

TEXTE

42/2015

Validierung von Analyseverfahren, die im Rahmen des Projektes HORIZONTAL entwickelt, jedoch nicht validiert wurden

Anhang 1

TEXTE 42/2015

Umweltforschungsplan des
Bundesministeriums für Umwelt,
Naturschutz, Bau und Reaktorsicherheit

Forschungskennzahl 3711 26 325
UBA-FB 002060

Validierung von Analyseverfahren, die im Rahmen des Projektes HORIZONTAL entwickelt, jedoch nicht validiert wurden

Anhang 1

von

Im Auftrag des Umweltbundesamtes

Impressum

Herausgeber:

Umweltbundesamt
Wörlitzer Platz 1
06844 Dessau-Roßlau
Tel: +49 340-2103-0
Fax: +49 340-2103-2285
info@umweltbundesamt.de
Internet: www.umweltbundesamt.de

 /umweltbundesamt.de
 /umweltbundesamt

Durchführung der Studie:

BAM Bundesanstalt für Materialforschung und –prüfung
12200 Berlin

Abschlussdatum:

Dezember 2014

Redaktion:

Fachgebiet III 2.5 Überwachungsverfahren, Abwasserentsorgung
Dr. Andrea Roskosch

Publikationen als pdf:

<http://www.umweltbundesamt.de/publikationen/validierung-von-analyseverfahren-die-im-rahmen-des>

ISSN 1862-4804

Dessau-Roßlau, Mai 2015

Das diesem Bericht zu Grunde liegende Vorhaben wurde mit Mitteln des Bundesministeriums für Umwelt, Naturschutz, Bau und Reaktorsicherheit unter der Forschungskennzahl 3711 26 325 gefördert. Die Verantwortung für den Inhalt dieser Veröffentlichung liegt bei den Autorinnen und Autoren.

Anhang 1: Tabellarische und graphische Darstellungen der von den beteiligten Laboratorien übermittelten Ringversuchsergebnisse - Anorganische Parameter (Anhang zum „Report to Participants“, in Englisch)

Compilation of Individual Participant Results from the Interlaboratory Study (Annex to the „Report to Participants“ from March 2013)

Contents

	Page
1. Explanation of terms used in tables and graphs	3
2. Compilation of all ICP-OES measurement results, CEN/TS 16170	5
2.1 Quality control solution: ICP-OES results	5
2.2 Validation results for three different digestion procedures applied to the matrices treated biowaste, sewage sludge and soil, respectively: ICP-OES	14
2.2.1 Silver	14
2.2.2 Arsenic	20
2.2.3 Cadmium	26
2.2.4 Cobalt	32
2.2.5 Chromium	38
2.2.6 Copper	44
2.2.7 Nickel	50
2.2.8 Lead	56
2.2.9 Tin	62
2.2.10 Vanadium	68
2.2.11 Zinc	74
3. Compilation of all ICP-MS measurement results, CEN/TS 16171	80
3.1 Quality control solution: ICP-MS results	80
3.2 Validation results for three different digestion procedures applied to the matrices treated biowaste, sewage sludge and soil, respectively: ICP-MS	86
3.2.1 Silver	87
3.2.2 Arsenic	92
3.2.3 Cadmium	98
3.2.4 Cobalt	104
3.2.5 Chromium	110
3.2.6 Copper	116
3.2.7 Mercury	122
3.2.8 Nickel	128
3.2.9 Lead	134
3.2.10 Selenium	140
3.2.11 Tin	146
3.2.12 Vanadium	152
3.2.13 Zinc	158
4. Compilation of all CV-AFS measurement results (Mercury), CEN/TS 16175-2	164

4.1	Quality control solution: CV-AFS results for mercury	164
4.2	Validation results for three different digestion procedures applied to the matrices treated biowaste, sewage sludge and soil, respectively: CV-AFS (Hg)	165

1. Explanation of terms used in tables and graphs

Terms used in tables	Explanation
Method	Method applied for statistical evaluation (ISO 5725-2)
Z-Score	For quality control solution QC: $\text{Z-Score} = \frac{(\text{Laboratory mean} - \text{BAM reference})}{\text{Ref.-SD set by BAM}}$ For samples CO, SL and SO: $\text{Z-Score} = \frac{(\text{Laboratory mean} - \text{Overall mean})}{S_R}$ For solid materials Z-Scores are given for information only. They were not relevant for statistical evaluation according to ISO 5725-2.
No. labs	Total number of participating laboratories, excluding those with results for quality control solution deviating more than 30% from the corresponding reference value
No. labs with val.	Number of laboratories taken into account for statistical evaluation, excluding those with measurement results below the limit of quantification
Mean	Overall mean of evaluated measurement results
Reference value	Analyte concentration in the quality control solution QC prepared by BAM
Ref.-SD	S_R defined to 15 % of the corresponding reference value (for QC solution only); set by BAM
SR Reprod. SD	Reproducibility standard deviation; identical with S_R (see Chapter 2.2.3 of the main document)
Sr Repeat. SD	Repeatability standard deviation; identical with S_r (see Chapter 2.2.3 of the main document)
RSD % VR	Relative reproducibility standard deviation; identical with CV_R (see Chapter 2.2.3 of the main document)
RSD % Vr	Relative repeatability standard deviation; identical with CV_r (see Chapter 2.2.3 of the main document)
No. A outliers	Number of outlying single measurement values of a laboratory according to Grubbs-test; these values were excluded from further statistical evaluation
No. B outliers	Number of outlying laboratory means according to Grubbs-test; these datasets were excluded from further statistical evaluation
No. C outliers	Number of outlying laboratory standard deviations (precision) according to Cochran-test; these datasets were excluded from further statistical evaluation
E	$ Z\text{-Score} > 2$; 'E' is given for information only (not relevant for statistical evaluation according to ISO 5725-2)
No. labs accept.	Number of accepted laboratories/datasets
No. values accept.	Number of accepted single value

1. Explanation of terms used in tables and graphs (continued)

Translation of German terms appearing in the graphs:

German Term	Translation & Explanation
Ringversuch	Interlaboratory comparison
Merkmal	Analyte
Probe	Sample
Anzahl Labore	Number of accepted laboratories/datasets
Anzahl Ausreißer Typ B	Number of outlying laboratory means according to Grubbs-test; these datasets were excluded from further statistical evaluation
Anzahl Ausreißer Typ C	Number of outlying laboratory standard deviations (precision) according to Cochran-test; these datasets were excluded from further statistical evaluation
Anzahl Einzelwerte	Number of accepted single values; identical with n_{acc}
Toleranzbereich	Tolerance limit (Overall mean $\pm 2 S_R$)

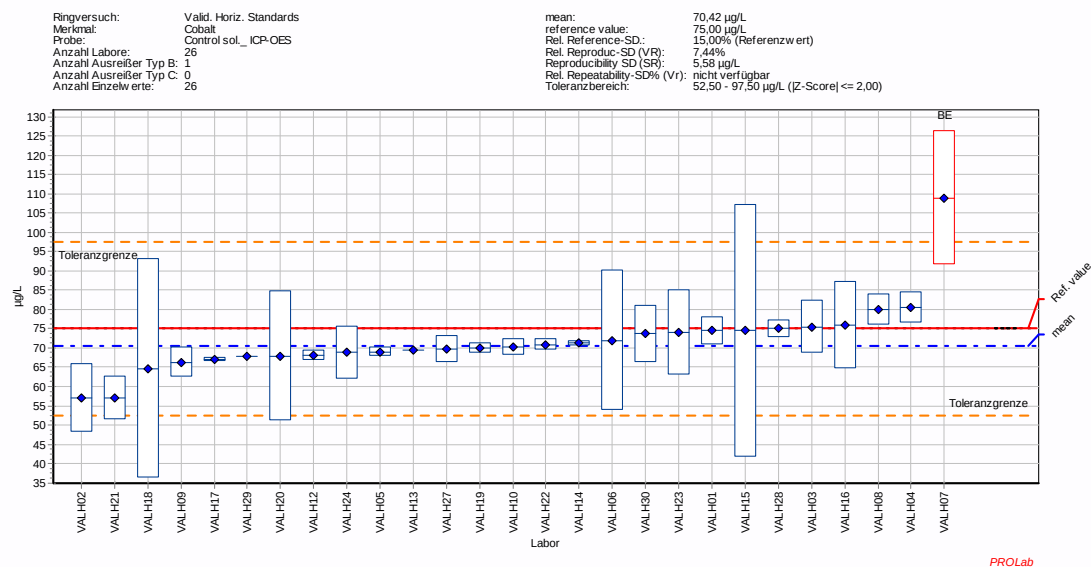
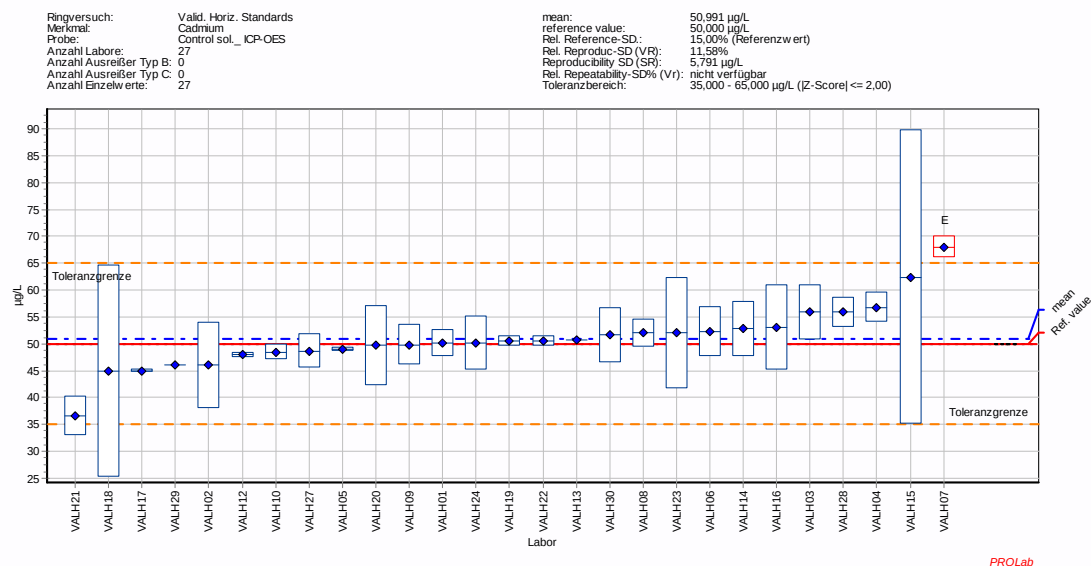
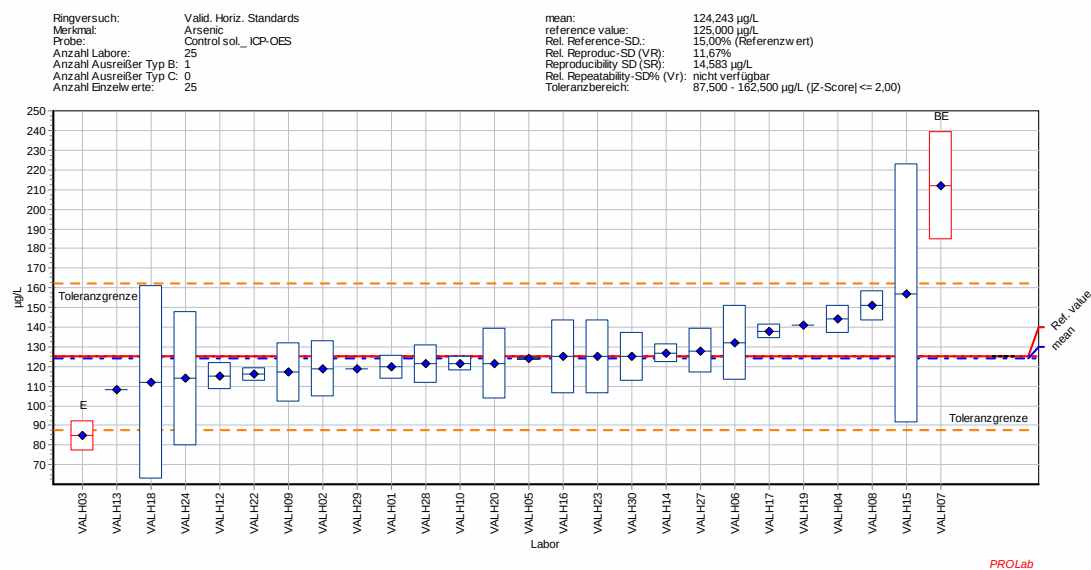
2. ICP-OES measurements, CEN/TS 16170

2.1 Quality control solution: ICP-OES

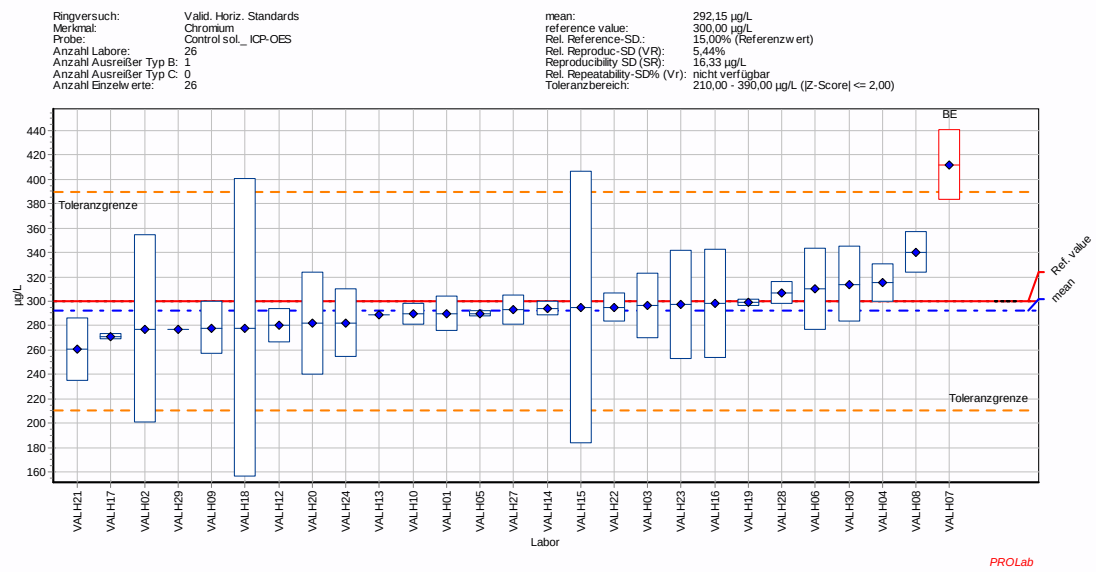
ICP-OES: QC sol.	Arsenic	Z-Score		Cadmium	Z-Score		Cobalt	Z-Score		Chromium	Z-Score	
Unit	µg/L			µg/L			µg/L			µg/L		
VALH01	119,8	-0,30		50,1	0,00		74,5	0,00		289,4	-0,20	
VALH02	119,0	-0,30		46,0	-0,50		57,0	-1,60		277,0	-0,50	
VALH03	84,9	-2,10	E	55,9	0,80		75,4	0,00		296,3	-0,10	
VALH04	144,0	1,00		56,8	0,90		80,5	0,50		315,0	0,30	
VALH05	124,0	-0,10		49,0	-0,10		69,0	-0,50		290,0	-0,20	
VALH06	132,0	0,40		52,3	0,30		72,0	-0,30		310,0	0,20	
VALH07	212,0	4,60	BE	68,0	2,40	E	109,0	3,00	BE	412,0	2,50	BE
VALH08	151,0	1,40		52,0	0,30		80,0	0,40		340,0	0,90	
VALH09	117,0	-0,40		49,8	0,00		66,3	-0,80		278,0	-0,50	
VALH10	121,5	-0,20		48,5	-0,20		70,3	-0,40		289,4	-0,20	
VALH12	115,0	-0,50		48,0	-0,30		68,0	-0,60		280,0	-0,40	
VALH13	108,0	-0,90		50,7	0,10		69,4	-0,50		289,0	-0,20	
VALH14	127,0	0,10		52,8	0,40		71,3	-0,30		294,0	-0,10	
VALH15	157,0	1,70		62,4	1,70		74,5	0,00		295,0	-0,10	
VALH16	125,0	0,00		53,0	0,40		76,0	0,10		298,0	0,00	
VALH17	138,0	0,70		45,0	-0,70		67,0	-0,70		271,0	-0,60	
VALH18	112,0	-0,70		44,9	-0,70		64,7	-0,90		278,0	-0,50	
VALH19	141,0	0,90		50,5	0,10		70,0	-0,40		299,0	0,00	
VALH20	121,5	-0,20		49,7	0,00		68,0	-0,60		281,7	-0,40	
VALH21	< 100,00			36,6	-1,80		57,0	-1,60		260,4	-0,90	
VALH22	116,0	-0,50		50,5	0,10		70,9	-0,40		295,0	-0,10	
VALH23	125,0	0,00		52,0	0,30		74,0	-0,10		297,0	-0,10	
VALH24	114,0	-0,60		50,2	0,00		68,9	-0,50		282,0	-0,40	
VALH27	128,0	0,20		48,6	-0,20		69,8	-0,50		293,0	-0,20	
VALH28	121,4	-0,20		55,9	0,80		75,0	0,00		306,8	0,20	
VALH29	119,0	-0,30		46,0	-0,50		67,7	-0,60		277,0	-0,50	
VALH30	125,0	0,00		51,6	0,20		73,7	-0,10		314,0	0,30	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	27			27			27			27		
No. labs with val.	26			27			27			27		
Mean	124,24			50,99			70,42			292,15		
Reference value	125			50			75			300		
Ref.-SD	18,75			7,5			11,25			45		
SR Reprod. SD	14,58			5,79			5,58			16,33		
RSD % VR	11,67%			11,58%			7,44%			5,44%		
No. A outliers	0			0			0			0		
No. B outliers	1			0			1			1		
No. C outliers	0			0			0			0		
No. labs accept.	25			27			26			26		
No. values accept.	25			27			26			26		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1
(Teilprojekt „Anorganische Parameter“)

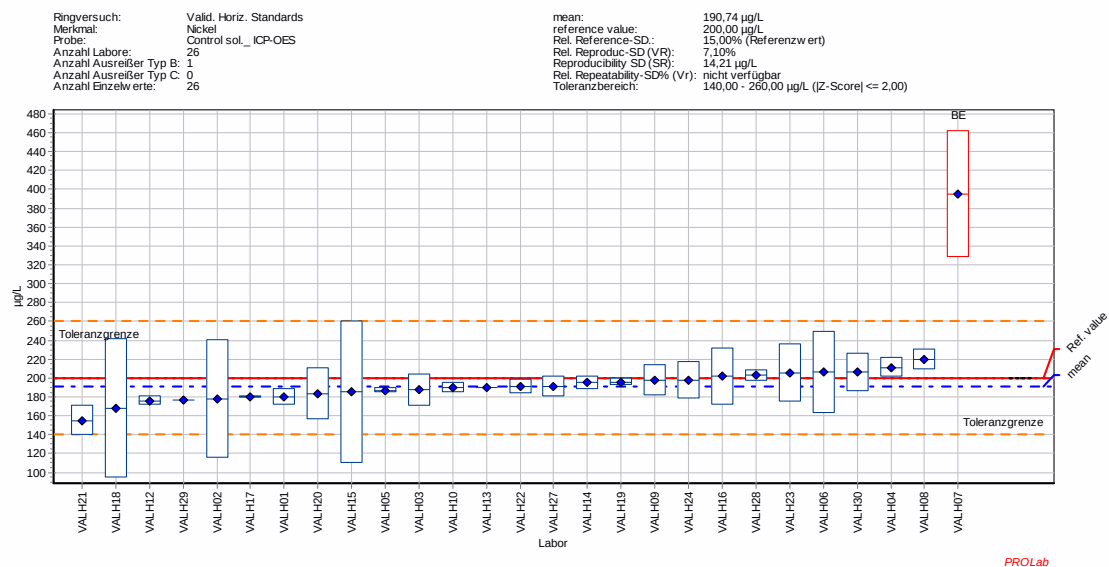
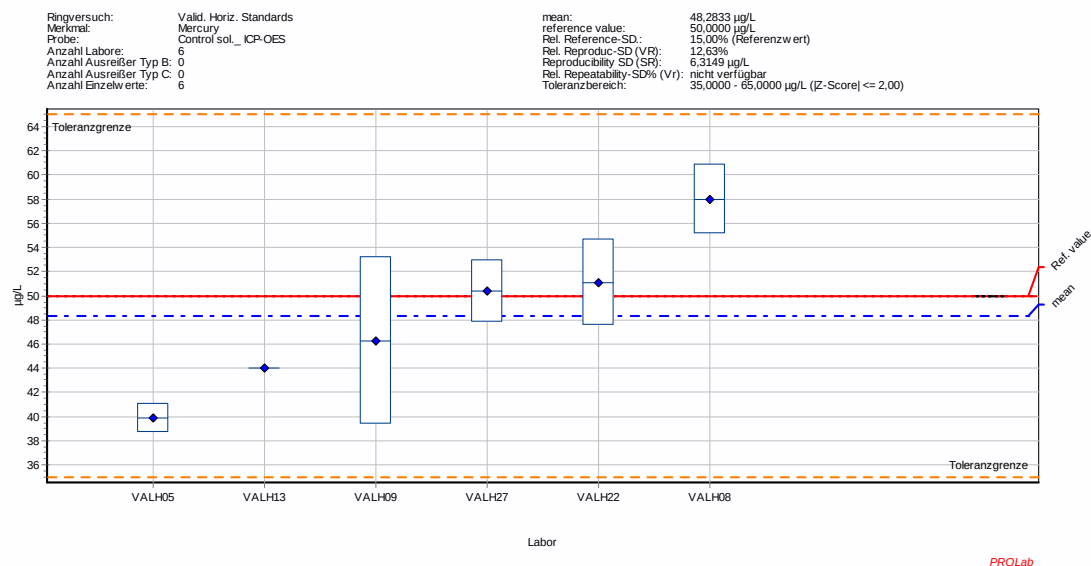
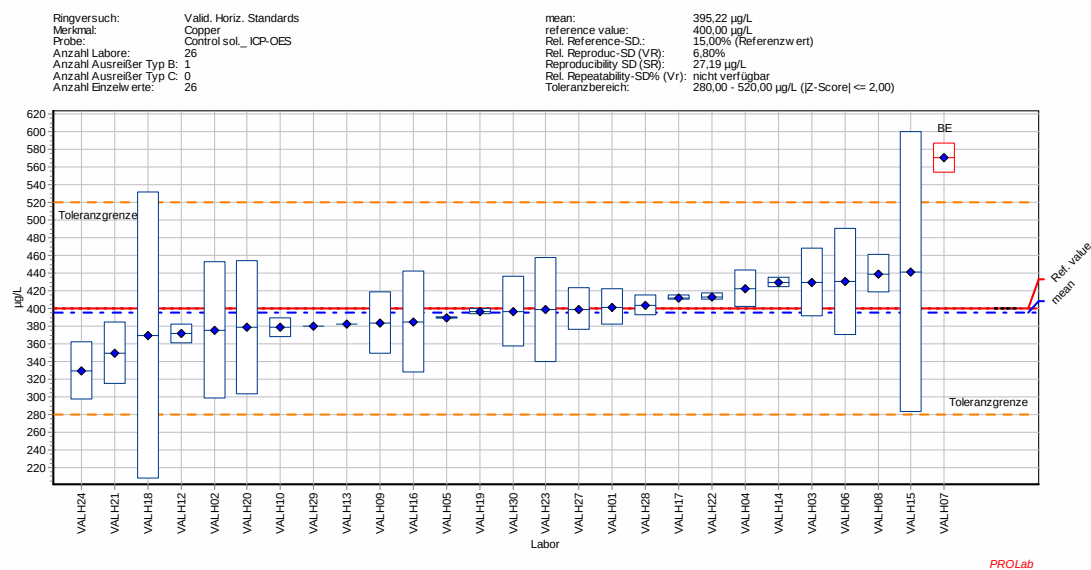


2.1 Quality control solution: ICP-OES measurements (continued)

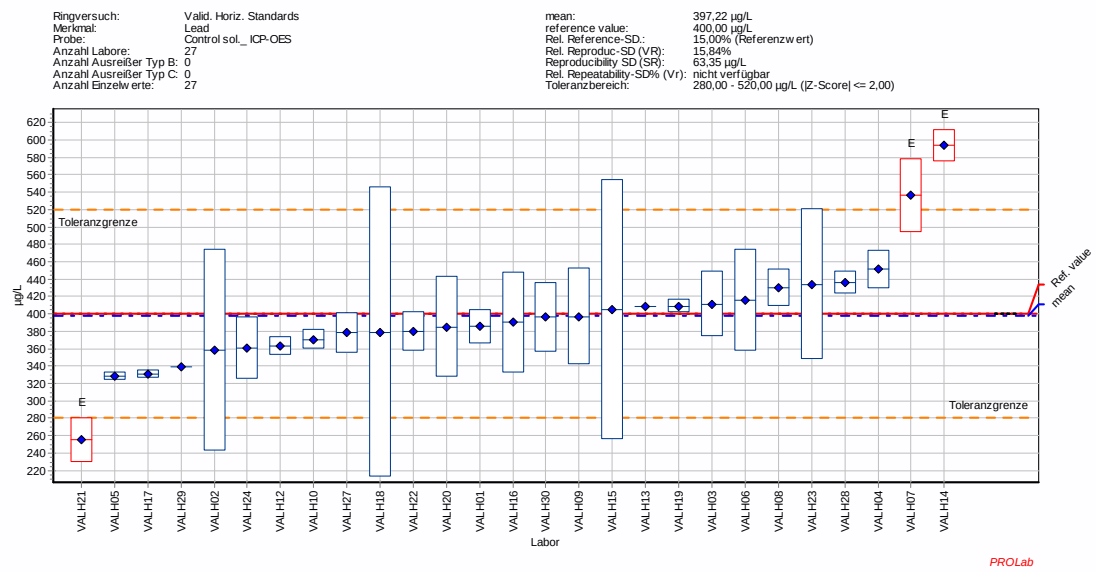
ICP-OES: QC sol.	Copper	Z-Score		Mercury	Z-Score		Nickel	Z-Score		Lead	Z-Score	
Unit	µg/L			µg/L			µg/L			µg/L		
VALH01	401,4	0,00					180,1	-0,70		385,2	-0,20	
VALH02	375,0	-0,40					178,0	-0,70		358,0	-0,70	
VALH03	429,3	0,50					187,7	-0,40		411,2	0,20	
VALH04	422,0	0,40					211,0	0,40		451,0	0,80	
VALH05	389,0	-0,20		39,9	-1,30		187,0	-0,40		328,0	-1,20	
VALH06	430,0	0,50					206,0	0,20		416,0	0,30	
VALH07	570,0	2,80	BE				395,0	6,50	BE	536,0	2,30	E
VALH08	439,0	0,70		58,0	1,10		220,0	0,70		430,0	0,50	
VALH09	383,0	-0,30		46,3	-0,50		198,0	-0,10		397,0	-0,10	
VALH10	378,1	-0,40					189,9	-0,30		370,5	-0,50	
VALH12	371,0	-0,50					176,0	-0,80		363,0	-0,60	
VALH13	382,0	-0,30		44,0	-0,80		190,0	-0,30		408,0	0,10	
VALH14	429,0	0,50					195,0	-0,20		593,4	3,20	E
VALH15	441,0	0,70					185,0	-0,50		405,0	0,10	
VALH16	384,0	-0,30					202,0	0,10		390,0	-0,20	
VALH17	412,0	0,20					180,0	-0,70		331,0	-1,10	
VALH18	369,0	-0,50		< 50,0000			168,0	-1,10		379,0	-0,30	
VALH19	396,0	-0,10					196,0	-0,10		409,0	0,10	
VALH20	377,9	-0,40					183,4	-0,60		385,0	-0,30	
VALH21	349,0	-0,80					155,2	-1,50		254,8	-2,40	E
VALH22	413,0	0,20		51,1	0,10		191,0	-0,30		380,0	-0,30	
VALH23	398,0	0,00					205,0	0,20		434,0	0,60	
VALH24	329,0	-1,20					198,0	-0,10		361,0	-0,70	
VALH27	399,0	0,00		50,4	0,10		191,0	-0,30		378,0	-0,40	
VALH28	403,0	0,10					202,8	0,10		435,9	0,60	
VALH29	380,0	-0,30					177,0	-0,80		339,0	-1,00	
VALH30	396,0	-0,10					206,0	0,20		396,0	-0,10	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	27			7			27			27		
No. labs with val.	27			6			27			27		
Mean	395,22			48,28			190,74			397,22		
Reference value	400			50			200			400		
Ref.-SD	60			7,5			30			60		
SR Reprod. SD	27,19			6,31			14,21			63,35		
RSD % VR	6,80%			12,63%			7,10%			15,84%		
No. A outliers	0			0			0			0		
No. B outliers	1			0			1			0		
No. C outliers	0			0			0			0		
No. labs accept.	26			6			26			27		
No. values accept.	26			6			26			27		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1
(Teilprojekt „Anorganische Parameter“)

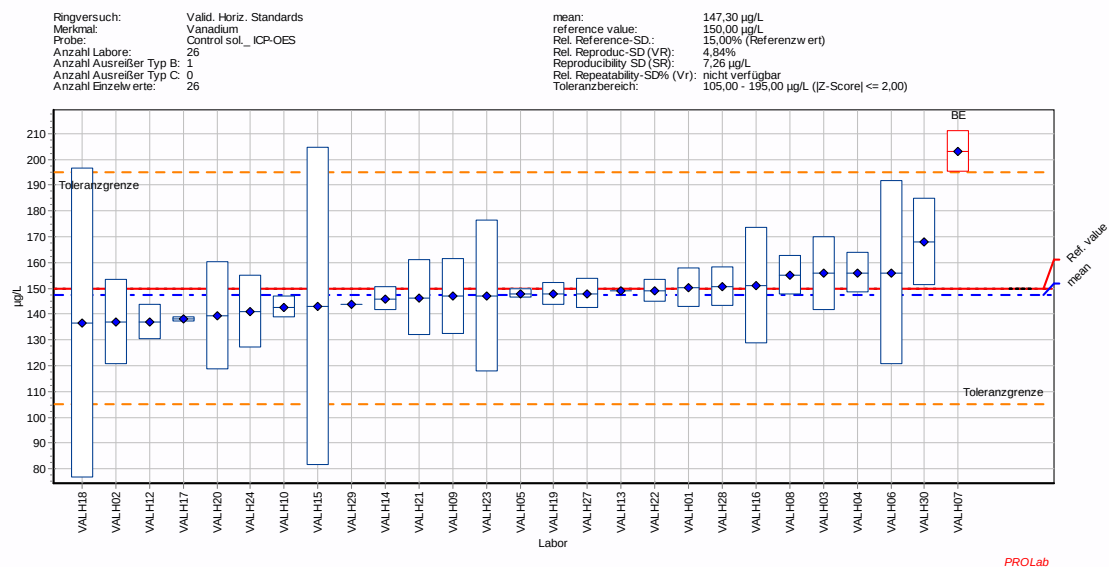
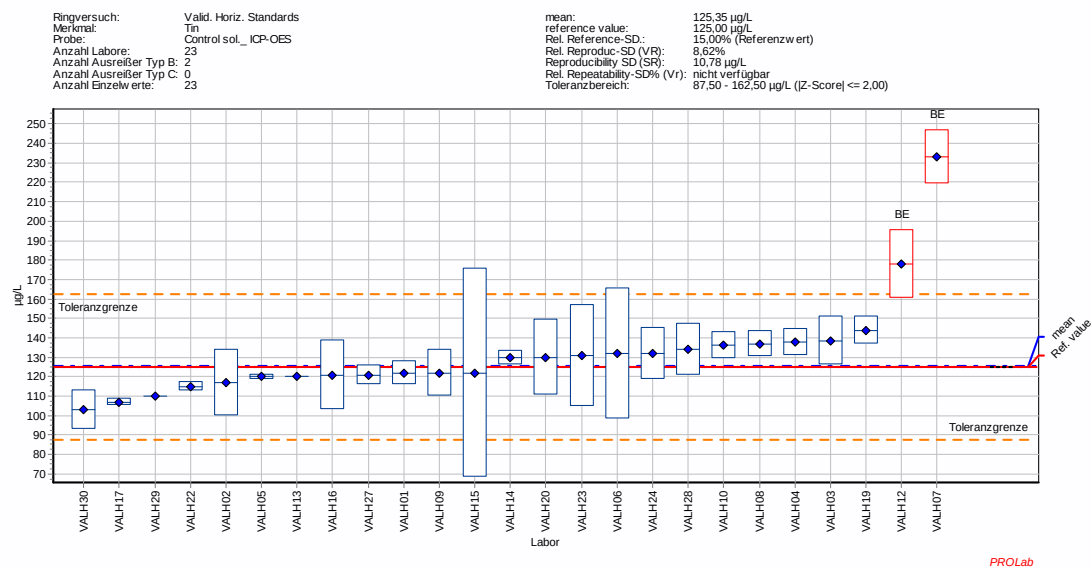
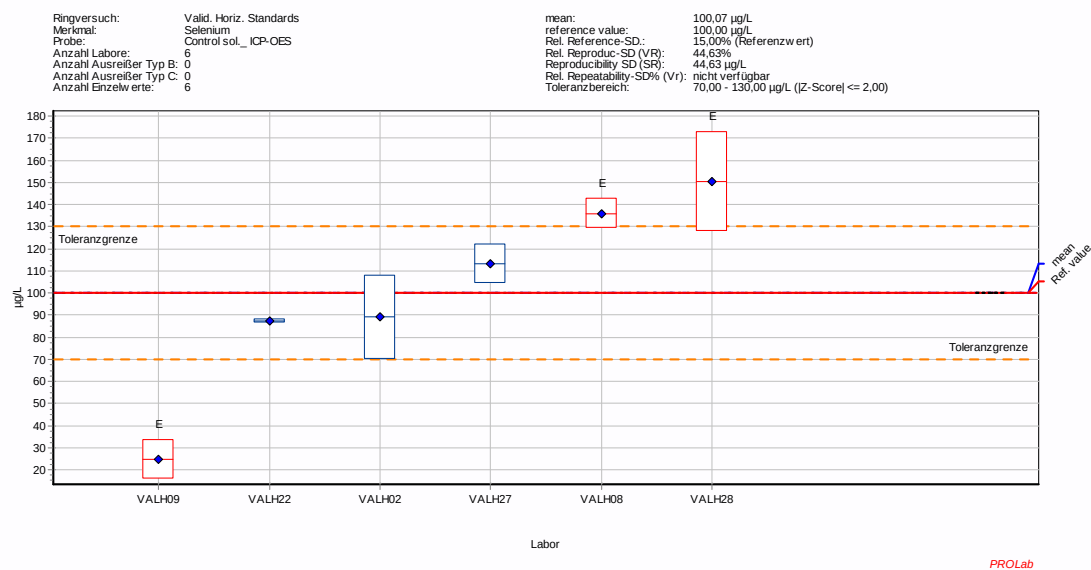


2.1 Quality control solution: ICP-OES measurements (continued)

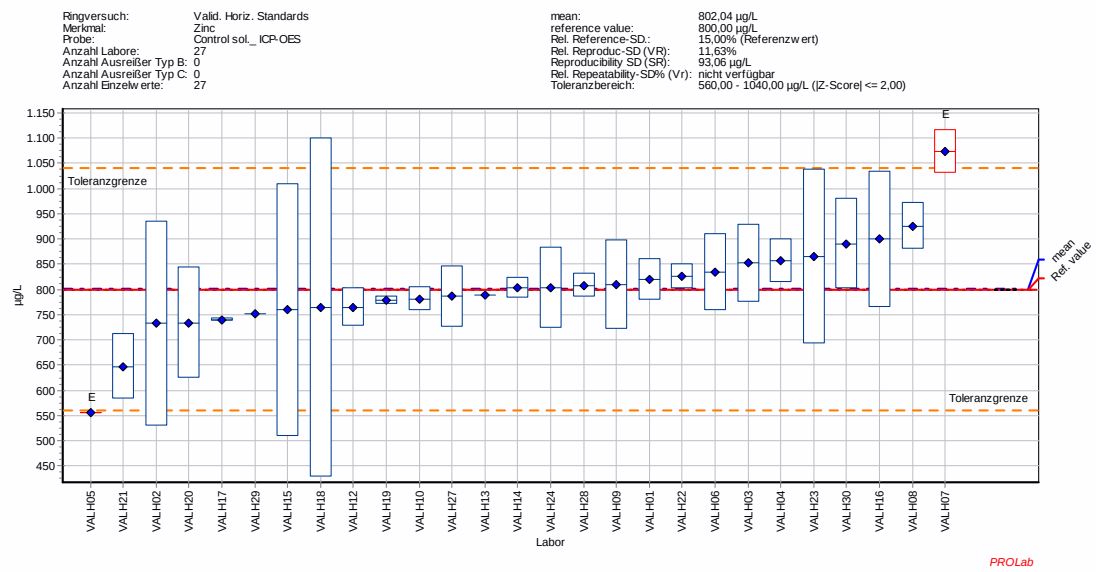
ICP-OES: QC sol.	Selenium	Z-Score		Tin	Z-Score		Vanadium	Z-Score		Zinc	Z-Score	
Unit	µg/L			µg/L			µg/L			µg/L		
VALH01				122,0	-0,20		150,3	0,00		820,3	0,20	
VALH02	89,0	-0,70		117,0	-0,40		137,0	-0,60		733,0	-0,60	
VALH03				138,6	0,70		155,7	0,30		851,9	0,40	
VALH04				138,0	0,70		156,0	0,30		857,0	0,50	
VALH05				120,0	-0,30		148,0	-0,10		555,0	-2,00	E
VALH06				132,0	0,40		156,0	0,30		834,0	0,30	
VALH07				233,0	5,80	BE	203,0	2,40	BE	1074,0	2,30	E
VALH08	136,0	2,40	E	137,0	0,60		155,0	0,20		926,0	1,10	
VALH09	24,7	-5,00	E	122,0	-0,20		147,0	-0,10		810,0	0,10	
VALH10				136,2	0,60		142,8	-0,30		781,3	-0,20	
VALH12				178,0	2,80	BE	137,0	-0,60		765,0	-0,30	
VALH13				120,0	-0,30		149,0	0,00		789,0	-0,10	
VALH14				130,0	0,30		146,0	-0,20		803,0	0,00	
VALH15				122,0	-0,20		143,0	-0,30		759,0	-0,30	
VALH16				121,0	-0,20		151,0	0,00		900,0	0,80	
VALH17				107,0	-1,00		138,0	-0,50		740,0	-0,50	
VALH18	< 100,00			< 150,00			136,6	-0,60		764,0	-0,30	
VALH19				144,0	1,00		148,0	-0,10		779,0	-0,20	
VALH20				130,1	0,30		139,5	-0,50		734,0	-0,60	
VALH21							146,4	-0,20		647,2	-1,30	
VALH22	87,3	-0,80		115,0	-0,50		149,0	0,00		826,0	0,20	
VALH23				131,0	0,30		147,0	-0,10		865,0	0,50	
VALH24				132,0	0,40		141,0	-0,40		804,0	0,00	
VALH27	113,0	0,90		121,0	-0,20		148,0	-0,10		786,0	-0,10	
VALH28	150,4	3,40	E	134,2	0,50		150,6	0,00		808,4	0,10	
VALH29				110,0	-0,80		144,0	-0,30		752,0	-0,40	
VALH30				103,0	-1,20		168,0	0,80		891,0	0,80	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	7			26			27			27		
No. labs with val.	6			25			27			27		
Mean	100,07			125,35			147,30			802,04		
Reference value	100			125			150			800		
Ref.-SD	15			18,75			22,5			120		
SR Reprod. SD	44,63			10,78			7,26			93,06		
RSD % VR	44,63%			8,62%			4,84%			11,63%		
No. A outliers	0			0			0			0		
No. B outliers	0			2			1			0		
No. C outliers	0			0			0			0		
No. labs accept.	6			23			26			27		
No. values accept.	6			23			26			27		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1
(Teilprojekt „Anorganische Parameter“)



UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1
(Teilprojekt „Anorganische Parameter“)

2.2 Validation results, ICP-OES measurements for three different digestions procedures:

A1: CEN 16173, nitric acid digestion; microwave 175 °C, 10 min

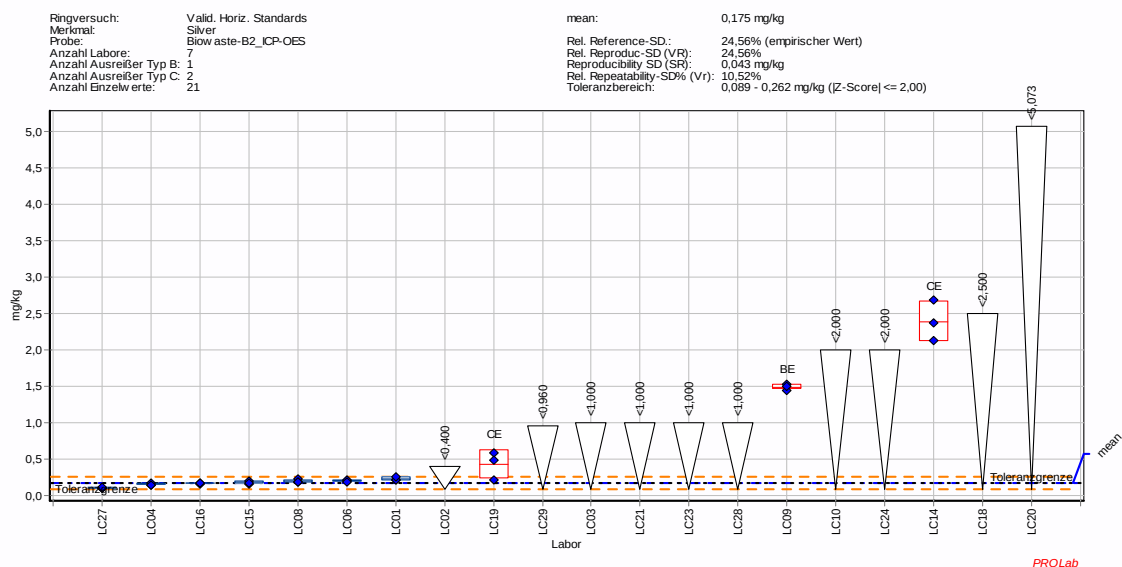
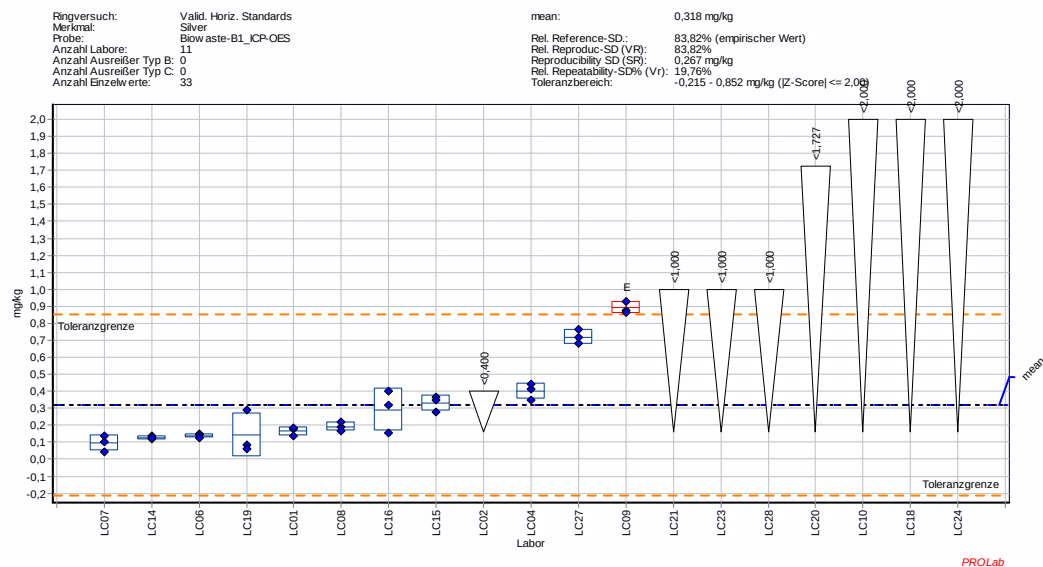
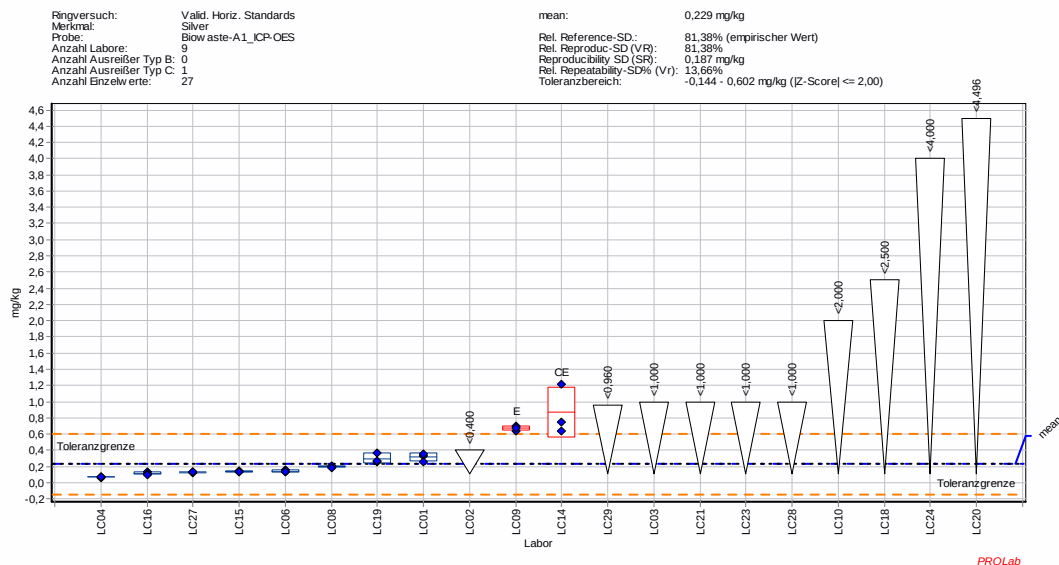
B1: CEN 16174, aqua regia digestion, Method A (open reflux)

B2: CEN 16174, aqua regia digestion; Method B (microwave, 175 °C, 10 min)

2.2.1.1 Biowaste, ICP-OES: Silver

ICP-OES: Silver	CO-A1_OS	Z-Score		CO-B1_OS	Z-Score		CO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	0,31	0,50		0,16	-0,60		0,23	-0,40	
VALH02	< 0,400			< 0,400			< 0,400		
VALH03	< 1,000						< 1,000		
VALH04	0,07	-0,90		0,40	0,30		0,15	-0,50	
VALH05							< 0,99		
VALH06	0,14	-0,50		0,14	-0,70		0,20	-0,40	
VALH07				0,09	-0,80				
VALH08	0,19	-0,20		0,19	-0,50		0,20	-0,40	
VALH09	0,67	2,40	E	0,89	2,10	E	1,49	2,20	E
VALH10	< 2,000			< 2,000			< 2,000		
VALH12									
VALH14	0,87	3,40	CE	0,13	-0,70		2,39	4,10	CE
VALH15	0,14	-0,50		0,33	0,10		0,18	-0,50	
VALH16	0,11	-0,60		0,29	-0,10		0,17	-0,50	
VALH17									
VALH18	< 2,500			< 2,000			< 2,500		
VALH19	0,30	0,40		0,14	-0,70		0,43	0,00	C
VALH20	< 4,496			< 1,727			< 5,073		
VALH21	< 1,000			< 1,000			< 1,000		
VALH22									
VALH23	< 1,000			< 1,000			< 1,000		
VALH24	< 4,000			< 2,000			< 2,000		
VALH27	0,13	-0,50		0,72	1,50		0,10	-0,60	
VALH28	< 1,000			< 1,000			< 1,000		
VALH29	< 0,960						< 0,960		
VALH30									
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	20			19			21		
No. labs with val.	10			11			10		
Mean	0,229			0,318			0,175		
SR Reprod. SD	0,187			0,267			0,043		
Sr Repeat. SD	0,031			0,063			0,018		
RSD % VR	81,38%			83,82%			24,56%		
RSD % Vr	13,66%			19,76%			10,52%		
No. A outliers	0			0			0		
No. B outliers	0			0			1		
No. C outliers	1			0			2		
No. labs accept.	9			11			7		
No. values accept.	27			33			21		

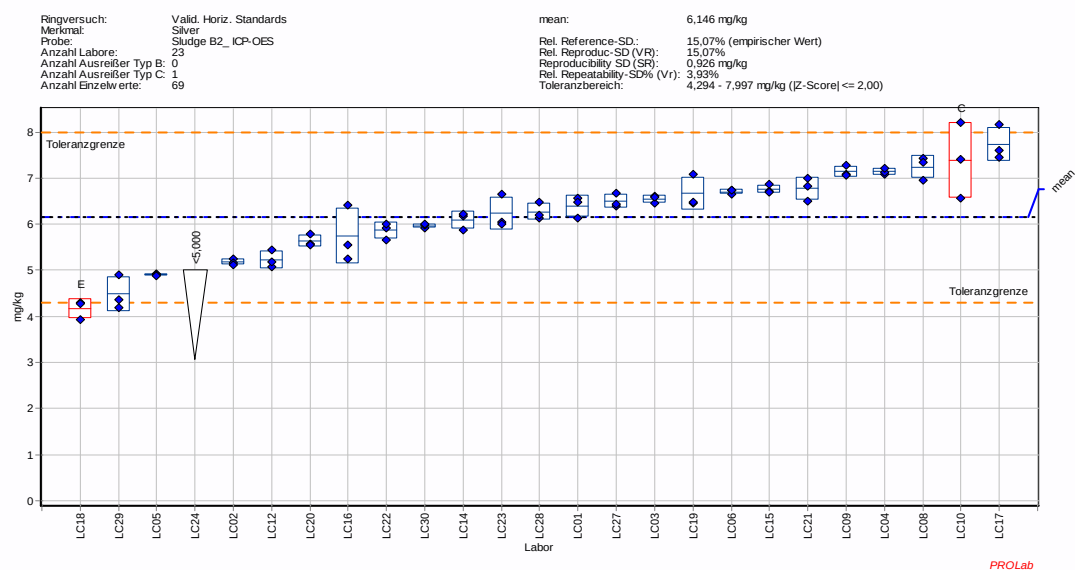
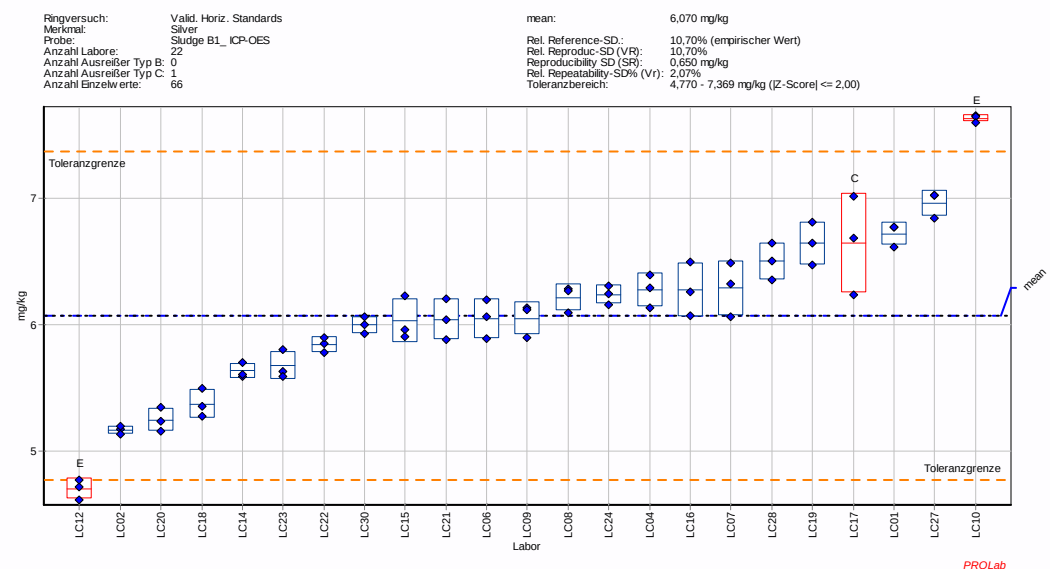
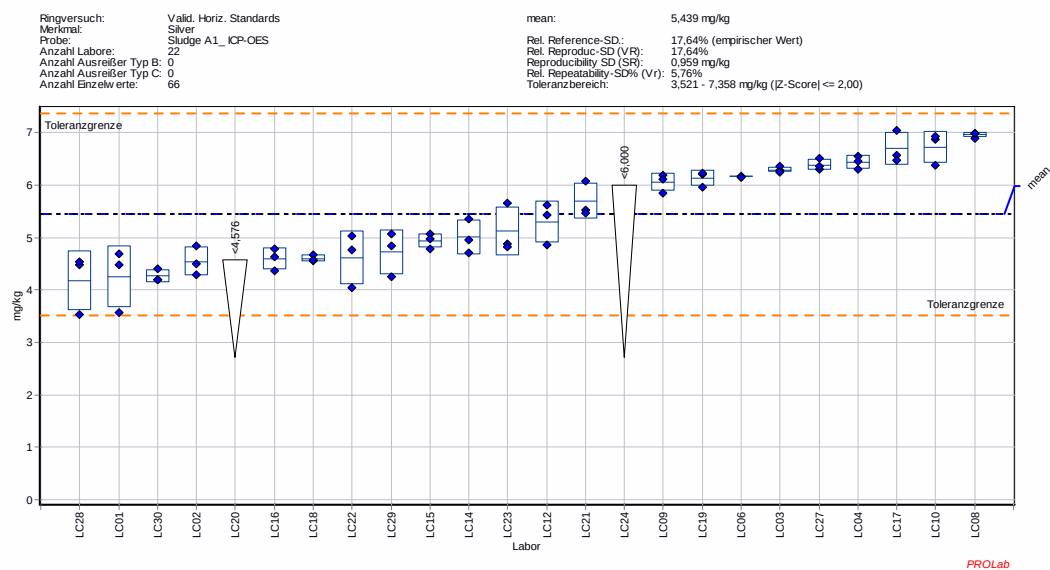
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.1.2 Sludge, ICP-OES: Silver

ICP-OES: Silver	SL-A1_OS	Z-Score		SL-B1_OS	Z-Score		SL-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	4,25	-1,20		6,72	1,00		6,39	0,30	
VALH02	4,55	-0,90		5,16	-1,40		5,18	-1,00	
VALH03	6,29	0,90					6,55	0,40	
VALH04	6,43	1,00		6,27	0,30		7,14	1,10	
VALH05							4,90	-1,30	
VALH06	6,16	0,80		6,05	0,00		6,70	0,60	
VALH07				6,29	0,30				
VALH08	6,96	1,60		6,21	0,20		7,24	1,20	
VALH09	6,05	0,60		6,05	0,00		7,14	1,10	
VALH10	6,73	1,30		7,64	2,40	E	7,39	1,30	C
VALH12	5,30	-0,10		4,70	-2,10	E	5,23	-1,00	
VALH14	5,01	-0,50		5,63	-0,70		6,09	-0,10	
VALH15	4,94	-0,50		6,03	-0,10		6,76	0,70	
VALH16	4,60	-0,90		6,28	0,30		5,74	-0,40	
VALH17	6,69	1,30		6,65	0,90	C	7,74	1,70	
VALH18	4,60	-0,90		5,37	-1,10		4,17	-2,10	E
VALH19	6,13	0,70		6,64	0,90		6,67	0,60	
VALH20	< 4,576			5,24	-1,30		5,63	-0,60	
VALH21	5,69	0,30		6,04	0,00		6,77	0,70	
VALH22	4,62	-0,90		5,84	-0,40		5,87	-0,30	
VALH23	5,12	-0,30		5,67	-0,60		6,23	0,10	
VALH24	< 6,000			6,24	0,30		< 5,000		
VALH27	6,39	1,00		6,96	1,40		6,50	0,40	
VALH28	4,18	-1,30		6,50	0,70		6,27	0,10	
VALH29	4,73	-0,70					4,48	-1,80	
VALH30	4,27	-1,20		6,00	-0,10		5,97	-0,20	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	24			23			25		
No. labs with val.	22			23			24		
Mean	5,439			6,07			6,146		
SR Reprod. SD	0,959			0,65			0,926		
Sr Repeat. SD	0,313			0,126			0,241		
RSD % VR	17,64%			10,70%			15,07%		
RSD % Vr	5,76%			2,07%			3,93%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	0			1			1		
No. labs accept.	22			22			23		
No. values accept.	66			66			69		

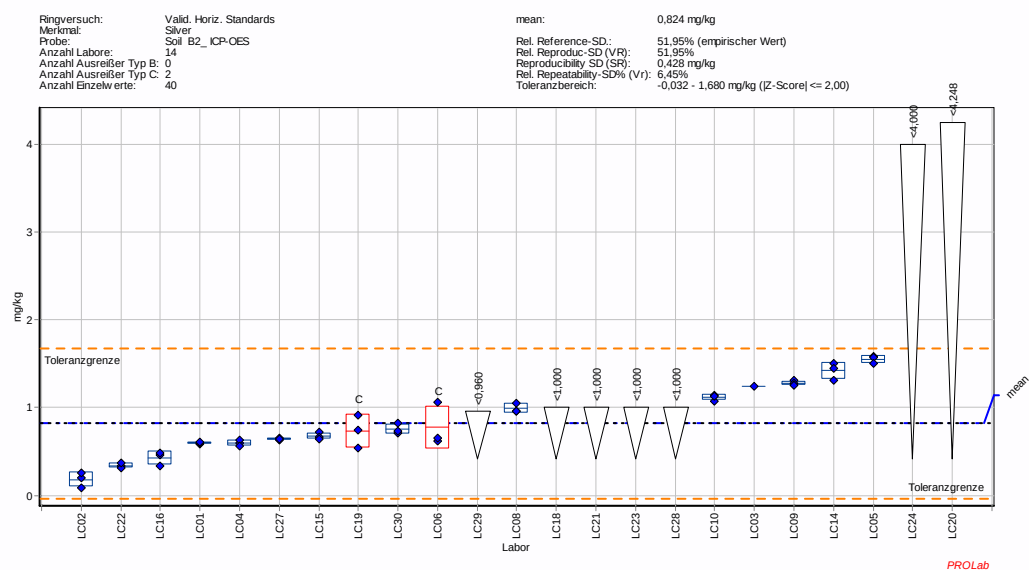
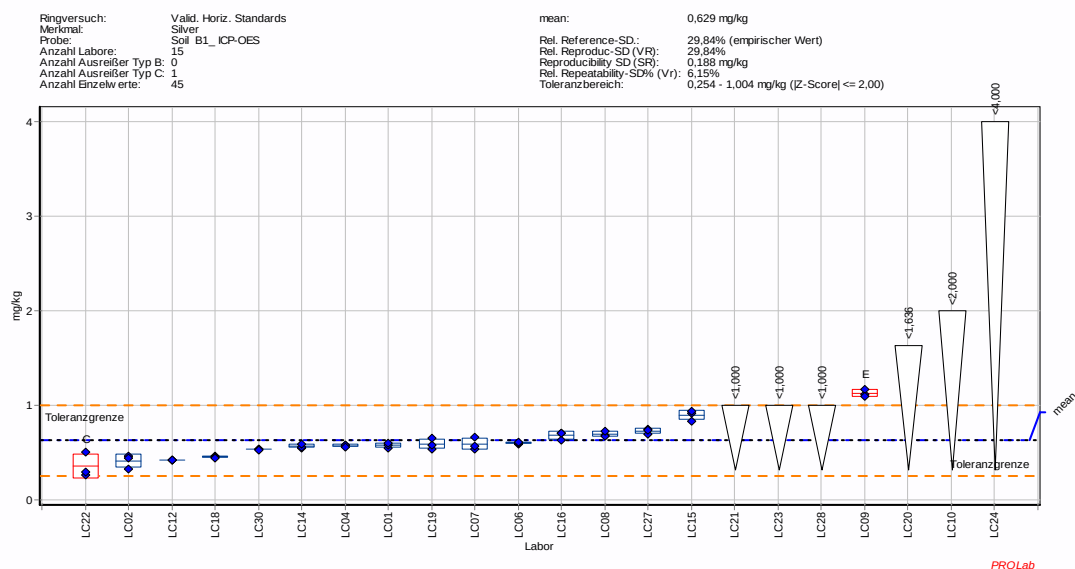
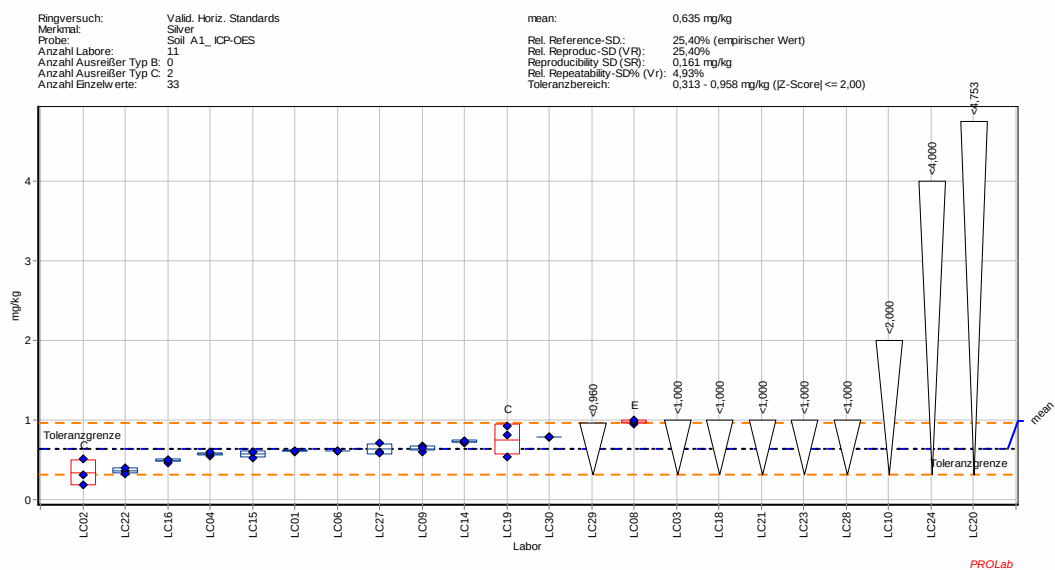
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.1.3 Soil, ICP-OES: Silver

ICP-OES: Silver	SO-A1_OS	Z-Score		SO-B1_OS	Z-Score		SO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	0,61	-0,20		0,57	-0,30		0,59	-0,50	
VALH02	0,34	-1,80	C	0,41	-1,20		0,18	-1,50	
VALH03	< 1,000						1,24	1,00	
VALH04	0,57	-0,40		0,57	-0,30		0,60	-0,50	
VALH05							1,55	1,70	
VALH06	0,61	-0,10		0,60	-0,20		0,78	-0,10	C
VALH07				0,59	-0,20				
VALH08	0,98	2,10	E	0,70	0,40		0,99	0,40	
VALH09	0,64	0,10		1,13	2,60	E	1,28	1,10	
VALH10	< 2,000			< 2,000			1,12	0,70	
VALH12				0,42	-1,10				
VALH14	0,73	0,60		0,57	-0,30		1,42	1,40	
VALH15	0,57	-0,40		0,90	1,40		0,68	-0,30	
VALH16	0,49	-0,90		0,68	0,30		0,43	-0,90	
VALH17									
VALH18	< 1,000			0,45	-0,90		< 1,000		
VALH19	0,76	0,80	C	0,59	-0,20		0,73	-0,20	C
VALH20	< 4,753			< 1,636			< 4,248		
VALH21	< 1,000			< 1,000			< 1,000		
VALH22	0,36	-1,70		0,35	-1,50	C	0,34	-1,10	
VALH23	< 1,000			< 1,000			< 1,000		
VALH24	< 4,000			< 4,000			< 4,000		
VALH27	0,63	0,00		0,73	0,50		0,64	-0,40	
VALH28	< 1,000			< 1,000			< 1,000		
VALH29	< 0,960						< 0,960		
VALH30	0,79	0,90		0,54	-0,50		0,76	-0,20	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	22			22			23		
No. labs with val.	13			16			16		
Mean	0,635			0,629			0,824		
Sr Reprod. SD	0,161			0,188			0,428		
Sr Repeat. SD	0,031			0,039			0,053		
RSD % VR	25,40%			29,84%			51,95%		
RSD % Vr	4,93%			6,15%			6,45%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	2			1			2		
No. labs accept.	11			15			14		
No. values accept.	33			45			40		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

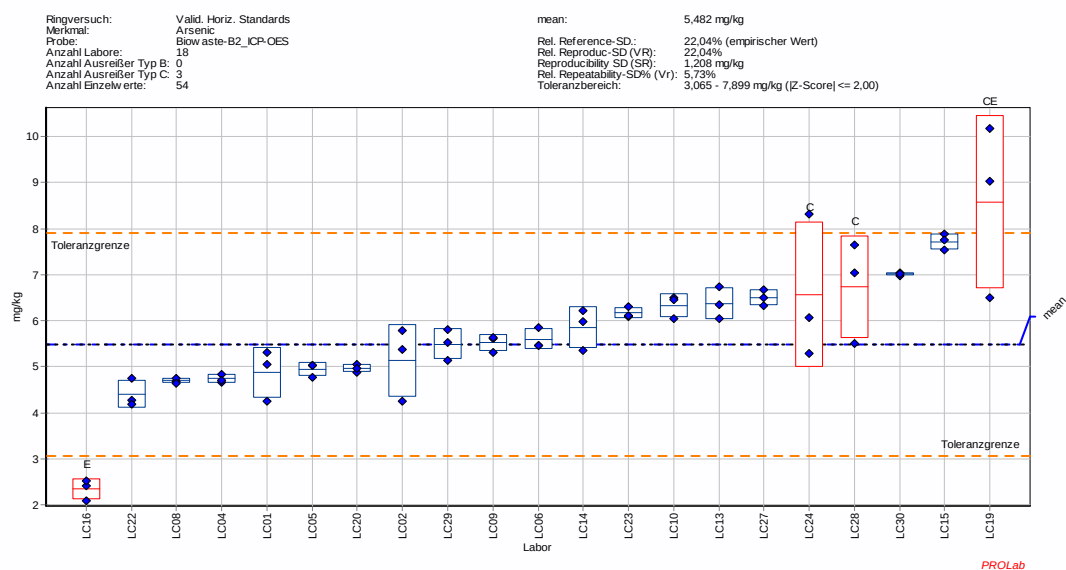
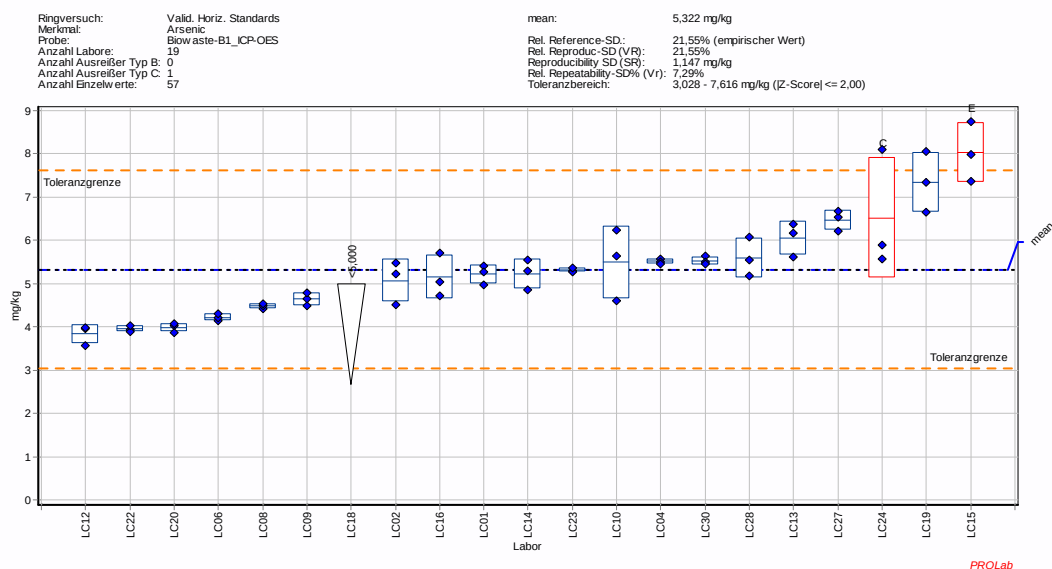
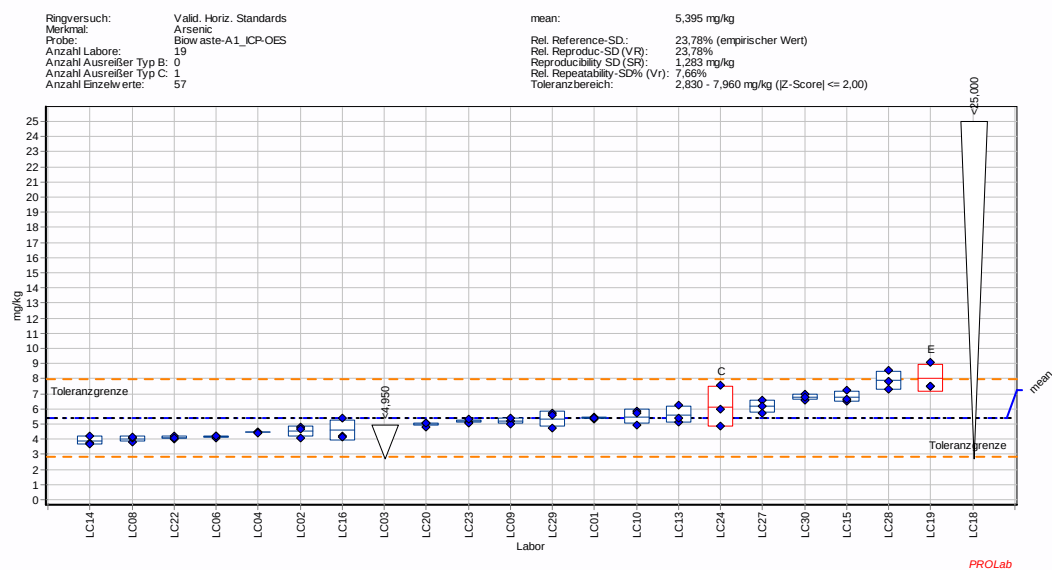


UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1
(Teilprojekt „Anorganische Parameter“)

2.2.2.1 Biowaste, ICP-OES: Arsenic

ICP-OES: Arsenic	CO-A1_OS	Z-Score		CO-B1_OS	Z-Score		CO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	5,38	0,00		5,22	-0,10		4,87	-0,50	
VALH02	4,53	-0,70		5,07	-0,20		5,13	-0,30	
VALH03	< 4,950						< 4,900		
VALH04	4,46	-0,70		5,51	0,20		4,74	-0,60	
VALH05							4,95	-0,40	
VALH06	4,16	-1,00		4,22	-1,00		5,60	0,10	
VALH07									
VALH08	4,02	-1,10		4,48	-0,70		4,70	-0,70	
VALH09	5,20	-0,20		4,64	-0,60		5,52	0,00	
VALH10	5,48	0,10		5,49	0,10		6,34	0,70	
VALH12				3,83	-1,30				
VALH13	5,60	0,20		6,06	0,60		6,38	0,70	
VALH14	3,90	-1,20		5,23	-0,10		5,85	0,30	
VALH15	6,80	1,10		8,03	2,40	E	7,72	1,80	
VALH16	4,58	-0,60		5,15	-0,20		2,35	-2,60	E
VALH17									
VALH18	< 25,000			< 5,000			< 25,000		
VALH19	8,02	2,00	E	7,35	1,80		8,57	2,60	CE
VALH20	4,97	-0,30		3,98	-1,20		4,97	-0,40	
VALH21									
VALH22	4,09	-1,00		3,96	-1,20		4,40	-0,90	
VALH23	5,17	-0,20		5,31	0,00		6,17	0,60	
VALH24	6,13	0,60	C	6,52	1,00	C	6,56	0,90	C
VALH27	6,16	0,60		6,47	1,00		6,49	0,80	
VALH28	7,88	1,90		5,60	0,20		6,73	1,00	C
VALH29	5,34	0,00					5,49	0,00	
VALH30	6,79	1,10		5,52	0,20		7,01	1,30	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	22			21			23		
No. labs with val.	20			20			21		
Mean	5,395			5,322			5,482		
SR Reprod. SD	1,283			1,147			1,208		
Sr Repeat. SD	0,413			0,388			0,314		
RSD % VR	23,78%			21,55%			22,04%		
RSD % Vr	7,66%			7,29%			5,73%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			1			3		
No. labs accept.	19			19			18		
No. values accept.	57			57			54		

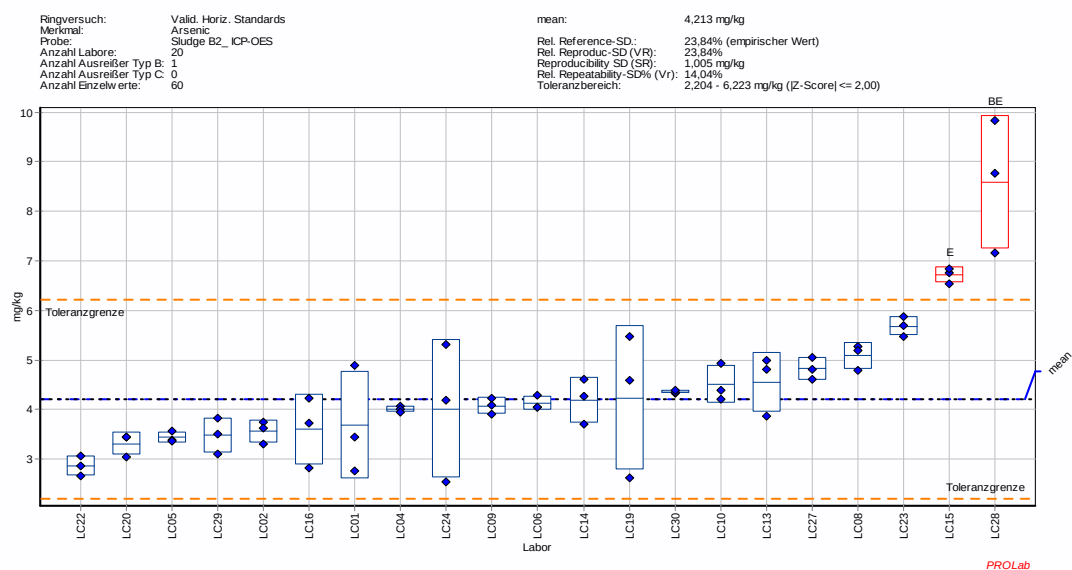
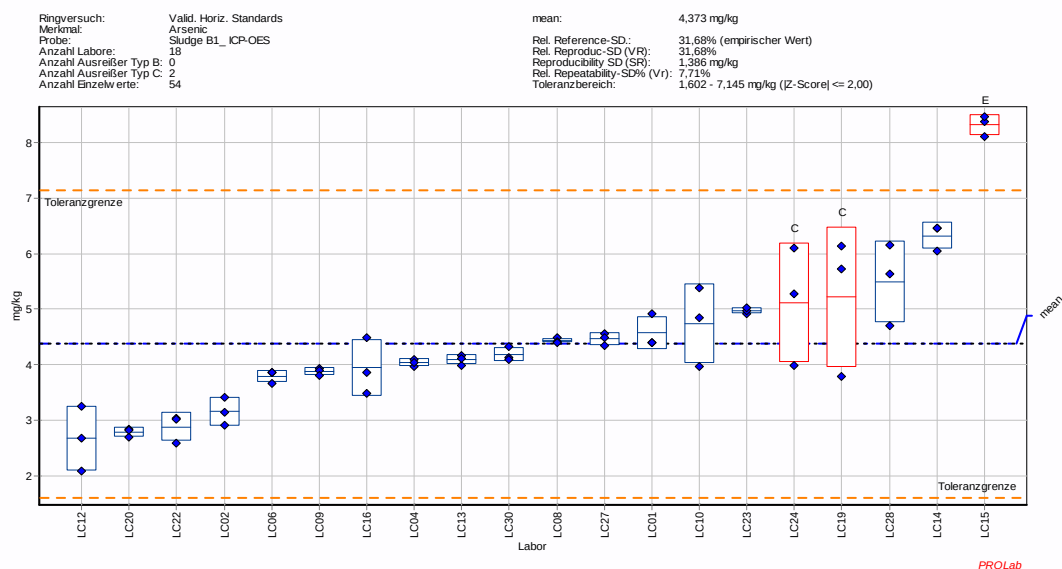
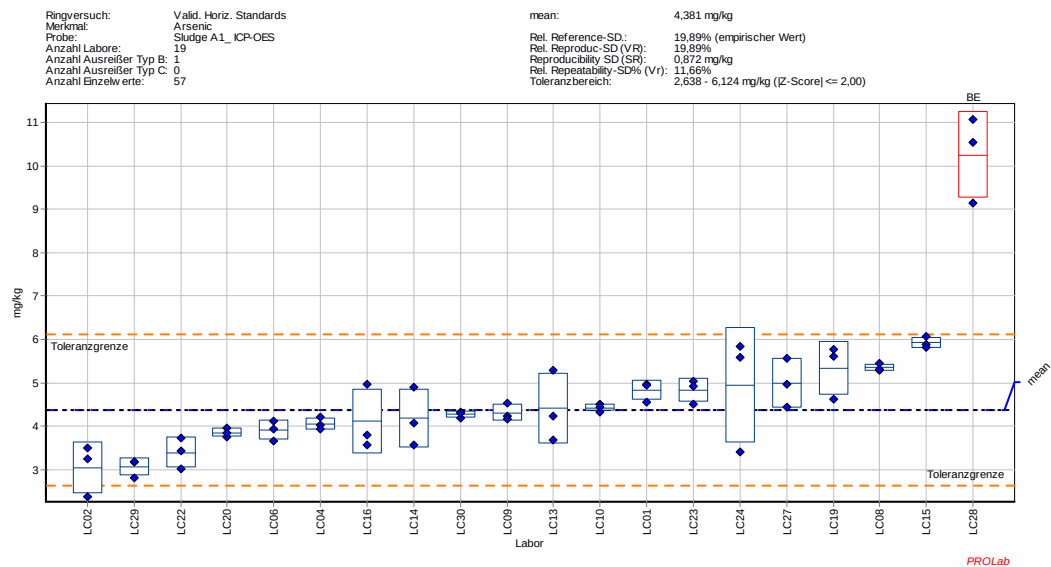
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.2.2 Sludge, ICP-OES: Arsenic

ICP-OES: Arsenic	SL-A1_OS	Z-Score		SL-B1_OS	Z-Score		SL-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	4,82	0,50		4,57	0,10		3,69	-0,50	
VALH02	3,04	-1,50		3,16	-0,90		3,56	-0,70	
VALH03	< 5,000						< 5,000		
VALH04	4,05	-0,40		4,04	-0,20		4,01	-0,20	
VALH05							3,43	-0,80	
VALH06	3,91	-0,50		3,79	-0,40		4,13	-0,10	
VALH07									
VALH08	5,35	1,10		4,44	0,00		5,08	0,90	
VALH09	4,31	-0,10		3,88	-0,40		4,08	-0,10	
VALH10	4,43	0,10		4,74	0,30		4,51	0,30	
VALH12				2,67	-1,20				
VALH13	4,41	0,00		4,09	-0,20		4,55	0,30	
VALH14	4,18	-0,20		6,32	1,40		4,19	0,00	
VALH15	5,92	1,80		8,32	2,80	E	6,71	2,50	E
VALH16	4,11	-0,30		3,95	-0,30		3,60	-0,60	
VALH17									
VALH18	< 5,000			< 1,000			< 5,000		
VALH19	5,34	1,10		5,22	0,60	C	4,23	0,00	
VALH20	3,86	-0,60		2,78	-1,10		3,31	-0,90	
VALH21									
VALH22	3,40	-1,10		2,88	-1,10		2,86	-1,30	
VALH23	4,83	0,50		4,97	0,40		5,68	1,50	
VALH24	4,94	0,60		5,12	0,50	C	4,01	-0,20	
VALH27	4,99	0,70		4,47	0,10		4,82	0,60	
VALH28	10,26	6,70	BE	5,50	0,80		8,59	4,40	BE
VALH29	3,07	-1,50					3,48	-0,70	
VALH30	4,27	-0,10		4,18	-0,10		4,36	0,10	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	22			21			23		
No. labs with val.	20			20			21		
Mean	4,381			4,373			4,213		
SR Reprod. SD	0,872			1,386			1,005		
Sr Repeat. SD	0,511			0,337			0,592		
RSD % VR	19,89%			31,68%			23,84%		
RSD % Vr	11,66%			7,71%			14,04%		
No. A outliers	0			0			0		
No. B outliers	1			0			1		
No. C outliers	0			2			0		
No. labs accept.	19			18			20		
No. values accept.	57			54			60		

