Proficiency Testing Scheme for Water Analysis

Round C61
Volatile Halogenated Hydrocarbons

Sample Dispatch: 1 July 2019

TULLN

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Round: C61	Date / Signature:	7.8.2019 Wolfgang Kandler

This report has 75 pages.

This report summarises the results of round C61 “Volatile Halogenated Hydrocarbons” within the IFA-Test Systems Proficiency-Testing Scheme for water analysis. The samples C61A and C61B were distributed to the participants on Monday, 1 July 2019. Closing date for reporting results to the IFA-Tulln was Friday, 2 August 2019.

16 laboratories participated in this interlaboratory comparison. 15 laboratories submitted results.

Samples

For sample preparation, ultrapure water was spiked with concentrated solutions of inorganic salts in order to simulate the ionic composition of natural ground water. The following salts were added to the samples: $Mg(NO_3)_2$, $MgSO_4$, Na_2SO_4, $NaHCO_3$, $KHCO_3$, $CaCl_2$ and $Ca(NO_3)_2$. Prior to sample preparation, blank samples of ultrapure water and artificial water matrix were analysed by Purge&Trap-GC-MS to exclude contamination with halogenated hydrocarbons and other interfering substances.

The samples were spiked with traces of trichloroethene, trichloromethane, 1,1,1-trichloroethane, tetrachloromethane, tribromomethane, tetrachloroethene, bromodichloromethane, 1,2-dichloroethane, dibromochloromethane, 1,1-dichloroethene, dichloromethane, cis-1,2-dichloroethene and trans-1,2-dichloroethene.

The calculation of the mass concentrations of the compounds was based on the weights of standards added to the samples.

Homogeneity, accuracy and stability tests at the IFA-Tulln

For verification of homogeneity samples were analysed for the compounds of interest by Purge&Trap-GC-MS measurements prior to shipment to the participants. The results of the measurements are listed in the result tables and the parameter oriented part of the report (”IFA result”).

Stability tests for the water samples of the present round were carried out four weeks after sample dispatch. The results of the measurements are listed in the result tables and the parameter oriented part of the report (”Stability test”).

Results

Data evaluation was based on target concentrations that were calculated from the weights of the standards used to prepare the samples. Their uncertainty intervals correspond to the expanded uncertainty (coverage factor k = 2) as described in the EURACHEM/CITAC Guide “Quantifying Uncertainty in Analytical Measurement, 3rd Edition (2012)”.

Recoveries for individual laboratory results and overall mean values were calculated from these target concentrations. The results were tested for outliers using the Hampel outlier test (level of significance 99 %). A minimum number of four results was required for the outlier test.

The target concentrations of trichloroethene, 1,1,1-trichloroethane and dichloromethane, which were not added to the sample C61A, were set to <0.08 µg/l trichloroethene, <0.08 µg/l 1,1,1-trichloroethane and <0.6 µg/l 1,2-dichloromethane, which meets the minimum quantifiable values defined by the Austrian ground and river water monitoring program and the quantification limits of the analytical methods applied at the IFA-Tulln.

Standard deviations and coefficients of variation (CVs) were only calculated when at least three results were available. The recoveries of the target concentrations, calculated from outlier-corrected data mean values ranged between 92.7 % (trichloroethene in sample C61B) and 115.9 % (1,1-dichloroethene in sample C61B). The between laboratory CVs covered the range between 5.2 % (tribromomethane in sample C61B) and 41.3 % (tetrachloromethane in sample C61A).

All confidence intervals of the outlier-corrected laboratory mean values encompass the corresponding target values with their uncertainties. Thus, statistically, no difference could be detected between theoretical target concentrations and outlier corrected laboratory means.

z-Scores

The most common approach is to form the z-score given by

$$z = \frac{x_i - \bar{x}}{\sigma}$$

z z-score
x_i result of laboratory
$\bar{x}$ target value or mean value („consensus value“)
σ standard deviation

Thus, the z-score is the ratio of the estimated bias (difference between result and target value) and a standard deviation. The z-score criteria were determined from relative standard deviations from all interlaboratory comparisons that were organised by the IFA-Tulln in the period from 2008 to 2018. They represent long-term performance data of all former participating laboratories. The z-scores are listed together with the recoveries in the tables of the parameter oriented part.

Additionally, each laboratory obtained for every sample a single sheet that summarises the z-scores of the laboratory in graphical and tabular form.

The following table lists the z-score criteria as relative standard deviation and their limits of applicability. Z-scores were only calculated, if the target values were higher than these limits.

Parameter	z-Score-criteria (%)	Lower limit [µg/L]
1,1,1-Trichloroethane	15	0.15
1,1-Dichloroethene	19	0.4
1,2-Dichloroethane	13	0.5
cis-1,2-Dichloroethene	14	0.15
trans-1,2-Dichloroethene	13	0.15
Bromodichloromethane	14	0.15
Dibromochloromethane	15	0.2
Dichloromethane	13	1
Tetrachloroethene	16	0.15
Tetrachloromethane	18	0.15
Tribromomethane	16	0.2
Trichloroethene	15	0.15
Trichloromethane	15	0.25

Normally, a classification based on z-scores is made this way:

|z-Score|	Classification
<2	satisfactory
2<|z|<3	questionable
>3	unsatisfactory

Please note that this evaluation is made on the background of the average performance of all participants of the IFA-Test-Systems proficiency testing scheme during the period from 2008 to 2018.

Illustration of results

An explanation to the illustration of the results is given on the following page.

The **laboratory oriented part** contains the measurement results and reported uncertainties of each individual laboratory for all parameters together with the achieved recoveries in graphical and tabular form. This part of the report also lists tables with the results originally reported by the laboratories.

In the **parameter oriented part** the reported results and corresponding uncertainties are illustrated together with recoveries of the target values and the z-scores for each parameter and all laboratories. This information is presented in graphical and tabular form. Results, which were identified as outliers by the Hampel test are marked with an asterisk in the column “out”. These values were not considered for the calculation of statistical parameters (mean values, standard deviations and confidence intervals). Moreover, the parameter oriented part contains the uncertainties of the target value. The uncertainty intervals correspond to the expanded uncertainty (coverage factor $k = 2$) as described in the EURACHEM / CITAC Guide “Quantifying Uncertainty in Analytical Measurement 3rd Edition (2012)”. The uncertainty interval of the reference concentration is illustrated in the graphs as a grey band around the 100 % recovery line.

Results, for which no recoveries could be calculated, are illustrated by one of the following symbols: **FN** (false negative), **FP** (false positive) or • - symbol.

- “FN”: a result is considered false negative when the “< result” reported is lower than the corresponding target value
- “FP”: False positive results can be obtained for compounds not added to the samples: a result is termed FP if it is higher than the corresponding limit of quantification of the analytical procedure employed at the IFA-Tulln.
- “•”: All other results for which no recovery can be calculated are illustrated by this symbol

Tulln, 7 August 2019

Sample C10B
Parameter Dichloromethane

Target value ± U (k=2) 10,4 µg/l ± 0,5 µg/l ***Obtained from mass weighed out, U = uncertainty***

IFA result ± U (k=2) 10,2 µg/l ± 1,0 µg/l ***Determined at IFA prior to shipment of samples***

Stability test ± U (k=2) 10,2 µg/l ± 1,0 µg/l ***Determined at IFA 5 weeks after sample dispatch***

Lab code	Result	Out	+/-	Unit	Recovery	z-Score
A	11,0		1,28	µg/l	106 %	0,30
B	9,0		1,8	µg/l	87 %	-0,71
C	10		2	µg/l	96 %	-0,20
D				µg/l		
E	13,7		0,40	µg/l	132 %	1,67
F	6,8		0,7	µg/l	65 %	-1,82
G	< 20			µg/l		
H				µg/l	•	
I	11,0			µg/l	106%	0,30
J	24,1	*	1,51	µg/l	232 %	6,93
K	10,09		1,22	µg/l	97 %	-0,16
L	2,76	*		µg/l	27 %	-3,87
M	6,38		1,87	µg/l	61 %	-2,03
N	< 5		0,5	µg/l	FN	
O	15,6	*	4	µg/l	150 %	2,63
P	10,3		1,0	µg/l	99 %	-0,05
Q	10		1,14	µg/l	96 %	-0,20
R	8,88		0,46	µg/l	85 %	-0,77
S				µg/l		
T	9,03		0,08	µg/l	87 %	-0,69
U	22,5	*	0,5	µg/l	216 %	6,12
V	10,33		0,25	µg/l	99 %	-0,04

Recovery of target value in percent

z-Score of the laboratory

An asterisk indicates a result detected as outlier by Hampel test

Interval expected to encompass target value as stated by participant

	All results	Outliers excl.	Unit
Mean +/- CI (99%) Recov. +/- CI (99%)	11,3 ± 3,8 108,3 ± 36,3	9,7 ± 1,6 93,6 ± 15,1	µg/l %
SD between labs RSD between labs	5,3 47,3	1,9 19,1	µg/l %
n for calculation	17	13	

Between laboratory standard deviation

Overall laboratory mean and recovery with corresponding confidence intervals (p=99%)

Number of data used for calculation of statistic parameters

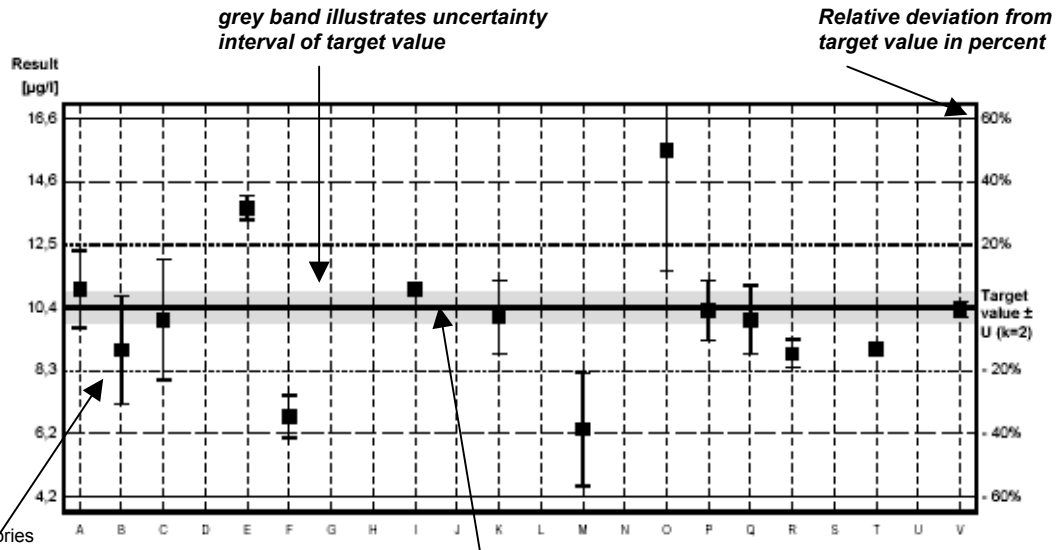


Diagram 1. Measurement results and corresponding uncertainty intervals

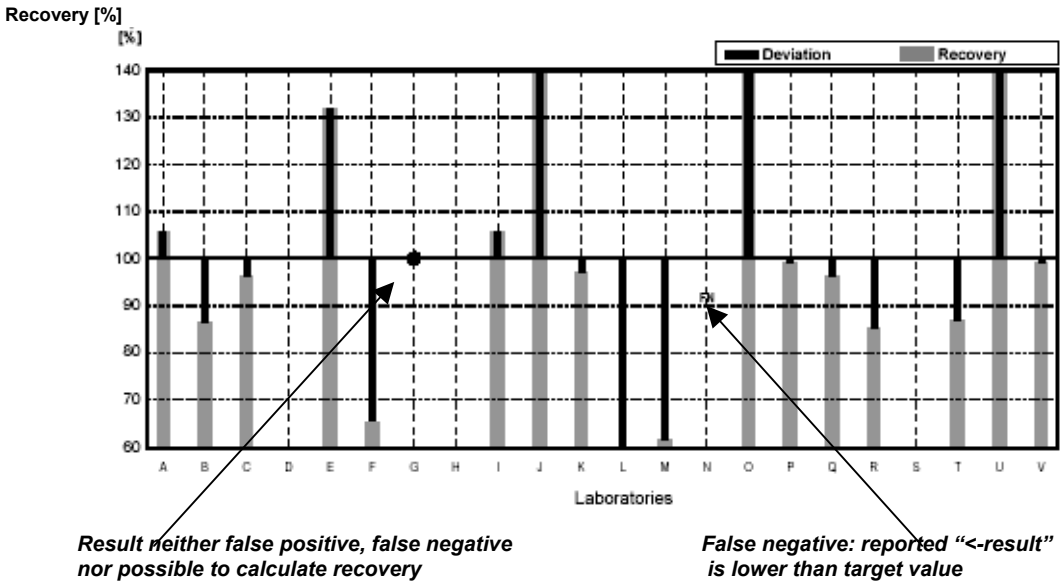


Diagram 2. Recoveries and deviations from target values

EXPLANATION

Illustration of Results
Tables and Parameter Oriented Part

Round C61
Volatile Halogenated Hydrocarbons

Sample Dispatch: 1 July 2019

Results Sample C61A

	Trichloro-ethene	Tetrachloro-ethene	1,1,1-Tri-chloroethane	Trichloro-methane	Tetrachloro-methane	1,1-Dichloro-ethene	Tribromo-methane
Target value	<0.08	0.21	<0.08	0.62	1.25	2.40	0.29
IFA Result	<0.04	0.20	<0.04	0.63	1.29	2.50	0.33
Stability test	<0.04	0.21	<0.04	0.63	1.29	2.49	0.33
A	<0.1	0.32	<0.1	1.31	2.34	8.65	0.40
B	<0.05	0.152	<0.05	0.670	1.65	3.17	0.312
C	<0.1	0.19	<0.1	0.78	1.70	3.35	0.28
D	<0.1	0.335	<0.1	0.733	2.16	3.84	0.293
E	<0.1	0.15	<0.1	0.63	1.16	2.44	0.32
F	<0.50	<0.50	<0.50	0.68	1.5		<0.50
G	<0.05	0.225	<0.05	0.621	1.29	2.34	0.293
H							
I	0.54	1.1	1.5	0.97	0.49	0.9	1.3
J	16.25	0.187	0.019	0.653	0.22	n.b.	0.31
K	<0.1	0.200	<0.1	0.606	1.26	2.52	0.248
L	<0.5	<0.5	<0.5	0.6	1.2	3.3	<0.5
M	<0.1	0.21	<0.1	0.65	1.16	2.32	0.33
N	<0.03	0.17	<0.02	0.63	1.23	2.51	0.30
O	<0.10	0.22	<0.10	0.68	1.43	3.01	0.32
P	<0.10	0.168	<0.10	0.505	0.966	1.91	0.251

All data in µg/L

Uncertainties Sample C61A

	Trichloro-ethene ±	Tetrachloro-ethene ±	1,1,1-Tri-chloroethane ±	Trichloro-methane ±	Tetrachloro-methane ±	1,1-Dichloro-ethene ±	Tribromo-methane ±
Target value		0.01		0.03	0.06	0.12	0.01
IFA Result		0.03		0.09	0.19	0.38	0.05
Stability test		0.03		0.09	0.19	0.37	0.05
A		0.05		0.20	0.35	1.73	0.06
B	0.001	0.002	0.001	0.007	0.017	0.032	0.003
C		0.06		0.23	0.51	1.01	0.08
D		0.040		0.170	0.52	1.61	0.020
E	0.03	0.04	0.03	0.16	0.30	0.63	0.08
F				0.17	0.40		
G		0.004		0.099	0.070	0.078	0.006
H							
I	0.2	0.3	0.4	0.3	0.2	0.3	0.3
J	1.3	0.01	0.003	0.03	0.01		0.03
K		0.017		0.121	0.32	0.49	0.062
L	0.1	0.1	0.1	0.2	0.3	0.8	0.1
M		0.03		0.10	0.17	0.35	0.05
N	0.00	0.03	0.00	0.13	0.25	0.50	0.06
O		0.04		0.14	0.29	0.60	0.06
P		0.0009		0.0073	0.0112	0.0186	0.0055

All data in µg/L

Results Sample C61A

	Bromodichloro-methane	Dibromochloro-methane	Dichloro-methane	1,2-Dichloro-ethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene
Target value	1.14	0.73	<0.6	2.88	2.02	0.23
IFA Result	1.16	0.78	<0.3	3.06	2.07	0.25
Stability test	1.16	0.77	<0.3	3.05	2.03	0.26
A	1.93	1.07	<0.1	4.30	3.41	0.43
B	1.28	0.757	<0.21	2.53	2.297	0.266
C	1.52	0.87		3.97	2.19	0.24
D	1.16	0.702	n.b.	2.59	2.32	0.339
E	1.10	0.74	<0.1	2.78	1.64	0.21
F	1.2	0.74	<0.50	3.3		
G	1.08	0.640	<0.05	3.06	2.03	0.225
H						
I	0.19	1.3	1.6	1.7	0.34	2.1
J	<0.1	0.677	11.46	n.b.	n.b.	n.b.
K	1.18	0.713	<1.0	2.83	1.87	0.242
L	1.0	0.6	<0.5	2.9	2.1	<0.5
M	1.21	0.72	<0.5	2.53	2.02	<0.5
N	1.14	0.71	<0.06	3.03	2.07	0.20
O	1.21	0.75	<1.00	2.86	2.11	<0.50
P	0.927	0.603	<0.10	2.48	1.64	0.193

All data in µg/L

Uncertainties Sample C61A

	Bromodichloro-methane ±	Dibromochloro-methane ±	Dichloro-methane ±	1,2-Dichloro-ethane ±	cis-1,2-Dichloroethene ±	trans-1,2-Dichloroethene ±
Target value	0.06	0.04		0.14	0.10	0.01
IFA Result	0.17	0.12		0.46	0.31	0.04
Stability test	0.17	0.12		0.46	0.30	0.04
A	0.29	0.16		0.65	0.51	0.06
B	0.013	0.008	0.002	0.025	0.023	0.003
C	0.46	0.26		1.19	0.66	0.07
D	0.24	0.080		0.54	0.57	0.080
E	0.29	0.19	0.03	0.72	0.43	0.05
F	0.24	0.15		0.73		
G	0.081	0.100		0.122	0.084	0.012
H						
I	0.1	0.3	0.4	0.4	0.1	0.6
J	0.05	0.01	0.5			
K	0.30	0.178		0.68	0.35	0.048
L	0.3	0.2	0.1	0.7	0.5	0.1
M	0.18	0.11		0.38	0.30	
N	0.23	0.14	0.00	0.61	0.41	0.04
O	0.24	0.15		0.57	0.42	
P	0.0166	0.0027		0.0013	0.0233	0.0022

All data in µg/L

Results Sample C61B

	Trichloro-ethene	Tetrachloro-ethene	1,1,1-Tri-chloroethane	Trichloro-methane	Tetrachloro-methane	1,1-Dichloro-ethene	Tribromo-methane
Target value	0.67	1.07	1.45	0.98	0.49	0.76	1.30
IFA Result	0.66	1.04	1.43	0.95	0.48	0.76	1.38
Stability test	0.68	1.05	1.45	0.95	0.50	0.80	1.39
A	1.41	1.97	3.40	2.08	0.86	2.53	1.85
B	0.728	1.07	1.67	1.03	0.604	0.925	1.28
C	0.59	0.97	1.82	1.20	0.59	0.90	1.27
D	1.12	1.92	2.89	1.42	1.11	1.76	1.28
E	0.60	0.93	1.43	1.08	0.50	0.78	1.40
F	0.75	1.2	1.8	1.1	0.55		1.3
G	0.615	1.02	1.64	0.960	0.475	0.682	1.25
H							
I	<0.1	0.19	<0.1	0.64	1.3	2.8	0.3
J	5.86	0.94	1.285	0.983	0.039	n.b.	1.213
K	0.602	0.987	1.37	0.969	0.472	0.759	1.24
L	0.5	1.1	1.6	0.9	<0.5	1.0	1.3
M	0.63	0.94	1.33	1.02	0.44	0.71	1.34
N	0.64	1.01	1.51	0.98	0.45	0.67	1.31
O	0.66	1.18	1.58	1.04	0.56	0.92	1.13
P	0.517	0.797	1.09	0.779	0.364	0.584	1.08

All data in µg/L

Uncertainties Sample C61B

	Trichloro-ethene ±	Tetrachloro-ethene ±	1,1,1-Tri-chloroethane ±	Trichloro-methane ±	Tetrachloro-methane ±	1,1-Dichloro-ethene ±	Tribromo-methane ±
Target value	0.03	0.05	0.07	0.05	0.02	0.04	0.07
IFA Result	0.10	0.16	0.21	0.14	0.07	0.11	0.21
Stability test	0.10	0.16	0.22	0.14	0.08	0.12	0.21
A	0.21	0.30	0.51	0.31	0.13	0.38	0.28
B	0.007	0.011	0.017	0.010	0.006	0.009	0.013
C	0.18	0.29	0.55	0.36	0.18	0.27	0.38
D	0.36	0.24	0.68	0.46	0.36	0.90	0.07
E	0.16	0.24	0.37	0.28	0.13	0.20	0.36
F	0.22	0.36	0.50	0.28	0.15		0.26
G	0.099	0.072	0.078	0.094	0.098	0.065	0.086
H							
I		0.1		0.2	0.3	1	0.1
J	0.4	0.05	0.08	0.06	0.005		0.05
K	0.043	0.082	0.26	0.194	0.119	0.149	0.31
L	0.1	0.3	0.4	0.2	0.1	0.3	0.3
M	0.09	0.14	0.20	0.15	0.07	0.11	0.20
N	0.13	0.20	0.30	0.20	0.09	0.13	0.26
O	0.13	0.24	0.32	0.21	0.11	0.18	0.23
P	0.0027	0.0061	0.0064	0.0020	0.0012	0.0028	0.0186

All data in µg/L

Results Sample C61B

	Bromodichloro-methane	Dibromochloro-methane	Dichloro-methane	1,2-Dichloro-ethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene
Target value	0.18	1.27	1.49	1.78	0.33	1.87
IFA Result	0.19	1.30	1.50	1.86	0.34	1.85
Stability test	0.19	1.31	1.51	1.87	0.35	1.85
A	0.28	1.88	3.02	2.69	0.45	3.07
B	0.205	1.30	1.67	1.55	0.361	2.03
C	0.20	1.47		2.33	0.30	1.98
D	0.217	1.42	n.b.	2.10	0.481	3.54
E	0.21	1.34	1.61	1.88	0.24	1.99
F	<0.50	1.3	2.1	2.1		
G	0.181	1.18	1.56	1.88	0.358	1.76
H						
I	1.2	0.76	<0.1	2.9	2.1	0.27
J	0.299	1.047	2.98	n.b.	n.b.	n.b.
K	0.192	1.29	1.15	1.91	0.295	1.78
L	<0.5	1.2	1.5	1.9	<0.5	2.2
M	0.21	1.29	1.43	1.39	<0.5	1.97
N	0.18	1.22	1.52	1.97	0.46	1.70
O	0.21	1.37	1.51	1.80	<0.50	2.08
P	0.122	1.04	1.21	1.52	0.271	1.44

All data in µg/L

Uncertainties Sample C61B

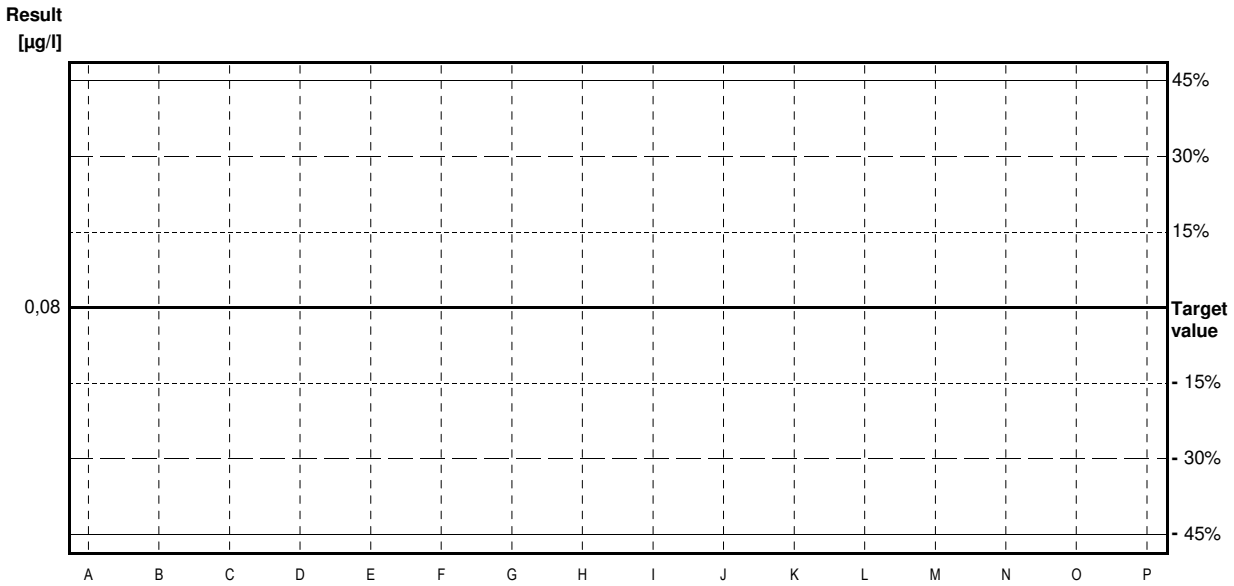
	Bromodichloro-methane ±	Dibromochloro-methane ±	Dichloro-methane ±	1,2-Dichloro-ethane ±	cis-1,2-Dichloroethene ±	trans-1,2-Dichloroethene ±
Target value	0.01	0.06	0.07	0.09	0.02	0.09
IFA Result	0.03	0.20	0.23	0.28	0.05	0.28
Stability test	0.03	0.20	0.23	0.28	0.05	0.28
A	0.04	0.28	0.45	0.40	0.07	0.46
B	0.002	0.013	0.017	0.016	0.004	0.020
C	0.06	0.44		0.70	0.09	0.59
D	0.050	0.13		0.59	0.170	1.29
E	0.06	0.35	0.42	0.49	0.06	0.52
F		0.26	0.44	0.46		
G	0.005	0.093	0.094	0.102	0.007	0.087
H						
I	0.3	0.2		1	0.6	0.1
J	0.05	0.08	0.1			
K	0.048	0.32	0.29	0.46	0.055	0.36
L	0.1	0.3	0.4	0.5	0.1	0.6
M	0.03	0.19	0.21	0.21		0.30
N	0.04	0.24	0.30	0.39	0.09	0.34
O	0.04	0.27	0.30	0.36		0.42
P	0.0020	0.0093	0.0070	0.0110	0.0038	0.0081

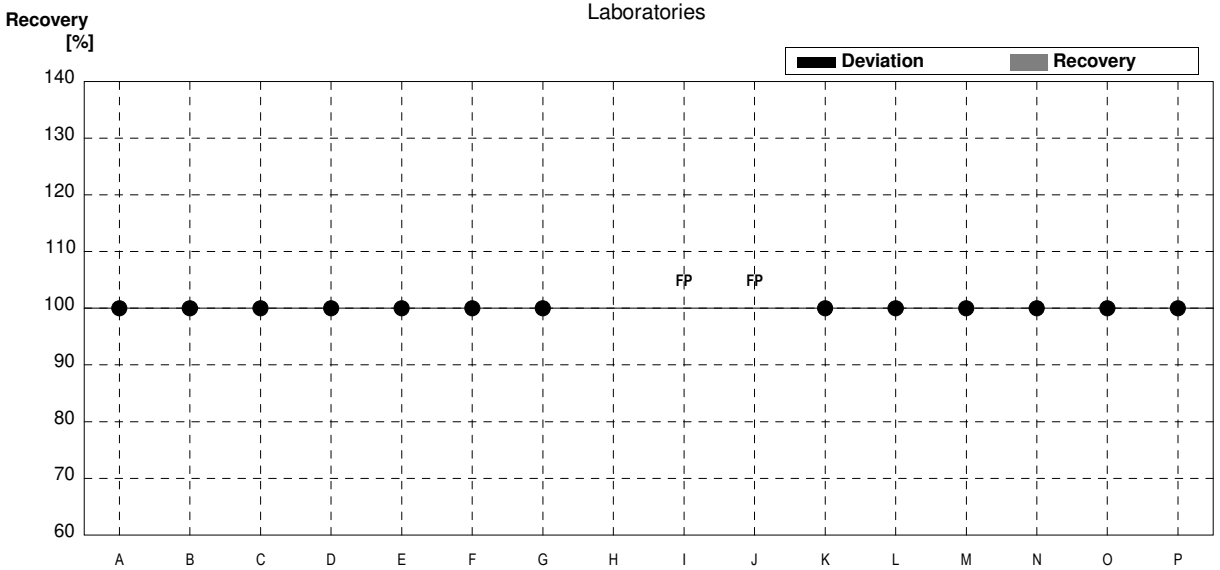
All data in µg/L

Sample C61A
Parameter Trichloroethene

Target value	<0,08	µg/l
IFA result	<0,04	µg/l
Stability test	<0,04	µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<0,1		µg/l	•	
B	<0,05	0,001	µg/l	•	
C	<0,1		µg/l	•	
D	<0,1		µg/l	•	
E	<0,1	0,03	µg/l	•	
F	<0,50		µg/l	•	
G	<0,05		µg/l	•	
H			µg/l		
I	0,54	0,2	µg/l	FP	
J	16,25	1,3	µg/l	FP	
K	<0,1		µg/l	•	
L	<0,5	0,1	µg/l	•	
M	<0,1		µg/l	•	
N	<0,03	0,00	µg/l	•	
O	<0,10		µg/l	•	
P	<0,10		µg/l	•	



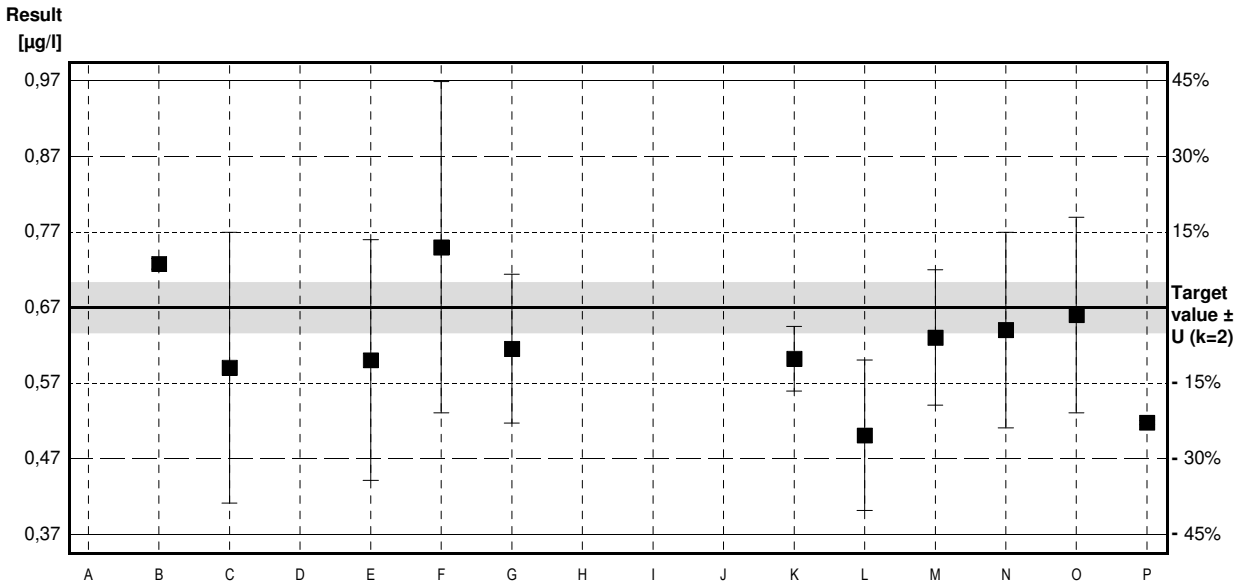


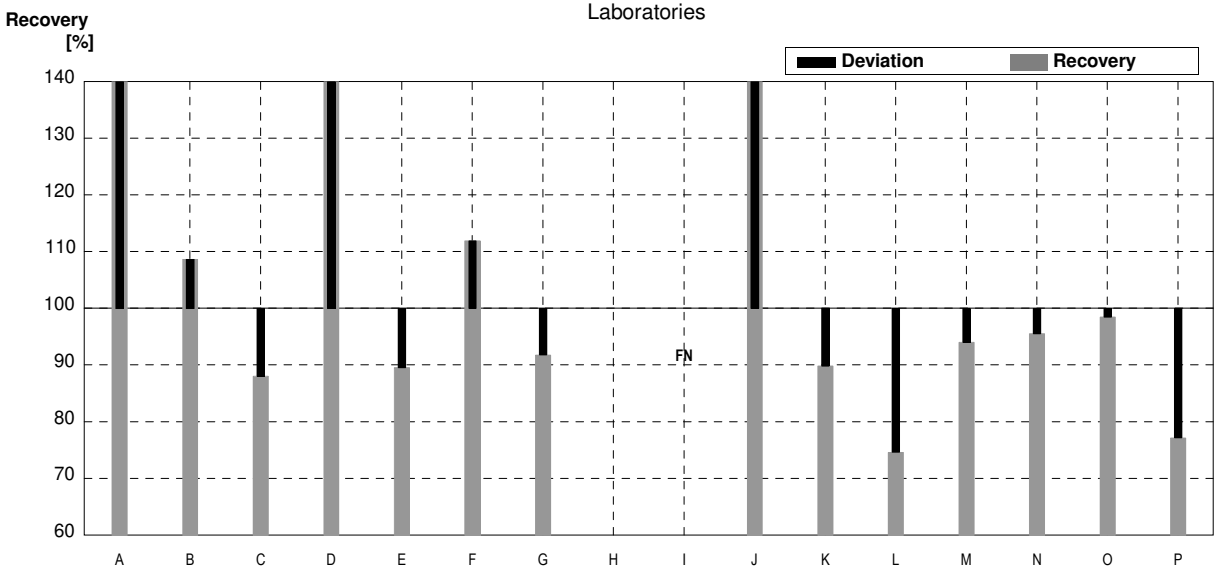
	All results	Outliers excl.	Unit
Mean ± CI(99%) Recov. ± CI(99%)			µg/l %
SD between labs RSD between labs			µg/l %
n for calculation			

Sample C61B
Parameter Trichloroethene

Target value	± U (k=2)	0,67 µg/l	±	0,03 µg/l
IFA result	± U (k=2)	0,66 µg/l	±	0,10 µg/l
Stability test	± U (k=2)	0,68 µg/l	±	0,10 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	1,41 *	0,21	µg/l	210%	7,36
B	0,728	0,007	µg/l	109%	0,58
C	0,59	0,18	µg/l	88%	-0,80
D	1,12 *	0,36	µg/l	167%	4,48
E	0,60	0,16	µg/l	90%	-0,70
F	0,75	0,22	µg/l	112%	0,80
G	0,615	0,099	µg/l	92%	-0,55
H			µg/l		
I	<0,1		µg/l	FN	
J	5,86 *	0,4	µg/l	875%	51,64
K	0,602	0,043	µg/l	90%	-0,68
L	0,5	0,1	µg/l	75%	-1,69
M	0,63	0,09	µg/l	94%	-0,40
N	0,64	0,13	µg/l	96%	-0,30
O	0,66	0,13	µg/l	99%	-0,10
P	0,517	0,0027	µg/l	77%	-1,52



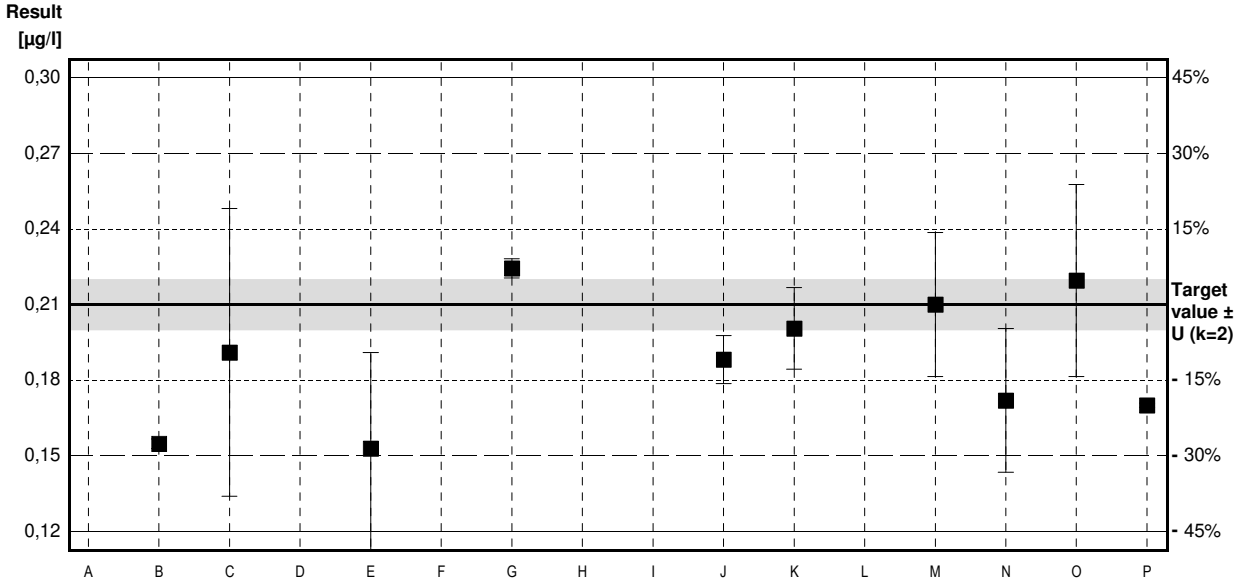


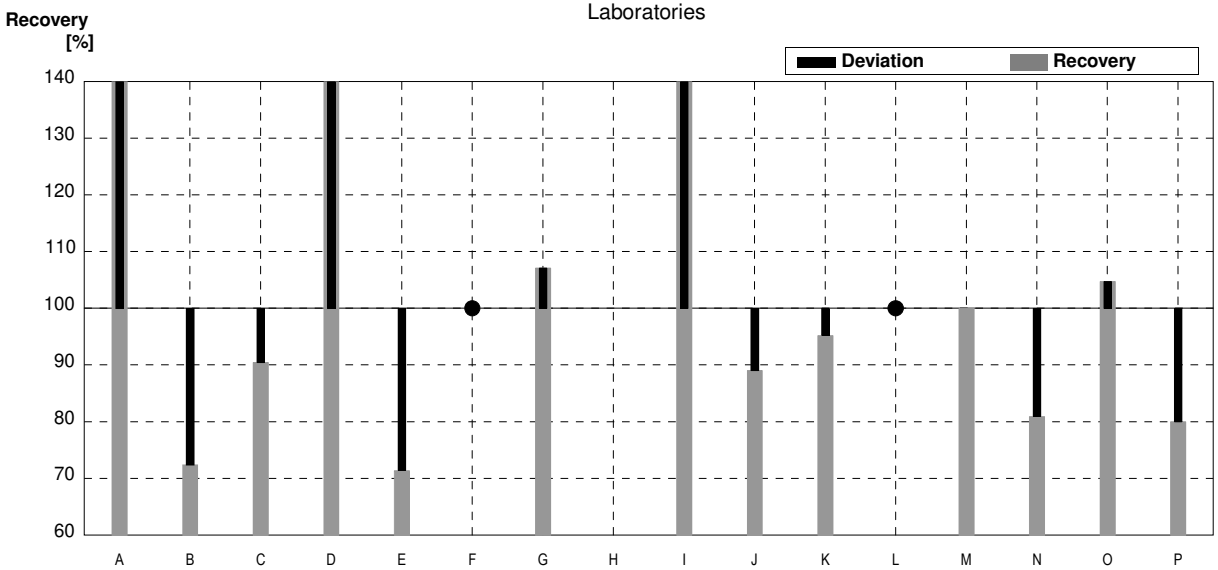
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,09 ± 1,12	0,62 ± 0,07	µg/l
Recov. ± CI(99%)	162,3 ± 167,6	92,7 ± 10,8	%
SD between labs	1,40	0,08	µg/l
RSD between labs	128,4	12,2	%
n for calculation	14	11	

