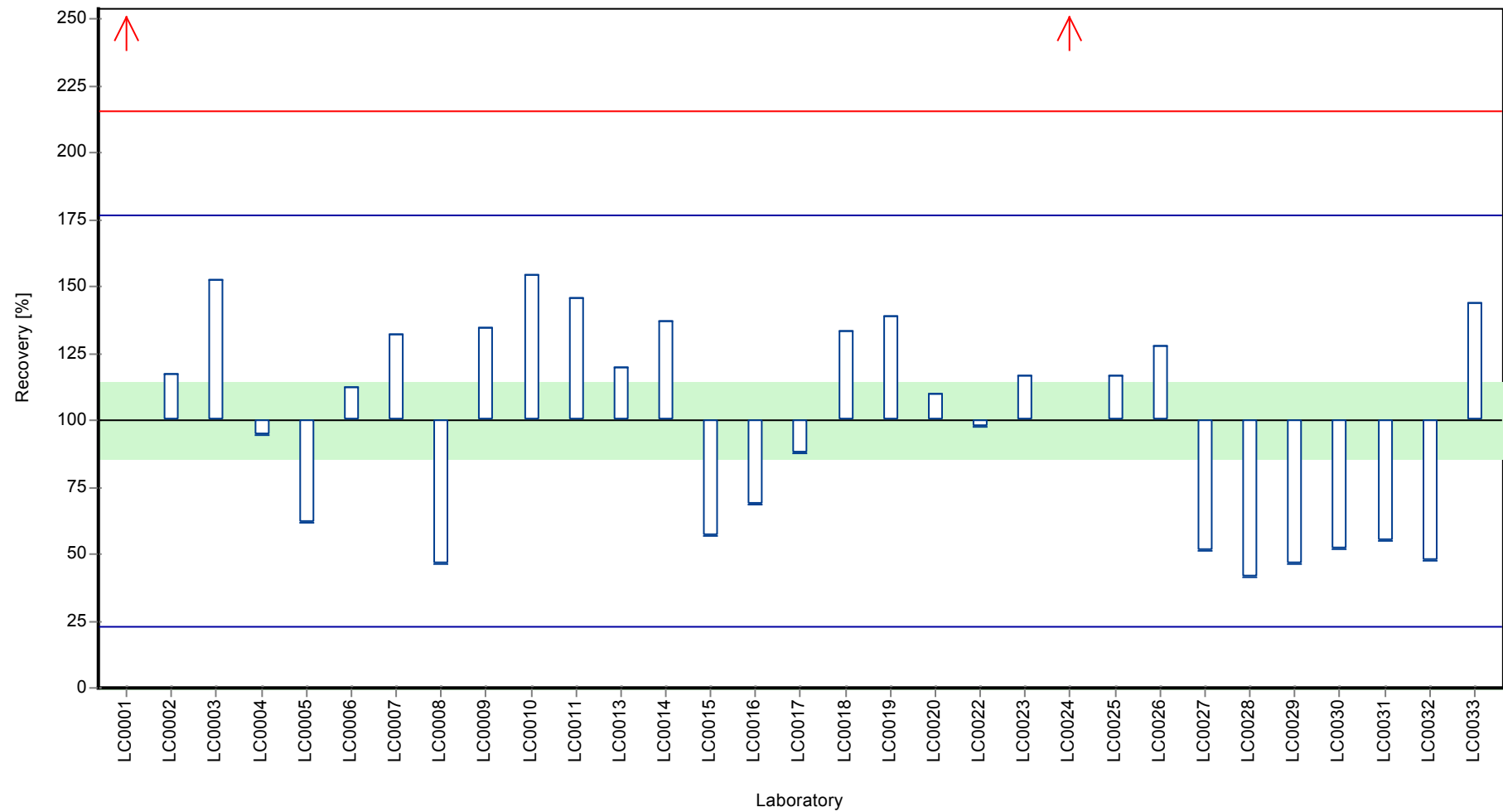
Characteristics of parameter

	all results	without outliers	Unit
Mean ± CI (99%)	0.71 ± 0.303	0.583 ± 0.125	mg/l
Minimum	0.241	0.241	mg/l
Maximum	3.2	0.9	mg/l
Standard deviation	0.562	0.224	mg/l
rel. Standard deviation	79.2	38.5	%
n	31	29	-

Graphical presentation of results
Results



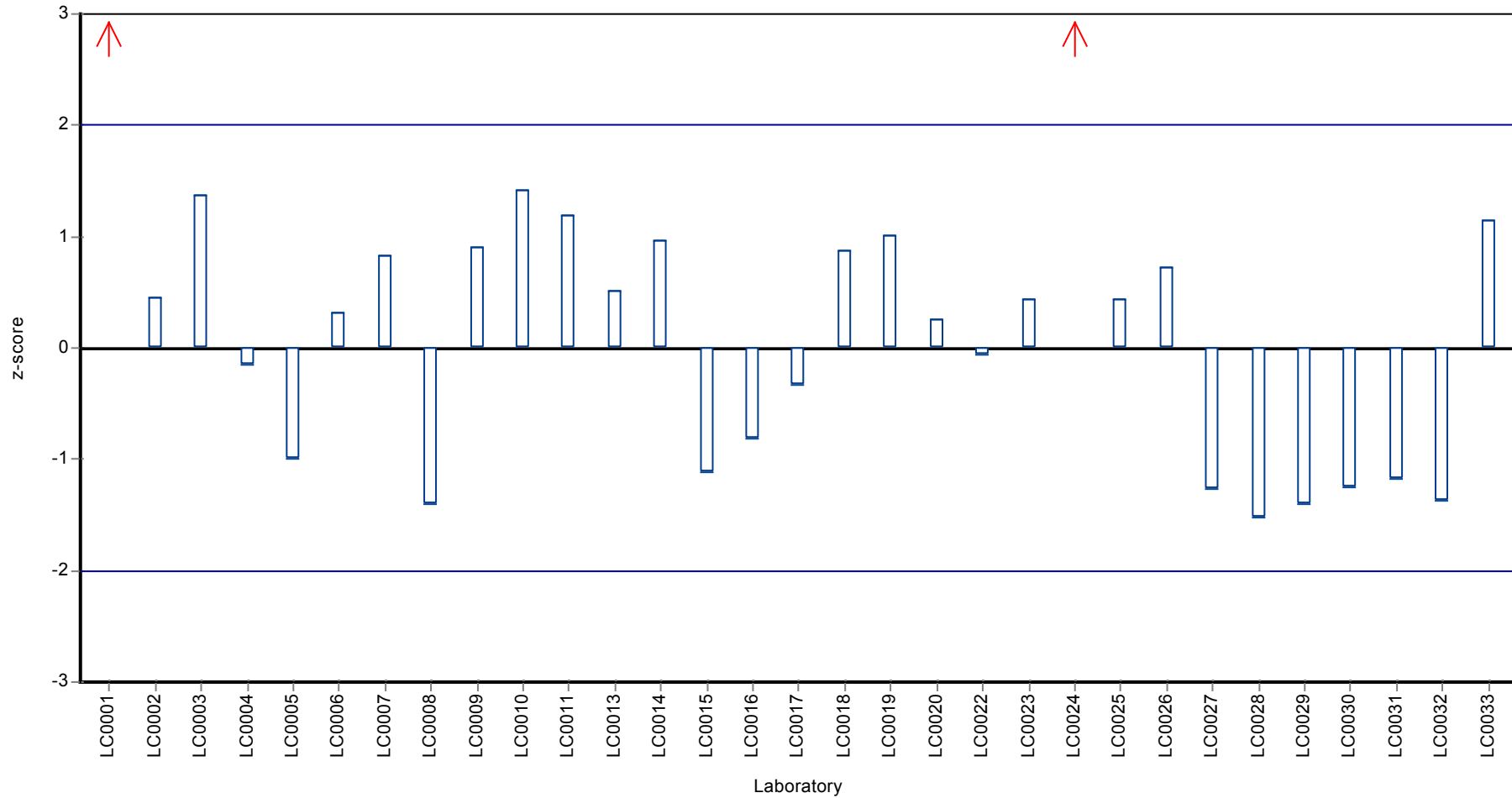
Recovery rate



Parameter oriented report Sum parameters SP01

Sample: SP01BKWI, Parameter: HC-Index

Z-score



Parameter oriented report

SP01 A - Phenol index

Phenol Index

Unit mg/l
 Mean ± CI (99%) 0.105 ± 0.00382
 Minimum - Maximum 0.095 - 0.12
 Control test value ± U -

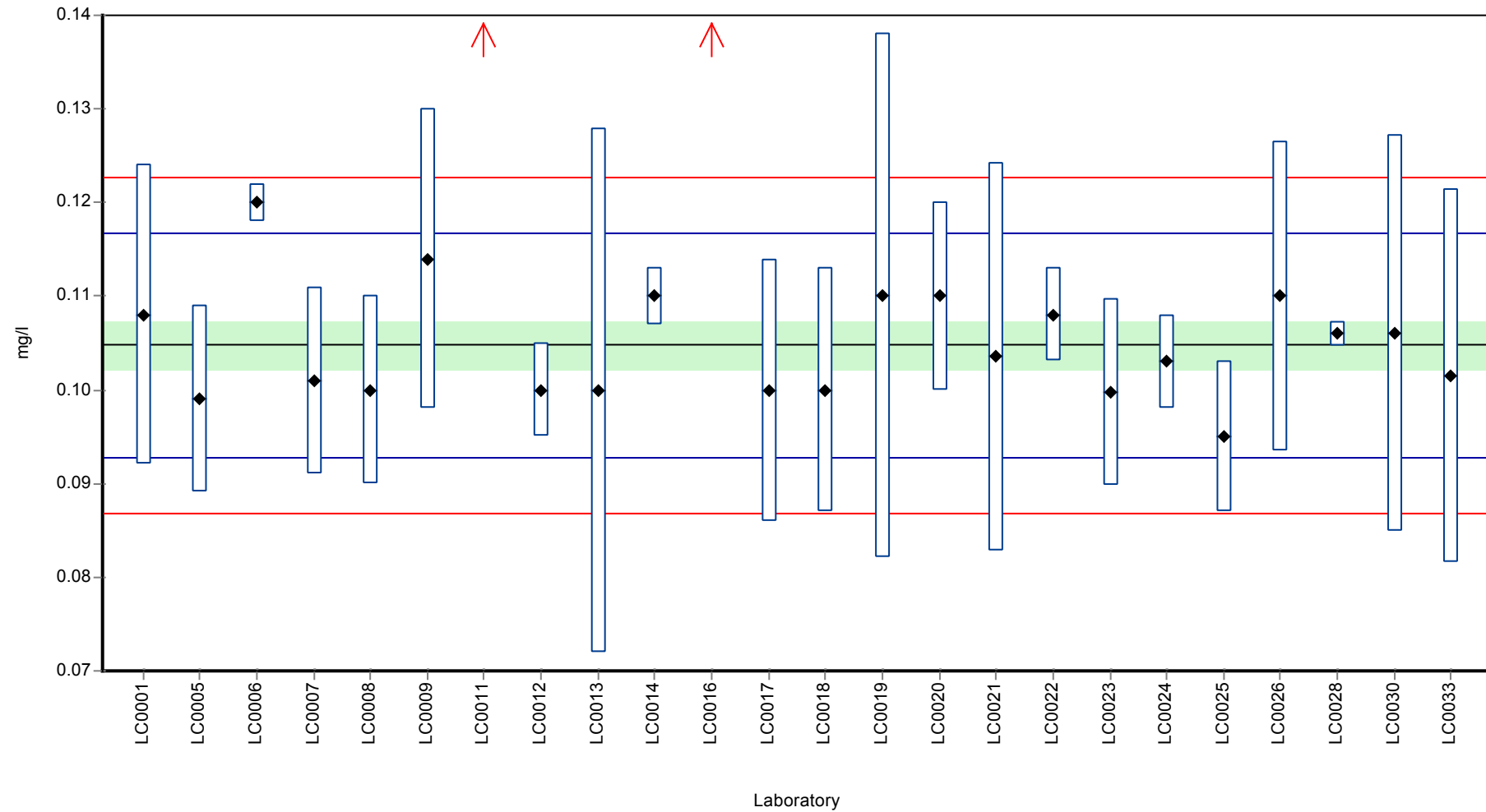
Labcode	Result	± U	Recovery [%]	z-score	Comments
LC0001	0.108	0.016	103	0.54	
LC0002	-	-	-	-	
LC0004	-	-	-	-	
LC0005	0.099	0.01	94.5	-0.97	
LC0006	0.12	0.002	115	2.55	
LC0007	0.101	0.01	96.4	-0.63	
LC0008	0.1	0.01	95.5	-0.8	
LC0009	0.114	0.016	109	1.55	
LC0010	-	-	-	-	
LC0011	3.86	1.04	3680	630	H
LC0012	0.1	0.005	95.5	-0.8	
LC0013	0.1	0.028	95.5	-0.8	
LC0014	0.11	0.003	105	0.88	
LC0015	-	-	-	-	
LC0016	5	0.25	4770	821	H
LC0017	0.1	0.014	95.5	-0.8	
LC0018	0.1	0.013	95.5	-0.8	
LC0019	0.11	0.028	105	0.88	
LC0020	0.11	0.01	105	0.88	
LC0021	0.10353	0.02071	98.8	-0.21	
LC0022	0.108	0.005	103	0.54	
LC0023	0.09981	0.01	95.3	-0.83	
LC0024	0.103	0.005	98.3	-0.3	
LC0025	0.095	0.008	90.7	-1.64	
LC0026	0.11	0.0165	105	0.88	
LC0027	-	-	-	-	
LC0028	0.106	0.0013	101	0.21	
LC0029	-	-	-	-	
LC0030	0.106	0.0212	101	0.21	
LC0031	-	-	-	-	
LC0032	-	-	-	-	
LC0033	0.1015	0.02	96.9	-0.55	

Characteristics of parameter

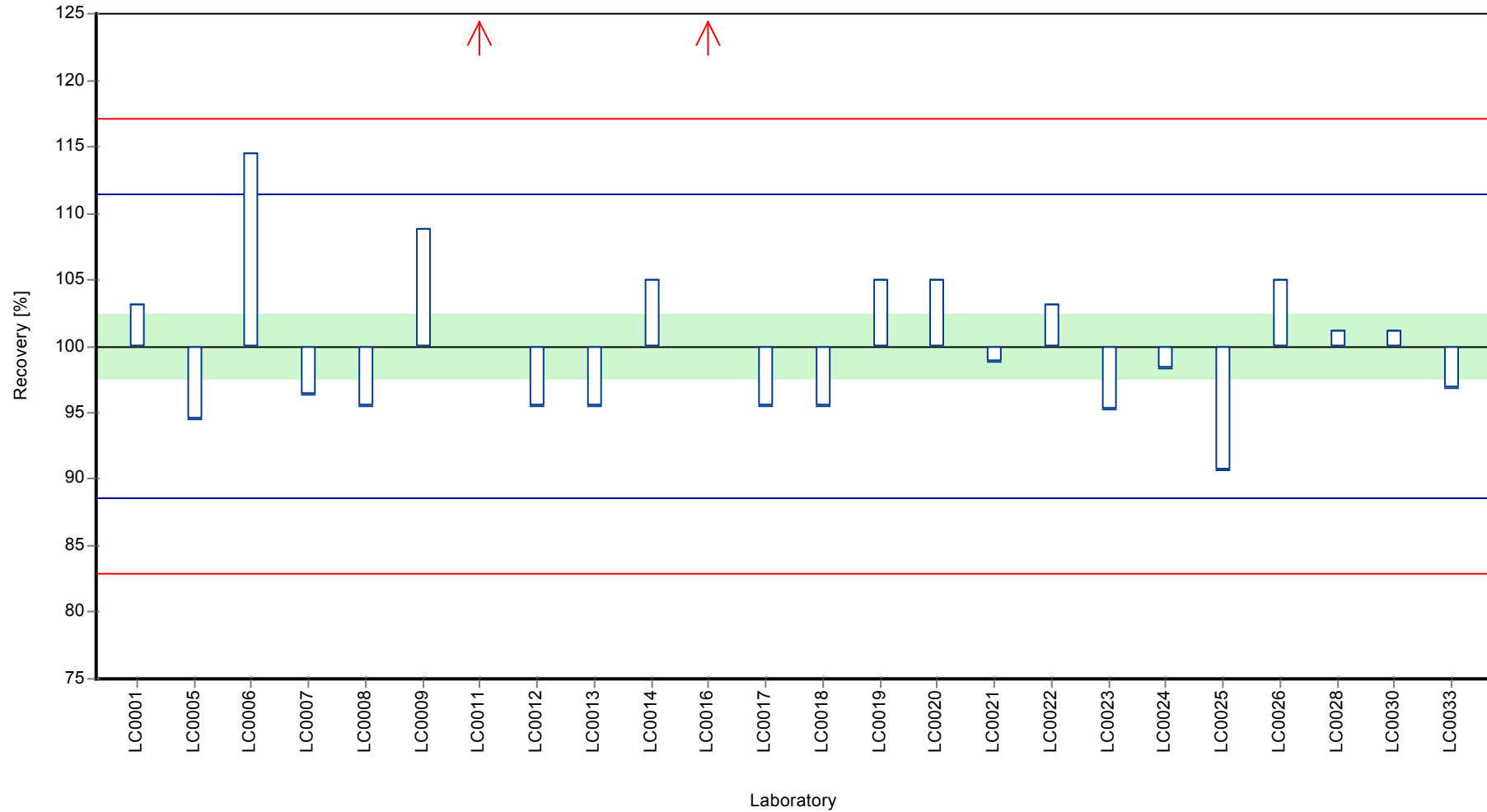
	all results	without outliers	Unit
Mean ± CI (99%)	0.465 ± 0.755	0.105 ± 0.00382	mg/l
Minimum	0.095	0.095	mg/l
Maximum	5	0.12	mg/l
Standard deviation	1.23	0.00596	mg/l
rel. Standard deviation	265	5.69	%
n	24	22	-

Graphical presentation of results

Results



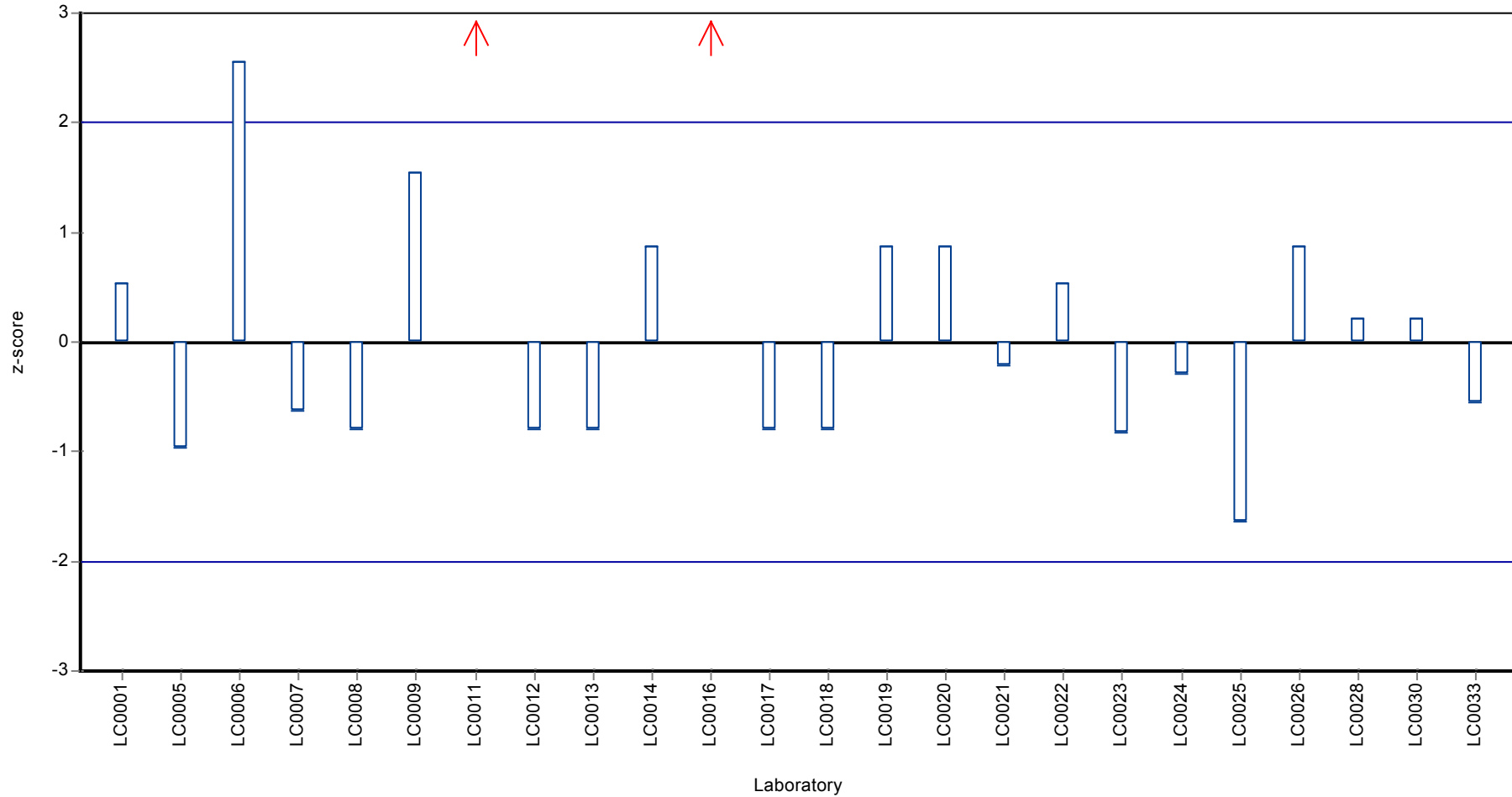
Recovery rate



Parameter oriented report Sum parameters SP01

Sample: SP01APHE, Parameter: Phenol Index

Z-score



Parameter oriented report

SP01 B - Phenol index

Phenol Index

Unit	mg/l
Mean ± CI (99%)	0.0338 ± 0.0028
Minimum - Maximum	0.022 - 0.0408
Control test value ± U	-