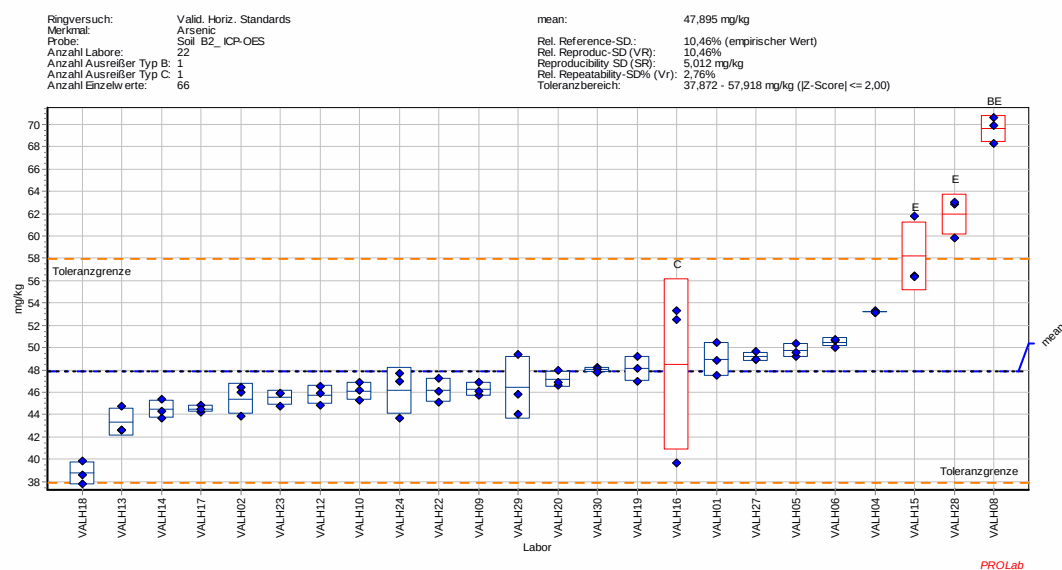
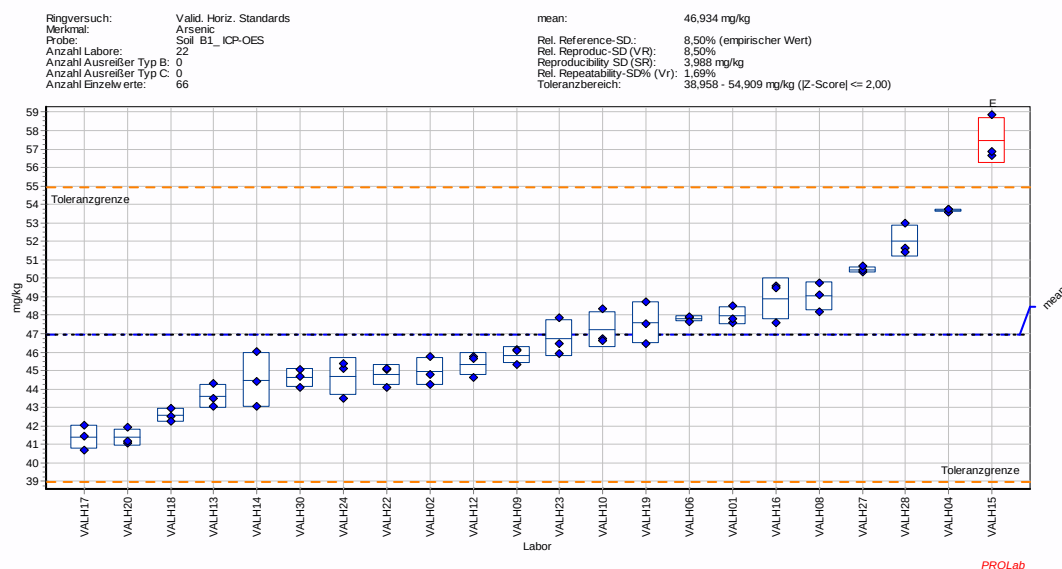
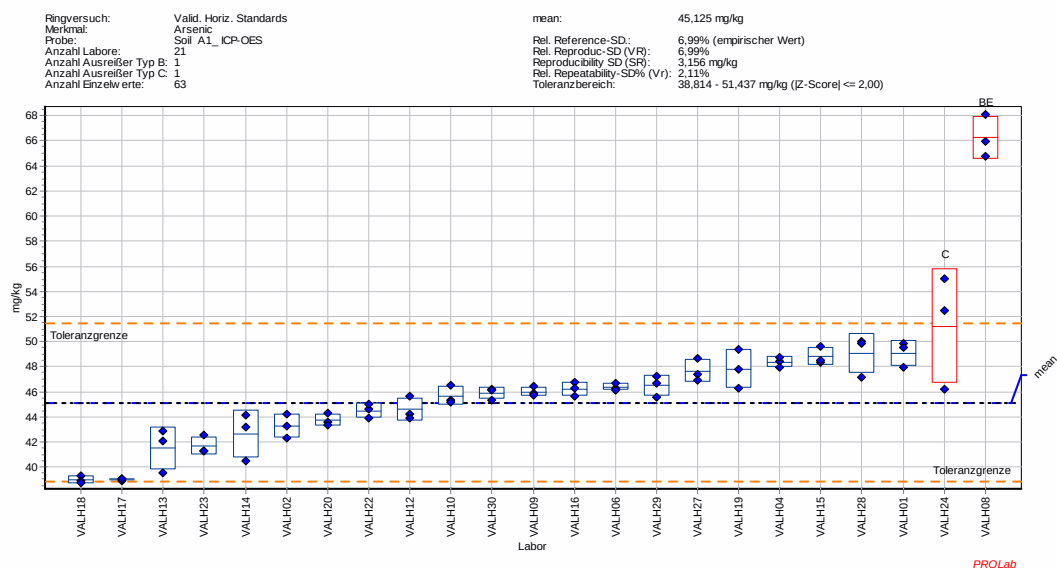
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.2.3 Soil, ICP-OES: Arsenic

ICP-OES: Arsenic	SO-A1_OS	Z-Score		SO-B1_OS	Z-Score		SO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	49,10	1,30		47,97	0,30		48,95	0,20	
VALH02	43,29	-0,60		44,95	-0,50		45,42	-0,50	
VALH03									
VALH04	48,38	1,00		53,68	1,70		53,19	1,10	
VALH05							49,72	0,40	
VALH06	46,40	0,40		47,80	0,20		50,48	0,50	
VALH07									
VALH08	66,24	6,80	BE	49,03	0,50		69,58	4,40	BE
VALH09	46,01	0,30		45,84	-0,30		46,23	-0,30	
VALH10	45,67	0,20		47,24	0,10		46,12	-0,40	
VALH12	44,60	-0,20		45,36	-0,40		45,74	-0,40	
VALH13	41,52	-1,20		43,62	-0,80		43,31	-0,90	
VALH14	42,62	-0,80		44,49	-0,60		44,46	-0,70	
VALH15	48,84	1,20		57,45	2,60	E	58,19	2,10	E
VALH16	46,24	0,30		48,89	0,50		48,49	0,10	C
VALH17	39,04	-2,00		41,39	-1,40		44,52	-0,70	
VALH18	39,00	-2,00		42,59	-1,10		38,73	-1,90	
VALH19	47,82	0,90		47,58	0,20		48,11	0,10	
VALH20	43,75	-0,50		41,39	-1,40		47,16	-0,10	
VALH21									
VALH22	44,50	-0,20		44,77	-0,50		46,16	-0,30	
VALH23	41,73	-1,10		46,76	0,00		45,52	-0,50	
VALH24	51,23	2,00	C	44,67	-0,60		46,13	-0,40	
VALH27	47,68	0,80		50,47	0,90		49,19	0,30	
VALH28	49,04	1,20		52,00	1,30		61,92	2,80	E
VALH29	46,51	0,40					46,40	-0,30	
VALH30	45,91	0,20		44,61	-0,60		48,02	0,00	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	23			22			24		
No. labs with val.	23			22			24		
Mean	45,125			46,934			47,895		
SR Reprod. SD	3,156			3,988			5,012		
Sr Repeat. SD	0,952			0,793			1,32		
RSD % VR	6,99%			8,50%			10,46%		
RSD % Vr	2,11%			1,69%			2,76%		
No. A outliers	0			0			0		
No. B outliers	1			0			1		
No. C outliers	1			0			1		
No. labs accept.	21			22			22		
No. values accept.	63			66			66		

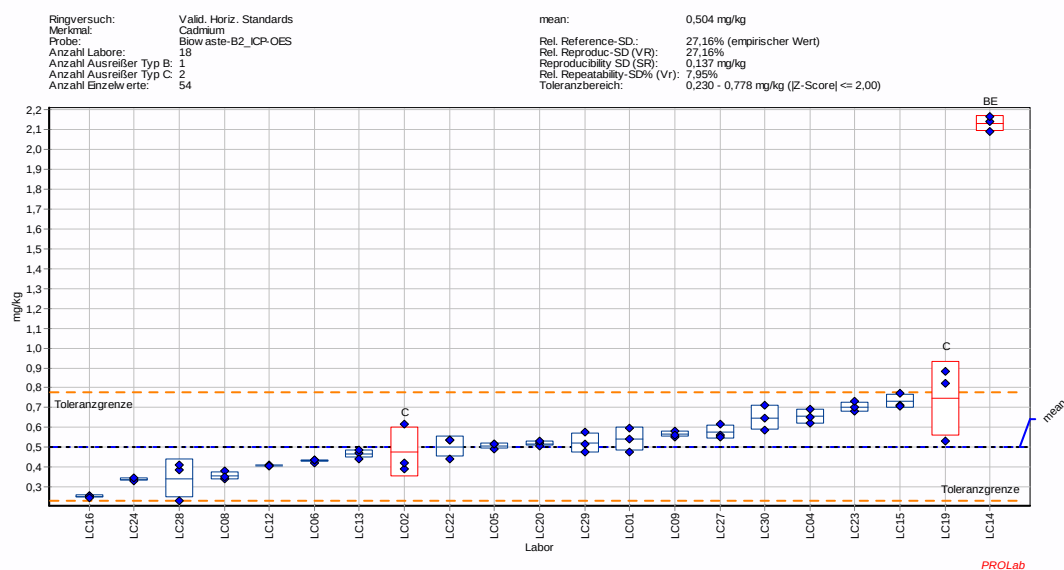
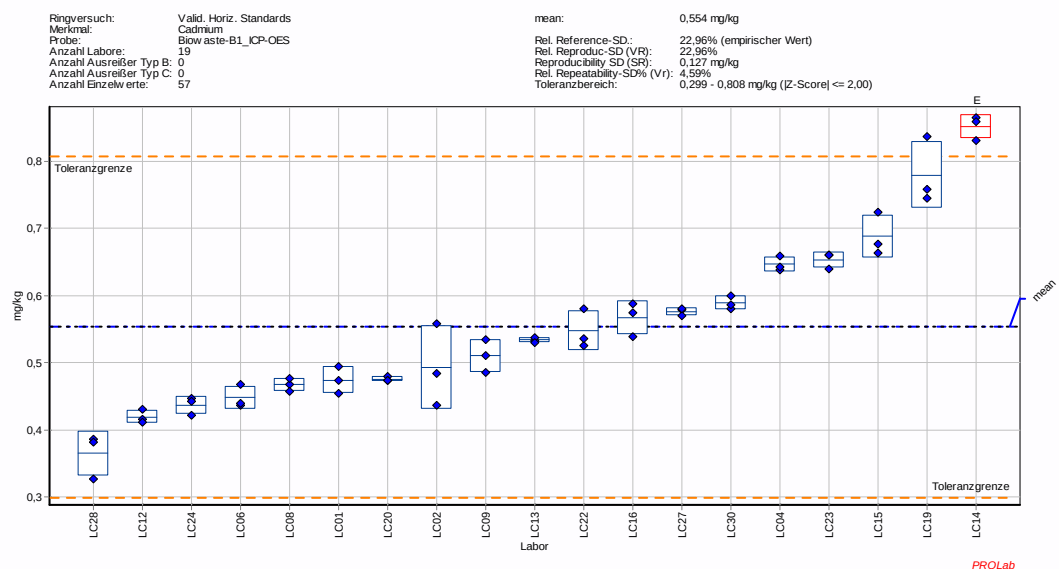
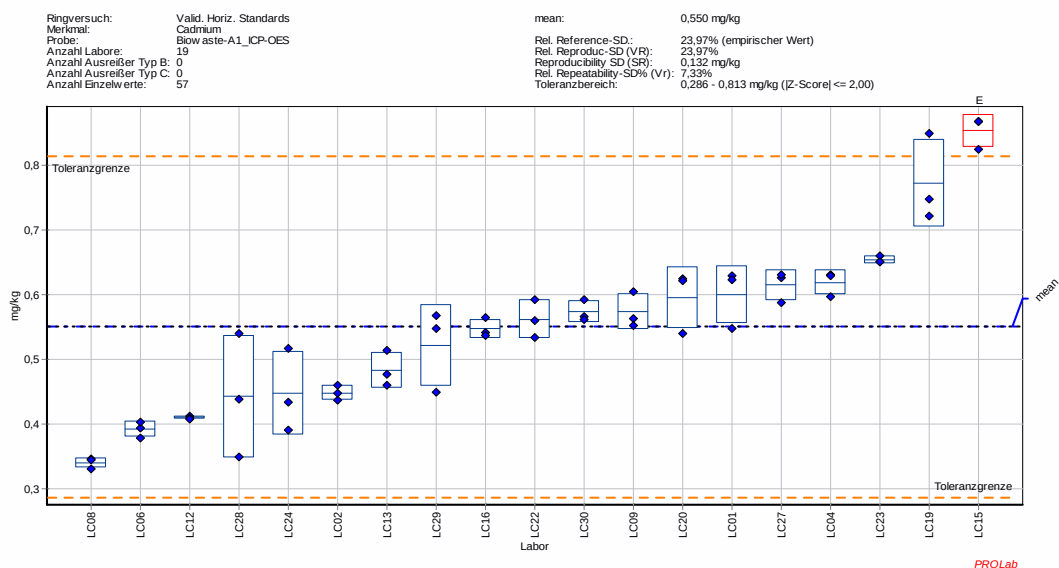
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.3.1 Biowaste, ICP-OES: Cadmium

ICP-OES: Cadmium	CO-A1_OS	Z-Score		CO-B1_OS	Z-Score		CO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	0,60	0,40		0,47	-0,60		0,54	0,30	
VALH02	0,45	-0,80		0,49	-0,50		0,48	-0,20	C
VALH03	< 1,000						< 1,000		
VALH04	0,62	0,50		0,65	0,70		0,66	1,10	
VALH05							0,51	0,00	
VALH06	0,39	-1,20		0,45	-0,80		0,43	-0,50	
VALH07									
VALH08	0,34	-1,60		0,47	-0,70		0,36	-1,10	
VALH09	0,57	0,20		0,51	-0,30		0,57	0,50	
VALH10	< 2,000			< 2,000			< 2,000		
VALH12	0,41	-1,10		0,42	-1,10		0,41	-0,70	
VALH13	0,48	-0,50		0,53	-0,20		0,47	-0,30	
VALH14				0,85	2,30	E	2,13	11,90	BE
VALH15	0,85	2,30	E	0,69	1,10		0,73	1,70	
VALH16	0,55	0,00		0,57	0,10		0,25	-1,80	
VALH17									
VALH18	< 1,000			< 1,000			< 1,000		
VALH19	0,77	1,70		0,78	1,80		0,75	1,80	C
VALH20	0,60	0,30		0,48	-0,60		0,52	0,10	
VALH21	< 1,000			< 1,000			< 1,000		
VALH22	0,56	0,10		0,55	-0,10		0,50	0,00	
VALH23	0,65	0,80		0,65	0,80		0,70	1,50	
VALH24	0,45	-0,80		0,44	-0,90		0,34	-1,20	
VALH27	0,61	0,50		0,58	0,20		0,58	0,50	
VALH28	0,44	-0,80		0,37	-1,50		0,34	-1,20	
VALH29	0,52	-0,20					0,52	0,10	
VALH30	0,57	0,20		0,59	0,30		0,65	1,10	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	23			22			25		
No. labs with val.	19			19			21		
Mean	0,550			0,554			0,504		
SR Reprod. SD	0,132			0,127			0,137		
Sr Repeat. SD	0,04			0,025			0,04		
RSD % VR	23,97%			22,96%			27,16%		
RSD % Vr	7,33%			4,59%			7,95%		
No. A outliers	0			0			0		
No. B outliers	0			0			1		
No. C outliers	0			0			2		
No. labs accept.	19			19			18		
No. values accept.	57			57			54		

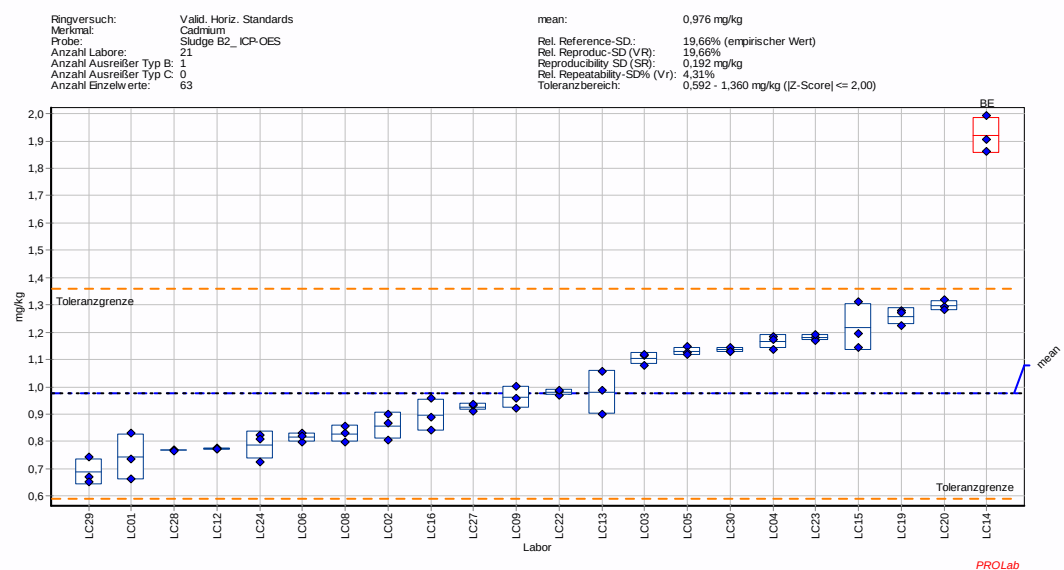
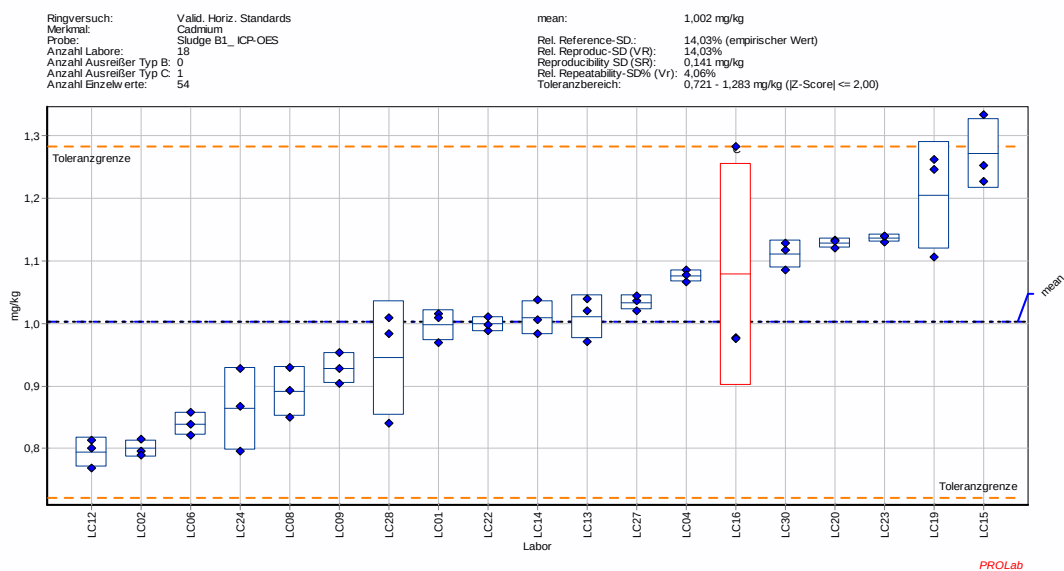
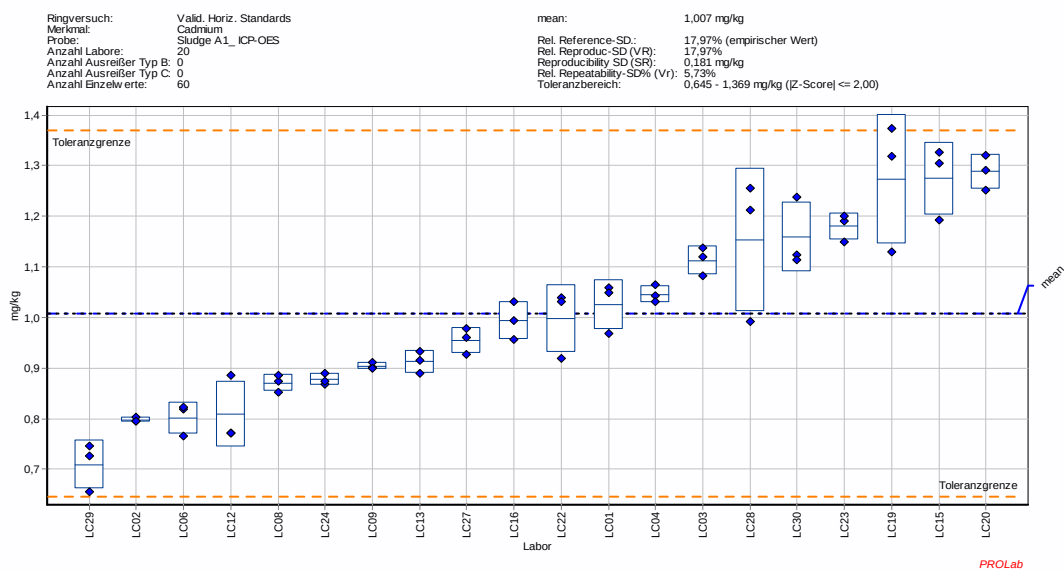
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.3.2 Sludge, ICP-OES: Cadmium

ICP-OES: Cadmium	SL-A1_OS	Z-Score		SL-B1_OS	Z-Score		SL-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	1,03	0,10		1,00	0,00		0,74	-1,20	
VALH02	0,80	-1,20		0,80	-1,40		0,86	-0,60	
VALH03	1,11	0,60					1,10	0,70	
VALH04	1,05	0,20		1,08	0,50		1,17	1,00	
VALH05							1,13	0,80	
VALH06	0,80	-1,10		0,84	-1,20		0,82	-0,80	
VALH07									
VALH08	0,87	-0,80		0,89	-0,80		0,83	-0,80	
VALH09	0,90	-0,60		0,93	-0,50		0,96	-0,10	
VALH10	< 2,000			< 2,000			< 2,000		
VALH12	0,81	-1,10		0,79	-1,50		0,77	-1,10	
VALH13	0,91	-0,50		1,01	0,10		0,98	0,00	
VALH14				1,01	0,10		1,92	4,90	BE
VALH15	1,28	1,50		1,27	1,90		1,22	1,30	
VALH16	0,99	-0,10		1,08	0,50	C	0,90	-0,40	
VALH17									
VALH18	< 2,000			< 1,000			< 2,000		
VALH19	1,27	1,50		1,21	1,40		1,26	1,50	
VALH20	1,29	1,60		1,13	0,90		1,30	1,70	
VALH21	< 1,000			< 1,000			< 1,000		
VALH22	1,00	-0,10		1,00	0,00		0,98	0,00	
VALH23	1,18	1,00		1,14	1,00		1,18	1,10	
VALH24	0,88	-0,70		0,86	-1,00		0,79	-1,00	
VALH27	0,96	-0,30		1,03	0,20		0,93	-0,30	
VALH28	1,15	0,80		0,95	-0,40		0,77	-1,10	
VALH29	0,71	-1,60					0,69	-1,50	
VALH30	1,16	0,80		1,11	0,80		1,14	0,80	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	23			22			25		
No. labs with val.	20			19			22		
Mean	1,007			1,002			0,976		
SR Reprod. SD	0,181			0,141			0,192		
Sr Repeat. SD	0,058			0,041			0,042		
RSD % VR	17,97%			14,03%			19,66%		
RSD % Vr	5,73%			4,06%			4,31%		
No. A outliers	0			0			0		
No. B outliers	0			0			1		
No. C outliers	0			1			0		
No. labs accept.	20			18			21		
No. values accept.	60			54			63		

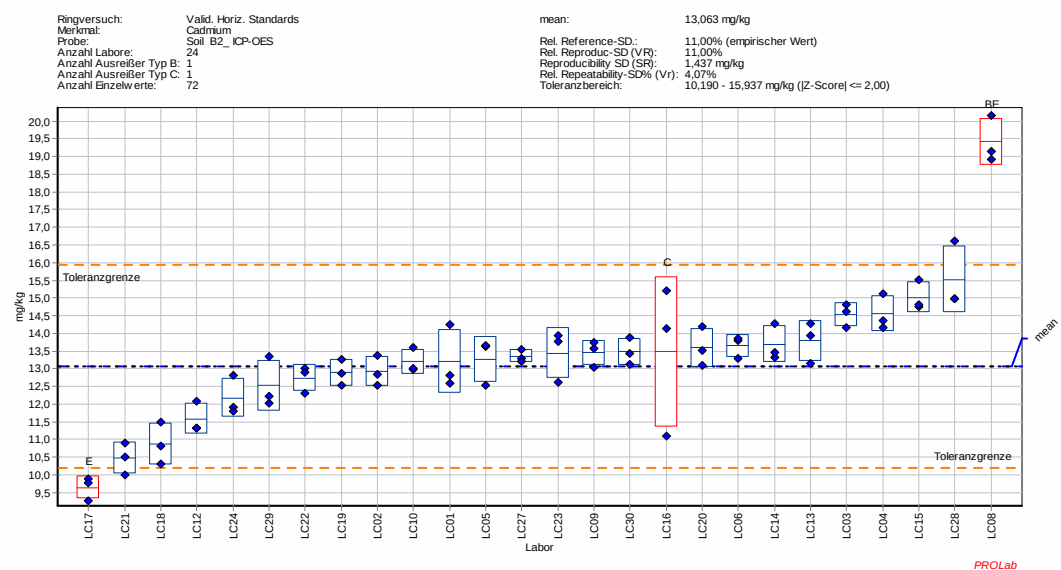
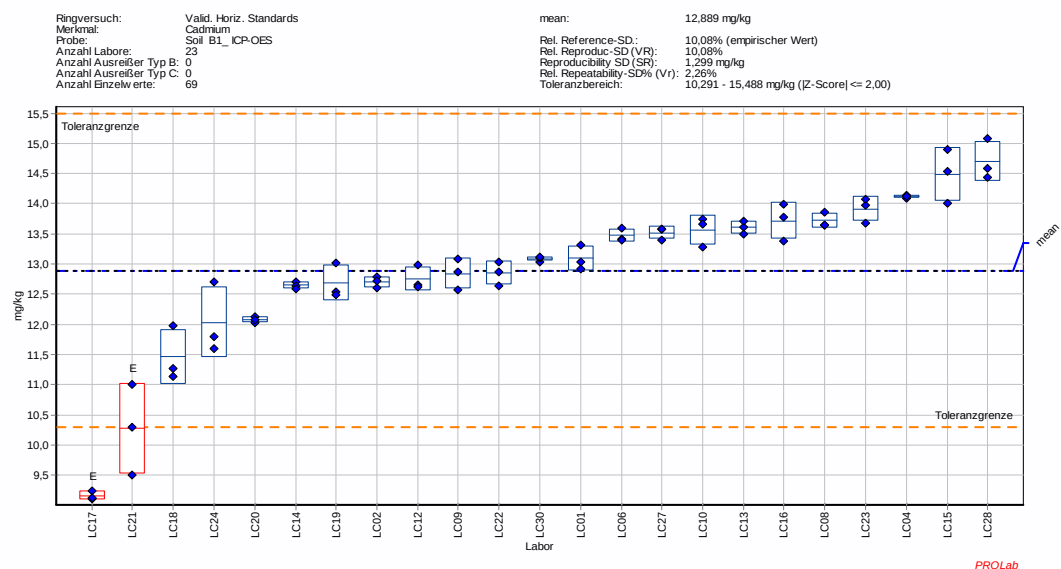
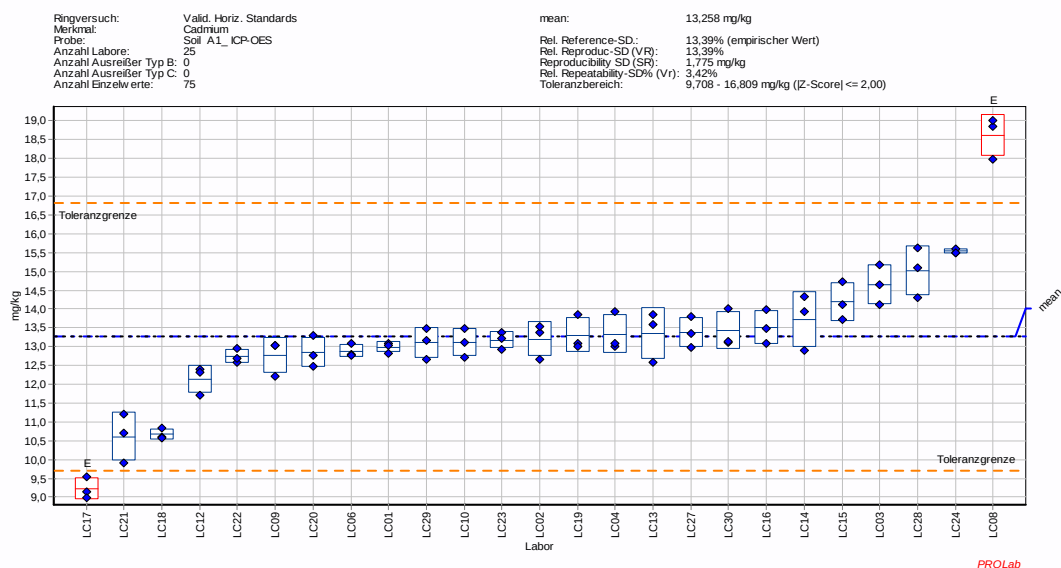
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.3.3 Soil, ICP-OES: Cadmium

ICP-OES: Cadmium	SO-A1_OS	Z-Score		SO-B1_OS	Z-Score		SO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	12,98	-0,20		13,09	0,20		13,21	0,10	
VALH02	13,20	0,00		12,70	-0,10		12,92	-0,10	
VALH03	14,65	0,80					14,53	1,00	
VALH04	13,34	0,00		14,12	0,90		14,55	1,00	
VALH05							13,27	0,10	
VALH06	12,88	-0,20		13,47	0,40		13,65	0,40	
VALH07									
VALH08	18,62	3,00	E	13,72	0,60		19,42	4,40	BE
VALH09	12,77	-0,30		12,84	0,00		13,45	0,30	
VALH10	13,11	-0,10		13,56	0,50		13,19	0,10	
VALH12	12,14	-0,60		12,75	-0,10		11,58	-1,00	
VALH13	13,34	0,00		13,61	0,60		13,79	0,50	
VALH14	13,72	0,30		12,65	-0,20		13,69	0,40	
VALH15	14,19	0,50		14,48	1,20		15,02	1,40	
VALH16	13,51	0,10		13,72	0,60		13,47	0,30	C
VALH17	9,22	-2,30	E	9,16	-2,90	E	9,64	-2,40	E
VALH18	10,67	-1,50		11,46	-1,10		10,87	-1,50	
VALH19	13,31	0,00		12,68	-0,20		12,89	-0,10	
VALH20	12,85	-0,20		12,07	-0,60		13,59	0,40	
VALH21	10,60	-1,50		10,27	-2,00	E	10,47	-1,80	
VALH22	12,74	-0,30		12,85	0,00		12,74	-0,20	
VALH23	13,17	0,00		13,91	0,80		13,44	0,30	
VALH24	15,53	1,30		12,03	-0,70		12,17	-0,60	
VALH27	13,38	0,10		13,51	0,50		13,35	0,20	
VALH28	15,01	1,00		14,70	1,40		15,53	1,70	
VALH29	13,10	-0,10					12,52	-0,40	
VALH30	13,42	0,10		13,08	0,10		13,47	0,30	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	25			23			26		
No. labs with val.	25			23			26		
Mean	13,258			12,889			13,063		
SR Reprod. SD	1,775			1,299			1,437		
Sr Repeat. SD	0,453			0,292			0,531		
RSD % VR	13,39%			10,08%			11,00%		
RSD % Vr	3,42%			2,26%			4,07%		
No. A outliers	0			0			0		
No. B outliers	0			0			1		
No. C outliers	0			0			1		
No. labs accept.	25			23			24		
No. values accept.	75			69			72		

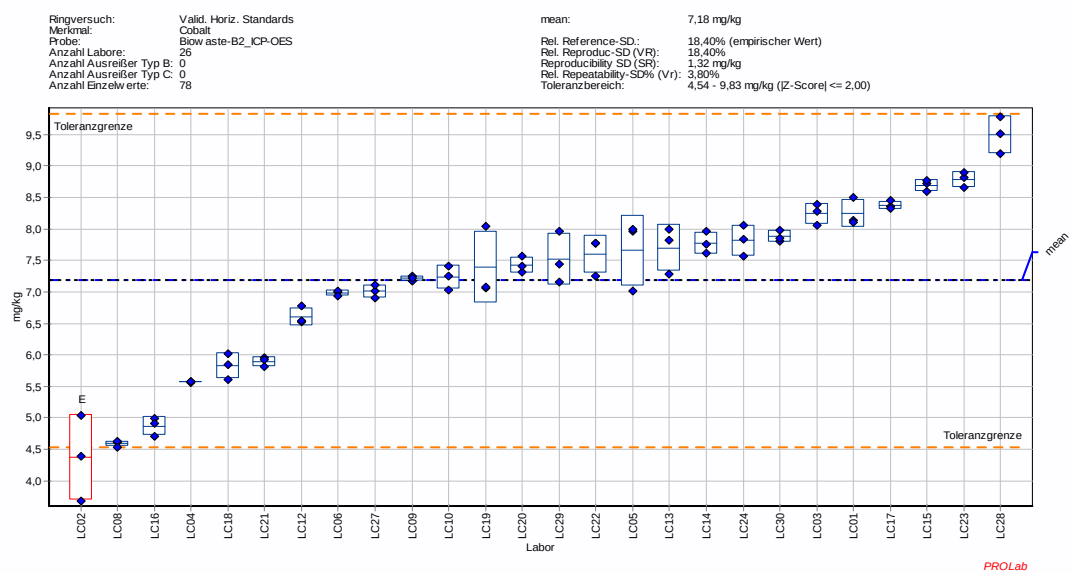
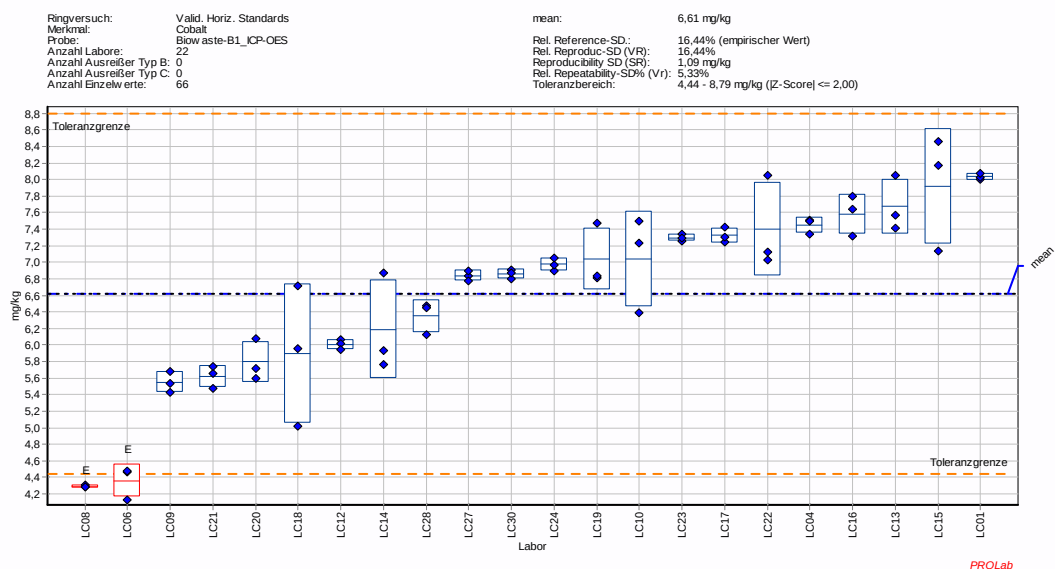
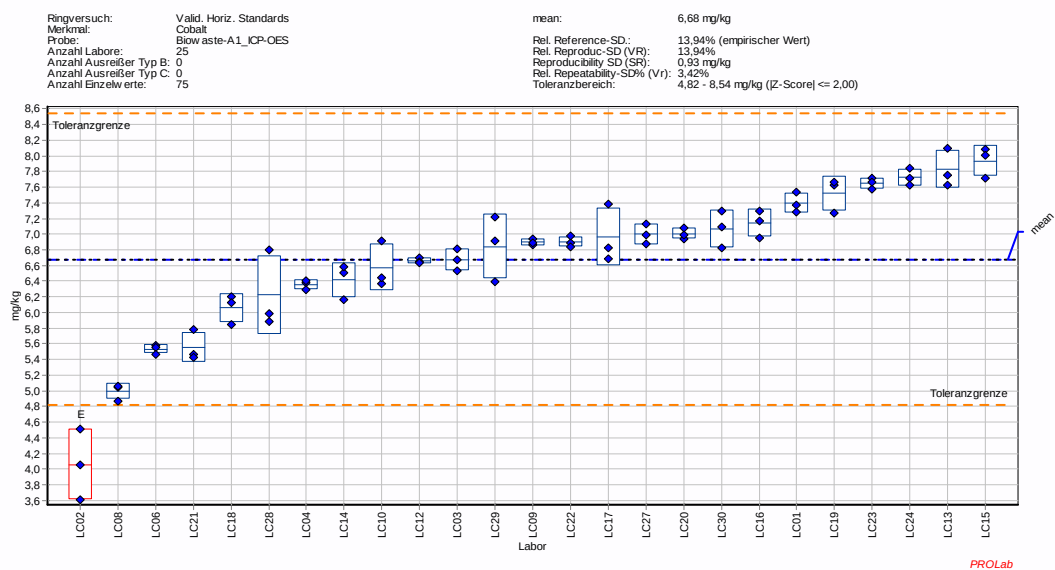
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.4.1 Biowaste, ICP-OES: Cobalt

ICP-OES: Cobalt	CO-A1_OS	Z-Score		CO-B1_OS	Z-Score		CO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	7,40	0,80		8,03	1,30		8,25	0,80	
VALH02	4,06	-2,80	E	< 0,30			4,37	-2,10	E
VALH03	6,67	0,00					8,24	0,80	
VALH04	6,36	-0,30		7,45	0,80		5,57	-1,20	
VALH05							7,66	0,40	
VALH06	5,53	-1,20		4,36	-2,10	E	6,98	-0,20	
VALH07									
VALH08	4,99	-1,80		4,29	-2,10	E	4,59	-2,00	
VALH09	6,90	0,20		5,55	-1,00		7,22	0,00	
VALH10	6,57	-0,10		7,04	0,40		7,23	0,00	
VALH12	6,66	0,00		6,01	-0,60		6,61	-0,40	
VALH13	7,83	1,20		7,67	1,00		7,70	0,40	
VALH14	6,42	-0,30		6,19	-0,40		7,78	0,40	
VALH15	7,93	1,30		7,92	1,20		8,69	1,10	
VALH16	7,14	0,50		7,58	0,90		4,87	-1,70	
VALH17	6,96	0,30		7,32	0,70		8,38	0,90	
VALH18	6,06	-0,70		5,90	-0,70		5,82	-1,00	
VALH19	7,52	0,90		7,04	0,40		7,39	0,20	
VALH20	7,00	0,30		5,80	-0,80		7,43	0,20	
VALH21	5,56	-1,20		5,62	-0,90		5,90	-1,00	
VALH22	6,90	0,20		7,40	0,70		7,59	0,30	
VALH23	7,65	1,00		7,30	0,60		8,78	1,20	
VALH24	7,72	1,10		6,97	0,30		7,82	0,50	
VALH27	7,00	0,30		6,84	0,20		7,01	-0,10	
VALH28	6,22	-0,50		6,35	-0,20		9,49	1,70	
VALH29	6,84	0,20					7,52	0,30	
VALH30	7,07	0,40		6,86	0,20		7,88	0,50	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	25			23			26		
No. labs with val.	25			22			26		
Mean	6,679			6,613			7,184		
SR Reprod. SD	0,93			1,09			1,32		
Sr Repeat. SD	0,23			0,35			0,27		
RSD % VR	13,94%			16,44%			18,40%		
RSD % Vr	3,42%			5,33%			3,80%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	0			0			0		
No. labs accept.	25			22			26		
No. values accept.	75			66			78		

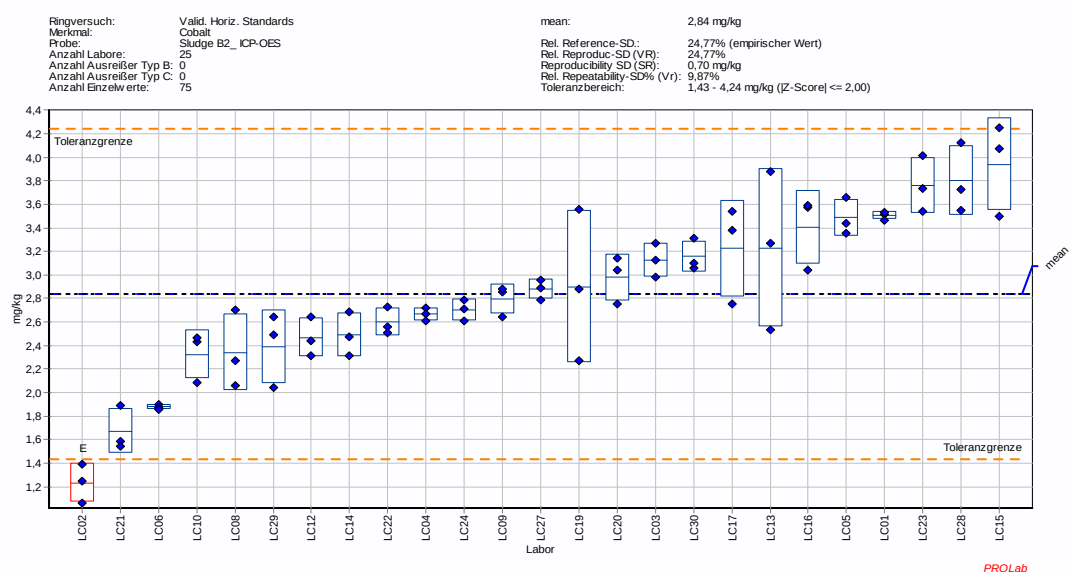
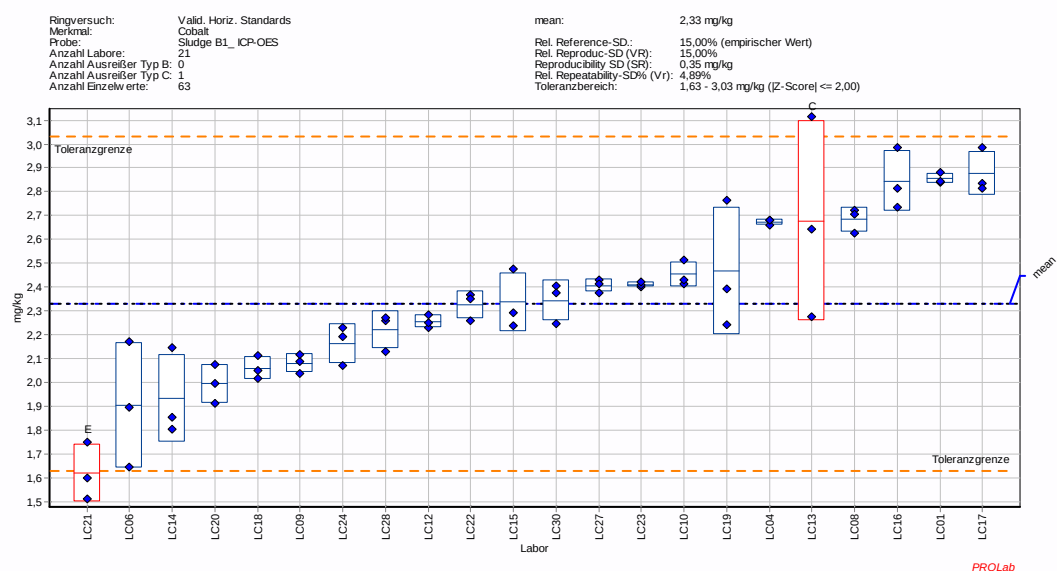
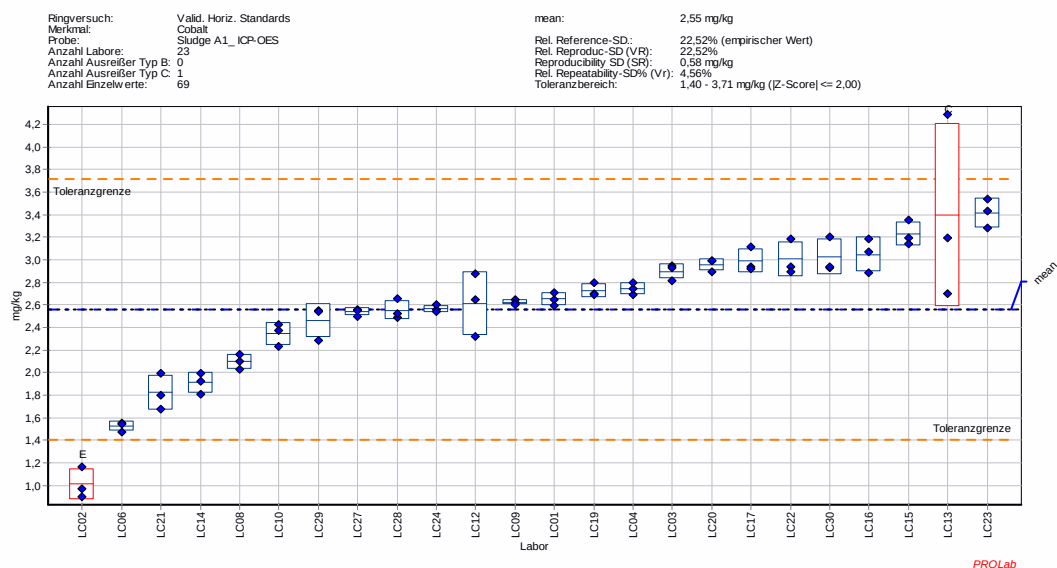
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.4.2 Sludge, ICP-OES: Cobalt

ICP-OES: Cobalt	SL-A1_OS	Z-Score		SL-B1_OS	Z-Score		SL-B2_OS	Z-Score	–
Unit	mg/kg			mg/kg			mg/kg		
VALH01	2,65	0,20		2,86	1,50		3,50	0,90	
VALH02	1,01	-2,70	E	< 0,30			1,23	-2,30	E
VALH03	2,90	0,60					3,12	0,40	
VALH04	2,74	0,30		2,67	1,00		2,67	-0,20	
VALH05							3,49	0,90	
VALH06	1,52	-1,80		1,90	-1,20		1,88	-1,40	
VALH07									
VALH08	2,10	-0,80		2,68	1,00		2,34	-0,70	
VALH09	2,62	0,10		2,08	-0,70		2,80	-0,10	
VALH10	2,34	-0,40		2,45	0,40		2,33	-0,70	
VALH12	2,61	0,10		2,26	-0,20		2,47	-0,50	
VALH13	3,40	1,50	C	2,68	1,00	C	3,23	0,60	
VALH14	1,91	-1,10		1,93	-1,10		2,49	-0,50	
VALH15	3,23	1,20		2,34	0,00		3,94	1,60	
VALH16	3,05	0,90		2,85	1,50		3,40	0,80	
VALH17	2,99	0,80		2,88	1,60		3,22	0,50	
VALH18	< 5,00			2,06	-0,80		< 5,00		
VALH19	2,73	0,30		2,47	0,40		2,90	0,10	
VALH20	2,96	0,70		1,99	-1,00		2,98	0,20	
VALH21	1,82	-1,30		1,62	-2,00	E	1,67	-1,70	
VALH22	3,00	0,80		2,33	0,00		2,60	-0,30	
VALH23	3,42	1,50		2,41	0,20		3,76	1,30	
VALH24	2,57	0,00		2,16	-0,50		2,70	-0,20	
VALH27	2,54	0,00		2,41	0,20		2,88	0,10	
VALH28	2,55	0,00		2,22	-0,30		3,80	1,40	
VALH29	2,46	-0,20					2,39	-0,60	
ValH30	3,02	0,80		2,34	0,00		3,16	0,50	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	25			23			26		
No. labs with val.	24			22			25		
Mean	2,555			2,329			2,838		
SR Reprod. SD	0,58			0,35			0,7		
Sr Repeat. SD	0,12			0,11			0,28		
RSD % VR	22,52%			15,00%			24,77%		
RSD % Vr	4,56%			4,89%			9,87%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			1			0		
No. labs accept.	23			21			25		
No. values accept.	69			63			75		

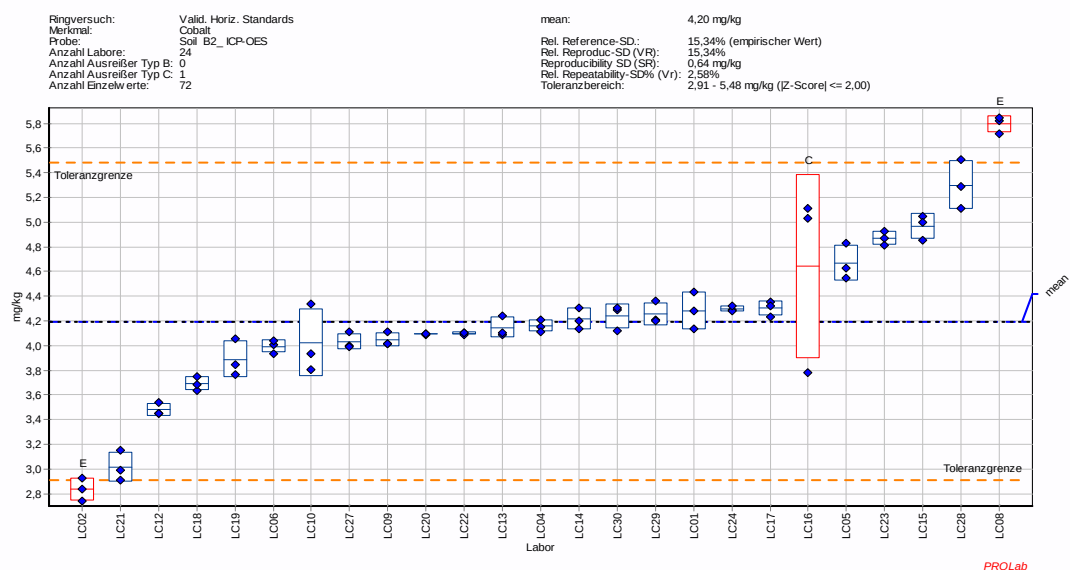
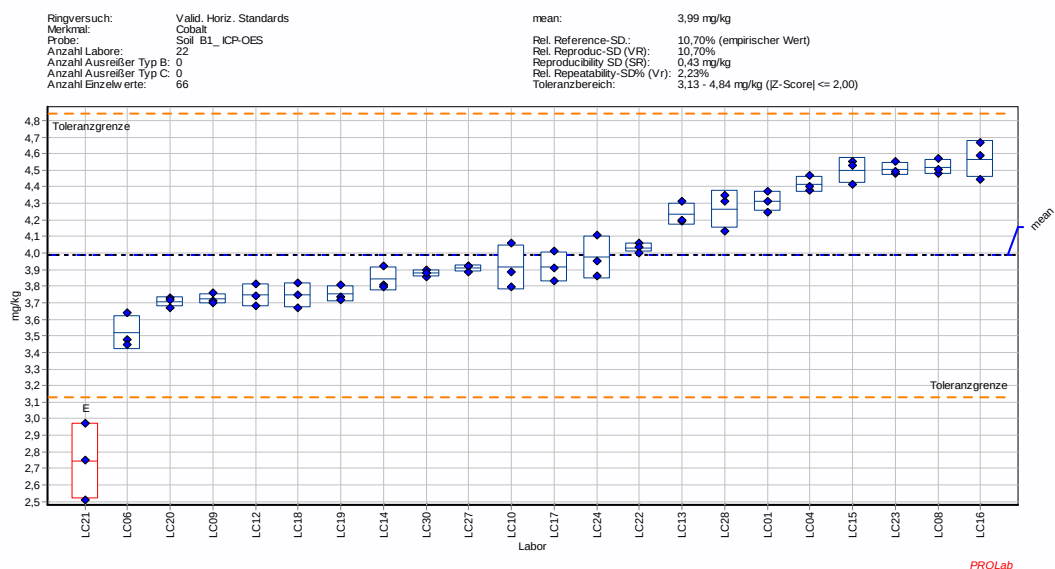
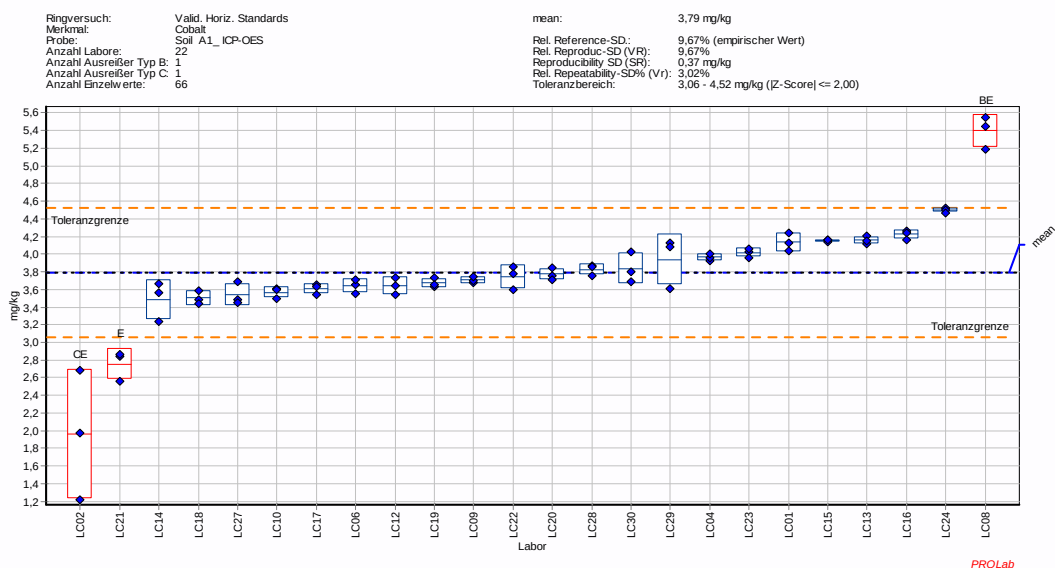
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.4.3 Soil, ICP-OES: Cobalt

ICP-OES: Cobalt	SO-A1_OS	Z-Score		SO-B1_OS	Z-Score		SO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	4,13	0,90		4,31	0,80		4,28	0,10	
VALH02	1,96	-5,00	CE	< 0,30			2,83	-2,10	E
VALH03	< 4,90						< 5,00		
VALH04	3,96	0,50		4,42	1,00		4,16	-0,10	
VALH05							4,67	0,70	
VALH06	3,64	-0,40		3,52	-1,10		3,99	-0,30	
VALH07									
VALH08	5,40	4,40	BE	4,52	1,20		5,80	2,50	E
VALH09	3,71	-0,20		3,72	-0,60		4,04	-0,20	
VALH10	3,57	-0,60		3,91	-0,20		4,02	-0,30	
VALH12	3,64	-0,40		3,74	-0,60		3,48	-1,10	
VALH13	4,16	1,00		4,23	0,60		4,14	-0,10	
VALH14	3,49	-0,80		3,84	-0,30		4,22	0,00	
VALH15	4,15	1,00		4,50	1,20		4,97	1,20	
VALH16	4,23	1,20		4,57	1,40		4,64	0,70	C
VALH17	3,61	-0,50		3,92	-0,20		4,30	0,20	
VALH18	3,50	-0,80		3,74	-0,60		3,69	-0,80	
VALH19	3,67	-0,30		3,75	-0,50		3,89	-0,50	
VALH20	3,77	0,00		3,71	-0,70		4,09	-0,20	
VALH21	2,76	-2,80	E	2,74	-2,90	E	3,02	-1,80	
VALH22	3,74	-0,10		4,03	0,10		4,10	-0,20	
VALH23	4,02	0,60		4,51	1,20		4,87	1,00	
VALH24	4,50	1,90		3,97	0,00		4,30	0,20	
VALH27	3,54	-0,70		3,91	-0,20		4,03	-0,30	
VALH28	3,83	0,10		4,26	0,60		5,30	1,70	
VALH29	3,94	0,40					4,26	0,10	
VALH30	3,84	0,10		3,88	-0,30		4,24	0,10	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	25			23			26		
No. labs with val.	24			22			25		
Mean	3,79			3,989			4,195		
SR Reprod. SD	0,37			0,43			0,64		
Sr Repeat. SD	0,11			0,09			0,11		
RSD % VR	9,67%			10,70%			15,34%		
RSD % Vr	3,02%			2,23%			2,58%		
No. A outliers	0			0			0		
No. B outliers	1			0			0		
No. C outliers	1			0			1		
No. labs accept.	22			22			24		
No. values accept.	66			66			72		

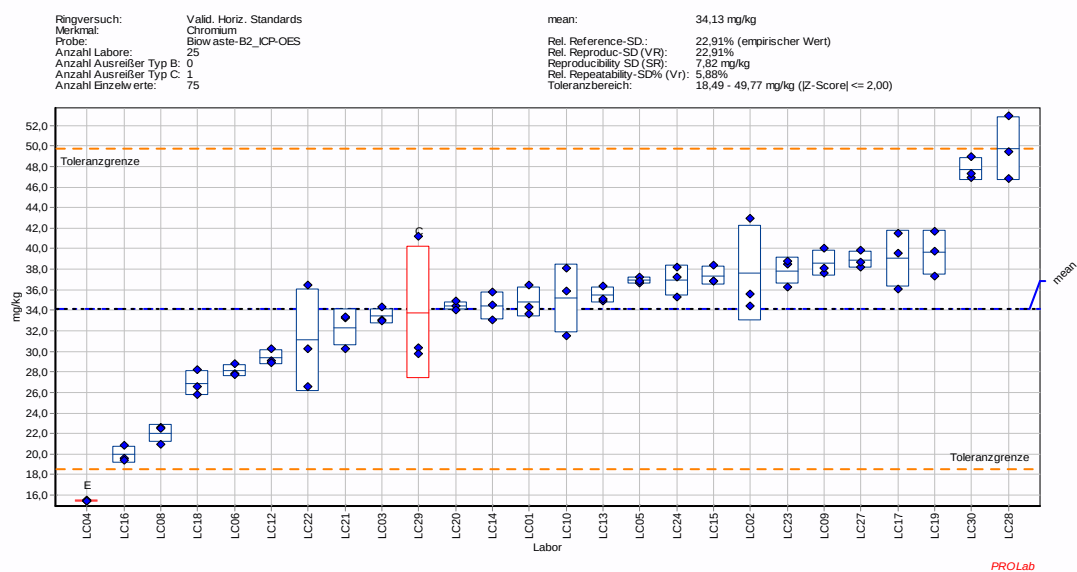
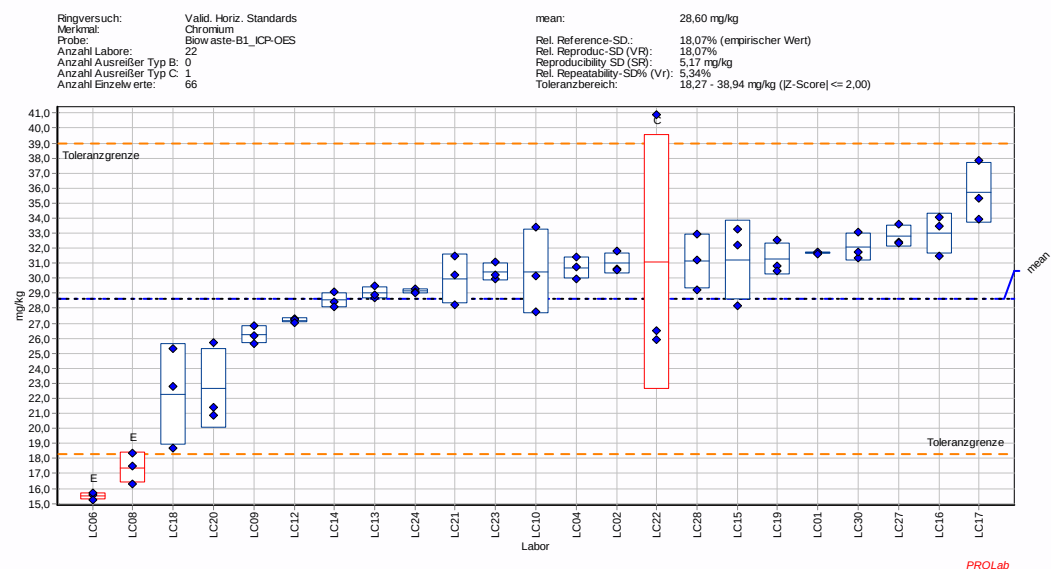
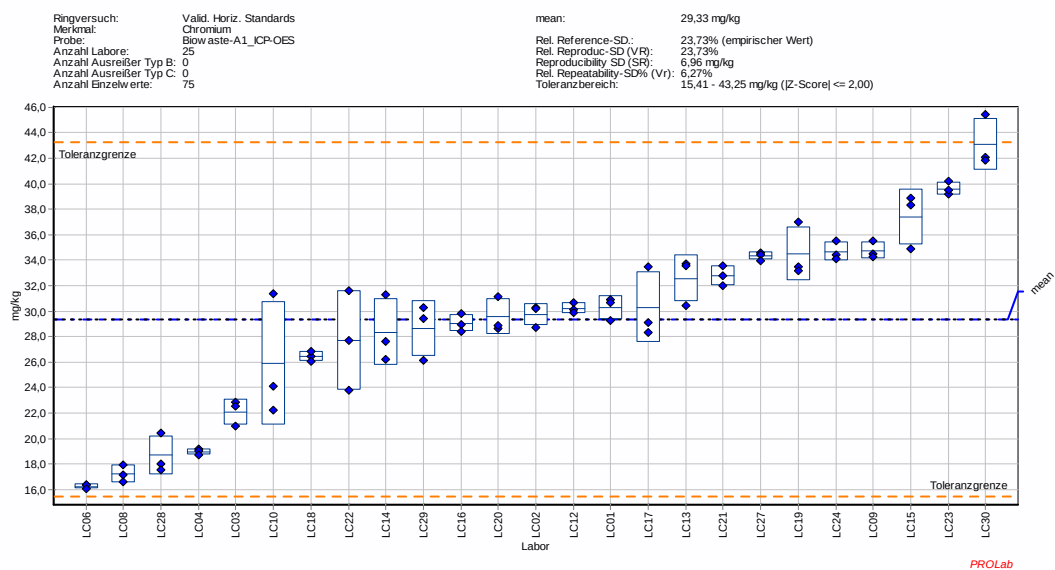
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.5.1 Biowaste, ICP-OES: Chromium

ICP-OES: Chromium	CO-A1_OS	Z-Score		CO-B1_OS	Z-Score		CO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	30,27	0,10		31,67	0,60		34,82	0,10	
VALH02	29,75	0,10		30,99	0,50		37,66	0,50	
VALH03	22,12	-1,00					33,43	-0,10	
VALH04	18,97	-1,50		30,70	0,40		15,45	-2,40	E
VALH05							36,90	0,40	
VALH06	16,26	-1,90		15,50	-2,50	E	28,11	-0,80	
VALH07									
VALH08	17,25	-1,70		17,39	-2,20	E	22,01	-1,60	
VALH09	34,76	0,80		26,22	-0,50		38,58	0,60	
VALH10	25,90	-0,50		30,44	0,40		35,16	0,10	
VALH12	30,23	0,10		27,20	-0,30		29,43	-0,60	
VALH13	32,58	0,50		29,02	0,10		35,45	0,20	
VALH14	28,36	-0,10		28,53	0,00		34,44	0,00	
VALH15	37,37	1,20		31,21	0,50		37,37	0,40	
VALH16	29,06	0,00		32,99	0,80		19,93	-1,80	
VALH17	30,30	0,10		35,69	1,40		39,05	0,60	
VALH18	26,46	-0,40		22,27	-1,20		26,87	-0,90	
VALH19	34,53	0,70		31,28	0,50		39,61	0,70	
VALH20	29,57	0,00		22,67	-1,10		34,43	0,00	
VALH21	32,80	0,50		29,97	0,30		32,33	-0,20	
VALH22	27,71	-0,20		31,10	0,50	C	31,10	-0,40	
VALH23	39,61	1,50		30,43	0,40		37,86	0,50	
VALH24	34,67	0,80		29,13	0,10		36,90	0,40	
VALH27	34,32	0,70		32,78	0,80		38,92	0,60	
VALH28	18,69	-1,50		31,12	0,50		49,72	2,00	
VALH29	28,62	-0,10					33,78	0,00	C
VALH30	43,11	2,00		32,06	0,70		47,75	1,70	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	25			23			26		
No. labs with val.	25			23			26		
Mean	29,33			28,6			34,13		
SR Reprod. SD	6,96			5,17			7,82		
Sr Repeat. SD	1,84			1,53			2,01		
RSD % VR	23,73%			18,07%			22,91%		
RSD % Vr	6,27%			5,34%			5,88%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	0			1			1		
No. labs accept.	25			22			25		
No. values accept.	75			66			75		

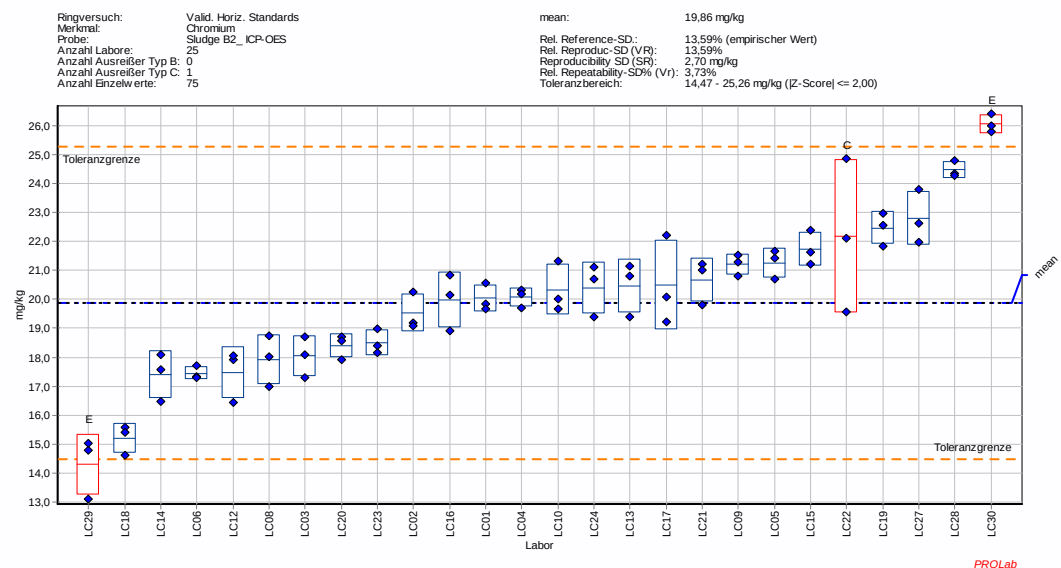
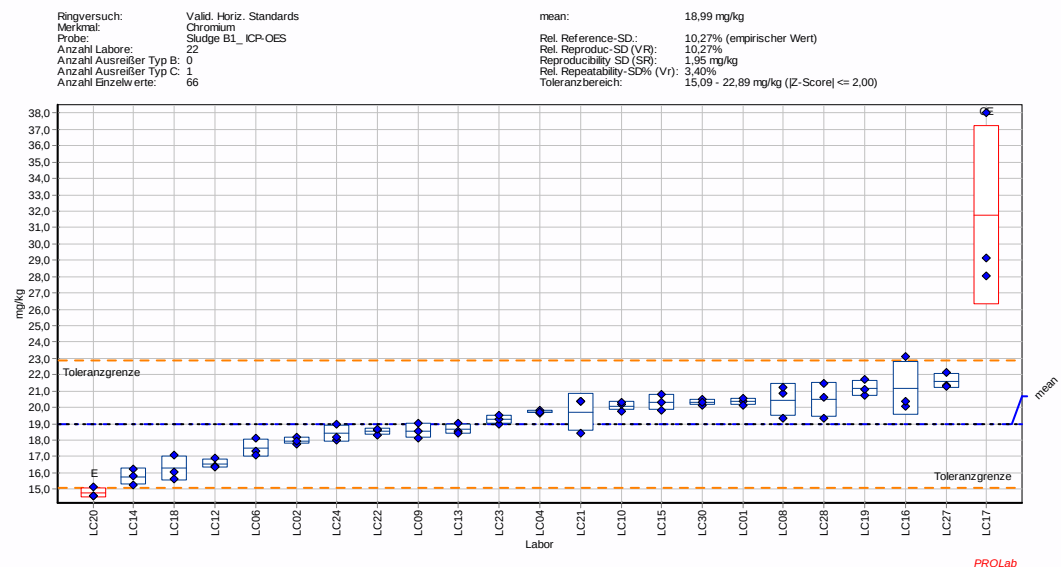
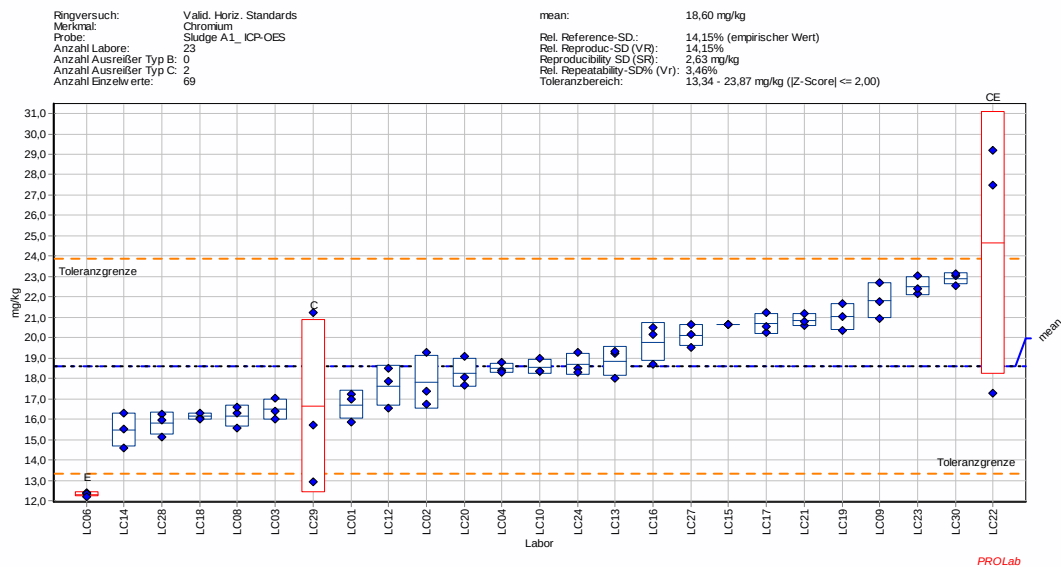
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.5.2 Sludge, ICP-OES: Chromium

ICP-OES: Chromium	SL-A1_OS	Z-Score		SL-B1_OS	Z-Score		SL-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	16,70	-0,70		20,36	0,70		20,03	0,10	
VALH02	17,81	-0,30		17,96	-0,50		19,52	-0,10	
VALH03	16,50	-0,80					18,04	-0,70	
VALH04	18,49	0,00		19,72	0,40		20,08	0,10	
VALH05							21,26	0,50	
VALH06	12,32	-2,40	E	17,51	-0,80		17,45	-0,90	
VALH07									
VALH08	16,16	-0,90		20,46	0,80		17,91	-0,70	
VALH09	21,81	1,20		18,57	-0,20		21,21	0,50	
VALH10	18,57	0,00		20,10	0,60		20,34	0,20	
VALH12	17,63	-0,40		16,56	-1,20		17,47	-0,90	
VALH13	18,86	0,10		18,66	-0,20		20,45	0,20	
VALH14	15,47	-1,20		15,77	-1,60		17,39	-0,90	
VALH15	20,67	0,80		20,31	0,70		21,74	0,70	
VALH16	19,78	0,40		21,17	1,10		19,97	0,00	
VALH17	20,69	0,80		31,74	6,50	CE	20,50	0,20	
VALH18	16,14	-0,90		16,27	-1,40		15,19	-1,70	
VALH19	21,02	0,90		21,17	1,10		22,46	1,00	
VALH20	18,28	-0,10		14,78	-2,20	E	18,40	-0,50	
VALH21	20,87	0,90		19,73	0,40		20,67	0,30	
VALH22	24,66	2,30	CE	18,52	-0,20		22,18	0,90	C
VALH23	22,53	1,50		19,27	0,10		18,50	-0,50	
VALH24	18,70	0,00		18,40	-0,30		20,40	0,20	
VALH27	20,11	0,60		21,60	1,30		22,79	1,10	
VALH28	15,80	-1,10		20,48	0,80		24,47	1,70	
VALH29	16,64	-0,70	C				14,30	-2,10	E
VALH30	22,91	1,60		20,33	0,70		26,06	2,30	E
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	25			23			26		
No. labs with val.	25			23			26		
Mean	18,6			18,99			19,86		
SR Reprod. SD	2,63			1,95			2,7		
Sr Repeat. SD	0,64			0,64			0,74		
RSD % VR	14,15%			10,27%			13,59%		
RSD % Vr	3,46%			3,40%			3,73%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	2			1			1		
No. labs accept.	23			22			25		
No. values accept.	69			66			75		

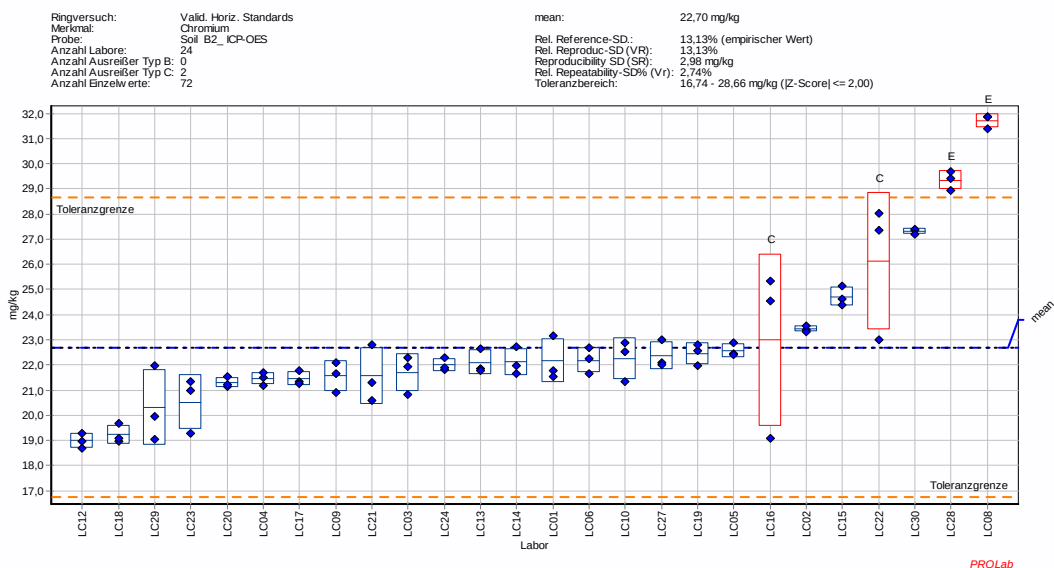
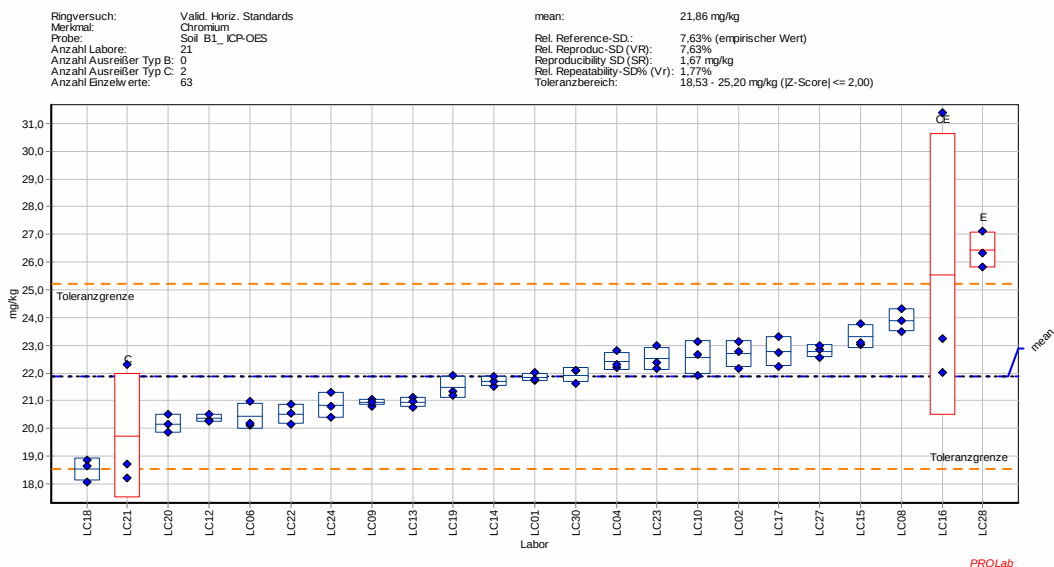
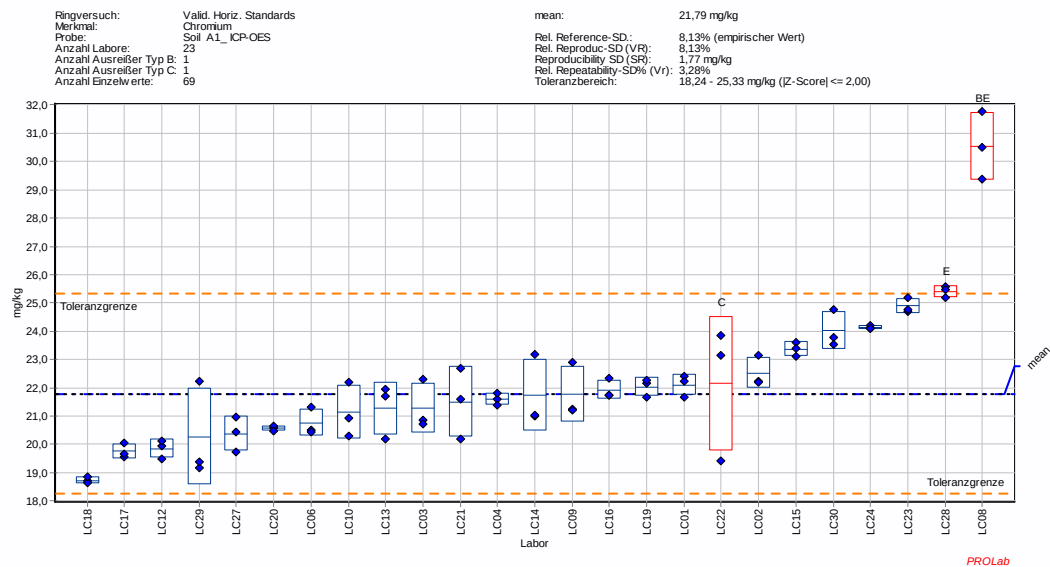
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.5.3 Soil, ICP-OES: Chromium

