ENVIRONMENT AGENCY AUSTRIA umweltbundesamt

# EVALUATION

# OF THE INTERLABORATORY COMPARISON TEST

# Chlorinated hydrocarbons and BTEX on activated charcoal tubes – CBL01

Sample dispatch on 20th October 2015

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# Table of contents

# 1 Interlaboratory comparison test: Chlorinated hydrocarbons and BTEX on activated charcoal tubes – CBL01

## 1.1 Participants and time schedule

- Number of registrations: 18
- Number of submitted data records: 17
- Dispatch of samples: 20th October 2015
- Closing date for submission of data: 17th November 2015

For the interlaboratory comparison test CBL01 the participants could participate in CL02 (chlorinated hydrocarbons on activated charcoal tubes) and/or BL03 (BTEX on activated charcoal tubes).

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

## 1.2 Sampling, sample material and distribution

Activated Orbo 32S-charcoal tubes (Supelco) were loaded using a certified calibration gas (Linde). One tube was loaded with benzene, toluene, ethylbenzene, m-, p- and o- xylene (BL03) and another tube was loaded with Trichloromethane, 1,1,1-Trichloroethane, Trichloroethene, Tetrachloromethane, Tetrachloroethene, cis-1,2-Dichlorethene, trans-1,2-Dichlorethene (CL02). In addition to CL02 and BL03, respectively, an unloaded activated charcoal tube was made available to determine the blank value. The tubes were loaded using a t-piece under pressure-less condition. The samples were prepared in two series (CL02 and BL03) using a pump with a continuous and defined flow. The flow of the pump was controlled before as well as after the loading of the tubes. The charcoal tubes were loaded on 19th October 2015 and dispatched on 20th October 2015.

## 1.3 Control testing

During sampling, aliquots of each sample were collected randomly for control testing. Testing was performed 8 days after 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 ± U The uncertainties of the check value were calculated as extended uncertainties (k=2).

# 2 Evaluation

The analytical results had to be made available to the organiser not later than 17th November 2015. Any results 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. The adjusted average value (after removal of outliers) for all submitted results was used as a basis for the calculation of recovery rates.

## z-Score

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

$$z - score = \frac{x_i - \overline{X}}{\sigma}$$

In this context,

$x_i$ is the measurement value of the participating laboratory.

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

σ 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 evaluation 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 (see 5 Explanatary notes on the parameter oriented report).

# 4 Explanatory notes

As explained in the paragraph evaluation (page 5), 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.

Please consider the recovery rate for your internal quality management system (see tetrachloromethane, tetrachloroethene, trans-1,2-dichloroethene and trichloro-ethene).

# 5 Explanatory notes on the parameter oriented report

| | |
|---|---|
| Mean ± CI (99%) | ***Mean of the participants results, without outliers ± 99% confidence interval*** |
| Minimum – Maximum | ***Minimum and maximum of all submitted results, after removal of outliers*** |
| Check value ± U | ***Mean of check value ± expanded uncertainty (k=2)*** |

| Labcode | Result | ± U | Recovery [%] | z-score | Comments |
|---|---|---|---|---|---|
| LC0001 | 0.015 | 0.0001 | 89. 7 | -0.5 | |
| LC0002 | 0.0148 | 0.003 | 88. 5 | 0.6 | |
| LC0003 | - | - | - | - | |
| LC0004 | - | - | - | - | |
| . . . | | | | | |
| LC0009 | 0.100 | 0.01 | 597.9 | 24.2 | H |

**Symbols and abbreviations:**

± U Results uncertainty as indicated by participant

\- *No data available*

Possible remarks in the column comments:

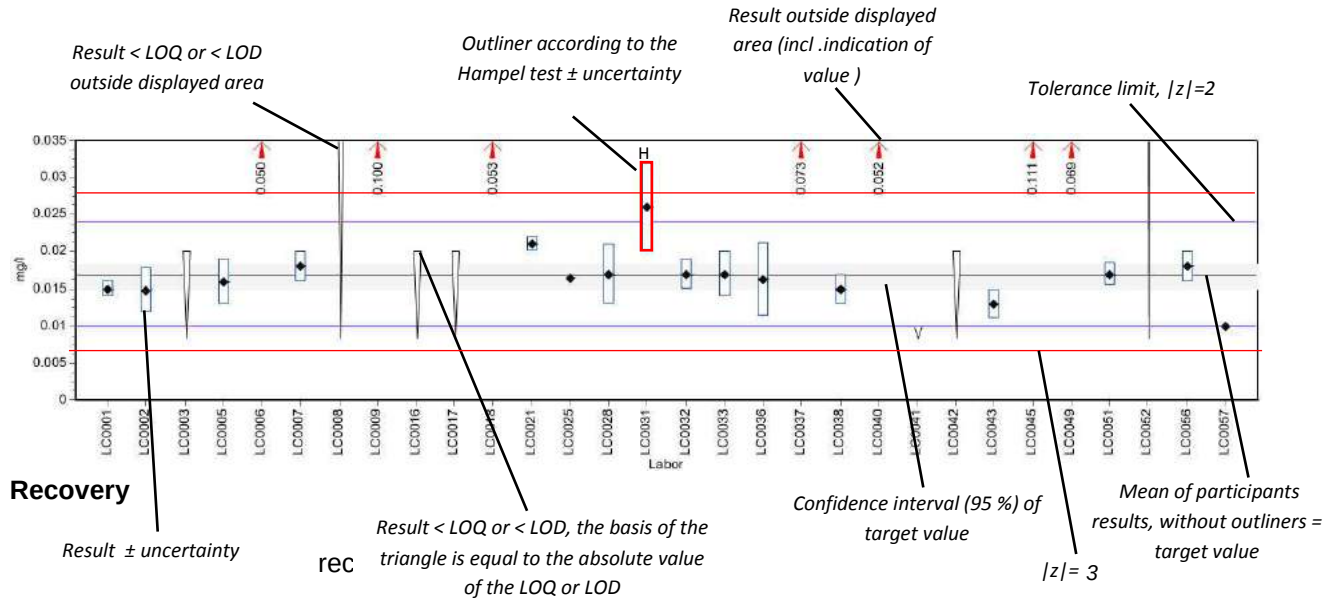
H Outlier according to Hampel-Test

FN False Negative – for a result < LOQ (level of quantification) or result < LOD (level of determination): The absolute value of the LOQ or LOD fulfils the condition of a outlier according to the Hampel test.

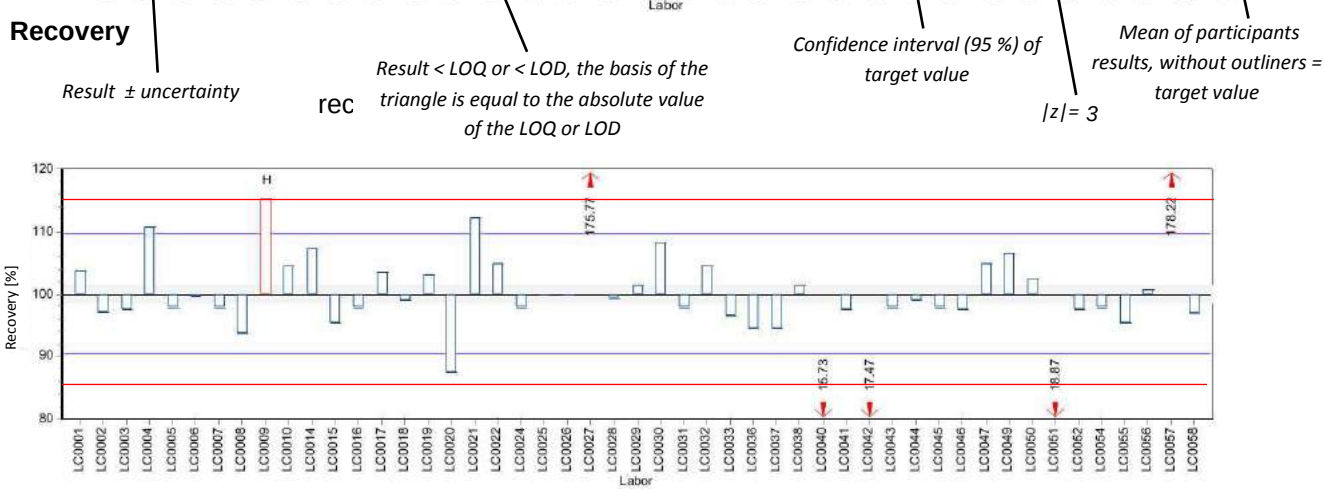
FP False Positive – for parameters where no target value is available because of a too low analyte content (n < 6): Result that exceeds the median of the absolute values of the transmitted LOQs or LODs by more than 100 %.

## Graphical presentation of results

### Results

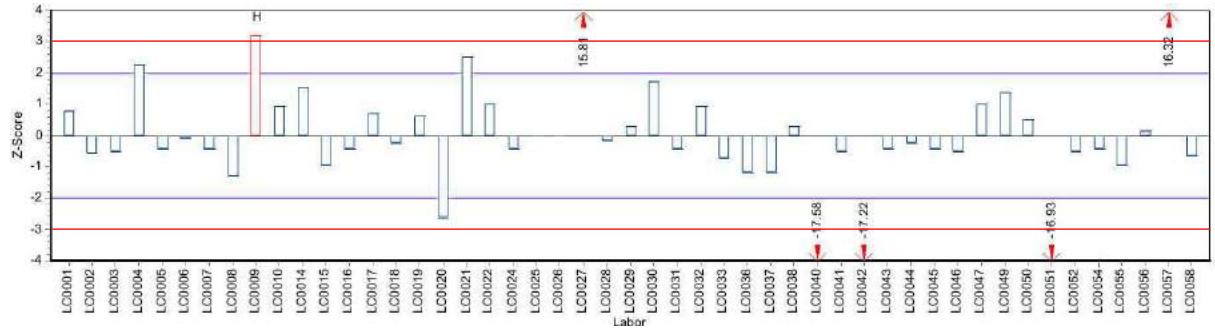



### Recovery




### z-Score

Presentation of results as z-scores.



# 6 Summary of results, after removal of outliers

| Parameter | Sample | Unit | Number of results for calculation | Number of outliners | Mean | ± CI (99%) | Minimum | Maximum | SD | RSD |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | BL03 | µg/tube | 11 | 3 | 1.49 | ± 0.11 | 1.271 | 1.7 | 0.121 | 8.12 |
| Toluene | BL03 | µg/tube | 11 | 2 | 3.03 | ± 0.209 | 2.48 | 3.32 | 0.231 | 7.63 |
| Ethylbenzene | BL03 | µg/tube | 11 | 2 | 4.09 | ± 0.372 | 3.29 | 4.6033 | 0.412 | 10.1 |
| Sum of m-Xylene and p-Xylene | BL03 | µg/tube | 11 | 2 | 7.31 | ± 1.13 | 4.14 | 8.9233 | 1.25 | 17 |
| o-Xylene | BL03 | µg/tube | 10 | 3 | 3.85 | ± 0.378 | 3.3 | 4.51 | 0.399 | 10.4 |
| 1,1,1-Trichloroethane | CL02 | µg/tube | 8 | 1 | 21.3 | ± 5.17 | 10.8 | 26.35 | 4.87 | 22.9 |
| cis-1,2-Dichloroethene | CL02 | µg/tube | 8 | 0 | 18.8 | ± 6.21 | 12.3 | 27.03 | 5.85 | 31.2 |
| Tetrachloromethane | CL02 | µg/tube | 9 | 0 | 30.4 | ± 14.7 | 9.15 | 48.2 | 14.7 | 48.3 |
| Trichloromethane | CL02 | µg/tube | 7 | 2 | 29.7 | ± 2.42 | 25.6 | 32.81 | 2.14 | 7.2 |
| Tetrachloroethene | CL02 | µg/tube | 9 | 0 | 25.7 | ± 14 | 3.8 | 39.02 | 14 | 54.5 |
| trans-1,2-Dichloroethene | CL02 | µg/tube | 8 | 0 | 16.2 | ± 10.2 | 6.72 | 29.61 | 9.57 | 59.1 |
| Trichloroethene | CL02 | µg/tube | 9 | 0 | 22.4 | ± 11.2 | 5.2 | 34.83 | 11.2 | 49.9 |

# 7 Parameter oriented report

# Parameter oriented report

## BL03

## Benzene

| | |
|---|---|
| Unit | µg/tube |
| Mean ± CI (99%) | 1.49 ± 0.11 |
| Minimum - Maximum | 1.271 - 1.7 |
| Check value ± U | 1.3 ± 0.14 |

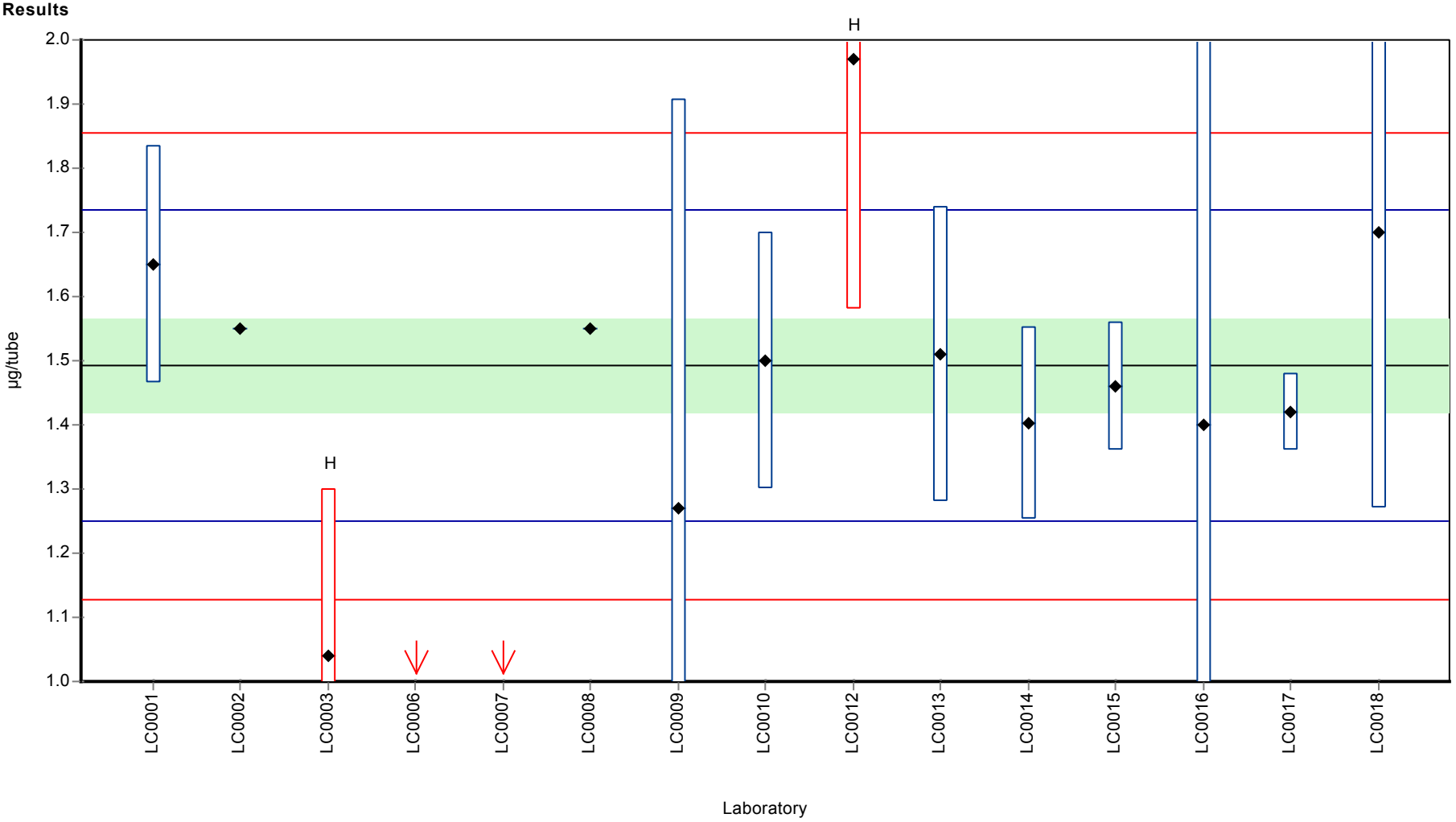
| Labcode | Result | ± U | Recovery [%] | z-score | Comments |
|---|---|---|---|---|---|
| LC0001 | 1.650 | 0.184 | 110.6 | 1.3 | |
| LC0002 | 1.550 | - | 103.9 | 0.5 | |
| LC0003 | 1.040 | 0.260 | 69.7 | -3.7 | H |
| LC0004 | - | - | - | - | |
| LC0006 | < 0.28 (LOQ) | - | - | - | |
| LC0007 | 0.577 | 0.100 | 38.7 | -7.6 | H |
| LC0008 | 1.550 | - | 103.9 | 0.5 | |
| LC0009 | 1.271 | 0.636 | 85.2 | -1.8 | |
| LC0010 | 1.500 | 0.200 | 100.5 | 0.1 | |
| LC0012 | 1.970 | 0.390 | 132.0 | 3.9 | H |
| LC0013 | 1.510 | 0.230 | 101.2 | 0.1 | |
| LC0014 | 1.403 | 0.150 | 94.0 | -0.7 | |
| LC0015 | 1.460 | 0.100 | 97.8 | -0.3 | |
| LC0016 | 1.400 | 1.500 | 93.8 | -0.8 | |
| LC0017 | 1.420 | 0.060 | 95.2 | -0.6 | |
| LC0018 | 1.700 | 0.430 | 113.9 | 1.7 | |

**Characteristics of parameter**

| | all results | without outliners | Unit |
|---|---|---|---|
| Mean ± CI (99%) | 1.43 ± 0.259 | 1.49 ± 0.11 | µg/tube |
| Minimum | 0.577 | 1.27 | µg/tube |
| Maximum | 1.97 | 1.7 | µg/tube |
| Standard deviation | 0.324 | 0.121 | µg/tube |
| rel. Standard deviation | 22.6 | 8.12 | % |
| n | 14 | 11 | - |

**Graphical presentation of results**

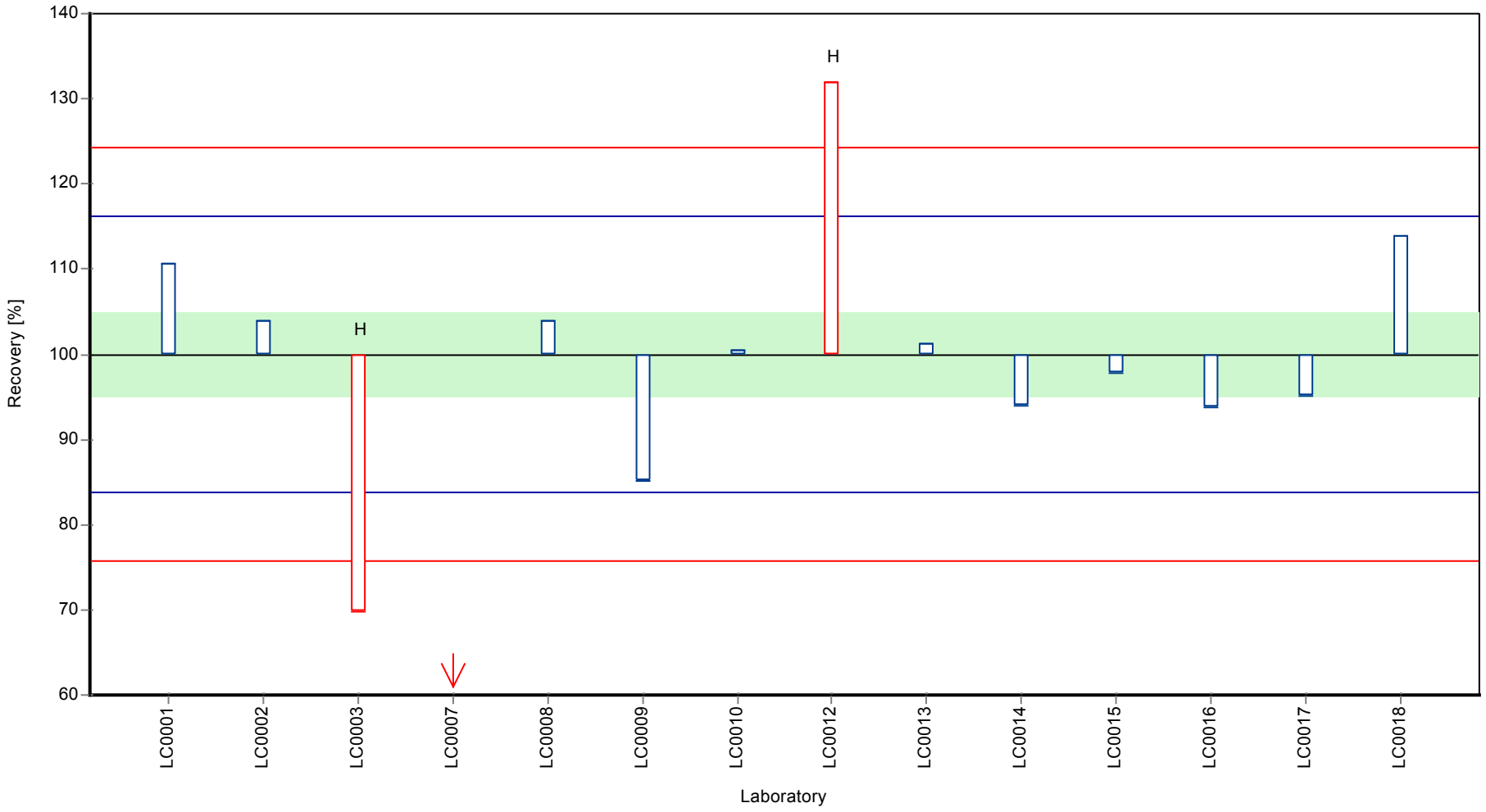
**Results**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

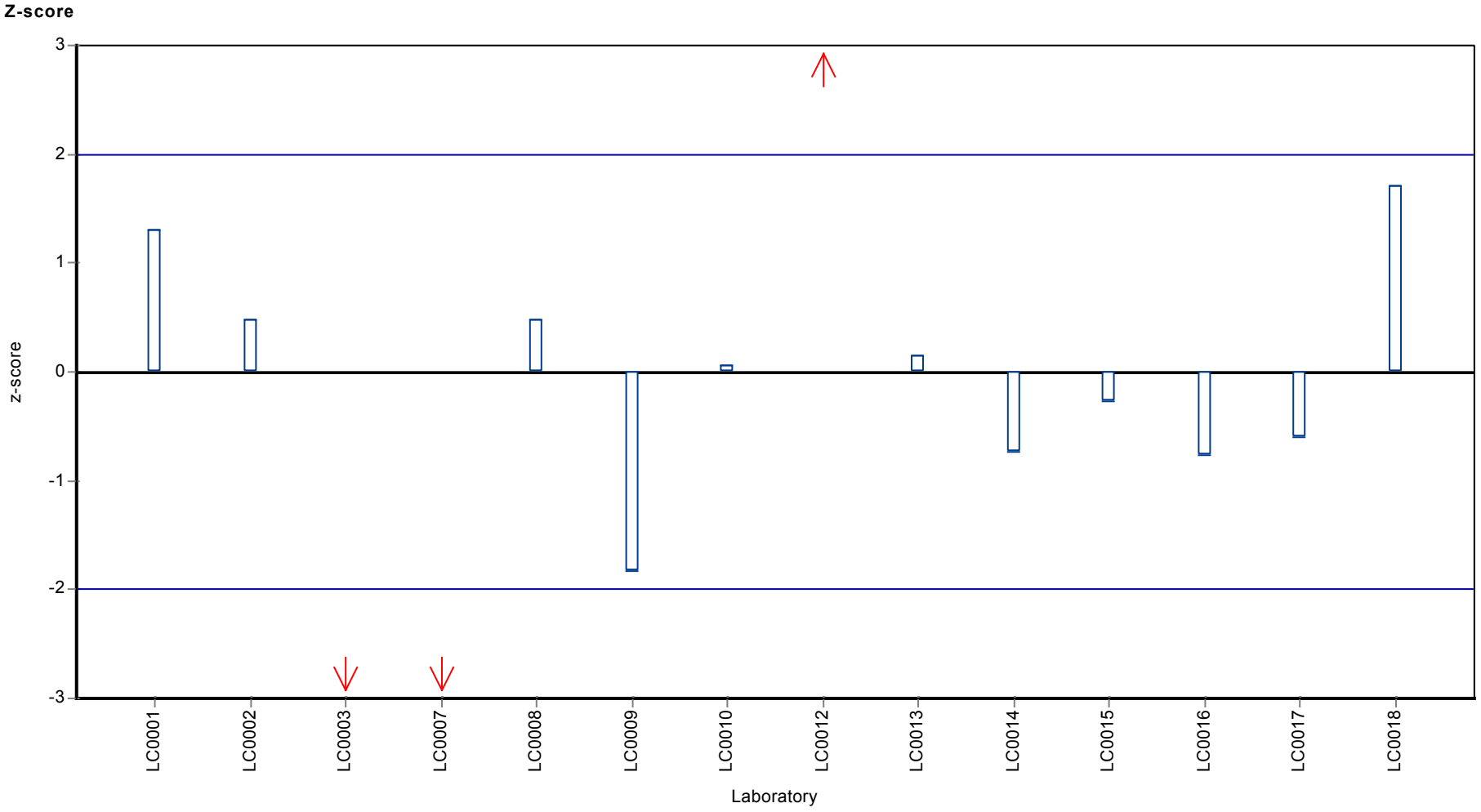
Sample: BL03, Parameter: Benzene

**Recovery rate**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Sample: BL03, Parameter: Benzene



# Parameter oriented report

## BL03

## Toluene

| | |
|---|---|
| Unit | µg/tube |
| Mean ± CI (99%) | 3.03 ± 0.209 |
| Minimum - Maximum | 2.48 - 3.32 |
| Check value ± U | 2.7 ± 0.31 |

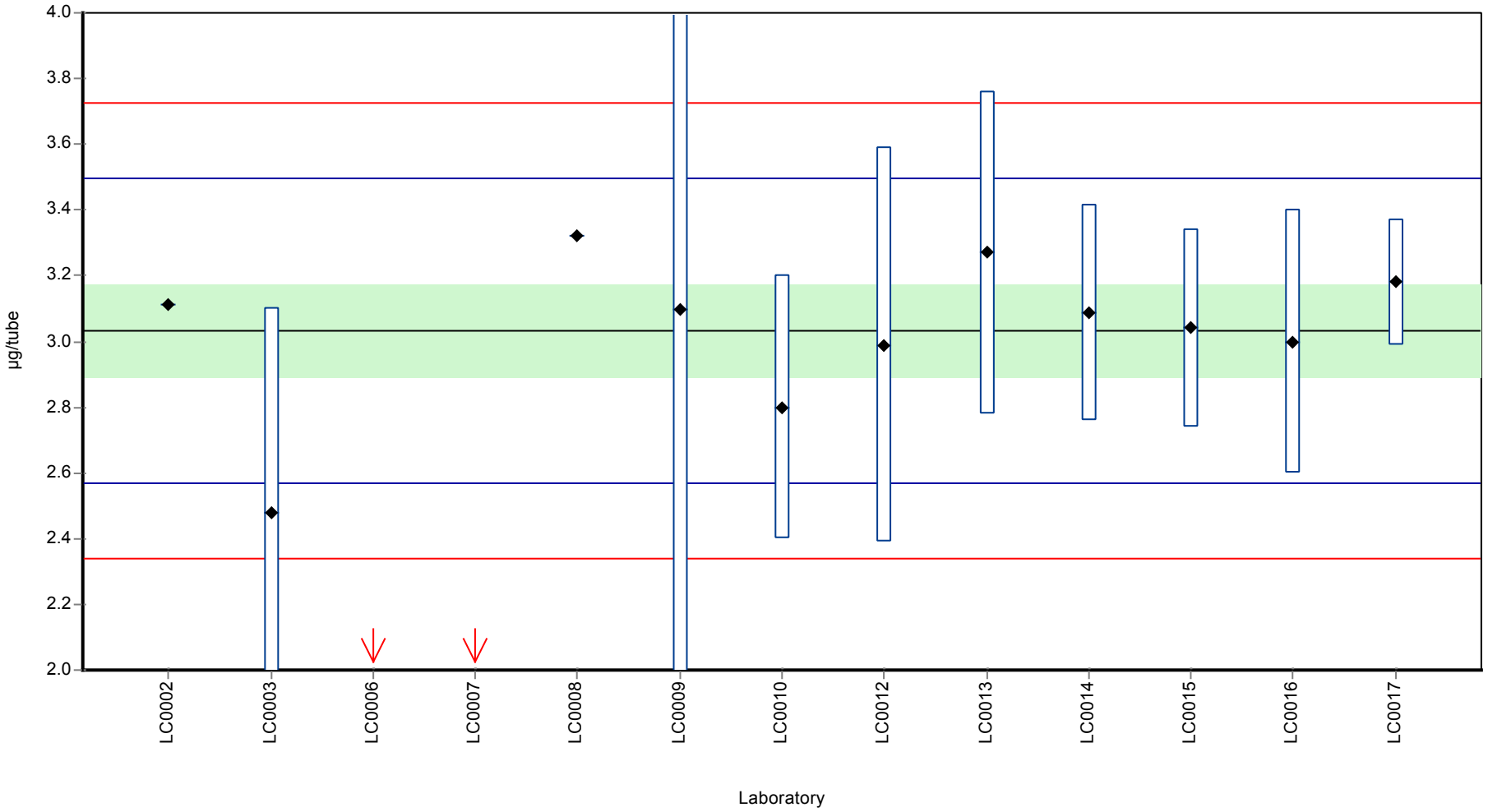
| Labcode | Result | ± U | Recovery [%] | z-score | Comments |
|---|---|---|---|---|---|
| LC0001 | - | - | - | - | |
| LC0002 | 3.110 | - | 102.5 | 0.3 | |
| LC0003 | 2.480 | 0.620 | 81.7 | -2.4 | |
| LC0004 | - | - | - | - | |
| LC0006 | 0.550 | 0.060 | 18.1 | -10.7 | H |
| LC0007 | 1.770 | 0.250 | 58.3 | -5.5 | H |
| LC0008 | 3.320 | - | 109.4 | 1.2 | |
| LC0009 | 3.095 | 1.548 | 102.0 | 0.3 | |
| LC0010 | 2.800 | 0.400 | 92.3 | -1.0 | |
| LC0012 | 2.990 | 0.600 | 98.6 | -0.2 | |
| LC0013 | 3.270 | 0.490 | 107.8 | 1.0 | |
| LC0014 | 3.086 | 0.330 | 101.7 | 0.2 | |
| LC0015 | 3.040 | 0.300 | 100.2 | 0.0 | |
| LC0016 | 3.000 | 0.400 | 98.9 | -0.1 | |
| LC0017 | 3.180 | 0.190 | 104.8 | 0.6 | |
| LC0018 | - | - | - | - | |

**Characteristics of parameter**

| | all results | without outliners | Unit |
|---|---|---|---|
| Mean ± CI (99%) | 2.75 ± 0.645 | 3.03 ± 0.209 | µg/tube |
| Minimum | 0.55 | 2.48 | µg/tube |
| Maximum | 3.32 | 3.32 | µg/tube |
| Standard deviation | 0.776 | 0.231 | µg/tube |
| rel. Standard deviation | 28.3 | 7.63 | % |
| n | 13 | 11 | - |