Sample C61A
Parameter Tetrachloroethene

Target value	± U (k=2)	0,21 µg/l	±	0,01 µg/l
IFA result	± U (k=2)	0,20 µg/l	±	0,03 µg/l
Stability test	± U (k=2)	0,21 µg/l	±	0,03 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	0,32	0,05	µg/l	152%	3,27
B	0,152	0,002	µg/l	72%	-1,73
C	0,19	0,06	µg/l	90%	-0,60
D	0,335	0,040	µg/l	160%	3,72
E	0,15	0,04	µg/l	71%	-1,79
F	<0,50		µg/l	•	
G	0,225	0,004	µg/l	107%	0,45
H			µg/l		
I	1,1 *	0,3	µg/l	524%	26,49
J	0,187	0,01	µg/l	89%	-0,68
K	0,200	0,017	µg/l	95%	-0,30
L	<0,5	0,1	µg/l	•	
M	0,21	0,03	µg/l	100%	0,00
N	0,17	0,03	µg/l	81%	-1,19
O	0,22	0,04	µg/l	105%	0,30
P	0,168	0,0009	µg/l	80%	-1,25



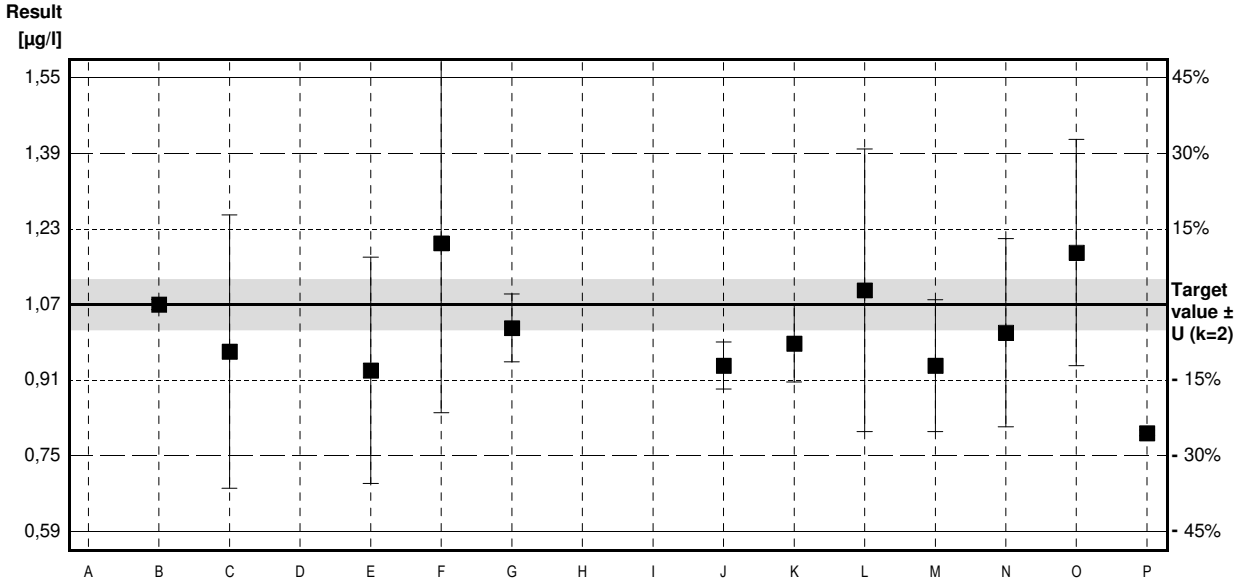


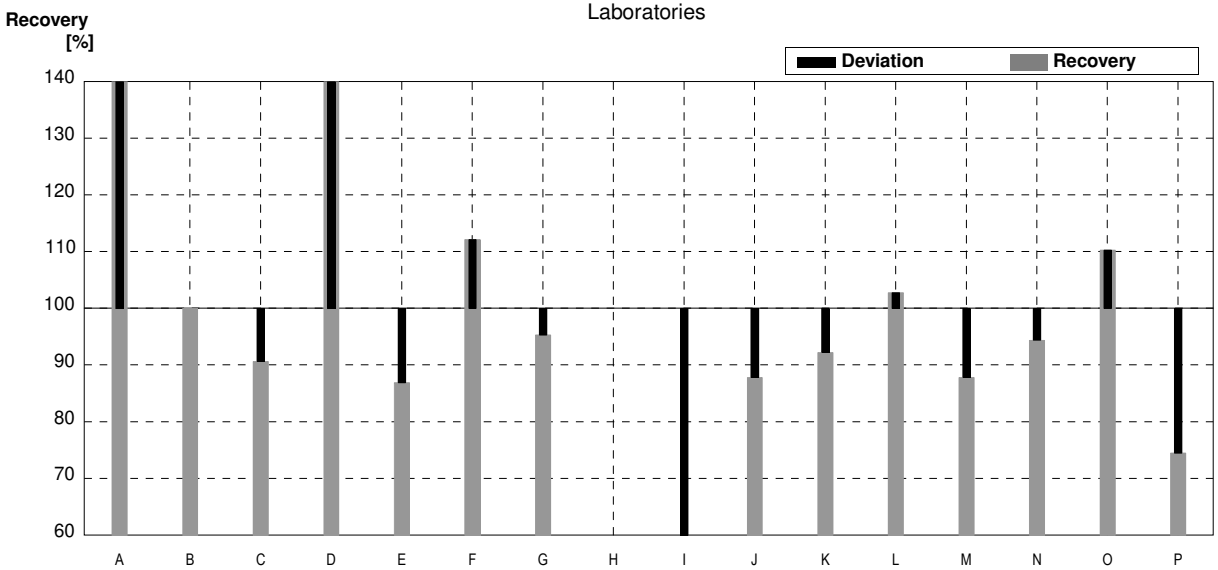
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,28 ± 0,21	0,21 ± 0,05	µg/l
Recov. ± CI(99%)	132,9 ± 102,0	100,3 ± 25,6	%
SD between labs	0,25	0,06	µg/l
RSD between labs	90,8	28,4	%
n for calculation	13	12	

Sample C61B
Parameter Tetrachloroethene

Target value	± U (k=2)	1,07 µg/l	±	0,05 µg/l
IFA result	± U (k=2)	1,04 µg/l	±	0,16 µg/l
Stability test	± U (k=2)	1,05 µg/l	±	0,16 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	1,97 *	0,30	µg/l	184%	5,26
B	1,07	0,011	µg/l	100%	0,00
C	0,97	0,29	µg/l	91%	-0,58
D	1,92 *	0,24	µg/l	179%	4,96
E	0,93	0,24	µg/l	87%	-0,82
F	1,2	0,36	µg/l	112%	0,76
G	1,02	0,072	µg/l	95%	-0,29
H			µg/l		
I	0,19 *	0,1	µg/l	18%	-5,14
J	0,94	0,05	µg/l	88%	-0,76
K	0,987	0,082	µg/l	92%	-0,48
L	1,1	0,3	µg/l	103%	0,18
M	0,94	0,14	µg/l	88%	-0,76
N	1,01	0,20	µg/l	94%	-0,35
O	1,18	0,24	µg/l	110%	0,64
P	0,797	0,0061	µg/l	74%	-1,59



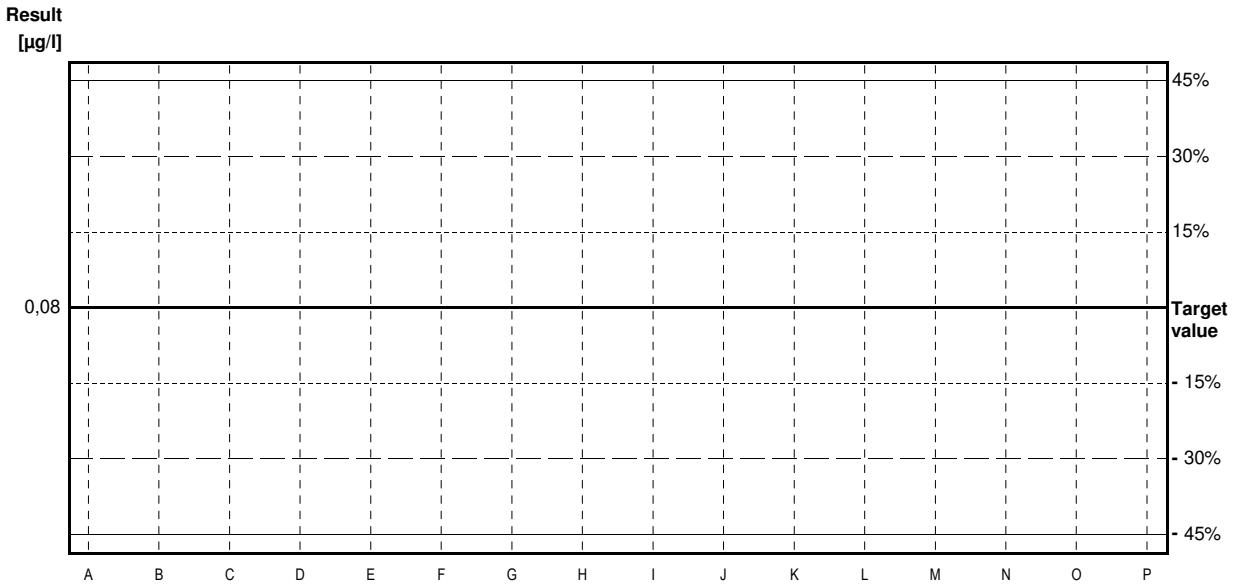


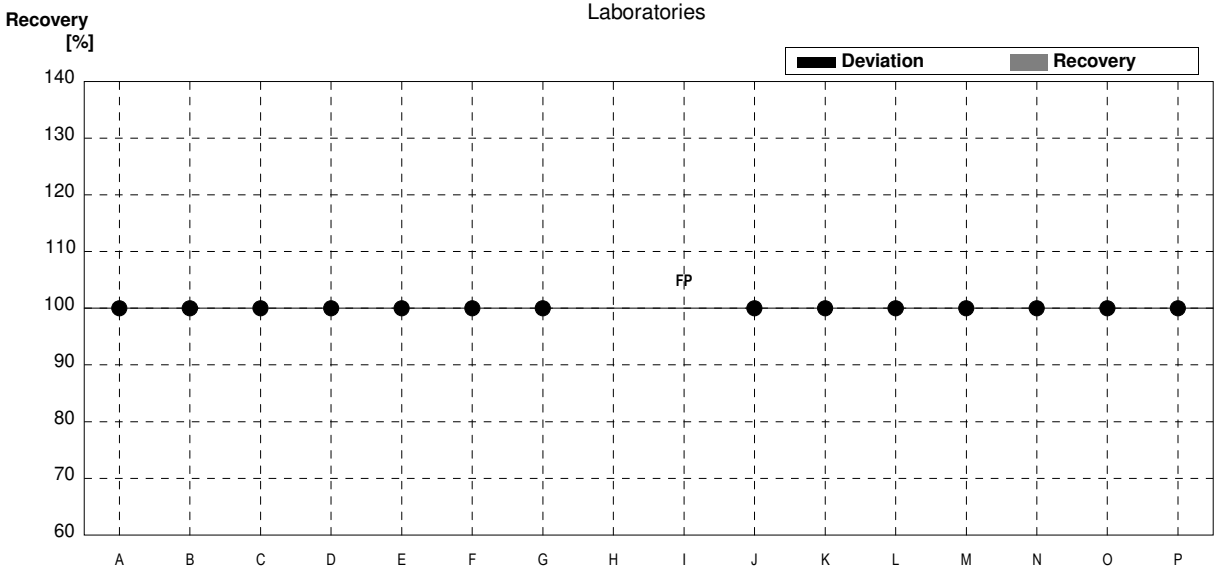
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,08 ± 0,32	1,01 ± 0,10	µg/l
Recov. ± CI(99%)	101,1 ± 30,3	94,6 ± 9,5	%
SD between labs	0,42	0,11	µg/l
RSD between labs	39,0	11,2	%
n for calculation	15	12	

Sample C61A
Parameter 1,1,1-Trichloroethane

Target value	<0,08	µg/l
IFA result	<0,04	µg/l
Stability test	<0,04	µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<0,1		µg/l	•	
B	<0,05	0,001	µg/l	•	
C	<0,1		µg/l	•	
D	<0,1		µg/l	•	
E	<0,1	0,03	µg/l	•	
F	<0,50		µg/l	•	
G	<0,05		µg/l	•	
H			µg/l		
I	1,5	0,4	µg/l	FP	
J	0,019	0,003	µg/l	•	
K	<0,1		µg/l	•	
L	<0,5	0,1	µg/l	•	
M	<0,1		µg/l	•	
N	<0,02	0,00	µg/l	•	
O	<0,10		µg/l	•	
P	<0,10		µg/l	•	





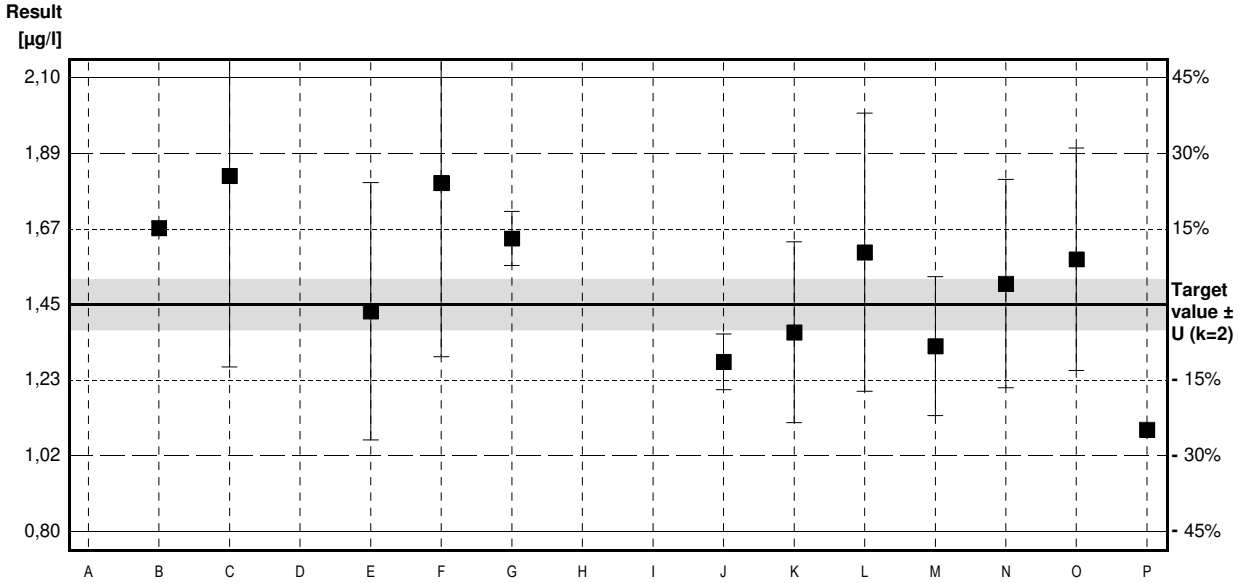
	All results	Outliers excl.	Unit
Mean ± CI(99%) Recov. ± CI(99%)			µg/l %
SD between labs RSD between labs			µg/l %
n for calculation			

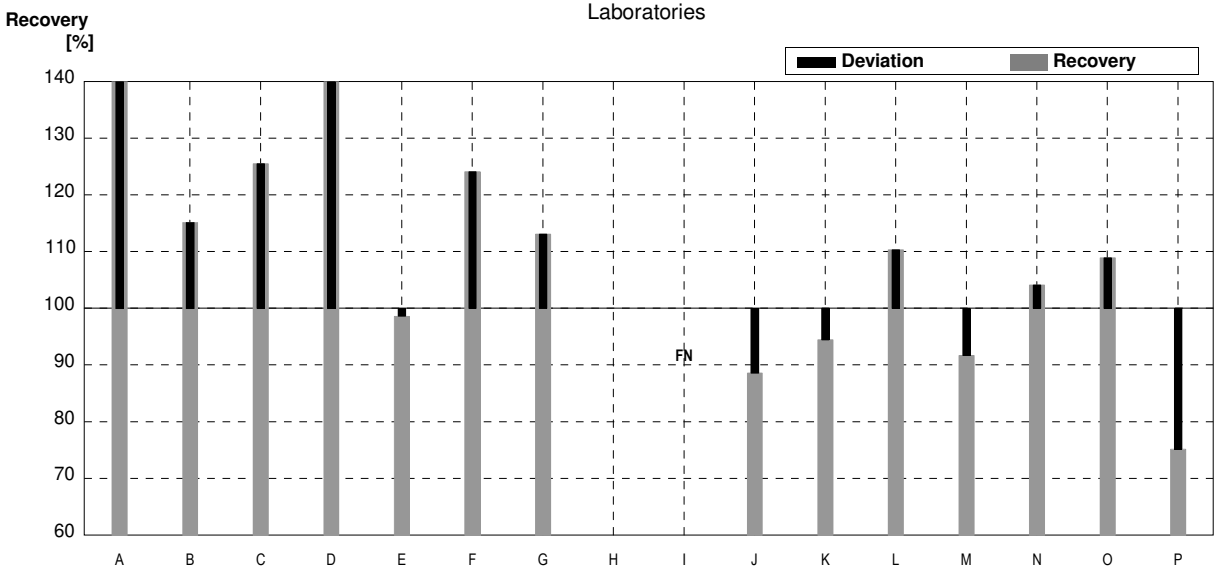
Sample C61B

Parameter 1,1,1-Trichloroethane

Target value	± U (k=2)	1,45 µg/l	±	0,07 µg/l
IFA result	± U (k=2)	1,43 µg/l	±	0,21 µg/l
Stability test	± U (k=2)	1,45 µg/l	±	0,22 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	3,40 *	0,51	µg/l	234%	8,97
B	1,67	0,017	µg/l	115%	1,01
C	1,82	0,55	µg/l	126%	1,70
D	2,89 *	0,68	µg/l	199%	6,62
E	1,43	0,37	µg/l	99%	-0,09
F	1,8	0,50	µg/l	124%	1,61
G	1,64	0,078	µg/l	113%	0,87
H			µg/l		
I	<0,1		µg/l	FN	
J	1,285	0,08	µg/l	89%	-0,76
K	1,37	0,26	µg/l	94%	-0,37
L	1,6	0,4	µg/l	110%	0,69
M	1,33	0,20	µg/l	92%	-0,55
N	1,51	0,30	µg/l	104%	0,28
O	1,58	0,32	µg/l	109%	0,60
P	1,09	0,0064	µg/l	75%	-1,66



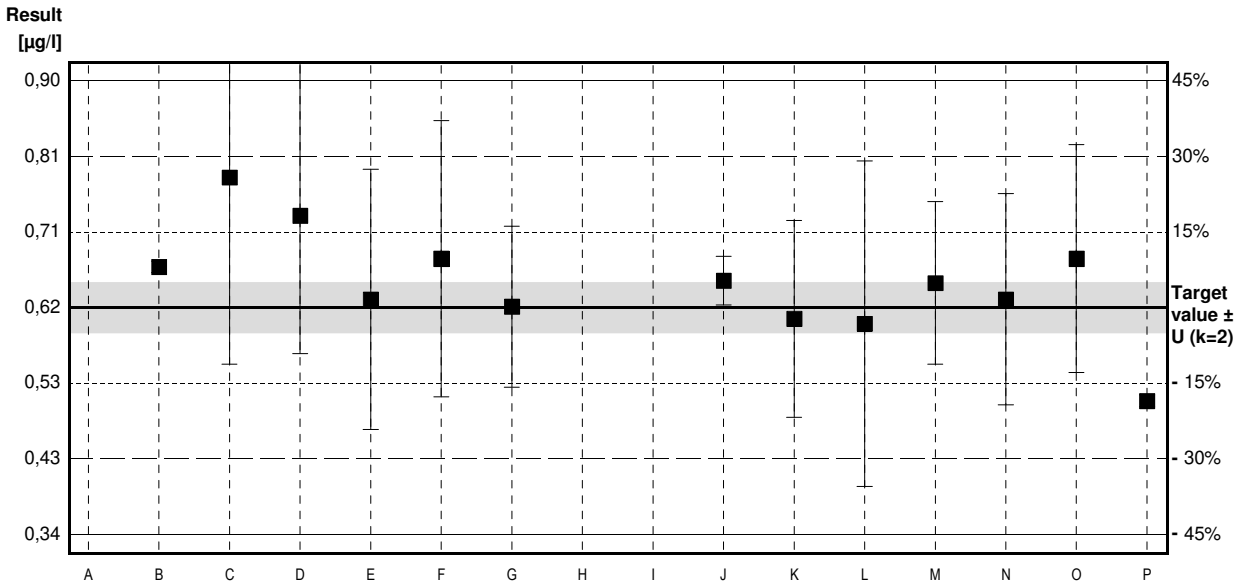


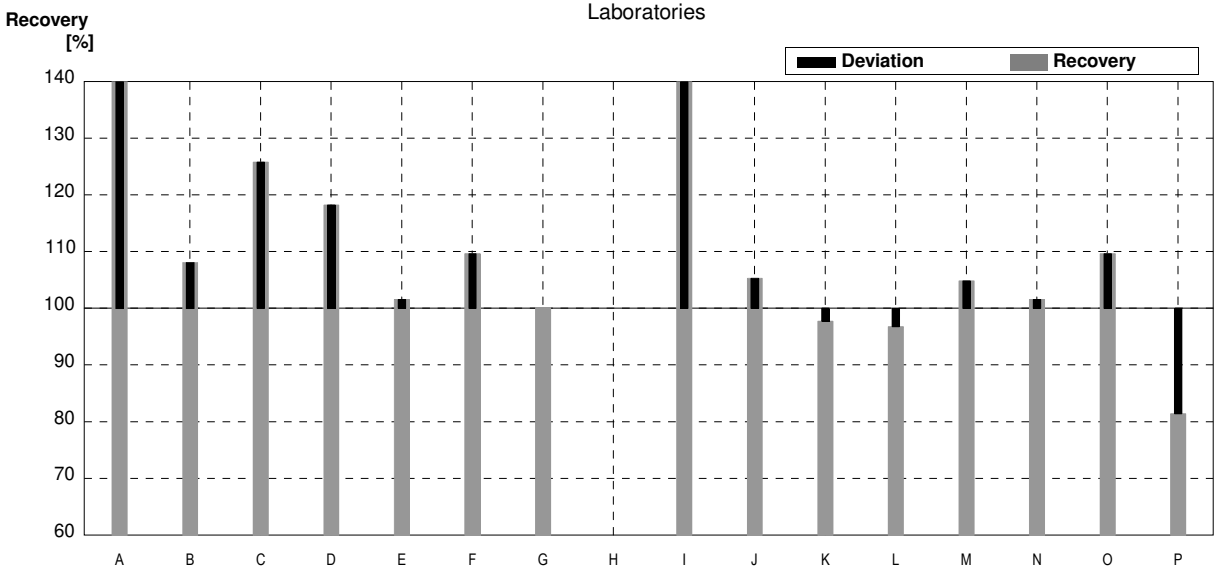
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,74 ± 0,51	1,51 ± 0,20	µg/l
Recov. ± CI(99%)	120,3 ± 35,2	104,2 ± 13,5	%
SD between labs	0,63	0,22	µg/l
RSD between labs	36,4	14,4	%
n for calculation	14	12	

Sample C61A
Parameter Trichloromethane

Target value	± U (k=2)	0,62 µg/l	±	0,03 µg/l
IFA result	± U (k=2)	0,63 µg/l	±	0,09 µg/l
Stability test	± U (k=2)	0,63 µg/l	±	0,09 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	1,31 *	0,20	µg/l	211%	7,42
B	0,670	0,007	µg/l	108%	0,54
C	0,78	0,23	µg/l	126%	1,72
D	0,733	0,170	µg/l	118%	1,22
E	0,63	0,16	µg/l	102%	0,11
F	0,68	0,17	µg/l	110%	0,65
G	0,621	0,099	µg/l	100%	0,01
H			µg/l		
I	0,97 *	0,3	µg/l	156%	3,76
J	0,653	0,03	µg/l	105%	0,35
K	0,606	0,121	µg/l	98%	-0,15
L	0,6	0,2	µg/l	97%	-0,22
M	0,65	0,10	µg/l	105%	0,32
N	0,63	0,13	µg/l	102%	0,11
O	0,68	0,14	µg/l	110%	0,65
P	0,505	0,0073	µg/l	81%	-1,24



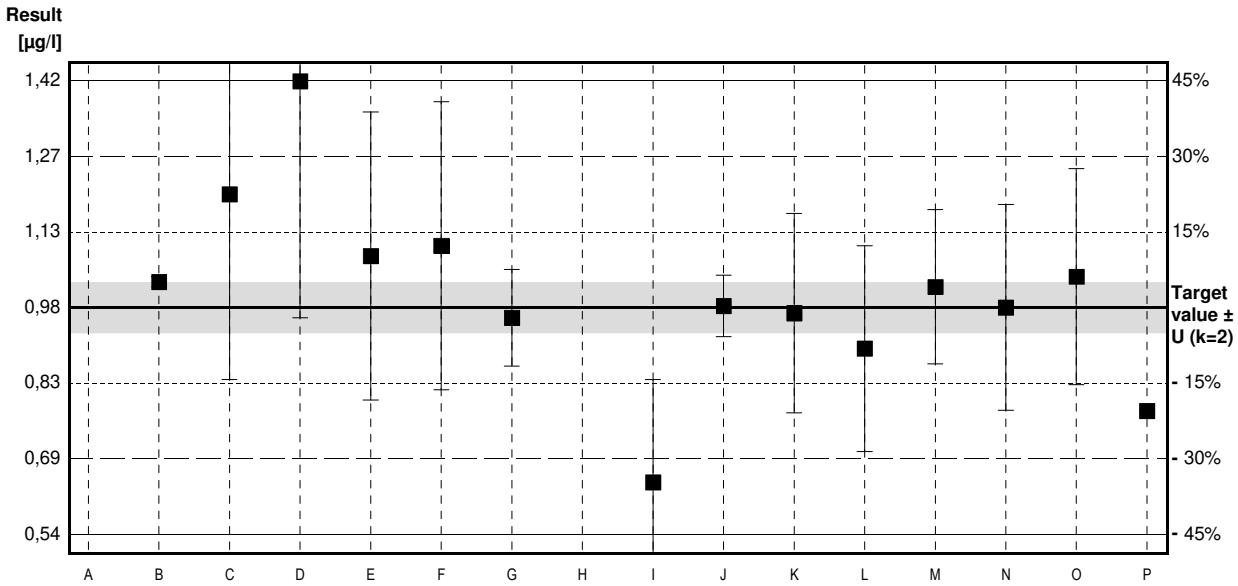


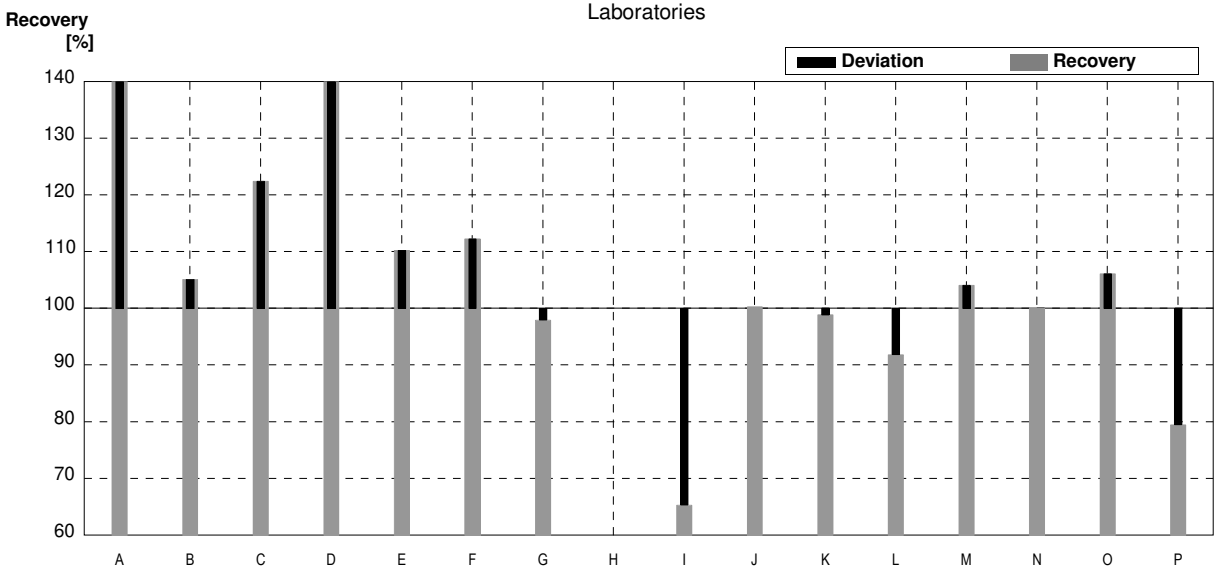
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,71 ± 0,15	0,65 ± 0,06	µg/l
Recov. ± CI(99%)	115,2 ± 24,1	104,7 ± 9,1	%
SD between labs	0,19	0,07	µg/l
RSD between labs	27,2	10,2	%
n for calculation	15	13	

Sample C61B
Parameter Trichloromethane

Target value	± U (k=2)	0,98 µg/l	±	0,05 µg/l
IFA result	± U (k=2)	0,95 µg/l	±	0,14 µg/l
Stability test	± U (k=2)	0,95 µg/l	±	0,14 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	2,08 *	0,31	µg/l	212%	7,48
B	1,03	0,010	µg/l	105%	0,34
C	1,20	0,36	µg/l	122%	1,50
D	1,42 *	0,46	µg/l	145%	2,99
E	1,08	0,28	µg/l	110%	0,68
F	1,1	0,28	µg/l	112%	0,82
G	0,960	0,094	µg/l	98%	-0,14
H			µg/l		
I	0,64 *	0,2	µg/l	65%	-2,31
J	0,983	0,06	µg/l	100%	0,02
K	0,969	0,194	µg/l	99%	-0,07
L	0,9	0,2	µg/l	92%	-0,54
M	1,02	0,15	µg/l	104%	0,27
N	0,98	0,20	µg/l	100%	0,00
O	1,04	0,21	µg/l	106%	0,41
P	0,779	0,0020	µg/l	79%	-1,37



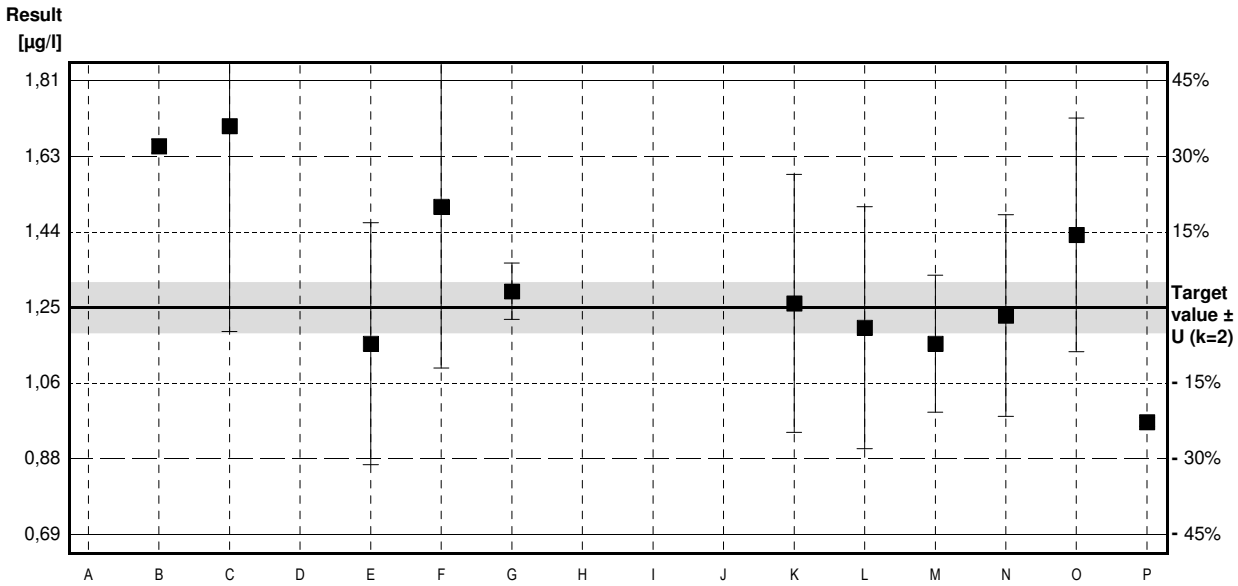


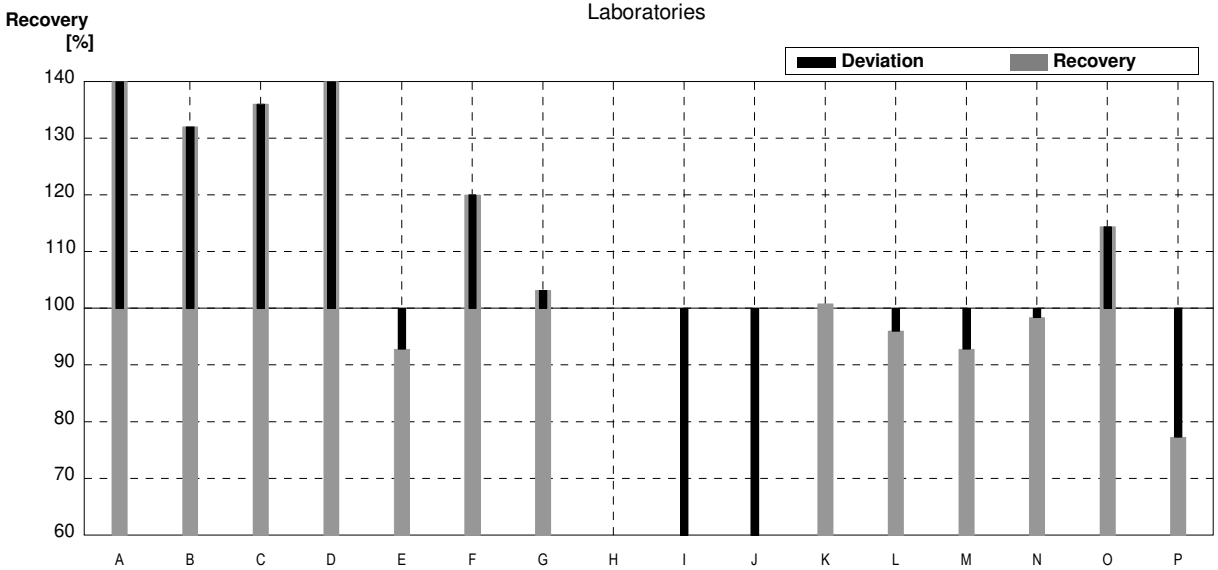
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,08 ± 0,25	1,00 ± 0,09	µg/l
Recov. ± CI(99%)	110,1 ± 25,7	102,4 ± 9,6	%
SD between labs	0,33	0,10	µg/l
RSD between labs	30,4	10,5	%
n for calculation	15	12	

Sample C61A
Parameter Tetrachloromethane

Target value	± U (k=2)	1,25 µg/l	±	0,06 µg/l
IFA result	± U (k=2)	1,29 µg/l	±	0,19 µg/l
Stability test	± U (k=2)	1,29 µg/l	±	0,19 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	2,34	0,35	µg/l	187%	4,84
B	1,65	0,017	µg/l	132%	1,78
C	1,70	0,51	µg/l	136%	2,00
D	2,16	0,52	µg/l	173%	4,04
E	1,16	0,30	µg/l	93%	-0,40
F	1,5	0,40	µg/l	120%	1,11
G	1,29	0,070	µg/l	103%	0,18
H			µg/l		
I	0,49	0,2	µg/l	39%	-3,38
J	0,22	0,01	µg/l	18%	-4,58
K	1,26	0,32	µg/l	101%	0,04
L	1,2	0,3	µg/l	96%	-0,22
M	1,16	0,17	µg/l	93%	-0,40
N	1,23	0,25	µg/l	98%	-0,09
O	1,43	0,29	µg/l	114%	0,80
P	0,966	0,0112	µg/l	77%	-1,26



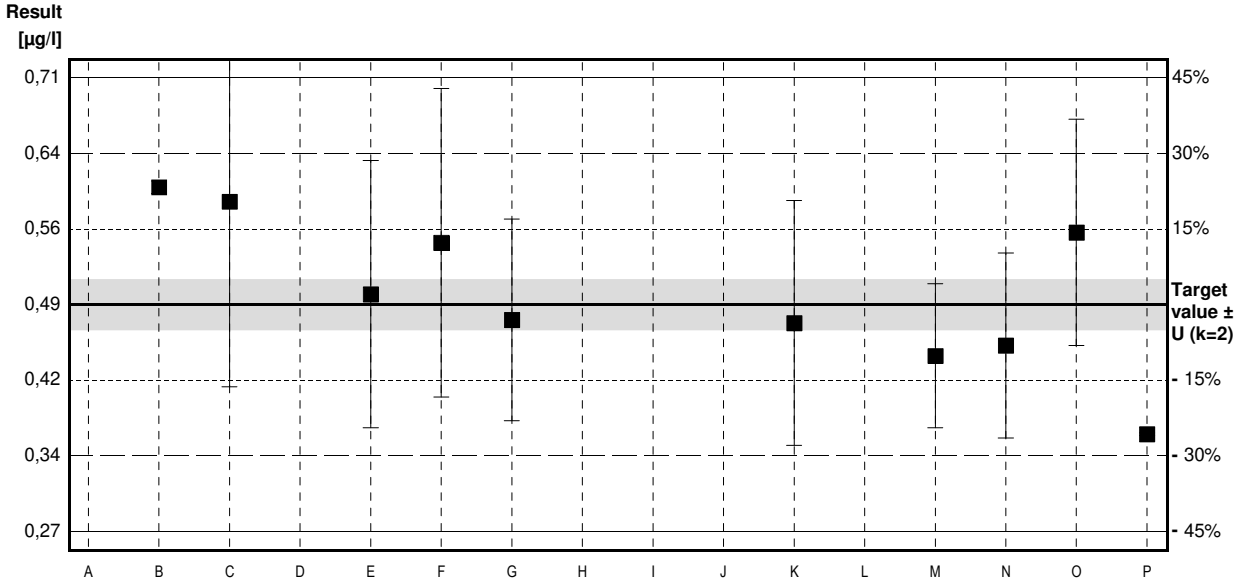


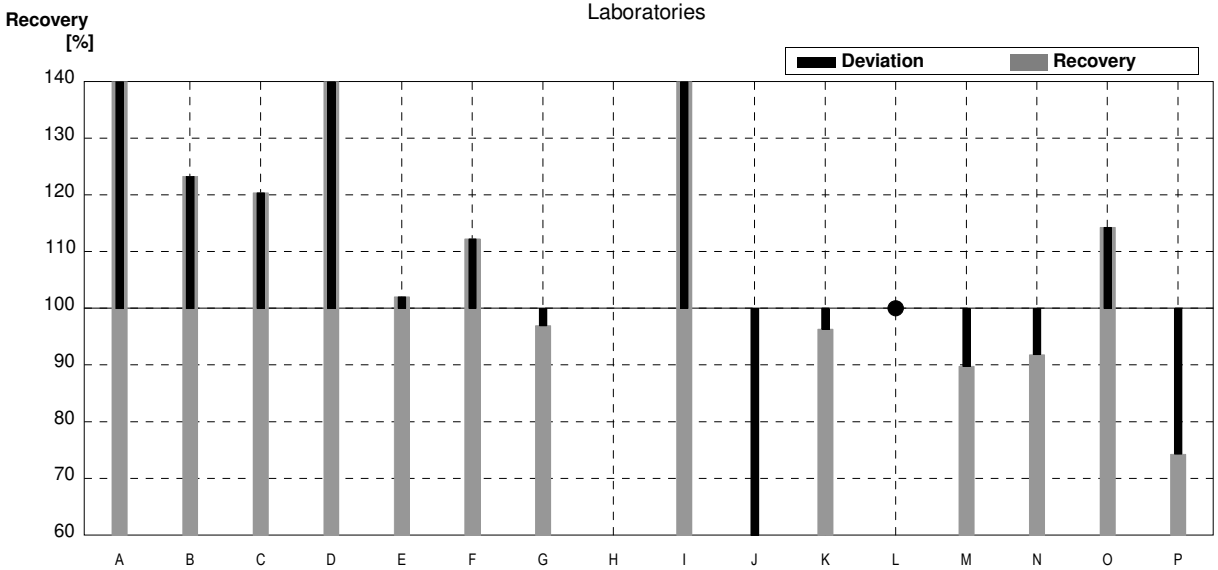
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,32 ± 0,42	1,32 ± 0,42	µg/l
Recov. ± CI(99%)	105,4 ± 33,5	105,4 ± 33,5	%
SD between labs	0,54	0,54	µg/l
RSD between labs	41,3	41,3	%
n for calculation	15	15	