ICP-OES: Chromium	SO-A1_OS	Z-Score		SO-B1_OS	Z-Score		SO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	22,11	0,20		21,84	0,00		22,17	-0,20	
VALH02	22,53	0,40		22,69	0,50		23,43	0,20	
VALH03	21,29	-0,30					21,68	-0,30	
VALH04	21,60	-0,10		22,43	0,30		21,45	-0,40	
VALH05							22,57	0,00	
VALH06	20,76	-0,60		20,43	-0,90		22,19	-0,20	
VALH07									
VALH08	30,54	4,90	BE	23,90	1,20		31,71	3,00	E
VALH09	21,79	0,00		20,94	-0,60		21,56	-0,40	
VALH10	21,15	-0,40		22,56	0,40		22,25	-0,20	
VALH12	19,85	-1,10		20,36	-0,90		18,99	-1,20	
VALH13	21,28	-0,30		20,96	-0,50		22,10	-0,20	
VALH14	21,74	0,00		21,70	-0,10		22,12	-0,20	
VALH15	23,37	0,90		23,30	0,90		24,72	0,70	
VALH16	21,93	0,10		25,55	2,20	CE	22,99	0,10	C
VALH17	19,76	-1,10		22,77	0,50		21,47	-0,40	
VALH18	18,73	-1,70		18,53	-2,00		19,23	-1,20	
VALH19	22,04	0,10		21,49	-0,20		22,44	-0,10	
VALH20	20,57	-0,70		20,17	-1,00		21,30	-0,50	
VALH21	21,50	-0,20		19,73	-1,30	C	21,57	-0,40	
VALH22	22,15	0,20	C	20,52	-0,80		26,13	1,20	C
VALH23	24,89	1,80		22,51	0,40		20,52	-0,70	
VALH24	24,13	1,30		20,83	-0,60		22,00	-0,20	
VALH27	20,38	-0,80		22,79	0,60		22,37	-0,10	
VALH28	25,42	2,00	E	26,43	2,70	E	29,34	2,20	E
VALH29	20,27	-0,90					20,32	-0,80	
VALH30	24,03	1,30		21,93	0,00		27,31	1,50	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	25			23			26		
No. labs with val.	25			23			26		
Mean	21,79			21,86			22,7		
Ref.-SD	1,77			1,67			2,98		
SR Reprod. SD	1,77			1,67			2,98		
Sr Repeat. SD	0,71			0,39			0,62		
RSD % VR	8,13%			7,63%			13,13%		
RSD % Vr	3,28%			1,77%			2,74%		
No. A outliers	0			0			0		
No. B outliers	1			0			0		
No. C outliers	1			2			2		
No. labs accept.	23			21			24		
No. values accept.	69			63			72		

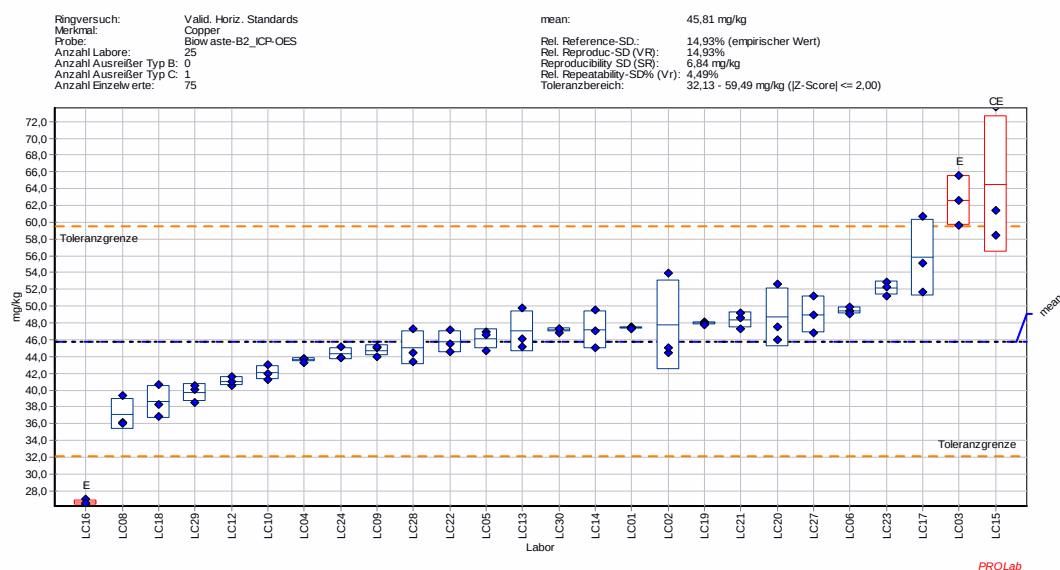
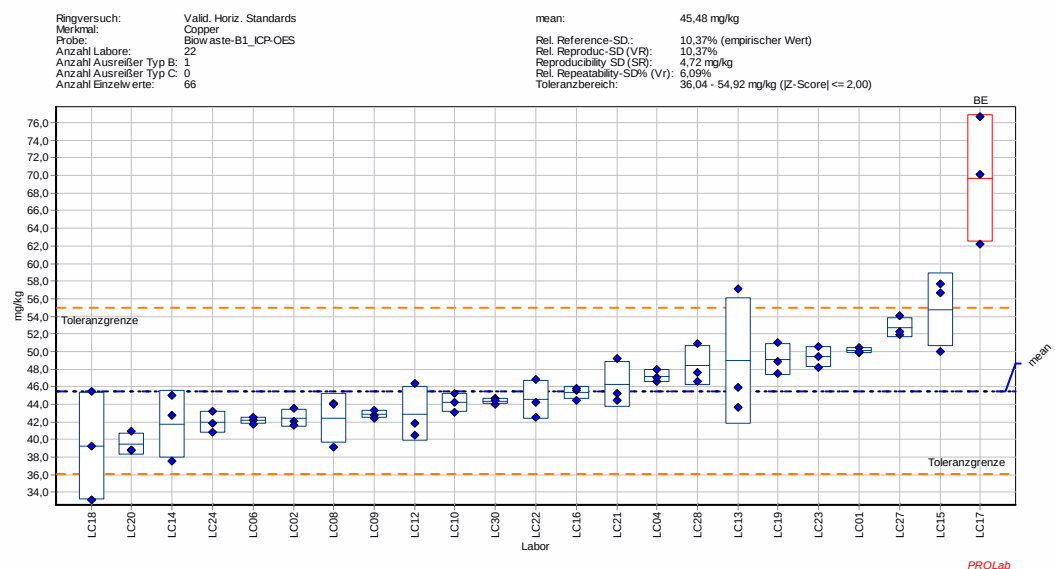
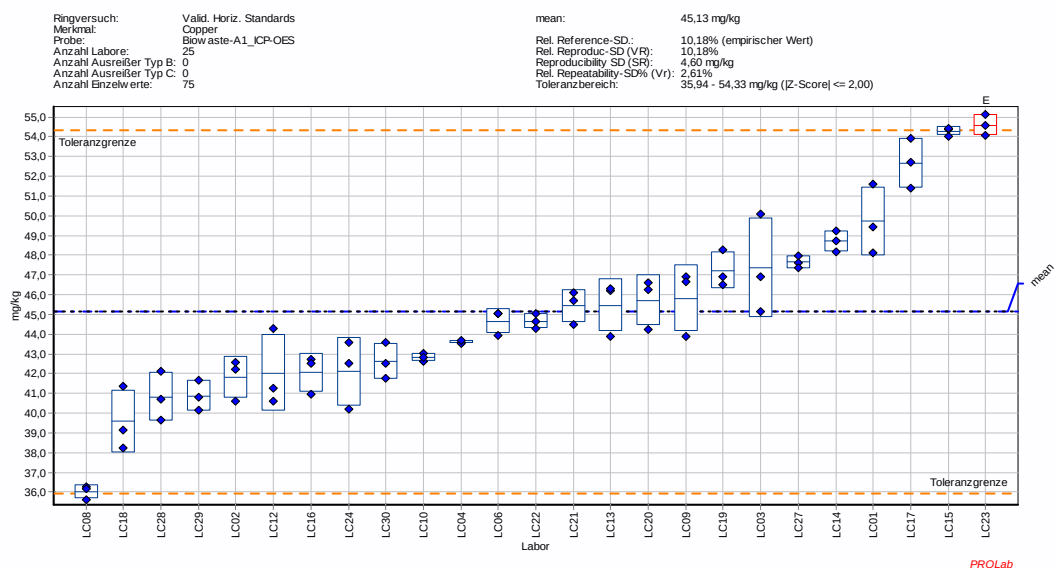
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.6.1 Biowaste, ICP-OES: Copper

ICP-OES: Copper	CO-A1_OS	Z-Score		CO-B1_OS	Z-Score		CO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	49,71	1,00		50,12	1,00		47,39	0,20	
VALH02	41,81	-0,70		42,40	-0,70		47,79	0,30	
VALH03	47,37	0,50					62,62	2,50	E
VALH04	43,61	-0,30		47,19	0,40		43,61	-0,30	
VALH05							46,07	0,00	
VALH06	44,66	-0,10		42,16	-0,70		49,46	0,50	
VALH07									
VALH08	36,02	-2,00		42,41	-0,70		37,15	-1,30	
VALH09	45,81	0,10		42,85	-0,60		44,72	-0,20	
VALH10	42,83	-0,50		44,22	-0,30		42,08	-0,50	
VALH12	42,04	-0,70		42,92	-0,50		41,05	-0,70	
VALH13	45,47	0,10		48,94	0,70		47,03	0,20	
VALH14	48,71	0,80		41,78	-0,80		47,20	0,20	
VALH15	54,28	2,00		54,76	2,00		64,54	2,70	CE
VALH16	42,05	-0,70		45,31	0,00		26,63	-2,80	E
VALH17	52,68	1,60		69,66	5,10	BE	55,83	1,50	
VALH18	39,58	-1,20		39,28	-1,30		38,58	-1,10	
VALH19	47,24	0,50		49,12	0,80		47,95	0,30	
VALH20	45,71	0,10		39,52	-1,30		48,69	0,40	
VALH21	45,43	0,10		46,27	0,20		48,37	0,40	
VALH22	44,66	-0,10		44,52	-0,20		45,72	0,00	
VALH23	54,59	2,10	E	49,42	0,80		52,13	0,90	
VALH24	42,10	-0,70		41,97	-0,70		44,33	-0,20	
VALH27	47,65	0,50		52,73	1,50		49,00	0,50	
VALH28	40,83	-0,90		48,39	0,60		45,02	-0,10	
VALH29	40,88	-0,90					39,71	-0,90	
VALH30	42,64	-0,50		44,33	-0,20		47,15	0,20	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	25			23			26		
No. labs with val.	25			23			26		
Mean	45,13			45,48			45,81		
SR Reprod. SD	4,60			4,72			6,84		
Sr Repeat. SD	1,18			2,77			2,06		
RSD % VR	10,18%			10,37%			14,93%		
RSD % Vr	2,61%			6,09%			4,49%		
No. A outliers	0			0			0		
No. B outliers	0			1			0		
No. C outliers	0			0			1		
No. labs accept.	25			22			25		
No. values accept.	75			66			75		

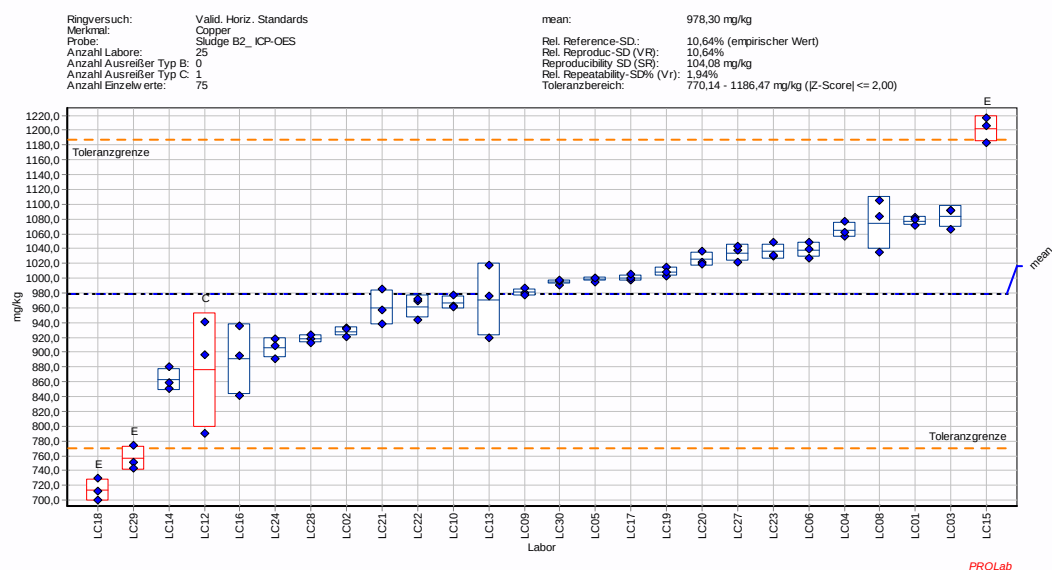
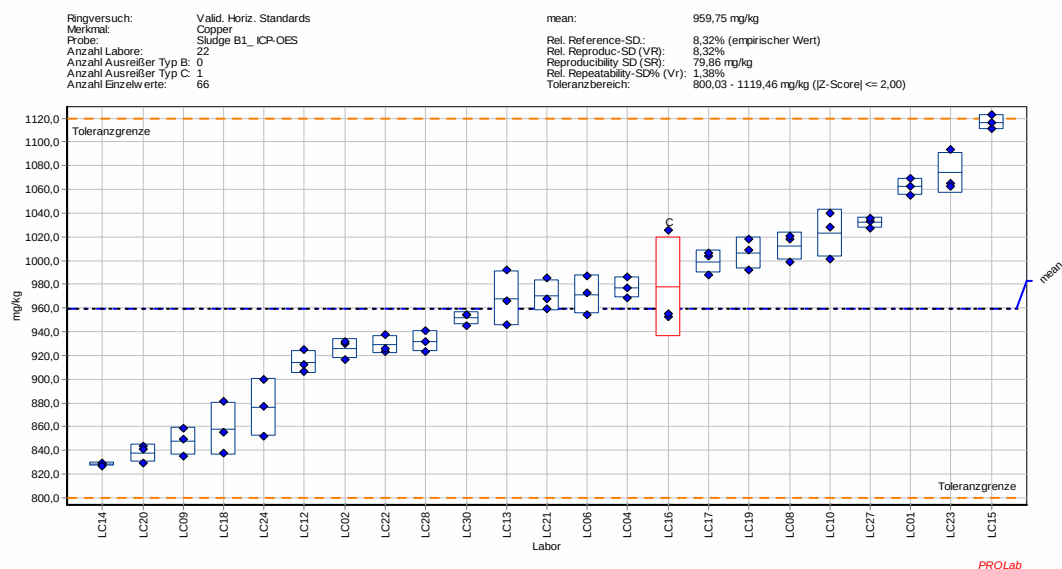
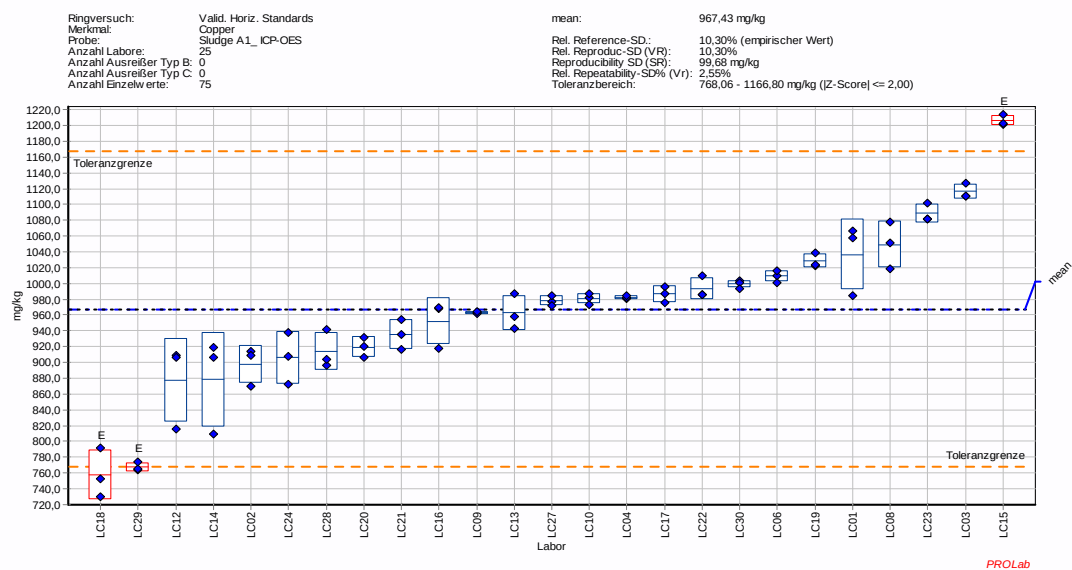
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.6.2 Sludge, ICP-OES: Copper

ICP-OES: Copper	SL-A1_OS	Z-Score		SL-B1_OS	Z-Score		SL-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	1036,27	0,70		1062,33	1,30		1077,33	1,00	
VALH02	897,33	-0,70		925,93	-0,40		928,23	-0,50	
VALH03	1116,33	1,50					1083,00	1,00	
VALH04	982,33	0,10		977,10	0,20		1065,33	0,80	
VALH05							998,53	0,20	
VALH06	1009,16	0,40		971,47	0,10		1038,36	0,60	
VALH07									
VALH08	1049,39	0,80		1012,31	0,70		1074,58	0,90	
VALH09	962,67	0,00		848,03	-1,40		981,13	0,00	
VALH10	980,79	0,10		1023,15	0,80		967,12	-0,10	
VALH12	877,27	-0,90		914,37	-0,60		875,83	-1,00	C
VALH13	962,83	0,00		967,87	0,10		970,80	-0,10	
VALH14	878,27	-0,90		828,23	-1,60		863,13	-1,10	
VALH15	1206,33	2,40	E	1116,67	2,00		1202,00	2,10	E
VALH16	951,95	-0,20		977,85	0,20	C	890,77	-0,80	
VALH17	986,50	0,20		999,23	0,50		1000,73	0,20	
VALH18	757,70	-2,10	E	857,97	-1,30		713,93	-2,50	E
VALH19	1028,67	0,60		1006,23	0,60		1008,67	0,30	
VALH20	919,53	-0,50		837,90	-1,50		1026,00	0,50	
VALH21	935,33	-0,30		970,67	0,10		960,00	-0,20	
VALH22	993,93	0,30		929,13	-0,40		961,70	-0,20	
VALH23	1088,67	1,20		1074,00	1,40		1036,33	0,60	
VALH24	906,00	-0,60		876,33	-1,00		906,00	-0,70	
VALH27	977,83	0,10		1032,00	0,90		1034,33	0,50	
VALH28	913,98	-0,50		932,06	-0,30		918,28	-0,60	
VALH29	767,30	-2,00	E				756,63	-2,10	E
VALH30	999,30	0,30		951,50	-0,10		994,67	0,20	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	25			23			26		
No. labs with val.	25			23			26		
Mean	967,43			959,75			978,3		
SR Reprod. SD	99,68			79,86			104,08		
Sr Repeat. SD	24,67			13,25			18,96		
RSD % VR	10,30%			8,32%			10,64%		
RSD % Vr	2,55%			1,38%			1,94%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	0			1			1		
No. labs accept.	25			22			25		
No. values accept.	75			66			75		

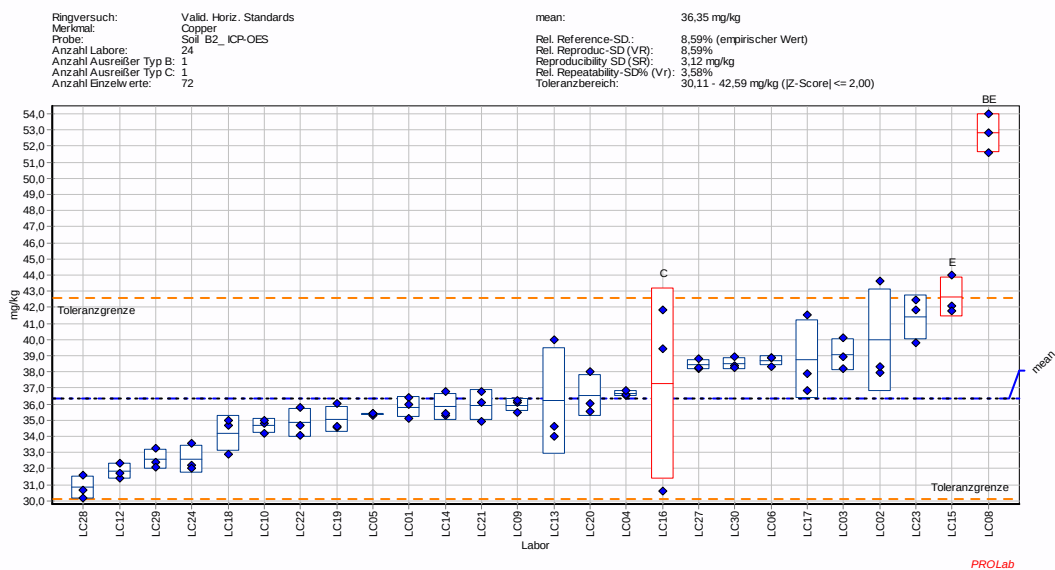
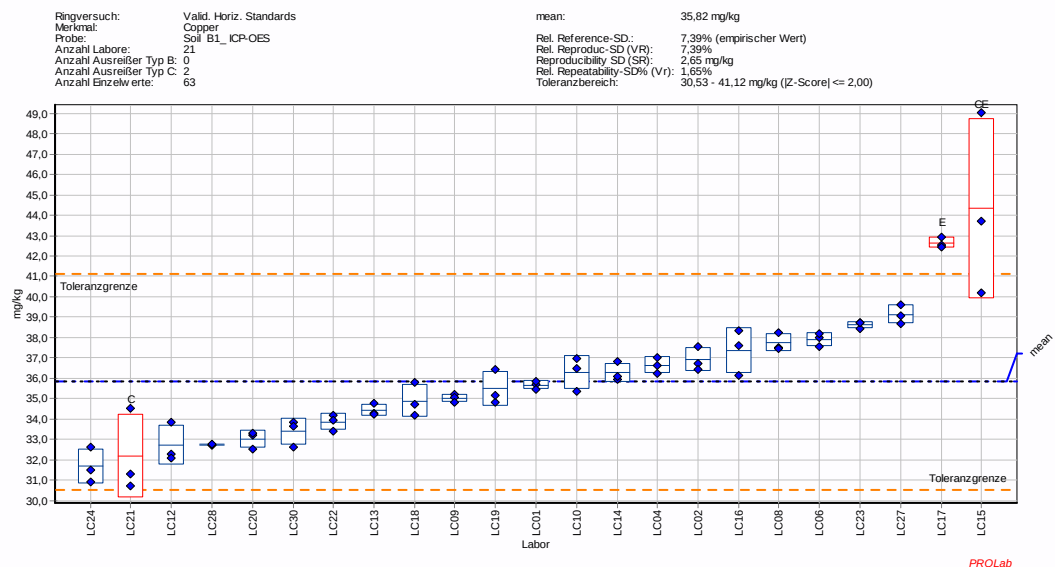
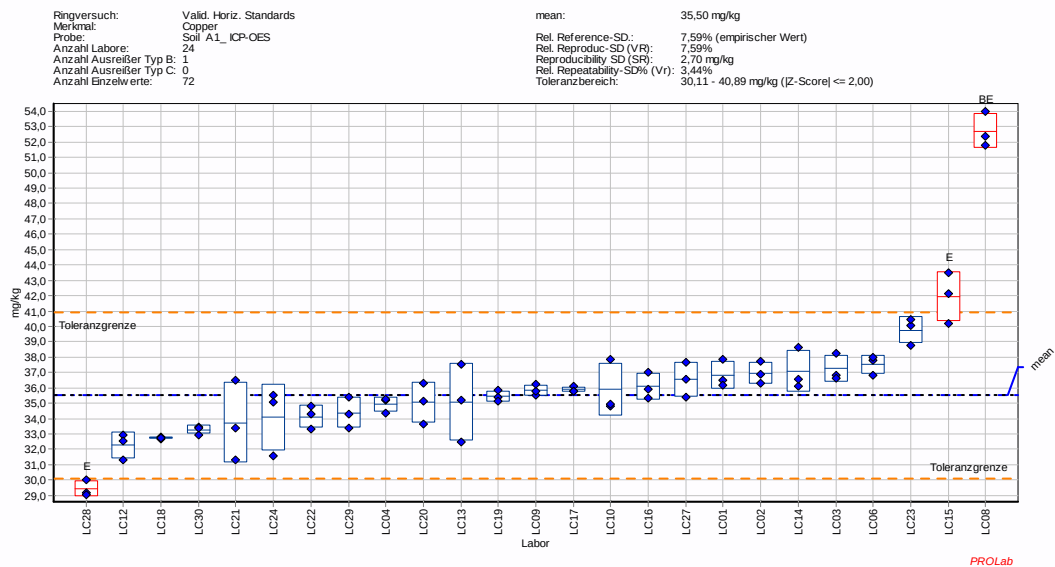
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.6.3 Soil, ICP-OES: Copper

ICP-OES: Copper	SO-A1_OS	Z-Score		SO-B1_OS	Z-Score		SO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	36,84	0,50		35,67	-0,10		35,82	-0,20	
VALH02	36,97	0,50		36,91	0,40		39,97	1,20	
VALH03	37,24	0,60					39,07	0,90	
VALH04	34,92	-0,20		36,63	0,30		36,66	0,10	
VALH05							35,39	-0,30	
VALH06	37,52	0,70		37,90	0,80		38,69	0,70	
VALH07									
VALH08	52,72	6,40	BE	37,74	0,70		52,81	5,30	BE
VALH09	35,84	0,10		35,02	-0,30		35,94	-0,10	
VALH10	35,89	0,10		36,27	0,20		34,66	-0,50	
VALH12	32,26	-1,20		32,72	-1,20		31,83	-1,40	
VALH13	35,06	-0,20		34,43	-0,50		36,22	0,00	
VALH14	37,10	0,60		36,27	0,20		35,84	-0,20	
VALH15	41,94	2,40	E	44,32	3,20	CE	42,62	2,00	E
VALH16	36,08	0,20		37,36	0,60		37,29	0,30	C
VALH17	35,88	0,10		42,64	2,60	E	38,77	0,80	
VALH18	32,74	-1,00		34,88	-0,40		34,18	-0,70	
VALH19	35,46	0,00		35,48	-0,10		35,06	-0,40	
VALH20	35,04	-0,20		33,01	-1,10		36,52	0,10	
VALH21	33,73	-0,70		32,17	-1,40	C	35,93	-0,10	
VALH22	34,12	-0,50		33,85	-0,70		34,85	-0,50	
VALH23	39,77	1,60		38,62	1,10		41,38	1,60	
VALH24	34,07	-0,50		31,67	-1,60		32,60	-1,20	
VALH27	36,53	0,40		39,13	1,20		38,43	0,70	
VALH28	29,42	-2,30	E	32,73	-1,20		30,82	-1,80	
VALH29	34,38	-0,40					32,59	-1,20	
VALH30	33,27	-0,80		33,38	-0,90		38,53	0,70	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	25			23			26		
No. labs with val.	25			23			26		
Mean	35,5			35,82			36,35		
SR Reprod. SD	2,7			2,65			3,12		
Sr Repeat. SD	1,22			0,59			1,3		
RSD % VR	7,59%			7,39%			8,59%		
RSD % Vr	3,44%			1,65%			3,58%		
No. A outliers	0			0			0		
No. B outliers	1			0			1		
No. C outliers	0			2			1		
No. labs accept.	24			21			24		
No. values accept.	72			63			72		

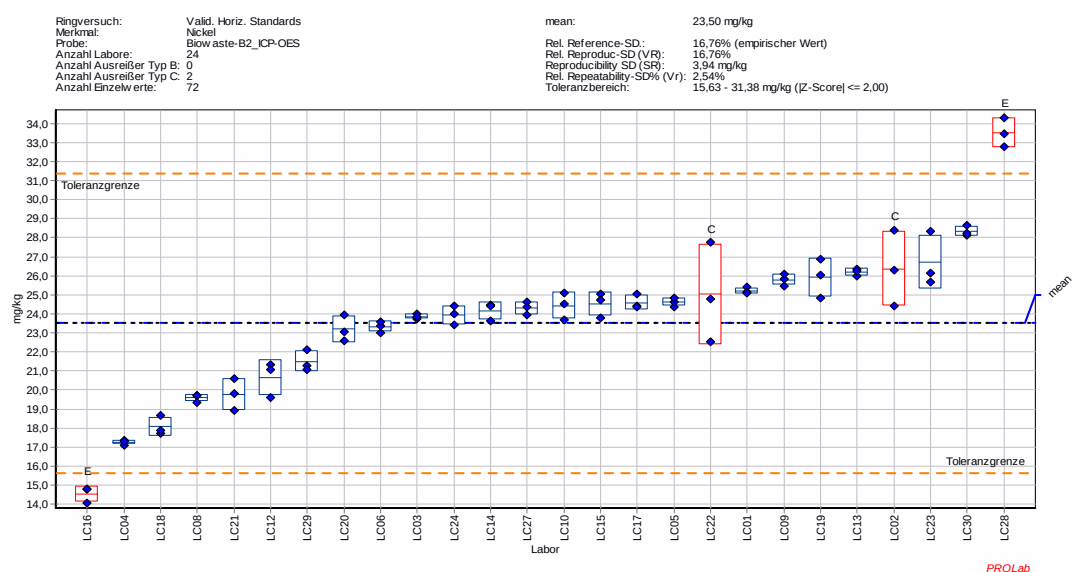
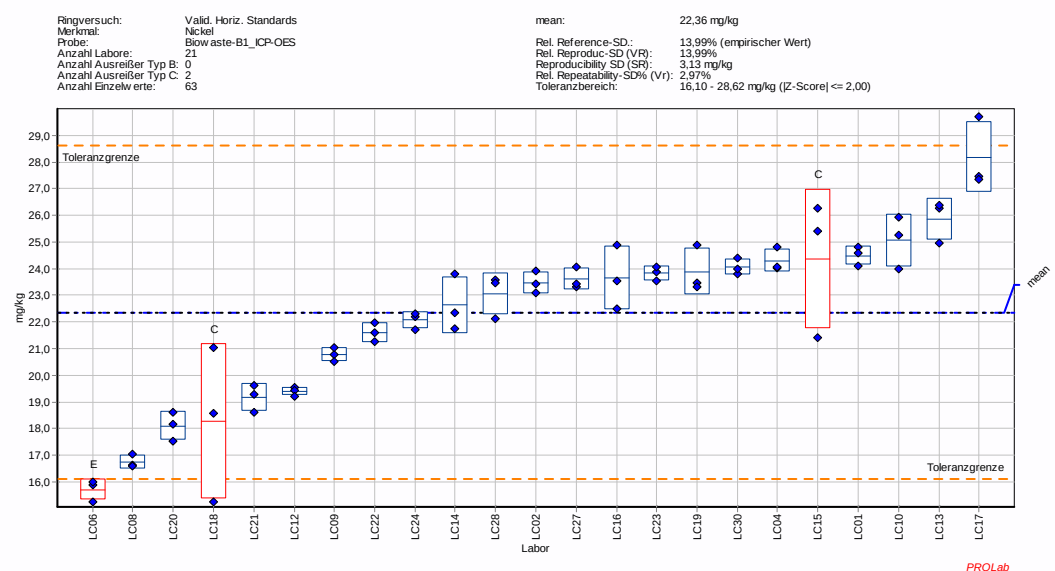
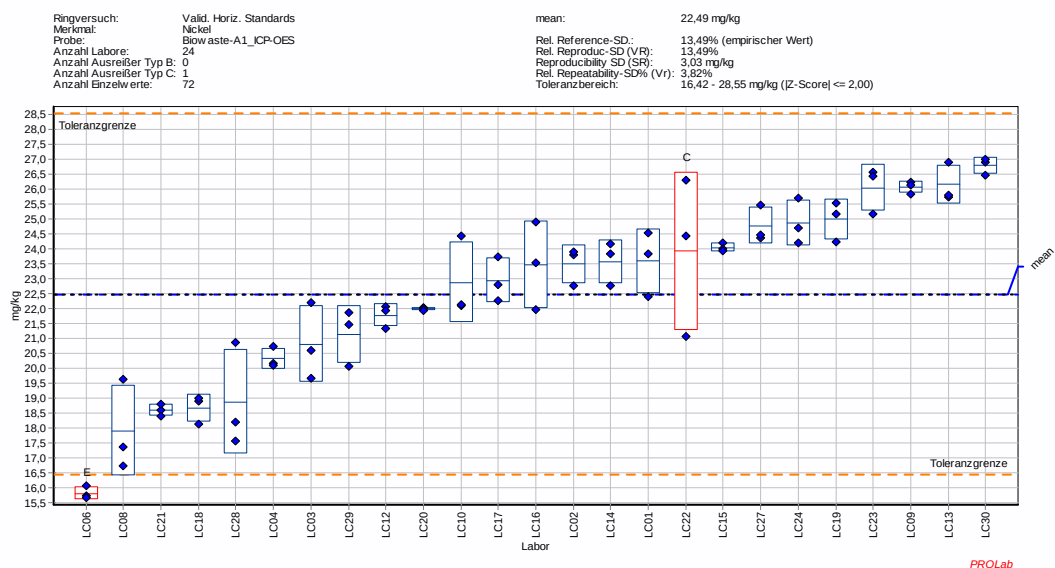
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.7.1 Biowaste, ICP-OES: Nickel

ICP-OES: Nickel	CO-A1_OS	Z-Score		CO-B1_OS	Z-Score		CO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	23,59	0,40		24,49	0,70		25,20	0,40	
VALH02	23,49	0,30		23,47	0,40		26,38	0,70	C
VALH03	20,82	-0,60					23,86	0,10	
VALH04	20,33	-0,70		24,30	0,60		17,25	-1,60	
VALH05							24,61	0,30	
VALH06	15,81	-2,20	E	15,70	-2,10	E	23,32	0,00	
VALH07									
VALH08	17,92	-1,50		16,76	-1,80		19,59	-1,00	
VALH09	26,07	1,20		20,77	-0,50		25,80	0,60	
VALH10	22,89	0,10		25,06	0,90		24,44	0,20	
VALH12	21,79	-0,20		19,39	-0,90		20,66	-0,70	
VALH13	26,16	1,20		25,86	1,10		26,20	0,70	
VALH14	23,59	0,40		22,63	0,10		24,17	0,20	
VALH15	24,05	0,50		24,36	0,60	C	24,51	0,30	
VALH16	23,47	0,30		23,65	0,40		14,55	-2,30	E
VALH17	22,95	0,20		28,17	1,90		24,60	0,30	
VALH18	18,67	-1,30		18,29	-1,30	C	18,08	-1,40	
VALH19	24,99	0,80		23,88	0,50		25,93	0,60	
VALH20	21,99	-0,20		18,10	-1,40		23,19	-0,10	
VALH21	18,60	-1,30		19,17	-1,00		19,77	-0,90	
VALH22	23,93	0,50	C	21,60	-0,20		25,03	0,40	C
VALH23	26,06	1,20		23,82	0,50		26,72	0,80	
VALH24	24,87	0,80		22,07	-0,10		23,93	0,10	
VALH27	24,79	0,80		23,61	0,40		24,31	0,20	
VALH28	18,88	-1,20		23,05	0,20		33,51	2,50	E
VALH29	21,14	-0,40					21,50	-0,50	
VALH30	26,80	1,40		24,06	0,50		28,34	1,20	
–	–	–	–	–	–	–	–	–	–
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	25			23			26		
No. labs with val.	25			23			26		
Mean	22,49			22,36			23,5		
SR Reprod. SD	3,03			3,13			3,94		
Sr Repeat. SD	0,86			0,66			0,6		
RSD % VR	13,49%			13,99%			16,76%		
RSD % Vr	3,82%			2,97%			2,54%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			2			2		
No. labs accept.	24			21			24		
No. values accept.	72			63			72		

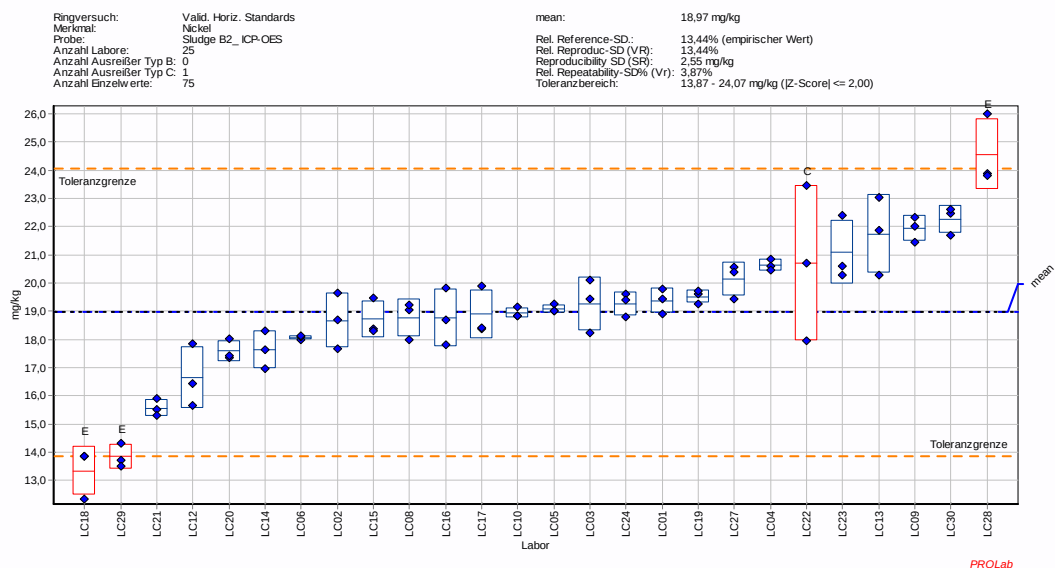
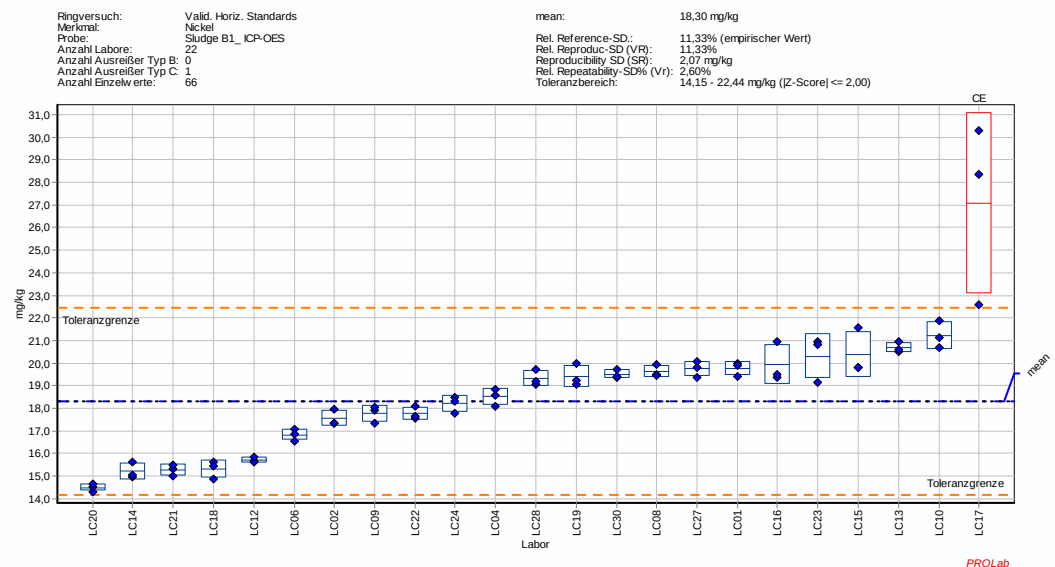
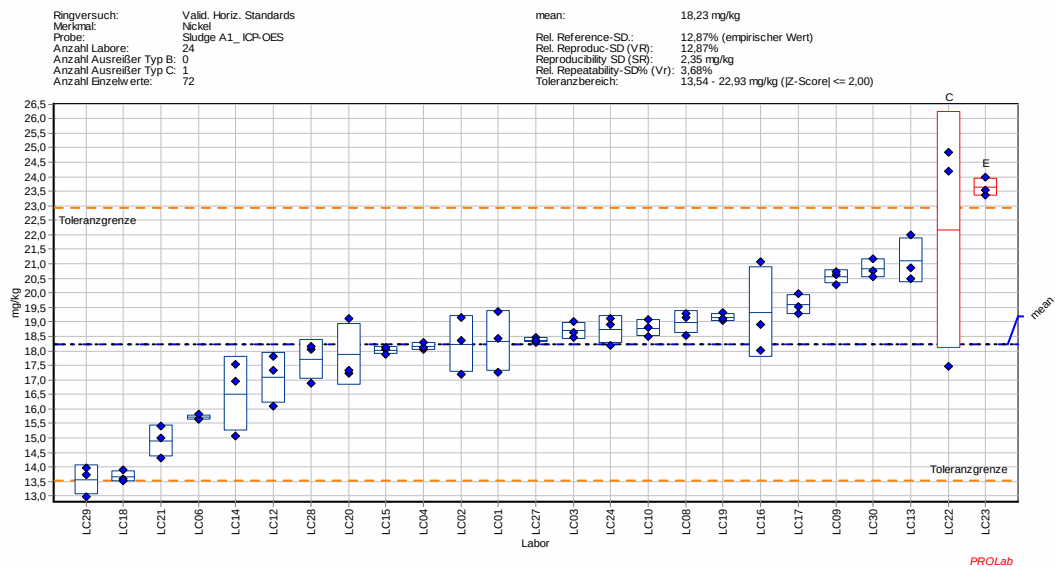
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.7.2 Sludge, ICP-OES: Nickel

ICP-OES: Nickel	SL-A1_OS	Z-Score		SL-B1_OS	Z-Score		SL-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	18,34	0,00		19,77	0,70		19,38	0,20	
VALH02	18,23	0,00		17,55	-0,40		18,67	-0,10	
VALH03	18,70	0,20					19,25	0,10	
VALH04	18,16	0,00		18,51	0,10		20,64	0,70	
VALH05							19,09	0,00	
VALH06	15,71	-1,10		16,83	-0,70		18,07	-0,40	
VALH07									
VALH08	19,00	0,30		19,63	0,60		18,76	-0,10	
VALH09	20,55	1,00		17,76	-0,30		21,93	1,20	
VALH10	18,79	0,20		21,22	1,40		18,94	0,00	
VALH12	17,08	-0,50		15,71	-1,20		16,64	-0,90	
VALH13	21,12	1,20		20,68	1,10		21,74	1,10	
VALH14	16,52	-0,70		15,21	-1,50		17,63	-0,50	
VALH15	18,01	-0,10		20,38	1,00		18,71	-0,10	
VALH16	19,33	0,50		19,93	0,80		18,77	-0,10	
VALH17	19,60	0,60		27,08	4,20	CE	18,90	0,00	
VALH18	13,68	-1,90		15,31	-1,40		13,34	-2,20	E
VALH19	19,16	0,40		19,42	0,50		19,52	0,20	
VALH20	17,89	-0,10		14,50	-1,80		17,59	-0,50	
VALH21	14,90	-1,40		15,27	-1,50		15,57	-1,30	
VALH22	22,17	1,70	C	17,77	-0,30		20,70	0,70	C
VALH23	23,63	2,30	E	20,31	1,00		21,09	0,80	
VALH24	18,73	0,20		18,20	0,00		19,27	0,10	
VALH27	18,37	0,10		19,75	0,70		20,13	0,50	
VALH28	17,71	-0,20		19,32	0,50		24,56	2,20	E
VALH29	13,56	-2,00					13,84	-2,00	E
VALH30	20,84	1,10		19,50	0,60		22,25	1,30	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	25			23			26		
No. labs with val.	25			23			26		
Mean	18,23			18,3			18,97		
SR Reprod. SD	2,35			2,07			2,55		
Sr Repeat. SD	0,67			0,48			0,73		
RSD % VR	12,87%			11,33%			13,44%		
RSD % Vr	3,68%			2,60%			3,87%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			1			1		
No. labs accept.	24			22			25		
No. values accept.	72			66			75		

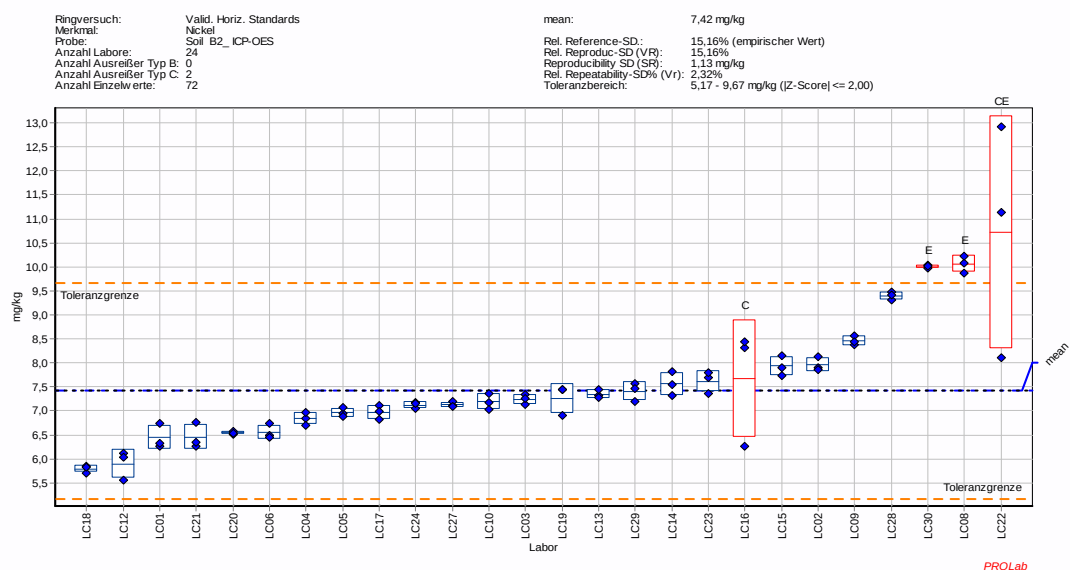
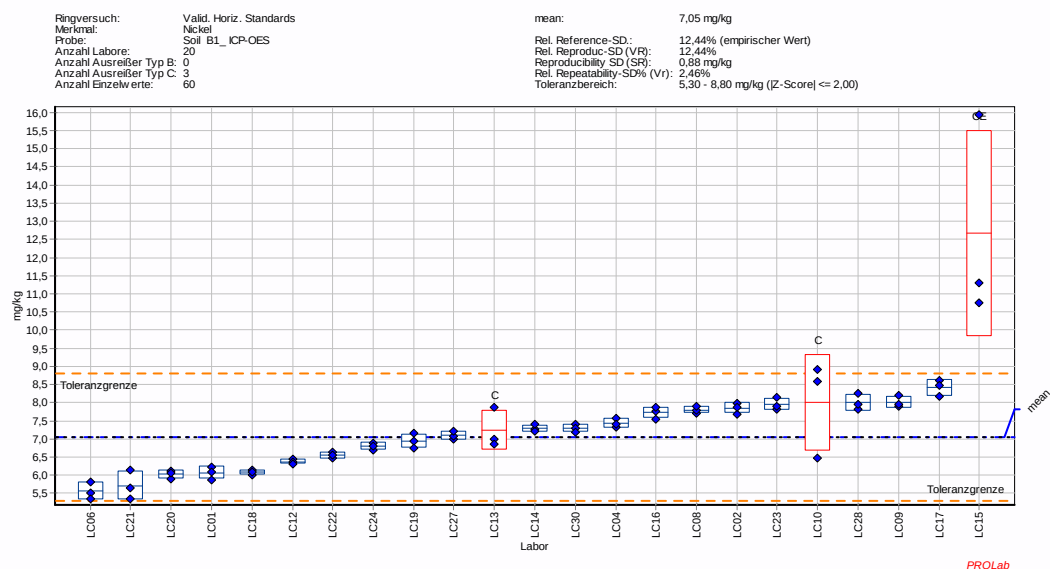
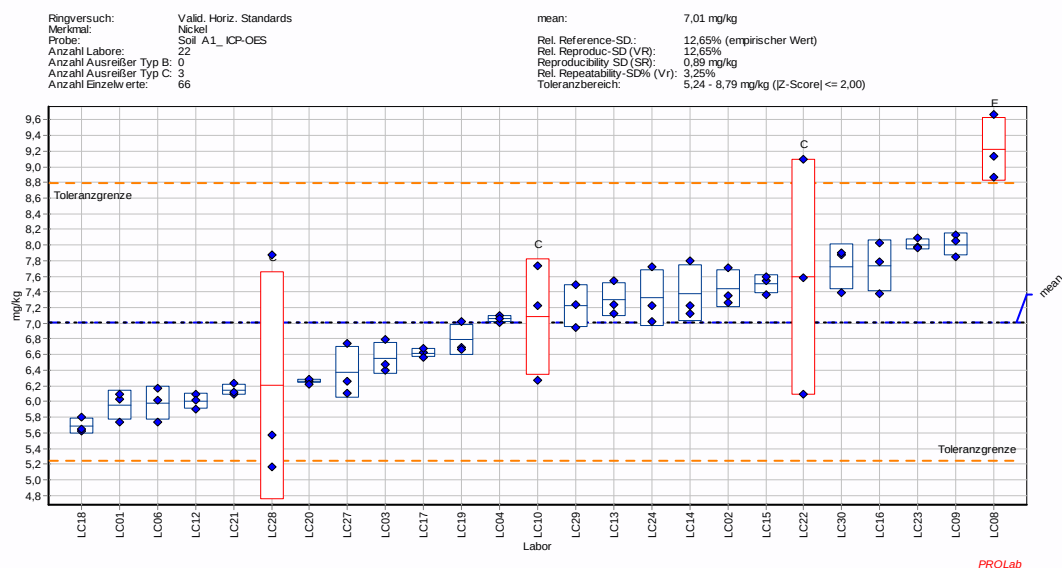
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.7.3 Soil, ICP-OES: Nickel

ICP-OES: Nickel	SO-A1_OS	Z-Score		SO-B1_OS	Z-Score		SO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	5,95	-1,20		6,06	-1,10		6,45	-0,90	
VALH02	7,44	0,50		7,85	0,90		7,97	0,50	
VALH03	6,55	-0,50					7,24	-0,20	
VALH04	7,05	0,00		7,43	0,40		6,84	-0,50	
VALH05							6,96	-0,40	
VALH06	5,98	-1,20		5,56	-1,70		6,55	-0,80	
VALH07									
VALH08	9,23	2,50	E	7,80	0,90		10,06	2,30	E
VALH09	8,01	1,10		8,02	1,10		8,46	0,90	
VALH10	7,08	0,10	C	8,00	1,10	C	7,19	-0,20	
VALH12	6,01	-1,10		6,37	-0,80		5,89	-1,40	
VALH13	7,30	0,30		7,24	0,20	C	7,35	-0,10	
VALH14	7,38	0,40		7,29	0,30		7,56	0,10	
VALH15	7,50	0,60		12,66	6,40	CE	7,93	0,50	
VALH16	7,73	0,80		7,73	0,80		7,67	0,20	C
VALH17	6,62	-0,40		8,42	1,60		6,97	-0,40	
VALH18	5,69	-1,50		6,08	-1,10		5,79	-1,40	
VALH19	6,79	-0,20		6,95	-0,10		7,26	-0,10	
VALH20	6,26	-0,90		6,02	-1,20		6,54	-0,80	
VALH21	6,15	-1,00		5,71	-1,50		6,46	-0,90	
VALH22	7,59	0,70	C	6,55	-0,60		10,72	2,90	CE
VALH23	8,01	1,10		7,95	1,00		7,62	0,20	
VALH24	7,32	0,30		6,79	-0,30		7,12	-0,30	
VALH27	6,37	-0,70		7,10	0,10		7,13	-0,30	
VALH28	6,20	-0,90	C	8,00	1,10		9,40	1,80	
VALH29	7,22	0,20					7,41	0,00	
VALH30	7,72	0,80		7,31	0,30		10,00	2,30	E
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	25			23			26		
No. labs with val.	25			23			26		
Mean	7,01			7,05			7,42		
SR Reprod. SD	0,89			0,88			1,13		
Sr Repeat. SD	0,23			0,17			0,17		
RSD % VR	12,65%			12,44%			15,16%		
RSD % Vr	3,25%			2,46%			2,32%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	3			3			2		
No. labs accept.	22			20			24		
No. values accept.	66			60			72		

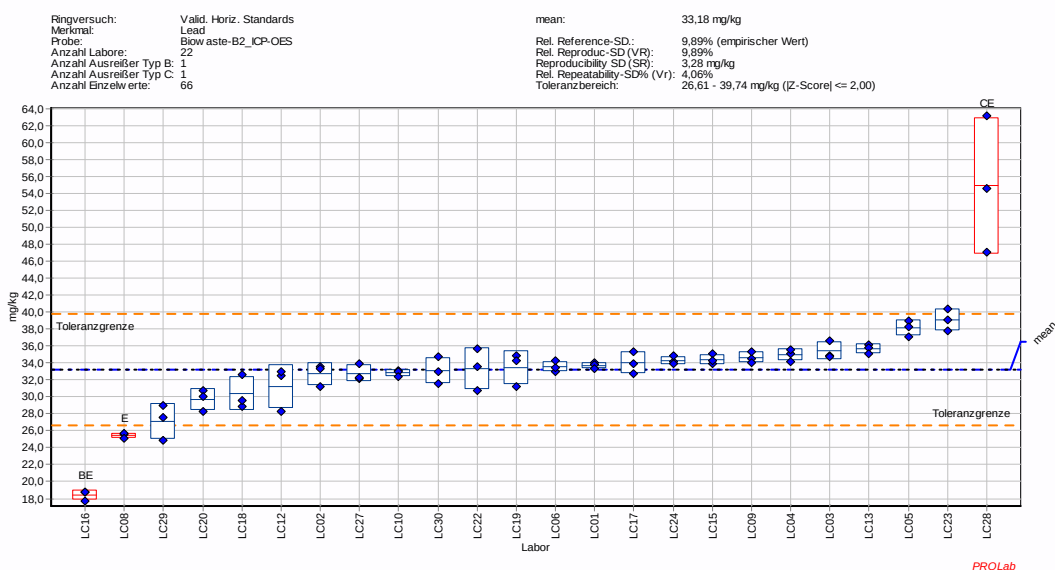
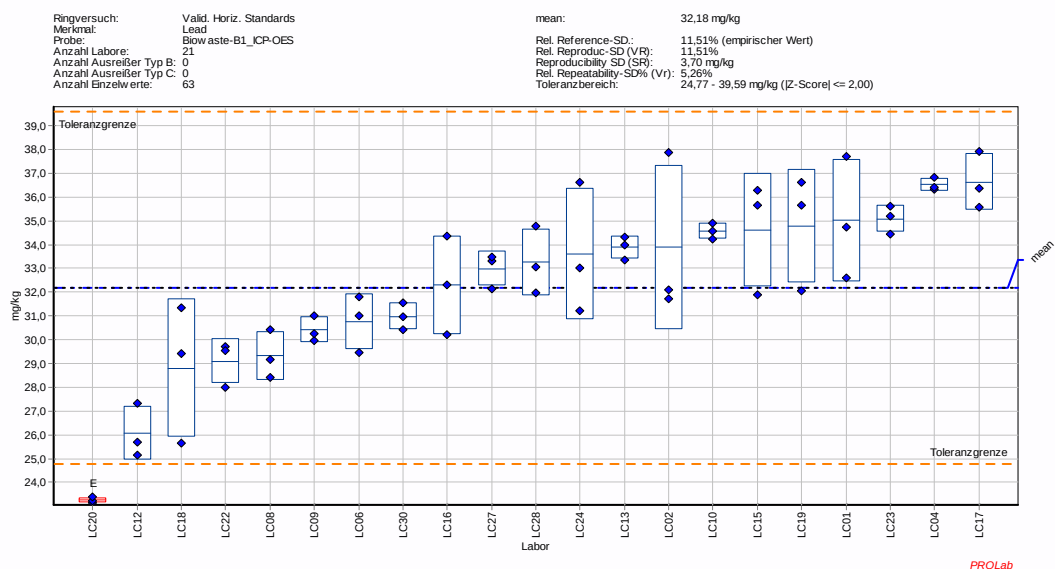
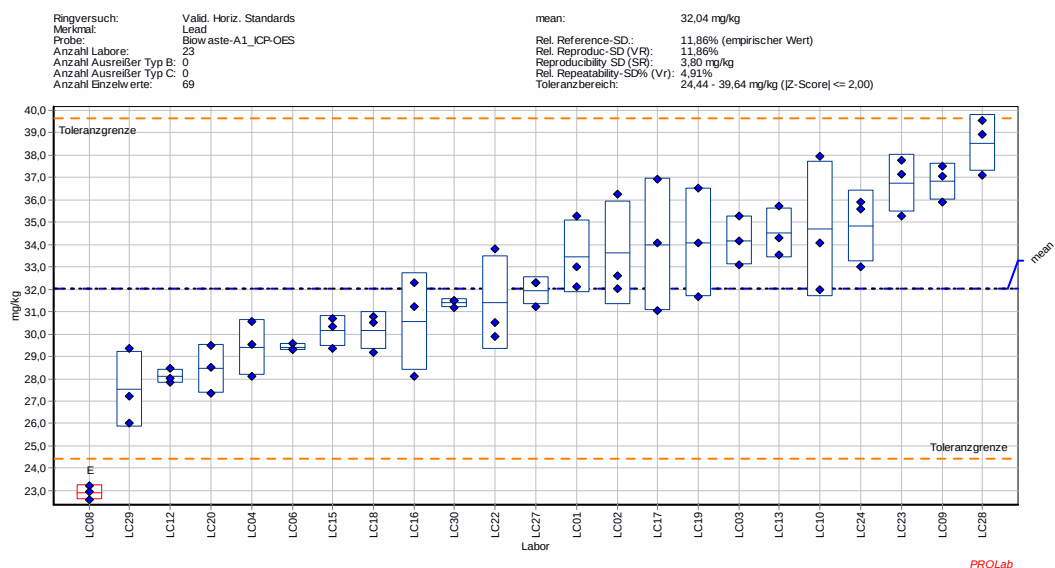
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.8.1 Biowaste, ICP-OES: Lead

ICP-OES: Lead	CO-A1_OS	Z-Score		CO-B1_OS	Z-Score		CO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	33,47	0,40		35,01	0,80		33,69	0,20	
VALH02	33,64	0,40		33,89	0,50		32,71	-0,10	
VALH03	34,19	0,60					35,40	0,70	
VALH04	29,40	-0,70		36,53	1,20		34,95	0,50	
VALH05							38,12	1,50	
VALH06	29,42	-0,70		30,76	-0,40		33,57	0,10	
VALH07									
VALH08	22,93	-2,40	E	29,32	-0,80		25,43	-2,40	E
VALH09	36,83	1,30		30,41	-0,50		34,64	0,40	
VALH10	34,69	0,70		34,56	0,60		32,81	-0,10	
VALH12	28,11	-1,00		26,06	-1,70		31,24	-0,60	
VALH13	34,53	0,70		33,89	0,50		35,68	0,80	
VALH14									
VALH15	30,14	-0,50		34,60	0,70		34,38	0,40	
VALH16	30,56	-0,40		32,29	0,00		18,40	-4,50	BE
VALH17	34,01	0,50		36,63	1,20		34,01	0,30	
VALH18	30,16	-0,50		28,80	-0,90		30,37	-0,90	
VALH19	34,09	0,50		34,77	0,70		33,43	0,10	
VALH20	28,45	-0,90		23,25	-2,40	E	29,72	-1,10	
VALH21									
VALH22	31,40	-0,20		29,09	-0,80		33,32	0,00	
VALH23	36,75	1,20		35,09	0,80		39,11	1,80	
VALH24	34,83	0,70		33,60	0,40		34,30	0,30	
VALH27	31,94	0,00		32,99	0,20		32,80	-0,10	
VALH28	38,55	1,70		33,27	0,30		54,91	6,60	CE
VALH29	27,55	-1,20					27,13	-1,80	
VALH30	31,39	-0,20		30,98	-0,30		33,10	0,00	
–	–	–	–	–	–	–	–	–	–
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	23			21			24		
No. labs with val.	23			21			24		
Mean	32,04			32,18			33,18		
SR Reprod. SD	3,8			3,7			3,28		
Sr Repeat. SD	1,57			1,69			1,35		
RSD % VR	11,86%			11,51%			9,89%		
RSD % Vr	4,91%			5,26%			4,06%		
No. A outliers	0			0			0		
No. B outliers	0			0			1		
No. C outliers	0			0			1		
No. labs accept.	23			21			22		
No. values accept.	69			63			66		

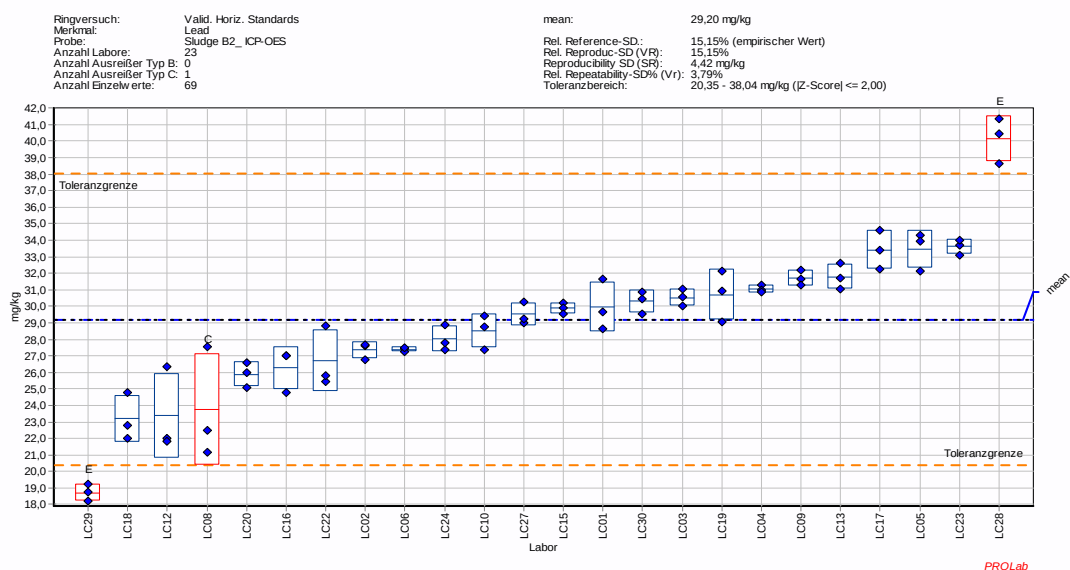
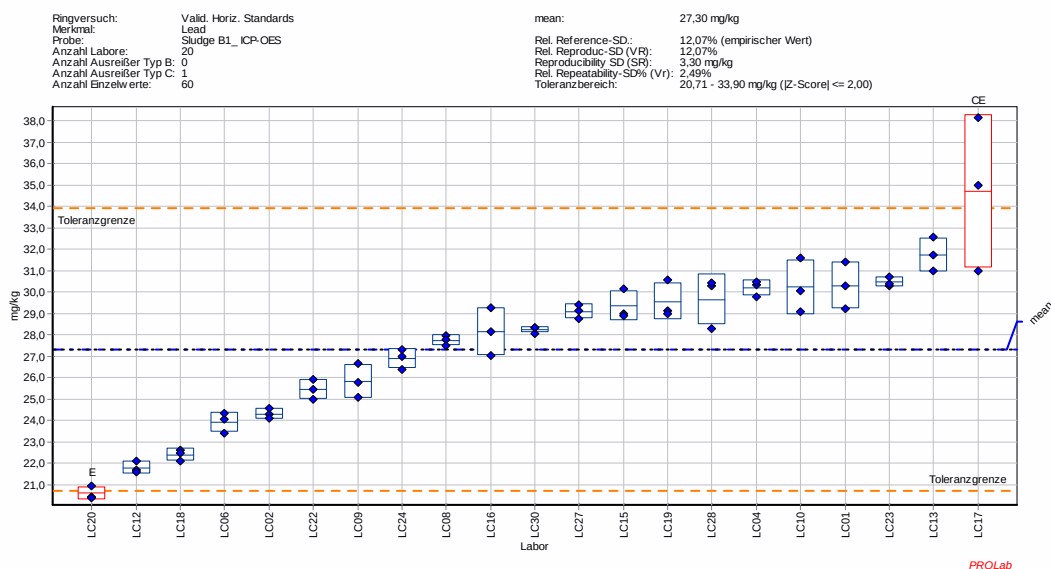
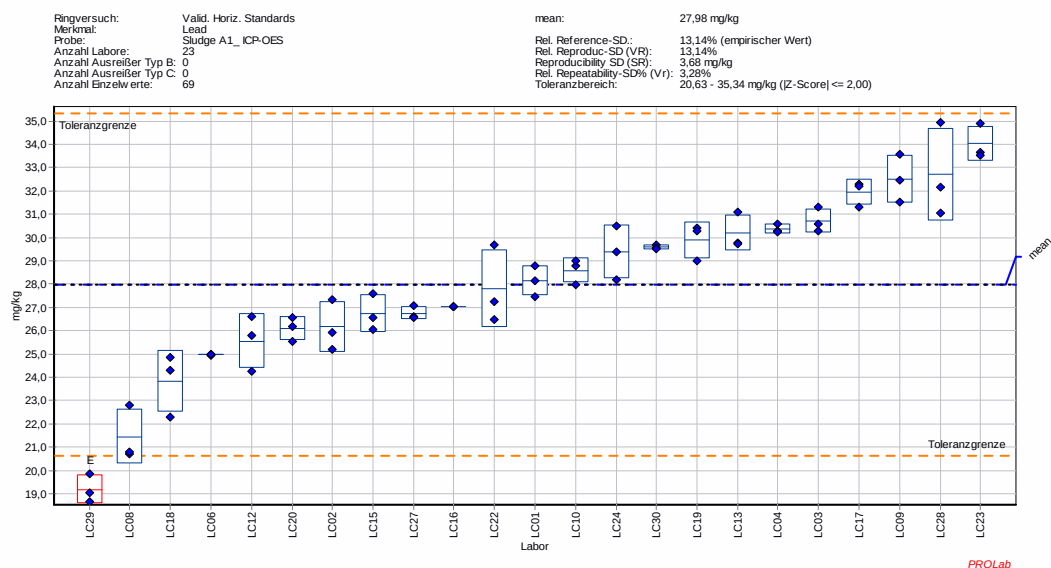
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.8.2 Sludge, ICP-OES: Lead

ICP-OES: Lead	SL-A1_OS	Z-Score		SL-B1_OS	Z-Score		SL-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	28,14	0,00		30,31	0,90		29,98	0,20	
VALH02	26,17	-0,50		24,32	-0,90		27,35	-0,40	
VALH03	30,72	0,70					30,53	0,30	
VALH04	30,37	0,60		30,21	0,90		31,04	0,40	
VALH05							33,46	1,00	
VALH06	24,97	-0,80		23,94	-1,00		27,39	-0,40	
VALH07									
VALH08	21,44	-1,80		27,75	0,10		23,74	-1,20	C
VALH09	32,51	1,20		25,85	-0,40		31,70	0,60	
VALH10	28,59	0,20		30,23	0,90		28,52	-0,20	
VALH12	25,55	-0,70		21,80	-1,70		23,38	-1,30	
VALH13	30,19	0,60		31,75	1,30		31,79	0,60	
VALH14									
VALH15	26,73	-0,30		29,34	0,60		29,88	0,20	
VALH16	27,03	-0,30		28,15	0,30		26,28	-0,70	
VALH17	31,94	1,10		34,70	2,20	CE	33,42	1,00	
VALH18	23,82	-1,10		22,41	-1,50		23,20	-1,40	
VALH19	29,89	0,50		29,57	0,70		30,70	0,30	
VALH20	26,08	-0,50		20,61	-2,00	E	25,88	-0,80	
VALH21									
VALH22	27,79	-0,10		25,46	-0,60		26,69	-0,60	
VALH23	34,03	1,60		30,46	1,00		33,61	1,00	
VALH24	29,37	0,40		26,90	-0,10		28,03	-0,30	
VALH27	26,74	-0,30		29,10	0,50		29,52	0,10	
VALH28	32,71	1,30		29,66	0,70		40,16	2,50	E
VALH29	19,18	-2,40	E				18,72	-2,40	E
VALH30	29,59	0,40		28,24	0,30		30,30	0,30	
	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	23			21			24		
No. labs with val.	23			21			24		
Mean	27,98			27,3			29,2		
SR Reprod. SD	3,68			3,30			4,42		
Sr Repeat. SD	0,92			0,68			1,11		
RSD % VR	13,14%			12,07%			15,15%		
RSD % Vr	3,28%			2,49%			3,79%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	0			1			1		
No. labs accept.	23			20			23		
No. values accept.	69			60			69		

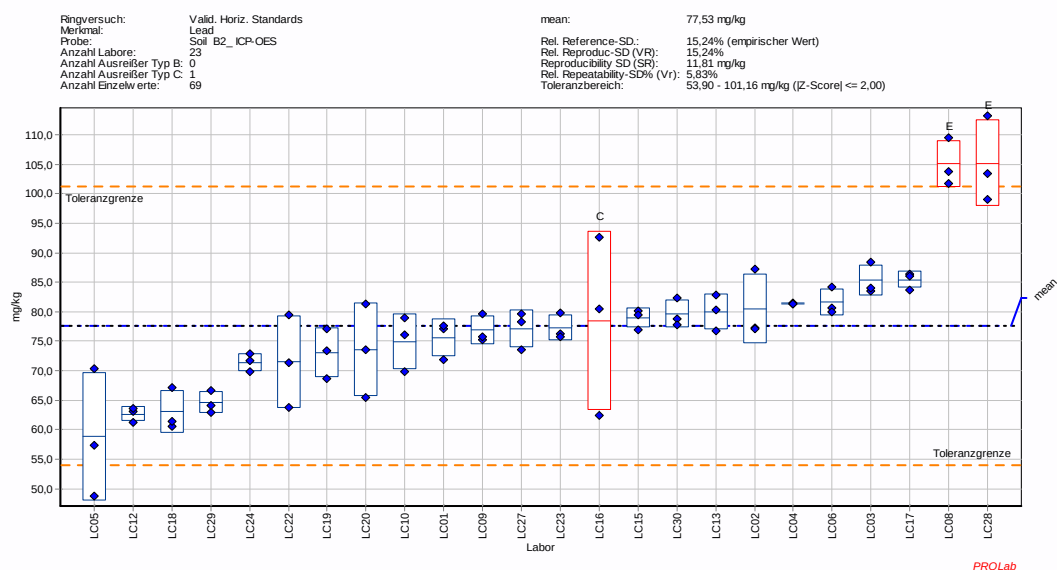
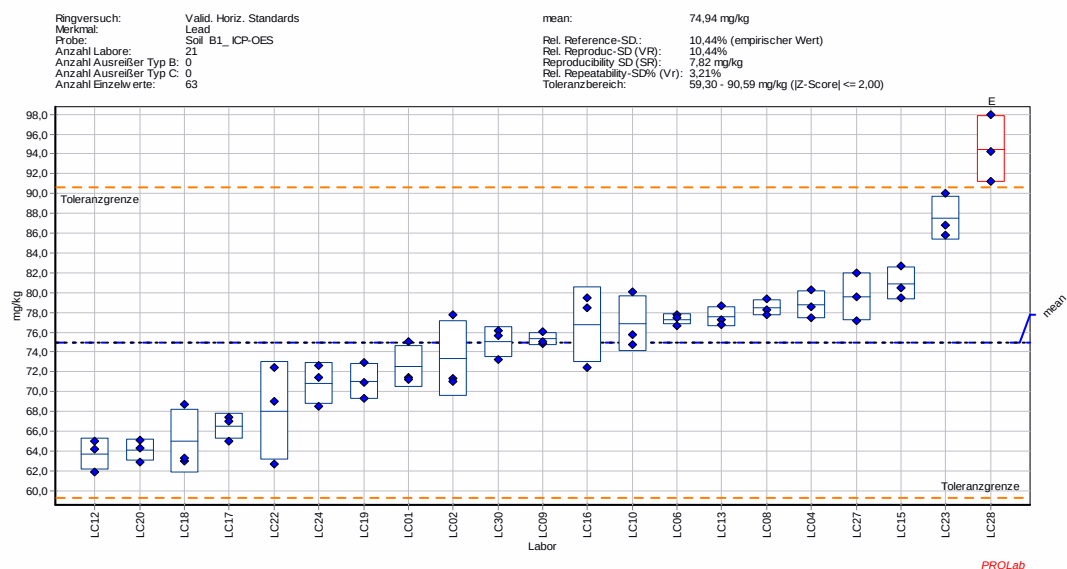
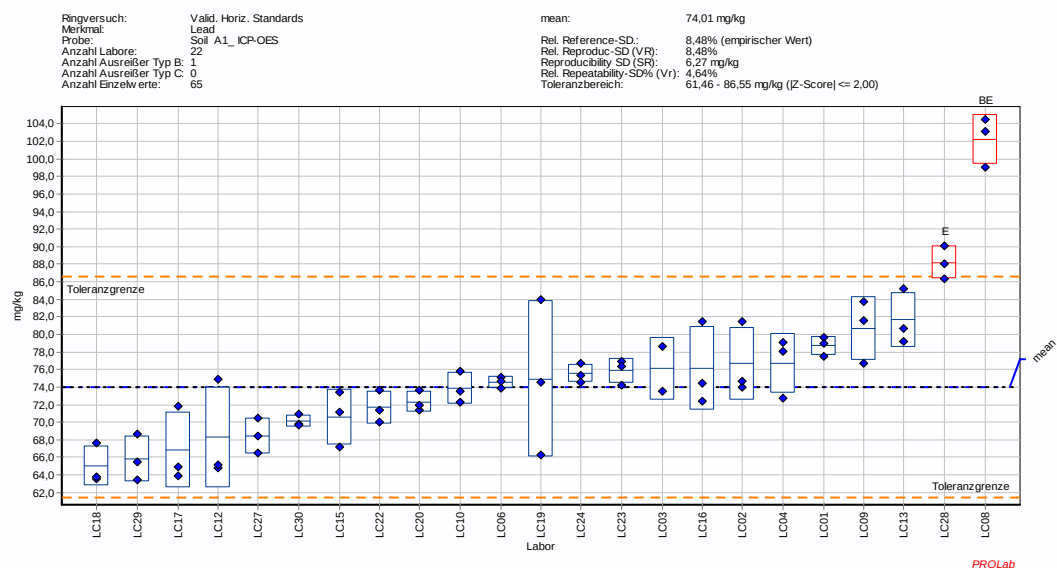
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.8.3 Soil, ICP-OES: Lead

ICP-OES: Lead	SO-A1_OS	Z-Score		SO-B1_OS	Z-Score		SO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	78,72	0,80		72,55	-0,30		75,54	-0,20	
VALH02	76,67	0,40		73,38	-0,20		80,51	0,30	
VALH03	76,10	0,30					85,29	0,70	
VALH04	76,68	0,40		78,80	0,50		81,40	0,30	
VALH05							58,79	-1,60	
VALH06	74,53	0,10		77,28	0,30		81,58	0,30	
VALH07									
VALH08	102,25	4,50	BE	78,48	0,50		105,06	2,30	E
VALH09	80,67	1,10		75,32	0,00		76,86	-0,10	
VALH10	73,89	0,00		76,85	0,20		74,94	-0,20	
VALH12	68,30	-0,90		63,71	-1,40		62,61	-1,30	
VALH13	81,68	1,20		77,57	0,30		79,96	0,20	
VALH14									
VALH15	70,58	-0,50		80,90	0,80		78,89	0,10	
VALH16	76,12	0,30		76,79	0,20		78,47	0,10	C
VALH17	66,89	-1,10		66,49	-1,10		85,39	0,70	
VALH18	65,01	-1,40		64,99	-1,30		63,03	-1,20	
VALH19	74,95	0,20		71,07	-0,50		73,05	-0,40	
VALH20	72,32	-0,30		64,08	-1,40		73,48	-0,30	
VALH21									
VALH22	71,68	-0,40		68,05	-0,90		71,52	-0,50	
VALH23	75,87	0,30		87,54	1,60		77,29	0,00	
VALH24	75,57	0,20		70,83	-0,50		71,43	-0,50	
VALH27	68,44	-0,90		79,59	0,60		77,14	0,00	
VALH28	88,21	2,30	E	94,48	2,50	E	105,20	2,30	E
VALH29	65,83	-1,30					64,56	-1,10	
VALH30	70,15	-0,60		75,02	0,00		79,60	0,20	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	23			21			24		
No. labs with val.	23			21			24		
Mean	74,01			74,94			77,53		
SR Reprod. SD	6,27			7,82			11,81		
Sr Repeat. SD	3,43			2,41			4,52		
RSD % VR	8,48%			10,44%			15,24%		
RSD % Vr	4,64%			3,21%			5,83%		
No. A outliers	0			0			0		
No. B outliers	1			0			0		
No. C outliers	0			0			1		
No. labs accept.	22			21			23		
No. values accept.	65			63			69		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

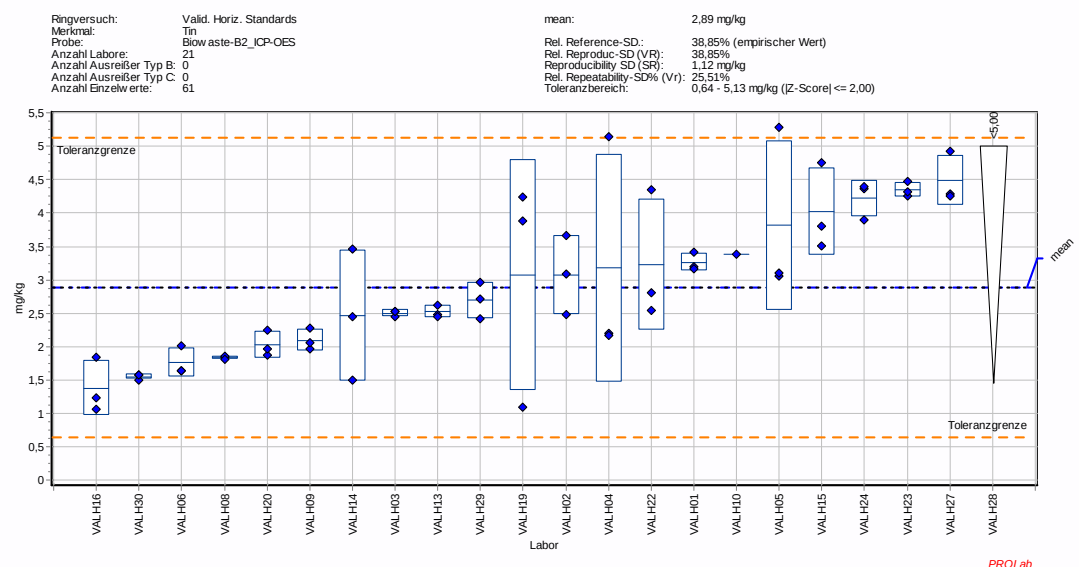
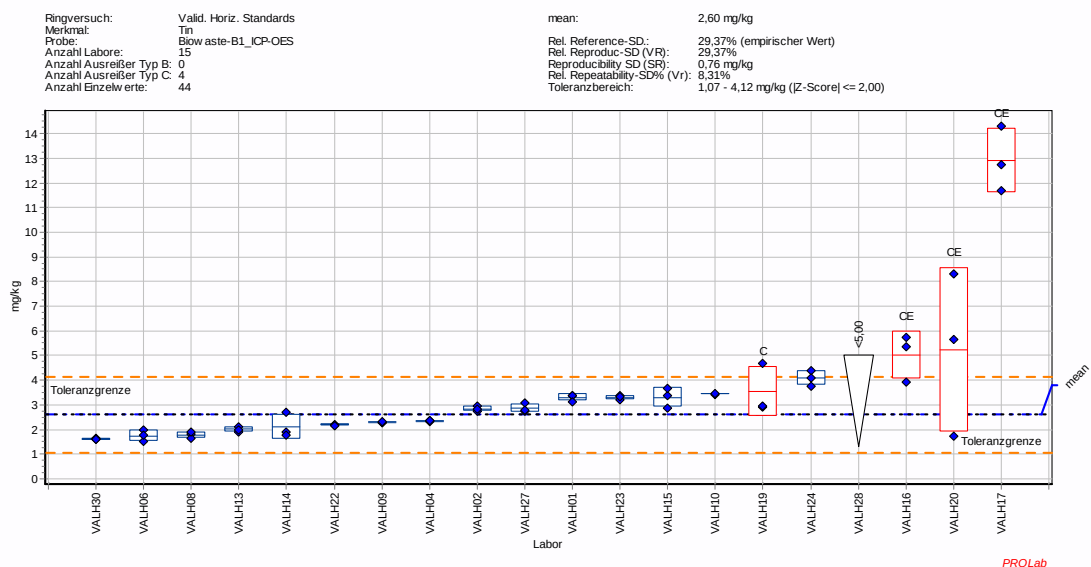
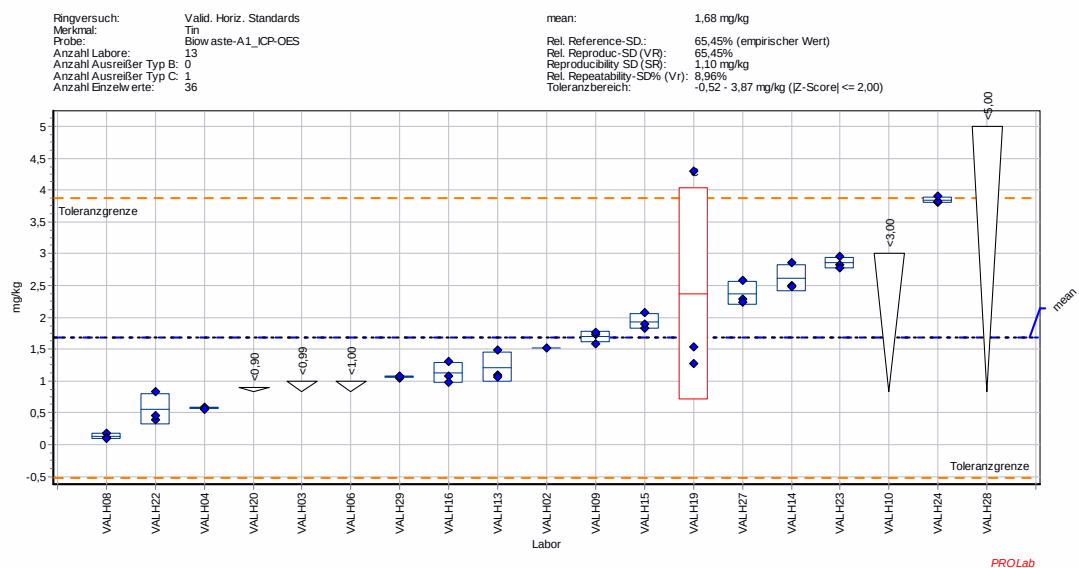


