IFA-Proficiency Testing Scheme for Water Analysis

Round M154
Metals

Sample Dispatch: 9 November 2020

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This report has 97 pages.

This report summarises the results of round M154 (trace metals) within the IFA-Proficiency Testing Scheme for Water Analysis. The samples M154A and M154B were distributed to 26 participants on Monday, 9 November 2020. Each participant received two samples of 250 mL filled into LDPE bottles.

Closing date for reporting results to the IFA-Tulln was Friday, 4 December 2020. 25 participants submitted results. To make the participants anonymous, each laboratory obtained a letter code by random.

Samples

The samples consisted of artificial ground water spiked with pure standards. For sample preparation, ultrapure water was spiked with concentrated solutions of salts in order to simulate the ionic composition of natural Austrian ground water. Ultrapure HNO_3 (0.5 % v/v) was added to stabilise the sample at a pH below 2, which meets the standard sampling procedure in the Austrian monitoring program. The following ultrapure salts were used: $CaCO_3$, $Mg(NO_3)_2$, NaCl, KCl, besides ultrapure H_2SO_4 for sulphate. By this, the matrix of the samples consisted of about 45.7 mg/L Ca, 19.5 mg/L Mg, 9.0 mg/L Na, 1.20 mg/L K, 21.3 mg/L SO_4^{2-}, 15.3 mg/L Cl^- in sample M154A and 15.6 mg/L Cl^- in sample M154B.

Traces of Al, As, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Ni, Se, U and Zn were added, using certified spectroscopy standards. For most of the compounds added to the samples, the target concentrations were higher than the minimum quantifiable values of the Austrian ground and river water monitoring program. The calculation of the target concentrations of the compounds was based on the mass of standard added to the samples.

Homogeneity, accuracy and stability tests at the IFA-Tulln

The samples were examined for homogeneity and correctness at the IFA before dispatch. The results are listed in the results tables and the parameter oriented part of the report ("IFA result").

To check the stability of the proficiency test samples, all parameters except Hg were determined in M154A and M154B four weeks after shipment.

According to our experience, the concentrations of Al, As, Cd, Cr, Cu, Fe, Pb, Mn, Ni, Se, U and Zn in the samples remain stable up to 18 months when stored at 4-6 °C in the dark. For the parameters Hg a concentration decrease of 2 % to 4 % per month can be expected.

Results

Data evaluation was based on target concentrations that were calculated from the weights of the standards used to produce 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 are related to the assigned concentrations. The results were tested for outliers by application of the Hampel outlier test (level of significance 99 %). A minimum number of four results was required for the outlier test.

The recoveries of the target concentrations, calculated from outlier-corrected data mean values ranged between 86.8 % (Hg in sample M154A) and 103.1 % (As in sample M154B).

The between laboratory CVs covered the ranged between 2,2 % (U in sample M154A) and 19.2 % (Hg in sample M154A).

All confidence intervals of the outlier-corrected laboratory mean values except that for uranium in M154A (94.4 % ± 2.4 %) and M154B (94.4 % ± 2.8 %) encompass the corresponding target values with their uncertainties. For all other parameters, no difference could be detected between target concentrations and outlier corrected laboratory mean values statistically.

z-scores

The most common approach to calculate a z-score is given by

$$z = \frac{x_i - X}{\sigma_{pt}}$$

z	z-score
x_i	result of laboratory
X	target value or mean value („consensus value“)
σ_{pt}	standard deviation for proficiency assessment

Thus, the z-score is the ratio of the estimated bias (difference between result and target value) and a standard deviation. The standard deviations for proficiency assessment were determined from the results of all interlaboratory comparisons that have been organised by the IFA-Tulln from 2009 to 2019. They represent average performance data of all former participating laboratories.

This approach was chosen, because standard deviations of the outlier-corrected measurements substantially vary between individual proficiency test rounds. Averaging standard deviations from proficiency testing rounds of several years can provide standard deviations for proficiency assessment on a broad data basis. It is therefore more suitable than a standard deviation taken directly from the interlaboratory comparison (EN ISO/IEC 17043:2010, B.3.1.3). Another advantage of previously determined standard deviations is that the participants can foresee which z-scores can be expected by their routine analysis methods before participation.

<u>Calculation example:</u>

A laboratory found 73.7 µg/L for the parameter Aluminium (recovery of 102%). The target value for Aluminium was 72.3 µg/L (100%). The relative standard deviation for proficiency assessment is given in the table below (as well as in the annual program www.ifatest.eu) by 8.2%, which is 5.9 µg/L Al, when based on the target value.

$$z = \frac{x_i - X}{\sigma_{pt}} = \frac{73.7\ \mu g/L - 72.3\ \mu g/L}{5.9\ \mu g/L} \quad 0.24 \qquad \textbf{or} \qquad \frac{102\% - 100\%}{8.2\%} \quad 0.24$$

z	z-score	
x_i	73.7 µg/L	equivalent to 102% (result of the laboratory)
X	72.3 µg/L	equivalent to 100% (target value)
σ_{pt}	5.9 µg/L	equivalent to 8.2% (standard deviation for proficiency assessment,see table below)

In the case of recalculation, deviations in the last digits may occur due to the fact that rounded values are given in the report for clarity.

The following table lists the standard deviations for proficiency assessment and their limits of applicability. Z-scores were only calculated, if the target values were higher than these limits.

Parameter	standard deviation for proficiency assessment	Lower limit
Aluminium	8.2%	8 µg/L
Arsenic	8.0%	0.5 µg/L
Cadmium	5.9%	0.1 µg/L
Chromium	6.6%	0.5 µg/L
Copper	8.8%	1.0 µg/L
Iron	7.0%	10 µg/L
Lead	7.2%	0.3 µg/L
Manganese	5.6%	2.0 µg/L
Mercury	11%	0.2 µg/L
Nickel	8.3%	1.0 µg/L
Selenium	11%	0.3 µg/L
Uranium	5.9%	0.35 µg/L
Zinc	8.0%	3 µg/L

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

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

The z-scores are listed in the parameter-oriented evaluation in the tables next to the recoveries. Additionally, each laboratory receives a sheet on which the obtained z-scores are summarized and graphically presented. The standard deviations for proficiency assessment are given in concentration units there.

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 values. 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 only be obtained for compounds that were evaluated on the basis of a “< target value”. A result is termed FP if it does not include (strike) the “< target” with its measurement uncertainty.
- “•”: All other results for which no recoveries can be calculated are illustrated by this symbol

Tulln, 14 December 2020

EXPLANATION

Sample M106A

Parameter Copper

Target value ± U (k=2)	4,79 µg/l	±	0,13 µg/l	*Obtained from sample preperation, U=uncertainty*
IFA result ± U (k=2)	4,79 µg/l	±	0,38 µg/l	*Determined at IFA prior to shipment of samples*
Stability test ± U (k=2)	4,69 µg/l	±	0,38 µg/l	*Determined at IFA 3 weeks after sample dispatch*

Lab Code	Result	±	Unit	Recovery	z-Score
A	5,16	0,4128	µg/l	108%	0,90
B	4,22	0,42	µg/l	88%	-1,38
C	4,45	0,13	µg/l	93%	-0,83
D			µg/l		
E			µg/l		
F	4,10	0,08	µg/l	86%	-1,68
G			µg/l		
H			µg/l		
I	4,75	0,74	µg/l	99%	-0,10
J	<5		µg/l	•	
K	4,76		µg/l	99%	-0,07
L	<10		µg/l	•	
M	4,8	0,5	µg/l	100%	0,02
N	3,7	0,4	µg/l	77%	-2,65
O	4,47	0,447	µg/l	93%	-0,78
P	6,0		µg/l	125%	2,94
Q	4,17	0,2	µg/l	87%	-1,51
R	4,6	0,8	µg/l	96%	-0,46
S	4,44	0,67	µg/l	93%	-0,85
T			µg/l		
U	4,675	0,935	µg/l	98%	-0,28
V	5,0	0,50	µg/l	104%	0,51
W	3,54	0,3	µg/l	74%	-3,03
X	7,108 *	0,749	µg/l	148%	5,63
Y	<10		µg/l	•	
Z			µg/l		
AA	<3,0		µg/l	FN	
AB	3,775	0,107	µg/l	79%	-2,46
AC	<10,0		µg/l	•	

Recovery of target value in percent

z-Score of the laboratory

An asterik 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%)	4,65 ± 0,57	4,51 ± 0,42	µg/l
Recov. ± CI(99%)	97,1 ± 12,0	94,1 ± 8,8	%
SD between labs	0,84	0,59	µg/l
RSD between labs	18,1	13,2	%
n for calculation	18	17	

Between laboratory standard deviation

Laboratory mean and recovery of target value with corresponding confidence intervals (p=99%)

Number of results used for calculation of statistic parameters

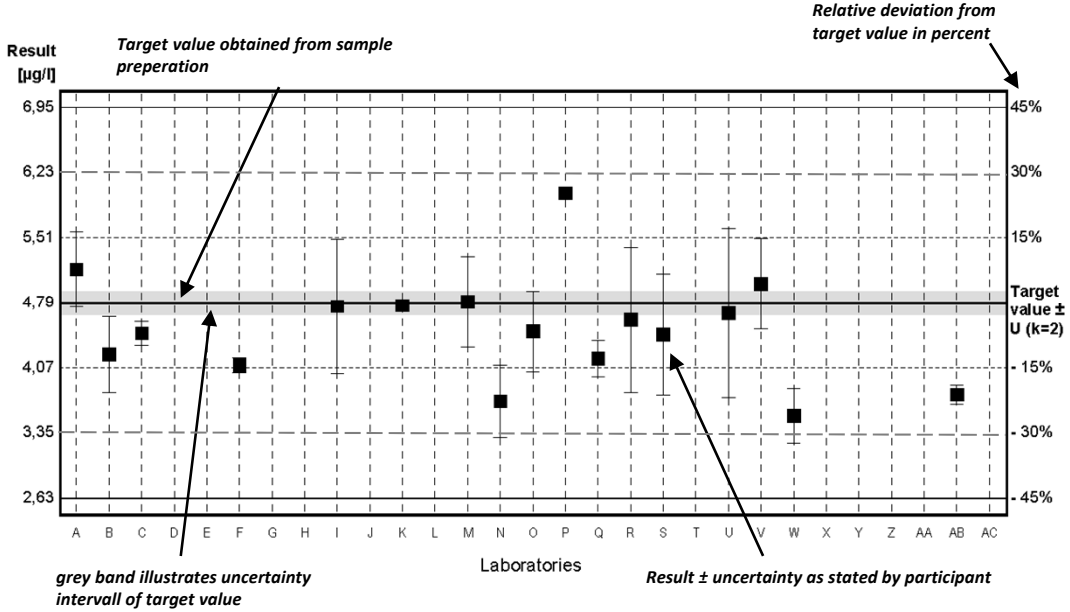


Diagram 1: Measurement results and their uncertainties

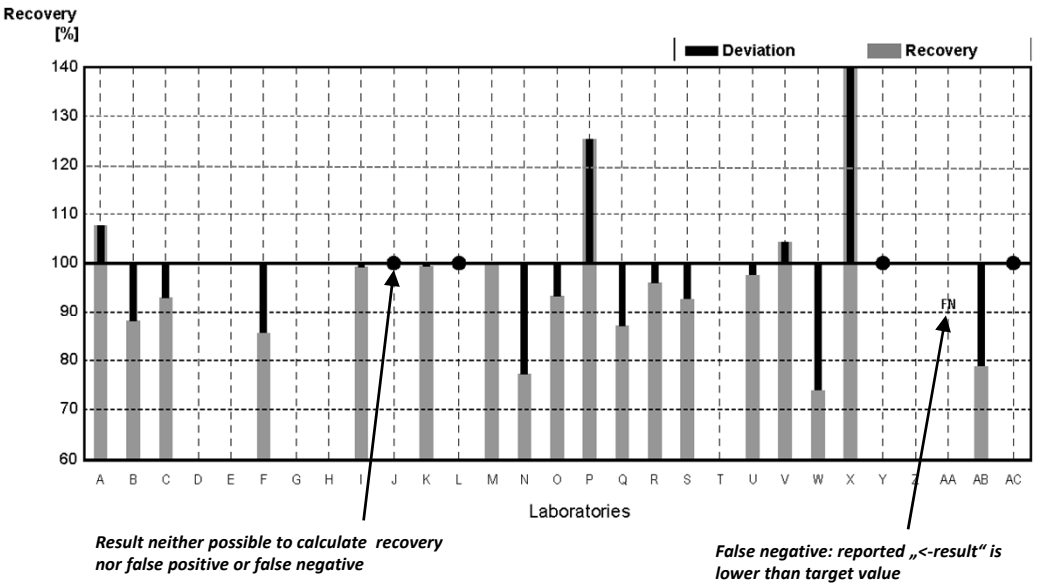


Diagram 2: Recoveries and deviations from target values

Illustration of Results
Tables and Parameter Oriented Part

Round M154
Metals

Sample Dispatch: 9 November 2020

TULLN

Results Sample M154A

	Aluminium	Arsenic	Lead	Cadmium	Chromium	Iron	Copper
Target value	49.8	1.20	9.26	0.299	7.00	30.0	1.10
IFA result	49.6	1.29	9.20	0.314	6.95	28.6	1.05
Stability test	50.0	1.19	8.90	0.308	6.80	27.8	1.03
A	<100	<5.0	7.80	<5.0	5.70	25.8	<5.0
B		<1.5	8.76	0.279	6.76		
C	58.00	1.10	9.40	0.2900	6.90	32.00	1.10
D	44.35	1.36	8.63	0.75	6.16	34.5	3.75
E	50.3	1.07	8.57	0.300	6.27	27.7	<1
F	49.4	2.20	12.0	0.305	8.58	31.7	1.01
G			9.020	0.255			2.160
H	50.3	1.30	9.02	0.275	6.84	28.8	0.994
I	57.5	1.38	8.82	0.318	7.84	33.9	1.06
J	47.3	1.15	8.7	0.304	6.5	28.1	1.01
K	47.2	1.22	9.41	0.301	6.62	30.3	1.14
L	51.6	1.158	9.160	0.281	6.760	27.3	0.99
M	50	1.20	8.5	0.301	6.9	30.2	1.05
N	46.6	<5.0	7.10	<1.0	5.50	19.2	<5.0
O	49.8		8.28	0.230		27.7	1.30
P	48.0	<1.5	8.63	<0.4	6.50	29.1	<5
Q	55	1.20	9.9	0.320	6.5	31.0	1.20
R	54					27.9	
S	52.2	1.27	9.56	0.287	7.61	28.1	1.03
T	48.1	1.24	8.84	0.300	6.74	29.7	1.01
U	46.3	1.15	8.9	0.248	6.4	27.8	1.04
V	51.7	<2	9.4	0.266	7.1	30.4	<10
W	41.3	1.31	6.6	0.288	6.1	16.1	1.97
X	48.2	1.20	8.73	0.287	6.67	29.0	1.02
Y							
Z	47.26	1.22	9.23	0.300	7.28	33.0	1.18

All data in µg/L

Measurement Uncertainties Sample M154A

	Aluminium ±	Arsenic ±	Lead ±	Cadmium ±	Chromium ±	Iron ±	Copper ±
Target value	0.3	0.01	0.06	0.003	0.04	0.2	0.02
IFA result	2.5	0.10	0.37	0.022	0.35	2.9	0.09
Stability test	2.5	0.10	0.36	0.022	0.34	2.8	0.09
A	0.0115	0.001	0.0009	0.0011	0.001	0.0013	0.0016
B			1.67	0.024	0.85		
C	5.80	0.132	0.752	0.0232	0.828	8.32	0.088
D	0.54	0.03	0.16	0.01	0.2	0.56	0.15
E	10	0.2	1	0.03	0.7	3	
F	4.1	0.18	0.86	0.02	0.57	2.2	0.09
G			1.126	0.057			0.211
H	0.799	0.020	0.159	0.017	0.017	0.457	0.020
I	8.62	0.21	1.32	0.048	1.18	5.09	0.16
J	7.1	0.173	1.30	0.0456	0.98	4.21	0.151
K	1.58	0.12	0.10	0.014	0.069	1.59	0.13
L	5.2	0.12	0.92	0.03	0.7	2.7	0.1
M	5	0.18	0.85	0.0301	0.69	3.02	0.105
N	4.6	0.5	0.71	0.1	0.55	1.9	0.5
O	8.0		1.90	0.051		3.3	0.16
P	1.2		0.04		0.38	0.6	
Q	5.5	0.12	1.0	0.032	0.65	3.1	0.12
R	14					3.3	
S	10.4	0.25	1.91	0.057	1.52	5.62	0.21
T	9.6	0.25	1.77	0.060	1.35	5.9	0.20
U	9.3	0.26	2.0	0.060	1.1	7.2	0.27
V	7.96		1.61	0.019	0.59	2.6	
W	4.1	0.13	0.66	0.029	0.61	1.6	0.20
X	5.4	0.07	0.93	0.013	0.94	3.2	0.06
Y							
Z	7	1	1	0.1	1	30	1

All data in µg/L

Results Sample M154A

	Manganese	Nickel	Mercury	Selenium	Uranium	Zinc
Target value	16.0	5.39	0.478	1.31	1.80	5.99
IFA result	15.9	5.37	0.422	1.25	1.77	6.09
Stability test	15.3	5.43		1.14	1.82	5.94
A	0.0138	<5.0	<0.40	<5.0		<5.0
B	15.2			<0.7		<10
C	16.00	5.10	0.480	1.20	1.78	6.00
D	14.25	4.82	0.234	1.58	<2.2	6.64
E	15.0	4.60	0.323	1.15	1.60	<10
F	15.1	5.57		2.43		5.41
G		5.368				
H	15.8	5.31	0.394	1.30	1.64	5.47
I	16.9	5.80	0.507	1.21	1.84	6.10
J	15.1	5.1	0.401	1.30	1.68	5.7
K	14.9	5.37	0.464	1.19	1.71	6.20
L	15.5	5.23	0.414	1.279	1.684	5.26
M	15.8	5.1	0.67	1.39	1.72	5.5
N	14.9	<5.0	0.450	<5.0		<5.0
O	15.3					5.56
P	15.1	5.00	0.305	1.32	<2	<10
Q	16.0	5.1	0.52	1.30	1.70	6.8
R	15.0					
S	17.4	5.71	0.510	1.32	1.90	5.53
T	15.4	5.16	0.453	1.25	1.70	5.71
U	15.0	4.96		1.22		5.3
V	16.2	5.3		<5		<10
W	12.6	3.48	0.373	<5		<5
X	14.1	5.19	0.424	1.30	1.68	5.64
Y						
Z	20.0	4.87	0.383			4.00

All data in µg/L

Measurement Uncertainties Sample M154A

	Manganese ±	Nickel ±	Mercury ±	Selenium ±	Uranium ±	Zinc ±
Target value	0.1	0.04	0.013	0.06	0.01	0.51
IFA result	1.4	0.48	0.042	0.18	0.18	1.22
Stability test	1.4	0.49		0.16	0.18	1.19
A	0.0008	0.0016	0.0139	0.002		0
B	1.4					
C	1.6	0.51	0.0576	0.18	0.089	0.6
D	0.42	0.17	0.011	0.10		0.18
E	2	1	0.04	0.2	0.2	
F	0.85	0.46		0.27		0.43
G		0.337				
H	0.213	0.042	0.005	0.100	0.033	0.131
I	2.53	0.87	0.076	0.18	0.28	0.91
J	2.27	0.76	0.060	0.195	0.252	0.85
K	1.16	0.17	0.007	0.15	0.14	0.354
L	1.6	0.52	0.042	0.13	0.17	0.5
M	1.58	0.51	0.067	0.209	0.172	0.55
N	1.5	0.5	0.045	0.5		0.5
O	1.8					0.72
P	0.2	0.06	0.025	0.14		
Q	1.6	0.51	0.05	0.13	0.17	0.68
R	2.4					
S	3.5	1.14	0.102	0.26	0.38	1.11
T	3.1	1.03	0.091	0.25	0.34	1.14
U	2.4	1.19		0.35		0.9
V	1.5	0.65				
W	1.3	0.35	0.037			
X	0.8	0.40	0.066	0.16	0.18	0.35
Y						
Z	15	1	0.1			10

All data in µg/L

Results Sample M154B

	Aluminium	Arsenic	Lead	Cadmium	Chromium	Iron	Copper
Target value	15.1	4.39	1.05	1.60	2.52	58.3	7.04
IFA result	15.0	4.78	1.06	1.63	2.48	55.4	6.61
Stability test	15.1	4.39	1.02	1.63	2.51	52.7	6.62
A	<100	<5.0	<5.0	<5.0	<5.0	52.3	5.90
B							
C	21.00	4.50	1.00	1.55	2.50	59.00	7.20
D	14.01	6.18	0.91	2.04	2.25	67.7	5.64
E	14.7	3.80	<1	1.53	2.23	53.3	5.97
F	16.0	4.25	1.04	1.79	2.71	61.6	7.11
G			1.134	1.304			6.720
H	14.7	4.60	0.923	1.53	2.43	58.7	6.71
I	17.1	4.97	1.10	1.64	2.77	64.1	7.18
J	14.0	4.28	0.99	1.56	2.30	55	6.5
K	13.6	4.67	<1.00	1.61	2.60	57.2	7.25
L	15.9	4.288	1.061	1.516	2.377	54.5	6.75
M	16.5	4.55	0.96	1.61	2.54	57	6.5
N	12.5	<5.0	<5.0	1.23	<5.0	36.7	6.9
O	16.4		0.370	1.52		53.6	7.07
P	<10	4.55	<1	1.52	<5	54.7	6.96
Q	17.0	4.40	1.10	1.70	2.30	56.0	6.8
R	16.0					54	
S	13.9	4.59	1.05	1.54	2.71	55.9	7.25
T	14.8	4.46	0.990	1.54	2.43	57.5	6.57
U	15.2	4.58	1.03	1.71	2.54	59	7.1
V	15.8	5.0	<2	1.64	<5.0	59.8	<10
W	12.1	4.31	1.07	1.24	2.58	37.3	7.2
X	13.4	4.39	1.01	1.55	2.37	58.4	6.62
Y							
Z	19.46	4.54	1.09	1.64	2.73	54.0	7.97

All data in µg/L

Measurement Uncertainties Sample M154B

	Aluminium ±	Arsenic ±	Lead ±	Cadmium ±	Chromium ±	Iron ±	Copper ±
Target value	0.2	0.03	0.02	0.01	0.02	0.3	0.05
IFA result	0.8	0.38	0.04	0.11	0.12	5.5	0.59
Stability test	0.8	0.35	0.04	0.11	0.13	5.3	0.60
A	0.0115	0.0014	0	0.0008	0.0010	0.0019	0.0018
B							
C	2.10	0.54	0.080	0.124	0.300	15.34	0.576
D	0.32	0.12	0.01	0.02	0.08	1.54	0.54
E	4	0.4		0.2	0.3	6	0.6
F	1.3	0.34	0.07	0.11	0.18	4.3	0.63
G			0.142	0.293			0.658
H	0.226	0.047	0.024	0.039	0.038	0.325	0.045
I	2.57	0.74	0.16	0.25	0.42	9.62	1.08
J	2.10	0.64	0.148	0.234	0.345	8.2	0.98
K	1.71	0.08		0.033	0.072	1.50	0.12
L	1.6	0.43	0.11	0.15	0.24	5.5	0.68
M	1.65	0.68	0.096	0.161	0.254	5.7	0.65
N	1.3	0.5	0.5	0.13	0.5	3.7	0.7
O	2.6		0.085	0.33		6.4	0.85
P		0.1		0.1		0.7	0.9
Q	1.70	0.44	0.11	0.17	0.23	5.6	0.68
R	4.0					7	
S	2.79	0.92	0.21	0.31	0.54	11.2	1.45
T	2.9	0.89	0.198	0.31	0.49	11.5	1.31
U	3.0	1.05	0.24	0.41	0.43	15	1.8
V	2.43	0.75		0.115		5.0	
W	1.2	0.43	0.11	0.12	0.26	3.7	0.7
X	1.5	0.25	0.11	0.07	0.33	6.5	0.36
Y							
Z	3	1	1	0.2	1	30	2

All data in µg/L

Results Sample M154B

	Manganese	Nickel	Mercury	Selenium	Uranium	Zinc
Target value	25.2	2.00	1.19	3.01	8.08	20.9
IFA result	24.4	1.99	1.14	3.30	7.91	20.1
Stability test	23.6	2.04		2.79	8.05	19.1
A	22.8	<5.0	<0.40	<5.0		19.8
B						
C	26.00	1.90	1.260	2.80	7.78	21.00
D	22.79	2.04	1.00	3.87	<5.7	18.79
E	23.3	1.60	0.987	2.60	7.07	18.3
F	22.1	2.04		4.38		21.8
G		2.113				
H	25.2	1.91	1.13	3.06	7.26	20.7
I	27.6	2.16	1.23	2.84	7.99	20.8
J	23.7	1.86	1.06	2.98	7.7	20.1
K	24.2	1.94	1.37	3.18	7.94	22.8
L	24.6	1.906	1.163	2.911	7.570	19.8
M	25.0	1.90	1.17	3.26	7.7	20.2
N	24.2	<5.0	1.17	<5.0		12.0
O	24.0					20.6
P	23.8	2.23	0.936	2.90	7.66	18.7
Q	24.0	1.90	1.30	3.00	7.60	21.0
R	23.5					
S	27.4	2.03	1.25	3.01	8.43	20.5
T	24.4	1.94	1.08	3.00	7.57	20.0
U	25.9	2.13		2.81		20.3
V	25.7	<2.0		<5		21.2
W	19.9	1.28	0.99	<5		13.1
X	22.3	1.96	1.25	3.02	7.70	21.2
Y						
Z	26.0	2.17	0.997			20.0

All data in µg/L

Measurement Uncertainties Sample M154B

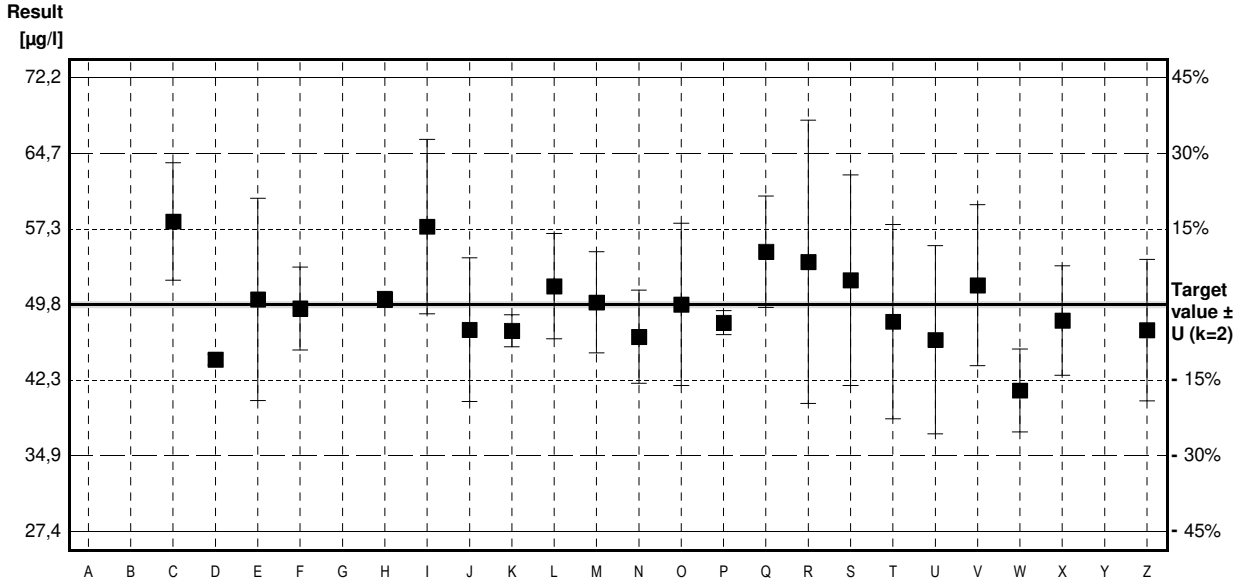
	Manganese ±	Nickel ±	Mercury ±	Selenium ±	Uranium ±	Zinc ±
Target value	0.2	0.03	0.02	0.06	0.05	0.5
IFA result	2.2	0.18	0.11	0.46	0.79	4.0
Stability test	2.1	0.18		0.39	0.81	3.8
A	0.0008	0.0008	0.0053	0.0026		0.0008
B						
C	2.60	0.19	0.1512	0.42	0.389	2.10
D	0.68	0.07	0.02	0.13		0.54
E	3	0.2	0.02	0.3	1	4
F	1.2	0.17		0.48		1.7
G		0.133				
H	0.327	0.019	0.006	0.026	0.134	0.260
I	4.14	0.32	0.18	0.43	1.20	3.12
J	3.55	0.279	0.159	0.447	1.15	3.02
K	1.10	0.19	0.006	0.13	0.14	0.33
L	2.5	0.11	0.12	0.29	0.76	2
M	2.5	0.190	0.117	0.494	0.77	2.02
N	2.4	0.5	0.12	0.5		1.2
O	2.9					2.7
P	0.3	0.2	0.02	0.11	0.13	1.4
Q	2.4	0.19	0.13	0.3	0.76	2.1
R	3.8					
S	5.47	0.41	0.25	0.60	1.69	4.10
T	4.82	0.39	0.22	0.60	1.51	4.0
U	4.2	0.51		0.81		3.2
V	2.4					2.97
W	2.0	0.13	0.10			1.3
X	1.2	0.15	0.19	0.36	0.82	1.3
Y						
Z	15	1	0.15			10

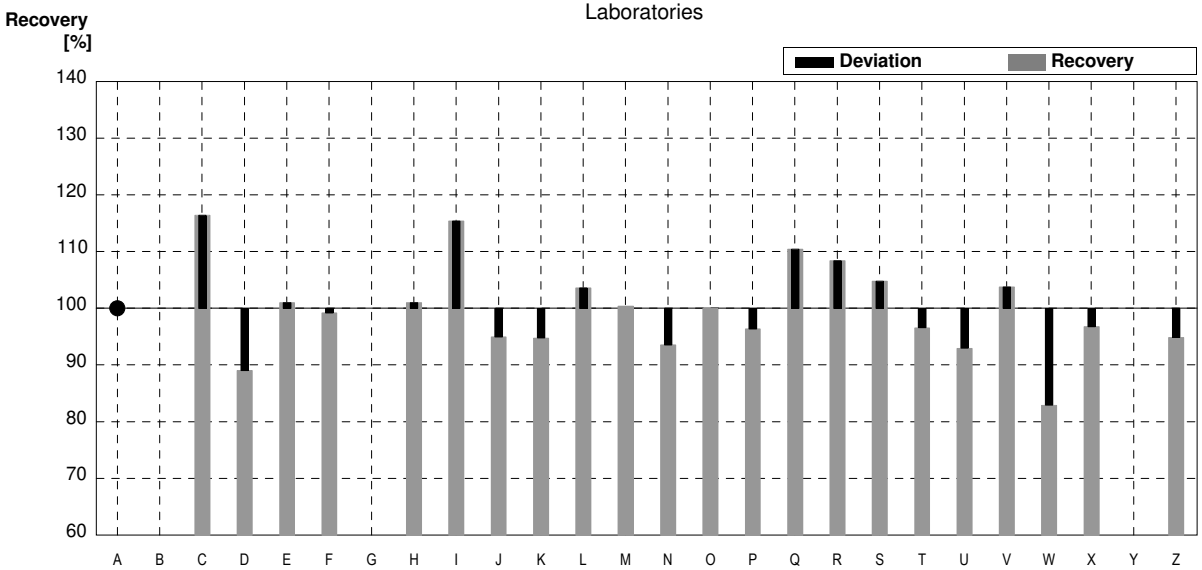
All data in µg/L

Sample M154A
Parameter Aluminium

Target value ± U (k=2)	49,8 µg/l	±	0,3 µg/l
IFA result ± U (k=2)	49,6 µg/l	±	2,5 µg/l
Stability test ± U (k=2)	50,0 µg/l	±	2,5 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<100	0,0115	µg/l	•	
B			µg/l		
C	58,00	5,80	µg/l	116%	2,01
D	44,35	0,54	µg/l	89%	-1,33
E	50,3	10	µg/l	101%	0,12
F	49,4	4,1	µg/l	99%	-0,10
G			µg/l		
H	50,3	0,799	µg/l	101%	0,12
I	57,5	8,62	µg/l	115%	1,89
J	47,3	7,1	µg/l	95%	-0,61
K	47,2	1,58	µg/l	95%	-0,64
L	51,6	5,2	µg/l	104%	0,44
M	50	5	µg/l	100%	0,05
N	46,6	4,6	µg/l	94%	-0,78
O	49,8	8,0	µg/l	100%	0,00
P	48,0	1,2	µg/l	96%	-0,44
Q	55	5,5	µg/l	110%	1,27
R	54	14	µg/l	108%	1,03
S	52,2	10,4	µg/l	105%	0,59
T	48,1	9,6	µg/l	97%	-0,42
U	46,3	9,3	µg/l	93%	-0,86
V	51,7	7,96	µg/l	104%	0,47
W	41,3	4,1	µg/l	83%	-2,08
X	48,2	5,4	µg/l	97%	-0,39
Y			µg/l		
Z	47,26	7	µg/l	95%	-0,62





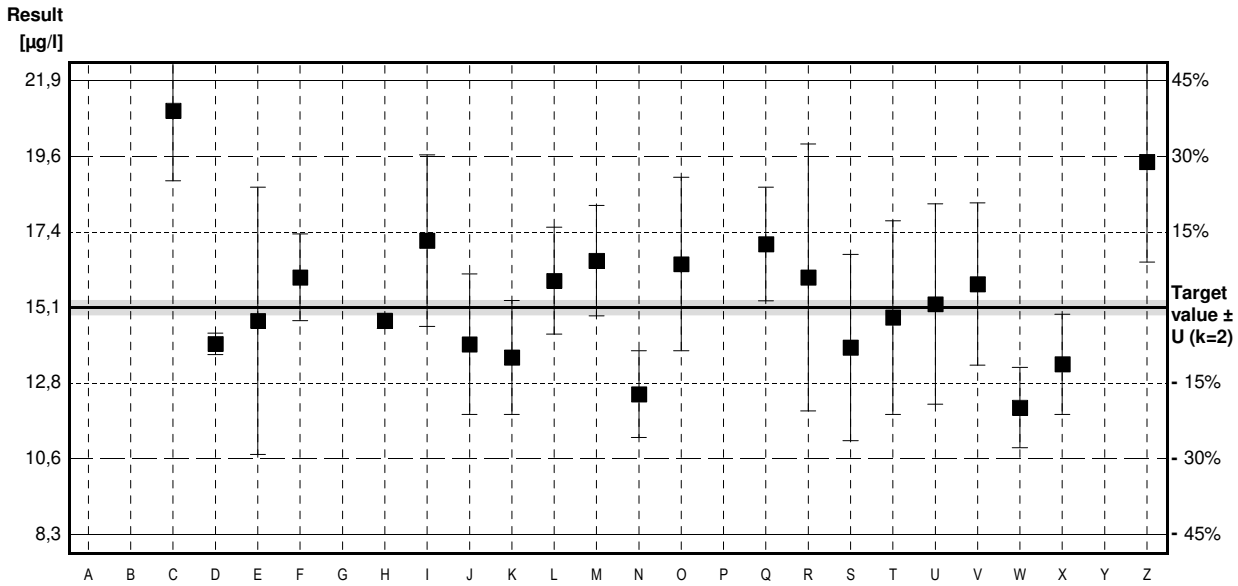
	All results	Outliers excl.	Unit
Mean ± CI(99%)	49,7 ± 2,4	49,7 ± 2,4	µg/l
Recov. ± CI(99%)	99,9 ± 4,9	99,9 ± 4,9	%
SD between labs	4,0	4,0	µg/l
RSD between labs	8,1	8,1	%
n for calculation	22	22	

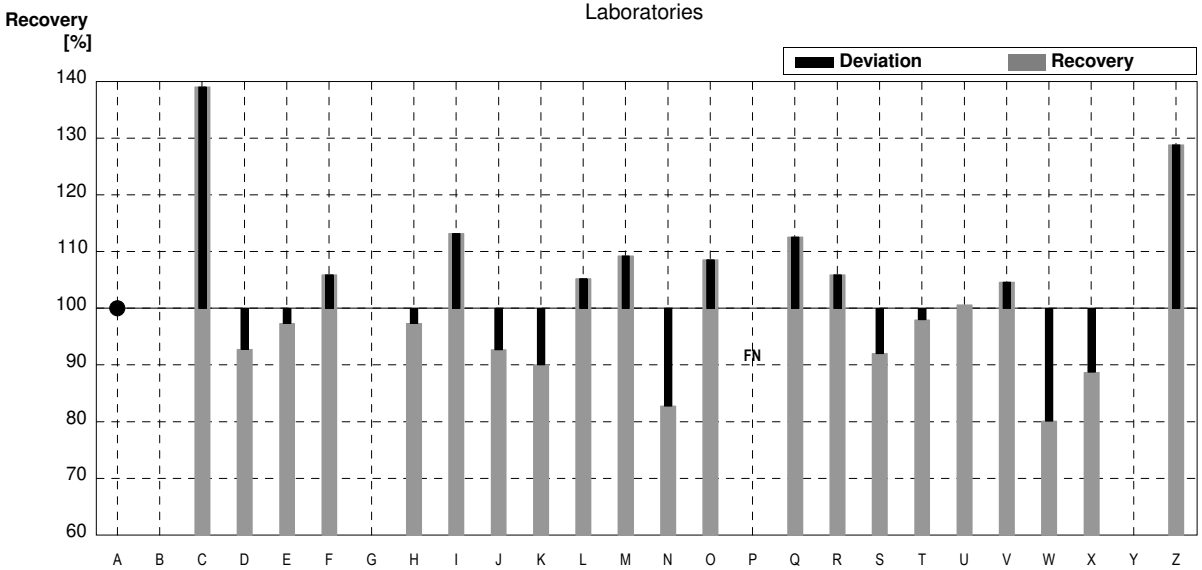
Sample M154B
Parameter Aluminium

Target value ± U (k=2)	15,1 µg/l	±	0,2 µg/l
IFA result ± U (k=2)	15,0 µg/l	±	0,8 µg/l
Stability test ± U (k=2)	15,1 µg/l	±	0,8 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<100	0,0115	µg/l	•	
B			µg/l		
C	21,00 *	2,10	µg/l	139%	4,76
D	14,01	0,32	µg/l	93%	-0,88
E	14,7	4	µg/l	97%	-0,32
F	16,0	1,3	µg/l	106%	0,73
G			µg/l		
H	14,7	0,226	µg/l	97%	-0,32
I	17,1	2,57	µg/l	113%	1,62
J	14,0	2,10	µg/l	93%	-0,89
K	13,6	1,71	µg/l	90%	-1,21
L	15,9	1,6	µg/l	105%	0,65
M	16,5	1,65	µg/l	109%	1,13
N	12,5	1,3	µg/l	83%	-2,10
O	16,4	2,6	µg/l	109%	1,05
P	<10		µg/l	FN	
Q	17,0	1,70	µg/l	113%	1,53
R	16,0	4,0	µg/l	106%	0,73
S	13,9	2,79	µg/l	92%	-0,97
T	14,8	2,9	µg/l	98%	-0,24
U	15,2	3,0	µg/l	101%	0,08
V	15,8	2,43	µg/l	105%	0,57
W	12,1	1,2	µg/l	80%	-2,42
X	13,4	1,5	µg/l	89%	-1,37
Y			µg/l		
Z	19,46	3	µg/l	129%	3,52

	All results	Outliers excl.	Unit
Mean ± CI(99%)	15,4 ± 1,3	15,2 ± 1,1	µg/l
Recov. ± CI(99%)	102,2 ± 8,8	100,4 ± 7,4	%
SD between labs	2,1	1,7	µg/l
RSD between labs	13,8	11,5	%
n for calculation	21	20	

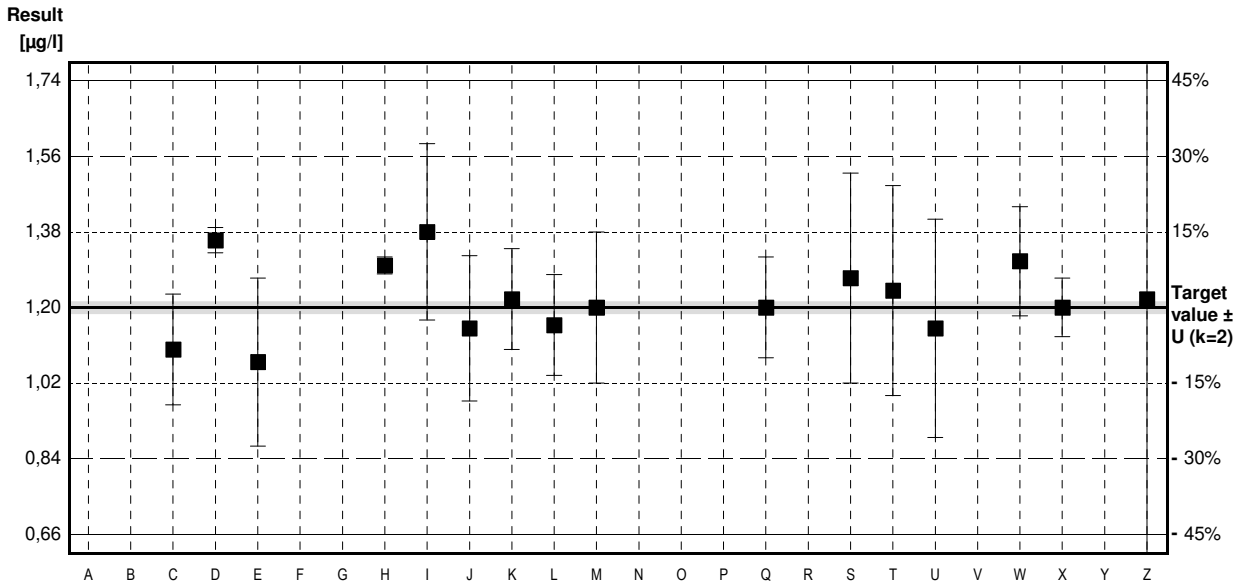


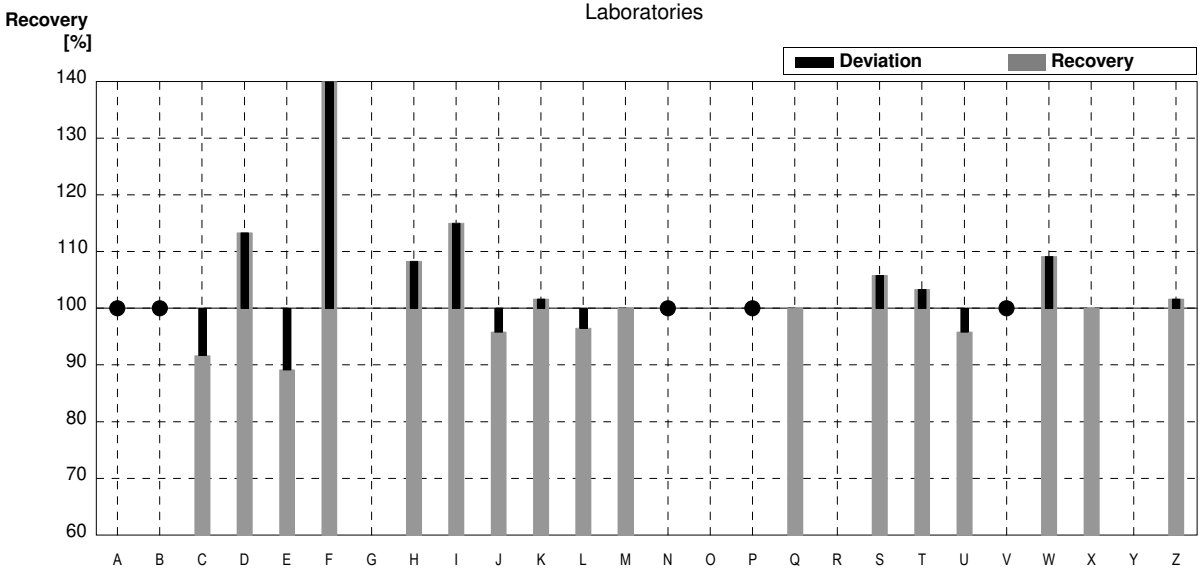


Sample M154A
Parameter Arsenic

Target value ± U (k=2)	1,20 µg/l	±	0,01 µg/l
IFA result ± U (k=2)	1,29 µg/l	±	0,10 µg/l
Stability test ± U (k=2)	1,19 µg/l	±	0,10 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<5,0	0,001	µg/l	•	
B	<1,5		µg/l	•	
C	1,10	0,132	µg/l	92%	-1,04
D	1,36	0,03	µg/l	113%	1,67
E	1,07	0,2	µg/l	89%	-1,35
F	2,20 *	0,18	µg/l	183%	10,42
G			µg/l		
H	1,30	0,020	µg/l	108%	1,04
I	1,38	0,21	µg/l	115%	1,88
J	1,15	0,173	µg/l	96%	-0,52
K	1,22	0,12	µg/l	102%	0,21
L	1,158	0,12	µg/l	97%	-0,44
M	1,20	0,18	µg/l	100%	0,00
N	<5,0	0,5	µg/l	•	
O			µg/l		
P	<1,5		µg/l	•	
Q	1,20	0,12	µg/l	100%	0,00
R			µg/l		
S	1,27	0,25	µg/l	106%	0,73
T	1,24	0,25	µg/l	103%	0,42
U	1,15	0,26	µg/l	96%	-0,52
V	<2		µg/l	•	
W	1,31	0,13	µg/l	109%	1,15
X	1,20	0,07	µg/l	100%	0,00
Y			µg/l		
Z	1,22	1	µg/l	102%	0,21



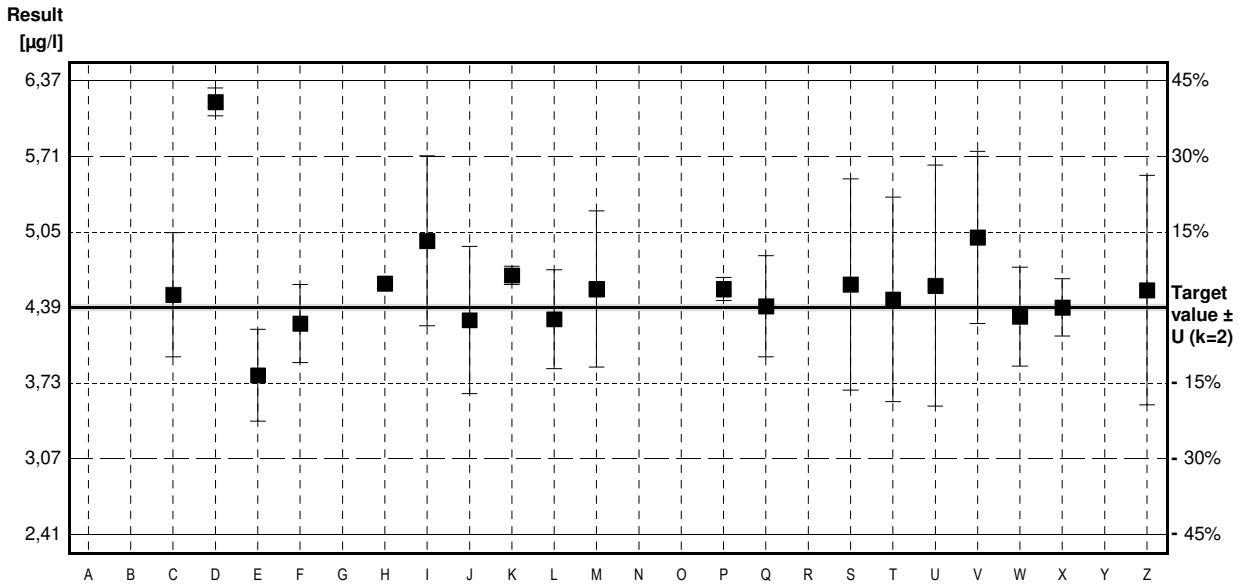


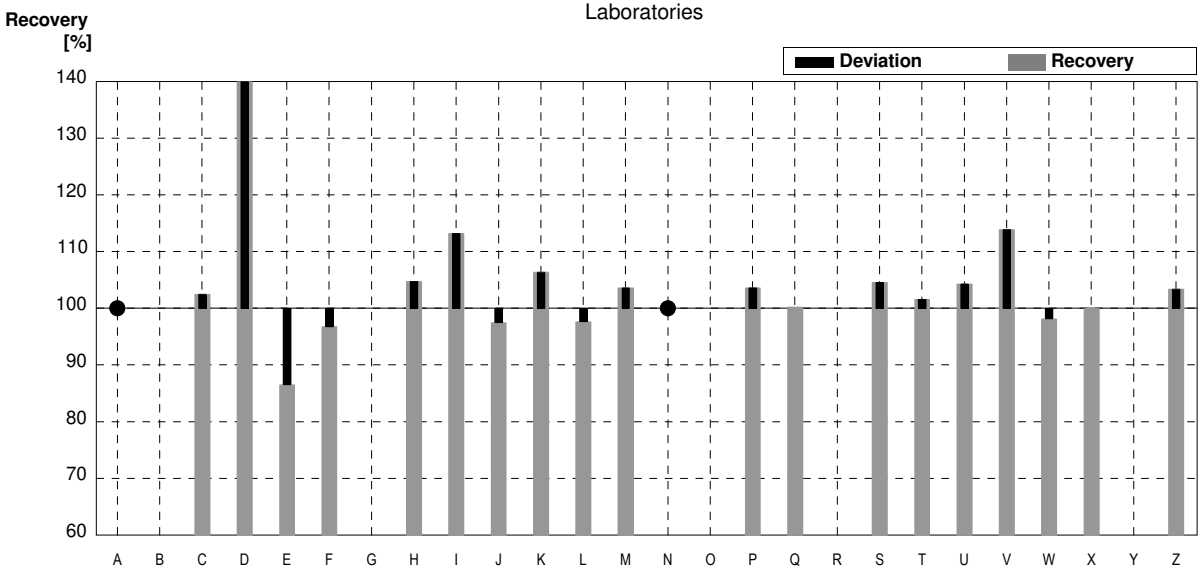
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,28 ± 0,18	1,22 ± 0,06	µg/l
Recov. ± CI(99%)	106,5 ± 14,9	101,7 ± 5,4	%
SD between labs	0,25	0,09	µg/l
RSD between labs	19,7	7,2	%
n for calculation	17	16	