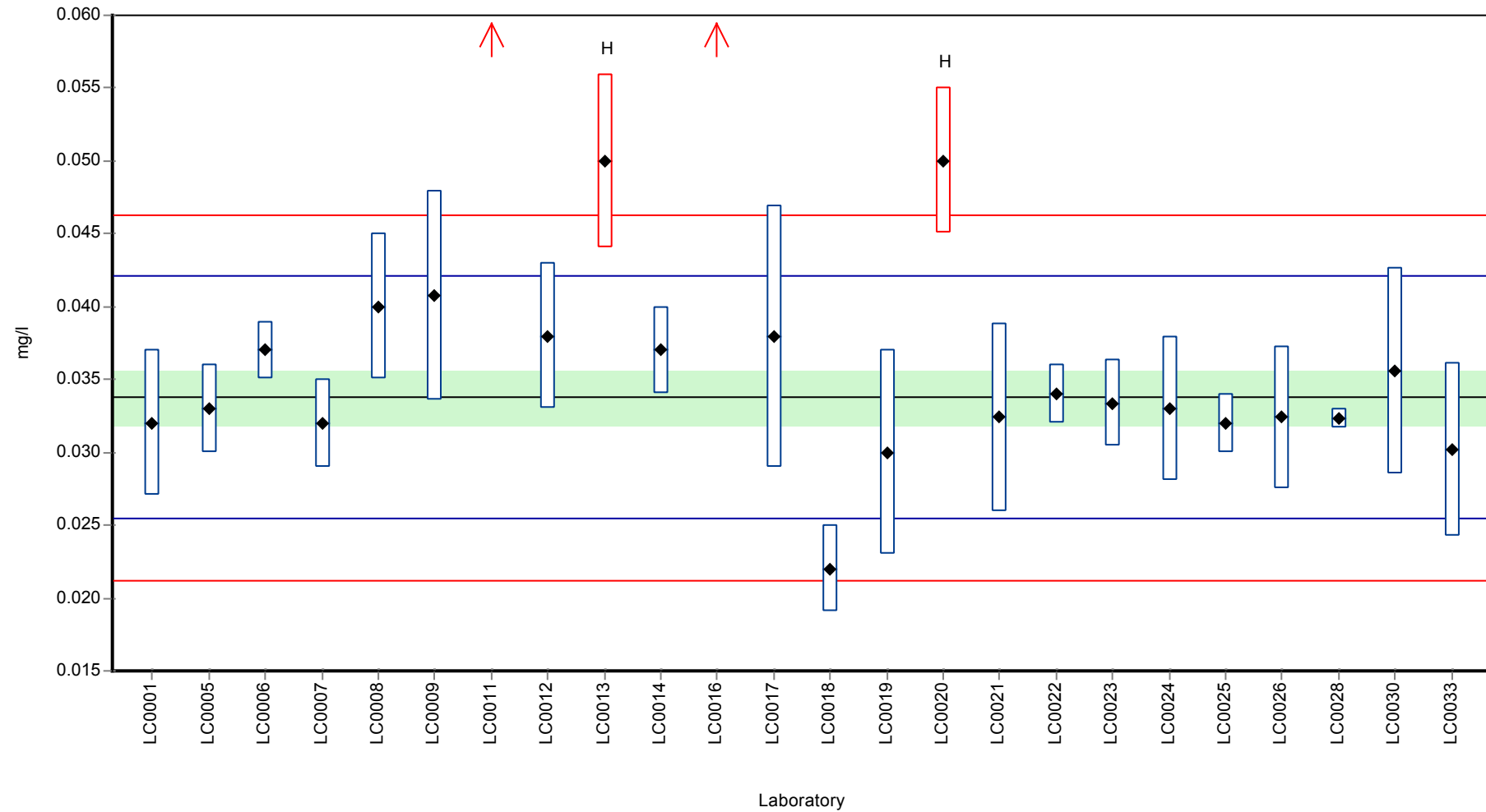
Labcode	Result	± U	Recovery [%]	z-score	Comments
LC0001	0.032	0.005	94.8	-0.42	
LC0002	-	-	-	-	
LC0004	-	-	-	-	
LC0005	0.033	0.003	97.8	-0.18	
LC0006	0.037	0.002	110	0.78	
LC0007	0.032	0.003	94.8	-0.42	
LC0008	0.04	0.005	119	1.5	
LC0009	0.0408	0.0072	121	1.69	
LC0010	-	-	-	-	
LC0011	2.72	0.73	8060	644	H
LC0012	0.038	0.005	113	1.02	
LC0013	0.05	0.006	148	3.9	H
LC0014	0.037	0.003	110	0.78	
LC0015	-	-	-	-	
LC0016	2.5	0.13	7410	591	H
LC0017	0.038	0.009	113	1.02	
LC0018	0.022	0.003	65.2	-2.82	
LC0019	0.03	0.007	88.9	-0.9	
LC0020	0.05	0.005	148	3.9	H
LC0021	0.0324	0.00648	96	-0.33	
LC0022	0.034	0.002	101	0.06	
LC0023	0.03338	0.003	98.9	-0.09	
LC0024	0.033	0.005	97.8	-0.18	
LC0025	0.032	0.002	94.8	-0.42	
LC0026	0.0324	0.00486	96	-0.33	
LC0027	-	-	-	-	
LC0028	0.0323	0.0007	95.7	-0.35	
LC0029	-	-	-	-	
LC0030	0.0356	0.00712	105	0.44	
LC0031	-	-	-	-	
LC0032	-	-	-	-	
LC0033	0.0302	0.006	89.5	-0.85	

Characteristics of parameter

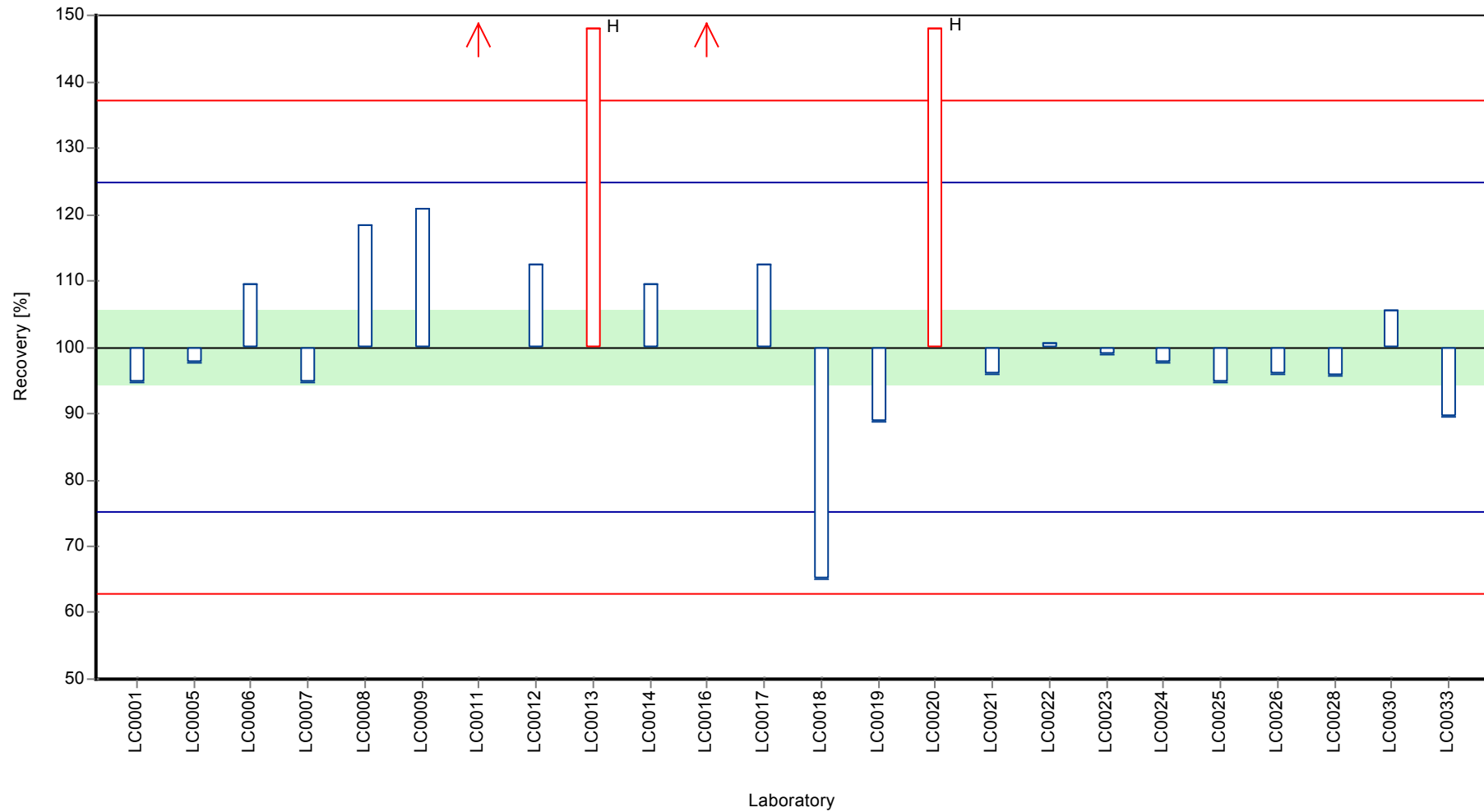
	all results	without outliers	Unit
Mean ± CI (99%)	0.25 ± 0.446	0.0338 ± 0.0028	mg/l
Minimum	0.022	0.022	mg/l
Maximum	2.72	0.0408	mg/l
Standard deviation	0.728	0.00417	mg/l
rel. Standard deviation	291	12.4	%
n	24	20	-

Graphical presentation of results

Results



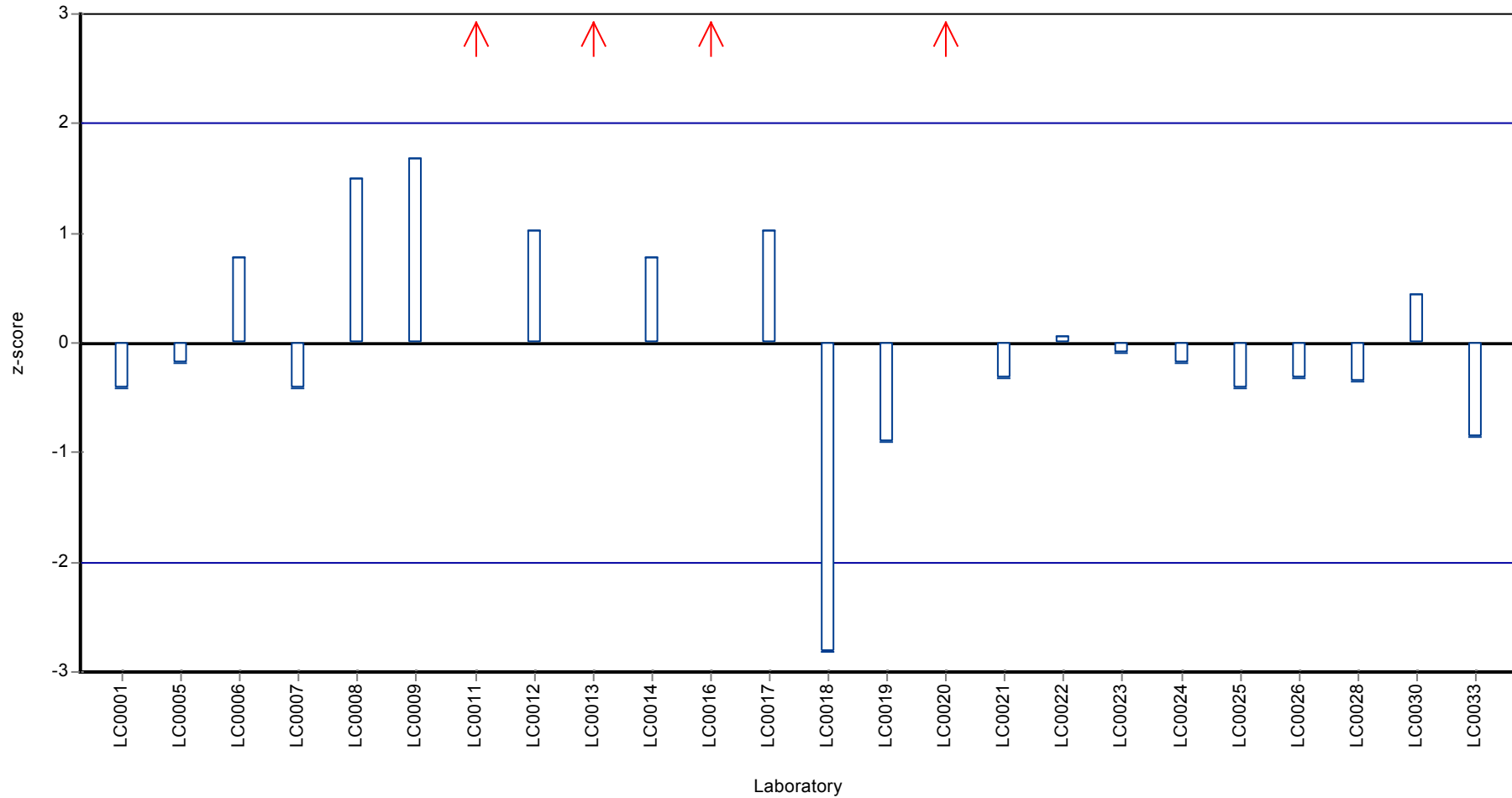
Recovery rate



Parameter oriented report Sum parameters SP01

Sample: SP01BPHE, Parameter: Phenol Index

Z-score



8 Laboratory oriented report

The laboratory oriented report is sorted by laboratory code.

The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	0.8	0.16	0.557	44.8	-1.77

Sample: SP01APHE

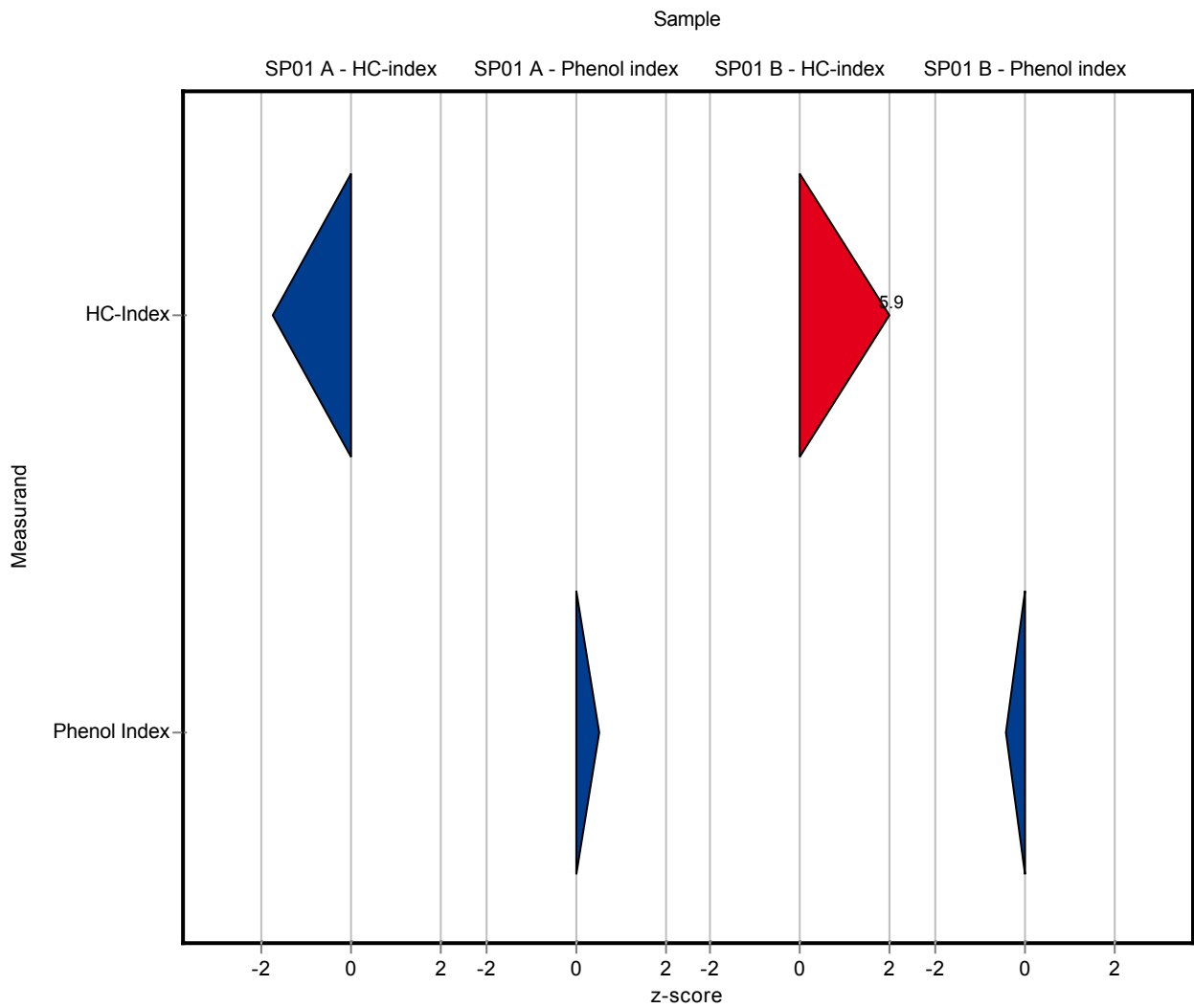
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	0.108	0.016	0.00596	103	0.54

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	1.9	0.38	0.224	326	5.87

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	0.032	0.005	0.00417	94.8	-0.42



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	2.7231	0.618	0.557	152	1.68