2.2.9.1 Biowaste, ICP-OES: Tin

ICP-OES: Tin	CO-A1_OS	Z-Score		CO-B1_OS	Z-Score		CO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	< 0,00			3,30	0,90		3,26	0,30	
VALH02	1,52	-0,10		2,83	0,30		3,07	0,20	
VALH03	< 0,99						2,50	-0,30	
VALH04	0,57	-1,00		2,34	-0,30		3,18	0,30	
VALH05							3,82	0,80	
VALH06	< 1,00			1,75	-1,10		1,76	-1,00	
VALH08	0,13	-1,40		1,78	-1,10		1,83	-0,90	
VALH09	1,69	0,00		2,29	-0,40		2,09	-0,70	
VALH10	< 3,00			3,44	1,10		3,39	0,50	
VALH13	1,21	-0,40		2,01	-0,80		2,52	-0,30	
VALH14	2,62	0,90		2,12	-0,60		2,47	-0,40	
VALH15	1,93	0,20		3,31	0,90		4,02	1,00	
VALH16	1,12	-0,50		5,01	3,20	CE	1,38	-1,30	
VALH17				12,91	13,50	CE			
VALH19	2,37	0,60	C	3,53	1,20	C	3,07	0,20	
VALH20	< 0,90			5,23	3,40	CE	2,03	-0,80	
VALH22	0,56	-1,00		2,19	-0,50		3,23	0,30	
VALH23	2,86	1,10		3,30	0,90		4,35	1,30	
VALH24	3,84	2,00		4,08	1,90		4,22	1,20	
VALH27	2,37	0,60		2,86	0,40		4,49	1,40	
VALH28	< 5,00			< 5,00			< 5,00		
VALH29	1,06	-0,60					2,70	-0,20	
VALH30				1,62	-1,30		1,55	-1,20	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	20			20			22		
No. labs with val.	14			19			21		
Mean	1,678			2,596			2,886		
SR Reprod. SD	1,098			0,763			1,121		
Sr Repeat. SD	0,15			0,216			0,736		
RSD % VR	65,45%			29,37%			38,85%		
RSD % Vr	8,96%			8,31%			25,51%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			4			0		
No. labs accept.	13			15			21		
No. values accept.	36			44			61		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

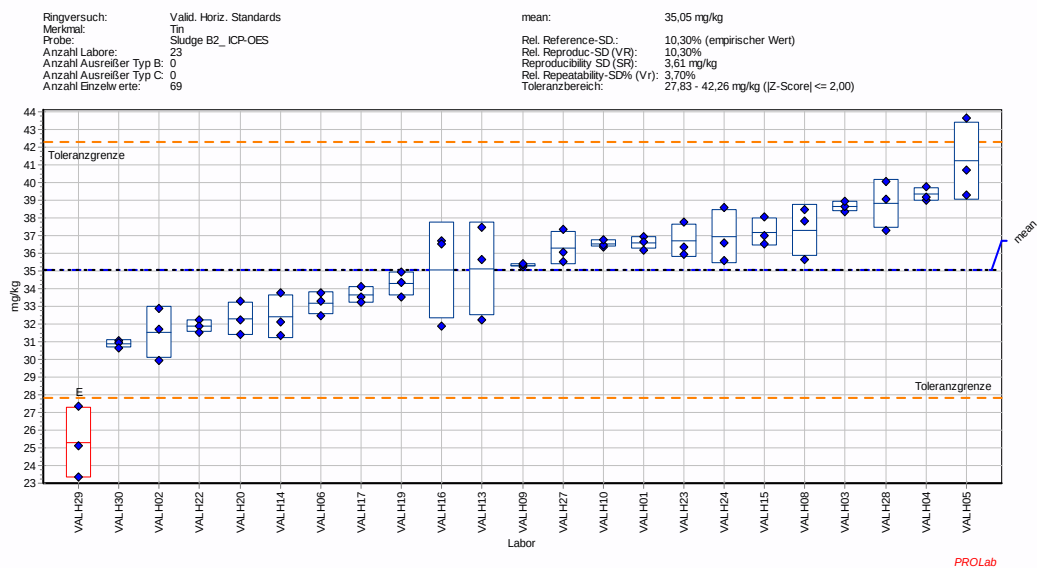
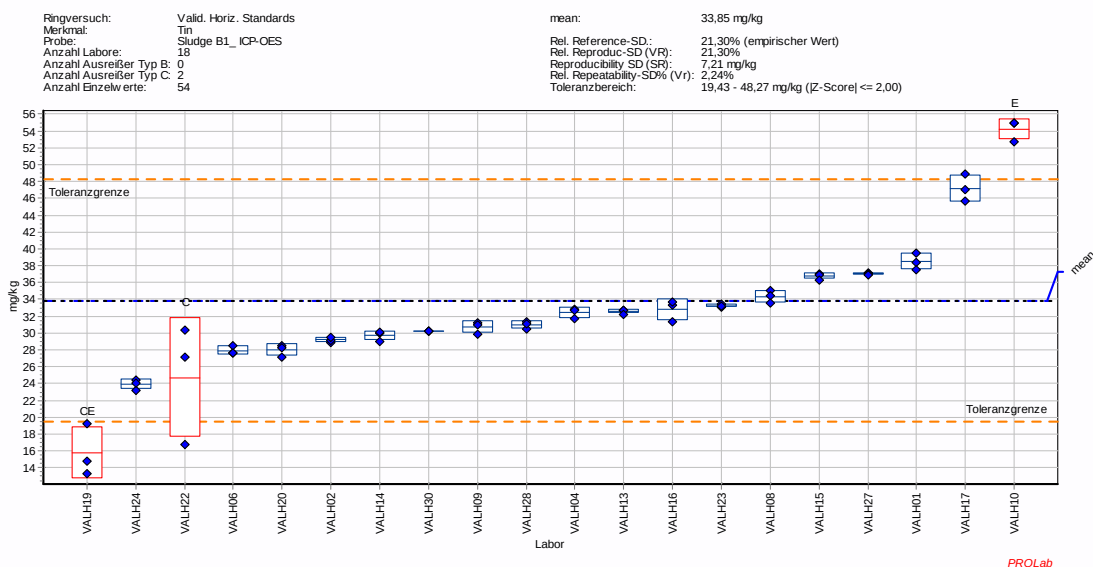
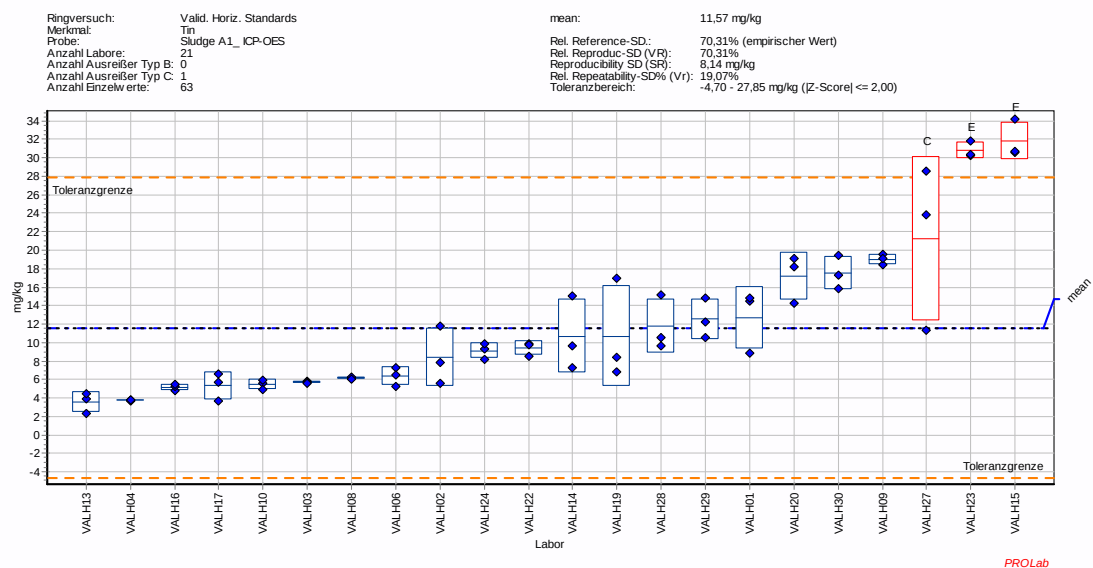


2.2.9.2 Sludge, ICP-OES: Tin

ICP-OES: Tin	SL-A1_OS	Z-Score		SL-B1_OS	Z-Score		SL-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	12,71	0,10		38,47	0,60		36,58	0,40	
VALH02	8,41	-0,40		29,17	-0,60		31,50	-1,00	
VALH03	5,69	-0,70					38,64	1,00	
VALH04	3,76	-1,00		32,41	-0,20		39,32	1,20	
VALH05							41,20	1,70	
VALH06	6,34	-0,60		27,90	-0,80		33,17	-0,50	
VALH08	6,15	-0,70		34,33	0,10		37,29	0,60	
VALH09	19,00	0,90		30,69	-0,40		35,31	0,10	
VALH10	5,48	-0,70		54,18	2,80	E	36,52	0,40	
VALH13	3,54	-1,00		32,54	-0,20		35,10	0,00	
VALH14	10,68	-0,10		29,68	-0,60		32,40	-0,70	
VALH15	31,81	2,50	E	36,73	0,40		37,18	0,60	
VALH16	5,16	-0,80		32,77	-0,10		35,02	0,00	
VALH17	5,35	-0,80		47,19	1,90		33,61	-0,40	
VALH19	10,70	-0,10		15,76	-2,50	CE	34,26	-0,20	
VALH20	17,19	0,70		27,97	-0,80		32,29	-0,80	
VALH22	9,37	-0,30		24,70	-1,30	C	31,85	-0,90	
VALH23	30,80	2,40	E	33,22	-0,10		36,68	0,50	
VALH24	9,13	-0,30		23,87	-1,40		36,93	0,50	
VALH27	21,24	1,20	C	37,03	0,40		36,29	0,30	
VALH28	11,77	0,00		30,97	-0,40		38,79	1,00	
VALH29	12,52	0,10					25,26	-2,70	E
VALH30	17,51	0,70		30,19	-0,50		30,87	-1,20	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	22			20			23		
No. labs with val.	22			20			23		
Mean	11,57			33,85			35,05		
SR Reprod. SD	8,139			7,21			3,609		
Sr Repeat. SD	2,208			0,759			1,297		
RSD % VR	70,31%			21,30%			10,30%		
RSD % Vr	19,07%			2,24%			3,70%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			2			0		
No. labs accept.	21			18			23		
No. values accept.	63			54			69		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

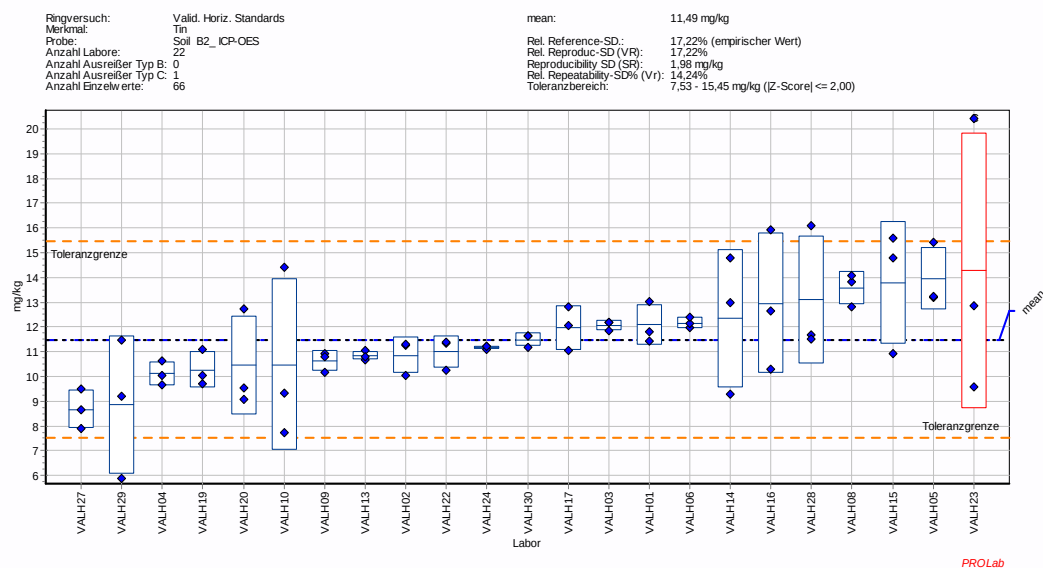
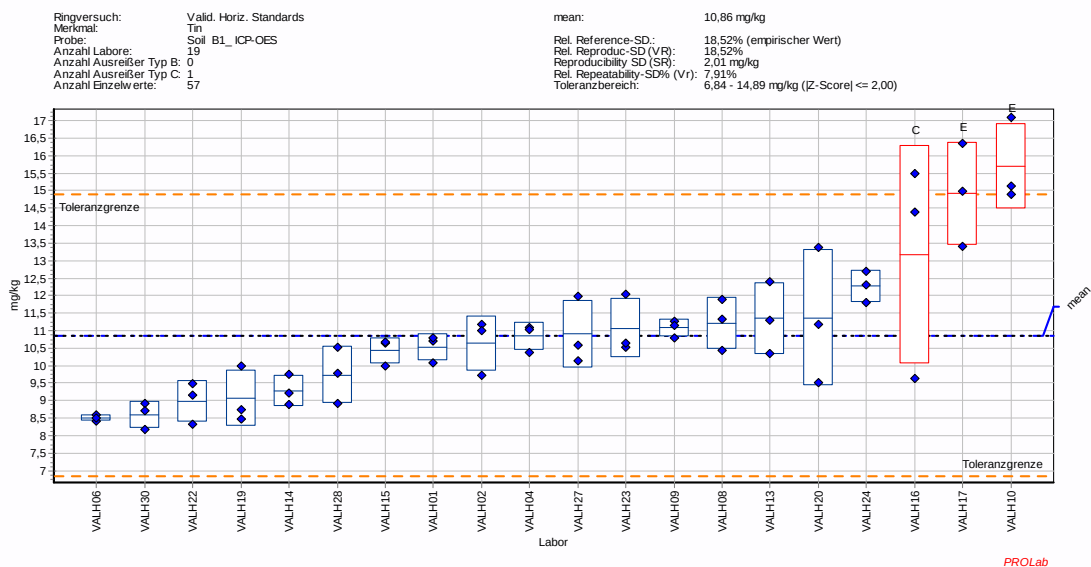
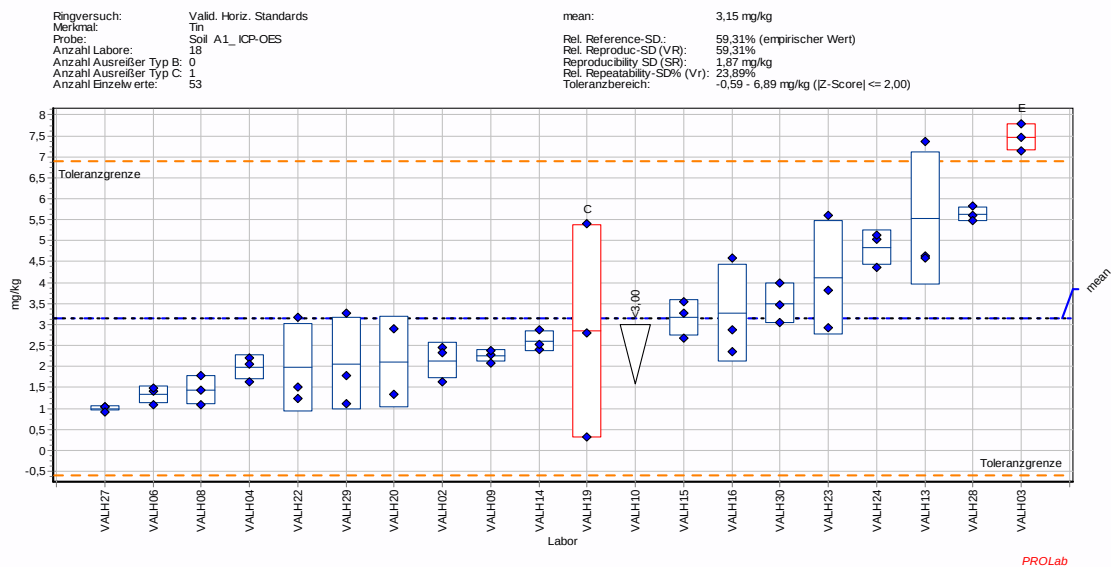


2.2.9.3 Soil, ICP-OES: Tin

ICP-OES: Tin	SO-A1_OS	Z-Score		SO-B1_OS	Z-Score		SO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	< 0,00			10,52	-0,20		12,08	0,30	
VALH02	2,14	-0,50		10,63	-0,10		10,85	-0,30	
VALH03	7,46	2,30E					12,07	0,30	
VALH04	1,97	-0,60		10,84	0,00		10,12	-0,70	
VALH05							13,95	1,20	
VALH06	1,33	-1,00		8,50	-1,20		12,16	0,30	
VALH08	1,43	-0,90		11,22	0,20		13,57	1,10	
VALH09	2,25	-0,50		11,08	0,10		10,63	-0,40	
VALH10	< 3,00			15,70	2,40E		10,48	-0,50	
VALH13	5,53	1,30		11,35	0,20		10,84	-0,30	
VALH14	2,60	-0,30		9,28	-0,80		12,34	0,40	
VALH15	3,16	0,00		10,43	-0,20		13,77	1,20	
VALH16	3,27	0,10		13,17	1,10C		12,96	0,70	
VALH17				14,91	2,00E		11,97	0,20	
VALH19	2,85	-0,20C		9,07	-0,90		10,27	-0,60	
VALH20	2,11	-0,60		11,36	0,20		10,44	-0,50	
VALH22	1,97	-0,60		8,99	-0,90		10,99	-0,30	
VALH23	4,12	0,50		11,07	0,10		14,28	1,40C	
VALH24	4,84	0,90		12,27	0,70		11,17	-0,20	
VALH27	1,00	-1,20		10,90	0,00		8,67	-1,40	
VALH28	5,63	1,30		9,74	-0,60		13,10	0,80	
VALH29	2,06	-0,60					8,84	-1,30	
VALH30	3,50	0,20		8,60	-1,10		11,48	0,00	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	21			20			23		
No. labs with val.	19			20			23		
Mean	3,153			10,865			11,488		
SR Reprod. SD	1,87			2,013			1,979		
Sr Repeat. SD	0,753			0,859			1,636		
RSD % VR	59,31%			18,52%			17,22%		
RSD % Vr	23,89%			7,91%			14,24%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			1			1		
No. labs accept.	18			19			22		
No. values accept.	53			57			66		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

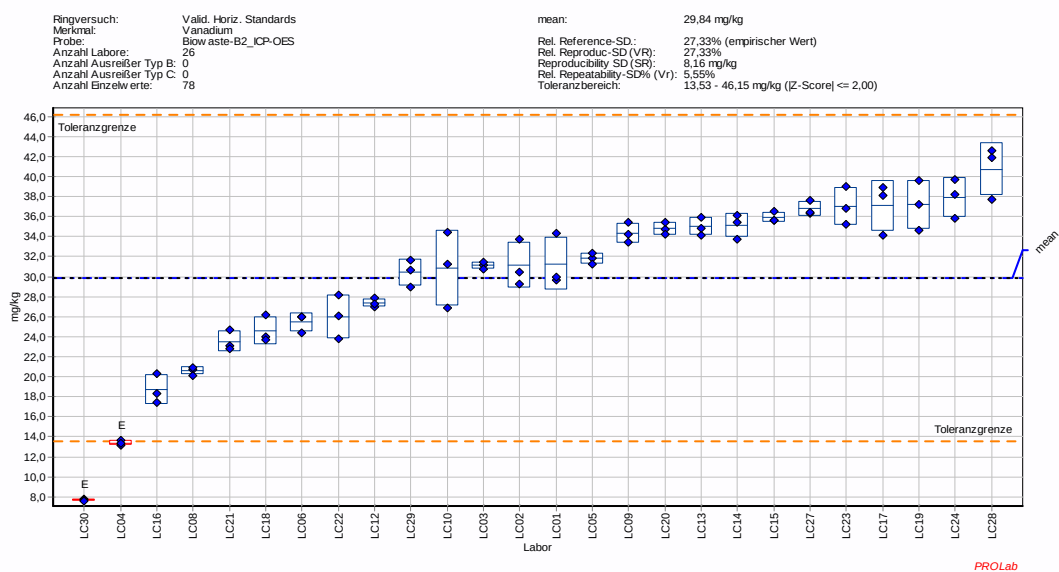
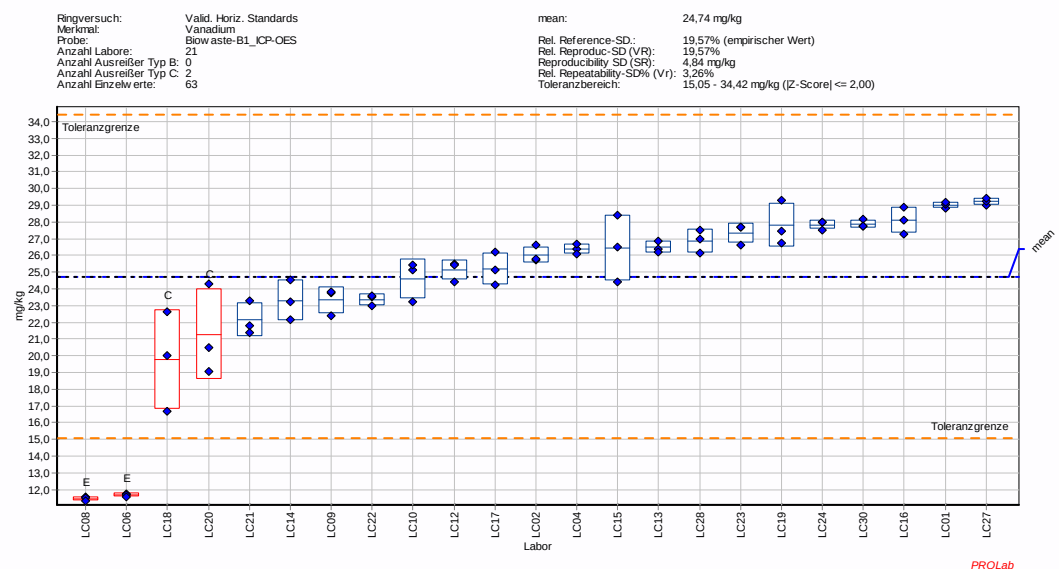
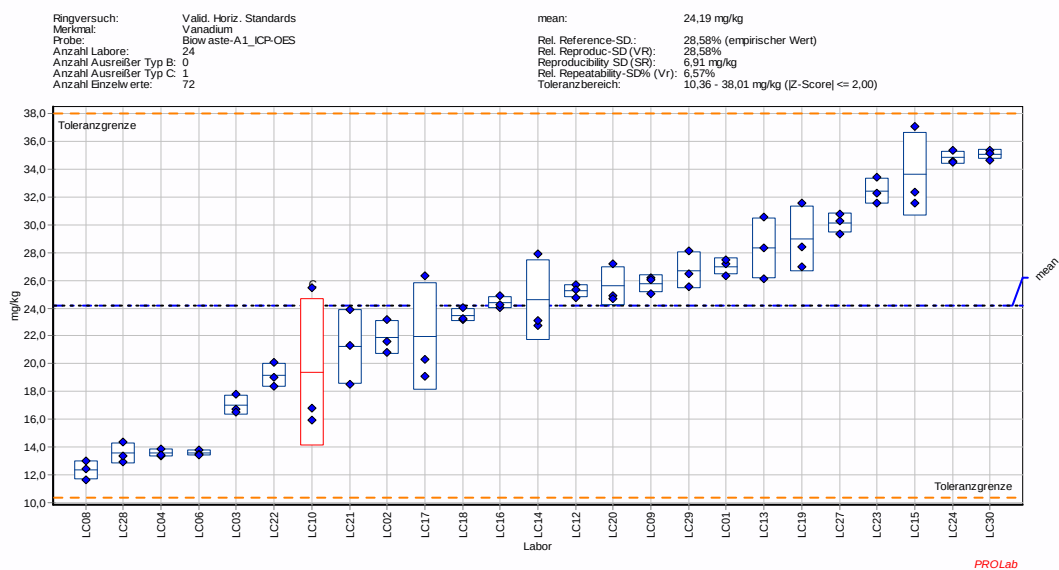


UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1
(Teilprojekt „Anorganische Parameter“)

2.2.10.1 Biowaste, ICP-OES: Vanadium

ICP-OES: Vanadium	CO-A1_OS	Z-Score		CO-B1_OS	Z-Score		CO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	27,01	0,40		29,00	0,90		31,30	0,20	
VALH02	21,89	-0,30		26,03	0,30		31,17	0,20	
VALH03	17,02	-1,00					31,12	0,20	
VALH04	13,56	-1,50		26,38	0,30		13,38	-2,00	E
VALH05							31,83	0,20	
VALH06	13,59	-1,50		11,67	-2,70	E	25,44	-0,50	
VALH07									
VALH08	12,34	-1,70		11,44	-2,70	E	20,58	-1,10	
VALH09	25,77	0,20		23,32	-0,30		34,36	0,60	
VALH10	19,40	-0,70	C	24,60	0,00		30,86	0,10	
VALH12	25,24	0,20		25,12	0,10		27,36	-0,30	
VALH13	28,32	0,60		26,48	0,40		34,99	0,60	
VALH14	24,59	0,10		23,30	-0,30		35,10	0,60	
VALH15	33,66	1,40		26,44	0,40		35,93	0,70	
VALH16	24,41	0,00		28,09	0,70		18,68	-1,40	
VALH17	21,93	-0,30		25,18	0,10		37,07	0,90	
VALH18	23,48	-0,10		19,76	-1,00	C	24,61	-0,60	
VALH19	28,98	0,70		27,82	0,60		37,17	0,90	
VALH20	25,59	0,20		21,28	-0,70	C	34,80	0,60	
VALH21	21,23	-0,40		22,17	-0,50		23,53	-0,80	
VALH22	19,17	-0,70		23,34	-0,30		25,98	-0,50	
VALH23	32,43	1,20		27,32	0,50		37,02	0,90	
VALH24	34,83	1,50		27,83	0,60		37,90	1,00	
VALH27	30,14	0,90		29,21	0,90		36,79	0,90	
VALH28	13,55	-1,50		26,86	0,40		40,75	1,30	
VALH29	26,70	0,40					30,41	0,10	
VALH30	35,07	1,60		27,86	0,60		7,68	-2,70	E
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	25			23			26		
No. labs with val.	25			23			26		
Mean	24,19			24,74			29,84		
SR Reprod. SD	6,91			4,84			8,16		
Sr Repeat. SD	1,59			0,81			1,66		
RSD % VR	28,58%			19,57%			27,33%		
RSD % Vr	6,57%			3,26%			5,55%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			2			0		
No. labs accept.	24			21			26		
No. values accept.	72			63			78		

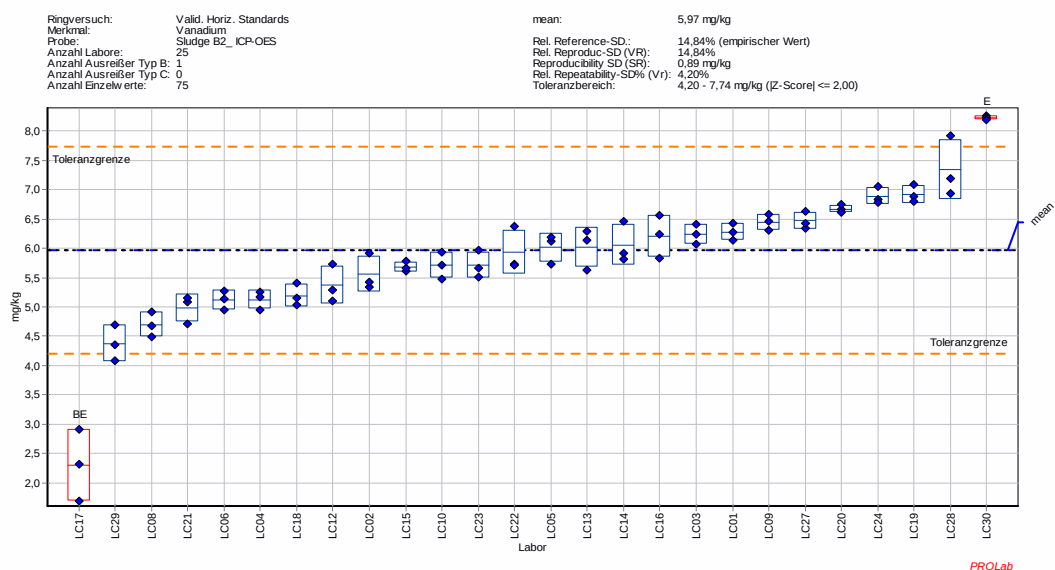
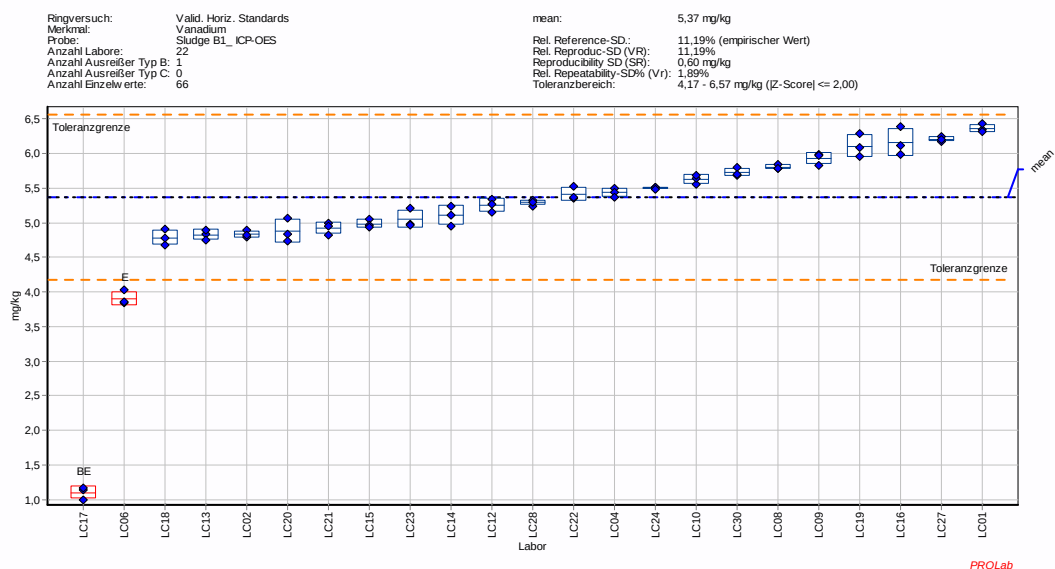
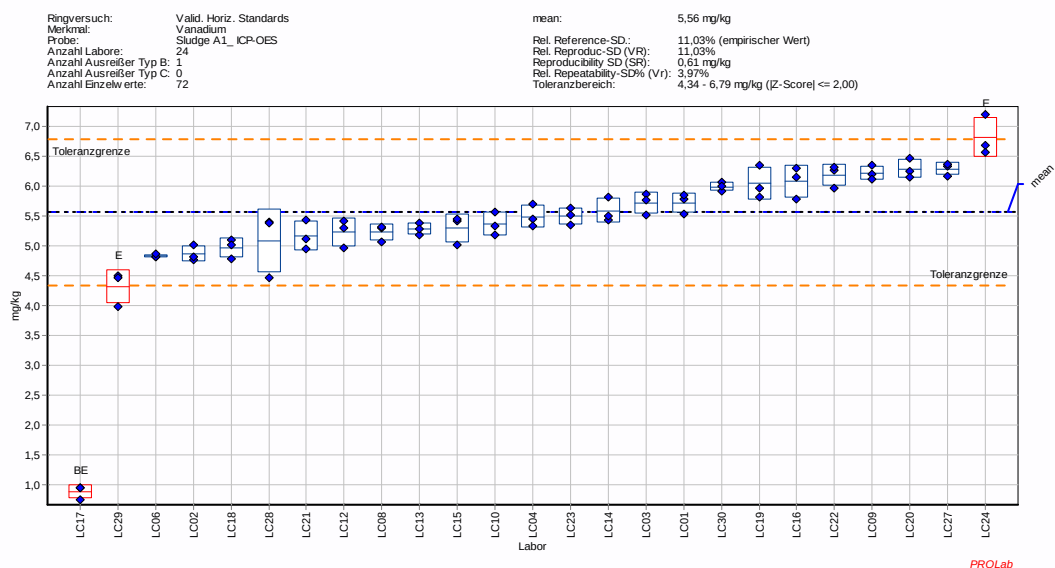
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.10.2 Sludge, ICP-OES: Vanadium

ICP-OES: Vanadium	SL-A1_OS			SL-B1_OS	Z-Score		SL-B2_OS	Z-Score	
Unit	mg/kg	Z-Score		mg/kg			mg/kg		
VALH01	5,72	0,30		6,37	1,70		6,28	0,40	
VALH02	4,86	-1,10		4,83	-0,90		5,56	-0,50	
VALH03	5,72	0,20					6,24	0,30	
VALH04	5,49	-0,10		5,44	0,10		5,12	-1,00	
VALH05							6,02	0,10	
VALH06	4,83	-1,20		3,91	-2,40	E	5,12	-1,00	
VALH07									
VALH08	5,23	-0,50		5,80	0,70		4,70	-1,40	
VALH09	6,22	1,10		5,93	0,90		6,45	0,50	
VALH10	5,36	-0,30		5,63	0,40		5,71	-0,30	
VALH12	5,23	-0,50		5,26	-0,20		5,38	-0,70	
VALH13	5,28	-0,50		4,83	-0,90		6,02	0,10	
VALH14	5,59	0,00		5,10	-0,40		6,06	0,10	
VALH15	5,29	-0,40		4,98	-0,60		5,68	-0,30	
VALH16	6,08	0,80		6,16	1,30		6,21	0,30	
VALH17	0,88	-7,60		1,10	-7,10	BE	2,31	-4,10	BE
VALH18	4,97	-1,00	BE	4,79	-1,00		5,20	-0,90	
VALH19	6,04	0,80		6,11	1,20		6,93	1,10	
VALH20	6,29	1,20		4,88	-0,80		6,67	0,80	
VALH21	5,17	-0,60		4,92	-0,70		4,98	-1,10	
VALH22	6,18	1,00		5,41	0,10		5,93	0,00	
VALH23	5,50	-0,10		5,05	-0,50		5,71	-0,30	
VALH24	6,82	2,00		5,50	0,20		6,89	1,00	
VALH27	6,29	1,20	E	6,21	1,40		6,47	0,60	
VALH28	5,09	-0,80		5,29	-0,10		7,34	1,50	
VALH29	4,32	-2,00					4,38	-1,80	
VALH30	5,99	0,7	E	5,73	0,60		8,23	2,50	E
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	25			23			26		
No. labs with val.	25			23			26		
Mean	5,56			5,37			5,97		
SR Reprod. SD	0,61			0,6			0,89		
Sr Repeat. SD	0,22			0,1			0,25		
RSD % VR	11,03%			11,19%			14,84%		
RSD % Vr	3,97%			1,89%			4,20%		
No. A outliers	0			0			0		
No. B outliers	1			1			1		
No. C outliers	0			0			0		
No. labs accept.	24			22			25		
No. values accept.	72			66			75		

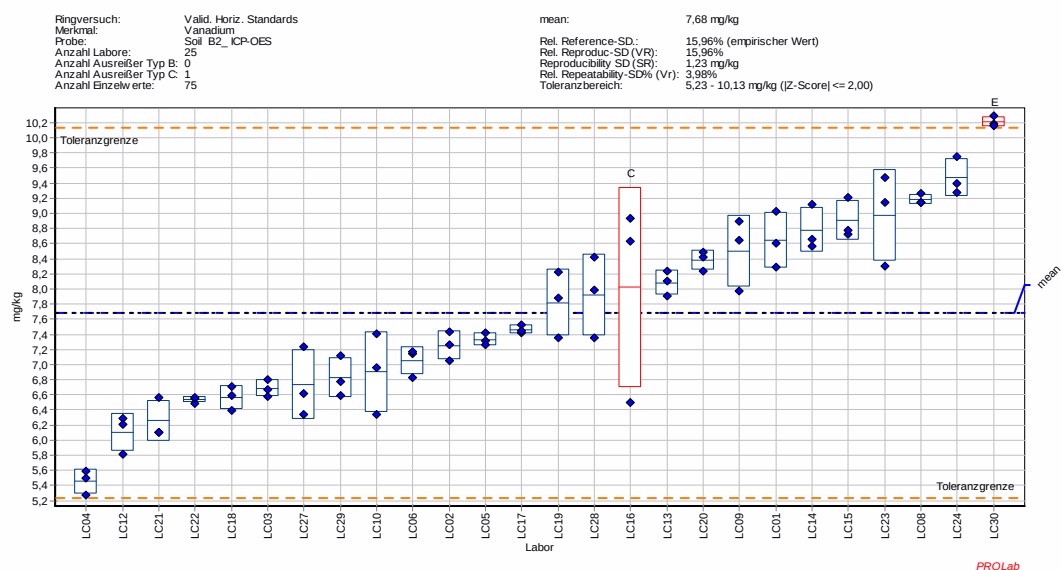
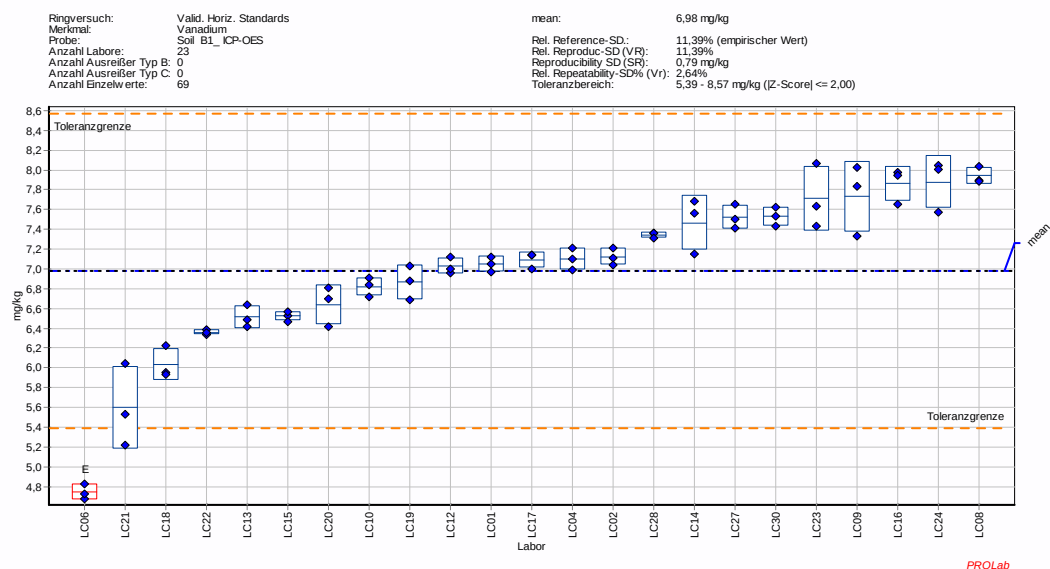
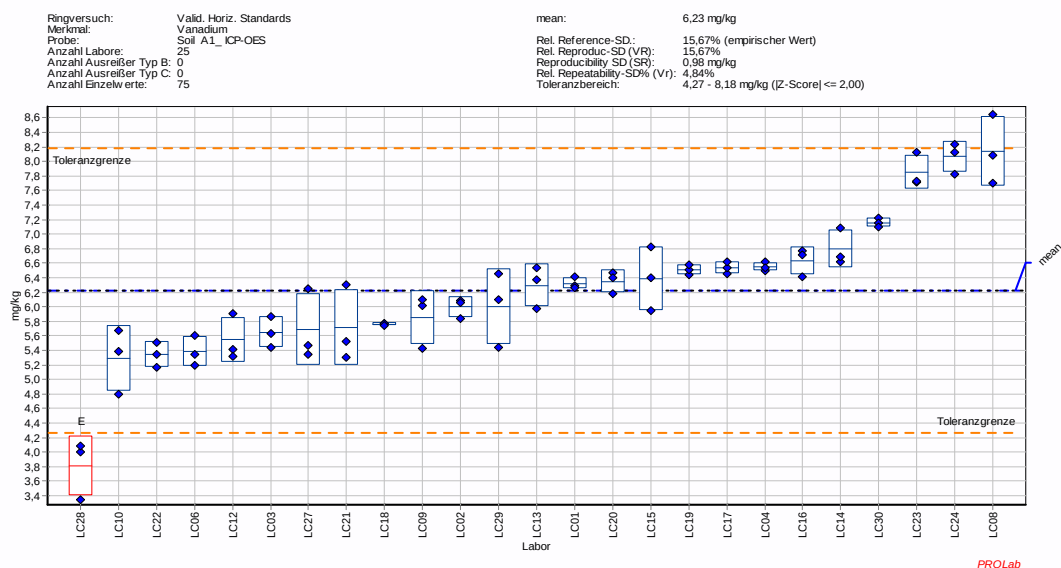
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.10.3 Soil, ICP-OES: Vanadium

ICP-OES: Vanadium	SO-A1_OS	Z-Score		SO-B1_OS	Z-Score		SO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	6,32	0,10		7,05	0,10		8,64	0,80	
VALH02	6,00	-0,20		7,12	0,20		7,25	-0,30	
VALH03	5,65	-0,60					6,68	-0,80	
VALH04	6,55	0,30		7,10	0,20		5,45	-1,80	
VALH05							7,33	-0,30	
VALH06	5,38	-0,90		4,74	-2,80	E	7,05	-0,50	
VALH07									
VALH08	8,14	2,00		7,94	1,20		9,18	1,20	
VALH09	5,85	-0,40		7,73	0,90		8,50	0,70	
VALH10	5,29	-1,00		6,82	-0,20		6,90	-0,60	
VALH12	5,55	-0,70		7,03	0,10		6,10	-1,30	
VALH13	6,30	0,10		6,52	-0,60		8,08	0,30	
VALH14	6,80	0,60		7,46	0,60		8,78	0,90	
VALH15	6,39	0,20		6,52	-0,60		8,91	1,00	
VALH16	6,63	0,40		7,86	1,10		8,02	0,30	C
VALH17	6,54	0,30		7,09	0,10		7,46	-0,20	
VALH18	5,76	-0,50		6,03	-1,20		6,56	-0,90	
VALH19	6,51	0,30		6,87	-0,10		7,82	0,10	
VALH20	6,35	0,10		6,64	-0,40		8,38	0,60	
VALH21	5,71	-0,50		5,60	-1,70		6,26	-1,20	
VALH22	5,34	-0,90		6,36	-0,80		6,54	-0,90	
VALH23	7,85	1,70		7,71	0,90		8,97	1,10	
VALH24	8,06	1,90		7,88	1,10		9,47	1,50	
VALH27	5,69	-0,60		7,52	0,70		6,73	-0,80	
VALH28	3,81	-2,50	E	7,34	0,50		7,92	0,20	
VALH29	6,00	-0,20					6,83	-0,70	
VALH30	7,16	1,00		7,53	0,70		10,21	2,10	E
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	25			23			26		
No. labs with val.	25			23			26		
Mean	6,23			6,98			7,68		
SR Reprod. SD	0,98			0,79			1,23		
Sr Repeat. SD	0,3			0,18			0,31		
RSD % VR	15,67%			11,39%			15,96%		
RSD % Vr	4,84%			2,64%			3,98%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	0			0			1		
No. labs accept.	25			23			25		
No. values accept.	75			69			75		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

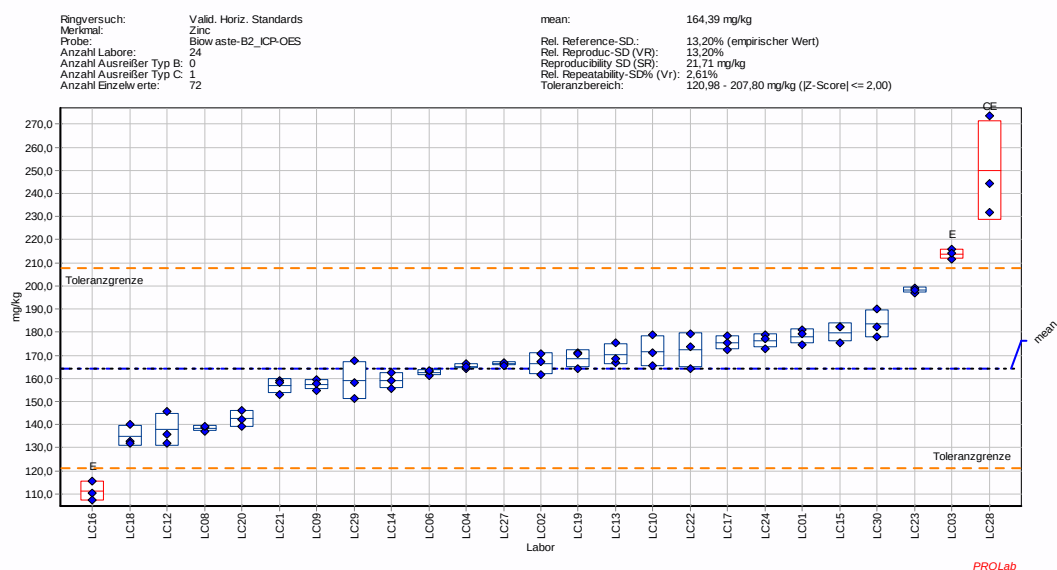
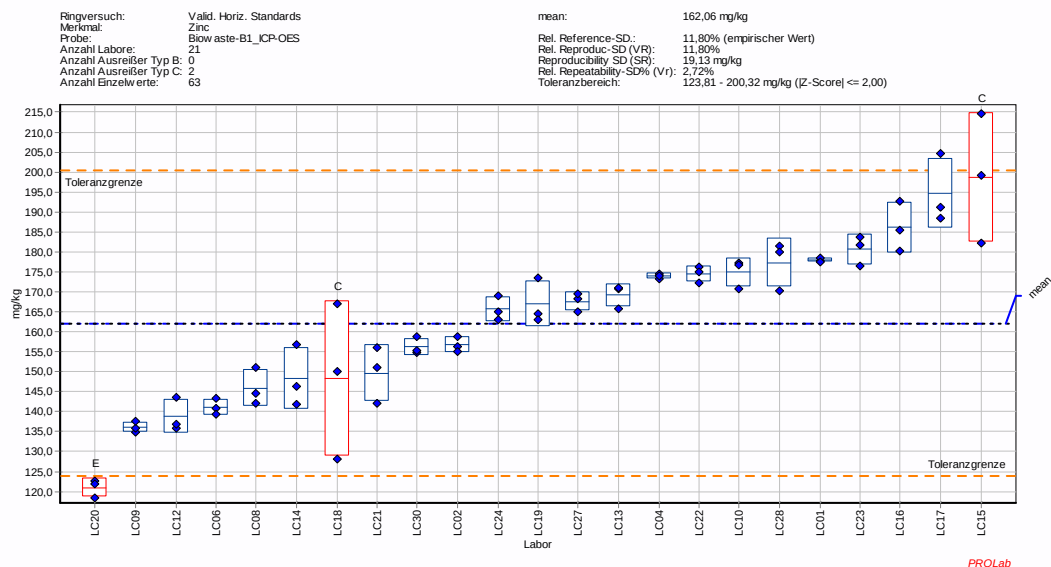
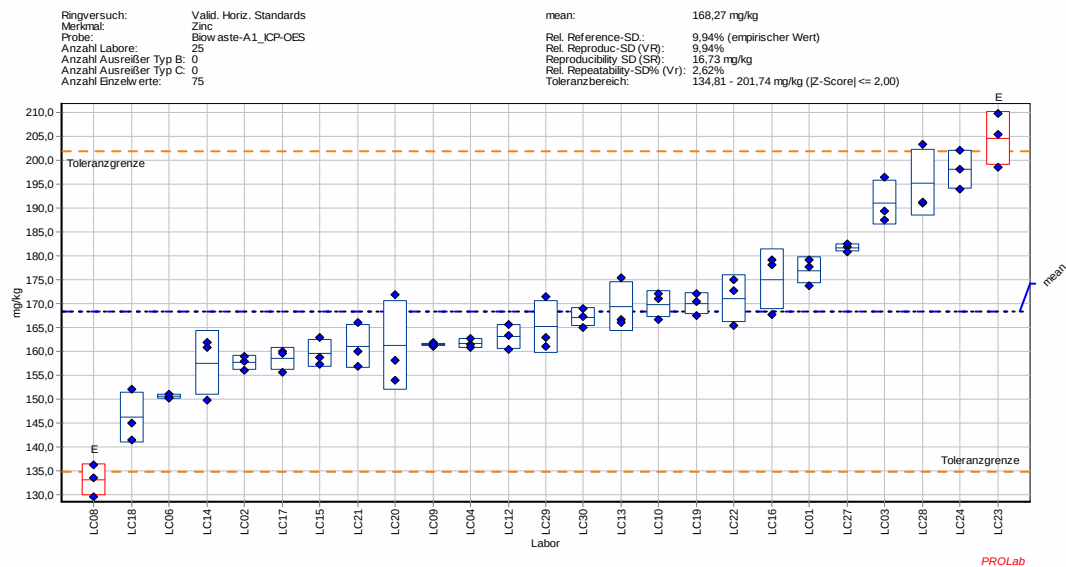


UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1
(Teilprojekt „Anorganische Parameter“)

2.2.11.1 Biowaste, ICP-OES: Zinc

ICP-OES: Zinc	CO-A1_OS	Z-Score		CO-B1_OS	Z-Score		CO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	176,90	0,50		177,93	0,80		178,20	0,60	
VALH02	157,67	-0,60		156,77	-0,30		166,43	0,10	
VALH03	191,07	1,40					213,80	2,30	E
VALH04	161,70	-0,40		173,97	0,60		165,27	0,00	
VALH05									
VALH06	150,59	-1,10		141,11	-1,10		162,40	-0,10	
VALH07									
VALH08	133,19	-2,10	E	145,94	-0,80		138,37	-1,20	
VALH09	161,43	-0,40		136,07	-1,40		157,37	-0,30	
VALH10	169,89	0,10		174,90	0,70		171,74	0,30	
VALH12	163,10	-0,30		138,77	-1,20		137,80	-1,20	
VALH13	169,30	0,10		169,13	0,40		170,30	0,30	
VALH14	157,60	-0,60		148,33	-0,70		159,07	-0,20	
VALH15	159,67	-0,50		198,67	1,90	C	179,90	0,70	
VALH16	175,00	0,40		186,11	1,30		111,11	-2,50	E
VALH17	158,50	-0,60		194,70	1,70		175,37	0,50	
VALH18	146,23	-1,30		148,40	-0,70	C	135,03	-1,40	
VALH19	169,97	0,10		167,00	0,30		168,57	0,20	
VALH20	161,27	-0,40		121,00	-2,10	E	142,47	-1,00	
VALH21	161,00	-0,40		149,67	-0,60		156,67	-0,40	
VALH22	171,03	0,20		174,50	0,70		172,33	0,40	
VALH23	204,50	2,20	E	180,60	1,00		198,17	1,60	
VALH24	198,00	1,80		165,67	0,20		176,33	0,60	
VALH27	181,70	0,80		167,60	0,30		166,27	0,10	
VALH28	195,20	1,60		177,29	0,80		249,87	3,90	CE
VALH29	165,17	-0,20					158,97	-0,20	
VALH30	167,13	-0,10		156,23	-0,30		183,47	0,90	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	25			23			25		
No. labs with val.	25			23			25		
Mean	168,27			162,06			164,39		
SR Reprod. SD	16,73			19,13			21,71		
Sr Repeat. SD	4,4			4,41			4,29		
RSD % VR	9,94%			11,80%			13,20%		
RSD % Vr	2,62%			2,72%			2,61%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	0			2			1		
No. labs accept.	25			21			24		
No. values accept.	75			63			72		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

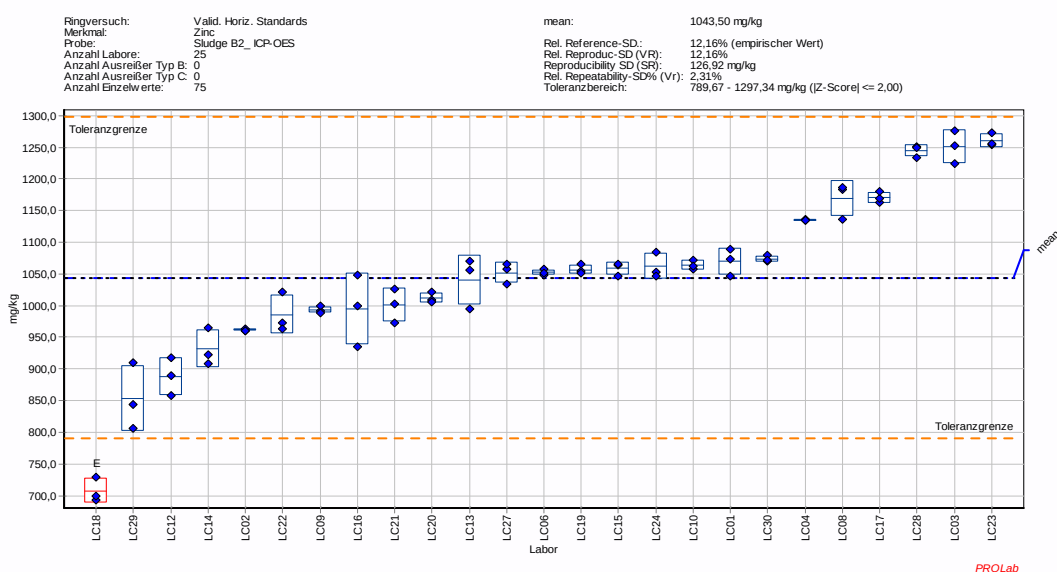
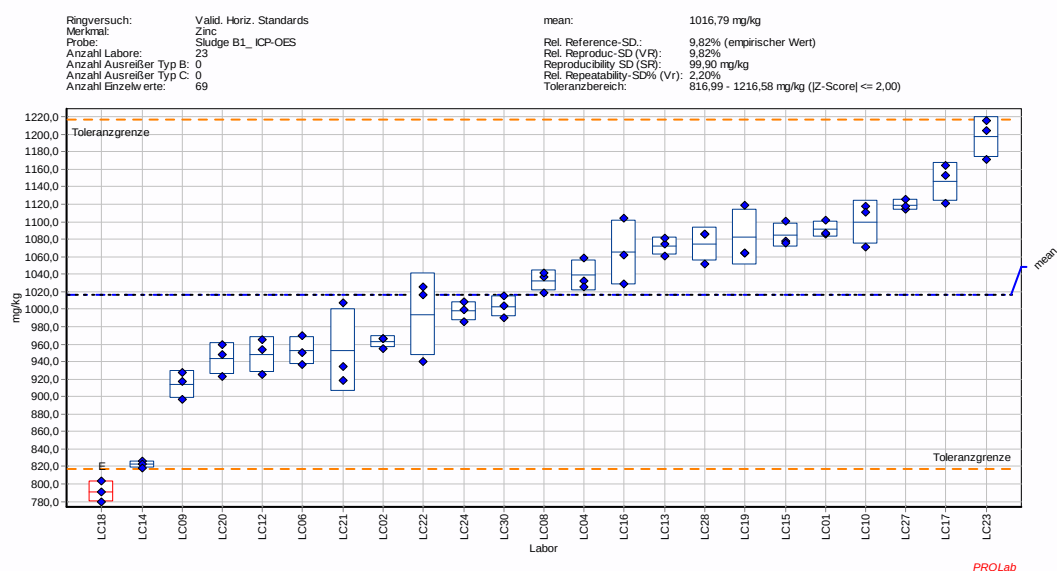
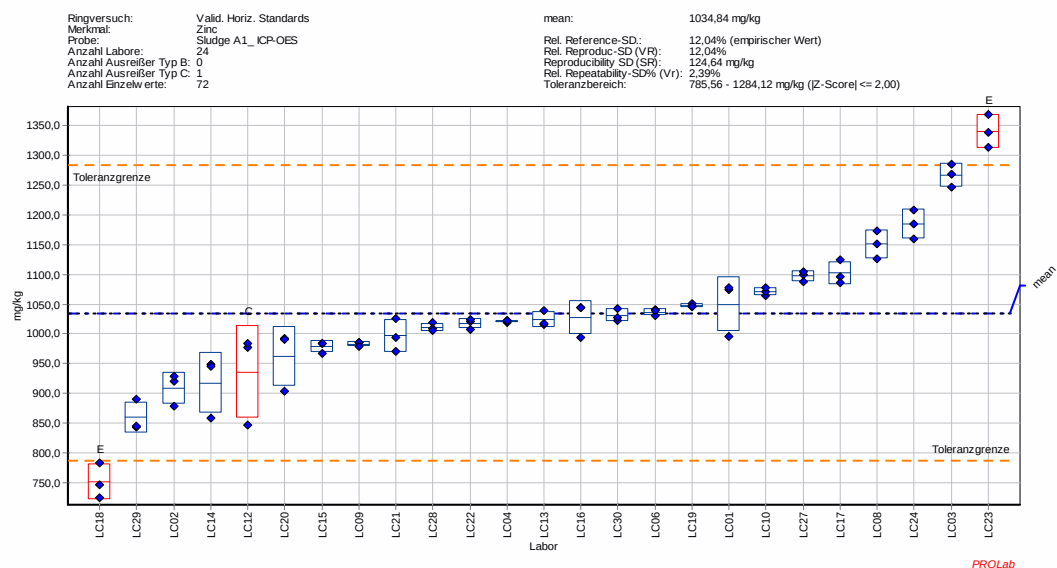


UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1
(Teilprojekt „Anorganische Parameter“)

2.2.11.2 Sludge, ICP-OES: Zinc

ICP-OES: Zinc	SL-A1_OS	Z-Score		SL-B1_OS	Z-Score		SL-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg	–	–
VALH01	1049,67	0,10		1091,67	0,70		1070,00	0,20	
VALH02	908,87	-1,00		962,43	-0,50		961,13	-0,60	
VALH03	1267,00	1,90					1251,00	1,60	
VALH04	1021,00	-0,10		1038,67	0,20		1135,33	0,70	
VALH05									
VALH06	1036,37	0,00		952,44	-0,60		1052,18	0,10	
VALH07									
VALH08	1150,57	0,90		1032,77	0,20		1168,75	1,00	
VALH09	983,00	-0,40		913,73	-1,00		993,03	-0,40	
VALH10	1071,27	0,30		1099,86	0,80		1063,92	0,20	
VALH12	935,80	-0,80	C	948,23	-0,70		888,17	-1,20	
VALH13	1024,00	-0,10		1072,00	0,60		1040,33	0,00	
VALH14	917,67	-0,90		822,27	-1,90		932,07	-0,90	
VALH15	978,80	-0,40		1085,00	0,70		1058,67	0,10	
VALH16	1027,40	-0,10		1064,94	0,50		994,37	-0,40	
VALH17	1102,00	0,50		1146,00	1,30		1170,67	1,00	
VALH18	751,00	-2,30	E	791,37	-2,30	E	707,60	-2,60	E
VALH19	1047,33	0,10		1082,33	0,70		1056,67	0,10	
VALH20	962,17	-0,60		943,53	-0,70		1012,00	-0,20	
VALH21	996,67	-0,30		953,00	-0,60		1000,67	-0,30	
VALH22	1017,67	-0,10		993,87	-0,20		985,67	-0,50	
VALH23	1340,33	2,50	E	1197,00	1,80		1260,67	1,70	
VALH24	1184,67	1,20		997,67	-0,20		1061,67	0,10	
VALH27	1097,00	0,50		1119,33	1,00		1052,00	0,10	
VALH28	1011,20	-0,20		1074,75	0,60		1244,27	1,60	
VALH29	859,20	-1,40					853,10	-1,50	
VALH30	1031,33	0,00		1003,23	-0,10		1073,67	0,20	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	25			23			25		
No. labs with val.	25			23			25		
Mean	1034,84			1016,79			1043,5		
SR Reprod. SD	124,64			99,9			126,92		
Sr Repeat. SD	24,69			22,41			24,14		
RSD % VR	12,04%			9,82%			12,16%		
RSD % Vr	2,39%			2,20%			2,31%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			0			0		
No. labs accept.	24			23			25		
No. values accept.	72			69			75		

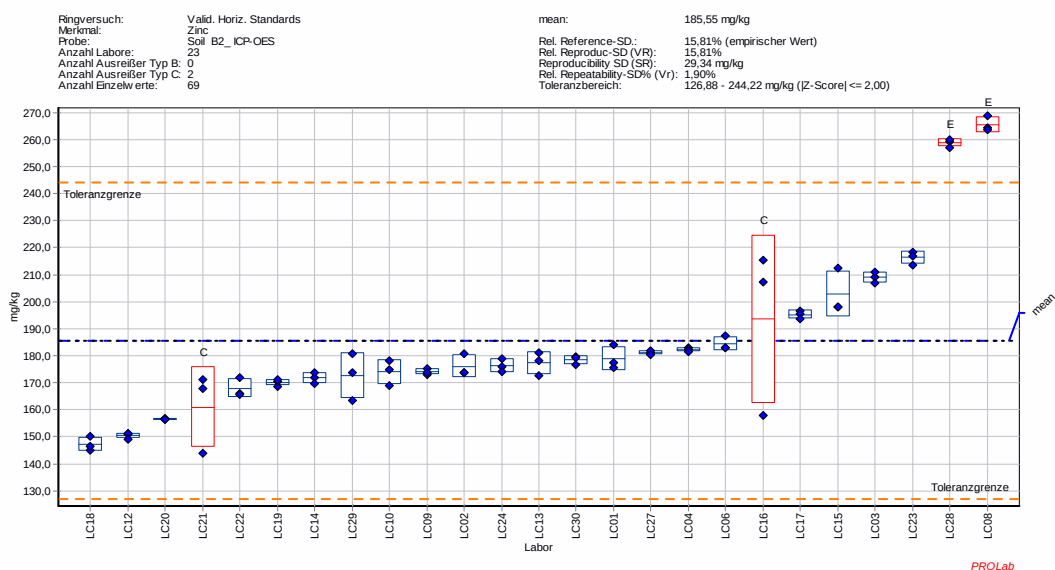
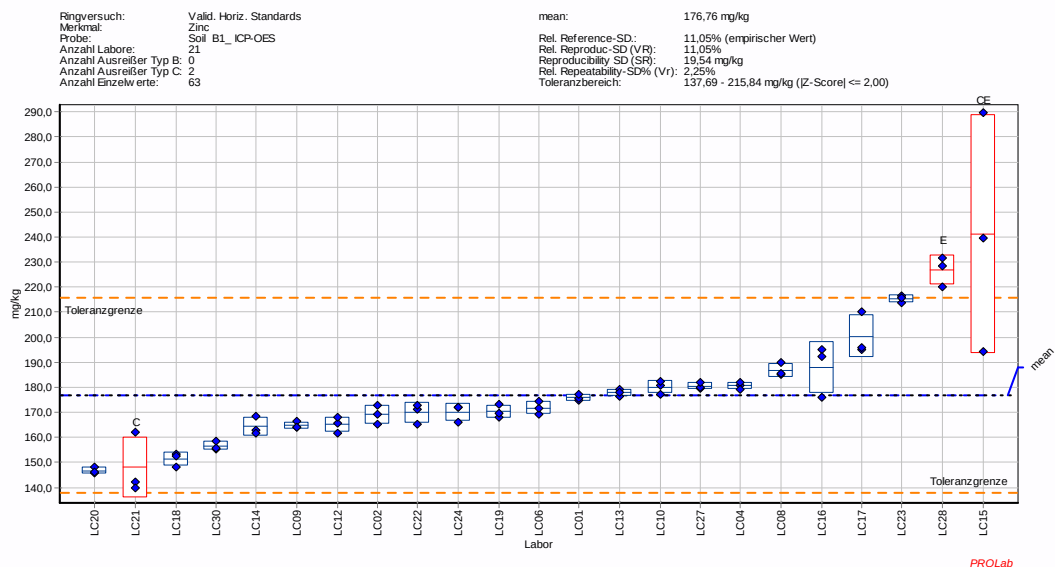
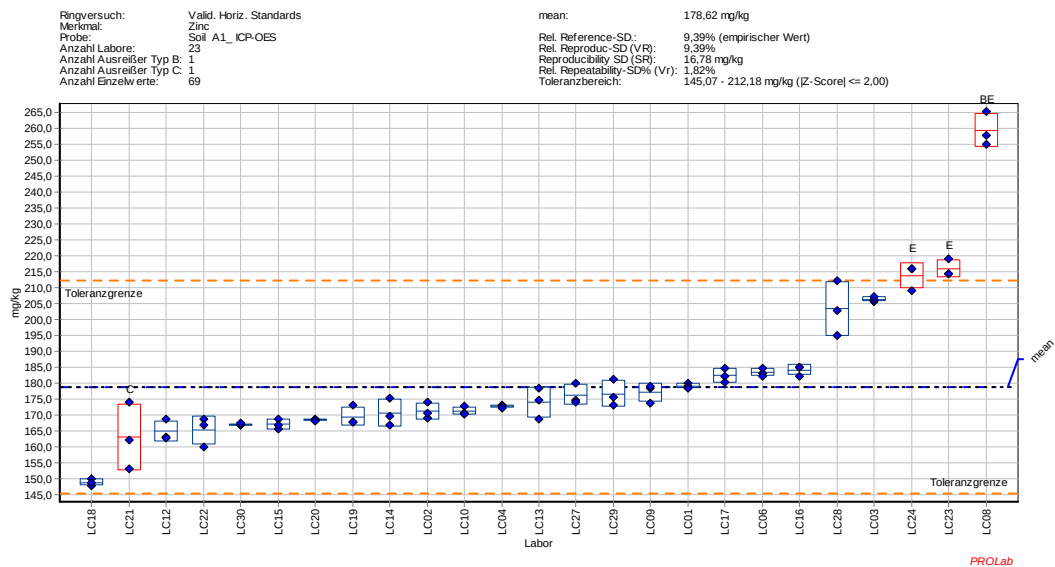
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



2.2.11.3 Soil, ICP-OES: Zinc

ICP-OES: Zinc	SO-A1_OS	Z-Score		SO-B1_OS	Z-Score		SO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg	–	–
VALH01	179,17	0,00		175,80	0,00		179,00	-0,20	
VALH02	171,17	-0,40		169,10	-0,40		176,13	-0,30	
VALH03	206,40	1,70					209,00	0,80	
VALH04	172,67	-0,40		180,67	0,20		182,33	-0,10	
VALH05									
VALH06	183,33	0,30		171,80	-0,30		184,47	0,00	
VALH07									
VALH08	259,42	4,80	BE	186,82	0,50		265,56	2,70	E
VALH09	177,05	-0,10		164,86	-0,60		174,06	-0,40	
VALH10	171,25	-0,40		180,08	0,20		173,94	-0,40	
VALH12	164,83	-0,80		165,07	-0,60		150,40	-1,20	
VALH13	173,93	-0,30		177,87	0,10		177,37	-0,30	
VALH14	170,57	-0,50		164,27	-0,60		171,80	-0,50	
VALH15	167,03	-0,70		241,20	3,30	CE	202,90	0,60	
VALH16	184,10	0,30		187,79	0,60		193,49	0,30	C
VALH17	182,40	0,20		200,30	1,20		195,30	0,30	
VALH18	148,77	-1,80		151,27	-1,30		147,17	-1,30	
VALH19	169,47	-0,50		170,37	-0,30		170,10	-0,50	
VALH20	168,37	-0,60		146,73	-1,50		156,53	-1,00	
VALH21	163,00	-0,90	C	148,00	-1,50	C	161,00	-0,80	C
VALH22	165,13	-0,80		169,83	-0,40		167,93	-0,60	
VALH23	215,97	2,20	E	215,37	2,00		216,33	1,00	
VALH24	213,67	2,10	E	170,00	-0,30		176,33	-0,30	
VALH27	176,23	-0,10		180,50	0,20		181,00	-0,20	
VALH28	203,29	1,50		226,82	2,60	E	258,81	2,50	E
VALH29	176,63	-0,10					172,67	-0,40	
VALH30	166,93	-0,70		156,67	-1,00		178,47	-0,20	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	25			23			25		
No. labs with val.	25			23			25		
Mean	178,62			176,76			185,55		
SR Reprod. SD	16,78			19,54			29,34		
Sr Repeat. SD	3,26			3,98			3,53		
RSD % VR	9,39%			11,05%			15,81%		
RSD % Vr	1,82%			2,25%			1,90%		
No. A outliers	0			0			0		
No. B outliers	1			0			0		
No. C outliers	1			2			2		
No. labs accept.	23			21			23		
No. values accept.	69			63			69		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

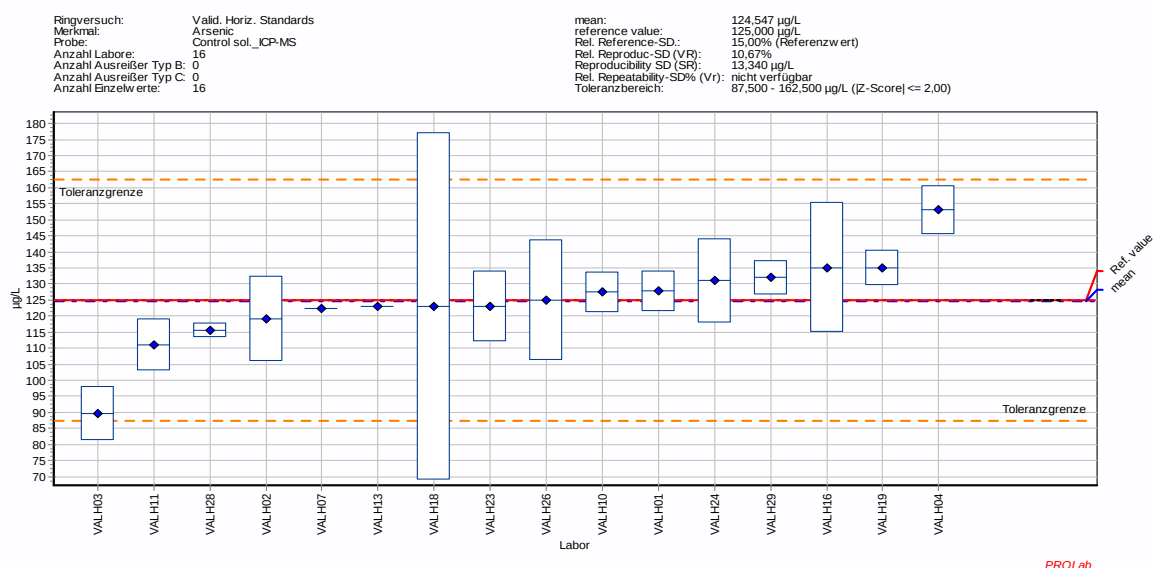


UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1
(Teilprojekt „Anorganische Parameter“)

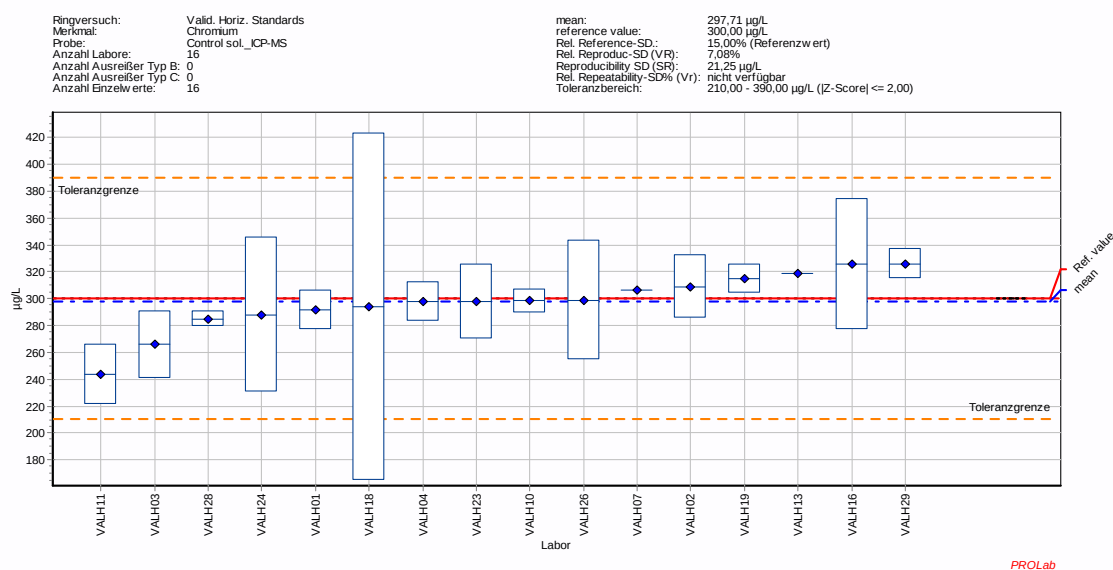
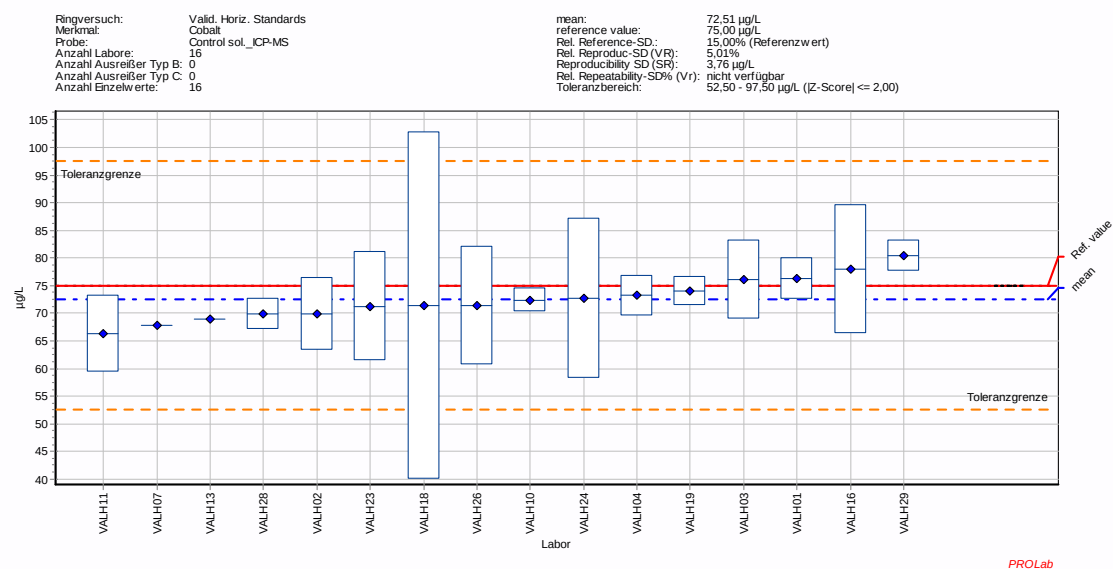
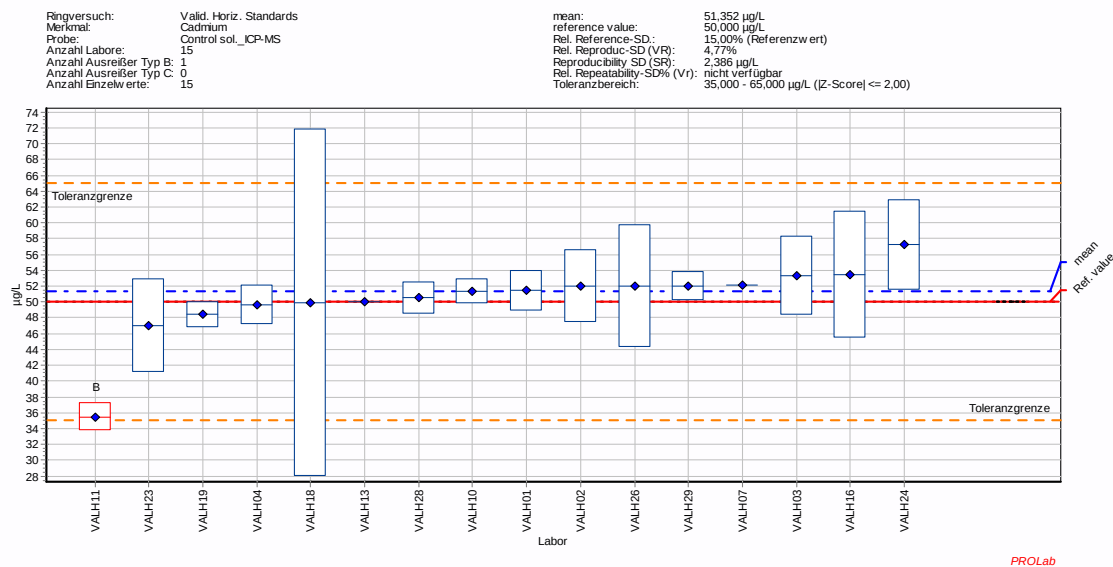
3. ICP-MS measurements, CEN/TS 16171

3.1 Quality control solution: ICP-MS

ICP-MS: QC sol.	Arsenic	Z-Score		Cadmium	Z-Score		Cobalt	Z-Score		Chromium	Z-Score
Unit	µg/L			µg/L			µg/L			µg/L	
VALH01	127,7	0,10		51,4	0,20		76,3	0,10		291,7	-0,20
VALH02	119,0	-0,30		52,0	0,30		69,9	-0,50		309,0	0,20
VALH03	89,6	-1,90		53,3	0,40		76,1	0,10		265,8	-0,80
VALH04	153,0	1,50		49,6	-0,10		73,2	-0,20		298,0	0,00
VALH07	122,5	-0,10		52,1	0,30		67,9	-0,60		306,6	0,10
VALH10	127,4	0,10		51,3	0,20		72,4	-0,20		298,5	0,00
VALH11	111,0	-0,70		35,5	-1,90	B	66,3	-0,80		244,0	-1,20
VALH13	123,0	-0,10		50,0	0,00		69,0	-0,50		319,0	0,40
VALH16	135,0	0,50		53,5	0,50		78,0	0,30		326,0	0,60
VALH18	123,0	-0,10		49,9	0,00		71,4	-0,30		294,0	-0,10
VALH19	135,0	0,50		48,4	-0,20		74,0	-0,10		315,0	0,30
VALH23	123,0	-0,10		47,0	-0,40		71,3	-0,30		298,0	0,00
VALH24	131,0	0,30		57,2	1,00		72,7	-0,20		288,0	-0,30
VALH26	125,0	0,00		52,0	0,30		71,4	-0,30		299,0	0,00
VALH28	115,6	-0,50		50,5	0,10		69,9	-0,50		284,9	-0,30
VALH29	132,0	0,40		52,0	0,30		80,4	0,50		326,0	0,60
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2			ISO 5725-2	
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0			Z <=2,0	
No. labs	16			16			16			16	
No. labs with val.	16			16			16			16	
Mean	124,5			51,4			72,5			297,7	
Reference value	125			50			75			300	
Ref.-SD	18,75			7,5			11,25			45	
SR Reprod. SD	13,34			2,386			3,76			21,25	
RSD % VR	10,67%			4,77%			5,01%			7,08%	
No. A outliers	0			0			0			0	
No. B outliers	0			1			0			0	
No. C outliers	0			0			0			0	
No. labs accept.	16			15			16			16	
No. values accept.	16			15			16			16	