Sample M154B
Parameter Arsenic

Target value	± U (k=2)	4,39 µg/l	±	0,03 µg/l
IFA result	± U (k=2)	4,78 µg/l	±	0,38 µg/l
Stability test	± U (k=2)	4,39 µg/l	±	0,35 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<5,0	0,0014	µg/l	•	
B			µg/l		
C	4,50	0,54	µg/l	103%	0,31
D	6,18 *	0,12	µg/l	141%	5,10
E	3,80 *	0,4	µg/l	87%	-1,68
F	4,25	0,34	µg/l	97%	-0,40
G			µg/l		
H	4,60	0,047	µg/l	105%	0,60
I	4,97	0,74	µg/l	113%	1,65
J	4,28	0,64	µg/l	97%	-0,31
K	4,67	0,08	µg/l	106%	0,80
L	4,288	0,43	µg/l	98%	-0,29
M	4,55	0,68	µg/l	104%	0,46
N	<5,0	0,5	µg/l	•	
O			µg/l		
P	4,55	0,1	µg/l	104%	0,46
Q	4,40	0,44	µg/l	100%	0,03
R			µg/l		
S	4,59	0,92	µg/l	105%	0,57
T	4,46	0,89	µg/l	102%	0,20
U	4,58	1,05	µg/l	104%	0,54
V	5,0	0,75	µg/l	114%	1,74
W	4,31	0,43	µg/l	98%	-0,23
X	4,39	0,25	µg/l	100%	0,00
Y			µg/l		
Z	4,54	1	µg/l	103%	0,43



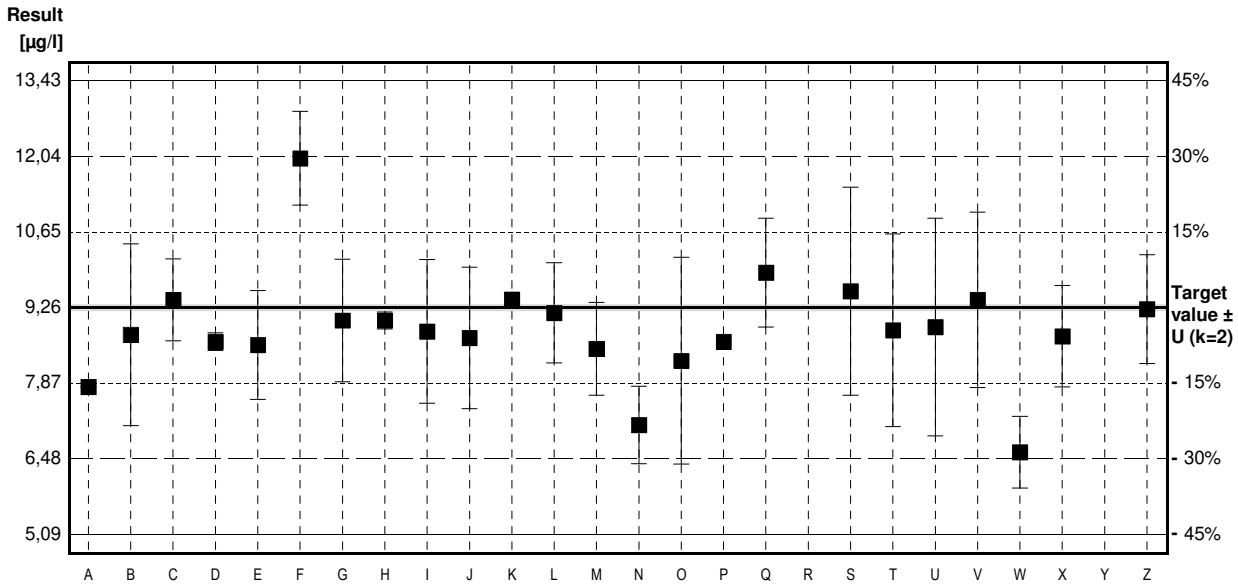


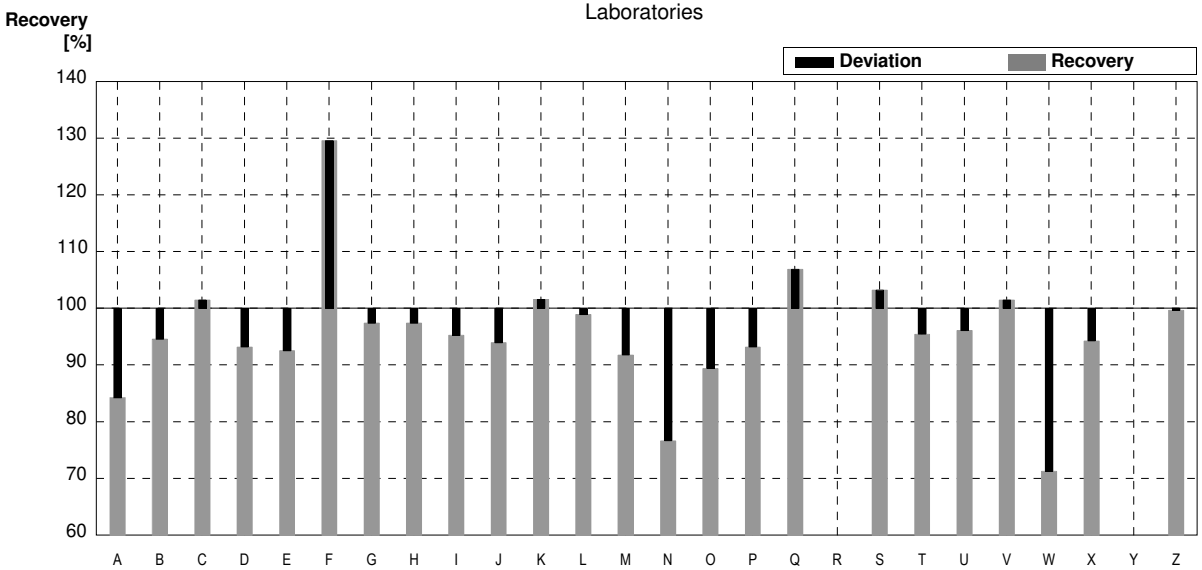
	All results	Outliers excl.	Unit
Mean ± CI(99%)	4,57 ± 0,31	4,53 ± 0,15	µg/l
Recov. ± CI(99%)	104,2 ± 7,1	103,1 ± 3,5	%
SD between labs	0,47	0,21	µg/l
RSD between labs	10,2	4,7	%
n for calculation	19	17	

Sample M154A
Parameter Lead

Target value	± U (k=2)	9,26 µg/l	±	0,06 µg/l
IFA result	± U (k=2)	9,20 µg/l	±	0,37 µg/l
Stability test	± U (k=2)	8,90 µg/l	±	0,36 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	7,80	0,0009	µg/l	84%	-2,19
B	8,76	1,67	µg/l	95%	-0,75
C	9,40	0,752	µg/l	102%	0,21
D	8,63	0,16	µg/l	93%	-0,94
E	8,57	1	µg/l	93%	-1,03
F	12,0 *	0,86	µg/l	130%	4,11
G	9,020	1,126	µg/l	97%	-0,36
H	9,02	0,159	µg/l	97%	-0,36
I	8,82	1,32	µg/l	95%	-0,66
J	8,7	1,30	µg/l	94%	-0,84
K	9,41	0,10	µg/l	102%	0,22
L	9,160	0,92	µg/l	99%	-0,15
M	8,5	0,85	µg/l	92%	-1,14
N	7,10 *	0,71	µg/l	77%	-3,24
O	8,28	1,90	µg/l	89%	-1,47
P	8,63	0,04	µg/l	93%	-0,94
Q	9,9	1,0	µg/l	107%	0,96
R			µg/l		
S	9,56	1,91	µg/l	103%	0,45
T	8,84	1,77	µg/l	95%	-0,63
U	8,9	2,0	µg/l	96%	-0,54
V	9,4	1,61	µg/l	102%	0,21
W	6,6 *	0,66	µg/l	71%	-3,99
X	8,73	0,93	µg/l	94%	-0,79
Y			µg/l		
Z	9,23	1	µg/l	100%	-0,04



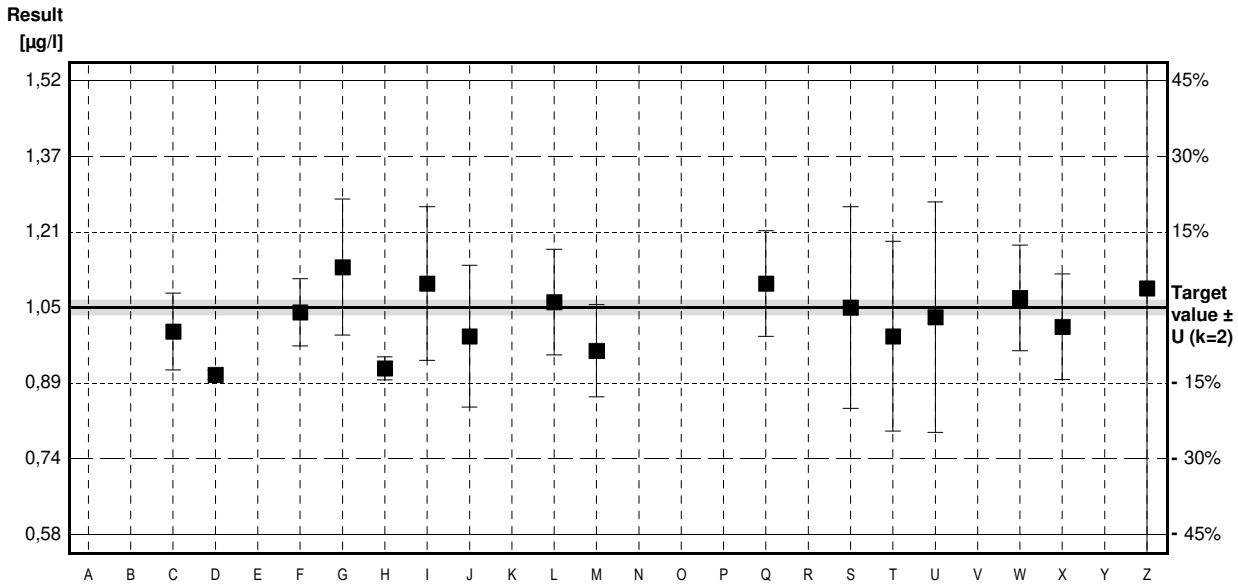


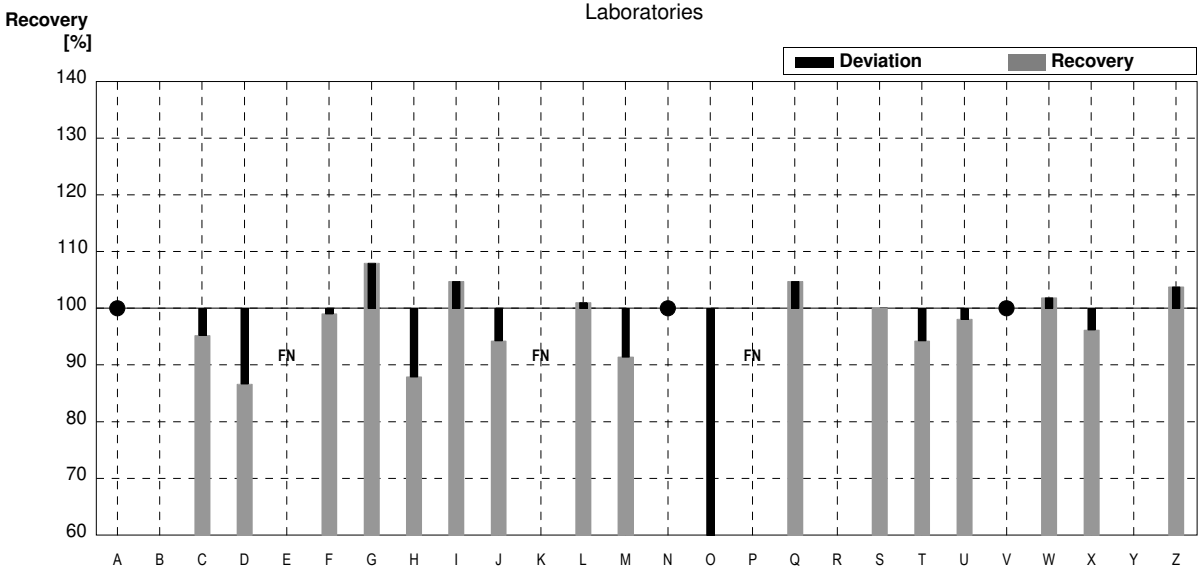
	All results	Outliers excl.	Unit
Mean ± CI(99%)	8,87 ± 0,57	8,92 ± 0,30	µg/l
Recov. ± CI(99%)	95,8 ± 6,1	96,3 ± 3,2	%
SD between labs	0,99	0,47	µg/l
RSD between labs	11,2	5,3	%
n for calculation	24	21	

Sample M154B
Parameter Lead

Target value ± U (k=2)	1,05 µg/l	±	0,02 µg/l
IFA result ± U (k=2)	1,06 µg/l	±	0,04 µg/l
Stability test ± U (k=2)	1,02 µg/l	±	0,04 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<5,0	0	µg/l	•	
B			µg/l		
C	1,00	0,080	µg/l	95%	-0,66
D	0,91	0,01	µg/l	87%	-1,85
E	<1		µg/l	FN	
F	1,04	0,07	µg/l	99%	-0,13
G	1,134	0,142	µg/l	108%	1,11
H	0,923	0,024	µg/l	88%	-1,68
I	1,10	0,16	µg/l	105%	0,66
J	0,99	0,148	µg/l	94%	-0,79
K	<1,00		µg/l	FN	
L	1,061	0,11	µg/l	101%	0,15
M	0,96	0,096	µg/l	91%	-1,19
N	<5,0	0,5	µg/l	•	
O	0,370 *	0,085	µg/l	35%	-8,99
P	<1		µg/l	FN	
Q	1,10	0,11	µg/l	105%	0,66
R			µg/l		
S	1,05	0,21	µg/l	100%	0,00
T	0,990	0,198	µg/l	94%	-0,79
U	1,03	0,24	µg/l	98%	-0,26
V	<2		µg/l	•	
W	1,07	0,11	µg/l	102%	0,26
X	1,01	0,11	µg/l	96%	-0,53
Y			µg/l		
Z	1,09	1	µg/l	104%	0,53



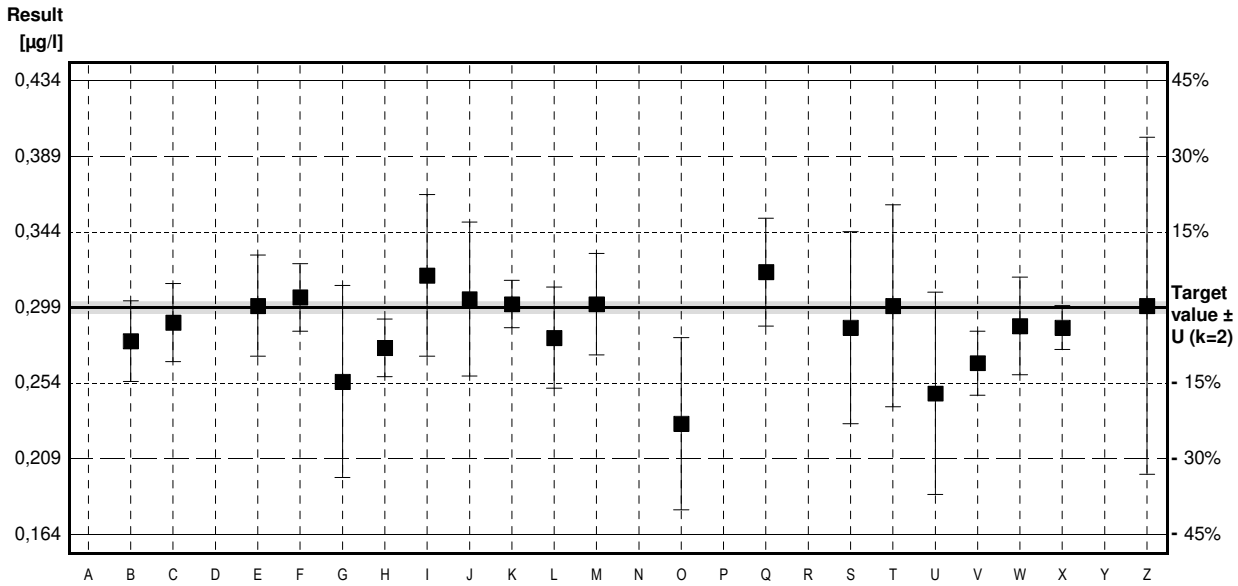


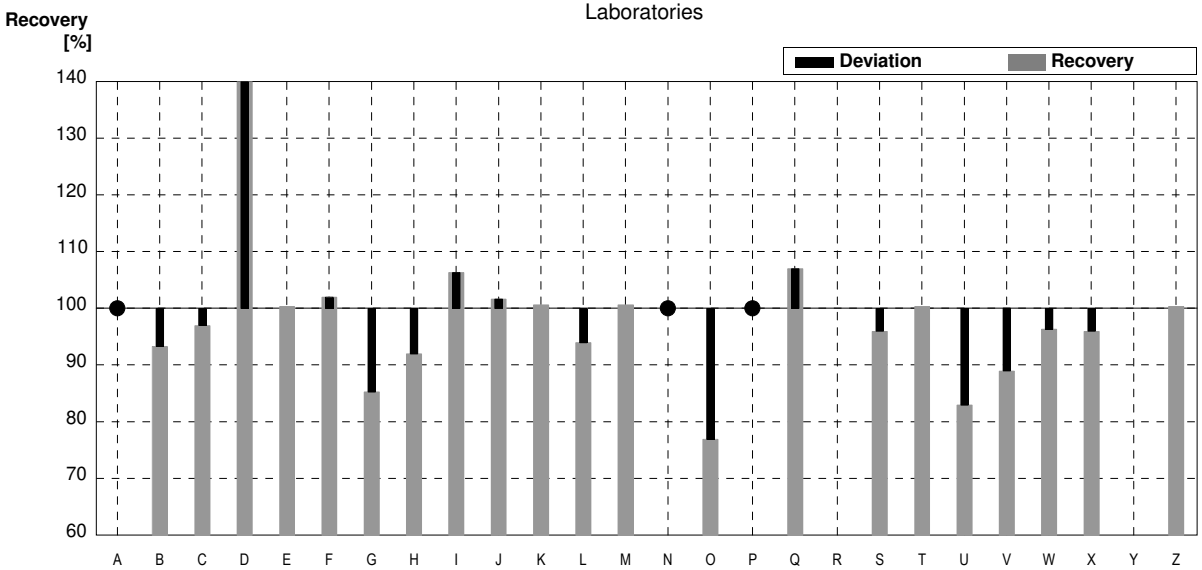
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,99 ± 0,12	1,03 ± 0,05	µg/l
Recov. ± CI(99%)	94,3 ± 11,6	98,0 ± 4,5	%
SD between labs	0,17	0,06	µg/l
RSD between labs	17,3	6,3	%
n for calculation	17	16	

Sample M154A
Parameter Cadmium

Target value	± U (k=2)	0,299 µg/l	±	0,003 µg/l
IFA result	± U (k=2)	0,314 µg/l	±	0,022 µg/l
Stability test	± U (k=2)	0,308 µg/l	±	0,022 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<5,0	0,0011	µg/l	•	
B	0,279	0,024	µg/l	93%	-1,13
C	0,2900	0,0232	µg/l	97%	-0,51
D	0,75 *	0,01	µg/l	251%	25,57
E	0,300	0,03	µg/l	100%	0,06
F	0,305	0,02	µg/l	102%	0,34
G	0,255	0,057	µg/l	85%	-2,49
H	0,275	0,017	µg/l	92%	-1,36
I	0,318	0,048	µg/l	106%	1,08
J	0,304	0,0456	µg/l	102%	0,28
K	0,301	0,014	µg/l	101%	0,11
L	0,281	0,03	µg/l	94%	-1,02
M	0,301	0,0301	µg/l	101%	0,11
N	<1,0	0,1	µg/l	•	
O	0,230 *	0,051	µg/l	77%	-3,91
P	<0,4		µg/l	•	
Q	0,320	0,032	µg/l	107%	1,19
R			µg/l		
S	0,287	0,057	µg/l	96%	-0,68
T	0,300	0,060	µg/l	100%	0,06
U	0,248	0,060	µg/l	83%	-2,89
V	0,266	0,019	µg/l	89%	-1,87
W	0,288	0,029	µg/l	96%	-0,62
X	0,287	0,013	µg/l	96%	-0,68
Y			µg/l		
Z	0,300	0,1	µg/l	100%	0,06



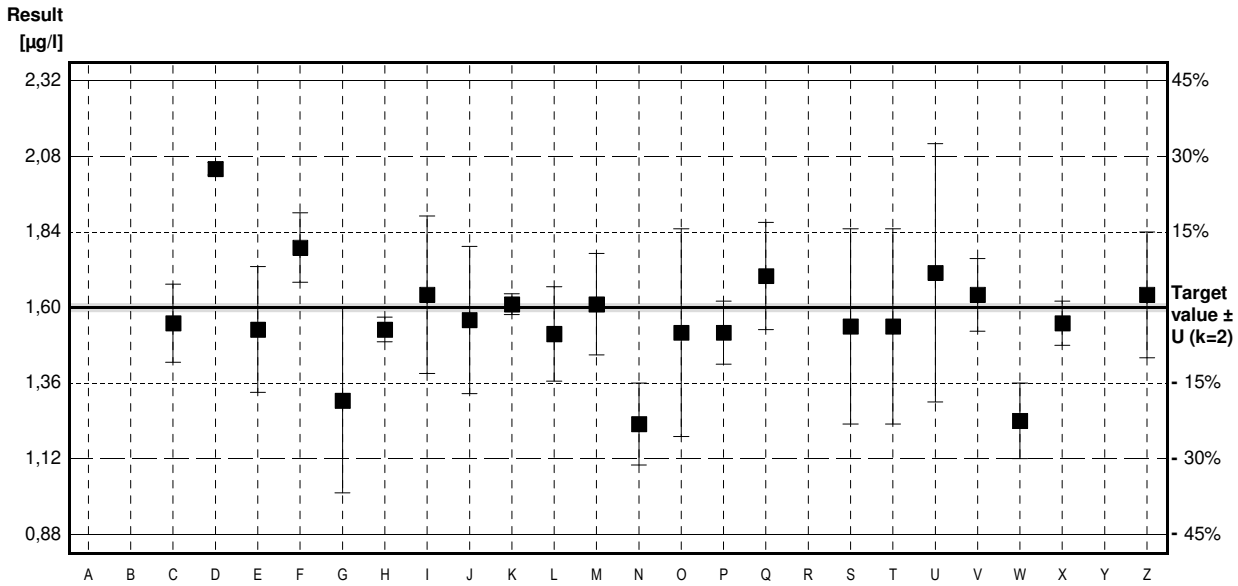


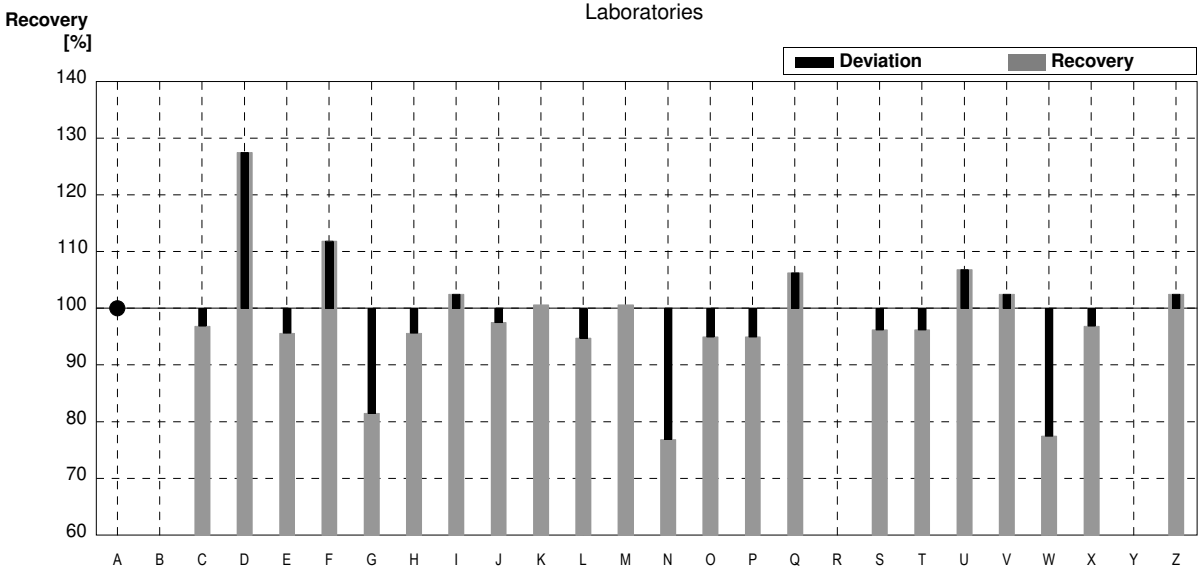
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,309 ± 0,064	0,290 ± 0,013	µg/l
Recov. ± CI(99%)	103,3 ± 21,5	96,9 ± 4,3	%
SD between labs	0,104	0,019	µg/l
RSD between labs	33,5	6,6	%
n for calculation	21	19	

Sample M154B
Parameter Cadmium

Target value	± U (k=2)	1,60 µg/l	±	0,01 µg/l
IFA result	± U (k=2)	1,63 µg/l	±	0,11 µg/l
Stability test	± U (k=2)	1,63 µg/l	±	0,11 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<5,0	0,0008	µg/l	•	
B			µg/l		
C	1,55	0,124	µg/l	97%	-0,53
D	2,04 *	0,02	µg/l	128%	4,66
E	1,53	0,2	µg/l	96%	-0,74
F	1,79	0,11	µg/l	112%	2,01
G	1,304	0,293	µg/l	82%	-3,14
H	1,53	0,039	µg/l	96%	-0,74
I	1,64	0,25	µg/l	103%	0,42
J	1,56	0,234	µg/l	98%	-0,42
K	1,61	0,033	µg/l	101%	0,11
L	1,516	0,15	µg/l	95%	-0,89
M	1,61	0,161	µg/l	101%	0,11
N	1,23 *	0,13	µg/l	77%	-3,92
O	1,52	0,33	µg/l	95%	-0,85
P	1,52	0,1	µg/l	95%	-0,85
Q	1,70	0,17	µg/l	106%	1,06
R			µg/l		
S	1,54	0,31	µg/l	96%	-0,64
T	1,54	0,31	µg/l	96%	-0,64
U	1,71	0,41	µg/l	107%	1,17
V	1,64	0,115	µg/l	103%	0,42
W	1,24 *	0,12	µg/l	78%	-3,81
X	1,55	0,07	µg/l	97%	-0,53
Y			µg/l		
Z	1,64	0,2	µg/l	103%	0,42



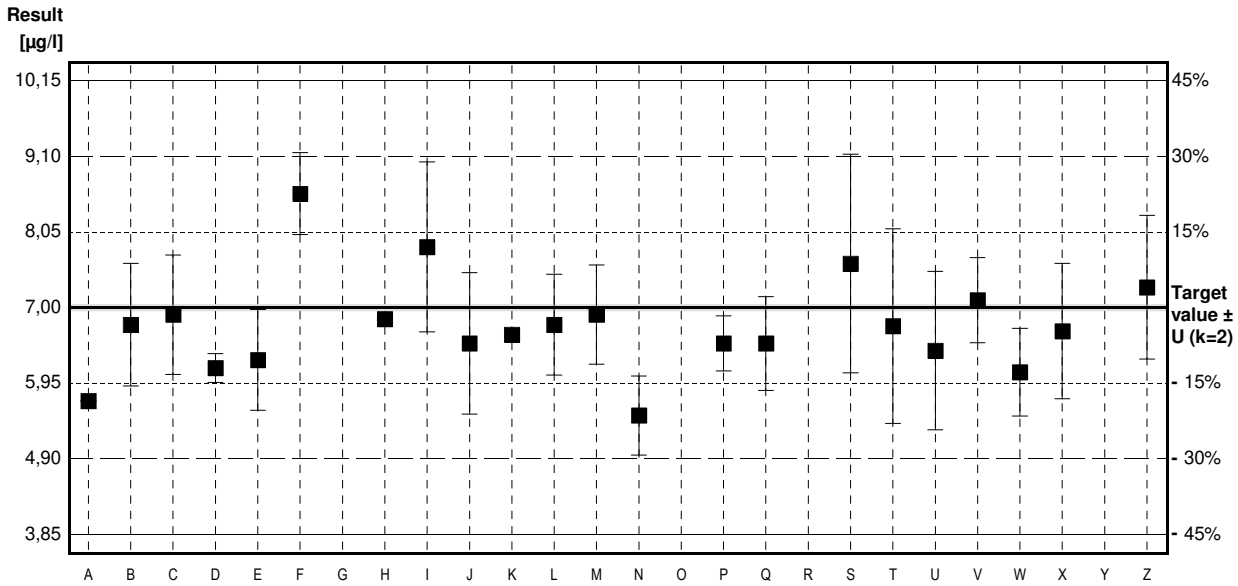


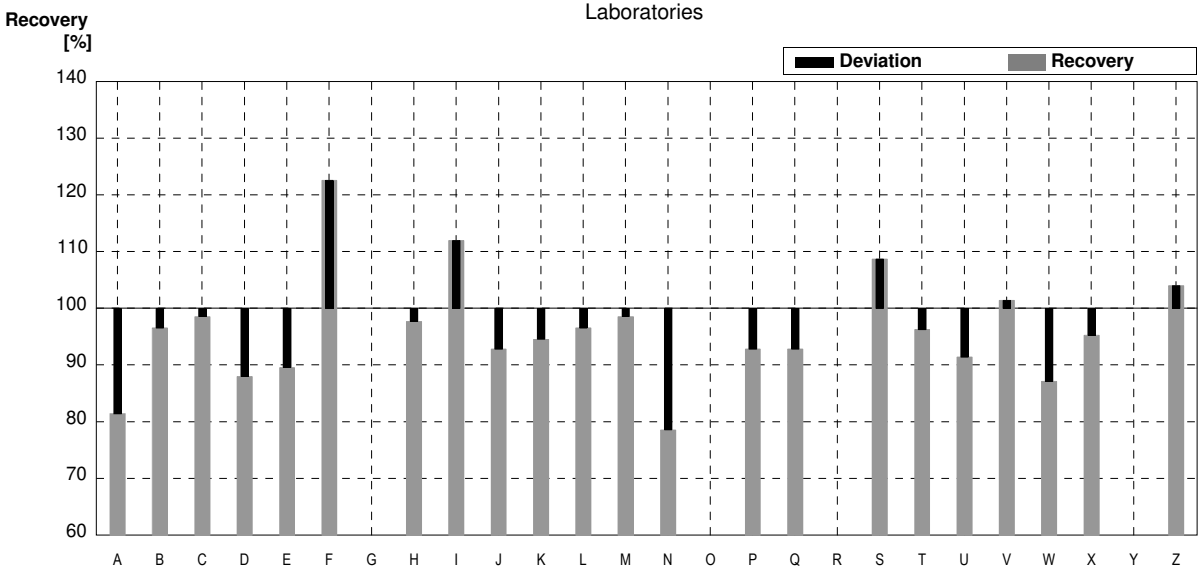
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,57 ± 0,10	1,58 ± 0,07	µg/l
Recov. ± CI(99%)	98,0 ± 6,5	98,7 ± 4,2	%
SD between labs	0,17	0,10	µg/l
RSD between labs	11,1	6,4	%
n for calculation	22	19	

Sample M154A
Parameter Chromium

Target value	± U (k=2)	7,00 µg/l	±	0,04 µg/l
IFA result	± U (k=2)	6,95 µg/l	±	0,35 µg/l
Stability test	± U (k=2)	6,80 µg/l	±	0,34 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	5,70	0,001	µg/l	81%	-2,81
B	6,76	0,85	µg/l	97%	-0,52
C	6,90	0,828	µg/l	99%	-0,22
D	6,16	0,2	µg/l	88%	-1,82
E	6,27	0,7	µg/l	90%	-1,58
F	8,58 *	0,57	µg/l	123%	3,42
G			µg/l		
H	6,84	0,017	µg/l	98%	-0,35
I	7,84	1,18	µg/l	112%	1,82
J	6,5	0,98	µg/l	93%	-1,08
K	6,62	0,069	µg/l	95%	-0,82
L	6,760	0,7	µg/l	97%	-0,52
M	6,9	0,69	µg/l	99%	-0,22
N	5,50 *	0,55	µg/l	79%	-3,25
O			µg/l		
P	6,50	0,38	µg/l	93%	-1,08
Q	6,5	0,65	µg/l	93%	-1,08
R			µg/l		
S	7,61	1,52	µg/l	109%	1,32
T	6,74	1,35	µg/l	96%	-0,56
U	6,4	1,1	µg/l	91%	-1,30
V	7,1	0,59	µg/l	101%	0,22
W	6,1	0,61	µg/l	87%	-1,95
X	6,67	0,94	µg/l	95%	-0,71
Y			µg/l		
Z	7,28	1	µg/l	104%	0,61



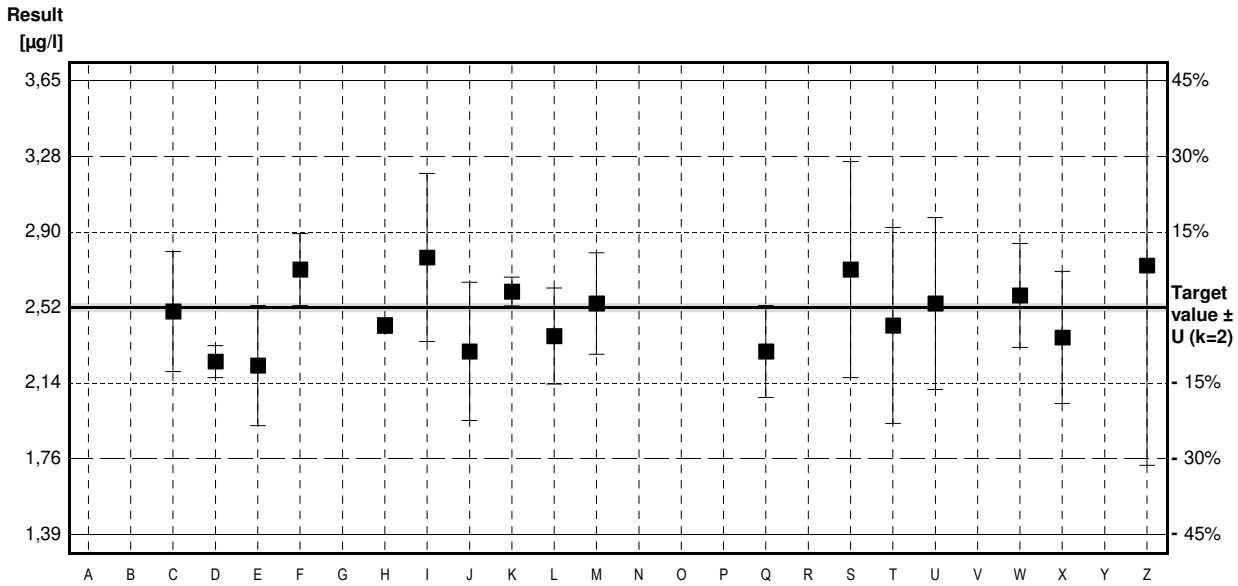


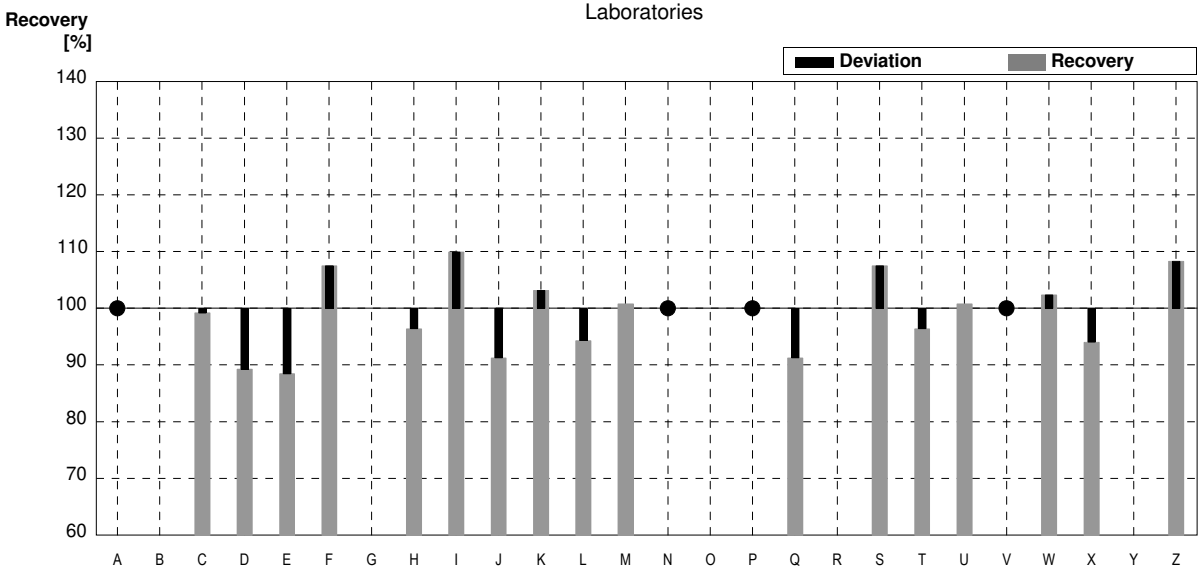
	All results	Outliers excl.	Unit
Mean ± CI(99%)	6,74 ± 0,41	6,71 ± 0,32	µg/l
Recov. ± CI(99%)	96,3 ± 5,9	95,8 ± 4,6	%
SD between labs	0,68	0,50	µg/l
RSD between labs	10,1	7,5	%
n for calculation	22	20	

Sample M154B
Parameter Chromium

Target value ± U (k=2)	2,52 µg/l	±	0,02 µg/l
IFA result ± U (k=2)	2,48 µg/l	±	0,12 µg/l
Stability test ± U (k=2)	2,51 µg/l	±	0,13 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<5,0	0,0010	µg/l	•	
B			µg/l		
C	2,50	0,300	µg/l	99%	-0,12
D	2,25	0,08	µg/l	89%	-1,62
E	2,23	0,3	µg/l	88%	-1,74
F	2,71	0,18	µg/l	108%	1,14
G			µg/l		
H	2,43	0,038	µg/l	96%	-0,54
I	2,77	0,42	µg/l	110%	1,50
J	2,30	0,345	µg/l	91%	-1,32
K	2,60	0,072	µg/l	103%	0,48
L	2,377	0,24	µg/l	94%	-0,86
M	2,54	0,254	µg/l	101%	0,12
N	<5,0	0,5	µg/l	•	
O			µg/l		
P	<5		µg/l	•	
Q	2,30	0,23	µg/l	91%	-1,32
R			µg/l		
S	2,71	0,54	µg/l	108%	1,14
T	2,43	0,49	µg/l	96%	-0,54
U	2,54	0,43	µg/l	101%	0,12
V	<5,0		µg/l	•	
W	2,58	0,26	µg/l	102%	0,36
X	2,37	0,33	µg/l	94%	-0,90
Y			µg/l		
Z	2,73	1	µg/l	108%	1,26



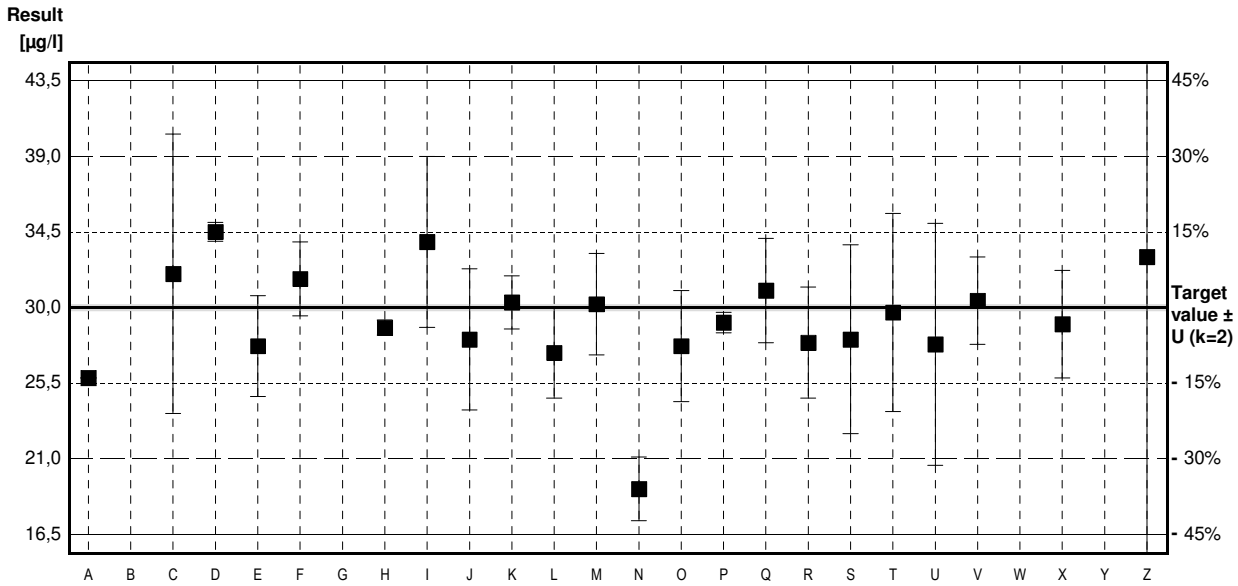


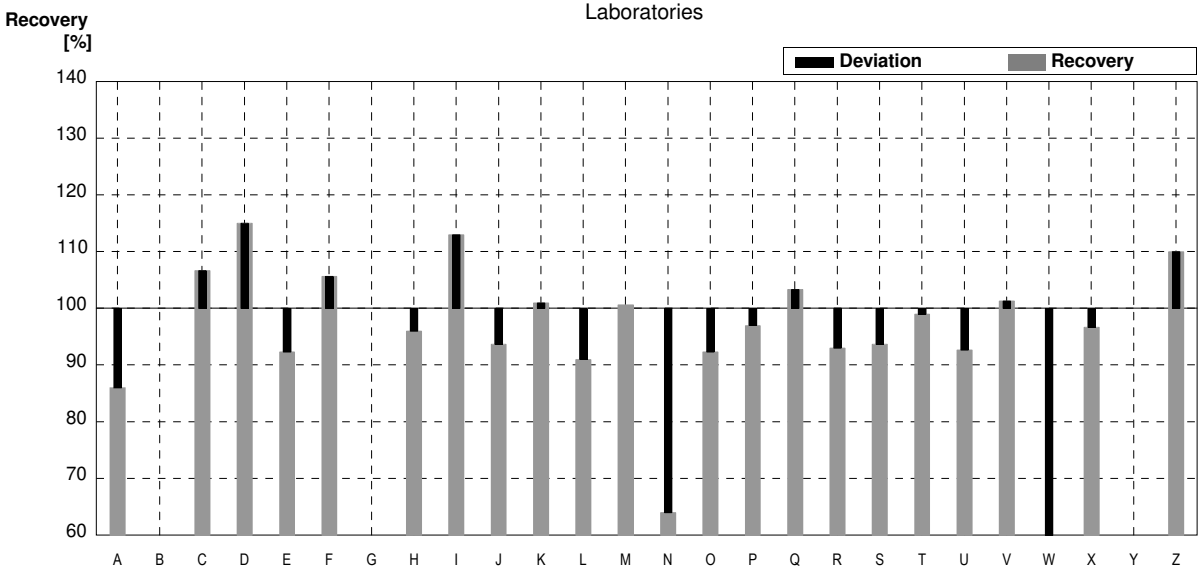
	All results	Outliers excl.	Unit
Mean ± CI(99%)	2,49 ± 0,12	2,49 ± 0,12	µg/l
Recov. ± CI(99%)	98,9 ± 4,9	98,9 ± 4,9	%
SD between labs	0,17	0,17	µg/l
RSD between labs	7,0	7,0	%
n for calculation	17	17	

Sample M154A
Parameter Iron

Target value ± U (k=2)	30,0 µg/l	±	0,2 µg/l
IFA result ± U (k=2)	28,6 µg/l	±	2,9 µg/l
Stability test ± U (k=2)	27,8 µg/l	±	2,8 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	25,8	0,0013	µg/l	86%	-2,00
B			µg/l		
C	32,00	8,32	µg/l	107%	0,95
D	34,5	0,56	µg/l	115%	2,14
E	27,7	3	µg/l	92%	-1,10
F	31,7	2,2	µg/l	106%	0,81
G			µg/l		
H	28,8	0,457	µg/l	96%	-0,57
I	33,9	5,09	µg/l	113%	1,86
J	28,1	4,21	µg/l	94%	-0,90
K	30,3	1,59	µg/l	101%	0,14
L	27,3	2,7	µg/l	91%	-1,29
M	30,2	3,02	µg/l	101%	0,10
N	19,2 *	1,9	µg/l	64%	-5,14
O	27,7	3,3	µg/l	92%	-1,10
P	29,1	0,6	µg/l	97%	-0,43
Q	31,0	3,1	µg/l	103%	0,48
R	27,9	3,3	µg/l	93%	-1,00
S	28,1	5,62	µg/l	94%	-0,90
T	29,7	5,9	µg/l	99%	-0,14
U	27,8	7,2	µg/l	93%	-1,05
V	30,4	2,6	µg/l	101%	0,19
W	16,1 *	1,6	µg/l	54%	-6,62
X	29,0	3,2	µg/l	97%	-0,48
Y			µg/l		
Z	33,0	30	µg/l	110%	1,43



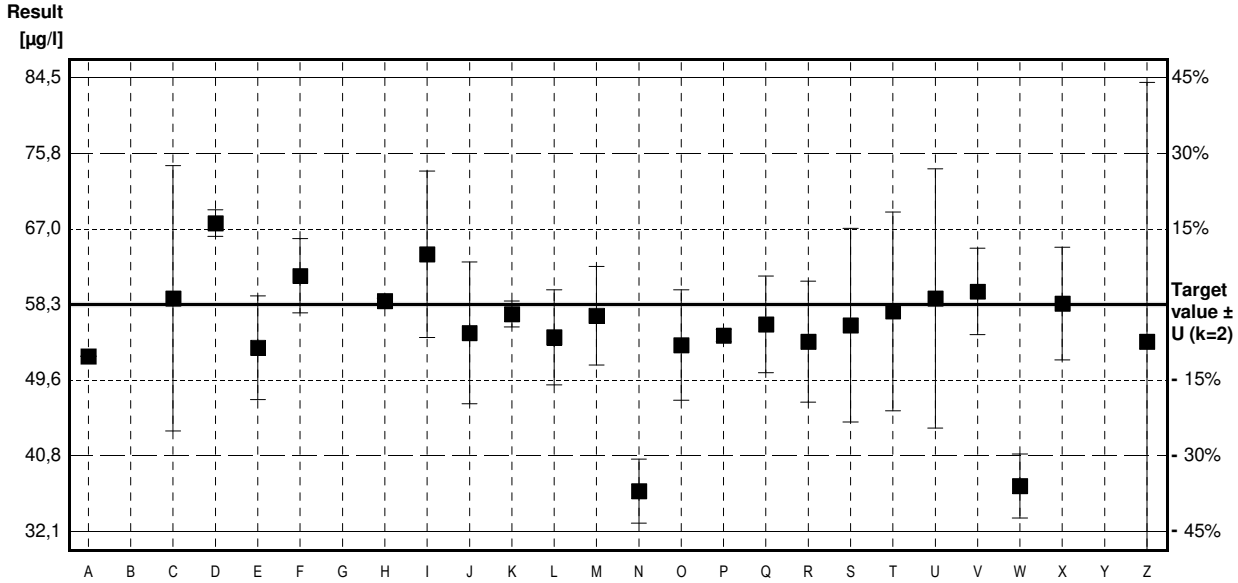


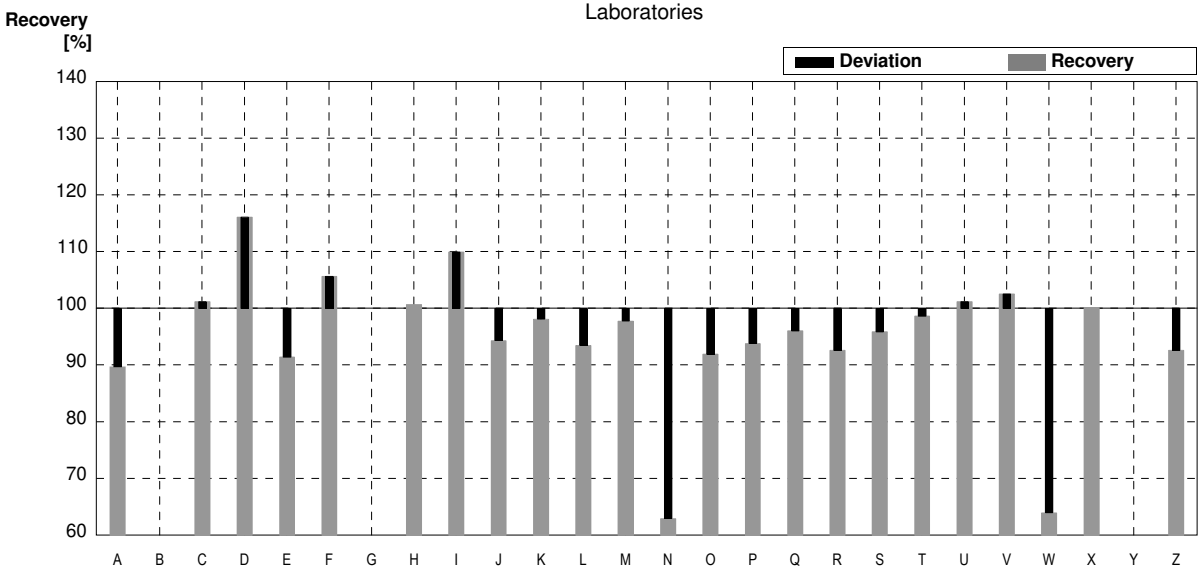
	All results	Outliers excl.	Unit
Mean ± CI(99%)	28,7 ± 2,4	29,7 ± 1,4	µg/l
Recov. ± CI(99%)	95,6 ± 8,1	99,0 ± 4,8	%
SD between labs	4,1	2,3	µg/l
RSD between labs	14,4	7,8	%
n for calculation	23	21	