Sample C61B
Parameter Tetrachloromethane

Target value	± U (k=2)	0,49 µg/l	±	0,02 µg/l
IFA result	± U (k=2)	0,48 µg/l	±	0,07 µg/l
Stability test	± U (k=2)	0,50 µg/l	±	0,08 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	0,86	0,13	µg/l	176%	4,20
B	0,604	0,006	µg/l	123%	1,29
C	0,59	0,18	µg/l	120%	1,13
D	1,11 *	0,36	µg/l	227%	7,03
E	0,50	0,13	µg/l	102%	0,11
F	0,55	0,15	µg/l	112%	0,68
G	0,475	0,098	µg/l	97%	-0,17
H			µg/l		
I	1,3 *	0,3	µg/l	265%	9,18
J	0,039 *	0,005	µg/l	8%	-5,11
K	0,472	0,119	µg/l	96%	-0,20
L	<0,5	0,1	µg/l	•	
M	0,44	0,07	µg/l	90%	-0,57
N	0,45	0,09	µg/l	92%	-0,45
O	0,56	0,11	µg/l	114%	0,79
P	0,364	0,0012	µg/l	74%	-1,43



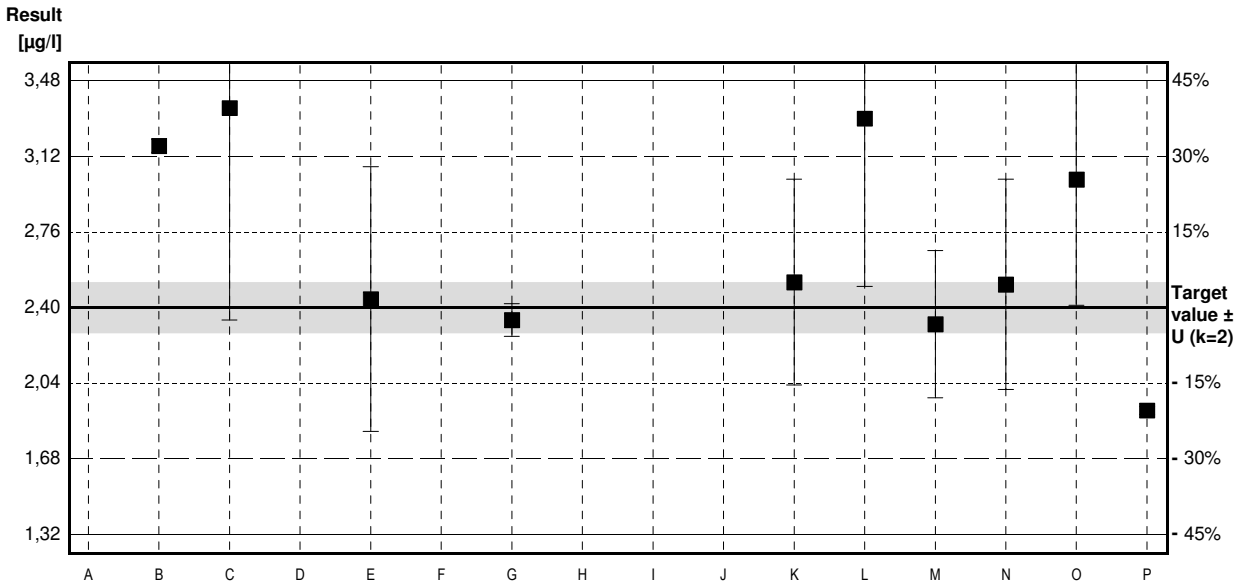


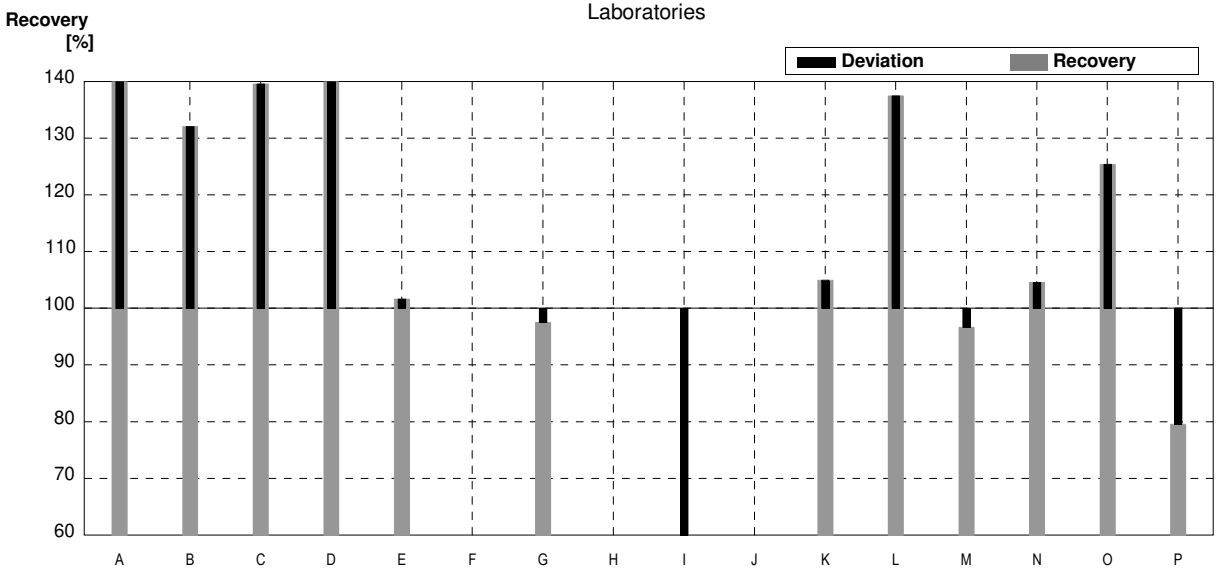
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,59 ± 0,25	0,53 ± 0,12	µg/l
Recov. ± CI(99%)	121,2 ± 51,6	108,8 ± 25,3	%
SD between labs	0,31	0,13	µg/l
RSD between labs	52,9	24,3	%
n for calculation	14	11	

Sample C61A
Parameter 1,1-Dichloroethene

Target value	± U (k=2)	2,40 µg/l	±	0,12 µg/l
IFA result	± U (k=2)	2,50 µg/l	±	0,38 µg/l
Stability test	± U (k=2)	2,49 µg/l	±	0,37 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	8,65 *	1,73	µg/l	360%	13,71
B	3,17	0,032	µg/l	132%	1,69
C	3,35	1,01	µg/l	140%	2,08
D	3,84	1,61	µg/l	160%	3,16
E	2,44	0,63	µg/l	102%	0,09
F			µg/l		
G	2,34	0,078	µg/l	98%	-0,13
H			µg/l		
I	0,9	0,3	µg/l	38%	-3,29
J	n,b.		µg/l		
K	2,52	0,49	µg/l	105%	0,26
L	3,3	0,8	µg/l	138%	1,97
M	2,32	0,35	µg/l	97%	-0,18
N	2,51	0,50	µg/l	105%	0,24
O	3,01	0,60	µg/l	125%	1,34
P	1,91	0,0186	µg/l	80%	-1,07



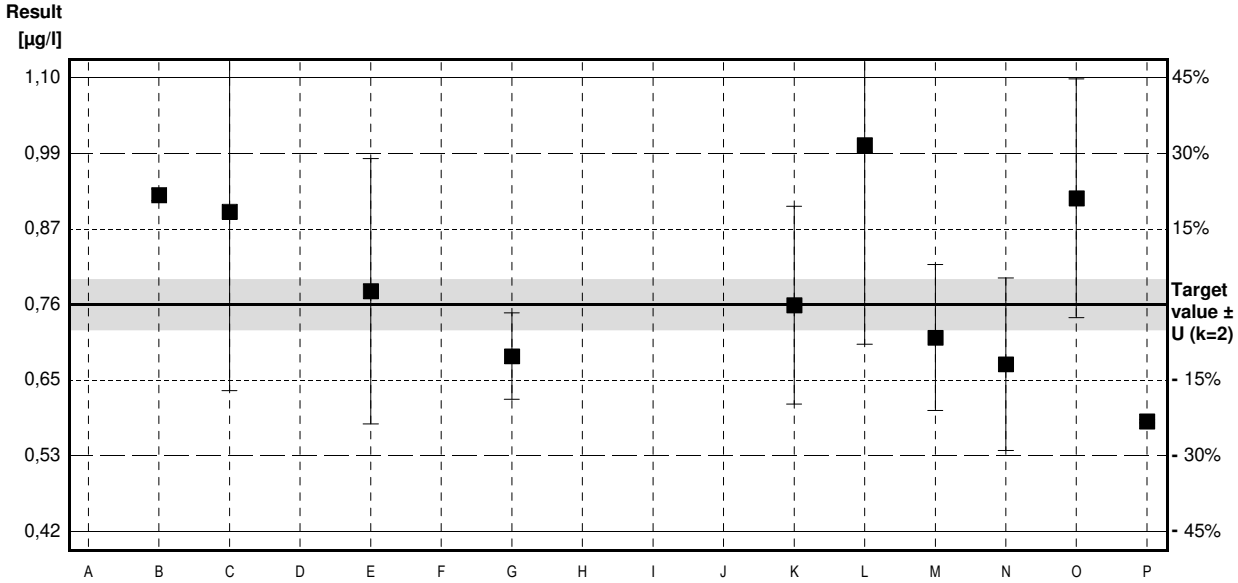


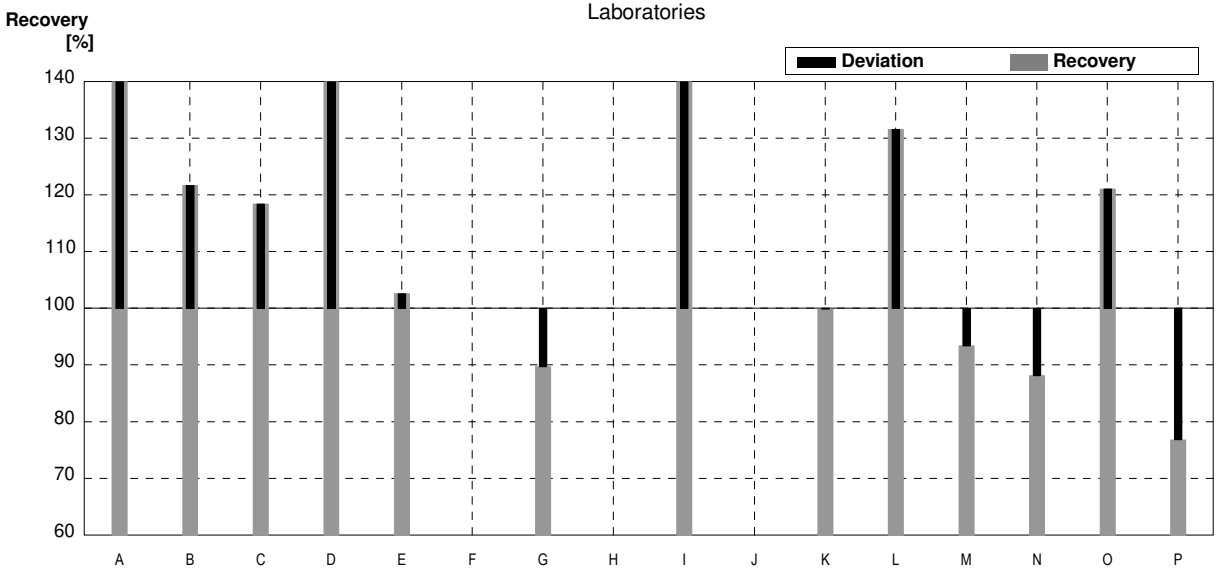
	All results	Outliers excl.	Unit
Mean ± CI(99%)	3,10 ± 1,54	2,63 ± 0,70	µg/l
Recov. ± CI(99%)	129,0 ± 64,4	109,8 ± 29,0	%
SD between labs	1,83	0,78	µg/l
RSD between labs	59,0	29,5	%
n for calculation	13	12	

Sample C61B
Parameter 1,1-Dichloroethene

Target value	± U (k=2)	0,76 µg/l	±	0,04 µg/l
IFA result	± U (k=2)	0,76 µg/l	±	0,11 µg/l
Stability test	± U (k=2)	0,80 µg/l	±	0,12 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	2,53 *	0,38	µg/l	333%	12,26
B	0,925	0,009	µg/l	122%	1,14
C	0,90	0,27	µg/l	118%	0,97
D	1,76	0,90	µg/l	232%	6,93
E	0,78	0,20	µg/l	103%	0,14
F			µg/l		
G	0,682	0,065	µg/l	90%	-0,54
H			µg/l		
I	2,8 *	1	µg/l	368%	14,13
J	n,b.		µg/l		
K	0,759	0,149	µg/l	100%	-0,01
L	1,0	0,3	µg/l	132%	1,66
M	0,71	0,11	µg/l	93%	-0,35
N	0,67	0,13	µg/l	88%	-0,62
O	0,92	0,18	µg/l	121%	1,11
P	0,584	0,0028	µg/l	77%	-1,22



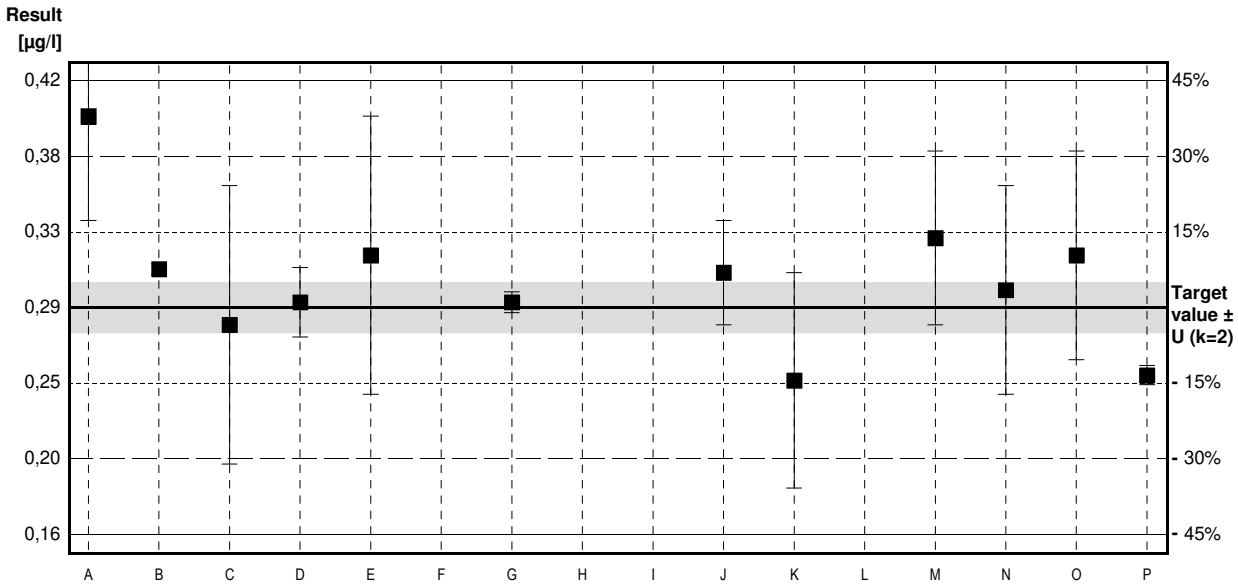


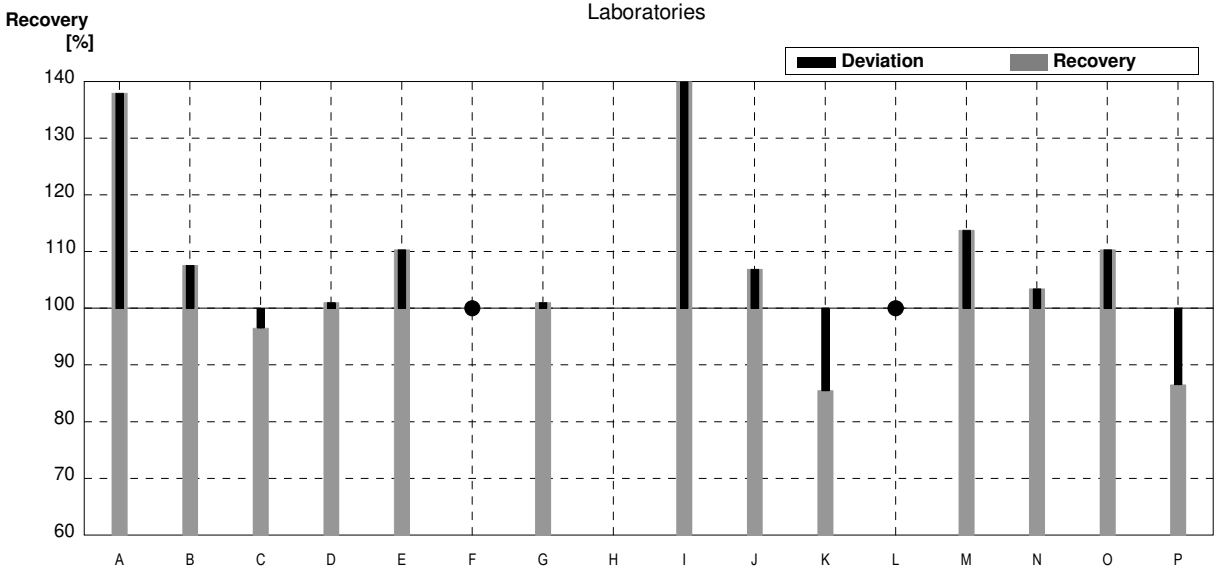
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,16 ± 0,62	0,88 ± 0,30	µg/l
Recov. ± CI(99%)	152,0 ± 81,5	115,9 ± 40,1	%
SD between labs	0,73	0,32	µg/l
RSD between labs	63,4	36,2	%
n for calculation	13	11	

Sample C61A
Parameter Tribromomethane

Target value	± U (k=2)	0,29 µg/l	±	0,01 µg/l
IFA result	± U (k=2)	0,33 µg/l	±	0,05 µg/l
Stability test	± U (k=2)	0,33 µg/l	±	0,05 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	0,40 *	0,06	µg/l	138%	2,37
B	0,312	0,003	µg/l	108%	0,47
C	0,28	0,08	µg/l	97%	-0,22
D	0,293	0,020	µg/l	101%	0,06
E	0,32	0,08	µg/l	110%	0,65
F	<0,50		µg/l	•	
G	0,293	0,006	µg/l	101%	0,06
H			µg/l		
I	1,3 *	0,3	µg/l	448%	21,77
J	0,31	0,03	µg/l	107%	0,43
K	0,248	0,062	µg/l	86%	-0,91
L	<0,5	0,1	µg/l	•	
M	0,33	0,05	µg/l	114%	0,86
N	0,30	0,06	µg/l	103%	0,22
O	0,32	0,06	µg/l	110%	0,65
P	0,251	0,0055	µg/l	87%	-0,84



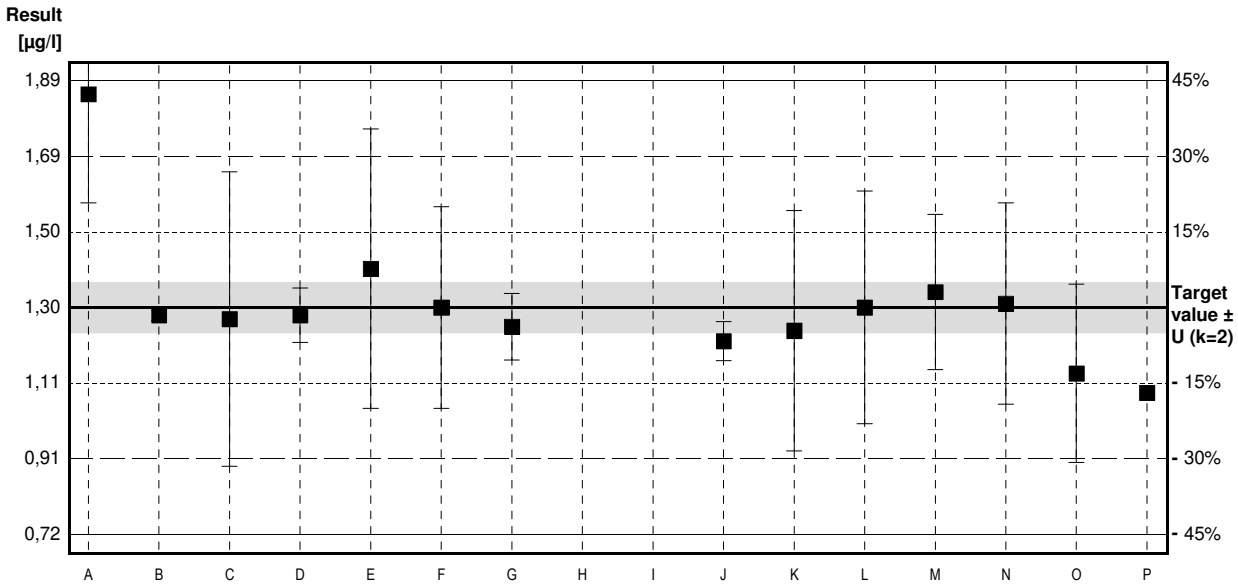


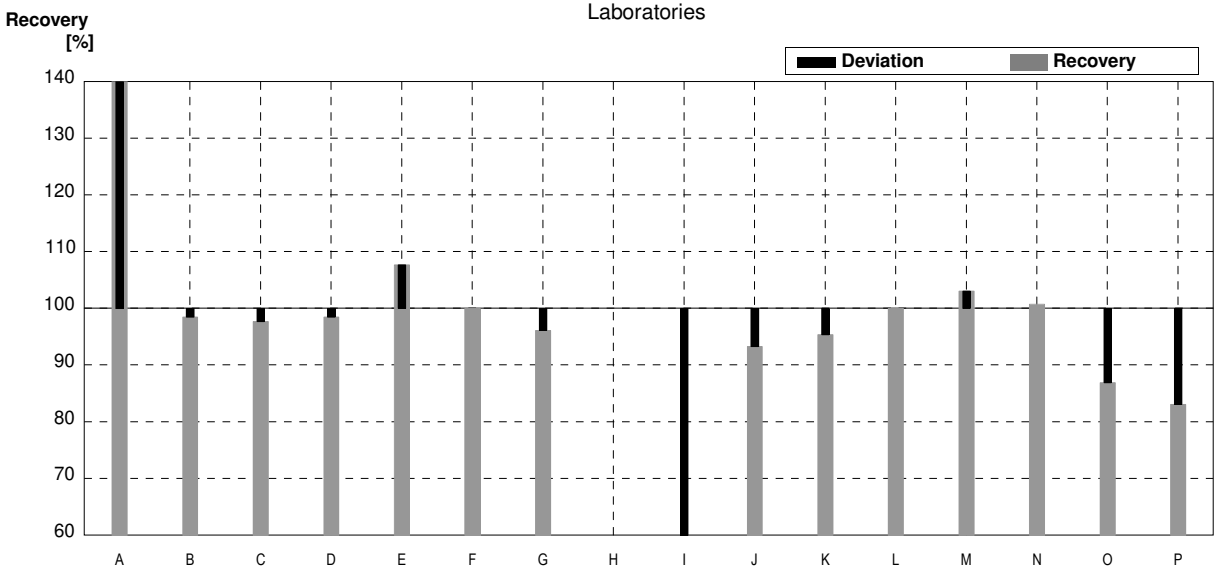
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,38 ± 0,24	0,30 ± 0,03	µg/l
Recov. ± CI(99%)	131,5 ± 81,3	102,1 ± 9,0	%
SD between labs	0,28	0,03	µg/l
RSD between labs	73,1	9,2	%
n for calculation	13	11	

Sample C61B
Parameter Tribromomethane

Target value	± U (k=2)	1,30 µg/l	±	0,07 µg/l
IFA result	± U (k=2)	1,38 µg/l	±	0,21 µg/l
Stability test	± U (k=2)	1,39 µg/l	±	0,21 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	1,85 *	0,28	µg/l	142%	2,64
B	1,28	0,013	µg/l	98%	-0,10
C	1,27	0,38	µg/l	98%	-0,14
D	1,28	0,07	µg/l	98%	-0,10
E	1,40	0,36	µg/l	108%	0,48
F	1,3	0,26	µg/l	100%	0,00
G	1,25	0,086	µg/l	96%	-0,24
H			µg/l		
I	0,3 *	0,1	µg/l	23%	-4,81
J	1,213	0,05	µg/l	93%	-0,42
K	1,24	0,31	µg/l	95%	-0,29
L	1,3	0,3	µg/l	100%	0,00
M	1,34	0,20	µg/l	103%	0,19
N	1,31	0,26	µg/l	101%	0,05
O	1,13	0,23	µg/l	87%	-0,82
P	1,08 *	0,0186	µg/l	83%	-1,06



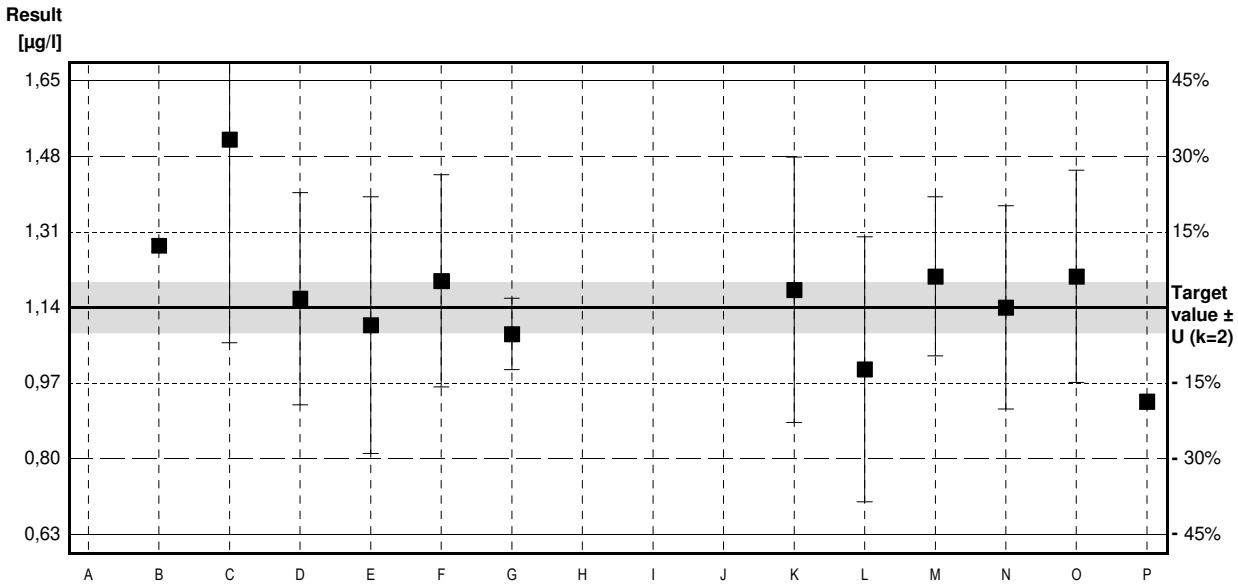


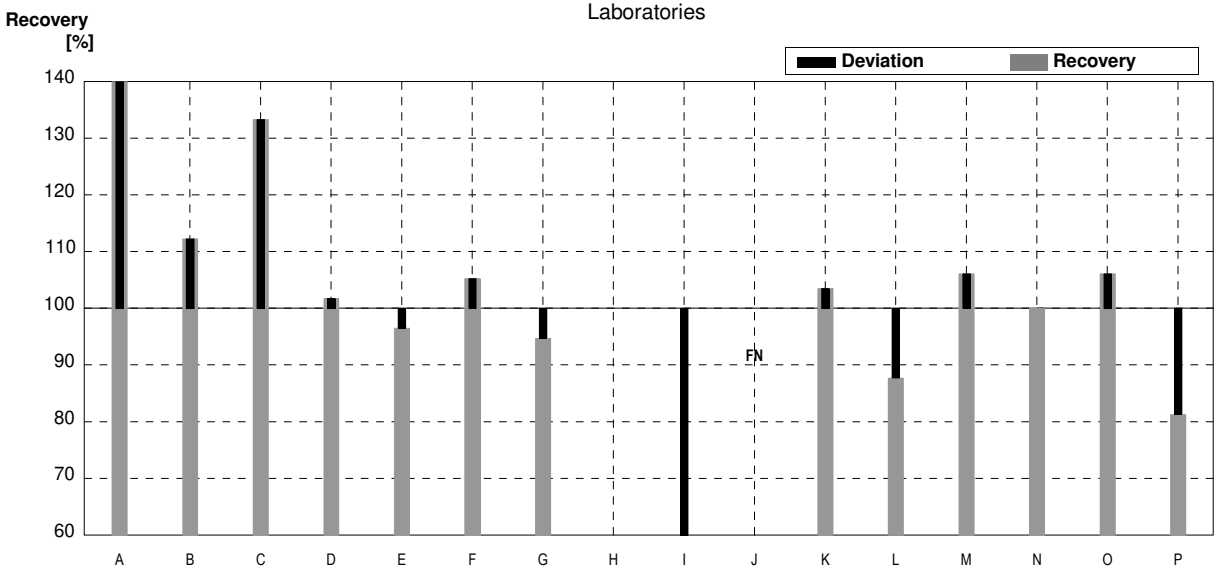
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,24 ± 0,24	1,28 ± 0,06	µg/l
Recov. ± CI(99%)	95,1 ± 18,4	98,2 ± 4,6	%
SD between labs	0,31	0,07	µg/l
RSD between labs	25,1	5,2	%
n for calculation	15	12	

Sample C61A
Parameter Bromodichloromethane

Target value	± U (k=2)	1,14 µg/l	±	0,06 µg/l
IFA result	± U (k=2)	1,16 µg/l	±	0,17 µg/l
Stability test	± U (k=2)	1,16 µg/l	±	0,17 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	1,93 *	0,29	µg/l	169%	4,95
B	1,28	0,013	µg/l	112%	0,88
C	1,52	0,46	µg/l	133%	2,38
D	1,16	0,24	µg/l	102%	0,13
E	1,10	0,29	µg/l	96%	-0,25
F	1,2	0,24	µg/l	105%	0,38
G	1,08	0,081	µg/l	95%	-0,38
H			µg/l		
I	0,19 *	0,1	µg/l	17%	-5,95
J	<0,1	0,05	µg/l	FN	
K	1,18	0,30	µg/l	104%	0,25
L	1,0	0,3	µg/l	88%	-0,88
M	1,21	0,18	µg/l	106%	0,44
N	1,14	0,23	µg/l	100%	0,00
O	1,21	0,24	µg/l	106%	0,44
P	0,927	0,0166	µg/l	81%	-1,33



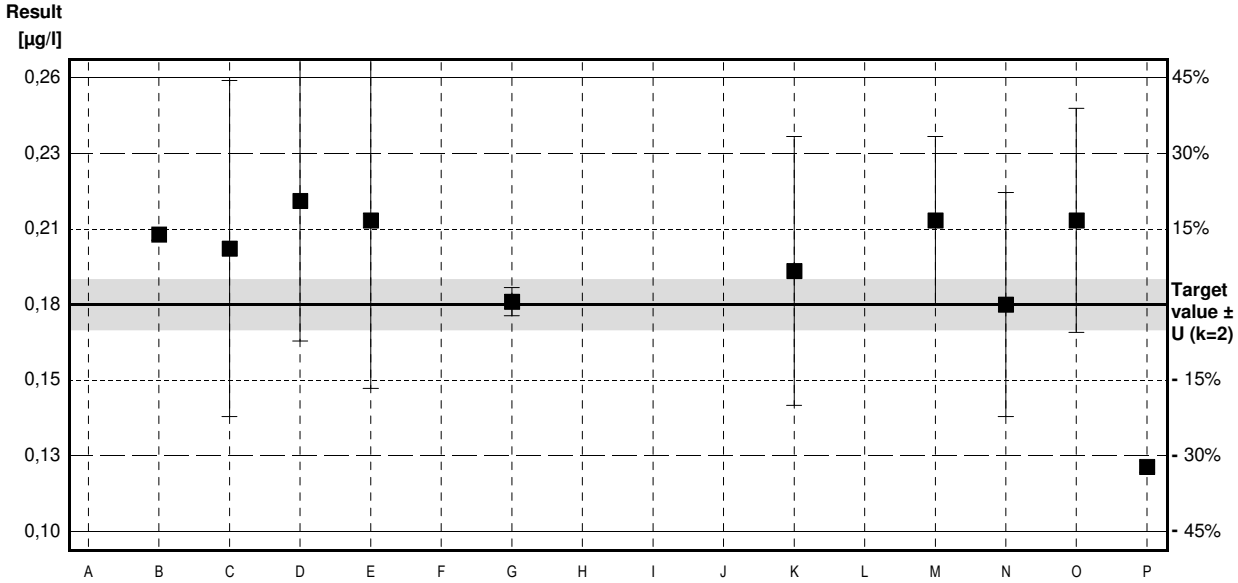


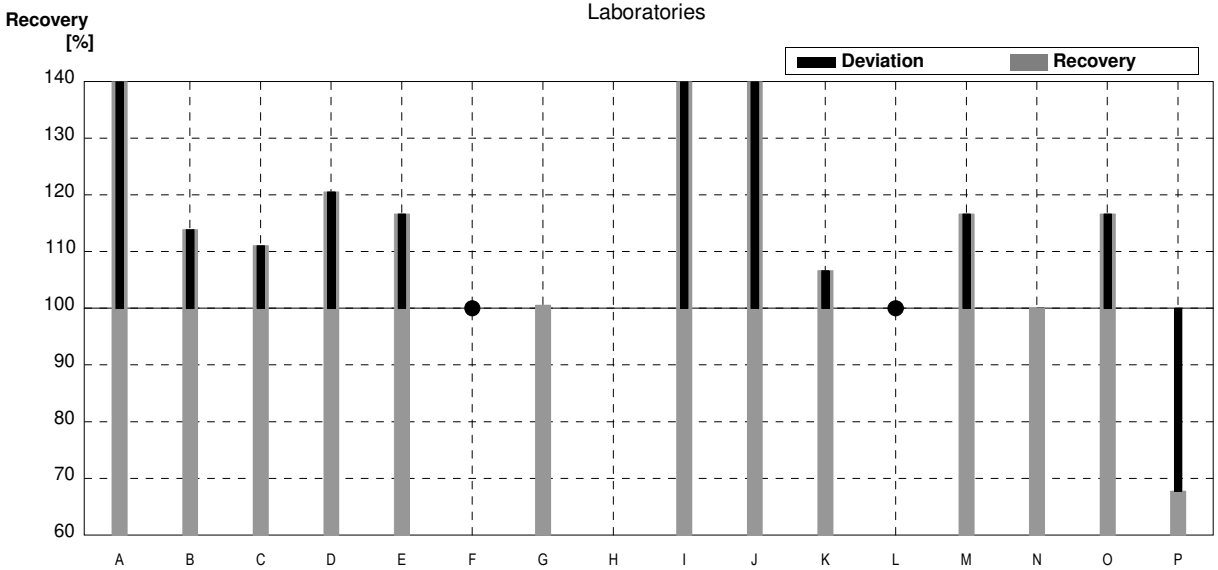
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,15 ± 0,30	1,17 ± 0,13	µg/l
Recov. ± CI(99%)	101,0 ± 26,1	102,4 ± 11,6	%
SD between labs	0,37	0,15	µg/l
RSD between labs	32,1	12,7	%
n for calculation	14	12	

Sample C61B
Parameter Bromodichloromethane

Target value	± U (k=2)	0,18 µg/l	±	0,01 µg/l
IFA result	± U (k=2)	0,19 µg/l	±	0,03 µg/l
Stability test	± U (k=2)	0,19 µg/l	±	0,03 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	0,28	0,04	µg/l	156%	3,97
B	0,205	0,002	µg/l	114%	0,99
C	0,20	0,06	µg/l	111%	0,79
D	0,217	0,050	µg/l	121%	1,47
E	0,21	0,06	µg/l	117%	1,19
F	<0,50		µg/l	•	
G	0,181	0,005	µg/l	101%	0,04
H			µg/l		
I	1,2 *	0,3	µg/l	667%	40,48
J	0,299 *	0,05	µg/l	166%	4,72
K	0,192	0,048	µg/l	107%	0,48
L	<0,5	0,1	µg/l	•	
M	0,21	0,03	µg/l	117%	1,19
N	0,18	0,04	µg/l	100%	0,00
O	0,21	0,04	µg/l	117%	1,19
P	0,122 *	0,0020	µg/l	68%	-2,30