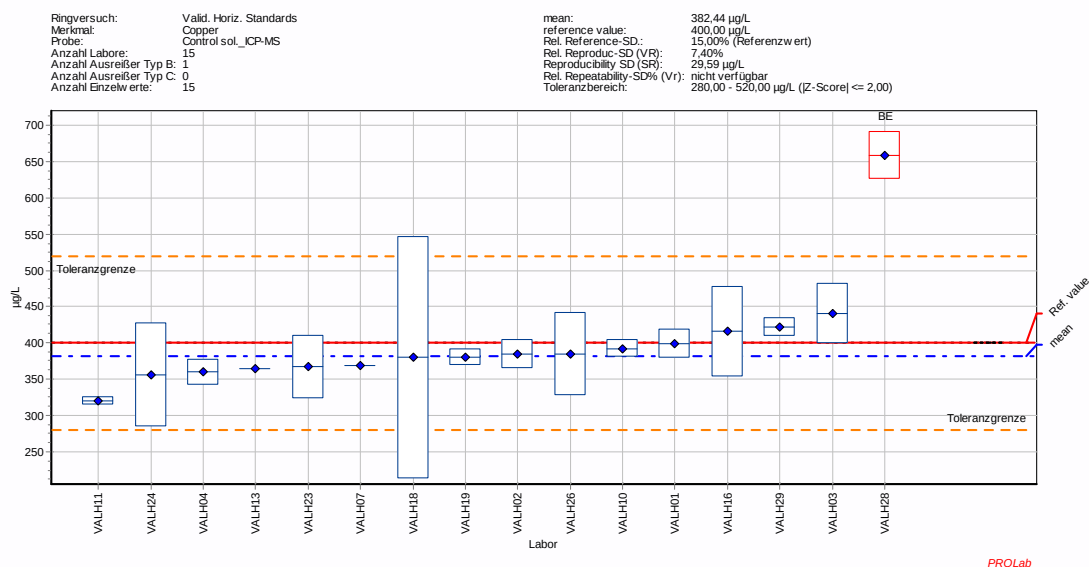
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



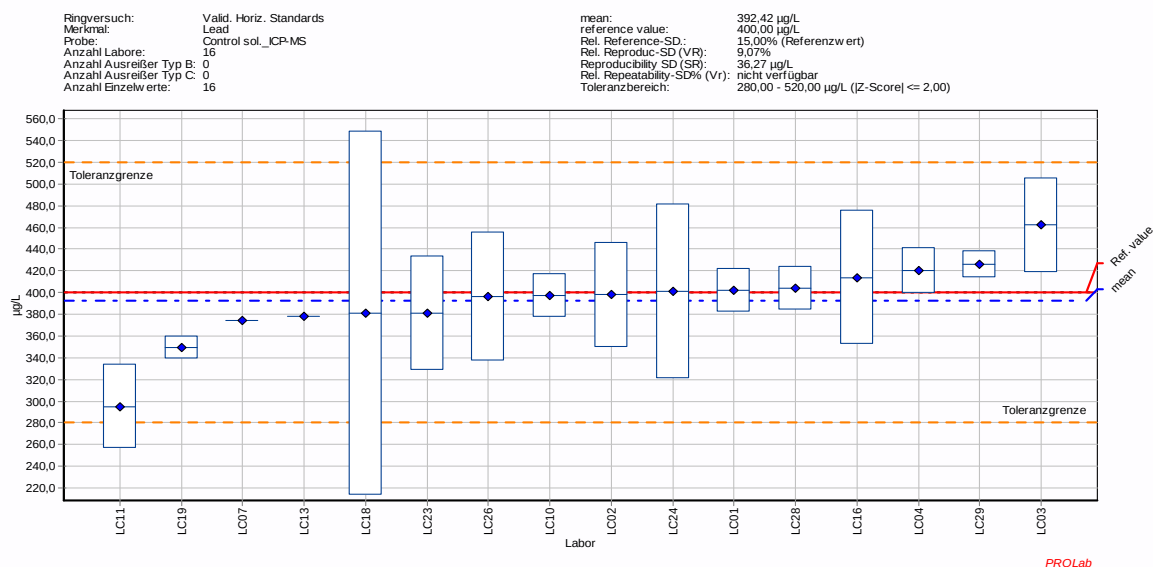
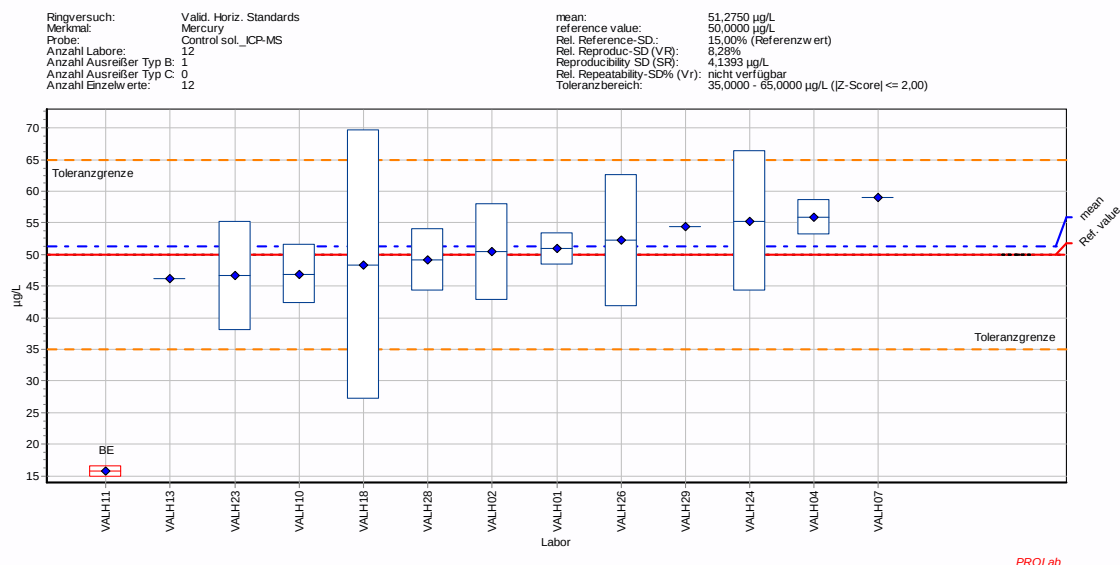
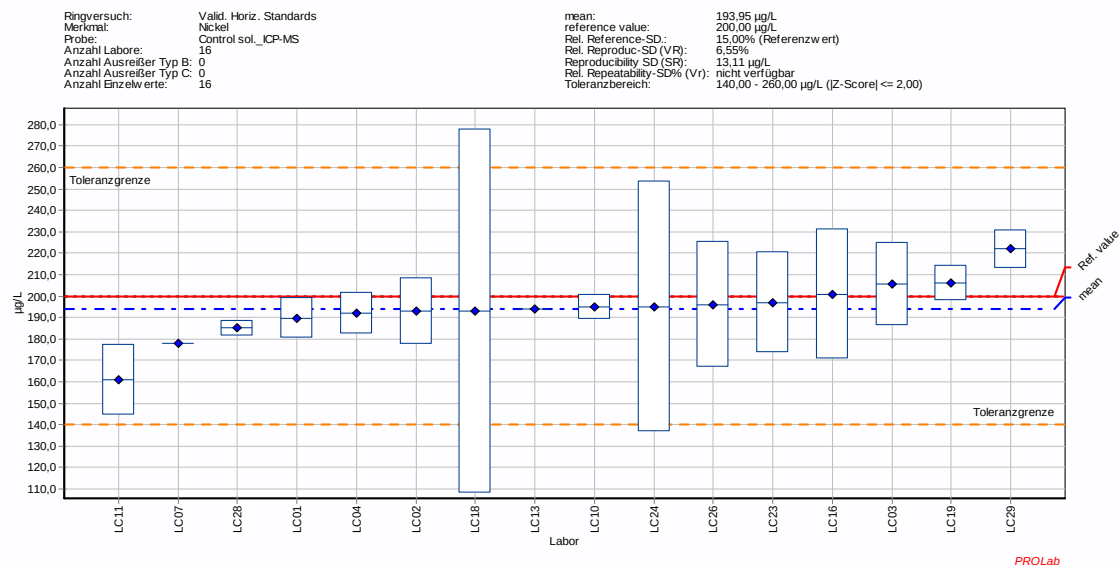
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1
(Teilprojekt „Anorganische Parameter“)

3.1 Quality control solution: ICP-MS measurements (continued)

ICP-MS: QC sol.	Copper	Z-Score		Mercury	Z-Score		Nickel	Z-Score		Lead	Z-Score
Unit	µg/L			µg/L			µg/L			µg/L	
VALH01	398,8	0,00		50,9	0,10		189,7	-0,30		402,2	0,00
VALH02	385,0	-0,30		50,4	0,10		193,0	-0,20		398,0	0,00
VALH03	440,1	0,70					205,6	0,20		462,1	1,00
VALH04	360,0	-0,70		55,9	0,80		192,0	-0,30		420,0	0,30
VALH07	369,3	-0,50		59,0	1,20		178,0	-0,70		374,5	-0,40
VALH10	392,3	-0,10		46,9	-0,40		194,8	-0,20		397,4	0,00
VALH11	320,0	-1,30		15,7	-4,60	BE	161,0	-1,30		295,0	-1,80
VALH13	364,0	-0,60		46,2	-0,50		194,0	-0,20		378,0	-0,40
VALH16	416,0	0,30					201,0	0,00		414,0	0,20
VALH18	380,0	-0,30		48,4	-0,20		193,0	-0,20		381,0	-0,30
VALH19	381,0	-0,30					206,0	0,20		349,0	-0,80
VALH23	367,0	-0,60		46,6	-0,50		197,0	-0,10		381,0	-0,30
VALH24	356,0	-0,70		55,3	0,70		195,0	-0,20		401,0	0,00
VALH26	385,0	-0,30		52,2	0,30		196,0	-0,10		396,0	-0,10
VALH28	658,4	4,30	BE	49,1	-0,10		185,0	-0,50		403,6	0,10
VALH29	422,0	0,40		54,3	0,60		222,0	0,70		426,0	0,40
	–	–	–	–	–	–	–	–	–	–	–
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2			ISO 5725-2	
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0			Z <= 2,0	
No. labs	16			13			16			16	
No. labs with val.	16			13			16			16	
Mean	382,4			51,3			194,0			392,4	
Reference value	400			50			200			400	
Ref.-SD	60			7,5			30			60	
SR Reprod. SD	29,59			4,1393			13,11			36,27	
RSD % VR	7,40%			8,28%			6,55%			9,07%	
No. A outliers	0			0			0			0	
No. B outliers	1			1			0			0	
No. C outliers	0			0			0			0	
No. labs accept.	15			12			16			16	
No. values accept.	15			12			16			16	



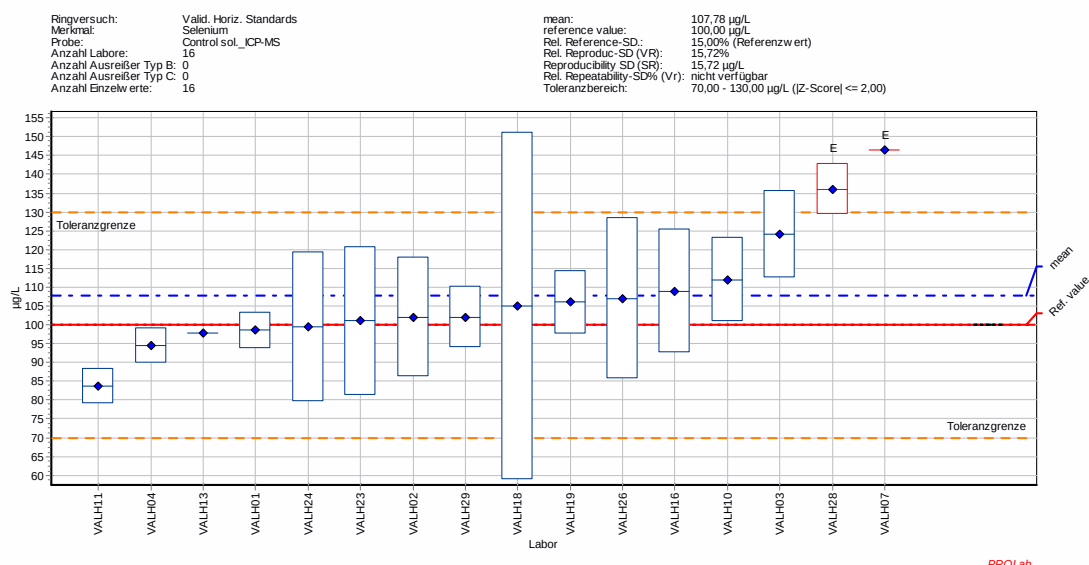
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



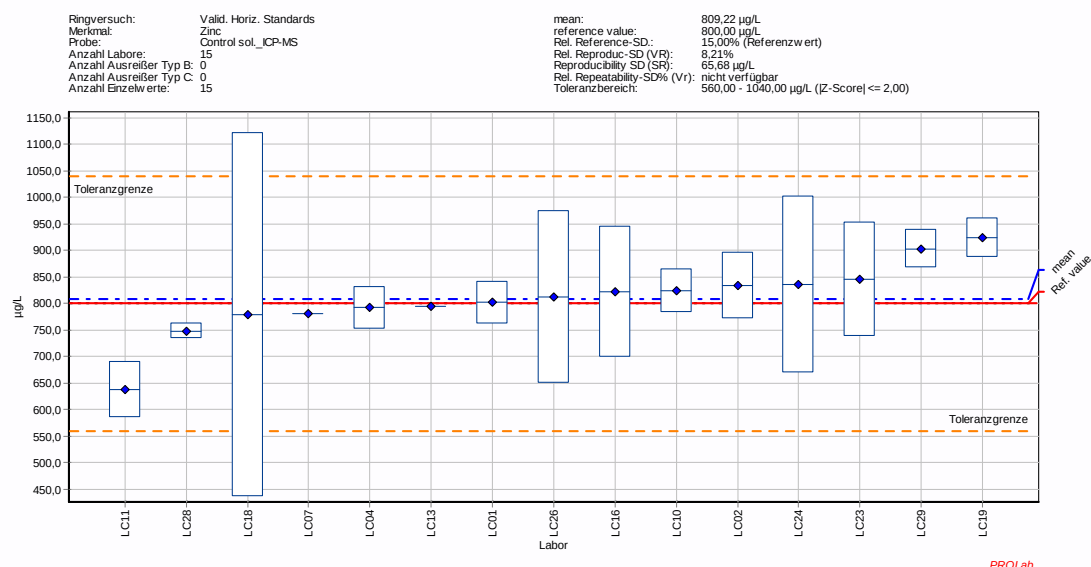
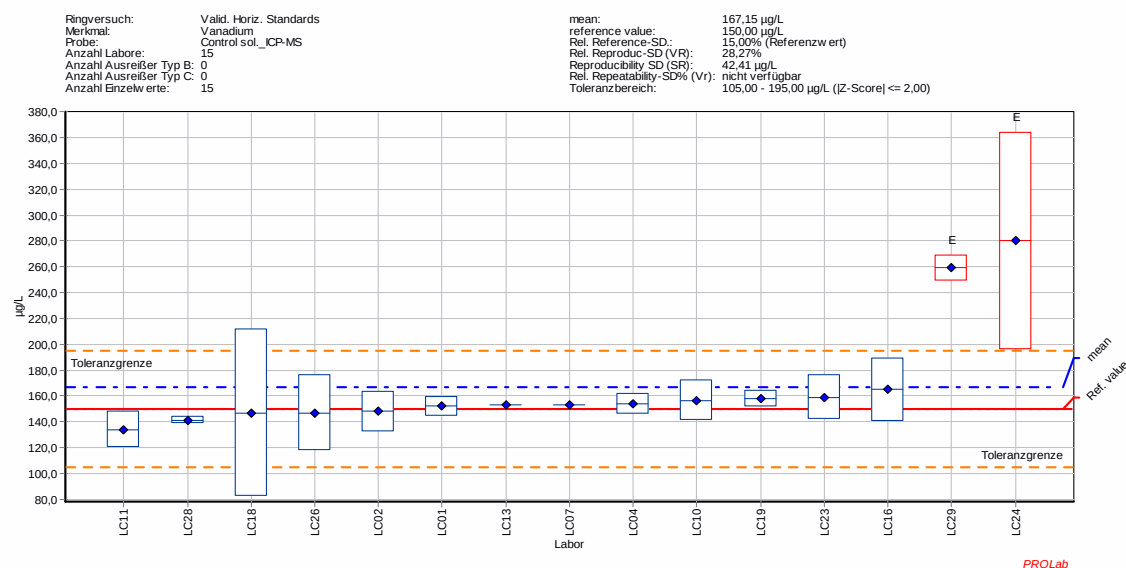
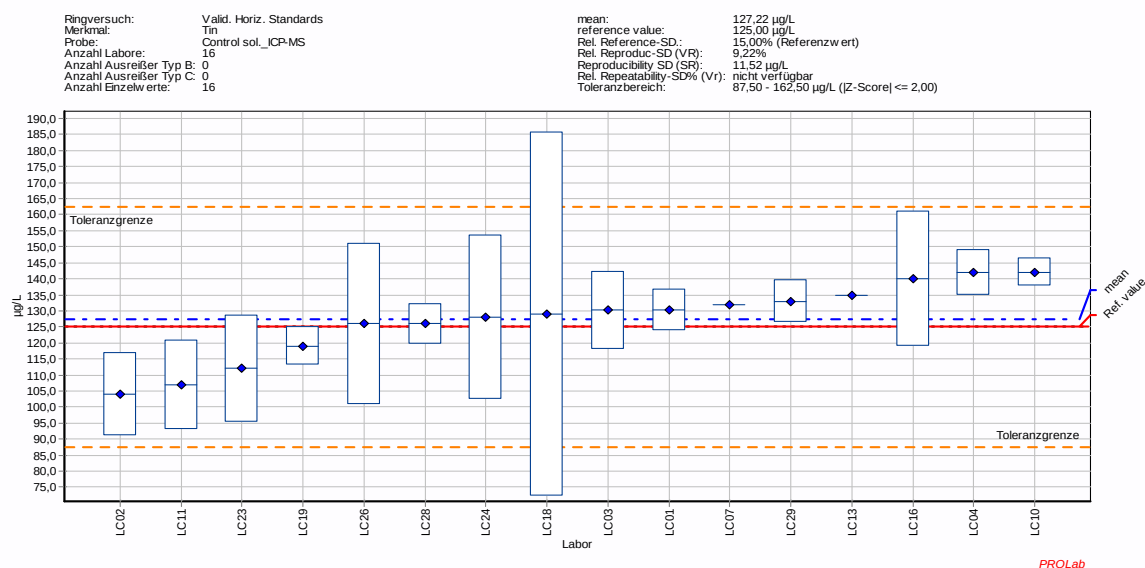
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1
(Teilprojekt „Anorganische Parameter“)

3.1 Quality control solution: ICP-MS measurements (continued)

ICP-MS: QC sol.	Selenium	Z-Score		Tin	Z-Score		Vanadium	Z-Score		Zinc	Z-Score
Unit	µg/L			µg/L			µg/L			µg/L	
VALH01	98,5	-0,10		130,3	0,30		152,0	0,10		801,7	0,00
VALH02	102,0	0,10		104,0	-1,10		148,0	-0,10		834,0	0,30
VALH03	124,0	1,60		130,2	0,30						
VALH04	94,5	-0,40		142,0	0,90		154,0	0,20		792,0	-0,10
VALH07	146,4	3,10	E	131,9	0,40		153,3	0,10		780,5	-0,20
VALH10	112,0	0,80		142,1	0,90		156,7	0,30		824,7	0,20
VALH11	83,7	-1,10		107,0	-1,00		134,0	-0,70		638,0	-1,40
VALH13	97,9	-0,10		135,0	0,50		153,0	0,10		795,0	0,00
VALH16	109,0	0,60		140,0	0,80		165,0	0,70		823,0	0,20
VALH18	105,0	0,30		129,0	0,20		147,0	-0,10		779,0	-0,20
VALH19	106,0	0,40		119,0	-0,30		158,0	0,40		924,0	1,00
VALH23	101,0	0,10		112,0	-0,70		159,0	0,40		846,0	0,40
VALH24	99,5	0,00		128,0	0,20		280,0	5,80	E	836,0	0,30
VALH26	107,0	0,50		126,0	0,10		147,0	-0,10		813,0	0,10
VALH28	136,1	2,40	E	126,0	0,10		141,3	-0,40		748,5	-0,40
VALH29	102,0	0,10		133,0	0,40		259,0	4,80	E	903,0	0,90
	–	–	–	–	–	–	–	–	–	–	–
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2			ISO 5725-2	
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0			Z <= 2,0	
No. labs	16			16			15			15	
No. labs with val.	16			16			15			15	
Mean	107,8			127,2			167,2			809,2	
Reference value	100			125			150			800	
Ref.-SD	15,0			18,75			22,5			120,0	
SR Reprod. SD	15,72			11,52			42,41			65,68	
RSD % VR	15,72%			9,22%			28,27%			8,21%	
No. A outliers	0			0			0			0	
No. B outliers	0			0			0			0	
No. C outliers	0			0			0			0	
No. labs accept.	16			16			15			15	
No. values accept.	16			16			15			15	



UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



3.2 Validation results, ICP-MS measurements for three different digestions procedures:

A1: CEN 16173, nitric acid digestion; microwave 175 °C, 10 min

B1: CEN 16174, aqua regia digestion; Method A (open reflux)

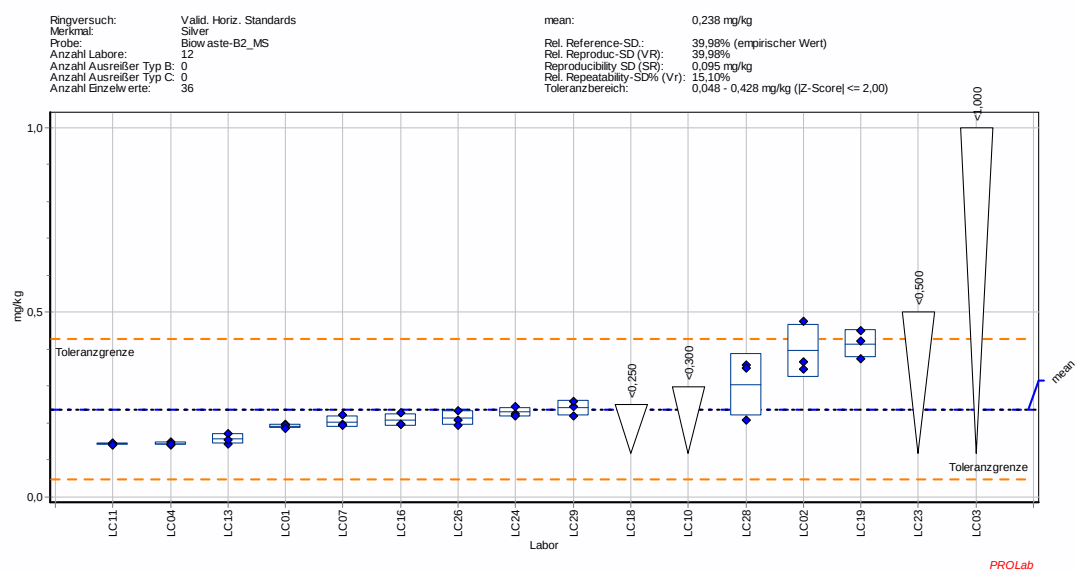
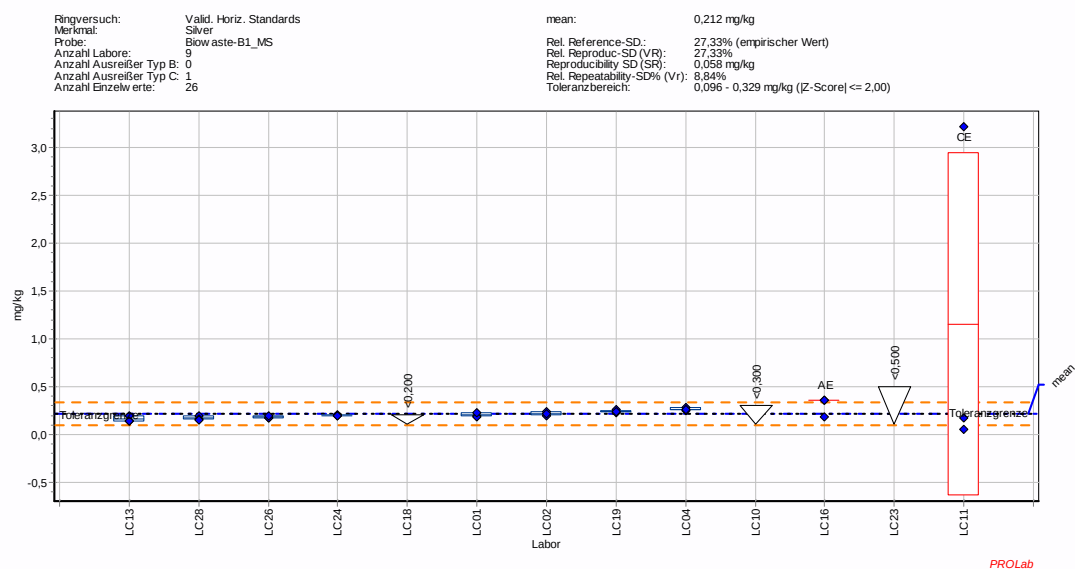
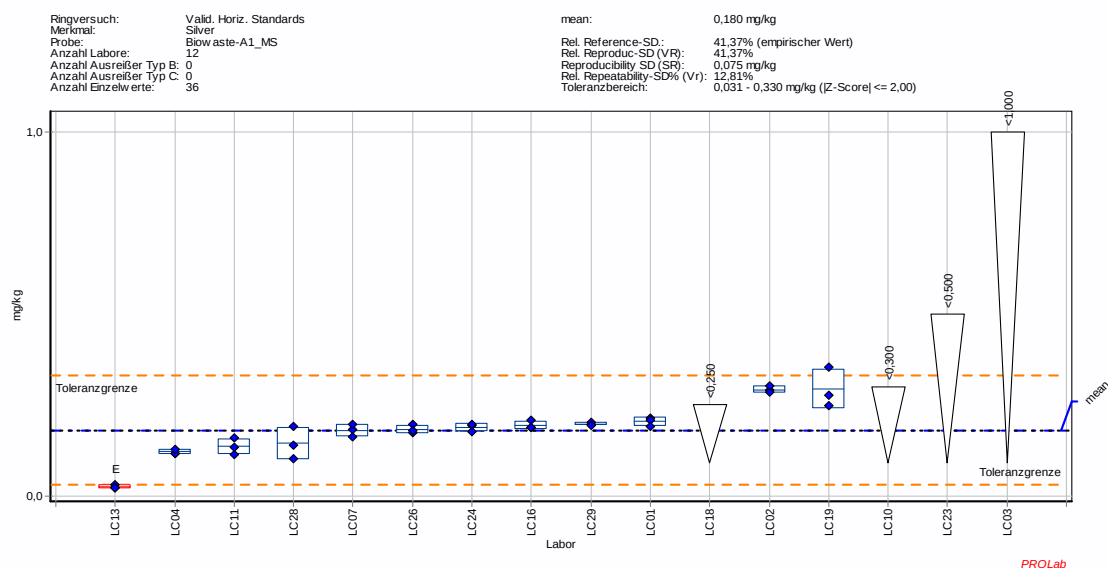
B2: CEN 16174, aqua regia digestion; Method B (microwave, 175 °C, 10 min)

3.2.1.1 Biowaste, ICP-MS: Silver

ICP-MS: Silver	CO-A1_OS	Z-Score		CO-B1_OS	Z-Score		CO-B2_OS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	0,21	0,30		0,20	-0,20		0,19	-0,50	
VALH02	0,29	1,50		0,21	0,00		0,40	1,70	
VALH03	< 1,000						< 1,000		
VALH04	0,12	-0,80		0,26	0,80		0,15	-1,00	
VALH07	0,18	0,00					0,20	-0,40	
VALH10	< 0,300			< 0,300			< 0,300		
VALH11	0,14	-0,60		1,15	16,10	CE	0,14	-1,00	
VALH13	0,03	-2,10	E	0,15	-1,00		0,16	-0,80	
VALH16	0,20	0,20		0,36	2,50	AE	0,21	-0,30	
VALH18	< 0,250			< 0,200			< 0,250		
VALH19	0,29	1,50		0,24	0,40		0,42	1,90	
VALH23	< 0,500			< 0,500			< 0,500		
VALH24	0,19	0,10		0,20	-0,30		0,23	-0,10	
VALH26	0,18	0,00		0,18	-0,60		0,21	-0,30	
VALH28	0,15	-0,50		0,17	-0,80		0,31	0,70	
VALH29	0,20	0,20					0,24	0,00	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	16			13			16		
No. labs with val.	12			10			12		
Mean	0,180			0,212			0,238		
SR Reprod. SD	0,075			0,058			0,095		
Sr Repeat. SD	0,023			0,019			0,036		
RSD % VR	41,37%			27,33%			39,98%		
RSD % Vr	12,81%			8,84%			15,10%		
No. A outliers	0			1			0		
No. B outliers	0			0			0		
No. C outliers	0			1			0		
No. labs accept.	12			9			12		
No. values accept.	36			26			36		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

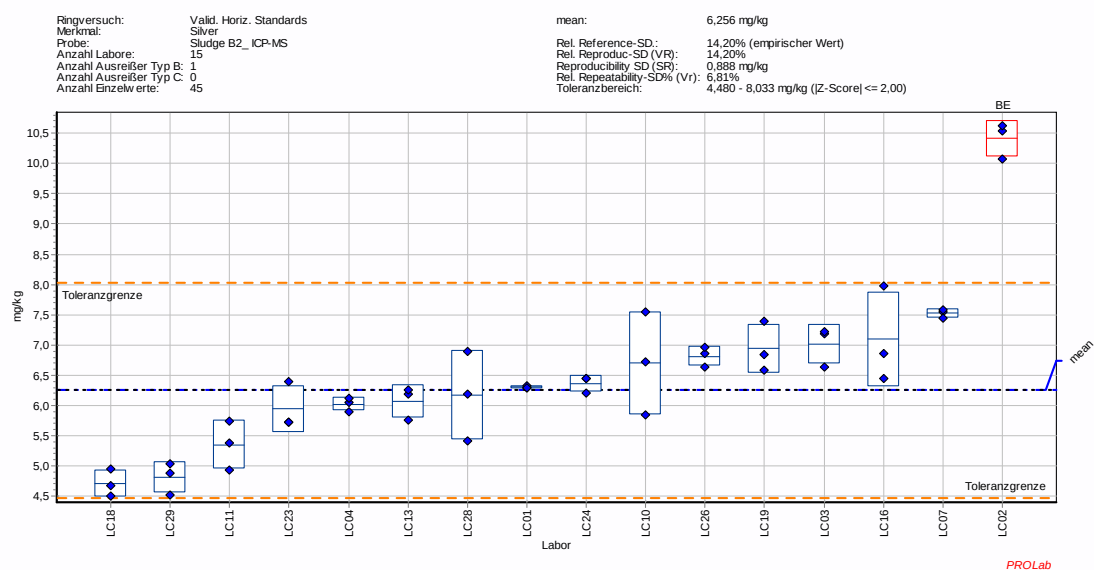
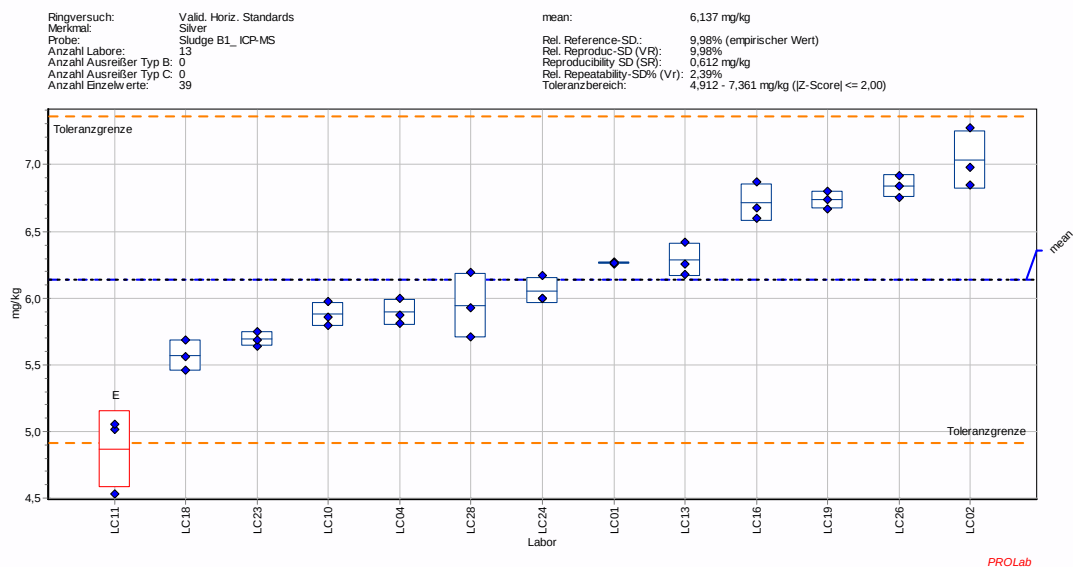
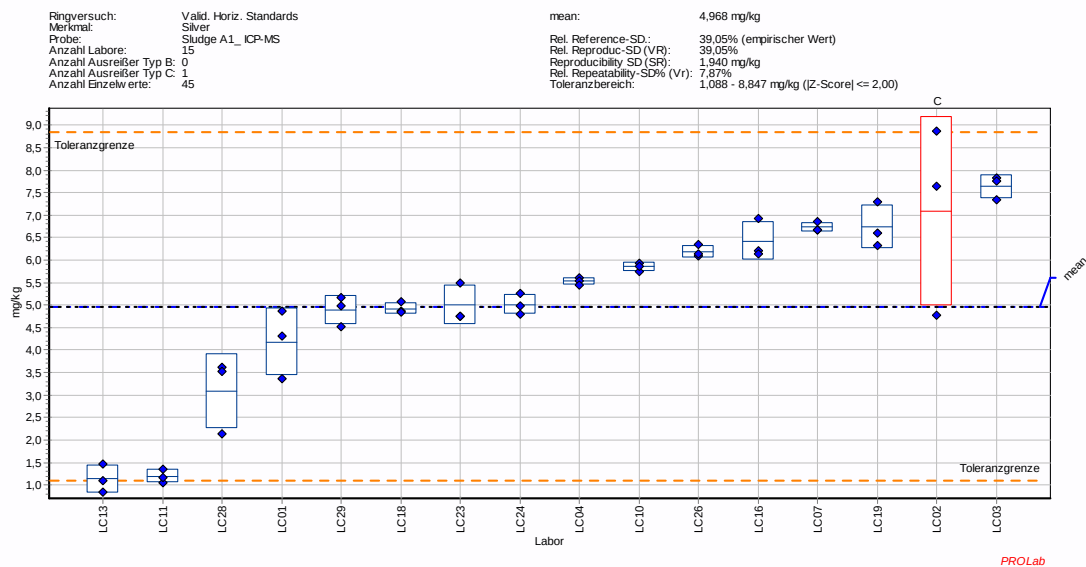


3.2.1.2 Sludge, ICP-MS: Silver

ICP-MS: Silver	SL-A1_MS	Z-Score		SL-B1_MS	Z-Score		SL-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	4,18	-0,40		6,26	0,20		6,31	0,10	
VALH02	7,09	1,10	C	7,04	1,50		10,41	4,70	BE
VALH03	7,64	1,40					7,02	0,90	
VALH04	5,53	0,30		5,90	-0,40		6,03	-0,30	
VALH07	6,73	0,90					7,52	1,40	
VALH10	5,85	0,50		5,88	-0,40		6,70	0,50	
VALH11	1,19	-1,90		4,87	-2,10	E	5,35	-1,00	
VALH13	1,13	-2,00		6,29	0,20		6,07	-0,20	
VALH16	6,43	0,80		6,72	0,90		7,10	0,90	
VALH18	4,92	0,00		5,57	-0,90		4,71	-1,70	
VALH19	6,74	0,90		6,74	1,00		6,94	0,80	
VALH23	5,00	0,00		5,69	-0,70		5,94	-0,40	
VALH24	5,01	0,00		6,06	-0,10		6,36	0,10	
VALH26	6,19	0,60		6,84	1,10		6,82	0,60	
VALH28	3,09	-1,00		5,94	-0,30		6,17	-0,10	
VALH29	4,89	0,00					4,82	-1,60	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	$ Z \leq 2,0$			$ Z \leq 2,0$			$ Z \leq 2,0$		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	4,968			6,137			6,256		
SR Reprod. SD	1,94			0,612			0,888		
Sr Repeat. SD	0,391			0,147			0,426		
RSD % VR	39,05%			9,98%			14,20%		
RSD % Vr	7,87%			2,39%			6,81%		
No. A outliers	0			0			0		
No. B outliers	0			0			1		
No. C outliers	1			0			0		
No. labs accept.	15			13			15		
No. values accept.	45			39			45		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

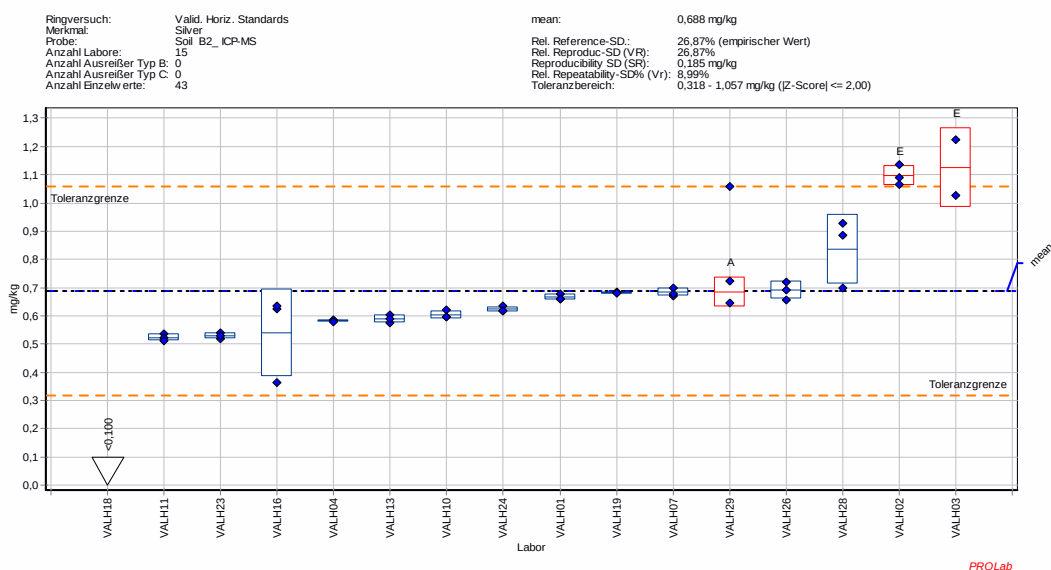
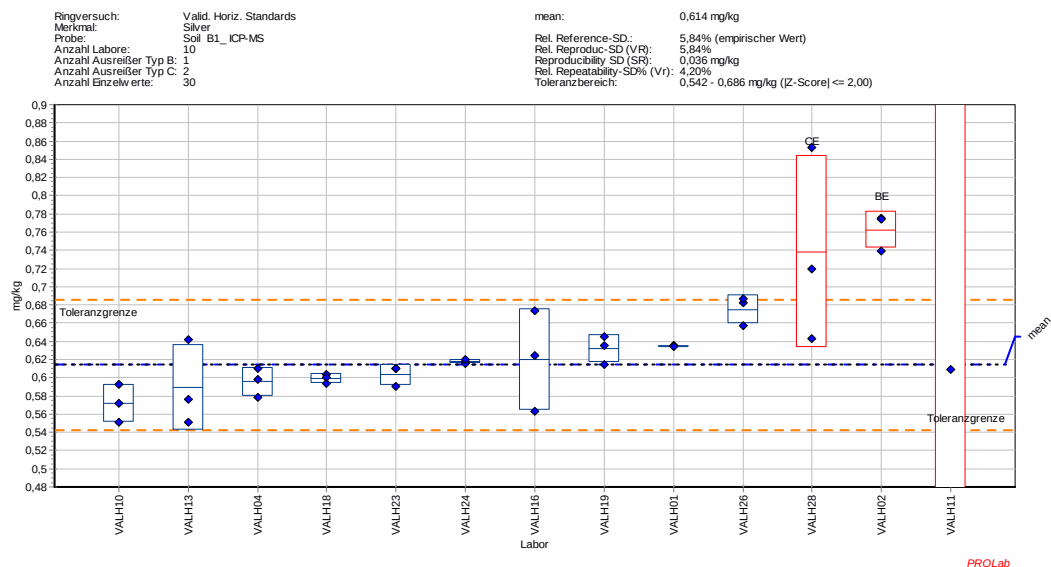
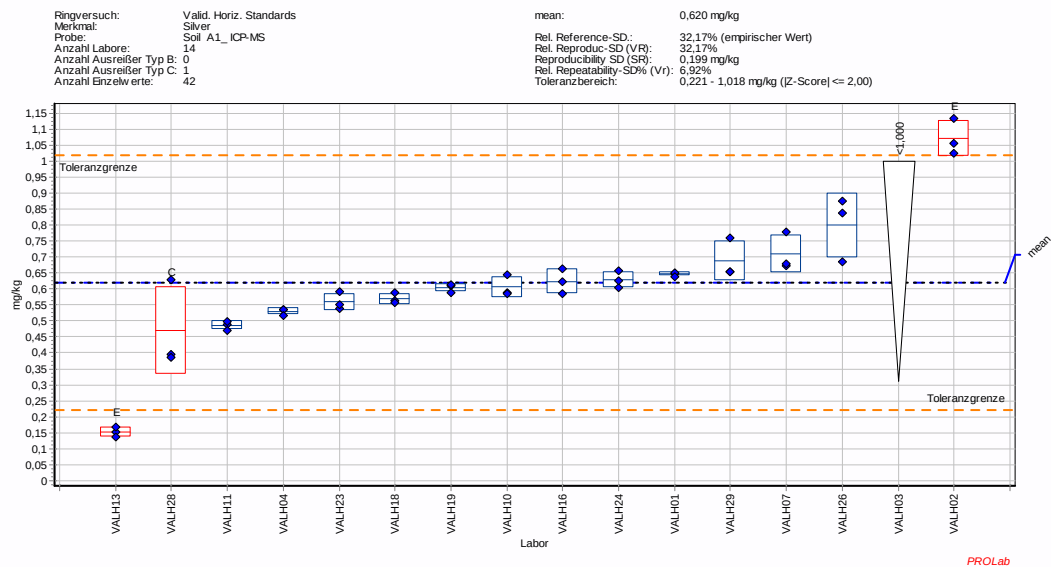


3.2.1.3 Soil, ICP-MS: Silver

ICP-MS: Silver	SO-A1_MS	Z-Score		SO-B1_MS	Z-Score		SO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	0,65	0,10		0,64	0,60		0,67	-0,10	
VALH02	1,07	2,30	E	0,76	4,10	BE	1,10	2,20	E
VALH03	< 1,000						1,13	2,40	E
VALH04	0,53	-0,50		0,60	-0,50		0,58	-0,60	
VALH07	0,71	0,50					0,68	0,00	
VALH10	0,61	-0,10		0,57	-1,20		0,60	-0,50	
VALH11	0,49	-0,70		2,00	38,50	CE	0,52	-0,90	
VALH13	0,15	-2,30	E	0,59	-0,70		0,59	-0,50	
VALH16	0,62	0,00		0,62	0,20		0,54	-0,80	
VALH18	0,57	-0,30		0,60	-0,40		< 0,100		
VALH19	0,60	-0,10		0,63	0,50		0,68	0,00	
VALH23	0,56	-0,30		0,60	-0,30		0,53	-0,90	
VALH24	0,63	0,00		0,62	0,10		0,62	-0,30	
VALH26	0,80	0,90		0,68	1,70		0,69	0,00	
VALH28	0,47	-0,70	C	0,74	3,50	CE	0,84	0,80	
VALH29	0,69	0,30					0,69	0,00	A

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	16			13			16		
No. labs with val.	15			13			15		
Mean	0,620			0,614			0,688		
SR Reprod. SD	0,199			0,036			0,185		
Sr Repeat. SD	0,043			0,026			0,062		
RSD % VR	32,17%			5,84%			26,87%		
RSD % Vr	6,92%			4,20%			8,99%		
No. A outliers	0			0			1		
No. B outliers	0			1			0		
No. C outliers	1			2			0		
No. labs accept.	14			10			15		
No. values accept.	42			30			43		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

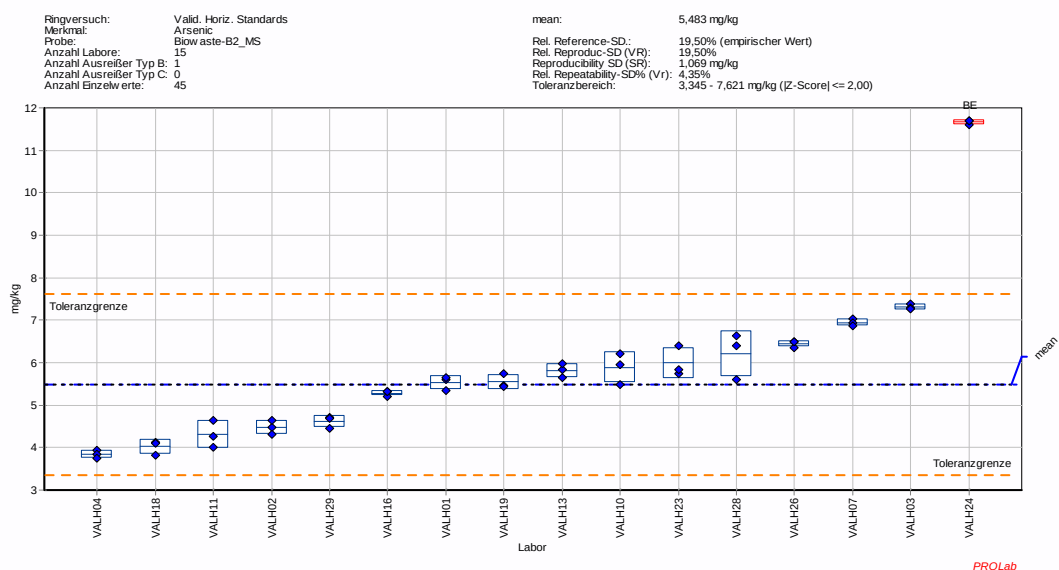
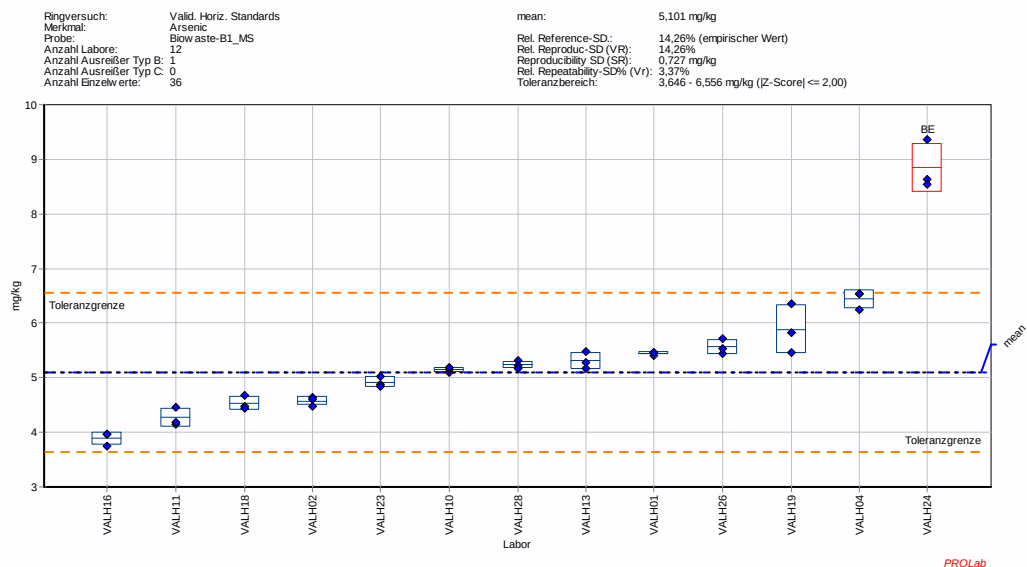
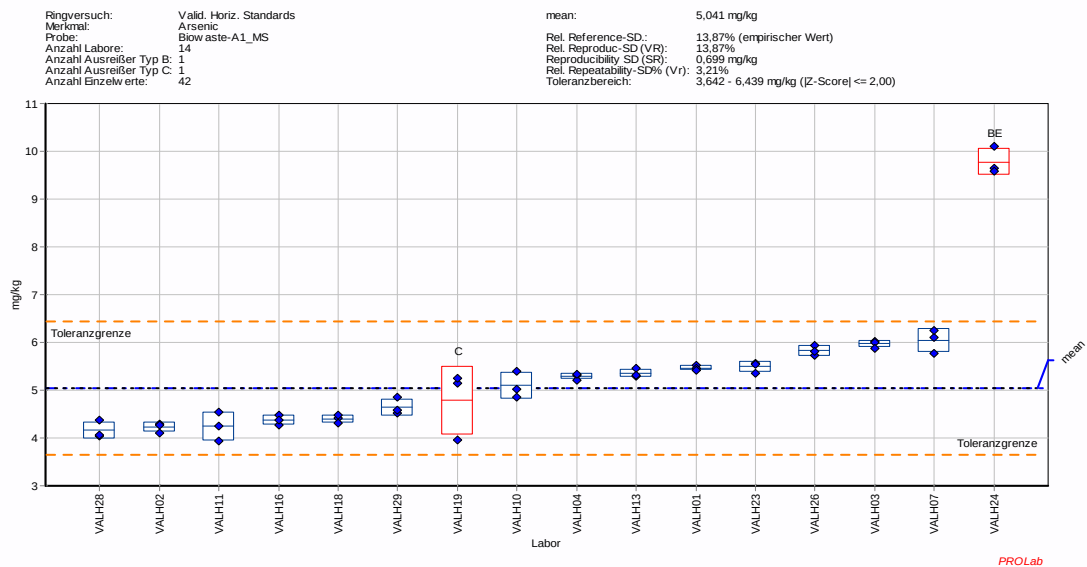


3.2.2.1 Biowaste, ICP-MS: Arsenic

ICP-MS: Arsenic	CO-A1_MS	Z-Score		CO-B1_MS	Z-Score		CO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	5,47	0,60		5,45	0,50		5,53	0,00	
VALH02	4,22	-1,20		4,57	-0,70		4,48	-0,90	
VALH03	5,97	1,30					7,31	1,70	
VALH04	5,29	0,40		6,44	1,80		3,85	-1,50	
VALH07	6,04	1,40					6,94	1,40	
VALH10	5,10	0,10		5,15	0,10		5,89	0,40	
VALH11	4,24	-1,10		4,27	-1,10		4,31	-1,10	
VALH13	5,35	0,40		5,31	0,30		5,81	0,30	
VALH16	4,38	-1,00		3,89	-1,70		5,28	-0,20	
VALH18	4,40	-0,90		4,53	-0,80		4,02	-1,40	
VALH19	4,78	-0,40	C	5,89	1,10		5,55	0,10	
VALH23	5,49	0,60		4,92	-0,20		5,99	0,50	
VALH24	9,78	6,80	BE	8,84	5,10	BE	11,67	5,80	BE
VALH26	5,83	1,10		5,56	0,60		6,44	0,90	
VALH28	4,16	-1,30		5,24	0,20		6,21	0,70	
VALH29	4,65	-0,60					4,62	-0,80	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	$ Z \leq 2,0$			$ Z \leq 2,0$			$ Z \leq 2,0$		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	5,041			5,101			5,483		
SR Reprod. SD	0,699			0,727			1,069		
Sr Repeat. SD	0,162			0,172			0,238		
RSD % VR	13,87%			14,26%			19,50%		
RSD % Vr	3,21%			3,37%			4,35%		
No. A outliers	0			0			0		
No. B outliers	1			1			1		
No. C outliers	1			0			0		
No. labs accept.	14			12			15		
No. values accept.	42			36			45		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

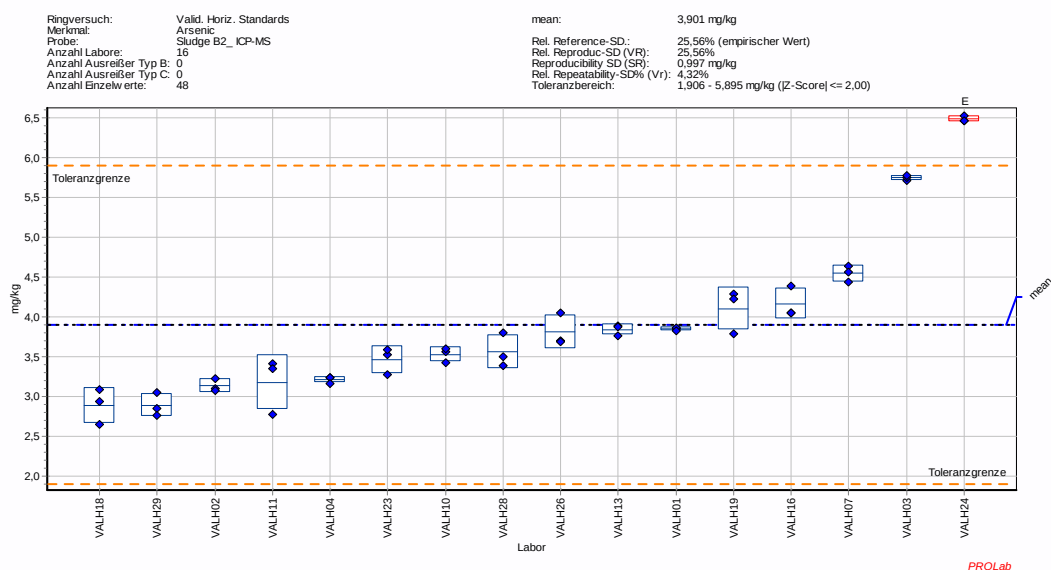
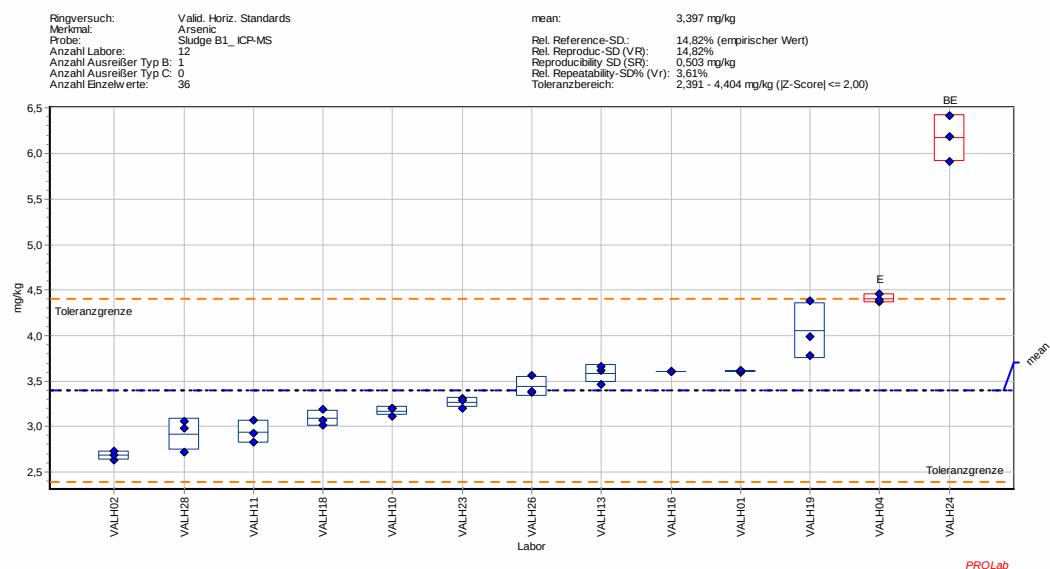
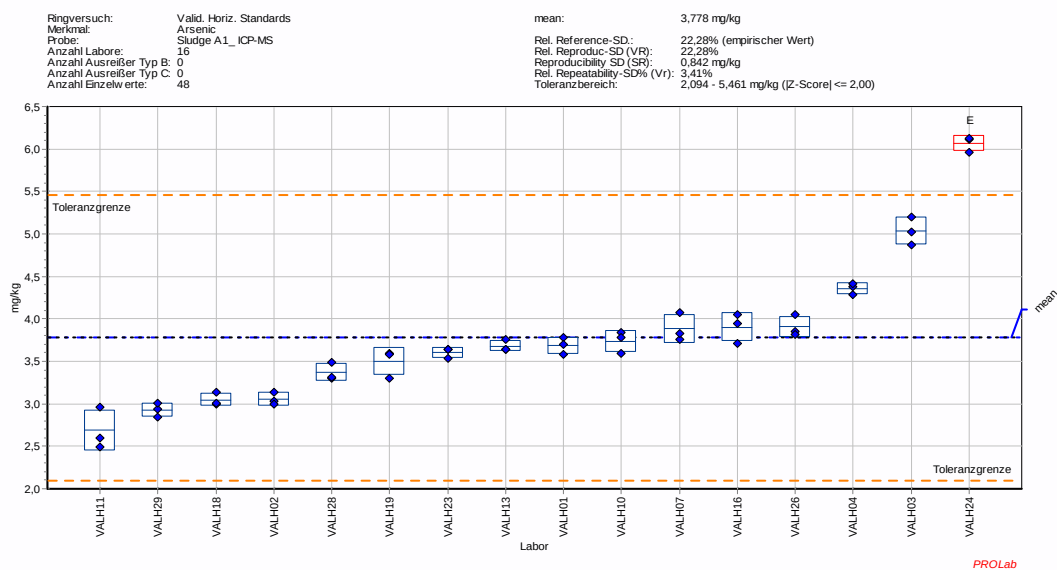


3.2.2.2 Sludge, ICP-MS: Arsenic

ICP-MS: Arsenic	SL-A1_MS	Z-Score		SL-B1_MS	Z-Score		SL-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	3,69	-0,10		3,61	0,40		3,85	-0,10	
VALH02	3,06	-0,90		2,68	-1,40		3,14	-0,80	
VALH03	5,03	1,50					5,74	1,80	
VALH04	4,36	0,70		4,41	2,00	E	3,21	-0,70	
VALH07	3,89	0,10					4,54	0,60	
VALH10	3,74	0,00		3,17	-0,40		3,53	-0,40	
VALH11	2,69	-1,30		2,94	-0,90		3,18	-0,70	
VALH13	3,68	-0,10		3,58	0,40		3,84	-0,10	
VALH16	3,90	0,10		3,60	0,40		4,17	0,30	
VALH18	3,05	-0,90		3,09	-0,60		2,89	-1,00	
VALH19	3,50	-0,30		4,05	1,30		4,10	0,20	
VALH23	3,60	-0,20		3,27	-0,30		3,46	-0,40	
VALH24	6,07	2,70	E	6,17	5,50	BE	6,48	2,60	E
VALH26	3,91	0,20		3,44	0,10		3,81	-0,10	
VALH28	3,37	-0,50		2,92	-0,90		3,56	-0,30	
VALH29	2,93	-1,00					2,89	-1,00	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	$ Z \leq 2,0$			$ Z \leq 2,0$			$ Z \leq 2,0$		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	3,778			3,397			3,901		
SR Reprod. SD	0,842			0,503			0,997		
Sr Repeat. SD	0,129			0,123			0,169		
RSD % VR	22,28%			14,82%			25,56%		
RSD % Vr	3,41%			3,61%			4,32%		
No. A outliers	0			0			0		
No. B outliers	0			1			0		
No. C outliers	0			0			0		
No. labs accept.	16			12			16		
No. values accept.	48			36			48		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

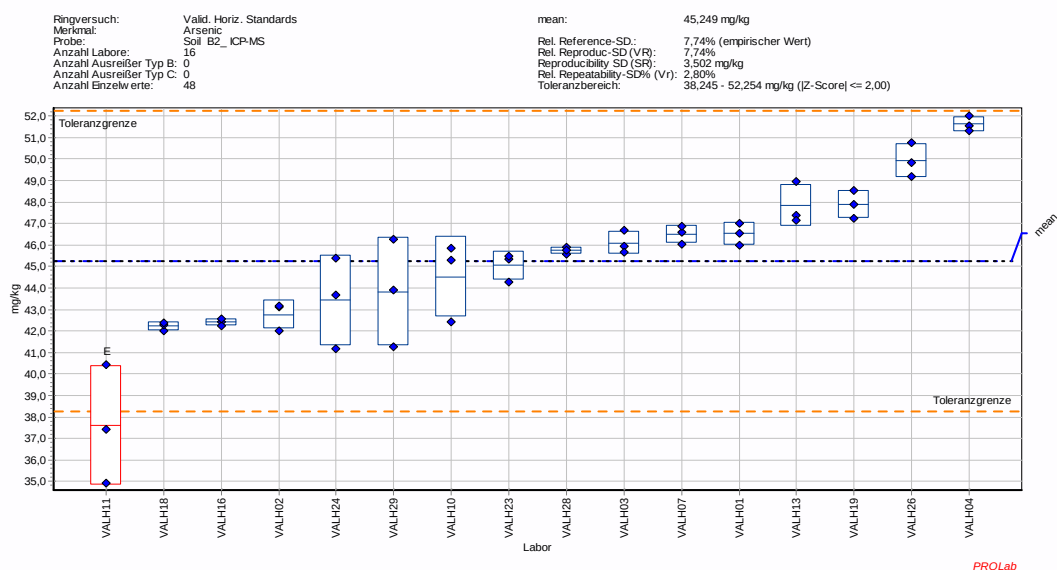
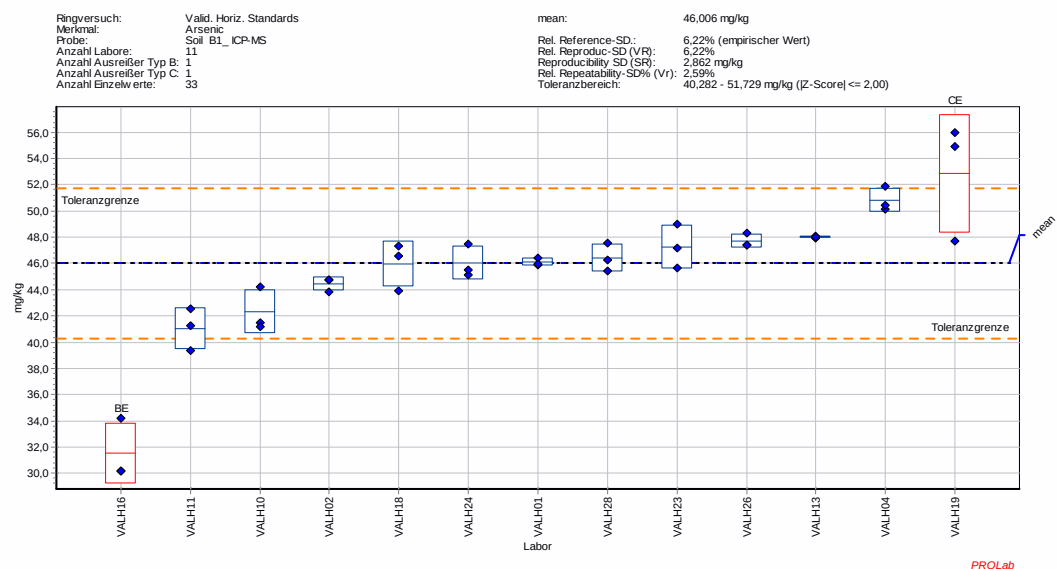
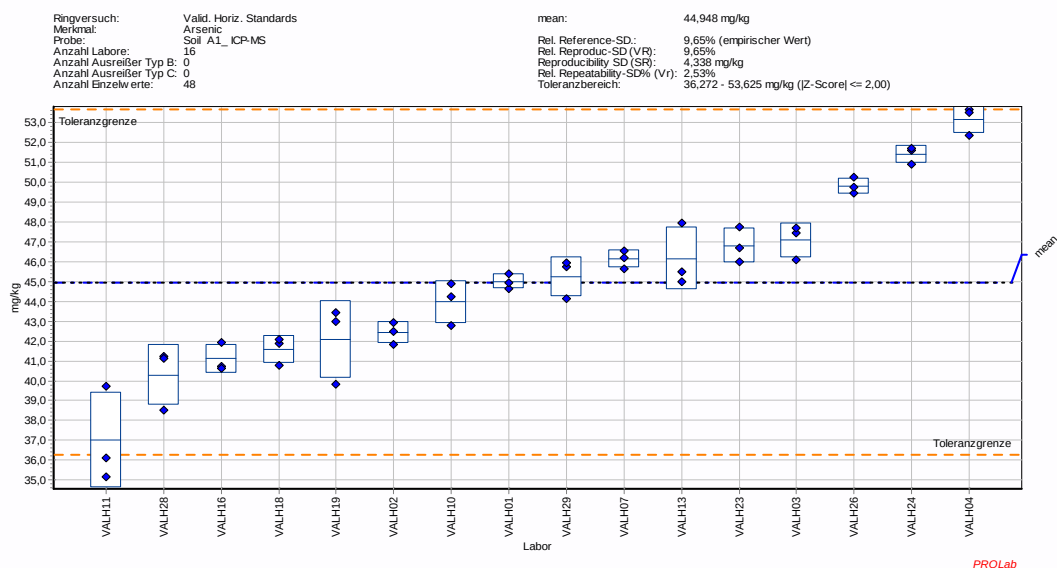


3.2.2.3 Soil, ICP-MS: Arsenic

ICP-MS: Arsenic	SO-A1_MS	Z-Score		SO-B1_MS	Z-Score		SO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	44,98	0,00		46,10	0,00		46,53	0,40	
VALH02	42,42	-0,60		44,44	-0,50		42,76	-0,70	
VALH03	47,06	0,50					46,11	0,20	
VALH04	53,15	1,90		50,80	1,70		51,62	1,80	
VALH07	46,13	0,30					46,50	0,40	
VALH10	43,96	-0,20		42,30	-1,30		44,53	-0,20	E
VALH11	37,01	-1,80		41,04	-1,70		37,60	-2,20	
VALH13	46,14	0,30		48,00	0,70		47,84	0,70	
VALH16	41,11	-0,90		31,52	-5,10	BE	42,42	-0,80	
VALH18	41,58	-0,80		45,96	0,00		42,22	-0,90	
VALH19	42,09	-0,70		52,84	2,40	CE	47,89	0,80	
VALH23	46,80	0,40		47,25	0,40		45,05	-0,10	
VALH24	51,40	1,50		46,03	0,00		43,43	-0,50	
VALH26	49,79	1,10		47,73	0,60		49,92	1,30	
VALH28	40,30	-1,10		46,41	0,10		45,75	0,10	
VALH29	45,24	0,10					43,82	-0,40	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	$ Z \leq 2,0$			$ Z \leq 2,0$			$ Z \leq 2,0$		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	44,948			46,006			45,249		
SR Reprod. SD	4,338			2,862			3,502		
Sr Repeat. SD	1,135			1,19			1,268		
RSD % VR	9,65%			6,22%			7,74%		
RSD % Vr	2,53%			2,59%			2,80%		
No. A outliers	0			0			0		
No. B outliers	0			1			0		
No. C outliers	0			1			0		
No. labs accept.	16			11			16		
No. values accept.	48			33			48		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

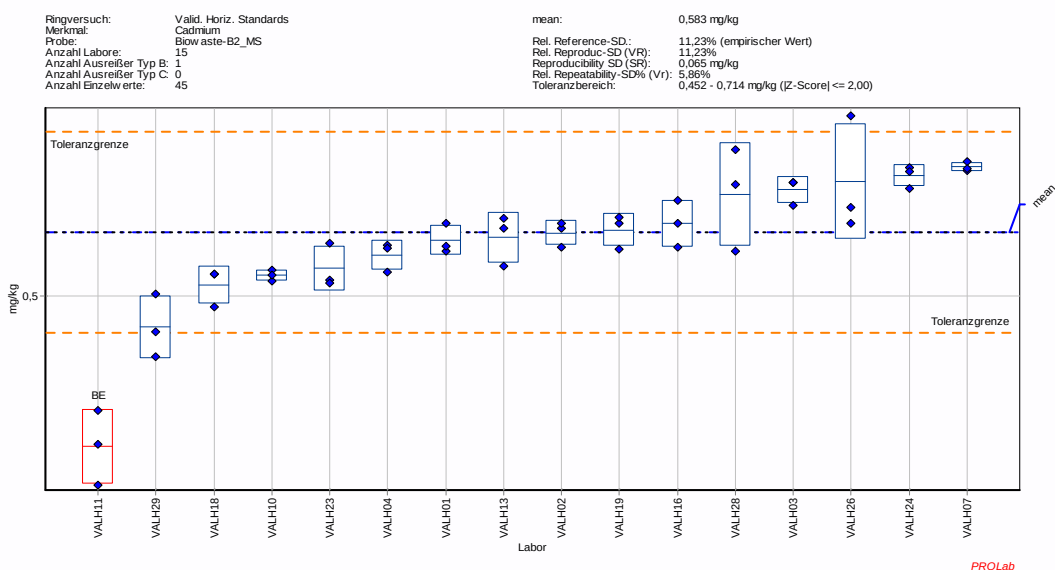
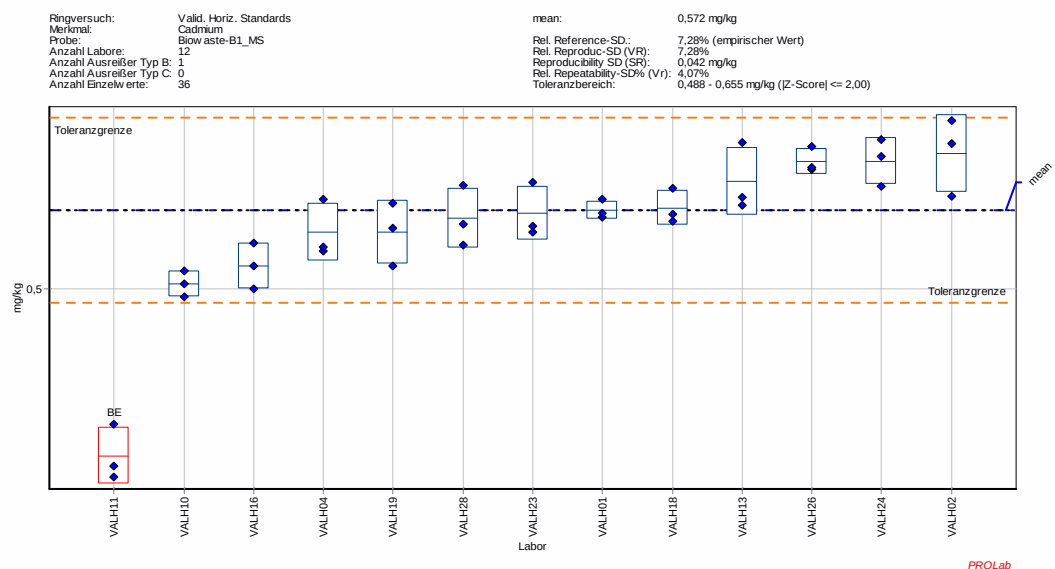
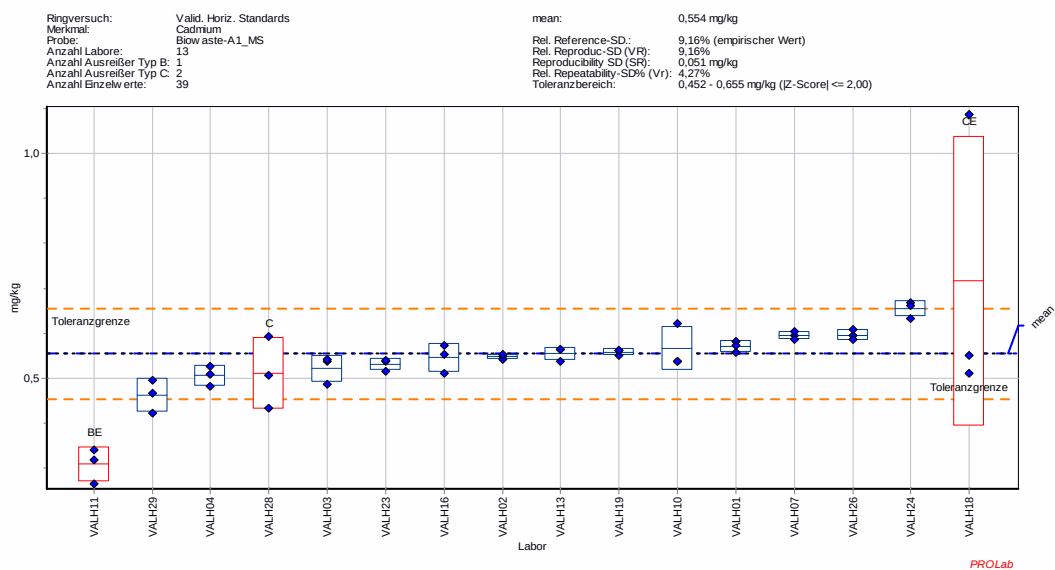


3.2.3.1 Biowaste, ICP-MS: Cadmium

ICP-MS: Cadmium	CO-A1_MS	Z-Score		CO-B1_MS	Z-Score		CO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	0,57	0,30		0,57	0,00		0,57	-0,20	
VALH02	0,55	-0,10		0,62	1,20		0,58	0,00	
VALH03	0,52	-0,60					0,64	0,80	
VALH04	0,51	-1,00		0,55	-0,50		0,55	-0,50	
VALH07	0,60	0,80					0,67	1,30	
VALH10	0,57	0,20		0,51	-1,60		0,53	-0,90	
VALH11	0,31	-4,90	BE	0,35	-5,30	BE	0,30	-4,30	BE
VALH13	0,55	0,00		0,60	0,60		0,58	-0,10	
VALH16	0,55	-0,20		0,52	-1,20		0,59	0,20	
VALH18	0,72	3,20	CE	0,57	0,00		0,51	-1,10	
VALH19	0,56	0,10		0,55	-0,50		0,59	0,00	
VALH23	0,53	-0,50		0,57	-0,10		0,54	-0,70	
VALH24	0,65	2,00		0,62	1,10		0,66	1,10	
VALH26	0,60	0,80		0,62	1,10		0,65	1,00	
VALH28	0,51	-0,90	C	0,56	-0,20		0,63	0,70	
VALH29	0,46	-1,80					0,46	-1,90	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	$ Z \leq 2,0$			$ Z \leq 2,0$			$ Z \leq 2,0$		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	0,554			0,572			0,583		
SR Reprod. SD	0,051			0,042			0,065		
Sr Repeat. SD	0,02			0,02			0,03		
RSD % VR	9,16%			7,28%			11,23%		
RSD % Vr	4,27%			4,07%			5,86%		
No. A outliers	0			0			0		
No. B outliers	1			1			1		
No. C outliers	2			0			0		
No. labs accept.	13			12			15		
No. values accept.	39			36			45		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

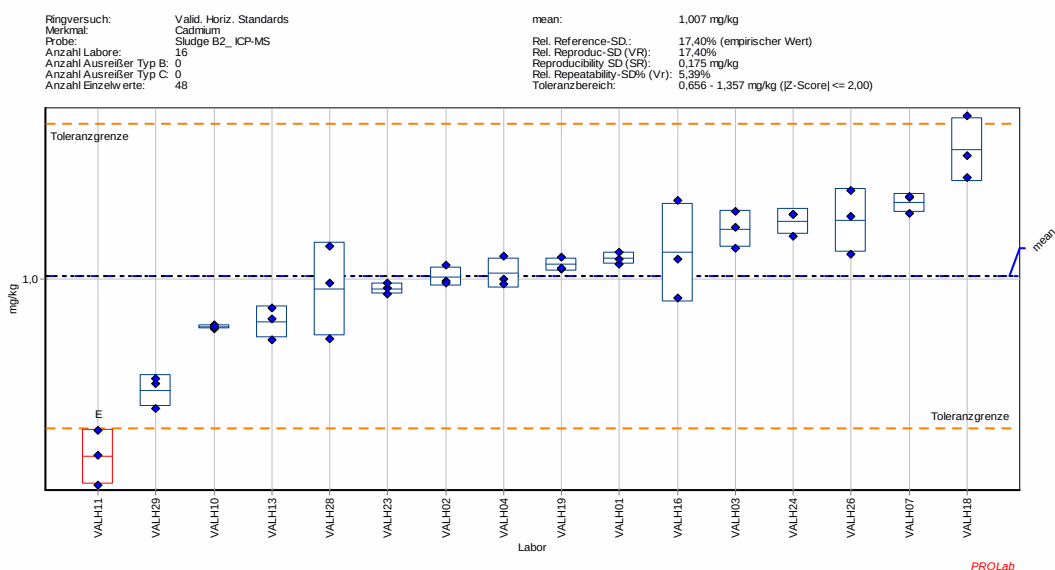
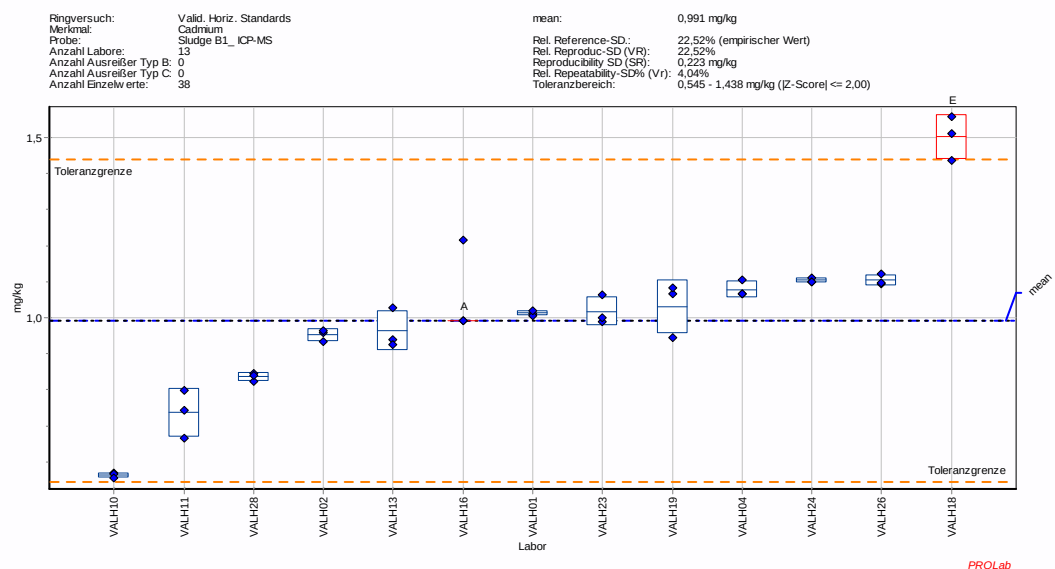
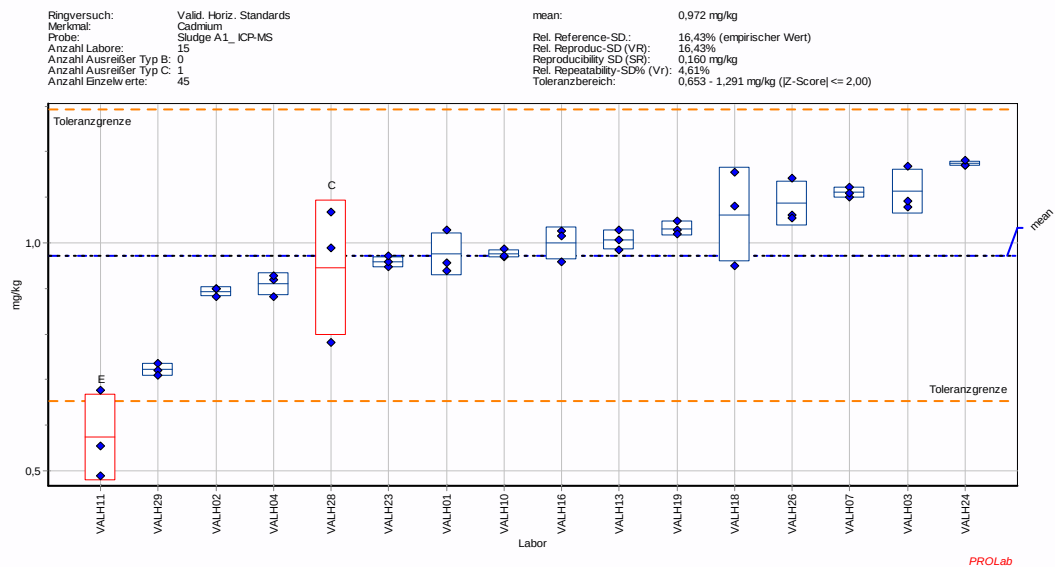