**Graphical presentation of results**

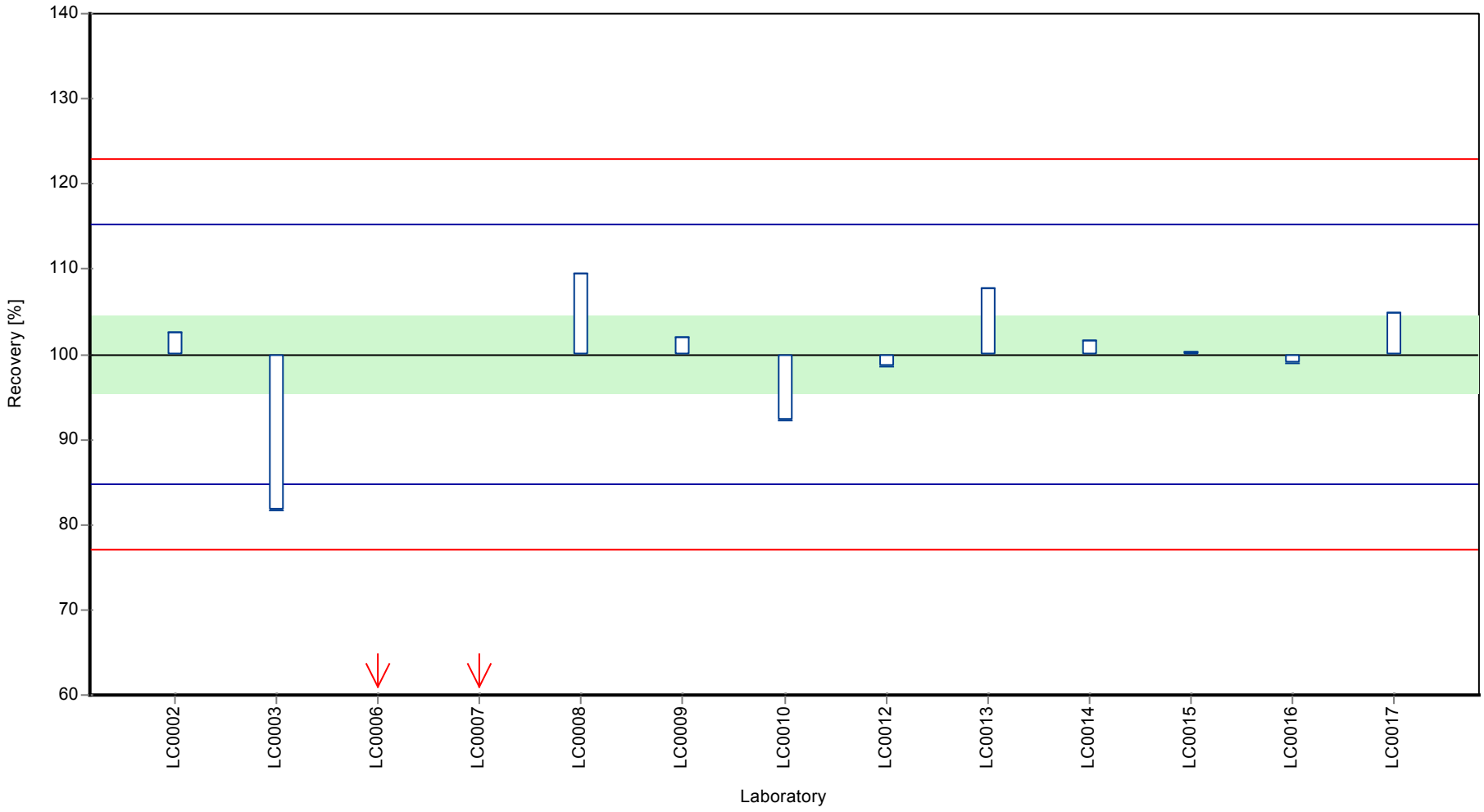
**Results**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

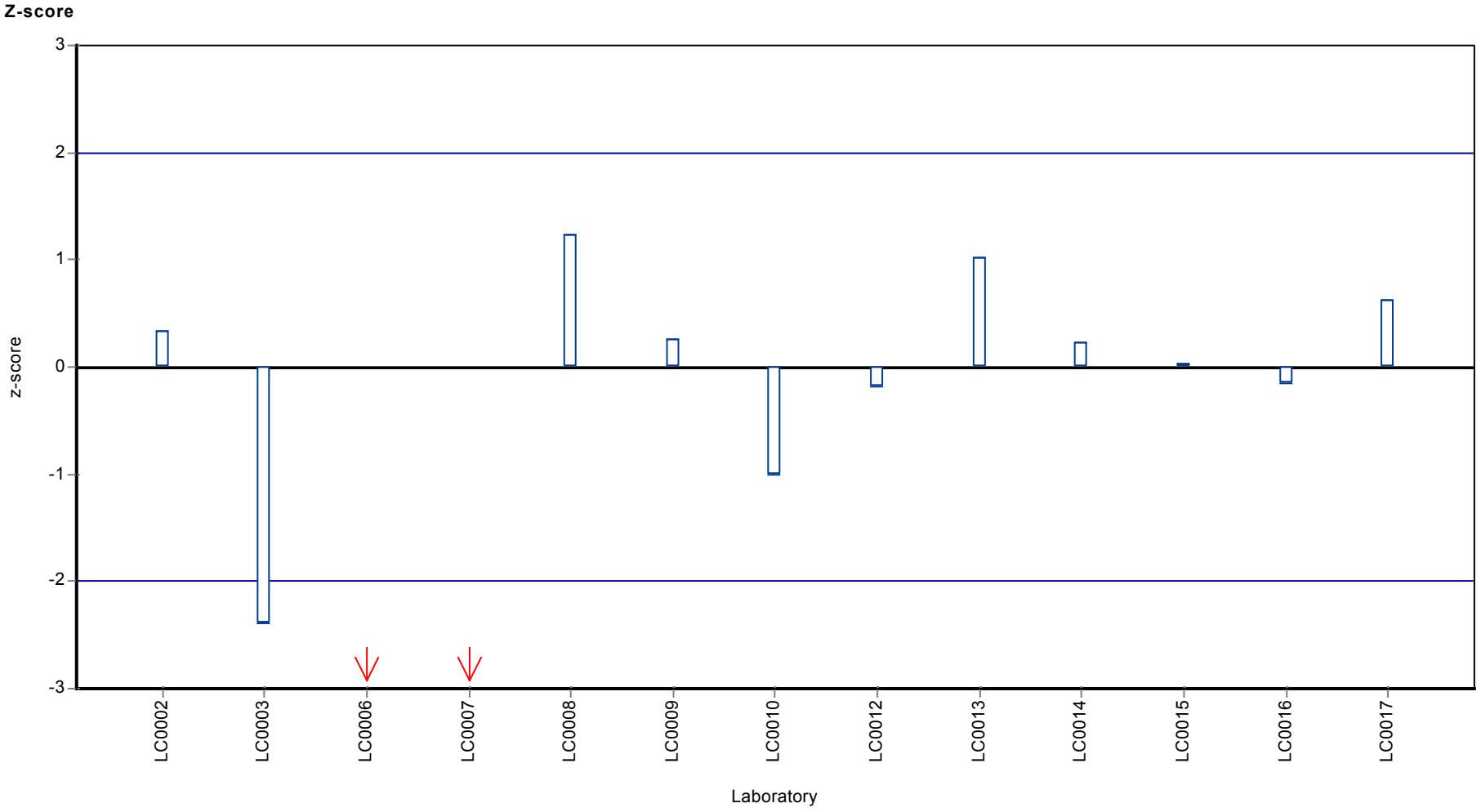
Sample: BL03, Parameter: Toluene

**Recovery rate**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Sample: BL03, Parameter: Toluene



# Parameter oriented report

## BL03

## Ethylbenzene

| | |
|---|---|
| Unit | µg/tube |
| Mean ± CI (99%) | 4.09 ± 0.372 |
| Minimum - Maximum | 3.29 - 4.6033 |
| Check value ± U | 3.7 ± 0.53 |

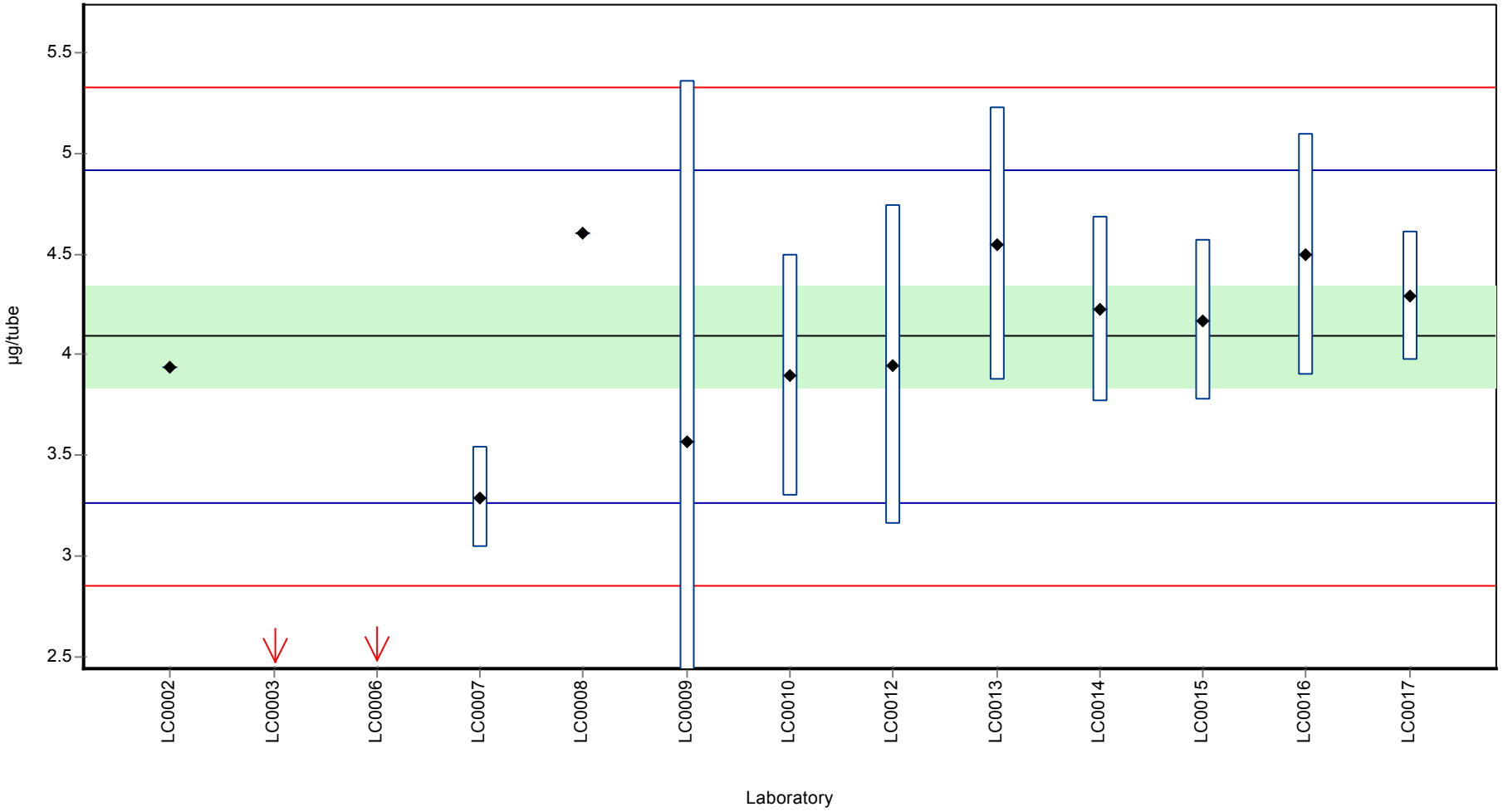
| Labcode | Result | ± U | Recovery [%] | z-score | Comments |
|---|---|---|---|---|---|
| LC0001 | - | - | - | - | |
| LC0002 | 3.940 | - | 96.3 | -0.4 | |
| LC0003 | 2.040 | 0.510 | 49.9 | -5.0 | H |
| LC0004 | - | - | - | - | |
| LC0006 | 0.950 | 0.100 | 23.2 | -7.6 | H |
| LC0007 | 3.290 | 0.250 | 80.4 | -1.9 | |
| LC0008 | 4.6033 | - | 112.5 | 1.2 | |
| LC0009 | 3.571 | 1.786 | 87.3 | -1.3 | |
| LC0010 | 3.900 | 0.600 | 95.4 | -0.5 | |
| LC0012 | 3.950 | 0.790 | 96.6 | -0.3 | |
| LC0013 | 4.550 | 0.680 | 111.2 | 1.1 | |
| LC0014 | 4.227 | 0.460 | 103.3 | 0.3 | |
| LC0015 | 4.170 | 0.400 | 102.0 | 0.2 | |
| LC0016 | 4.500 | 0.600 | 110.0 | 1.0 | |
| LC0017 | 4.290 | 0.320 | 104.9 | 0.5 | |
| LC0018 | - | - | - | - | |

**Characteristics of parameter**

| | all results | without outliners | Unit |
|---|---|---|---|
| Mean ± CI (99%) | 3.69 ± 0.889 | 4.09 ± 0.372 | µg/tube |
| Minimum | 0.95 | 3.29 | µg/tube |
| Maximum | 4.6 | 4.6 | µg/tube |
| Standard deviation | 1.07 | 0.412 | µg/tube |
| rel. Standard deviation | 28.9 | 10.1 | % |
| n | 13 | 11 | - |

**Graphical presentation of results**

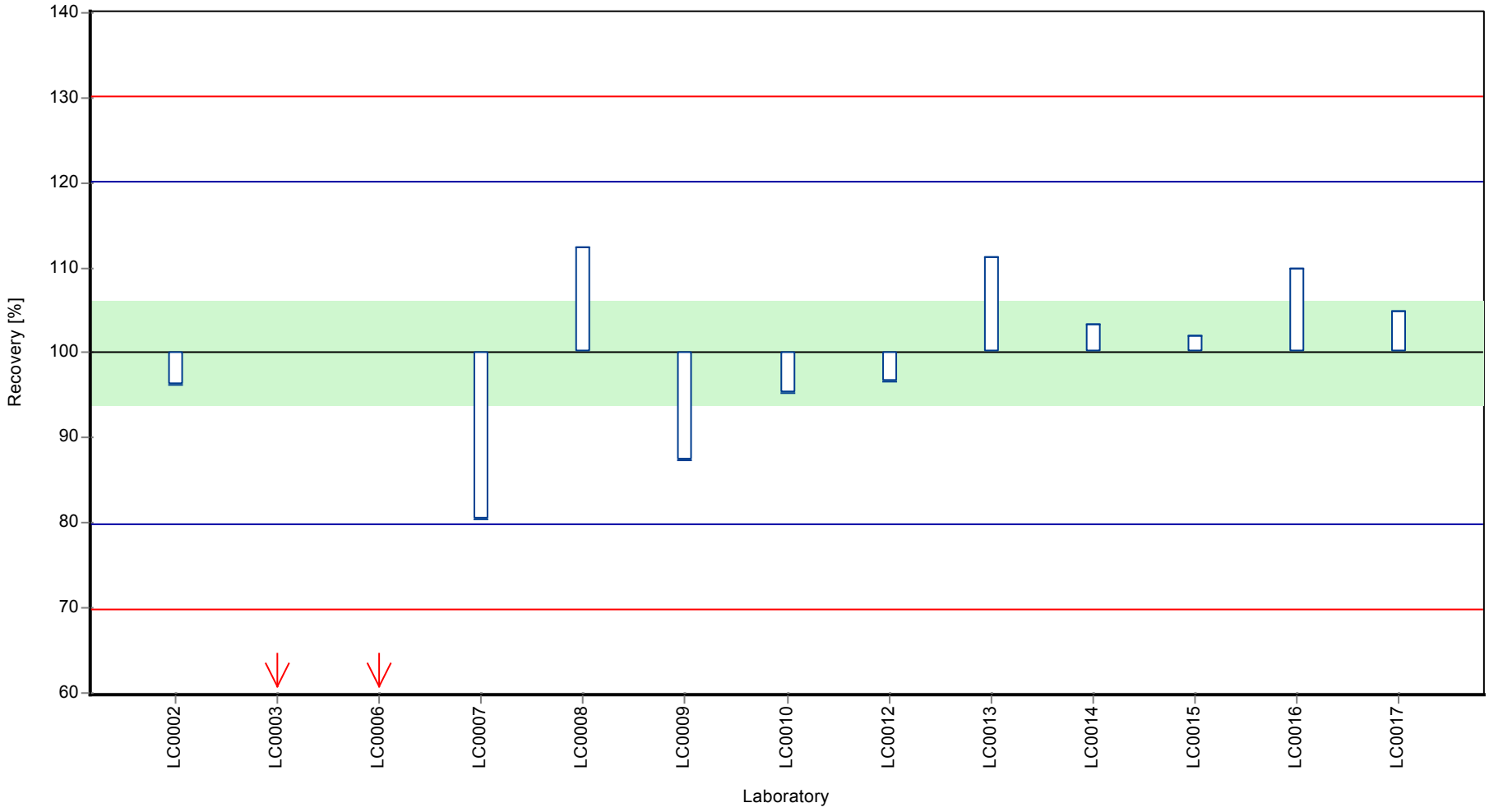
**Results**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

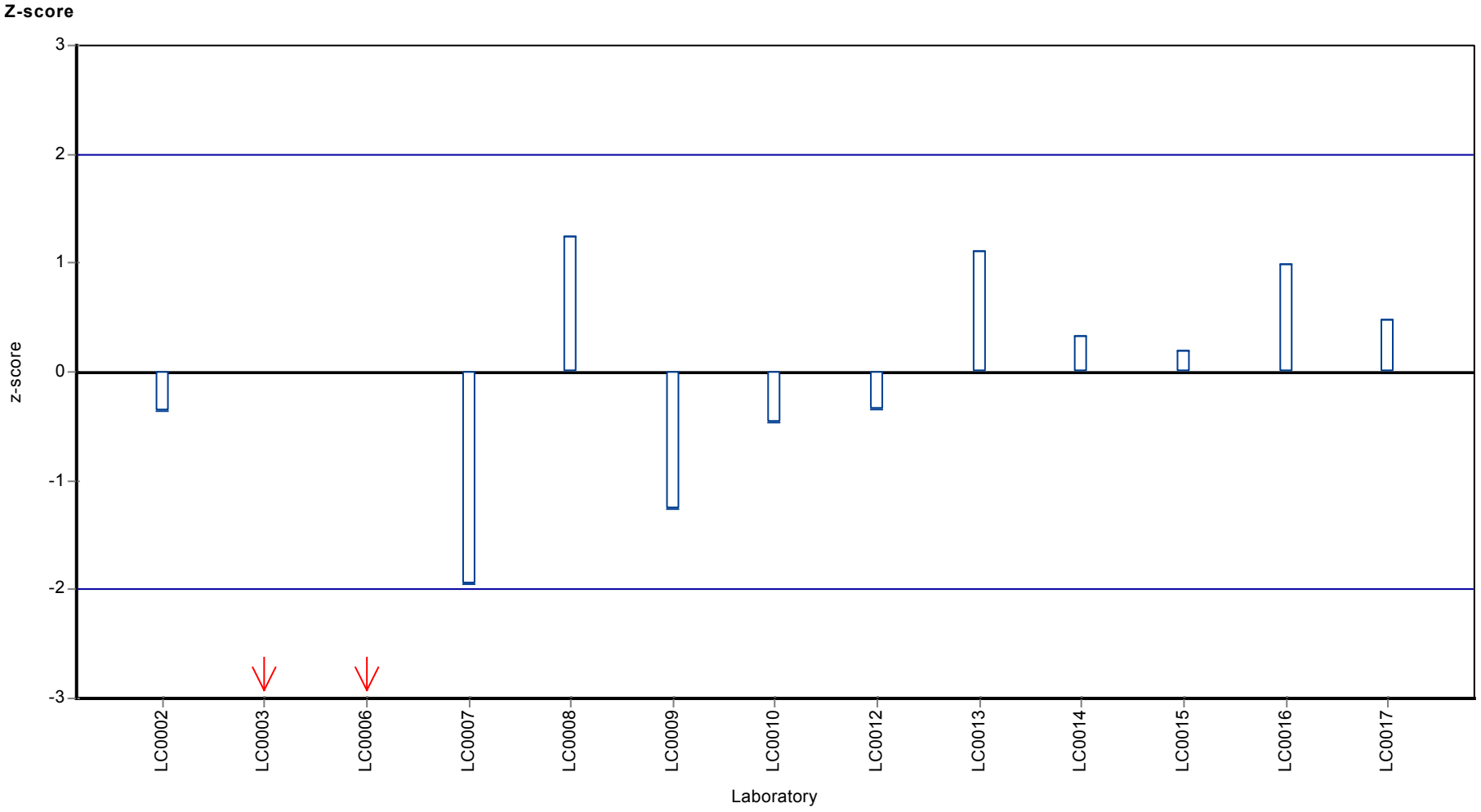
Sample: BL03, Parameter: Ethylbenzene

**Recovery rate**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Sample: BL03, Parameter: Ethylbenzene



# Parameter oriented report

## BL03

## Sum of m-Xylene and p-Xylene

| | |
|---|---|
| Unit | µg/tube |
| Mean ± CI (99%) | 7.31 ± 1.13 |
| Minimum - Maximum | 4.14 - 8.9233 |
| Check value ± U | 7.0 ± 1.1 |

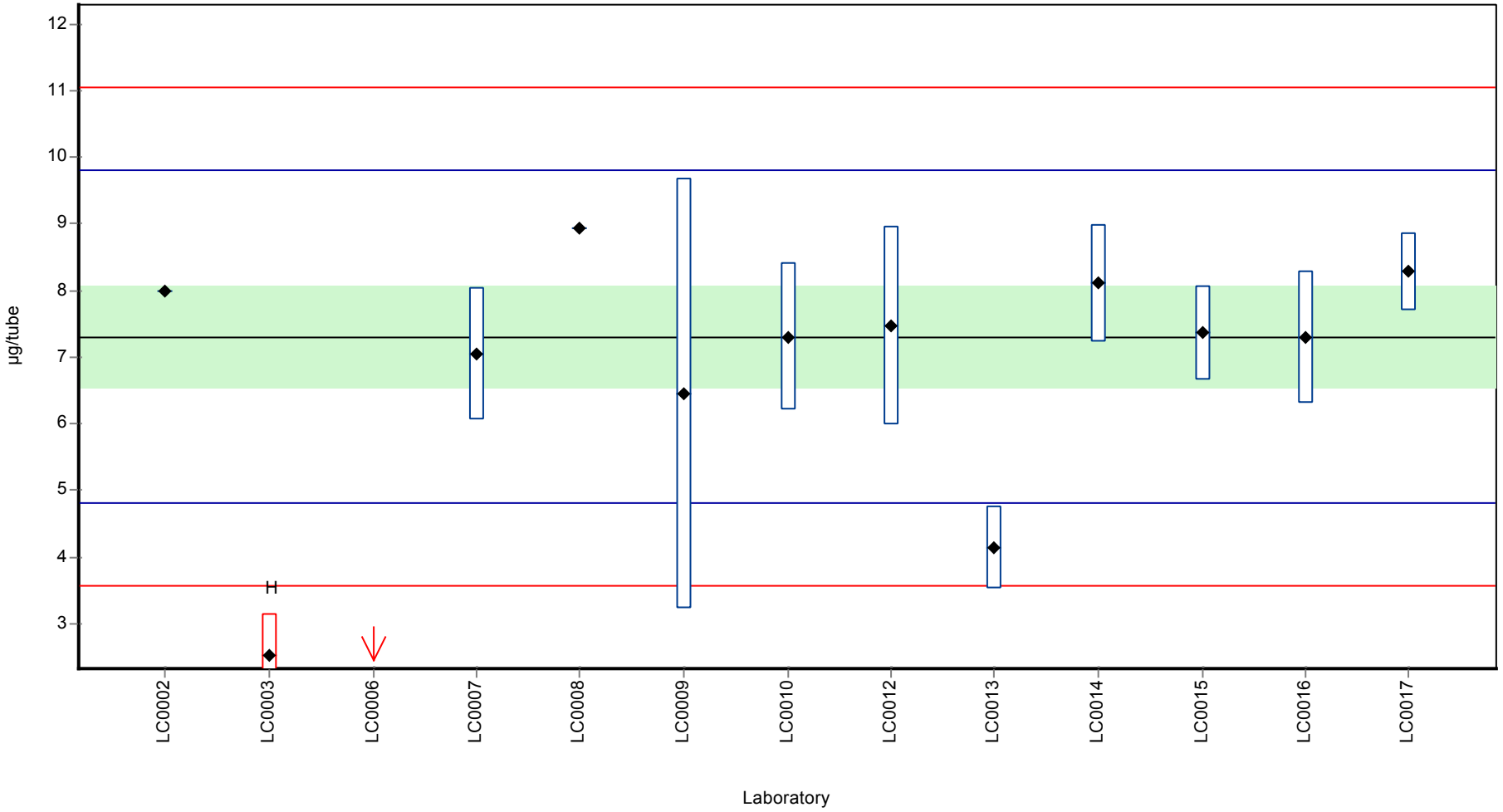
| Labcode | Result | ± U | Recovery [%] | z-score | Comments |
|---|---|---|---|---|---|
| LC0001 | - | - | - | - | |
| LC0002 | 7.990 | - | 109.4 | 0.5 | |
| LC0003 | 2.520 | 0.630 | 34.5 | -3.8 | H |
| LC0004 | - | - | - | - | |
| LC0006 | 1.970 | 0.200 | 27.0 | -4.3 | H |
| LC0007 | 7.050 | 1.000 | 96.5 | -0.2 | |
| LC0008 | 8.9233 | - | 122.1 | 1.3 | |
| LC0009 | 6.453 | 3.227 | 88.3 | -0.7 | |
| LC0010 | 7.300 | 1.100 | 99.9 | 0.0 | |
| LC0012 | 7.470 | 1.490 | 102.2 | 0.1 | |
| LC0013 | 4.140 | 0.620 | 56.7 | -2.5 | |
| LC0014 | 8.102 | 0.880 | 110.9 | 0.6 | |
| LC0015 | 7.360 | 0.700 | 100.7 | 0.0 | |
| LC0016 | 7.300 | 1.000 | 99.9 | 0.0 | |
| LC0017 | 8.280 | 0.580 | 113.3 | 0.8 | |
| LC0018 | - | - | - | - | |

**Characteristics of parameter**

| | all results | without outliners | Unit |
|---|---|---|---|
| Mean ± CI (99%) | 6.53 ± 1.85 | 7.31 ± 1.13 | µg/tube |
| Minimum | 1.97 | 4.14 | µg/tube |
| Maximum | 8.92 | 8.92 | µg/tube |
| Standard deviation | 2.22 | 1.25 | µg/tube |
| rel. Standard deviation | 34 | 17 | % |
| n | 13 | 11 | - |

**Graphical presentation of results**

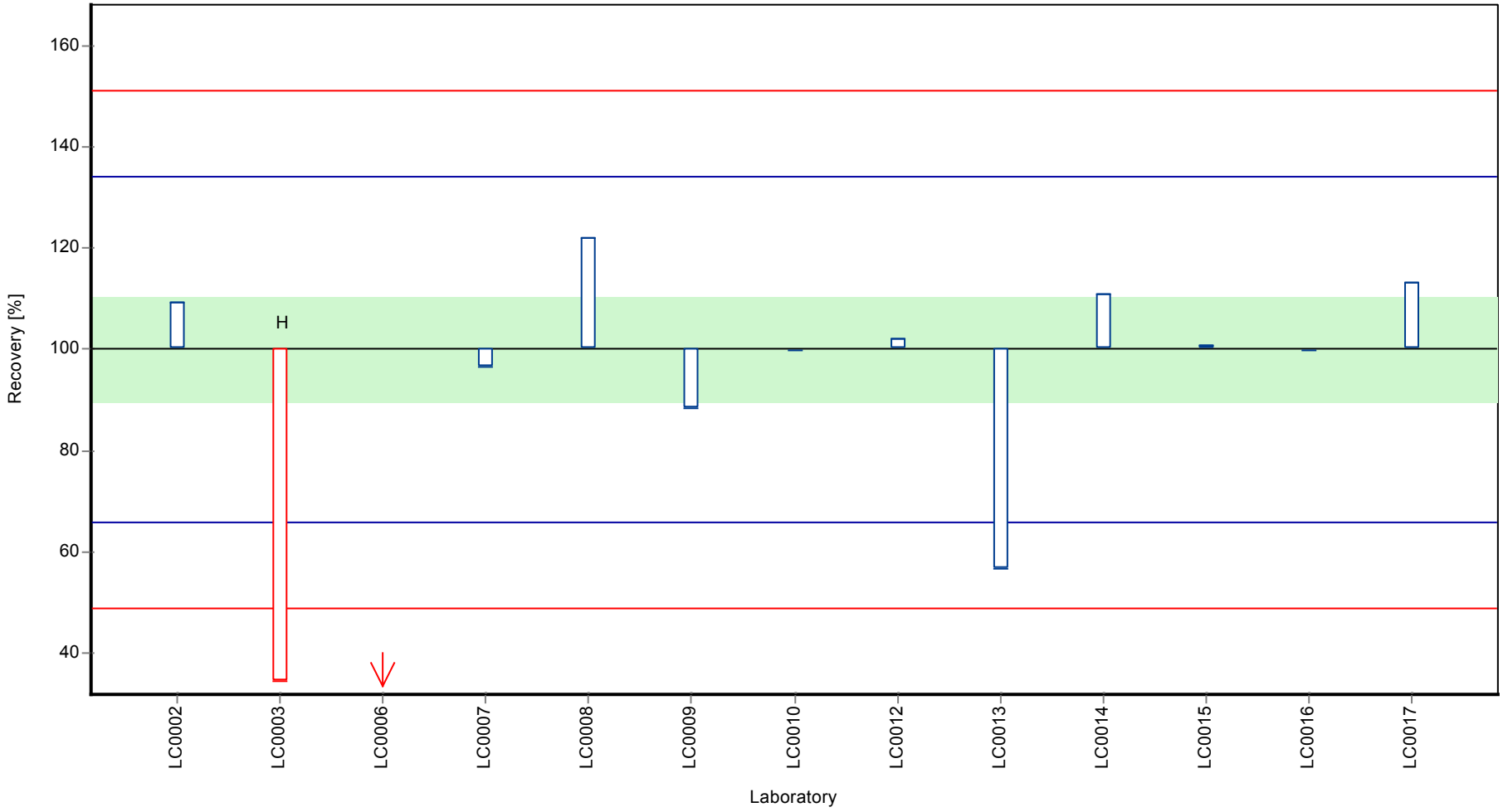
**Results**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

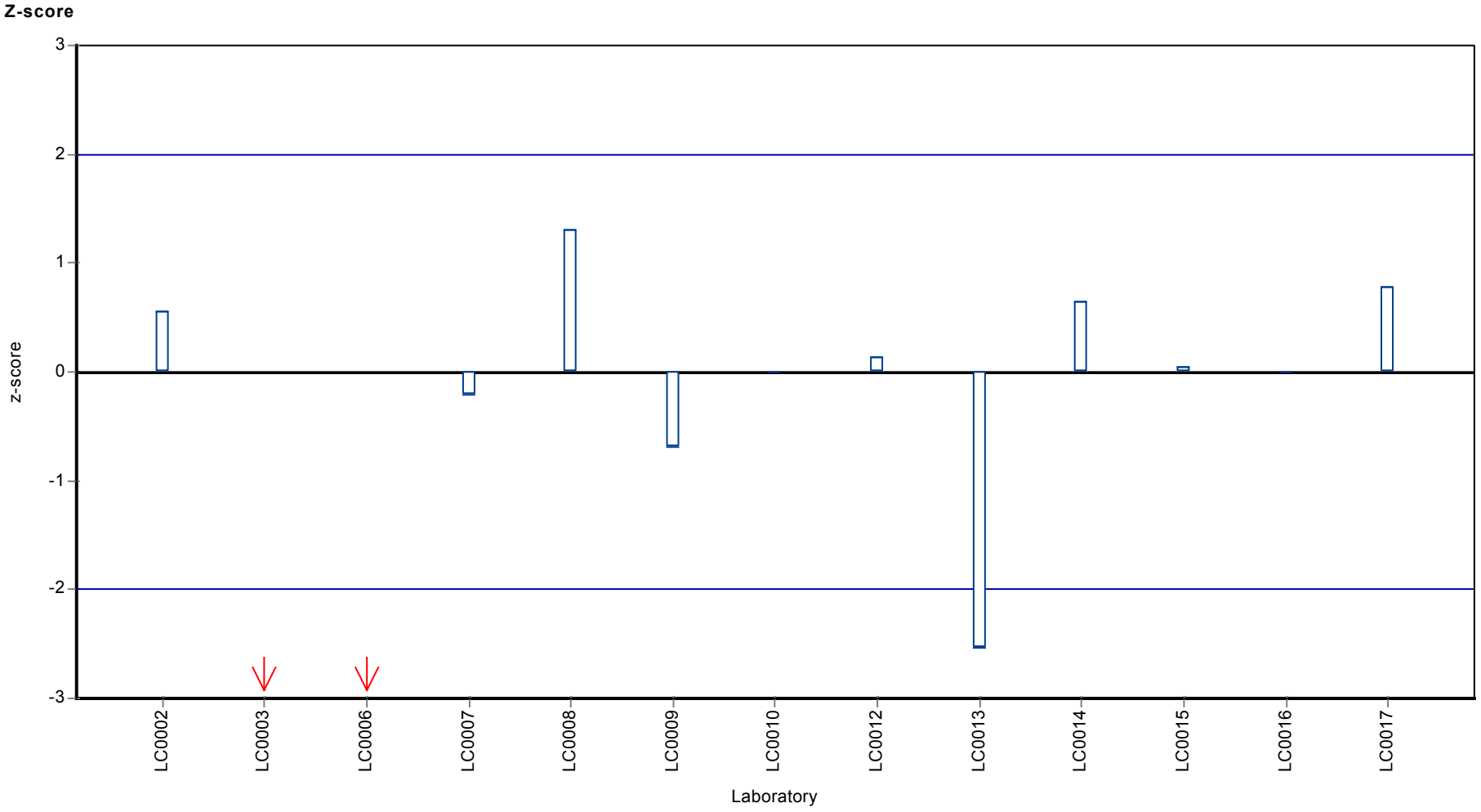
Sample: BL03, Parameter: Sum of m-Xylene and p-Xylene