Sample M154B
Parameter Iron

Target value ± U (k=2)	58,3 µg/l	±	0,3 µg/l
IFA result ± U (k=2)	55,4 µg/l	±	5,5 µg/l
Stability test ± U (k=2)	52,7 µg/l	±	5,3 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	52,3	0,0019	µg/l	90%	-1,47
B			µg/l		
C	59,00	15,34	µg/l	101%	0,17
D	67,7 *	1,54	µg/l	116%	2,30
E	53,3	6	µg/l	91%	-1,23
F	61,6	4,3	µg/l	106%	0,81
G			µg/l		
H	58,7	0,325	µg/l	101%	0,10
I	64,1	9,62	µg/l	110%	1,42
J	55	8,2	µg/l	94%	-0,81
K	57,2	1,50	µg/l	98%	-0,27
L	54,5	5,5	µg/l	93%	-0,93
M	57	5,7	µg/l	98%	-0,32
N	36,7 *	3,7	µg/l	63%	-5,29
O	53,6	6,4	µg/l	92%	-1,15
P	54,7	0,7	µg/l	94%	-0,88
Q	56,0	5,6	µg/l	96%	-0,56
R	54	7	µg/l	93%	-1,05
S	55,9	11,2	µg/l	96%	-0,59
T	57,5	11,5	µg/l	99%	-0,20
U	59	15	µg/l	101%	0,17
V	59,8	5,0	µg/l	103%	0,37
W	37,3 *	3,7	µg/l	64%	-5,15
X	58,4	6,5	µg/l	100%	0,02
Y			µg/l		
Z	54,0	30	µg/l	93%	-1,05



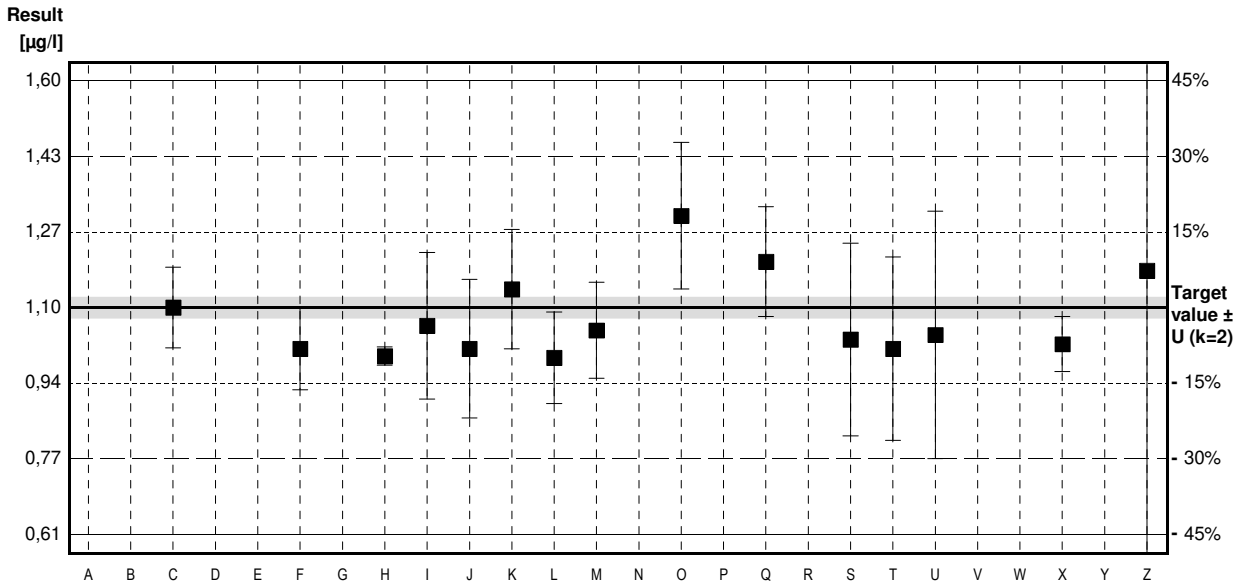


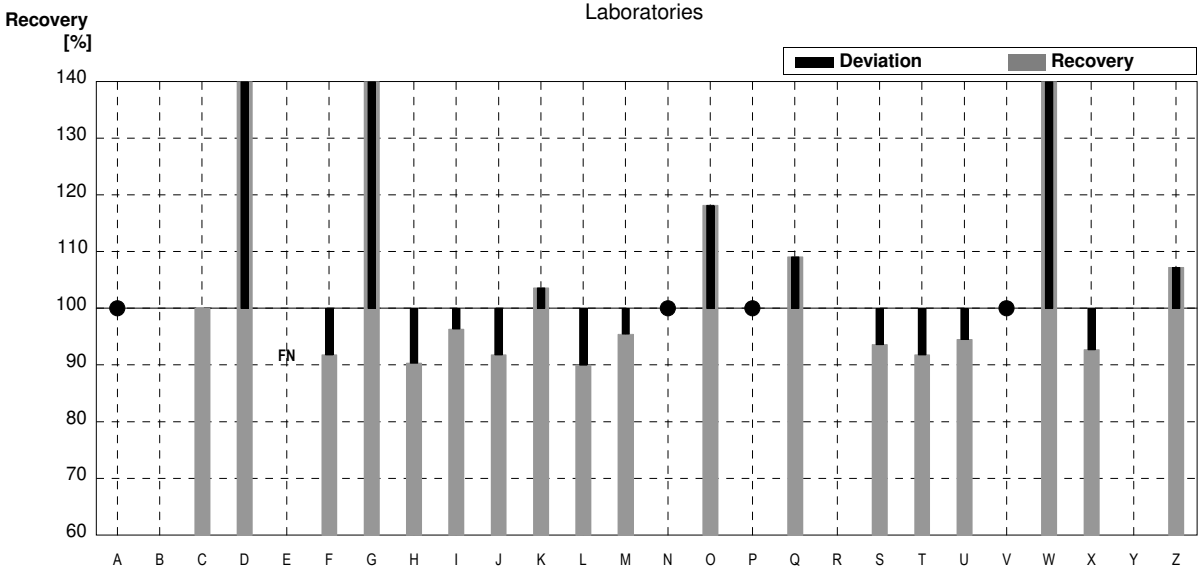
	All results	Outliers excl.	Unit
Mean ± CI(99%)	55,5 ± 4,0	56,8 ± 1,9	µg/l
Recov. ± CI(99%)	95,3 ± 6,9	97,4 ± 3,3	%
SD between labs	6,9	3,0	µg/l
RSD between labs	12,4	5,3	%
n for calculation	23	20	

Sample M154A
Parameter Copper

Target value ± U (k=2)	1,10 µg/l	±	0,02 µg/l
IFA result ± U (k=2)	1,05 µg/l	±	0,09 µg/l
Stability test ± U (k=2)	1,03 µg/l	±	0,09 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<5,0	0,0016	µg/l	•	
B			µg/l		
C	1,10	0,088	µg/l	100%	0,00
D	3,75 *	0,15	µg/l	341%	27,38
E	<1		µg/l	FN	
F	1,01	0,09	µg/l	92%	-0,93
G	2,160 *	0,211	µg/l	196%	10,95
H	0,994	0,020	µg/l	90%	-1,10
I	1,06	0,16	µg/l	96%	-0,41
J	1,01	0,151	µg/l	92%	-0,93
K	1,14	0,13	µg/l	104%	0,41
L	0,99	0,1	µg/l	90%	-1,14
M	1,05	0,105	µg/l	95%	-0,52
N	<5,0	0,5	µg/l	•	
O	1,30	0,16	µg/l	118%	2,07
P	<5		µg/l	•	
Q	1,20	0,12	µg/l	109%	1,03
R			µg/l		
S	1,03	0,21	µg/l	94%	-0,72
T	1,01	0,20	µg/l	92%	-0,93
U	1,04	0,27	µg/l	95%	-0,62
V	<10		µg/l	•	
W	1,97 *	0,20	µg/l	179%	8,99
X	1,02	0,06	µg/l	93%	-0,83
Y			µg/l		
Z	1,18	1	µg/l	107%	0,83



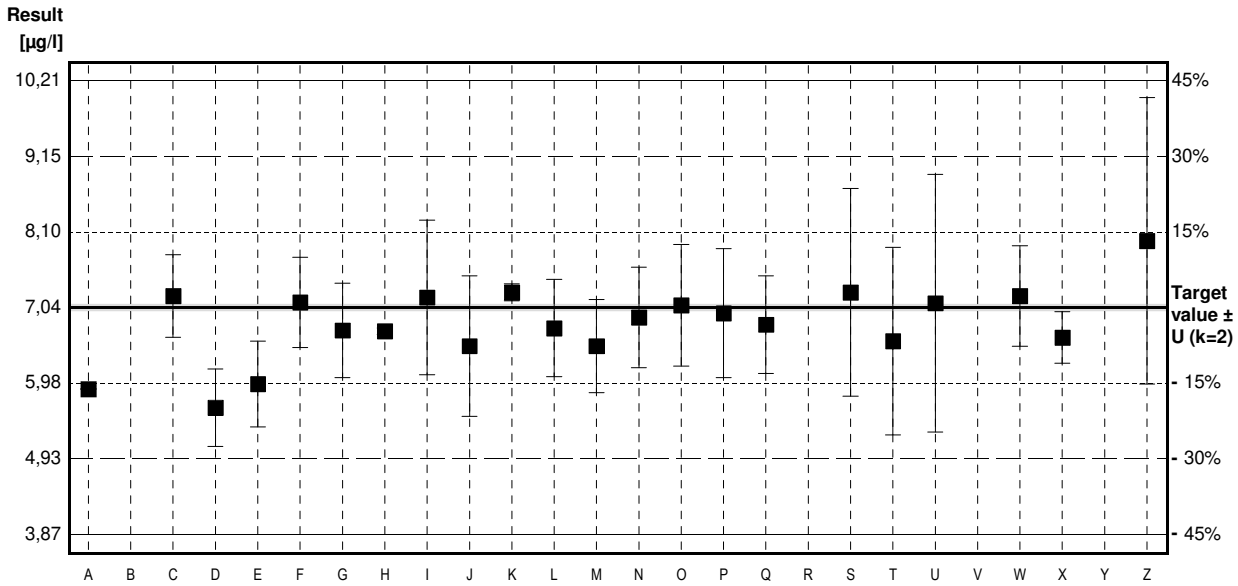


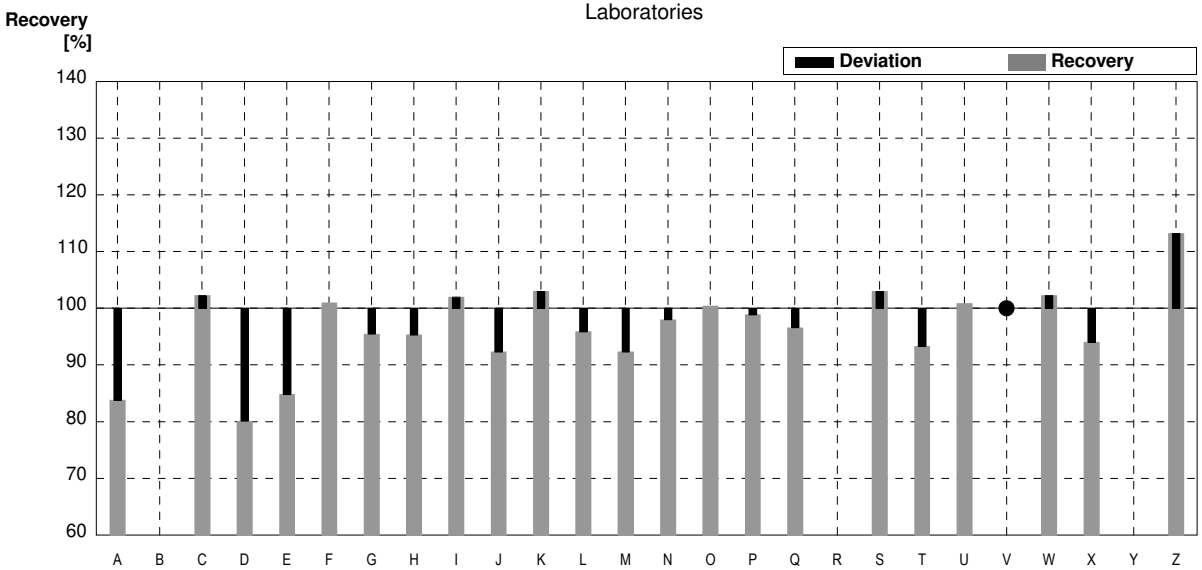
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,33 ± 0,47	1,08 ± 0,07	µg/l
Recov. ± CI(99%)	121,3 ± 42,7	97,8 ± 6,4	%
SD between labs	0,69	0,09	µg/l
RSD between labs	51,6	8,5	%
n for calculation	18	15	

Sample M154B
Parameter Copper

Target value ± U (k=2)	7,04 µg/l	±	0,05 µg/l
IFA result ± U (k=2)	6,61 µg/l	±	0,59 µg/l
Stability test ± U (k=2)	6,62 µg/l	±	0,60 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	5,90	0,0018	µg/l	84%	-1,84
B			µg/l		
C	7,20	0,576	µg/l	102%	0,26
D	5,64	0,54	µg/l	80%	-2,26
E	5,97	0,6	µg/l	85%	-1,73
F	7,11	0,63	µg/l	101%	0,11
G	6,720	0,658	µg/l	95%	-0,52
H	6,71	0,045	µg/l	95%	-0,53
I	7,18	1,08	µg/l	102%	0,23
J	6,5	0,98	µg/l	92%	-0,87
K	7,25	0,12	µg/l	103%	0,34
L	6,75	0,68	µg/l	96%	-0,47
M	6,5	0,65	µg/l	92%	-0,87
N	6,9	0,7	µg/l	98%	-0,23
O	7,07	0,85	µg/l	100%	0,05
P	6,96	0,9	µg/l	99%	-0,13
Q	6,8	0,68	µg/l	97%	-0,39
R			µg/l		
S	7,25	1,45	µg/l	103%	0,34
T	6,57	1,31	µg/l	93%	-0,76
U	7,1	1,8	µg/l	101%	0,10
V	<10		µg/l	•	
W	7,2	0,7	µg/l	102%	0,26
X	6,62	0,36	µg/l	94%	-0,68
Y			µg/l		
Z	7,97	2	µg/l	113%	1,50





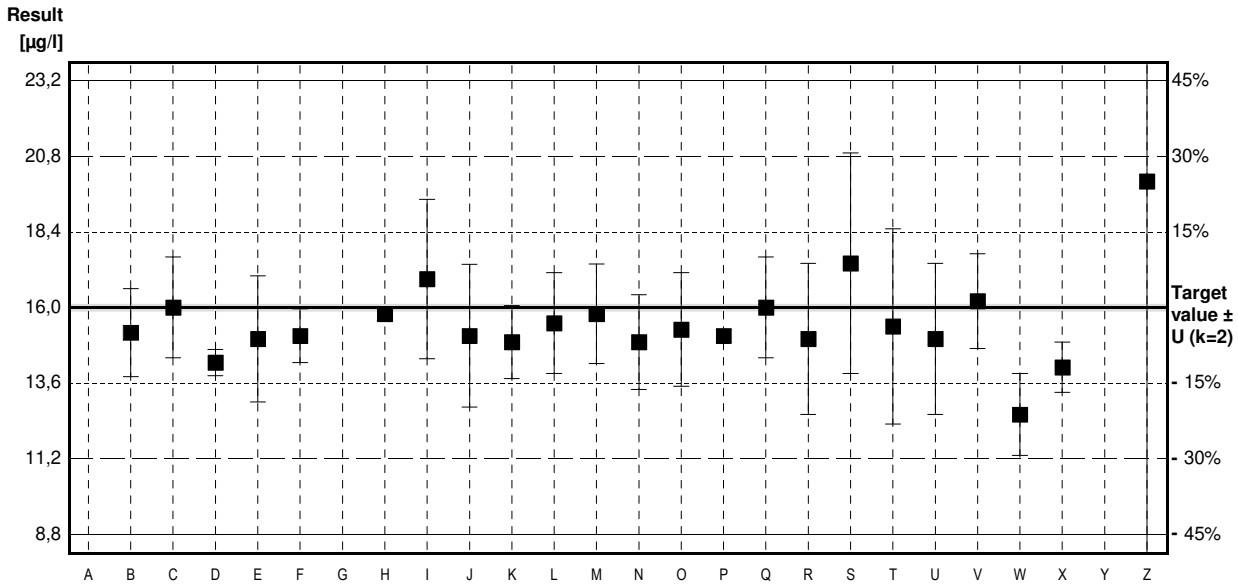
	All results	Outliers excl.	Unit
Mean ± CI(99%)	6,81 ± 0,31	6,81 ± 0,31	µg/l
Recov. ± CI(99%)	96,8 ± 4,4	96,8 ± 4,4	%
SD between labs	0,52	0,52	µg/l
RSD between labs	7,6	7,6	%
n for calculation	22	22	

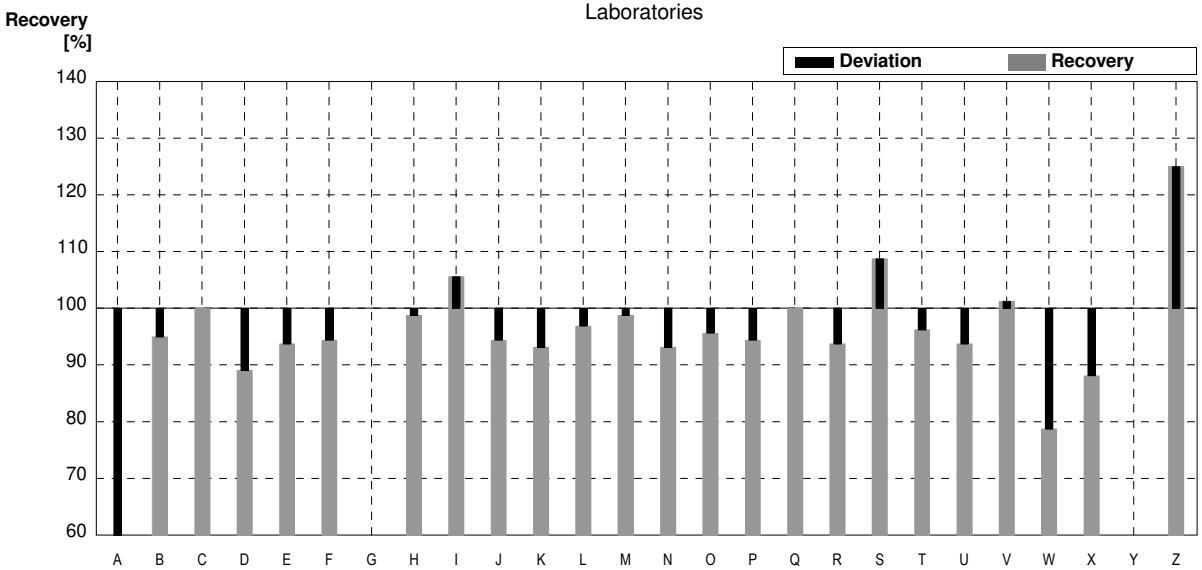
Sample M154A
Parameter Manganese

Target value ± U (k=2)	16,0 µg/l	±	0,1 µg/l
IFA result ± U (k=2)	15,9 µg/l	±	1,4 µg/l
Stability test ± U (k=2)	15,3 µg/l	±	1,4 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	0,0138 *	0,0008	µg/l	0%	-17,84
B	15,2	1,4	µg/l	95%	-0,89
C	16,00	1,6	µg/l	100%	0,00
D	14,25	0,42	µg/l	89%	-1,95
E	15,0	2	µg/l	94%	-1,12
F	15,1	0,85	µg/l	94%	-1,00
G			µg/l		
H	15,8	0,213	µg/l	99%	-0,22
I	16,9	2,53	µg/l	106%	1,00
J	15,1	2,27	µg/l	94%	-1,00
K	14,9	1,16	µg/l	93%	-1,23
L	15,5	1,6	µg/l	97%	-0,56
M	15,8	1,58	µg/l	99%	-0,22
N	14,9	1,5	µg/l	93%	-1,23
O	15,3	1,8	µg/l	96%	-0,78
P	15,1	0,2	µg/l	94%	-1,00
Q	16,0	1,6	µg/l	100%	0,00
R	15,0	2,4	µg/l	94%	-1,12
S	17,4	3,5	µg/l	109%	1,56
T	15,4	3,1	µg/l	96%	-0,67
U	15,0	2,4	µg/l	94%	-1,12
V	16,2	1,5	µg/l	101%	0,22
W	12,6 *	1,3	µg/l	79%	-3,79
X	14,1	0,8	µg/l	88%	-2,12
Y			µg/l		
Z	20,0 *	15	µg/l	125%	4,46

	All results	Outliers excl.	Unit
Mean ± CI(99%)	14,9 ± 2,0	15,4 ± 0,5	µg/l
Recov. ± CI(99%)	92,9 ± 12,3	96,4 ± 3,0	%
SD between labs	3,4	0,8	µg/l
RSD between labs	23,1	5,1	%
n for calculation	24	21	

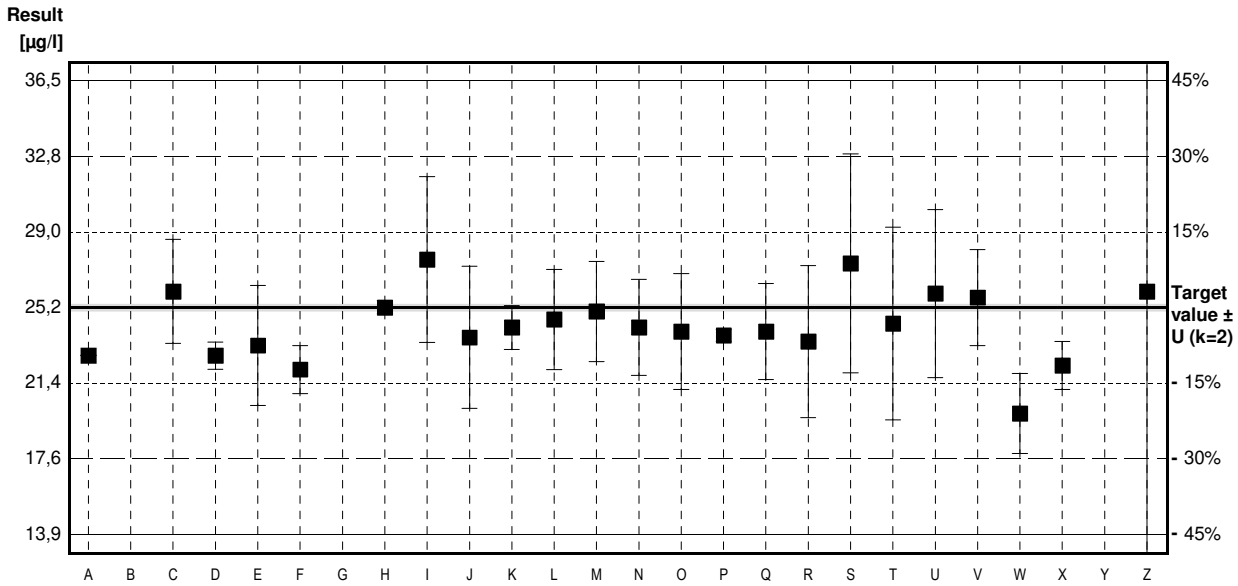


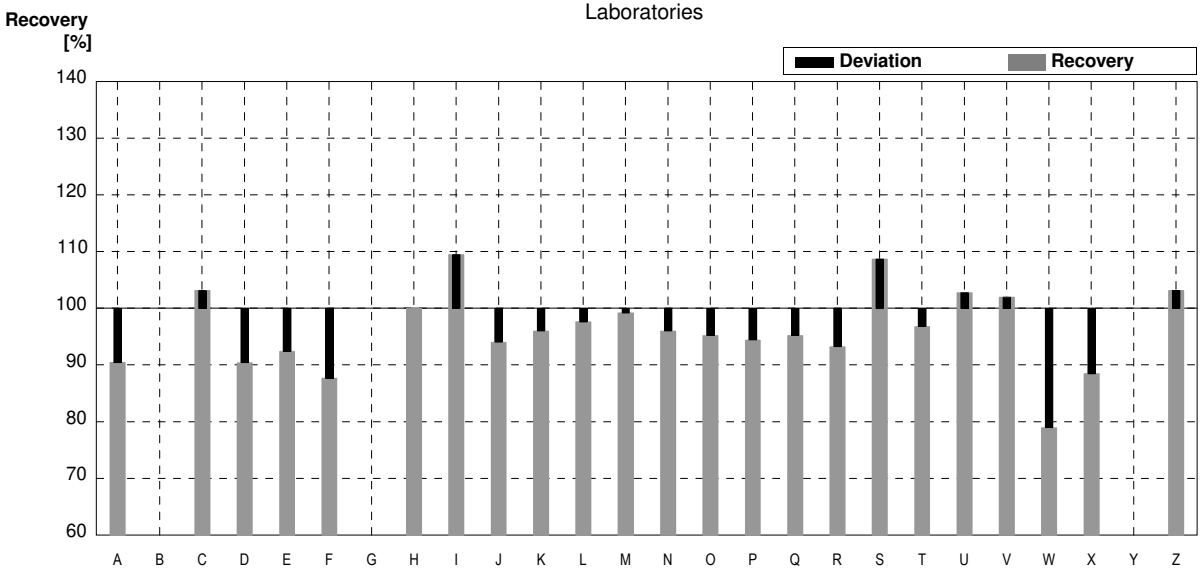


Sample M154B
Parameter Manganese

Target value ± U (k=2)	25,2 µg/l	±	0,2 µg/l
IFA result ± U (k=2)	24,4 µg/l	±	2,2 µg/l
Stability test ± U (k=2)	23,6 µg/l	±	2,1 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	22,8	0,0008	µg/l	90%	-1,70
B			µg/l		
C	26,00	2,60	µg/l	103%	0,57
D	22,79	0,68	µg/l	90%	-1,71
E	23,3	3	µg/l	92%	-1,35
F	22,1	1,2	µg/l	88%	-2,20
G			µg/l		
H	25,2	0,327	µg/l	100%	0,00
I	27,6	4,14	µg/l	110%	1,70
J	23,7	3,55	µg/l	94%	-1,06
K	24,2	1,10	µg/l	96%	-0,71
L	24,6	2,5	µg/l	98%	-0,43
M	25,0	2,5	µg/l	99%	-0,14
N	24,2	2,4	µg/l	96%	-0,71
O	24,0	2,9	µg/l	95%	-0,85
P	23,8	0,3	µg/l	94%	-0,99
Q	24,0	2,4	µg/l	95%	-0,85
R	23,5	3,8	µg/l	93%	-1,20
S	27,4	5,47	µg/l	109%	1,56
T	24,4	4,82	µg/l	97%	-0,57
U	25,9	4,2	µg/l	103%	0,50
V	25,7	2,4	µg/l	102%	0,35
W	19,9	2,0	µg/l	79%	-3,76
X	22,3	1,2	µg/l	88%	-2,05
Y			µg/l		
Z	26,0	15	µg/l	103%	0,57



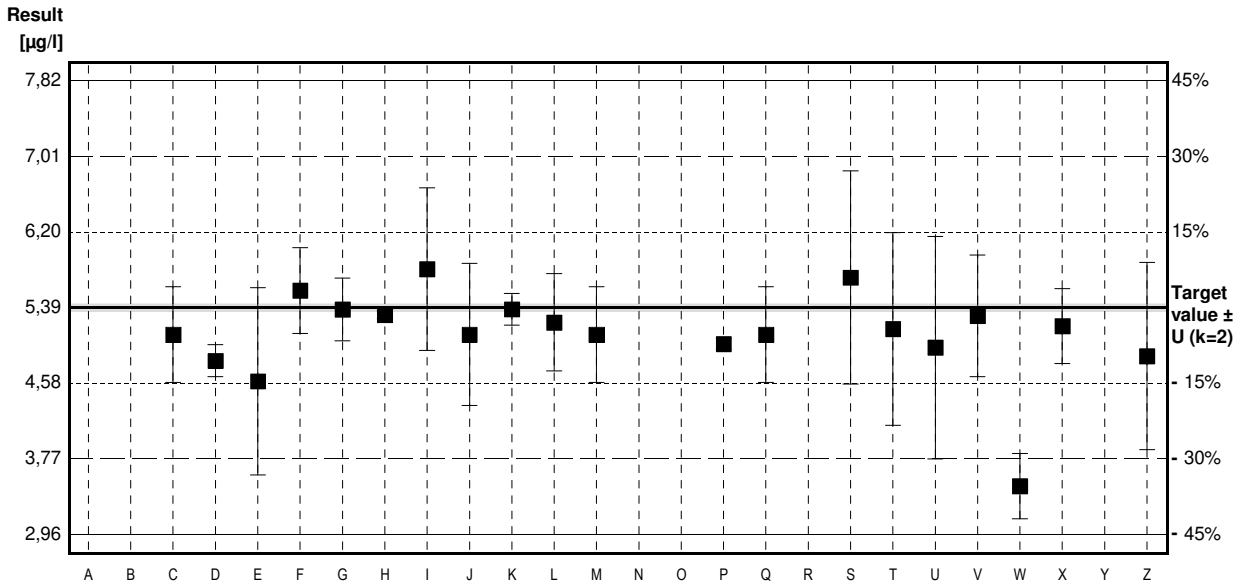


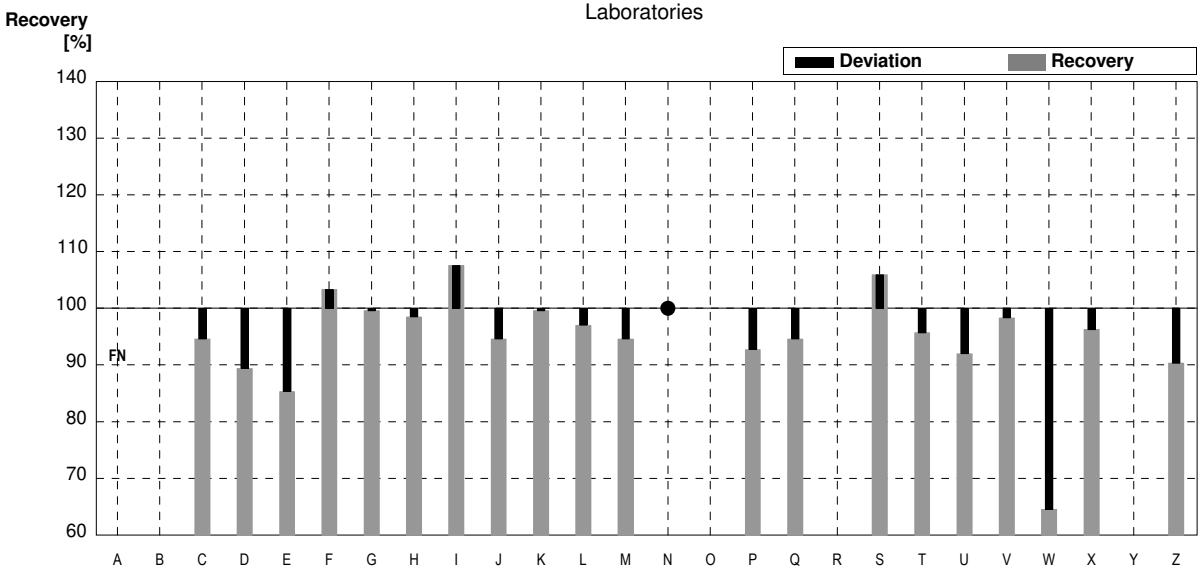
	All results	Outliers excl.	Unit
Mean ± CI(99%)	24,3 ± 1,0	24,3 ± 1,0	µg/l
Recov. ± CI(99%)	96,3 ± 4,1	96,3 ± 4,1	%
SD between labs	1,7	1,7	µg/l
RSD between labs	7,2	7,2	%
n for calculation	23	23	

Sample M154A
Parameter Nickel

Target value ± U (k=2)	5,39 µg/l	±	0,04 µg/l
IFA result ± U (k=2)	5,37 µg/l	±	0,48 µg/l
Stability test ± U (k=2)	5,43 µg/l	±	0,49 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<5,0	0,0016	µg/l	FN	
B			µg/l		
C	5,10	0,51	µg/l	95%	-0,65
D	4,82	0,17	µg/l	89%	-1,27
E	4,60	1	µg/l	85%	-1,77
F	5,57	0,46	µg/l	103%	0,40
G	5,368	0,337	µg/l	100%	-0,05
H	5,31	0,042	µg/l	99%	-0,18
I	5,80	0,87	µg/l	108%	0,92
J	5,1	0,76	µg/l	95%	-0,65
K	5,37	0,17	µg/l	100%	-0,04
L	5,23	0,52	µg/l	97%	-0,36
M	5,1	0,51	µg/l	95%	-0,65
N	<5,0	0,5	µg/l	•	
O			µg/l		
P	5,00	0,06	µg/l	93%	-0,87
Q	5,1	0,51	µg/l	95%	-0,65
R			µg/l		
S	5,71	1,14	µg/l	106%	0,72
T	5,16	1,03	µg/l	96%	-0,51
U	4,96	1,19	µg/l	92%	-0,96
V	5,3	0,65	µg/l	98%	-0,20
W	3,48 *	0,35	µg/l	65%	-4,27
X	5,19	0,40	µg/l	96%	-0,45
Y			µg/l		
Z	4,87	1	µg/l	90%	-1,16



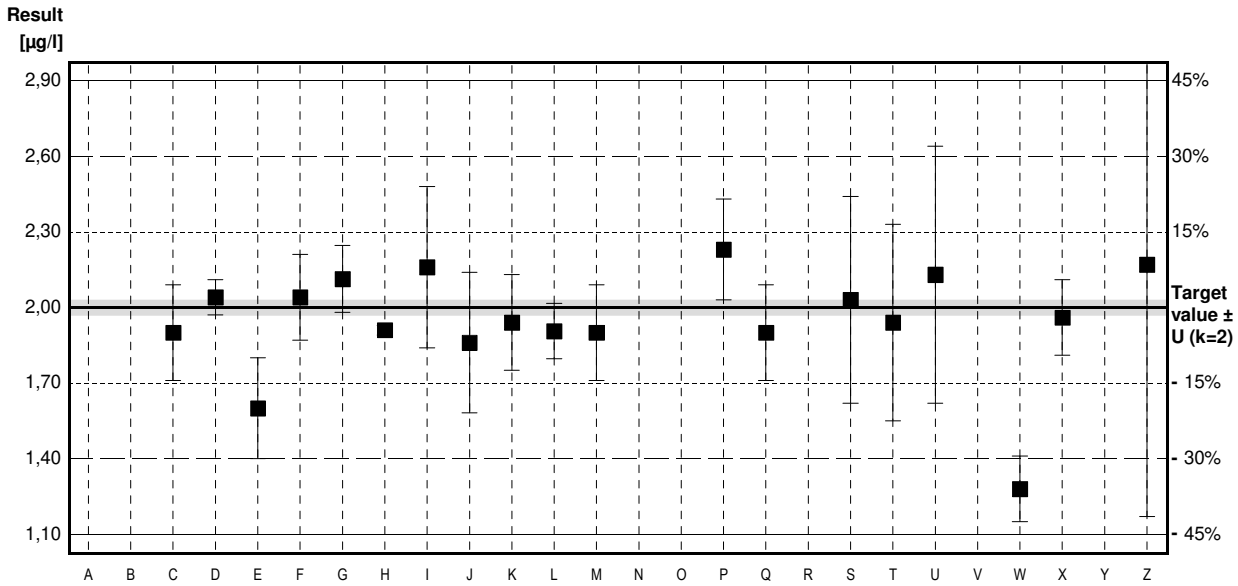


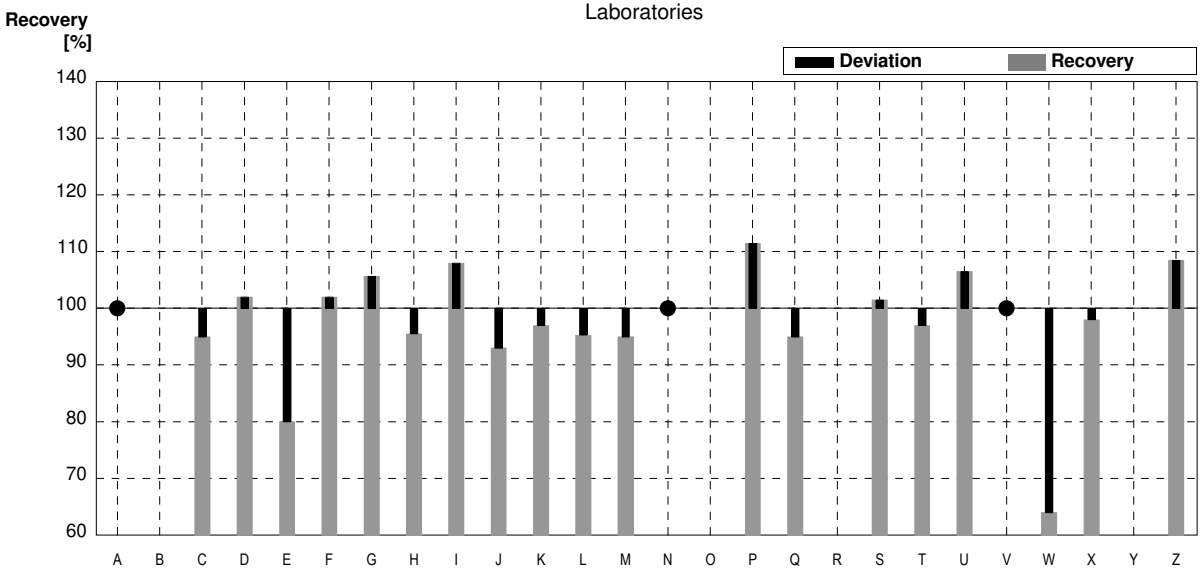
	All results	Outliers excl.	Unit
Mean ± CI(99%)	5,11 ± 0,31	5,19 ± 0,20	µg/l
Recov. ± CI(99%)	94,7 ± 5,7	96,3 ± 3,6	%
SD between labs	0,48	0,30	µg/l
RSD between labs	9,4	5,7	%
n for calculation	20	19	

Sample M154B
Parameter Nickel

Target value	± U (k=2)	2,00 µg/l	±	0,03 µg/l
IFA result	± U (k=2)	1,99 µg/l	±	0,18 µg/l
Stability test	± U (k=2)	2,04 µg/l	±	0,18 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<5,0	0,0008	µg/l	•	
B			µg/l		
C	1,90	0,19	µg/l	95%	-0,60
D	2,04	0,07	µg/l	102%	0,24
E	1,60	0,2	µg/l	80%	-2,41
F	2,04	0,17	µg/l	102%	0,24
G	2,113	0,133	µg/l	106%	0,68
H	1,91	0,019	µg/l	96%	-0,54
I	2,16	0,32	µg/l	108%	0,96
J	1,86	0,279	µg/l	93%	-0,84
K	1,94	0,19	µg/l	97%	-0,36
L	1,906	0,11	µg/l	95%	-0,57
M	1,90	0,190	µg/l	95%	-0,60
N	<5,0	0,5	µg/l	•	
O			µg/l		
P	2,23	0,2	µg/l	112%	1,39
Q	1,90	0,19	µg/l	95%	-0,60
R			µg/l		
S	2,03	0,41	µg/l	102%	0,18
T	1,94	0,39	µg/l	97%	-0,36
U	2,13	0,51	µg/l	107%	0,78
V	<2,0		µg/l	•	
W	1,28 *	0,13	µg/l	64%	-4,34
X	1,96	0,15	µg/l	98%	-0,24
Y			µg/l		
Z	2,17	1	µg/l	109%	1,02



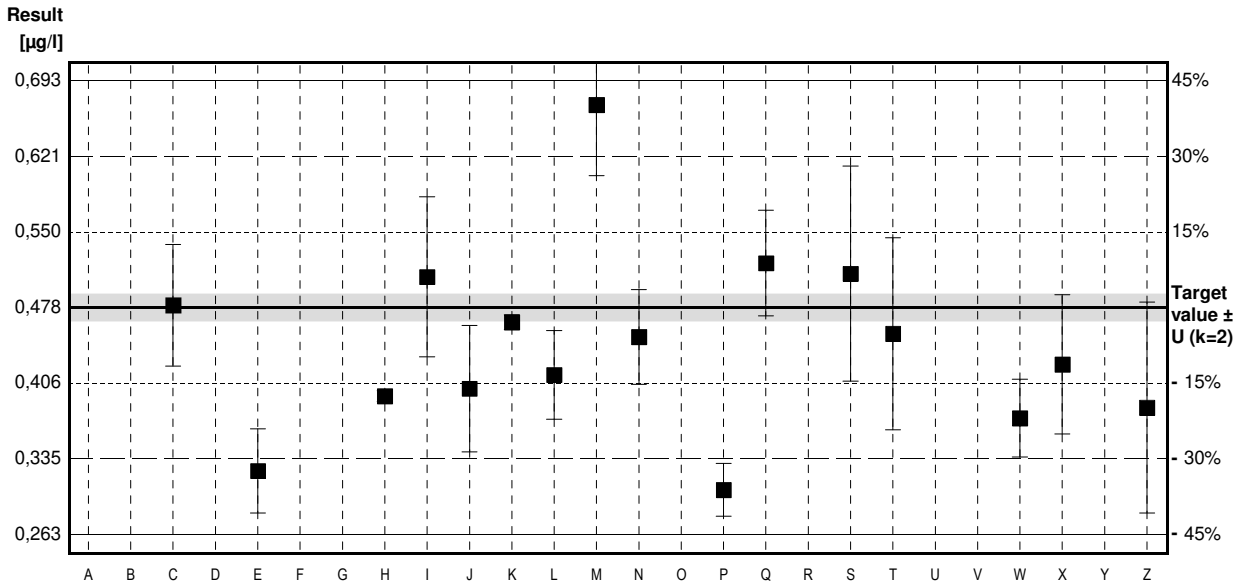


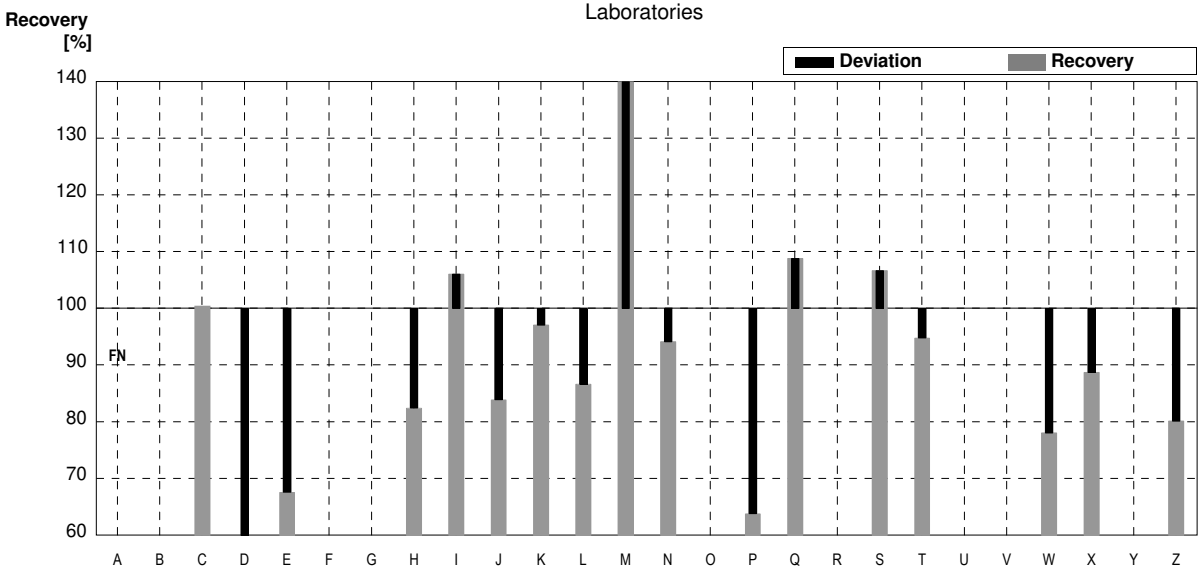
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,95 ± 0,14	1,98 ± 0,10	µg/l
Recov. ± CI(99%)	97,4 ± 7,2	99,2 ± 5,1	%
SD between labs	0,22	0,15	µg/l
RSD between labs	11,1	7,5	%
n for calculation	19	18	

Sample M154A
Parameter Mercury

Target value ± U (k=2) 0,478 µg/l ± 0,013 µg/l
IFA result ± U (k=2) 0,422 µg/l ± 0,042 µg/l
Stability test µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<0,40	0,0139	µg/l	FN	
B			µg/l		
C	0,480	0,0576	µg/l	100%	0,04
D	0,234	0,011	µg/l	49%	-4,64
E	0,323	0,04	µg/l	68%	-2,95
F			µg/l		
G			µg/l		
H	0,394	0,005	µg/l	82%	-1,60
I	0,507	0,076	µg/l	106%	0,55
J	0,401	0,060	µg/l	84%	-1,46
K	0,464	0,007	µg/l	97%	-0,27
L	0,414	0,042	µg/l	87%	-1,22
M	0,67 *	0,067	µg/l	140%	3,65
N	0,450	0,045	µg/l	94%	-0,53
O			µg/l		
P	0,305	0,025	µg/l	64%	-3,29
Q	0,52	0,05	µg/l	109%	0,80
R			µg/l		
S	0,510	0,102	µg/l	107%	0,61
T	0,453	0,091	µg/l	95%	-0,48
U			µg/l		
V			µg/l		
W	0,373	0,037	µg/l	78%	-2,00
X	0,424	0,066	µg/l	89%	-1,03
Y			µg/l		
Z	0,383	0,1	µg/l	80%	-1,81



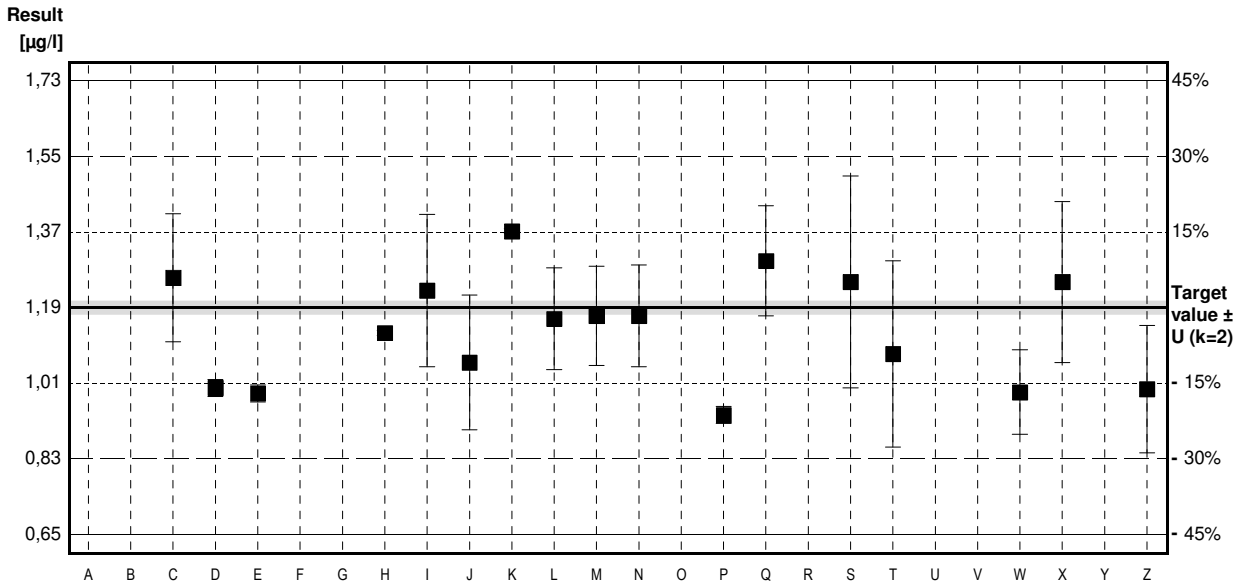


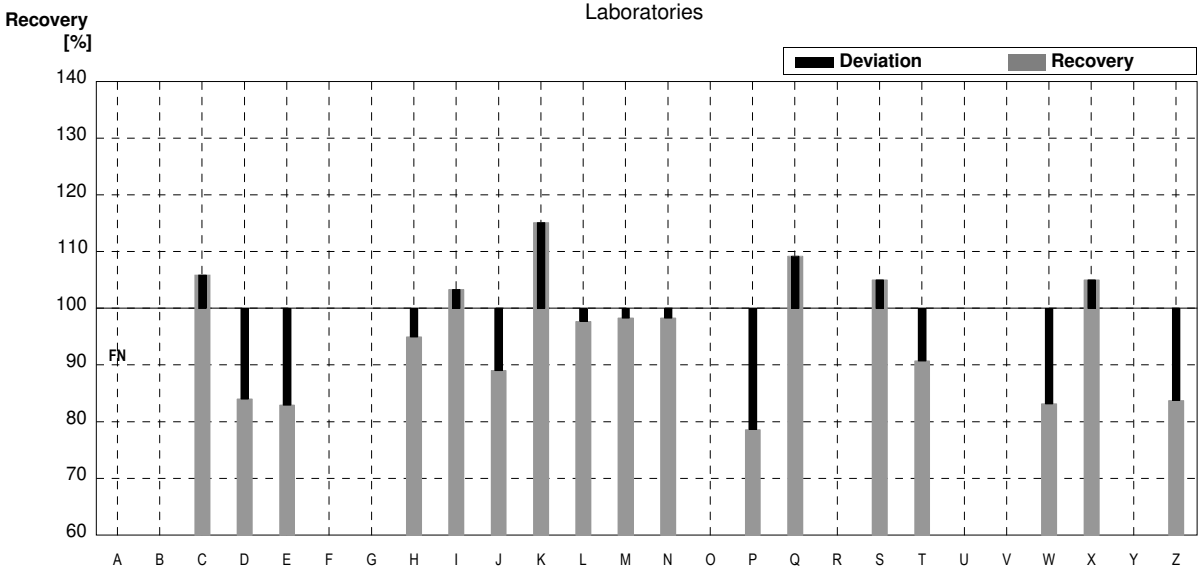
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,430 ± 0,070	0,415 ± 0,059	µg/l
Recov. ± CI(99%)	89,9 ± 14,6	86,8 ± 12,3	%
SD between labs	0,099	0,079	µg/l
RSD between labs	23,0	19,2	%
n for calculation	17	16	