3.2.3.2 Sludge, ICP-MS: Cadmium

ICP-MS: Cadmium	SL-A1_MS	Z-Score		SL-B1_MS	Z-Score		SL-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	0,97	0,00		1,01	0,10		1,05	0,20	
VALH02	0,89	-0,50		0,95	-0,20		1,01	0,00	
VALH03	1,11	0,90					1,12	0,60	
VALH04	0,91	-0,40		1,08	0,40		1,01	0,00	
VALH07	1,11	0,90					1,18	1,00	
VALH10	0,98	0,00		0,56	-1,90		0,89	-0,70	
VALH11	0,57	-2,50	E	0,74	-1,10		0,59	-2,40	E
VALH13	1,01	0,20		0,96	-0,10		0,90	-0,60	
VALH16	1,00	0,20		0,99	0,00	A	1,06	0,30	
VALH18	1,06	0,60		1,50	2,30	E	1,30	1,70	
VALH19	1,03	0,40		1,03	0,20		1,03	0,20	
VALH23	0,96	-0,10		1,02	0,10		0,98	-0,20	
VALH24	1,17	1,30		1,10	0,50		1,13	0,70	
VALH26	1,09	0,70		1,10	0,50		1,14	0,70	
VALH28	0,95	-0,20	C	0,84	-0,70		0,98	-0,20	
VALH29	0,72	-1,60					0,74	-1,50	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	$ Z \leq 2,0$			$ Z \leq 2,0$			$ Z \leq 2,0$		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	0,972			0,991			1,007		
SR Reprod. SD	0,16			0,223			0,175		
Sr Repeat. SD	0,05			0,04			0,05		
RSD % VR	16,43%			22,52%			17,40%		
RSD % Vr	4,61%			4,04%			5,39%		
No. A outliers	0			1			0		
No. B outliers	0			0			0		
No. C outliers	1			0			0		
No. labs accept.	15			13			16		
No. values accept.	45			38			48		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

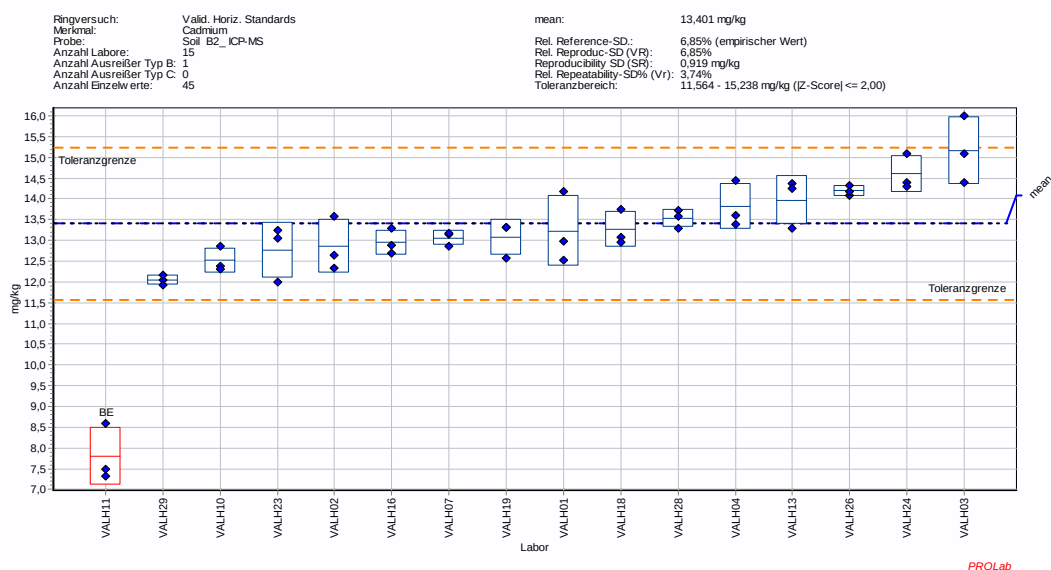
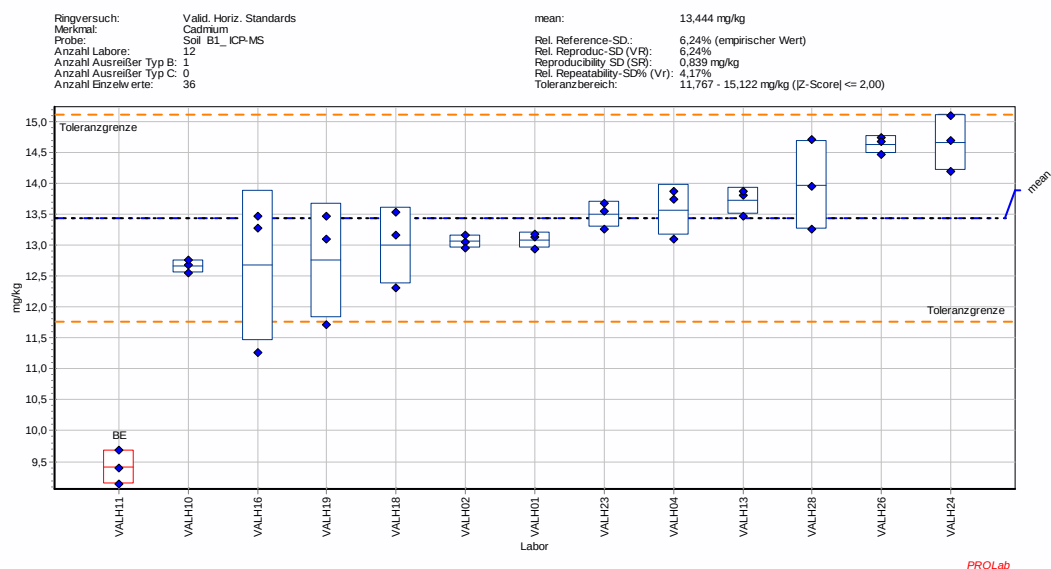
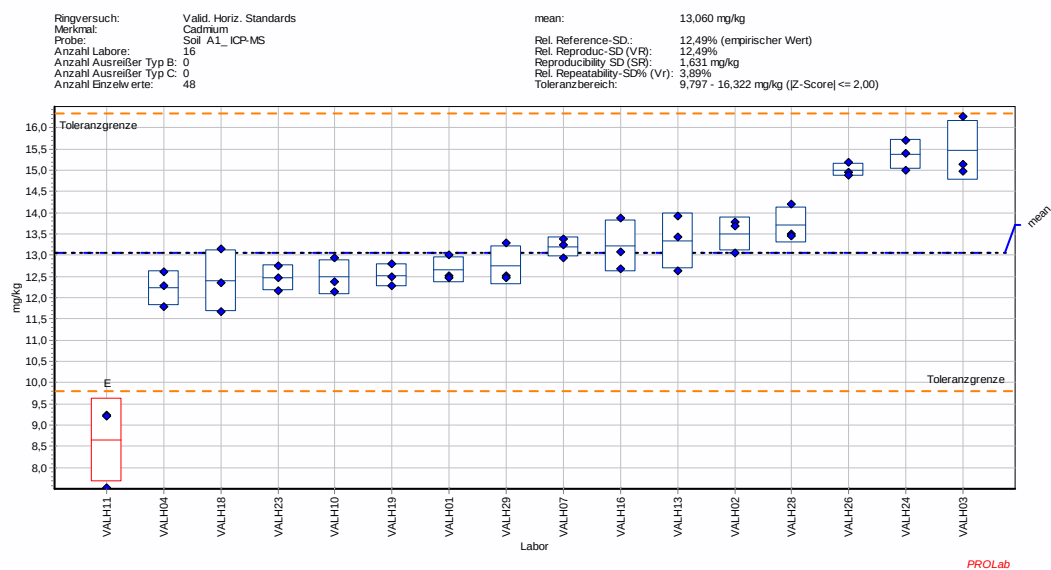


3.2.3.3 Soil, ICP-MS: Cadmium

ICP-MS: Cadmium	SO-A1_MS	Z-Score		SO-B1_MS	Z-Score		SO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	12,66	-0,20		13,09	-0,40		13,23	-0,20	
VALH02	13,51	0,30		13,06	-0,50		12,85	-0,60	
VALH03	15,46	1,50					15,16	1,90	
VALH04	12,22	-0,50		13,58	0,20		13,82	0,50	
VALH07	13,19	0,10					13,06	-0,40	
VALH10	12,49	-0,40		12,66	-0,90		12,52	-1,00	
VALH11	8,66	-2,70	E	9,41	-4,80	BE	7,80	-6,10	BE
VALH13	13,33	0,20		13,72	0,30		13,97	0,60	
VALH16	13,21	0,10		12,68	-0,90		12,95	-0,50	
VALH18	12,40	-0,40		13,00	-0,50		13,26	-0,20	
VALH19	12,53	-0,30		12,76	-0,80		13,07	-0,40	
VALH23	12,47	-0,40		13,50	0,10		12,76	-0,70	
VALH24	15,37	1,40		14,67	1,50		14,60	1,30	
VALH26	15,00	1,20		14,63	1,40		14,19	0,90	
VALH28	13,71	0,40		13,98	0,60		13,53	0,10	
VALH29	12,75	-0,20					12,05	-1,50	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	$ Z \leq 2,0$			$ Z \leq 2,0$			$ Z \leq 2,0$		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	13,06			13,44			13,40		
SR Reprod. SD	1,631			0,839			0,919		
Sr Repeat. SD	0,51			0,56			0,50		
RSD % VR	12,49%			6,24%			6,85%		
RSD % Vr	3,89%			4,17%			3,74%		
No. A outliers	0			0			0		
No. B outliers	0			1			1		
No. C outliers	0			0			0		
No. labs accept.	16			12			15		
No. values accept.	48			36			45		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

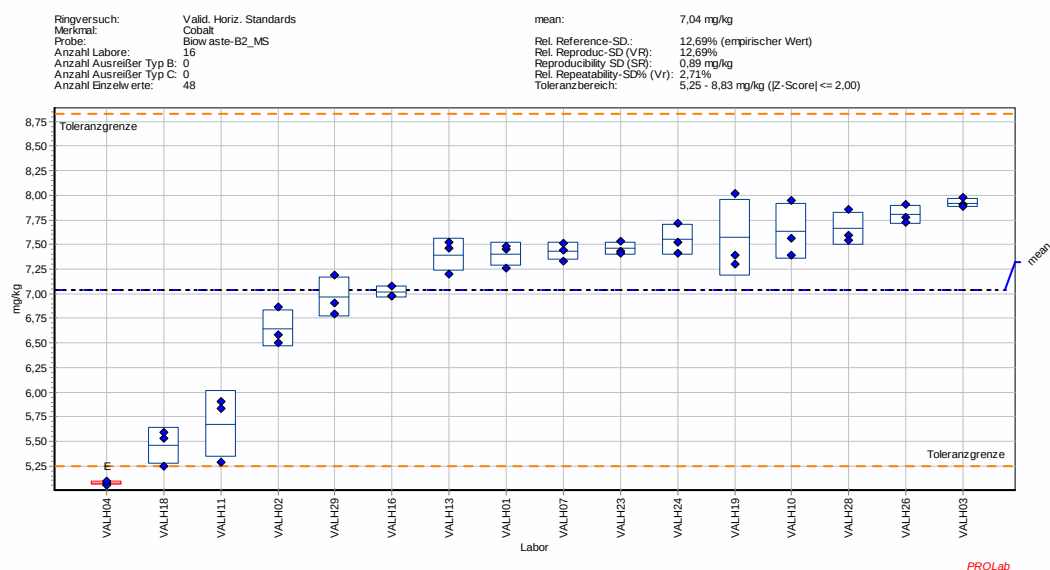
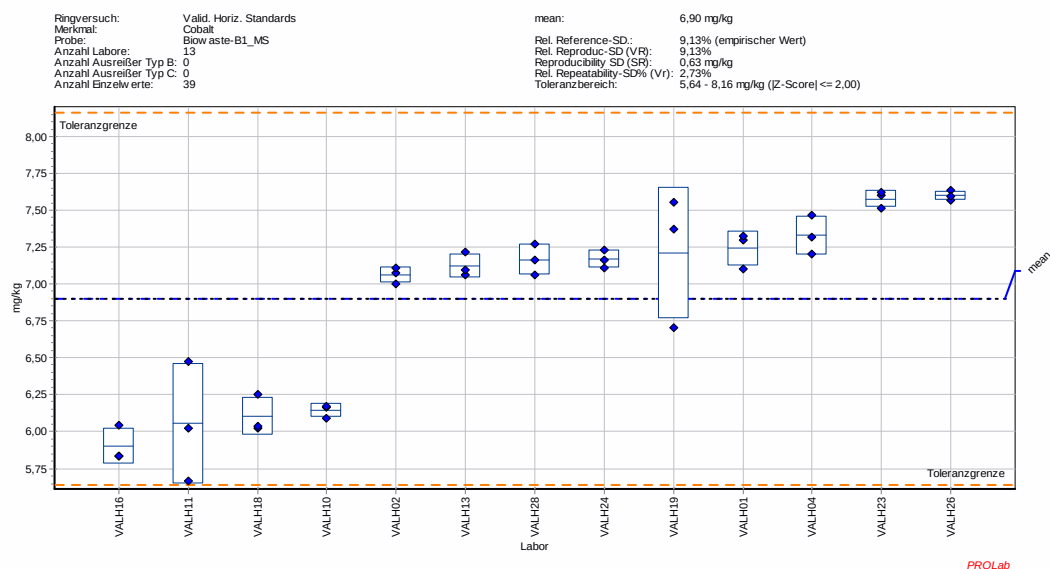
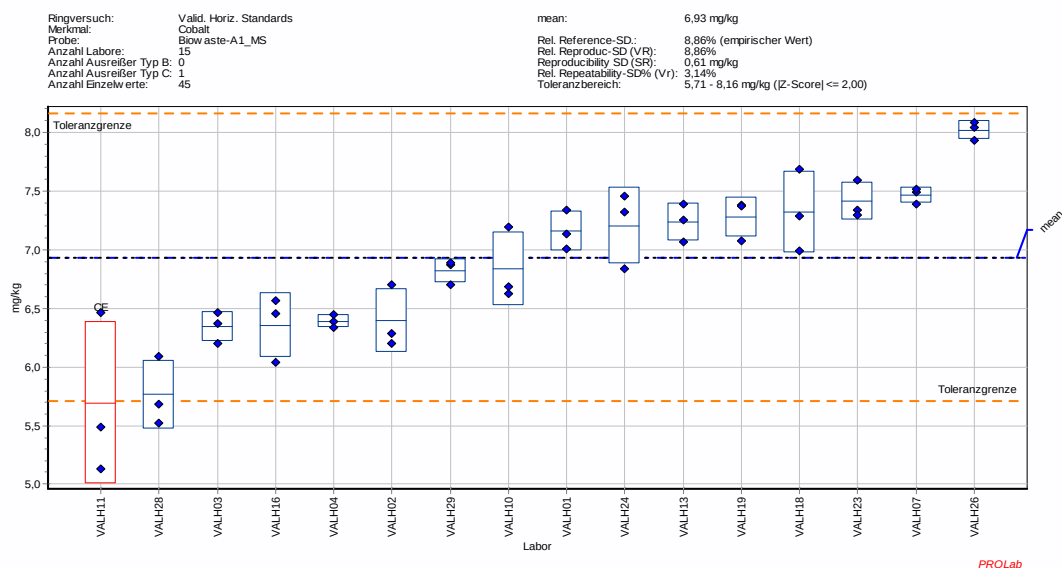


3.2.4.1 Biowaste, ICP-MS: Cobalt

ICP-MS: Cobalt	CO-A1_MS	Z-Score		CO-B1_MS	Z-Score		CO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	7,16	0,40		7,24	0,50		7,40	0,40	
VALH02	6,40	-0,90		7,06	0,30		6,65	-0,40	
VALH03	6,34	-1,00					7,92	1,00	
VALH04	6,39	-0,90		7,33	0,70		5,07	-2,20	E
VALH07	7,47	0,90					7,43	0,40	
VALH10	6,84	-0,20		6,14	-1,20		7,64	0,70	
VALH11	5,69	-2,00	CE	6,05	-1,30		5,68	-1,50	
VALH13	7,24	0,50		7,12	0,40		7,39	0,40	
VALH16	6,35	-0,90		5,90	-1,60		7,01	0,00	
VALH18	7,32	0,60		6,10	-1,30		5,46	-1,80	
VALH19	7,28	0,60		7,21	0,50		7,57	0,60	
VALH23	7,41	0,80		7,58	1,10		7,46	0,50	
VALH24	7,21	0,40		7,17	0,40		7,55	0,60	
VALH26	8,02	1,80		7,60	1,10		7,80	0,90	
VALH28	5,77	-1,90		7,17	0,40		7,66	0,70	
VALH29	6,82	-0,20					6,97	-0,10	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	$ Z \leq 2,0$			$ Z \leq 2,0$			$ Z \leq 2,0$		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	6,934			6,898			7,041		
SR Reprod. SD	0,614			0,63			0,894		
Sr Repeat. SD	0,217			0,188			0,191		
RSD % VR	8,86%			9,13%			12,69%		
RSD % Vr	3,14%			2,73%			2,71%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			0			0		
No. labs accept.	15			13			16		
No. values accept.	45			39			48		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

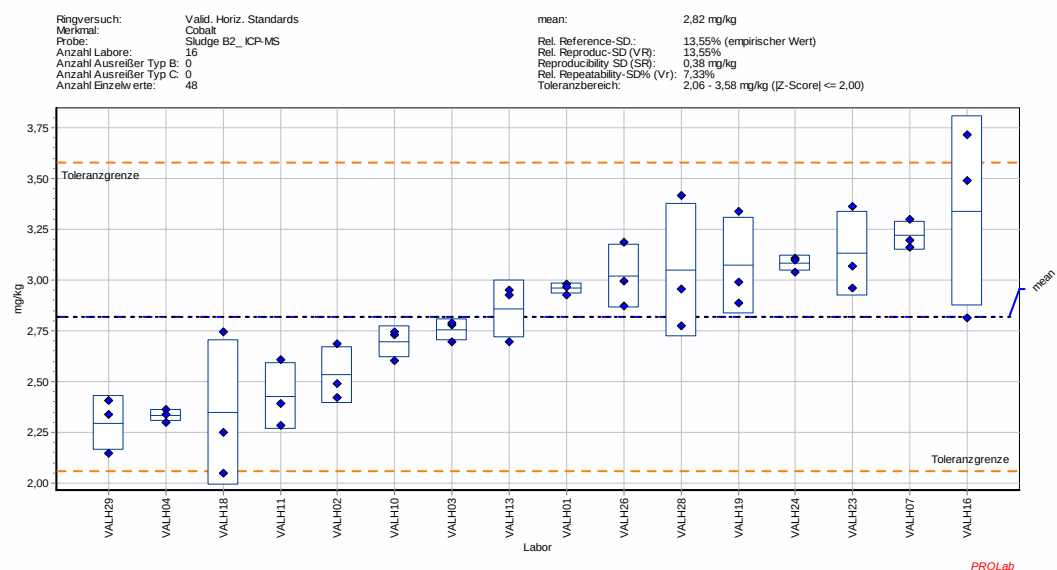
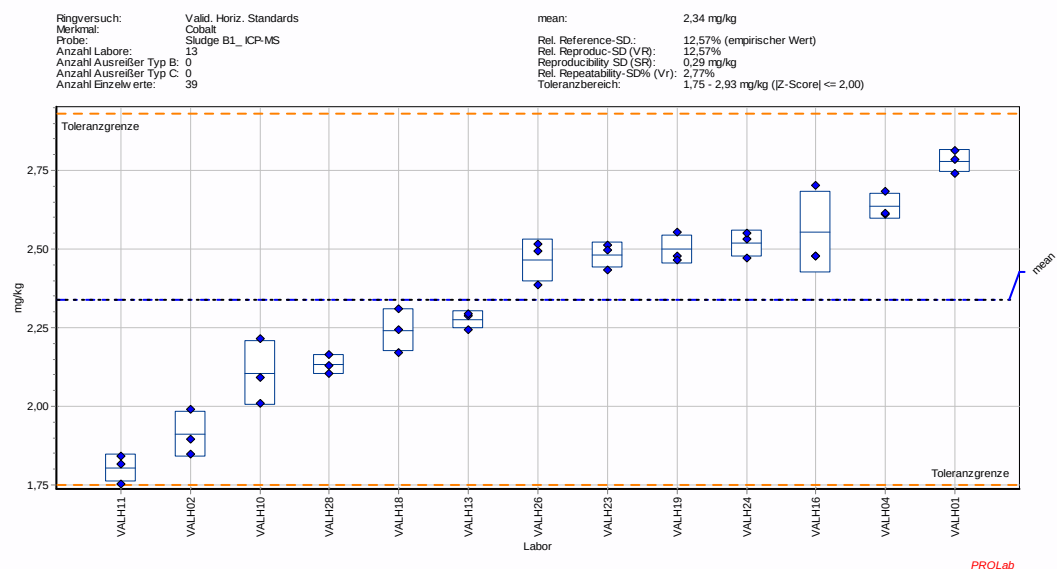
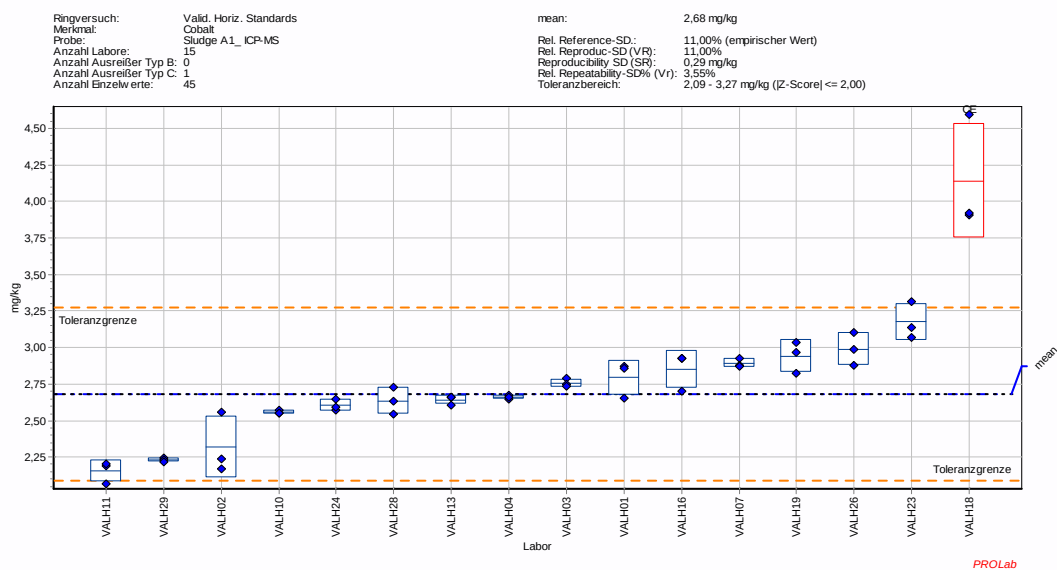


3.2.4.2 Sludge, ICP-MS: Cobalt

ICP-MS: Cobalt	SL-A1_MS	Z-Score		SL-B1_MS	Z-Score		SL-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	2,79	0,40		2,78	1,50		2,96	0,40	
VALH02	2,32	-1,20		1,91	-1,50		2,53	-0,80	
VALH03	2,76	0,30					2,75	-0,20	
VALH04	2,66	-0,10		2,63	1,00		2,33	-1,30	
VALH07	2,89	0,70					3,22	1,00	
VALH10	2,56	-0,40		2,10	-0,80		2,69	-0,30	
VALH11	2,15	-1,80		1,80	-1,80		2,43	-1,00	
VALH13	2,64	-0,10		2,27	-0,20		2,86	0,10	
VALH16	2,85	0,60		2,55	0,70		3,34	1,40	
VALH18	4,14	4,90	CE	2,24	-0,30		2,35	-1,20	
VALH19	2,94	0,90		2,50	0,50		3,07	0,70	
VALH23	3,18	1,70		2,48	0,50		3,13	0,80	
VALH24	2,60	-0,30		2,52	0,60		3,08	0,70	
VALH26	2,99	1,00		2,46	0,40		3,02	0,50	
VALH28	2,64	-0,20		2,13	-0,70		3,05	0,60	
VALH29	2,23	-1,50					2,30	-1,40	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	$ Z \leq 2,0$			$ Z \leq 2,0$			$ Z \leq 2,0$		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	2,681			2,337			2,820		
SR Reprod. SD	0,295			0,294			0,382		
Sr Repeat. SD	0,095			0,065			0,207		
RSD % VR	11,00%			12,57%			13,55%		
RSD % Vr	3,55%			2,77%			7,33%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			0			0		
No. labs accept.	15			13			16		
No. values accept.	45			39			48		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

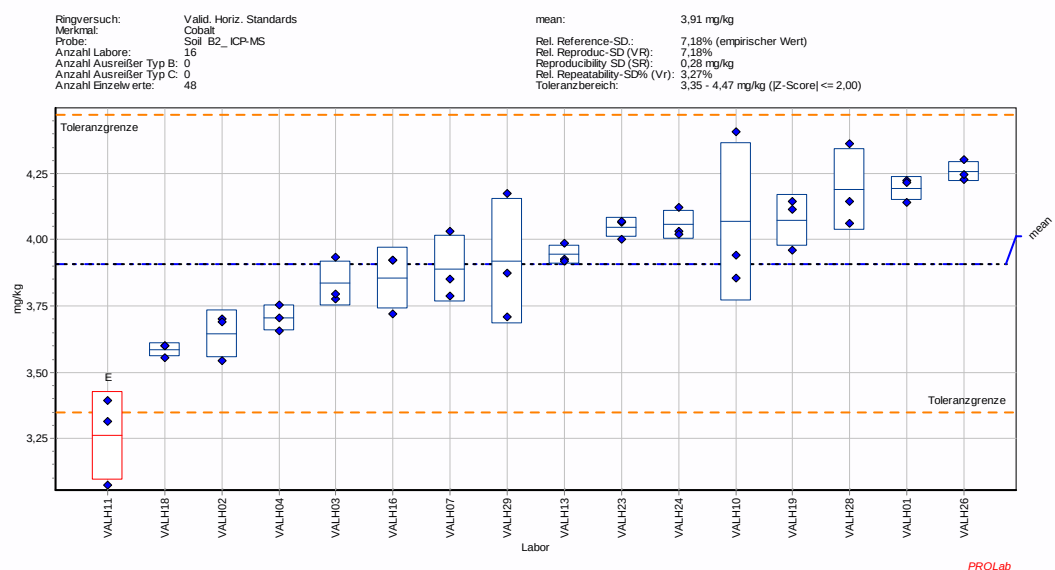
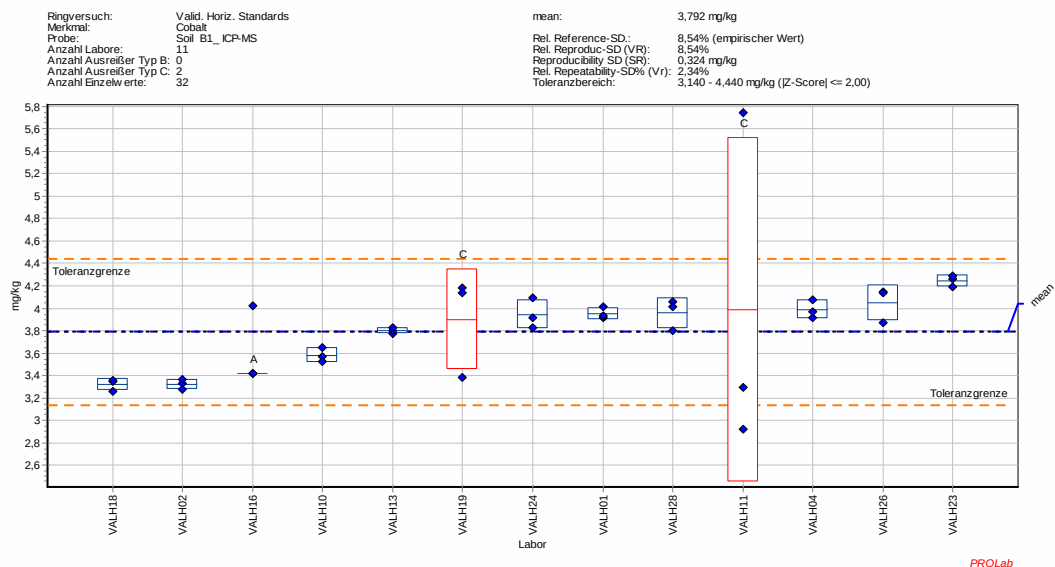
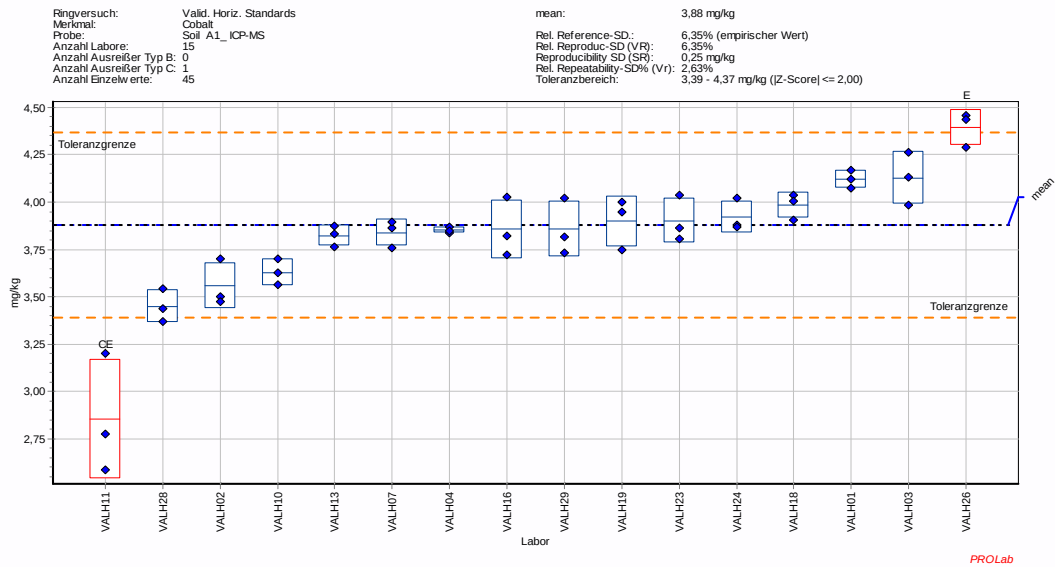


3.2.4.3 Soil, ICP-MS: Cobalt

ICP-MS: Cobalt	SO-A1_MS	Z-Score		SO-B1_MS	Z-Score		SO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	4,12	1,00		3,95	0,50		4,19	1,00	
VALH02	3,56	-1,30		3,32	-1,40		3,65	-0,90	
VALH03	4,13	1,00					3,84	-0,30	
VALH04	3,85	-0,10		3,99	0,60		3,71	-0,70	
VALH07	3,84	-0,20					3,89	-0,10	
VALH10	3,63	-1,00		3,58	-0,70		4,07	0,60	
VALH11	2,86	-4,20	CE	3,99	0,60	C	3,26	-2,30	E
VALH13	3,82	-0,20		3,80	0,00		3,94	0,10	
VALH16	3,86	-0,10		3,42	-1,10	A	3,86	-0,20	
VALH18	3,98	0,40		3,32	-1,50		3,58	-1,20	
VALH19	3,90	0,10		3,90	0,30	C	4,07	0,60	
VALH23	3,90	0,10		4,25	1,40		4,05	0,50	
VALH24	3,92	0,20		3,95	0,50		4,06	0,50	
VALH26	4,39	2,10	E	4,05	0,80		4,26	1,20	
VALH28	3,45	-1,70		3,96	0,50		4,19	1,00	
VALH29	3,86	-0,10					3,92	0,00	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	3,881			3,792			3,908		
SR Reprod. SD	0,247			0,324			0,281		
Sr Repeat. SD	0,102			0,089			0,128		
RSD % VR	6,35%			8,54%			7,18%		
RSD % Vr	2,63%			2,34%			3,27%		
No. A outliers	0			1			0		
No. B outliers	0			0			0		
No. C outliers	1			2			0		
No. labs accept.	15			11			16		
No. values accept.	45			32			48		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

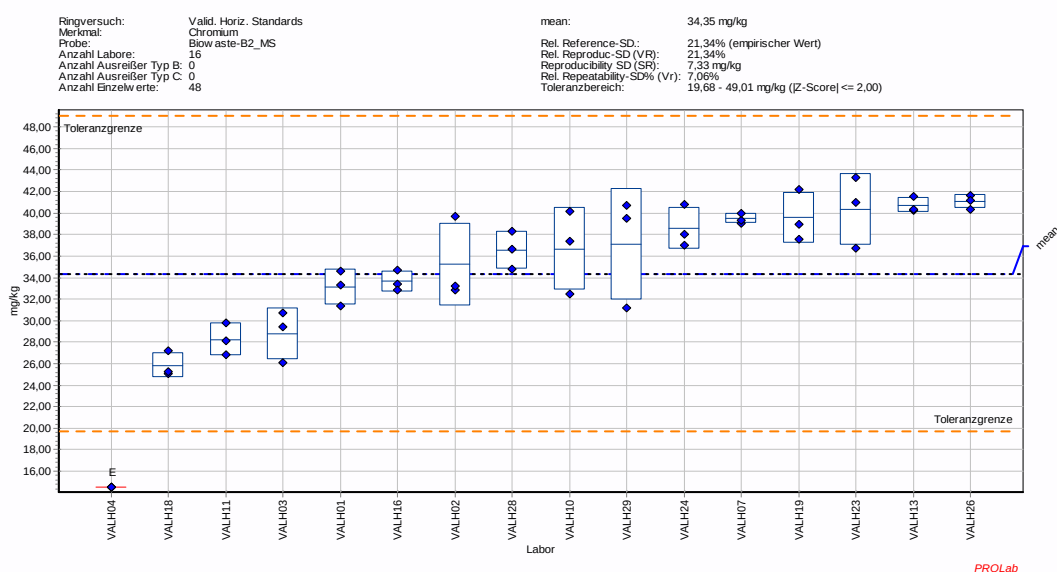
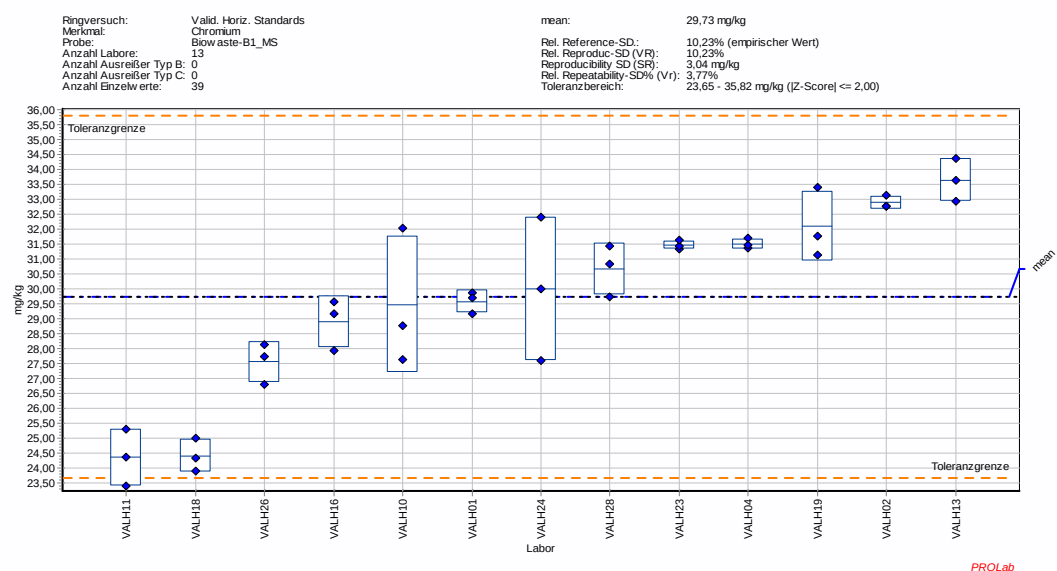
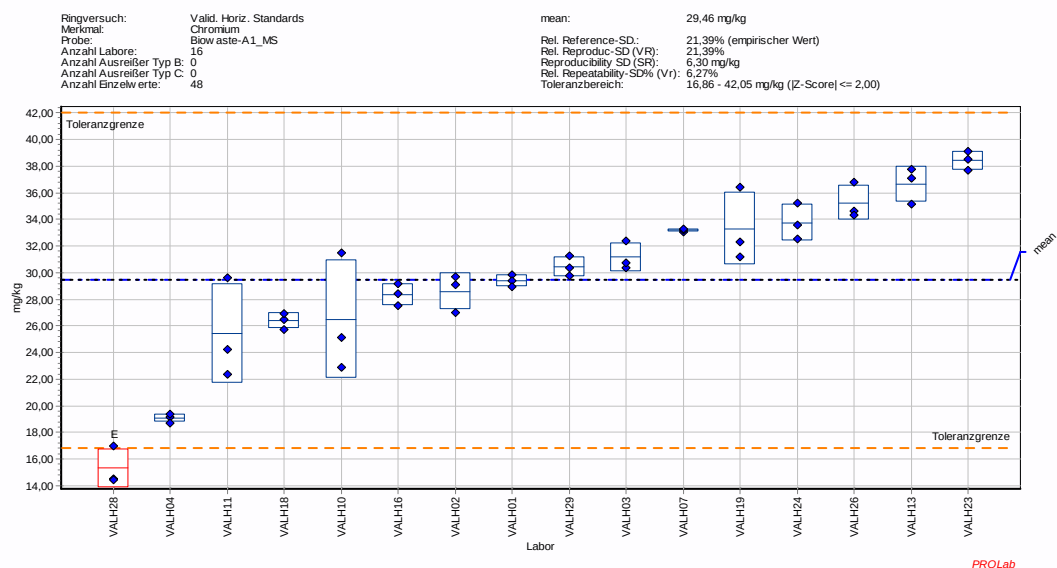


3.2.5.1 Biowaste, ICP-MS: Chromium

ICP-MS: Chromium	CO-A1_MS	Z-Score		CO-B1_MS	Z-Score		CO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	29,40	0,00		29,58	-0,10		33,13	-0,20	
VALH02	28,61	-0,10		32,89	1,00		35,22	0,10	
VALH03	31,17	0,30					28,77	-0,80	
VALH04	19,08	-1,60		31,51	0,60		14,54	-2,70	E
VALH07	33,18	0,60					39,47	0,70	
VALH10	26,51	-0,50		29,47	-0,10		36,68	0,30	
VALH11	25,42	-0,60		24,35	-1,80		28,26	-0,80	
VALH13	36,65	1,10		33,65	1,30		40,73	0,90	
VALH16	28,37	-0,20		28,89	-0,30		33,65	-0,10	
VALH18	26,38	-0,50		24,41	-1,80		25,83	-1,20	
VALH19	33,31	0,60		32,09	0,80		39,57	0,70	
VALH23	38,41	1,40		31,46	0,60		40,36	0,80	
VALH24	33,77	0,70		30,00	0,10		38,60	0,60	
VALH26	35,26	0,90		27,55	-0,70		41,05	0,90	
VALH28	15,31	-2,20	E	30,67	0,30		36,57	0,30	
VALH29	30,46	0,20					37,12	0,40	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	$ Z \leq 2,0$			$ Z \leq 2,0$			$ Z \leq 2,0$		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	29,46			29,73			34,35		
SR Reprod. SD	6,30			3,04			7,33		
Sr Repeat. SD	1,85			1,12			2,42		
RSD % VR	21,39%			10,23%			21,34%		
RSD % Vr	6,27%			3,77%			7,06%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	0			0			0		
No. labs accept.	16			13			16		
No. values accept.	48			39			48		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

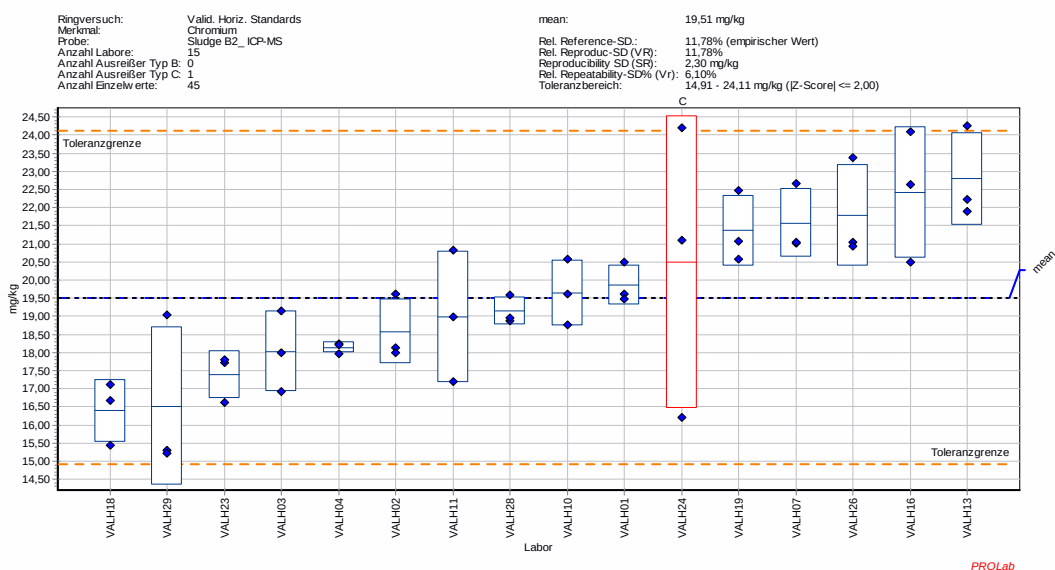
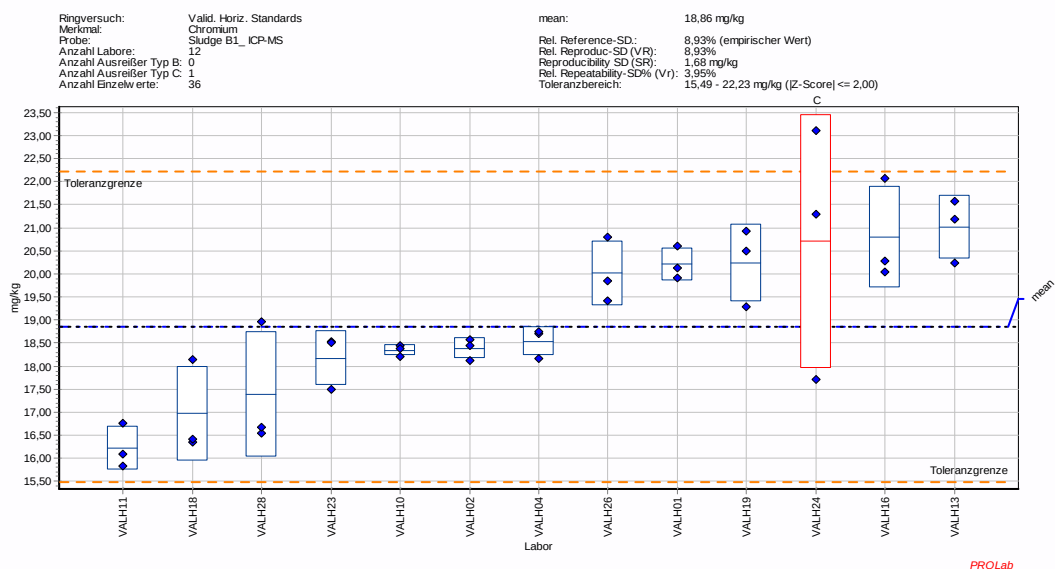
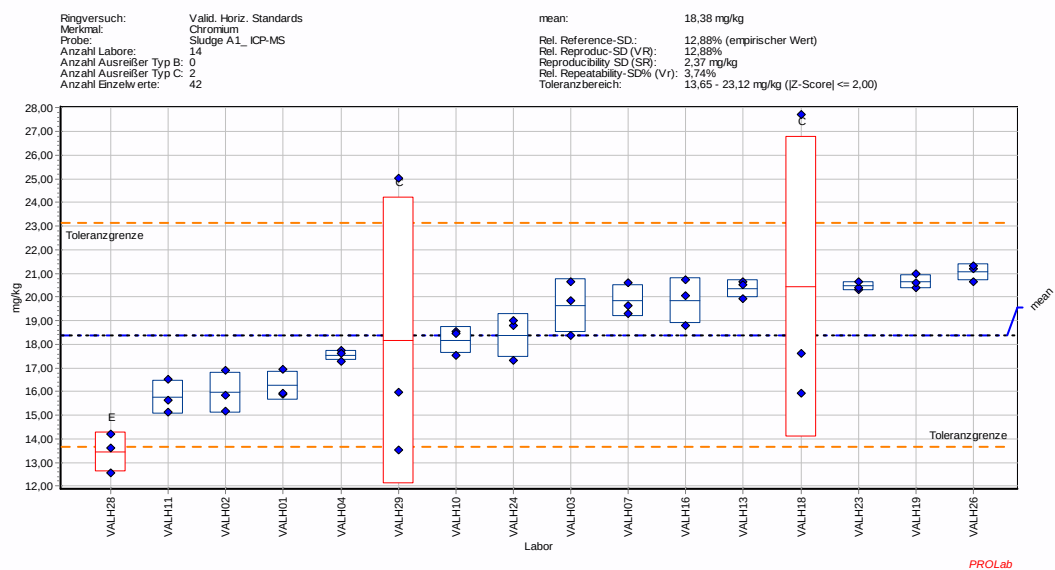


3.2.5.2 Sludge, ICP-MS: Chromium

ICP-MS: Chromium	SL-A1_MS	Z-Score		SL-B1_MS	Z-Score		SL-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		–
VALH01	16,25	-0,90		20,21	0,80		19,87	0,20	
VALH02	15,97	-1,00		18,39	-0,30		18,58	-0,40	
VALH03	19,63	0,50					18,03	-0,60	
VALH04	17,54	-0,40		18,54	-0,20		18,14	-0,60	
VALH07	19,85	0,60					21,57	0,90	
VALH10	18,18	-0,10		18,34	-0,30		19,64	0,10	
VALH11	15,76	-1,10		16,23	-1,60		18,99	-0,20	
VALH13	20,36	0,80		21,00	1,30		22,79	1,40	
VALH16	19,86	0,60		20,80	1,20		22,41	1,30	
VALH18	20,43	0,90	C	16,97	-1,10		16,40	-1,40	
VALH19	20,66	1,00		20,24	0,80		21,37	0,80	
VALH23	20,46	0,90		18,17	-0,40		17,38	-0,90	C
VALH24	18,37	0,00		20,70	1,10	C	20,50	0,40	
VALH26	21,06	1,10		20,02	0,70		21,79	1,00	
VALH28	13,45	-2,10	E	17,39	-0,90		19,13	-0,20	
VALH29	18,17	-0,10	C				16,52	-1,30	–

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	$ Z \leq 2,0$			$ Z \leq 2,0$			$ Z \leq 2,0$		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	18,38			18,86			19,51		
SR Reprod. SD	2,37			1,68			2,30		
Sr Repeat. SD	0,69			0,75			1,19		
RSD % VR	12,88%			8,93%			11,78%		
RSD % Vr	3,74%			3,95%			6,10%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	2			1			1		
No. labs accept.	14			12			15		
No. values accept.	42			36			45		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

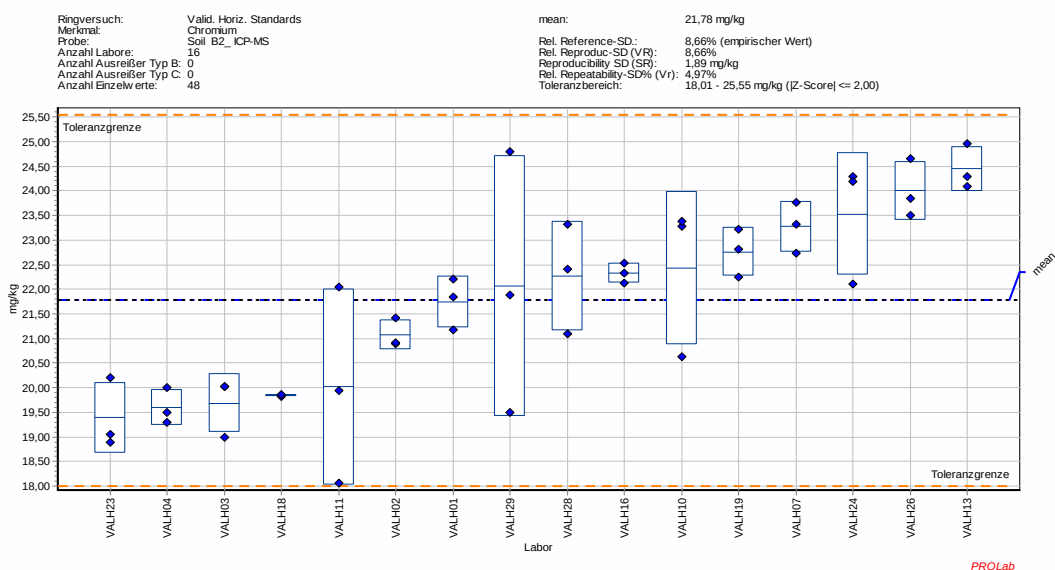
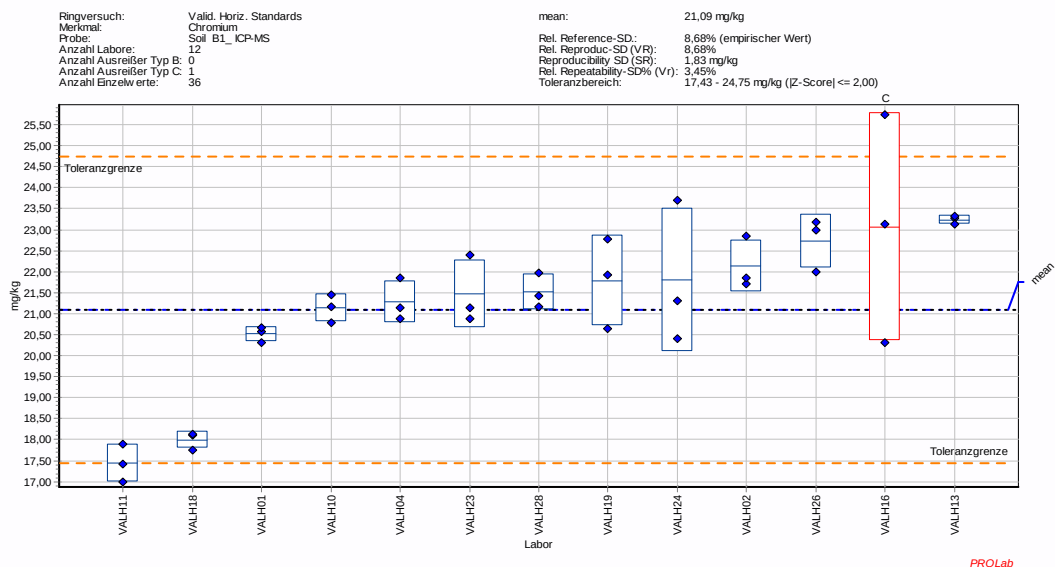
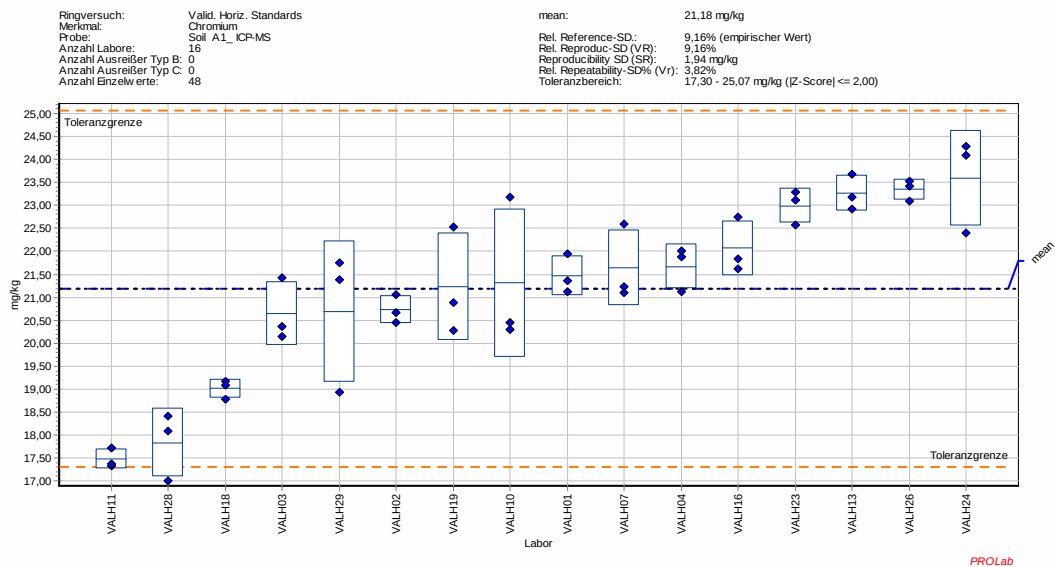


3.2.5.3 Soil, ICP-MS: Chromium

ICP-MS: Chromium	SO-A1_MS	Z-Score		SO-B1_MS	Z-Score		SO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		–
VALH01	21,47	0,10		20,51	-0,30		21,74	0,00	
VALH02	20,73	-0,20		22,14	0,60		21,08	-0,40	
VALH03	20,64	-0,30					19,68	-1,10	
VALH04	21,67	0,30		21,28	0,10		19,60	-1,20	
VALH07	21,64	0,20					23,27	0,80	
VALH10	21,31	0,10		21,14	0,00		22,43	0,30	
VALH11	17,47	-1,90		17,44	-2,00		20,02	-0,90	
VALH13	23,27	1,10		23,23	1,20		24,45	1,40	
VALH16	22,07	0,50		23,07	1,10	C	22,33	0,30	
VALH18	19,01	-1,10		17,99	-1,70		19,85	-1,00	
VALH19	21,23	0,00		21,78	0,40		22,76	0,50	
VALH23	22,99	0,90		21,47	0,20		19,39	-1,30	
VALH24	23,60	1,20		21,80	0,40		23,53	0,90	
VALH26	23,35	1,10		22,72	0,90		24,00	1,20	
VALH28	17,83	-1,70		21,52	0,20		22,27	0,30	
VALH29	20,69	-0,30					22,06	0,20	–

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	21,18			21,09			21,78		
SR Reprod. SD	1,94			1,83			1,89		
Sr Repeat. SD	0,81			0,73			1,08		
RSD % VR	9,16%			8,68%			8,66%		
RSD % Vr	3,82%			3,45%			4,97%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	0			1			0		
No. labs accept.	16			12			16		
No. values accept.	48			36			48		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

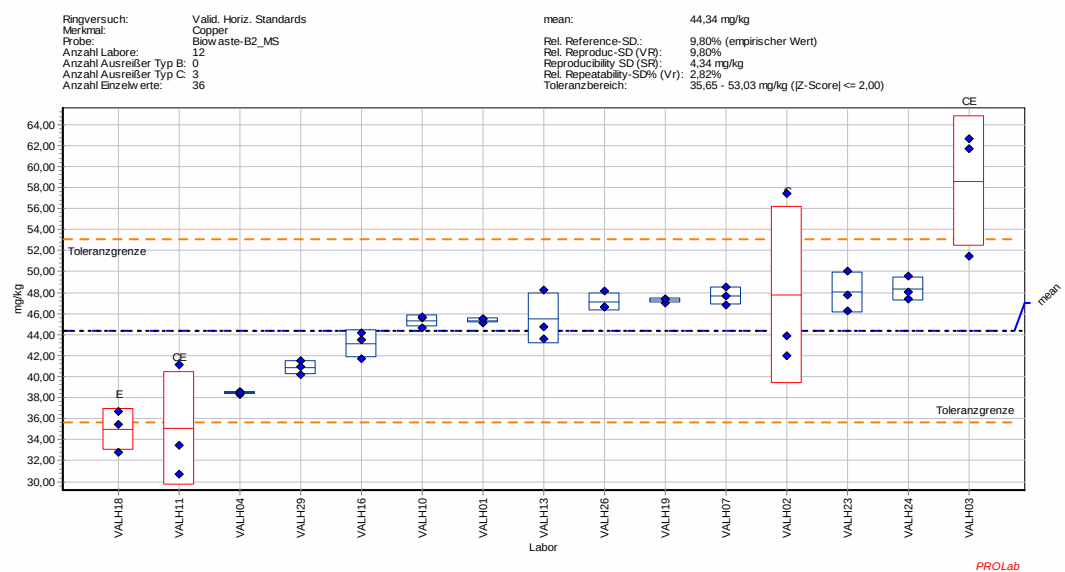
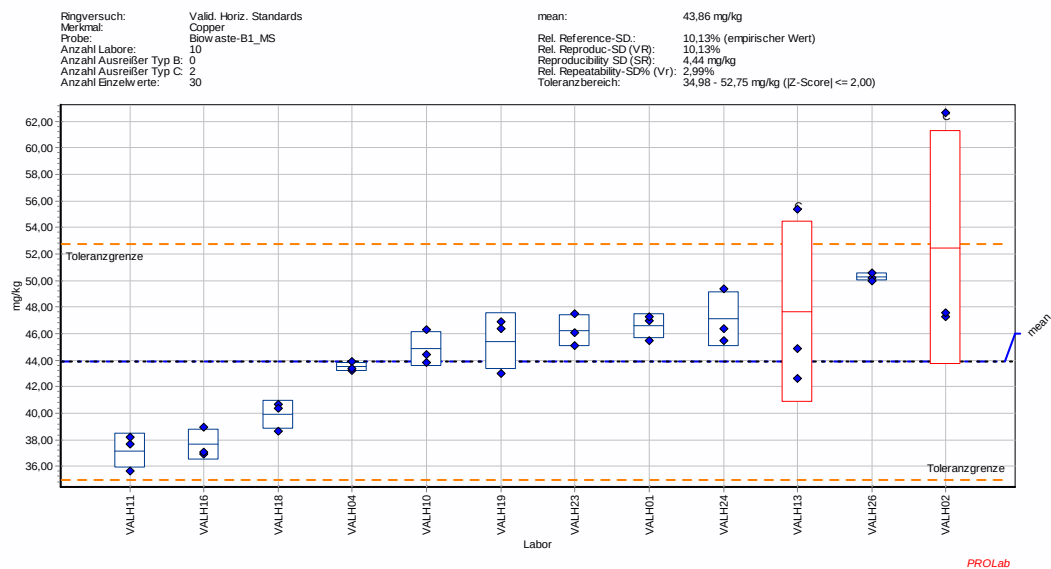
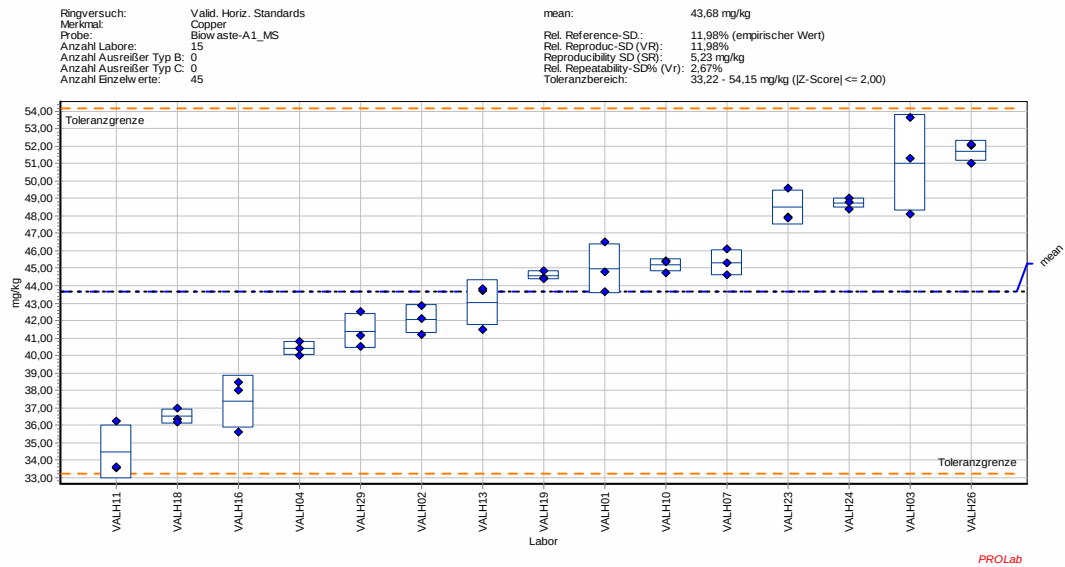


3.2.6.1 Biowaste, ICP-MS: Copper

ICP-MS: Copper	CO-A1_MS	Z-Score		CO-B1_MS	Z-Score		CO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	44,98	0,20		46,57	0,60		45,35	0,20	
VALH02	42,06	-0,30		52,49	1,90	C	47,75	0,80	C
VALH03	51,03	1,40					58,61	3,30	CE
VALH04	40,40	-0,60		43,49	-0,10		38,48	-1,30	
VALH07	45,33	0,30					47,69	0,80	
VALH10	45,18	0,30		44,86	0,20		45,30	0,20	
VALH11	34,46	-1,80		37,17	-1,50		35,09	-2,10	CE
VALH13	43,02	-0,10		47,64	0,80	C	45,53	0,30	
VALH16	37,36	-1,20		37,64	-1,40		43,13	-0,30	
VALH18	36,49	-1,40		39,89	-0,90		34,98	-2,20	E
VALH19	44,59	0,20		45,42	0,40		47,27	0,70	
VALH23	48,49	0,90		46,23	0,50		48,01	0,80	
VALH24	48,73	1,00		47,10	0,70		48,37	0,90	
VALH26	51,74	1,50		50,26	1,40		47,13	0,60	
VALH28									
VALH29	41,40	-0,40					40,86	-0,80	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	$ Z \leq 2,0$			$ Z \leq 2,0$			$ Z \leq 2,0$		
No. labs	15			12			15		
No. labs with val.	15			12			15		
Mean	43,68			43,86			44,34		
SR Reprod. SD	5,23			4,44			4,34		
Sr Repeat. SD	1,17			1,31			1,25		
RSD % VR	11,98%			10,13%			9,80%		
RSD % Vr	2,67%			2,99%			2,82%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	0			2			3		
No. labs accept.	15			10			12		
No. values accept.	45			30			36		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

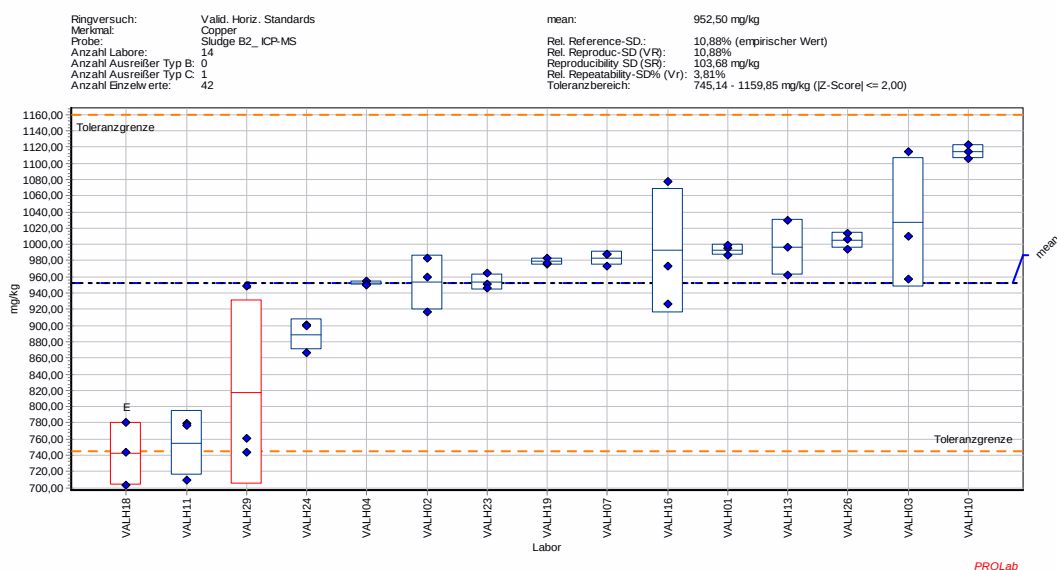
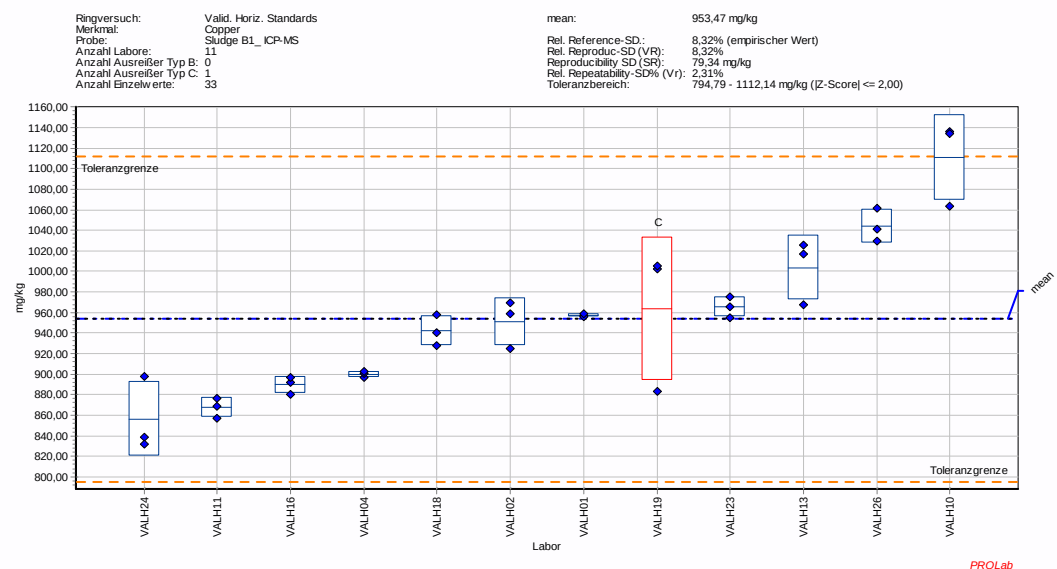
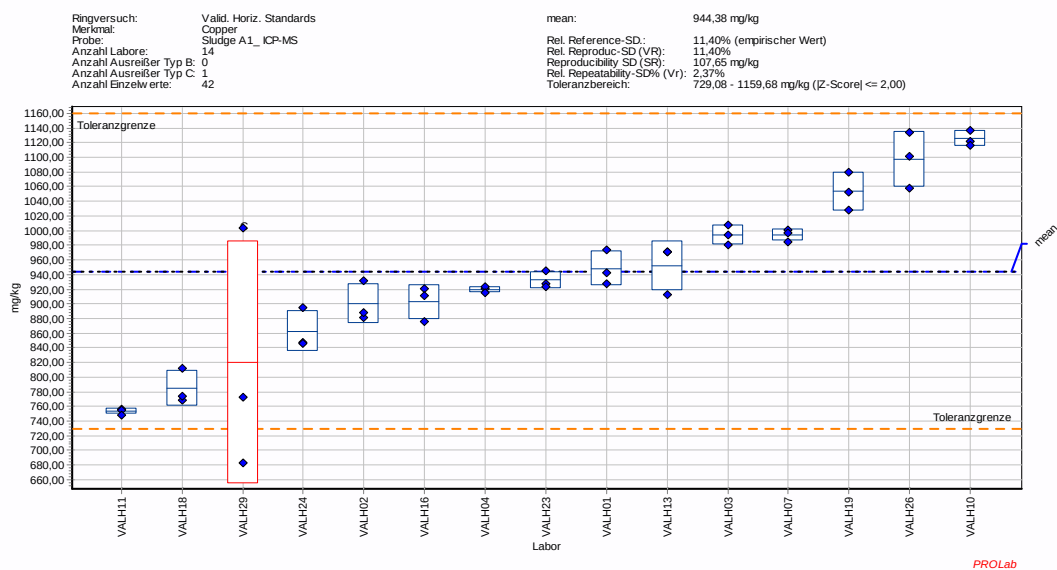


3.2.6.2 Sludge, ICP-MS: Copper

ICP-MS: Copper	SL-A1_MS	Z-Score		SL-B1_MS	Z-Score		SL-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	948,03	0,00		957,23	0,00		993,30	0,40	
VALH02	900,12	-0,40		951,20	0,00		952,94	0,00	
VALH03	994,30	0,50					1026,80	0,70	
VALH04	919,77	-0,20		899,70	-0,70		951,97	0,00	
VALH07	994,53	0,50					982,88	0,30	
VALH10	1125,53	1,70		1111,19	2,00		1114,56	1,60	
VALH11	753,53	-1,80		867,43	-1,10		755,33	-1,90	
VALH13	951,97	0,10		1003,47	0,60		996,17	0,40	
VALH16	902,77	-0,40		889,63	-0,80		992,27	0,40	
VALH18	784,70	-1,50		942,23	-0,10		742,40	-2,00	E
VALH19	1053,33	1,00		963,27	0,10	C	978,87	0,30	
VALH23	932,43	-0,10		965,40	0,20		953,70	0,00	
VALH24	862,67	-0,80		856,33	-1,20		889,00	-0,60	
VALH26	1097,67	1,40		1044,33	1,10		1004,80	0,50	
VALH28									
VALH29	820,00	-1,20	C				817,80	-1,30	C

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	$ Z \leq 2,0$			$ Z \leq 2,0$			$ Z \leq 2,0$		
No. labs	15			12			15		
No. labs with val.	15			12			15		
Mean	944,38			953,47			952,5		
SR Reprod. SD	107,65			79,34			103,68		
Sr Repeat. SD	22,41			21,98			36,26		
RSD % VR	11,40%			8,32%			10,88%		
RSD % Vr	2,37%			2,31%			3,81%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			1			1		
No. labs accept.	14			11			14		
No. values accept.	42			33			42		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

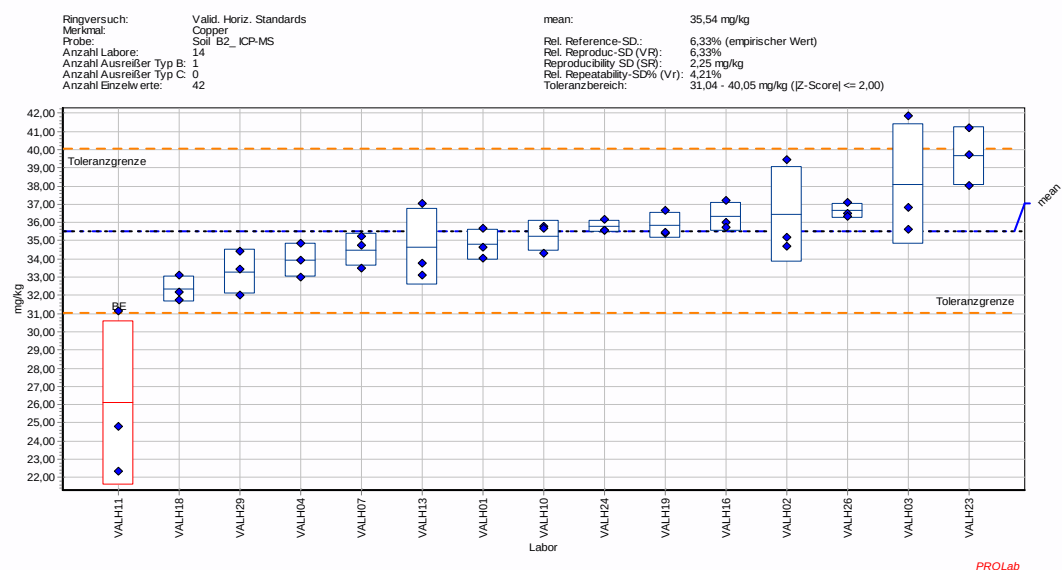
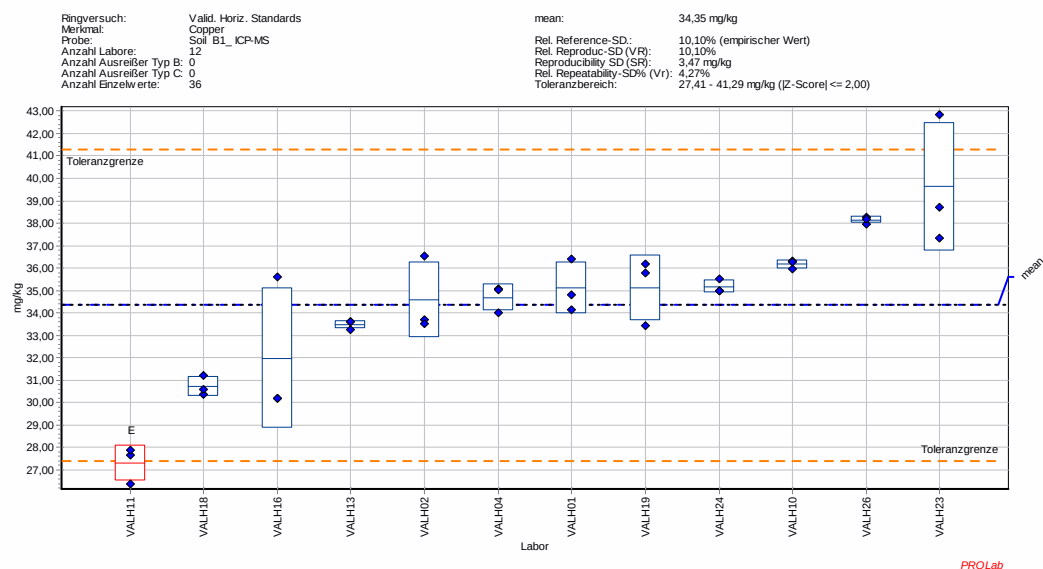
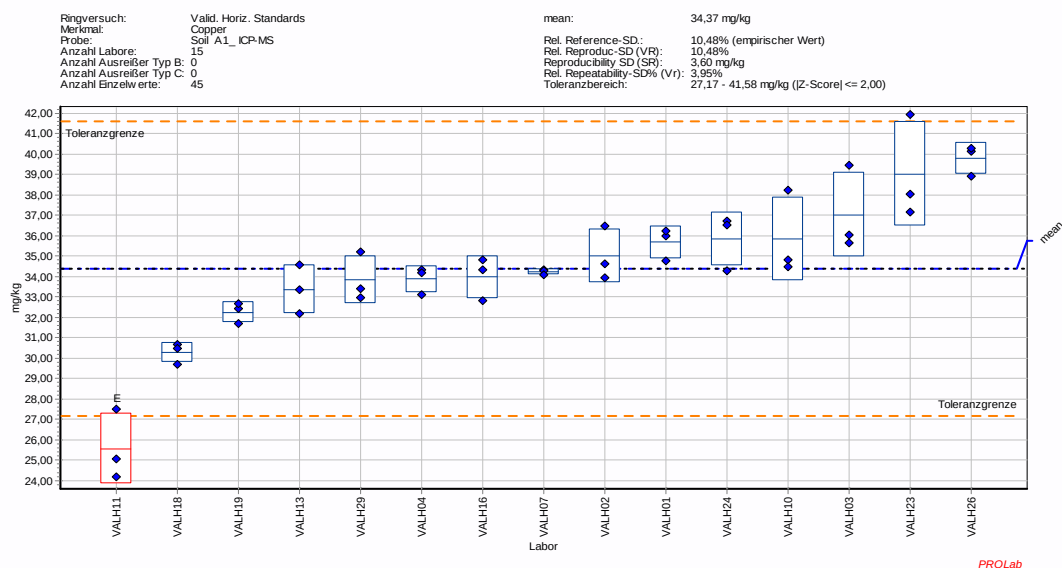


3.2.6.3 Soil, ICP-MS: Copper

ICP-MS: Copper	SO-A1_MS	Z-Score		SO-B1_MS	Z-Score		SO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	35,67	0,40		35,12	0,20		34,79	-0,30	
VALH02	35,00	0,20		34,59	0,10		36,45	0,40	
VALH03	37,03	0,70					38,10	1,10	
VALH04	33,87	-0,10		34,70	0,10		33,93	-0,70	
VALH07	34,24	0,00					34,51	-0,50	
VALH10	35,84	0,40		36,18	0,50		35,27	-0,10	
VALH11	25,58	-2,40	E	27,31	-2,00	E	26,10	-4,20	BE
VALH13	33,38	-0,30		33,49	-0,20		34,65	-0,40	
VALH16	33,97	-0,10		31,99	-0,70		36,32	0,30	
VALH18	30,29	-1,10		30,73	-1,00		32,36	-1,40	
VALH19	32,25	-0,60		35,12	0,20		35,85	0,10	
VALH23	39,03	1,30		39,63	1,50		39,65	1,80	
VALH24	35,83	0,40		35,17	0,20		35,80	0,10	
VALH26	39,78	1,50		38,14	1,10		36,65	0,50	
VALH28									
VALH29	33,85	-0,10					33,30	-1,00	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	$ Z \leq 2,0$			$ Z \leq 2,0$			$ Z \leq 2,0$		
No. labs	15			12			15		
No. labs with val.	15			12			15		
Mean	34,37			34,35			35,54		
SR Reprod. SD	3,60			3,47			2,25		
Sr Repeat. SD	1,36			1,47			1,50		
RSD % VR	10,48%			10,10%			6,33%		
RSD % Vr	3,95%			4,27%			4,21%		
No. A outliers	0			0			0		
No. B outliers	0			0			1		
No. C outliers	0			0			0		
No. labs accept.	15			12			14		
No. values accept.	45			36			42		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