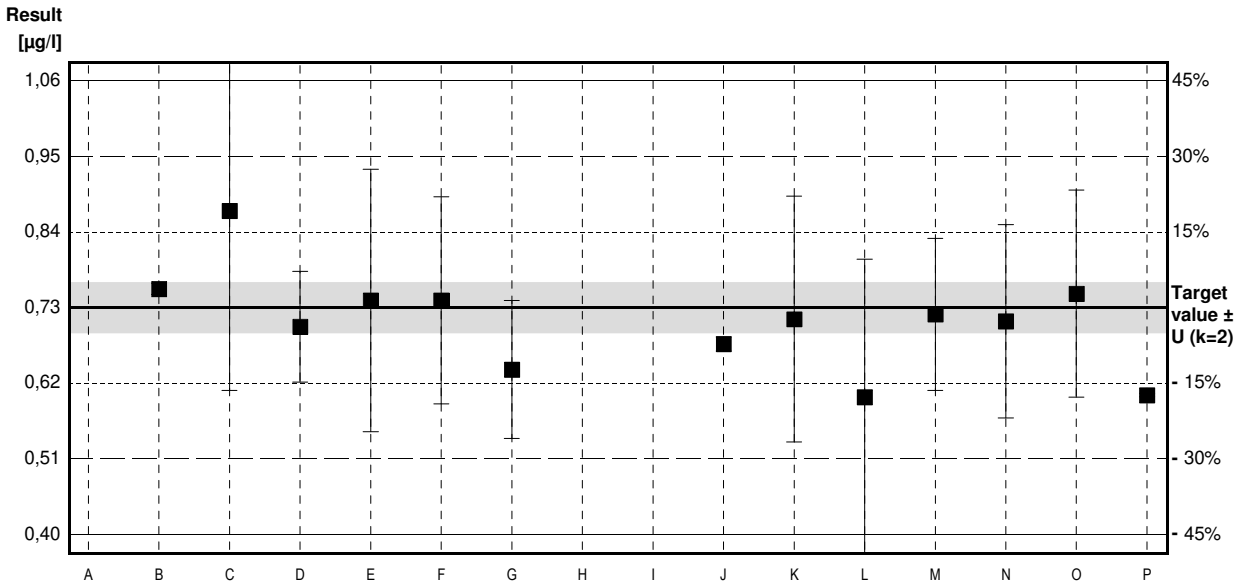


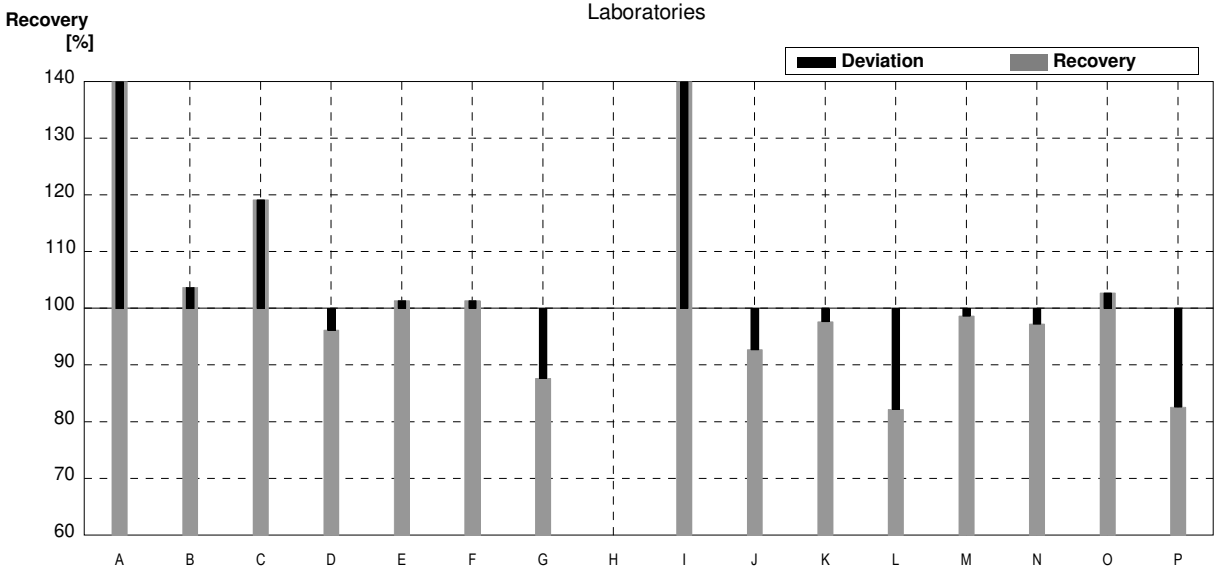
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,29 ± 0,24	0,21 ± 0,03	µg/l
Recov. ± CI(99%)	158,4 ± 130,8	115,8 ± 16,2	%
SD between labs	0,28	0,03	µg/l
RSD between labs	97,6	13,5	%
n for calculation	13	10	

Sample C61A
Parameter Dibromochloromethane

Target value	± U (k=2)	0,73 µg/l	±	0,04 µg/l
IFA result	± U (k=2)	0,78 µg/l	±	0,12 µg/l
Stability test	± U (k=2)	0,77 µg/l	±	0,12 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	1,07 *	0,16	µg/l	147%	3,11
B	0,757	0,008	µg/l	104%	0,25
C	0,87	0,26	µg/l	119%	1,28
D	0,702	0,080	µg/l	96%	-0,26
E	0,74	0,19	µg/l	101%	0,09
F	0,74	0,15	µg/l	101%	0,09
G	0,640	0,100	µg/l	88%	-0,82
H			µg/l		
I	1,3 *	0,3	µg/l	178%	5,21
J	0,677	0,01	µg/l	93%	-0,48
K	0,713	0,178	µg/l	98%	-0,16
L	0,6	0,2	µg/l	82%	-1,19
M	0,72	0,11	µg/l	99%	-0,09
N	0,71	0,14	µg/l	97%	-0,18
O	0,75	0,15	µg/l	103%	0,18
P	0,603	0,0027	µg/l	83%	-1,16



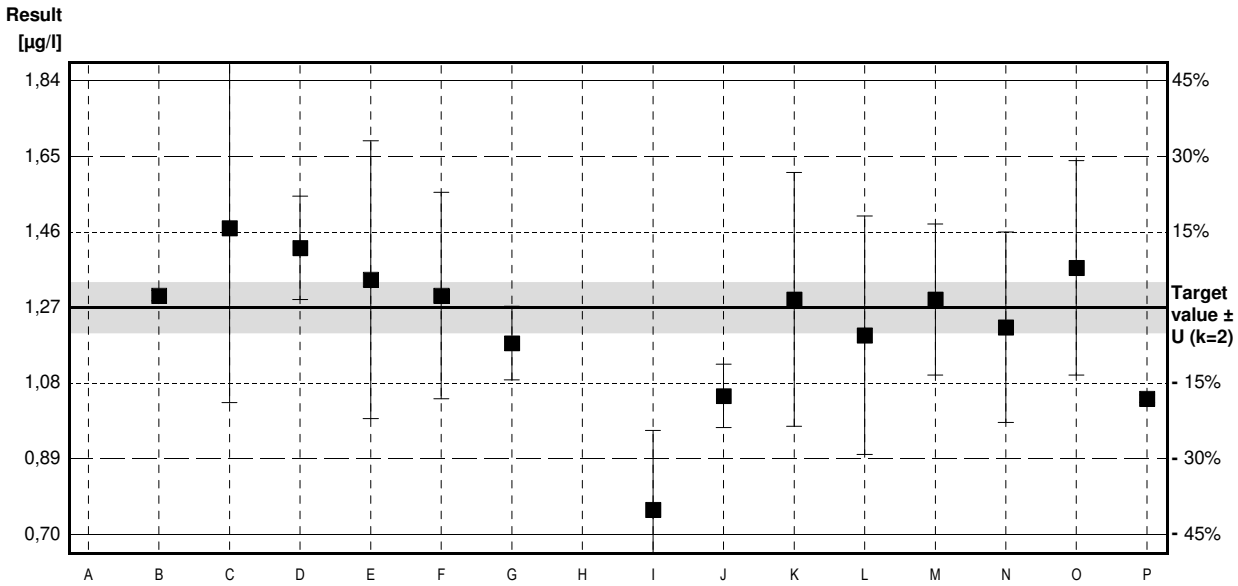


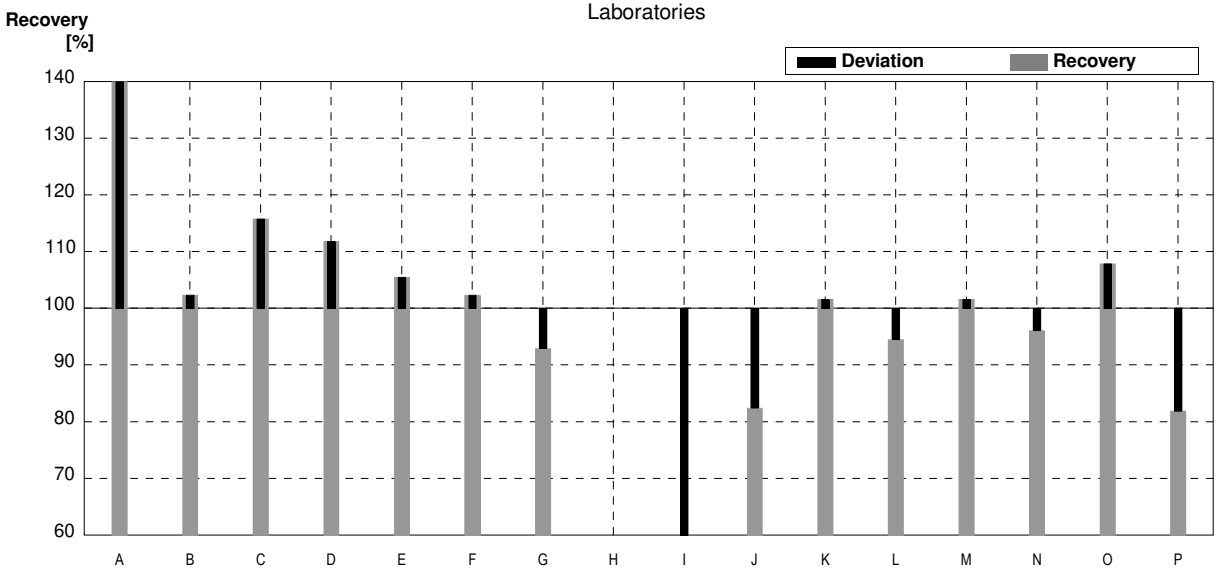
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,77 ± 0,14	0,71 ± 0,06	µg/l
Recov. ± CI(99%)	105,9 ± 19,5	97,2 ± 8,3	%
SD between labs	0,19	0,07	µg/l
RSD between labs	23,9	10,0	%
n for calculation	15	13	

Sample C61B
Parameter Dibromochloromethane

Target value	± U (k=2)	1,27 µg/l	±	0,06 µg/l
IFA result	± U (k=2)	1,30 µg/l	±	0,20 µg/l
Stability test	± U (k=2)	1,31 µg/l	±	0,20 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	1,88 *	0,28	µg/l	148%	3,20
B	1,30	0,013	µg/l	102%	0,16
C	1,47	0,44	µg/l	116%	1,05
D	1,42	0,13	µg/l	112%	0,79
E	1,34	0,35	µg/l	106%	0,37
F	1,3	0,26	µg/l	102%	0,16
G	1,18	0,093	µg/l	93%	-0,47
H			µg/l		
I	0,76 *	0,2	µg/l	60%	-2,68
J	1,047	0,08	µg/l	82%	-1,17
K	1,29	0,32	µg/l	102%	0,10
L	1,2	0,3	µg/l	94%	-0,37
M	1,29	0,19	µg/l	102%	0,10
N	1,22	0,24	µg/l	96%	-0,26
O	1,37	0,27	µg/l	108%	0,52
P	1,04	0,0093	µg/l	82%	-1,21



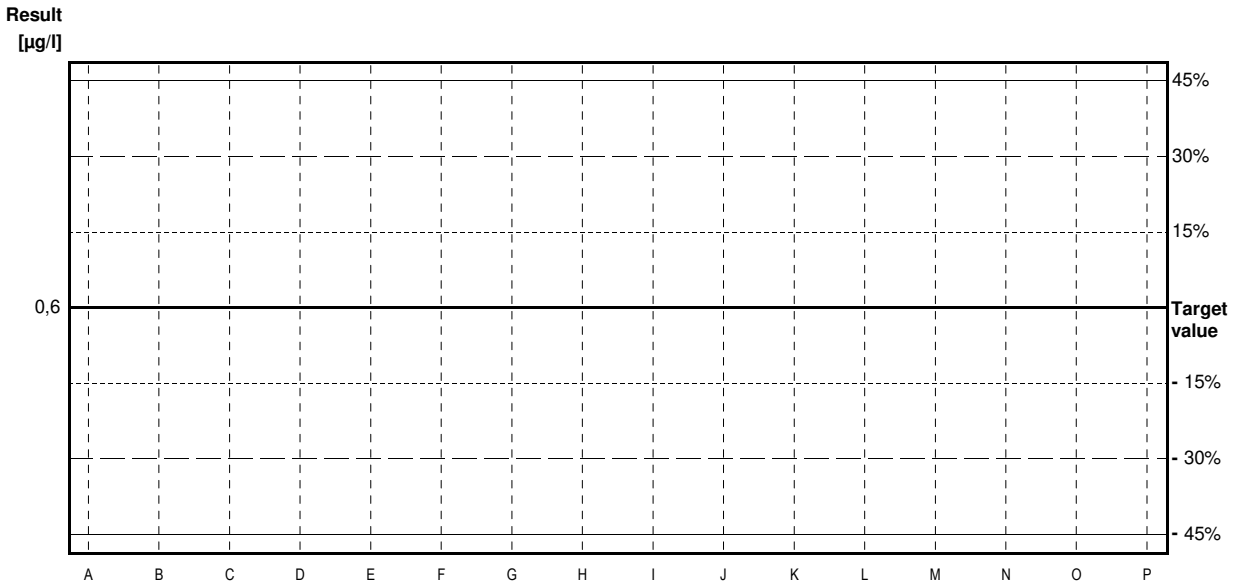


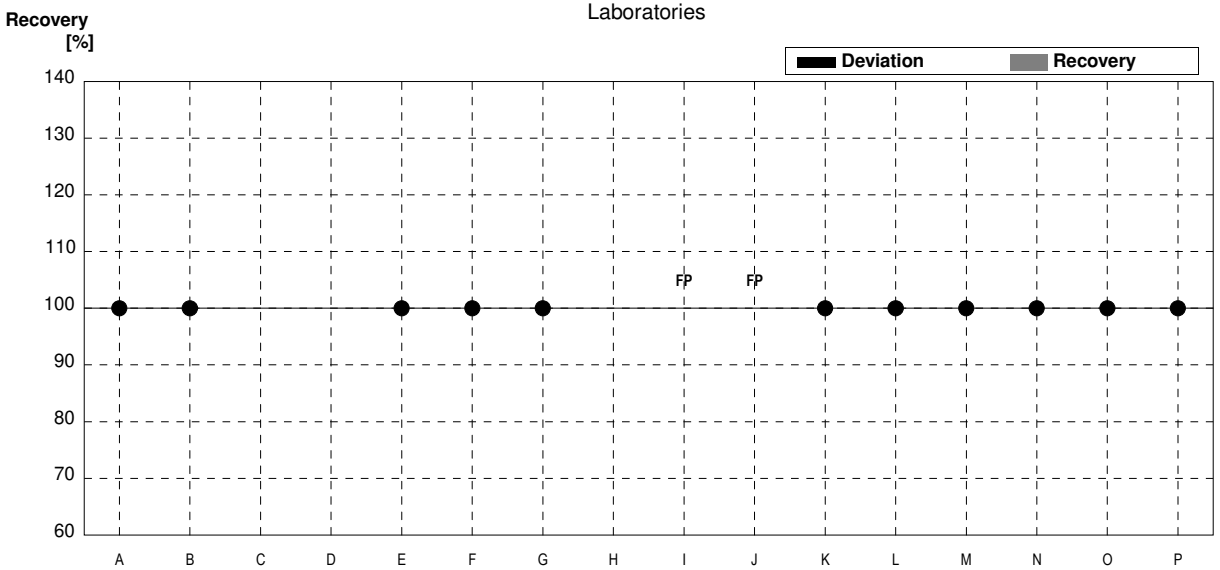
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,27 ± 0,19	1,27 ± 0,11	µg/l
Recov. ± CI(99%)	100,3 ± 14,8	99,7 ± 8,6	%
SD between labs	0,24	0,13	µg/l
RSD between labs	19,1	10,1	%
n for calculation	15	13	

Sample C61A
Parameter Dichloromethane

Target value	<0,6 µg/l
IFA result	<0,3 µg/l
Stability test	<0,3 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<0,1		µg/l	•	
B	<0,21	0,002	µg/l	•	
C			µg/l		
D	n,b.		µg/l		
E	<0,1	0,03	µg/l	•	
F	<0,50		µg/l	•	
G	<0,05		µg/l	•	
H			µg/l		
I	1,6	0,4	µg/l	FP	
J	11,46	0,5	µg/l	FP	
K	<1,0		µg/l	•	
L	<0,5	0,1	µg/l	•	
M	<0,5		µg/l	•	
N	<0,06	0,00	µg/l	•	
O	<1,00		µg/l	•	
P	<0,10		µg/l	•	



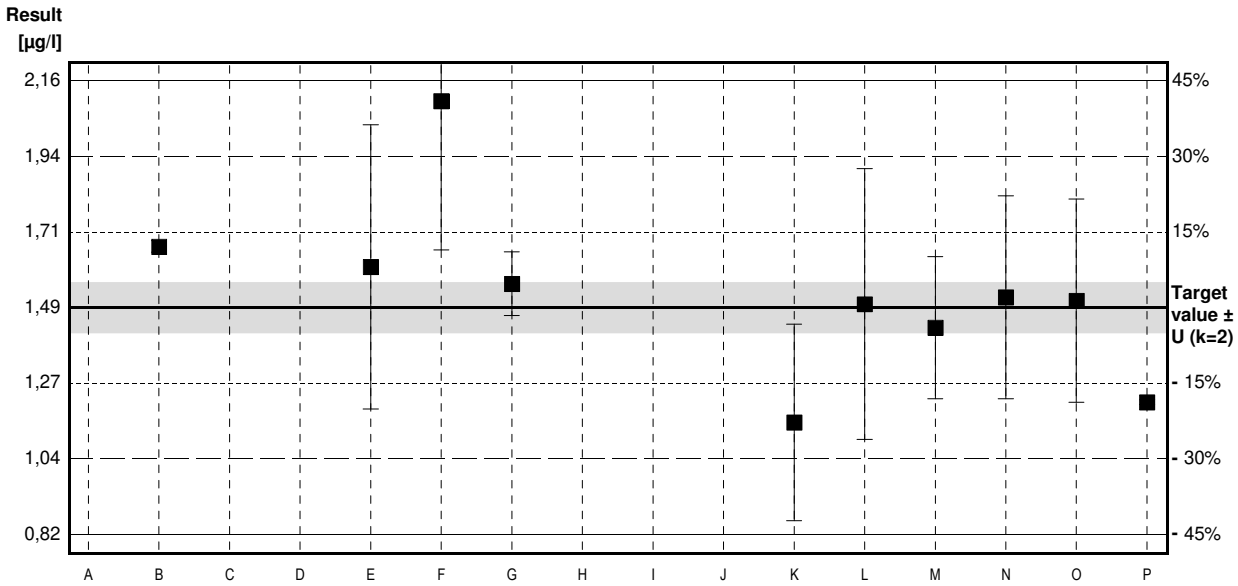


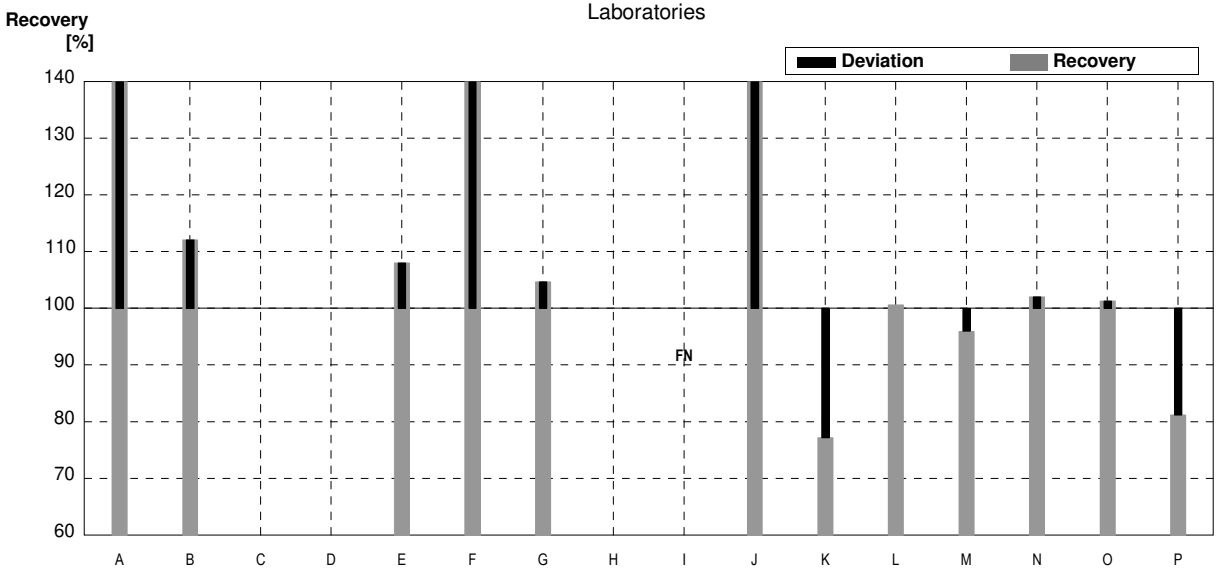
	All results	Outliers excl.	Unit
Mean ± CI(99%) Recov. ± CI(99%)			µg/l %
SD between labs RSD between labs			µg/l %
n for calculation			

Sample C61B
Parameter Dichloromethane

Target value	± U (k=2)	1,49 µg/l	±	0,07 µg/l
IFA result	± U (k=2)	1,50 µg/l	±	0,23 µg/l
Stability test	± U (k=2)	1,51 µg/l	±	0,23 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	3,02 *	0,45	µg/l	203%	7,90
B	1,67	0,017	µg/l	112%	0,93
C			µg/l		
D	n,b.		µg/l		
E	1,61	0,42	µg/l	108%	0,62
F	2,1	0,44	µg/l	141%	3,15
G	1,56	0,094	µg/l	105%	0,36
H			µg/l		
I	<0,1		µg/l	FN	
J	2,98 *	0,1	µg/l	200%	7,69
K	1,15	0,29	µg/l	77%	-1,76
L	1,5	0,4	µg/l	101%	0,05
M	1,43	0,21	µg/l	96%	-0,31
N	1,52	0,30	µg/l	102%	0,15
O	1,51	0,30	µg/l	101%	0,10
P	1,21	0,0070	µg/l	81%	-1,45



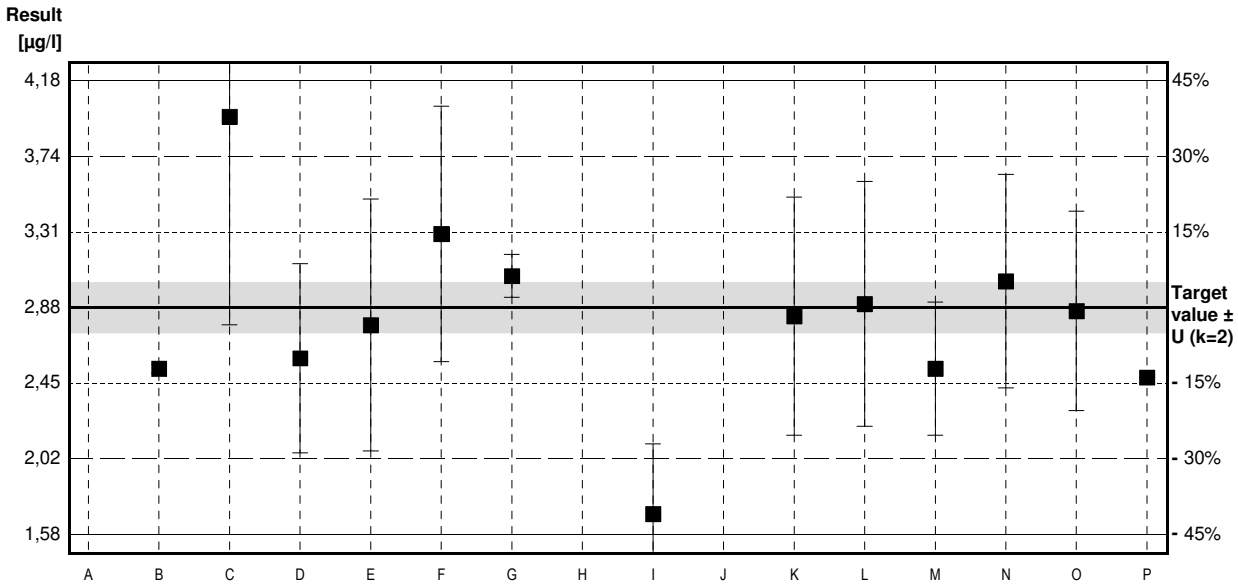


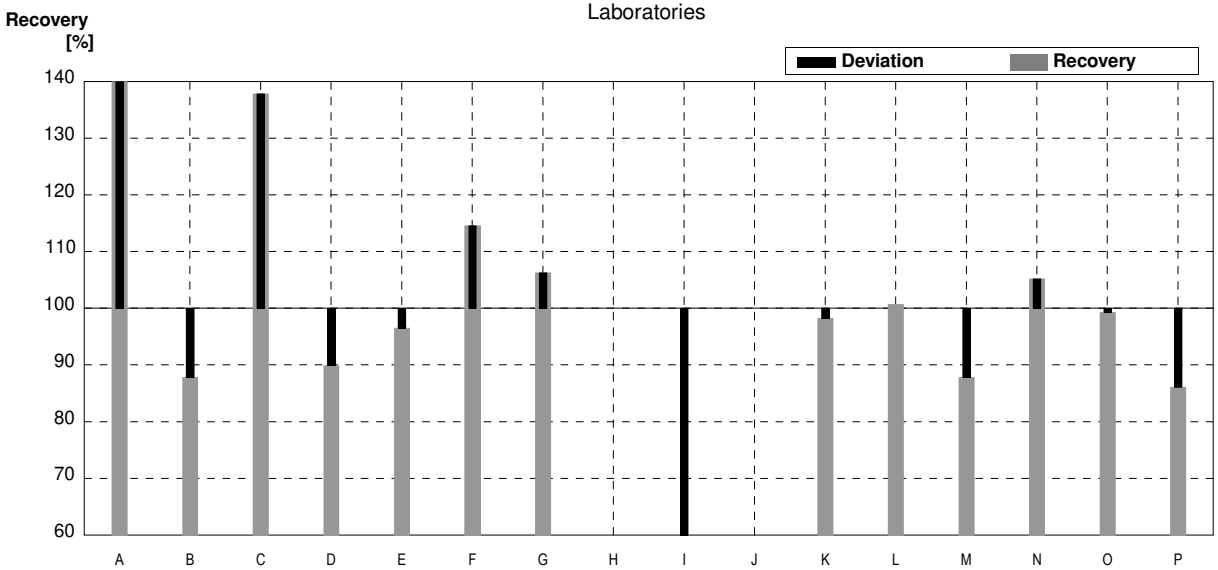
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,77 ± 0,56	1,53 ± 0,27	µg/l
Recov. ± CI(99%)	118,9 ± 37,4	102,4 ± 18,1	%
SD between labs	0,62	0,26	µg/l
RSD between labs	35,0	17,1	%
n for calculation	12	10	

Sample C61A
Parameter 1,2-Dichloroethane

Target value	± U (k=2)	2,88 µg/l	±	0,14 µg/l
IFA result	± U (k=2)	3,06 µg/l	±	0,46 µg/l
Stability test	± U (k=2)	3,05 µg/l	±	0,46 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	4,30 *	0,65	µg/l	149%	3,79
B	2,53	0,025	µg/l	88%	-0,93
C	3,97	1,19	µg/l	138%	2,91
D	2,59	0,54	µg/l	90%	-0,77
E	2,78	0,72	µg/l	97%	-0,27
F	3,3	0,73	µg/l	115%	1,12
G	3,06	0,122	µg/l	106%	0,48
H			µg/l		
I	1,7	0,4	µg/l	59%	-3,15
J	n,b.		µg/l		
K	2,83	0,68	µg/l	98%	-0,13
L	2,9	0,7	µg/l	101%	0,05
M	2,53	0,38	µg/l	88%	-0,93
N	3,03	0,61	µg/l	105%	0,40
O	2,86	0,57	µg/l	99%	-0,05
P	2,48	0,0013	µg/l	86%	-1,07



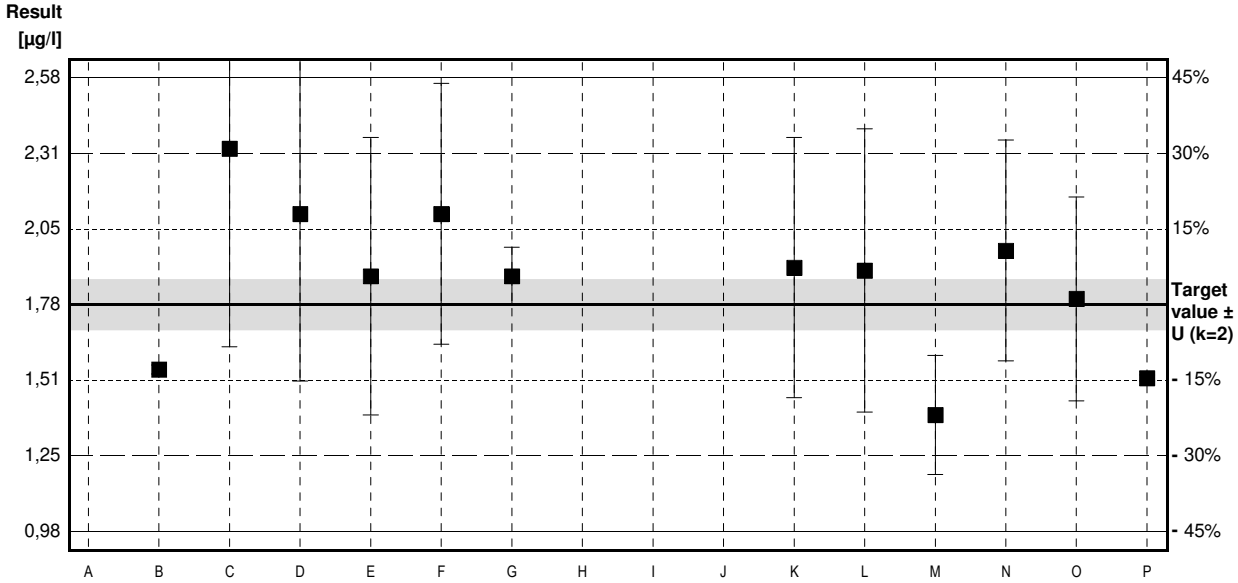


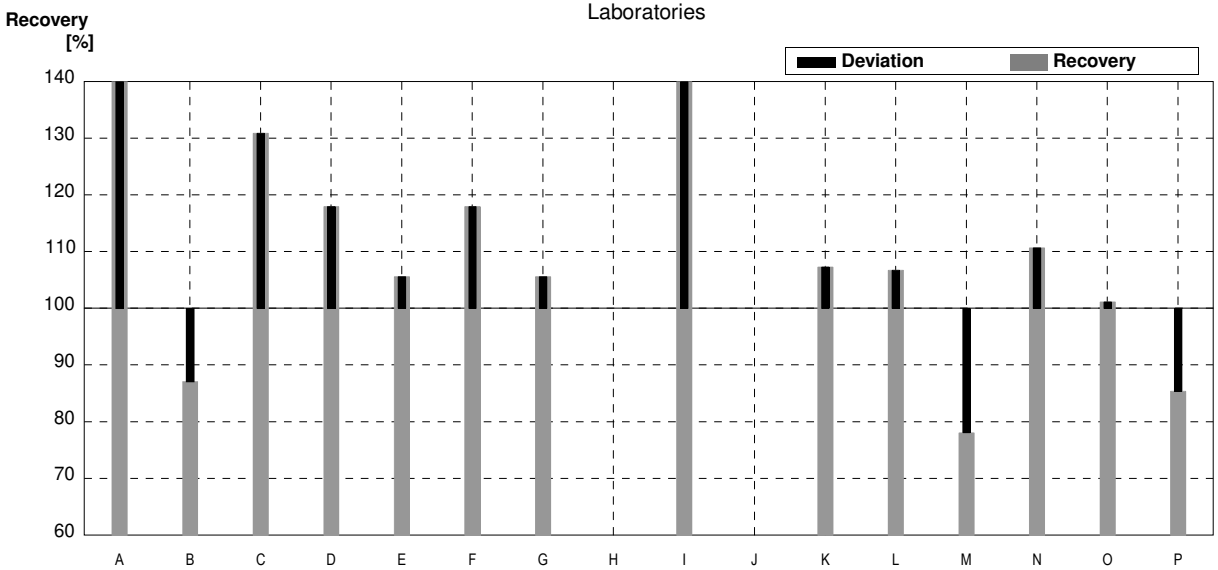
	All results	Outliers excl.	Unit
Mean ± CI(99%)	2,92 ± 0,51	2,81 ± 0,44	µg/l
Recov. ± CI(99%)	101,3 ± 17,9	97,6 ± 15,3	%
SD between labs	0,64	0,52	µg/l
RSD between labs	21,9	18,5	%
n for calculation	14	13	

Sample C61B
Parameter 1,2-Dichloroethane

Target value	± U (k=2)	1,78 µg/l	±	0,09 µg/l
IFA result	± U (k=2)	1,86 µg/l	±	0,28 µg/l
Stability test	± U (k=2)	1,87 µg/l	±	0,28 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	2,69	0,40	µg/l	151%	3,93
B	1,55	0,016	µg/l	87%	-0,99
C	2,33	0,70	µg/l	131%	2,38
D	2,10	0,59	µg/l	118%	1,38
E	1,88	0,49	µg/l	106%	0,43
F	2,1	0,46	µg/l	118%	1,38
G	1,88	0,102	µg/l	106%	0,43
H			µg/l		
I	2,9 *	1	µg/l	163%	4,84
J	n,b.		µg/l		
K	1,91	0,46	µg/l	107%	0,56
L	1,9	0,5	µg/l	107%	0,52
M	1,39	0,21	µg/l	78%	-1,69
N	1,97	0,39	µg/l	111%	0,82
O	1,80	0,36	µg/l	101%	0,09
P	1,52	0,0110	µg/l	85%	-1,12



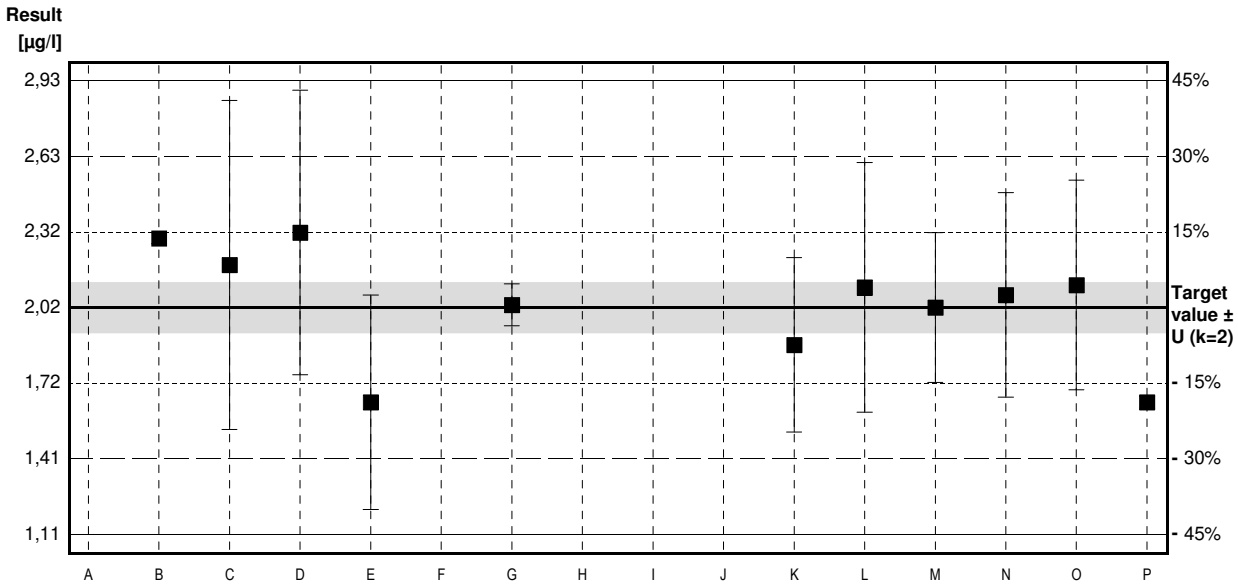


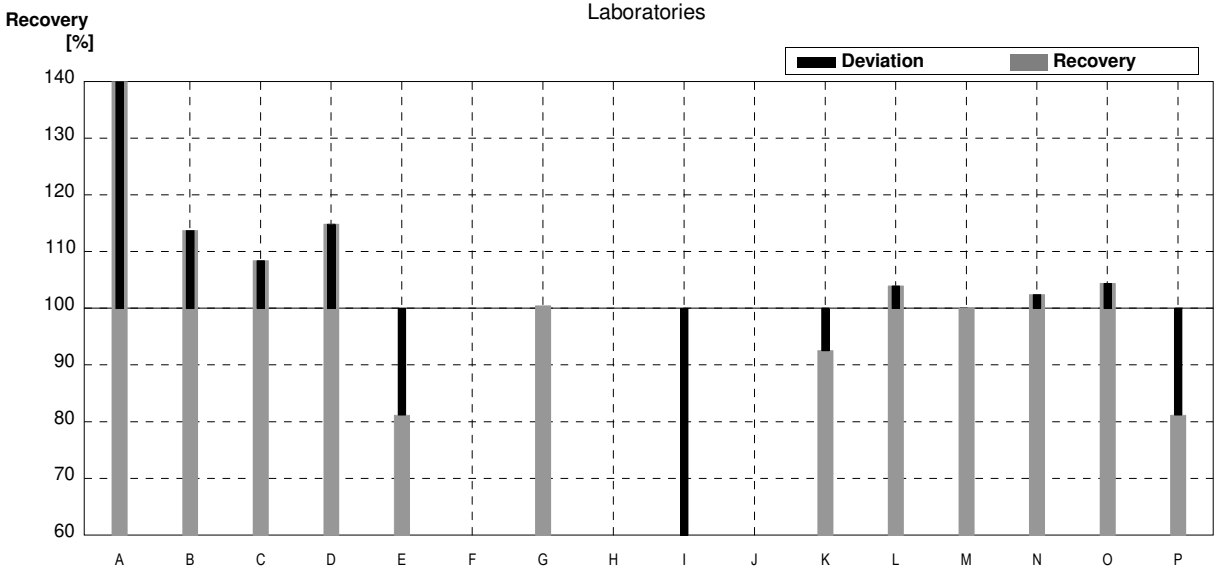
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,99 ± 0,34	1,92 ± 0,29	µg/l
Recov. ± CI(99%)	112,0 ± 19,0	108,1 ± 16,4	%
SD between labs	0,42	0,34	µg/l
RSD between labs	21,1	17,9	%
n for calculation	14	13	