Sample: SP01APHE

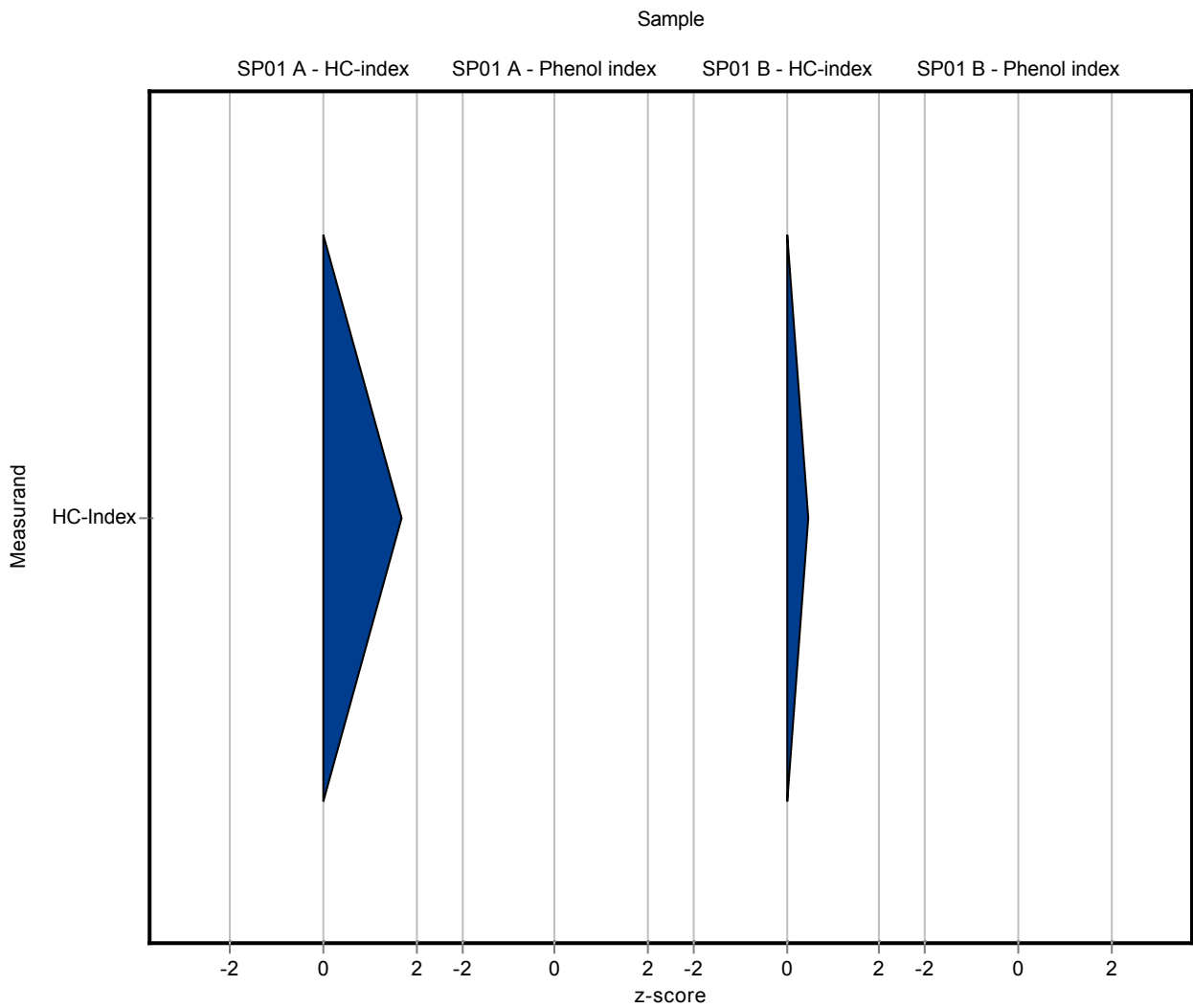
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	-	-	0.00596	-	-

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.6849	0.155	0.224	117	0.45

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	-	-	0.00417	-	-



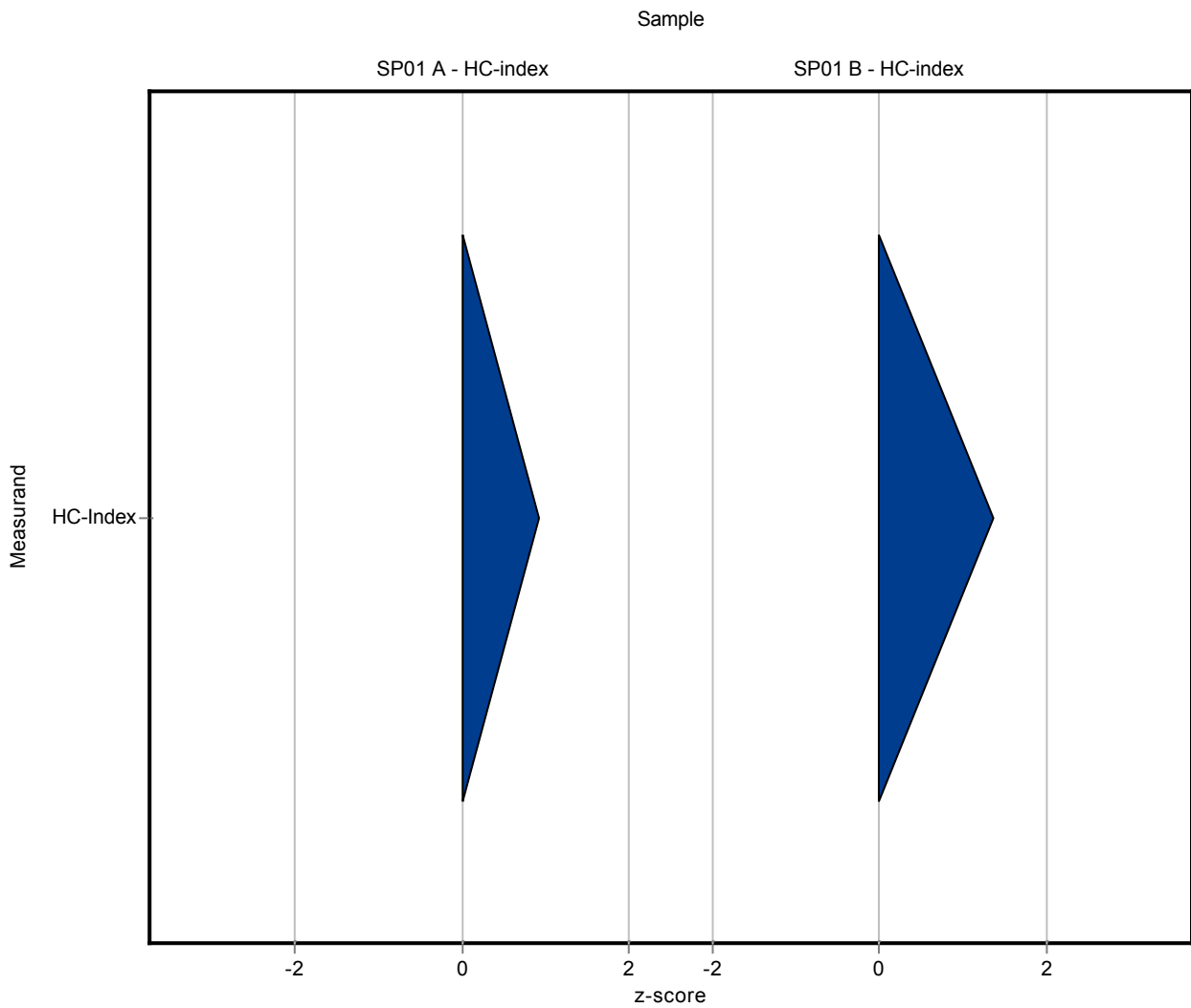
The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79 ± 0.31	2.3	-	0.557	129	0.92

Sample: SP01BKWI

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583 ± 0.125	0.89	-	0.224	153	1.37



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	1.9	0.5	0.557	106	0.2

Sample: SP01APHE

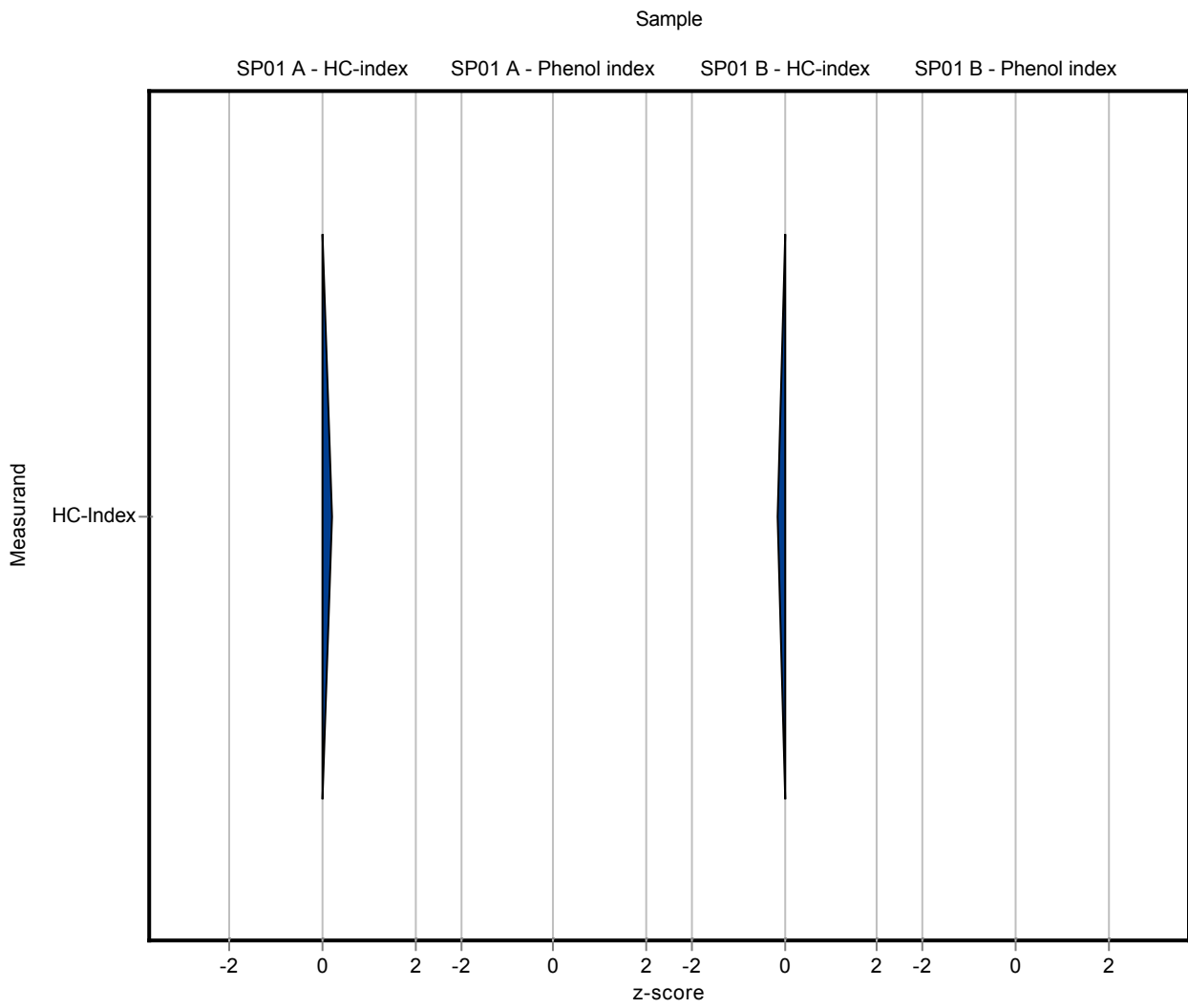
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	-	-	0.00596	-	-

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.55	0.15	0.224	94.3	-0.15

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	-	-	0.00417	-	-



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	1.06	0.1	0.557	59.3	-1.3

Sample: SP01APHE

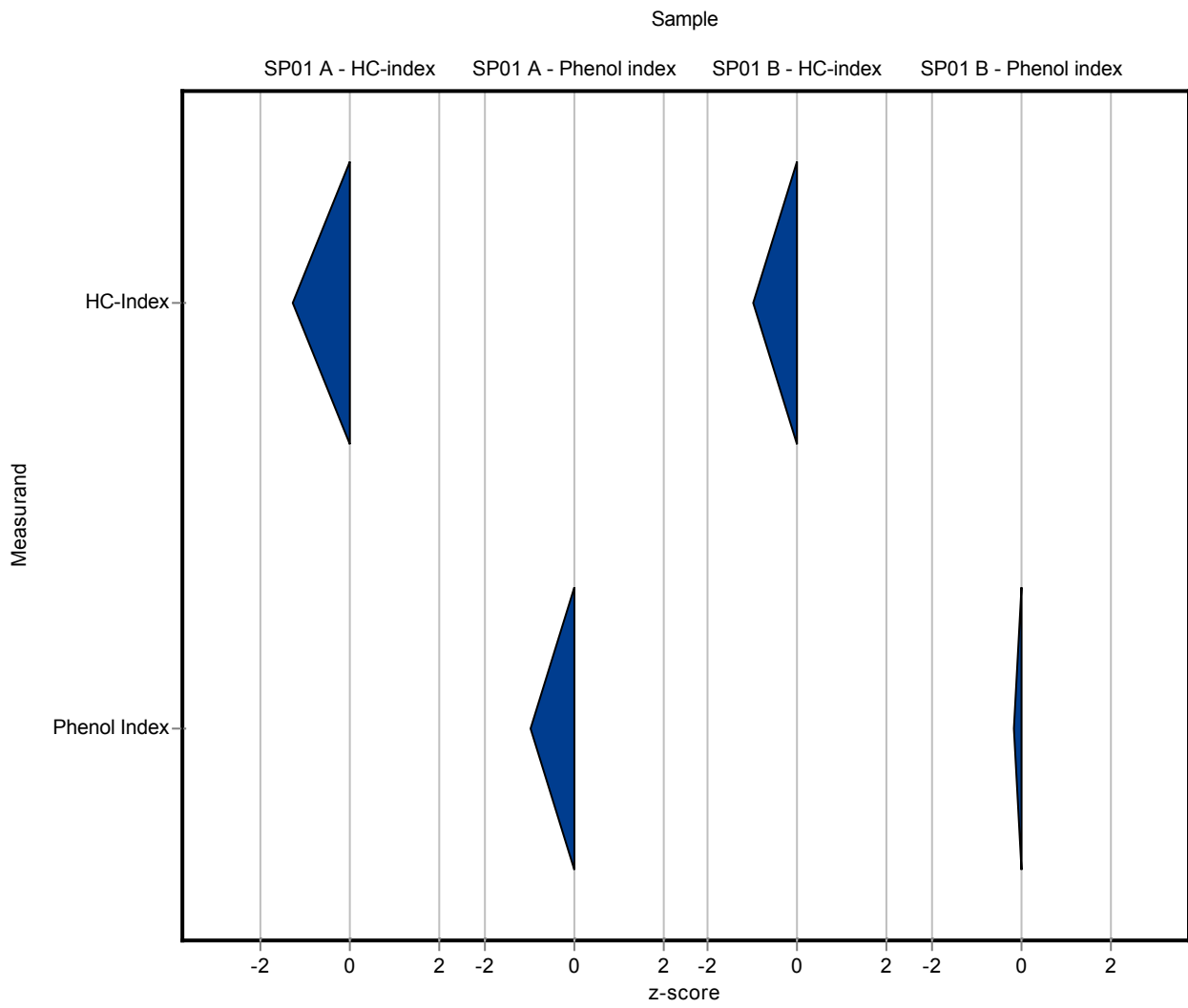
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	0.099	0.01	0.00596	94.5	-0.97

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.36	0.04	0.224	61.7	-0.99

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	0.033	0.003	0.00417	97.8	-0.18



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	1.955	0.1	0.557	109	0.3

Sample: SP01APHE

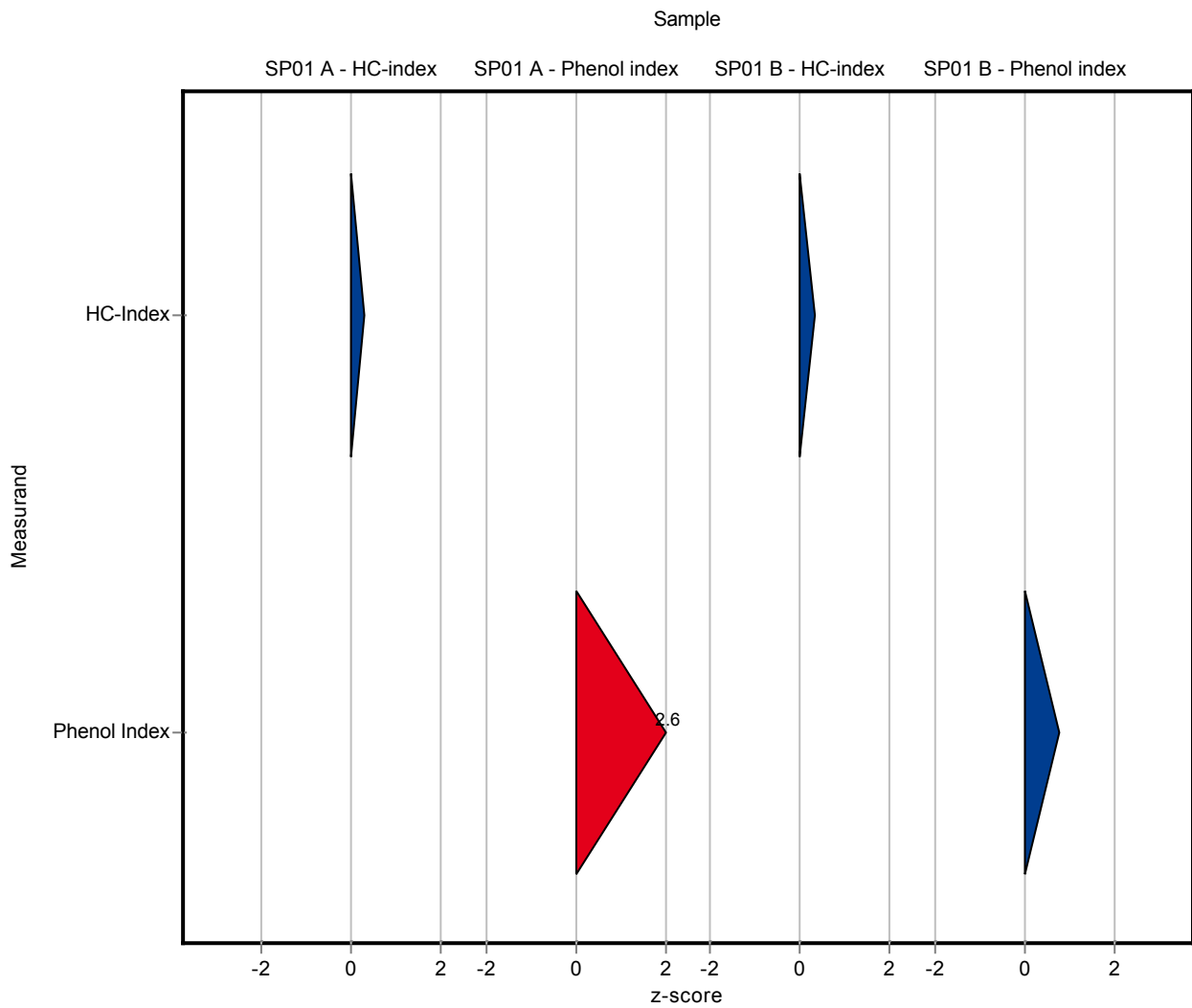
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	0.12	0.002	0.00596	115	2.55

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.654	0.04	0.224	112	0.32

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	0.037	0.002	0.00417	110	0.78



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79 ± 0.31	2	0.3	0.557	112	0.38

Sample: SP01APHE

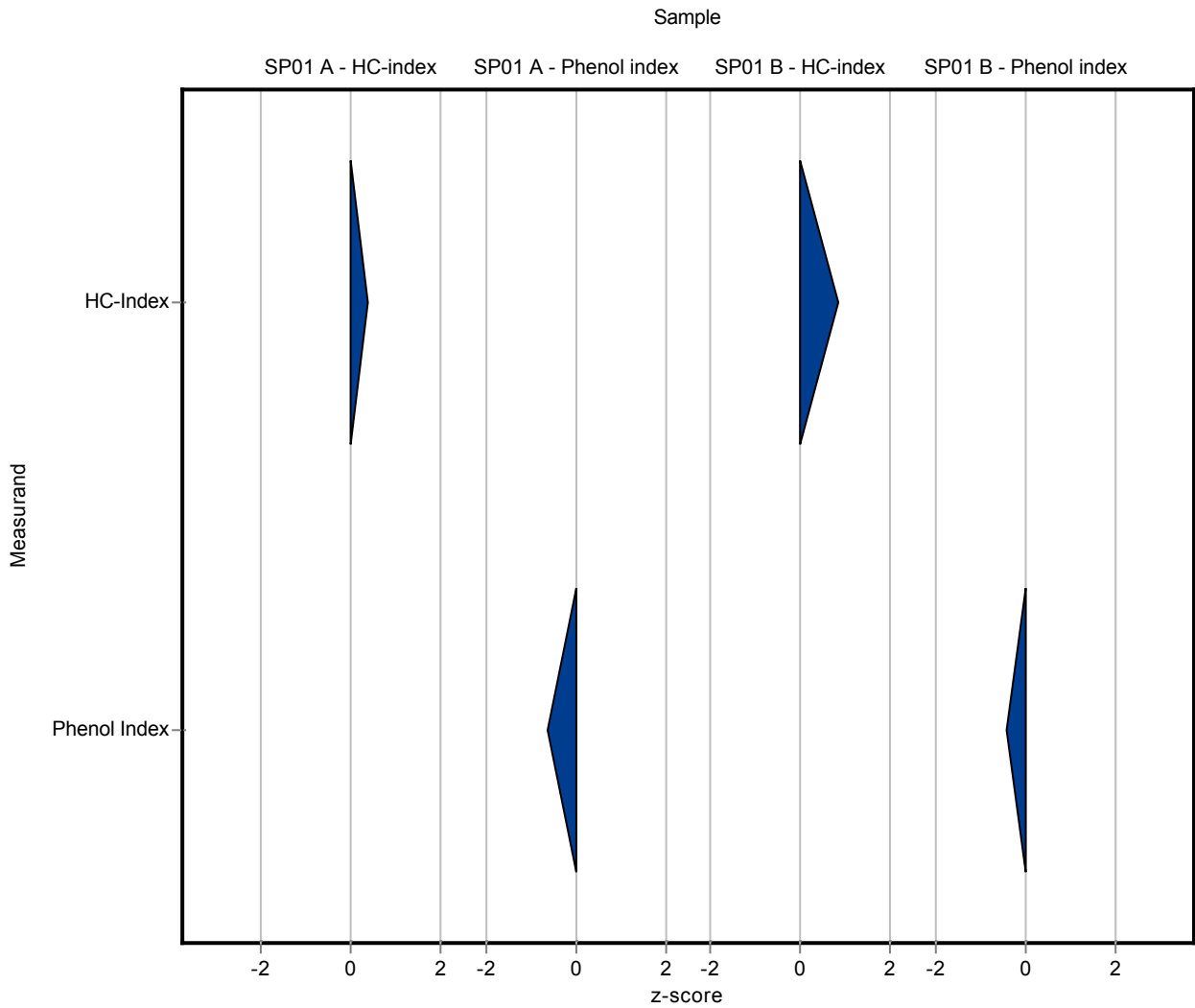
Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105 ± 0.00382	0.101	0.01	0.00596	96.4	-0.63