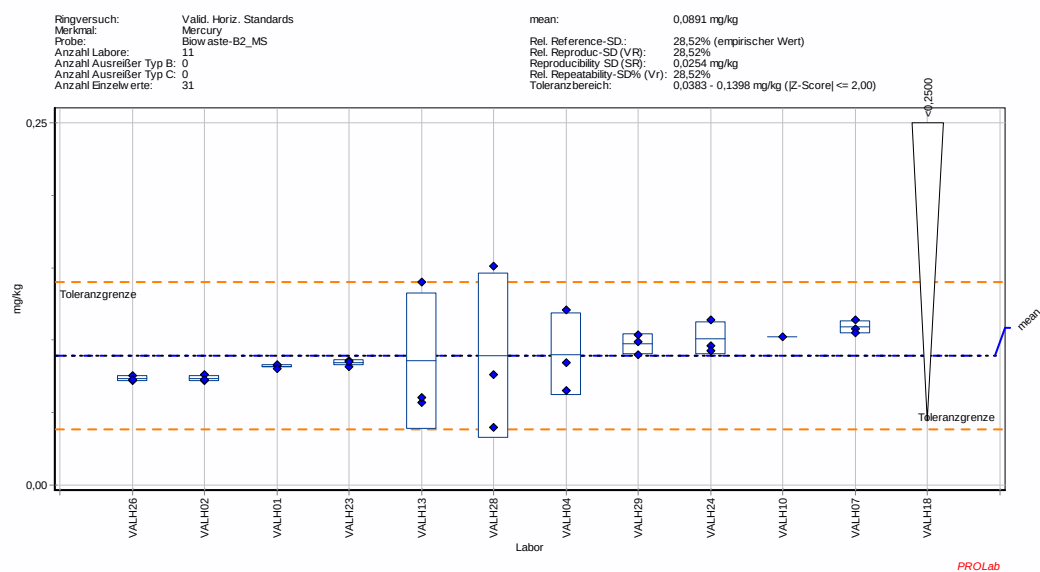
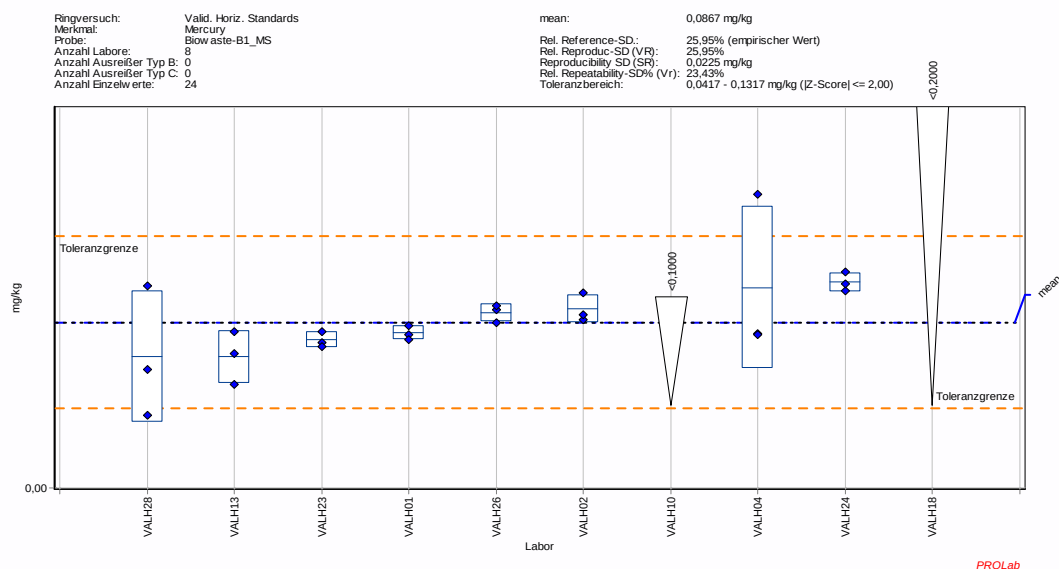
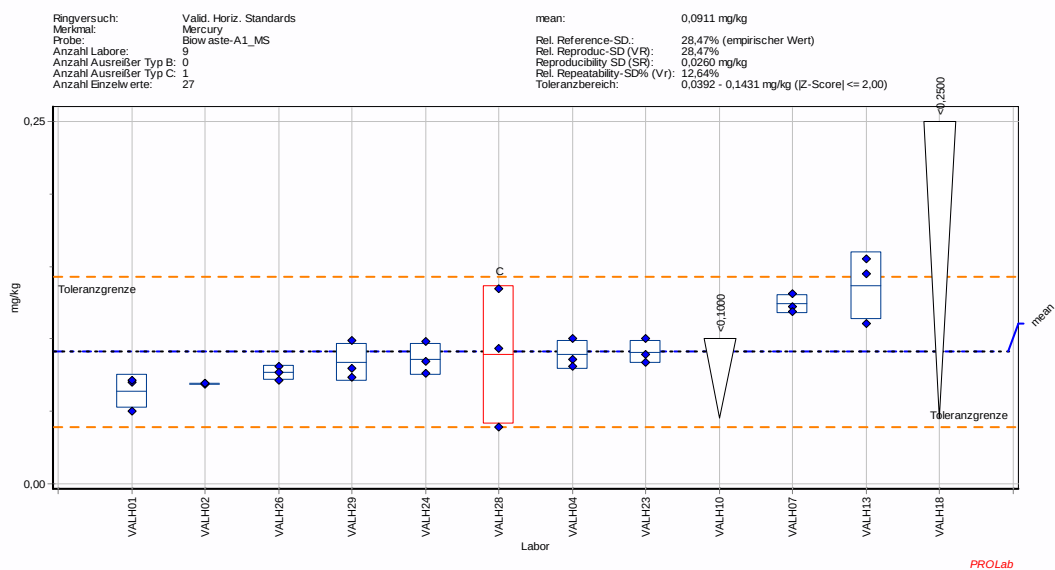


3.2.7.1 Biowaste, ICP-MS: Mercury

ICP-MS: Mercury	CO-A1_MS	Z-Score		CO-B1_MS	Z-Score		CO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	0,064	-1,00		0,081	-0,20		0,082	-0,30	
VALH02	0,069	-0,90		0,094	0,30		0,074	-0,60	
VALH04	0,089	-0,10		0,105	0,80		0,090	0,00	
VALH07	0,124	1,30					0,109	0,80	
VALH10	< 0,1000			< 0,1000			0,102	0,50	
VALH11									
VALH13	0,137	1,80		0,069	-0,80		0,086	-0,10	
VALH18	< 0,2500			< 0,2000			< 0,2500		
VALH23	0,091	0,00		0,077	-0,40		0,084	-0,20	
VALH24	0,086	-0,20		0,108	0,90		0,101	0,50	
VALH26	0,077	-0,60		0,092	0,20		0,074	-0,60	
VALH28	0,089	-0,10	C	0,069	-0,80		0,089	0,00	
VALH29	0,084	-0,30					0,098	0,30	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	12			10			12		
No. labs with val.	10			8			11		
Mean	0,0911			0,0867			0,0891		
SR Reprod. SD	0,026			0,023			0,025		
Sr Repeat. SD	0,012			0,020			0,025		
RSD % VR	28,47%			25,95%			28,52%		
RSD % Vr	12,64%			23,43%			26,25%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			0			0		
No. labs accept.	9			8			11		
No. values accept.	27			24			31		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

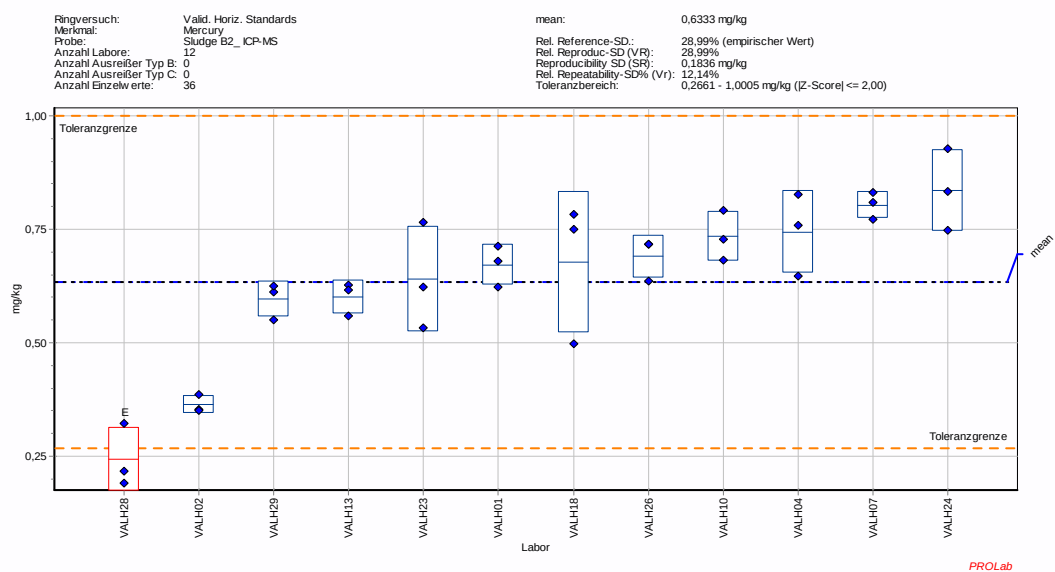
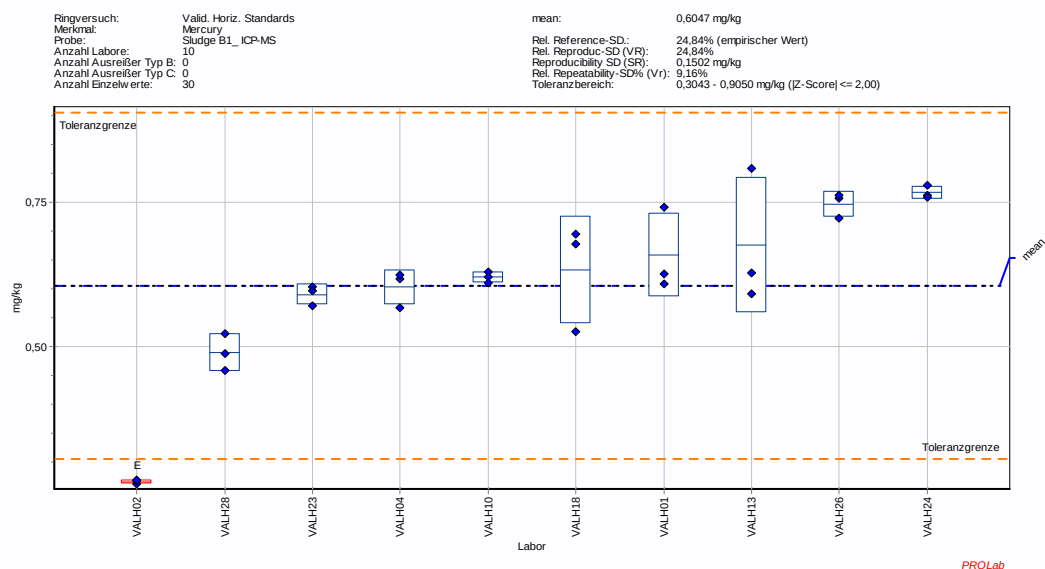
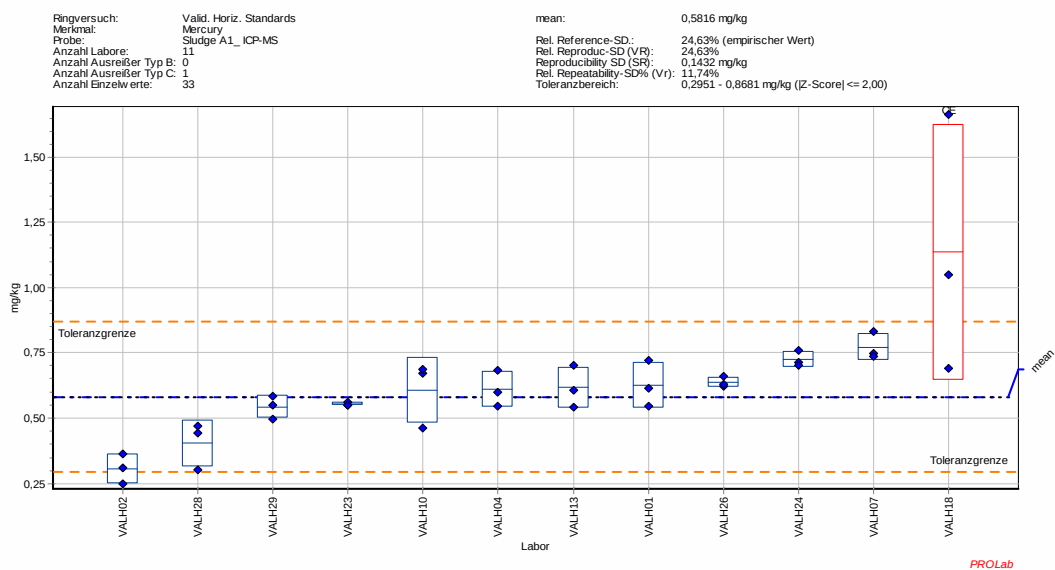


3.2.7.2 Sludge, ICP-MS: Mercury

ICP-MS: Mercury	SL-A1_MS	Z-Score		SL-B1_MS	Z-Score		SL-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	0,627	0,30		0,659	0,40		0,672	0,20	
VALH02	0,306	-1,90		0,265	-2,30	E	0,363	-1,50	
VALH04	0,609	0,20		0,603	0,00		0,744	0,60	
VALH07	0,771	1,30					0,804	0,90	
VALH10	0,606	0,20		0,620	0,10		0,734	0,50	
VALH11									
VALH13	0,616	0,20		0,676	0,50		0,601	-0,20	
VALH18	1,135	3,90	CE	0,633	0,20		0,677	0,20	
VALH23	0,554	-0,20		0,590	-0,10		0,640	0,00	
VALH24	0,725	1,00		0,767	1,10		0,836	1,10	
VALH26	0,638	0,40		0,747	0,90		0,690	0,30	
VALH28	0,404	-1,20		0,489	-0,80		0,243	-2,10	E
VALH29	0,543	-0,30					0,596	-0,20	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	12			10			12		
No. labs with val.	12			10			12		
Mean	0,5816			0,6047			0,6333		
SR Reprod. SD	0,143			0,150			0,184		
Sr Repeat. SD	0,068			0,055			0,077		
RSD % VR	24,63%			24,84%			28,99%		
RSD % Vr	11,74%			9,16%			12,14%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			0			0		
No. labs accept.	11			10			12		
No. values accept.	33			30			36		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

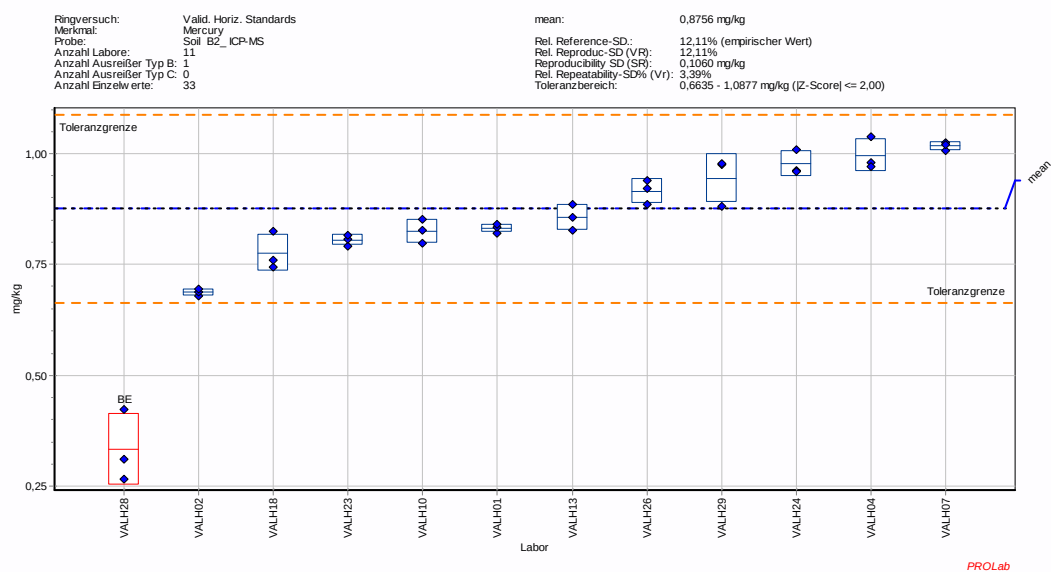
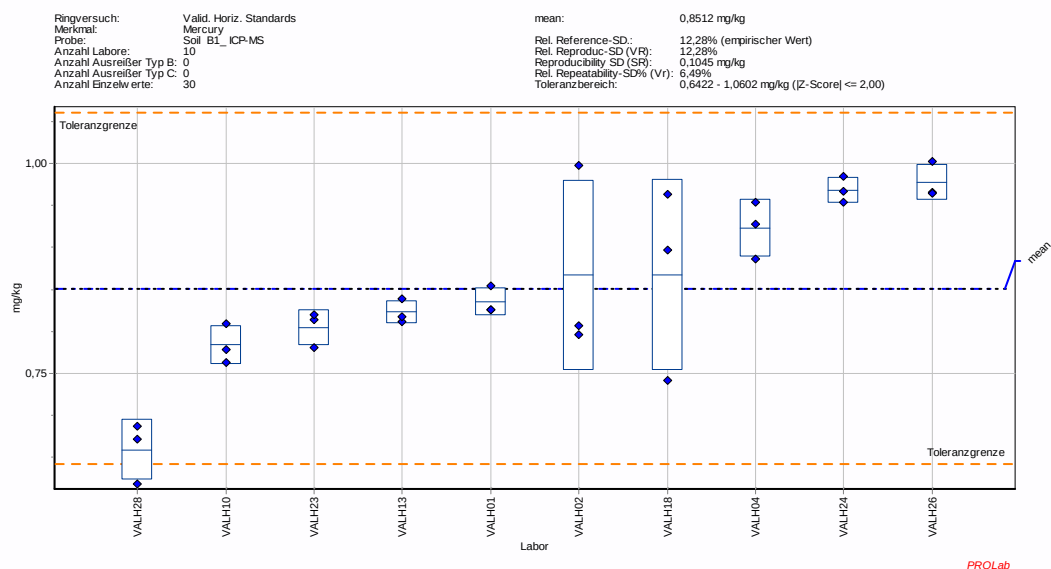
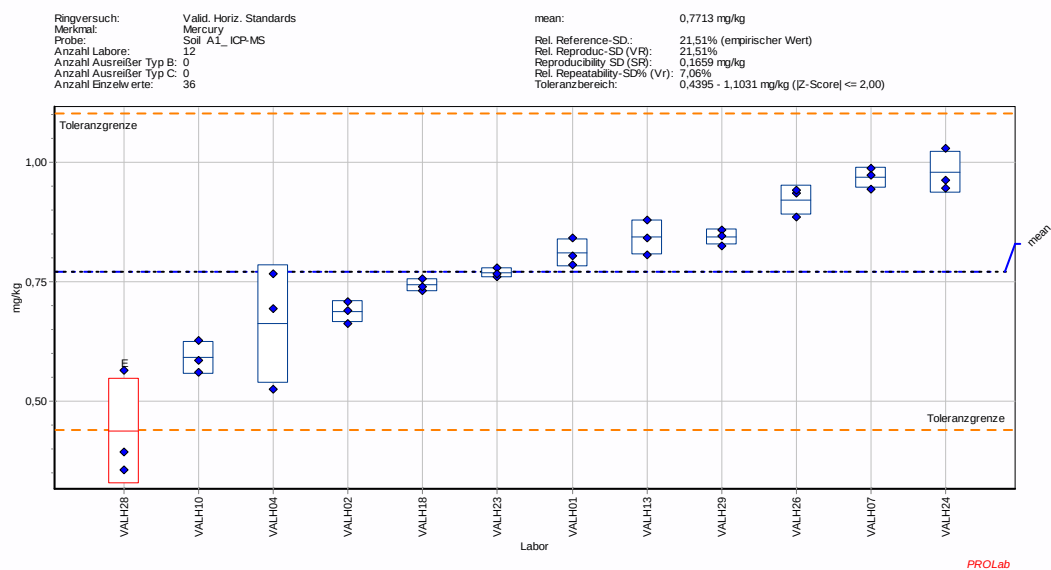


3.2.7.3 Soil, ICP-MS: Mercury

ICP-MS: Mercury	SO-A1_MS	Z-Score		SO-B1_MS	Z-Score		SO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	0,811	0,20		0,836	-0,10		0,832	-0,40	
VALH02	0,687	-0,50		0,867	0,20		0,687	-1,80	
VALH04	0,662	-0,70		0,923	0,70		0,997	1,10	
VALH07	0,969	1,20					1,017	1,30	
VALH10	0,591	-1,10		0,784	-0,60		0,825	-0,50	
VALH11									
VALH13	0,843	0,40		0,823	-0,30		0,857	-0,20	
VALH18	0,743	-0,20		0,868	0,20		0,776	-0,90	
VALH23	0,769	0,00		0,805	-0,40		0,805	-0,70	
VALH24	0,980	1,30		0,969	1,10		0,977	1,00	
VALH26	0,922	0,90		0,978	1,20		0,915	0,40	
VALH28	0,437	-2,00	E	0,659	-1,80		0,333	-5,10	
VALH29	0,843	0,40					0,944	0,60	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	12			10			12		
No. labs with val.	12			10			12		
Mean	0,7713			0,8512			0,8756		
SR Reprod. SD	0,166			0,105			0,106		
Sr Repeat. SD	0,055			0,055			0,030		
RSD % VR	21,51%			12,28%			12,11%		
RSD % Vr	7,06%			6,49%			3,39%		
No. A outliers	0			0			0		
No. B outliers	0			0			1		
No. C outliers	0			0			0		
No. labs accept.	12			10			11		
No. values accept.	36			30			33		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

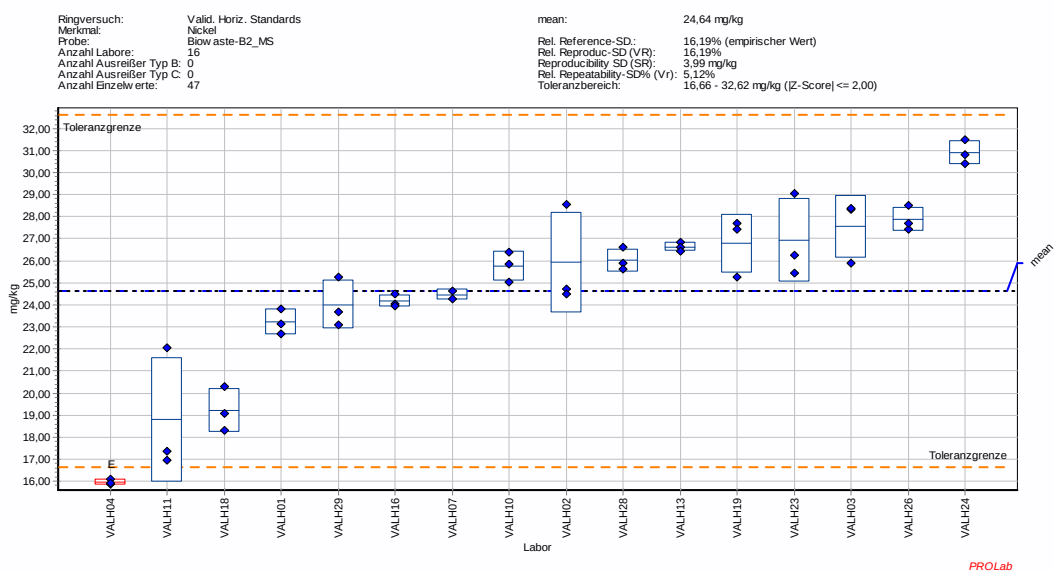
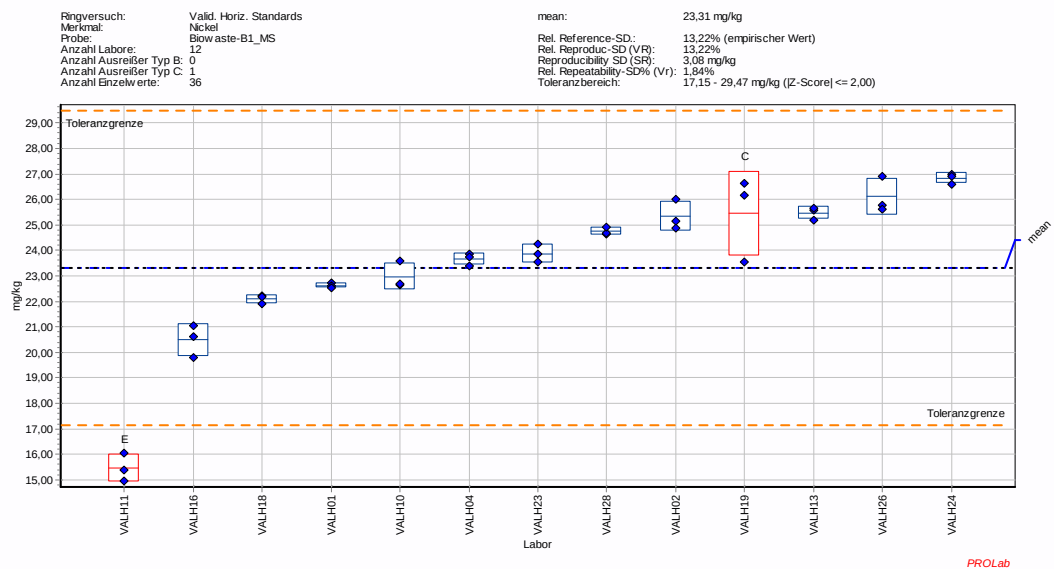
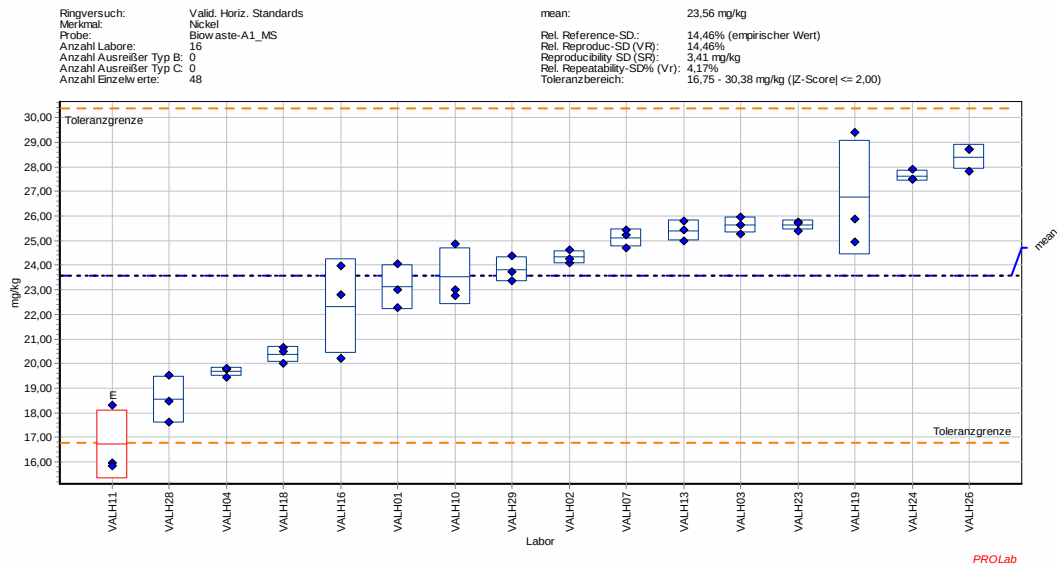


3.2.8.1 Biowaste, ICP-MS: Nickel

ICP-MS: Nickel	CO-A1_MS	Z-Score		CO-B1_MS	Z-Score		CO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	23,11	-0,10		22,63	-0,20		23,22	-0,40	
VALH02	24,33	0,20		25,34	0,70		25,92	0,30	
VALH03	25,63	0,60					27,55	0,70	
VALH04	19,67	-1,10		23,66	0,10		15,96	-2,20	E
VALH07	25,11	0,50					24,46	0,00	
VALH10	23,55	0,00		22,98	-0,10		25,75	0,30	
VALH11	16,71	-2,00	E	15,47	-2,50	E	18,79	-1,50	
VALH13	25,41	0,50		25,47	0,70		26,62	0,50	
VALH16	22,33	-0,40		20,49	-0,90		24,17	-0,10	
VALH18	20,38	-0,90		22,09	-0,40		19,22	-1,40	
VALH19	26,76	0,90		25,44	0,70	C	26,78	0,50	
VALH23	25,63	0,60		23,87	0,20		26,92	0,60	
VALH24	27,63	1,20		26,83	1,10		30,90	1,60	
VALH26	28,41	1,40		26,11	0,90		27,88	0,80	
VALH28	18,54	-1,50		24,75	0,50		26,02	0,30	
VALH29	23,83	0,10					24,01	-0,20	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	$ Z \leq 2,0$			$ Z \leq 2,0$			$ Z \leq 2,0$		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	23,56			23,31			24,64		
SR Reprod. SD	3,41			3,08			3,99		
Sr Repeat. SD	0,98			0,43			1,26		
RSD % VR	14,46%			13,22%			16,19%		
RSD % Vr	4,17%			1,84%			5,12%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	0			1			0		
No. labs accept.	16			12			16		
No. values accept.	48			36			47		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

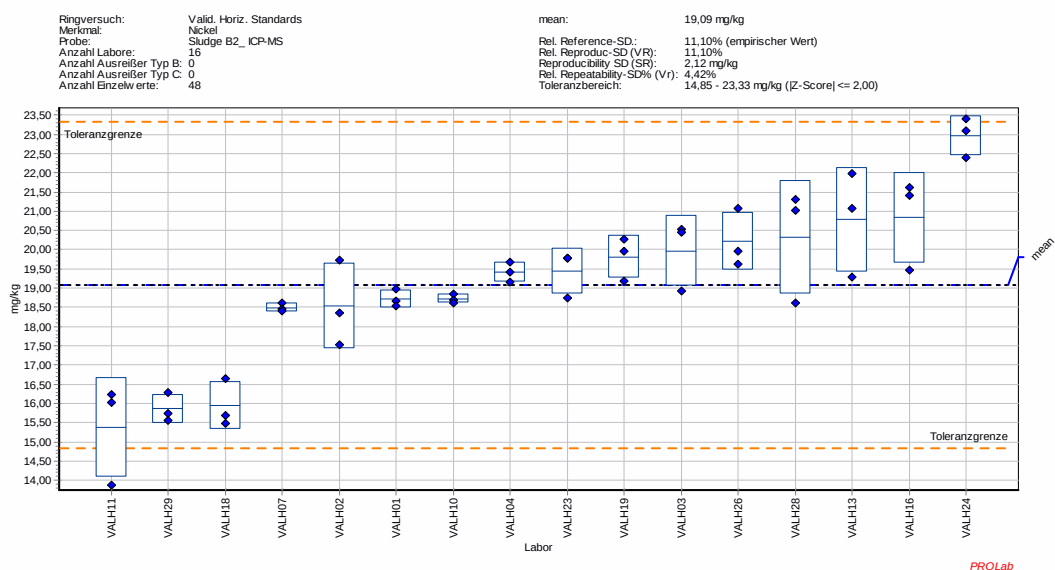
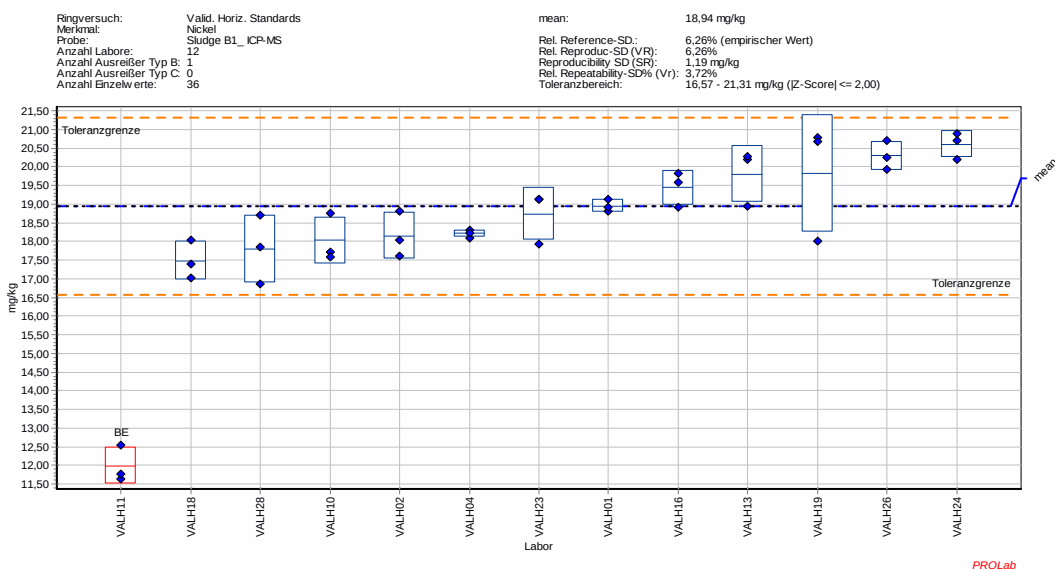
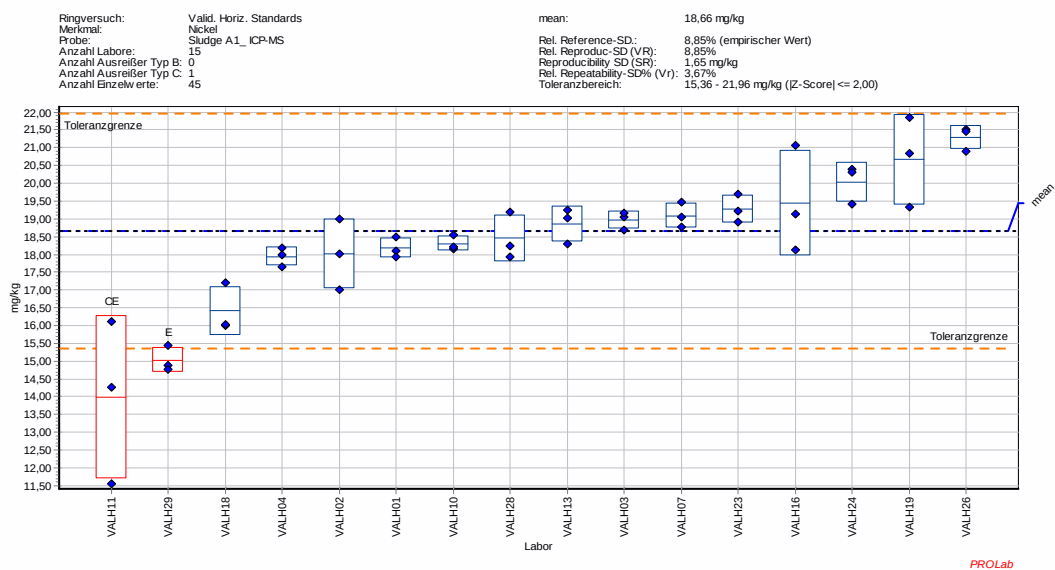


3.2.8.2 Sludge, ICP-MS: Nickel

ICP-MS: Nickel	SL-A1_MS	Z-Score		SL-B1_MS	Z-Score		SL-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	18,17	-0,30		18,95	0,00		18,73	-0,20	
VALH02	18,01	-0,40		18,15	-0,70		18,55	-0,30	
VALH03	18,97	0,20					19,97	0,40	
VALH04	17,94	-0,40		18,21	-0,60		19,41	0,20	
VALH07	19,09	0,30					18,49	-0,30	
VALH10	18,30	-0,20		18,02	-0,80		18,73	-0,20	
VALH11	13,98	-2,80	CE	11,99	-5,90	BE	15,38	-1,80	
VALH13	18,85	0,10		19,80	0,70		20,78	0,80	
VALH16	19,44	0,50		19,44	0,40		20,83	0,80	
VALH18	16,41	-1,40		17,49	-1,20		15,94	-1,50	
VALH19	20,66	1,20		19,82	0,70		19,81	0,30	
VALH23	19,28	0,40		18,74	-0,20		19,44	0,20	
VALH24	20,03	0,80		20,60	1,40		22,97	1,80	
VALH26	21,30	1,60		20,29	1,10		20,22	0,50	
VALH28	18,45	-0,10		17,80	-1,00		20,31	0,60	
VALH29	15,03	-2,20	E				15,87	-1,50	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	18,66			18,94			19,09		
SR Reprod. SD	1,65			1,19			2,12		
Sr Repeat. SD	0,68			0,70			0,84		
RSD % VR	8,85%			6,26%			11,10%		
RSD % Vr	3,67%			3,72%			4,42%		
No. A outliers	0			0			0		
No. B outliers	0			1			0		
No. C outliers	1			0			0		
No. labs accept.	15			12			16		
No. values accept.	45			36			48		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

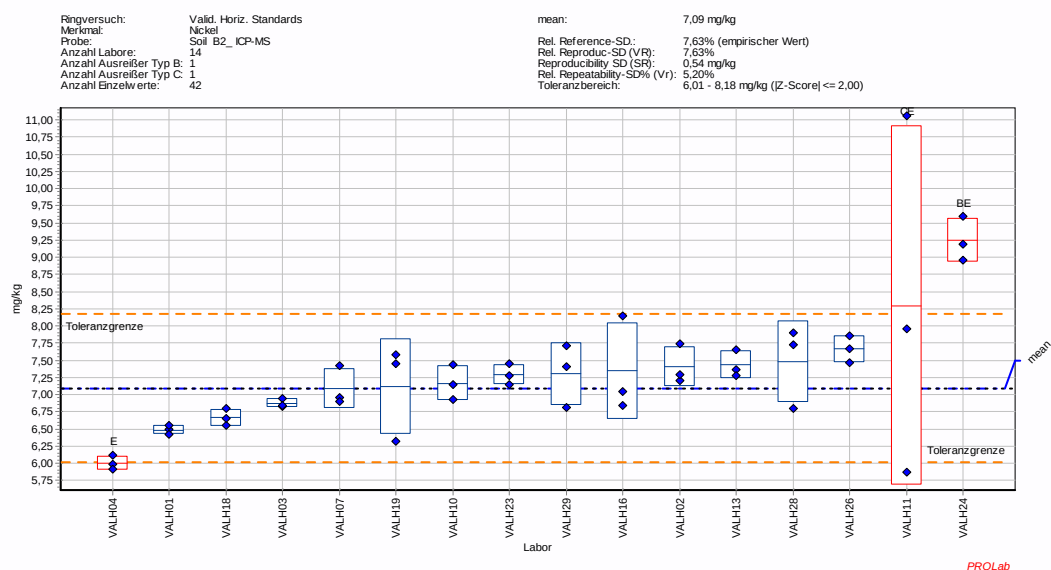
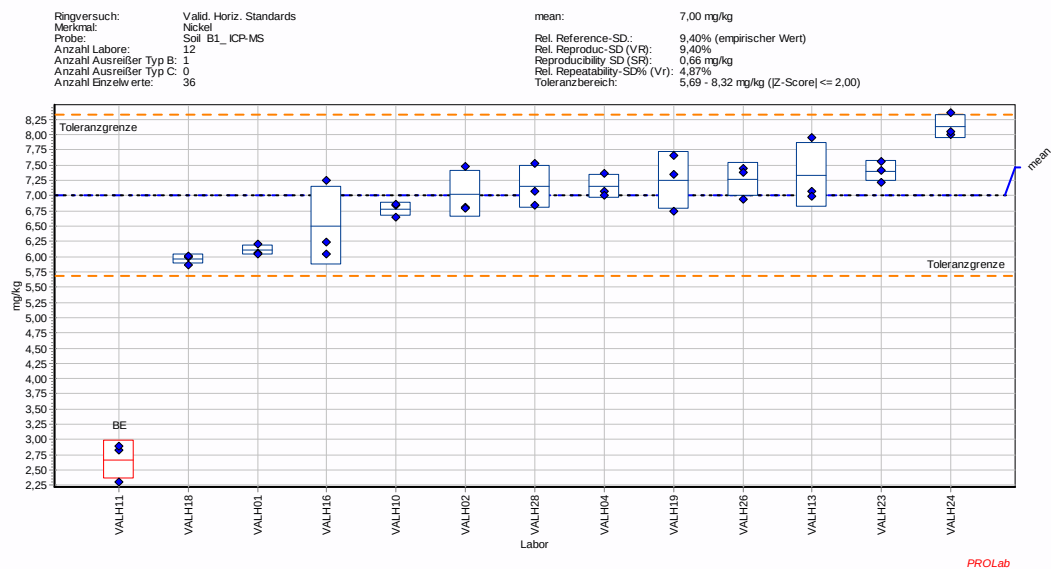
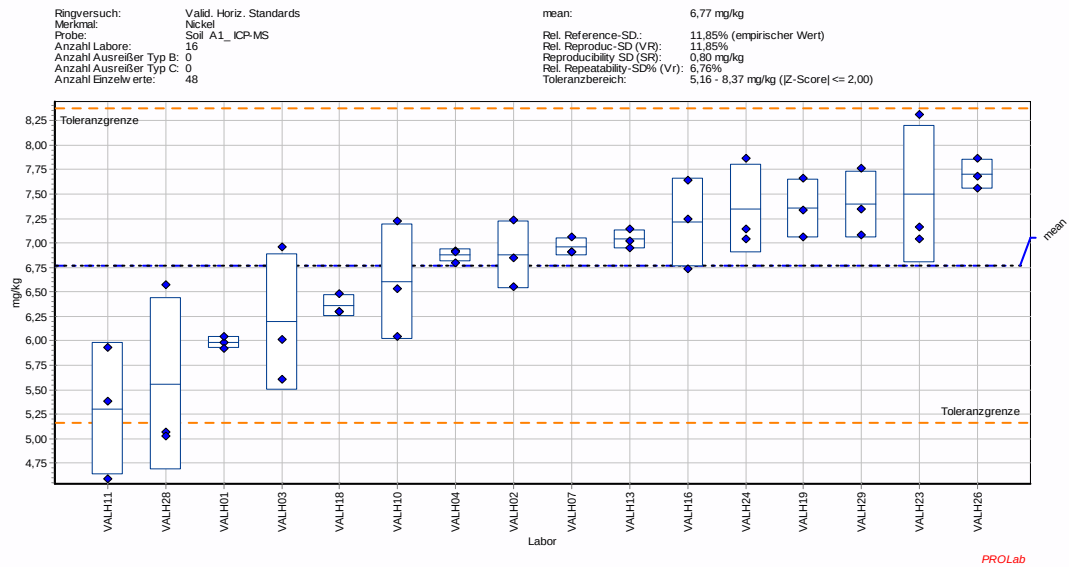


3.2.8.3 Soil, ICP-MS: Nickel

ICP-MS: Nickel	SO-A1_MS	Z-Score		SO-B1_MS	Z-Score		SO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	5,98	-1,00		6,11	-1,40		6,48	-1,10	
VALH02	6,88	0,10		7,03	0,00		7,41	0,60	
VALH03	6,20	-0,70					6,88	-0,40	
VALH04	6,87	0,10		7,15	0,20		6,00	-2,00	E
VALH07	6,96	0,20					7,09	0,00	
VALH10	6,60	-0,20		6,78	-0,30		7,17	0,10	
VALH11	5,30	-1,80		2,67	-6,60	BE	8,30	2,20	CE
VALH13	7,04	0,30		7,33	0,50		7,43	0,60	
VALH16	7,21	0,60		6,51	-0,80		7,34	0,50	
VALH18	6,36	-0,50		5,96	-1,60		6,66	-0,80	
VALH19	7,35	0,70		7,25	0,40		7,12	0,00	
VALH23	7,50	0,90		7,40	0,60		7,29	0,40	
VALH24	7,35	0,70		8,14	1,70		9,25	4,00	BE
VALH26	7,70	1,20		7,26	0,40		7,66	1,10	
VALH28	5,56	-1,50		7,15	0,20		7,47	0,70	
VALH29	7,39	0,80					7,30	0,40	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	$ Z \leq 2,0$			$ Z \leq 2,0$			$ Z \leq 2,0$		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	6,77			7,00			7,09		
SR Reprod. SD	0,8			0,66			0,54		
Sr Repeat. SD	0,46			0,34			0,37		
RSD % VR	11,85%			9,40%			7,63%		
RSD % Vr	6,76%			4,87%			5,20%		
No. A outliers	0			0			0		
No. B outliers	0			1			1		
No. C outliers	0			0			1		
No. labs accept.	16			12			14		
No. values accept.	48			36			42		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

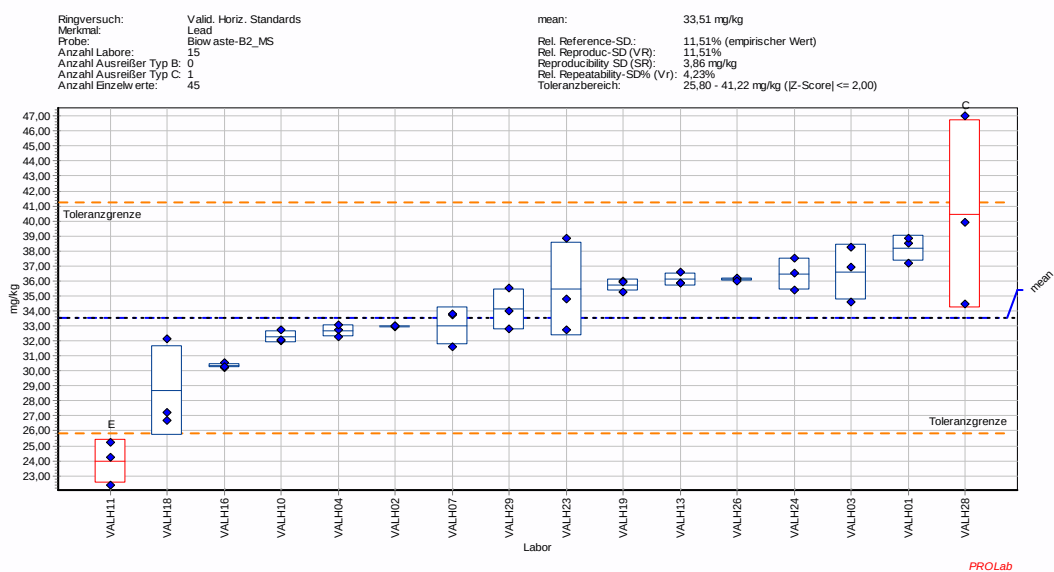
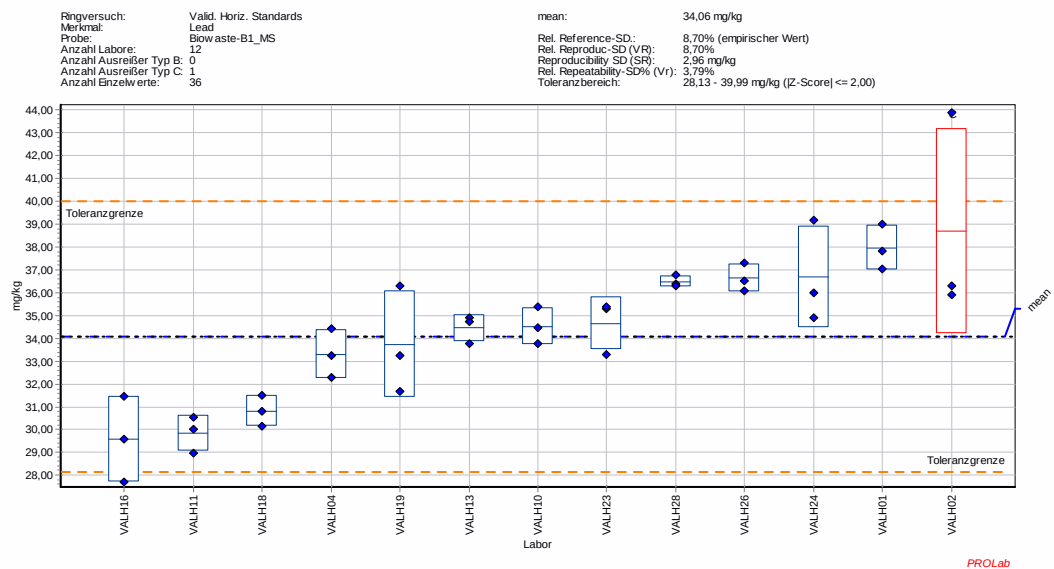
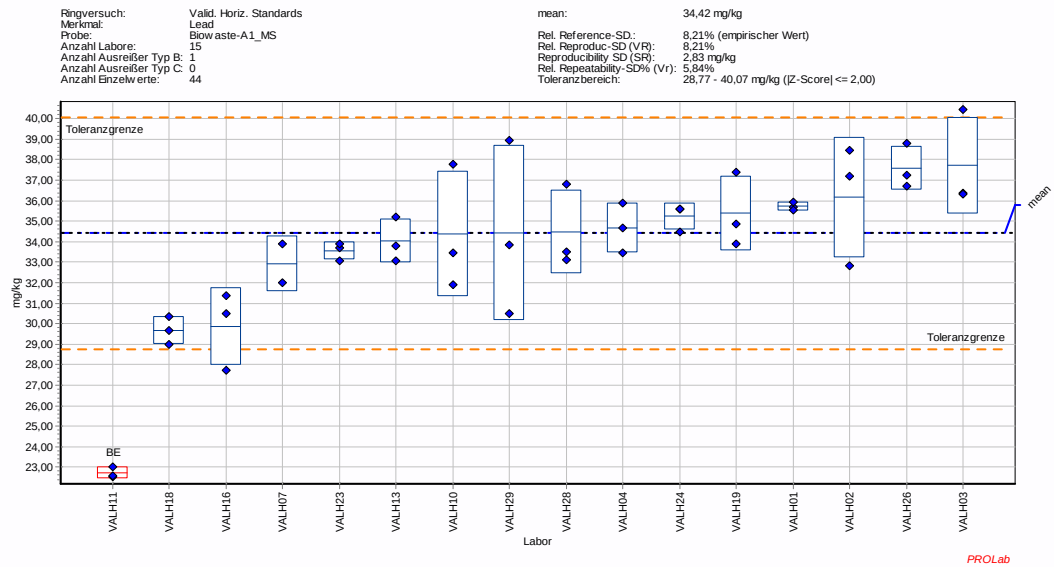


3.2.9.1 Biowaste, ICP-MS: Lead

ICP-MS: Lead	CO-A1_MS	Z-Score		CO-B1_MS	Z-Score		CO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	35,73	0,50		37,97	1,30		38,18	1,20	
VALH02	36,17	0,60		38,70	1,60	C	32,97	-0,10	
VALH03	37,71	1,20					36,58	0,80	
VALH04	34,68	0,10		33,31	-0,30		32,68	-0,20	
VALH07	32,94	-0,50					33,02	-0,10	
VALH10	34,38	0,00		34,53	0,20		32,28	-0,30	
VALH11	22,72	-4,10	BE	29,85	-1,40		23,97	-2,50	
VALH13	34,03	-0,10		34,46	0,10		36,10	0,70	
VALH16	29,86	-1,60		29,58	-1,50		30,35	-0,80	
VALH18	29,67	-1,70		30,82	-1,10		28,68	-1,30	
VALH19	35,38	0,30		33,74	-0,10		35,73	0,60	
VALH23	33,57	-0,30		34,66	0,20		35,46	0,50	
VALH24	35,23	0,30		36,70	0,90		36,47	0,80	
VALH26	37,57	1,10		36,64	0,90		36,10	0,70	
VALH28	34,47	0,00		36,49	0,80		40,46	1,80	C
VALH29	34,43	0,00					34,10	0,20	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	$ Z \leq 2,0$			$ Z \leq 2,0$			$ Z \leq 2,0$		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	34,42			34,06			33,51		
SR Reprod. SD	2,83			2,96			3,86		
Sr Repeat. SD	2,01			1,29			1,42		
RSD % VR	8,21%			8,70%			11,51%		
RSD % Vr	5,84%			3,79%			4,23%		
No. A outliers	0			0			0		
No. B outliers	1			0			0		
No. C outliers	0			1			1		
No. labs accept.	15			12			15		
No. values accept.	44			36			45		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

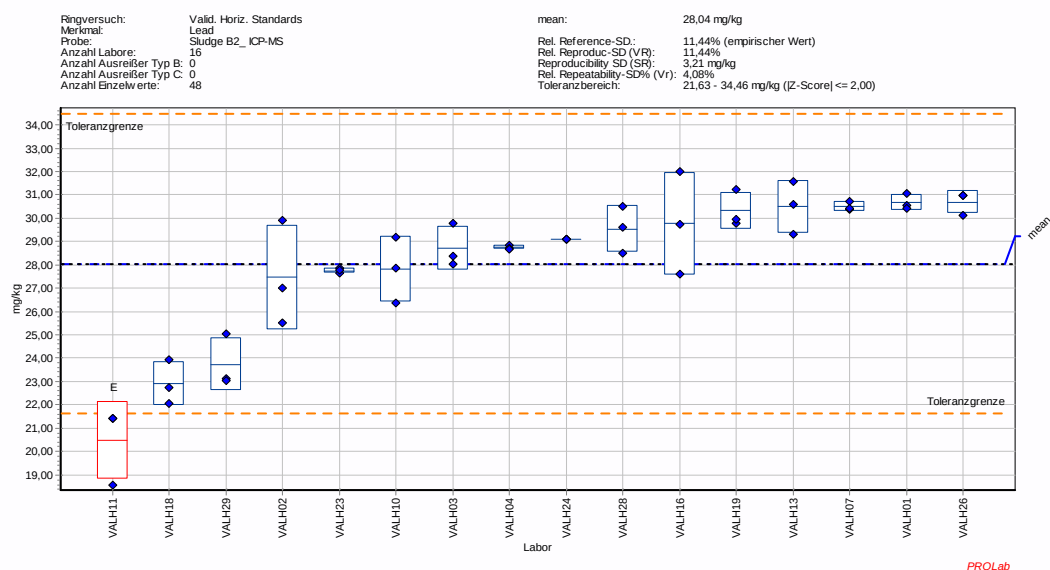
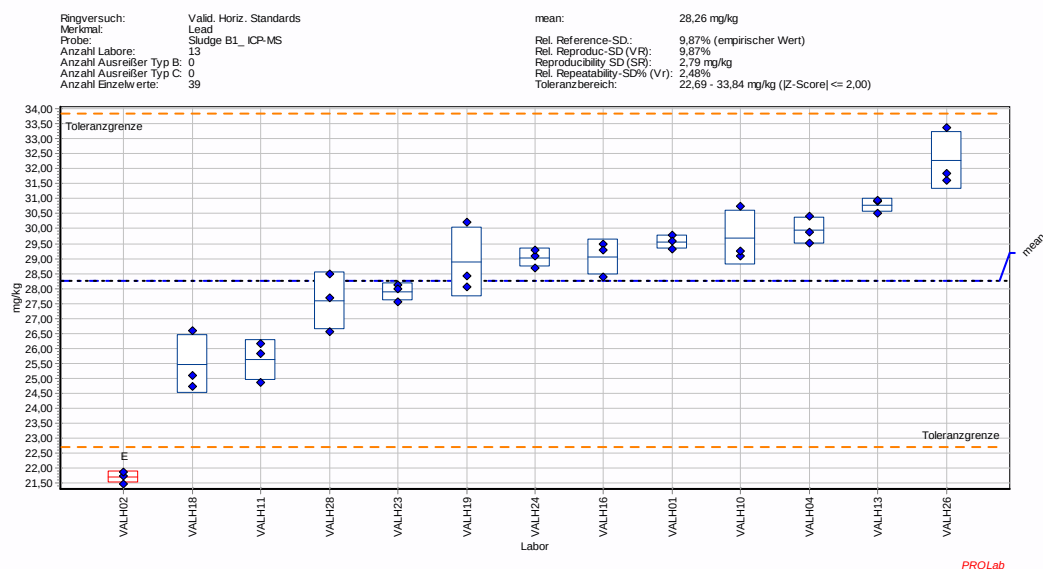
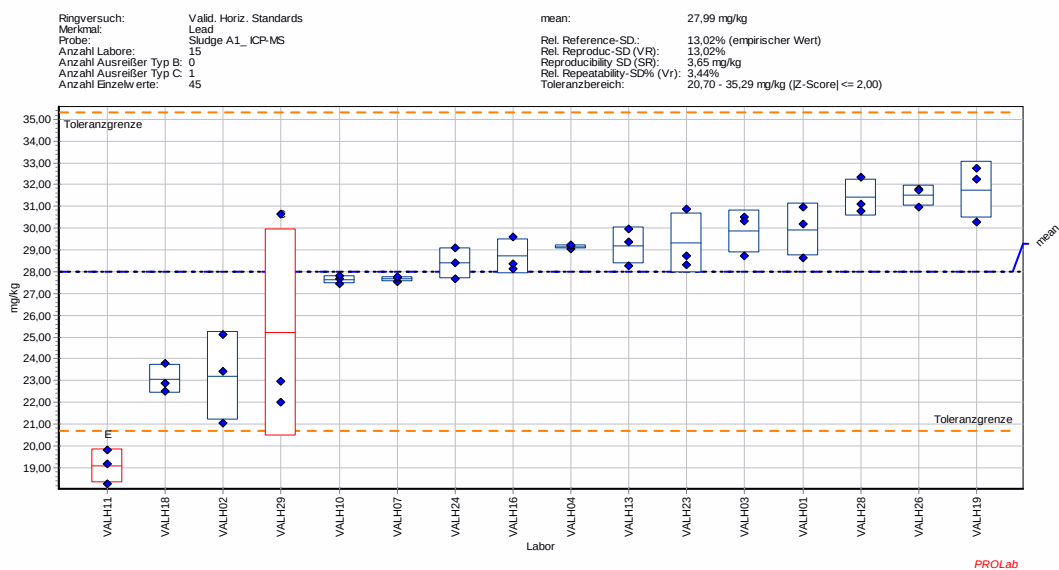


3.2.9.2 Sludge, ICP-MS: Lead

ICP-MS: Lead	SL-A1_MS	Z-Score		SL-B1_MS	Z-Score		SL-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	29,94	0,50		29,56	0,50		30,68	0,80	
VALH02	23,20	-1,30		21,68	-2,40	E	27,46	-0,20	
VALH03	29,85	0,50					28,72	0,20	
VALH04	29,14	0,30		29,93	0,60		28,75	0,20	
VALH07	27,67	-0,10					30,50	0,80	
VALH10	27,64	-0,10		29,70	0,50		27,81	-0,10	
VALH11	19,09	-2,40	E	25,61	-1,00		20,47	-2,40	E
VALH13	29,20	0,30		30,78	0,90		30,49	0,80	
VALH16	28,72	0,20		29,05	0,30		29,77	0,50	
VALH18	23,06	-1,40		25,46	-1,00		22,91	-1,60	
VALH19	31,77	1,00		28,89	0,20		30,32	0,70	
VALH23	29,32	0,40		27,88	-0,10		27,75	-0,10	
VALH24	28,40	0,10		29,03	0,30		29,10	0,30	
VALH26	31,50	1,00		32,28	1,40		30,70	0,80	
VALH28	31,41	0,90		27,58	-0,20		29,54	0,50	
VALH29	25,22	-0,80	C				23,74	-1,30	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	27,99			28,26			28,04		
SR Reprod. SD	3,65			2,79			3,21		
Sr Repeat. SD	0,96			0,70			1,14		
RSD % VR	13,02%			9,87%			11,44%		
RSD % Vr	3,44%			2,48%			4,08%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			0			0		
No. labs accept.	15			13			16		
No. values accept.	45			39			48		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

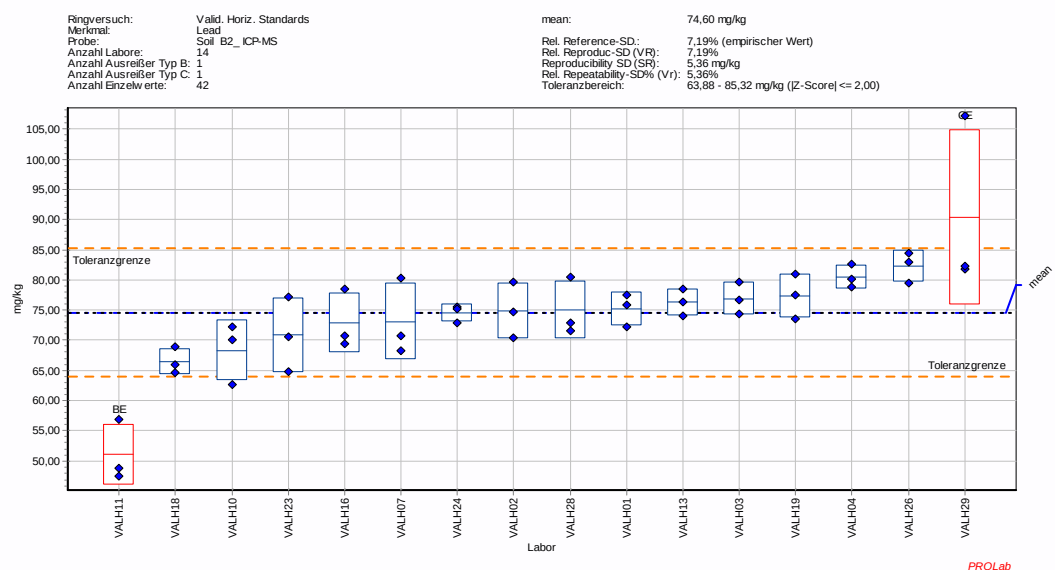
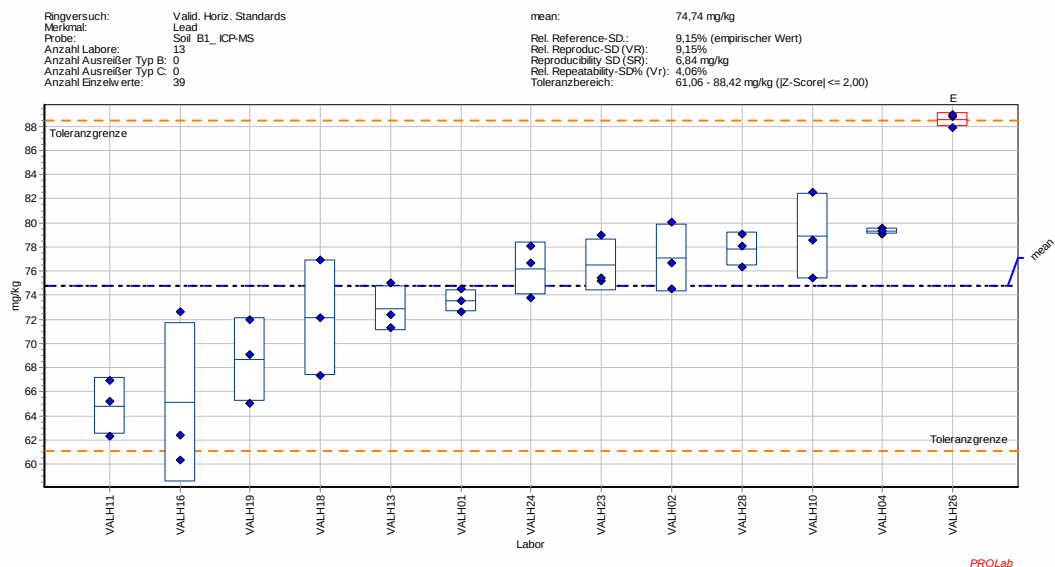
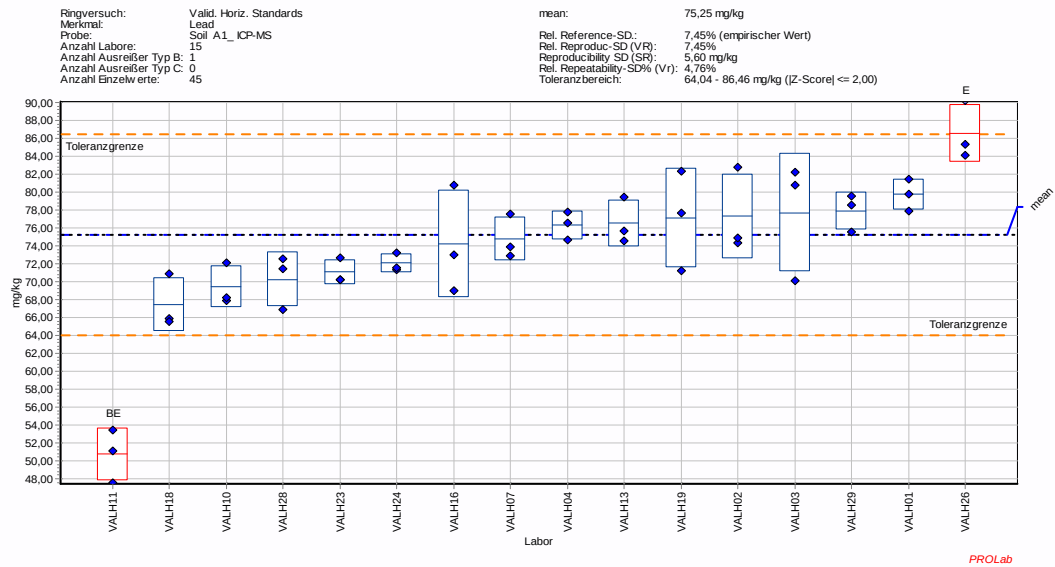


3.2.9.3 Soil, ICP-MS: Lead

ICP-MS: Lead	SO-A1_MS	Z-Score		SO-B1_MS	Z-Score		SO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	79,75	0,80		73,54	-0,20		75,18	0,10	
VALH02	77,34	0,40		77,10	0,30		74,86	0,00	
VALH03	77,73	0,40					76,91	0,40	
VALH04	76,33	0,20		79,32	0,70		80,50	1,10	
VALH07	74,77	-0,10					73,10	-0,30	
VALH10	69,47	-1,00		78,86	0,60		68,27	-1,20	
VALH11	50,74	-4,40	BE	64,84	-1,40		51,03	-4,40	BE
VALH13	76,56	0,20		72,90	-0,30		76,29	0,30	
VALH16	74,28	-0,20		65,12	-1,40		72,87	-0,30	
VALH18	67,46	-1,40		72,14	-0,40		66,49	-1,50	
VALH19	77,12	0,30		68,68	-0,90		77,32	0,50	
VALH23	71,08	-0,70		76,52	0,30		70,82	-0,70	
VALH24	72,10	-0,60		76,20	0,20		74,50	0,00	
VALH26	86,59	2,00	E	88,53	2,00	E	82,27	1,40	
VALH28	70,30	-0,90		77,83	0,50		74,97	0,10	
VALH29	77,90	0,50					90,44	3,00	CE

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	75,25			74,74			74,60		
SR Reprod. SD	5,60			6,84			5,36		
Sr Repeat. SD	3,58			3,04			4,00		
RSD % VR	7,45%			9,15%			7,19%		
RSD % Vr	4,76%			4,06%			5,36%		
No. A outliers	0			0			0		
No. B outliers	1			0			1		
No. C outliers	0			0			1		
No .labs accept.	15			13			14		
No. values accept.	45			39			42		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

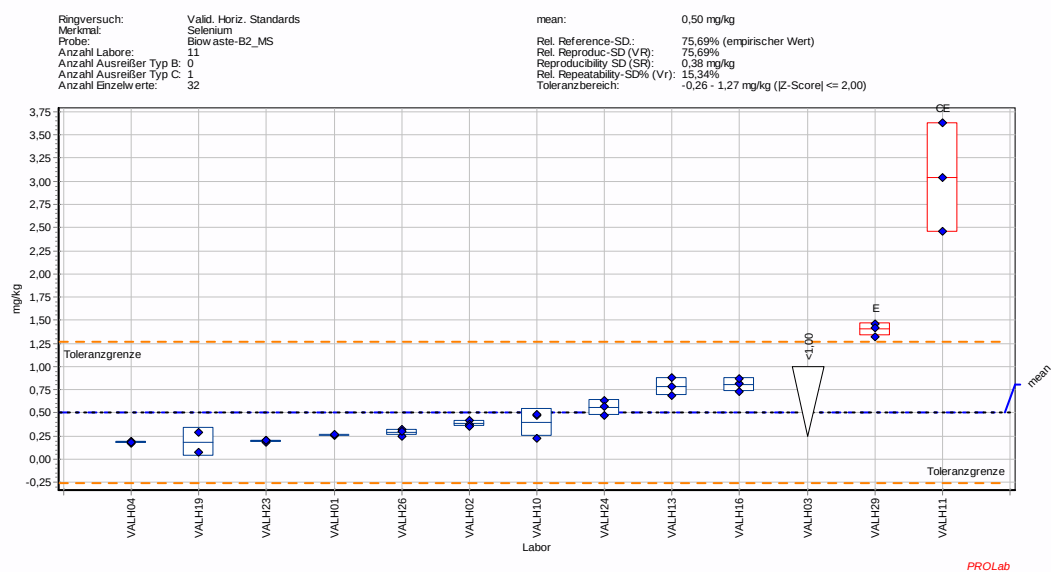
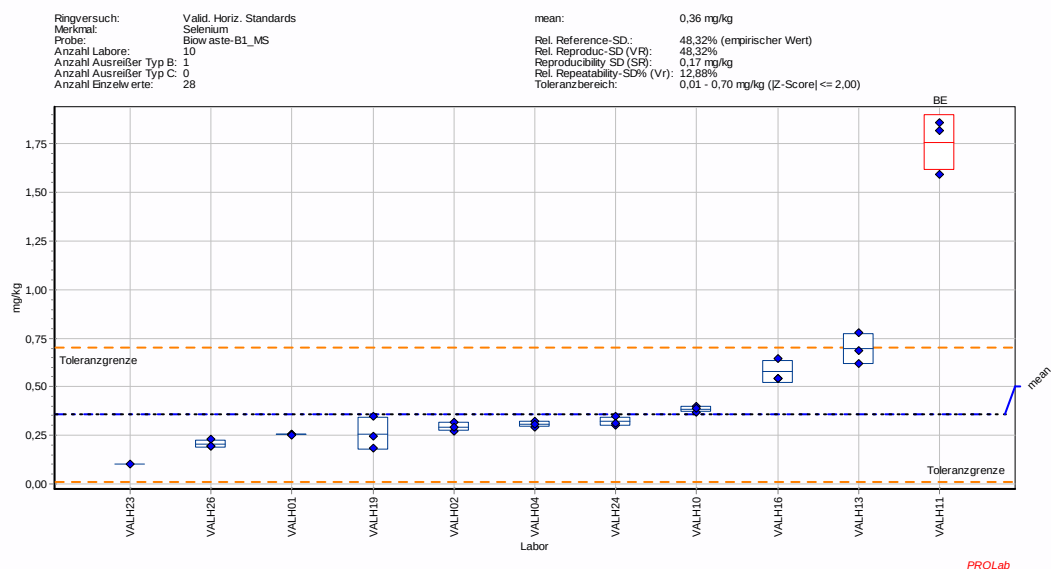
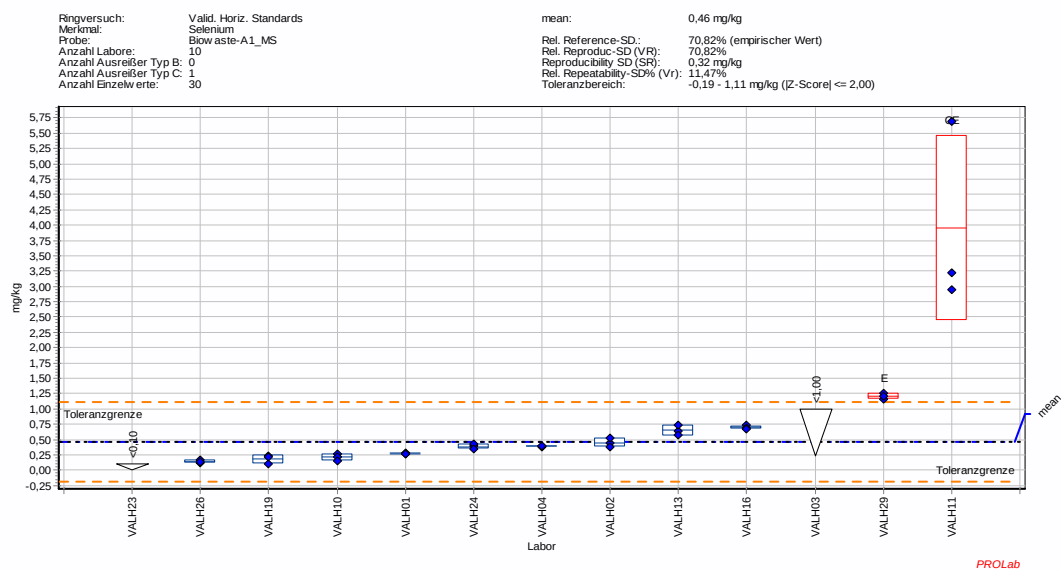


3.2.10.1 Biowaste, ICP-MS: Selenium

ICP-MS: Selenium	CO-A1_MS	Z-Score		CO-B1_MS	Z-Score		CO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	0,27	-0,60		0,25	-0,60		0,26	-0,60	
VALH02	0,45	0,00		0,29	-0,40		0,38	-0,30	
VALH03	< 1,00						< 1,00		
VALH04	0,39	-0,20		0,31	-0,30		0,18	-0,80	
VALH07									
VALH10	0,21	-0,80		0,38	0,20		0,40	-0,30	
VALH11	3,95	10,80	CE	1,76	8,10	BE	3,04	6,60	CE
VALH13	0,65	0,60		0,70	2,00		0,78	0,70	
VALH16	0,70	0,70		0,58	1,30		0,81	0,80	
VALH18	< 2,50			< 2,00			< 2,50		
VALH19	0,18	-0,90		0,26	-0,60		0,19	-0,80	
VALH23	< 0,10			0,10	-1,50		0,19	-0,80	
VALH24	0,39	-0,20		0,32	-0,20		0,56	0,10	
VALH26	0,14	-1,00		0,21	-0,90		0,29	-0,60	
VALH28									
VALH29	1,20	2,30	E				1,40	2,40	E

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	14			12			14		
No. labs with val.	11			11			12		
Mean	0,46			0,36			0,50		
SR Reprod. SD	0,32			0,17			0,38		
Sr Repeat. SD	0,05			0,05			0,08		
RSD % VR	70,82%			48,32%			75,69%		
RSD % Vr	11,47%			12,88%			15,34%		
No. A outliers	0			0			0		
No. B outliers	0			1			0		
No. C outliers	1			0			1		
No. labs accept.	10			10			11		
No. values accept.	30			28			32		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

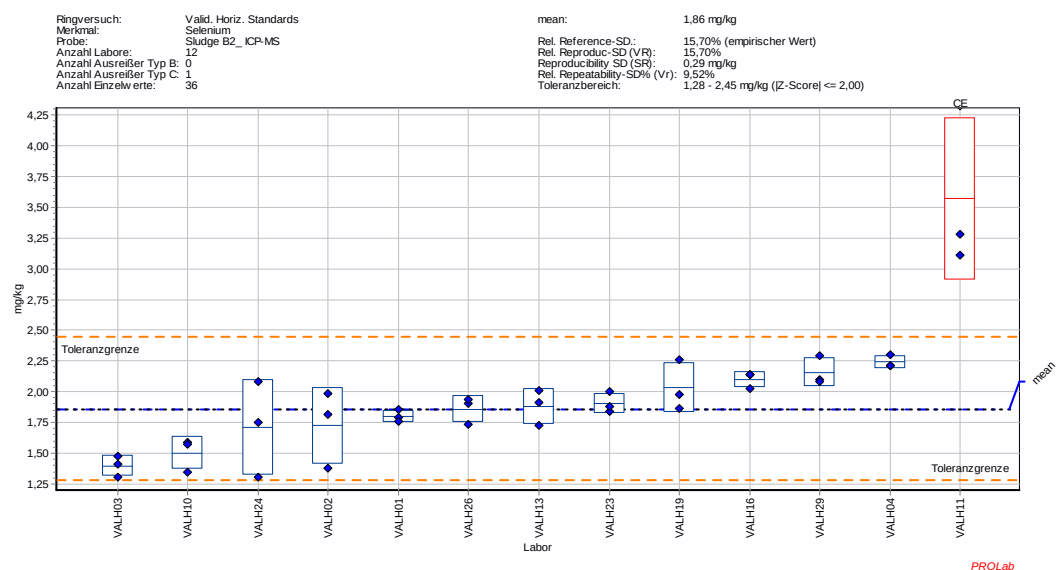
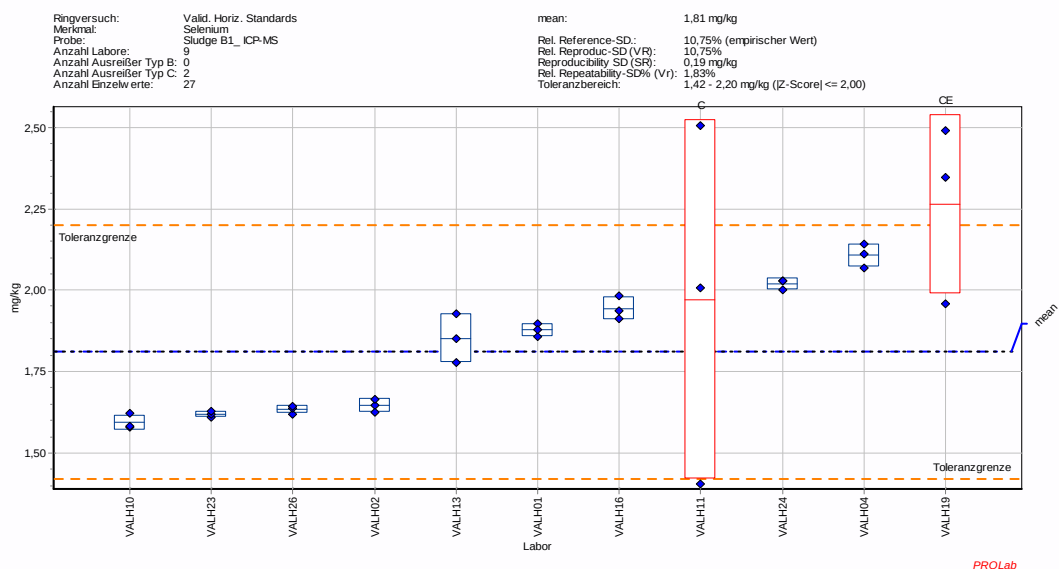
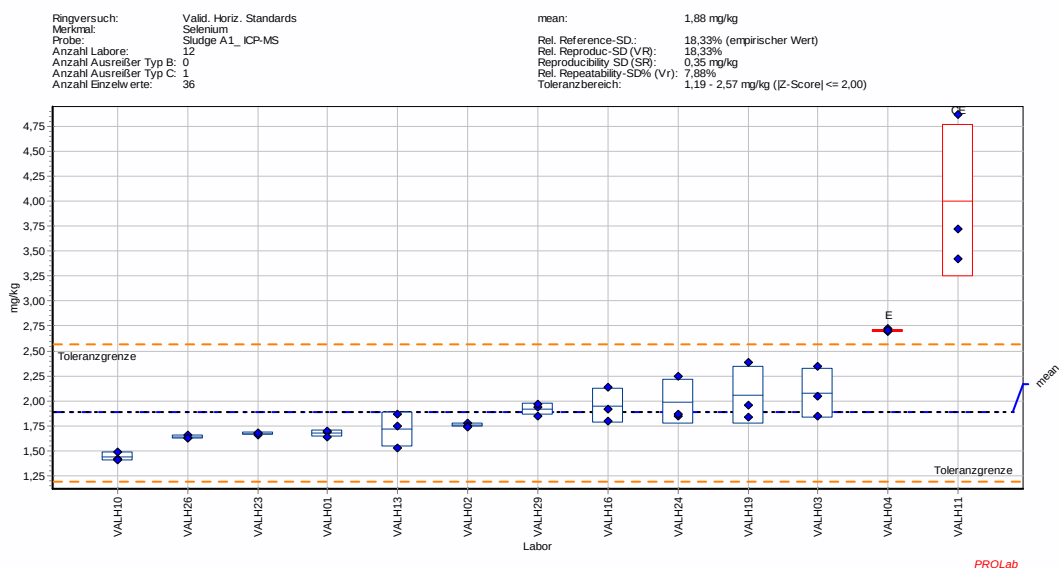


3.2.10.2 Sludge, ICP-MS: Selenium

ICP-MS: Selenium	SL-A1_MS	Z-Score		SL-B1_MS	Z-Score		SL-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	1,67	-0,60		1,88	0,30		1,80	-0,20	
VALH02	1,76	-0,40		1,65	-0,80		1,72	-0,50	
VALH03	2,08	0,60					1,40	-1,60	
VALH04	2,70	2,40	E	2,11	1,50		2,24	1,30	
VALH07									
VALH10	1,44	-1,30		1,59	-1,10		1,51	-1,20	
VALH11	4,00	6,10	CE	1,97	0,80	C	3,57	5,80	CE
VALH13	1,72	-0,50		1,85	0,20		1,88	0,10	
VALH16	1,95	0,20		1,94	0,70		2,10	0,80	
VALH18	< 5,00			< 1,00			< 5,00		
VALH19	2,06	0,50		2,26	2,30	CE	2,03	0,60	
VALH23	1,67	-0,60		1,62	-1,00		1,91	0,20	
VALH24	1,99	0,30		2,02	1,10		1,71	-0,50	
VALH26	1,64	-0,70		1,63	-0,90		1,86	0,00	
VALH28									
VALH29	1,92	0,10					2,16	1,00	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	14			12			14		
No. labs with val.	13			11			13		
Mean	1,88			1,81			1,86		
SR Reprod. SD	0,35			0,19			0,29		
Sr Repeat. SD	0,15			0,03			0,18		
RSD % VR	18,33%			10,75%			15,70%		
RSD % Vr	7,88%			1,83%			9,52%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			2			1		
No. labs accept.	12			9			12		
No. values accept.	36			27			36		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