**Recovery rate**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Sample: BL03, Parameter: Sum of m-Xylene and p-Xylene



# Parameter oriented report

## BL03

## o-Xylene

| | |
|---|---|
| Unit | µg/tube |
| Mean ± CI (99%) | 3.85 ± 0.378 |
| Minimum - Maximum | 3.3 - 4.51 |
| Check value ± U | 3.5 ± 0.58 |

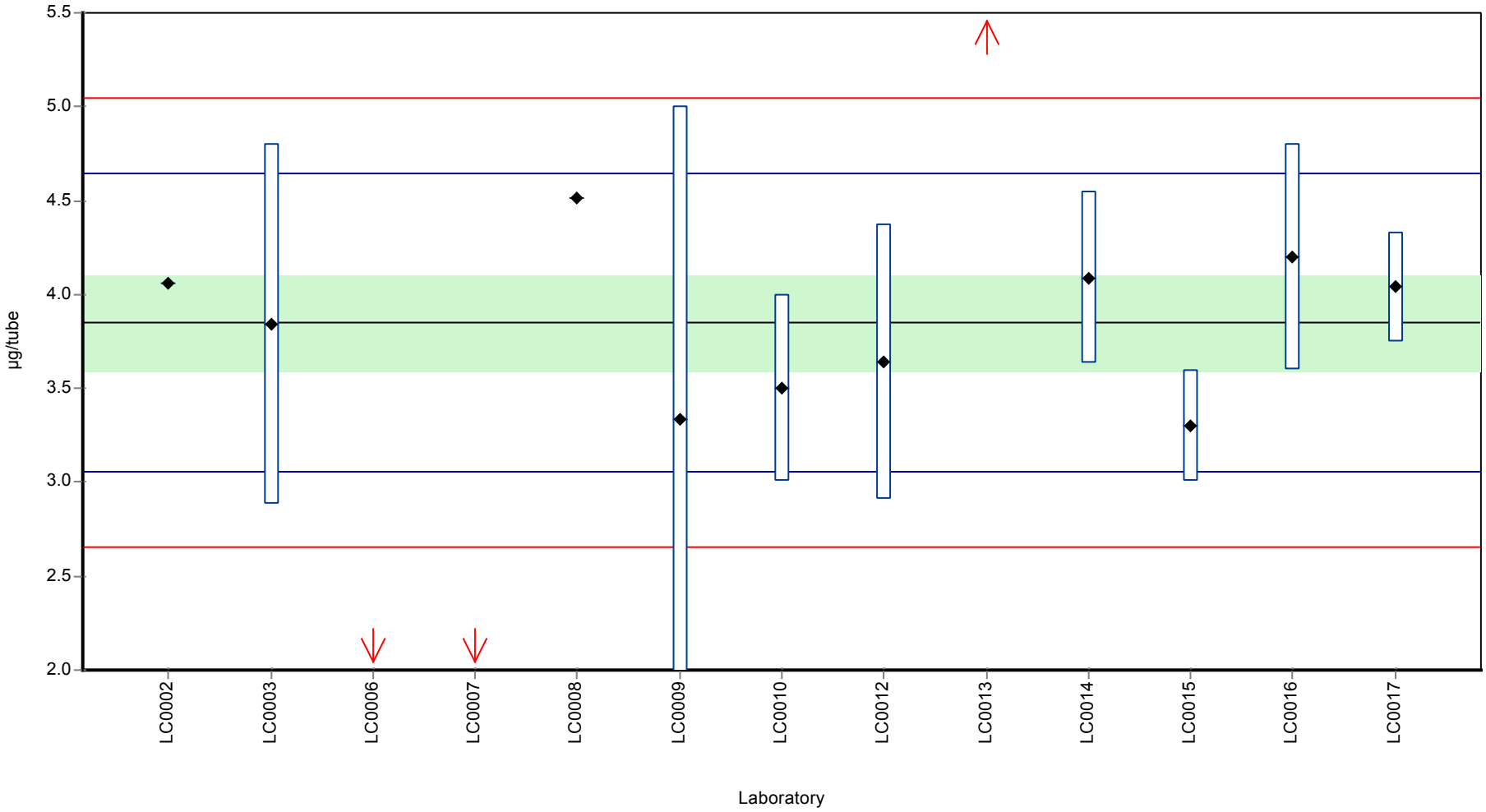
| Labcode | Result | ± U | Recovery [%] | z-score | Comments |
|---|---|---|---|---|---|
| LC0001 | - | - | - | - | |
| LC0002 | 4.060 | - | 105.4 | 0.5 | |
| LC0003 | 3.840 | 0.960 | 99.7 | 0.0 | |
| LC0004 | - | - | - | - | |
| LC0006 | 0.960 | 0.100 | 24.9 | -7.3 | H |
| LC0007 | 1.960 | 0.250 | 50.9 | -4.7 | H |
| LC0008 | 4.510 | - | 117.1 | 1.7 | |
| LC0009 | 3.335 | 1.668 | 86.6 | -1.3 | |
| LC0010 | 3.500 | 0.500 | 90.9 | -0.9 | |
| LC0012 | 3.640 | 0.730 | 94.5 | -0.5 | |
| LC0013 | 8.760 | 1.310 | 227.4 | 12.3 | H |
| LC0014 | 4.090 | 0.460 | 106.2 | 0.6 | |
| LC0015 | 3.300 | 0.300 | 85.7 | -1.4 | |
| LC0016 | 4.200 | 0.600 | 109.0 | 0.9 | |
| LC0017 | 4.040 | 0.290 | 104.9 | 0.5 | |
| LC0018 | - | - | - | - | |

**Characteristics of parameter**

| | all results | without outliners | Unit |
|---|---|---|---|
| Mean ± CI (99%) | 3.86 ± 1.47 | 3.85 ± 0.378 | µg/tube |
| Minimum | 0.96 | 3.3 | µg/tube |
| Maximum | 8.76 | 4.51 | µg/tube |
| Standard deviation | 1.77 | 0.399 | µg/tube |
| rel. Standard deviation | 45.8 | 10.4 | % |
| n | 13 | 10 | - |

**Graphical presentation of results**

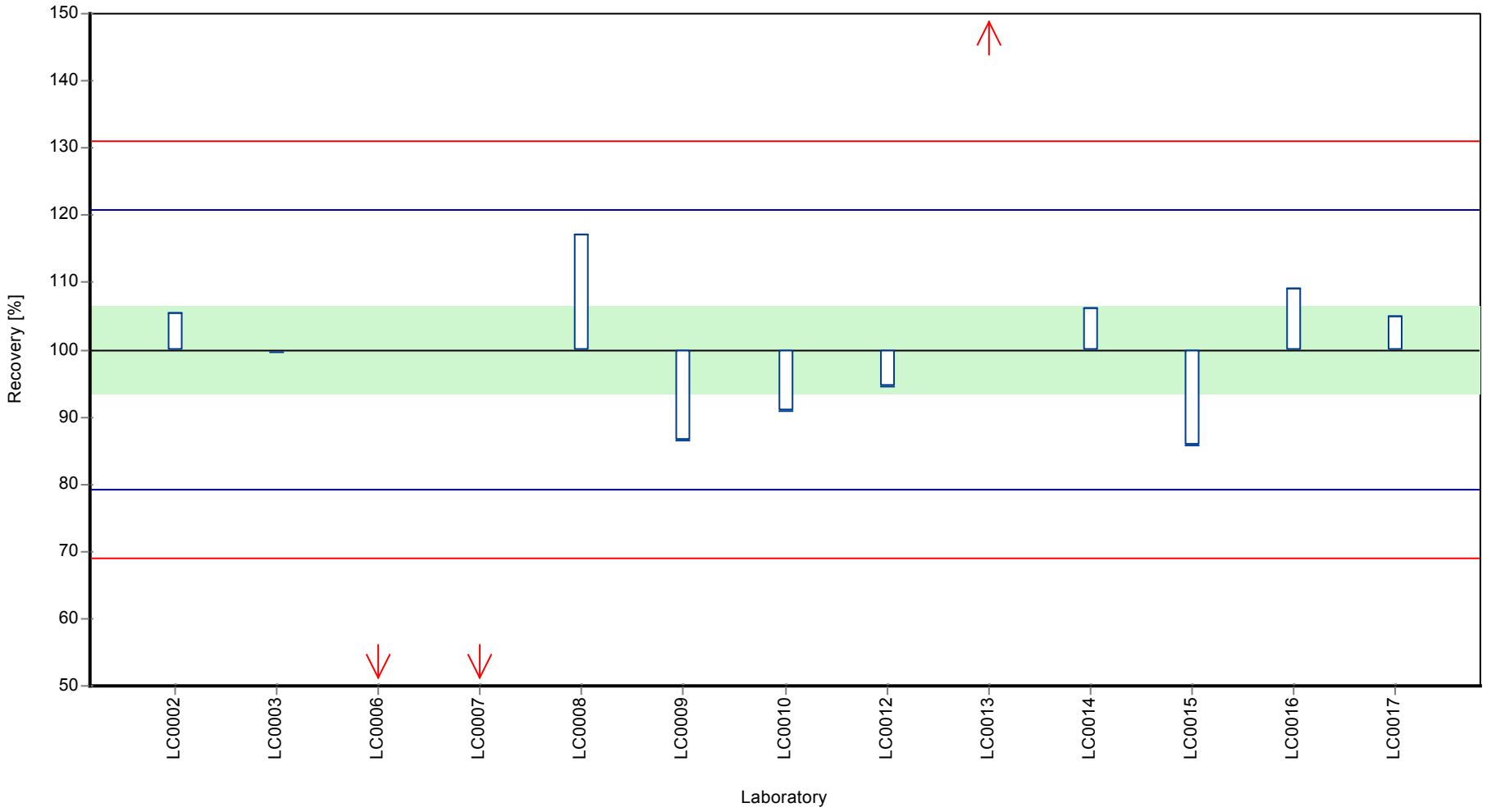
**Results**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Sample: BL03, Parameter: o-Xylene

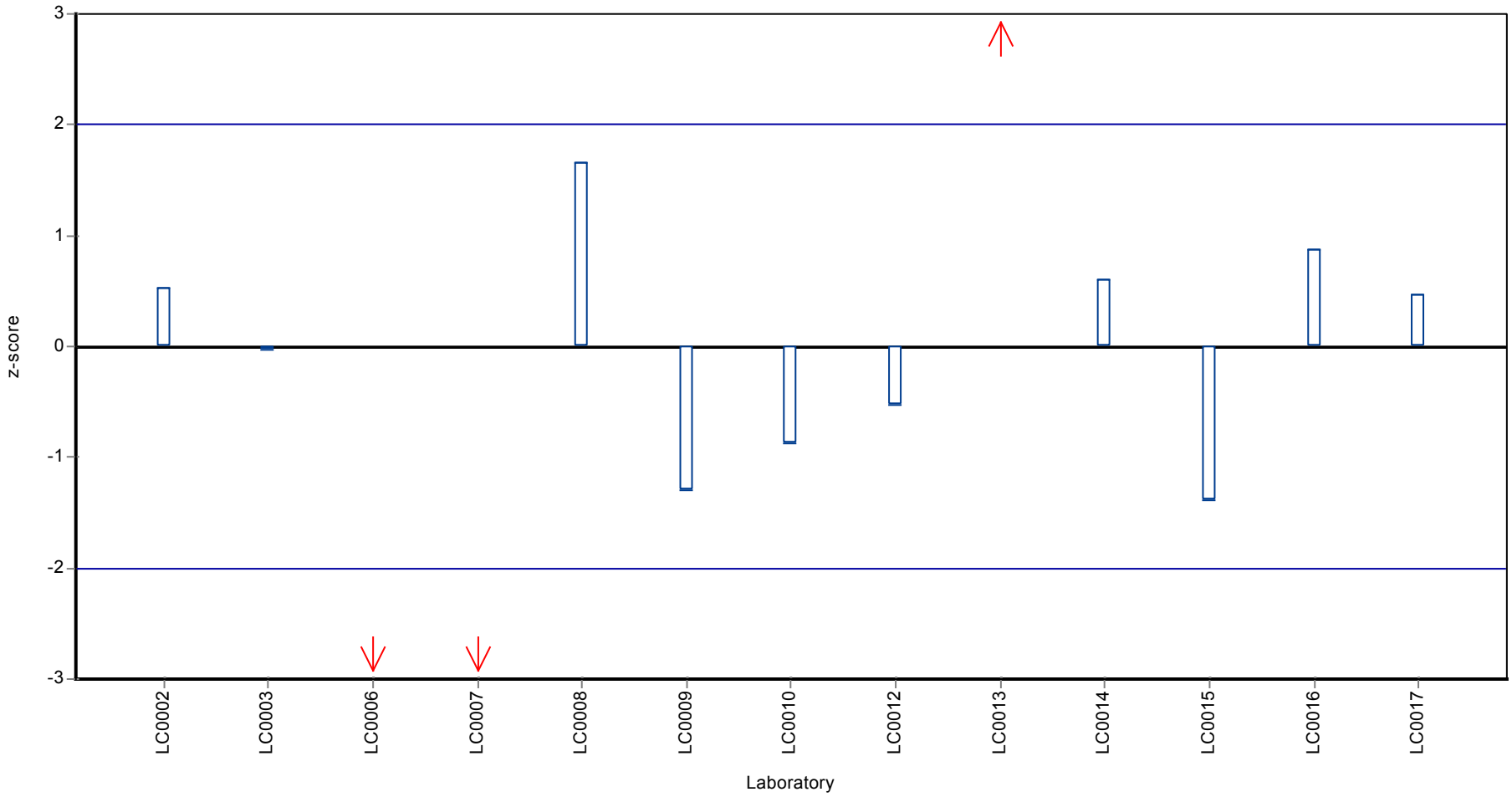
**Recovery rate**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Sample: BL03, Parameter: o-Xylene

**Z-score**



# Parameter oriented report

## CL02

### 1,1,1-Trichloroethane

| | |
|---|---|
| Unit | µg/tube |
| Mean ± CI (99%) | 21.3 ± 5.17 |
| Minimum - Maximum | 10.8 - 26.35 |
| Check value ± U | 24 ± 1.3 |

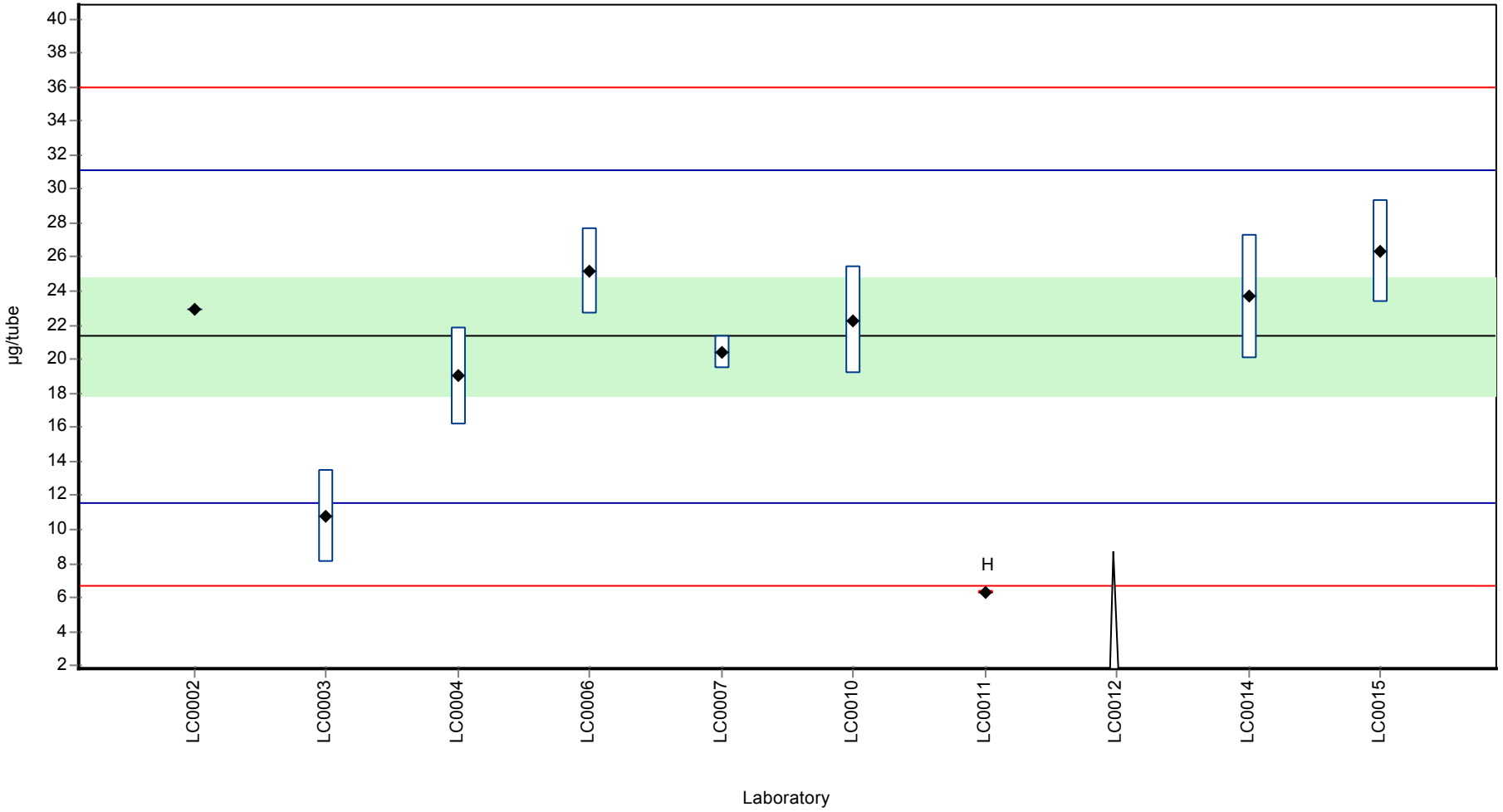
| Labcode | Result | ± U | Recovery [%] | z-score | Comments |
|---|---|---|---|---|---|
| LC0002 | 22.930 | - | 107.5 | 0.3 | |
| LC0003 | 10.800 | 2.700 | 50.6 | -2.2 | |
| LC0004 | 19.000 | 2.850 | 89.1 | -0.5 | |
| LC0005 | - | - | - | - | |
| LC0006 | 25.200 | 2.520 | 118.1 | 0.8 | |
| LC0007 | 20.400 | 1.000 | 95.6 | -0.2 | |
| LC0010 | 22.300 | 3.200 | 104.5 | 0.2 | |
| LC0011 | 6.340 | 0.100 | 29.7 | -3.1 | H |
| LC0012 | - | - | - | - | |
| LC0014 | 23.674 | 3.670 | 111.0 | 0.5 | |
| LC0015 | 26.350 | 3.000 | 123.5 | 1.0 | |

**Characteristics of parameter**

| | all results | without outliners | Unit |
|---|---|---|---|
| Mean ± CI (99%) | 19.7 ± 6.77 | 21.3 ± 5.17 | µg/tube |
| Minimum | 6.34 | 10.8 | µg/tube |
| Maximum | 26.4 | 26.4 | µg/tube |
| Standard deviation | 6.77 | 4.87 | µg/tube |
| rel. Standard deviation | 34.4 | 22.9 | % |
| n | 9 | 8 | - |

**Graphical presentation of results**

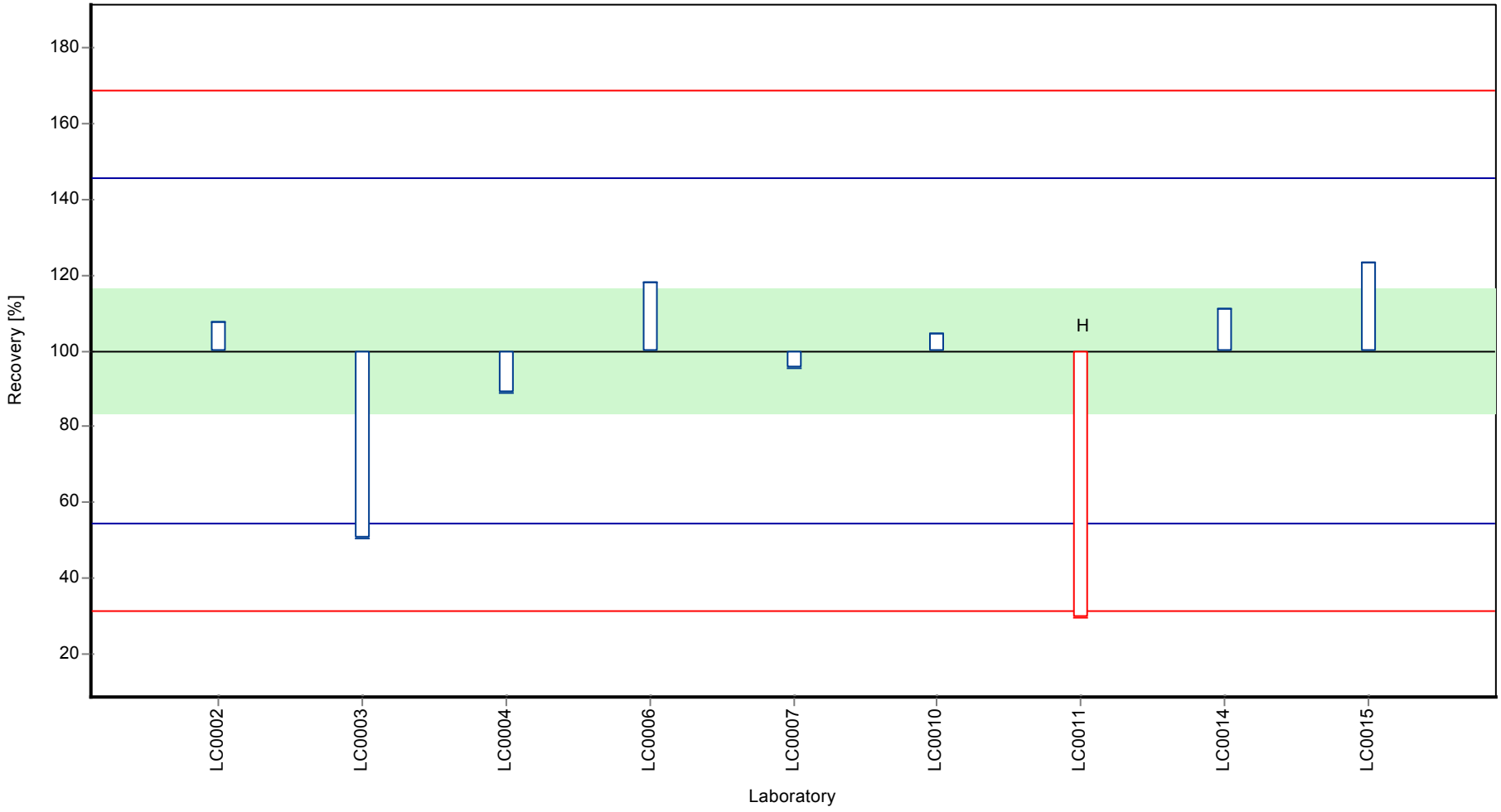
**Results**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

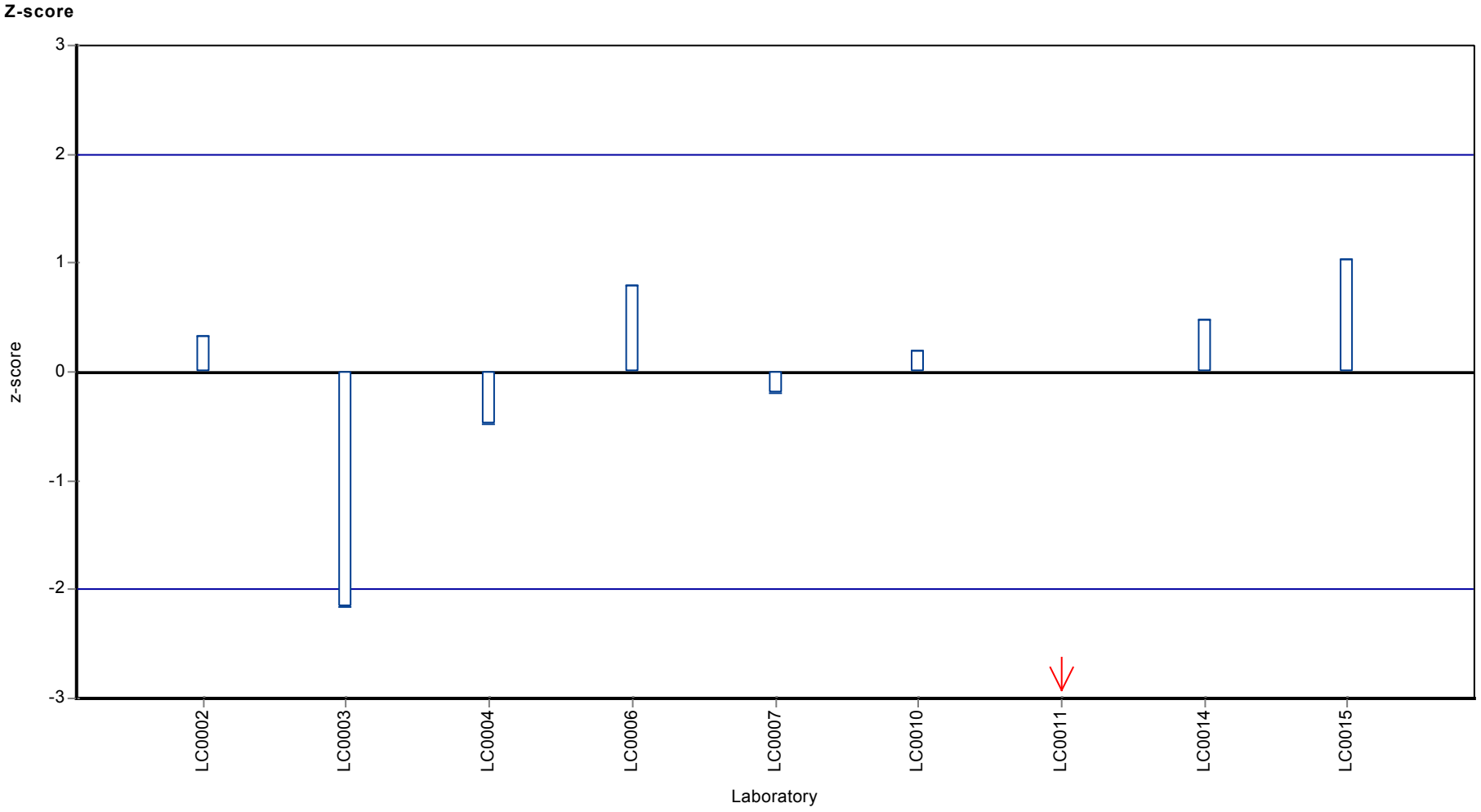
Sample: CL02, Parameter: 1,1,1-Trichloroethane

**Recovery rate**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Sample: CL02, Parameter: 1,1,1-Trichloroethane



# Parameter oriented report

## CL02

## cis-1,2-Dichloroethene

| | |
|---|---|
| Unit | µg/tube |
| Mean ± CI (99%) | 18.8 ± 6.21 |
| Minimum - Maximum | 12.3 - 27.03 |
| Check value ± U | 24 ± 1 |

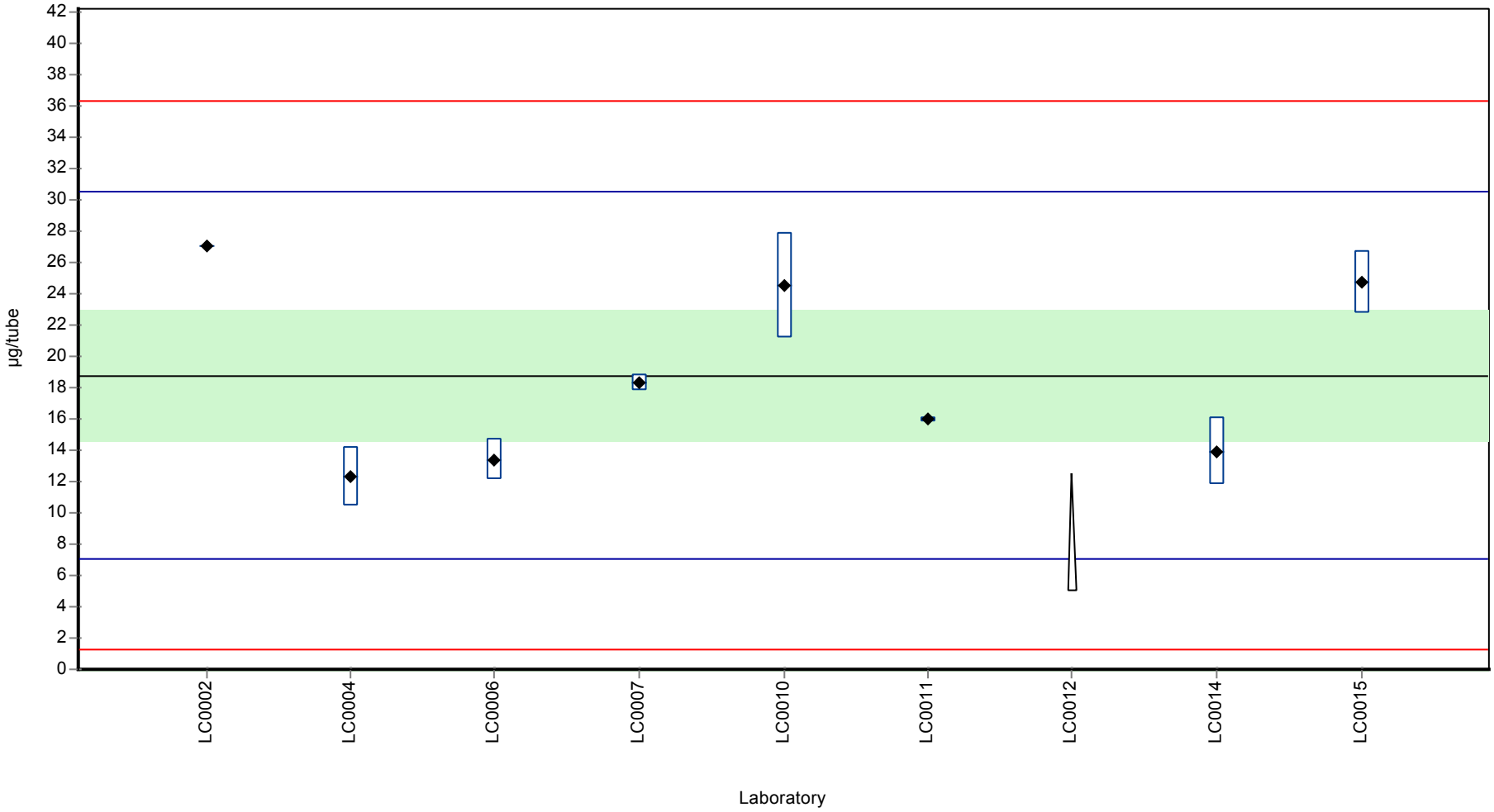
| Labcode | Result | ± U | Recovery [%] | z-score | Comments |
|---|---|---|---|---|---|
| LC0002 | 27.030 | - | 144.1 | 1.4 | |
| LC0003 | - | - | - | - | |
| LC0004 | 12.300 | 1.850 | 65.6 | -1.1 | |
| LC0005 | - | - | - | - | |
| LC0006 | 13.400 | 1.340 | 71.4 | -0.9 | |
| LC0007 | 18.300 | 0.500 | 97.5 | -0.1 | |
| LC0010 | 24.500 | 3.400 | 130.6 | 1.0 | |
| LC0011 | 15.940 | 0.200 | 85.0 | -0.5 | |
| LC0012 | - | - | - | - | |
| LC0014 | 13.889 | 2.150 | 74.0 | -0.8 | |
| LC0015 | 24.750 | 2.000 | 131.9 | 1.0 | |

**Characteristics of parameter**

| | all results | without outliners | Unit |
|---|---|---|---|
| Mean ± CI (99%) | 18.8 ± 6.21 | 18.8 ± 6.21 | µg/tube |
| Minimum | 12.3 | 12.3 | µg/tube |
| Maximum | 27 | 27 | µg/tube |
| Standard deviation | 5.85 | 5.85 | µg/tube |
| rel. Standard deviation | 31.2 | 31.2 | % |
| n | 8 | 8 | - |