Sample: SP01BKWI

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583 ± 0.125	0.77	0.116	0.224	132	0.83

Sample: SP01BPHE

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338 ± 0.0028	0.032	0.003	0.00417	94.8	-0.42



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79 ± 0.31	1.5	0.3	0.557	84	-0.51

Sample: SP01APHE

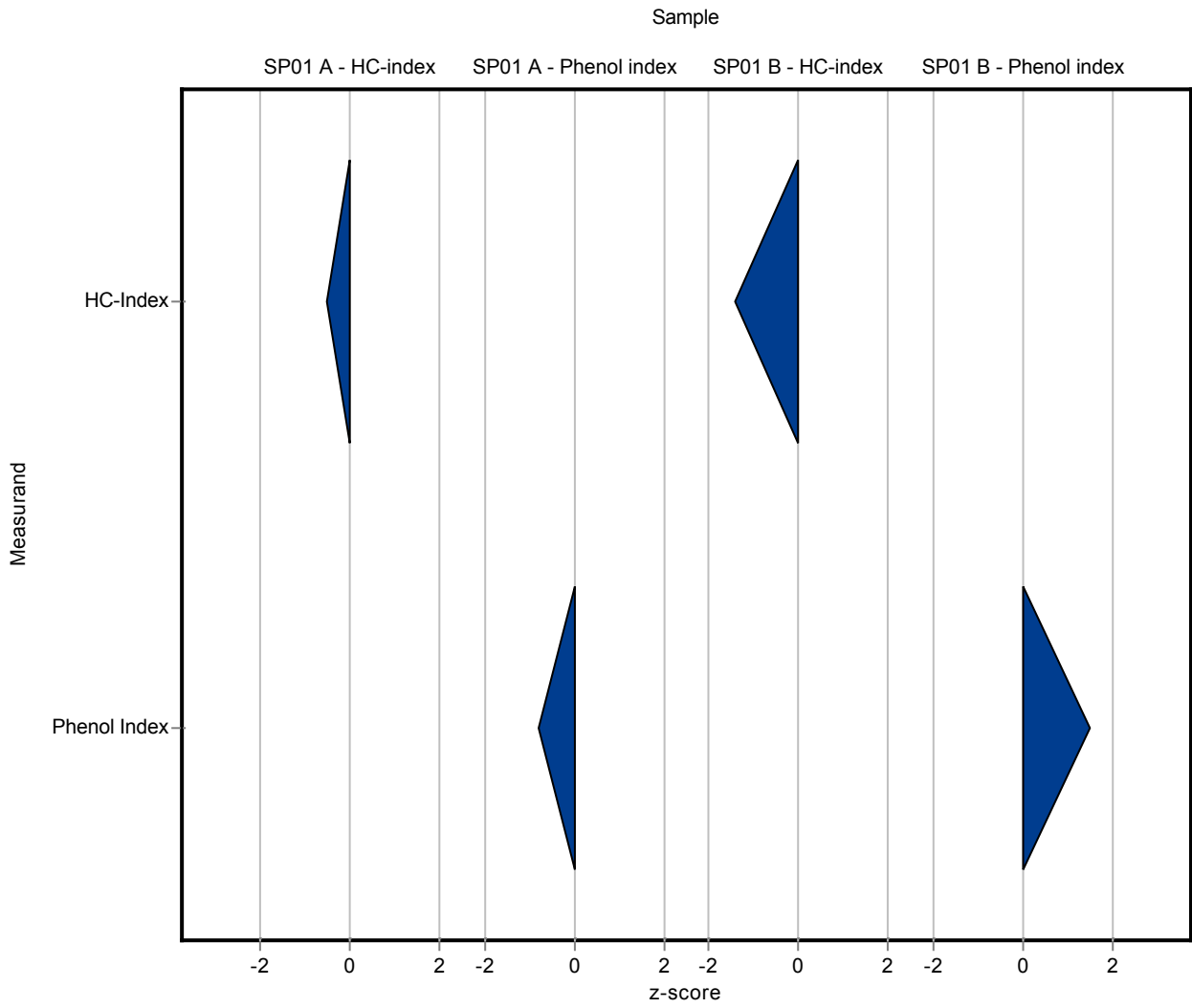
Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105 ± 0.00382	0.1	0.01	0.00596	95.5	-0.8

Sample: SP01BKWI

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583 ± 0.125	0.27	0.05	0.224	46.3	-1.4

Sample: SP01BPHE

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338 ± 0.0028	0.04	0.005	0.00417	119	1.5



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	2.53	0.46	0.557	142	1.34

Sample: SP01APHE

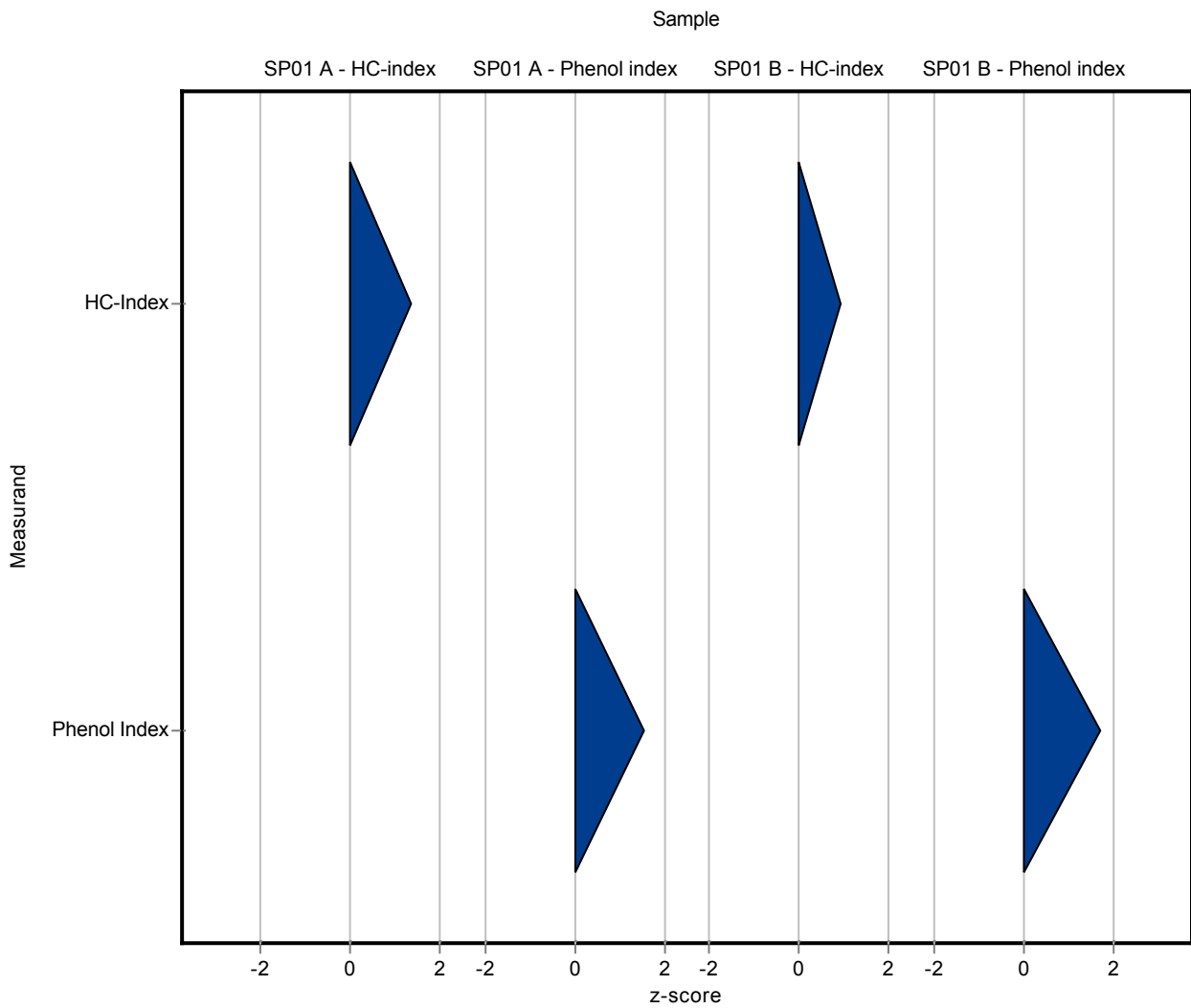
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	0.114	0.016	0.00596	109	1.55

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.786	0.122	0.224	135	0.9

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	0.0408	0.0072	0.00417	121	1.69



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	2.4	0.4	0.557	134	1.1

Sample: SP01APHE

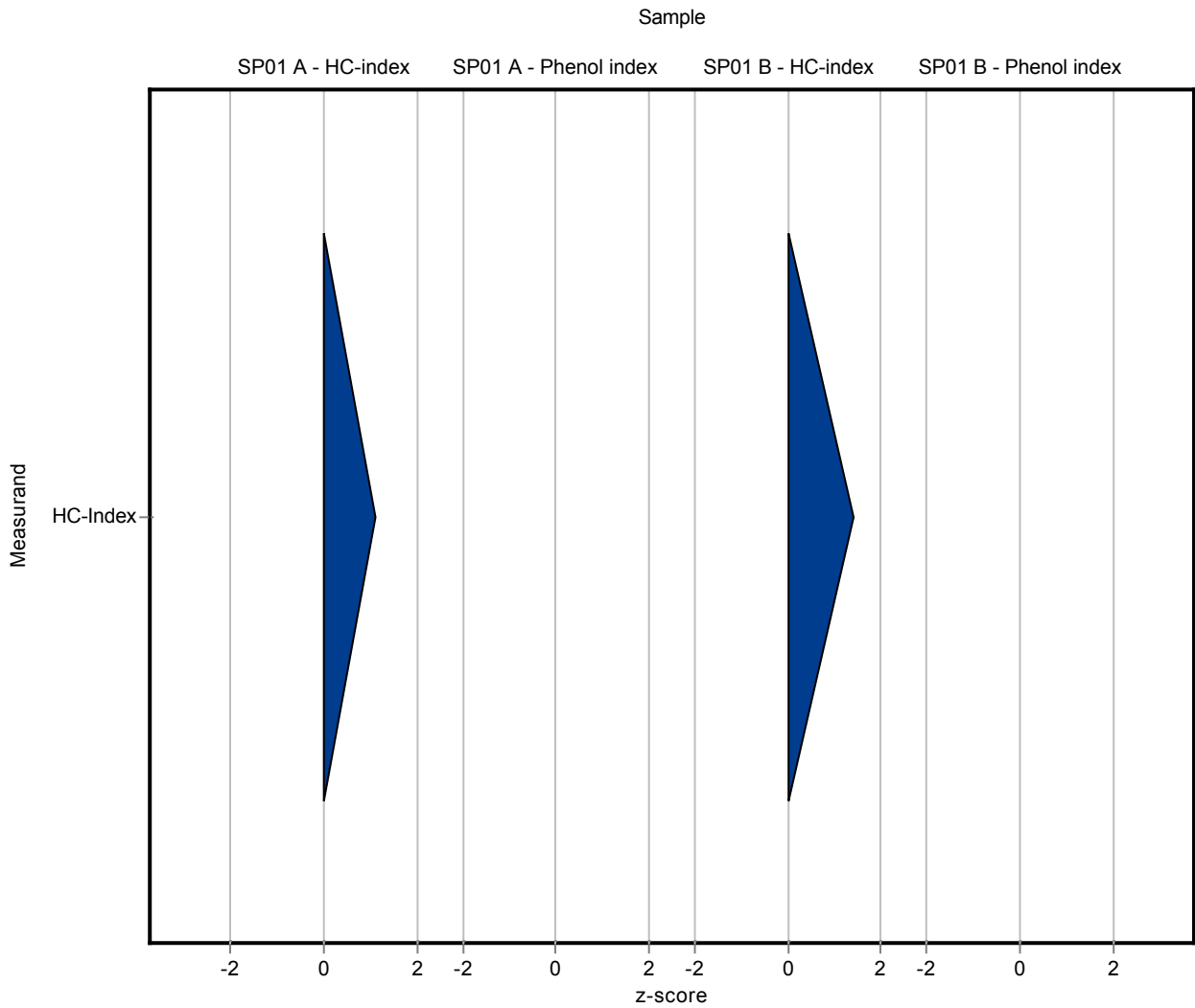
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	-	-	0.00596	-	-

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.9	0.2	0.224	154	1.41

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	-	-	0.00417	-	-



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	1.69	0.21	0.557	94.6	-0.17

Sample: SP01APHE

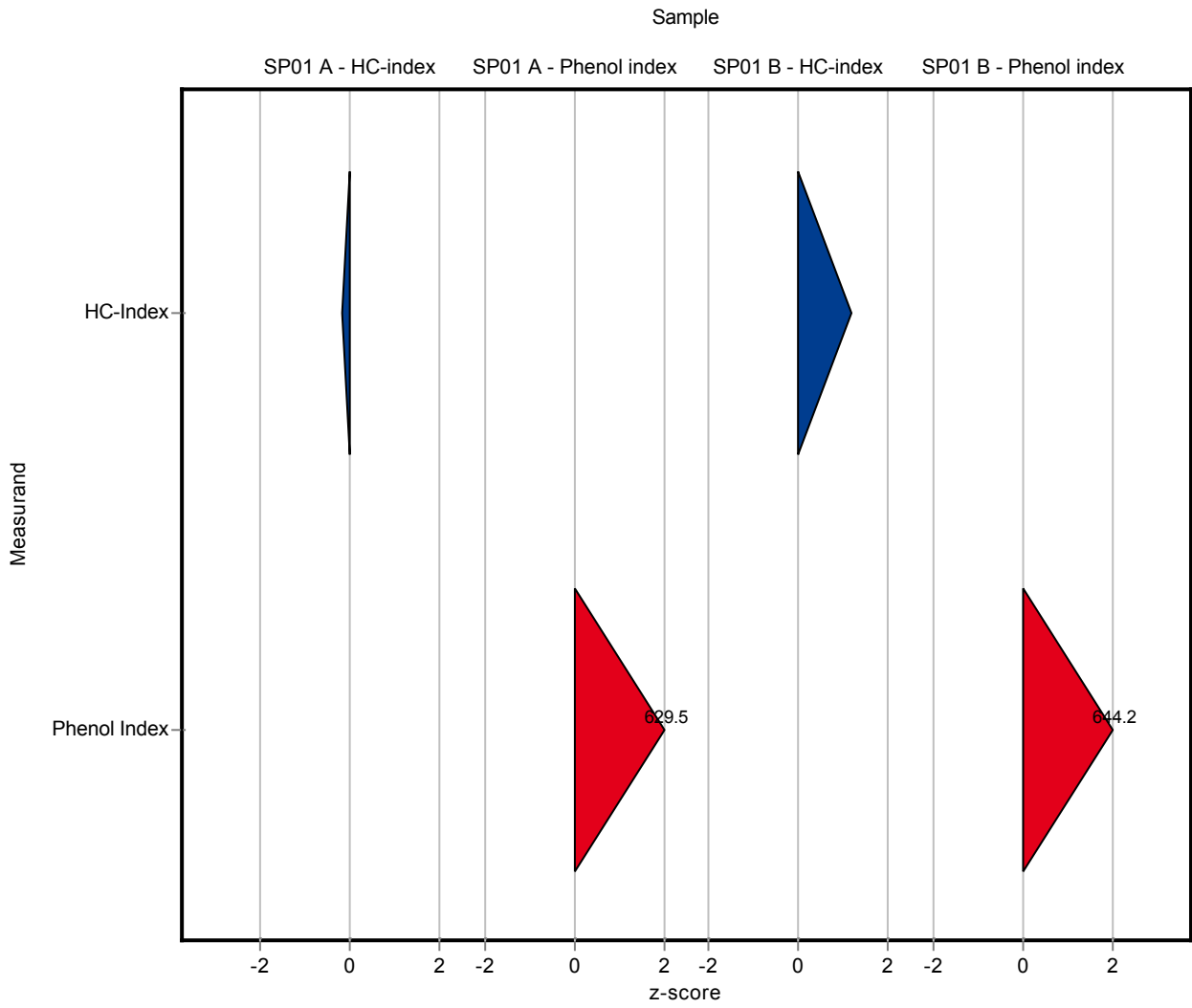
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	3.86	1.04	0.00596	3680	630

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.85	0.1	0.224	146	1.19

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	2.72	0.73	0.00417	8060	644



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79 ± 0.31	-	-	0.557	-	-

Sample: SP01APHE

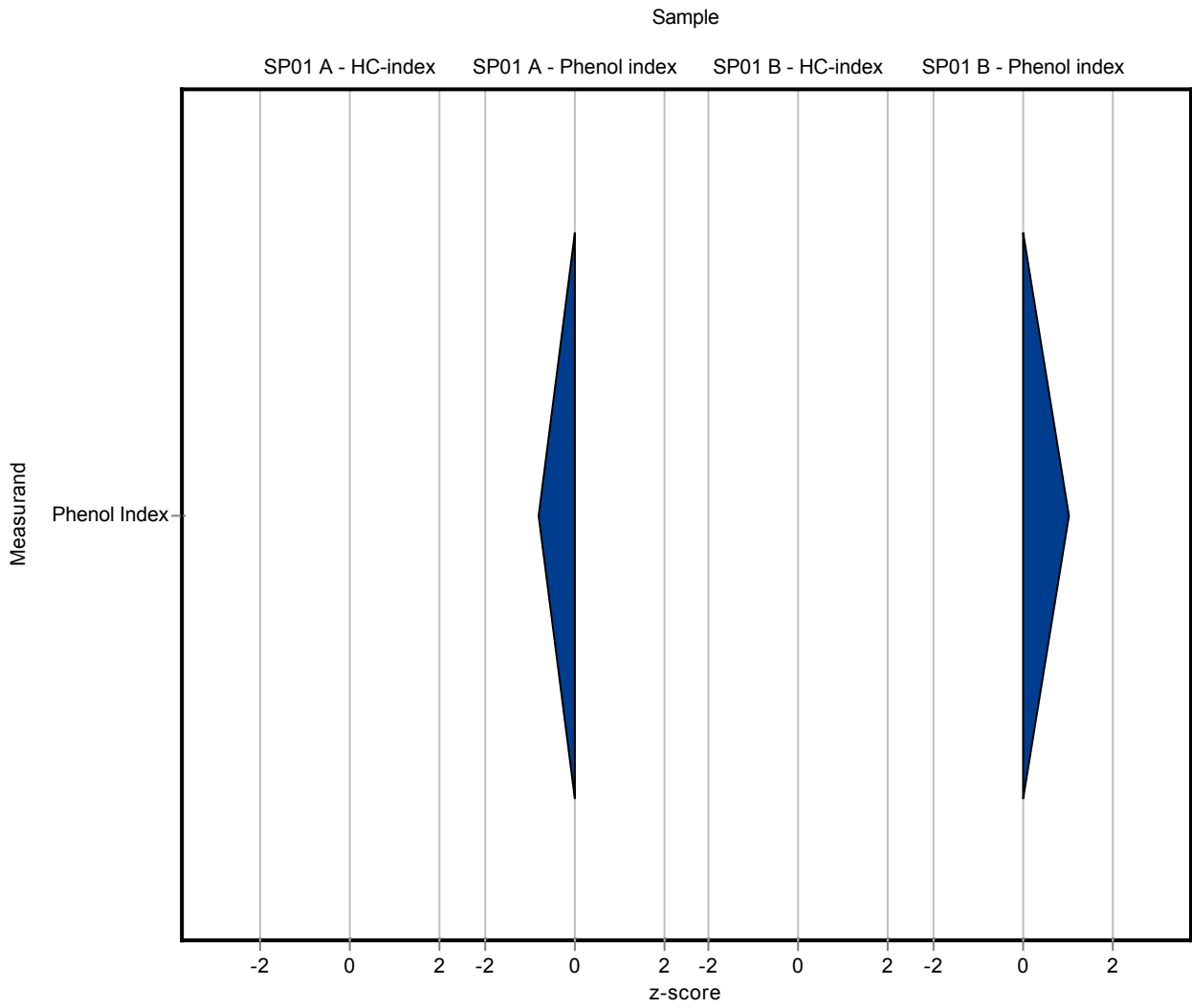
Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105 ± 0.00382	0.1	0.005	0.00596	95.5	-0.8