Sample C61A
Parameter cis-1,2-Dichloroethene

Target value	± U (k=2)	2,02 µg/l	±	0,10 µg/l
IFA result	± U (k=2)	2,07 µg/l	±	0,31 µg/l
Stability test	± U (k=2)	2,03 µg/l	±	0,30 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	3,41 *	0,51	µg/l	169%	4,92
B	2,297	0,023	µg/l	114%	0,98
C	2,19	0,66	µg/l	108%	0,60
D	2,32	0,57	µg/l	115%	1,06
E	1,64	0,43	µg/l	81%	-1,34
F			µg/l		
G	2,03	0,084	µg/l	100%	0,04
H			µg/l		
I	0,34 *	0,1	µg/l	17%	-5,94
J	n,b.		µg/l		
K	1,87	0,35	µg/l	93%	-0,53
L	2,1	0,5	µg/l	104%	0,28
M	2,02	0,30	µg/l	100%	0,00
N	2,07	0,41	µg/l	102%	0,18
O	2,11	0,42	µg/l	104%	0,32
P	1,64	0,0233	µg/l	81%	-1,34





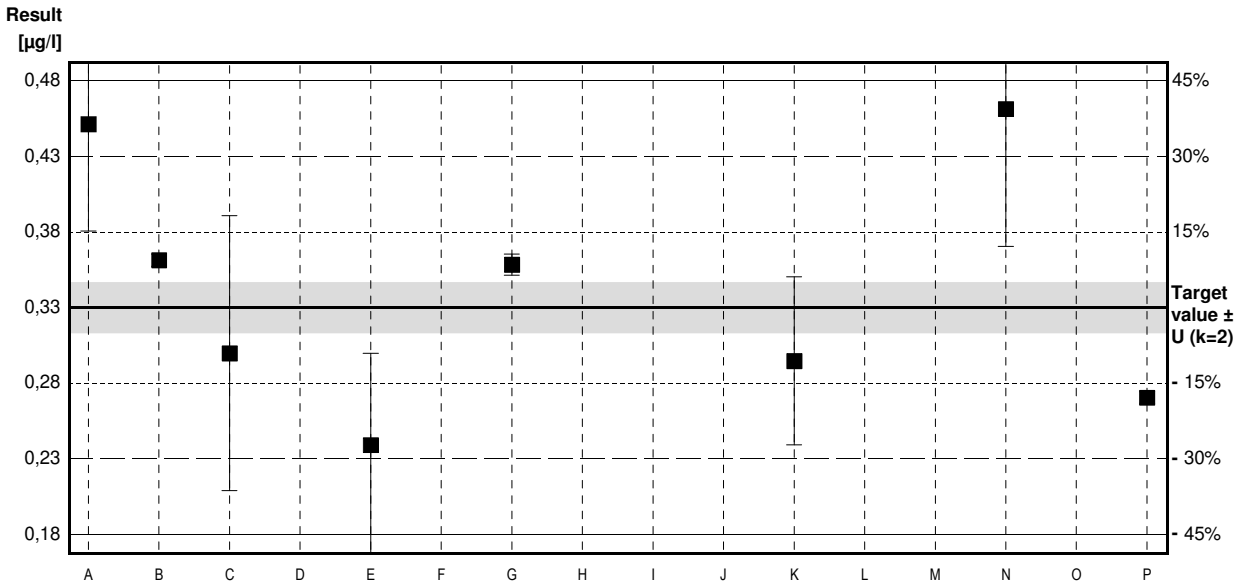
	All results	Outliers excl.	Unit
Mean ± CI(99%)	2,00 ± 0,56	2,03 ± 0,22	µg/l
Recov. ± CI(99%)	99,2 ± 27,8	100,3 ± 10,8	%
SD between labs	0,66	0,23	µg/l
RSD between labs	33,1	11,3	%
n for calculation	13	11	

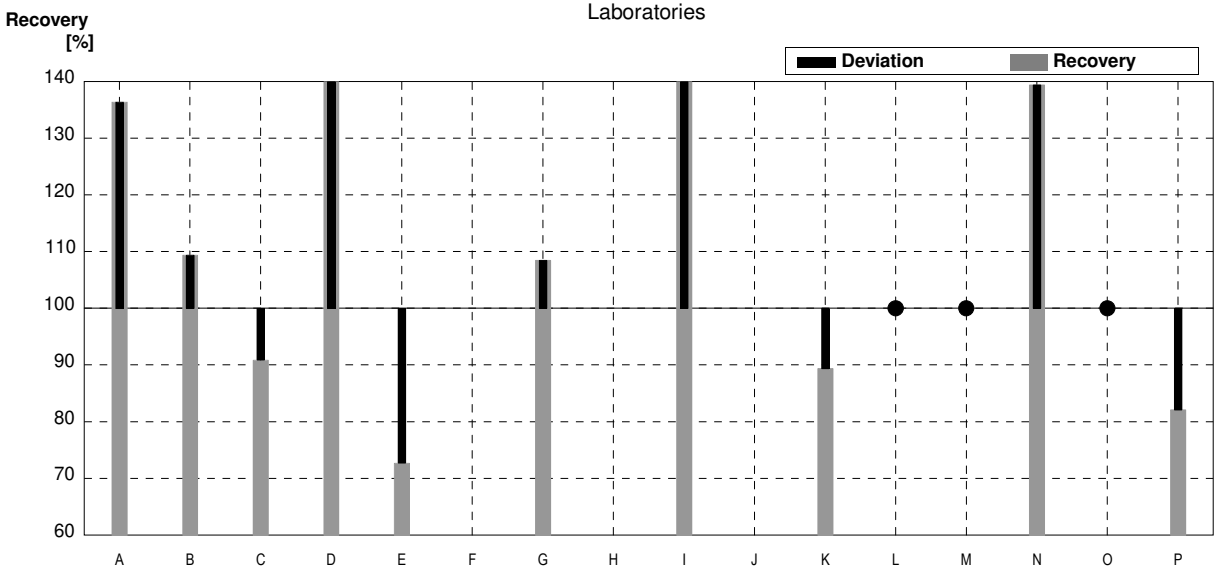
Sample C61B

Parameter cis-1,2-Dichloroethene

Target value ± U (k=2)	0,33 µg/l	±	0,02 µg/l
IFA result ± U (k=2)	0,34 µg/l	±	0,05 µg/l
Stability test ± U (k=2)	0,35 µg/l	±	0,05 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	0,45	0,07	µg/l	136%	2,60
B	0,361	0,004	µg/l	109%	0,67
C	0,30	0,09	µg/l	91%	-0,65
D	0,481	0,170	µg/l	146%	3,27
E	0,24	0,06	µg/l	73%	-1,95
F			µg/l		
G	0,358	0,007	µg/l	108%	0,61
H			µg/l		
I	2,1 *	0,6	µg/l	636%	38,31
J	n,b.		µg/l		
K	0,295	0,055	µg/l	89%	-0,76
L	<0,5	0,1	µg/l	•	
M	<0,5		µg/l	•	
N	0,46	0,09	µg/l	139%	2,81
O	<0,50		µg/l	•	
P	0,271	0,0038	µg/l	82%	-1,28





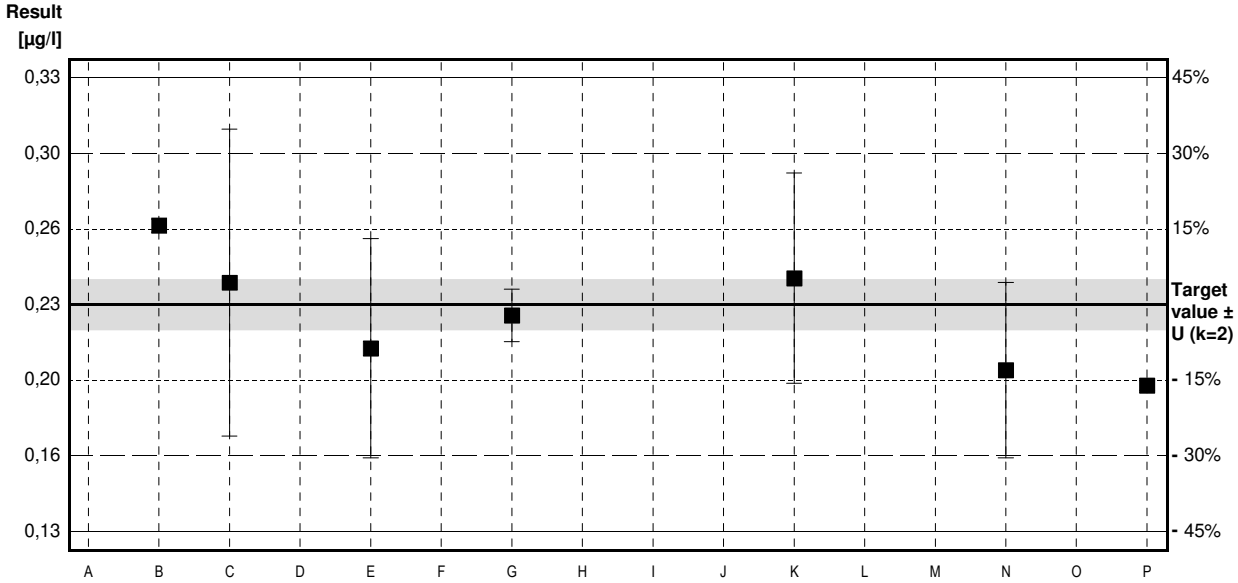
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,53 ± 0,58	0,36 ± 0,10	µg/l
Recov. ± CI(99%)	161,1 ± 175,2	108,3 ± 30,1	%
SD between labs	0,56	0,09	µg/l
RSD between labs	104,8	24,8	%
n for calculation	10	9	

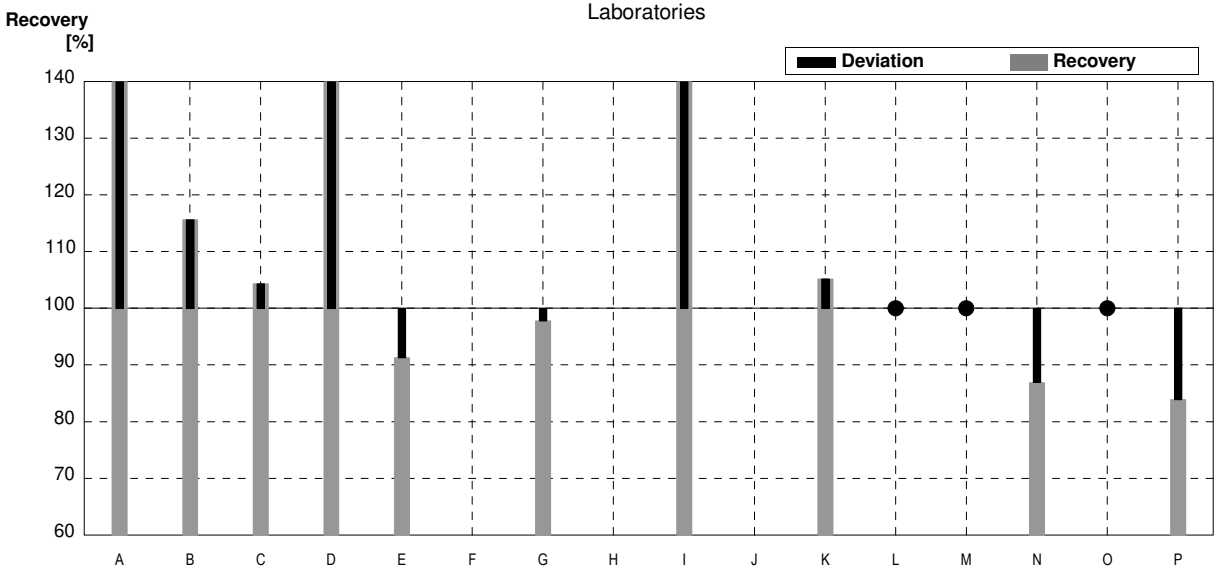
Sample C61A

Parameter trans-1,2-Dichloroethene

Target value	± U (k=2)	0,23 µg/l	±	0,01 µg/l
IFA result	± U (k=2)	0,25 µg/l	±	0,04 µg/l
Stability test	± U (k=2)	0,26 µg/l	±	0,04 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	0,43 *	0,06	µg/l	187%	6,69
B	0,266	0,003	µg/l	116%	1,20
C	0,24	0,07	µg/l	104%	0,33
D	0,339	0,080	µg/l	147%	3,65
E	0,21	0,05	µg/l	91%	-0,67
F			µg/l		
G	0,225	0,012	µg/l	98%	-0,17
H			µg/l		
I	2,1 *	0,6	µg/l	913%	62,54
J	n,b.		µg/l		
K	0,242	0,048	µg/l	105%	0,40
L	<0,5	0,1	µg/l	•	
M	<0,5		µg/l	•	
N	0,20	0,04	µg/l	87%	-1,00
O	<0,50		µg/l	•	
P	0,193	0,0022	µg/l	84%	-1,24





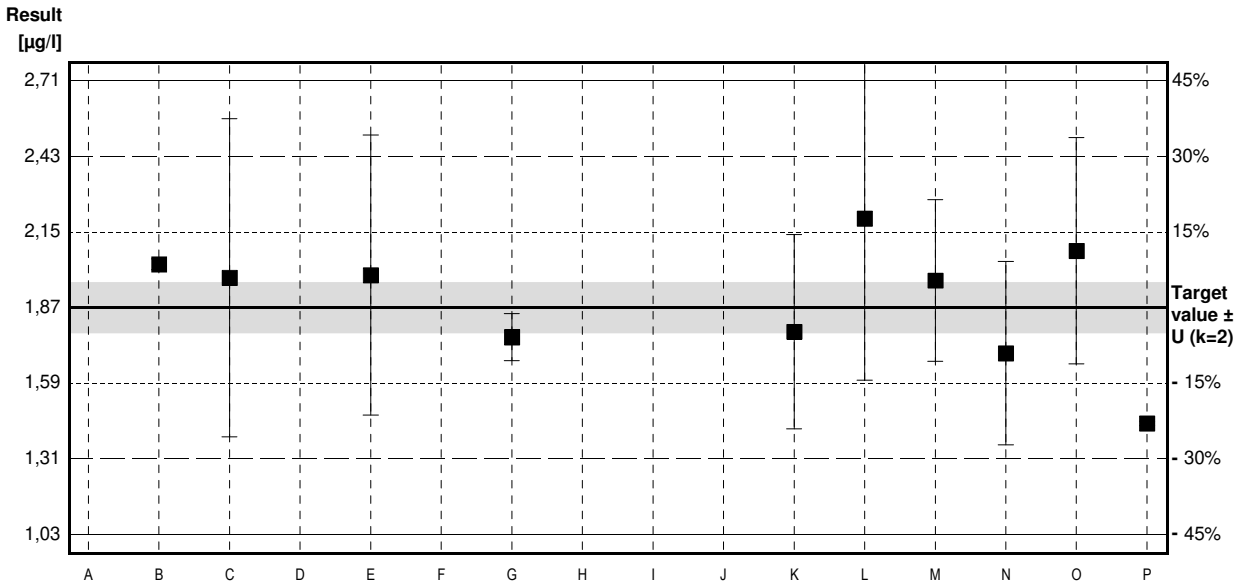
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,44 ± 0,61	0,24 ± 0,06	µg/l
Recov. ± CI(99%)	193,3 ± 264,4	104,1 ± 25,2	%
SD between labs	0,59	0,05	µg/l
RSD between labs	131,9	19,6	%
n for calculation	10	8	

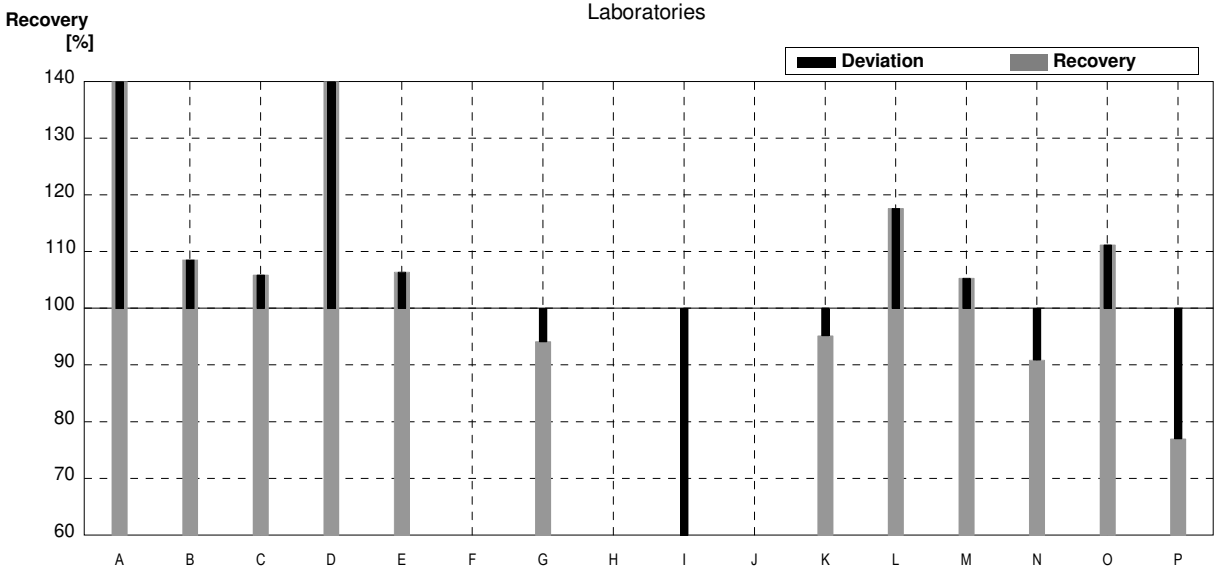
Sample C61B

Parameter trans-1,2-Dichloroethene

Target value	± U (k=2)	1,87 µg/l	±	0,09 µg/l
IFA result	± U (k=2)	1,85 µg/l	±	0,28 µg/l
Stability test	± U (k=2)	1,85 µg/l	±	0,28 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	3,07 *	0,46	µg/l	164%	4,94
B	2,03	0,020	µg/l	109%	0,66
C	1,98	0,59	µg/l	106%	0,45
D	3,54 *	1,29	µg/l	189%	6,87
E	1,99	0,52	µg/l	106%	0,49
F			µg/l		
G	1,76	0,087	µg/l	94%	-0,45
H			µg/l		
I	0,27 *	0,1	µg/l	14%	-6,58
J	n,b.		µg/l		
K	1,78	0,36	µg/l	95%	-0,37
L	2,2	0,6	µg/l	118%	1,36
M	1,97	0,30	µg/l	105%	0,41
N	1,70	0,34	µg/l	91%	-0,70
O	2,08	0,42	µg/l	111%	0,86
P	1,44	0,0081	µg/l	77%	-1,77





	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,99 ± 0,65	1,89 ± 0,23	µg/l
Recov. ± CI(99%)	106,2 ± 34,7	101,2 ± 12,3	%
SD between labs	0,77	0,22	µg/l
RSD between labs	38,6	11,7	%
n for calculation	13	10	

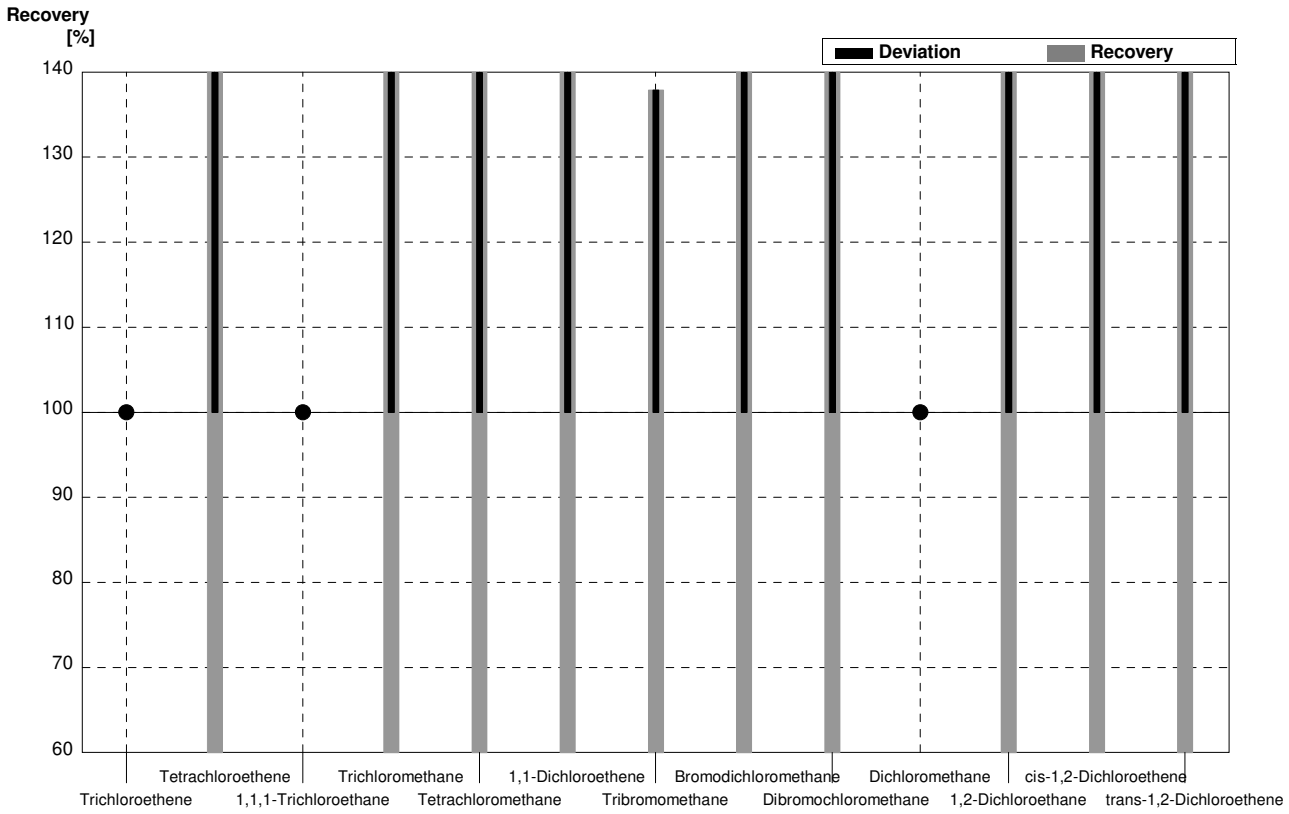
Illustration of Results
Laboratory Oriented Part

Round C61
Volatile Halogenated Hydrocarbons

Sample Dispatch: 1 July 2019

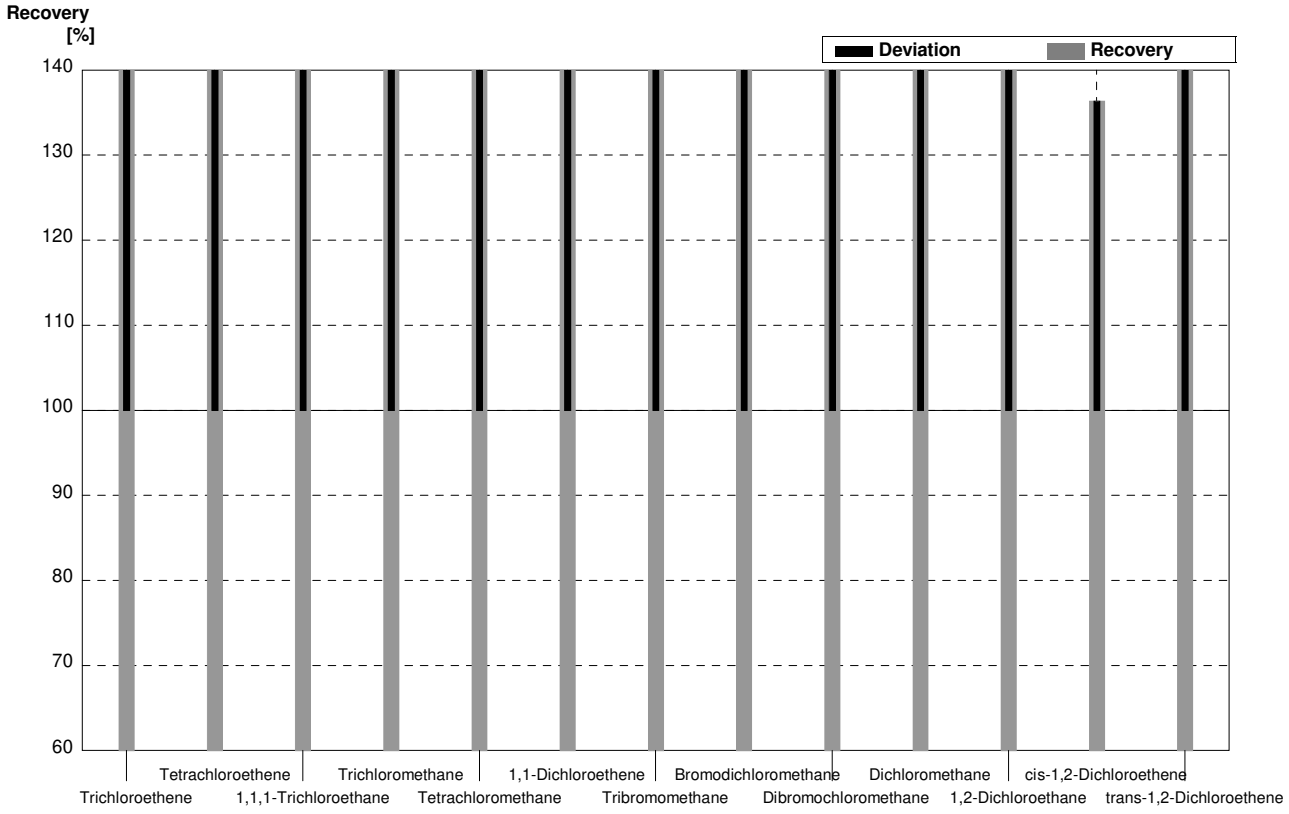
Sample C61A
Laboratory A

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	<0,08		<0,1		µg/l	•
Tetrachloroethene	0,21	0,01	0,32	0,05	µg/l	152%
1,1,1-Trichloroethane	<0,08		<0,1		µg/l	•
Trichloromethane	0,62	0,03	1,31	0,20	µg/l	211%
Tetrachloromethane	1,25	0,06	2,34	0,35	µg/l	187%
1,1-Dichloroethene	2,40	0,12	8,65	1,73	µg/l	360%
Tribromomethane	0,29	0,01	0,40	0,06	µg/l	138%
Bromodichloromethane	1,14	0,06	1,93	0,29	µg/l	169%
Dibromochloromethane	0,73	0,04	1,07	0,16	µg/l	147%
Dichloromethane	<0,6		<0,1		µg/l	•
1,2-Dichloroethane	2,88	0,14	4,30	0,65	µg/l	149%
cis-1,2-Dichloroethene	2,02	0,10	3,41	0,51	µg/l	169%
trans-1,2-Dichloroethene	0,23	0,01	0,43	0,06	µg/l	187%



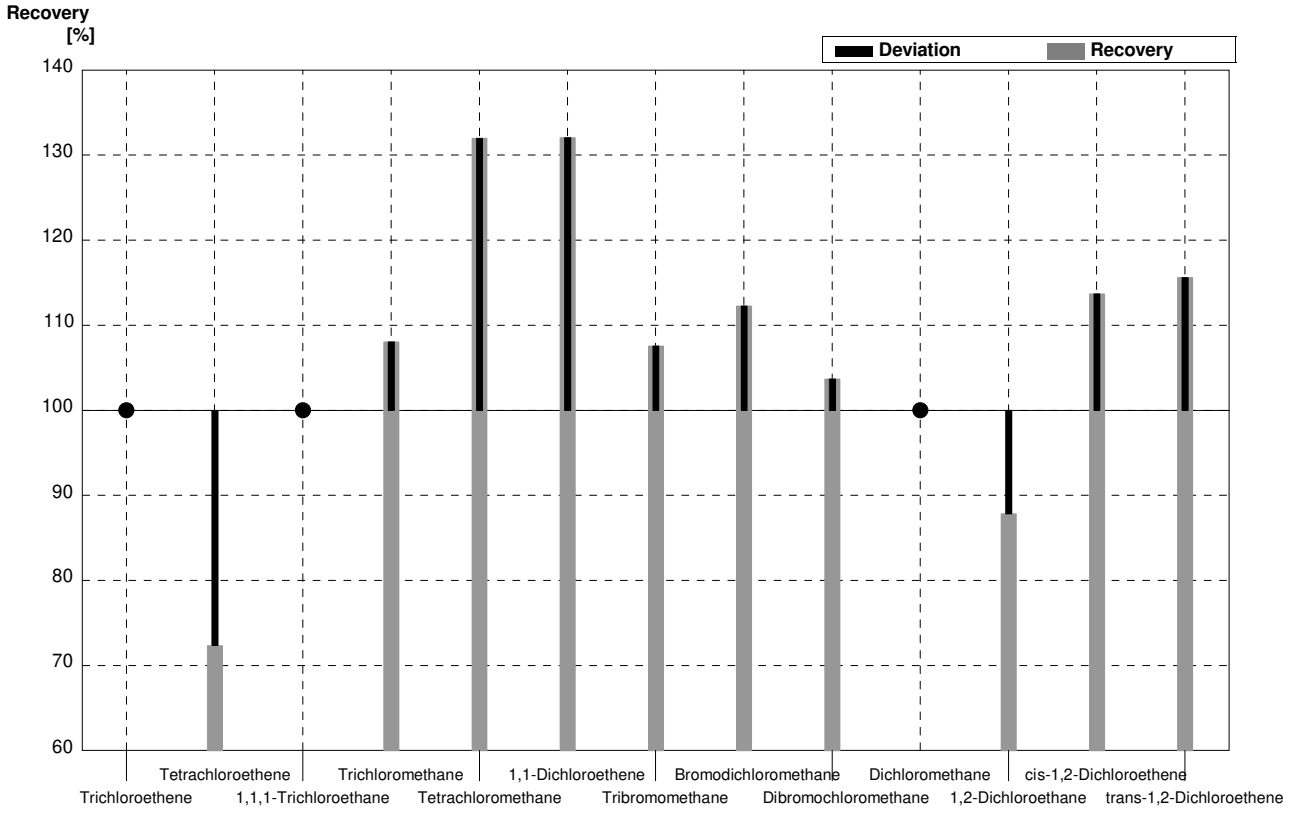
Sample C61B
Laboratory A

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,67	0,03	1,41	0,21	µg/l	210%
Tetrachloroethene	1,07	0,05	1,97	0,30	µg/l	184%
1,1,1-Trichloroethane	1,45	0,07	3,40	0,51	µg/l	234%
Trichloromethane	0,98	0,05	2,08	0,31	µg/l	212%
Tetrachloromethane	0,49	0,02	0,86	0,13	µg/l	176%
1,1-Dichloroethene	0,76	0,04	2,53	0,38	µg/l	333%
Tribromomethane	1,30	0,07	1,85	0,28	µg/l	142%
Bromodichloromethane	0,18	0,01	0,28	0,04	µg/l	156%
Dibromochloromethane	1,27	0,06	1,88	0,28	µg/l	148%
Dichloromethane	1,49	0,07	3,02	0,45	µg/l	203%
1,2-Dichloroethane	1,78	0,09	2,69	0,40	µg/l	151%
cis-1,2-Dichloroethene	0,33	0,02	0,45	0,07	µg/l	136%
trans-1,2-Dichloroethene	1,87	0,09	3,07	0,46	µg/l	164%



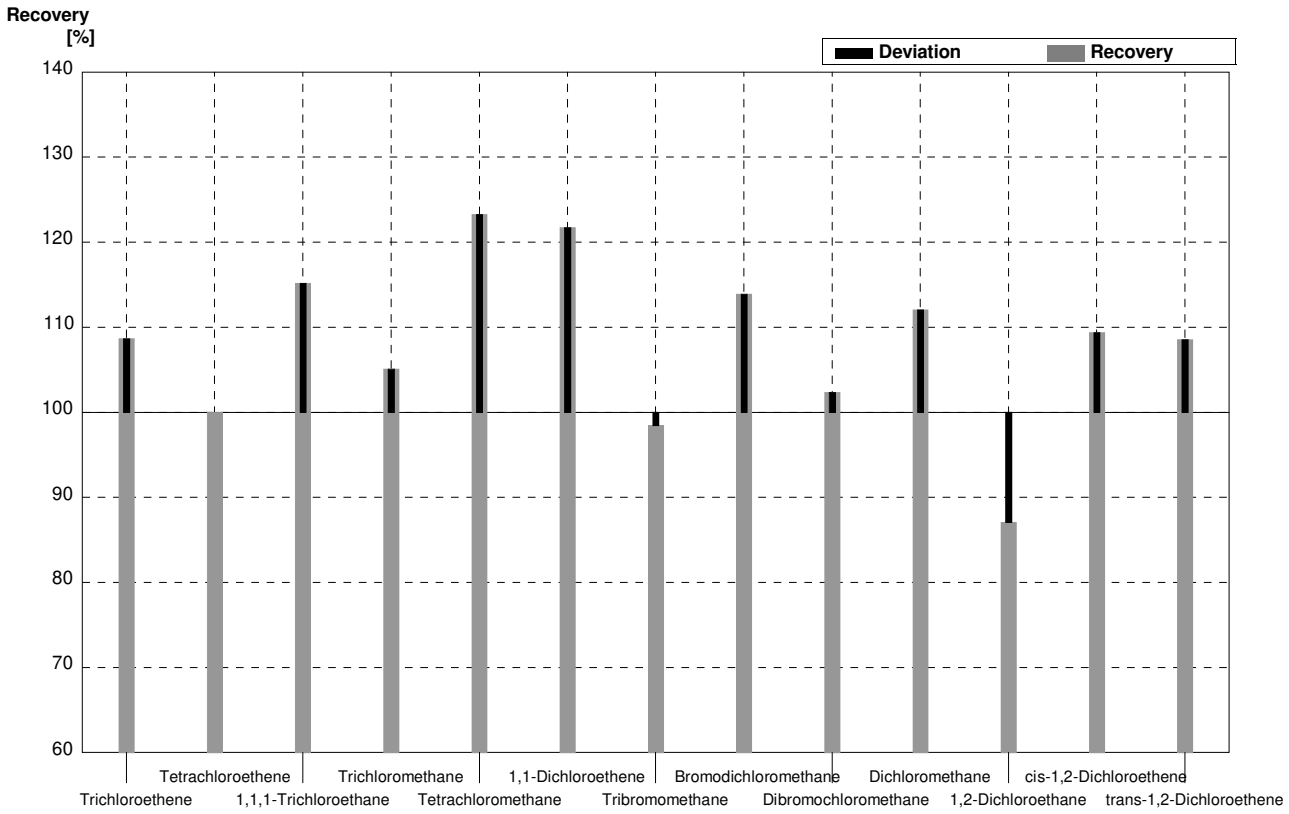
Sample C61A
Laboratory B

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	<0,08		<0,05	0,001	µg/l	•
Tetrachloroethene	0,21	0,01	0,152	0,002	µg/l	72%
1,1,1-Trichloroethane	<0,08		<0,05	0,001	µg/l	•
Trichloromethane	0,62	0,03	0,670	0,007	µg/l	108%
Tetrachloromethane	1,25	0,06	1,65	0,017	µg/l	132%
1,1-Dichloroethene	2,40	0,12	3,17	0,032	µg/l	132%
Tribromomethane	0,29	0,01	0,312	0,003	µg/l	108%
Bromodichloromethane	1,14	0,06	1,28	0,013	µg/l	112%
Dibromochloromethane	0,73	0,04	0,757	0,008	µg/l	104%
Dichloromethane	<0,6		<0,21	0,002	µg/l	•
1,2-Dichloroethane	2,88	0,14	2,53	0,025	µg/l	88%
cis-1,2-Dichloroethene	2,02	0,10	2,297	0,023	µg/l	114%
trans-1,2-Dichloroethene	0,23	0,01	0,266	0,003	µg/l	116%



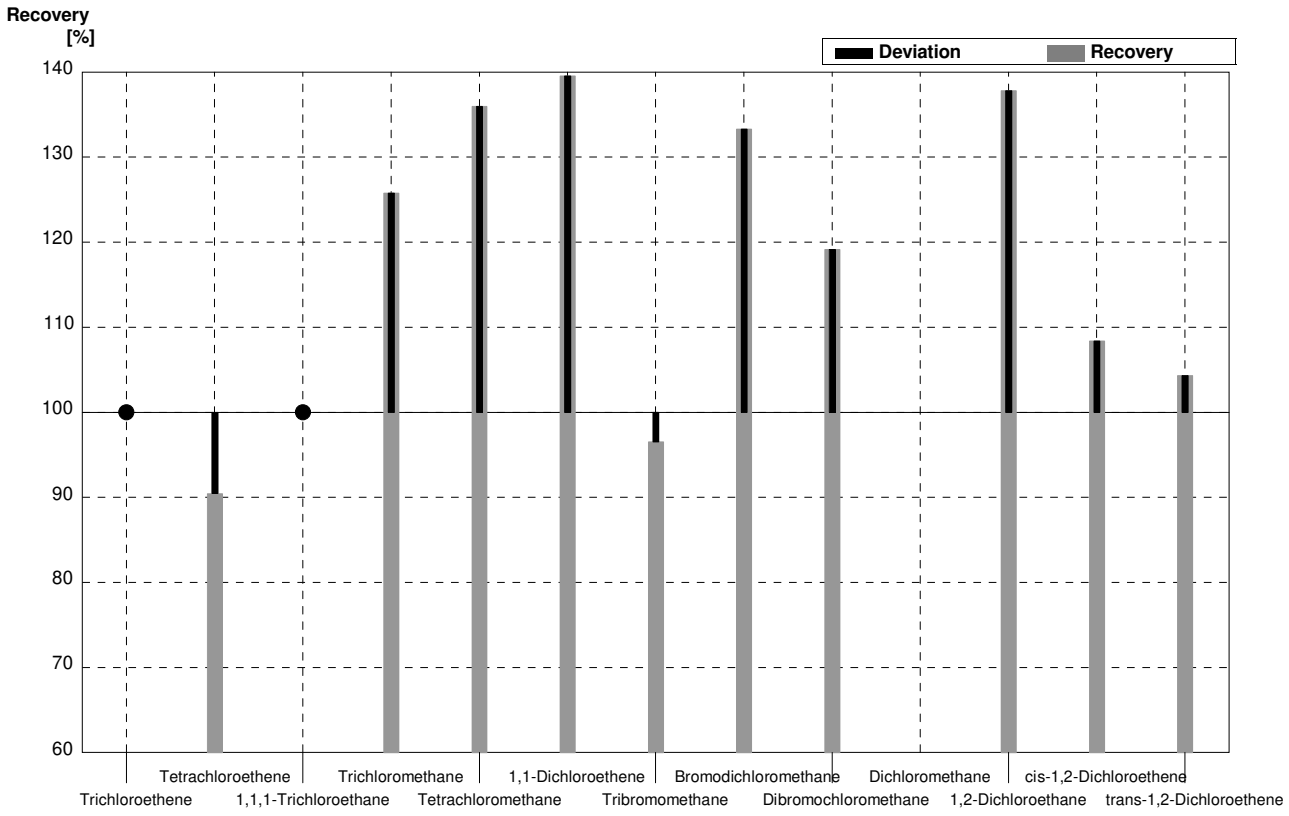
Sample C61B
Laboratory B

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,67	0,03	0,728	0,007	µg/l	109%
Tetrachloroethene	1,07	0,05	1,07	0,011	µg/l	100%
1,1,1-Trichloroethane	1,45	0,07	1,67	0,017	µg/l	115%
Trichloromethane	0,98	0,05	1,03	0,010	µg/l	105%
Tetrachloromethane	0,49	0,02	0,604	0,006	µg/l	123%
1,1-Dichloroethene	0,76	0,04	0,925	0,009	µg/l	122%
Tribromomethane	1,30	0,07	1,28	0,013	µg/l	98%
Bromodichloromethane	0,18	0,01	0,205	0,002	µg/l	114%
Dibromochloromethane	1,27	0,06	1,30	0,013	µg/l	102%
Dichloromethane	1,49	0,07	1,67	0,017	µg/l	112%
1,2-Dichloroethane	1,78	0,09	1,55	0,016	µg/l	87%
cis-1,2-Dichloroethene	0,33	0,02	0,361	0,004	µg/l	109%
trans-1,2-Dichloroethene	1,87	0,09	2,03	0,020	µg/l	109%