**Graphical presentation of results**

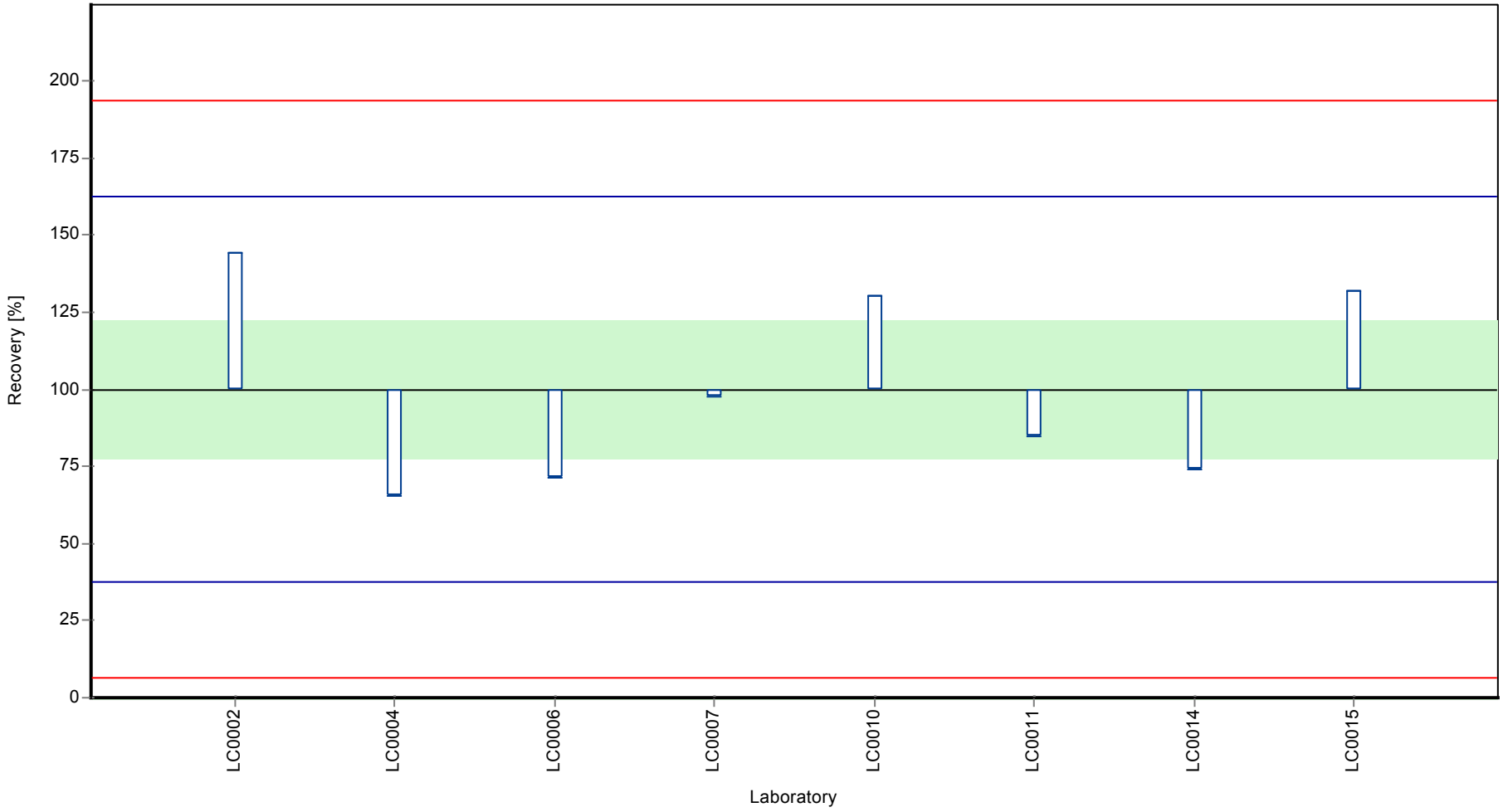
**Results**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Sample: CL02, Parameter: cis-1,2-Dichloroethene

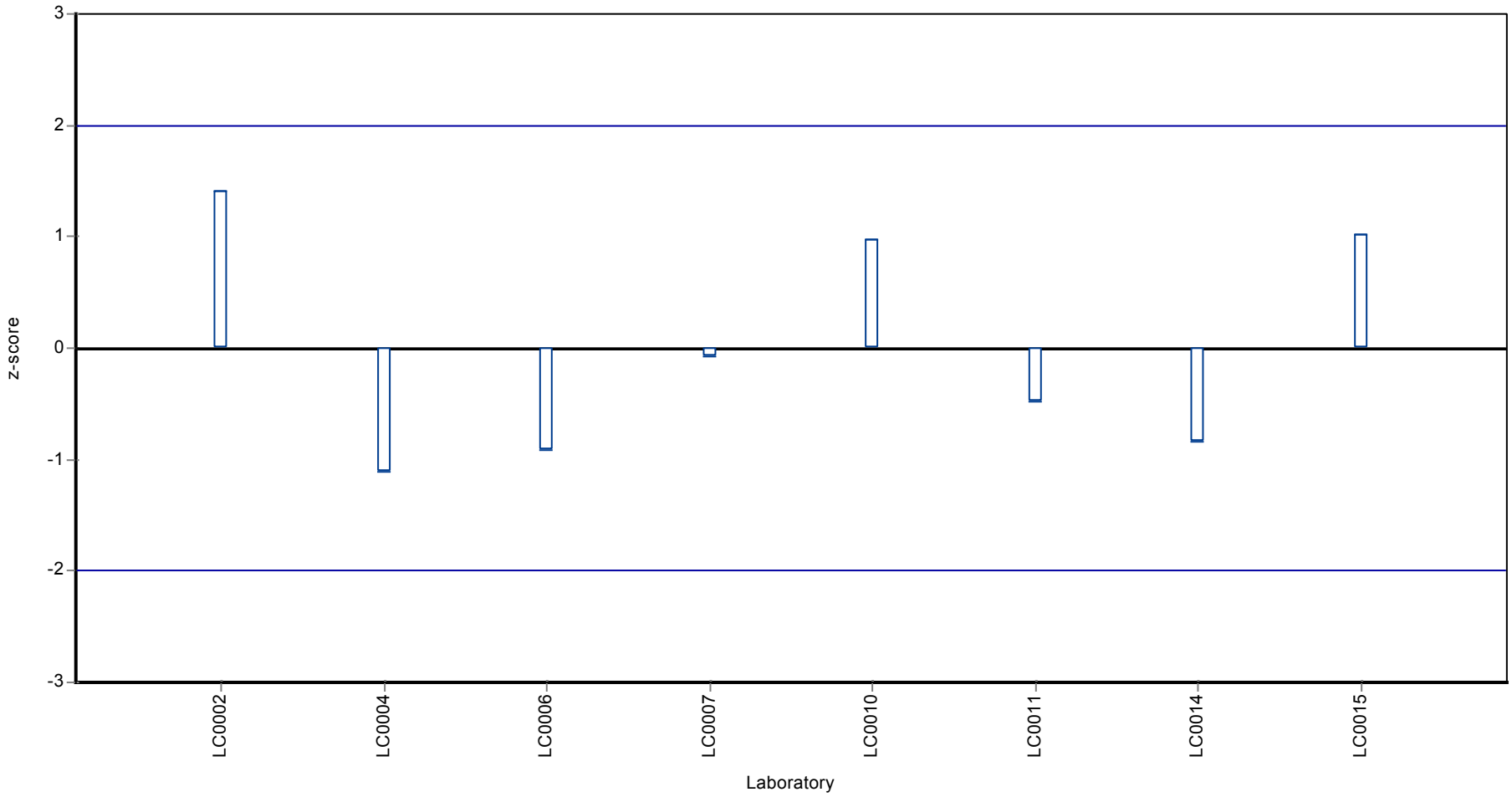
**Recovery rate**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Sample: CL02, Parameter: cis-1,2-Dichloroethene

**Z-score**



# Parameter oriented report

## CL02

## Tetrachloromethane

| | |
|---|---|
| Unit | µg/tube |
| Mean ± CI (99%) | 30.4 ± 14.7 |
| Minimum - Maximum | 9.15 - 48.2 |
| Check value ± U | 37 ± 3.1 |

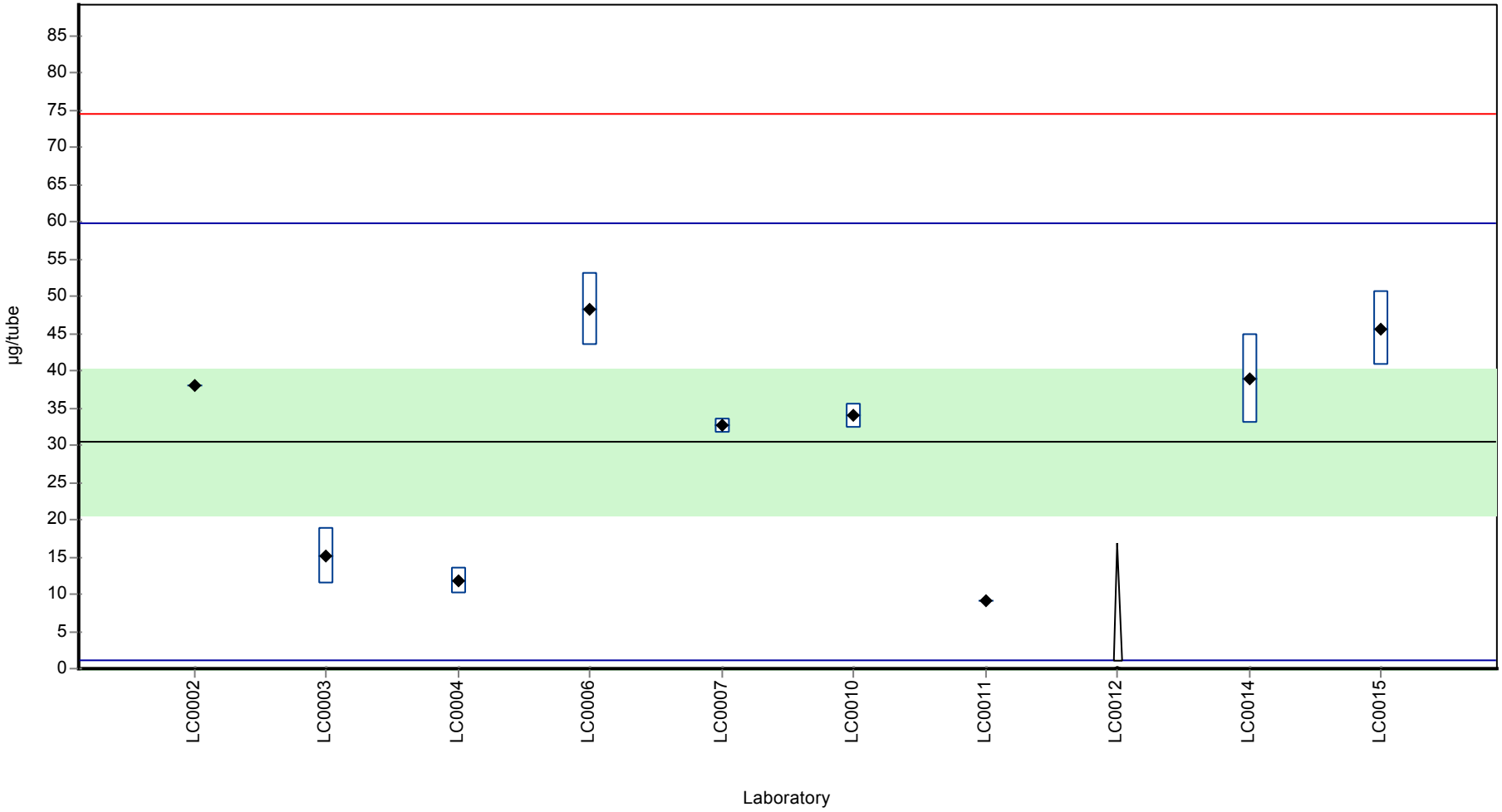
| Labcode | Result | ± U | Recovery [%] | z-score | Comments |
|---|---|---|---|---|---|
| LC0002 | 38.100 | - | 125.4 | 0.5 | |
| LC0003 | 15.200 | 3.800 | 50.0 | -1.0 | |
| LC0004 | 11.800 | 1.760 | 38.8 | -1.3 | |
| LC0005 | - | - | - | - | |
| LC0006 | 48.200 | 4.820 | 158.7 | 1.2 | |
| LC0007 | 32.600 | 1.000 | 107.3 | 0.2 | |
| LC0010 | 33.900 | 1.700 | 111.6 | 0.2 | |
| LC0011 | 9.150 | 0.100 | 30.1 | -1.4 | |
| LC0012 | - | - | - | - | |
| LC0014 | 38.807 | 6.020 | 127.7 | 0.6 | |
| LC0015 | 45.660 | 5.000 | 150.3 | 1.0 | |

**Characteristics of parameter**

| | all results | without outliners | Unit |
|---|---|---|---|
| Mean ± CI (99%) | 30.4 ± 14.7 | 30.4 ± 14.7 | µg/tube |
| Minimum | 9.15 | 9.15 | µg/tube |
| Maximum | 48.2 | 48.2 | µg/tube |
| Standard deviation | 14.7 | 14.7 | µg/tube |
| rel. Standard deviation | 48.3 | 48.3 | % |
| n | 9 | 9 | - |

**Graphical presentation of results**

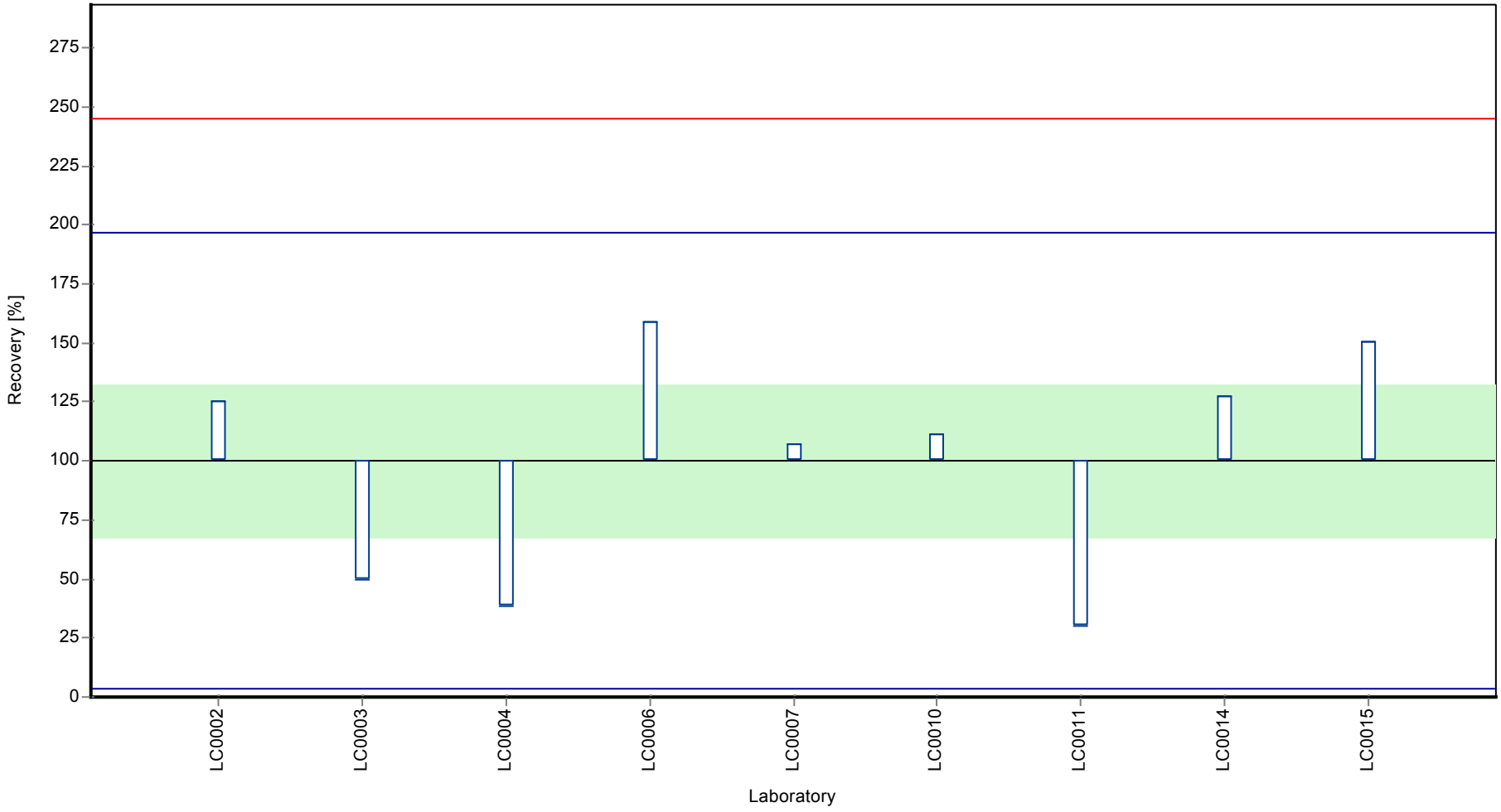
**Results**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

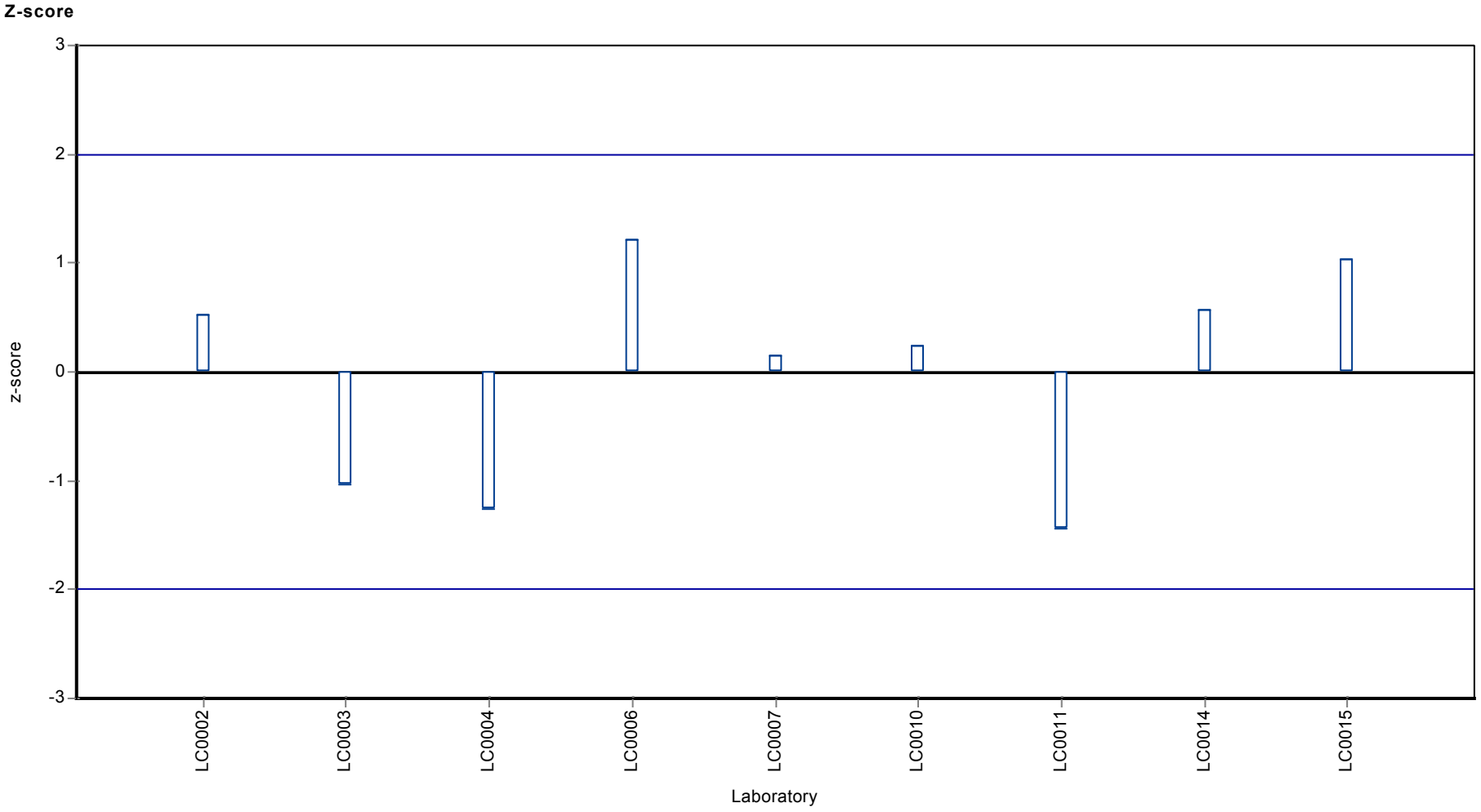
Sample: CL02, Parameter: Tetrachloromethane

**Recovery rate**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Sample: CL02, Parameter: Tetrachloromethane



# Parameter oriented report

## CL02

## Trichloromethane

| | |
|---|---|
| Unit | µg/tube |
| Mean ± Cl (99%) | 29.7 ± 2.42 |
| Minimum - Maximum | 25.6 - 32.81 |
| Check value ± U | 30 ± 1.4 |

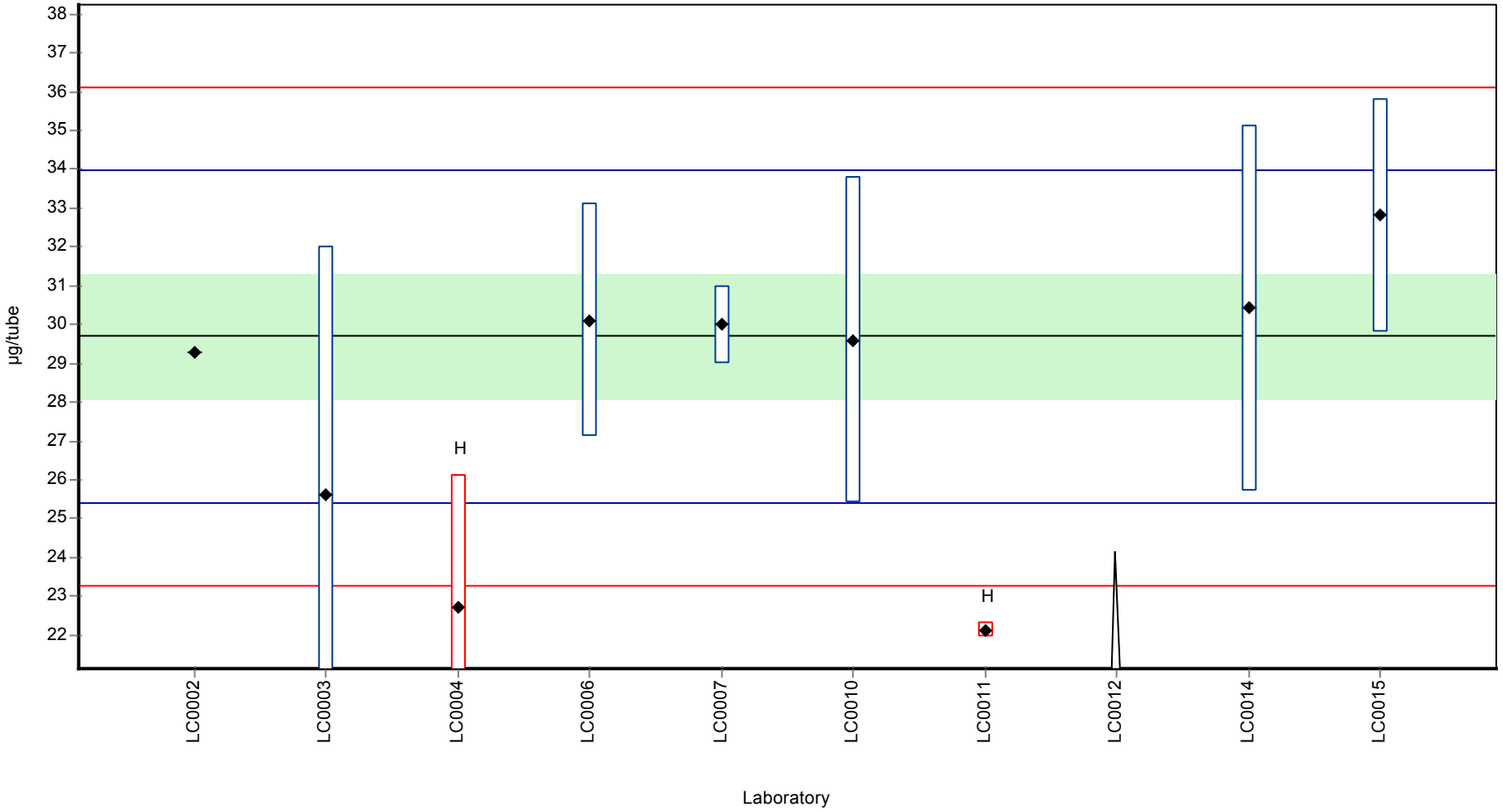
| Labcode | Result | ± U | Recovery [%] | z-score | Comments |
|---|---|---|---|---|---|
| LC0002 | 29.300 | - | 98.7 | -0.2 | |
| LC0003 | 25.600 | 6.400 | 86.2 | -1.9 | |
| LC0004 | 22.700 | 3.410 | 76.5 | -3.3 | H |
| LC0005 | - | - | - | - | |
| LC0006 | 30.100 | 3.010 | 101.4 | 0.2 | |
| LC0007 | 30.000 | 1.000 | 101.0 | 0.1 | |
| LC0010 | 29.600 | 4.200 | 99.7 | 0.0 | |
| LC0011 | 22.130 | 0.200 | 74.5 | -3.5 | H |
| LC0012 | - | - | - | - | |
| LC0014 | 30.421 | 4.720 | 102.5 | 0.3 | |
| LC0015 | 32.810 | 3.000 | 110.5 | 1.5 | |

**Characteristics of parameter**

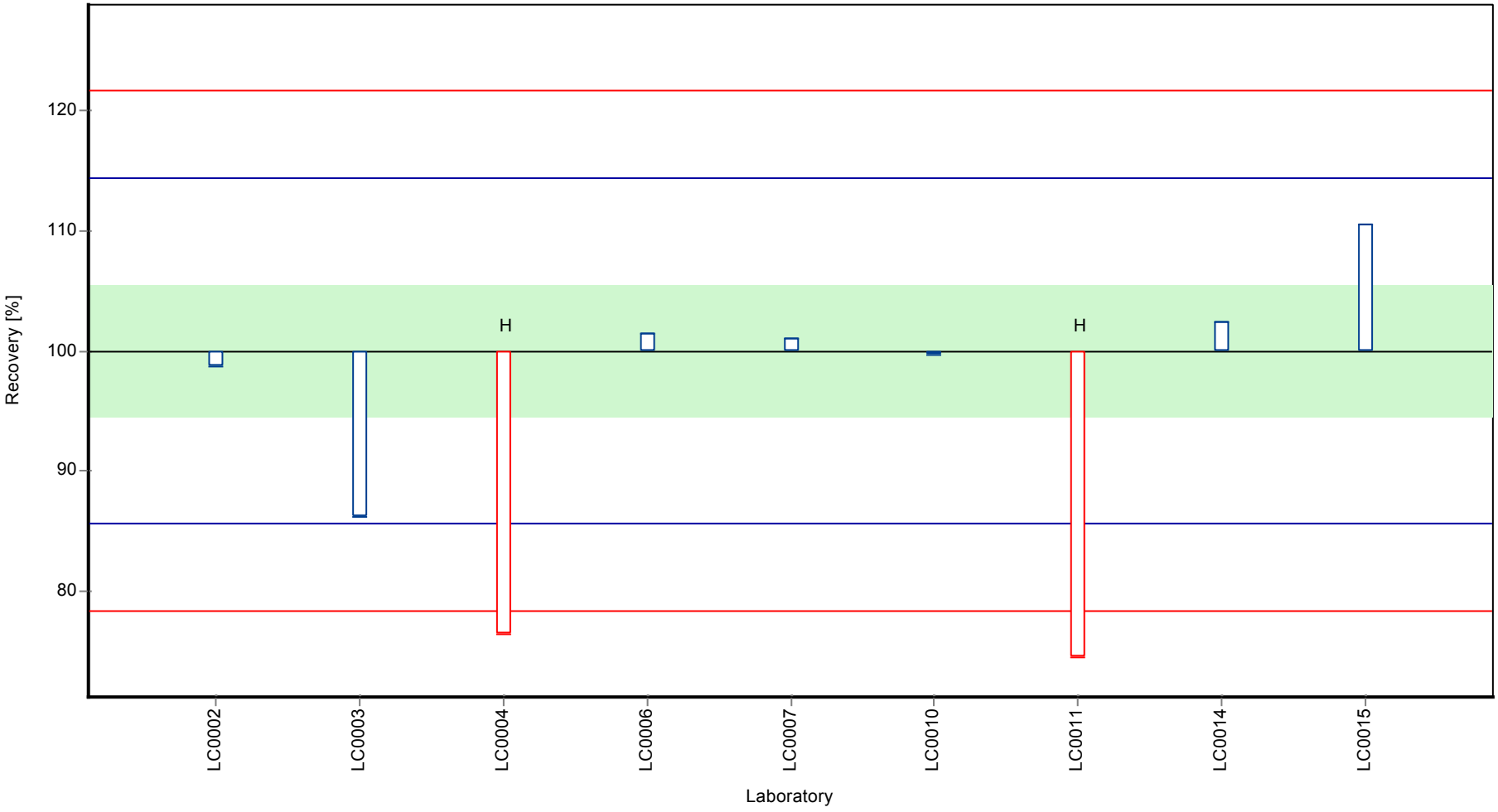
| | all results | without outliners | Unit |
|---|---|---|---|
| Mean ± Cl (99%) | 28.1 ± 3.71 | 29.7 ± 2.42 | µg/tube |
| Minimum | 22.1 | 25.6 | µg/tube |
| Maximum | 32.8 | 32.8 | µg/tube |
| Standard deviation | 3.71 | 2.14 | µg/tube |
| rel. Standard deviation | 13.2 | 7.2 | % |
| n | 9 | 7 | - |

**Graphical presentation of results**

**Results**

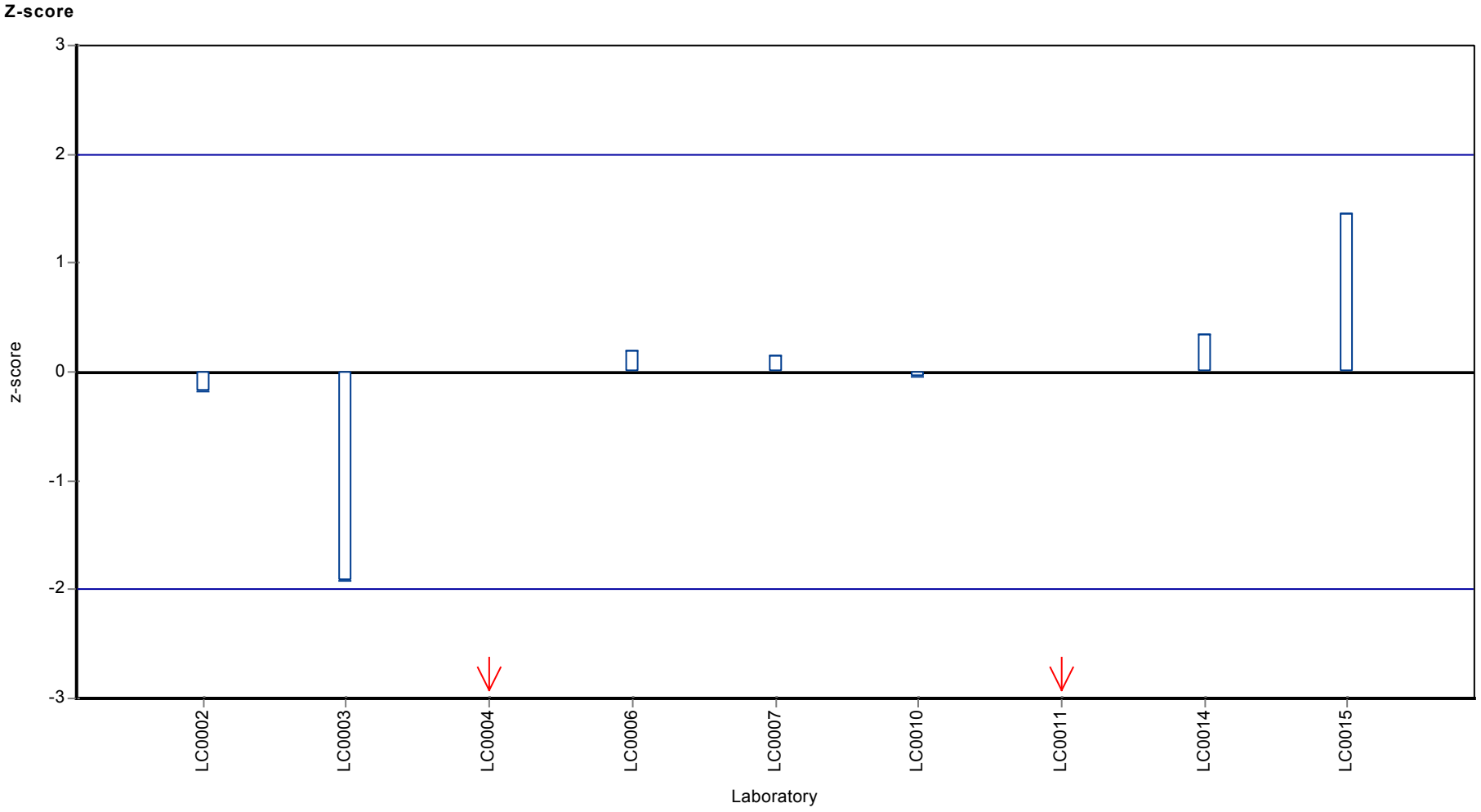


**Recovery rate**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Sample: CL02, Parameter: Trichloromethane



# Parameter oriented report

## CL02

## Tetrachloroethene

| | |
|---|---|
| Unit | µg/tube |
| Mean ± CI (99%) | 25.7 ± 14 |
| Minimum - Maximum | 3.8 - 39.02 |
| Check value ± U | 37 ± 4 |