Sample: SP01BKWI

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583 ± 0.125	-	-	0.224	-	-

Sample: SP01BPHE

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338 ± 0.0028	0.038	0.005	0.00417	113	1.02



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79 ± 0.31	2.3	0.12	0.557	129	0.92

Sample: SP01APHE

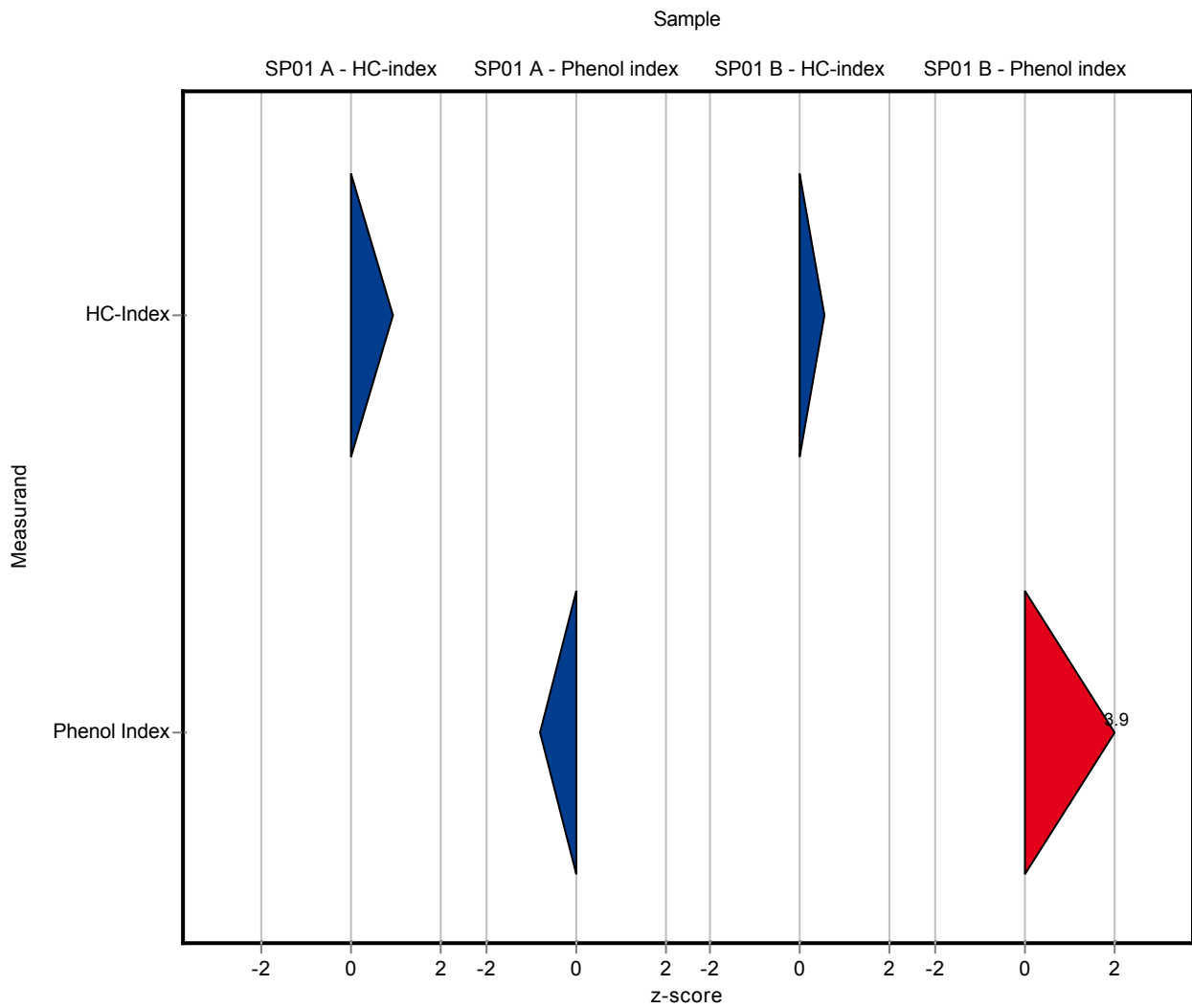
Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105 ± 0.00382	0.1	0.028	0.00596	95.5	-0.8

Sample: SP01BKWI

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583 ± 0.125	0.7	0.09	0.224	120	0.52

Sample: SP01BPHE

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338 ± 0.0028	0.05	0.006	0.00417	148	3.9



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	3.9	-	0.557	218	3.79

Sample: SP01APHE

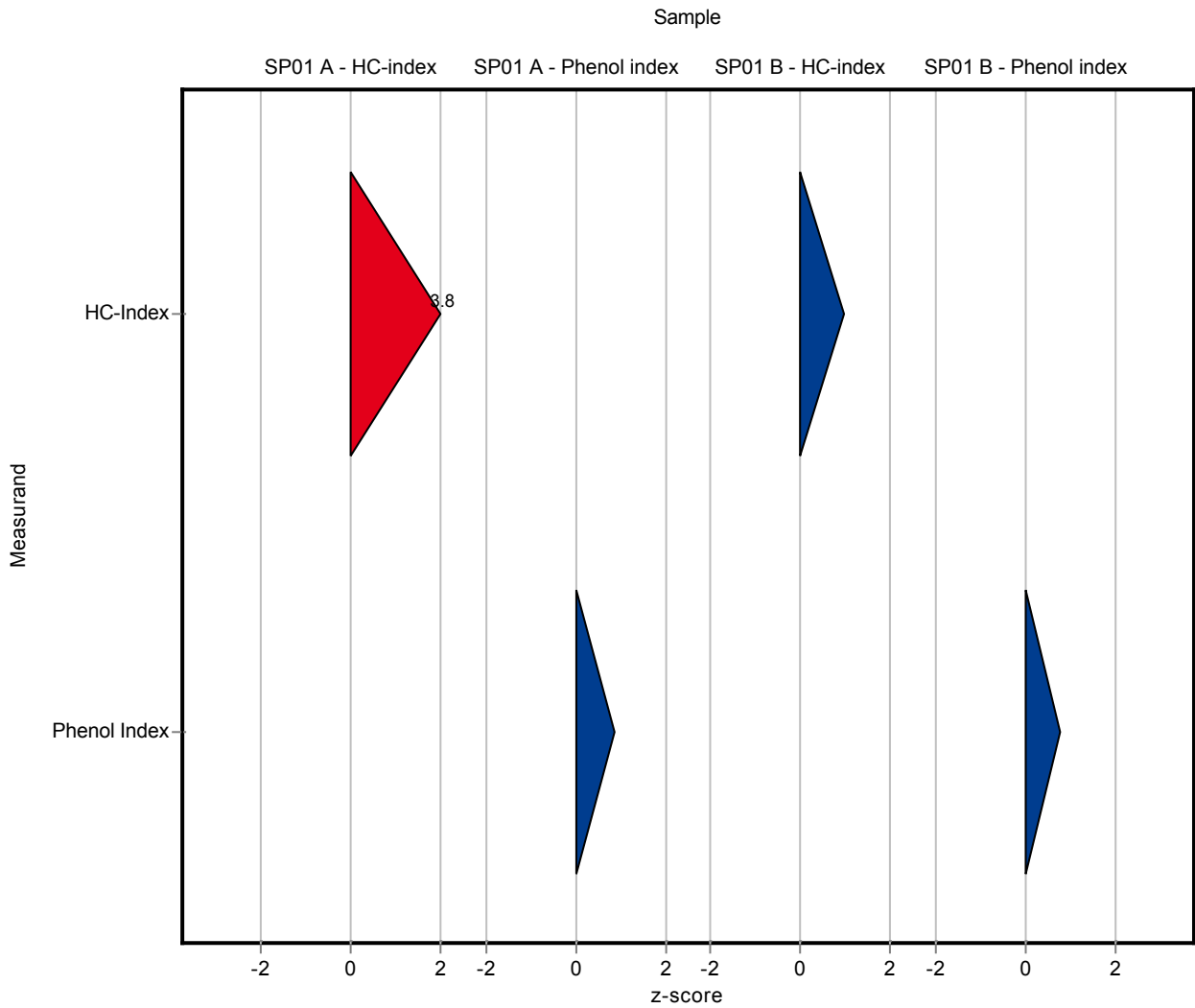
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	0.11	0.003	0.00596	105	0.88

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.8	-	0.224	137	0.97

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	0.037	0.003	0.00417	110	0.78



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	1.148	0.195	0.557	64.3	-1.15

Sample: SP01APHE

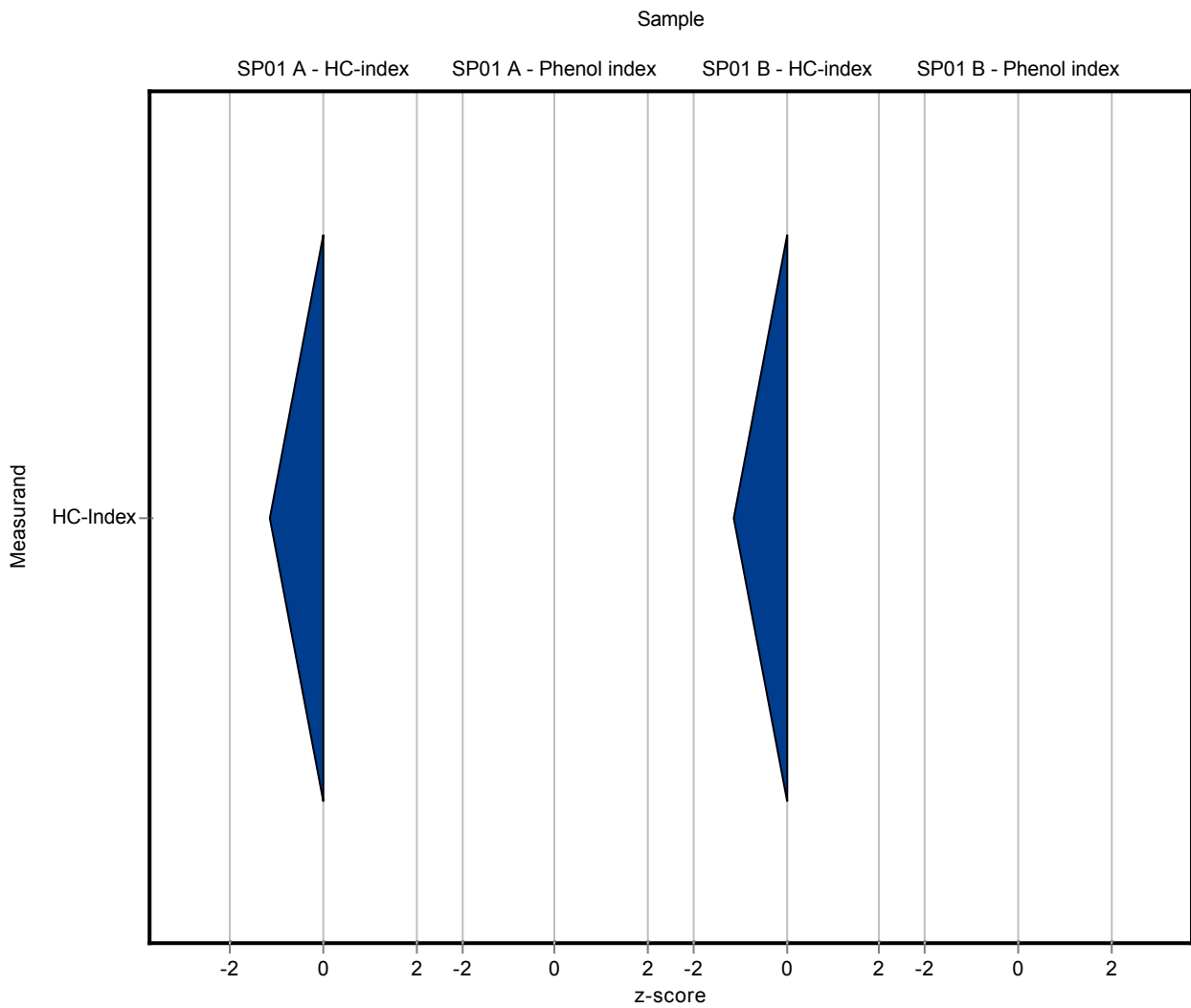
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	-	-	0.00596	-	-

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.332	0.056	0.224	56.9	-1.12

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	-	-	0.00417	-	-



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	0.9	0.2	0.557	50.4	-1.59

Sample: SP01APHE

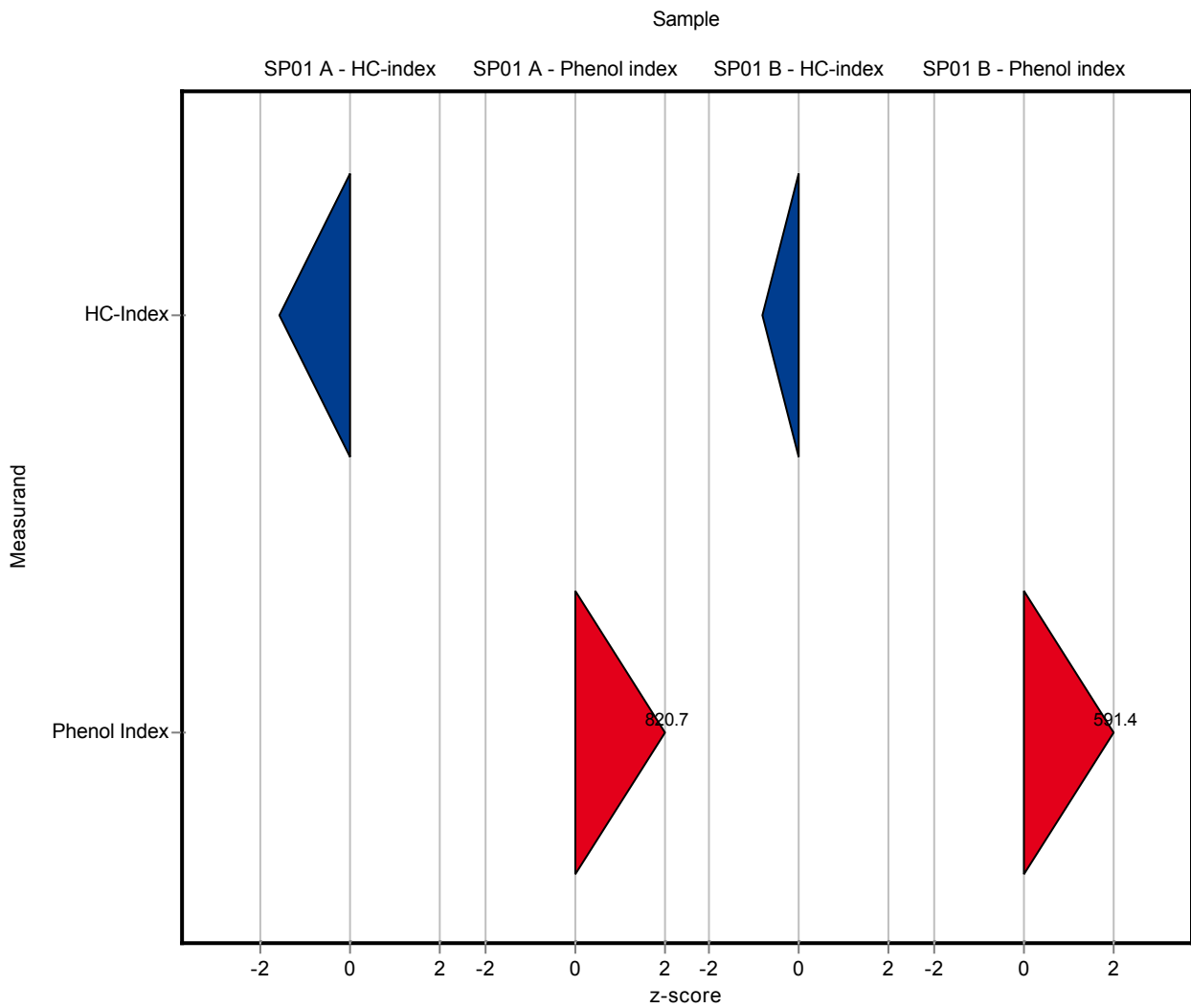
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	5	0.25	0.00596	4770	821

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.4	0.1	0.224	68.6	-0.82

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	2.5	0.13	0.00417	7410	591



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79 ± 0.31	1.32	0.18	0.557	73.9	-0.84

Sample: SP01APHE

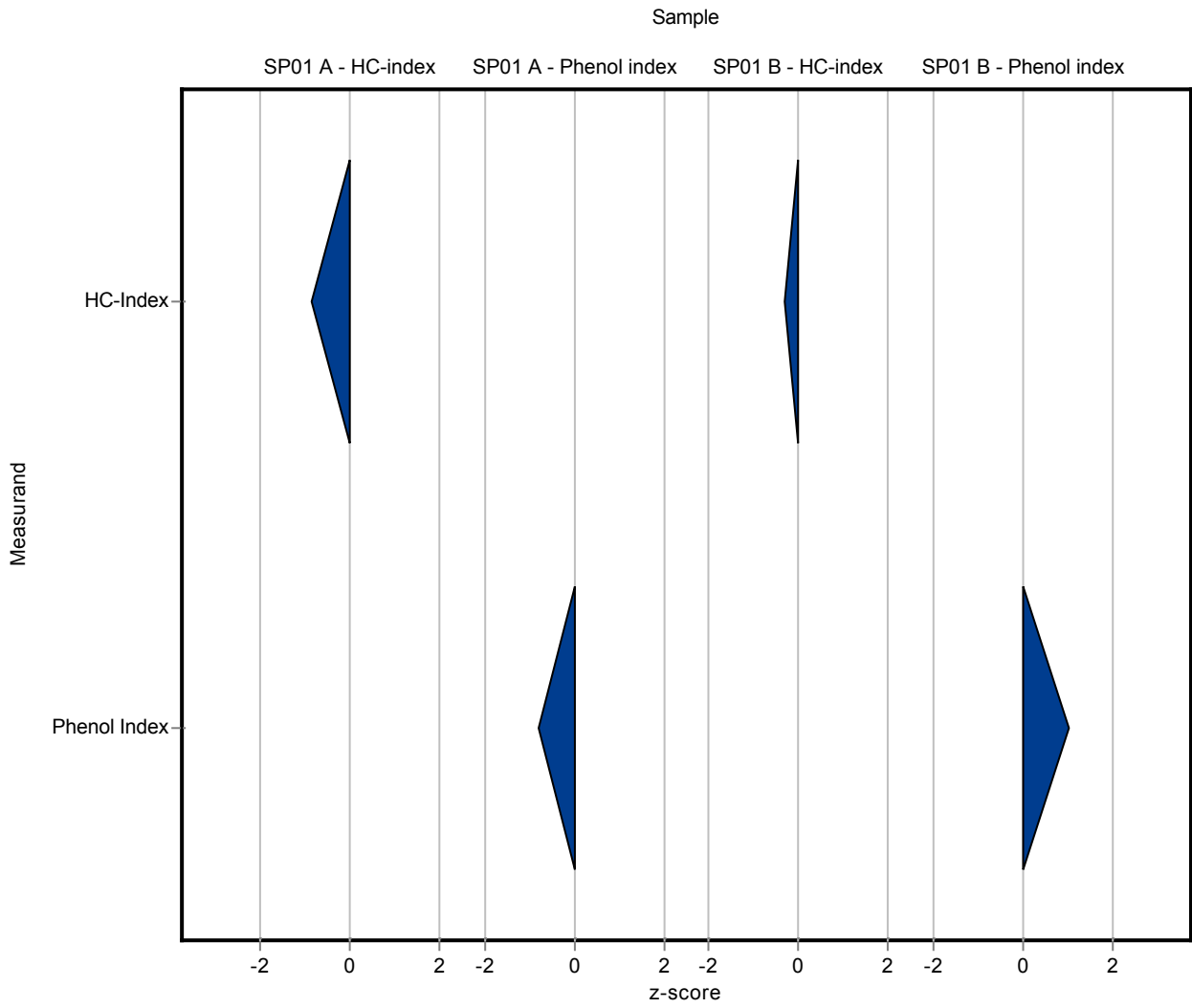
Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105 ± 0.00382	0.1	0.014	0.00596	95.5	-0.8