Sample M154B
Parameter Mercury

Target value ± U (k=2)	1,19 µg/l	±	0,02 µg/l		
IFA result ± U (k=2)	1,14 µg/l	±	0,11 µg/l		
Stability test	µg/l				

Lab Code	Result	±	Unit	Recovery	z-Score
A	<0,40	0,0053	µg/l	FN	
B			µg/l		
C	1,260	0,1512	µg/l	106%	0,53
D	1,00	0,02	µg/l	84%	-1,45
E	0,987	0,02	µg/l	83%	-1,55
F			µg/l		
G			µg/l		
H	1,13	0,006	µg/l	95%	-0,46
I	1,23	0,18	µg/l	103%	0,31
J	1,06	0,159	µg/l	89%	-0,99
K	1,37	0,006	µg/l	115%	1,38
L	1,163	0,12	µg/l	98%	-0,21
M	1,17	0,117	µg/l	98%	-0,15
N	1,17	0,12	µg/l	98%	-0,15
O			µg/l		
P	0,936	0,02	µg/l	79%	-1,94
Q	1,30	0,13	µg/l	109%	0,84
R			µg/l		
S	1,25	0,25	µg/l	105%	0,46
T	1,08	0,22	µg/l	91%	-0,84
U			µg/l		
V			µg/l		
W	0,99	0,10	µg/l	83%	-1,53
X	1,25	0,19	µg/l	105%	0,46
Y			µg/l		
Z	0,997	0,15	µg/l	84%	-1,47



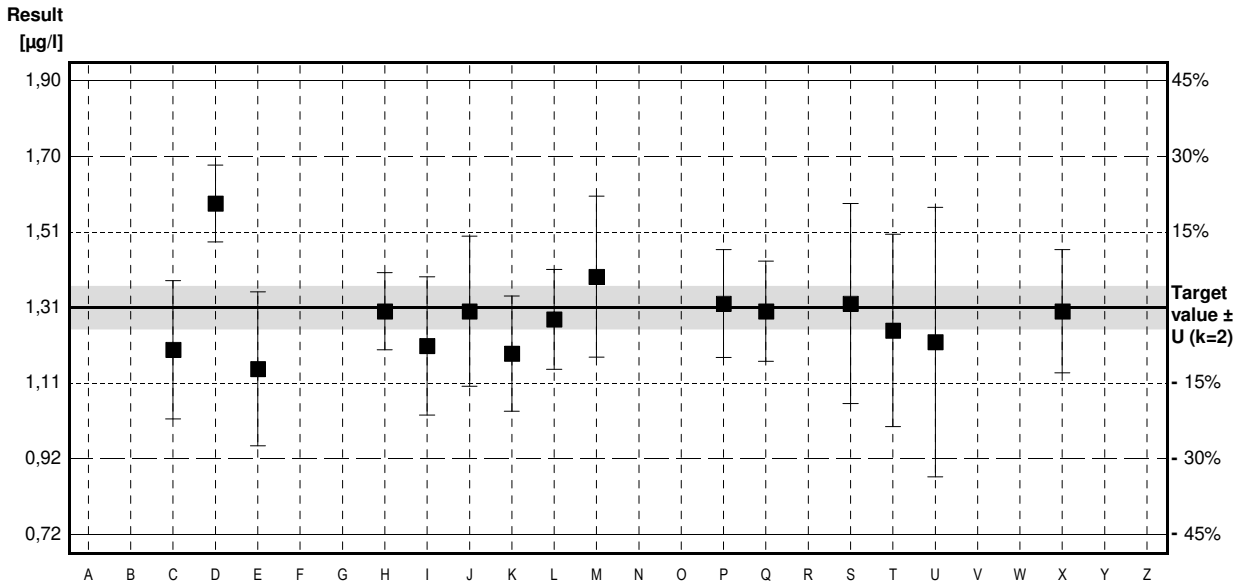


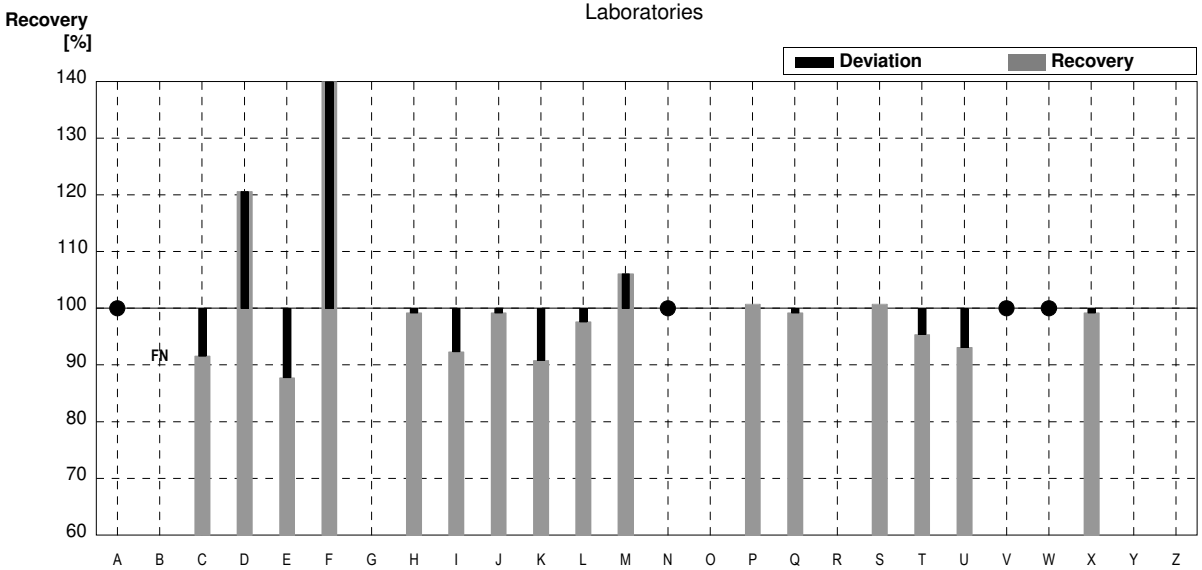
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,14 ± 0,09	1,14 ± 0,09	µg/l
Recov. ± CI(99%)	95,6 ± 7,7	95,6 ± 7,7	%
SD between labs	0,13	0,13	µg/l
RSD between labs	11,3	11,3	%
n for calculation	17	17	

Sample M154A
Parameter Selenium

Target value	± U (k=2)	1,31 µg/l	±	0,06 µg/l
IFA result	± U (k=2)	1,25 µg/l	±	0,18 µg/l
Stability test	± U (k=2)	1,14 µg/l	±	0,16 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<5,0	0,002	µg/l	•	
B	<0,7		µg/l	FN	
C	1,20	0,18	µg/l	92%	-0,76
D	1,58	0,10	µg/l	121%	1,87
E	1,15	0,2	µg/l	88%	-1,11
F	2,43 *	0,27	µg/l	185%	7,77
G			µg/l		
H	1,30	0,100	µg/l	99%	-0,07
I	1,21	0,18	µg/l	92%	-0,69
J	1,30	0,195	µg/l	99%	-0,07
K	1,19	0,15	µg/l	91%	-0,83
L	1,279	0,13	µg/l	98%	-0,22
M	1,39	0,209	µg/l	106%	0,56
N	<5,0	0,5	µg/l	•	
O			µg/l		
P	1,32	0,14	µg/l	101%	0,07
Q	1,30	0,13	µg/l	99%	-0,07
R			µg/l		
S	1,32	0,26	µg/l	101%	0,07
T	1,25	0,25	µg/l	95%	-0,42
U	1,22	0,35	µg/l	93%	-0,62
V	<5		µg/l	•	
W	<5		µg/l	•	
X	1,30	0,16	µg/l	99%	-0,07
Y			µg/l		
Z			µg/l		



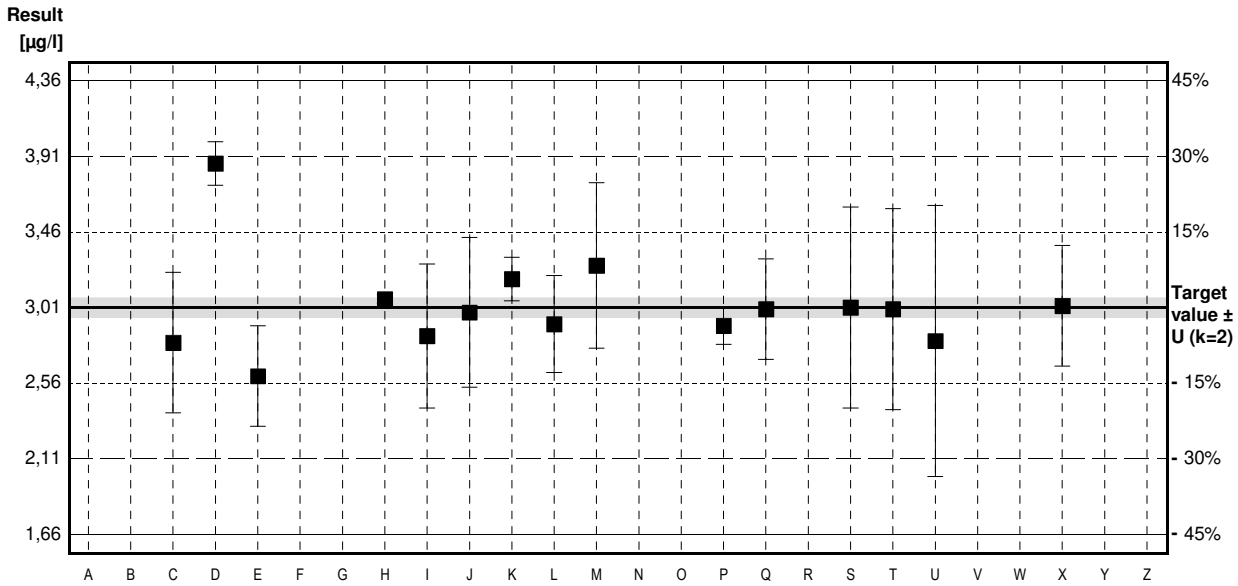


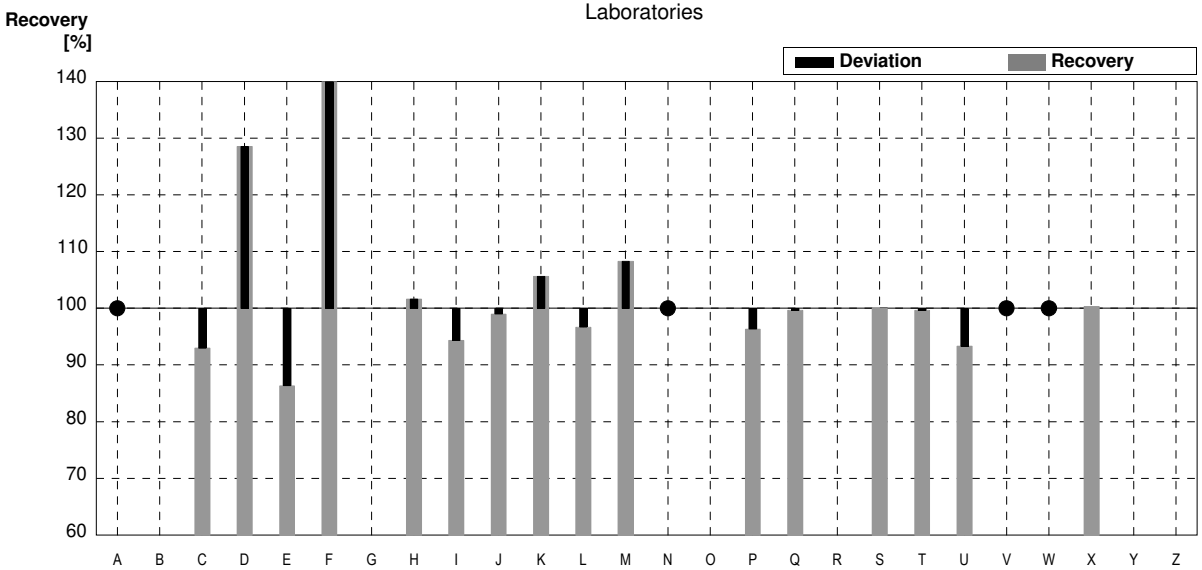
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,36 ± 0,22	1,29 ± 0,08	µg/l
Recov. ± CI(99%)	103,7 ± 17,0	98,3 ± 6,0	%
SD between labs	0,30	0,10	µg/l
RSD between labs	22,3	8,0	%
n for calculation	16	15	

Sample M154B
Parameter Selenium

Target value ± U (k=2)	3,01 µg/l	±	0,06 µg/l
IFA result ± U (k=2)	3,30 µg/l	±	0,46 µg/l
Stability test ± U (k=2)	2,79 µg/l	±	0,39 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<5,0	0,0026	µg/l	•	
B			µg/l		
C	2,80	0,42	µg/l	93%	-0,63
D	3,87 *	0,13	µg/l	129%	2,60
E	2,60	0,3	µg/l	86%	-1,24
F	4,38 *	0,48	µg/l	146%	4,14
G			µg/l		
H	3,06	0,026	µg/l	102%	0,15
I	2,84	0,43	µg/l	94%	-0,51
J	2,98	0,447	µg/l	99%	-0,09
K	3,18	0,13	µg/l	106%	0,51
L	2,911	0,29	µg/l	97%	-0,30
M	3,26	0,494	µg/l	108%	0,76
N	<5,0	0,5	µg/l	•	
O			µg/l		
P	2,90	0,11	µg/l	96%	-0,33
Q	3,00	0,3	µg/l	100%	-0,03
R			µg/l		
S	3,01	0,60	µg/l	100%	0,00
T	3,00	0,60	µg/l	100%	-0,03
U	2,81	0,81	µg/l	93%	-0,60
V	<5		µg/l	•	
W	<5		µg/l	•	
X	3,02	0,36	µg/l	100%	0,03
Y			µg/l		
Z			µg/l		



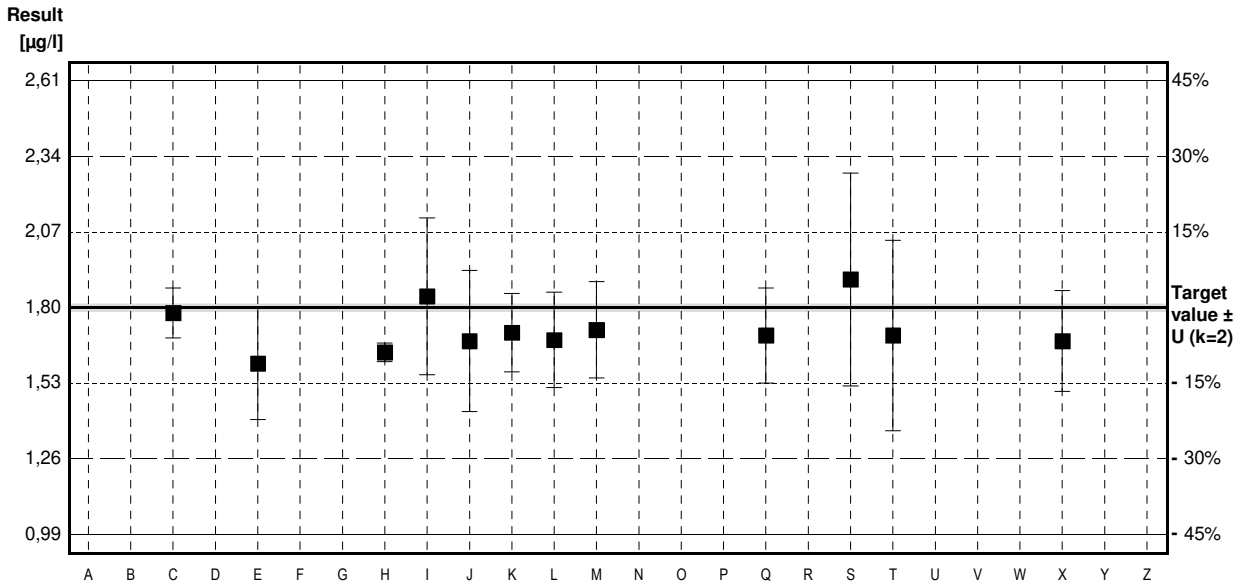


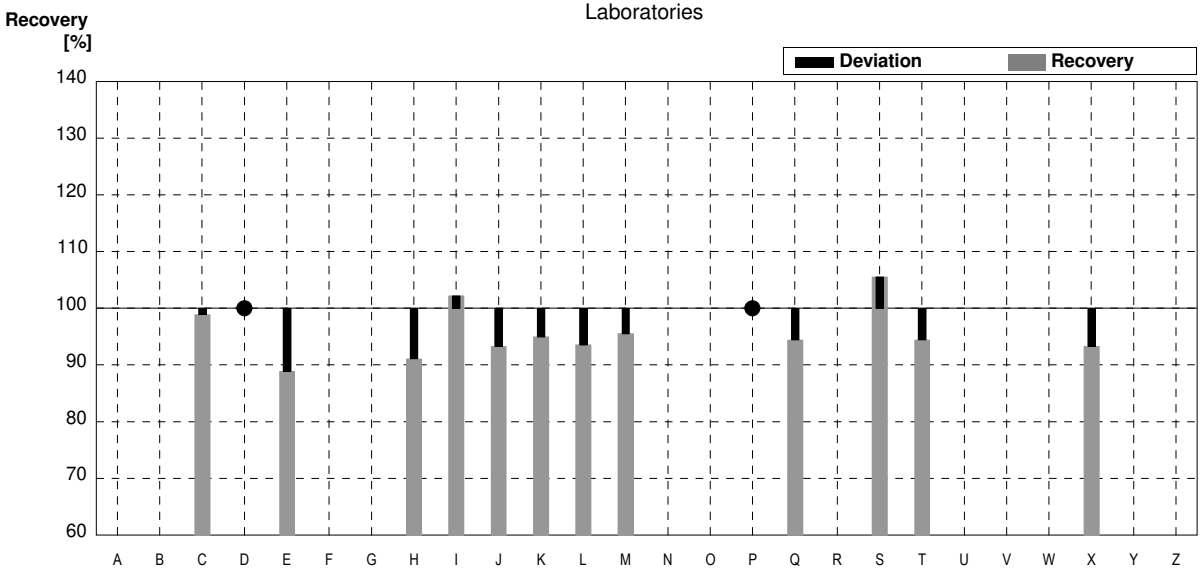
	All results	Outliers excl.	Unit
Mean ± CI(99%)	3,10 ± 0,32	2,96 ± 0,13	µg/l
Recov. ± CI(99%)	103,0 ± 10,7	98,2 ± 4,4	%
SD between labs	0,44	0,17	µg/l
RSD between labs	14,1	5,6	%
n for calculation	16	14	

Sample M154A
Parameter Uranium

Target value	± U (k=2)	1,80 µg/l	±	0,01 µg/l
IFA result	± U (k=2)	1,77 µg/l	±	0,18 µg/l
Stability test	± U (k=2)	1,82 µg/l	±	0,18 µg/l

Lab Code	Result		±	Unit	Recovery	z-Score
A				µg/l		
B				µg/l		
C	1,78		0,089	µg/l	99%	-0,19
D	<2,2			µg/l	•	
E	1,60	*	0,2	µg/l	89%	-1,88
F				µg/l		
G				µg/l		
H	1,64		0,033	µg/l	91%	-1,51
I	1,84	*	0,28	µg/l	102%	0,38
J	1,68		0,252	µg/l	93%	-1,13
K	1,71		0,14	µg/l	95%	-0,85
L	1,684		0,17	µg/l	94%	-1,09
M	1,72		0,172	µg/l	96%	-0,75
N				µg/l		
O				µg/l		
P	<2			µg/l	•	
Q	1,70		0,17	µg/l	94%	-0,94
R				µg/l		
S	1,90	*	0,38	µg/l	106%	0,94
T	1,70		0,34	µg/l	94%	-0,94
U				µg/l		
V				µg/l		
W				µg/l		
X	1,68		0,18	µg/l	93%	-1,13
Y				µg/l		
Z				µg/l		



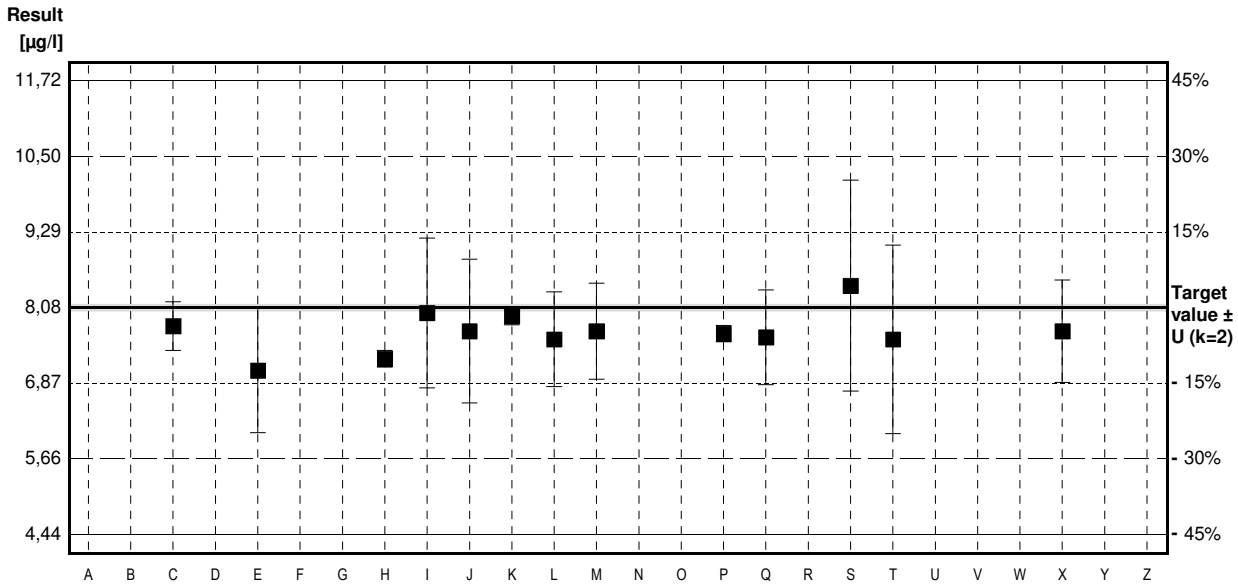


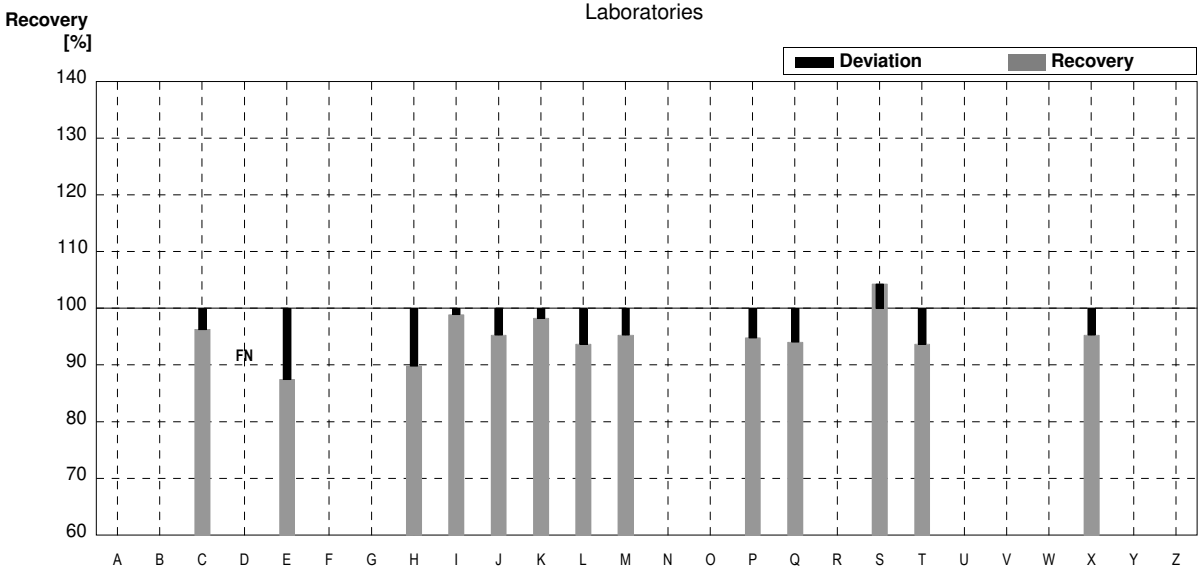
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,72 ± 0,07	1,70 ± 0,04	µg/l
Recov. ± CI(99%)	95,5 ± 4,2	94,4 ± 2,4	%
SD between labs	0,08	0,04	µg/l
RSD between labs	4,9	2,2	%
n for calculation	12	9	

Sample M154B
Parameter Uranium

Target value	± U (k=2)	8,08 µg/l	±	0,05 µg/l
IFA result	± U (k=2)	7,91 µg/l	±	0,79 µg/l
Stability test	± U (k=2)	8,05 µg/l	±	0,81 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A			µg/l		
B			µg/l		
C	7,78	0,389	µg/l	96%	-0,63
D	<5,7		µg/l	FN	
E	7,07	1	µg/l	88%	-2,12
F			µg/l		
G			µg/l		
H	7,26	0,134	µg/l	90%	-1,72
I	7,99	1,20	µg/l	99%	-0,19
J	7,7	1,15	µg/l	95%	-0,80
K	7,94	0,14	µg/l	98%	-0,29
L	7,570	0,76	µg/l	94%	-1,07
M	7,7	0,77	µg/l	95%	-0,80
N			µg/l		
O			µg/l		
P	7,66	0,13	µg/l	95%	-0,88
Q	7,60	0,76	µg/l	94%	-1,01
R			µg/l		
S	8,43 *	1,69	µg/l	104%	0,73
T	7,57	1,51	µg/l	94%	-1,07
U			µg/l		
V			µg/l		
W			µg/l		
X	7,70	0,82	µg/l	95%	-0,80
Y			µg/l		
Z			µg/l		



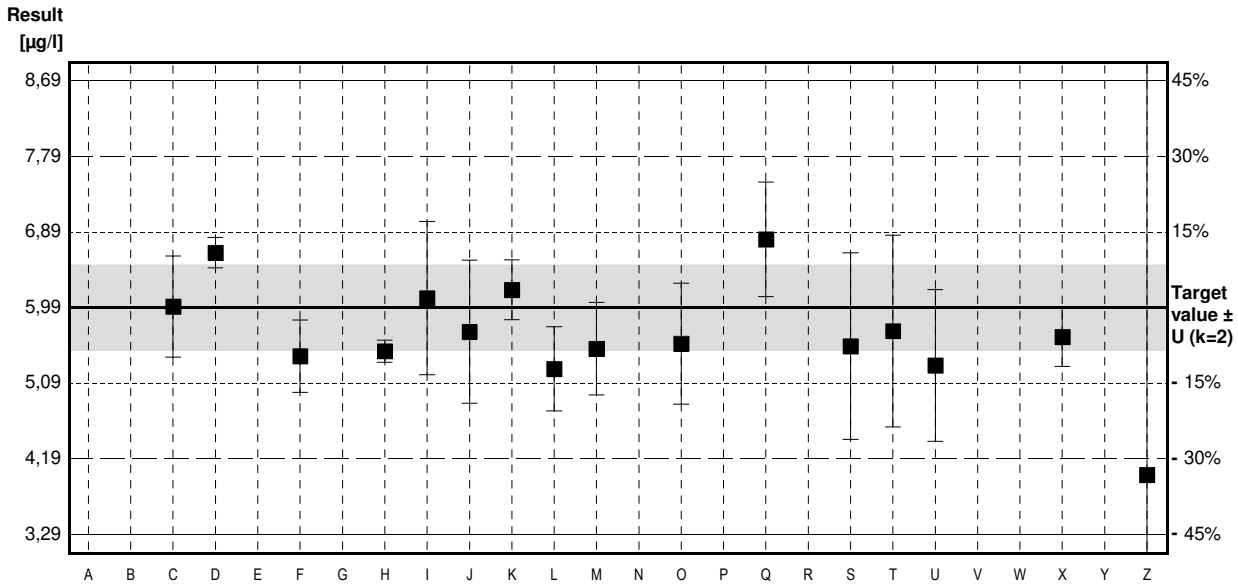


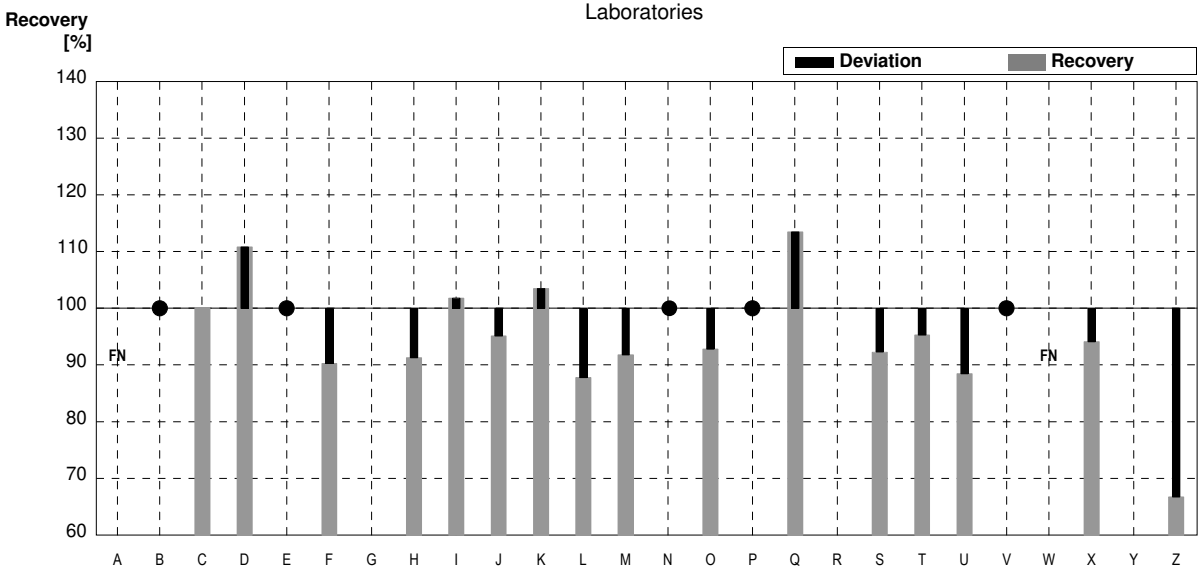
	All results	Outliers excl.	Unit
Mean ± CI(99%)	7,69 ± 0,28	7,63 ± 0,23	µg/l
Recov. ± CI(99%)	95,2 ± 3,5	94,4 ± 2,8	%
SD between labs	0,33	0,26	µg/l
RSD between labs	4,3	3,4	%
n for calculation	13	12	

Sample M154A
Parameter Zinc

Target value ± U (k=2)	5,99 µg/l	±	0,51 µg/l
IFA result ± U (k=2)	6,09 µg/l	±	1,22 µg/l
Stability test ± U (k=2)	5,94 µg/l	±	1,19 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<5,0	0	µg/l	FN	
B	<10		µg/l	•	
C	6,00	0,6	µg/l	100%	0,02
D	6,64	0,18	µg/l	111%	1,36
E	<10		µg/l	•	
F	5,41	0,43	µg/l	90%	-1,21
G			µg/l		
H	5,47	0,131	µg/l	91%	-1,09
I	6,10	0,91	µg/l	102%	0,23
J	5,7	0,85	µg/l	95%	-0,61
K	6,20	0,354	µg/l	104%	0,44
L	5,26	0,5	µg/l	88%	-1,52
M	5,5	0,55	µg/l	92%	-1,02
N	<5,0	0,5	µg/l	•	
O	5,56	0,72	µg/l	93%	-0,90
P	<10		µg/l	•	
Q	6,8 *	0,68	µg/l	114%	1,69
R			µg/l		
S	5,53	1,11	µg/l	92%	-0,96
T	5,71	1,14	µg/l	95%	-0,58
U	5,3	0,9	µg/l	88%	-1,44
V	<10		µg/l	•	
W	<5		µg/l	FN	
X	5,64	0,35	µg/l	94%	-0,73
Y			µg/l		
Z	4,00 *	10	µg/l	67%	-4,15





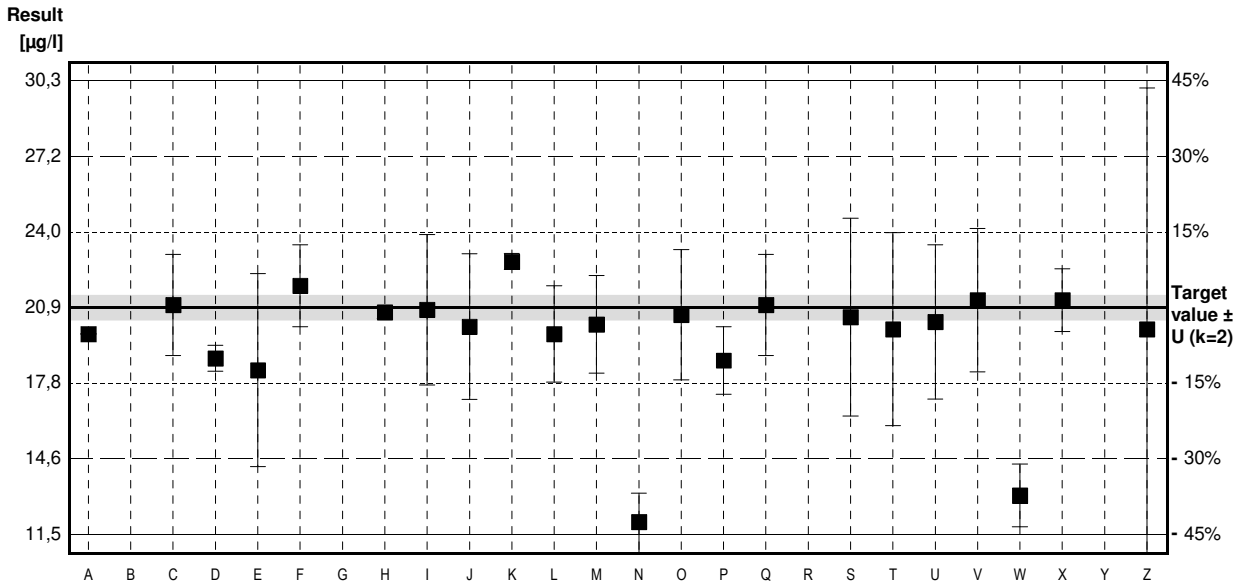
	All results	Outliers excl.	Unit
Mean ± CI(99%)	5,68 ± 0,47	5,72 ± 0,31	µg/l
Recov. ± CI(99%)	94,8 ± 7,8	95,4 ± 5,2	%
SD between labs	0,64	0,39	µg/l
RSD between labs	11,2	6,8	%
n for calculation	16	14	

Sample M154B
Parameter Zinc

Target value ± U (k=2)	20,9 µg/l	±	0,5 µg/l
IFA result ± U (k=2)	20,1 µg/l	±	4,0 µg/l
Stability test ± U (k=2)	19,1 µg/l	±	3,8 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	19,8	0,0008	µg/l	95%	-0,66
B			µg/l		
C	21,00	2,10	µg/l	100%	0,06
D	18,79	0,54	µg/l	90%	-1,26
E	18,3	4	µg/l	88%	-1,56
F	21,8	1,7	µg/l	104%	0,54
G			µg/l		
H	20,7	0,260	µg/l	99%	-0,12
I	20,8	3,12	µg/l	100%	-0,06
J	20,1	3,02	µg/l	96%	-0,48
K	22,8	0,33	µg/l	109%	1,14
L	19,8	2	µg/l	95%	-0,66
M	20,2	2,02	µg/l	97%	-0,42
N	12,0 *	1,2	µg/l	57%	-5,32
O	20,6	2,7	µg/l	99%	-0,18
P	18,7	1,4	µg/l	89%	-1,32
Q	21,0	2,1	µg/l	100%	0,06
R			µg/l		
S	20,5	4,10	µg/l	98%	-0,24
T	20,0	4,0	µg/l	96%	-0,54
U	20,3	3,2	µg/l	97%	-0,36
V	21,2	2,97	µg/l	101%	0,18
W	13,1 *	1,3	µg/l	63%	-4,67
X	21,2	1,3	µg/l	101%	0,18
Y			µg/l		
Z	20,0	10	µg/l	96%	-0,54

	All results	Outliers excl.	Unit
Mean ± CI(99%)	19,7 ± 1,5	20,4 ± 0,7	µg/l
Recov. ± CI(99%)	94,1 ± 7,3	97,5 ± 3,2	%
SD between labs	2,5	1,1	µg/l
RSD between labs	12,8	5,2	%
n for calculation	22	20	



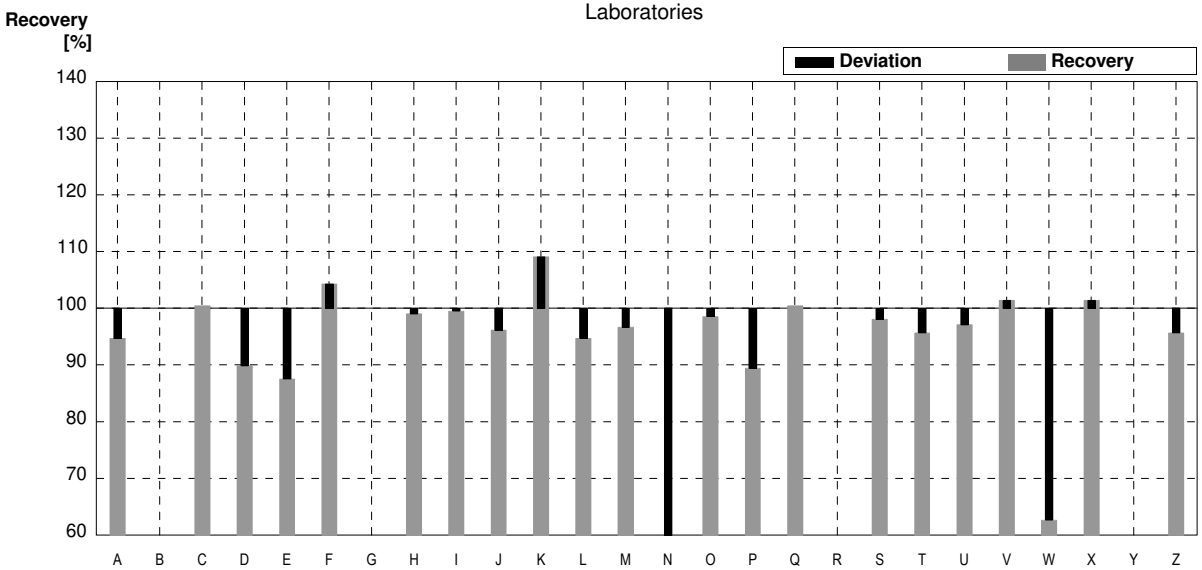


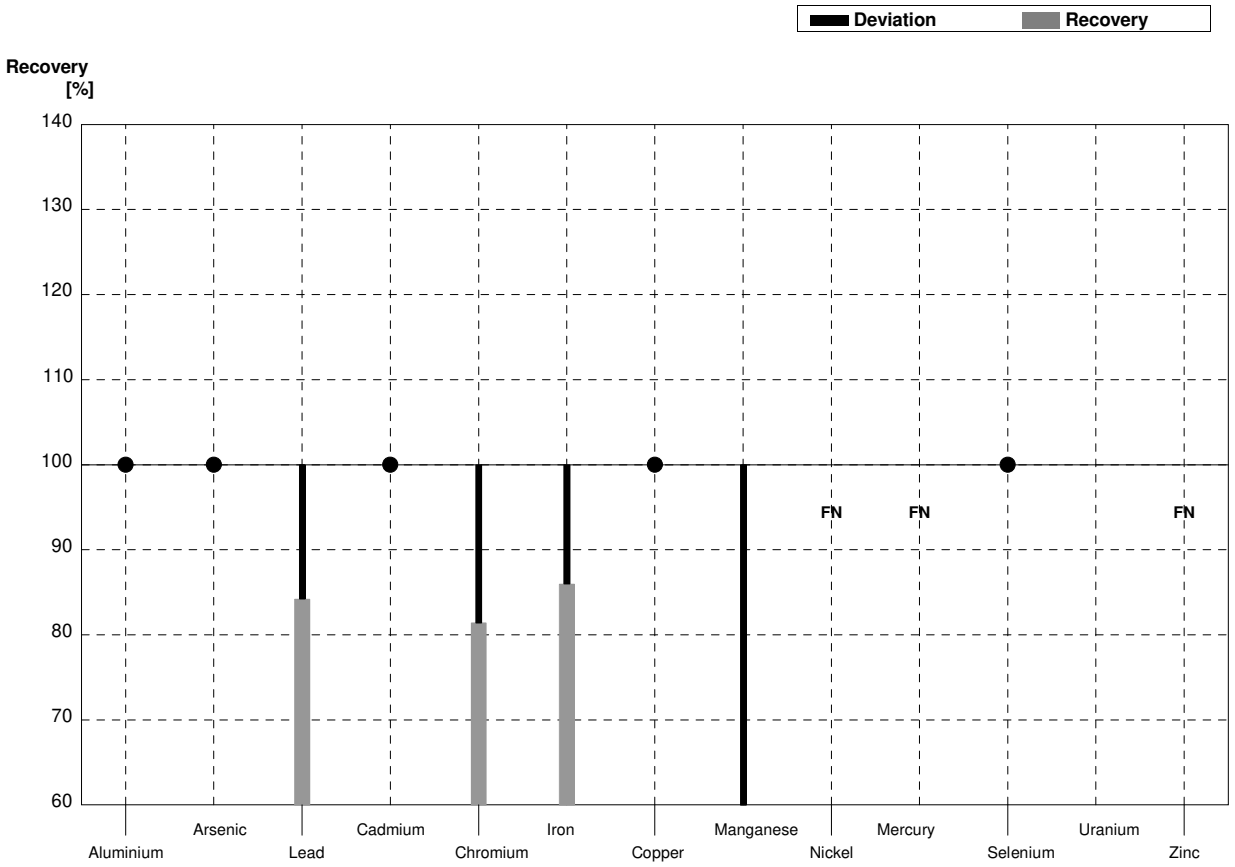
Illustration of Results
Laboratory Oriented Part

Round M154
Metals

Sample Dispatch: 9 November 2020

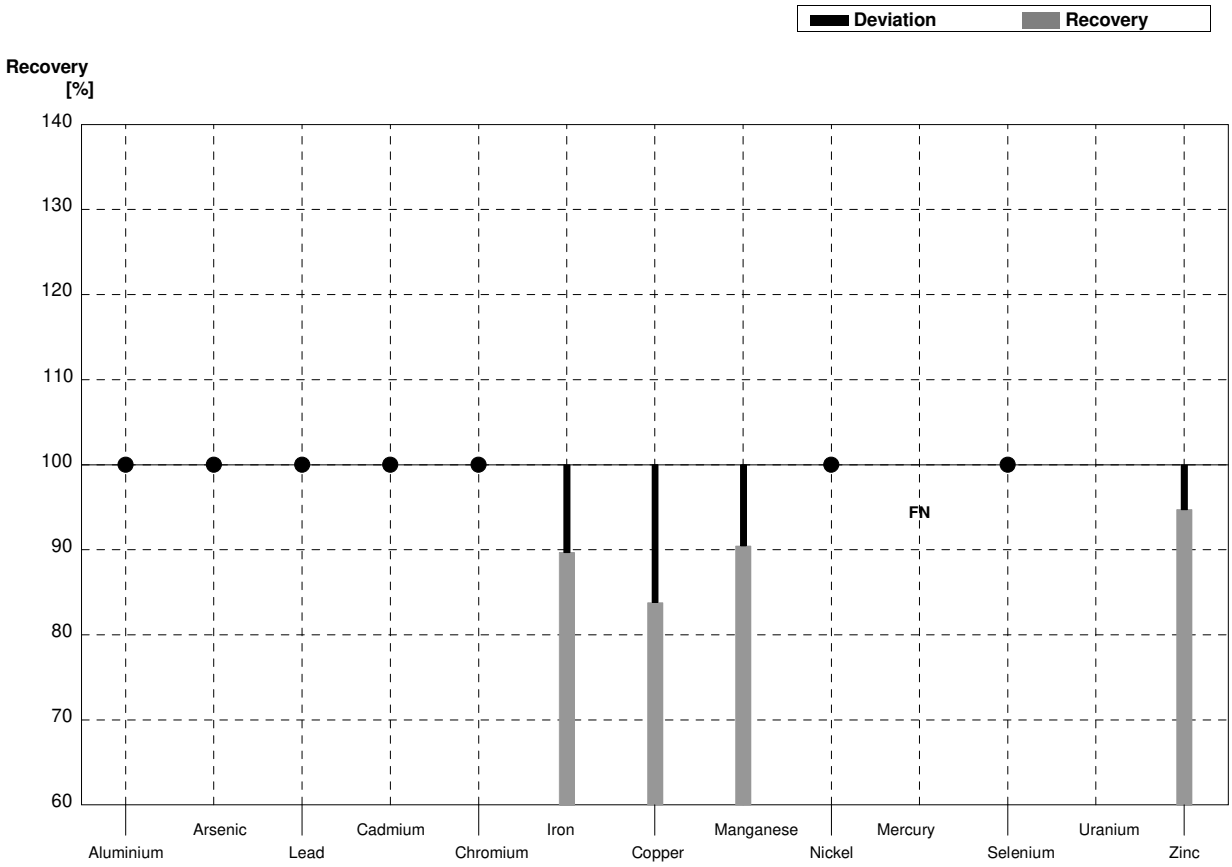
Sample **M154A**
Laboratory **A**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	<100	0,0115	µg/l	•
Arsenic	1,20	0,01	<5,0	0,001	µg/l	•
Lead	9,26	0,06	7,80	0,0009	µg/l	84%
Cadmium	0,299	0,003	<5,0	0,0011	µg/l	•
Chromium	7,00	0,04	5,70	0,001	µg/l	81%
Iron	30,0	0,2	25,8	0,0013	µg/l	86%
Copper	1,10	0,02	<5,0	0,0016	µg/l	•
Manganese	16,0	0,1	0,0138	0,0008	µg/l	0%
Nickel	5,39	0,04	<5,0	0,0016	µg/l	FN
Mercury	0,478	0,013	<0,40	0,0139	µg/l	FN
Selenium	1,31	0,06	<5,0	0,002	µg/l	•
Uranium	1,80	0,01			µg/l	
Zinc	5,99	0,51	<5,0	0	µg/l	FN



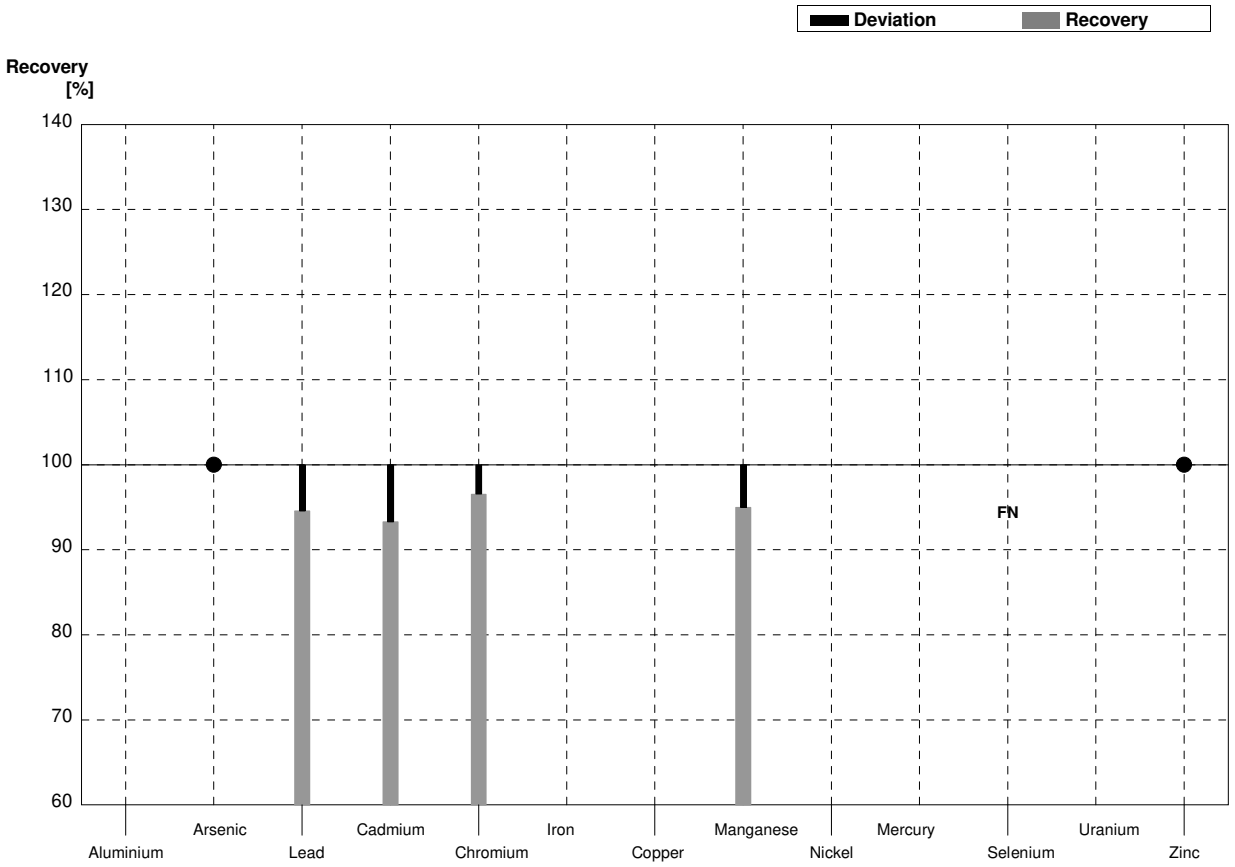
Sample **M154B**
Laboratory **A**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	<100	0,0115	µg/l	•
Arsenic	4,39	0,03	<5,0	0,0014	µg/l	•
Lead	1,05	0,02	<5,0	0	µg/l	•
Cadmium	1,60	0,01	<5,0	0,0008	µg/l	•
Chromium	2,52	0,02	<5,0	0,0010	µg/l	•
Iron	58,3	0,3	52,3	0,0019	µg/l	90%
Copper	7,04	0,05	5,90	0,0018	µg/l	84%
Manganese	25,2	0,2	22,8	0,0008	µg/l	90%
Nickel	2,00	0,03	<5,0	0,0008	µg/l	•
Mercury	1,19	0,02	<0,40	0,0053	µg/l	FN
Selenium	3,01	0,06	<5,0	0,0026	µg/l	•
Uranium	8,08	0,05			µg/l	
Zinc	20,9	0,5	19,8	0,0008	µg/l	95%