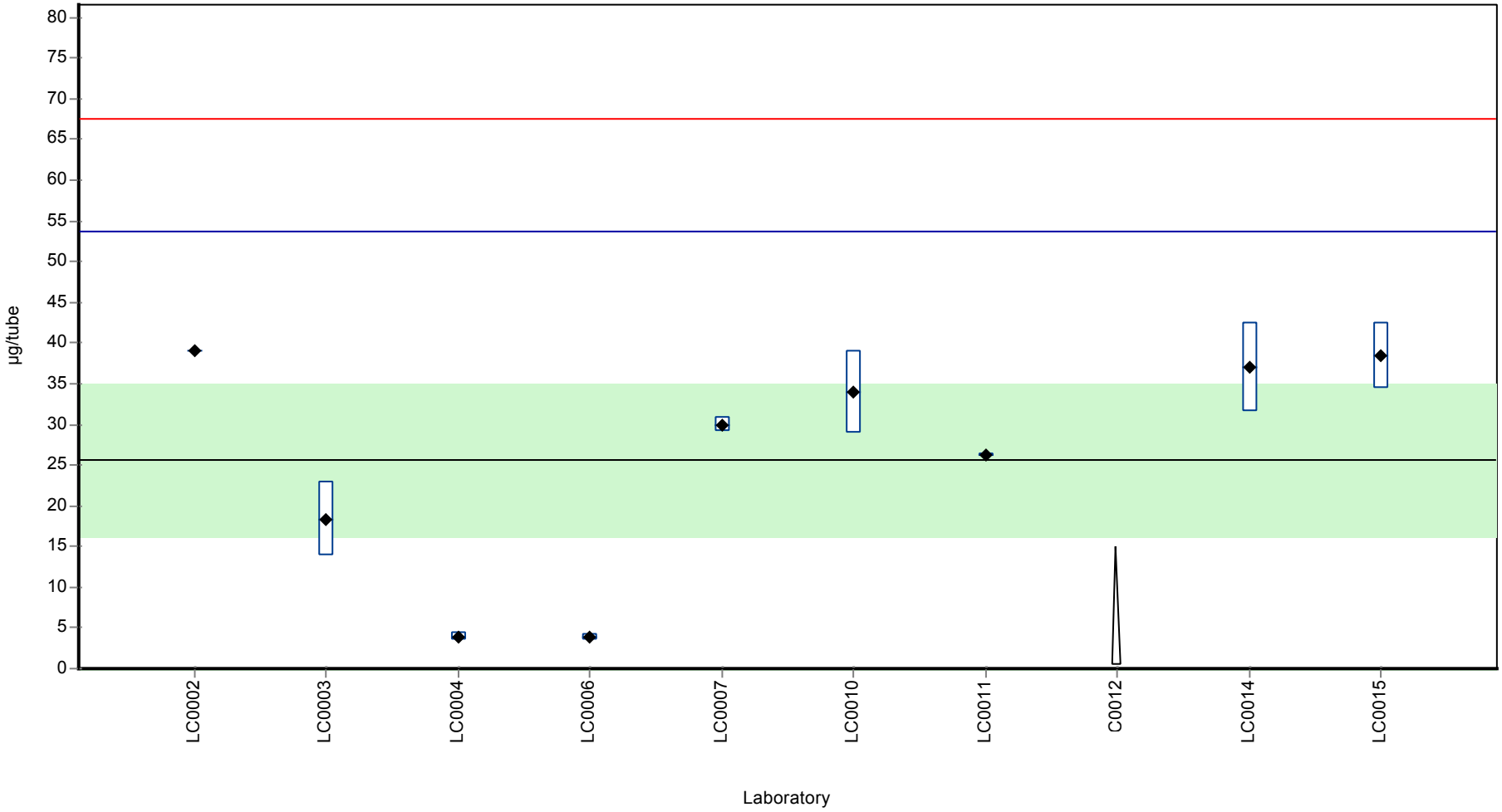
| Labcode | Result | ± U | Recovery [%] | z-score | Comments |
|---|---|---|---|---|---|
| LC0002 | 39.020 | - | 152.1 | 1.0 | |
| LC0003 | 18.400 | 4.600 | 71.7 | -0.5 | |
| LC0004 | 3.950 | 0.590 | 15.4 | -1.6 | |
| LC0005 | - | - | - | - | |
| LC0006 | 3.800 | 0.380 | 14.8 | -1.6 | |
| LC0007 | 30.000 | 1.000 | 116.9 | 0.3 | |
| LC0010 | 34.000 | 5.100 | 132.5 | 0.6 | |
| LC0011 | 26.180 | 0.200 | 102.0 | 0.0 | |
| LC0012 | - | - | - | - | |
| LC0014 | 37.072 | 5.520 | 144.5 | 0.8 | |
| LC0015 | 38.470 | 4.000 | 150.0 | 0.9 | |

**Characteristics of parameter**

| | all results | without outliners | Unit |
|---|---|---|---|
| Mean ± CI (99%) | 25.7 ± 14 | 25.7 ± 14 | µg/tube |
| Minimum | 3.8 | 3.8 | µg/tube |
| Maximum | 39 | 39 | µg/tube |
| Standard deviation | 14 | 14 | µg/tube |
| rel. Standard deviation | 54.5 | 54.5 | % |
| n | 9 | 9 | - |

**Graphical presentation of results**

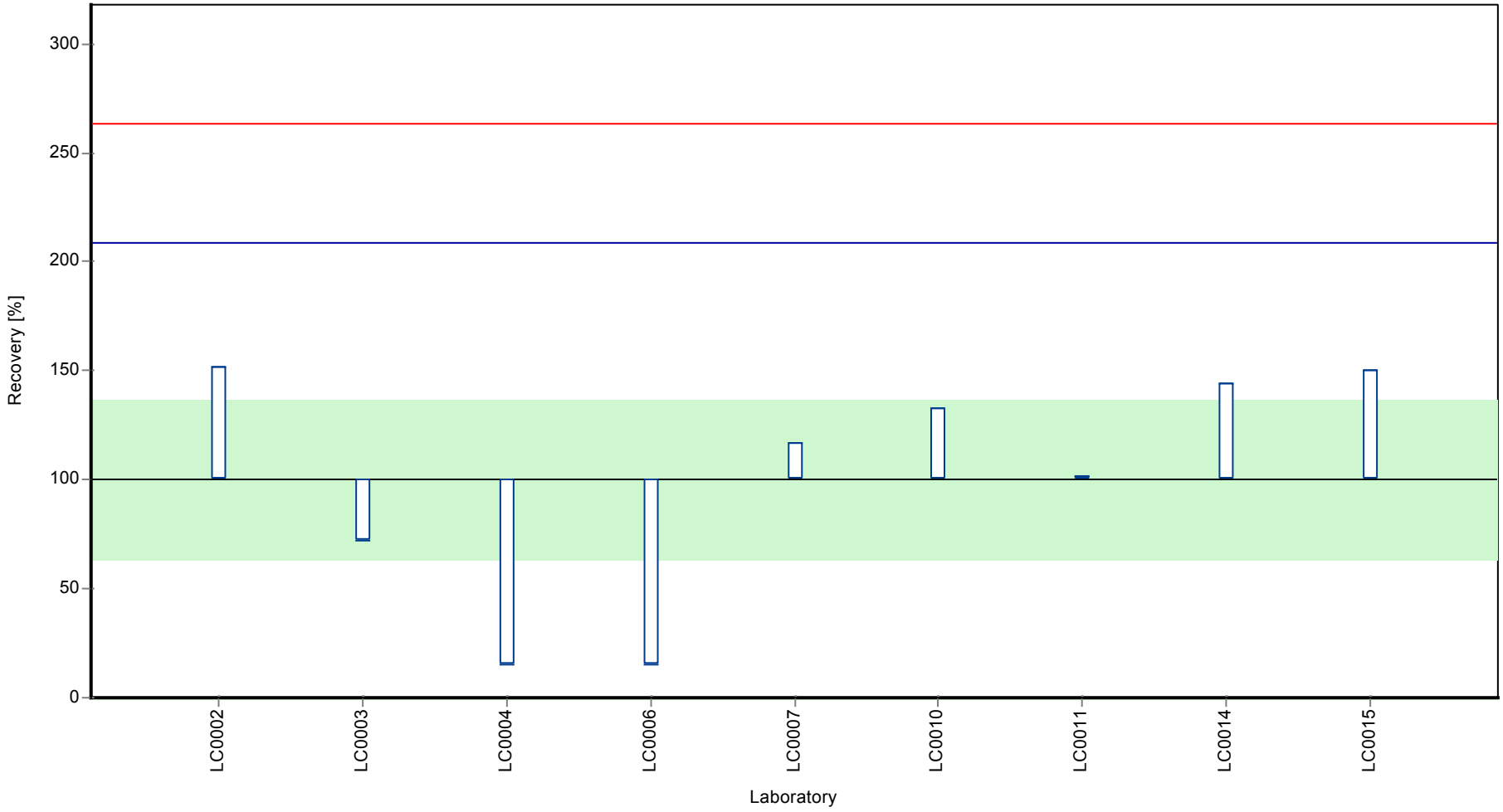
**Results**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Sample: CL02, Parameter: Tetrachloroethene

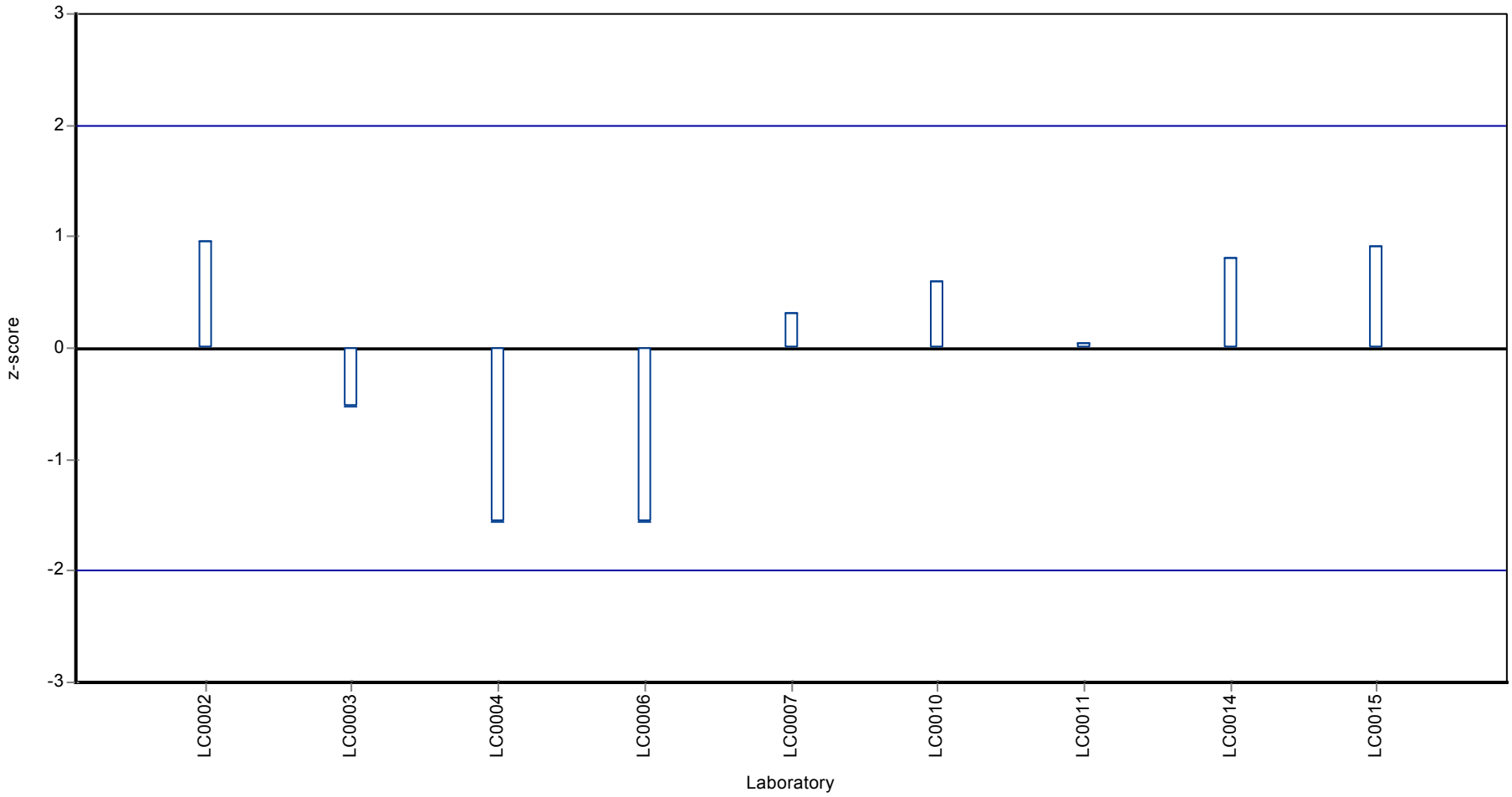
**Recovery rate**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Sample: CL02, Parameter: Tetrachloroethene

**Z-score**



# Parameter oriented report

## CL02

### trans-1,2-Dichloroethene

| | |
|---|---|
| Unit | µg/tube |
| Mean ± CI (99%) | 16.2 ± 10.2 |
| Minimum - Maximum | 6.72 - 29.61 |
| Check value ± U | 25 ± 1.2 |

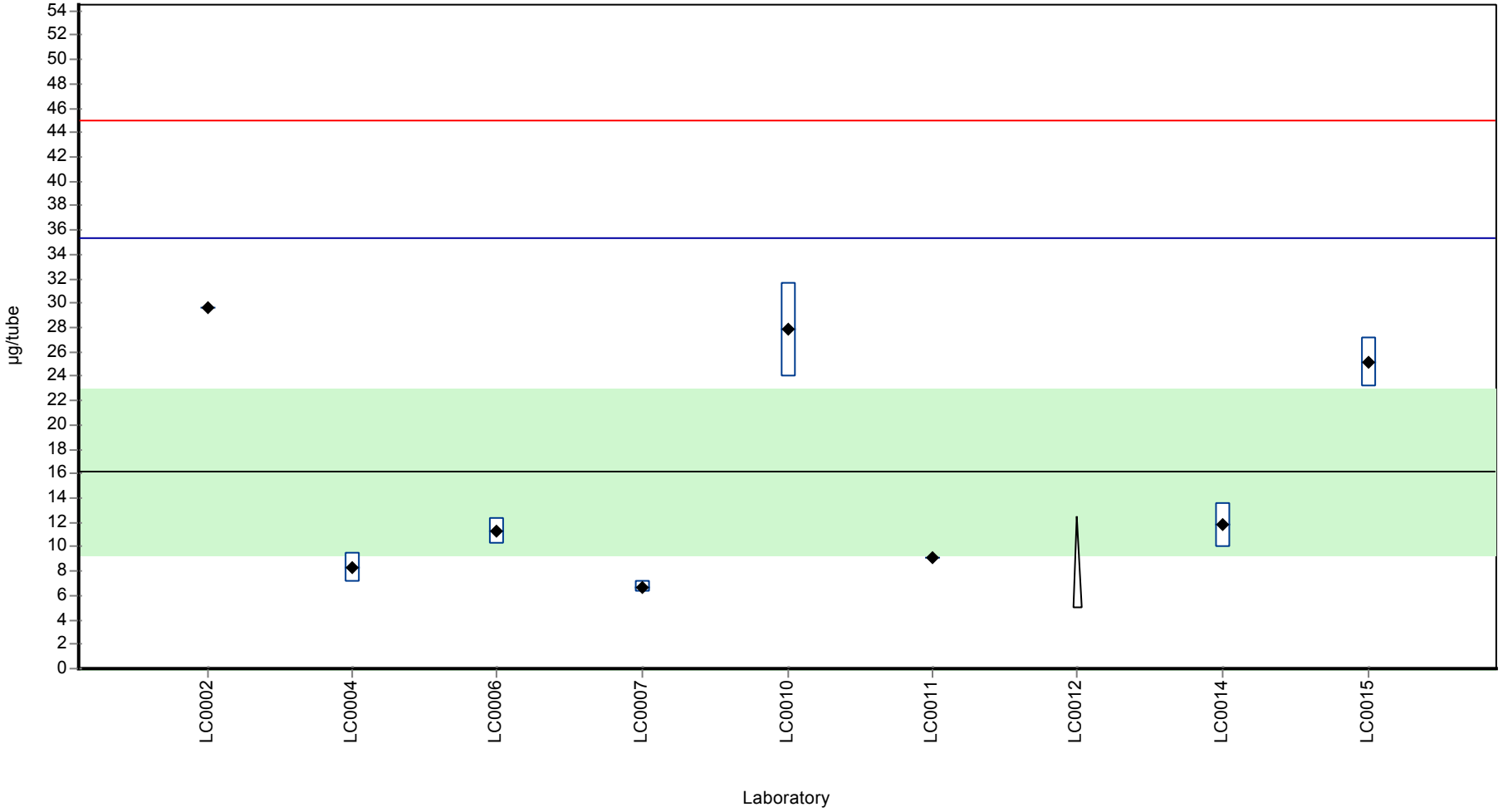
| Labcode | Result | ± U | Recovery [%] | z-score | Comments |
|---|---|---|---|---|---|
| LC0002 | 29.610 | - | 182.7 | 1.4 | |
| LC0003 | - | - | - | - | |
| LC0004 | 8.260 | 1.240 | 51.0 | -0.8 | |
| LC0005 | - | - | - | - | |
| LC0006 | 11.300 | 1.130 | 69.7 | -0.5 | |
| LC0007 | 6.720 | 0.500 | 41.5 | -1.0 | |
| LC0010 | 27.800 | 3.900 | 171.5 | 1.2 | |
| LC0011 | 9.070 | 0.100 | 56.0 | -0.7 | |
| LC0012 | - | - | - | - | |
| LC0014 | 11.765 | 1.820 | 72.6 | -0.5 | |
| LC0015 | 25.140 | 2.000 | 155.1 | 0.9 | |

**Characteristics of parameter**

| | all results | without outliners | Unit |
|---|---|---|---|
| Mean ± CI (99%) | 16.2 ± 10.2 | 16.2 ± 10.2 | µg/tube |
| Minimum | 6.72 | 6.72 | µg/tube |
| Maximum | 29.6 | 29.6 | µg/tube |
| Standard deviation | 9.57 | 9.57 | µg/tube |
| rel. Standard deviation | 59.1 | 59.1 | % |
| n | 8 | 8 | - |

**Graphical presentation of results**

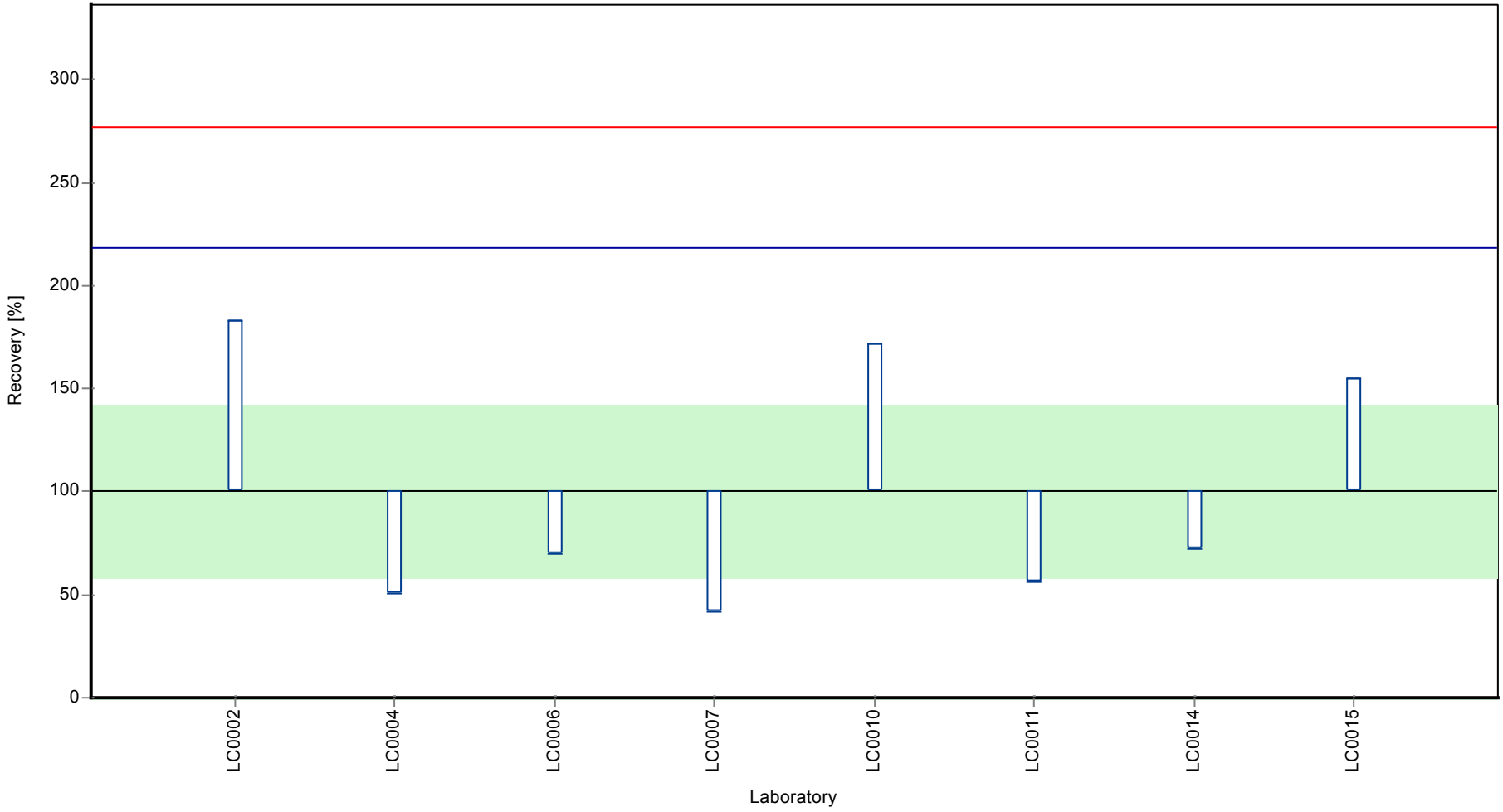
**Results**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Sample: CL02, Parameter: trans-1,2-Dichloroethene

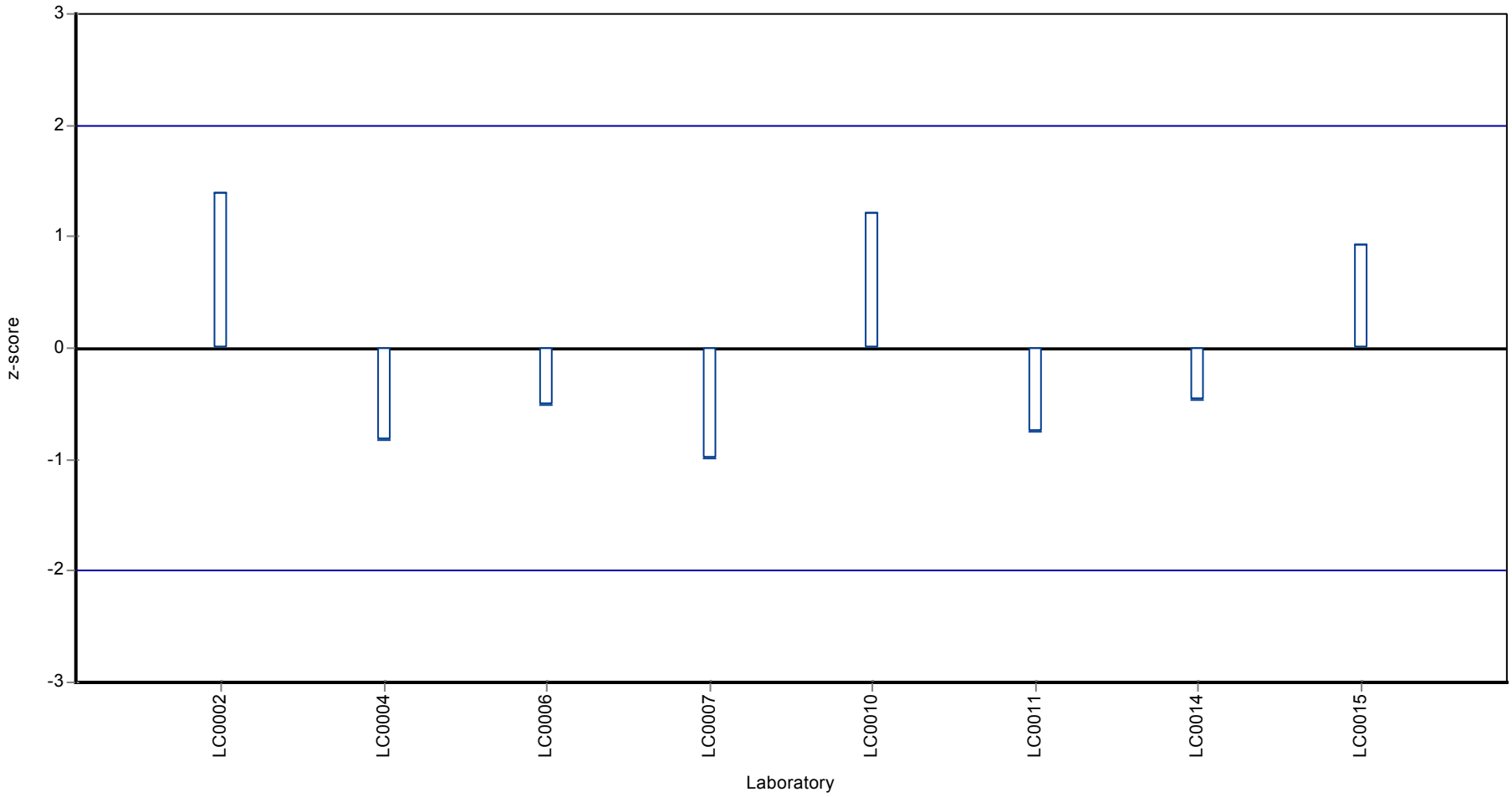
**Recovery rate**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Sample: CL02, Parameter: trans-1,2-Dichloroethene

**Z-score**



# Parameter oriented report

## CL02

## Trichloroethene

| | |
|---|---|
| Unit | µg/tube |
| Mean ± CI (99%) | 22.4 ± 11.2 |
| Minimum - Maximum | 5.2 - 34.83 |
| Check value ± U | 31 ± 2 |

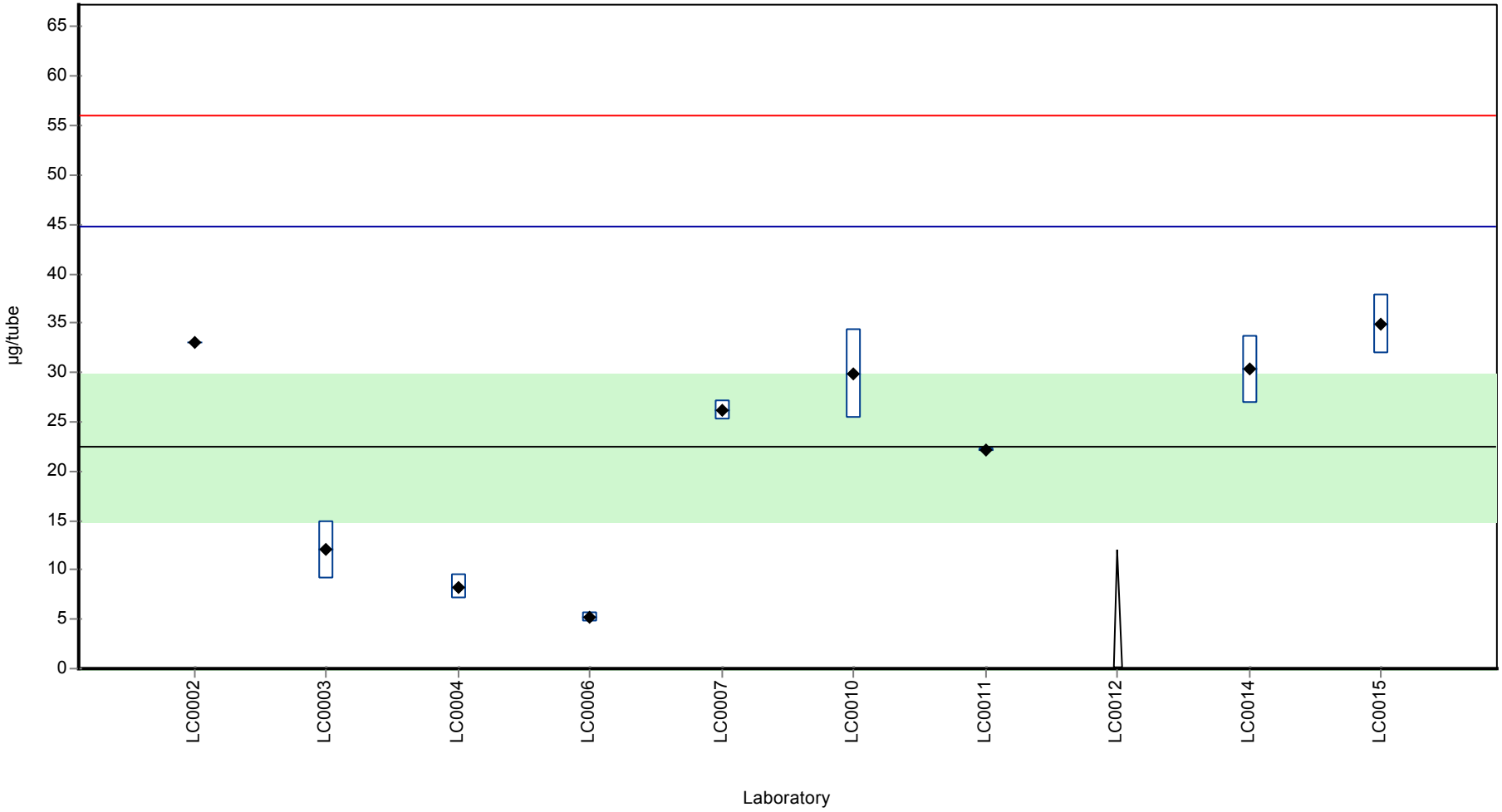
| Labcode | Result | ± U | Recovery [%] | z-score | Comments |
|---|---|---|---|---|---|
| LC0002 | 33.070 | - | 147.4 | 0.9 | |
| LC0003 | 12.000 | 3.000 | 53.5 | -0.9 | |
| LC0004 | 8.290 | 1.250 | 36.9 | -1.3 | |
| LC0005 | - | - | - | - | |
| LC0006 | 5.200 | 0.520 | 23.2 | -1.5 | |
| LC0007 | 26.200 | 1.000 | 116.8 | 0.3 | |
| LC0010 | 29.900 | 4.500 | 133.3 | 0.7 | |
| LC0011 | 22.150 | 0.200 | 98.7 | 0.0 | |
| LC0012 | - | - | - | - | |
| LC0014 | 30.305 | 3.490 | 135.1 | 0.7 | |
| LC0015 | 34.830 | 3.000 | 155.2 | 1.1 | |

**Characteristics of parameter**

| | all results | without outliners | Unit |
|---|---|---|---|
| Mean ± CI (99%) | 22.4 ± 11.2 | 22.4 ± 11.2 | µg/tube |
| Minimum | 5.2 | 5.2 | µg/tube |
| Maximum | 34.8 | 34.8 | µg/tube |
| Standard deviation | 11.2 | 11.2 | µg/tube |
| rel. Standard deviation | 49.9 | 49.9 | % |
| n | 9 | 9 | - |