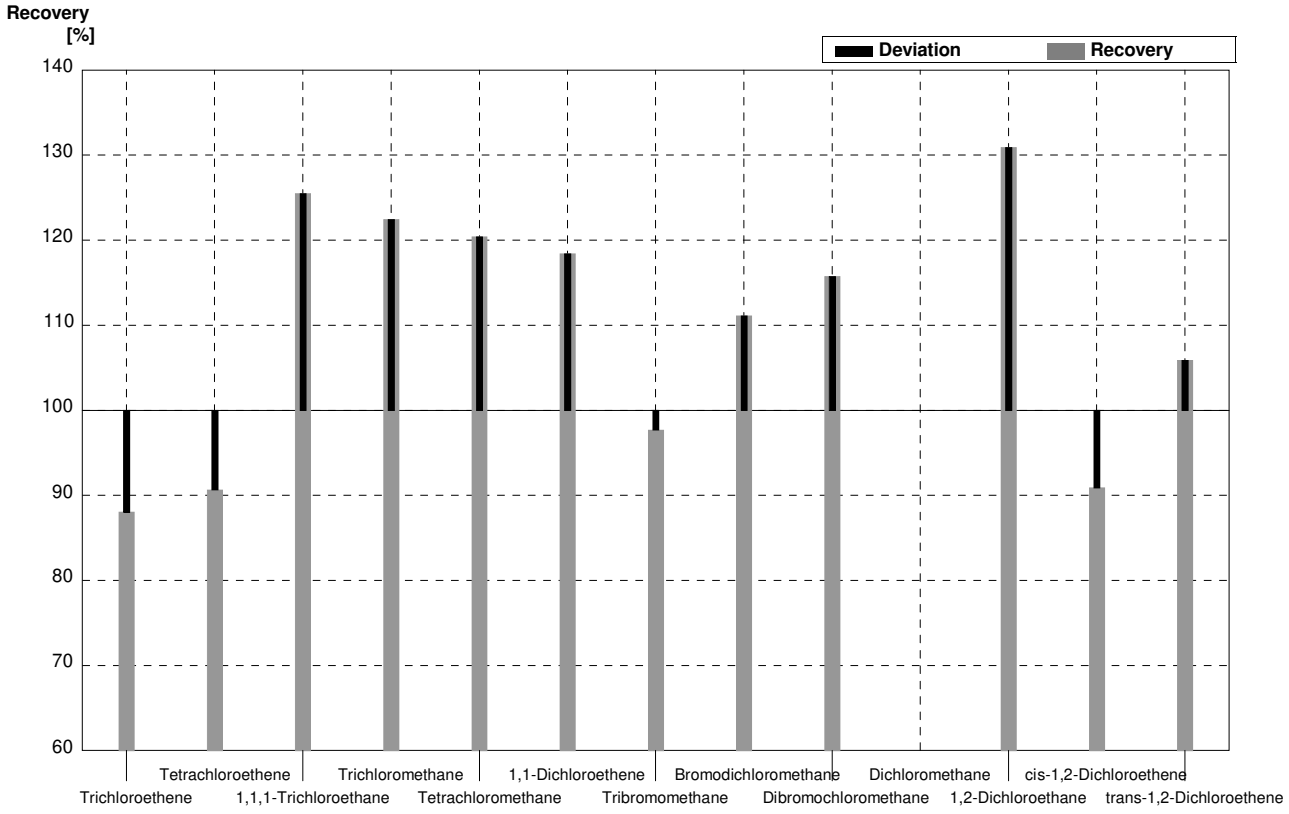
Sample C61A
Laboratory C

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	<0,08		<0,1		µg/l	•
Tetrachloroethene	0,21	0,01	0,19	0,06	µg/l	90%
1,1,1-Trichloroethane	<0,08		<0,1		µg/l	•
Trichloromethane	0,62	0,03	0,78	0,23	µg/l	126%
Tetrachloromethane	1,25	0,06	1,70	0,51	µg/l	136%
1,1-Dichloroethene	2,40	0,12	3,35	1,01	µg/l	140%
Tribromomethane	0,29	0,01	0,28	0,08	µg/l	97%
Bromodichloromethane	1,14	0,06	1,52	0,46	µg/l	133%
Dibromochloromethane	0,73	0,04	0,87	0,26	µg/l	119%
Dichloromethane	<0,6				µg/l	
1,2-Dichloroethane	2,88	0,14	3,97	1,19	µg/l	138%
cis-1,2-Dichloroethene	2,02	0,10	2,19	0,66	µg/l	108%
trans-1,2-Dichloroethene	0,23	0,01	0,24	0,07	µg/l	104%



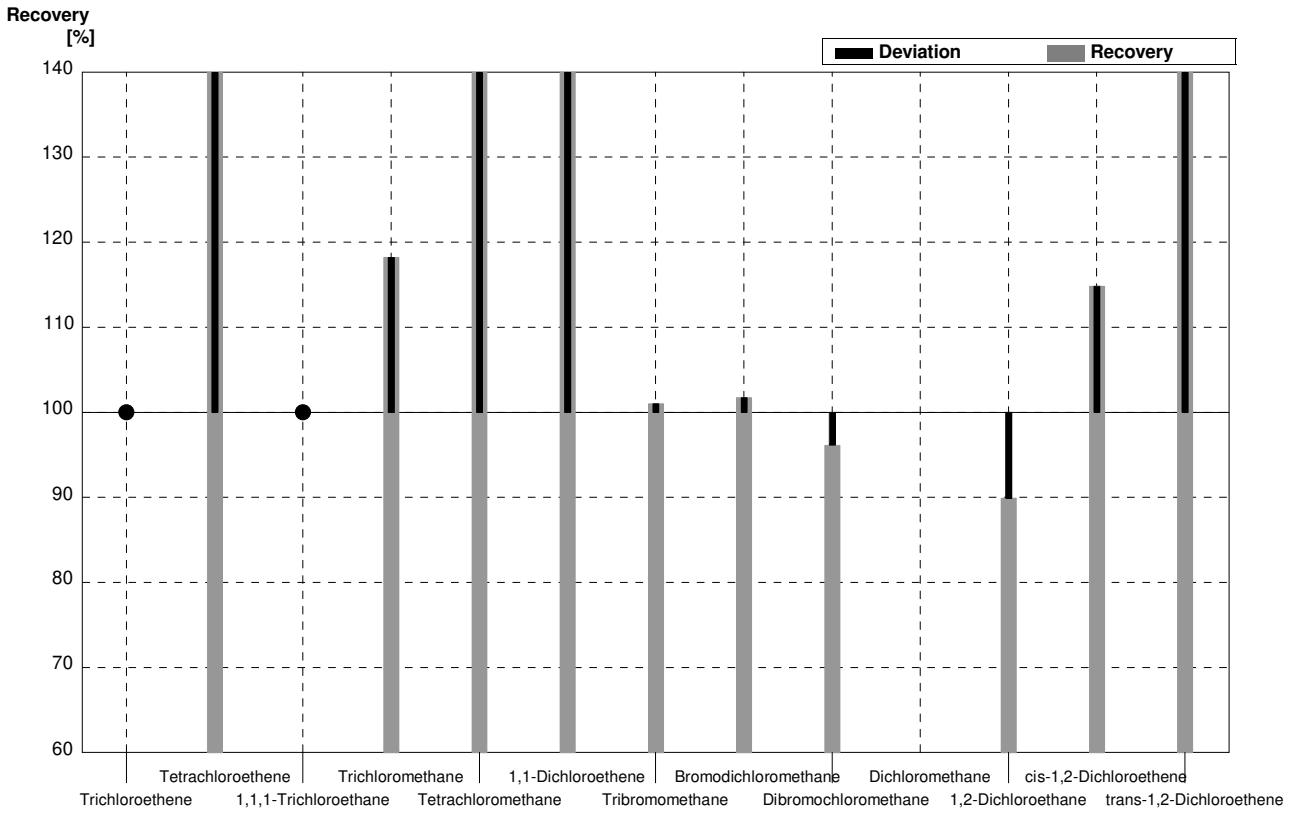
Sample C61B
Laboratory C

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,67	0,03	0,59	0,18	µg/l	88%
Tetrachloroethene	1,07	0,05	0,97	0,29	µg/l	91%
1,1,1-Trichloroethane	1,45	0,07	1,82	0,55	µg/l	126%
Trichloromethane	0,98	0,05	1,20	0,36	µg/l	122%
Tetrachloromethane	0,49	0,02	0,59	0,18	µg/l	120%
1,1-Dichloroethene	0,76	0,04	0,90	0,27	µg/l	118%
Tribromomethane	1,30	0,07	1,27	0,38	µg/l	98%
Bromodichloromethane	0,18	0,01	0,20	0,06	µg/l	111%
Dibromochloromethane	1,27	0,06	1,47	0,44	µg/l	116%
Dichloromethane	1,49	0,07			µg/l	
1,2-Dichloroethane	1,78	0,09	2,33	0,70	µg/l	131%
cis-1,2-Dichloroethene	0,33	0,02	0,30	0,09	µg/l	91%
trans-1,2-Dichloroethene	1,87	0,09	1,98	0,59	µg/l	106%



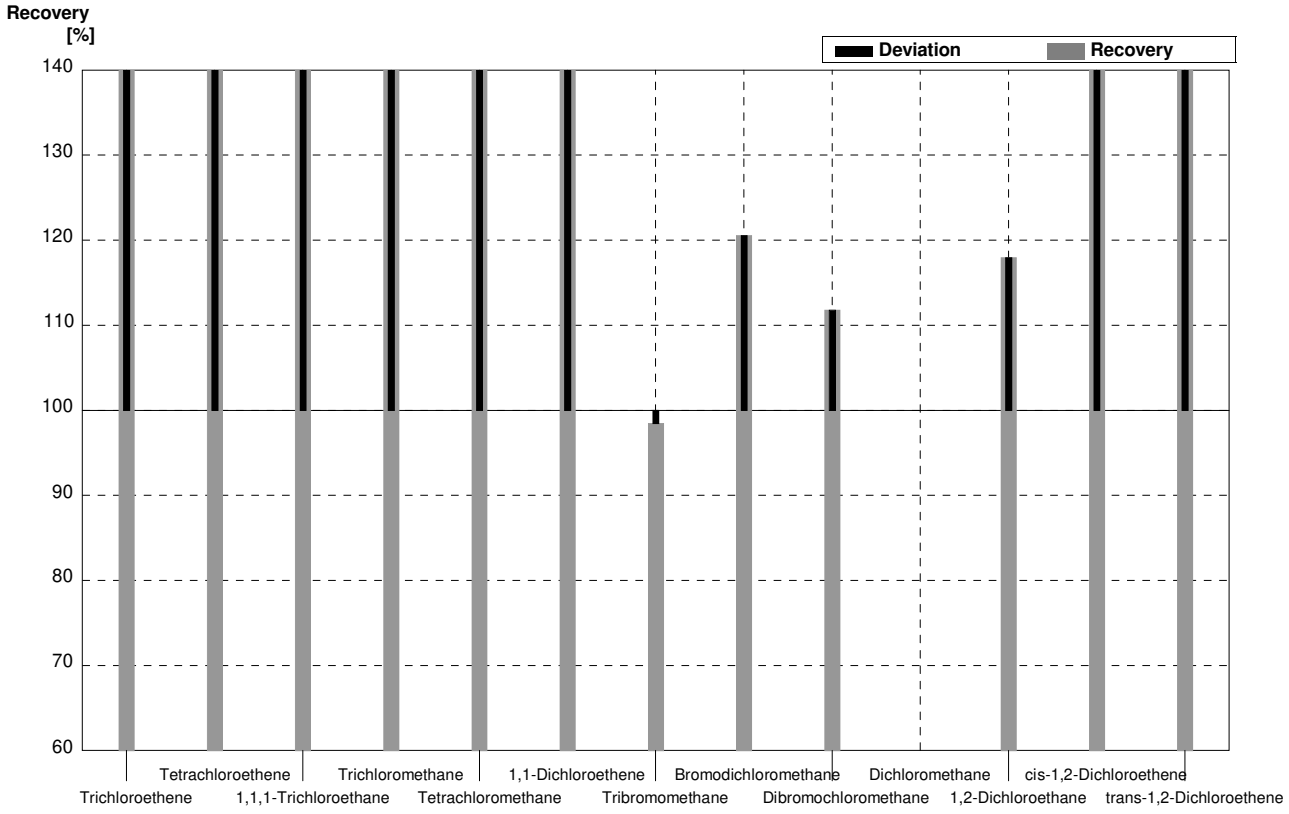
Sample C61A
Laboratory D

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	<0,08		<0,1		µg/l	•
Tetrachloroethene	0,21	0,01	0,335	0,040	µg/l	160%
1,1,1-Trichloroethane	<0,08		<0,1		µg/l	•
Trichloromethane	0,62	0,03	0,733	0,170	µg/l	118%
Tetrachloromethane	1,25	0,06	2,16	0,52	µg/l	173%
1,1-Dichloroethene	2,40	0,12	3,84	1,61	µg/l	160%
Tribromomethane	0,29	0,01	0,293	0,020	µg/l	101%
Bromodichloromethane	1,14	0,06	1,16	0,24	µg/l	102%
Dibromochloromethane	0,73	0,04	0,702	0,080	µg/l	96%
Dichloromethane	<0,6		n,b.		µg/l	
1,2-Dichloroethane	2,88	0,14	2,59	0,54	µg/l	90%
cis-1,2-Dichloroethene	2,02	0,10	2,32	0,57	µg/l	115%
trans-1,2-Dichloroethene	0,23	0,01	0,339	0,080	µg/l	147%



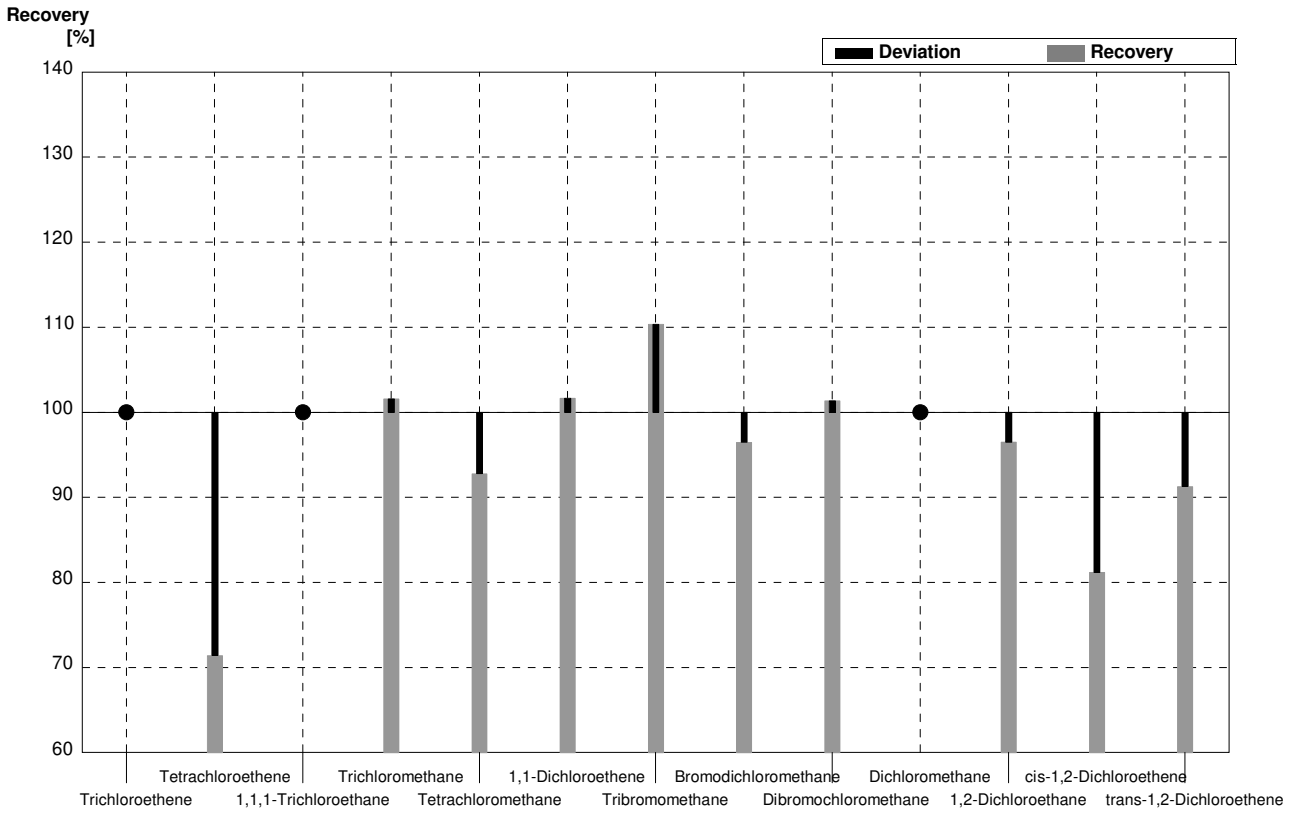
Sample C61B
Laboratory D

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,67	0,03	1,12	0,36	µg/l	167%
Tetrachloroethene	1,07	0,05	1,92	0,24	µg/l	179%
1,1,1-Trichloroethane	1,45	0,07	2,89	0,68	µg/l	199%
Trichloromethane	0,98	0,05	1,42	0,46	µg/l	145%
Tetrachloromethane	0,49	0,02	1,11	0,36	µg/l	227%
1,1-Dichloroethene	0,76	0,04	1,76	0,90	µg/l	232%
Tribromomethane	1,30	0,07	1,28	0,07	µg/l	98%
Bromodichloromethane	0,18	0,01	0,217	0,050	µg/l	121%
Dibromochloromethane	1,27	0,06	1,42	0,13	µg/l	112%
Dichloromethane	1,49	0,07	n,b.		µg/l	
1,2-Dichloroethane	1,78	0,09	2,10	0,59	µg/l	118%
cis-1,2-Dichloroethene	0,33	0,02	0,481	0,170	µg/l	146%
trans-1,2-Dichloroethene	1,87	0,09	3,54	1,29	µg/l	189%



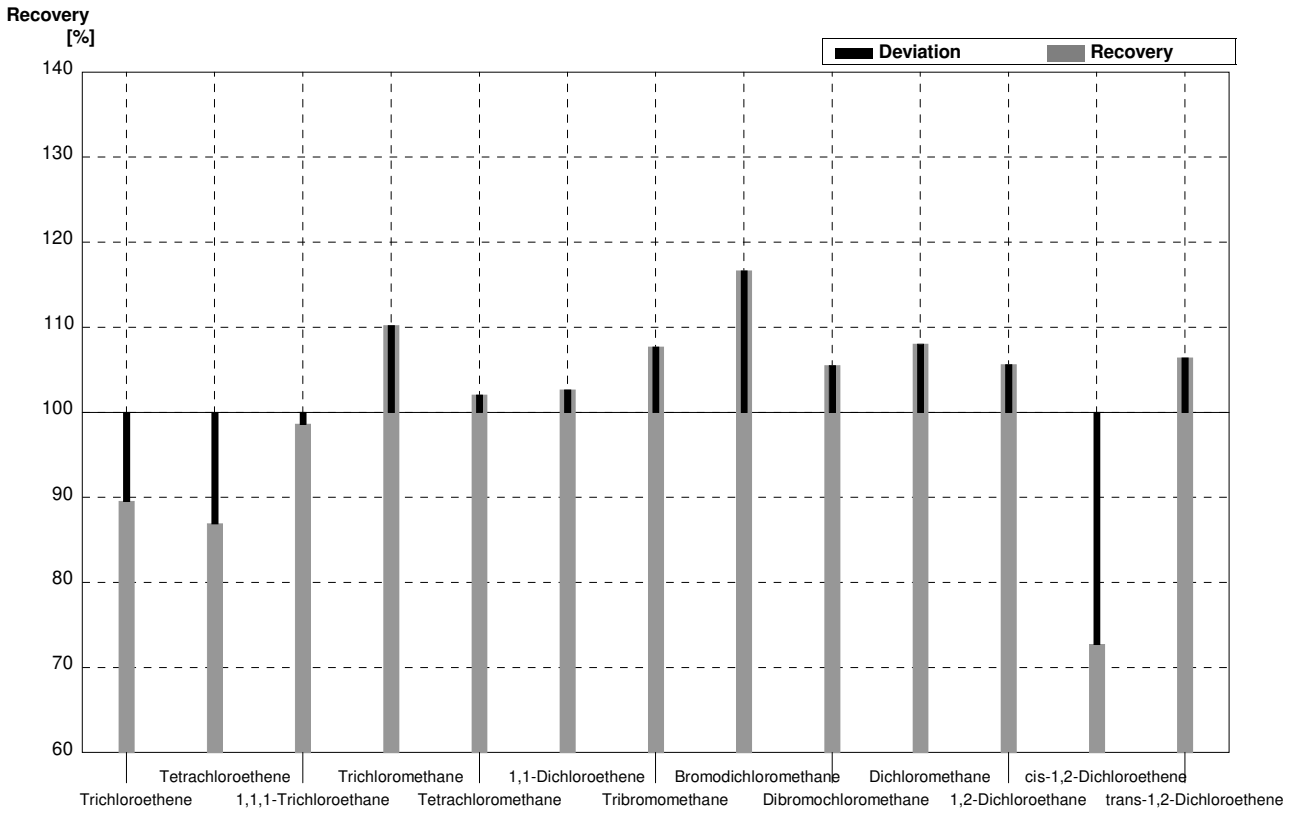
Sample C61A
Laboratory E

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	<0,08		<0,1	0,03	µg/l	•
Tetrachloroethene	0,21	0,01	0,15	0,04	µg/l	71%
1,1,1-Trichloroethane	<0,08		<0,1	0,03	µg/l	•
Trichloromethane	0,62	0,03	0,63	0,16	µg/l	102%
Tetrachloromethane	1,25	0,06	1,16	0,30	µg/l	93%
1,1-Dichloroethene	2,40	0,12	2,44	0,63	µg/l	102%
Tribromomethane	0,29	0,01	0,32	0,08	µg/l	110%
Bromodichloromethane	1,14	0,06	1,10	0,29	µg/l	96%
Dibromochloromethane	0,73	0,04	0,74	0,19	µg/l	101%
Dichloromethane	<0,6		<0,1	0,03	µg/l	•
1,2-Dichloroethane	2,88	0,14	2,78	0,72	µg/l	97%
cis-1,2-Dichloroethene	2,02	0,10	1,64	0,43	µg/l	81%
trans-1,2-Dichloroethene	0,23	0,01	0,21	0,05	µg/l	91%



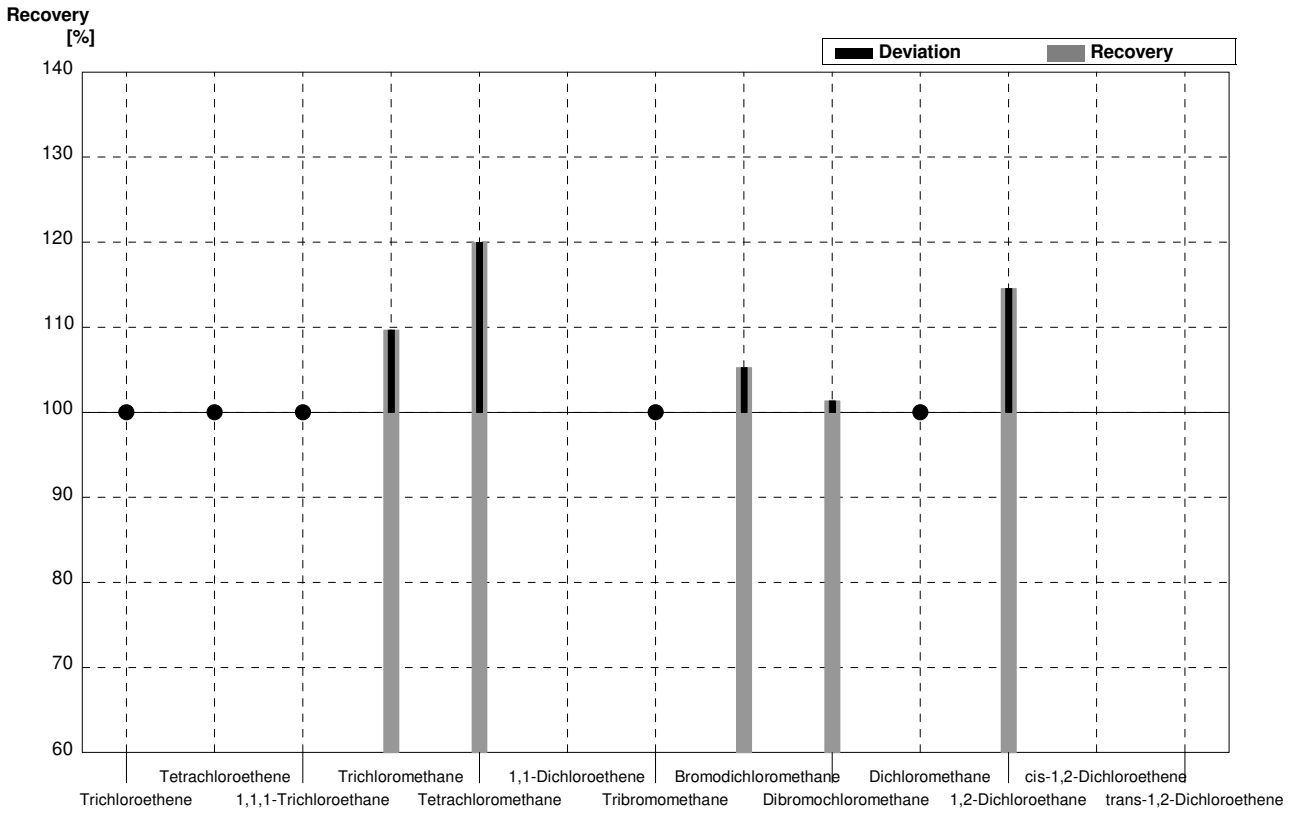
Sample C61B
Laboratory E

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,67	0,03	0,60	0,16	µg/l	90%
Tetrachloroethene	1,07	0,05	0,93	0,24	µg/l	87%
1,1,1-Trichloroethane	1,45	0,07	1,43	0,37	µg/l	99%
Trichloromethane	0,98	0,05	1,08	0,28	µg/l	110%
Tetrachloromethane	0,49	0,02	0,50	0,13	µg/l	102%
1,1-Dichloroethene	0,76	0,04	0,78	0,20	µg/l	103%
Tribromomethane	1,30	0,07	1,40	0,36	µg/l	108%
Bromodichloromethane	0,18	0,01	0,21	0,06	µg/l	117%
Dibromochloromethane	1,27	0,06	1,34	0,35	µg/l	106%
Dichloromethane	1,49	0,07	1,61	0,42	µg/l	108%
1,2-Dichloroethane	1,78	0,09	1,88	0,49	µg/l	106%
cis-1,2-Dichloroethene	0,33	0,02	0,24	0,06	µg/l	73%
trans-1,2-Dichloroethene	1,87	0,09	1,99	0,52	µg/l	106%



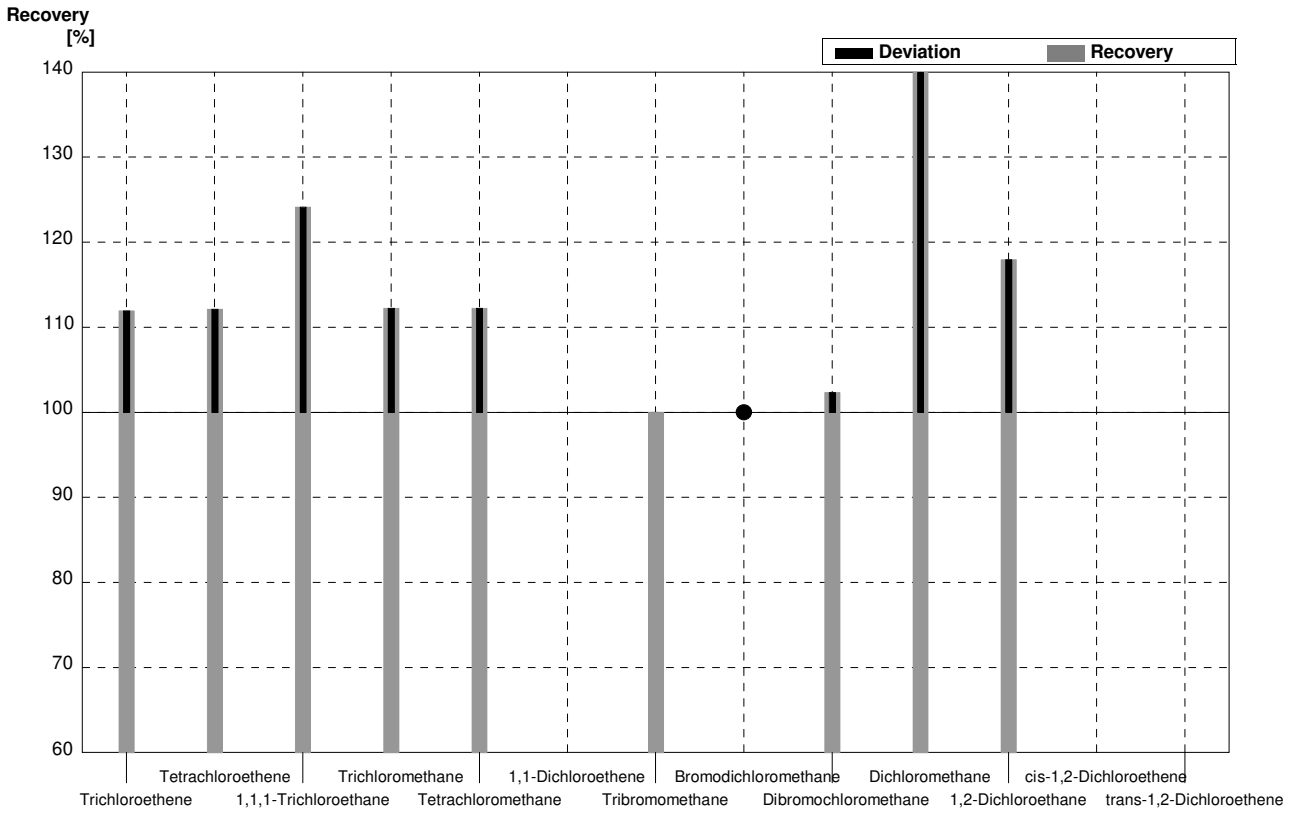
Sample C61A
Laboratory F

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	<0,08		<0,50		µg/l	•
Tetrachloroethene	0,21	0,01	<0,50		µg/l	•
1,1,1-Trichloroethane	<0,08		<0,50		µg/l	•
Trichloromethane	0,62	0,03	0,68	0,17	µg/l	110%
Tetrachloromethane	1,25	0,06	1,5	0,40	µg/l	120%
1,1-Dichloroethene	2,40	0,12			µg/l	
Tribromomethane	0,29	0,01	<0,50		µg/l	•
Bromodichloromethane	1,14	0,06	1,2	0,24	µg/l	105%
Dibromochloromethane	0,73	0,04	0,74	0,15	µg/l	101%
Dichloromethane	<0,6		<0,50		µg/l	•
1,2-Dichloroethane	2,88	0,14	3,3	0,73	µg/l	115%
cis-1,2-Dichloroethene	2,02	0,10			µg/l	
trans-1,2-Dichloroethene	0,23	0,01			µg/l	



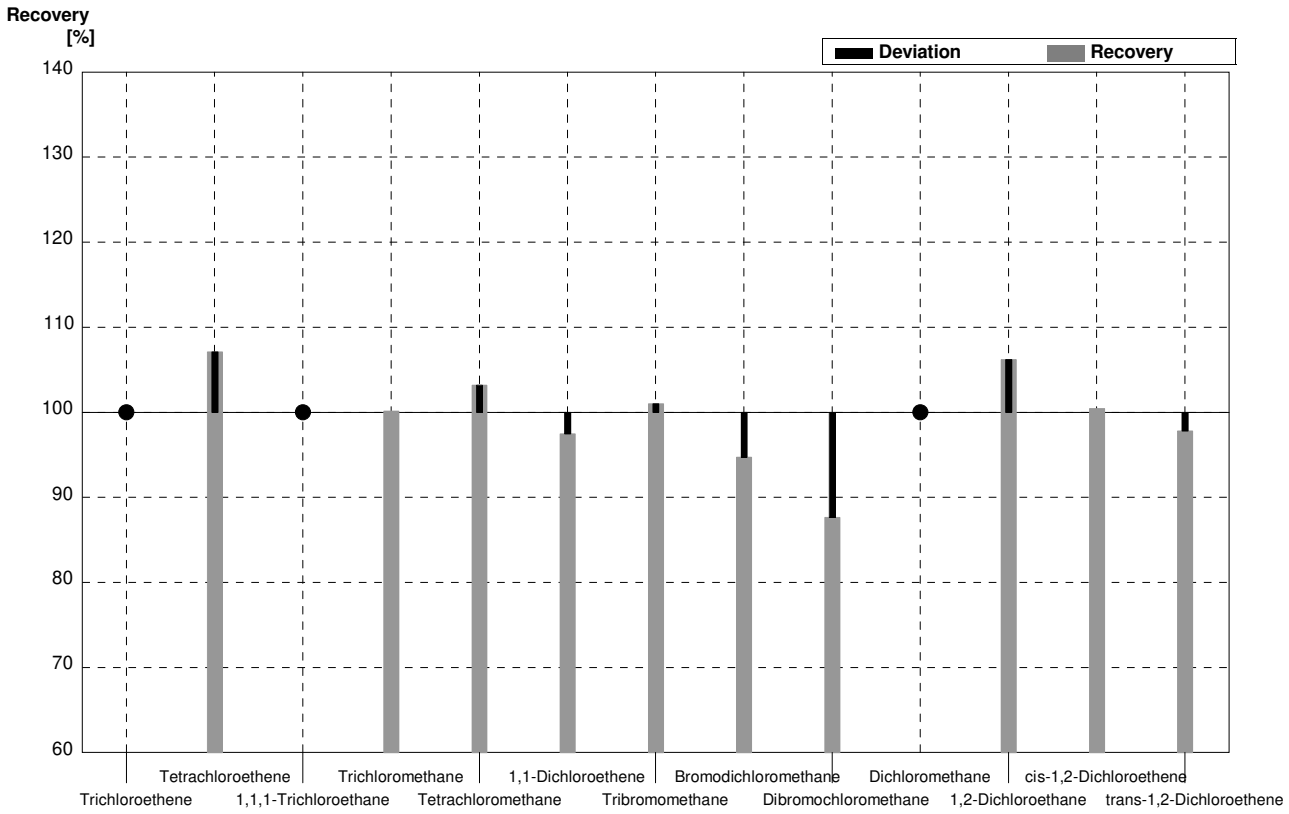
Sample C61B
Laboratory F

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,67	0,03	0,75	0,22	µg/l	112%
Tetrachloroethene	1,07	0,05	1,2	0,36	µg/l	112%
1,1,1-Trichloroethane	1,45	0,07	1,8	0,50	µg/l	124%
Trichloromethane	0,98	0,05	1,1	0,28	µg/l	112%
Tetrachloromethane	0,49	0,02	0,55	0,15	µg/l	112%
1,1-Dichloroethene	0,76	0,04			µg/l	
Tribromomethane	1,30	0,07	1,3	0,26	µg/l	100%
Bromodichloromethane	0,18	0,01	<0,50		µg/l	•
Dibromochloromethane	1,27	0,06	1,3	0,26	µg/l	102%
Dichloromethane	1,49	0,07	2,1	0,44	µg/l	141%
1,2-Dichloroethane	1,78	0,09	2,1	0,46	µg/l	118%
cis-1,2-Dichloroethene	0,33	0,02			µg/l	
trans-1,2-Dichloroethene	1,87	0,09			µg/l	



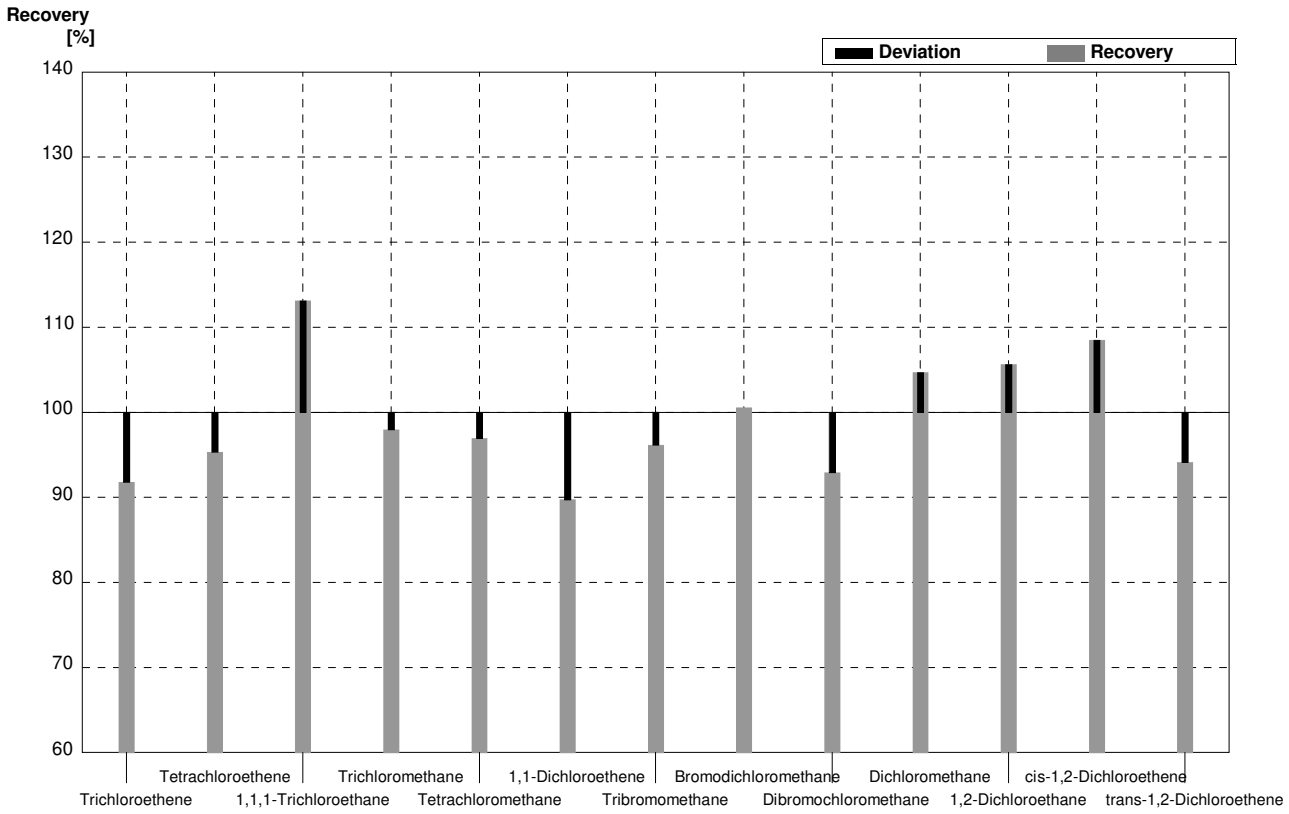
Sample C61A
Laboratory G

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	<0,08		<0,05		µg/l	•
Tetrachloroethene	0,21	0,01	0,225	0,004	µg/l	107%
1,1,1-Trichloroethane	<0,08		<0,05		µg/l	•
Trichloromethane	0,62	0,03	0,621	0,099	µg/l	100%
Tetrachloromethane	1,25	0,06	1,29	0,070	µg/l	103%
1,1-Dichloroethene	2,40	0,12	2,34	0,078	µg/l	98%
Tribromomethane	0,29	0,01	0,293	0,006	µg/l	101%
Bromodichloromethane	1,14	0,06	1,08	0,081	µg/l	95%
Dibromochloromethane	0,73	0,04	0,640	0,100	µg/l	88%
Dichloromethane	<0,6		<0,05		µg/l	•
1,2-Dichloroethane	2,88	0,14	3,06	0,122	µg/l	106%
cis-1,2-Dichloroethene	2,02	0,10	2,03	0,084	µg/l	100%
trans-1,2-Dichloroethene	0,23	0,01	0,225	0,012	µg/l	98%