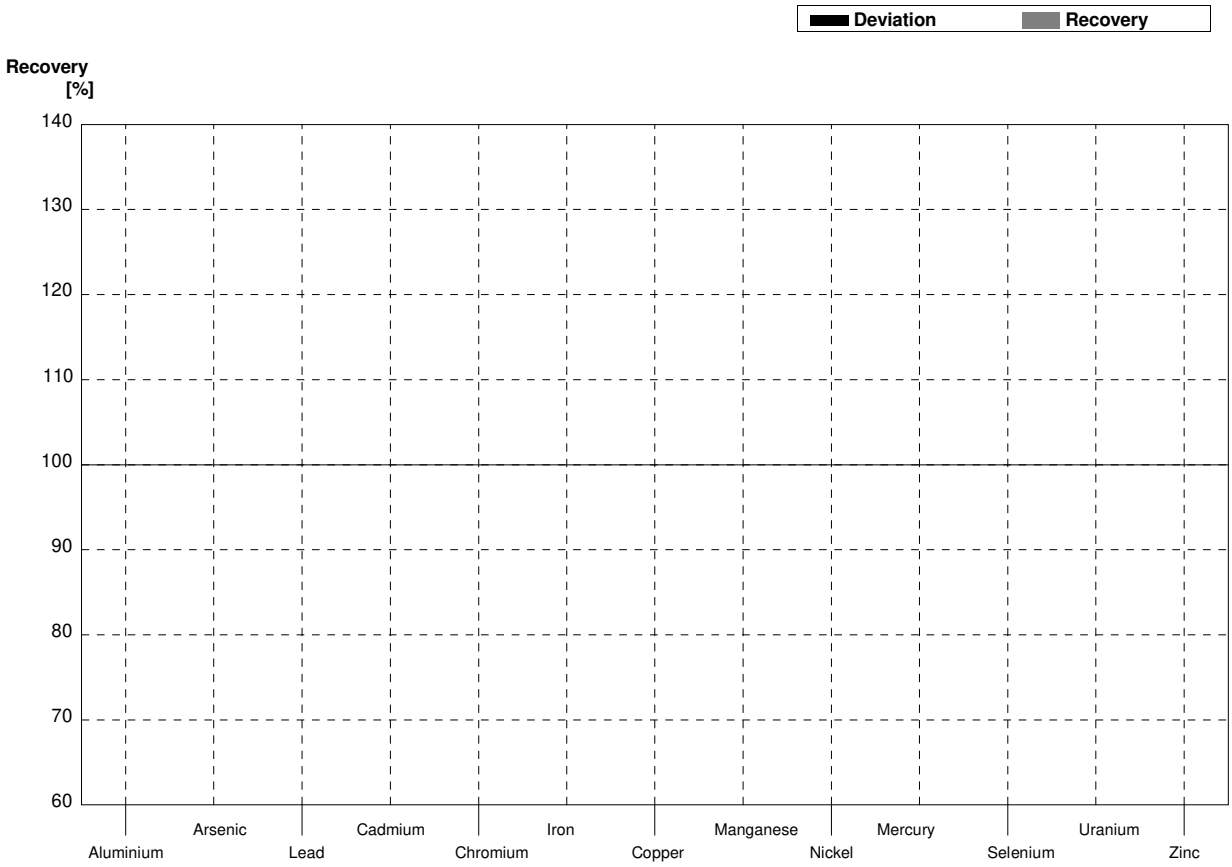
Sample **M154A**
Laboratory **B**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3			µg/l	
Arsenic	1,20	0,01	<1,5		µg/l	•
Lead	9,26	0,06	8,76	1,67	µg/l	95%
Cadmium	0,299	0,003	0,279	0,024	µg/l	93%
Chromium	7,00	0,04	6,76	0,85	µg/l	97%
Iron	30,0	0,2			µg/l	
Copper	1,10	0,02			µg/l	
Manganese	16,0	0,1	15,2	1,4	µg/l	95%
Nickel	5,39	0,04			µg/l	
Mercury	0,478	0,013			µg/l	
Selenium	1,31	0,06	<0,7		µg/l	FN
Uranium	1,80	0,01			µg/l	
Zinc	5,99	0,51	<10		µg/l	•



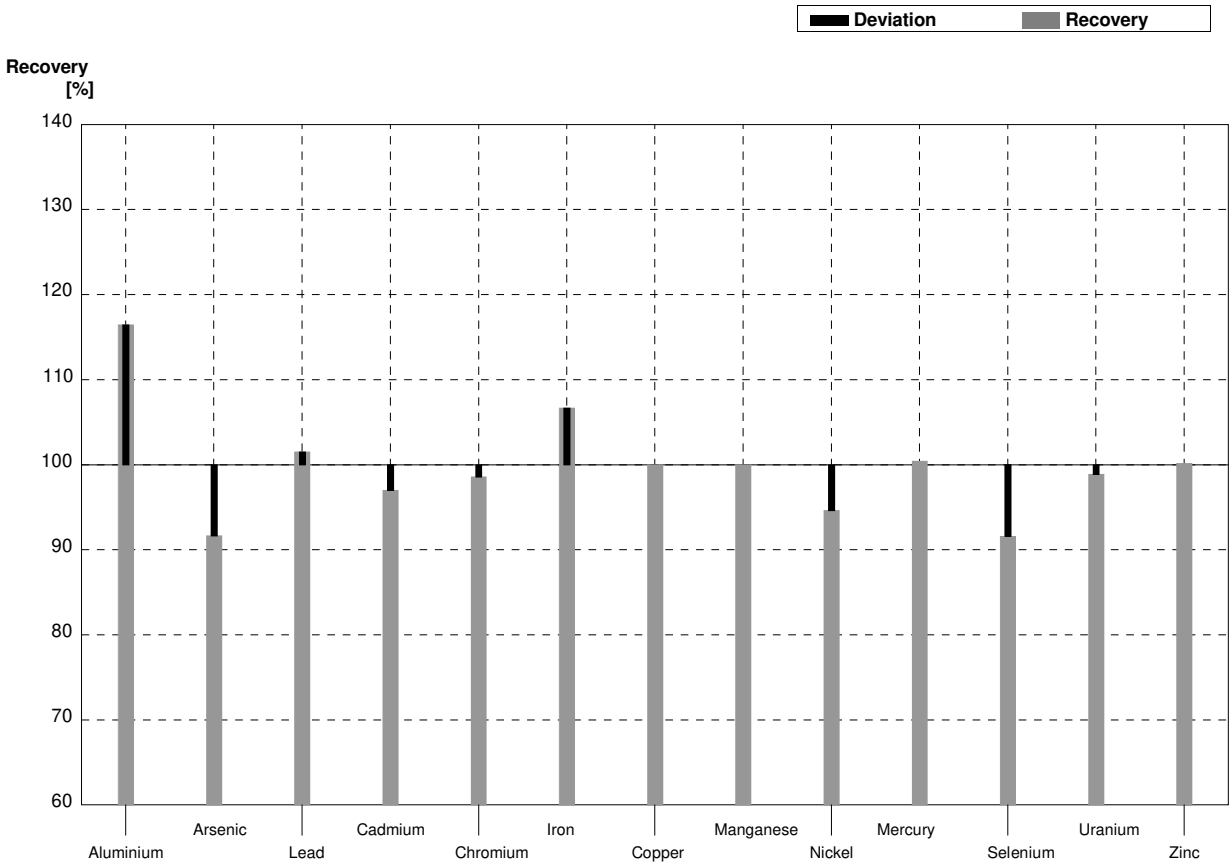
Sample **M154B**
Laboratory **B**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2			µg/l	
Arsenic	4,39	0,03			µg/l	
Lead	1,05	0,02			µg/l	
Cadmium	1,60	0,01			µg/l	
Chromium	2,52	0,02			µg/l	
Iron	58,3	0,3			µg/l	
Copper	7,04	0,05			µg/l	
Manganese	25,2	0,2			µg/l	
Nickel	2,00	0,03			µg/l	
Mercury	1,19	0,02			µg/l	
Selenium	3,01	0,06			µg/l	
Uranium	8,08	0,05			µg/l	
Zinc	20,9	0,5			µg/l	



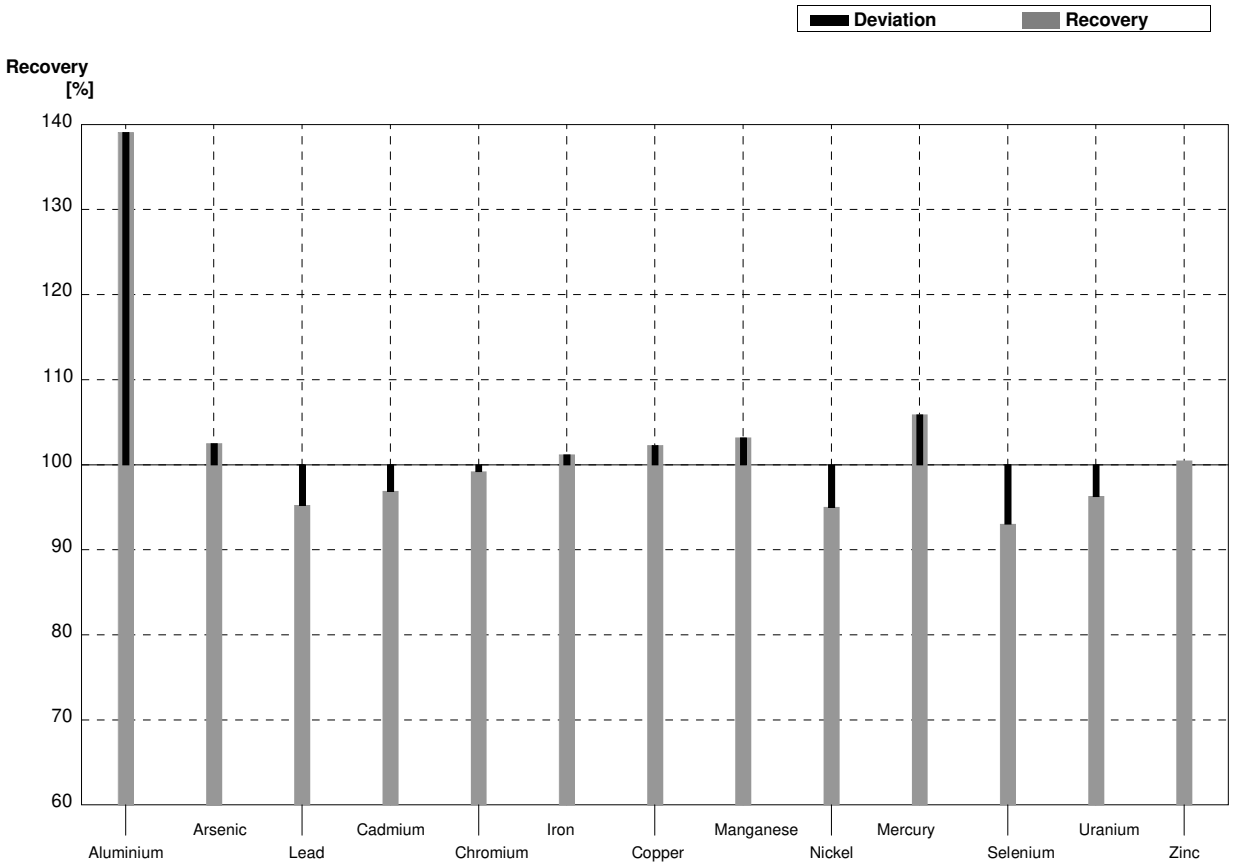
Sample **M154A**
Laboratory **C**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	58,00	5,80	µg/l	116%
Arsenic	1,20	0,01	1,10	0,132	µg/l	92%
Lead	9,26	0,06	9,40	0,752	µg/l	102%
Cadmium	0,299	0,003	0,2900	0,0232	µg/l	97%
Chromium	7,00	0,04	6,90	0,828	µg/l	99%
Iron	30,0	0,2	32,00	8,32	µg/l	107%
Copper	1,10	0,02	1,10	0,088	µg/l	100%
Manganese	16,0	0,1	16,00	1,6	µg/l	100%
Nickel	5,39	0,04	5,10	0,51	µg/l	95%
Mercury	0,478	0,013	0,480	0,0576	µg/l	100%
Selenium	1,31	0,06	1,20	0,18	µg/l	92%
Uranium	1,80	0,01	1,78	0,089	µg/l	99%
Zinc	5,99	0,51	6,00	0,6	µg/l	100%



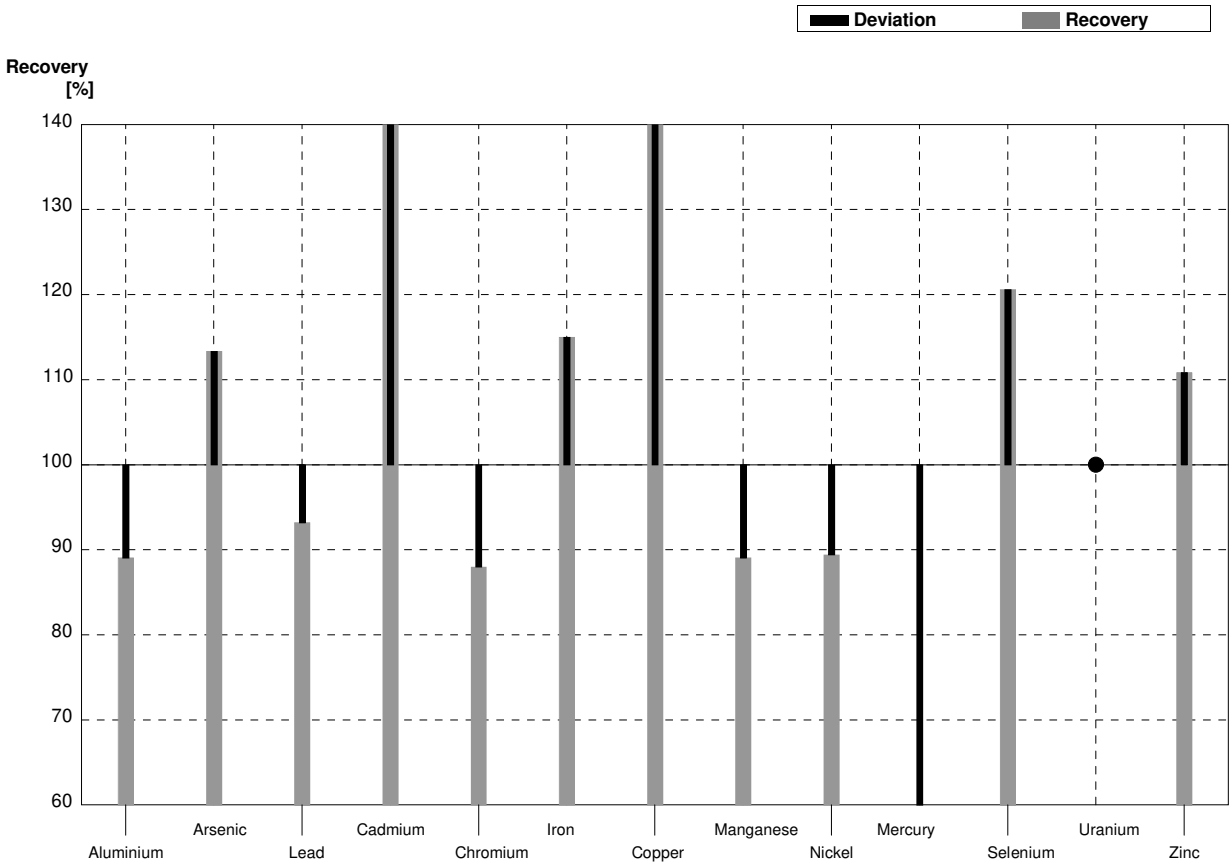
Sample **M154B**
Laboratory **C**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	21,00	2,10	µg/l	139%
Arsenic	4,39	0,03	4,50	0,54	µg/l	103%
Lead	1,05	0,02	1,00	0,080	µg/l	95%
Cadmium	1,60	0,01	1,55	0,124	µg/l	97%
Chromium	2,52	0,02	2,50	0,300	µg/l	99%
Iron	58,3	0,3	59,00	15,34	µg/l	101%
Copper	7,04	0,05	7,20	0,576	µg/l	102%
Manganese	25,2	0,2	26,00	2,60	µg/l	103%
Nickel	2,00	0,03	1,90	0,19	µg/l	95%
Mercury	1,19	0,02	1,260	0,1512	µg/l	106%
Selenium	3,01	0,06	2,80	0,42	µg/l	93%
Uranium	8,08	0,05	7,78	0,389	µg/l	96%
Zinc	20,9	0,5	21,00	2,10	µg/l	100%



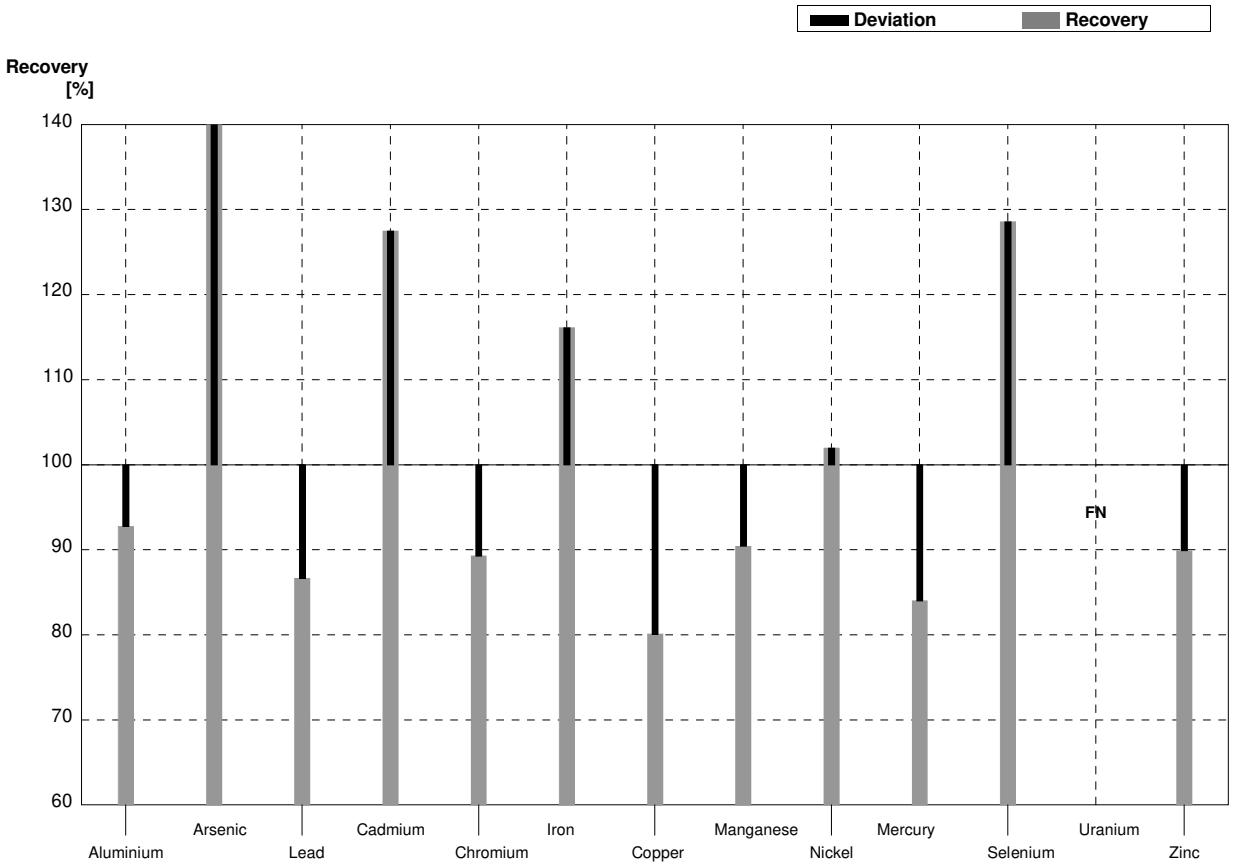
Sample **M154A**
Laboratory **D**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	44,35	0,54	µg/l	89%
Arsenic	1,20	0,01	1,36	0,03	µg/l	113%
Lead	9,26	0,06	8,63	0,16	µg/l	93%
Cadmium	0,299	0,003	0,75	0,01	µg/l	251%
Chromium	7,00	0,04	6,16	0,2	µg/l	88%
Iron	30,0	0,2	34,5	0,56	µg/l	115%
Copper	1,10	0,02	3,75	0,15	µg/l	341%
Manganese	16,0	0,1	14,25	0,42	µg/l	89%
Nickel	5,39	0,04	4,82	0,17	µg/l	89%
Mercury	0,478	0,013	0,234	0,011	µg/l	49%
Selenium	1,31	0,06	1,58	0,10	µg/l	121%
Uranium	1,80	0,01	<2,2		µg/l	•
Zinc	5,99	0,51	6,64	0,18	µg/l	111%



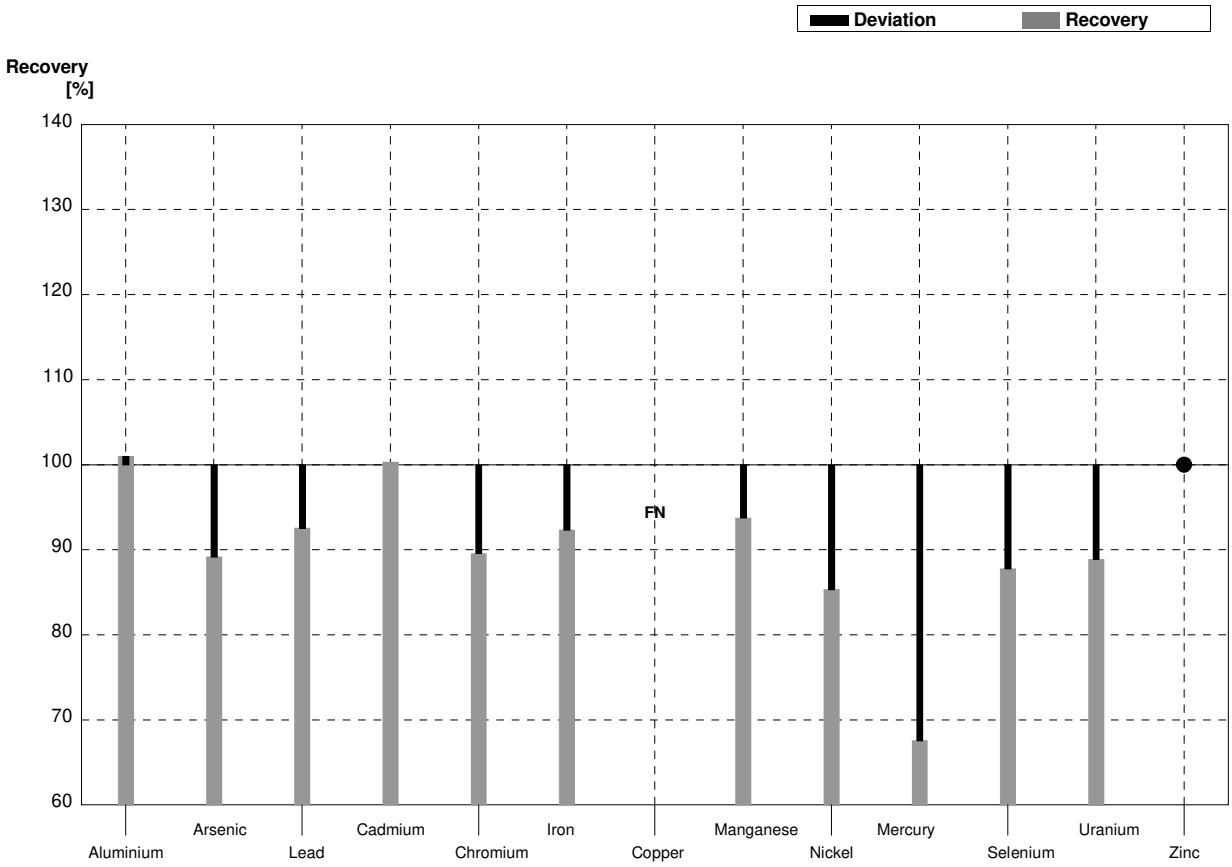
Sample **M154B**
Laboratory **D**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	14,01	0,32	µg/l	93%
Arsenic	4,39	0,03	6,18	0,12	µg/l	141%
Lead	1,05	0,02	0,91	0,01	µg/l	87%
Cadmium	1,60	0,01	2,04	0,02	µg/l	128%
Chromium	2,52	0,02	2,25	0,08	µg/l	89%
Iron	58,3	0,3	67,7	1,54	µg/l	116%
Copper	7,04	0,05	5,64	0,54	µg/l	80%
Manganese	25,2	0,2	22,79	0,68	µg/l	90%
Nickel	2,00	0,03	2,04	0,07	µg/l	102%
Mercury	1,19	0,02	1,00	0,02	µg/l	84%
Selenium	3,01	0,06	3,87	0,13	µg/l	129%
Uranium	8,08	0,05	<5,7		µg/l	FN
Zinc	20,9	0,5	18,79	0,54	µg/l	90%



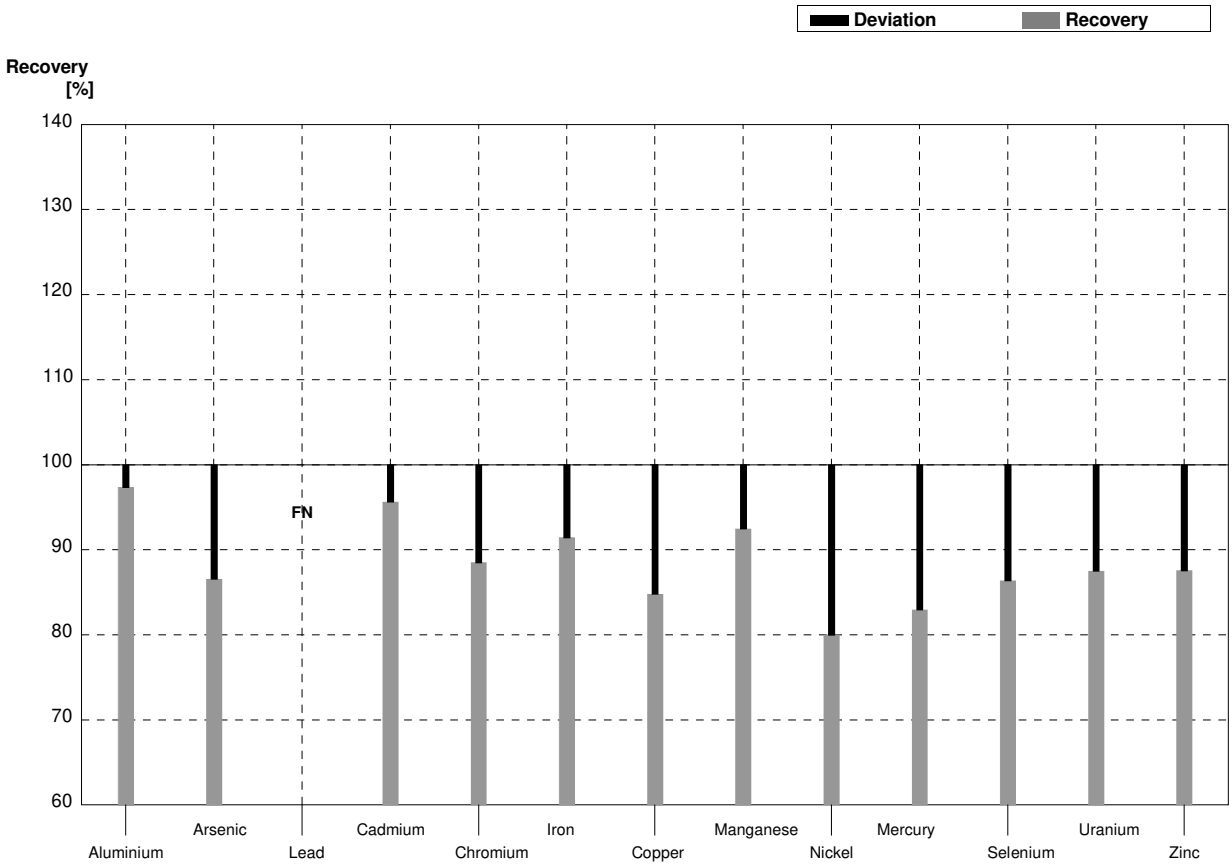
Sample **M154A**
Laboratory **E**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	50,3	10	µg/l	101%
Arsenic	1,20	0,01	1,07	0,2	µg/l	89%
Lead	9,26	0,06	8,57	1	µg/l	93%
Cadmium	0,299	0,003	0,300	0,03	µg/l	100%
Chromium	7,00	0,04	6,27	0,7	µg/l	90%
Iron	30,0	0,2	27,7	3	µg/l	92%
Copper	1,10	0,02	<1		µg/l	FN
Manganese	16,0	0,1	15,0	2	µg/l	94%
Nickel	5,39	0,04	4,60	1	µg/l	85%
Mercury	0,478	0,013	0,323	0,04	µg/l	68%
Selenium	1,31	0,06	1,15	0,2	µg/l	88%
Uranium	1,80	0,01	1,60	0,2	µg/l	89%
Zinc	5,99	0,51	<10		µg/l	•



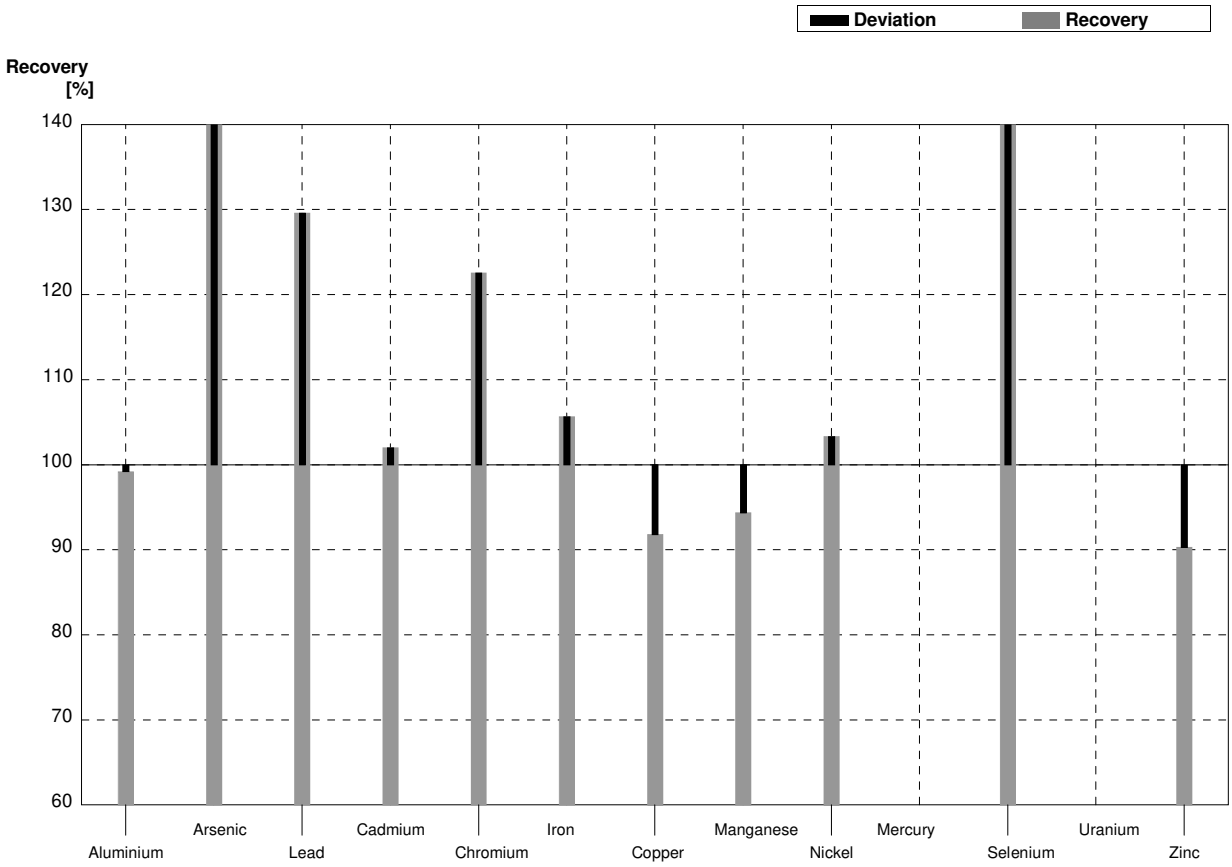
Sample **M154B**
Laboratory **E**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	14,7	4	µg/l	97%
Arsenic	4,39	0,03	3,80	0,4	µg/l	87%
Lead	1,05	0,02	<1		µg/l	FN
Cadmium	1,60	0,01	1,53	0,2	µg/l	96%
Chromium	2,52	0,02	2,23	0,3	µg/l	88%
Iron	58,3	0,3	53,3	6	µg/l	91%
Copper	7,04	0,05	5,97	0,6	µg/l	85%
Manganese	25,2	0,2	23,3	3	µg/l	92%
Nickel	2,00	0,03	1,60	0,2	µg/l	80%
Mercury	1,19	0,02	0,987	0,02	µg/l	83%
Selenium	3,01	0,06	2,60	0,3	µg/l	86%
Uranium	8,08	0,05	7,07	1	µg/l	88%
Zinc	20,9	0,5	18,3	4	µg/l	88%



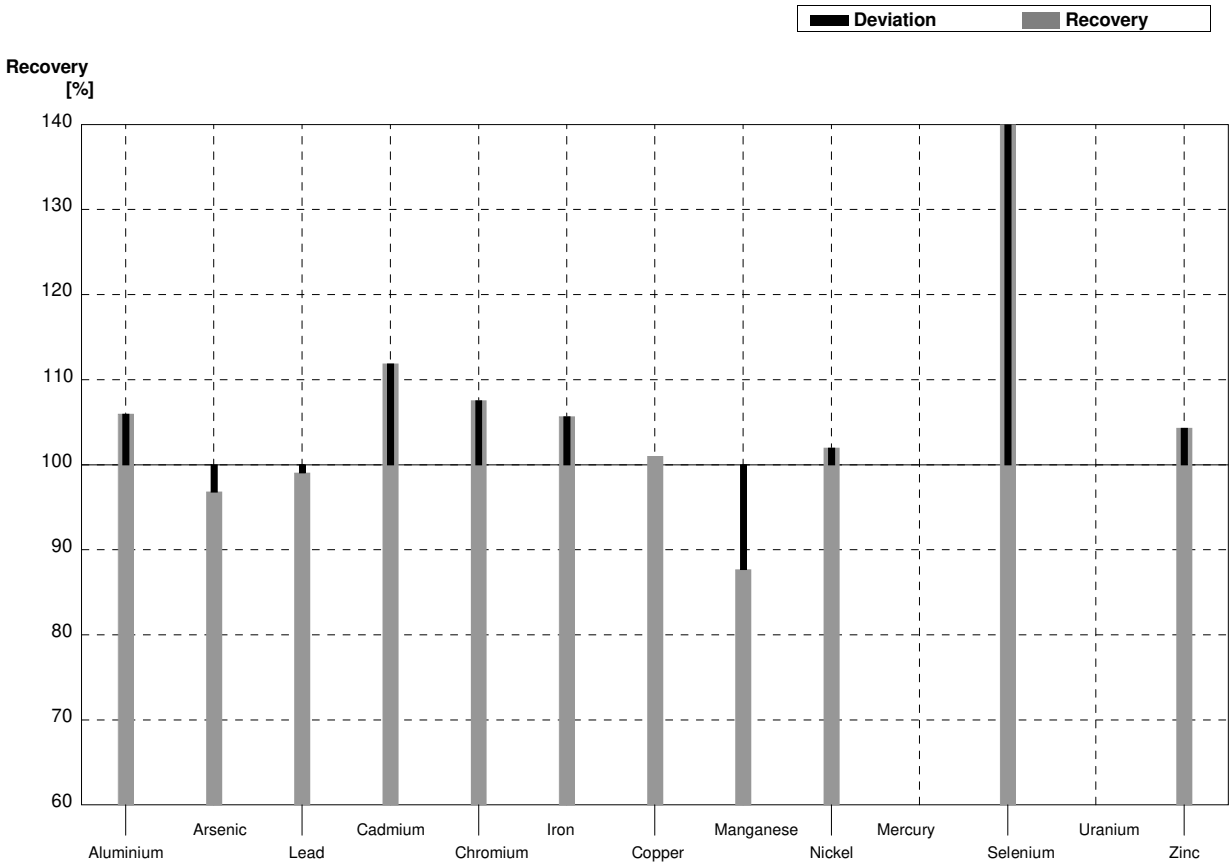
Sample **M154A**
Laboratory **F**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	49,4	4,1	µg/l	99%
Arsenic	1,20	0,01	2,20	0,18	µg/l	183%
Lead	9,26	0,06	12,0	0,86	µg/l	130%
Cadmium	0,299	0,003	0,305	0,02	µg/l	102%
Chromium	7,00	0,04	8,58	0,57	µg/l	123%
Iron	30,0	0,2	31,7	2,2	µg/l	106%
Copper	1,10	0,02	1,01	0,09	µg/l	92%
Manganese	16,0	0,1	15,1	0,85	µg/l	94%
Nickel	5,39	0,04	5,57	0,46	µg/l	103%
Mercury	0,478	0,013			µg/l	
Selenium	1,31	0,06	2,43	0,27	µg/l	185%
Uranium	1,80	0,01			µg/l	
Zinc	5,99	0,51	5,41	0,43	µg/l	90%



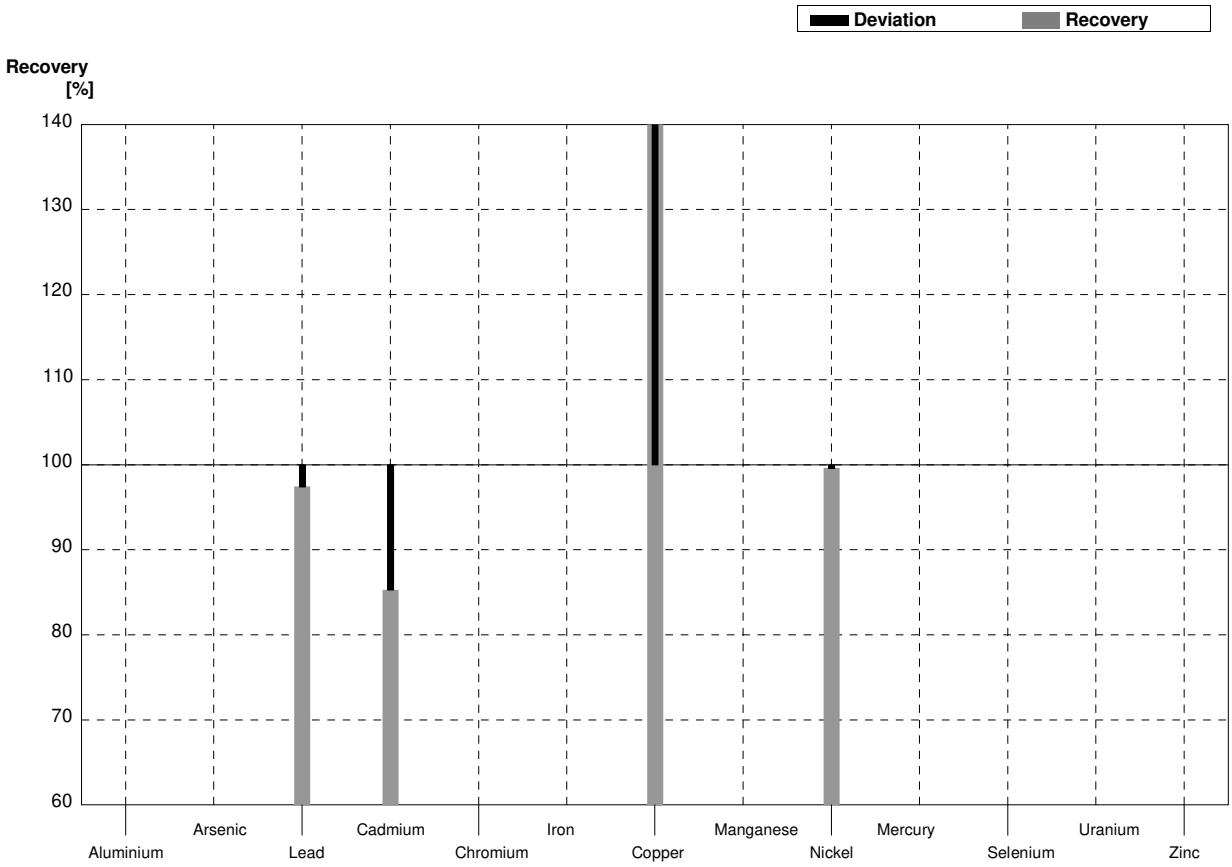
Sample **M154B**
Laboratory **F**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	16,0	1,3	µg/l	106%
Arsenic	4,39	0,03	4,25	0,34	µg/l	97%
Lead	1,05	0,02	1,04	0,07	µg/l	99%
Cadmium	1,60	0,01	1,79	0,11	µg/l	112%
Chromium	2,52	0,02	2,71	0,18	µg/l	108%
Iron	58,3	0,3	61,6	4,3	µg/l	106%
Copper	7,04	0,05	7,11	0,63	µg/l	101%
Manganese	25,2	0,2	22,1	1,2	µg/l	88%
Nickel	2,00	0,03	2,04	0,17	µg/l	102%
Mercury	1,19	0,02			µg/l	
Selenium	3,01	0,06	4,38	0,48	µg/l	146%
Uranium	8,08	0,05			µg/l	
Zinc	20,9	0,5	21,8	1,7	µg/l	104%



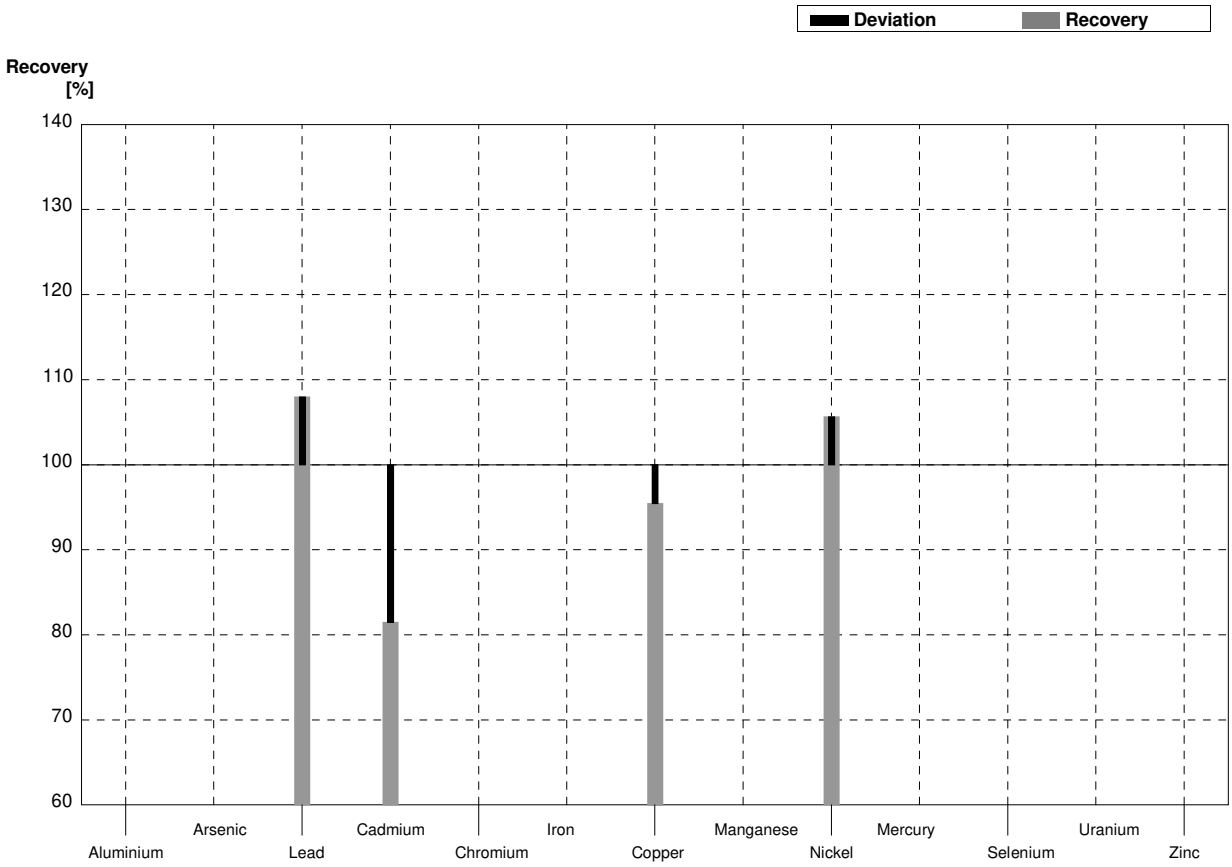
Sample **M154A**
Laboratory **G**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3			µg/l	
Arsenic	1,20	0,01			µg/l	
Lead	9,26	0,06	9,020	1,126	µg/l	97%
Cadmium	0,299	0,003	0,255	0,057	µg/l	85%
Chromium	7,00	0,04			µg/l	
Iron	30,0	0,2			µg/l	
Copper	1,10	0,02	2,160	0,211	µg/l	196%
Manganese	16,0	0,1			µg/l	
Nickel	5,39	0,04	5,368	0,337	µg/l	100%
Mercury	0,478	0,013			µg/l	
Selenium	1,31	0,06			µg/l	
Uranium	1,80	0,01			µg/l	
Zinc	5,99	0,51			µg/l	



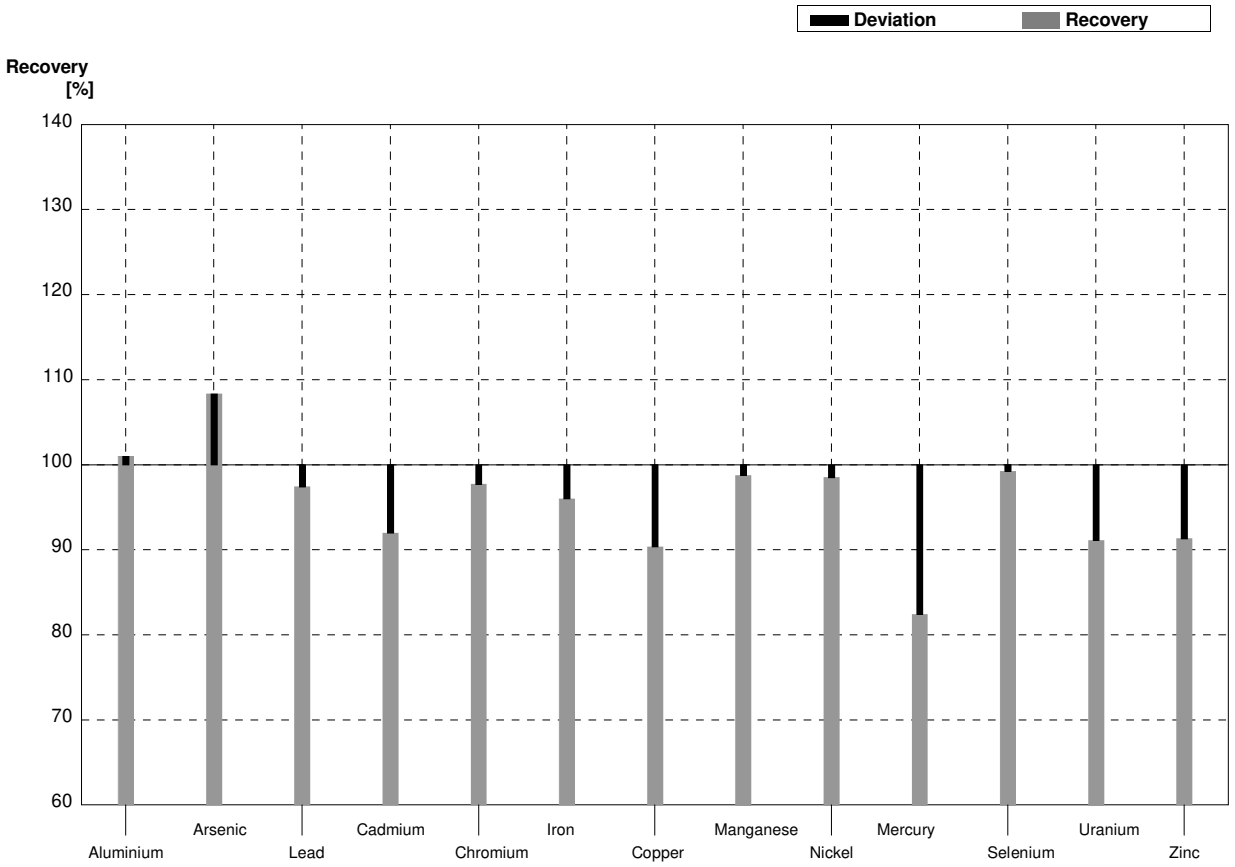
Sample **M154B**
Laboratory **G**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2			µg/l	
Arsenic	4,39	0,03			µg/l	
Lead	1,05	0,02	1,134	0,142	µg/l	108%
Cadmium	1,60	0,01	1,304	0,293	µg/l	82%
Chromium	2,52	0,02			µg/l	
Iron	58,3	0,3			µg/l	
Copper	7,04	0,05	6,720	0,658	µg/l	95%
Manganese	25,2	0,2			µg/l	
Nickel	2,00	0,03	2,113	0,133	µg/l	106%
Mercury	1,19	0,02			µg/l	
Selenium	3,01	0,06			µg/l	
Uranium	8,08	0,05			µg/l	
Zinc	20,9	0,5			µg/l	