**Graphical presentation of results**

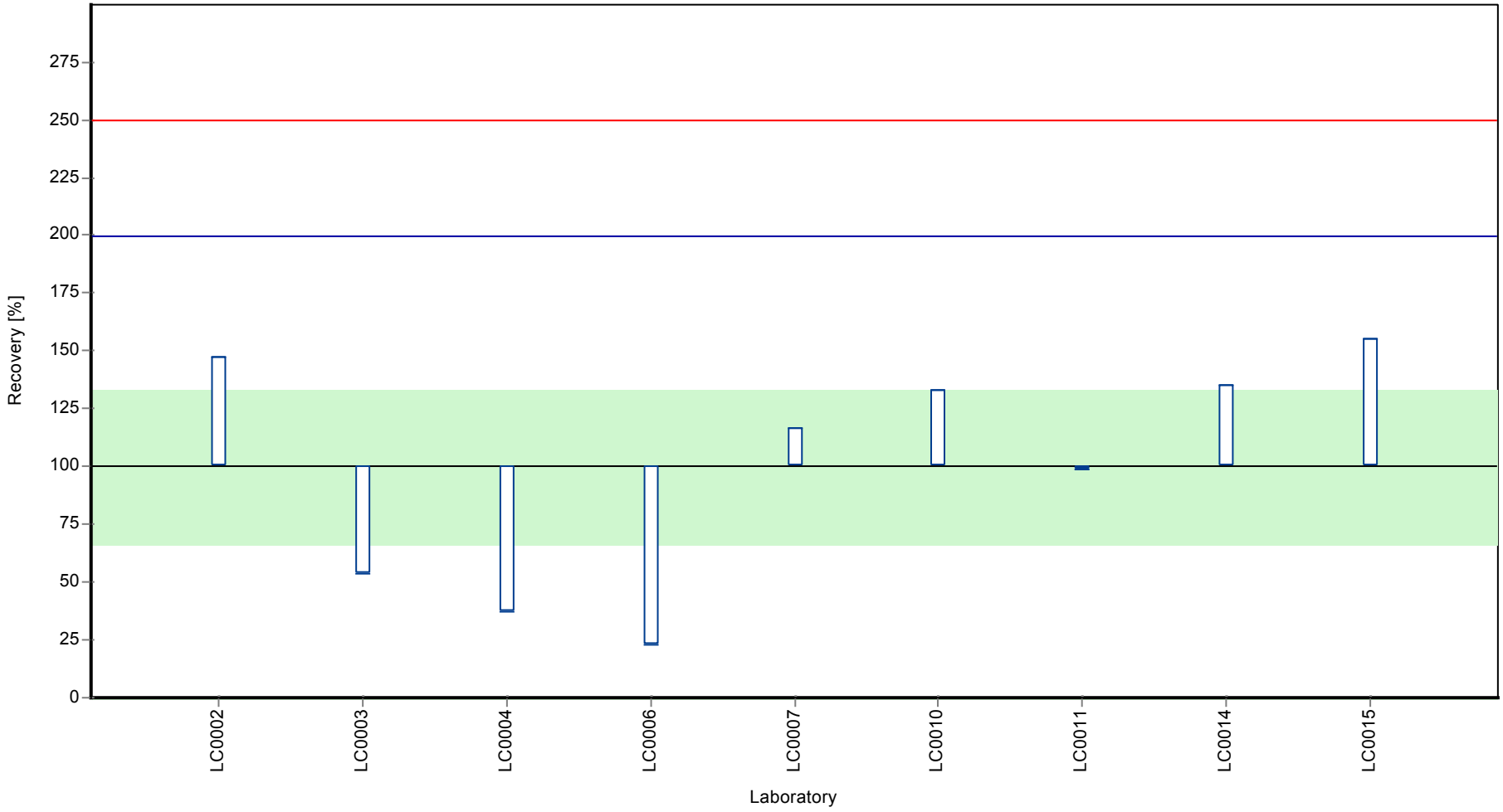
**Results**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Sample: CL02, Parameter: Trichloroethene

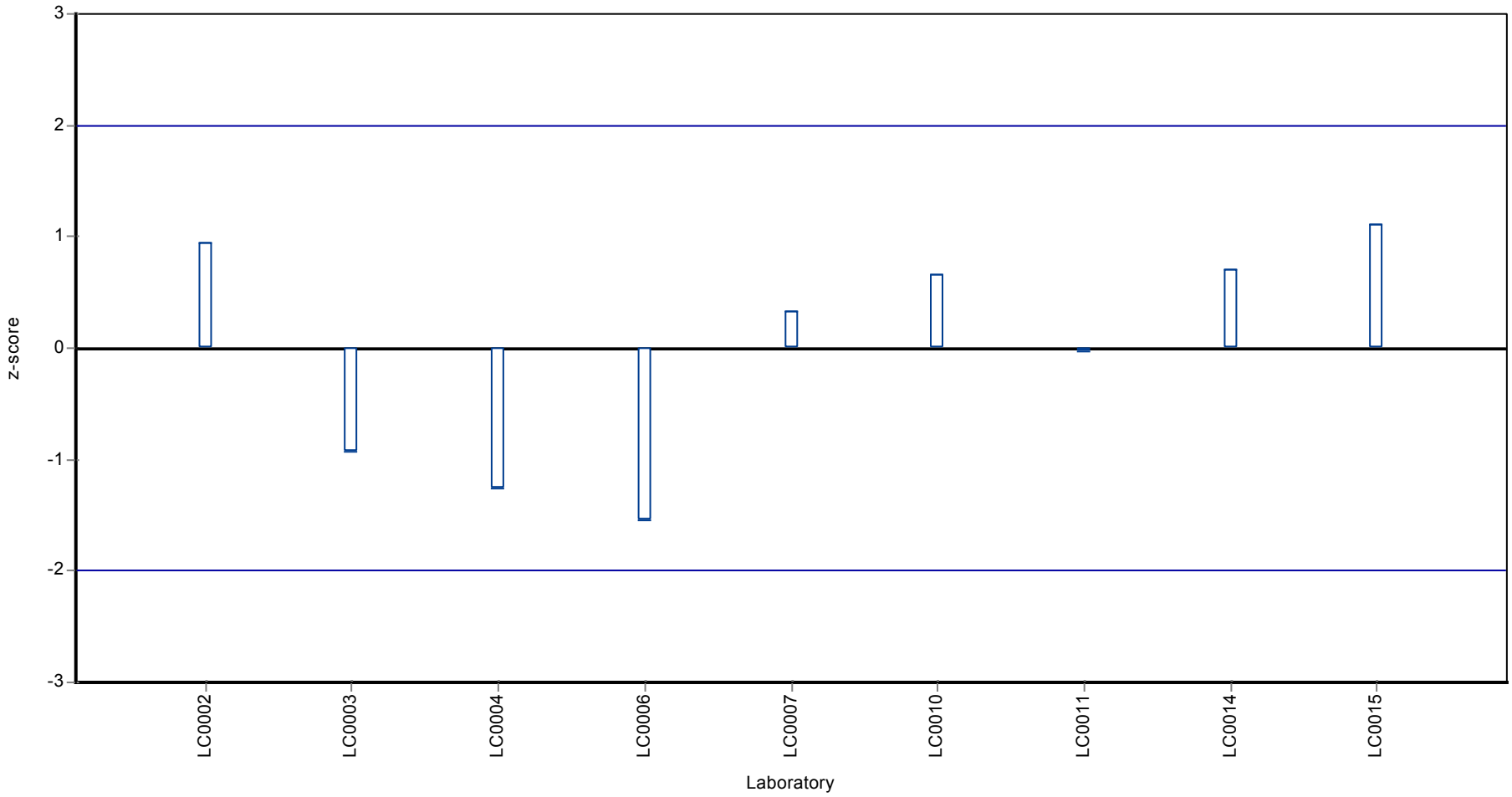
**Recovery rate**



Parameter oriented report Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Sample: CL02, Parameter: Trichloroethene

**Z-score**

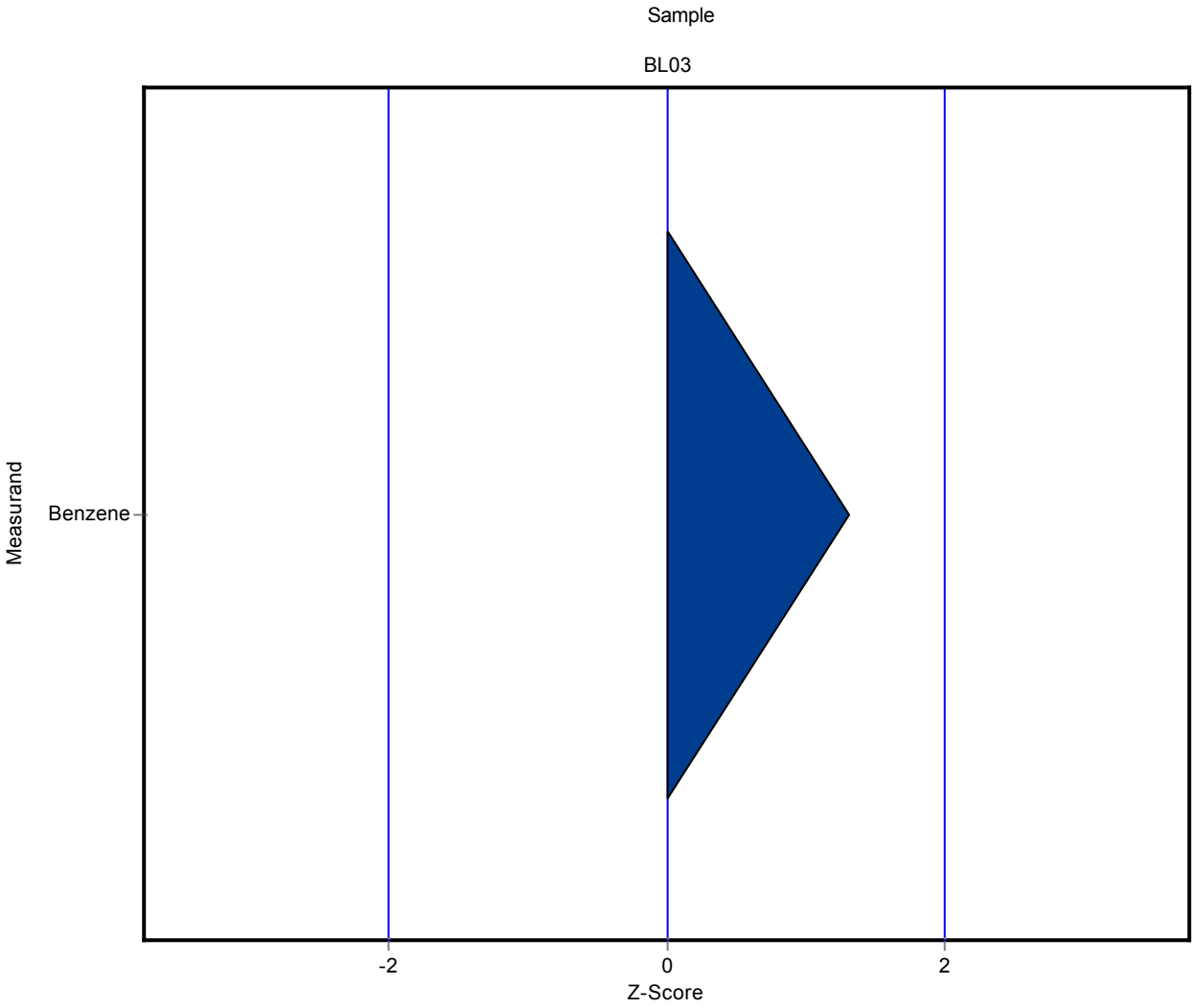


# 8 Laboratory oriented report

The following results were achieved:

Sample: BL03

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| Benzene | µg/tu | 1.49 | ± 0.11 | 1.65 | 0.184 | 0.121 | 110.6 | 1.30 |
| Toluene | µg/tu | 3.03 | ± 0.209 | - | - | 0.231 | - | - |
| Ethylbenzene | µg/tu | 4.09 | ± 0.372 | - | - | 0.412 | - | - |
| Sum of m-Xylene and p-Xylene | µg/tu | 7.31 | ± 1.13 | - | - | 1.25 | - | - |
| o-Xylene | µg/tu | 3.85 | ± 0.378 | - | - | 0.399 | - | - |


Sample
BL03
Measurand
Benzene
-2
0
2
Z-Score

Summary of results Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Laboratory: LC0002

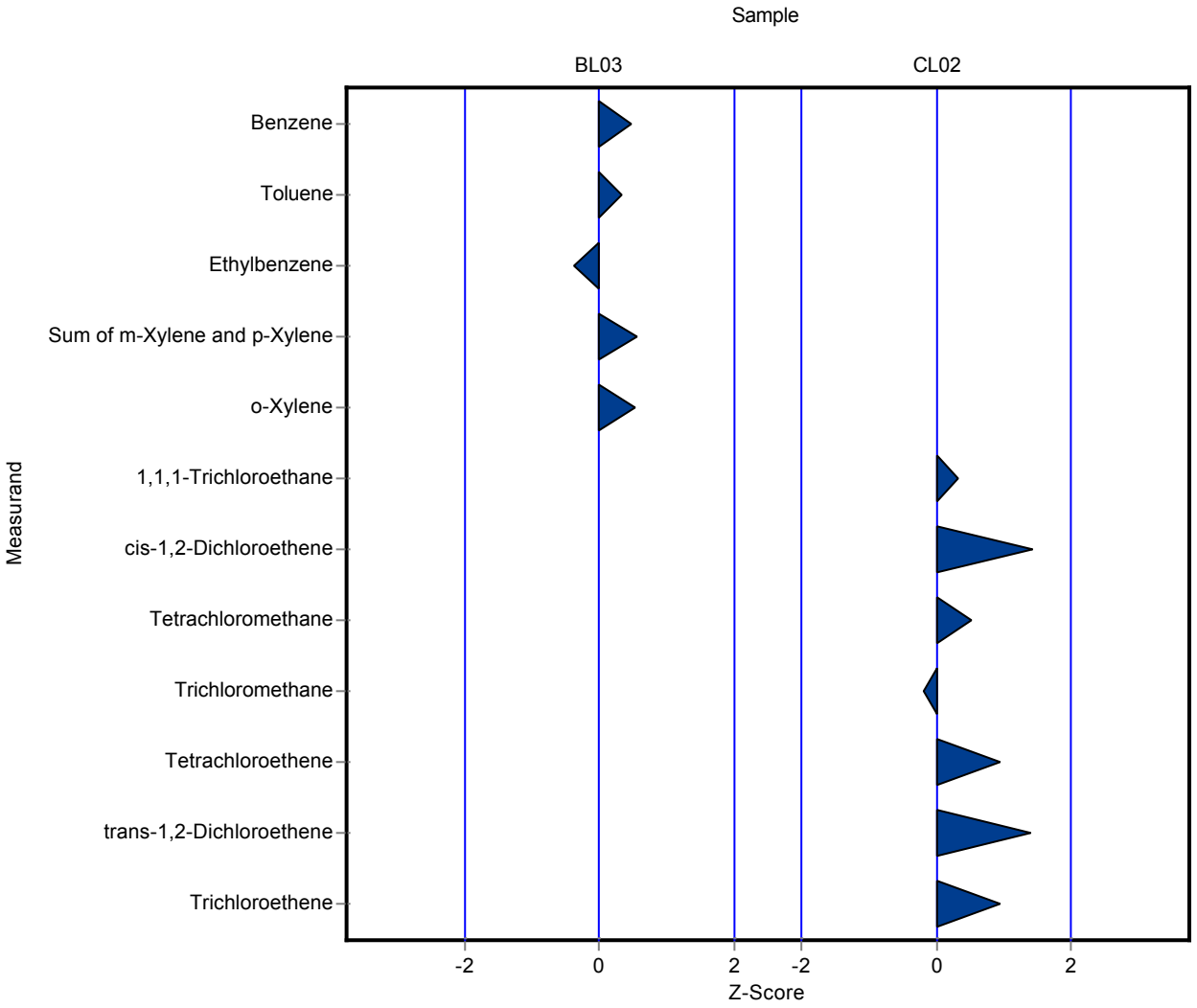
The following results were achieved:

## Sample: BL03

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| Benzene | µg/tu | 1.49 | ± 0.11 | 1.55 | - | 0.121 | 103.9 | 0.48 |
| Toluene | µg/tu | 3.03 | ± 0.209 | 3.11 | - | 0.231 | 102.5 | 0.33 |
| Ethylbenzene | µg/tu | 4.09 | ± 0.372 | 3.94 | - | 0.412 | 96.3 | -0.36 |
| Sum of m-Xylene and p-Xylene | µg/tu | 7.31 | ± 1.13 | 7.99 | - | 1.25 | 109.4 | 0.55 |
| o-Xylene | µg/tu | 3.85 | ± 0.378 | 4.06 | - | 0.399 | 105.4 | 0.52 |

## Sample: CL02

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | µg/tu | 21.3 | ± 5.17 | 22.93 | - | 4.87 | 107.5 | 0.33 |
| cis-1,2-Dichloroethene | µg/tu | 18.8 | ± 6.21 | 27.03 | - | 5.85 | 144.1 | 1.41 |
| Tetrachloromethane | µg/tu | 30.4 | ± 14.7 | 38.1 | - | 14.7 | 125.4 | 0.53 |
| Trichloromethane | µg/tu | 29.7 | ± 2.42 | 29.3 | - | 2.14 | 98.7 | -0.18 |
| Tetrachloroethene | µg/tu | 25.7 | ± 14 | 39.02 | - | 14 | 152.1 | 0.96 |
| trans-1,2-Dichloroethene | µg/tu | 16.2 | ± 10.2 | 29.61 | - | 9.57 | 182.7 | 1.40 |
| Trichloroethene | µg/tu | 22.4 | ± 11.2 | 33.07 | - | 11.2 | 147.4 | 0.95 |


Sample
BL03
CL02
Benzene
Toluene
Ethylbenzene
Sum of m-Xylene and p-Xylene
o-Xylene
1,1,1-Trichloroethane
cis-1,2-Dichloroethene
Tetrachloromethane
Trichloromethane
Tetrachloroethene
trans-1,2-Dichloroethene
Trichloroethene
Measurand
-2
0
2
-2
0
2
Z-Score

Summary of results Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Laboratory: LC0003

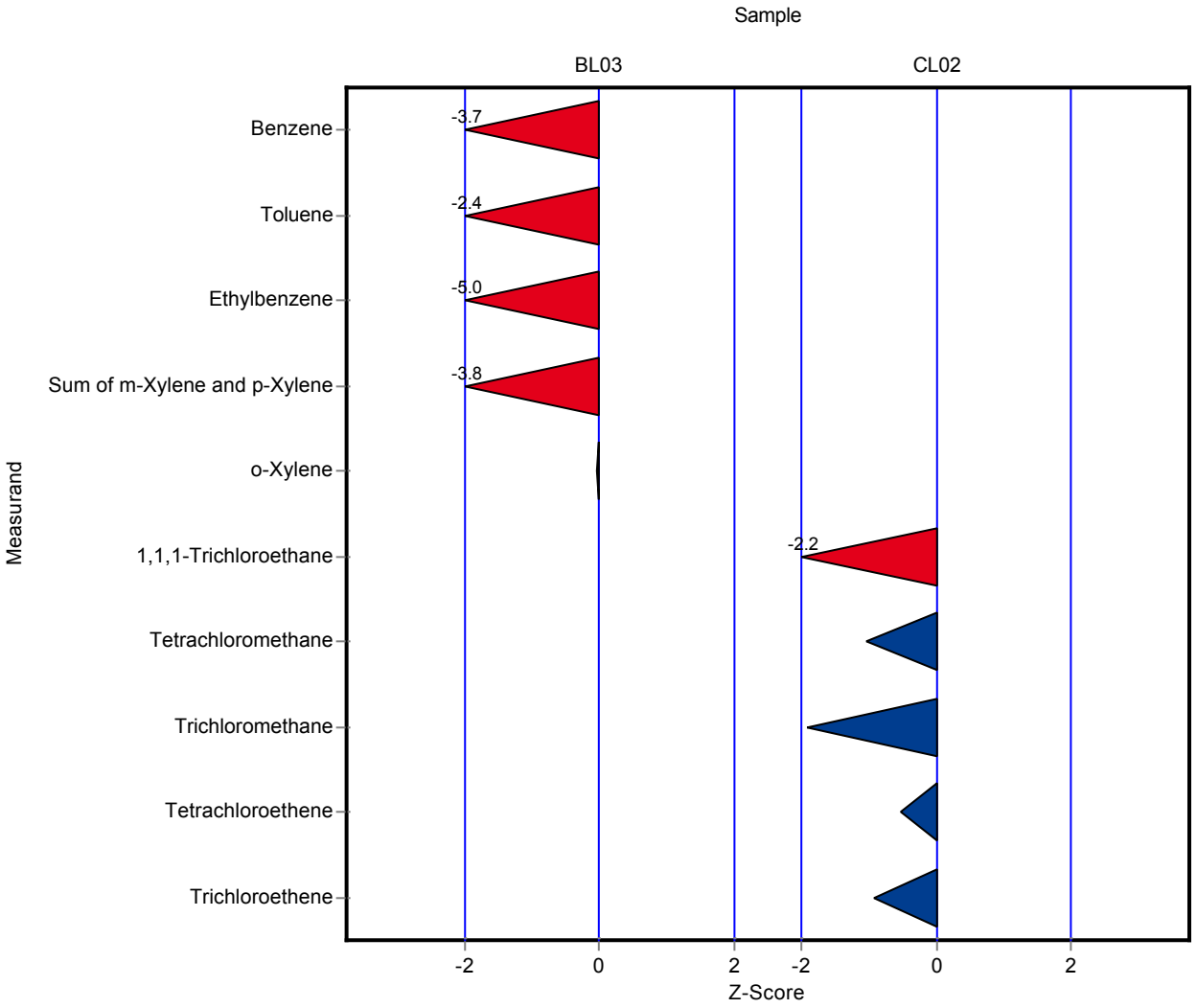
The following results were achieved:

## Sample: BL03

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| Benzene | µg/tu | 1.49 | ± 0.11 | 1.04 | 0.26 | 0.121 | 69.7 | -3.73 |
| Toluene | µg/tu | 3.03 | ± 0.209 | 2.48 | 0.62 | 0.231 | 81.7 | -2.39 |
| Ethylbenzene | µg/tu | 4.09 | ± 0.372 | 2.04 | 0.51 | 0.412 | 49.9 | -4.98 |
| Sum of m-Xylene and p-Xylene | µg/tu | 7.31 | ± 1.13 | 2.52 | 0.63 | 1.25 | 34.5 | -3.84 |
| o-Xylene | µg/tu | 3.85 | ± 0.378 | 3.84 | 0.96 | 0.399 | 99.7 | -0.03 |

## Sample: CL02

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | µg/tu | 21.3 | ± 5.17 | 10.8 | 2.7 | 4.87 | 50.6 | -2.16 |
| cis-1,2-Dichloroethene | µg/tu | 18.8 | ± 6.21 | - | - | 5.85 | - | - |
| Tetrachloromethane | µg/tu | 30.4 | ± 14.7 | 15.2 | 3.8 | 14.7 | 50.0 | -1.03 |
| Trichloromethane | µg/tu | 29.7 | ± 2.42 | 25.6 | 6.4 | 2.14 | 86.2 | -1.91 |
| Tetrachloroethene | µg/tu | 25.7 | ± 14 | 18.4 | 4.6 | 14 | 71.7 | -0.52 |
| trans-1,2-Dichloroethene | µg/tu | 16.2 | ± 10.2 | - | - | 9.57 | - | - |
| Trichloroethene | µg/tu | 22.4 | ± 11.2 | 12 | 3 | 11.2 | 53.5 | -0.93 |


Sample
BL03
CL02
Measurand
Benzene
Toluene
Ethylbenzene
Sum of m-Xylene and p-Xylene
o-Xylene
1,1,1-Trichloroethane
Tetrachloromethane
Trichloromethane
Tetrachloroethene
Trichloroethene
-3.7
-2.4
-5.0
-3.8
-2.2
-2
0
2
-2
0
2
Z-Score

Summary of results Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Laboratory: LC0004

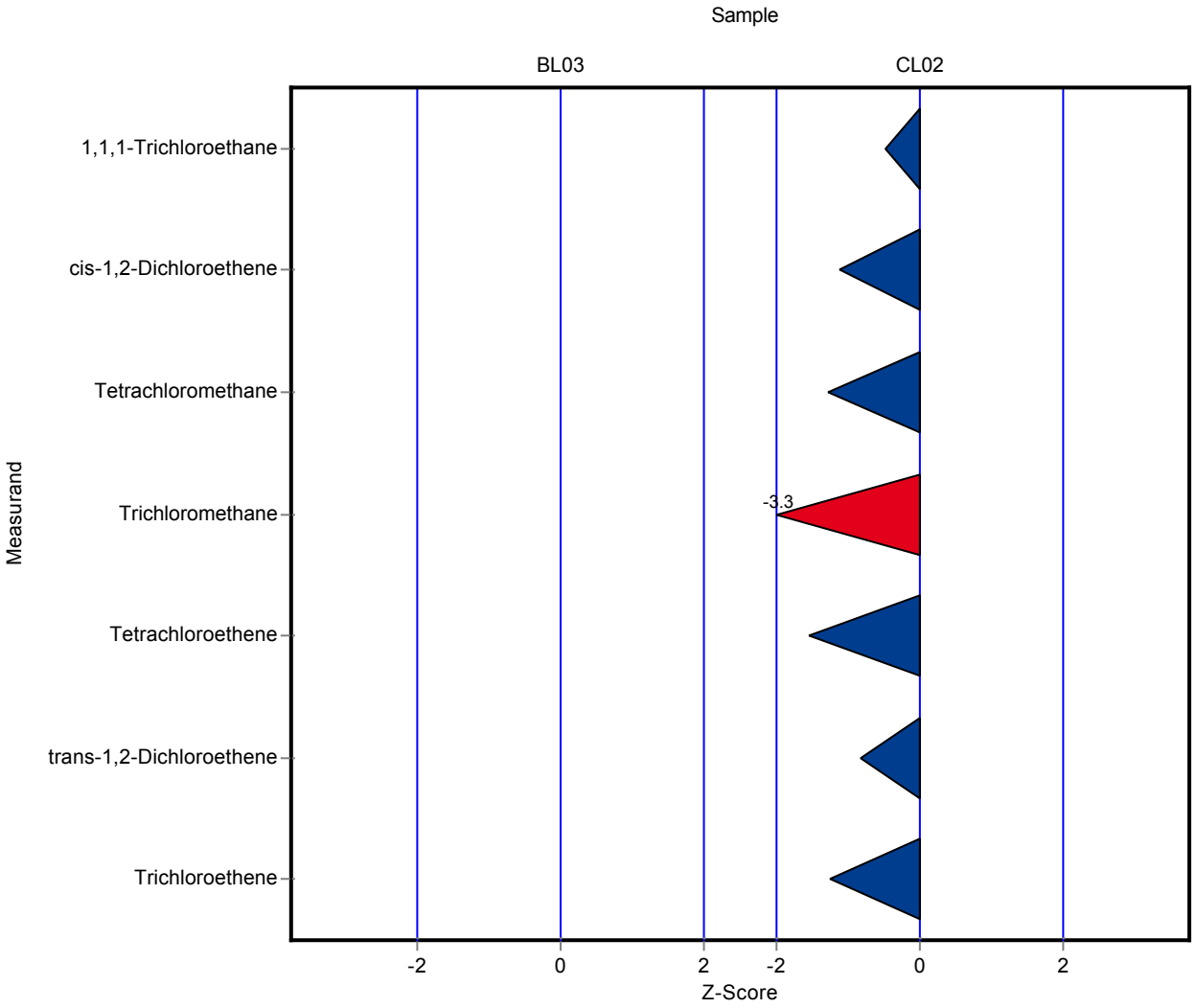
The following results were achieved:

## Sample: BL03

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| Benzene | µg/tu | 1.49 | ± 0.11 | - | - | 0.121 | - | - |
| Toluene | µg/tu | 3.03 | ± 0.209 | - | - | 0.231 | - | - |
| Ethylbenzene | µg/tu | 4.09 | ± 0.372 | - | - | 0.412 | - | - |
| Sum of m-Xylene and p-Xylene | µg/tu | 7.31 | ± 1.13 | - | - | 1.25 | - | - |
| o-Xylene | µg/tu | 3.85 | ± 0.378 | - | - | 0.399 | - | - |

## Sample: CL02

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | µg/tu | 21.3 | ± 5.17 | 19 | 2.85 | 4.87 | 89.1 | -0.48 |
| cis-1,2-Dichloroethene | µg/tu | 18.8 | ± 6.21 | 12.3 | 1.85 | 5.85 | 65.6 | -1.10 |
| Tetrachloromethane | µg/tu | 30.4 | ± 14.7 | 11.8 | 1.76 | 14.7 | 38.8 | -1.27 |
| Trichloromethane | µg/tu | 29.7 | ± 2.42 | 22.7 | 3.41 | 2.14 | 76.5 | -3.27 |
| Tetrachloroethene | µg/tu | 25.7 | ± 14 | 3.95 | 0.59 | 14 | 15.4 | -1.55 |
| trans-1,2-Dichloroethene | µg/tu | 16.2 | ± 10.2 | 8.26 | 1.24 | 9.57 | 51.0 | -0.83 |
| Trichloroethene | µg/tu | 22.4 | ± 11.2 | 8.29 | 1.25 | 11.2 | 36.9 | -1.26 |


Sample
BL03
CL02
1,1,1-Trichloroethane
cis-1,2-Dichloroethene
Tetrachloromethane
Trichloromethane
Tetrachloroethene
trans-1,2-Dichloroethene
Trichloroethene
Measurand
-3,3
-2
0
2
-2
0
2
Z-Score

Summary of results Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Laboratory: LC0005

The following results were achieved:

Sample: CL02

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | µg/tu | 21.3 | ± 5.17 | - | - | 4.87 | - | - |
| cis-1,2-Dichloroethene | µg/tu | 18.8 | ± 6.21 | - | - | 5.85 | - | - |
| Tetrachloromethane | µg/tu | 30.4 | ± 14.7 | - | - | 14.7 | - | - |
| Trichloromethane | µg/tu | 29.7 | ± 2.42 | - | - | 2.14 | - | - |
| Tetrachloroethene | µg/tu | 25.7 | ± 14 | - | - | 14 | - | - |
| trans-1,2-Dichloroethene | µg/tu | 16.2 | ± 10.2 | - | - | 9.57 | - | - |
| Trichloroethene | µg/tu | 22.4 | ± 11.2 | - | - | 11.2 | - | - |

Summary of results Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Laboratory: LC0006

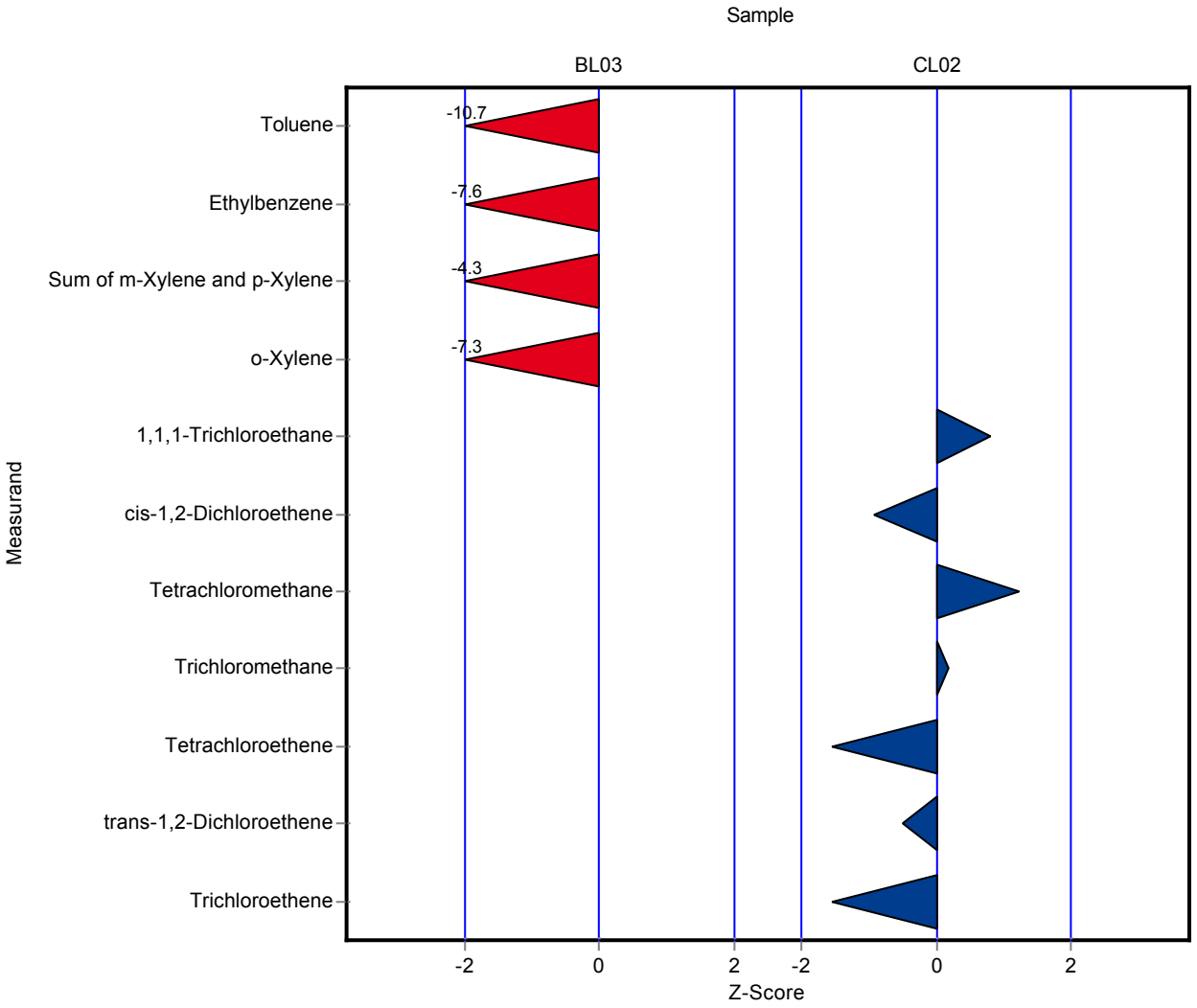
The following results were achieved:

## Sample: BL03

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| Benzene | µg/tu | 1.49 | ± 0.11 | <0.28 (LOQ) | - | 0.121 | - | - |
| Toluene | µg/tu | 3.03 | ± 0.209 | 0.55 | 0.06 | 0.231 | 18.1 | -10.73 |
| Ethylbenzene | µg/tu | 4.09 | ± 0.372 | 0.95 | 0.1 | 0.412 | 23.2 | -7.63 |
| Sum of m-Xylene and p-Xylene | µg/tu | 7.31 | ± 1.13 | 1.97 | 0.2 | 1.25 | 27.0 | -4.28 |
| o-Xylene | µg/tu | 3.85 | ± 0.378 | 0.96 | 0.1 | 0.399 | 24.9 | -7.25 |

## Sample: CL02

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | µg/tu | 21.3 | ± 5.17 | 25.2 | 2.52 | 4.87 | 118.1 | 0.79 |
| cis-1,2-Dichloroethene | µg/tu | 18.8 | ± 6.21 | 13.4 | 1.34 | 5.85 | 71.4 | -0.92 |
| Tetrachloromethane | µg/tu | 30.4 | ± 14.7 | 48.2 | 4.82 | 14.7 | 158.7 | 1.21 |
| Trichloromethane | µg/tu | 29.7 | ± 2.42 | 30.1 | 3.01 | 2.14 | 101.4 | 0.19 |
| Tetrachloroethene | µg/tu | 25.7 | ± 14 | 3.8 | 0.38 | 14 | 14.8 | -1.56 |
| trans-1,2-Dichloroethene | µg/tu | 16.2 | ± 10.2 | 11.3 | 1.13 | 9.57 | 69.7 | -0.51 |
| Trichloroethene | µg/tu | 22.4 | ± 11.2 | 5.2 | 0.52 | 11.2 | 23.2 | -1.54 |


Sample
BL03
CL02
Toluene
Ethylbenzene
Sum of m-Xylene and p-Xylene
o-Xylene
1,1,1-Trichloroethane
cis-1,2-Dichloroethene
Tetrachloromethane
Trichloromethane
Tetrachloroethene
trans-1,2-Dichloroethene
Trichloroethene
Measurand
-10.7
-7.6
-4.3
-7.3
-2
0
2
-2
0
2
Z-Score

Summary of results Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Laboratory: LC0007

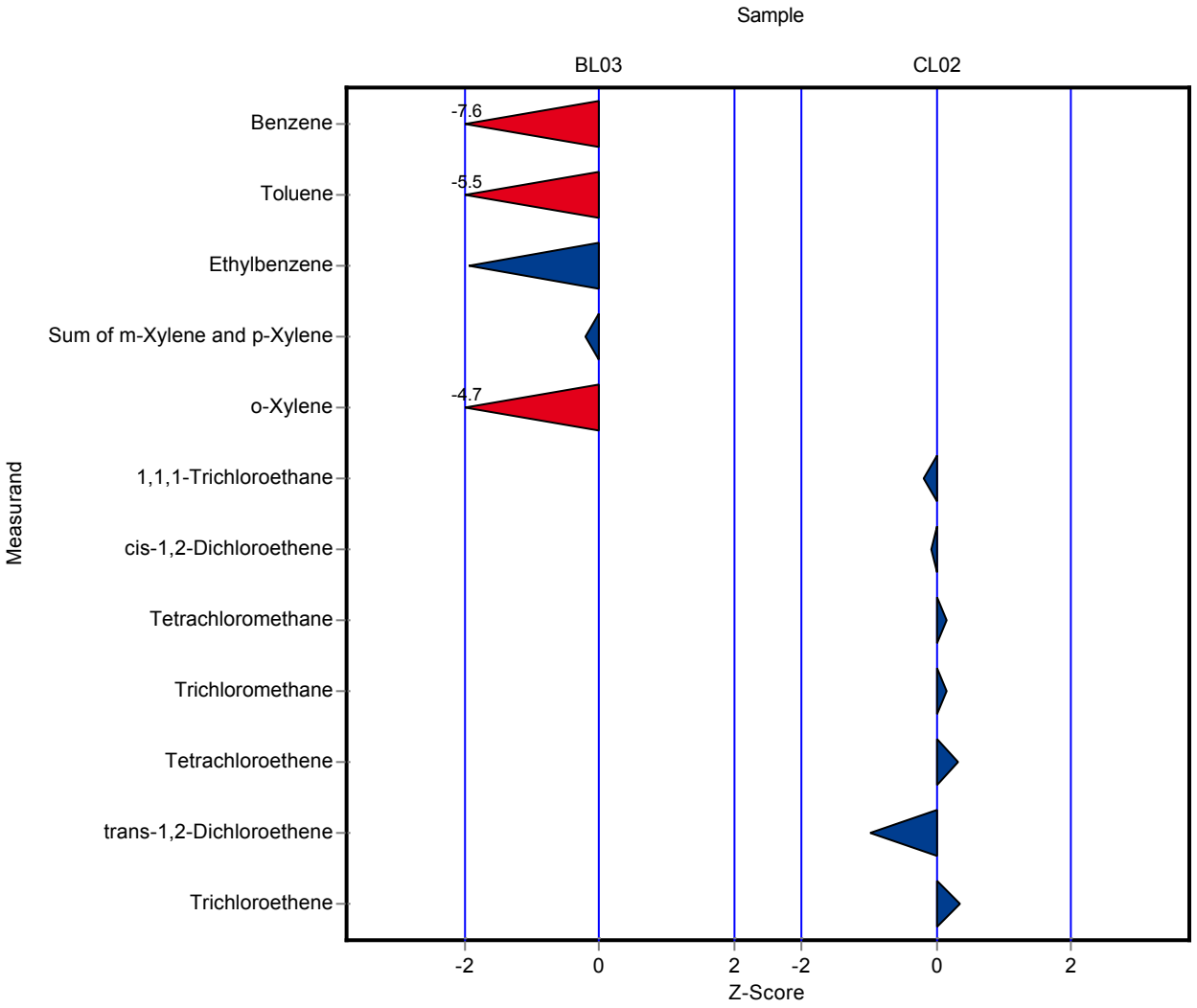
The following results were achieved:

## Sample: BL03

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| Benzene | µg/tu | 1.49 | ± 0.11 | 0.577 | 0.1 | 0.121 | 38.7 | -7.55 |
| Toluene | µg/tu | 3.03 | ± 0.209 | 1.77 | 0.25 | 0.231 | 58.3 | -5.46 |
| Ethylbenzene | µg/tu | 4.09 | ± 0.372 | 3.29 | 0.25 | 0.412 | 80.4 | -1.94 |
| Sum of m-Xylene and p-Xylene | µg/tu | 7.31 | ± 1.13 | 7.05 | 1 | 1.25 | 96.5 | -0.21 |
| o-Xylene | µg/tu | 3.85 | ± 0.378 | 1.96 | 0.25 | 0.399 | 50.9 | -4.74 |

## Sample: CL02

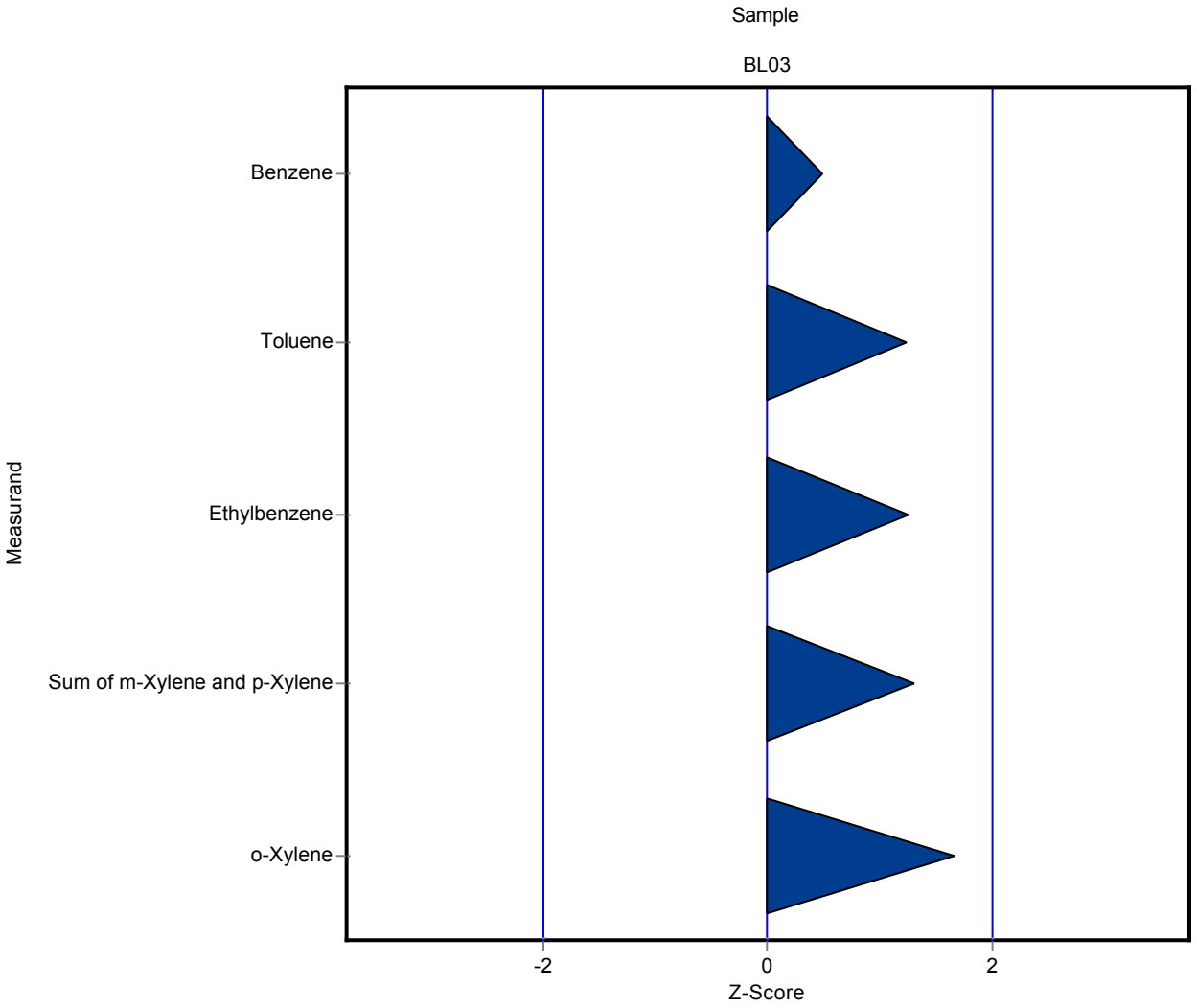
| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | µg/tu | 21.3 | ± 5.17 | 20.4 | 1 | 4.87 | 95.6 | -0.19 |
| cis-1,2-Dichloroethene | µg/tu | 18.8 | ± 6.21 | 18.3 | 0.5 | 5.85 | 97.5 | -0.08 |
| Tetrachloromethane | µg/tu | 30.4 | ± 14.7 | 32.6 | 1 | 14.7 | 107.3 | 0.15 |
| Trichloromethane | µg/tu | 29.7 | ± 2.42 | 30 | 1 | 2.14 | 101.0 | 0.14 |
| Tetrachloroethene | µg/tu | 25.7 | ± 14 | 30 | 1 | 14 | 116.9 | 0.31 |
| trans-1,2-Dichloroethene | µg/tu | 16.2 | ± 10.2 | 6.72 | 0.5 | 9.57 | 41.5 | -0.99 |
| Trichloroethene | µg/tu | 22.4 | ± 11.2 | 26.2 | 1 | 11.2 | 116.8 | 0.34 |


Sample
BL03
CL02
Benzene
Toluene
Ethylbenzene
Sum of m-Xylene and p-Xylene
o-Xylene
1,1,1-Trichloroethane
cis-1,2-Dichloroethene
Tetrachloromethane
Trichloromethane
Tetrachloroethene
trans-1,2-Dichloroethene
Trichloroethene
Measurand
-7.6
-5.5
-4.7
-2
0
2
-2
0
2
Z-Score

The following results were achieved:

Sample: BL03

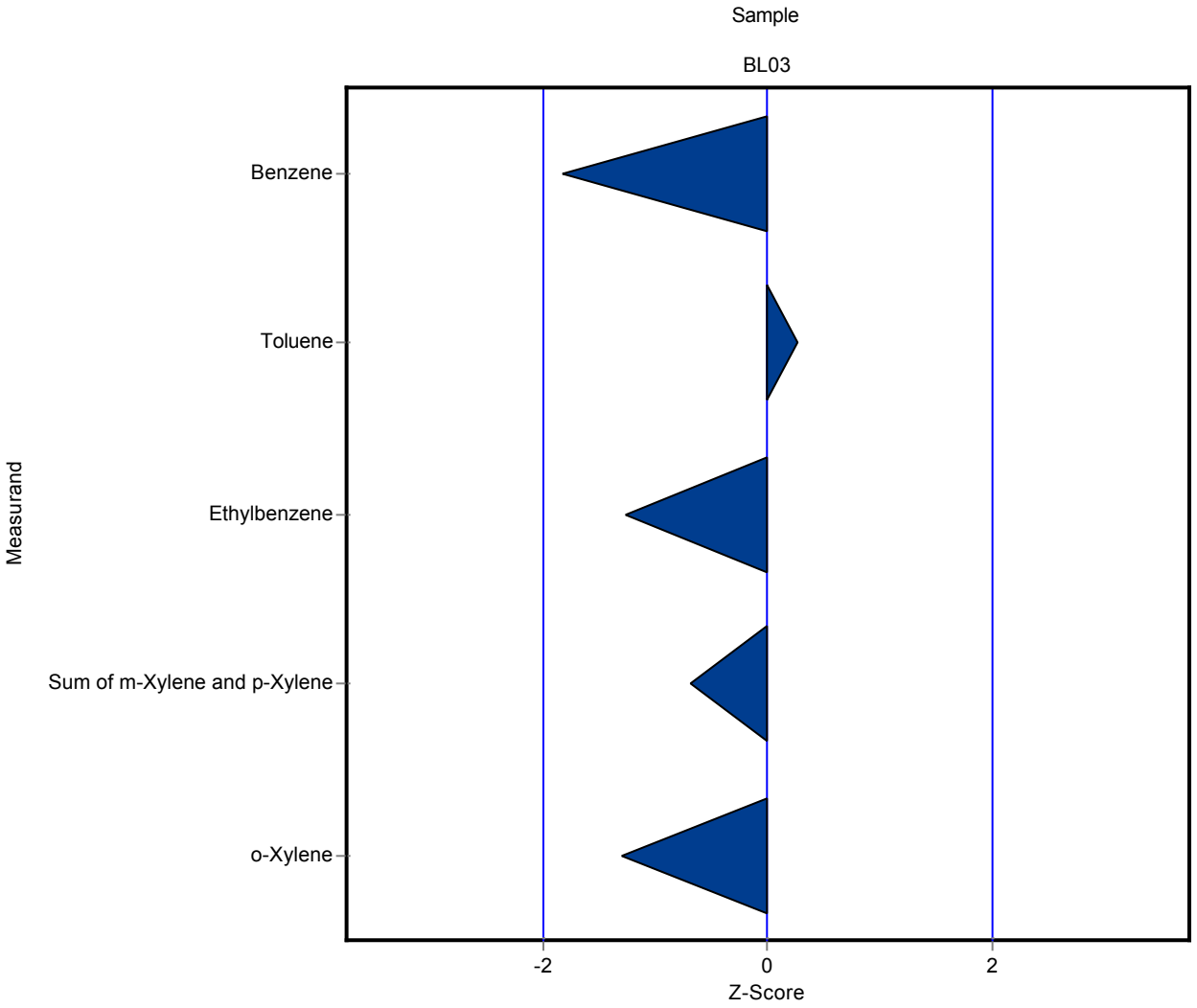
| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| Benzene | µg/tu | 1.49 | ± 0.11 | 1.55 | - | 0.121 | 103.9 | 0.48 |
| Toluene | µg/tu | 3.03 | ± 0.209 | 3.32 | - | 0.231 | 109.4 | 1.24 |
| Ethylbenzene | µg/tu | 4.09 | ± 0.372 | 4.6033 | - | 0.412 | 112.5 | 1.25 |
| Sum of m-Xylene and p-Xylene | µg/tu | 7.31 | ± 1.13 | 8.9233 | - | 1.25 | 122.1 | 1.30 |
| o-Xylene | µg/tu | 3.85 | ± 0.378 | 4.51 | - | 0.399 | 117.1 | 1.65 |


Sample
BL03
Benzene
Toluene
Ethylbenzene
Sum of m-Xylene and p-Xylene
o-Xylene
Measurand
-2
0
2
Z-Score

The following results were achieved:

Sample: BL03

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| Benzene | µg/tu | 1.49 | ± 0.11 | 1.271 | 0.636 | 0.121 | 85.2 | -1.83 |
| Toluene | µg/tu | 3.03 | ± 0.209 | 3.095 | 1.548 | 0.231 | 102.0 | 0.26 |
| Ethylbenzene | µg/tu | 4.09 | ± 0.372 | 3.571 | 1.786 | 0.412 | 87.3 | -1.26 |
| Sum of m-Xylene and p-Xylene | µg/tu | 7.31 | ± 1.13 | 6.453 | 3.227 | 1.25 | 88.3 | -0.69 |
| o-Xylene | µg/tu | 3.85 | ± 0.378 | 3.335 | 1.668 | 0.399 | 86.6 | -1.30 |


Sample
BL03
Benzene
Toluene
Ethylbenzene
Sum of m-Xylene and p-Xylene
o-Xylene
Measurand
-2
0
2
Z-Score

Summary of results Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Laboratory: LC0010

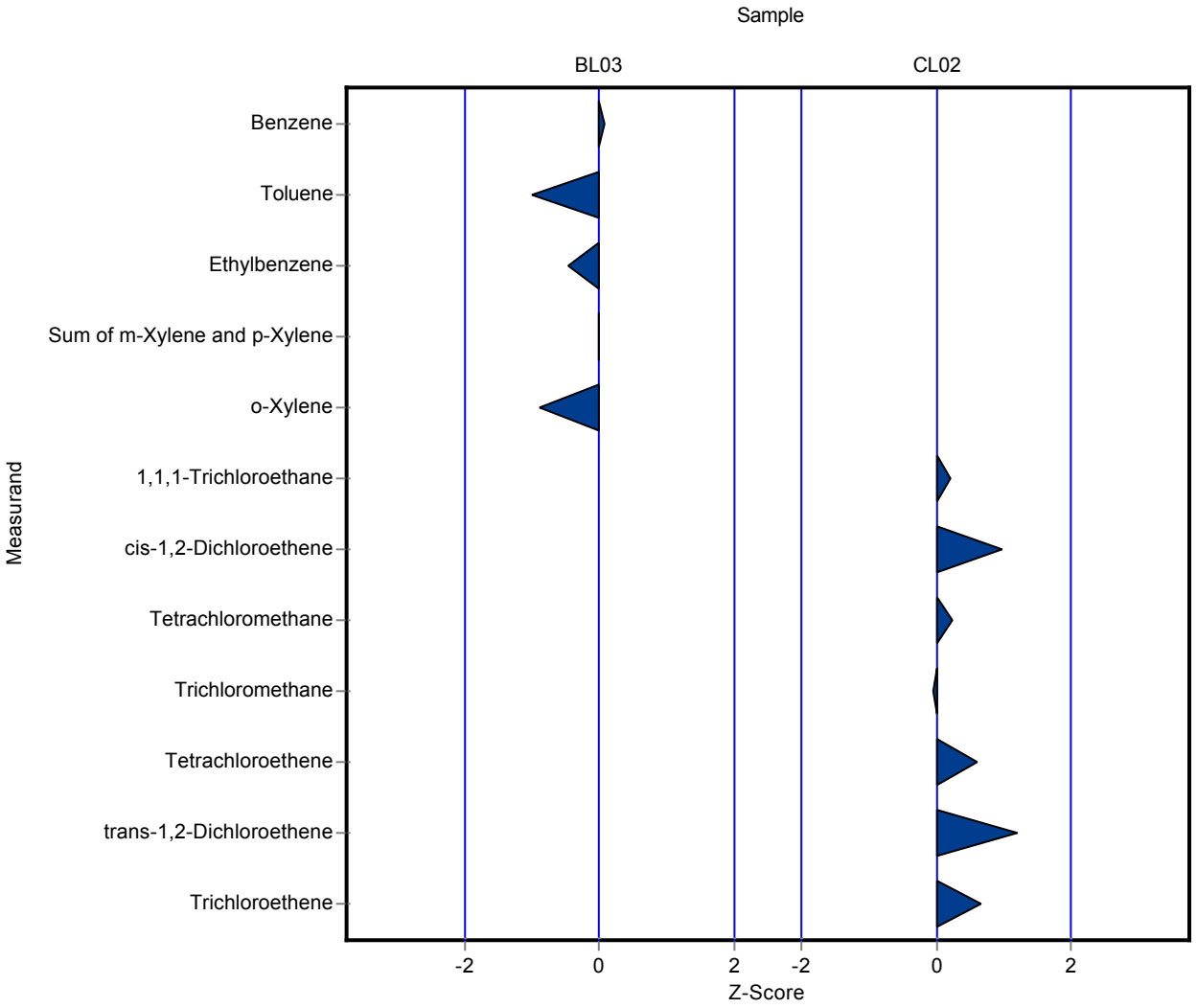
The following results were achieved:

## Sample: BL03

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| Benzene | µg/tu | 1.49 | ± 0.11 | 1.5 | 0.2 | 0.121 | 100.5 | 0.06 |
| Toluene | µg/tu | 3.03 | ± 0.209 | 2.8 | 0.4 | 0.231 | 92.3 | -1.01 |
| Ethylbenzene | µg/tu | 4.09 | ± 0.372 | 3.9 | 0.6 | 0.412 | 95.4 | -0.46 |
| Sum of m-Xylene and p-Xylene | µg/tu | 7.31 | ± 1.13 | 7.3 | 1.1 | 1.25 | 99.9 | 0.00 |
| o-Xylene | µg/tu | 3.85 | ± 0.378 | 3.5 | 0.5 | 0.399 | 90.9 | -0.88 |

## Sample: CL02

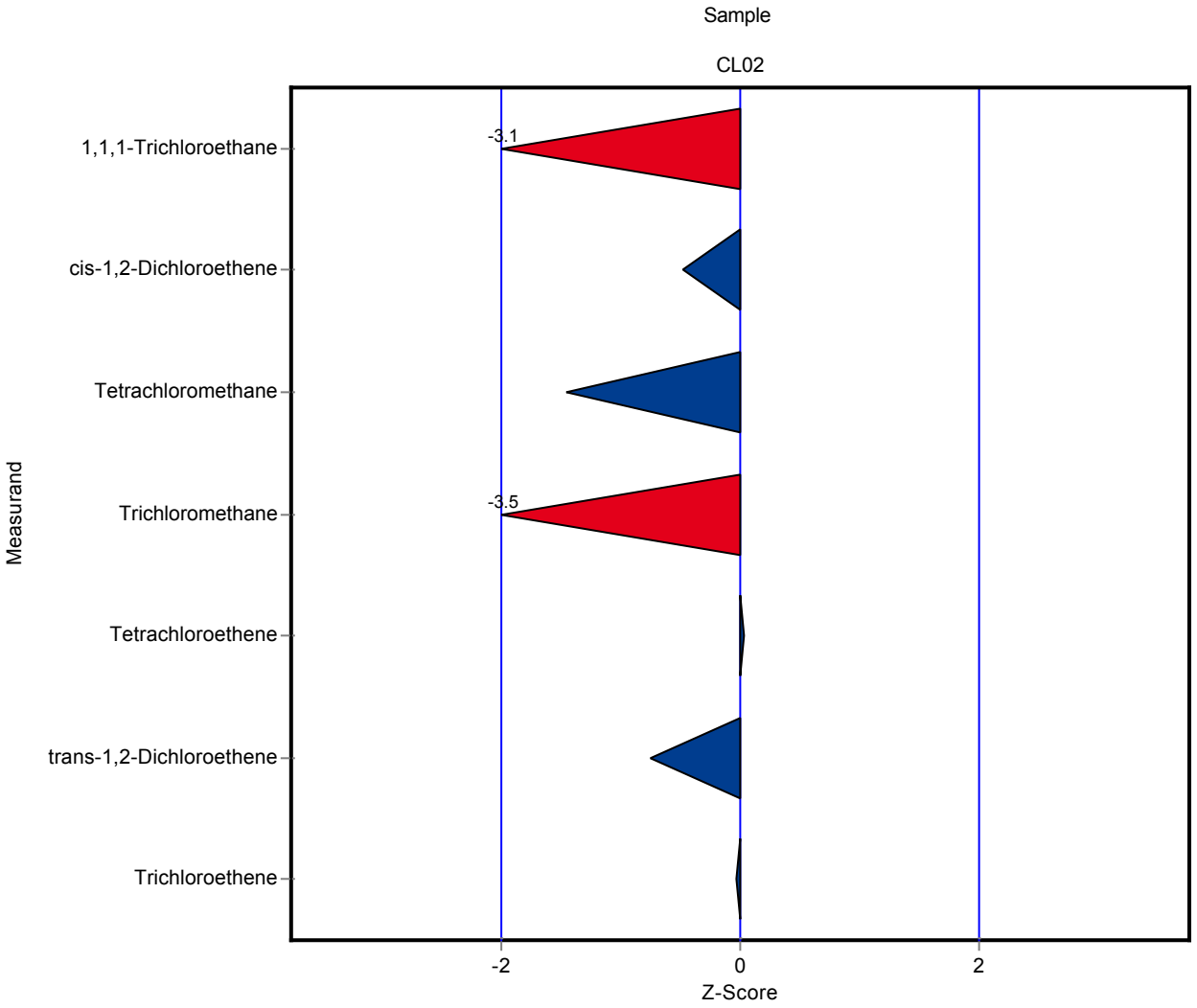
| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | µg/tu | 21.3 | ± 5.17 | 22.3 | 3.2 | 4.87 | 104.5 | 0.20 |
| cis-1,2-Dichloroethene | µg/tu | 18.8 | ± 6.21 | 24.5 | 3.4 | 5.85 | 130.6 | 0.98 |
| Tetrachloromethane | µg/tu | 30.4 | ± 14.7 | 33.9 | 1.7 | 14.7 | 111.6 | 0.24 |
| Trichloromethane | µg/tu | 29.7 | ± 2.42 | 29.6 | 4.2 | 2.14 | 99.7 | -0.04 |
| Tetrachloroethene | µg/tu | 25.7 | ± 14 | 34 | 5.1 | 14 | 132.5 | 0.60 |
| trans-1,2-Dichloroethene | µg/tu | 16.2 | ± 10.2 | 27.8 | 3.9 | 9.57 | 171.5 | 1.21 |
| Trichloroethene | µg/tu | 22.4 | ± 11.2 | 29.9 | 4.5 | 11.2 | 133.3 | 0.67 |


Sample
BL03
CL02
Benzene
Toluene
Ethylbenzene
Sum of m-Xylene and p-Xylene
o-Xylene
1,1,1-Trichloroethane
cis-1,2-Dichloroethene
Tetrachloromethane
Trichloromethane
Tetrachloroethene
trans-1,2-Dichloroethene
Trichloroethene
Measurand
-2
0
2
-2
0
2
Z-Score

The following results were achieved:

Sample: CL02

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | µg/tu | 21.3 | ± 5.17 | 6.34 | 0.1 | 4.87 | 29.7 | -3.08 |
| cis-1,2-Dichloroethene | µg/tu | 18.8 | ± 6.21 | 15.94 | 0.2 | 5.85 | 85.0 | -0.48 |
| Tetrachloromethane | µg/tu | 30.4 | ± 14.7 | 9.15 | 0.1 | 14.7 | 30.1 | -1.45 |
| Trichloromethane | µg/tu | 29.7 | ± 2.42 | 22.13 | 0.2 | 2.14 | 74.5 | -3.54 |
| Tetrachloroethene | µg/tu | 25.7 | ± 14 | 26.18 | 0.2 | 14 | 102.0 | 0.04 |
| trans-1,2-Dichloroethene | µg/tu | 16.2 | ± 10.2 | 9.07 | 0.1 | 9.57 | 56.0 | -0.75 |
| Trichloroethene | µg/tu | 22.4 | ± 11.2 | 22.15 | 0.2 | 11.2 | 98.7 | -0.03 |


Sample
CL02
1,1,1-Trichloroethane
cis-1,2-Dichloroethene
Tetrachloromethane
Trichloromethane
Tetrachloroethene
trans-1,2-Dichloroethene
Trichloroethene
Measurand
-3.1
-3.5
-2
0
2
Z-Score

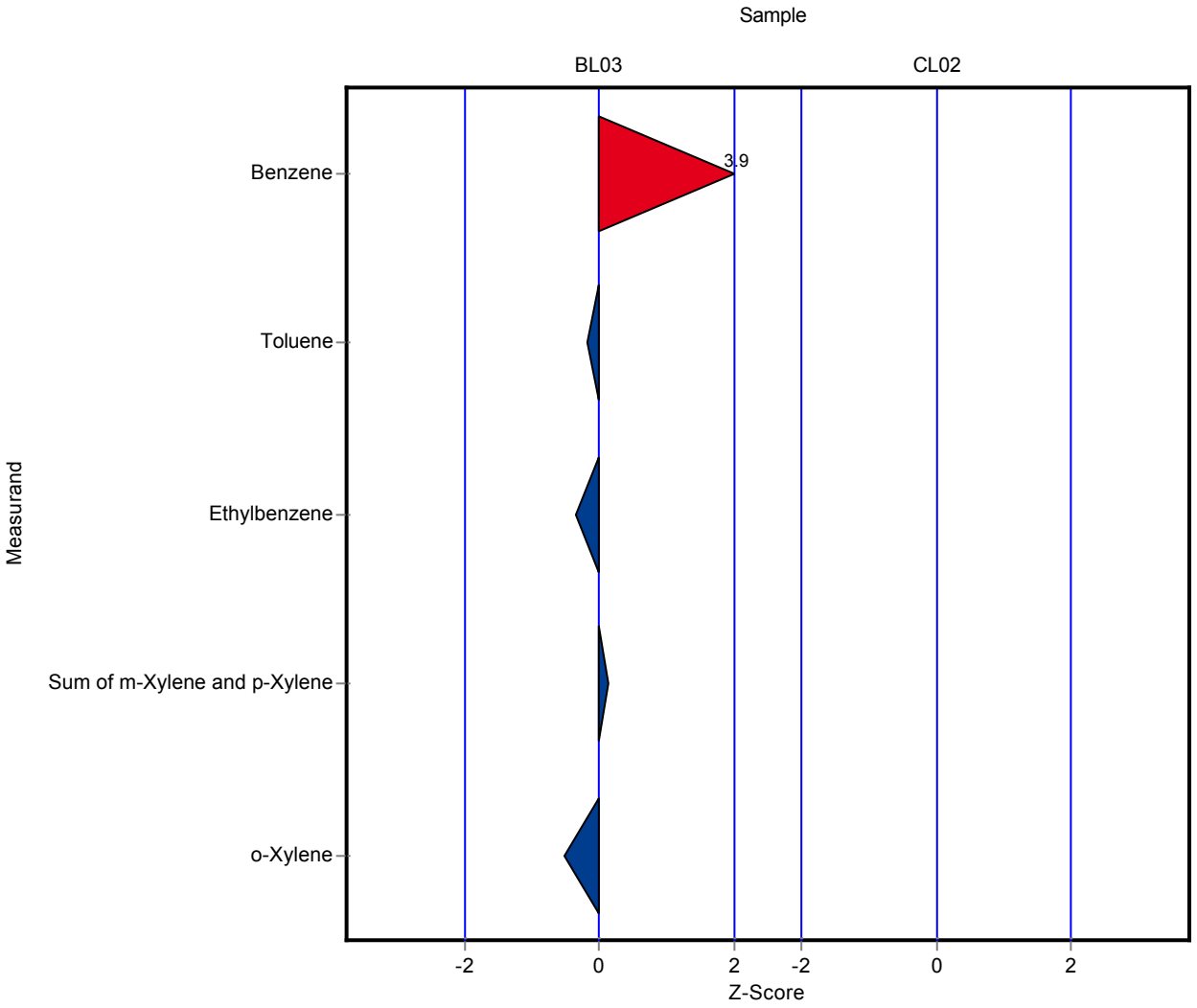
The following results were achieved:

## Sample: BL03

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| Benzene | µg/tu | 1.49 | ± 0.11 | 1.97 | 0.39 | 0.121 | 132.0 | 3.94 |
| Toluene | µg/tu | 3.03 | ± 0.209 | 2.99 | 0.6 | 0.231 | 98.6 | -0.19 |
| Ethylbenzene | µg/tu | 4.09 | ± 0.372 | 3.95 | 0.79 | 0.412 | 96.6 | -0.34 |
| Sum of m-Xylene and p-Xylene | µg/tu | 7.31 | ± 1.13 | 7.47 | 1.49 | 1.25 | 102.2 | 0.13 |
| o-Xylene | µg/tu | 3.85 | ± 0.378 | 3.64 | 0.73 | 0.399 | 94.5 | -0.53 |

## Sample: CL02

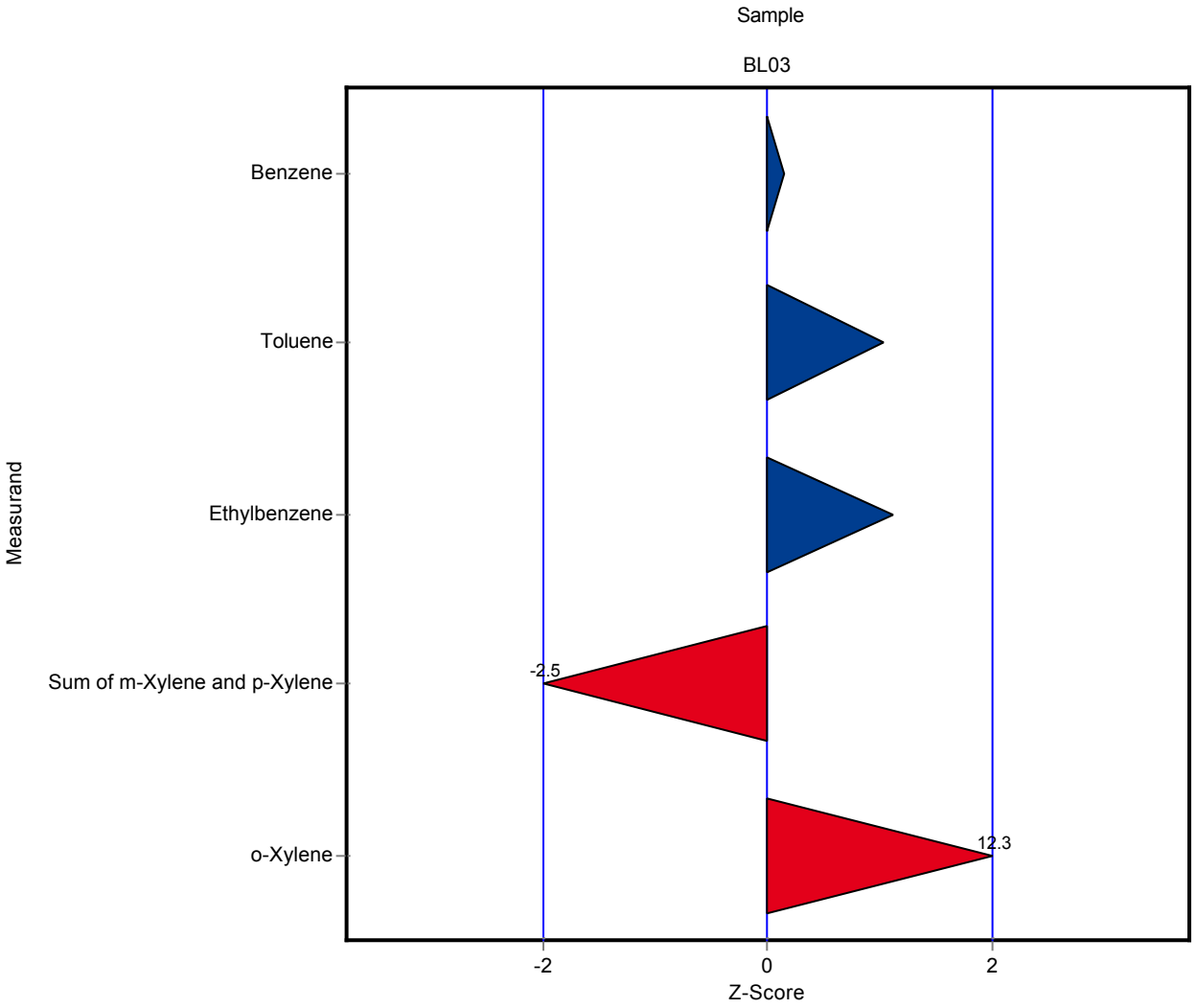
| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | µg/tu | 21.3 | ± 5.17 | - | - | 4.87 | - | - |
| cis-1,2-Dichloroethene | µg/tu | 18.8 | ± 6.21 | - | - | 5.85 | - | - |
| Tetrachloromethane | µg/tu | 30.4 | ± 14.7 | - | - | 14.7 | - | - |
| Trichloromethane | µg/tu | 29.7 | ± 2.42 | - | - | 2.14 | - | - |
| Tetrachloroethene | µg/tu | 25.7 | ± 14 | - | - | 14 | - | - |
| trans-1,2-Dichloroethene | µg/tu | 16.2 | ± 10.2 | - | - | 9.57 | - | - |
| Trichloroethene | µg/tu | 22.4 | ± 11.2 | - | - | 11.2 | - | - |


Sample
BL03
CL02
Benzene
Toluene
Ethylbenzene
Sum of m-Xylene and p-Xylene
o-Xylene
Measurand
3.9
-2
0
2
-2
0
2
Z-Score

The following results were achieved:

Sample: BL03

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| Benzene | µg/tu | 1.49 | ± 0.11 | 1.51 | 0.23 | 0.121 | 101.2 | 0.15 |
| Toluene | µg/tu | 3.03 | ± 0.209 | 3.27 | 0.49 | 0.231 | 107.8 | 1.02 |
| Ethylbenzene | µg/tu | 4.09 | ± 0.372 | 4.55 | 0.68 | 0.412 | 111.2 | 1.12 |
| Sum of m-Xylene and p-Xylene | µg/tu | 7.31 | ± 1.13 | 4.14 | 0.62 | 1.25 | 56.7 | -2.54 |
| o-Xylene | µg/tu | 3.85 | ± 0.378 | 8.76 | 1.31 | 0.399 | 227.4 | 12.31 |


Sample
BL03
Measurand
Benzene
Toluene
Ethylbenzene
Sum of m-Xylene and p-Xylene
o-Xylene
-2.5
12.3
-2
0
2
Z-Score

Summary of results Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Laboratory: LC0014

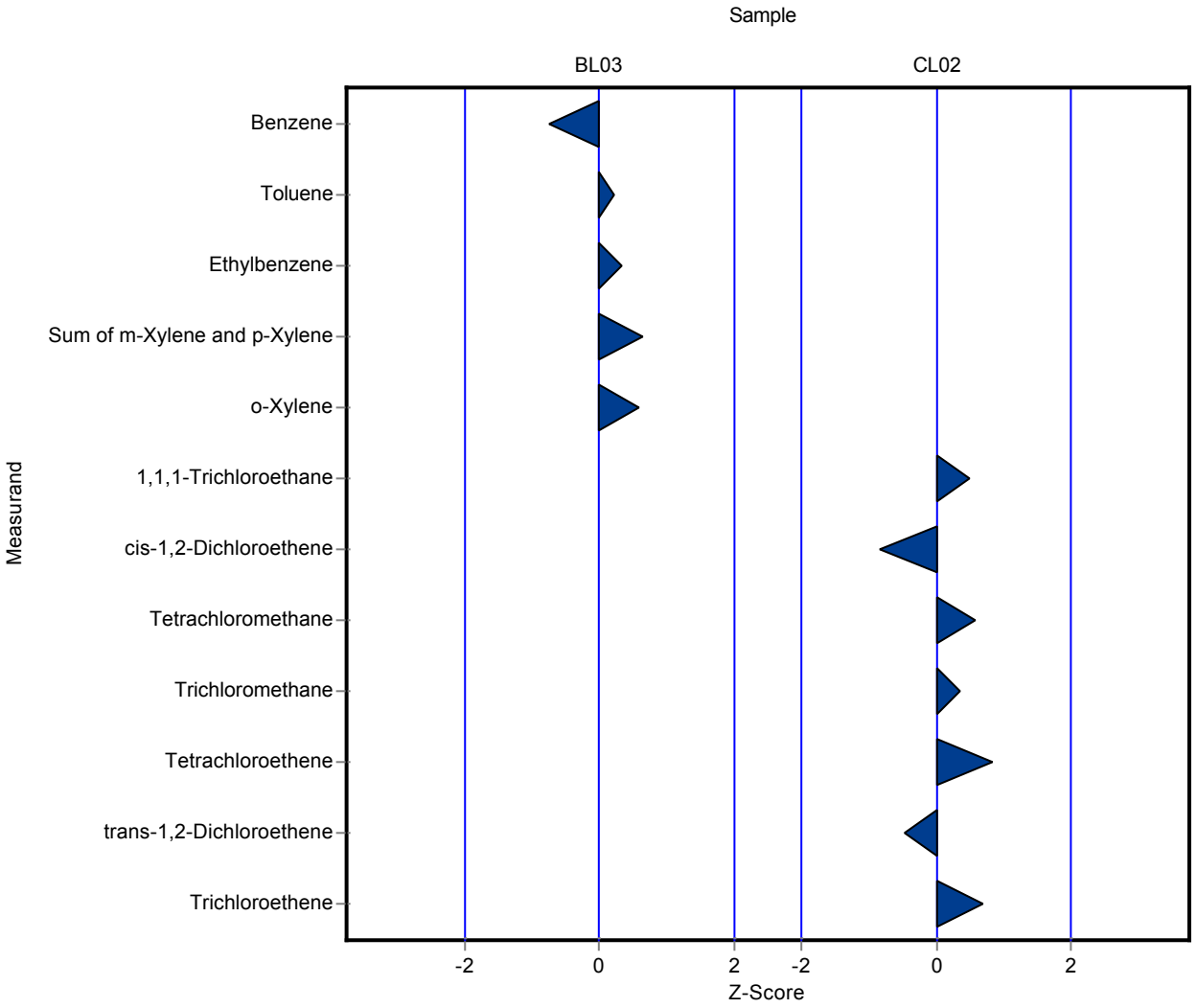
The following results were achieved:

## Sample: BL03

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| Benzene | µg/tu | 1.49 | ± 0.11 | 1.403 | 0.15 | 0.121 | 94.0 | -0.74 |
| Toluene | µg/tu | 3.03 | ± 0.209 | 3.086 | 0.33 | 0.231 | 101.7 | 0.23 |
| Ethylbenzene | µg/tu | 4.09 | ± 0.372 | 4.227 | 0.46 | 0.412 | 103.3 | 0.33 |
| Sum of m-Xylene and p-Xylene | µg/tu | 7.31 | ± 1.13 | 8.102 | 0.88 | 1.25 | 110.9 | 0.64 |
| o-Xylene | µg/tu | 3.85 | ± 0.378 | 4.09 | 0.46 | 0.399 | 106.2 | 0.60 |

## Sample: CL02

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | µg/tu | 21.3 | ± 5.17 | 23.674 | 3.67 | 4.87 | 111.0 | 0.48 |
| cis-1,2-Dichloroethene | µg/tu | 18.8 | ± 6.21 | 13.889 | 2.15 | 5.85 | 74.0 | -0.83 |
| Tetrachloromethane | µg/tu | 30.4 | ± 14.7 | 38.807 | 6.02 | 14.7 | 127.7 | 0.57 |
| Trichloromethane | µg/tu | 29.7 | ± 2.42 | 30.421 | 4.72 | 2.14 | 102.5 | 0.34 |
| Tetrachloroethene | µg/tu | 25.7 | ± 14 | 37.072 | 5.52 | 14 | 144.5 | 0.82 |
| trans-1,2-Dichloroethene | µg/tu | 16.2 | ± 10.2 | 11.765 | 1.82 | 9.57 | 72.6 | -0.46 |
| Trichloroethene | µg/tu | 22.4 | ± 11.2 | 30.305 | 3.49 | 11.2 | 135.1 | 0.70 |


Sample
BL03
CL02
Benzene
Toluene
Ethylbenzene
Sum of m-Xylene and p-Xylene
o-Xylene
1,1,1-Trichloroethane
cis-1,2-Dichloroethene
Tetrachloromethane
Trichloromethane
Tetrachloroethene
trans-1,2-Dichloroethene
Trichloroethene
Measurand
-2
0
2
-2
0
2
Z-Score

Summary of results Chlorinated Hydrocarbons and BTEX on activated charcoal tubes - CBL01

Laboratory: LC0015

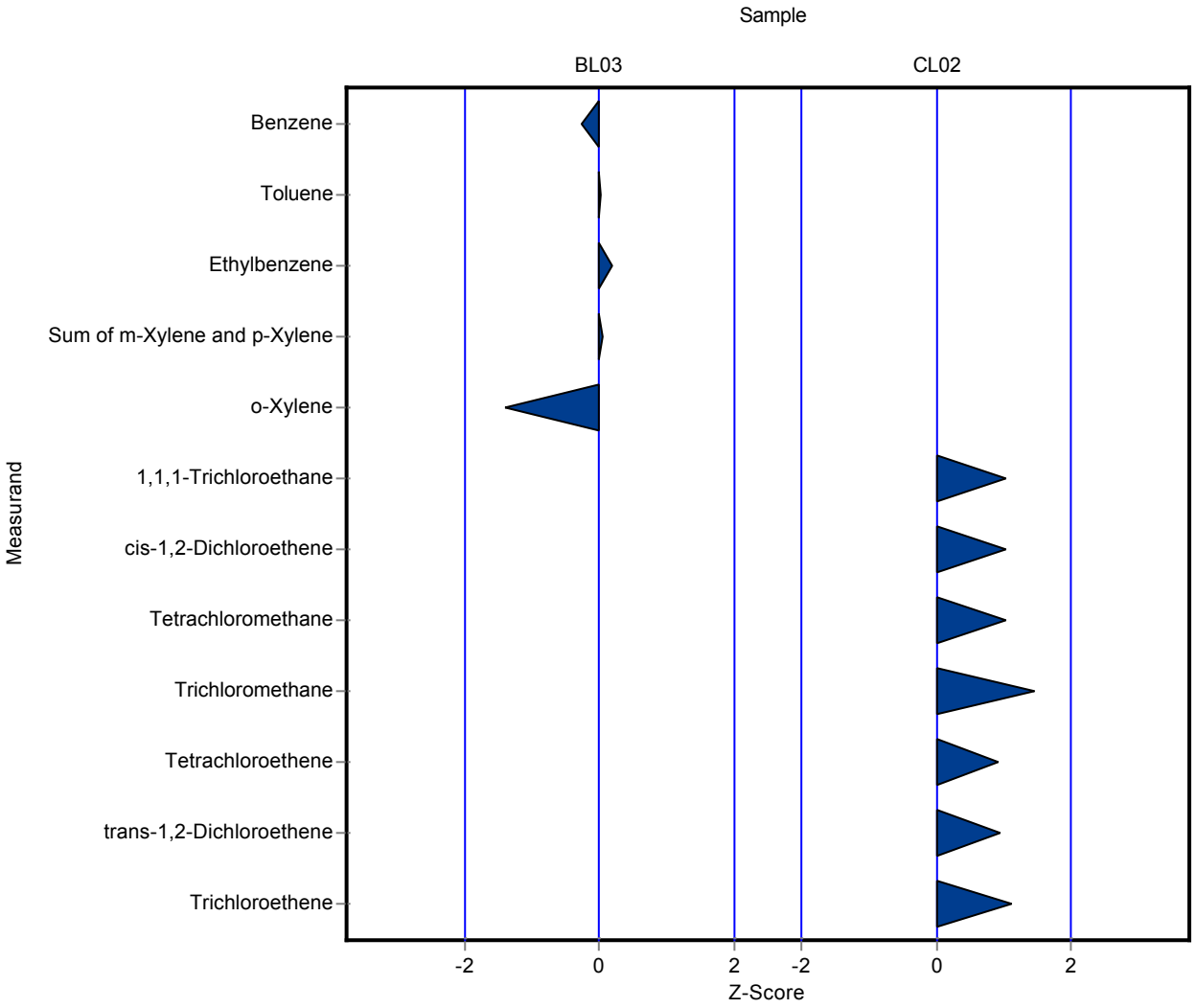
The following results were achieved:

## Sample: BL03

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| Benzene | µg/tu | 1.49 | ± 0.11 | 1.46 | 0.1 | 0.121 | 97.8 | -0.27 |
| Toluene | µg/tu | 3.03 | ± 0.209 | 3.04 | 0.3 | 0.231 | 100.2 | 0.03 |
| Ethylbenzene | µg/tu | 4.09 | ± 0.372 | 4.17 | 0.4 | 0.412 | 102.0 | 0.19 |
| Sum of m-Xylene and p-Xylene | µg/tu | 7.31 | ± 1.13 | 7.36 | 0.7 | 1.25 | 100.7 | 0.04 |
| o-Xylene | µg/tu | 3.85 | ± 0.378 | 3.3 | 0.3 | 0.399 | 85.7 | -1.38 |

## Sample: CL02

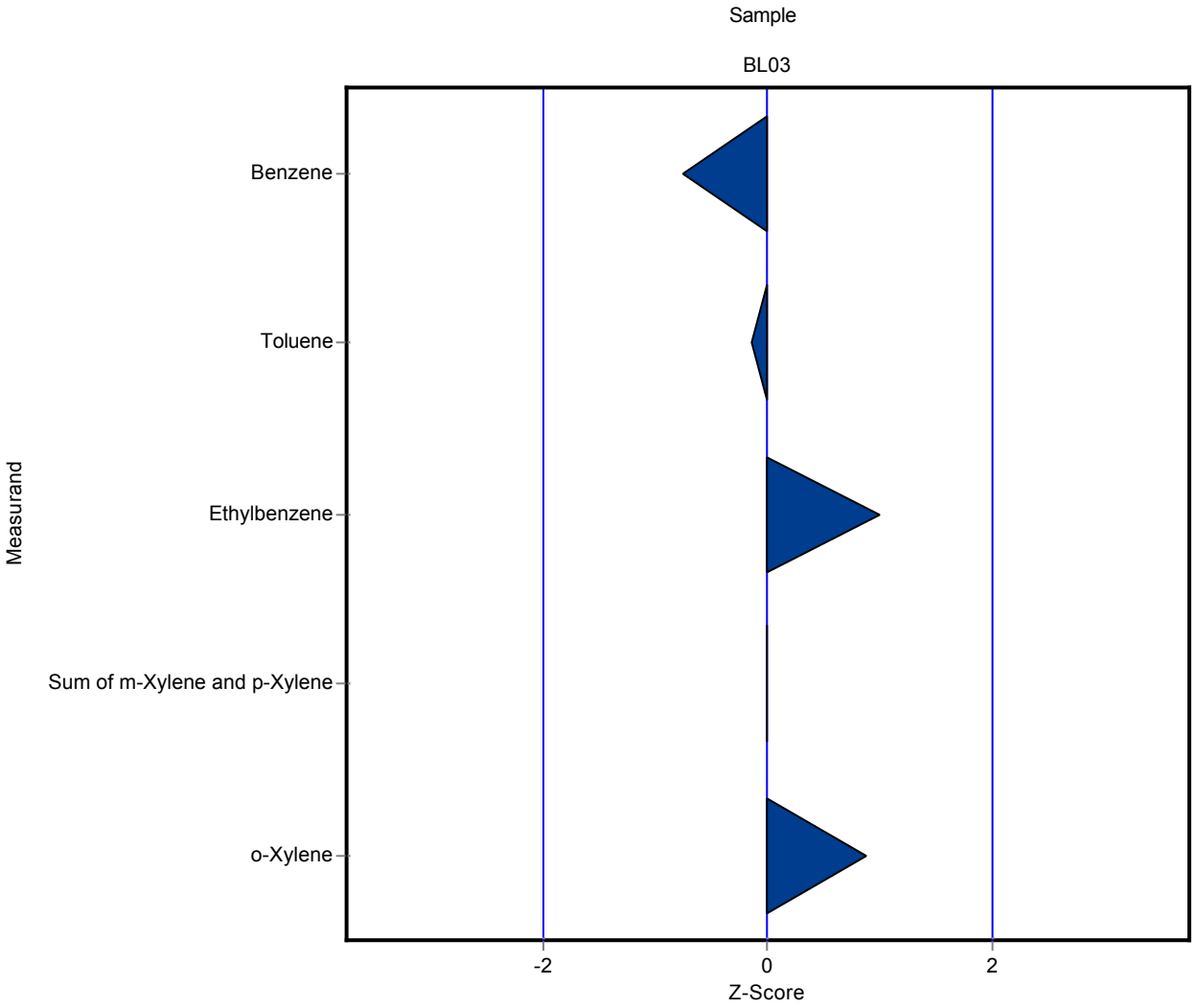
| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | µg/tu | 21.3 | ± 5.17 | 26.35 | 3 | 4.87 | 123.5 | 1.03 |
| cis-1,2-Dichloroethene | µg/tu | 18.8 | ± 6.21 | 24.75 | 2 | 5.85 | 131.9 | 1.02 |
| Tetrachloromethane | µg/tu | 30.4 | ± 14.7 | 45.66 | 5 | 14.7 | 150.3 | 1.04 |
| Trichloromethane | µg/tu | 29.7 | ± 2.42 | 32.81 | 3 | 2.14 | 110.5 | 1.46 |
| Tetrachloroethene | µg/tu | 25.7 | ± 14 | 38.47 | 4 | 14 | 150.0 | 0.92 |
| trans-1,2-Dichloroethene | µg/tu | 16.2 | ± 10.2 | 25.14 | 2 | 9.57 | 155.1 | 0.93 |
| Trichloroethene | µg/tu | 22.4 | ± 11.2 | 34.83 | 3 | 11.2 | 155.2 | 1.11 |


Sample
BL03
CL02
Benzene
Toluene
Ethylbenzene
Sum of m-Xylene and p-Xylene
o-Xylene
1,1,1-Trichloroethane
cis-1,2-Dichloroethene
Tetrachloromethane
Trichloromethane
Tetrachloroethene
trans-1,2-Dichloroethene
Trichloroethene
Measurand
-2
0
2
-2
0
2
Z-Score

The following results were achieved:

Sample: BL03

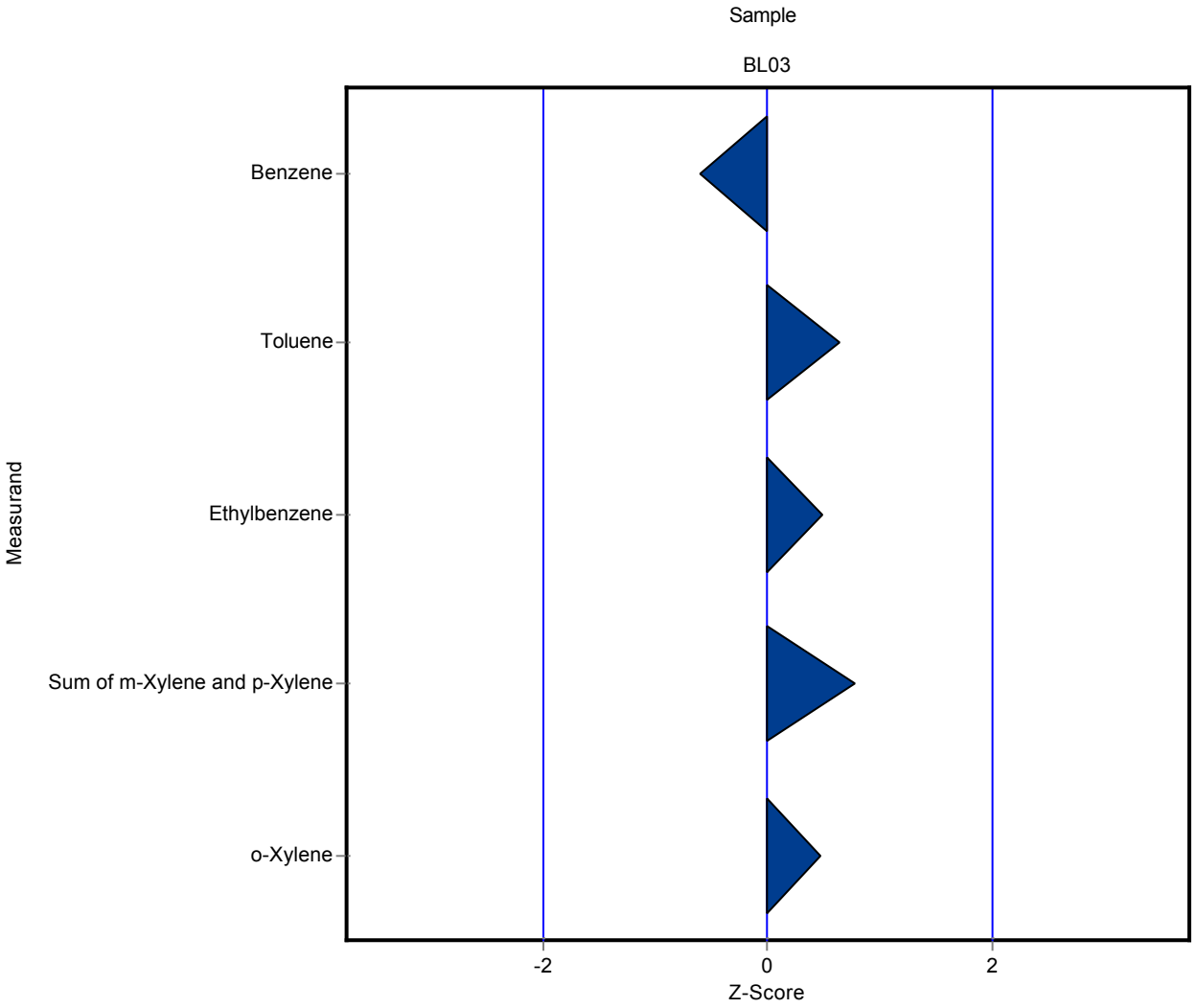
| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| Benzene | µg/tu | 1.49 | ± 0.11 | 1.4 | 1.5 | 0.121 | 93.8 | -0.76 |
| Toluene | µg/tu | 3.03 | ± 0.209 | 3 | 0.4 | 0.231 | 98.9 | -0.15 |
| Ethylbenzene | µg/tu | 4.09 | ± 0.372 | 4.5 | 0.6 | 0.412 | 110.0 | 1.00 |
| Sum of m-Xylene and p-Xylene | µg/tu | 7.31 | ± 1.13 | 7.3 | 1 | 1.25 | 99.9 | 0.00 |
| o-Xylene | µg/tu | 3.85 | ± 0.378 | 4.2 | 0.6 | 0.399 | 109.0 | 0.87 |


Sample
BL03
Benzene
Toluene
Ethylbenzene
Sum of m-Xylene and p-Xylene
o-Xylene
Measurand
-2
0
2
Z-Score

The following results were achieved:

Sample: BL03

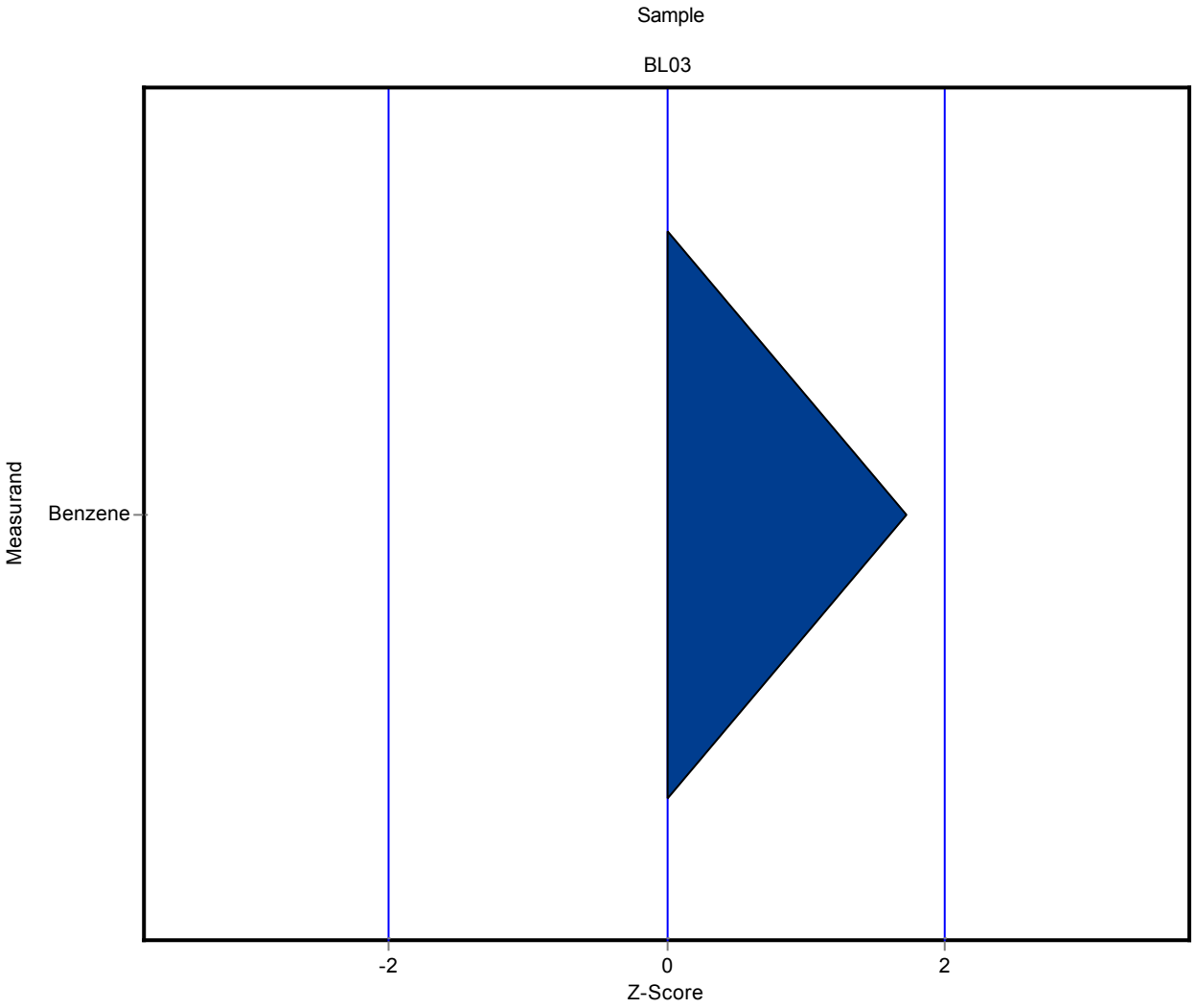
| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| Benzene | µg/tu | 1.49 | ± 0.11 | 1.42 | 0.06 | 0.121 | 95.2 | -0.60 |
| Toluene | µg/tu | 3.03 | ± 0.209 | 3.18 | 0.19 | 0.231 | 104.8 | 0.63 |
| Ethylbenzene | µg/tu | 4.09 | ± 0.372 | 4.29 | 0.32 | 0.412 | 104.9 | 0.49 |
| Sum of m-Xylene and p-Xylene | µg/tu | 7.31 | ± 1.13 | 8.28 | 0.58 | 1.25 | 113.3 | 0.78 |
| o-Xylene | µg/tu | 3.85 | ± 0.378 | 4.04 | 0.29 | 0.399 | 104.9 | 0.47 |


Sample
BL03
Benzene
Toluene
Ethylbenzene
Sum of m-Xylene and p-Xylene
o-Xylene
Measurand
-2
0
2
Z-Score

The following results were achieved:

Sample: BL03

| Parameter | Unit | Target | ± CI(99%) | Result | ± U | Criteria | Recovery | z-score |
|---|---|---|---|---|---|---|---|---|
| Benzene | µg/tu | 1.49 | ± 0.11 | 1.7 | 0.43 | 0.121 | 113.9 | 1.72 |
| Toluene | µg/tu | 3.03 | ± 0.209 | - | - | 0.231 | - | - |
| Ethylbenzene | µg/tu | 4.09 | ± 0.372 | - | - | 0.412 | - | - |
| Sum of m-Xylene and p-Xylene | µg/tu | 7.31 | ± 1.13 | - | - | 1.25 | - | - |
| o-Xylene | µg/tu | 3.85 | ± 0.378 | - | - | 0.399 | - | - |


Sample
BL03
Measurand
Benzene
-2
0
2
Z-Score