Sample: SP01BKWI

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583 ± 0.125	0.51	0.07	0.224	87.4	-0.33

Sample: SP01BPHE

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338 ± 0.0028	0.038	0.009	0.00417	113	1.02



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	2.145	0.28	0.557	120	0.64

Sample: SP01APHE

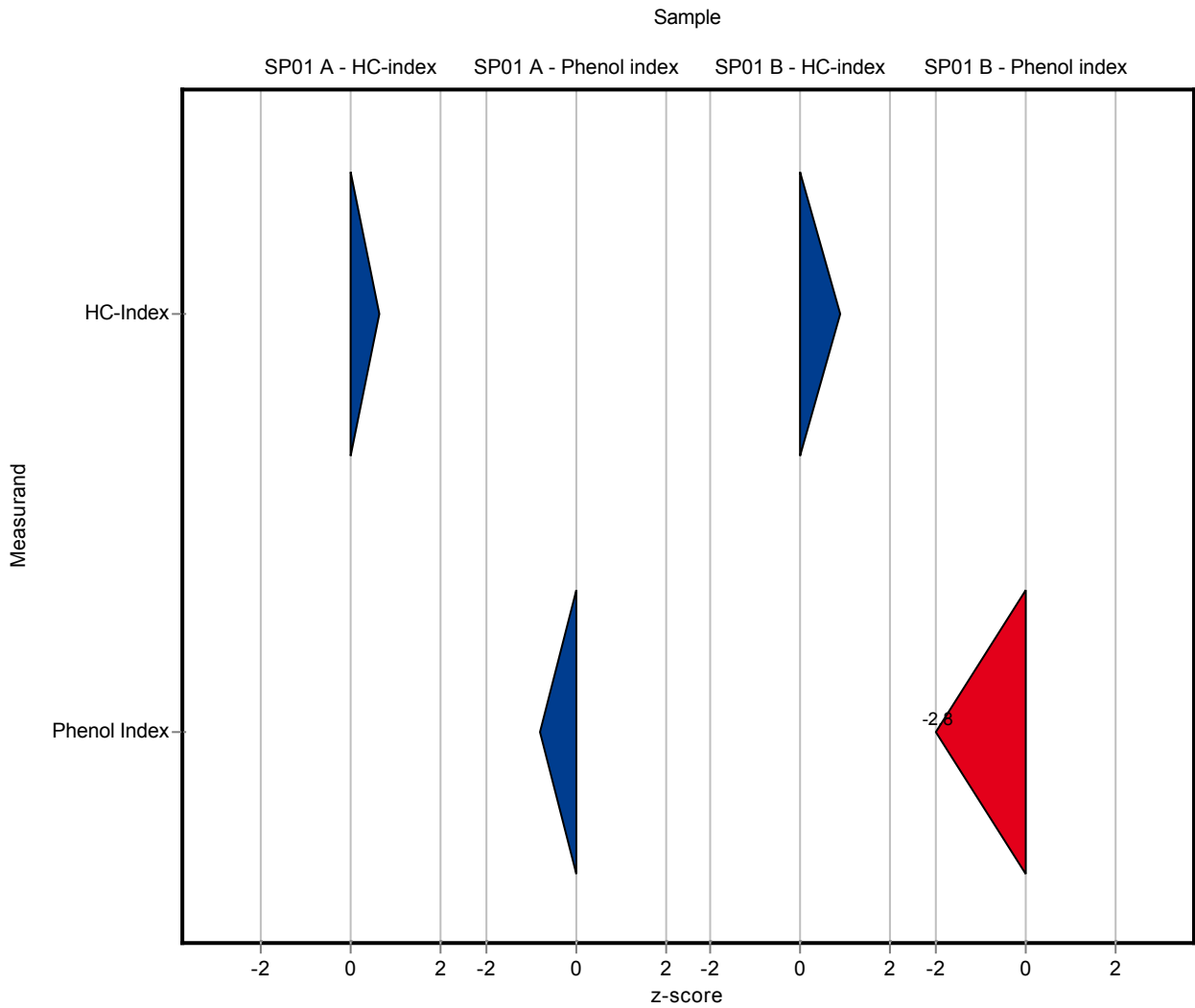
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	0.1	0.013	0.00596	95.5	-0.8

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.78	0.1	0.224	134	0.88

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	0.022	0.003	0.00417	65.2	-2.82



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79 ± 0.31	2.55	0.58	0.557	143	1.37

Sample: SP01APHE

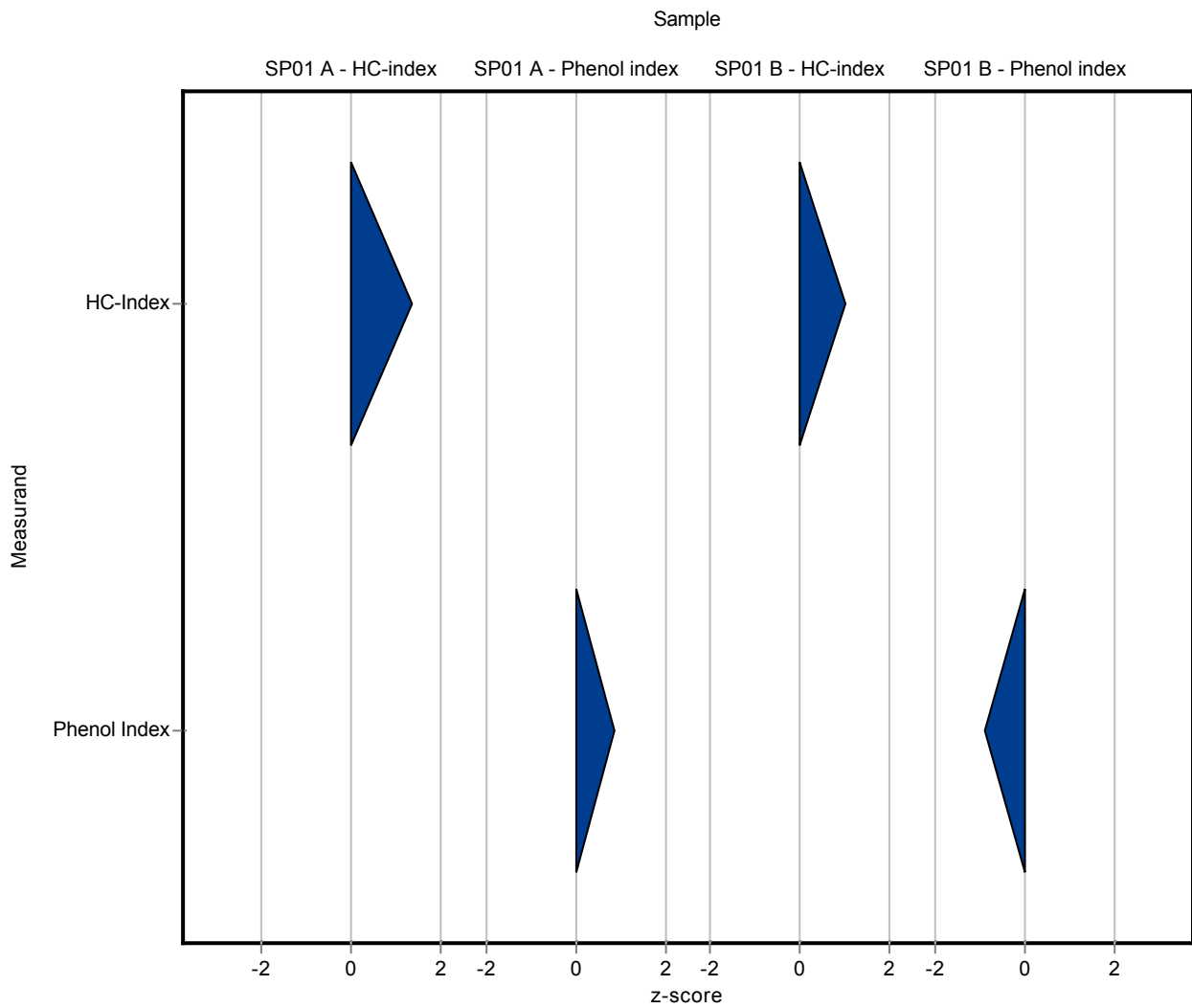
Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105 ± 0.00382	0.11	0.028	0.00596	105	0.88

Sample: SP01BKWI

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583 ± 0.125	0.81	0.165	0.224	139	1.01

Sample: SP01BPHE

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338 ± 0.0028	0.03	0.007	0.00417	88.9	-0.9



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	2.03	0.66	0.557	114	0.44

Sample: SP01APHE

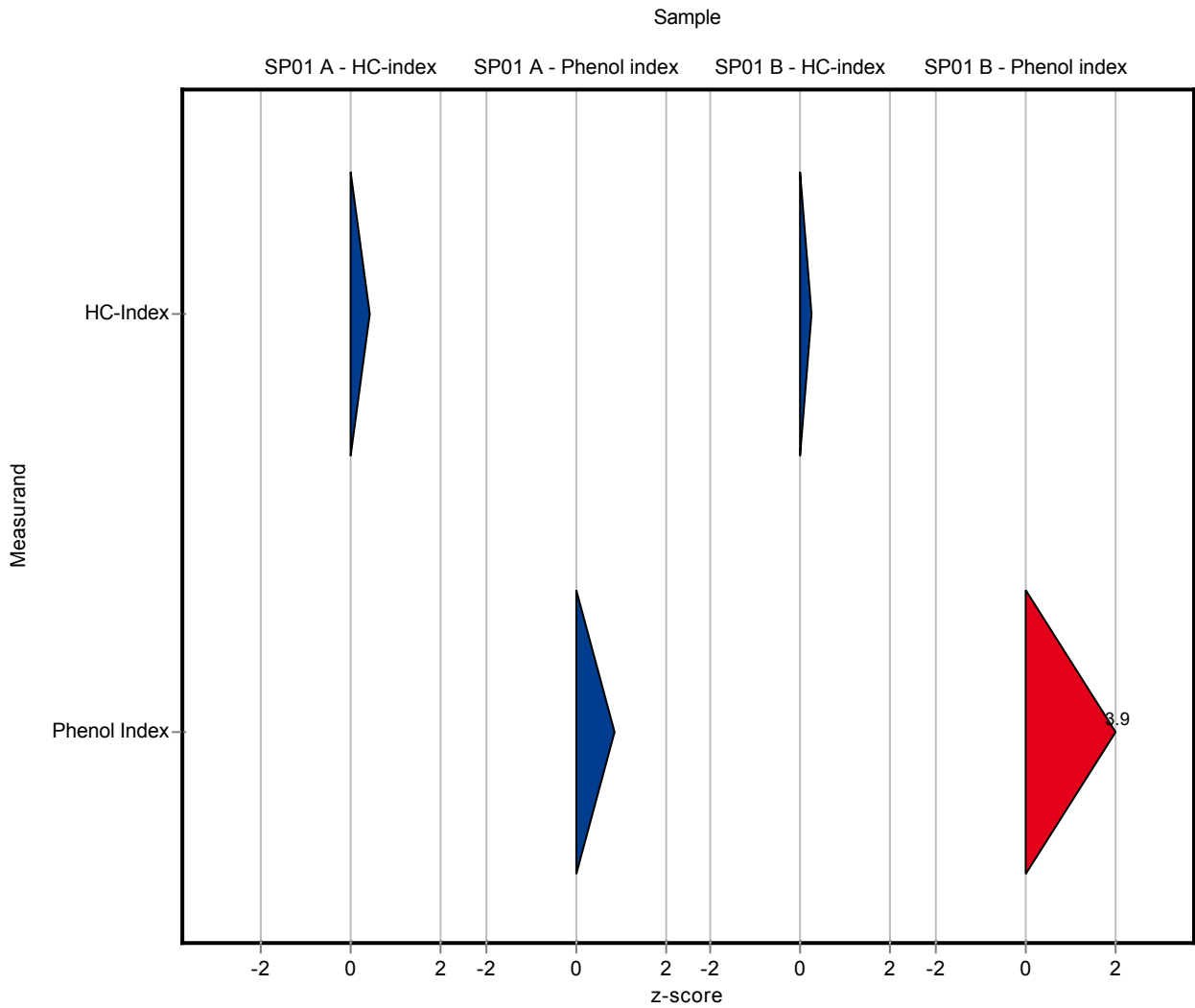
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	0.11	0.01	0.00596	105	0.88

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.64	0.21	0.224	110	0.25

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	0.05	0.005	0.00417	148	3.9



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	-	-	0.557	-	-

Sample: SP01APHE

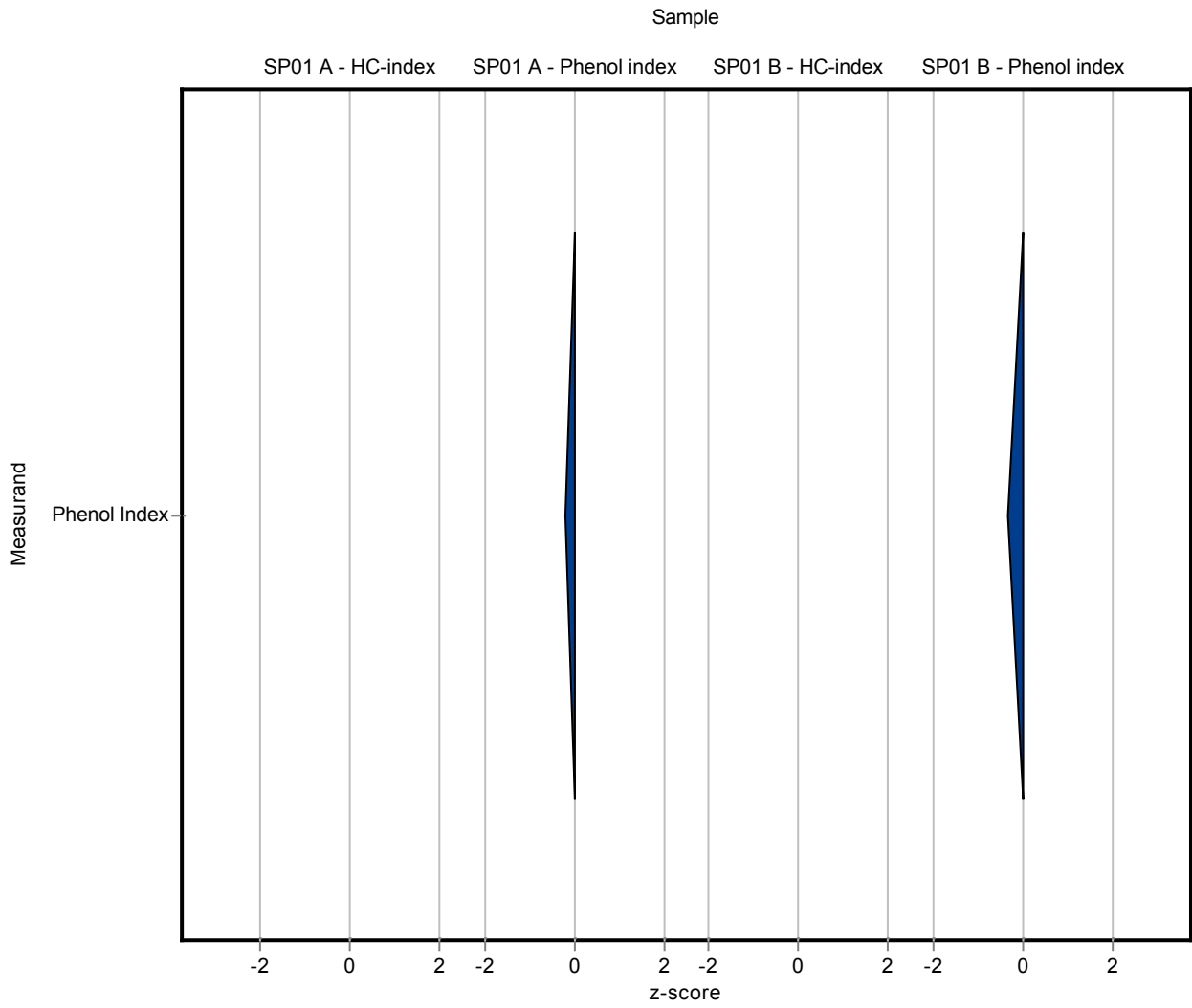
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	0.10353	0.02071	0.00596	98.8	-0.21

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	-	-	0.224	-	-

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	0.0324	0.00648	0.00417	96	-0.33



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	1.61	0.44	0.557	90.1	-0.32

Sample: SP01APHE

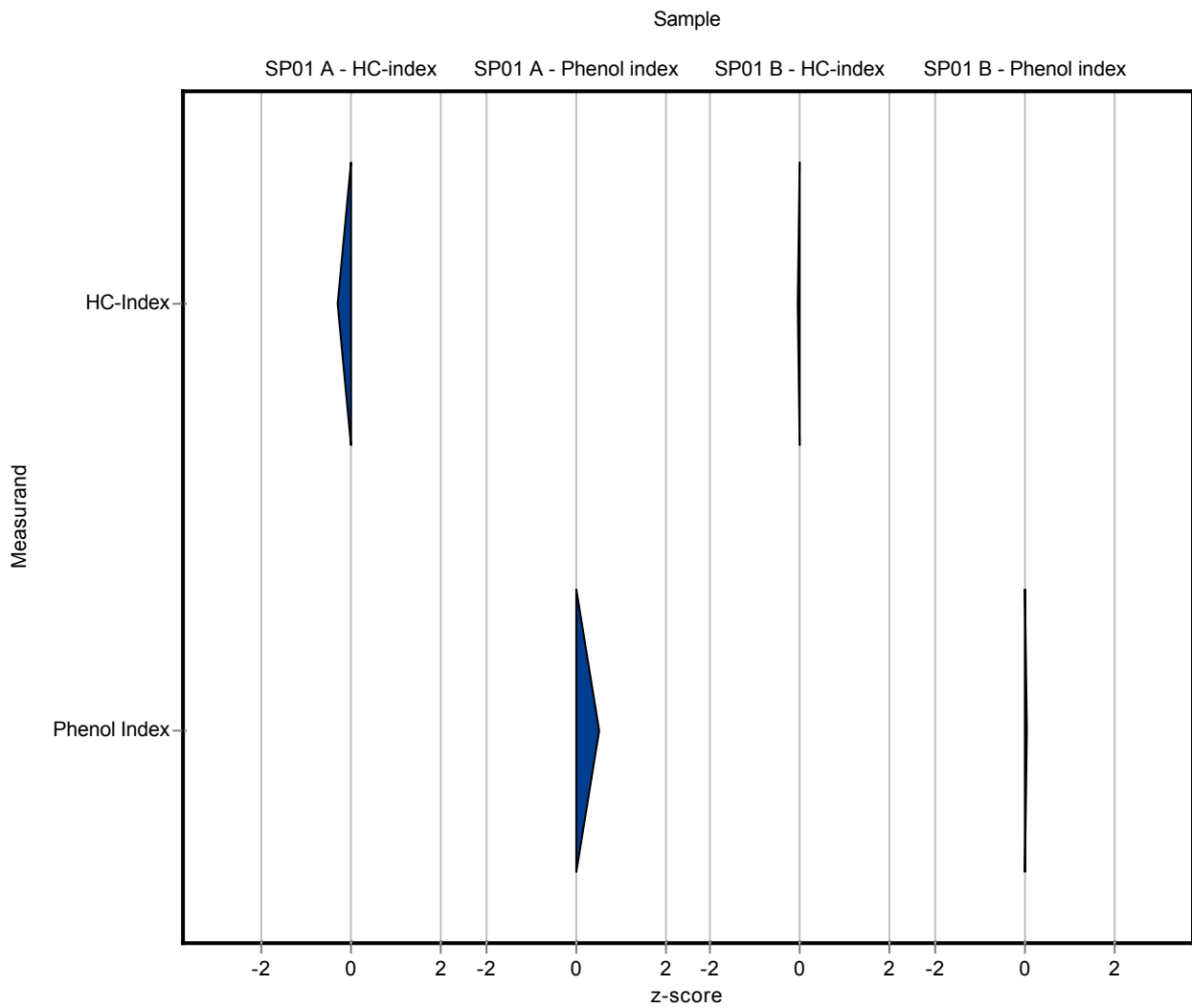
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	0.108	0.005	0.00596	103	0.54