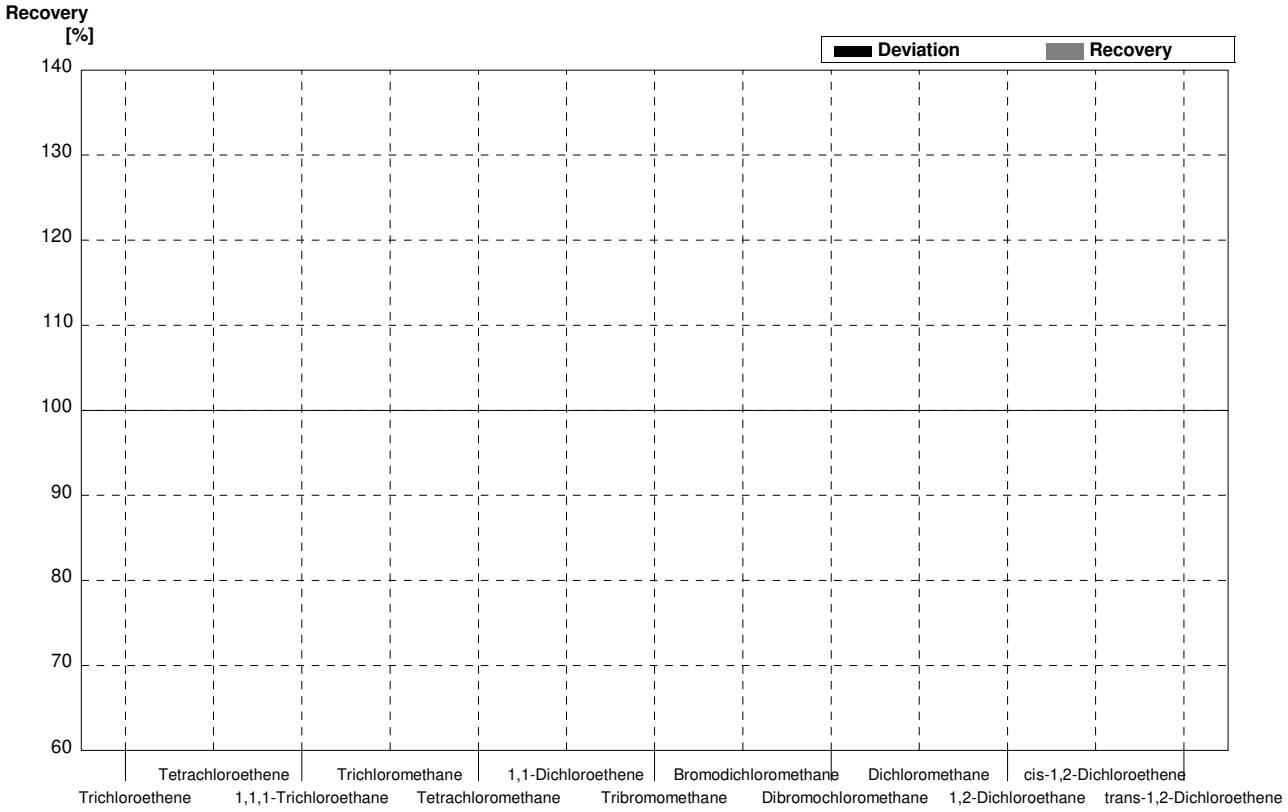
Sample C61B
Laboratory G

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,67	0,03	0,615	0,099	µg/l	92%
Tetrachloroethene	1,07	0,05	1,02	0,072	µg/l	95%
1,1,1-Trichloroethane	1,45	0,07	1,64	0,078	µg/l	113%
Trichloromethane	0,98	0,05	0,960	0,094	µg/l	98%
Tetrachloromethane	0,49	0,02	0,475	0,098	µg/l	97%
1,1-Dichloroethene	0,76	0,04	0,682	0,065	µg/l	90%
Tribromomethane	1,30	0,07	1,25	0,086	µg/l	96%
Bromodichloromethane	0,18	0,01	0,181	0,005	µg/l	101%
Dibromochloromethane	1,27	0,06	1,18	0,093	µg/l	93%
Dichloromethane	1,49	0,07	1,56	0,094	µg/l	105%
1,2-Dichloroethane	1,78	0,09	1,88	0,102	µg/l	106%
cis-1,2-Dichloroethene	0,33	0,02	0,358	0,007	µg/l	108%
trans-1,2-Dichloroethene	1,87	0,09	1,76	0,087	µg/l	94%



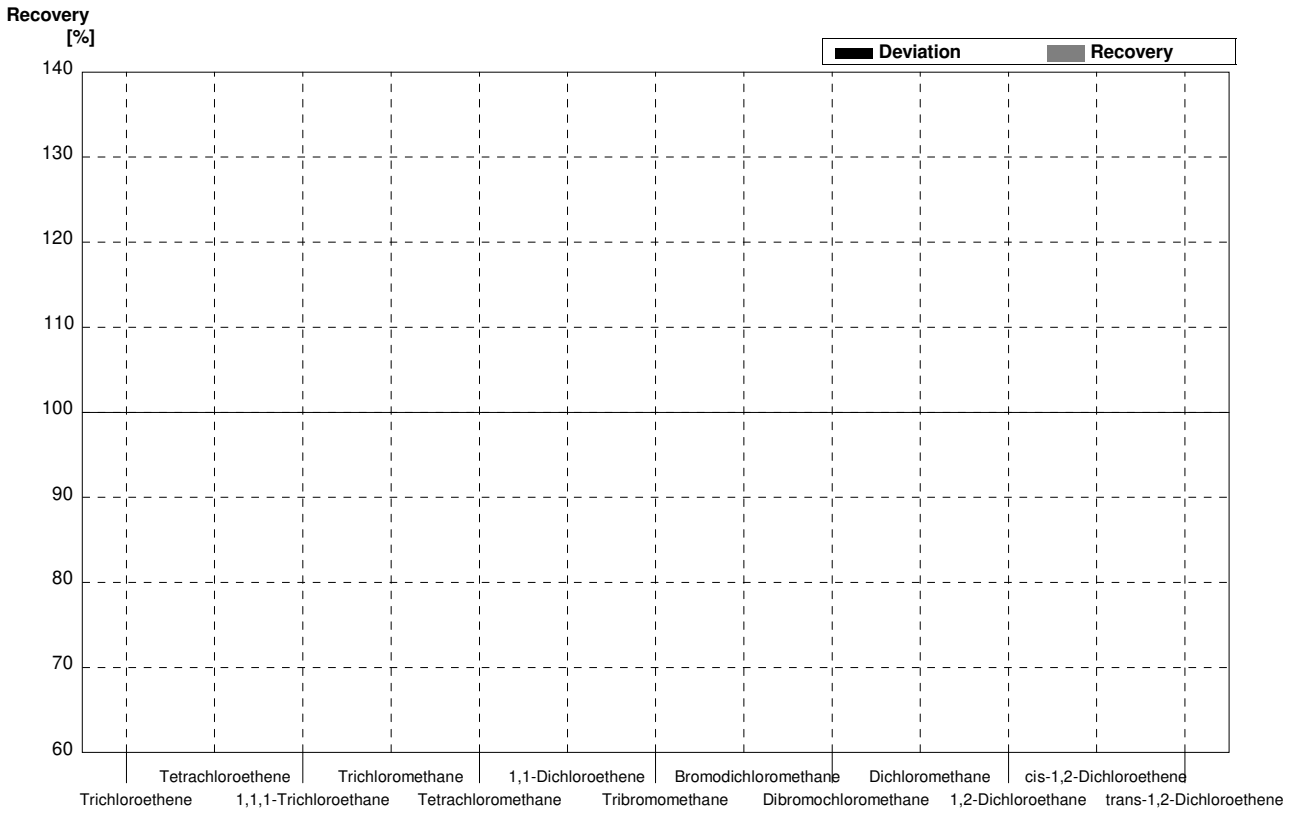
Sample C61A
Laboratory H

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	<0,08				µg/l	
Tetrachloroethene	0,21	0,01			µg/l	
1,1,1-Trichloroethane	<0,08				µg/l	
Trichloromethane	0,62	0,03			µg/l	
Tetrachloromethane	1,25	0,06			µg/l	
1,1-Dichloroethene	2,40	0,12			µg/l	
Tribromomethane	0,29	0,01			µg/l	
Bromodichloromethane	1,14	0,06			µg/l	
Dibromochloromethane	0,73	0,04			µg/l	
Dichloromethane	<0,6				µg/l	
1,2-Dichloroethane	2,88	0,14			µg/l	
cis-1,2-Dichloroethene	2,02	0,10			µg/l	
trans-1,2-Dichloroethene	0,23	0,01			µg/l	



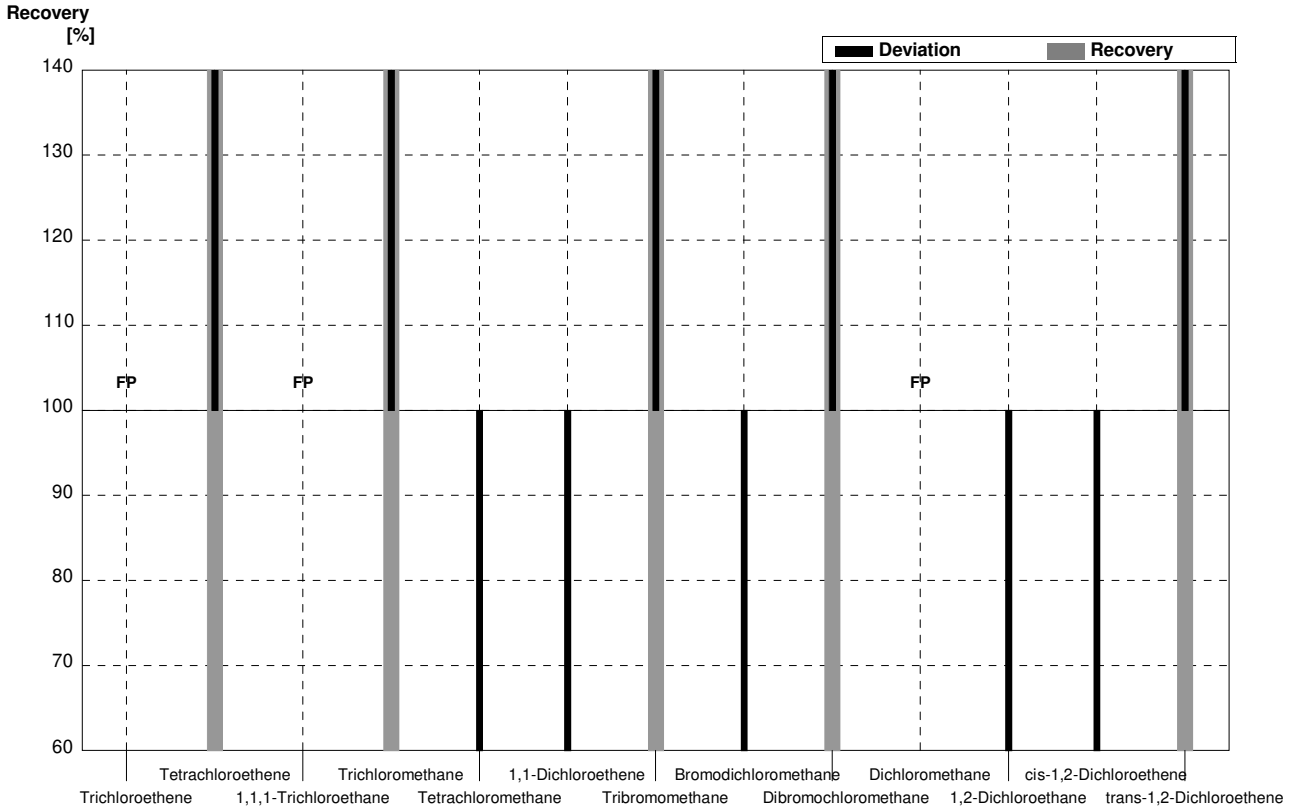
Sample C61B
Laboratory H

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,67	0,03			µg/l	
Tetrachloroethene	1,07	0,05			µg/l	
1,1,1-Trichloroethane	1,45	0,07			µg/l	
Trichloromethane	0,98	0,05			µg/l	
Tetrachloromethane	0,49	0,02			µg/l	
1,1-Dichloroethene	0,76	0,04			µg/l	
Tribromomethane	1,30	0,07			µg/l	
Bromodichloromethane	0,18	0,01			µg/l	
Dibromochloromethane	1,27	0,06			µg/l	
Dichloromethane	1,49	0,07			µg/l	
1,2-Dichloroethane	1,78	0,09			µg/l	
cis-1,2-Dichloroethene	0,33	0,02			µg/l	
trans-1,2-Dichloroethene	1,87	0,09			µg/l	



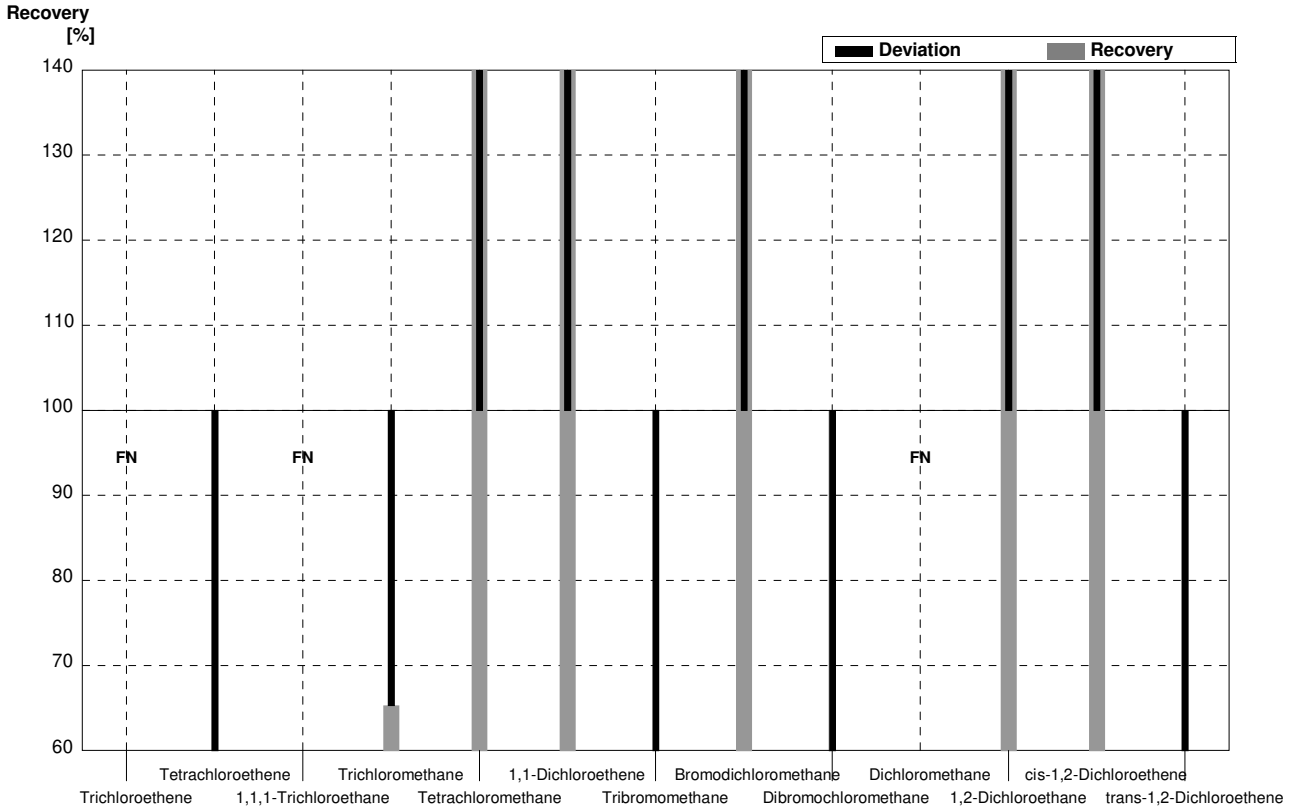
Sample C61A
Laboratory I

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	<0,08		0,54	0,2	µg/l	FP
Tetrachloroethene	0,21	0,01	1,1	0,3	µg/l	524%
1,1,1-Trichloroethane	<0,08		1,5	0,4	µg/l	FP
Trichloromethane	0,62	0,03	0,97	0,3	µg/l	156%
Tetrachloromethane	1,25	0,06	0,49	0,2	µg/l	39%
1,1-Dichloroethene	2,40	0,12	0,9	0,3	µg/l	38%
Tribromomethane	0,29	0,01	1,3	0,3	µg/l	448%
Bromodichloromethane	1,14	0,06	0,19	0,1	µg/l	17%
Dibromochloromethane	0,73	0,04	1,3	0,3	µg/l	178%
Dichloromethane	<0,6		1,6	0,4	µg/l	FP
1,2-Dichloroethane	2,88	0,14	1,7	0,4	µg/l	59%
cis-1,2-Dichloroethene	2,02	0,10	0,34	0,1	µg/l	17%
trans-1,2-Dichloroethene	0,23	0,01	2,1	0,6	µg/l	913%



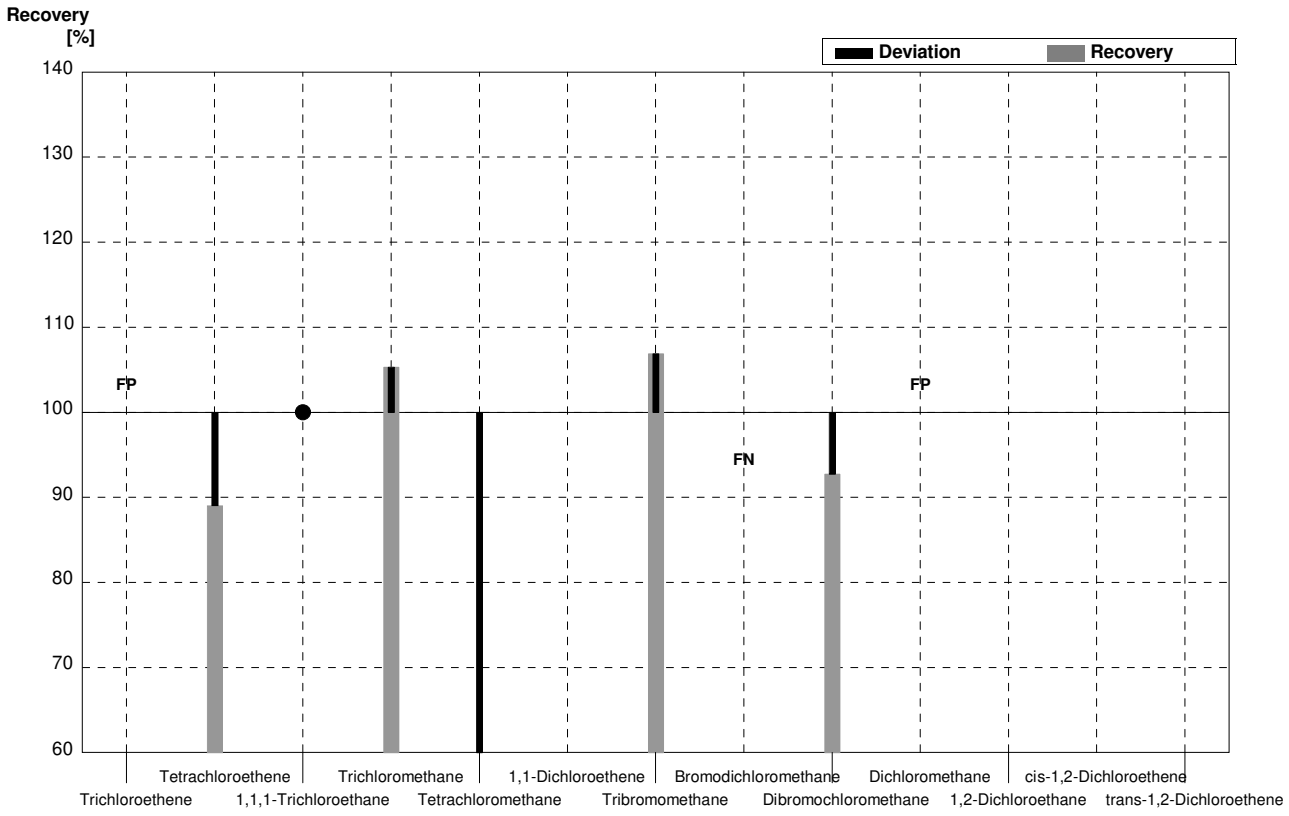
Sample C61B
Laboratory I

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,67	0,03	<0,1		µg/l	FN
Tetrachloroethene	1,07	0,05	0,19	0,1	µg/l	18%
1,1,1-Trichloroethane	1,45	0,07	<0,1		µg/l	FN
Trichloromethane	0,98	0,05	0,64	0,2	µg/l	65%
Tetrachloromethane	0,49	0,02	1,3	0,3	µg/l	265%
1,1-Dichloroethene	0,76	0,04	2,8	1	µg/l	368%
Tribromomethane	1,30	0,07	0,3	0,1	µg/l	23%
Bromodichloromethane	0,18	0,01	1,2	0,3	µg/l	667%
Dibromochloromethane	1,27	0,06	0,76	0,2	µg/l	60%
Dichloromethane	1,49	0,07	<0,1		µg/l	FN
1,2-Dichloroethane	1,78	0,09	2,9	1	µg/l	163%
cis-1,2-Dichloroethene	0,33	0,02	2,1	0,6	µg/l	636%
trans-1,2-Dichloroethene	1,87	0,09	0,27	0,1	µg/l	14%



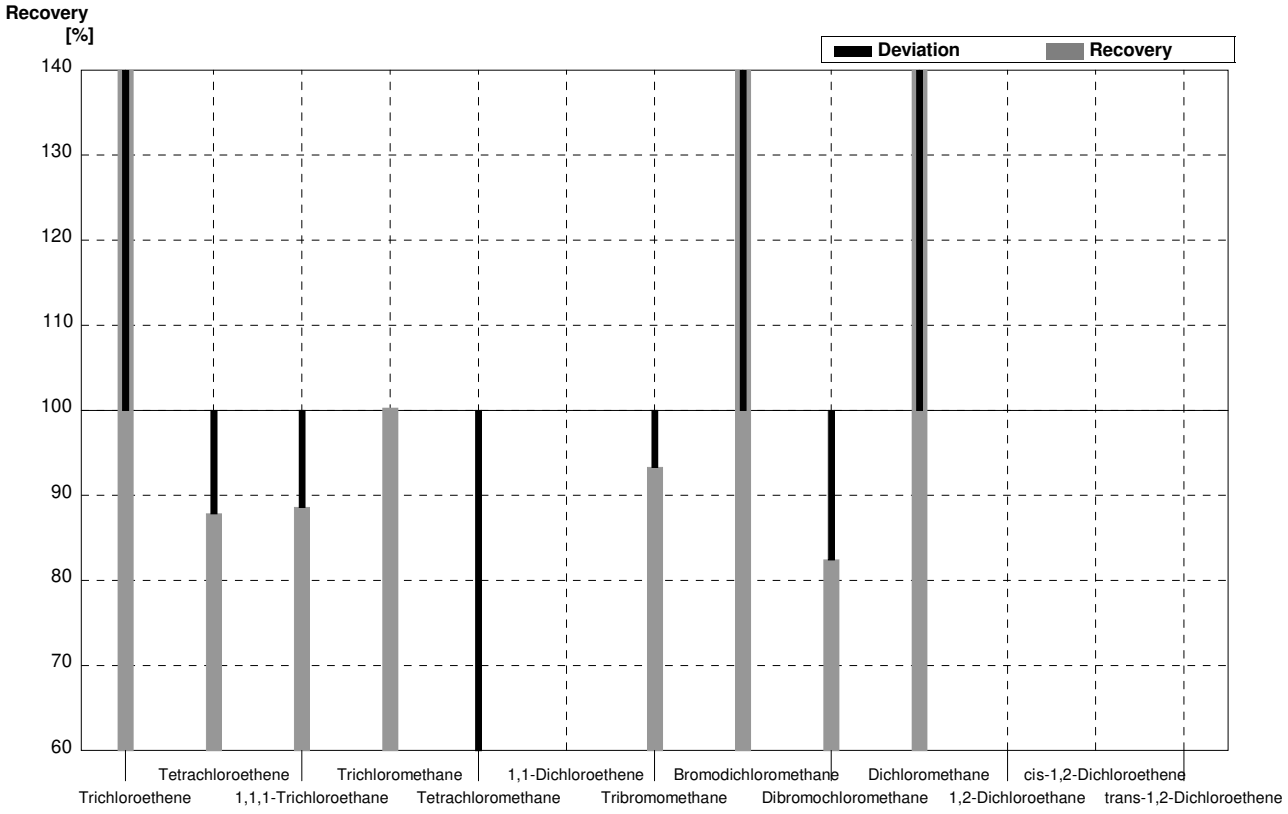
Sample C61A
Laboratory J

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	<0,08		16,25	1,3	µg/l	FP
Tetrachloroethene	0,21	0,01	0,187	0,01	µg/l	89%
1,1,1-Trichloroethane	<0,08		0,019	0,003	µg/l	•
Trichloromethane	0,62	0,03	0,653	0,03	µg/l	105%
Tetrachloromethane	1,25	0,06	0,22	0,01	µg/l	18%
1,1-Dichloroethene	2,40	0,12	n,b.		µg/l	
Tribromomethane	0,29	0,01	0,31	0,03	µg/l	107%
Bromodichloromethane	1,14	0,06	<0,1	0,05	µg/l	FN
Dibromochloromethane	0,73	0,04	0,677	0,01	µg/l	93%
Dichloromethane	<0,6		11,46	0,5	µg/l	FP
1,2-Dichloroethane	2,88	0,14	n,b.		µg/l	
cis-1,2-Dichloroethene	2,02	0,10	n,b.		µg/l	
trans-1,2-Dichloroethene	0,23	0,01	n,b.		µg/l	



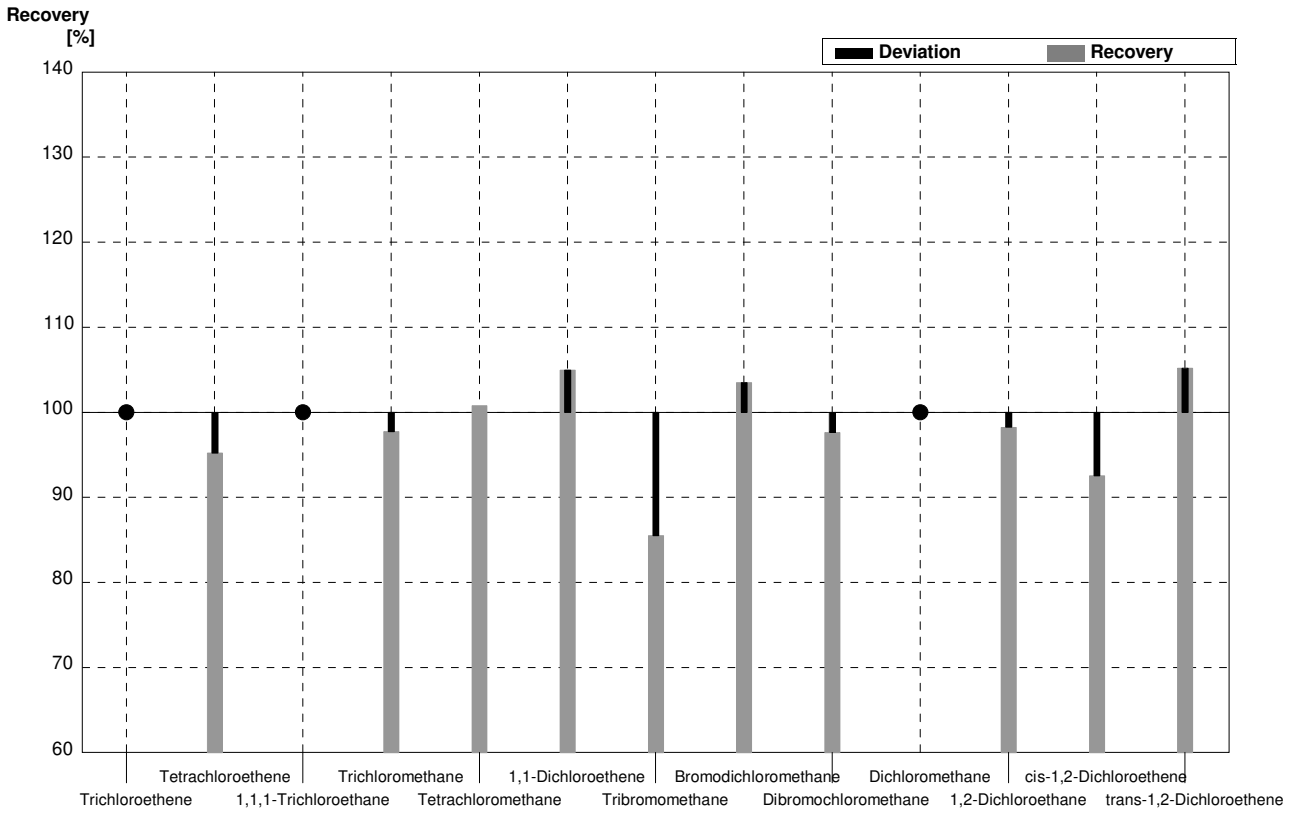
Sample C61B
Laboratory J

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,67	0,03	5,86	0,4	µg/l	875%
Tetrachloroethene	1,07	0,05	0,94	0,05	µg/l	88%
1,1,1-Trichloroethane	1,45	0,07	1,285	0,08	µg/l	89%
Trichloromethane	0,98	0,05	0,983	0,06	µg/l	100%
Tetrachloromethane	0,49	0,02	0,039	0,005	µg/l	8%
1,1-Dichloroethene	0,76	0,04	n,b.		µg/l	
Tribromomethane	1,30	0,07	1,213	0,05	µg/l	93%
Bromodichloromethane	0,18	0,01	0,299	0,05	µg/l	166%
Dibromochloromethane	1,27	0,06	1,047	0,08	µg/l	82%
Dichloromethane	1,49	0,07	2,98	0,1	µg/l	200%
1,2-Dichloroethane	1,78	0,09	n,b.		µg/l	
cis-1,2-Dichloroethene	0,33	0,02	n,b.		µg/l	
trans-1,2-Dichloroethene	1,87	0,09	n,b.		µg/l	



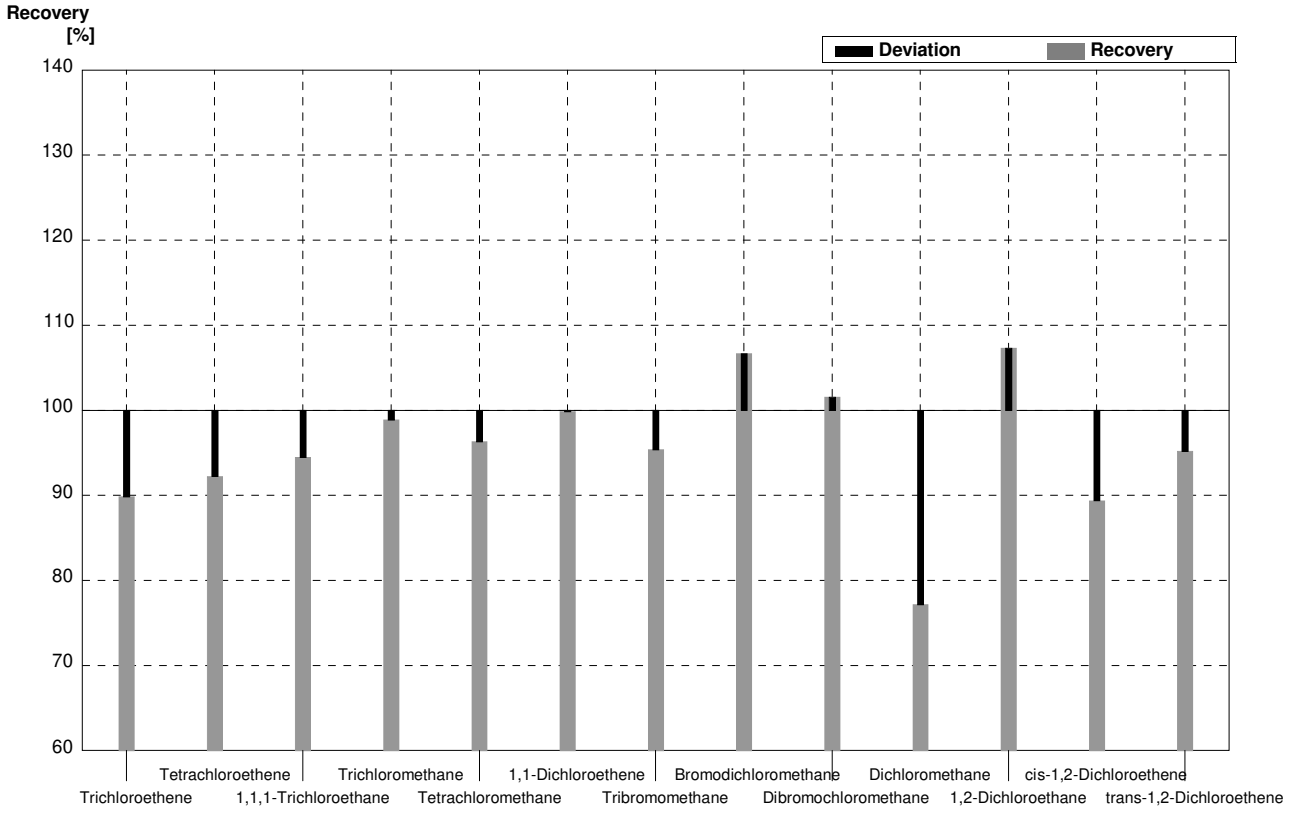
Sample C61A
Laboratory K

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	<0,08		<0,1		µg/l	•
Tetrachloroethene	0,21	0,01	0,200	0,017	µg/l	95%
1,1,1-Trichloroethane	<0,08		<0,1		µg/l	•
Trichloromethane	0,62	0,03	0,606	0,121	µg/l	98%
Tetrachloromethane	1,25	0,06	1,26	0,32	µg/l	101%
1,1-Dichloroethene	2,40	0,12	2,52	0,49	µg/l	105%
Tribromomethane	0,29	0,01	0,248	0,062	µg/l	86%
Bromodichloromethane	1,14	0,06	1,18	0,30	µg/l	104%
Dibromochloromethane	0,73	0,04	0,713	0,178	µg/l	98%
Dichloromethane	<0,6		<1,0		µg/l	•
1,2-Dichloroethane	2,88	0,14	2,83	0,68	µg/l	98%
cis-1,2-Dichloroethene	2,02	0,10	1,87	0,35	µg/l	93%
trans-1,2-Dichloroethene	0,23	0,01	0,242	0,048	µg/l	105%



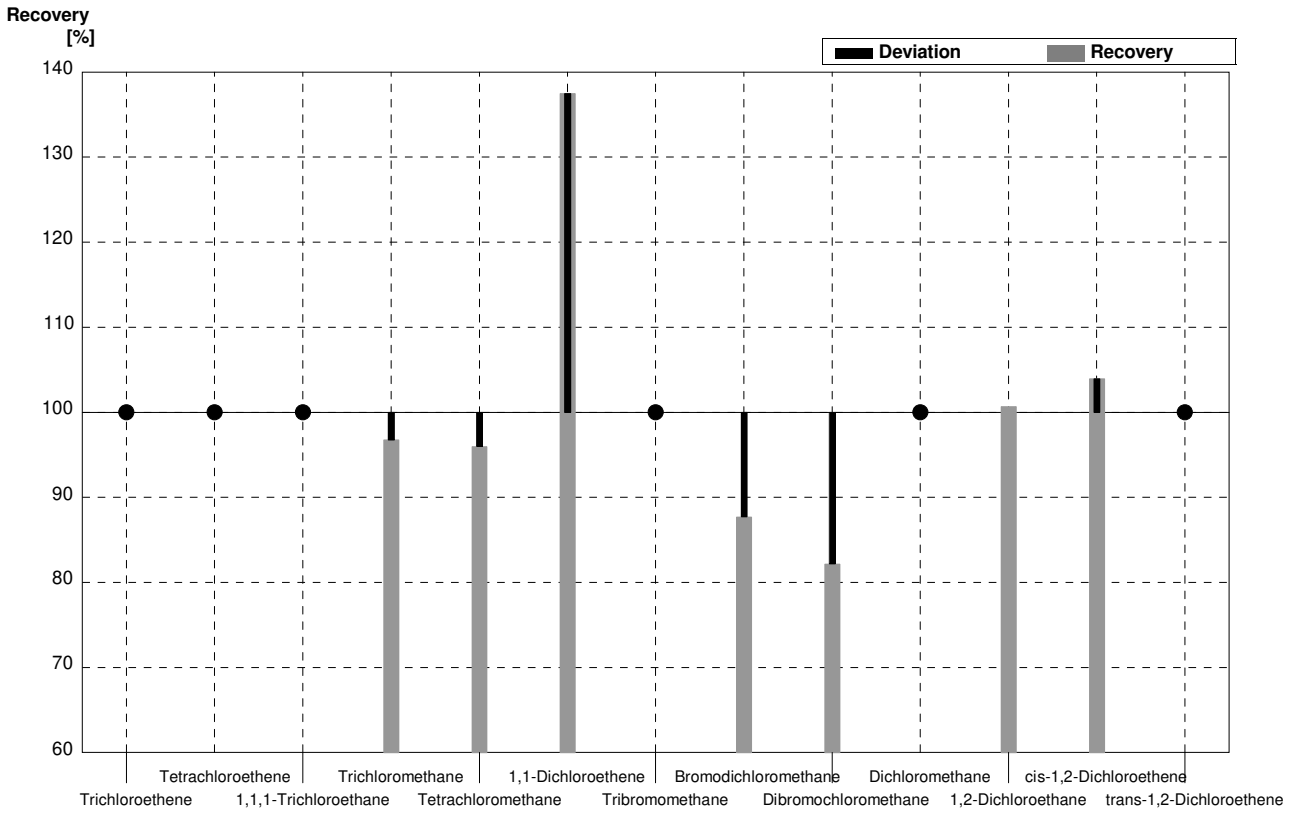
Sample C61B
Laboratory K

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,67	0,03	0,602	0,043	µg/l	90%
Tetrachloroethene	1,07	0,05	0,987	0,082	µg/l	92%
1,1,1-Trichloroethane	1,45	0,07	1,37	0,26	µg/l	94%
Trichloromethane	0,98	0,05	0,969	0,194	µg/l	99%
Tetrachloromethane	0,49	0,02	0,472	0,119	µg/l	96%
1,1-Dichloroethene	0,76	0,04	0,759	0,149	µg/l	100%
Tribromomethane	1,30	0,07	1,24	0,31	µg/l	95%
Bromodichloromethane	0,18	0,01	0,192	0,048	µg/l	107%
Dibromochloromethane	1,27	0,06	1,29	0,32	µg/l	102%
Dichloromethane	1,49	0,07	1,15	0,29	µg/l	77%
1,2-Dichloroethane	1,78	0,09	1,91	0,46	µg/l	107%
cis-1,2-Dichloroethene	0,33	0,02	0,295	0,055	µg/l	89%
trans-1,2-Dichloroethene	1,87	0,09	1,78	0,36	µg/l	95%