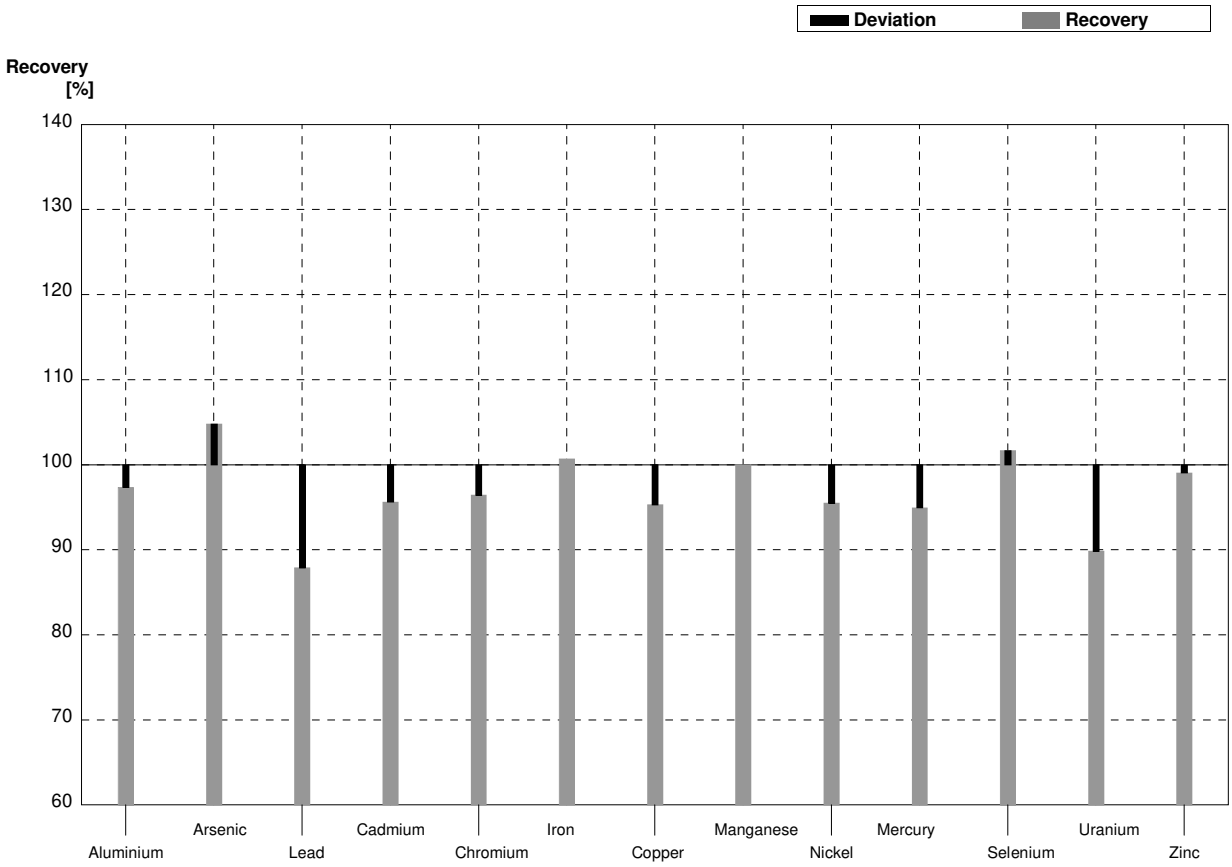
Sample **M154A**
Laboratory **H**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	50,3	0,799	µg/l	101%
Arsenic	1,20	0,01	1,30	0,020	µg/l	108%
Lead	9,26	0,06	9,02	0,159	µg/l	97%
Cadmium	0,299	0,003	0,275	0,017	µg/l	92%
Chromium	7,00	0,04	6,84	0,017	µg/l	98%
Iron	30,0	0,2	28,8	0,457	µg/l	96%
Copper	1,10	0,02	0,994	0,020	µg/l	90%
Manganese	16,0	0,1	15,8	0,213	µg/l	99%
Nickel	5,39	0,04	5,31	0,042	µg/l	99%
Mercury	0,478	0,013	0,394	0,005	µg/l	82%
Selenium	1,31	0,06	1,30	0,100	µg/l	99%
Uranium	1,80	0,01	1,64	0,033	µg/l	91%
Zinc	5,99	0,51	5,47	0,131	µg/l	91%



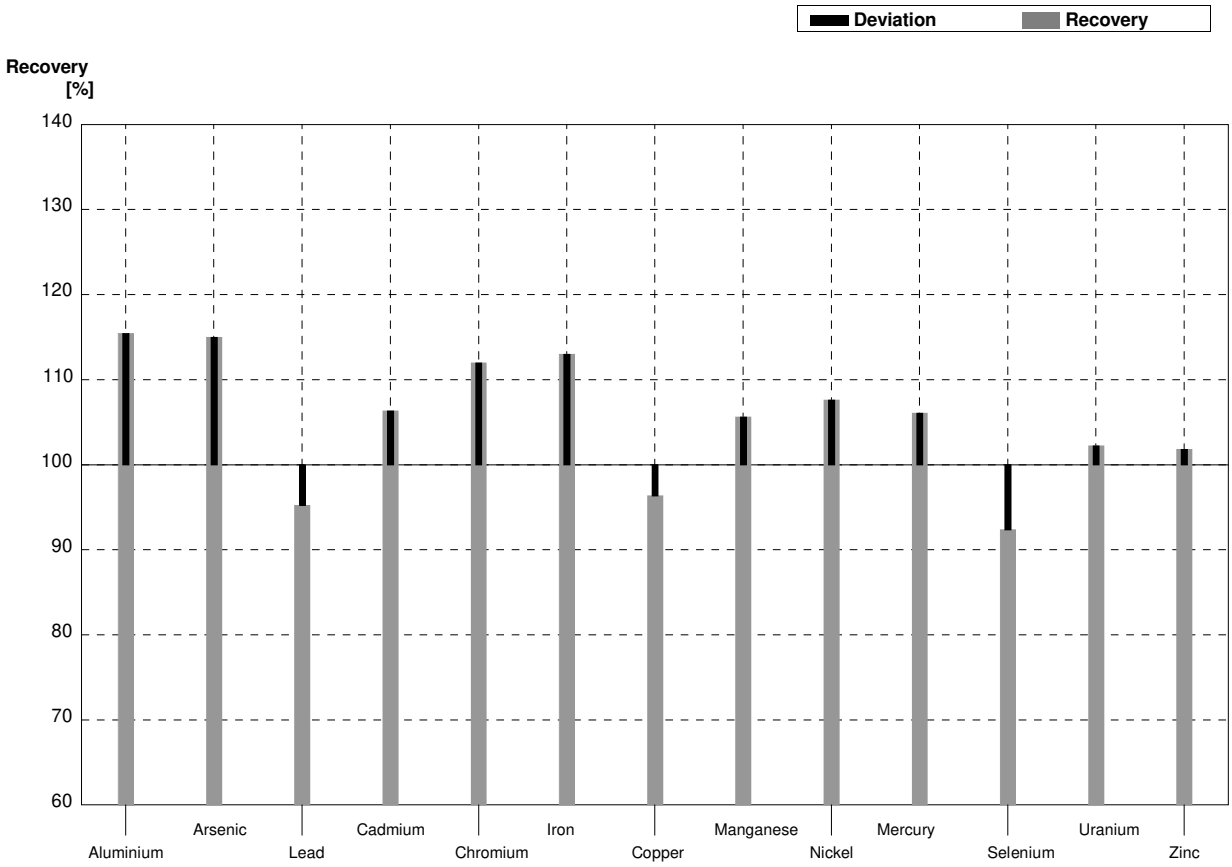
Sample **M154B**
Laboratory **H**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	14,7	0,226	µg/l	97%
Arsenic	4,39	0,03	4,60	0,047	µg/l	105%
Lead	1,05	0,02	0,923	0,024	µg/l	88%
Cadmium	1,60	0,01	1,53	0,039	µg/l	96%
Chromium	2,52	0,02	2,43	0,038	µg/l	96%
Iron	58,3	0,3	58,7	0,325	µg/l	101%
Copper	7,04	0,05	6,71	0,045	µg/l	95%
Manganese	25,2	0,2	25,2	0,327	µg/l	100%
Nickel	2,00	0,03	1,91	0,019	µg/l	96%
Mercury	1,19	0,02	1,13	0,006	µg/l	95%
Selenium	3,01	0,06	3,06	0,026	µg/l	102%
Uranium	8,08	0,05	7,26	0,134	µg/l	90%
Zinc	20,9	0,5	20,7	0,260	µg/l	99%



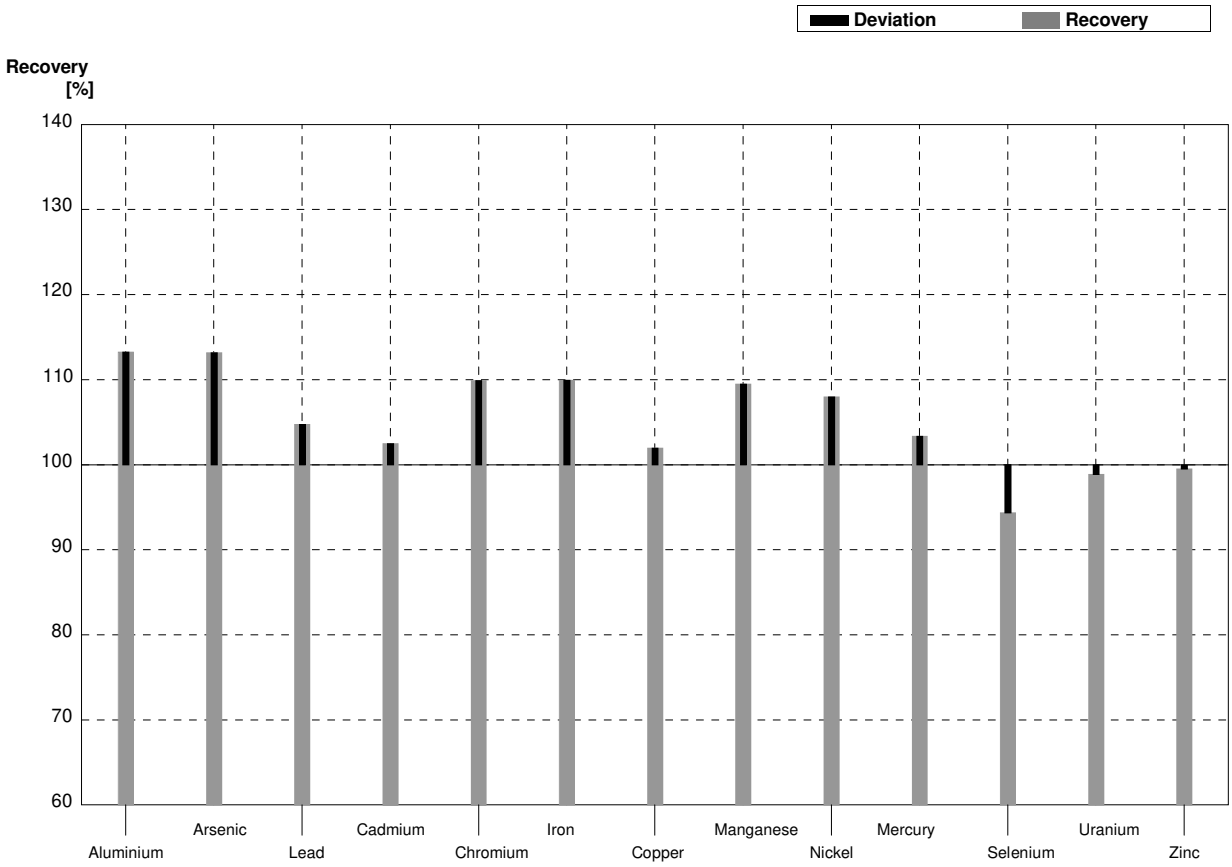
Sample M154A
Laboratory I

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	57,5	8,62	µg/l	115%
Arsenic	1,20	0,01	1,38	0,21	µg/l	115%
Lead	9,26	0,06	8,82	1,32	µg/l	95%
Cadmium	0,299	0,003	0,318	0,048	µg/l	106%
Chromium	7,00	0,04	7,84	1,18	µg/l	112%
Iron	30,0	0,2	33,9	5,09	µg/l	113%
Copper	1,10	0,02	1,06	0,16	µg/l	96%
Manganese	16,0	0,1	16,9	2,53	µg/l	106%
Nickel	5,39	0,04	5,80	0,87	µg/l	108%
Mercury	0,478	0,013	0,507	0,076	µg/l	106%
Selenium	1,31	0,06	1,21	0,18	µg/l	92%
Uranium	1,80	0,01	1,84	0,28	µg/l	102%
Zinc	5,99	0,51	6,10	0,91	µg/l	102%



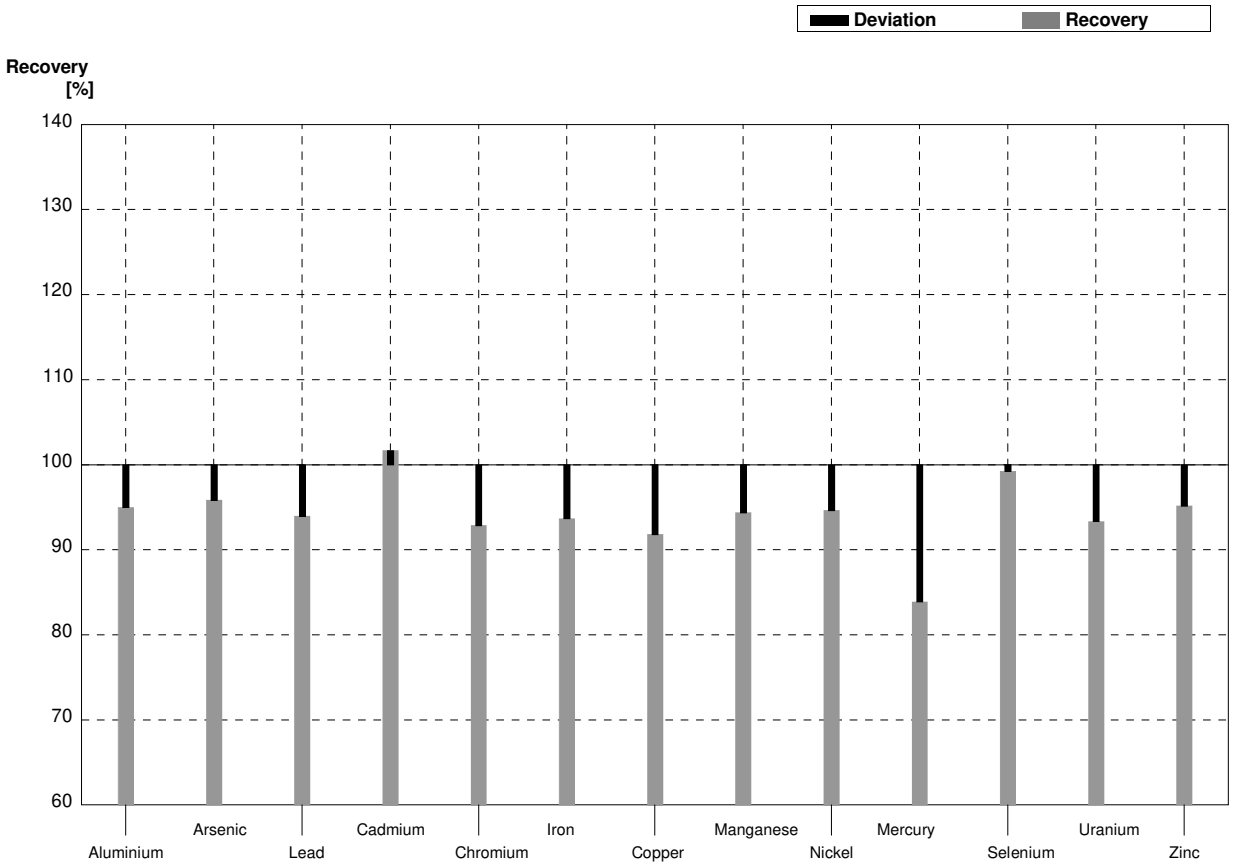
Sample M154B
Laboratory I

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	17,1	2,57	µg/l	113%
Arsenic	4,39	0,03	4,97	0,74	µg/l	113%
Lead	1,05	0,02	1,10	0,16	µg/l	105%
Cadmium	1,60	0,01	1,64	0,25	µg/l	103%
Chromium	2,52	0,02	2,77	0,42	µg/l	110%
Iron	58,3	0,3	64,1	9,62	µg/l	110%
Copper	7,04	0,05	7,18	1,08	µg/l	102%
Manganese	25,2	0,2	27,6	4,14	µg/l	110%
Nickel	2,00	0,03	2,16	0,32	µg/l	108%
Mercury	1,19	0,02	1,23	0,18	µg/l	103%
Selenium	3,01	0,06	2,84	0,43	µg/l	94%
Uranium	8,08	0,05	7,99	1,20	µg/l	99%
Zinc	20,9	0,5	20,8	3,12	µg/l	100%



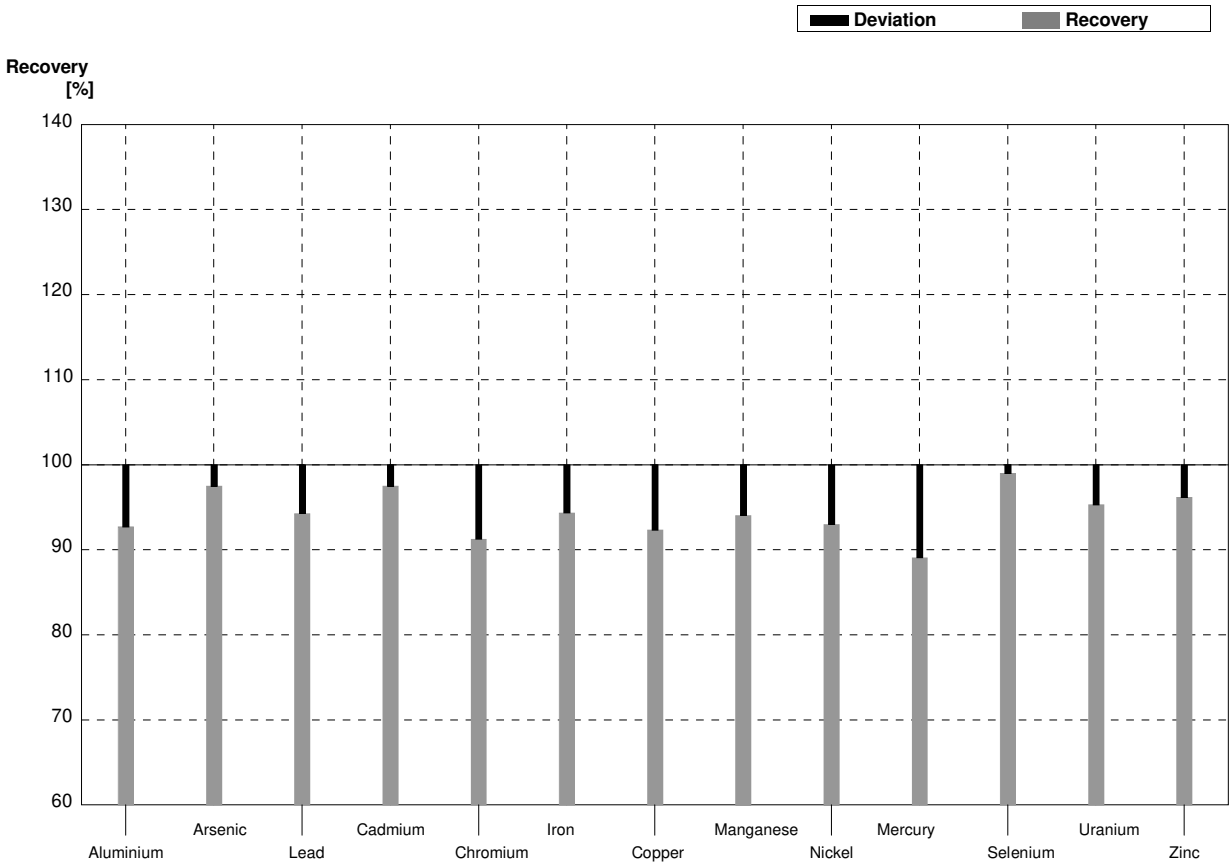
Sample **M154A**
Laboratory **J**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	47,3	7,1	µg/l	95%
Arsenic	1,20	0,01	1,15	0,173	µg/l	96%
Lead	9,26	0,06	8,7	1,30	µg/l	94%
Cadmium	0,299	0,003	0,304	0,0456	µg/l	102%
Chromium	7,00	0,04	6,5	0,98	µg/l	93%
Iron	30,0	0,2	28,1	4,21	µg/l	94%
Copper	1,10	0,02	1,01	0,151	µg/l	92%
Manganese	16,0	0,1	15,1	2,27	µg/l	94%
Nickel	5,39	0,04	5,1	0,76	µg/l	95%
Mercury	0,478	0,013	0,401	0,060	µg/l	84%
Selenium	1,31	0,06	1,30	0,195	µg/l	99%
Uranium	1,80	0,01	1,68	0,252	µg/l	93%
Zinc	5,99	0,51	5,7	0,85	µg/l	95%



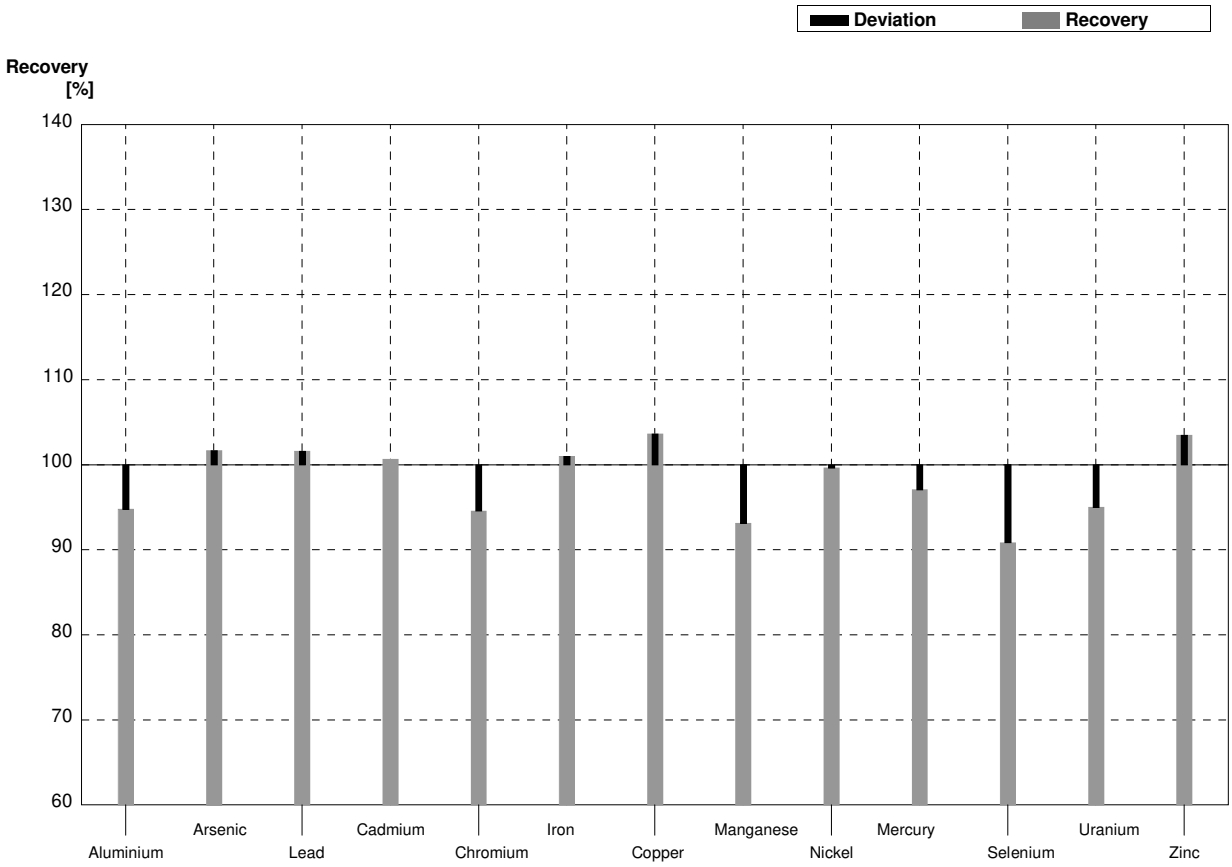
Sample **M154B**
Laboratory **J**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	14,0	2,10	µg/l	93%
Arsenic	4,39	0,03	4,28	0,64	µg/l	97%
Lead	1,05	0,02	0,99	0,148	µg/l	94%
Cadmium	1,60	0,01	1,56	0,234	µg/l	98%
Chromium	2,52	0,02	2,30	0,345	µg/l	91%
Iron	58,3	0,3	55	8,2	µg/l	94%
Copper	7,04	0,05	6,5	0,98	µg/l	92%
Manganese	25,2	0,2	23,7	3,55	µg/l	94%
Nickel	2,00	0,03	1,86	0,279	µg/l	93%
Mercury	1,19	0,02	1,06	0,159	µg/l	89%
Selenium	3,01	0,06	2,98	0,447	µg/l	99%
Uranium	8,08	0,05	7,7	1,15	µg/l	95%
Zinc	20,9	0,5	20,1	3,02	µg/l	96%



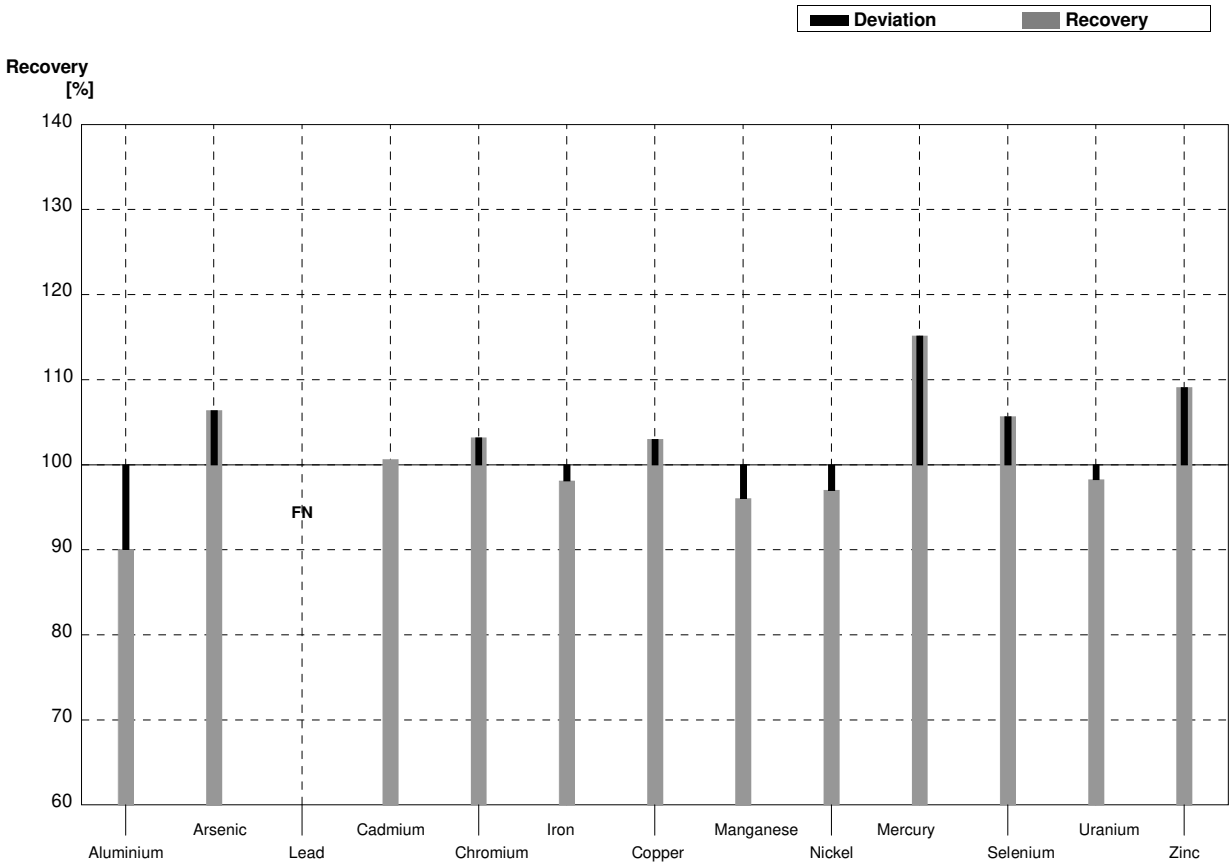
Sample **M154A**
Laboratory **K**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	47,2	1,58	µg/l	95%
Arsenic	1,20	0,01	1,22	0,12	µg/l	102%
Lead	9,26	0,06	9,41	0,10	µg/l	102%
Cadmium	0,299	0,003	0,301	0,014	µg/l	101%
Chromium	7,00	0,04	6,62	0,069	µg/l	95%
Iron	30,0	0,2	30,3	1,59	µg/l	101%
Copper	1,10	0,02	1,14	0,13	µg/l	104%
Manganese	16,0	0,1	14,9	1,16	µg/l	93%
Nickel	5,39	0,04	5,37	0,17	µg/l	100%
Mercury	0,478	0,013	0,464	0,007	µg/l	97%
Selenium	1,31	0,06	1,19	0,15	µg/l	91%
Uranium	1,80	0,01	1,71	0,14	µg/l	95%
Zinc	5,99	0,51	6,20	0,354	µg/l	104%



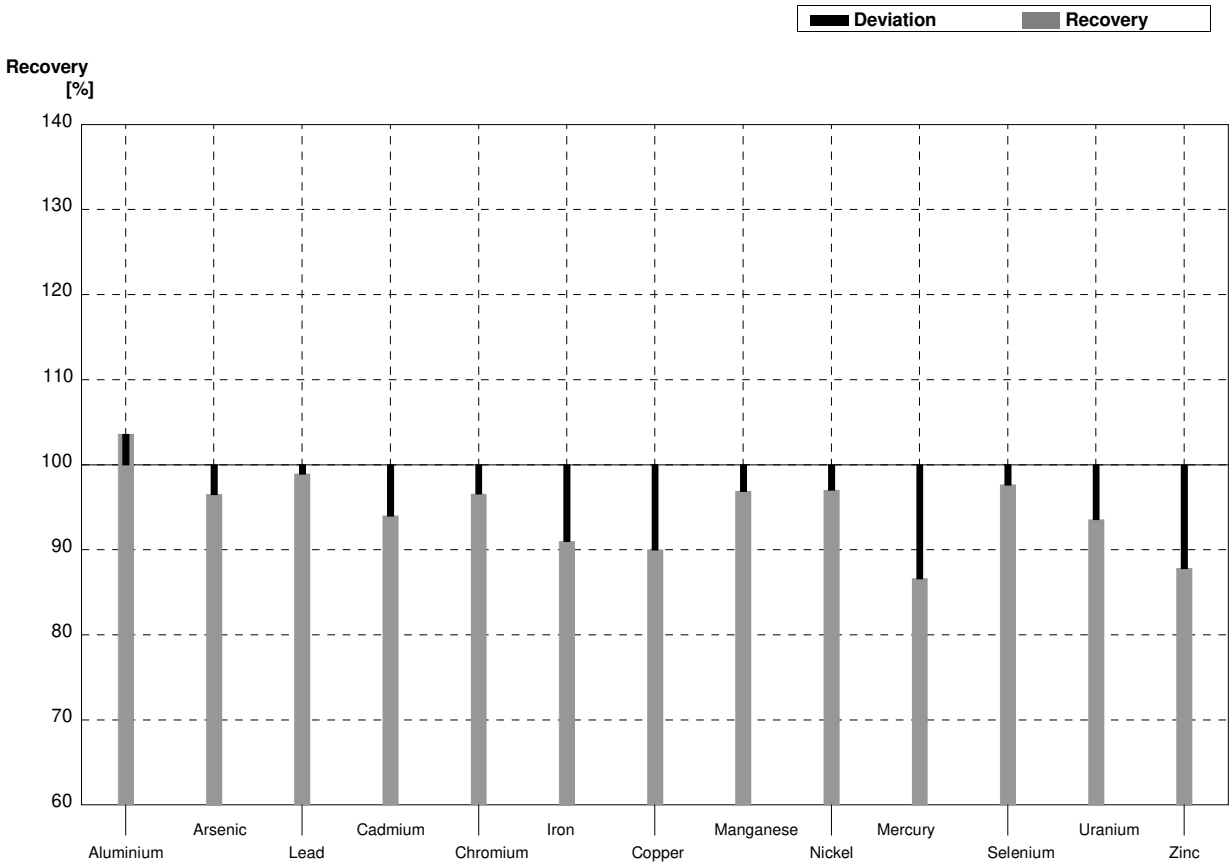
Sample **M154B**
Laboratory **K**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	13,6	1,71	µg/l	90%
Arsenic	4,39	0,03	4,67	0,08	µg/l	106%
Lead	1,05	0,02	<1,00		µg/l	FN
Cadmium	1,60	0,01	1,61	0,033	µg/l	101%
Chromium	2,52	0,02	2,60	0,072	µg/l	103%
Iron	58,3	0,3	57,2	1,50	µg/l	98%
Copper	7,04	0,05	7,25	0,12	µg/l	103%
Manganese	25,2	0,2	24,2	1,10	µg/l	96%
Nickel	2,00	0,03	1,94	0,19	µg/l	97%
Mercury	1,19	0,02	1,37	0,006	µg/l	115%
Selenium	3,01	0,06	3,18	0,13	µg/l	106%
Uranium	8,08	0,05	7,94	0,14	µg/l	98%
Zinc	20,9	0,5	22,8	0,33	µg/l	109%



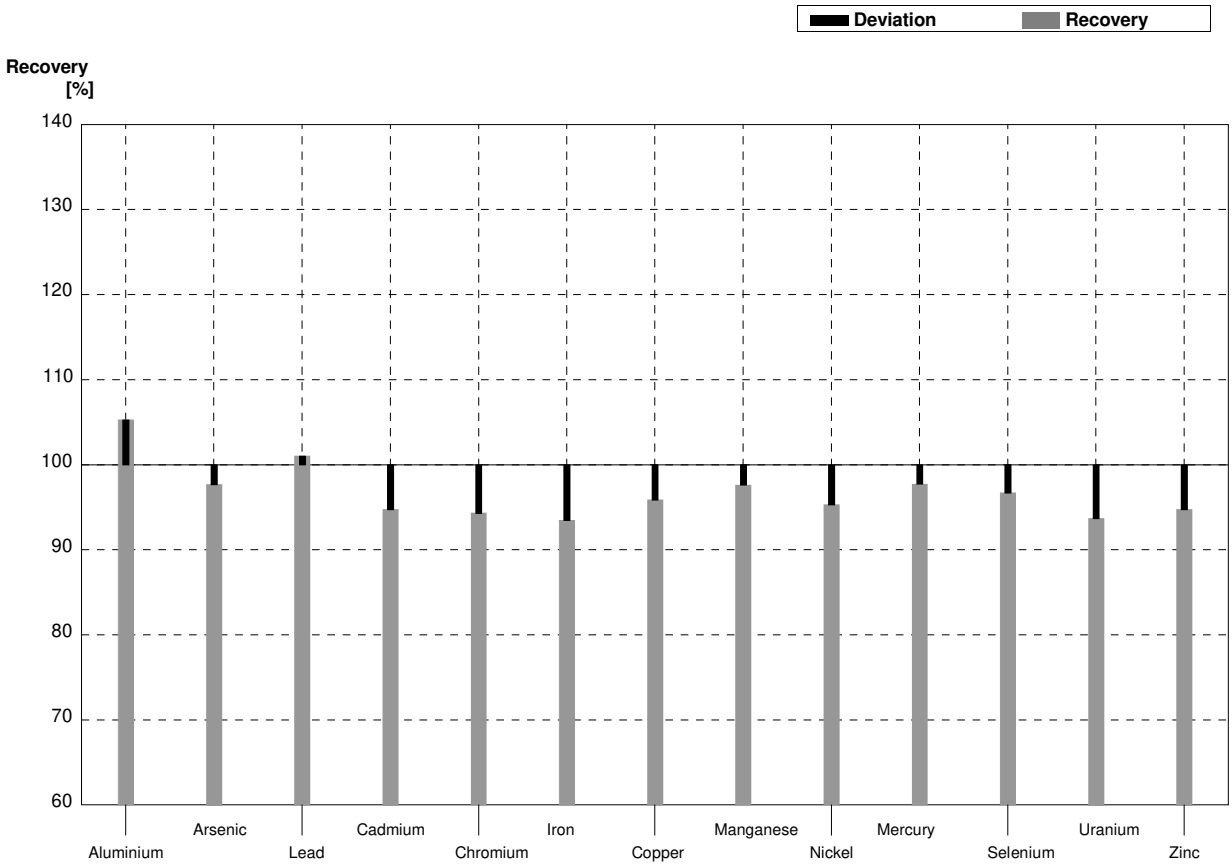
Sample **M154A**
Laboratory **L**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	51,6	5,2	µg/l	104%
Arsenic	1,20	0,01	1,158	0,12	µg/l	97%
Lead	9,26	0,06	9,160	0,92	µg/l	99%
Cadmium	0,299	0,003	0,281	0,03	µg/l	94%
Chromium	7,00	0,04	6,760	0,7	µg/l	97%
Iron	30,0	0,2	27,3	2,7	µg/l	91%
Copper	1,10	0,02	0,99	0,1	µg/l	90%
Manganese	16,0	0,1	15,5	1,6	µg/l	97%
Nickel	5,39	0,04	5,23	0,52	µg/l	97%
Mercury	0,478	0,013	0,414	0,042	µg/l	87%
Selenium	1,31	0,06	1,279	0,13	µg/l	98%
Uranium	1,80	0,01	1,684	0,17	µg/l	94%
Zinc	5,99	0,51	5,26	0,5	µg/l	88%



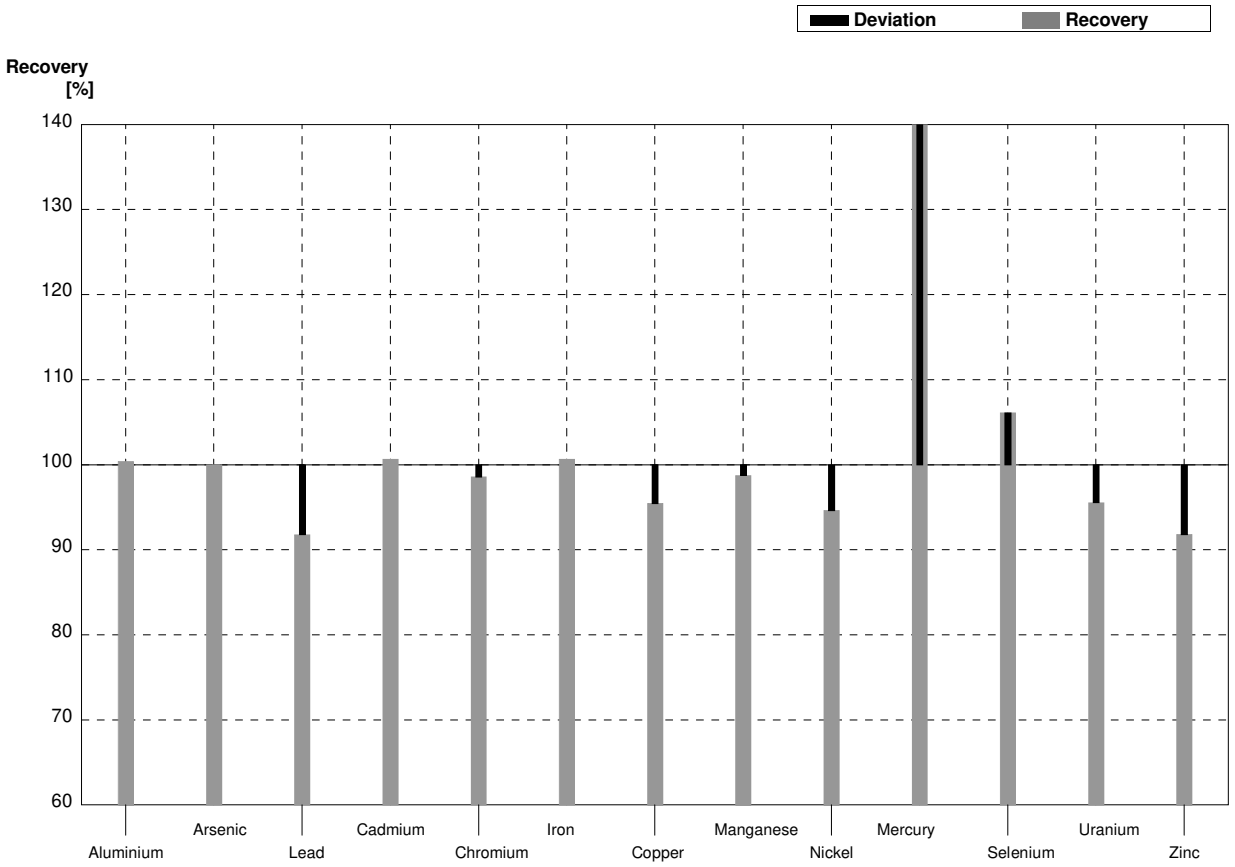
Sample **M154B**
Laboratory **L**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	15,9	1,6	µg/l	105%
Arsenic	4,39	0,03	4,288	0,43	µg/l	98%
Lead	1,05	0,02	1,061	0,11	µg/l	101%
Cadmium	1,60	0,01	1,516	0,15	µg/l	95%
Chromium	2,52	0,02	2,377	0,24	µg/l	94%
Iron	58,3	0,3	54,5	5,5	µg/l	93%
Copper	7,04	0,05	6,75	0,68	µg/l	96%
Manganese	25,2	0,2	24,6	2,5	µg/l	98%
Nickel	2,00	0,03	1,906	0,11	µg/l	95%
Mercury	1,19	0,02	1,163	0,12	µg/l	98%
Selenium	3,01	0,06	2,911	0,29	µg/l	97%
Uranium	8,08	0,05	7,570	0,76	µg/l	94%
Zinc	20,9	0,5	19,8	2	µg/l	95%



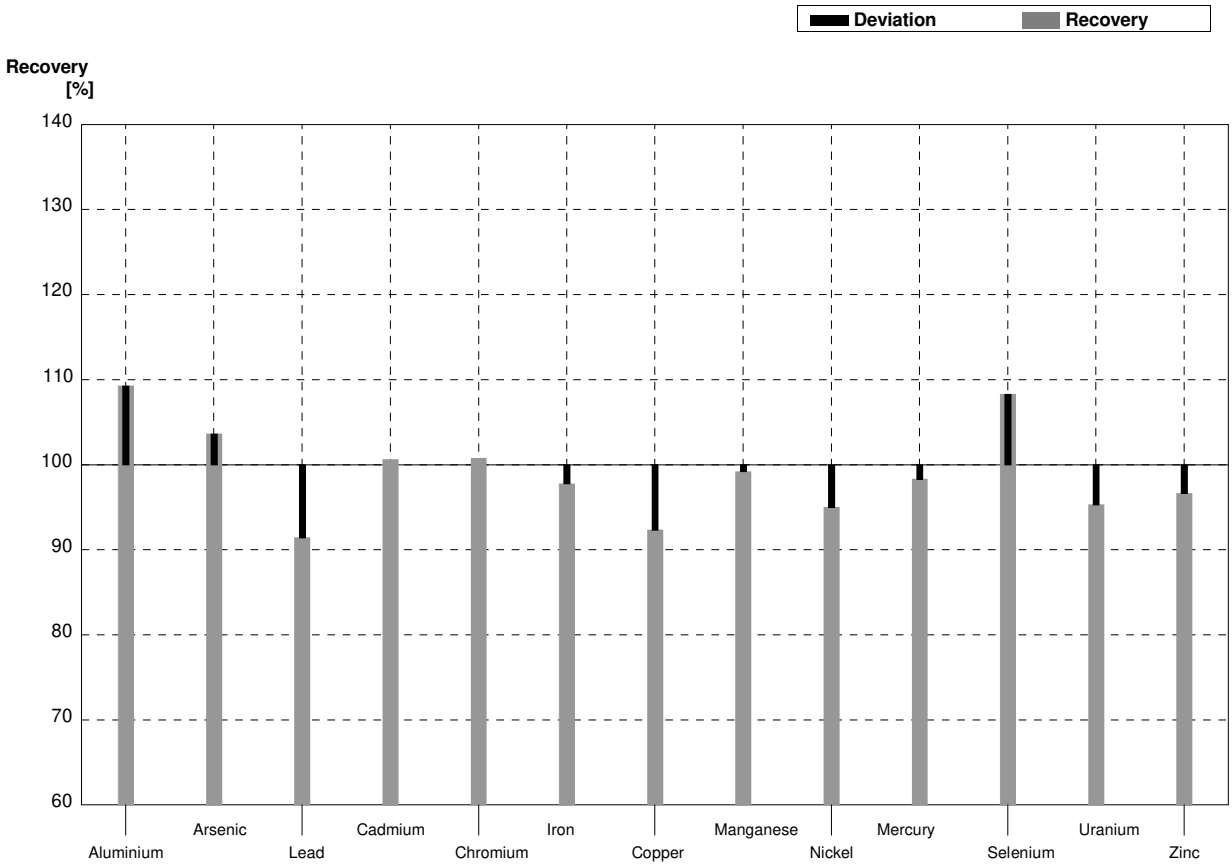
Sample **M154A**
Laboratory **M**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	50	5	µg/l	100%
Arsenic	1,20	0,01	1,20	0,18	µg/l	100%
Lead	9,26	0,06	8,5	0,85	µg/l	92%
Cadmium	0,299	0,003	0,301	0,0301	µg/l	101%
Chromium	7,00	0,04	6,9	0,69	µg/l	99%
Iron	30,0	0,2	30,2	3,02	µg/l	101%
Copper	1,10	0,02	1,05	0,105	µg/l	95%
Manganese	16,0	0,1	15,8	1,58	µg/l	99%
Nickel	5,39	0,04	5,1	0,51	µg/l	95%
Mercury	0,478	0,013	0,67	0,067	µg/l	140%
Selenium	1,31	0,06	1,39	0,209	µg/l	106%
Uranium	1,80	0,01	1,72	0,172	µg/l	96%
Zinc	5,99	0,51	5,5	0,55	µg/l	92%



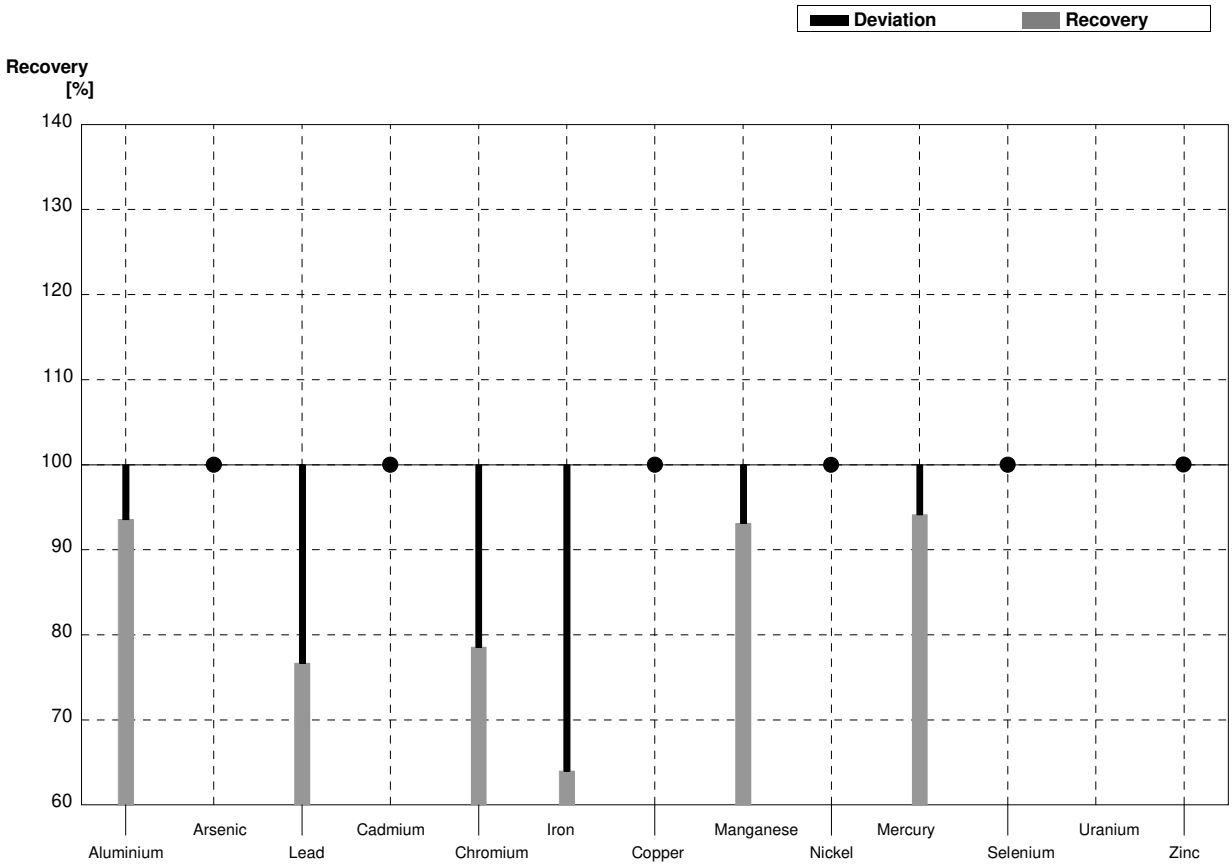
Sample **M154B**
Laboratory **M**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	16,5	1,65	µg/l	109%
Arsenic	4,39	0,03	4,55	0,68	µg/l	104%
Lead	1,05	0,02	0,96	0,096	µg/l	91%
Cadmium	1,60	0,01	1,61	0,161	µg/l	101%
Chromium	2,52	0,02	2,54	0,254	µg/l	101%
Iron	58,3	0,3	57	5,7	µg/l	98%
Copper	7,04	0,05	6,5	0,65	µg/l	92%
Manganese	25,2	0,2	25,0	2,5	µg/l	99%
Nickel	2,00	0,03	1,90	0,190	µg/l	95%
Mercury	1,19	0,02	1,17	0,117	µg/l	98%
Selenium	3,01	0,06	3,26	0,494	µg/l	108%
Uranium	8,08	0,05	7,7	0,77	µg/l	95%
Zinc	20,9	0,5	20,2	2,02	µg/l	97%