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.57	0.16	0.224	97.7	-0.06

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	0.034	0.002	0.00417	101	0.06



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	1.8553	0.19	0.557	104	0.12

Sample: SP01APHE

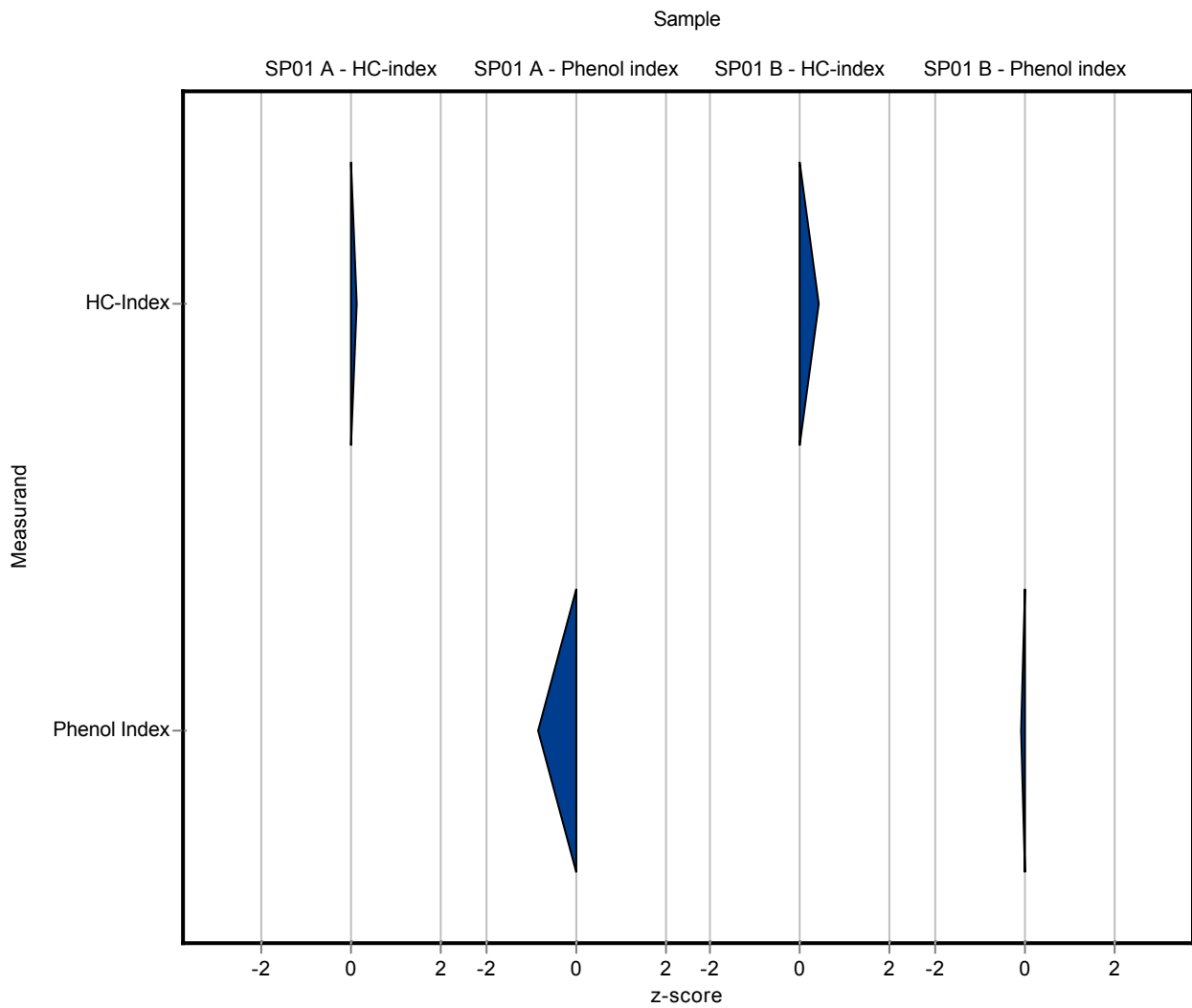
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	0.09981	0.01	0.00596	95.3	-0.83

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.6806	0.07	0.224	117	0.43

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	0.03338	0.003	0.00417	98.9	-0.09



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	5.9	-	0.557	330	7.38

Sample: SP01APHE

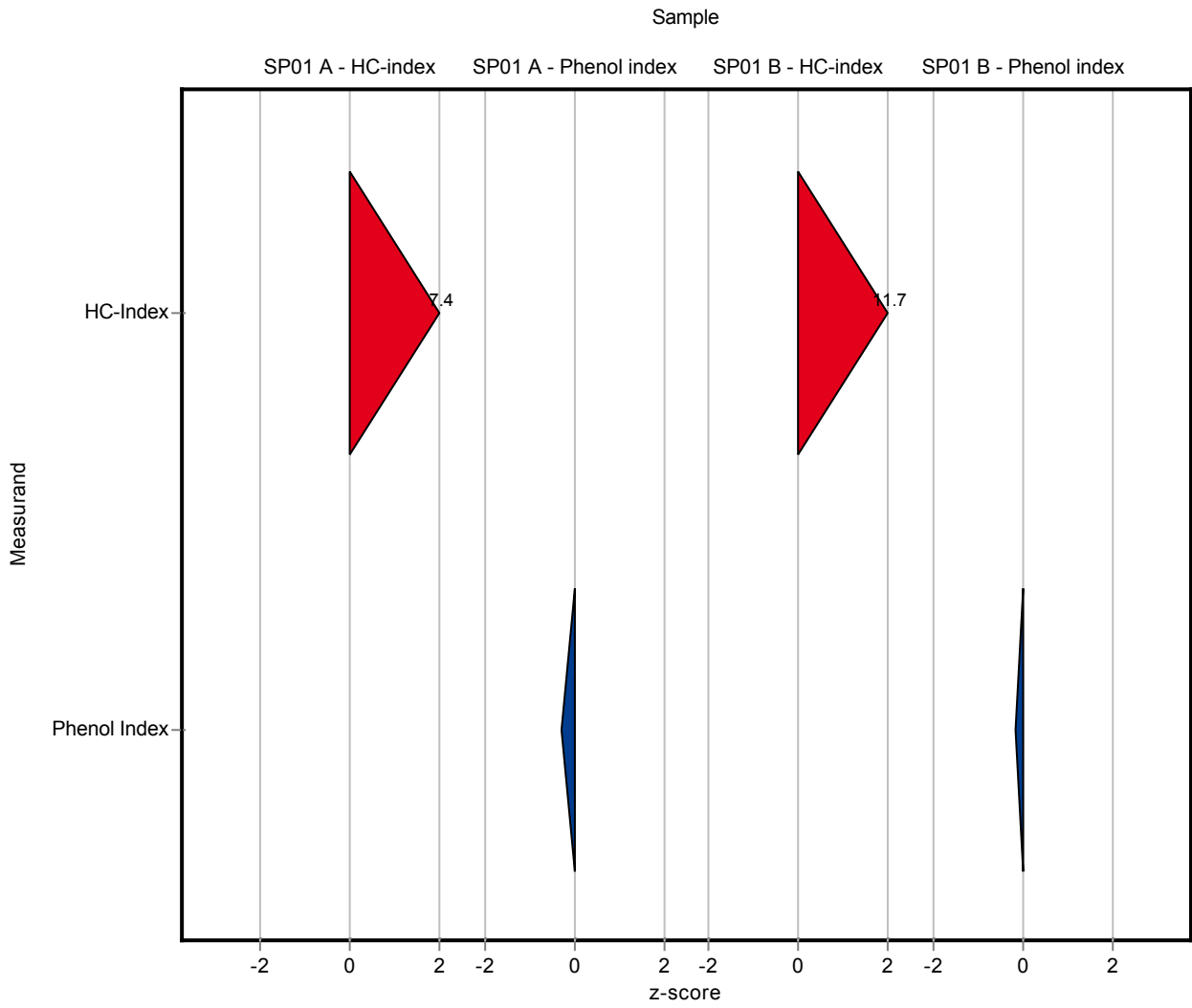
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	0.103	0.005	0.00596	98.3	-0.3

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	3.2	-	0.224	549	11.7

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	0.033	0.005	0.00417	97.8	-0.18



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	2.3	0.3	0.557	129	0.92

Sample: SP01APHE

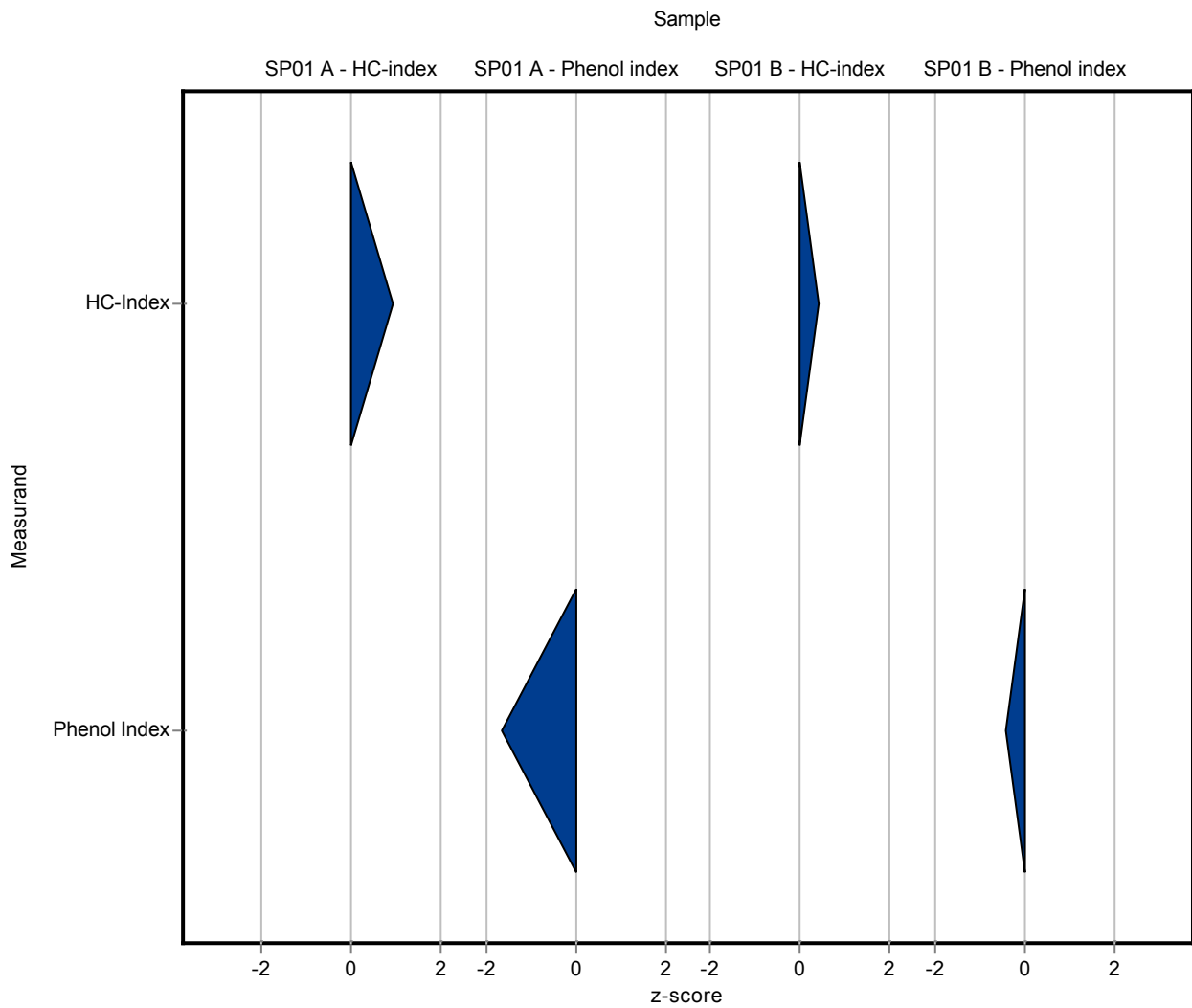
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	0.095	0.008	0.00596	90.7	-1.64

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.68	0.12	0.224	117	0.43

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	0.032	0.002	0.00417	94.8	-0.42



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	1.98	0.396	0.557	111	0.35

Sample: SP01APHE

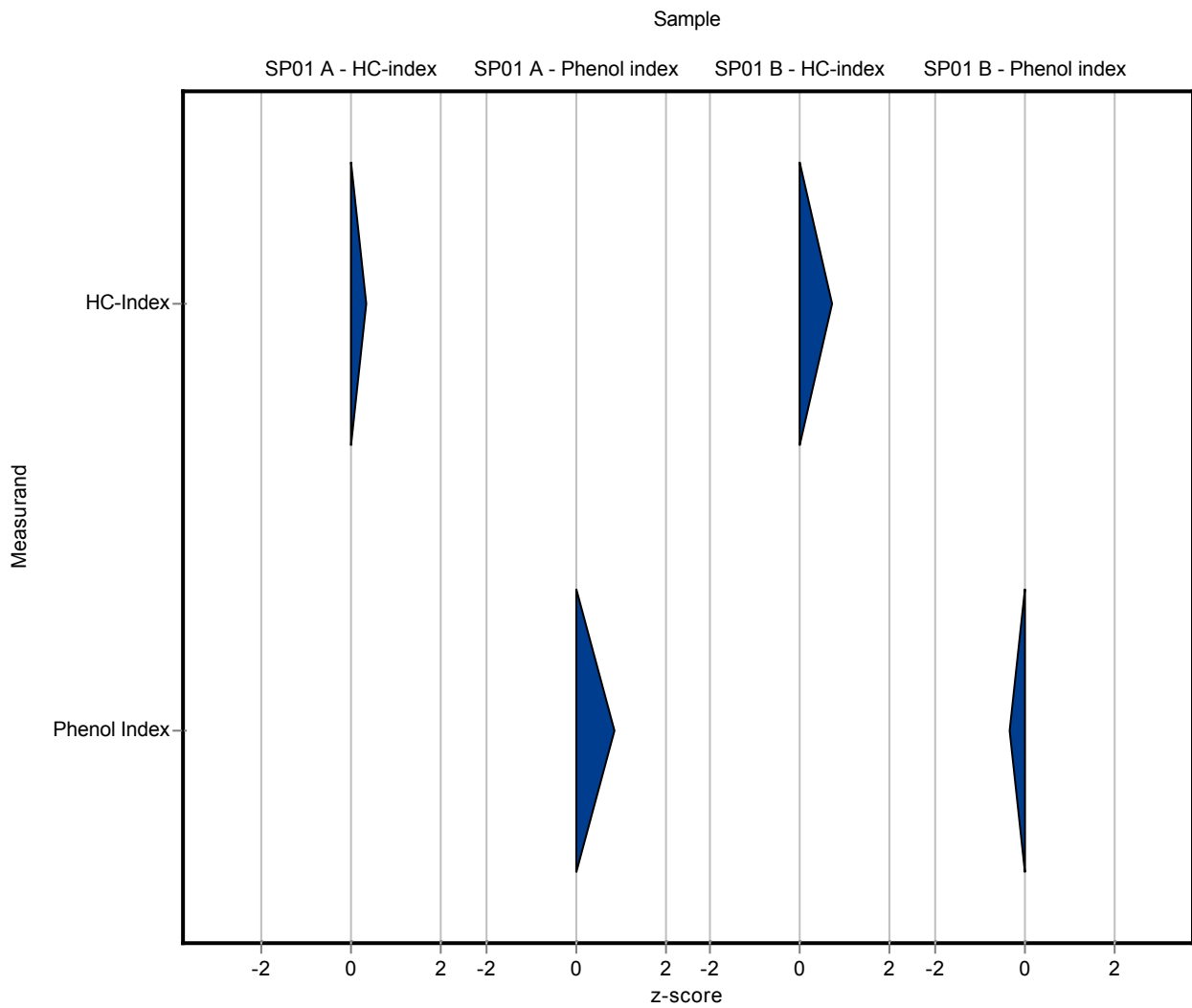
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	0.11	0.0165	0.00596	105	0.88

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.746	0.149	0.224	128	0.72

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	0.0324	0.00486	0.00417	96	-0.33



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79 ± 0.31	1.3	0.13	0.557	72.8	-0.87

Sample: SP01APHE

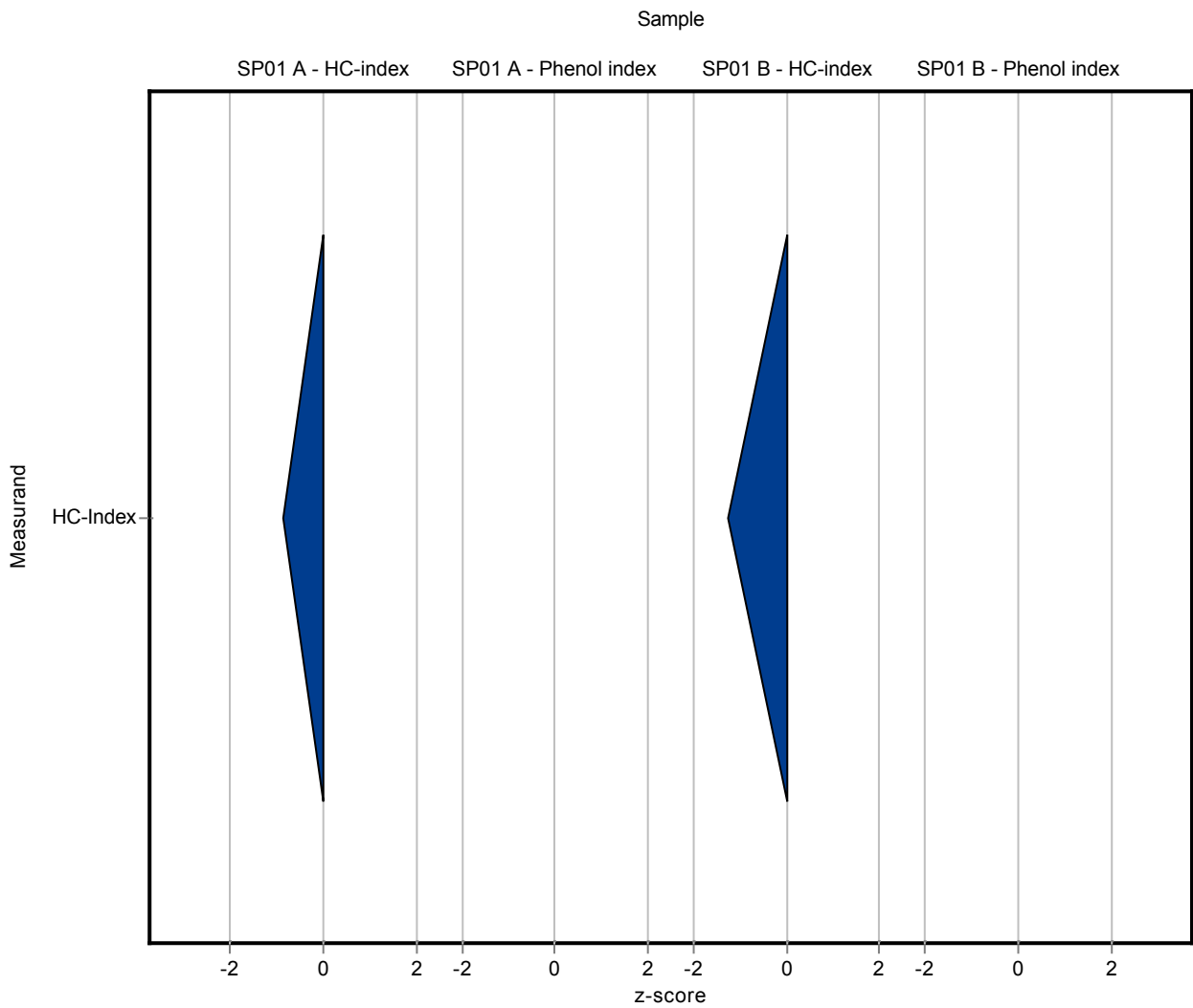
Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105 ± 0.00382	-	-	0.00596	-	-

Sample: SP01BKWI

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583 ± 0.125	0.3	0.03	0.224	51.4	-1.26

Sample: SP01BPHE

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338 ± 0.0028	-	-	0.00417	-	-



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79 ± 0.31	1.55	0.21	0.557	86.8	-0.42