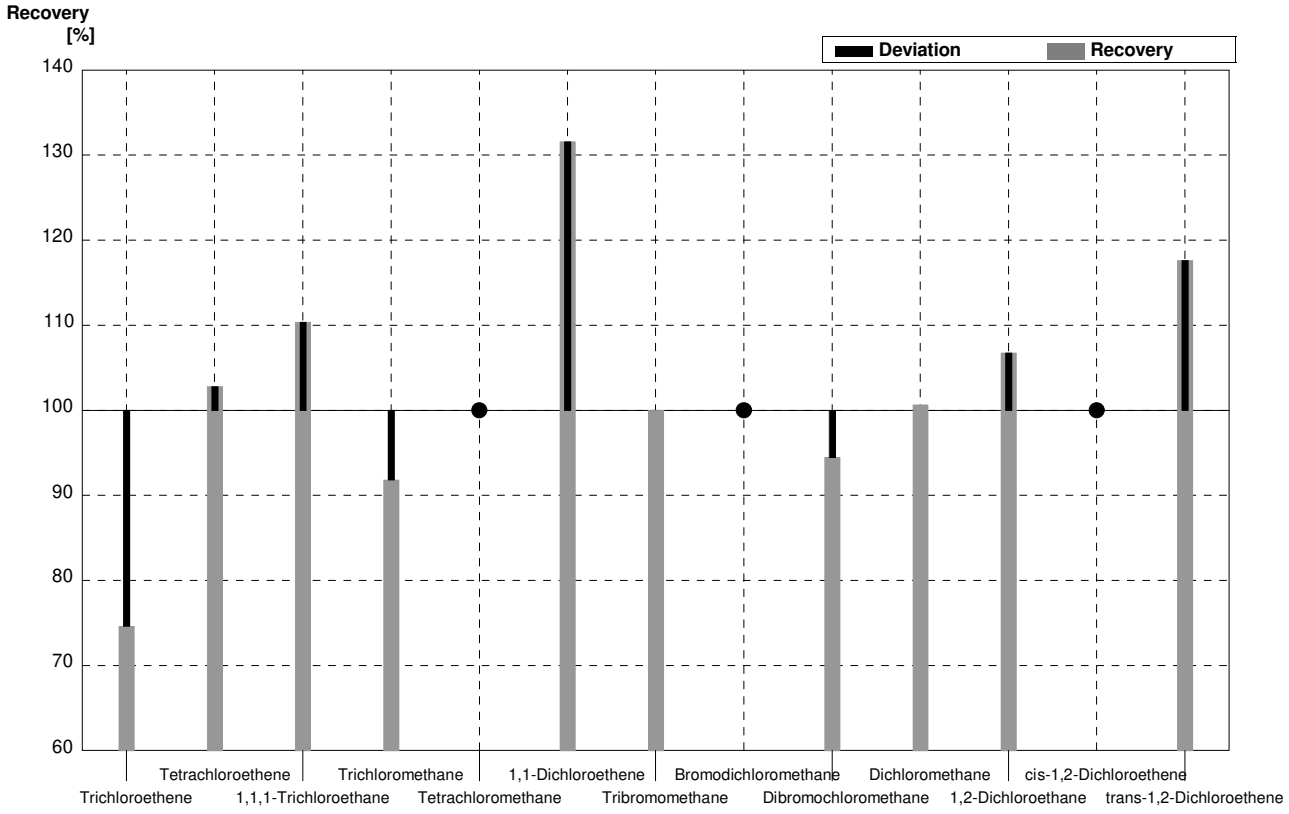
Sample C61A
Laboratory L

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	<0,08		<0,5	0,1	µg/l	•
Tetrachloroethene	0,21	0,01	<0,5	0,1	µg/l	•
1,1,1-Trichloroethane	<0,08		<0,5	0,1	µg/l	•
Trichloromethane	0,62	0,03	0,6	0,2	µg/l	97%
Tetrachloromethane	1,25	0,06	1,2	0,3	µg/l	96%
1,1-Dichloroethene	2,40	0,12	3,3	0,8	µg/l	138%
Tribromomethane	0,29	0,01	<0,5	0,1	µg/l	•
Bromodichloromethane	1,14	0,06	1,0	0,3	µg/l	88%
Dibromochloromethane	0,73	0,04	0,6	0,2	µg/l	82%
Dichloromethane	<0,6		<0,5	0,1	µg/l	•
1,2-Dichloroethane	2,88	0,14	2,9	0,7	µg/l	101%
cis-1,2-Dichloroethene	2,02	0,10	2,1	0,5	µg/l	104%
trans-1,2-Dichloroethene	0,23	0,01	<0,5	0,1	µg/l	•



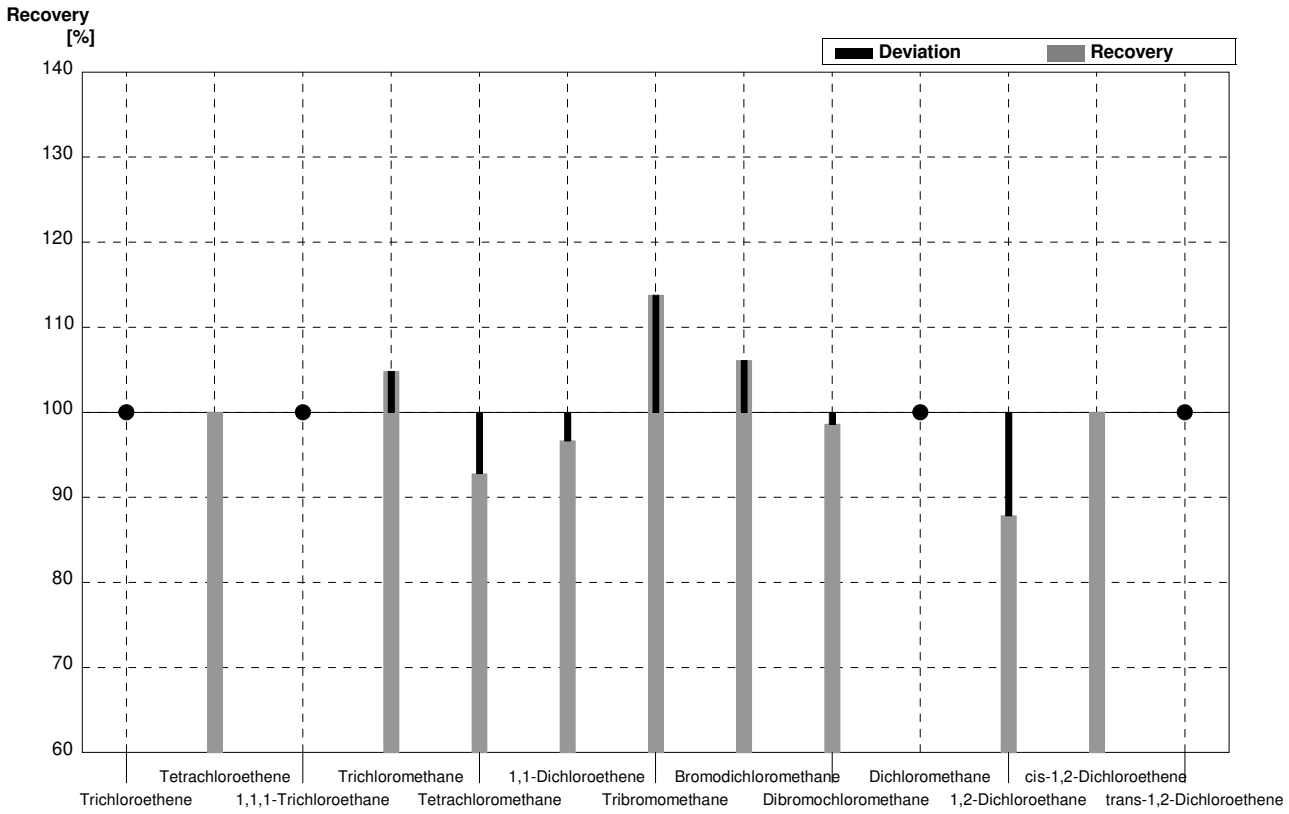
Sample C61B
Laboratory L

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,67	0,03	0,5	0,1	µg/l	75%
Tetrachloroethene	1,07	0,05	1,1	0,3	µg/l	103%
1,1,1-Trichloroethane	1,45	0,07	1,6	0,4	µg/l	110%
Trichloromethane	0,98	0,05	0,9	0,2	µg/l	92%
Tetrachloromethane	0,49	0,02	<0,5	0,1	µg/l	•
1,1-Dichloroethene	0,76	0,04	1,0	0,3	µg/l	132%
Tribromomethane	1,30	0,07	1,3	0,3	µg/l	100%
Bromodichloromethane	0,18	0,01	<0,5	0,1	µg/l	•
Dibromochloromethane	1,27	0,06	1,2	0,3	µg/l	94%
Dichloromethane	1,49	0,07	1,5	0,4	µg/l	101%
1,2-Dichloroethane	1,78	0,09	1,9	0,5	µg/l	107%
cis-1,2-Dichloroethene	0,33	0,02	<0,5	0,1	µg/l	•
trans-1,2-Dichloroethene	1,87	0,09	2,2	0,6	µg/l	118%



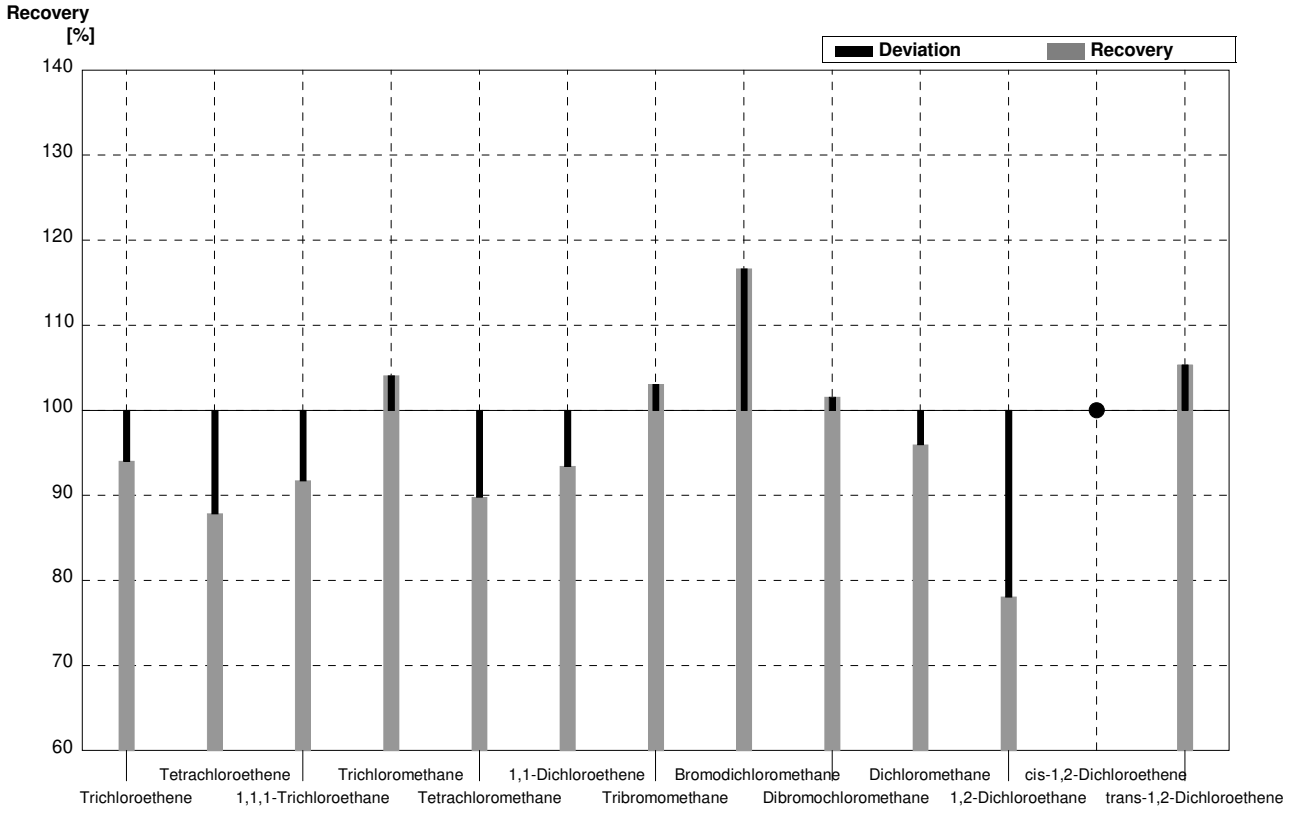
Sample C61A
Laboratory M

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	<0,08		<0,1		µg/l	•
Tetrachloroethene	0,21	0,01	0,21	0,03	µg/l	100%
1,1,1-Trichloroethane	<0,08		<0,1		µg/l	•
Trichloromethane	0,62	0,03	0,65	0,10	µg/l	105%
Tetrachloromethane	1,25	0,06	1,16	0,17	µg/l	93%
1,1-Dichloroethene	2,40	0,12	2,32	0,35	µg/l	97%
Tribromomethane	0,29	0,01	0,33	0,05	µg/l	114%
Bromodichloromethane	1,14	0,06	1,21	0,18	µg/l	106%
Dibromochloromethane	0,73	0,04	0,72	0,11	µg/l	99%
Dichloromethane	<0,6		<0,5		µg/l	•
1,2-Dichloroethane	2,88	0,14	2,53	0,38	µg/l	88%
cis-1,2-Dichloroethene	2,02	0,10	2,02	0,30	µg/l	100%
trans-1,2-Dichloroethene	0,23	0,01	<0,5		µg/l	•



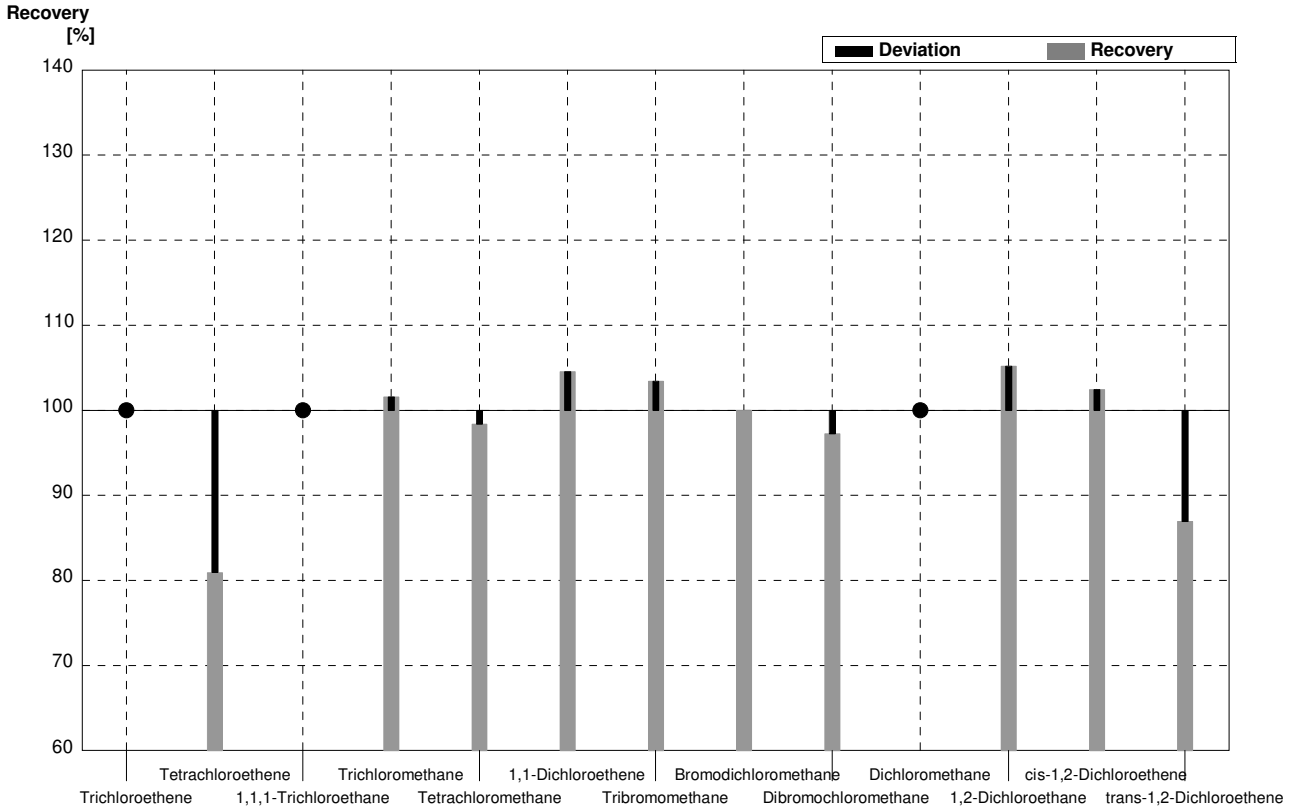
Sample C61B
Laboratory M

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,67	0,03	0,63	0,09	µg/l	94%
Tetrachloroethene	1,07	0,05	0,94	0,14	µg/l	88%
1,1,1-Trichloroethane	1,45	0,07	1,33	0,20	µg/l	92%
Trichloromethane	0,98	0,05	1,02	0,15	µg/l	104%
Tetrachloromethane	0,49	0,02	0,44	0,07	µg/l	90%
1,1-Dichloroethene	0,76	0,04	0,71	0,11	µg/l	93%
Tribromomethane	1,30	0,07	1,34	0,20	µg/l	103%
Bromodichloromethane	0,18	0,01	0,21	0,03	µg/l	117%
Dibromochloromethane	1,27	0,06	1,29	0,19	µg/l	102%
Dichloromethane	1,49	0,07	1,43	0,21	µg/l	96%
1,2-Dichloroethane	1,78	0,09	1,39	0,21	µg/l	78%
cis-1,2-Dichloroethene	0,33	0,02	<0,5		µg/l	•
trans-1,2-Dichloroethene	1,87	0,09	1,97	0,30	µg/l	105%



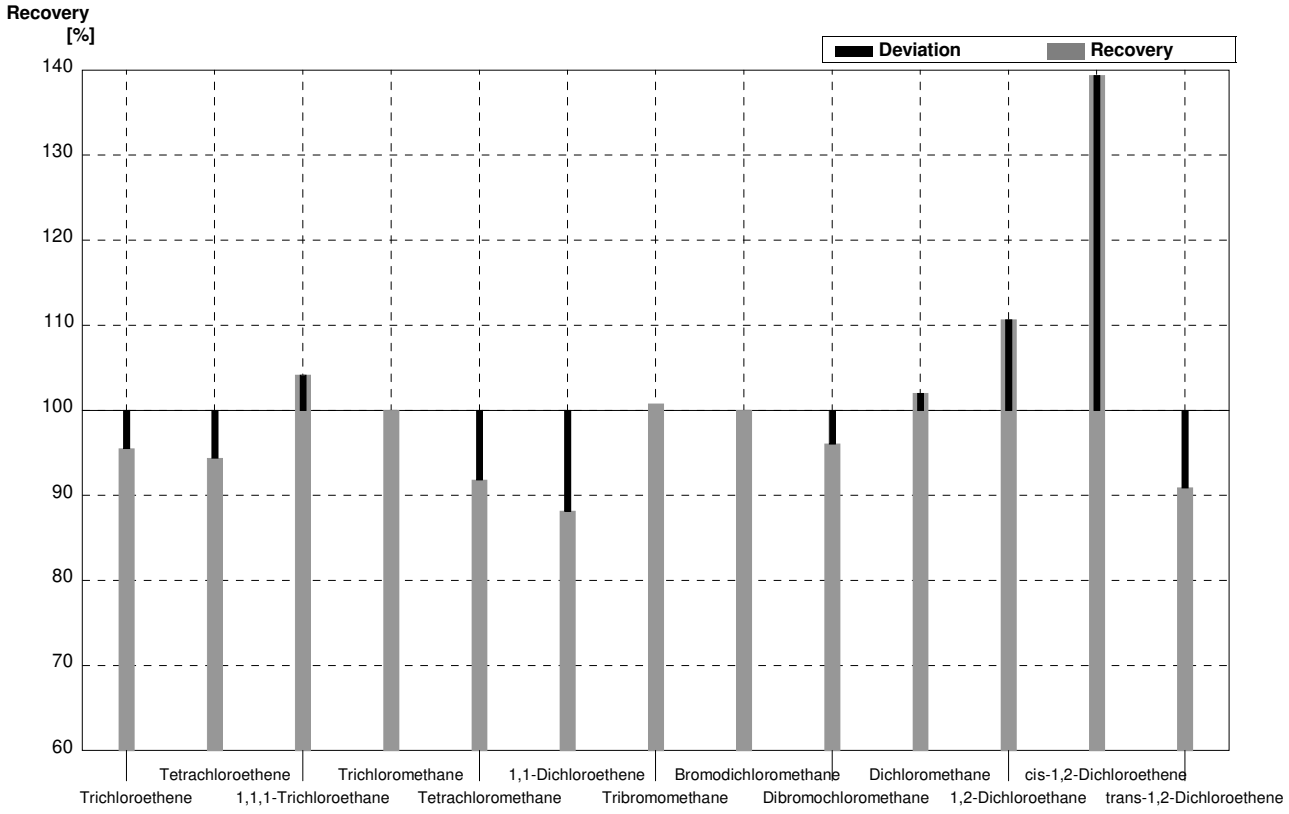
Sample C61A
Laboratory N

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	<0,08		<0,03	0,00	µg/l	•
Tetrachloroethene	0,21	0,01	0,17	0,03	µg/l	81%
1,1,1-Trichloroethane	<0,08		<0,02	0,00	µg/l	•
Trichloromethane	0,62	0,03	0,63	0,13	µg/l	102%
Tetrachloromethane	1,25	0,06	1,23	0,25	µg/l	98%
1,1-Dichloroethene	2,40	0,12	2,51	0,50	µg/l	105%
Tribromomethane	0,29	0,01	0,30	0,06	µg/l	103%
Bromodichloromethane	1,14	0,06	1,14	0,23	µg/l	100%
Dibromochloromethane	0,73	0,04	0,71	0,14	µg/l	97%
Dichloromethane	<0,6		<0,06	0,00	µg/l	•
1,2-Dichloroethane	2,88	0,14	3,03	0,61	µg/l	105%
cis-1,2-Dichloroethene	2,02	0,10	2,07	0,41	µg/l	102%
trans-1,2-Dichloroethene	0,23	0,01	0,20	0,04	µg/l	87%



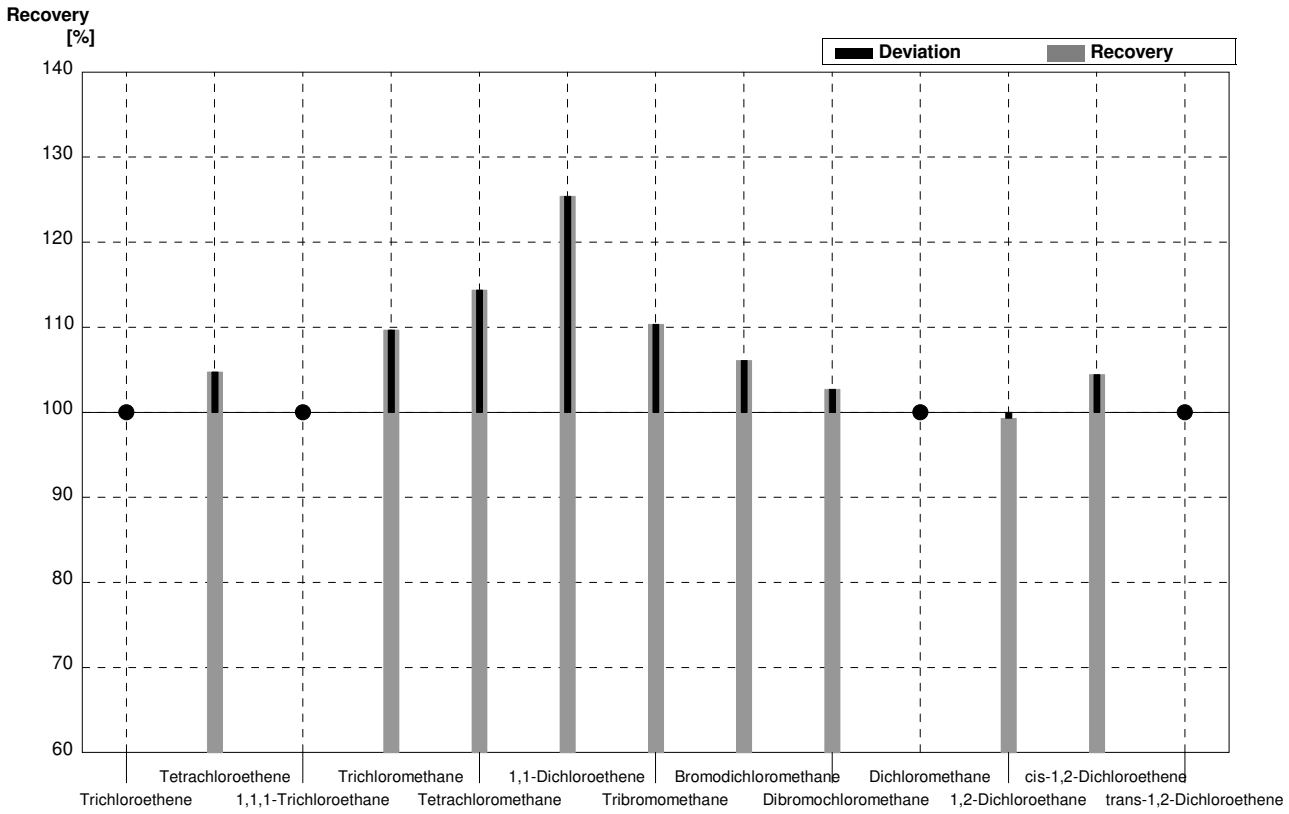
Sample C61B
Laboratory N

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,67	0,03	0,64	0,13	µg/l	96%
Tetrachloroethene	1,07	0,05	1,01	0,20	µg/l	94%
1,1,1-Trichloroethane	1,45	0,07	1,51	0,30	µg/l	104%
Trichloromethane	0,98	0,05	0,98	0,20	µg/l	100%
Tetrachloromethane	0,49	0,02	0,45	0,09	µg/l	92%
1,1-Dichloroethene	0,76	0,04	0,67	0,13	µg/l	88%
Tribromomethane	1,30	0,07	1,31	0,26	µg/l	101%
Bromodichloromethane	0,18	0,01	0,18	0,04	µg/l	100%
Dibromochloromethane	1,27	0,06	1,22	0,24	µg/l	96%
Dichloromethane	1,49	0,07	1,52	0,30	µg/l	102%
1,2-Dichloroethane	1,78	0,09	1,97	0,39	µg/l	111%
cis-1,2-Dichloroethene	0,33	0,02	0,46	0,09	µg/l	139%
trans-1,2-Dichloroethene	1,87	0,09	1,70	0,34	µg/l	91%



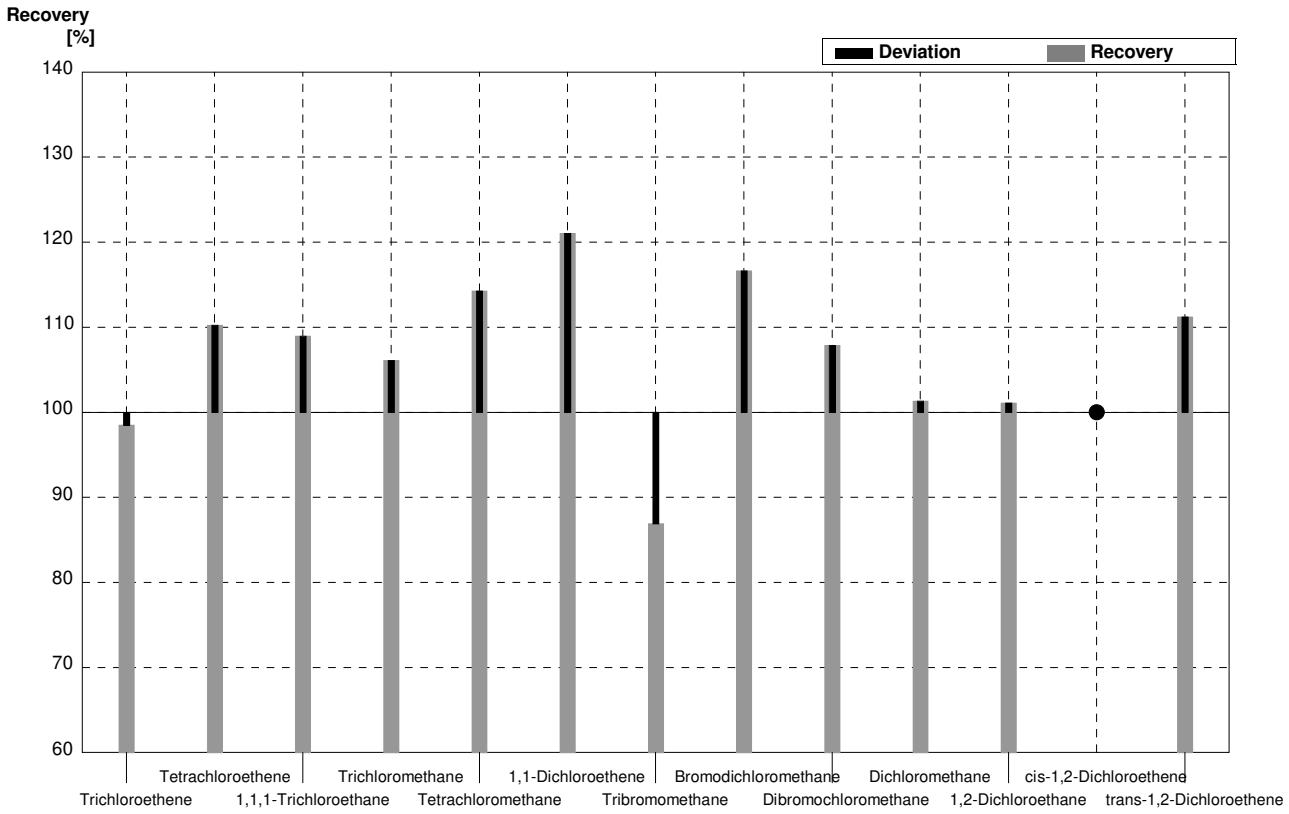
Sample C61A
Laboratory O

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	<0,08		<0,10		µg/l	•
Tetrachloroethene	0,21	0,01	0,22	0,04	µg/l	105%
1,1,1-Trichloroethane	<0,08		<0,10		µg/l	•
Trichloromethane	0,62	0,03	0,68	0,14	µg/l	110%
Tetrachloromethane	1,25	0,06	1,43	0,29	µg/l	114%
1,1-Dichloroethene	2,40	0,12	3,01	0,60	µg/l	125%
Tribromomethane	0,29	0,01	0,32	0,06	µg/l	110%
Bromodichloromethane	1,14	0,06	1,21	0,24	µg/l	106%
Dibromochloromethane	0,73	0,04	0,75	0,15	µg/l	103%
Dichloromethane	<0,6		<1,00		µg/l	•
1,2-Dichloroethane	2,88	0,14	2,86	0,57	µg/l	99%
cis-1,2-Dichloroethene	2,02	0,10	2,11	0,42	µg/l	104%
trans-1,2-Dichloroethene	0,23	0,01	<0,50		µg/l	•



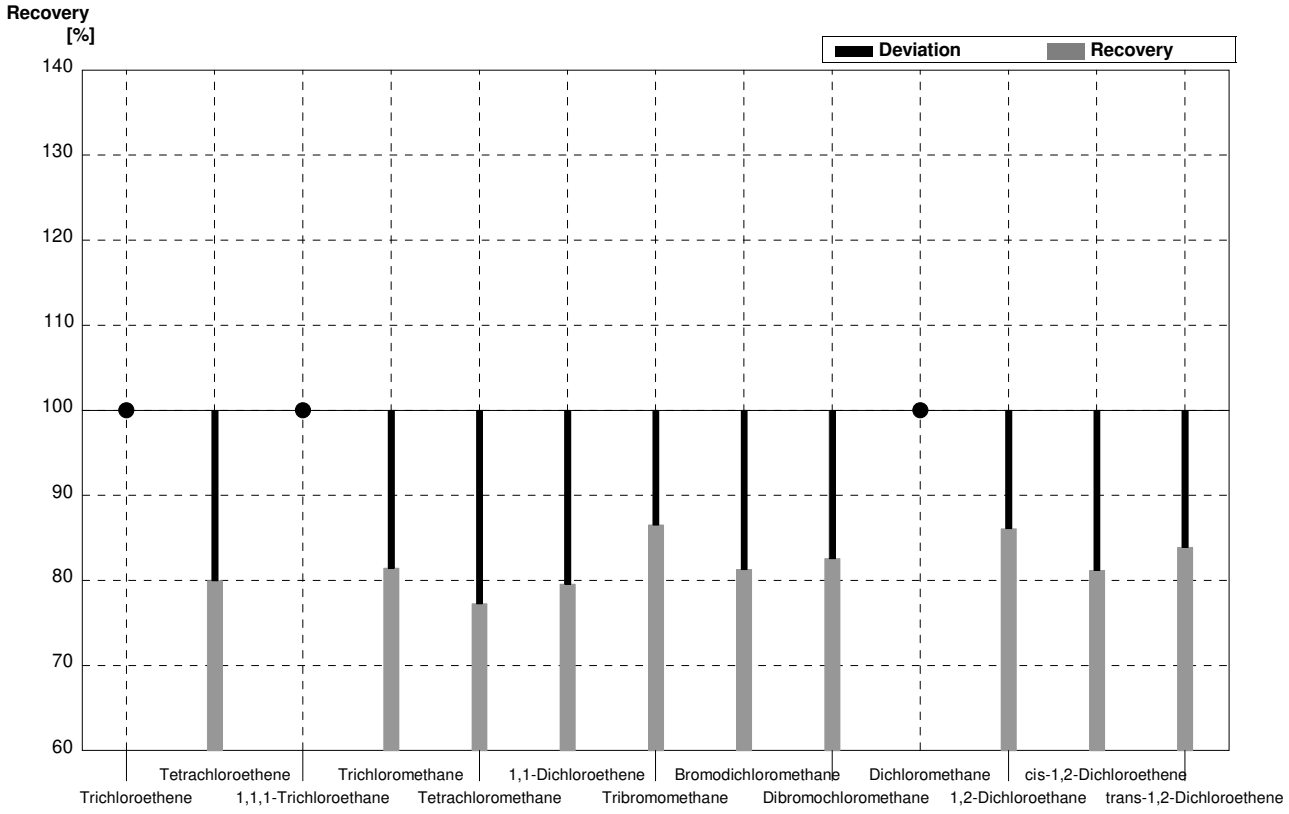
Sample C61B
Laboratory O

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,67	0,03	0,66	0,13	µg/l	99%
Tetrachloroethene	1,07	0,05	1,18	0,24	µg/l	110%
1,1,1-Trichloroethane	1,45	0,07	1,58	0,32	µg/l	109%
Trichloromethane	0,98	0,05	1,04	0,21	µg/l	106%
Tetrachloromethane	0,49	0,02	0,56	0,11	µg/l	114%
1,1-Dichloroethene	0,76	0,04	0,92	0,18	µg/l	121%
Tribromomethane	1,30	0,07	1,13	0,23	µg/l	87%
Bromodichloromethane	0,18	0,01	0,21	0,04	µg/l	117%
Dibromochloromethane	1,27	0,06	1,37	0,27	µg/l	108%
Dichloromethane	1,49	0,07	1,51	0,30	µg/l	101%
1,2-Dichloroethane	1,78	0,09	1,80	0,36	µg/l	101%
cis-1,2-Dichloroethene	0,33	0,02	<0,50		µg/l	•
trans-1,2-Dichloroethene	1,87	0,09	2,08	0,42	µg/l	111%



Sample C61A
Laboratory P

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	<0,08		<0,10		µg/l	•
Tetrachloroethene	0,21	0,01	0,168	0,0009	µg/l	80%
1,1,1-Trichloroethane	<0,08		<0,10		µg/l	•
Trichloromethane	0,62	0,03	0,505	0,0073	µg/l	81%
Tetrachloromethane	1,25	0,06	0,966	0,0112	µg/l	77%
1,1-Dichloroethene	2,40	0,12	1,91	0,0186	µg/l	80%
Tribromomethane	0,29	0,01	0,251	0,0055	µg/l	87%
Bromodichloromethane	1,14	0,06	0,927	0,0166	µg/l	81%
Dibromochloromethane	0,73	0,04	0,603	0,0027	µg/l	83%
Dichloromethane	<0,6		<0,10		µg/l	•
1,2-Dichloroethane	2,88	0,14	2,48	0,0013	µg/l	86%
cis-1,2-Dichloroethene	2,02	0,10	1,64	0,0233	µg/l	81%
trans-1,2-Dichloroethene	0,23	0,01	0,193	0,0022	µg/l	84%



Sample C61B
Laboratory P

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,67	0,03	0,517	0,0027	µg/l	77%
Tetrachloroethene	1,07	0,05	0,797	0,0061	µg/l	74%
1,1,1-Trichloroethane	1,45	0,07	1,09	0,0064	µg/l	75%
Trichloromethane	0,98	0,05	0,779	0,0020	µg/l	79%
Tetrachloromethane	0,49	0,02	0,364	0,0012	µg/l	74%
1,1-Dichloroethene	0,76	0,04	0,584	0,0028	µg/l	77%
Tribromomethane	1,30	0,07	1,08	0,0186	µg/l	83%
Bromodichloromethane	0,18	0,01	0,122	0,0020	µg/l	68%
Dibromochloromethane	1,27	0,06	1,04	0,0093	µg/l	82%
Dichloromethane	1,49	0,07	1,21	0,0070	µg/l	81%
1,2-Dichloroethane	1,78	0,09	1,52	0,0110	µg/l	85%
cis-1,2-Dichloroethene	0,33	0,02	0,271	0,0038	µg/l	82%
trans-1,2-Dichloroethene	1,87	0,09	1,44	0,0081	µg/l	77%