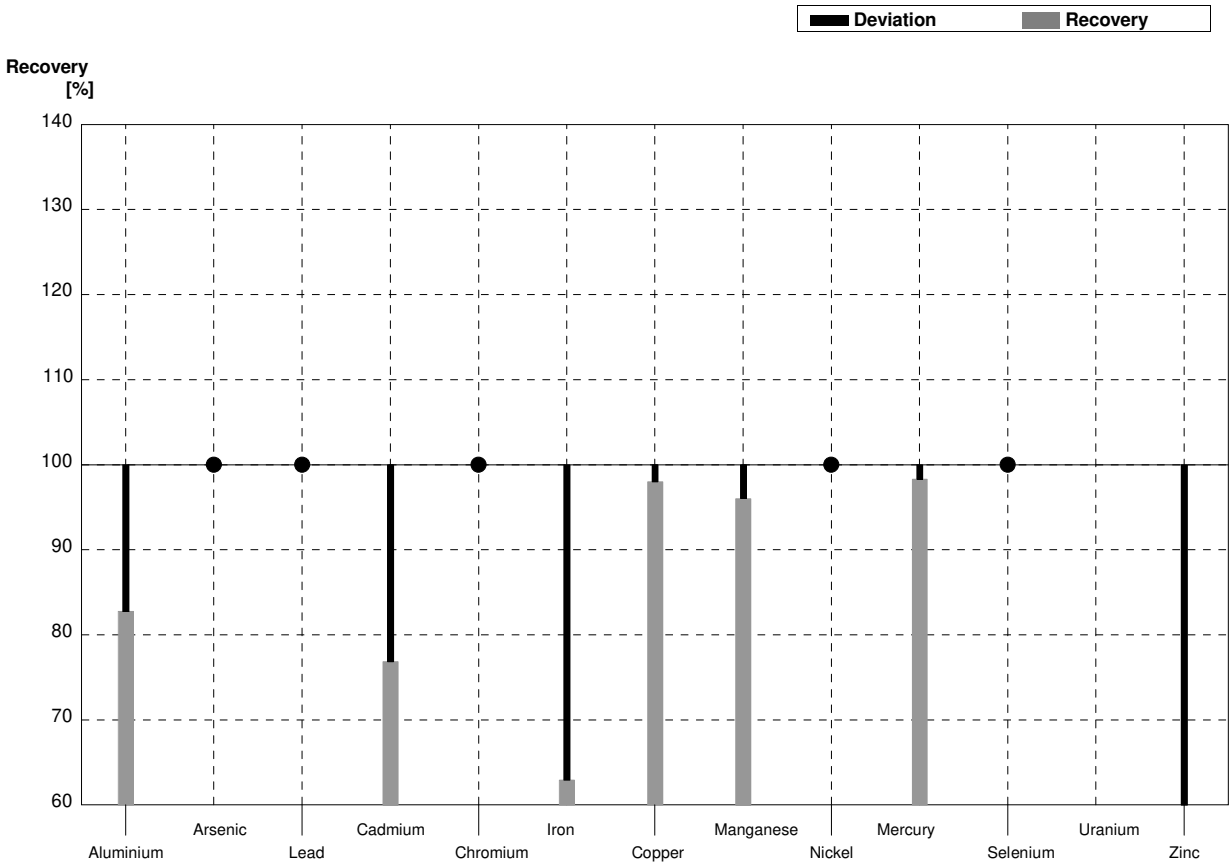
Sample **M154A**
Laboratory **N**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	46,6	4,6	µg/l	94%
Arsenic	1,20	0,01	<5,0	0,5	µg/l	•
Lead	9,26	0,06	7,10	0,71	µg/l	77%
Cadmium	0,299	0,003	<1,0	0,1	µg/l	•
Chromium	7,00	0,04	5,50	0,55	µg/l	79%
Iron	30,0	0,2	19,2	1,9	µg/l	64%
Copper	1,10	0,02	<5,0	0,5	µg/l	•
Manganese	16,0	0,1	14,9	1,5	µg/l	93%
Nickel	5,39	0,04	<5,0	0,5	µg/l	•
Mercury	0,478	0,013	0,450	0,045	µg/l	94%
Selenium	1,31	0,06	<5,0	0,5	µg/l	•
Uranium	1,80	0,01			µg/l	
Zinc	5,99	0,51	<5,0	0,5	µg/l	•



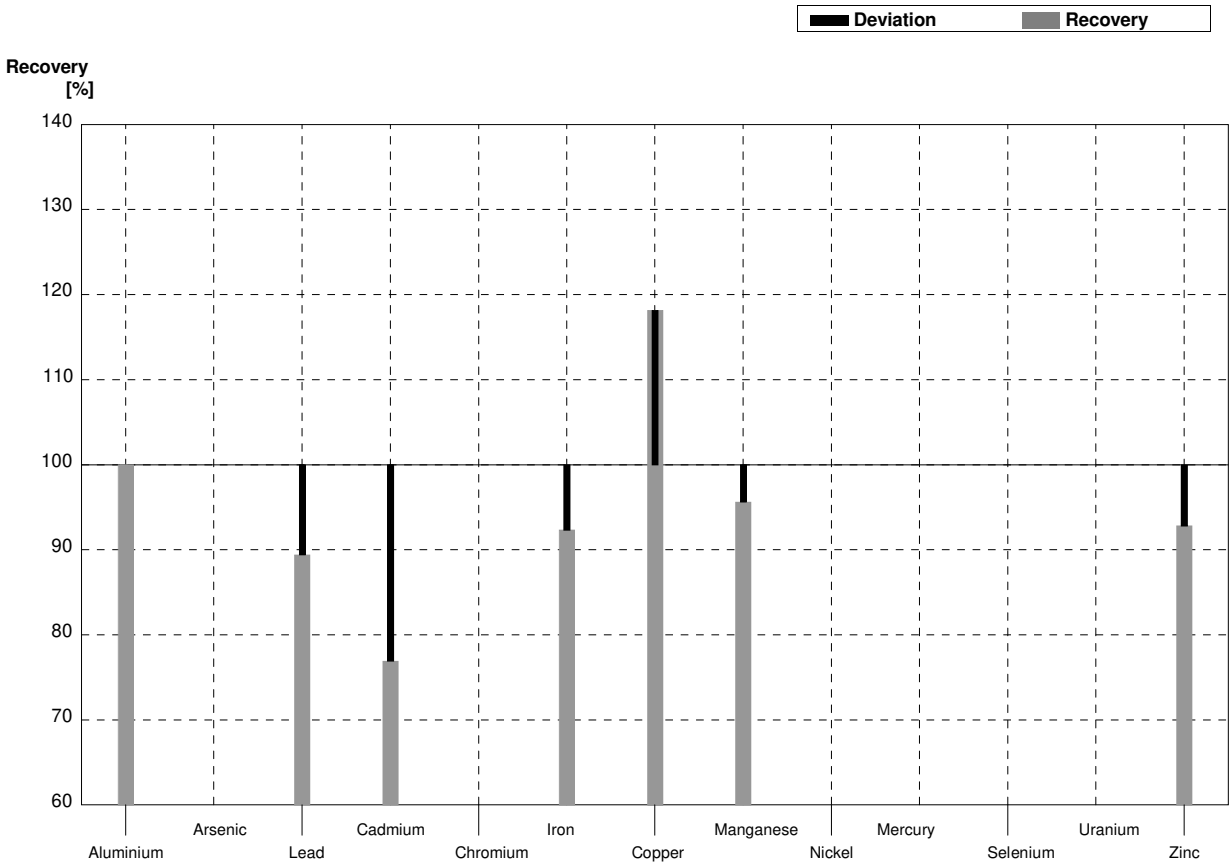
Sample **M154B**
Laboratory **N**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	12,5	1,3	µg/l	83%
Arsenic	4,39	0,03	<5,0	0,5	µg/l	•
Lead	1,05	0,02	<5,0	0,5	µg/l	•
Cadmium	1,60	0,01	1,23	0,13	µg/l	77%
Chromium	2,52	0,02	<5,0	0,5	µg/l	•
Iron	58,3	0,3	36,7	3,7	µg/l	63%
Copper	7,04	0,05	6,9	0,7	µg/l	98%
Manganese	25,2	0,2	24,2	2,4	µg/l	96%
Nickel	2,00	0,03	<5,0	0,5	µg/l	•
Mercury	1,19	0,02	1,17	0,12	µg/l	98%
Selenium	3,01	0,06	<5,0	0,5	µg/l	•
Uranium	8,08	0,05			µg/l	
Zinc	20,9	0,5	12,0	1,2	µg/l	57%



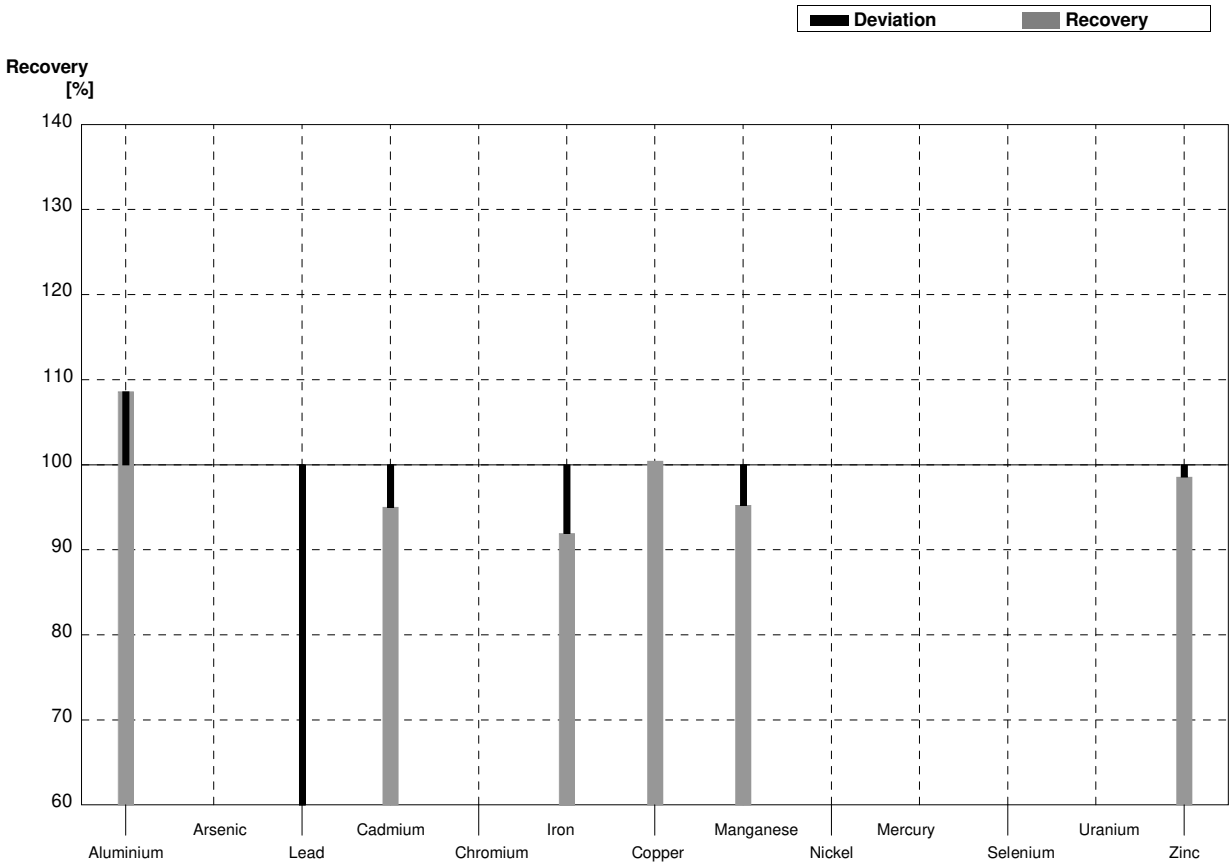
Sample **M154A**
Laboratory **O**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	49,8	8,0	µg/l	100%
Arsenic	1,20	0,01			µg/l	
Lead	9,26	0,06	8,28	1,90	µg/l	89%
Cadmium	0,299	0,003	0,230	0,051	µg/l	77%
Chromium	7,00	0,04			µg/l	
Iron	30,0	0,2	27,7	3,3	µg/l	92%
Copper	1,10	0,02	1,30	0,16	µg/l	118%
Manganese	16,0	0,1	15,3	1,8	µg/l	96%
Nickel	5,39	0,04			µg/l	
Mercury	0,478	0,013			µg/l	
Selenium	1,31	0,06			µg/l	
Uranium	1,80	0,01			µg/l	
Zinc	5,99	0,51	5,56	0,72	µg/l	93%



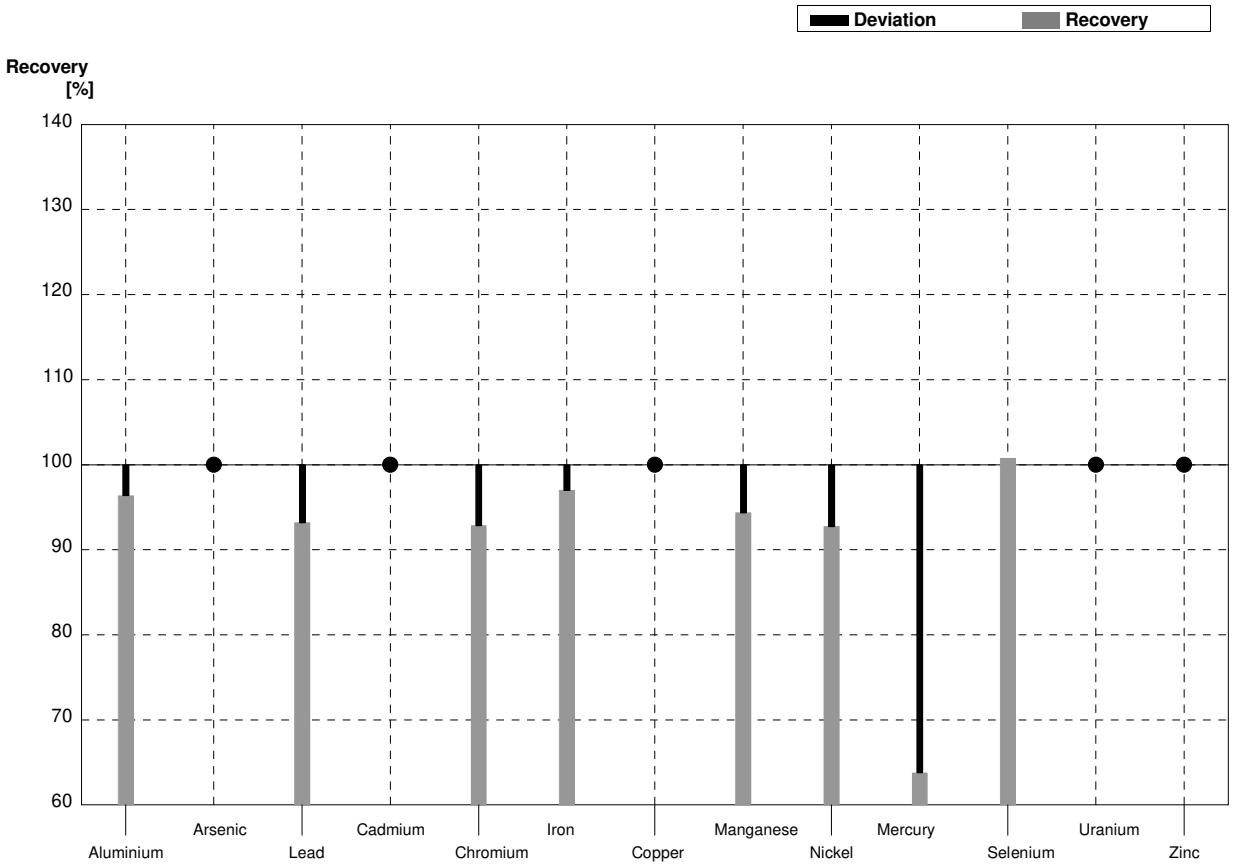
Sample **M154B**
Laboratory **O**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	16,4	2,6	µg/l	109%
Arsenic	4,39	0,03			µg/l	
Lead	1,05	0,02	0,370	0,085	µg/l	35%
Cadmium	1,60	0,01	1,52	0,33	µg/l	95%
Chromium	2,52	0,02			µg/l	
Iron	58,3	0,3	53,6	6,4	µg/l	92%
Copper	7,04	0,05	7,07	0,85	µg/l	100%
Manganese	25,2	0,2	24,0	2,9	µg/l	95%
Nickel	2,00	0,03			µg/l	
Mercury	1,19	0,02			µg/l	
Selenium	3,01	0,06			µg/l	
Uranium	8,08	0,05			µg/l	
Zinc	20,9	0,5	20,6	2,7	µg/l	99%



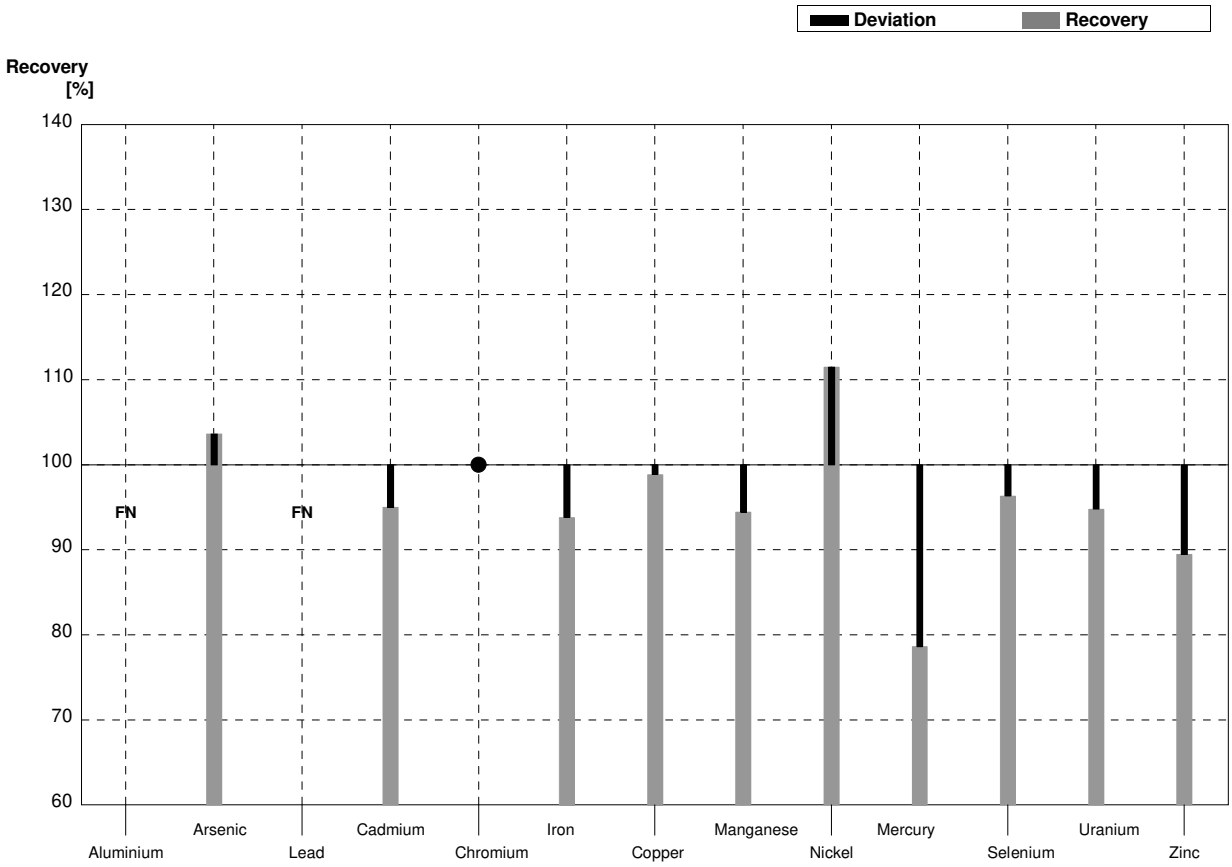
Sample **M154A**
Laboratory **P**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	48,0	1,2	µg/l	96%
Arsenic	1,20	0,01	<1,5		µg/l	•
Lead	9,26	0,06	8,63	0,04	µg/l	93%
Cadmium	0,299	0,003	<0,4		µg/l	•
Chromium	7,00	0,04	6,50	0,38	µg/l	93%
Iron	30,0	0,2	29,1	0,6	µg/l	97%
Copper	1,10	0,02	<5		µg/l	•
Manganese	16,0	0,1	15,1	0,2	µg/l	94%
Nickel	5,39	0,04	5,00	0,06	µg/l	93%
Mercury	0,478	0,013	0,305	0,025	µg/l	64%
Selenium	1,31	0,06	1,32	0,14	µg/l	101%
Uranium	1,80	0,01	<2		µg/l	•
Zinc	5,99	0,51	<10		µg/l	•



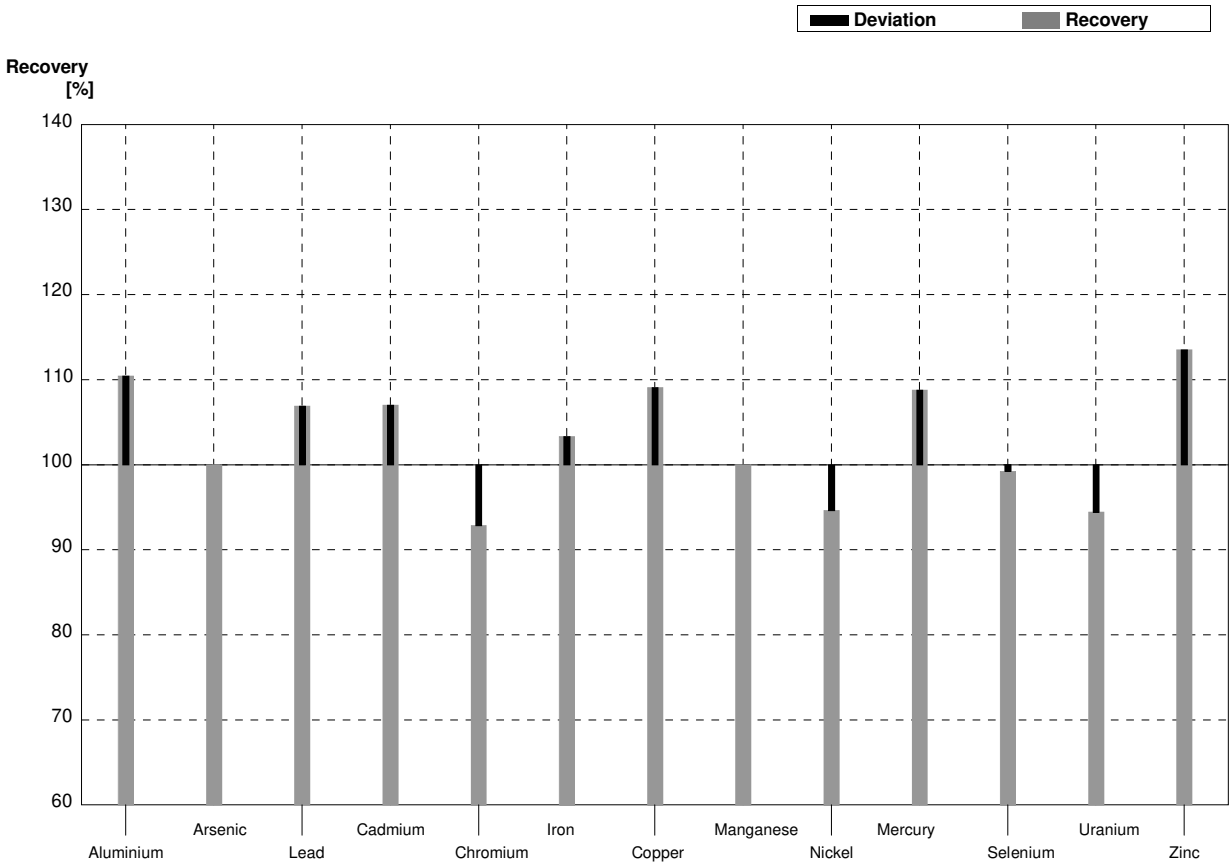
Sample **M154B**
Laboratory **P**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	<10		µg/l	FN
Arsenic	4,39	0,03	4,55	0,1	µg/l	104%
Lead	1,05	0,02	<1		µg/l	FN
Cadmium	1,60	0,01	1,52	0,1	µg/l	95%
Chromium	2,52	0,02	<5		µg/l	•
Iron	58,3	0,3	54,7	0,7	µg/l	94%
Copper	7,04	0,05	6,96	0,9	µg/l	99%
Manganese	25,2	0,2	23,8	0,3	µg/l	94%
Nickel	2,00	0,03	2,23	0,2	µg/l	112%
Mercury	1,19	0,02	0,936	0,02	µg/l	79%
Selenium	3,01	0,06	2,90	0,11	µg/l	96%
Uranium	8,08	0,05	7,66	0,13	µg/l	95%
Zinc	20,9	0,5	18,7	1,4	µg/l	89%



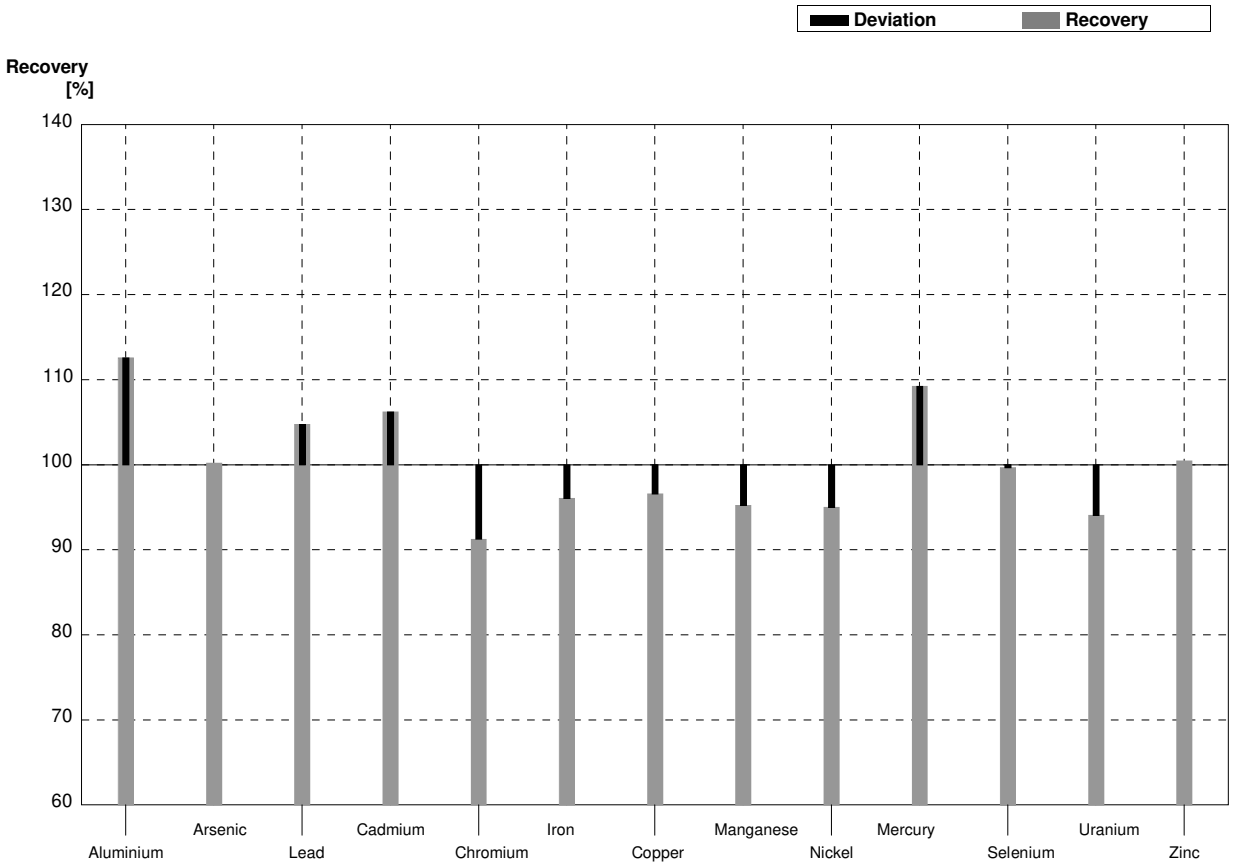
Sample **M154A**
Laboratory **Q**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	55	5,5	µg/l	110%
Arsenic	1,20	0,01	1,20	0,12	µg/l	100%
Lead	9,26	0,06	9,9	1,0	µg/l	107%
Cadmium	0,299	0,003	0,320	0,032	µg/l	107%
Chromium	7,00	0,04	6,5	0,65	µg/l	93%
Iron	30,0	0,2	31,0	3,1	µg/l	103%
Copper	1,10	0,02	1,20	0,12	µg/l	109%
Manganese	16,0	0,1	16,0	1,6	µg/l	100%
Nickel	5,39	0,04	5,1	0,51	µg/l	95%
Mercury	0,478	0,013	0,52	0,05	µg/l	109%
Selenium	1,31	0,06	1,30	0,13	µg/l	99%
Uranium	1,80	0,01	1,70	0,17	µg/l	94%
Zinc	5,99	0,51	6,8	0,68	µg/l	114%



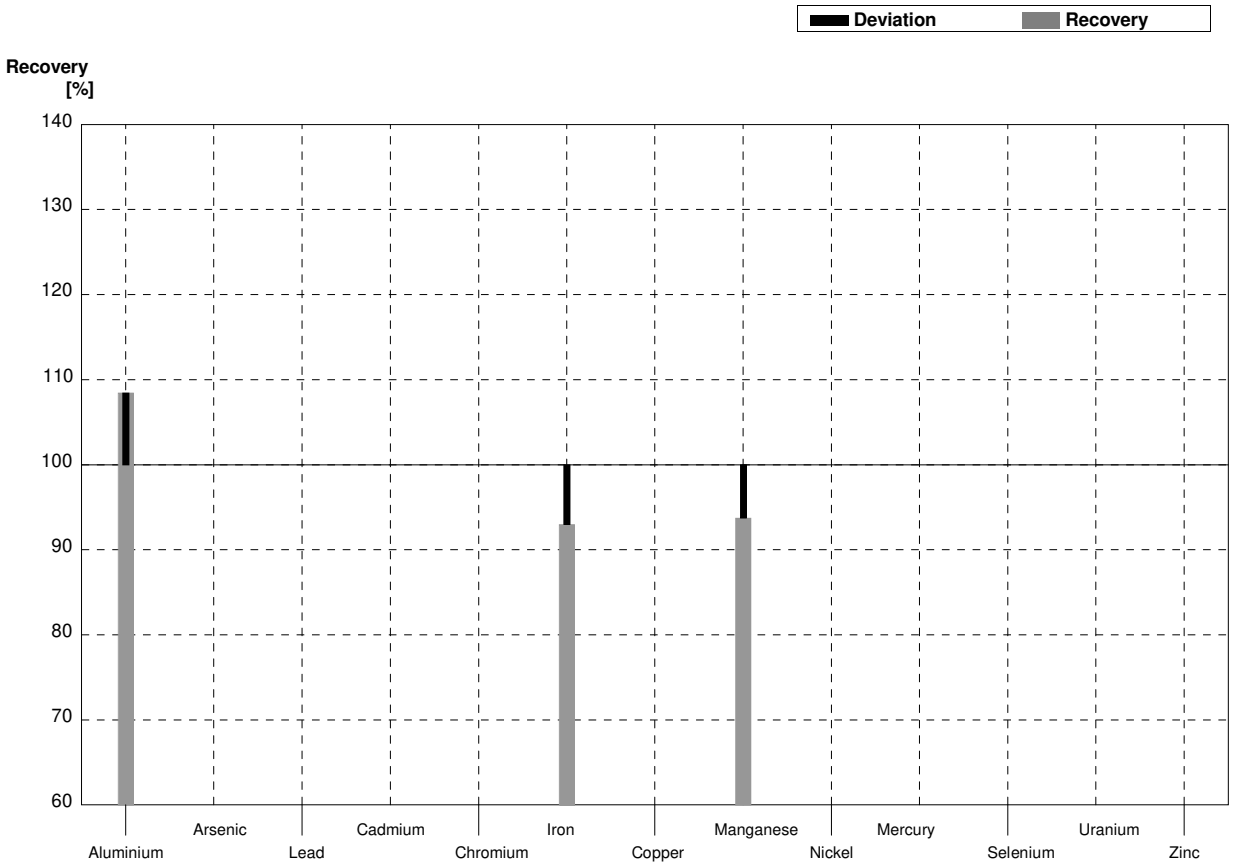
Sample **M154B**
Laboratory **Q**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	17,0	1,70	µg/l	113%
Arsenic	4,39	0,03	4,40	0,44	µg/l	100%
Lead	1,05	0,02	1,10	0,11	µg/l	105%
Cadmium	1,60	0,01	1,70	0,17	µg/l	106%
Chromium	2,52	0,02	2,30	0,23	µg/l	91%
Iron	58,3	0,3	56,0	5,6	µg/l	96%
Copper	7,04	0,05	6,8	0,68	µg/l	97%
Manganese	25,2	0,2	24,0	2,4	µg/l	95%
Nickel	2,00	0,03	1,90	0,19	µg/l	95%
Mercury	1,19	0,02	1,30	0,13	µg/l	109%
Selenium	3,01	0,06	3,00	0,3	µg/l	100%
Uranium	8,08	0,05	7,60	0,76	µg/l	94%
Zinc	20,9	0,5	21,0	2,1	µg/l	100%



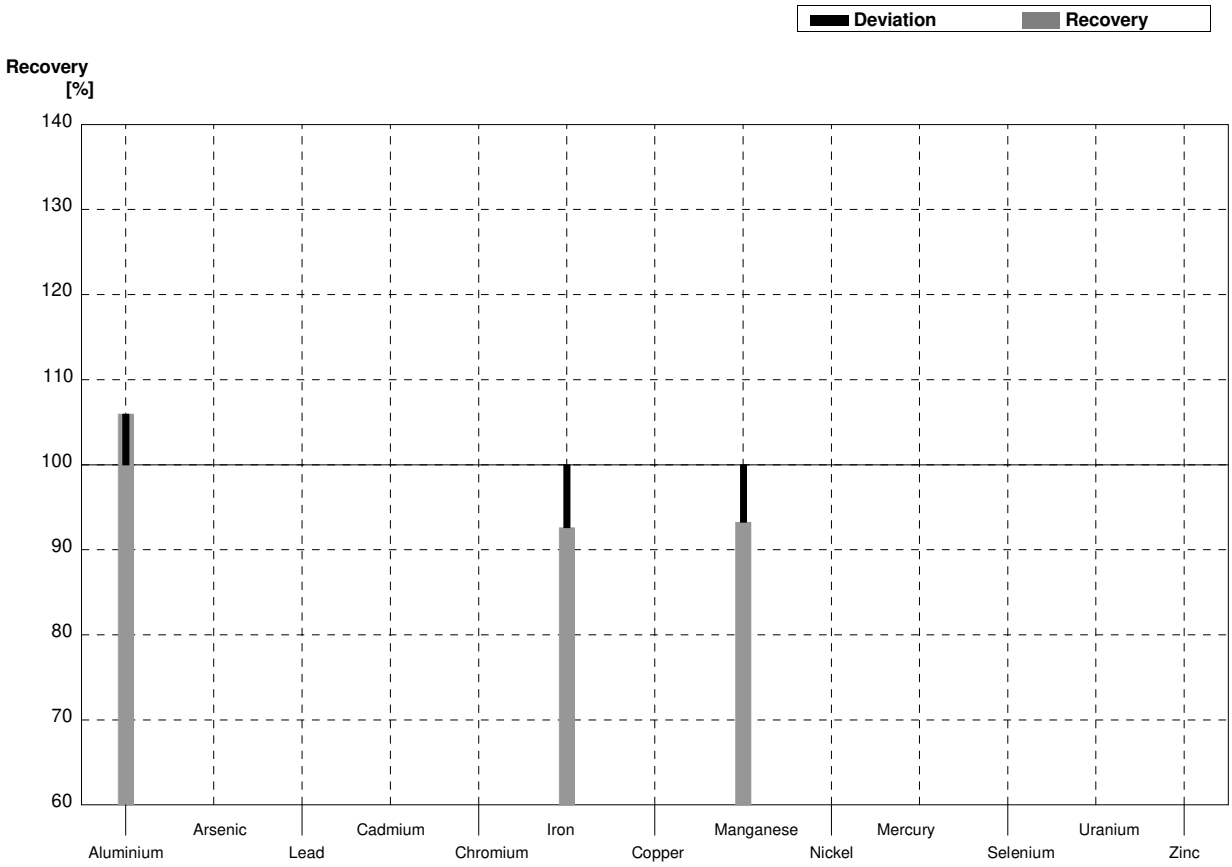
Sample **M154A**
Laboratory **R**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	54	14	µg/l	108%
Arsenic	1,20	0,01			µg/l	
Lead	9,26	0,06			µg/l	
Cadmium	0,299	0,003			µg/l	
Chromium	7,00	0,04			µg/l	
Iron	30,0	0,2	27,9	3,3	µg/l	93%
Copper	1,10	0,02			µg/l	
Manganese	16,0	0,1	15,0	2,4	µg/l	94%
Nickel	5,39	0,04			µg/l	
Mercury	0,478	0,013			µg/l	
Selenium	1,31	0,06			µg/l	
Uranium	1,80	0,01			µg/l	
Zinc	5,99	0,51			µg/l	



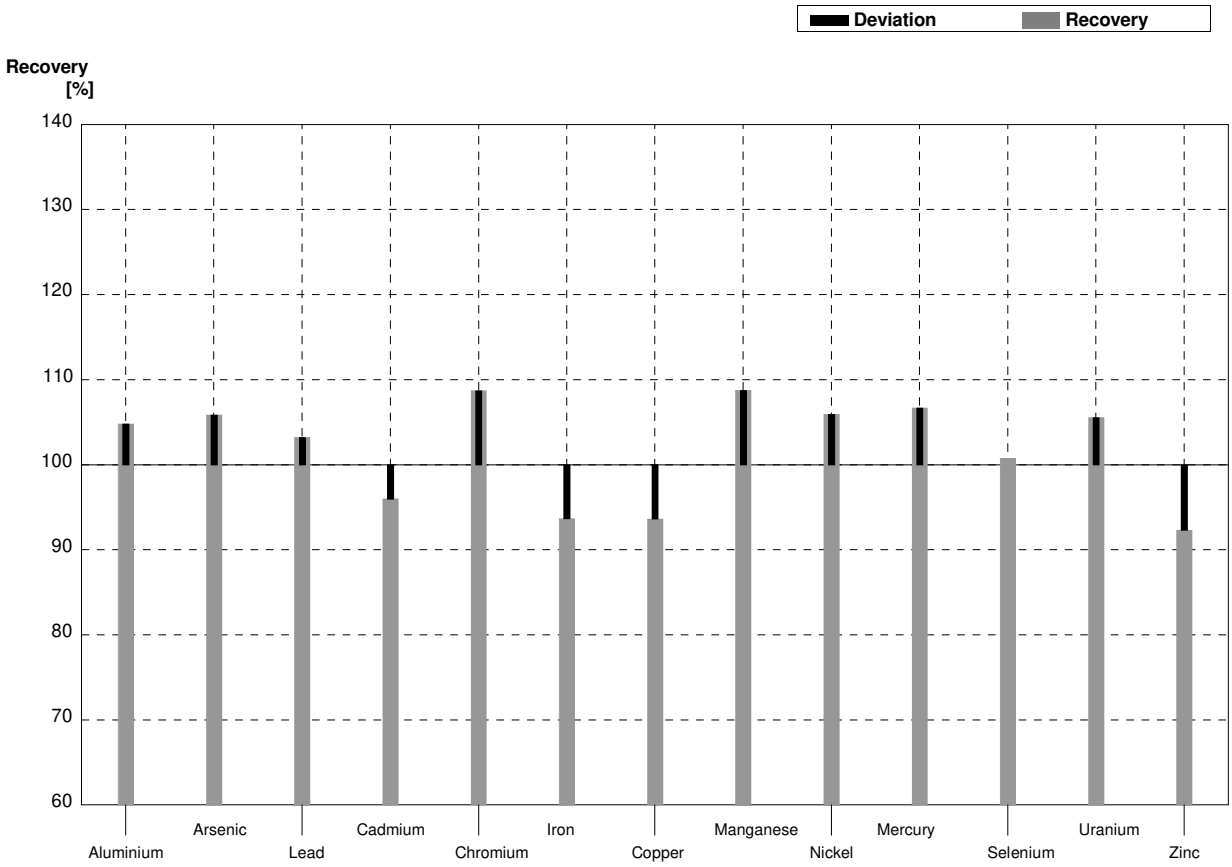
Sample **M154B**
Laboratory **R**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	16,0	4,0	µg/l	106%
Arsenic	4,39	0,03			µg/l	
Lead	1,05	0,02			µg/l	
Cadmium	1,60	0,01			µg/l	
Chromium	2,52	0,02			µg/l	
Iron	58,3	0,3	54	7	µg/l	93%
Copper	7,04	0,05			µg/l	
Manganese	25,2	0,2	23,5	3,8	µg/l	93%
Nickel	2,00	0,03			µg/l	
Mercury	1,19	0,02			µg/l	
Selenium	3,01	0,06			µg/l	
Uranium	8,08	0,05			µg/l	
Zinc	20,9	0,5			µg/l	



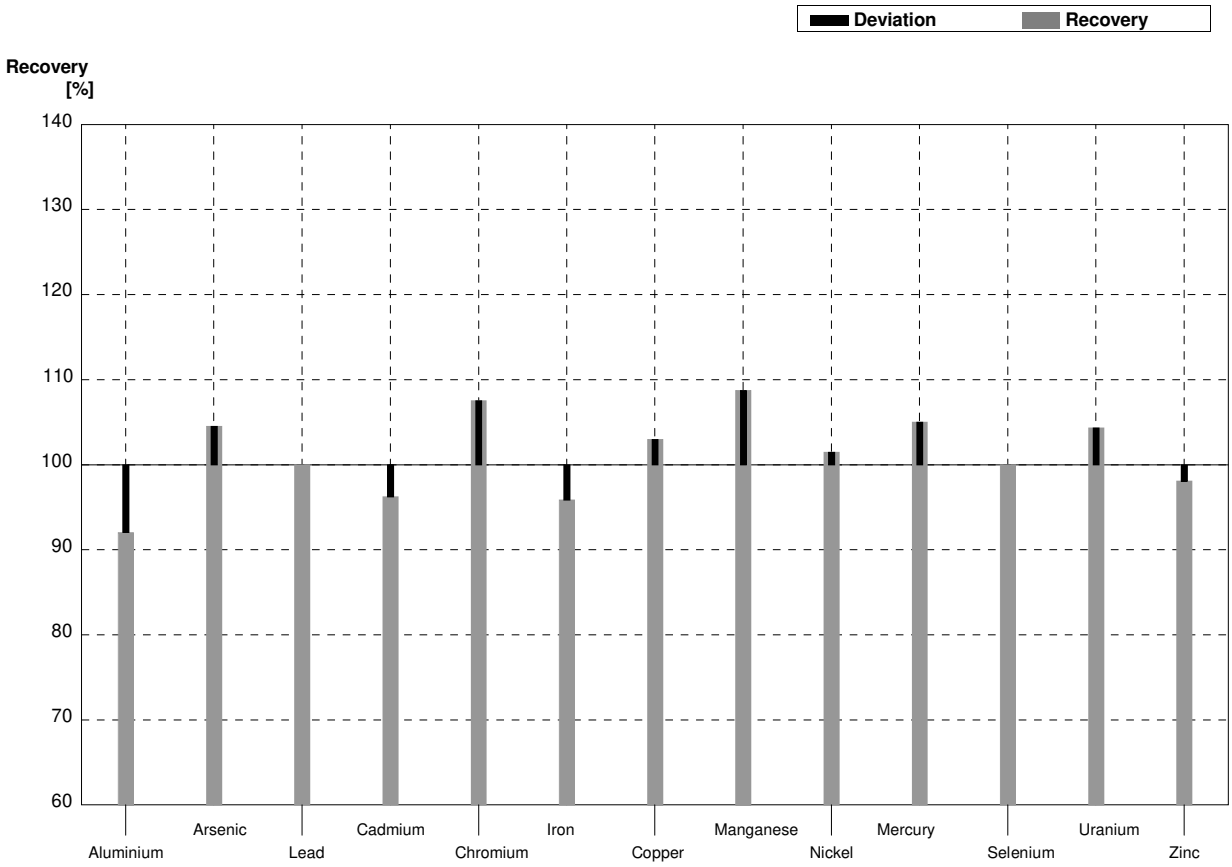
Sample **M154A**
Laboratory **S**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	52,2	10,4	µg/l	105%
Arsenic	1,20	0,01	1,27	0,25	µg/l	106%
Lead	9,26	0,06	9,56	1,91	µg/l	103%
Cadmium	0,299	0,003	0,287	0,057	µg/l	96%
Chromium	7,00	0,04	7,61	1,52	µg/l	109%
Iron	30,0	0,2	28,1	5,62	µg/l	94%
Copper	1,10	0,02	1,03	0,21	µg/l	94%
Manganese	16,0	0,1	17,4	3,5	µg/l	109%
Nickel	5,39	0,04	5,71	1,14	µg/l	106%
Mercury	0,478	0,013	0,510	0,102	µg/l	107%
Selenium	1,31	0,06	1,32	0,26	µg/l	101%
Uranium	1,80	0,01	1,90	0,38	µg/l	106%
Zinc	5,99	0,51	5,53	1,11	µg/l	92%



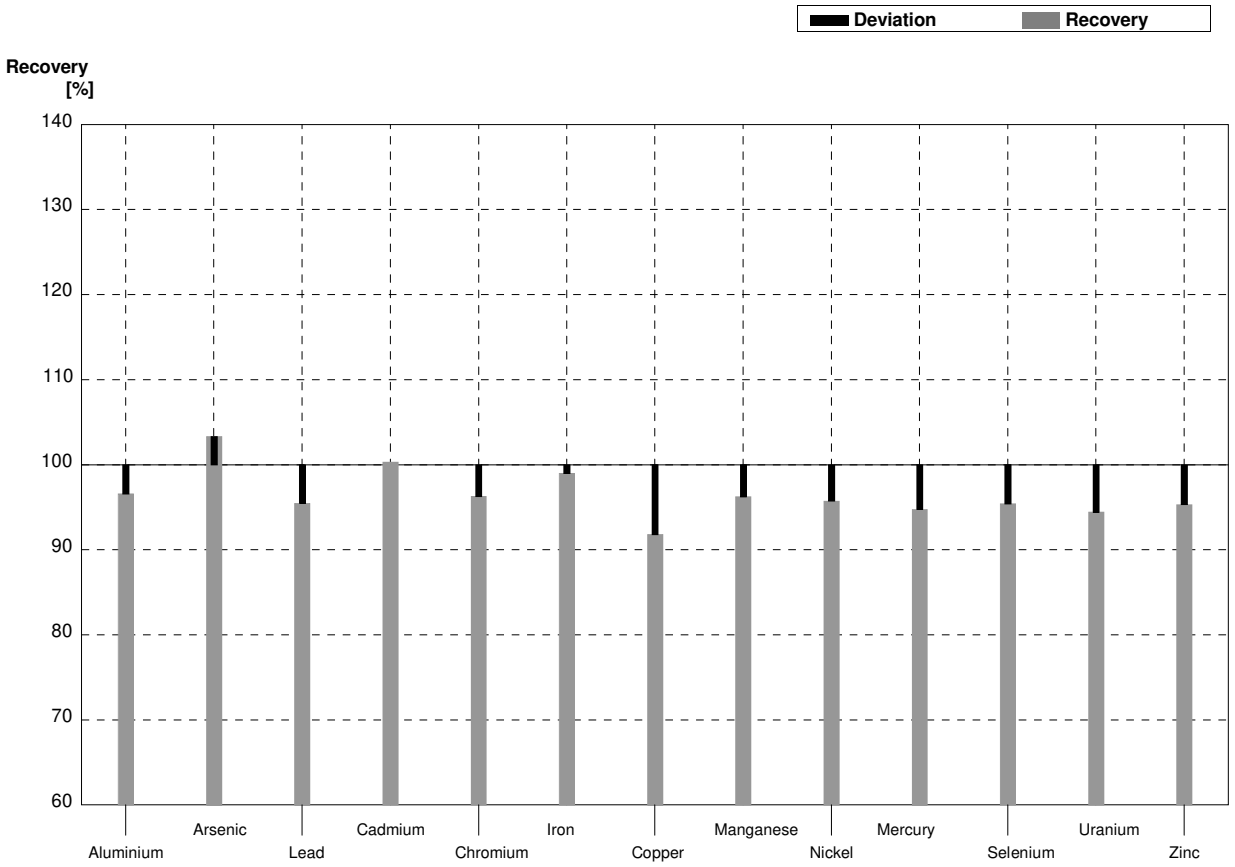
Sample **M154B**
Laboratory **S**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	13,9	2,79	µg/l	92%
Arsenic	4,39	0,03	4,59	0,92	µg/l	105%
Lead	1,05	0,02	1,05	0,21	µg/l	100%
Cadmium	1,60	0,01	1,54	0,31	µg/l	96%
Chromium	2,52	0,02	2,71	0,54	µg/l	108%
Iron	58,3	0,3	55,9	11,2	µg/l	96%
Copper	7,04	0,05	7,25	1,45	µg/l	103%
Manganese	25,2	0,2	27,4	5,47	µg/l	109%
Nickel	2,00	0,03	2,03	0,41	µg/l	102%
Mercury	1,19	0,02	1,25	0,25	µg/l	105%
Selenium	3,01	0,06	3,01	0,60	µg/l	100%
Uranium	8,08	0,05	8,43	1,69	µg/l	104%
Zinc	20,9	0,5	20,5	4,10	µg/l	98%