Sample: SP01APHE

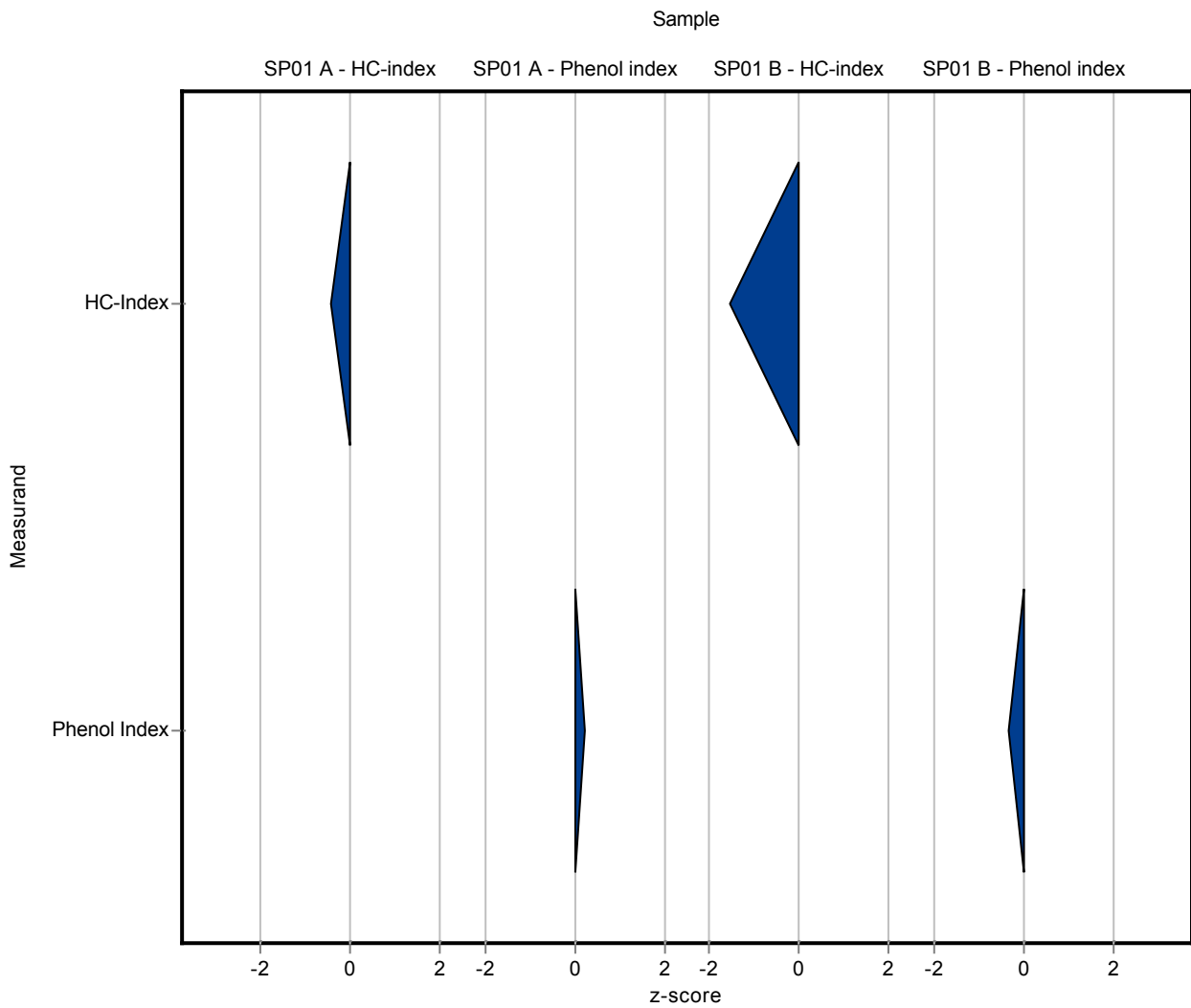
Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105 ± 0.00382	0.106	0.0013	0.00596	101	0.21

Sample: SP01BKWI

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583 ± 0.125	0.241	0.01	0.224	41.3	-1.53

Sample: SP01BPHE

Parameter	Unit	Target ± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338 ± 0.0028	0.0323	0.0007	0.00417	95.7	-0.35



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	1.78	0.18	0.557	99.7	-0.01

Sample: SP01APHE

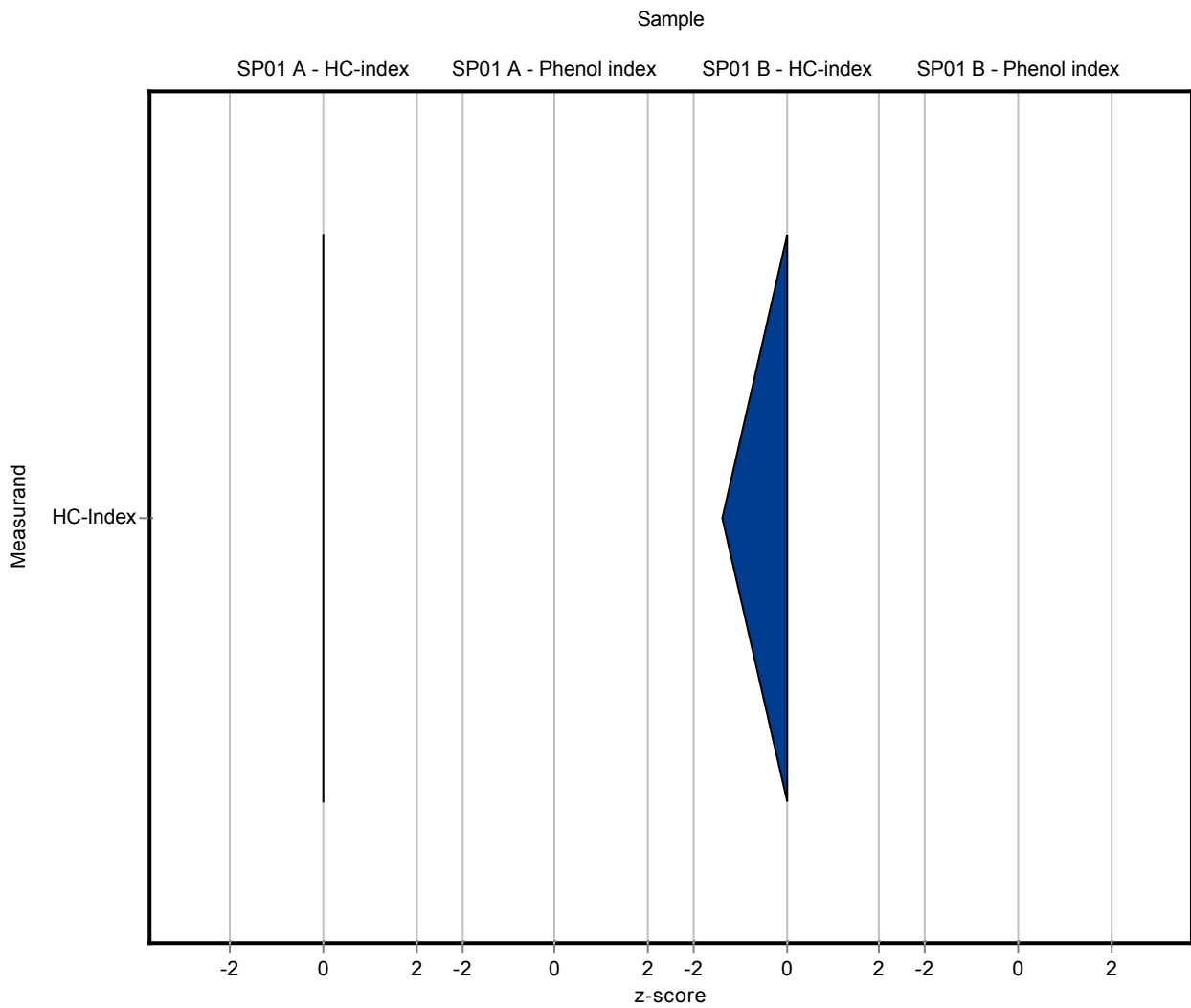
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	-	-	0.00596	-	-

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.27	0.06	0.224	46.3	-1.4

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	-	-	0.00417	-	-



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	0.945	0.425	0.557	52.9	-1.51

Sample: SP01APHE

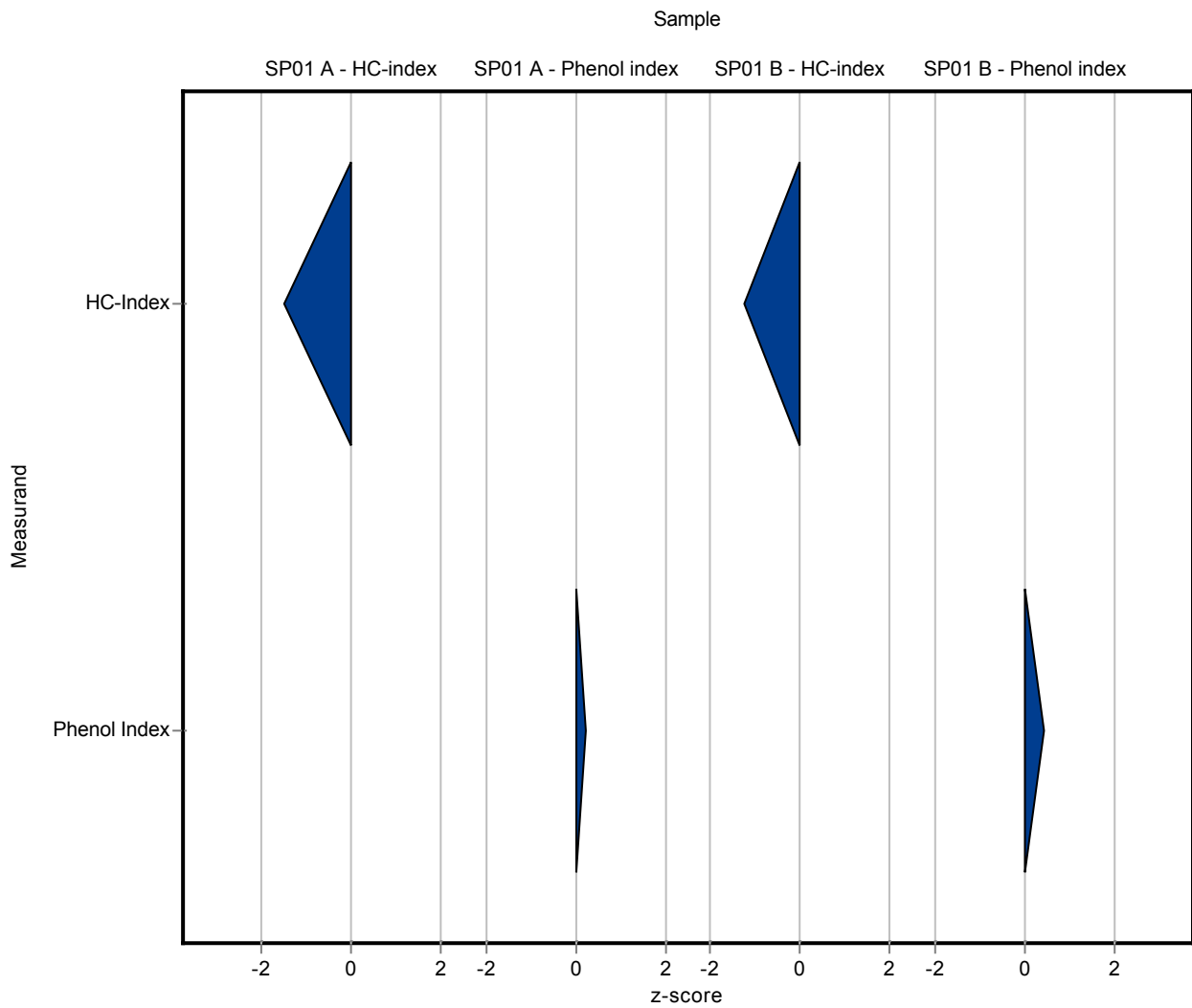
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	0.106	0.0212	0.00596	101	0.21

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.304	0.137	0.224	52.1	-1.24

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	0.0356	0.00712	0.00417	105	0.44



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	1.08	-	0.557	60.5	-1.27

Sample: SP01APHE

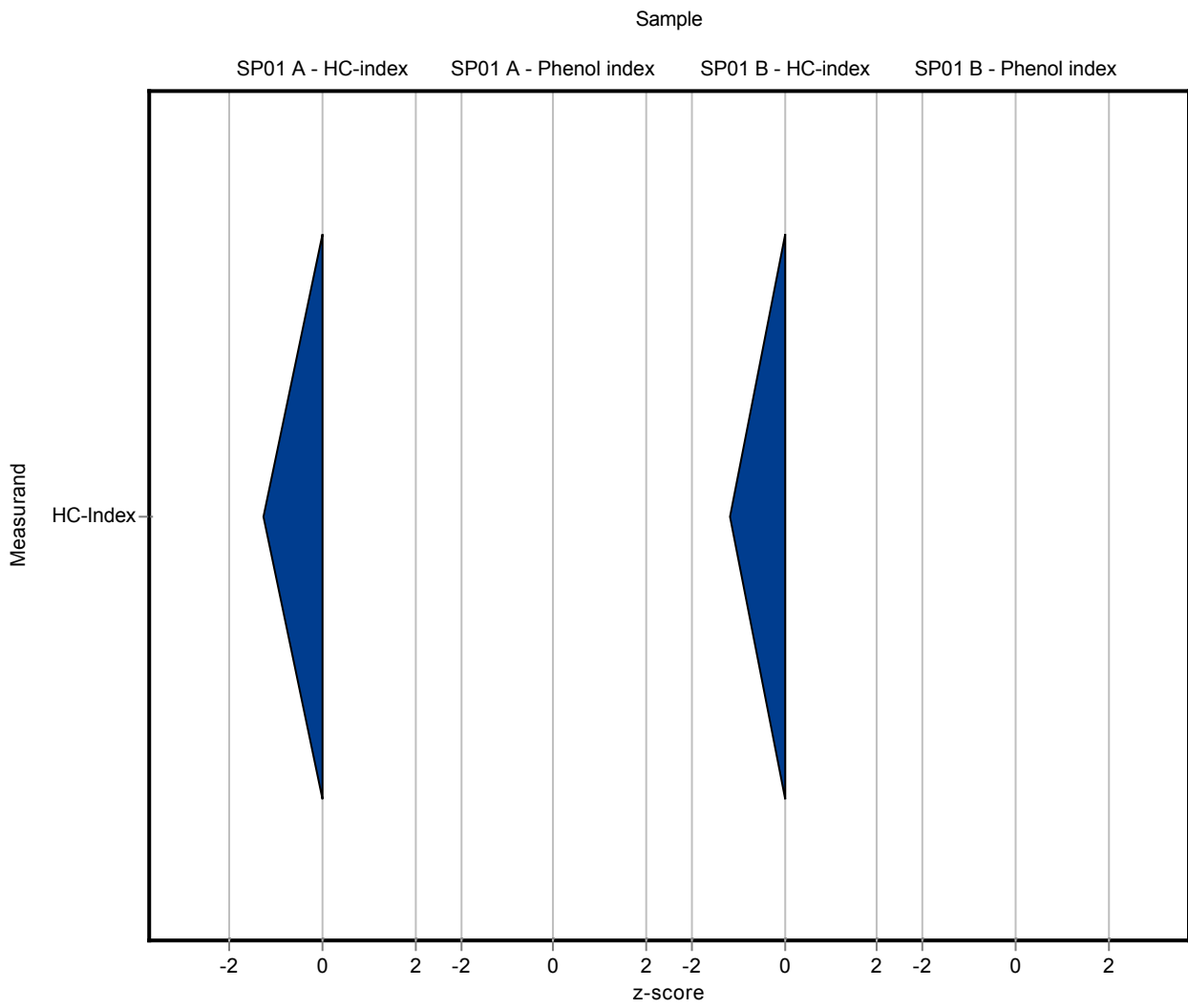
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	-	-	0.00596	-	-

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.32	-	0.224	54.9	-1.17

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	-	-	0.00417	-	-



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	1.576	-	0.557	88.2	-0.38

Sample: SP01APHE

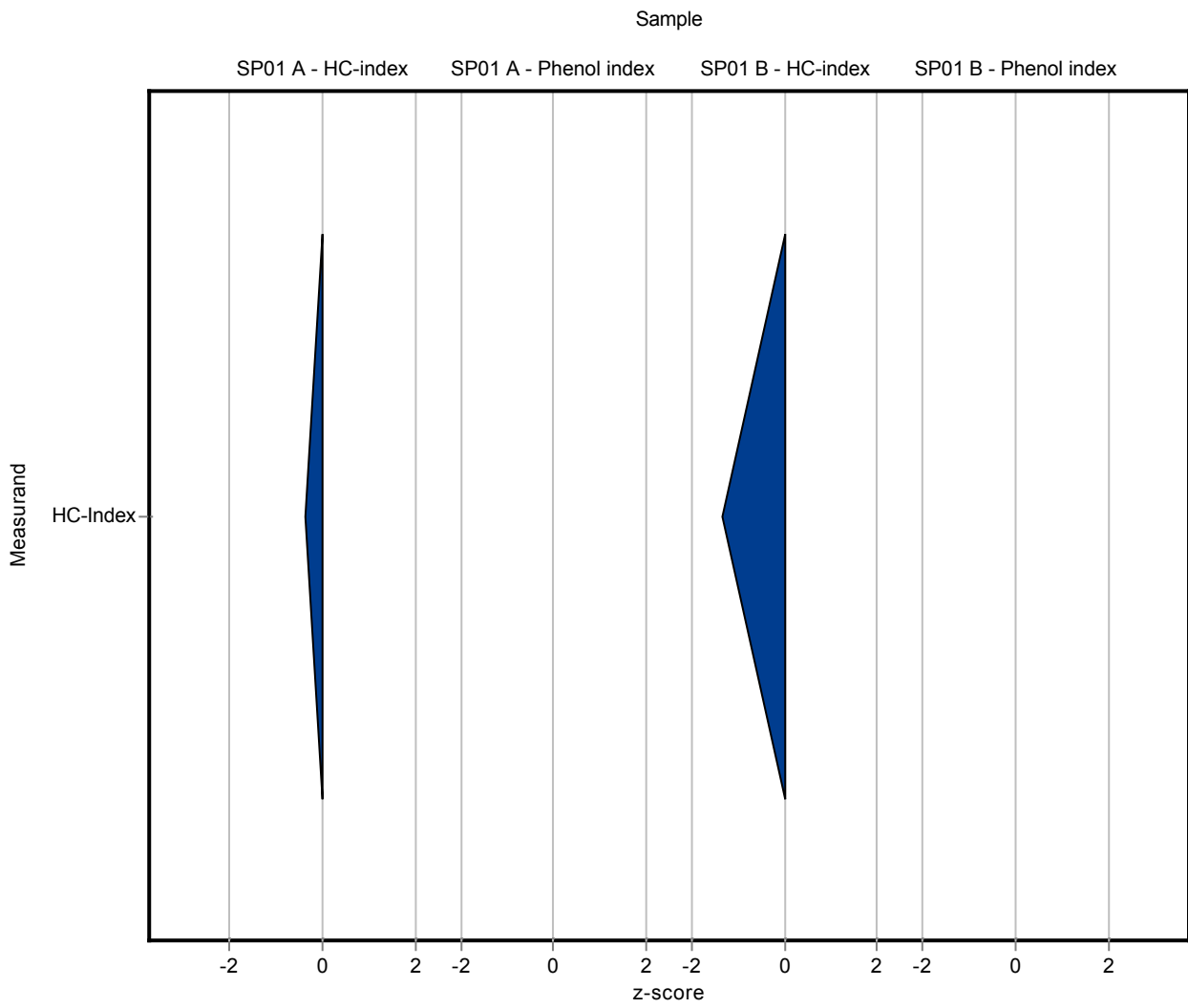
Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	-	-	0.00596	-	-

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.277	-	0.224	47.5	-1.36

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	-	-	0.00417	-	-



The following results were achieved:

Sample: SP01AKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	1.79	± 0.31	2.57	0.38	0.557	144	1.41

Sample: SP01APHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.105	± 0.00382	0.1015	0.02	0.00596	96.9	-0.55

Sample: SP01BKWI

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
HC-Index	mg/l	0.583	± 0.125	0.84	0.12	0.224	144	1.14

Sample: SP01BPHE

Parameter	Unit	Target	± CI(99%)	Result	± U	Criteria	Recovery	z-score
Phenol Index	mg/l	0.0338	± 0.0028	0.0302	0.006	0.00417	89.5	-0.85