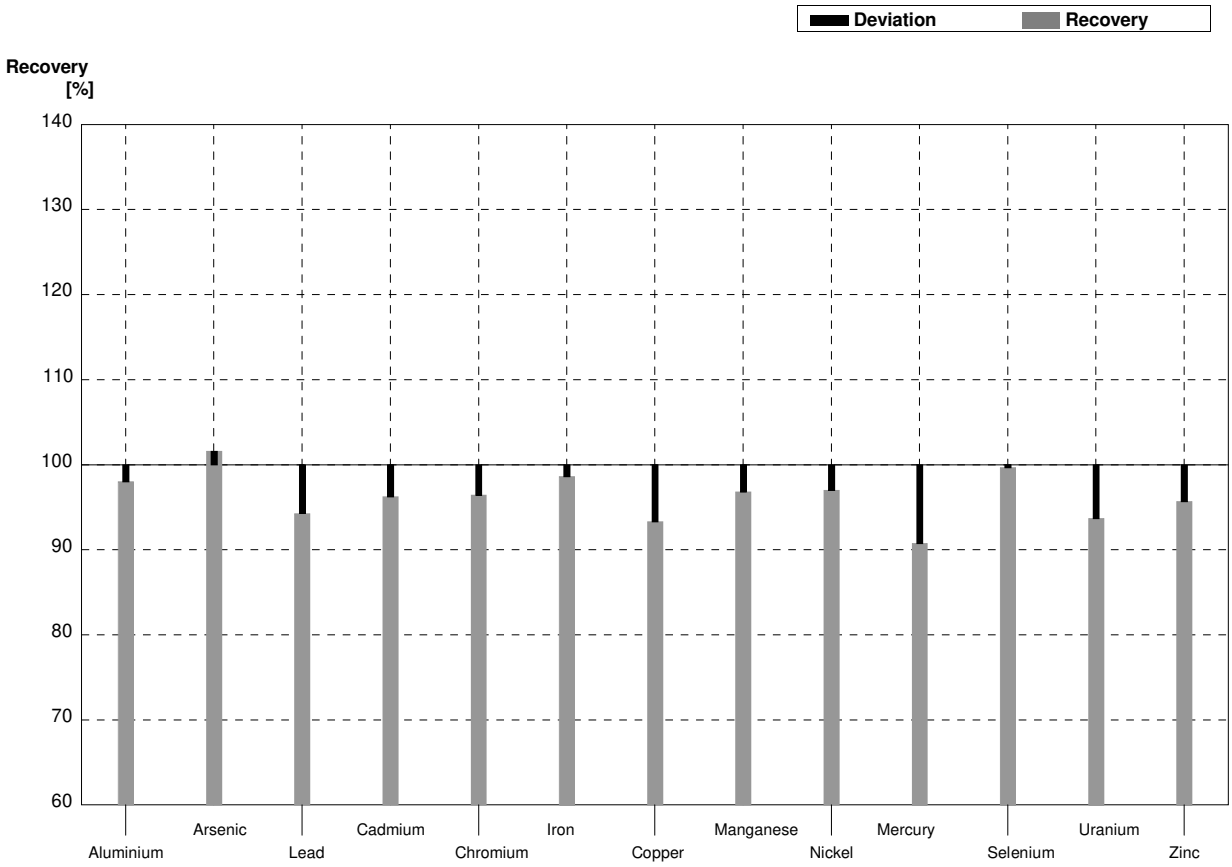
Sample **M154A**
Laboratory **T**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	48,1	9,6	µg/l	97%
Arsenic	1,20	0,01	1,24	0,25	µg/l	103%
Lead	9,26	0,06	8,84	1,77	µg/l	95%
Cadmium	0,299	0,003	0,300	0,060	µg/l	100%
Chromium	7,00	0,04	6,74	1,35	µg/l	96%
Iron	30,0	0,2	29,7	5,9	µg/l	99%
Copper	1,10	0,02	1,01	0,20	µg/l	92%
Manganese	16,0	0,1	15,4	3,1	µg/l	96%
Nickel	5,39	0,04	5,16	1,03	µg/l	96%
Mercury	0,478	0,013	0,453	0,091	µg/l	95%
Selenium	1,31	0,06	1,25	0,25	µg/l	95%
Uranium	1,80	0,01	1,70	0,34	µg/l	94%
Zinc	5,99	0,51	5,71	1,14	µg/l	95%



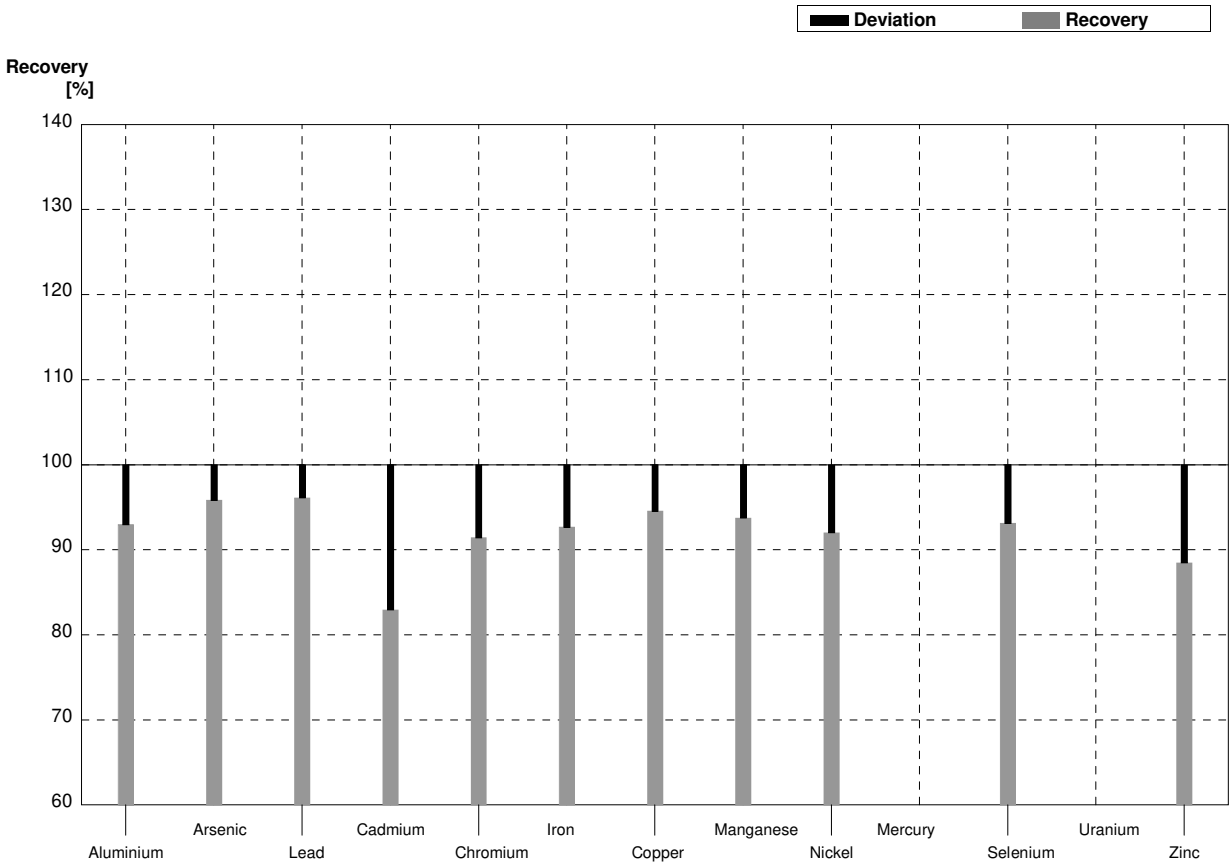
Sample **M154B**
Laboratory **T**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	14,8	2,9	µg/l	98%
Arsenic	4,39	0,03	4,46	0,89	µg/l	102%
Lead	1,05	0,02	0,990	0,198	µg/l	94%
Cadmium	1,60	0,01	1,54	0,31	µg/l	96%
Chromium	2,52	0,02	2,43	0,49	µg/l	96%
Iron	58,3	0,3	57,5	11,5	µg/l	99%
Copper	7,04	0,05	6,57	1,31	µg/l	93%
Manganese	25,2	0,2	24,4	4,82	µg/l	97%
Nickel	2,00	0,03	1,94	0,39	µg/l	97%
Mercury	1,19	0,02	1,08	0,22	µg/l	91%
Selenium	3,01	0,06	3,00	0,60	µg/l	100%
Uranium	8,08	0,05	7,57	1,51	µg/l	94%
Zinc	20,9	0,5	20,0	4,0	µg/l	96%



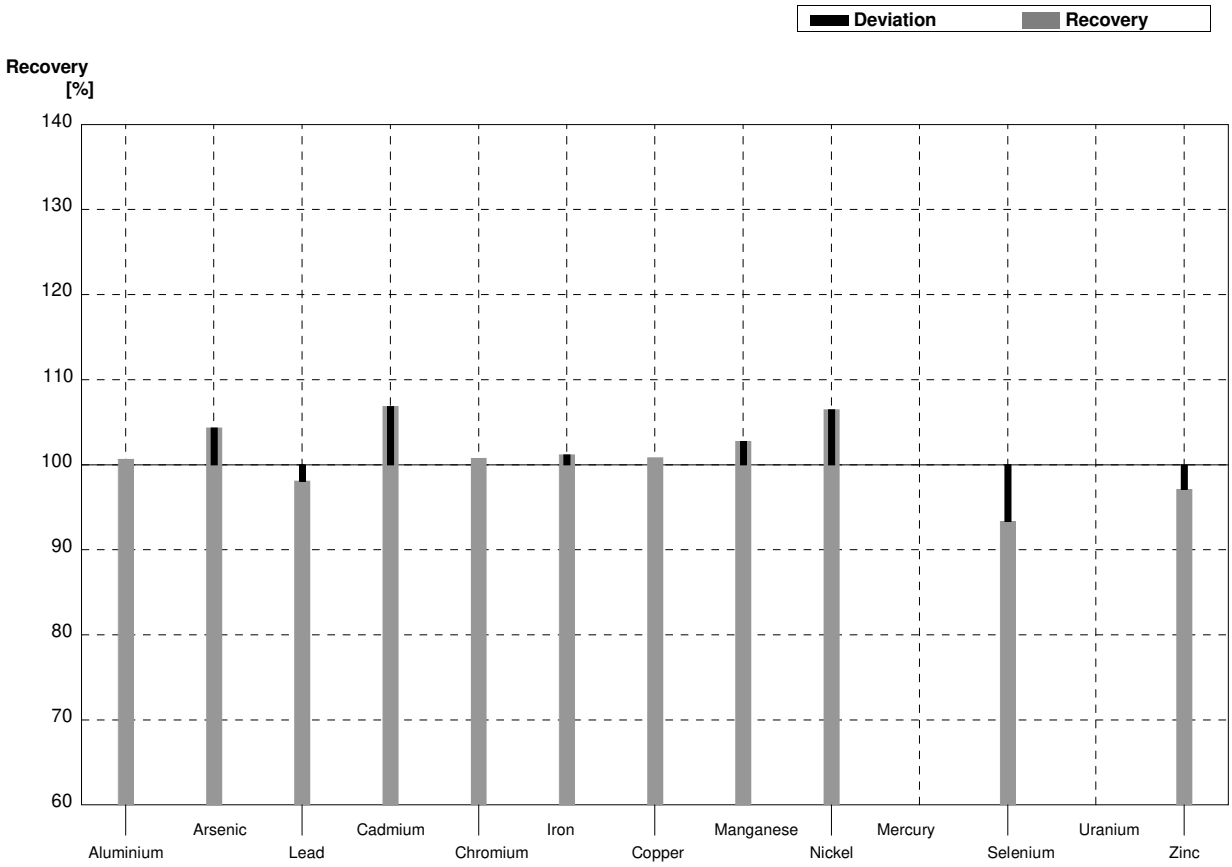
Sample **M154A**
Laboratory **U**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	46,3	9,3	µg/l	93%
Arsenic	1,20	0,01	1,15	0,26	µg/l	96%
Lead	9,26	0,06	8,9	2,0	µg/l	96%
Cadmium	0,299	0,003	0,248	0,060	µg/l	83%
Chromium	7,00	0,04	6,4	1,1	µg/l	91%
Iron	30,0	0,2	27,8	7,2	µg/l	93%
Copper	1,10	0,02	1,04	0,27	µg/l	95%
Manganese	16,0	0,1	15,0	2,4	µg/l	94%
Nickel	5,39	0,04	4,96	1,19	µg/l	92%
Mercury	0,478	0,013			µg/l	
Selenium	1,31	0,06	1,22	0,35	µg/l	93%
Uranium	1,80	0,01			µg/l	
Zinc	5,99	0,51	5,3	0,9	µg/l	88%



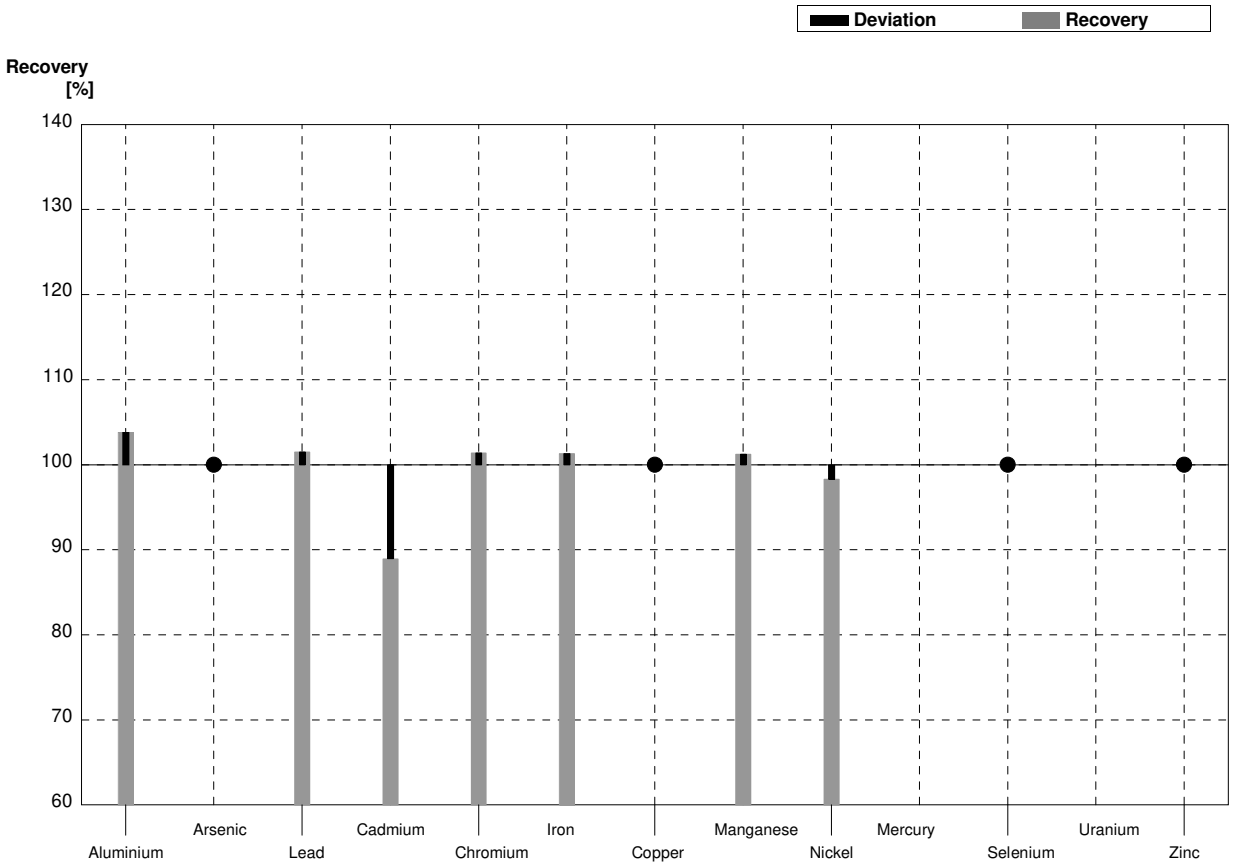
Sample **M154B**
Laboratory **U**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	15,2	3,0	µg/l	101%
Arsenic	4,39	0,03	4,58	1,05	µg/l	104%
Lead	1,05	0,02	1,03	0,24	µg/l	98%
Cadmium	1,60	0,01	1,71	0,41	µg/l	107%
Chromium	2,52	0,02	2,54	0,43	µg/l	101%
Iron	58,3	0,3	59	15	µg/l	101%
Copper	7,04	0,05	7,1	1,8	µg/l	101%
Manganese	25,2	0,2	25,9	4,2	µg/l	103%
Nickel	2,00	0,03	2,13	0,51	µg/l	107%
Mercury	1,19	0,02			µg/l	
Selenium	3,01	0,06	2,81	0,81	µg/l	93%
Uranium	8,08	0,05			µg/l	
Zinc	20,9	0,5	20,3	3,2	µg/l	97%



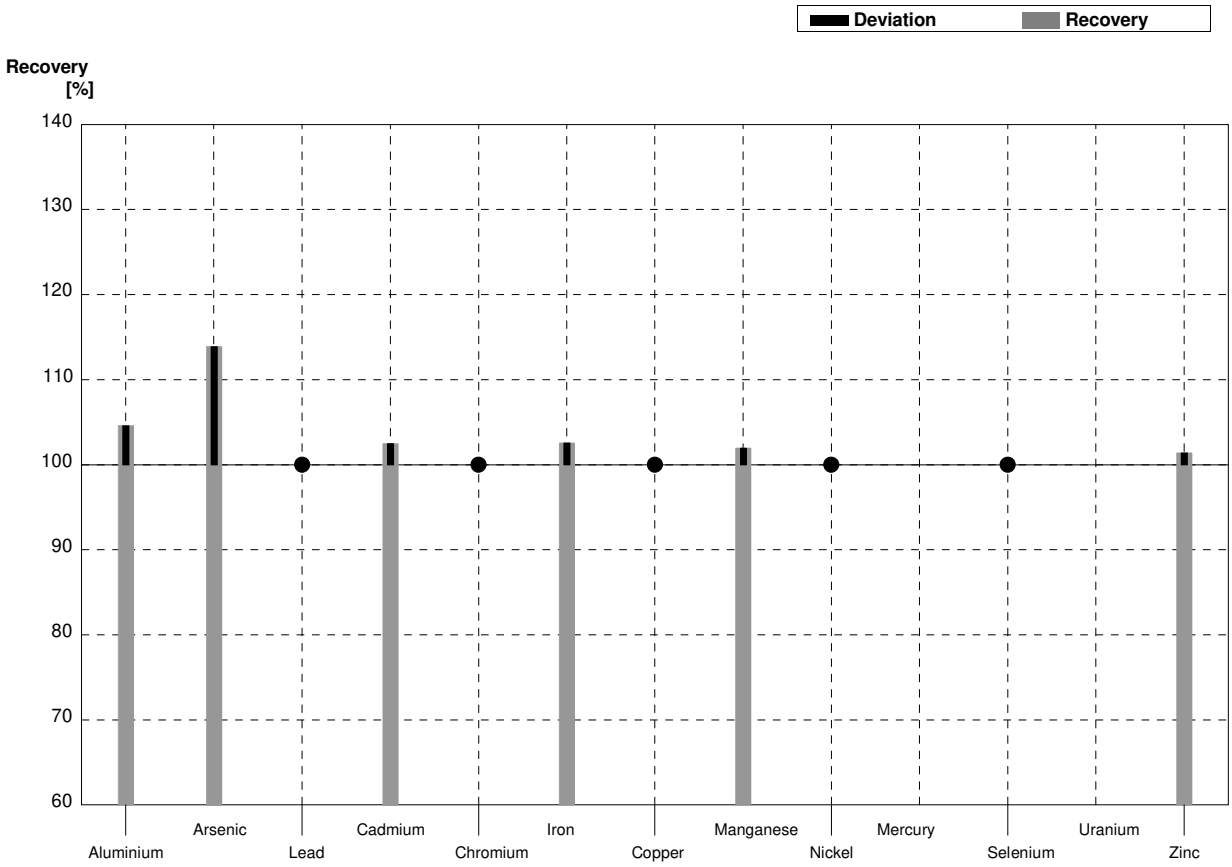
Sample **M154A**
Laboratory **V**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	51,7	7,96	µg/l	104%
Arsenic	1,20	0,01	<2		µg/l	•
Lead	9,26	0,06	9,4	1,61	µg/l	102%
Cadmium	0,299	0,003	0,266	0,019	µg/l	89%
Chromium	7,00	0,04	7,1	0,59	µg/l	101%
Iron	30,0	0,2	30,4	2,6	µg/l	101%
Copper	1,10	0,02	<10		µg/l	•
Manganese	16,0	0,1	16,2	1,5	µg/l	101%
Nickel	5,39	0,04	5,3	0,65	µg/l	98%
Mercury	0,478	0,013			µg/l	
Selenium	1,31	0,06	<5		µg/l	•
Uranium	1,80	0,01			µg/l	
Zinc	5,99	0,51	<10		µg/l	•



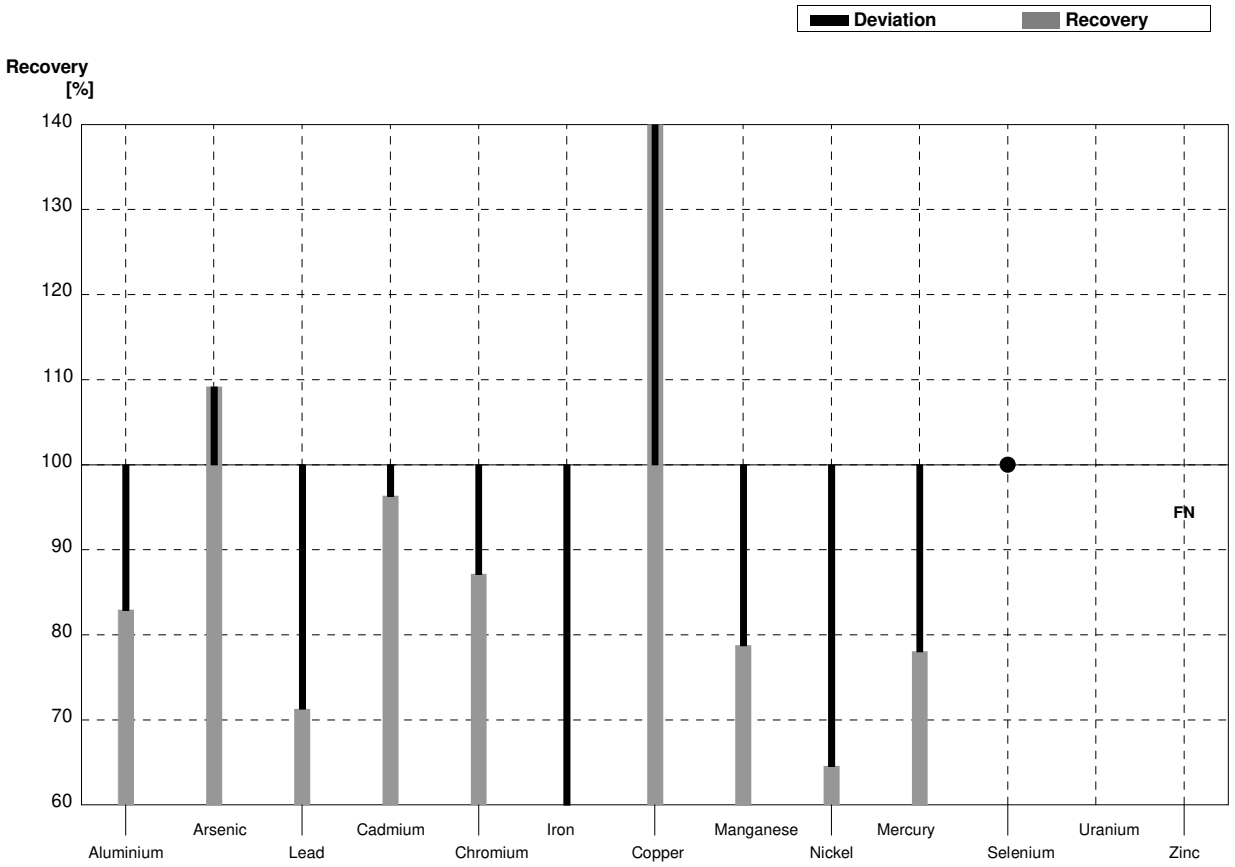
Sample **M154B**
Laboratory **V**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	15,8	2,43	µg/l	105%
Arsenic	4,39	0,03	5,0	0,75	µg/l	114%
Lead	1,05	0,02	<2		µg/l	•
Cadmium	1,60	0,01	1,64	0,115	µg/l	103%
Chromium	2,52	0,02	<5,0		µg/l	•
Iron	58,3	0,3	59,8	5,0	µg/l	103%
Copper	7,04	0,05	<10		µg/l	•
Manganese	25,2	0,2	25,7	2,4	µg/l	102%
Nickel	2,00	0,03	<2,0		µg/l	•
Mercury	1,19	0,02			µg/l	
Selenium	3,01	0,06	<5		µg/l	•
Uranium	8,08	0,05			µg/l	
Zinc	20,9	0,5	21,2	2,97	µg/l	101%



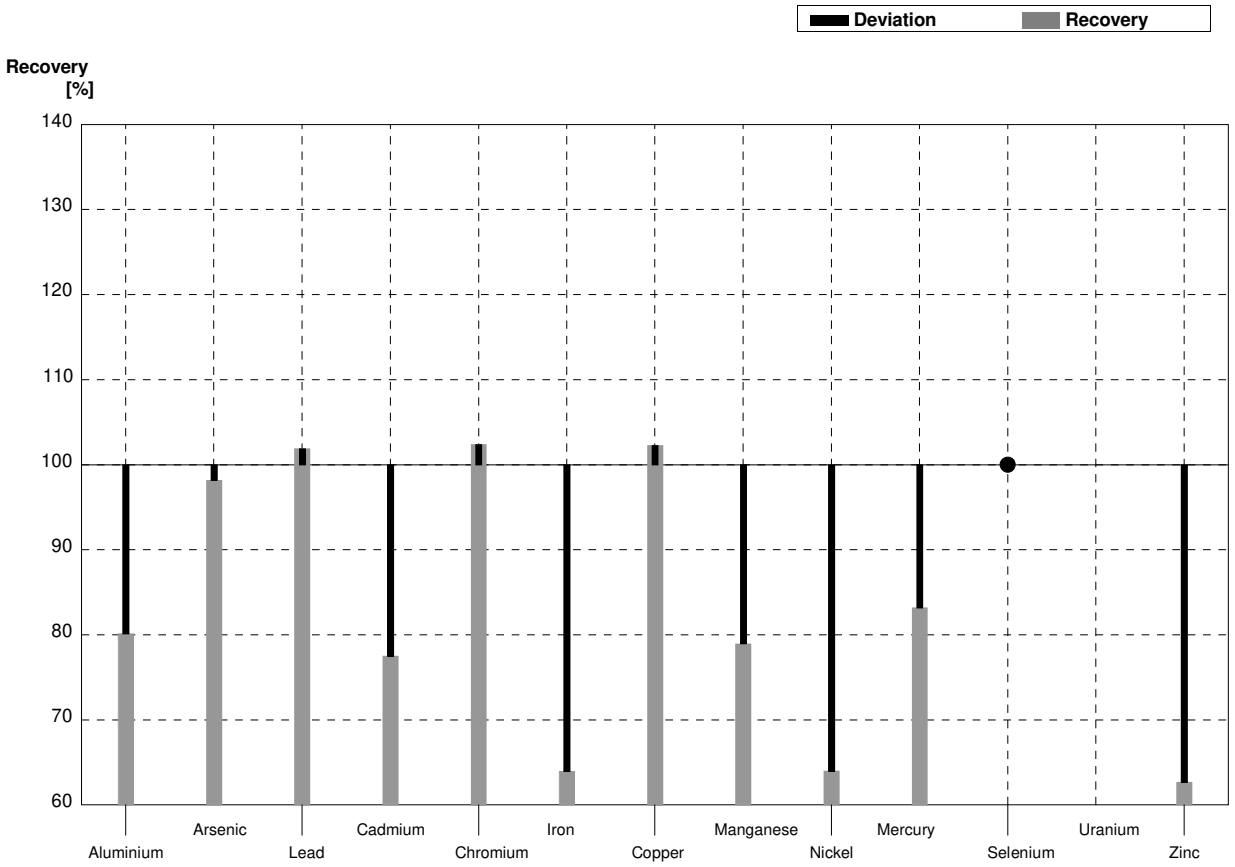
Sample **M154A**
Laboratory **W**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	41,3	4,1	µg/l	83%
Arsenic	1,20	0,01	1,31	0,13	µg/l	109%
Lead	9,26	0,06	6,6	0,66	µg/l	71%
Cadmium	0,299	0,003	0,288	0,029	µg/l	96%
Chromium	7,00	0,04	6,1	0,61	µg/l	87%
Iron	30,0	0,2	16,1	1,6	µg/l	54%
Copper	1,10	0,02	1,97	0,20	µg/l	179%
Manganese	16,0	0,1	12,6	1,3	µg/l	79%
Nickel	5,39	0,04	3,48	0,35	µg/l	65%
Mercury	0,478	0,013	0,373	0,037	µg/l	78%
Selenium	1,31	0,06	<5		µg/l	•
Uranium	1,80	0,01			µg/l	
Zinc	5,99	0,51	<5		µg/l	FN



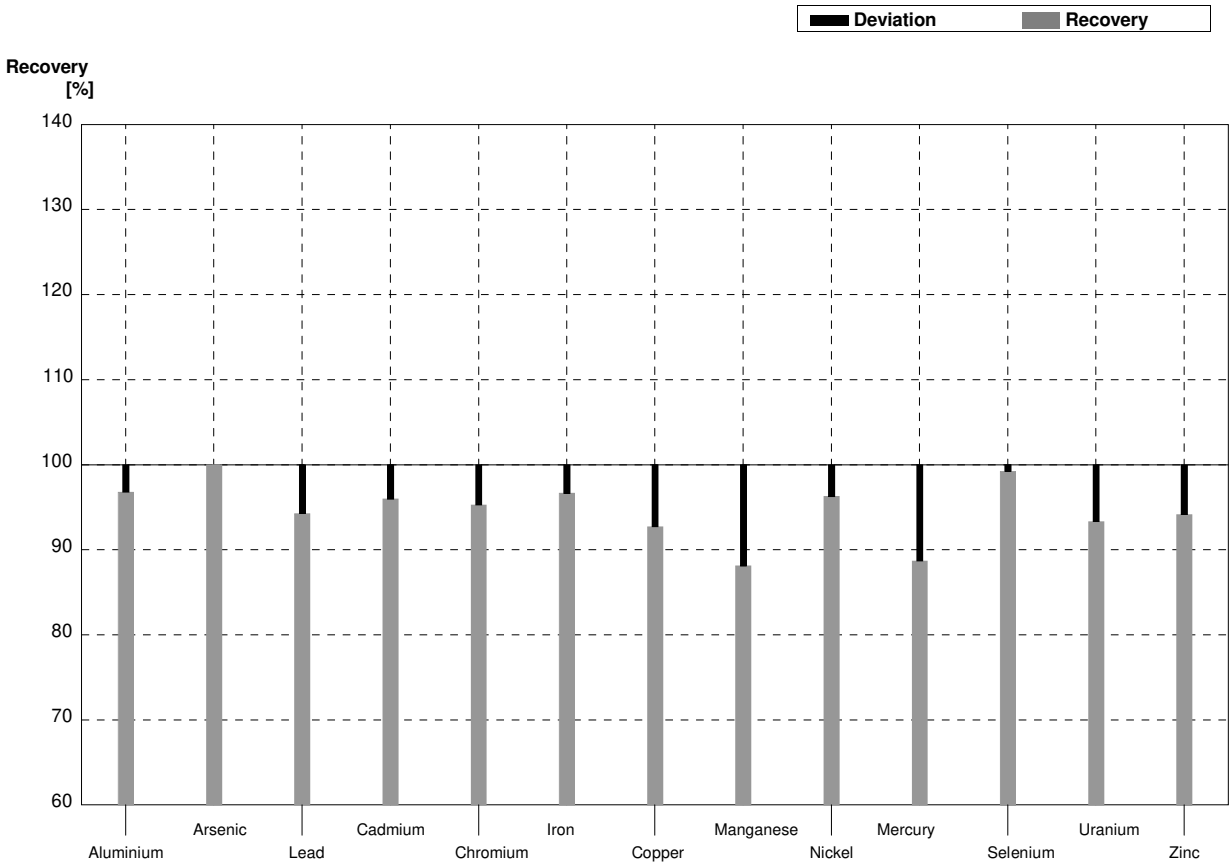
Sample **M154B**
Laboratory **W**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	12,1	1,2	µg/l	80%
Arsenic	4,39	0,03	4,31	0,43	µg/l	98%
Lead	1,05	0,02	1,07	0,11	µg/l	102%
Cadmium	1,60	0,01	1,24	0,12	µg/l	78%
Chromium	2,52	0,02	2,58	0,26	µg/l	102%
Iron	58,3	0,3	37,3	3,7	µg/l	64%
Copper	7,04	0,05	7,2	0,7	µg/l	102%
Manganese	25,2	0,2	19,9	2,0	µg/l	79%
Nickel	2,00	0,03	1,28	0,13	µg/l	64%
Mercury	1,19	0,02	0,99	0,10	µg/l	83%
Selenium	3,01	0,06	<5		µg/l	•
Uranium	8,08	0,05			µg/l	
Zinc	20,9	0,5	13,1	1,3	µg/l	63%



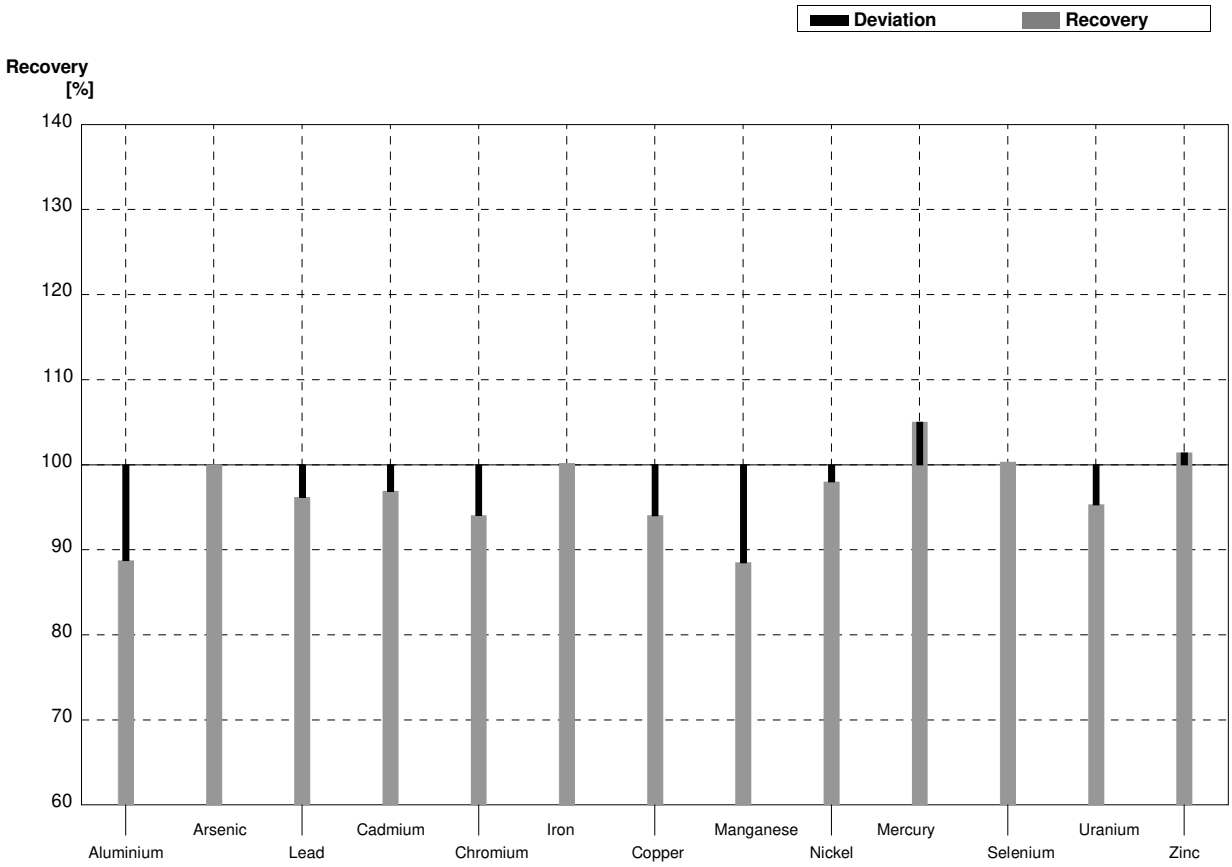
Sample **M154A**
Laboratory **X**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	48,2	5,4	µg/l	97%
Arsenic	1,20	0,01	1,20	0,07	µg/l	100%
Lead	9,26	0,06	8,73	0,93	µg/l	94%
Cadmium	0,299	0,003	0,287	0,013	µg/l	96%
Chromium	7,00	0,04	6,67	0,94	µg/l	95%
Iron	30,0	0,2	29,0	3,2	µg/l	97%
Copper	1,10	0,02	1,02	0,06	µg/l	93%
Manganese	16,0	0,1	14,1	0,8	µg/l	88%
Nickel	5,39	0,04	5,19	0,40	µg/l	96%
Mercury	0,478	0,013	0,424	0,066	µg/l	89%
Selenium	1,31	0,06	1,30	0,16	µg/l	99%
Uranium	1,80	0,01	1,68	0,18	µg/l	93%
Zinc	5,99	0,51	5,64	0,35	µg/l	94%



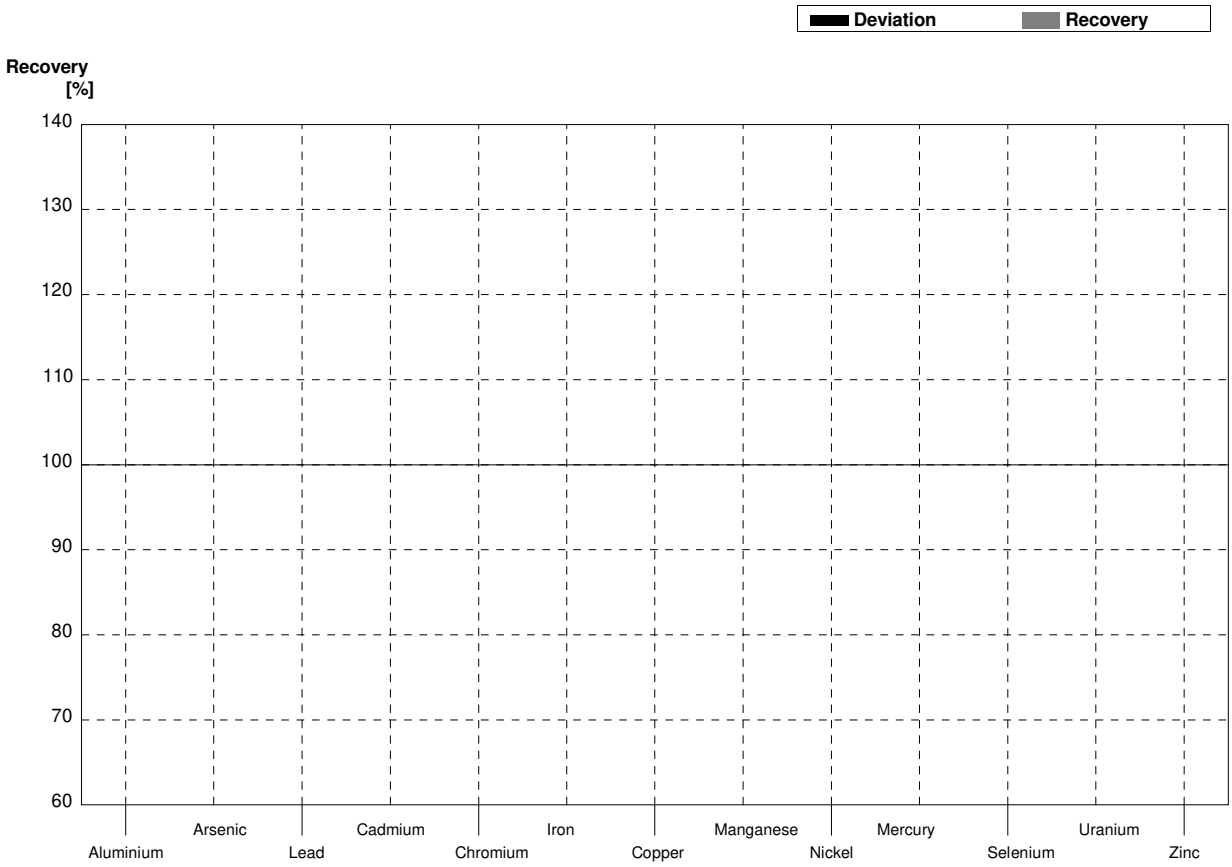
Sample **M154B**
Laboratory **X**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	13,4	1,5	µg/l	89%
Arsenic	4,39	0,03	4,39	0,25	µg/l	100%
Lead	1,05	0,02	1,01	0,11	µg/l	96%
Cadmium	1,60	0,01	1,55	0,07	µg/l	97%
Chromium	2,52	0,02	2,37	0,33	µg/l	94%
Iron	58,3	0,3	58,4	6,5	µg/l	100%
Copper	7,04	0,05	6,62	0,36	µg/l	94%
Manganese	25,2	0,2	22,3	1,2	µg/l	88%
Nickel	2,00	0,03	1,96	0,15	µg/l	98%
Mercury	1,19	0,02	1,25	0,19	µg/l	105%
Selenium	3,01	0,06	3,02	0,36	µg/l	100%
Uranium	8,08	0,05	7,70	0,82	µg/l	95%
Zinc	20,9	0,5	21,2	1,3	µg/l	101%



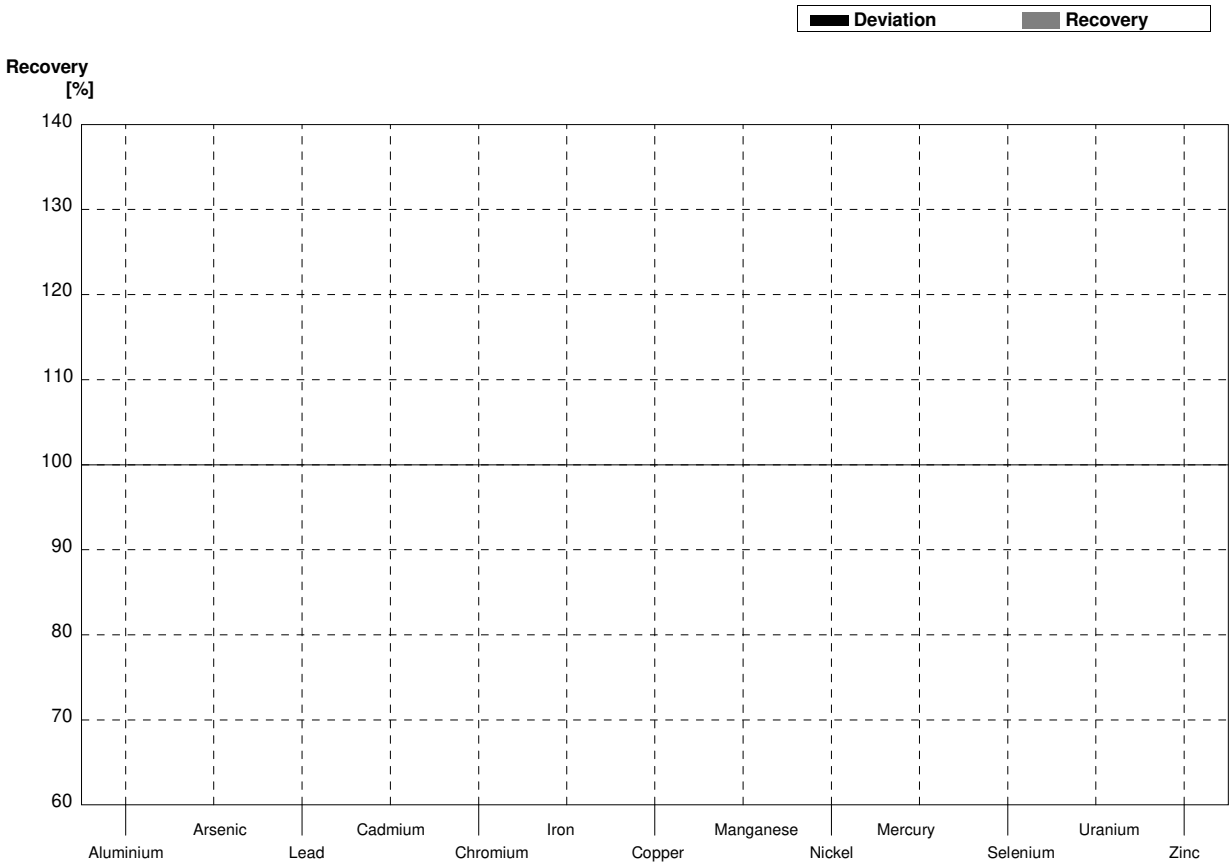
Sample **M154A**
Laboratory **Y**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3			µg/l	
Arsenic	1,20	0,01			µg/l	
Lead	9,26	0,06			µg/l	
Cadmium	0,299	0,003			µg/l	
Chromium	7,00	0,04			µg/l	
Iron	30,0	0,2			µg/l	
Copper	1,10	0,02			µg/l	
Manganese	16,0	0,1			µg/l	
Nickel	5,39	0,04			µg/l	
Mercury	0,478	0,013			µg/l	
Selenium	1,31	0,06			µg/l	
Uranium	1,80	0,01			µg/l	
Zinc	5,99	0,51			µg/l	



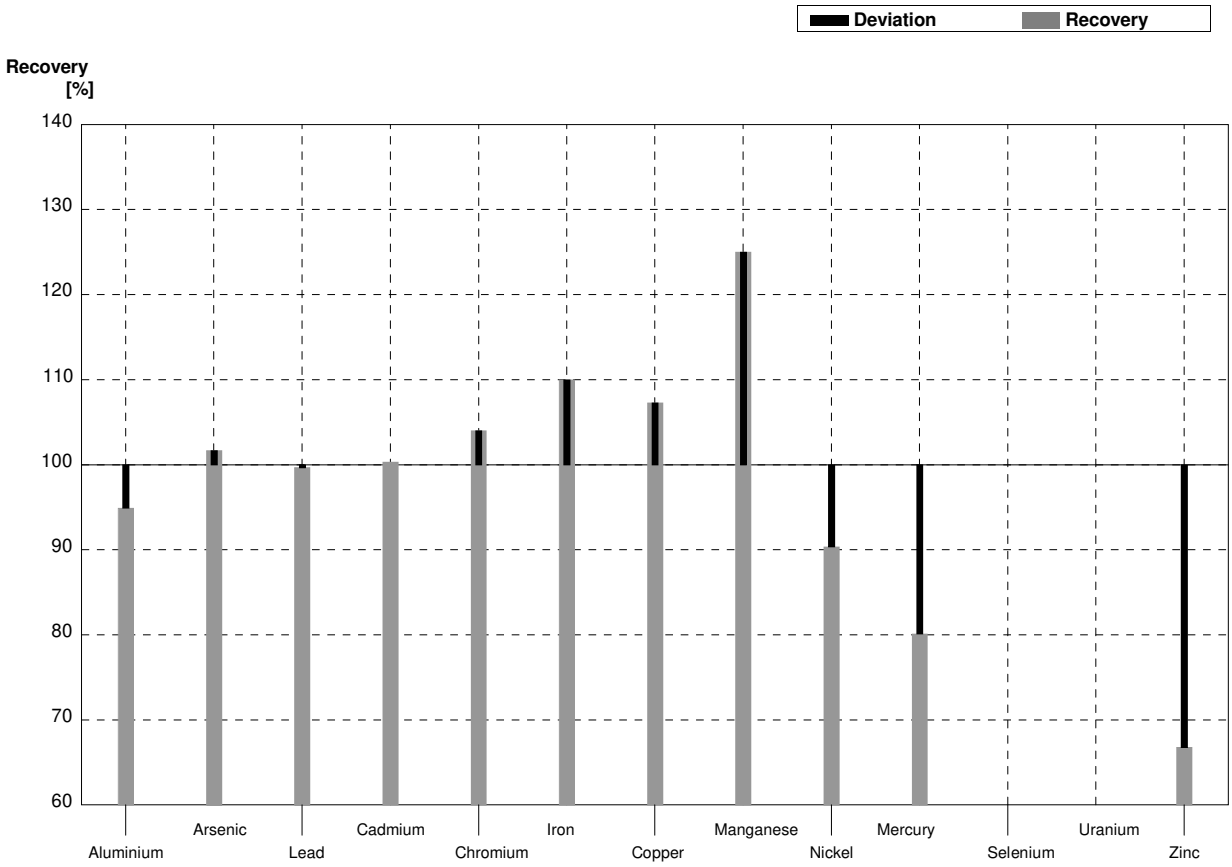
Sample **M154B**
Laboratory **Y**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2			µg/l	
Arsenic	4,39	0,03			µg/l	
Lead	1,05	0,02			µg/l	
Cadmium	1,60	0,01			µg/l	
Chromium	2,52	0,02			µg/l	
Iron	58,3	0,3			µg/l	
Copper	7,04	0,05			µg/l	
Manganese	25,2	0,2			µg/l	
Nickel	2,00	0,03			µg/l	
Mercury	1,19	0,02			µg/l	
Selenium	3,01	0,06			µg/l	
Uranium	8,08	0,05			µg/l	
Zinc	20,9	0,5			µg/l	



Sample **M154A**
Laboratory **Z**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	49,8	0,3	47,26	7	µg/l	95%
Arsenic	1,20	0,01	1,22	1	µg/l	102%
Lead	9,26	0,06	9,23	1	µg/l	100%
Cadmium	0,299	0,003	0,300	0,1	µg/l	100%
Chromium	7,00	0,04	7,28	1	µg/l	104%
Iron	30,0	0,2	33,0	30	µg/l	110%
Copper	1,10	0,02	1,18	1	µg/l	107%
Manganese	16,0	0,1	20,0	15	µg/l	125%
Nickel	5,39	0,04	4,87	1	µg/l	90%
Mercury	0,478	0,013	0,383	0,1	µg/l	80%
Selenium	1,31	0,06			µg/l	
Uranium	1,80	0,01			µg/l	
Zinc	5,99	0,51	4,00	10	µg/l	67%



Sample **M154B**
Laboratory **Z**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Aluminium	15,1	0,2	19,46	3	µg/l	129%
Arsenic	4,39	0,03	4,54	1	µg/l	103%
Lead	1,05	0,02	1,09	1	µg/l	104%
Cadmium	1,60	0,01	1,64	0,2	µg/l	103%
Chromium	2,52	0,02	2,73	1	µg/l	108%
Iron	58,3	0,3	54,0	30	µg/l	93%
Copper	7,04	0,05	7,97	2	µg/l	113%
Manganese	25,2	0,2	26,0	15	µg/l	103%
Nickel	2,00	0,03	2,17	1	µg/l	109%
Mercury	1,19	0,02	0,997	0,15	µg/l	84%
Selenium	3,01	0,06			µg/l	
Uranium	8,08	0,05			µg/l	
Zinc	20,9	0,5	20,0	10	µg/l	96%