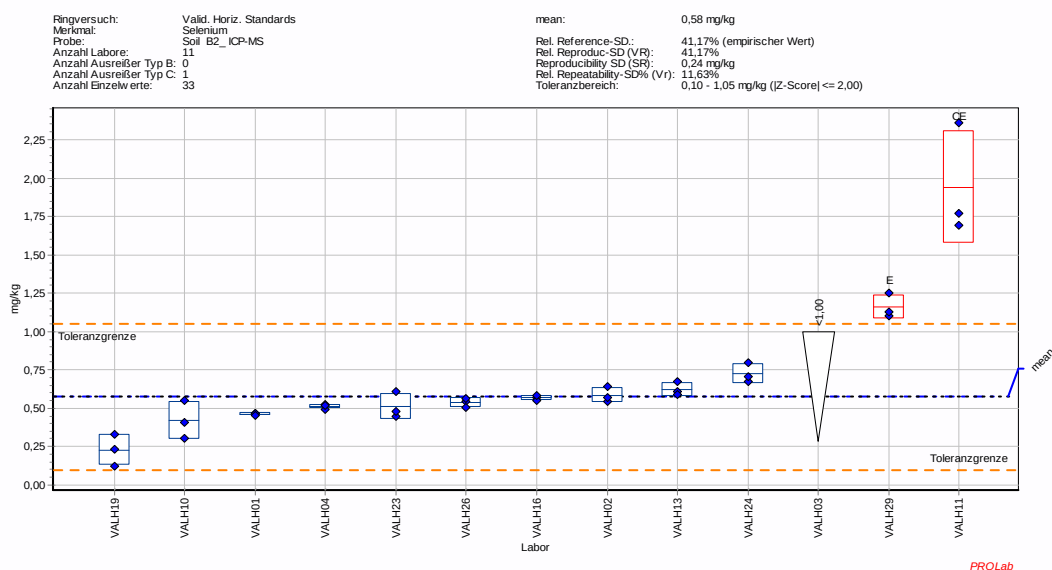
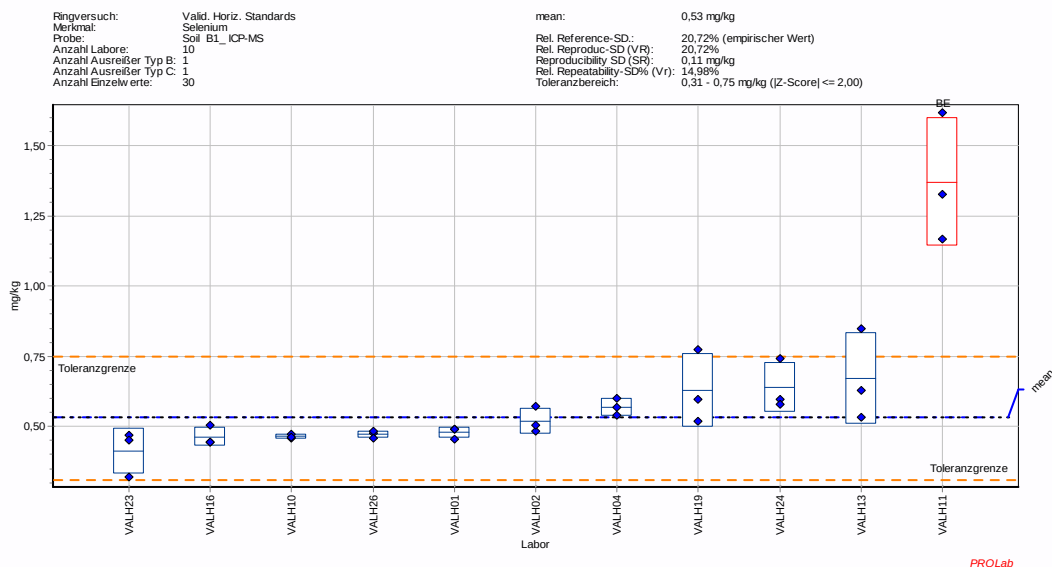
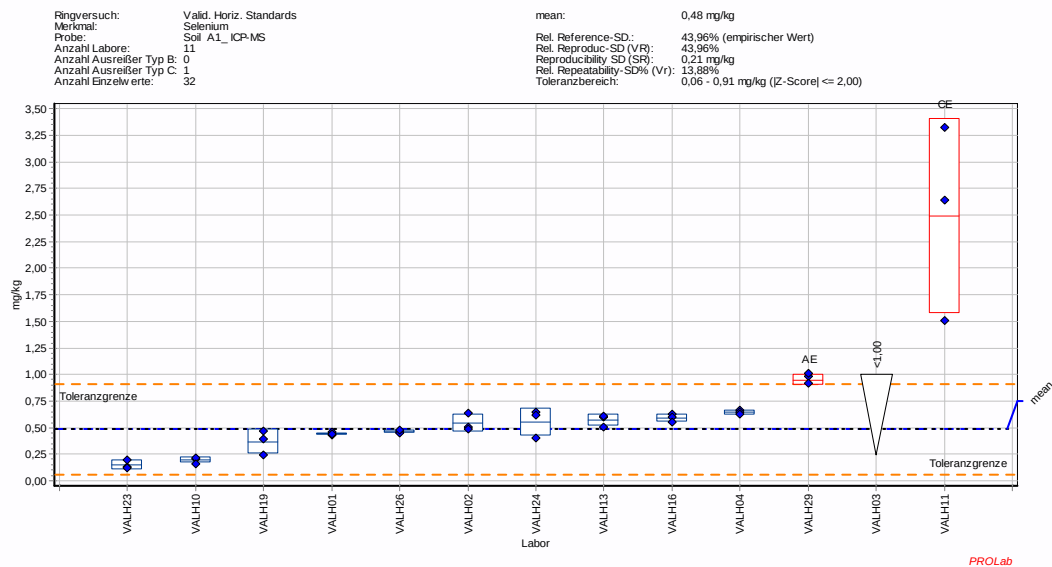


3.2.10.3 Soil, ICP-MS: Selenium

ICP-MS: Selenium	SO-A1_MS	Z-Score		SO-B1_MS	Z-Score		SO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	0,44	-0,20		0,48	-0,50		0,46	-0,50	
VALH02	0,54	0,30		0,52	-0,10		0,59	0,00	
VALH03	< 1,00						< 1,00		
VALH04	0,64	0,80		0,57	0,30		0,51	-0,30	
VALH07									
VALH10	0,19	-1,40		0,46	-0,60		0,42	-0,70	
VALH11	2,49	9,40	CE	1,37	7,60	BE	1,94	5,80	CE
VALH13	0,57	0,40		0,67	1,30		0,62	0,20	
VALH16	0,59	0,50		0,46	-0,60		0,57	0,00	
VALH18	< 1,00			6,69	55,90	CE	< 1,00		
VALH19	0,37	-0,50		0,63	0,90		0,23	-1,50	
VALH23	0,15	-1,60		0,41	-1,10		0,51	-0,30	
VALH24	0,56	0,30		0,64	1,00		0,73	0,60	
VALH26	0,46	-0,10		0,47	-0,50		0,54	-0,20	
VALH28									
VALH29	0,95	2,20	AE				1,16	2,50	E

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	14			12			14		
No. labs with val.	12			12			12		
Mean	0,48			0,53			0,58		
SR Reprod. SD	0,21			0,11			0,24		
Sr Repeat. SD	0,07			0,08			0,07		
RSD % VR	43,96%			20,72%			41,17%		
RSD % Vr	13,88%			14,98%			11,63%		
No. A outliers	1			0			0		
No. B outliers	0			1			0		
No. C outliers	1			1			1		
No. labs accept.	11			10			11		
No. values accept.	32			30			33		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

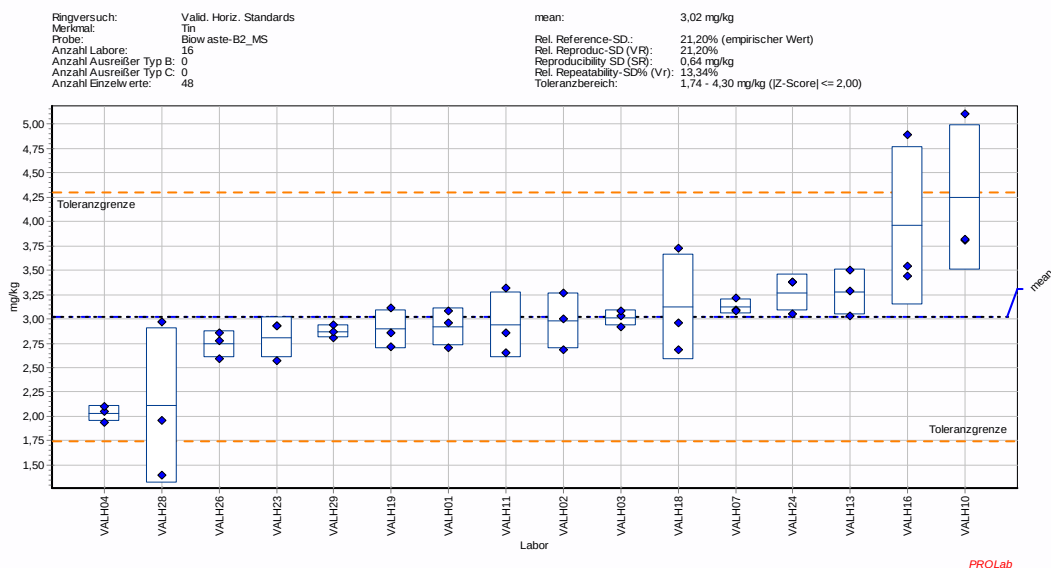
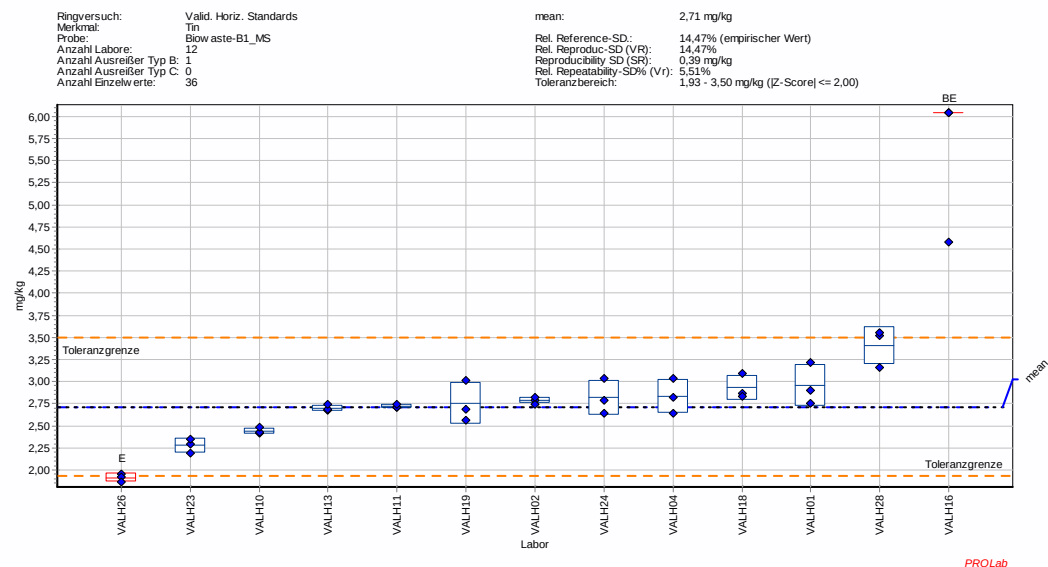
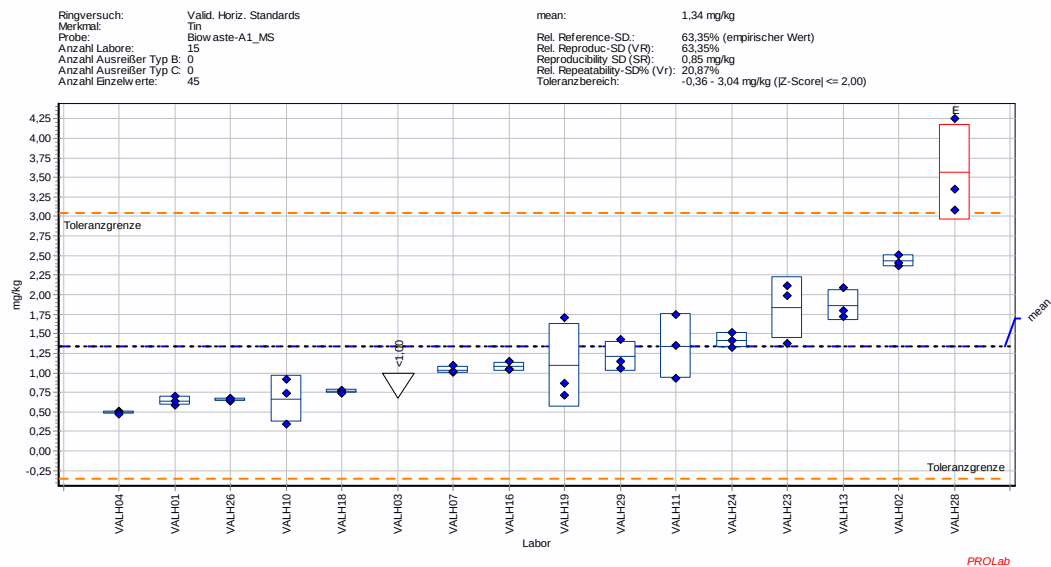


3.2.11.1 Biowaste, ICP-MS: Tin

ICP-MS: Tin	CO-A1_MS	Z-Score		CO-B1_MS	Z-Score		CO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	0,64	-0,80		2,96	0,60		2,92	-0,20	
VALH02	2,43	1,30		2,79	0,20		2,98	-0,10	
VALH03	< 1,00						3,01	0,00	
VALH04	0,49	-1,00		2,84	0,30		2,03	-1,50	
VALH07	1,04	-0,40					3,13	0,20	
VALH10	0,67	-0,80		2,44	-0,70		4,25	1,90	
VALH11	1,34	0,00		2,72	0,00		2,94	-0,10	
VALH13	1,87	0,60		2,70	0,00		3,27	0,40	
VALH16	1,08	-0,30		6,04	8,50	BE	3,96	1,50	
VALH18	0,76	-0,70		2,93	0,60		3,12	0,20	
VALH19	1,09	-0,30		2,75	0,10		2,89	-0,20	
VALH23	1,83	0,60		2,28	-1,10		2,81	-0,30	
VALH24	1,42	0,10		2,82	0,30		3,27	0,40	
VALH26	0,66	-0,80		1,91	-2,00	E	2,74	-0,40	
VALH28	3,56	2,60	E	3,41	1,80		2,11	-1,40	
VALH29	1,21	-0,20					2,87	-0,20	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	16			13			16		
No. labs with val.	15			13			16		
Mean	1,34			2,71			3,02		
SR Reprod. SD	0,85			0,39			0,64		
Sr Repeat. SD	0,28			0,15			0,40		
RSD % VR	63,35%			14,47%			21,20%		
RSD % Vr	20,87%			5,51%			13,34%		
No. A outliers	0			0			0		
No. B outliers	0			1			0		
No. C outliers	0			0			0		
No. labs accept.	15			12			16		
No. values accept.	45			36			48		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

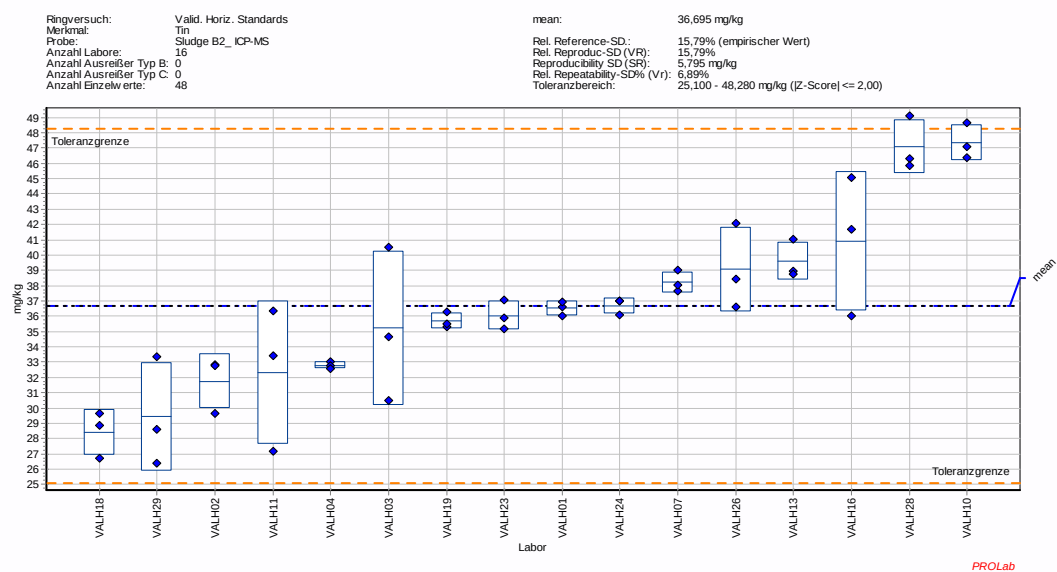
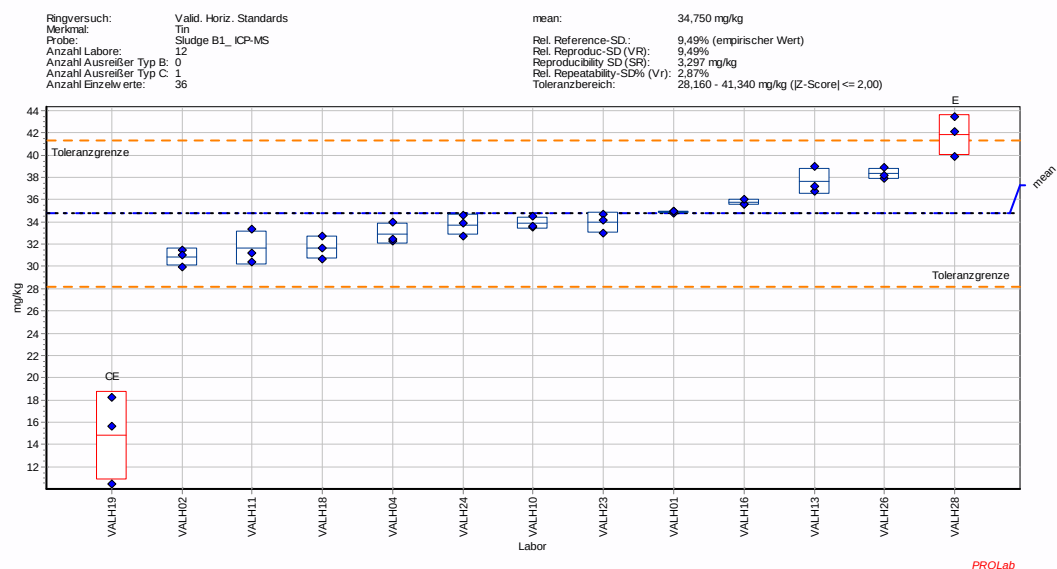
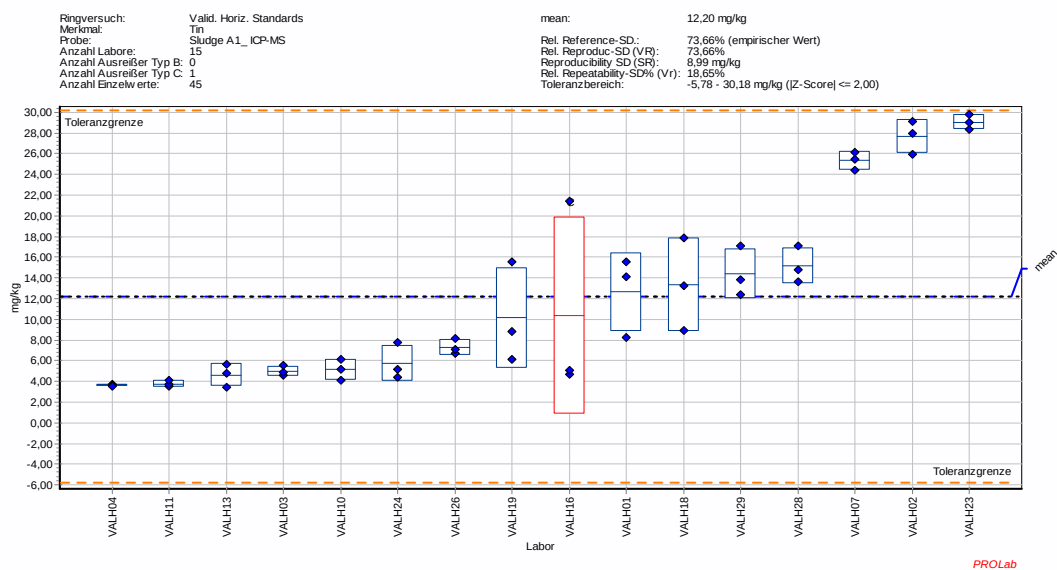


3.2.11.2 Sludge, ICP-MS: Tin

ICP-MS: Tin	SL-A1_MS	Z-Score		SL-B1_MS	Z-Score		SL-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	12,63	0,00		34,89	0,00		36,51	0,00	
VALH02	27,68	1,70		30,85	-1,20		31,76	-0,90	
VALH03	5,01	-0,80					35,21	-0,30	
VALH04	3,64	-1,00		32,91	-0,60		32,79	-0,70	
VALH07	25,32	1,50					38,23	0,30	
VALH10	5,15	-0,80		33,87	-0,30		47,36	1,80	
VALH11	3,77	-0,90		31,63	-0,90		32,30	-0,80	
VALH13	4,63	-0,80		37,65	0,90		39,59	0,50	
VALH16	10,40	-0,20	C	35,74	0,30		40,92	0,70	
VALH18	13,36	0,10		31,66	-0,90		28,42	-1,40	
VALH19	10,15	-0,20		14,81	-6,00	CE	35,69	-0,20	
VALH23	29,04	1,90		33,93	-0,20		36,04	-0,10	
VALH24	5,79	-0,70		33,73	-0,30		36,70	0,00	
VALH26	7,31	-0,50		38,31	1,10		39,06	0,40	
VALH28	15,16	0,30		41,81	2,10	E	47,09	1,80	
VALH29	14,42	0,20					29,44	-1,30	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	12,2			34,75			36,69		
SR Reprod. SD	8,99			3,30			5,79		
Sr Repeat. SD	2,28			1,00			2,53		
RSD % VR	73,66%			9,49%			15,79%		
RSD % Vr	18,65%			2,87%			6,89%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			1			0		
No. labs accept.	15			12			16		
No. values accept.	45			36			48		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

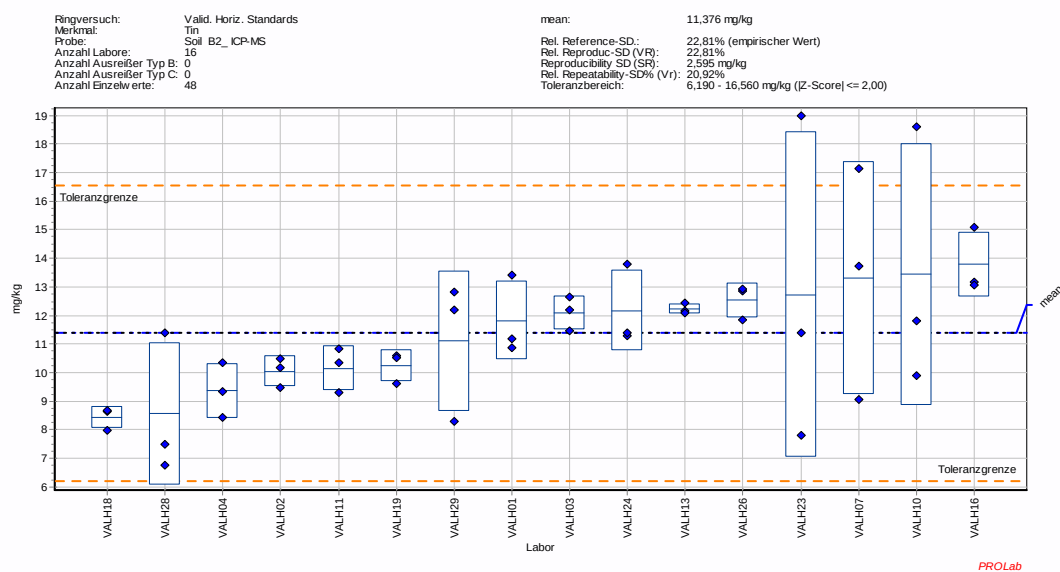
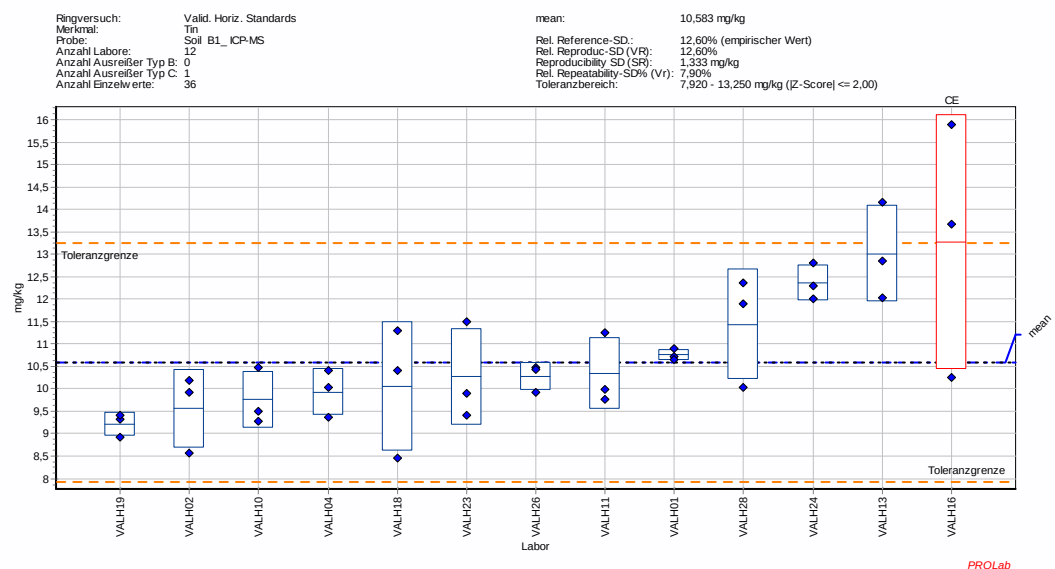
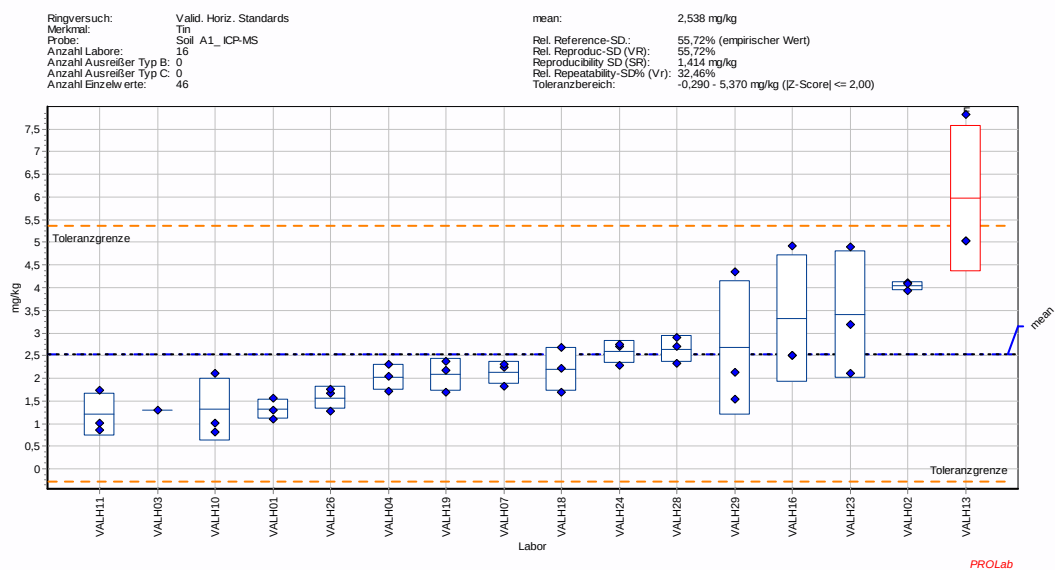


3.2.11.3 Soil, ICP-MS: Tin

ICP-MS: Tin	SO-A1_MS	Z-Score		SO-B1_MS	Z-Score		SO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	1,32	-0,90		10,76	0,10		11,82	0,20	
VALH02	4,04	1,10		9,56	-0,80		10,05	-0,50	
VALH03	1,30	-0,90					12,10	0,30	
VALH04	2,03	-0,40		9,93	-0,50		9,37	-0,80	
VALH07	2,13	-0,30					13,30	0,70	
VALH10	1,32	-0,90		9,76	-0,60		13,45	0,80	
VALH11	1,20	-0,90		10,34	-0,20		10,15	-0,50	
VALH13	5,97	2,40	E	13,02	1,80		12,23	0,30	
VALH16	3,32	0,60		13,28	2,00	CE	13,78	0,90	
VALH18	2,20	-0,20		10,05	-0,40		8,43	-1,10	
VALH19	2,09	-0,30		9,22	-1,00		10,24	-0,40	
VALH23	3,40	0,60		10,27	-0,20		12,73	0,50	
VALH24	2,59	0,00		12,37	1,30		12,17	0,30	
VALH26	1,57	-0,70		10,28	-0,20		12,53	0,40	
VALH28	2,65	0,10		11,44	0,60		8,55	-1,10	
VALH29	2,68	0,10					11,11	-0,10	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	16			13			16		
No. labs with val.	16			13			16		
Mean	2,538			10,583			11,376		
SR Reprod. SD	1,41			1,33			2,59		
Sr Repeat. SD	0,82			0,84			2,38		
RSD % VR	55,72%			12,60%			22,81%		
RSD % Vr	32,46%			7,90%			20,92%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	0			1			0		
No. labs accept.	16			12			16		
No. values accept.	46			36			48		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

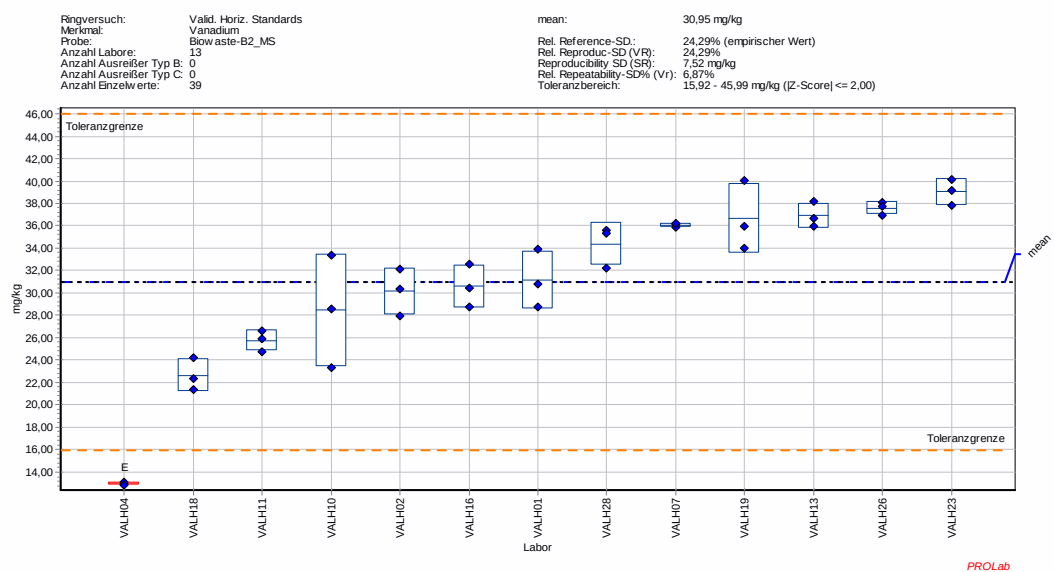
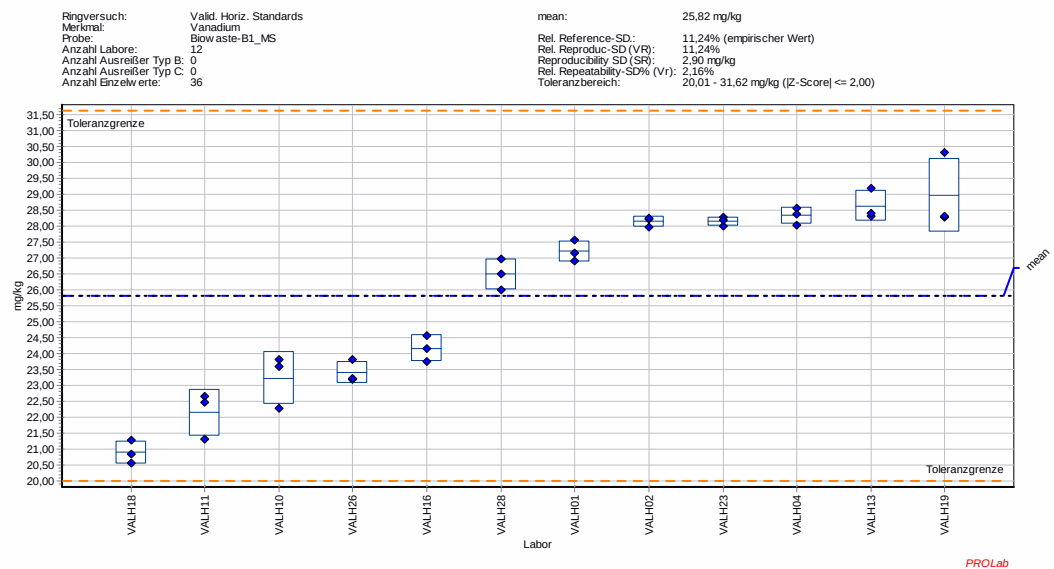
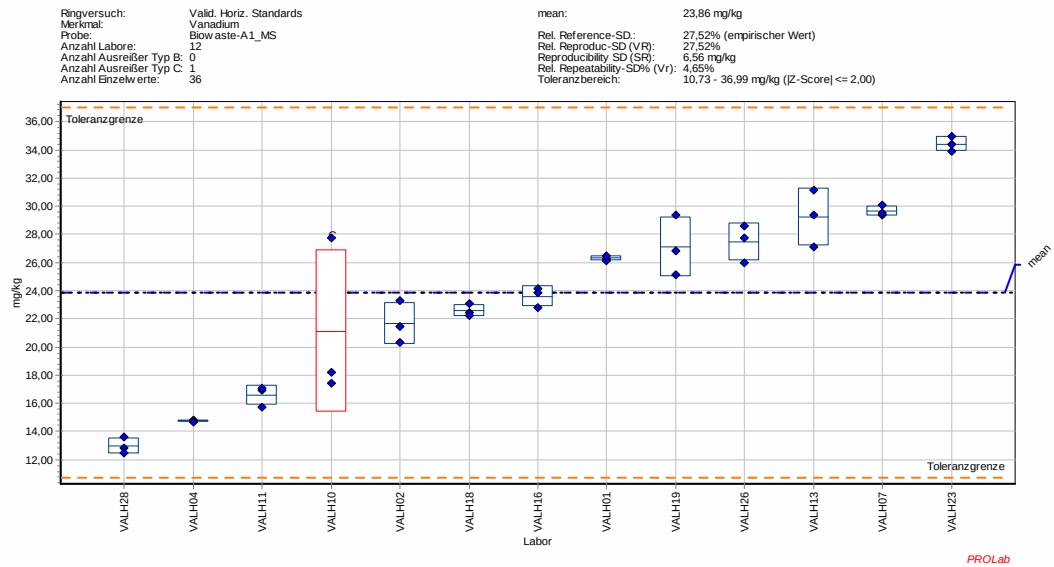


3.2.12.1 Biowaste, ICP-MS: Vanadium

ICP-MS: Vanadium	CO-A1_MS	Z-Score		CO-B1_MS	Z-Score		CO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	26,31	0,40		27,21	0,50		31,15	0,00	
VALH02	21,68	-0,30		28,14	0,80		30,14	-0,10	
VALH04	14,74	-1,40		28,33	0,90		12,96	-2,40	E
VALH07	29,67	0,90					36,07	0,70	
VALH10	21,12	-0,40	C	23,24	-0,90		28,44	-0,30	
VALH11	16,57	-1,10		22,15	-1,30		25,77	-0,70	
VALH13	29,21	0,80		28,64	1,00		36,92	0,80	
VALH16	23,61	0,00		24,17	-0,60		30,59	0,00	
VALH18	22,59	-0,20		20,90	-1,70		22,65	-1,10	
VALH19	27,10	0,50		28,97	1,10		36,66	0,80	
VALH23	34,42	1,60		28,15	0,80		39,03	1,10	
VALH24									
VALH26	27,45	0,50		23,41	-0,80		37,59	0,90	
VALH28	12,94	-1,70		26,49	0,20		34,39	0,50	
VALH29									

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	13			12			13		
No. labs with val.	13			12			13		
Mean	23,86			25,82			30,95		
SR Reprod. SD	6,56			2,90			7,52		
Sr Repeat. SD	1,11			0,56			2,13		
RSD % VR	27,52%			11,24%			24,29%		
RSD % Vr	4,65%			2,16%			6,87%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			0			0		
No. labs accept.	12			12			13		
No. values accept.	36			36			39		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

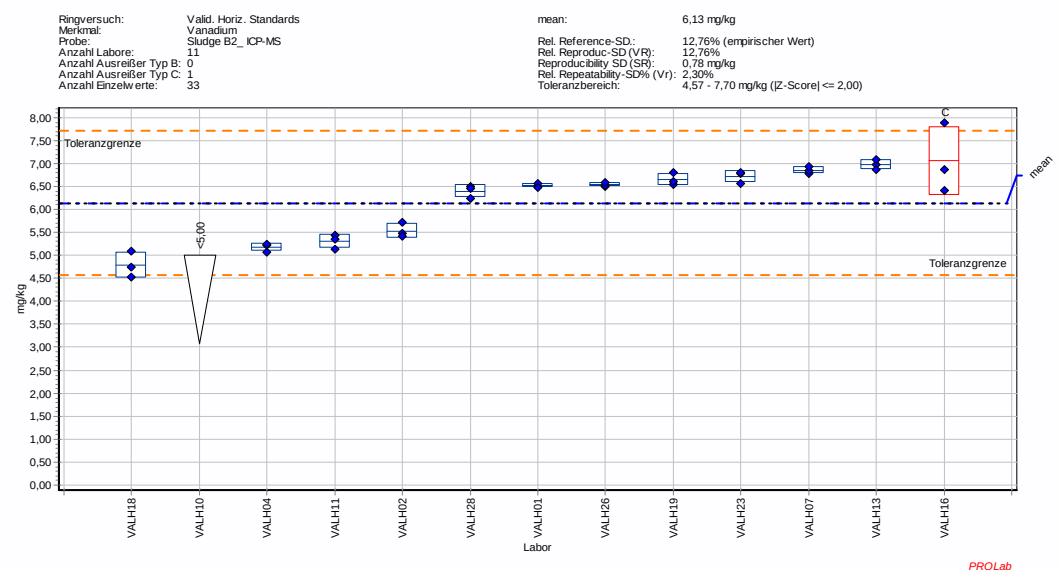
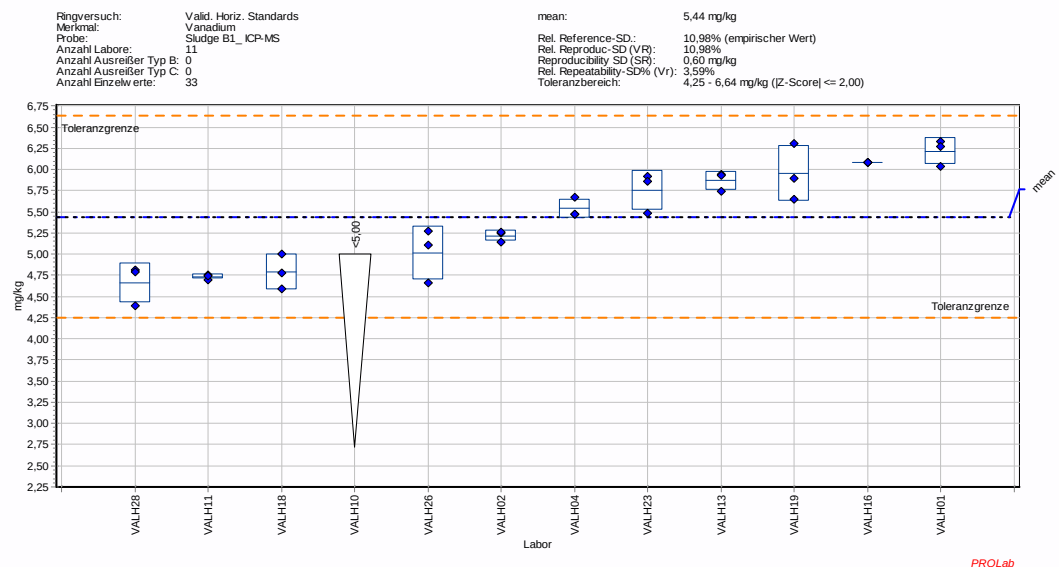
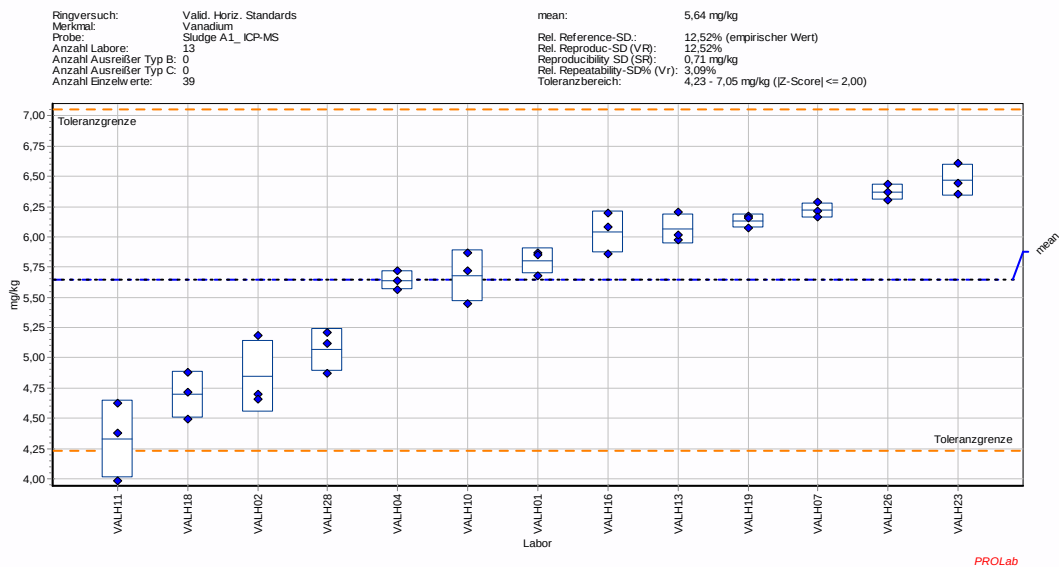


3.2.12.2 Sludge, ICP-MS: Vanadium

ICP-MS: Vanadium	SL-A1_MS	Z-Score		SL-B1_MS	Z-Score		SL-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	5,80	0,20		6,22	1,30		6,51	0,50	
VALH02	4,85	-1,10		5,22	-0,40		5,53	-0,80	
VALH04	5,64	0,00		5,54	0,20		5,18	-1,20	
VALH07	6,22	0,80					6,85	0,90	
VALH10	5,68	0,00		< 5,00			< 5,00		
VALH11	4,33	-1,90		4,74	-1,20		5,30	-1,10	
VALH13	6,06	0,60		5,87	0,70		6,97	1,10	
VALH16	6,04	0,60		6,08	1,10		7,06	1,20	C
VALH18	4,70	-1,30		4,79	-1,10		4,79	-1,70	
VALH19	6,13	0,70		5,95	0,90		6,65	0,70	
VALH23	6,47	1,20		5,75	0,50		6,72	0,70	
VALH24									
VALH26	6,37	1,00		5,02	-0,70		6,54	0,50	
VALH28	5,07	-0,80		4,66	-1,30		6,40	0,30	
VALH29									

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	13			12			13		
No. labs with val.	13			11			12		
Mean	5,64			5,44			6,13		
SR Reprod. SD	0,71			0,60			0,78		
Sr Repeat. SD	0,17			0,20			0,14		
RSD % VR	12,52%			10,98%			12,76%		
RSD % Vr	3,09%			3,59%			2,30%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	0			0			1		
No. labs accept.	13			11			11		
No. values accept.	39			33			33		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

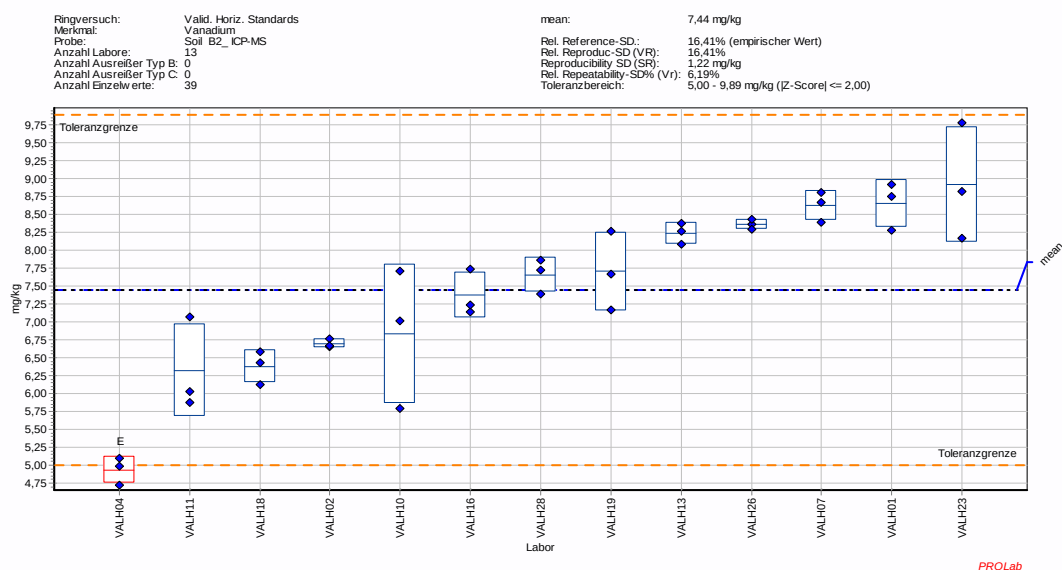
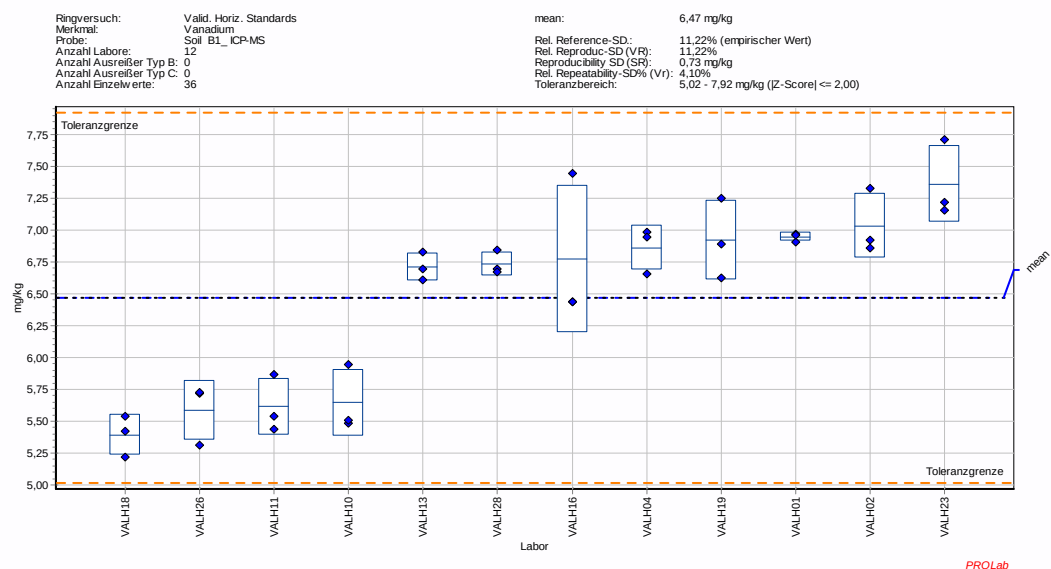
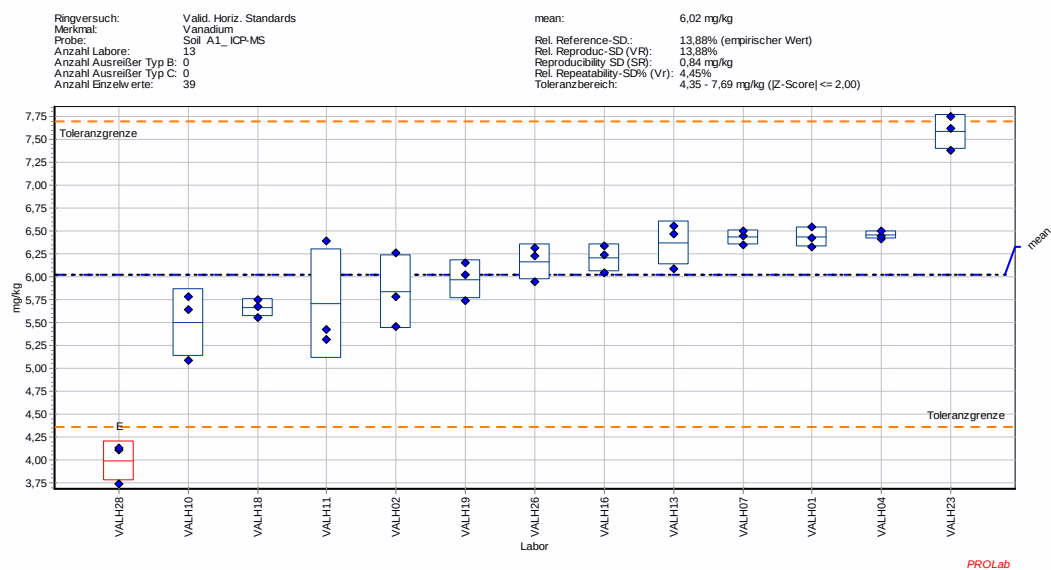


3.2.12.3 Soil, ICP-MS: Vanadium

ICP-MS: Vanadium	SO-A1_MS	Z-Score		SO-B1_MS	Z-Score		SO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	6,43	0,50		6,95	0,70		8,65	1,00	
VALH02	5,83	-0,20		7,04	0,80		6,70	-0,60	
VALH04	6,45	0,50		6,86	0,50		4,94	-2,00	E
VALH07	6,43	0,50					8,63	1,00	
VALH10	5,50	-0,60		5,65	-1,10		6,84	-0,50	
VALH11	5,71	-0,40		5,62	-1,20		6,33	-0,90	
VALH13	6,37	0,40		6,71	0,30		8,25	0,70	
VALH16	6,20	0,20		6,77	0,40		7,38	-0,10	
VALH18	5,66	-0,40		5,40	-1,50		6,38	-0,90	
VALH19	5,97	-0,10		6,92	0,60		7,71	0,20	
VALH23	7,58	1,90		7,36	1,20		8,92	1,20	
VALH24									
VALH26	6,16	0,20		5,59	-1,20		8,37	0,80	
VALH28	3,99	-2,40	E	6,74	0,40		7,66	0,20	
VALH29									

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	13			12			13		
No. labs with val.	13			12			13		
Mean	6,02			6,47			7,44		
SR Reprod. SD	0,84			0,73			1,22		
Sr Repeat. SD	0,27			0,27			0,46		
RSD % VR	13,88%			11,22%			16,41%		
RSD % Vr	4,45%			4,10%			6,19%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	0			0			0		
No. labs accept.	13			12			13		
No. values accept.	39			36			39		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

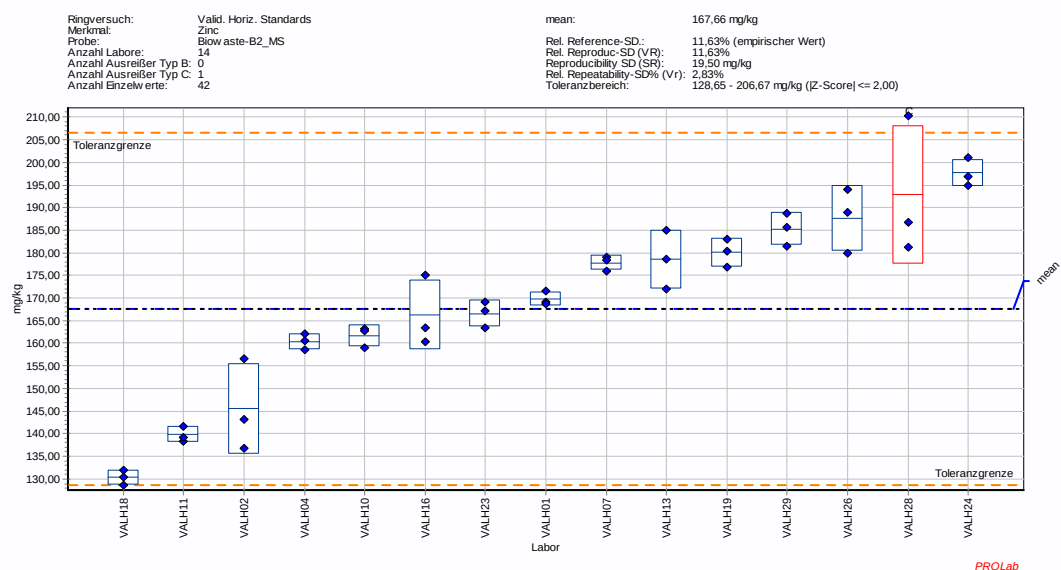
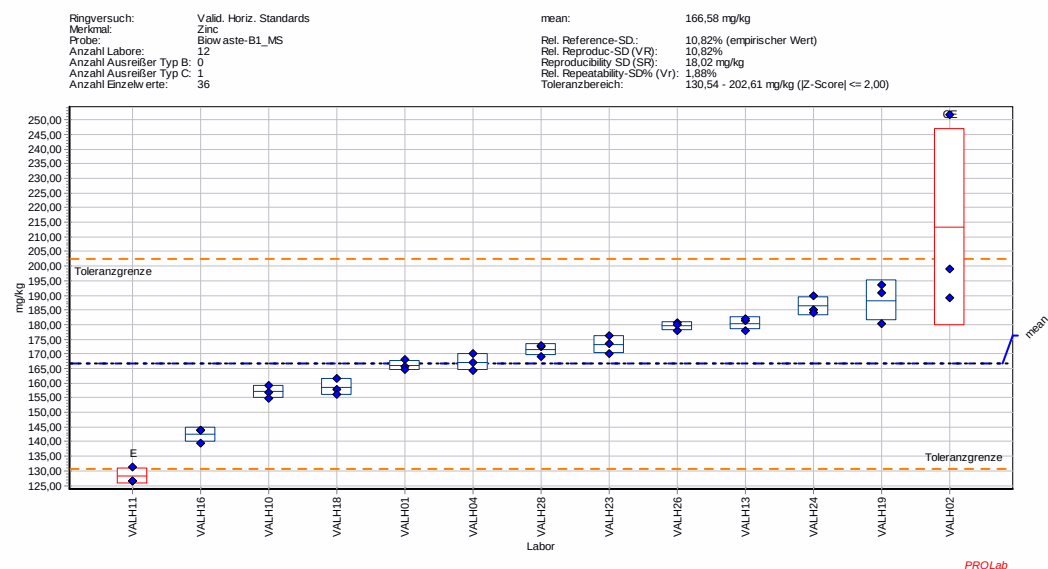
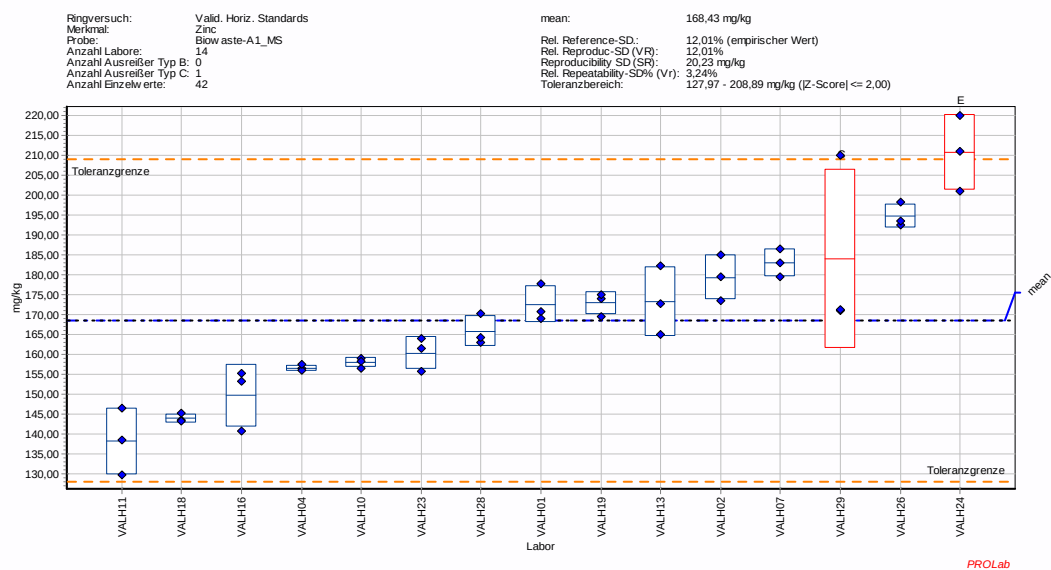


3.2.13.1 Biowaste, ICP-MS: Zinc

ICP-MS: Zinc	CO-A1_MS	Z-Score		CO-B1_MS	Z-Score		CO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	172,5	0,20		166,1	0,00		169,8	0,10	
VALH02	179,3	0,50		213,3	2,60	CE	145,5	-1,10	
VALH04	156,5	-0,60		167,2	0,00		160,4	-0,40	
VALH07	182,9	0,70					177,8	0,50	
VALH10	157,9	-0,50		157,1	-0,50		161,7	-0,30	
VALH11	138,1	-1,50		128,2	-2,10	E	139,8	-1,40	
VALH13	173,2	0,20		180,4	0,80		178,6	0,60	
VALH16	149,6	-0,90		142,4	-1,30		166,3	-0,10	
VALH18	143,9	-1,20		158,7	-0,40		130,3	-1,90	
VALH19	172,8	0,20		188,3	1,20		180,1	0,60	
VALH23	160,3	-0,40		173,3	0,40		166,5	-0,10	
VALH24	210,7	2,10	E	186,3	1,10		197,7	1,50	
VALH26	194,7	1,30		179,6	0,70		187,6	1,00	
VALH28	165,7	-0,10		171,5	0,30		192,8	1,30	C
VALH29	184,0	0,80	C				185,3	0,90	

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	15			13			15		
No. labs with val.	15			13			15		
Mean	168,43			166,58			167,66		
SR Reprod. SD	20,23			18,02			19,50		
Sr Repeat. SD	5,46			3,13			4,74		
RSD % VR	12,01%			10,82%			11,63%		
RSD % Vr	3,24%			1,88%			2,83%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	1			1			1		
No. labs accept.	14			12			14		
No. values accept.	42			36			42		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

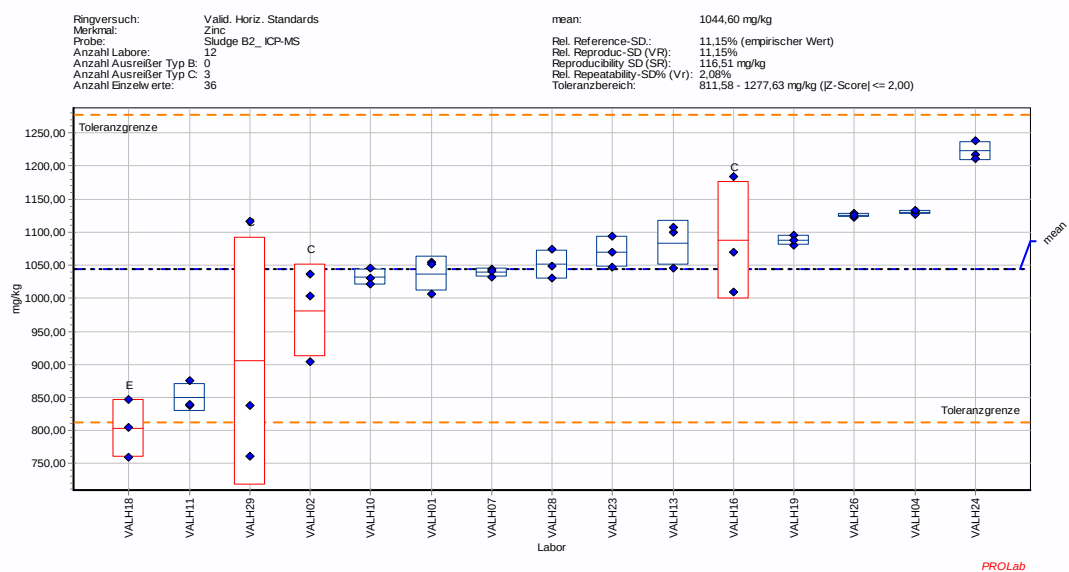
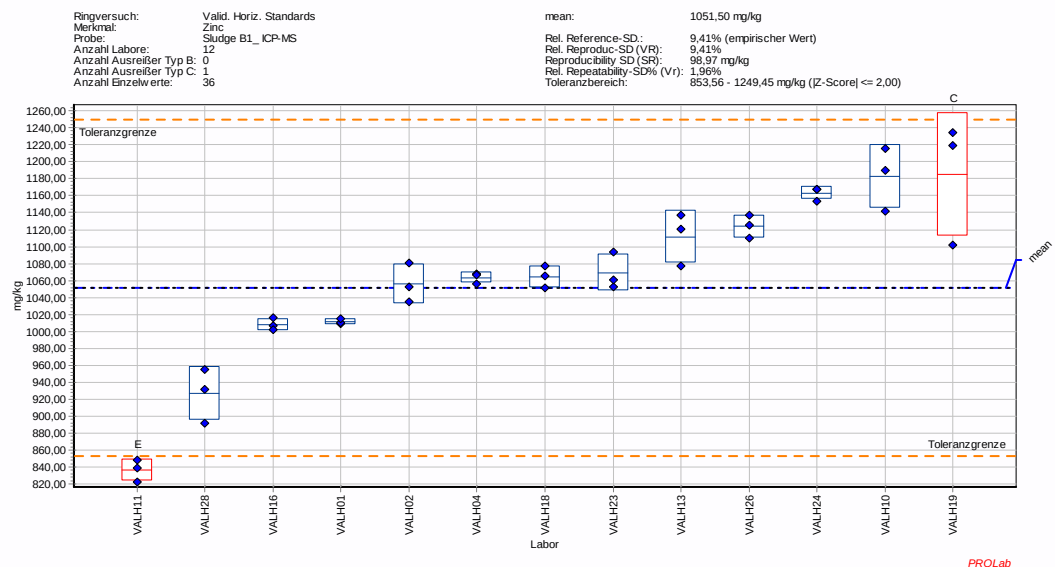
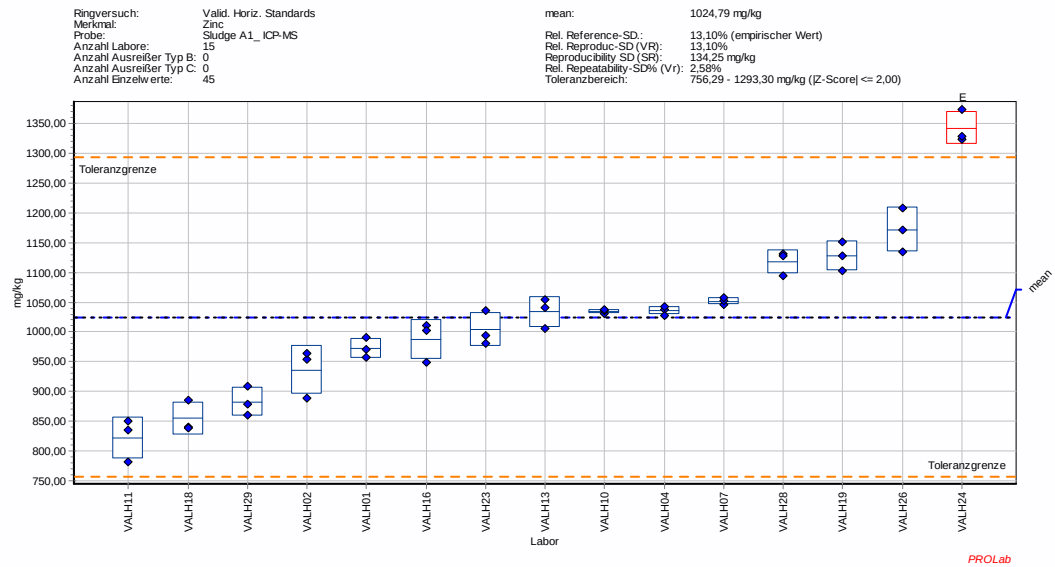


3.2.13.2 Sludge, ICP-MS: Zinc

ICP-MS: Zinc	SL-A1_MS	Z-Score		SL-B1_MS	Z-Score		SL-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	972,8	-0,40		1011,3	-0,40		1037,3	-0,10	
VALH02	935,4	-0,70		1056,3	0,00		981,6	-0,50	C
VALH04	1035,7	0,10		1063,7	0,10		1130,3	0,70	
VALH07	1051,7	0,20					1039,0	0,00	
VALH10	1034,4	0,10		1182,8	1,30		1032,4	-0,10	
VALH11	821,7	-1,50		836,5	-2,20	E	850,5	-1,70	
VALH13	1033,7	0,10		1111,7	0,60		1084,0	0,30	
VALH16	986,7	-0,30		1008,3	-0,40		1087,3	0,40	C
VALH18	854,3	-1,30		1064,3	0,10		803,4	-2,10	E
VALH19	1127,7	0,80		1185,3	1,40	C	1088,0	0,40	
VALH23	1003,4	-0,20		1069,3	0,20		1070,3	0,20	
VALH24	1342,3	2,40	E	1163,3	1,10		1222,7	1,50	
VALH26	1171,7	1,10		1124,0	0,70		1125,7	0,70	
VALH28	1117,9	0,70		926,4	-1,30		1051,6	0,10	
VALH29	882,6	-1,10					905,0	-1,20	C

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	$ Z \leq 2,0$			$ Z \leq 2,0$			$ Z \leq 2,0$		
No. labs	15			13			15		
No. labs with val.	15			13			15		
Mean	1024,8			1051,5			1044,6		
SR Reprod. SD	134,25			98,97			116,51		
Sr Repeat. SD	26,43			20,6			21,77		
RSD % VR	13,10%			9,41%			11,15%		
RSD % Vr	2,58%			1,96%			2,08%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	0			1			3		
No. labs accept.	15			12			12		
No. values accept.	45			36			36		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

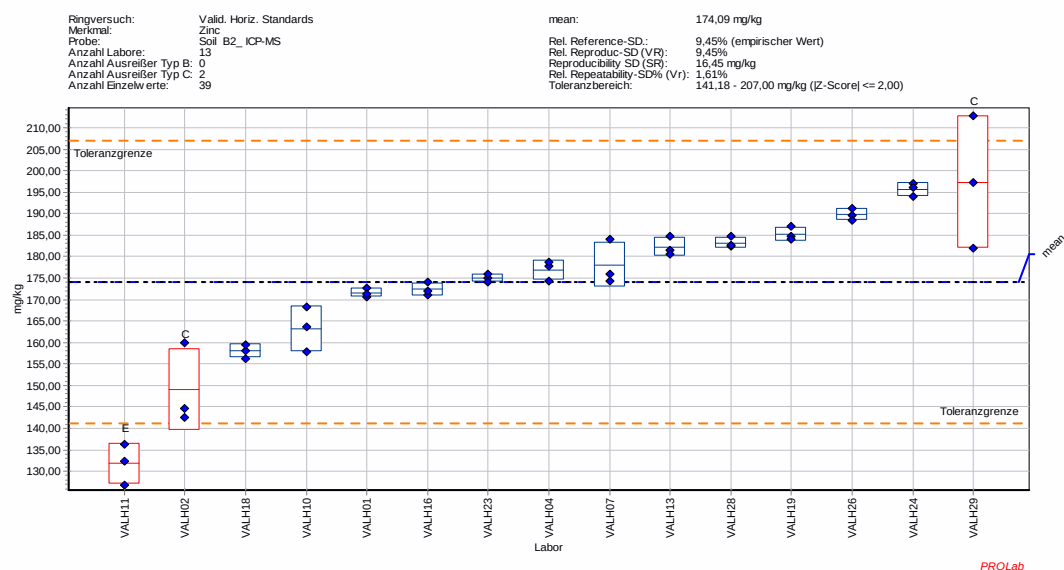
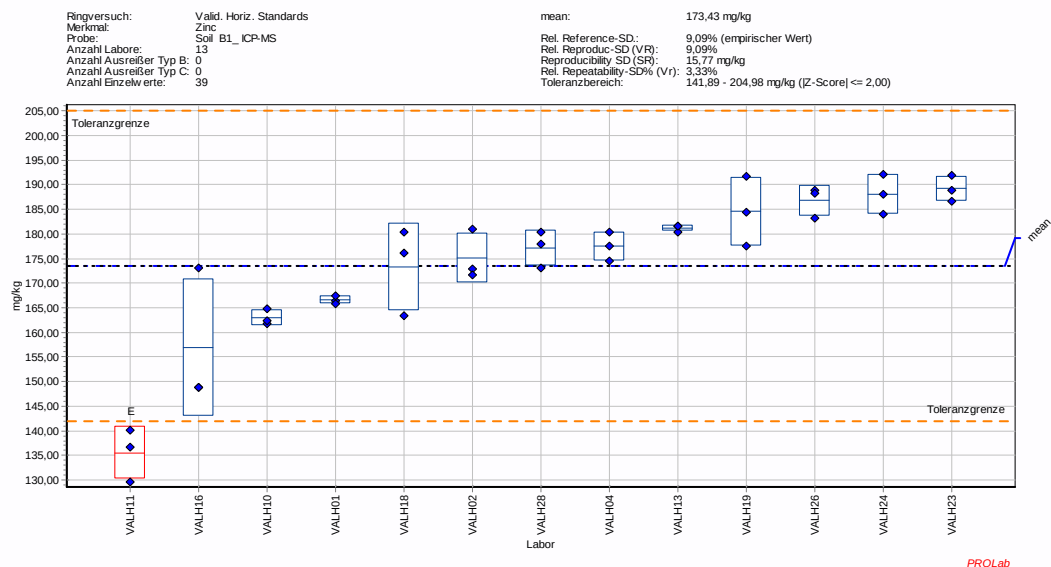
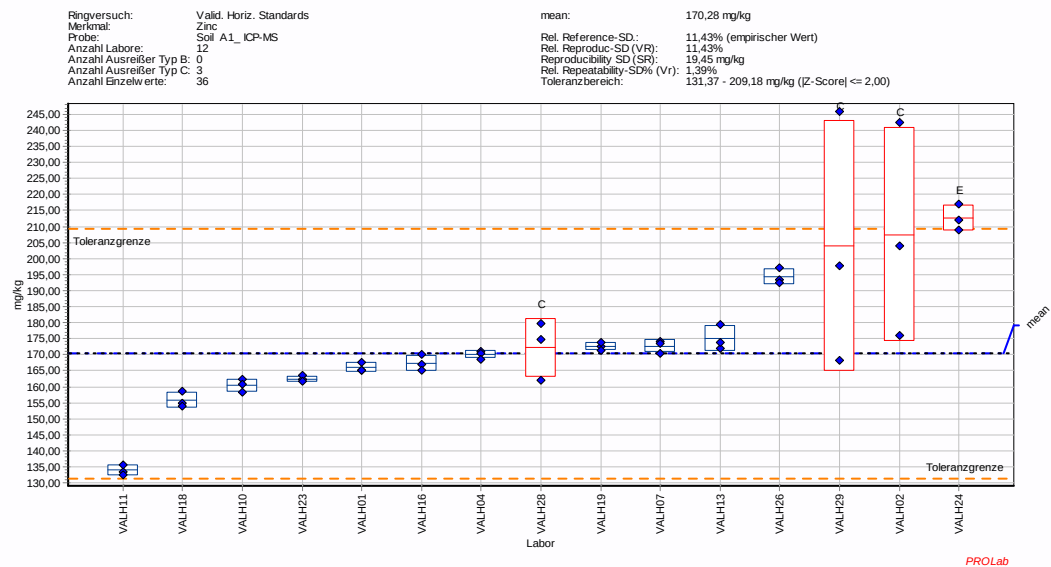


3.2.13.3 Soil, ICP-MS: Zinc

ICP-MS: Zinc	SO-A1_MS	Z-Score		SO-B1_MS	Z-Score		SO-B2_MS	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	166,0	-0,20		166,6	-0,40		171,6	-0,20	
VALH02	207,5	1,90	C	175,1	0,10		149,1	-1,50	C
VALH04	170,1	0,00		177,4	0,30		176,9	0,20	
VALH07	172,6	0,10					178,1	0,20	
VALH10	160,4	-0,50		163,0	-0,70		163,2	-0,70	
VALH11	133,9	-1,90		135,5	-2,40	E	131,8	-2,60	E
VALH13	175,1	0,20		181,2	0,50		182,3	0,50	
VALH16	167,3	-0,20		156,9	-1,00		172,4	-0,10	
VALH18	155,9	-0,70		173,3	0,00		158,0	-1,00	
VALH19	172,6	0,10		184,5	0,70		185,3	0,70	
VALH23	162,4	-0,40		189,2	1,00		175,0	0,10	
VALH24	212,7	2,20	E	188,0	0,90		195,7	1,30	
VALH26	194,3	1,20		186,7	0,80		189,8	1,00	
VALH28	172,1	0,10	C	177,1	0,20		183,2	0,60	
VALH29	203,9	1,70	C				197,3	1,40	C

Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <= 2,0			Z <= 2,0			Z <= 2,0		
No. labs	15			13			15		
No. labs with val.	15			13			15		
Mean	170,28			173,43			174,09		
SR Reprod. SD	19,45			15,77			16,45		
Sr Repeat. SD	2,36			5,78			2,81		
RSD % VR	11,43%			9,09%			9,45%		
RSD % Vr	1,39%			3,33%			1,61%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	3			0			2		
No. labs accept.	12			13			13		
No. values accept.	36			39			39		

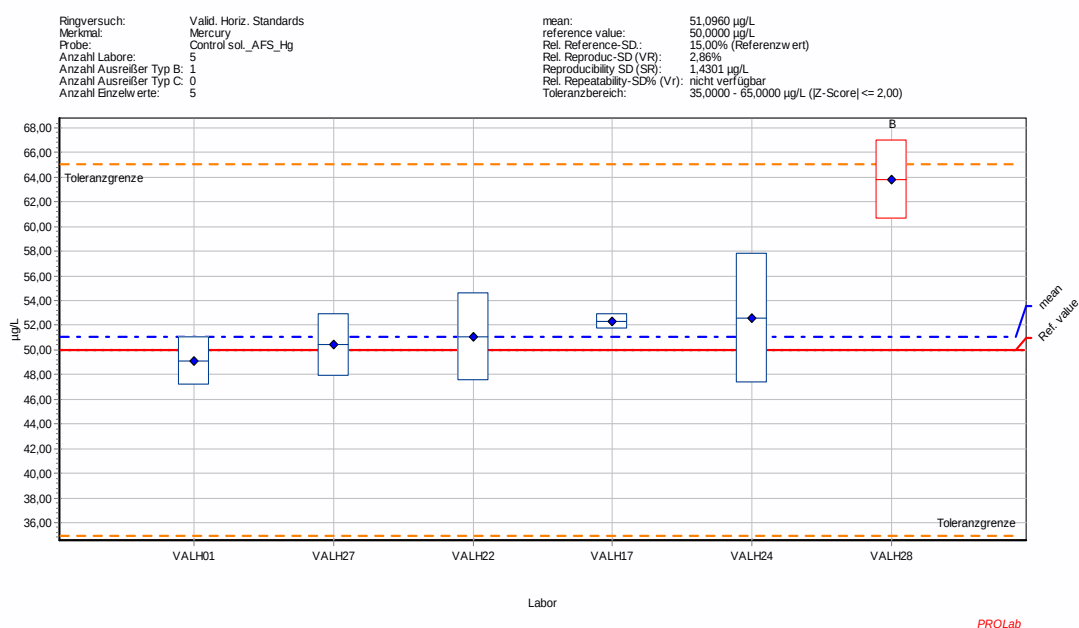
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



4. CV-AFS measurements (Mercury), CEN/TS 16175-2

4.1 Quality control solution for mercury: CV-AFS

CV-AFS (Hg): QC solution	Mercury	Z-Score	
Unit	µg/L		
VALH01	49,1	-0,1	
VALH17	52,3	0,3	
VALH22	51,08	0,1	
VALH24	52,6	0,3	
VALH27	50,4	0,1	
VALH28	63,8	1,8	B
Method	ISO 5725-2		
Z-Score	$ Z \leq 2,0$		
No. labs	6		
No. labs with val.	6		
Mean	51,10		
Reference value	50		
Ref.-SD	7,5		
SR Reprod. SD	1,43		
RSD % VR	2,86%		
No. A outliers	0		
No. B outliers	1		
No. C outliers	0		
No. labs accept.	5		
No. values accept.	5		



4.2 Validation results, CV-AFS measurements (Hg) for three different digestions procedures:

A1: CEN 16173, nitric acid digestion; microwave 175 °C, 10 min

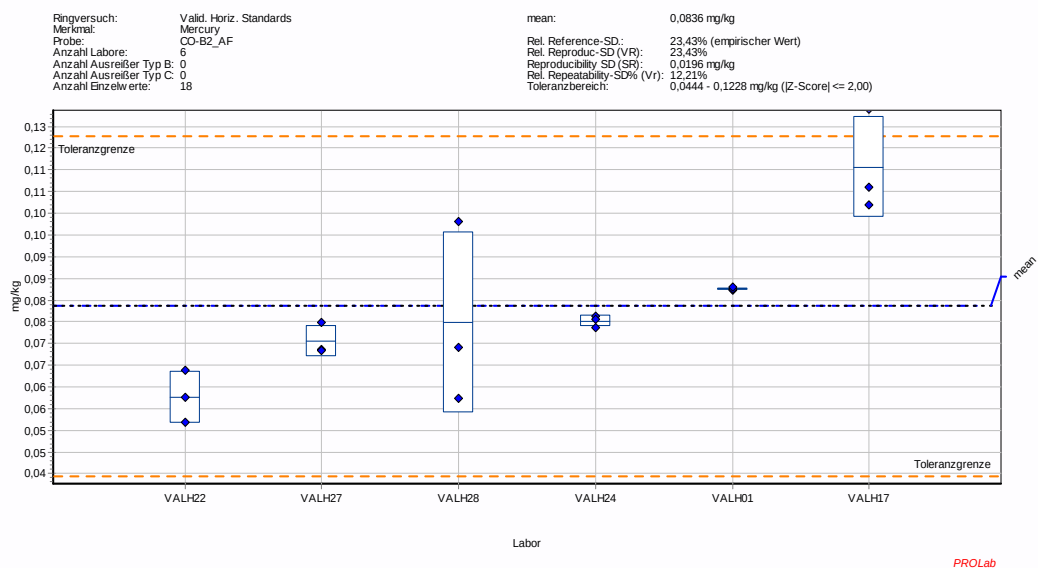
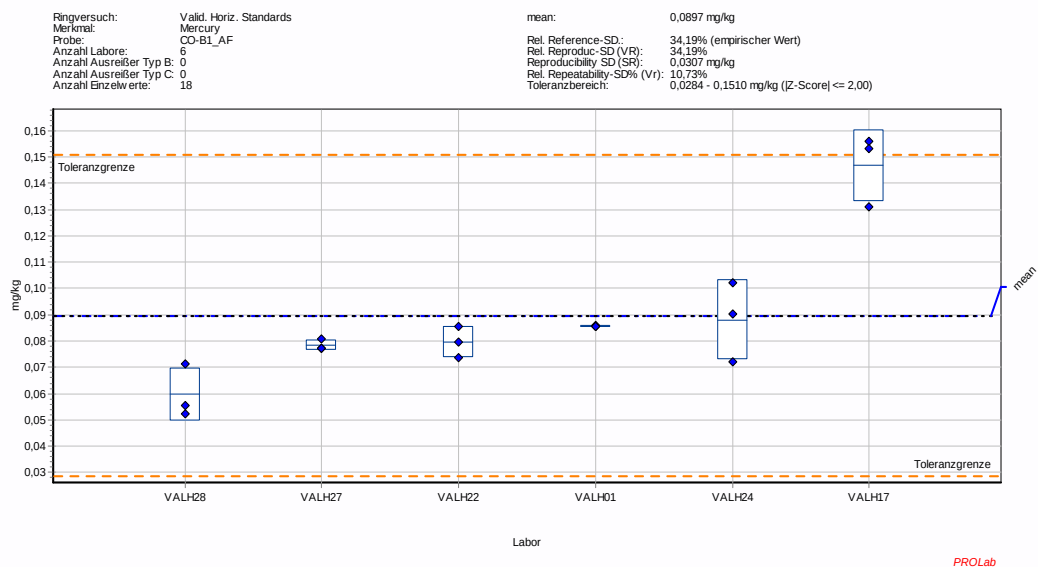
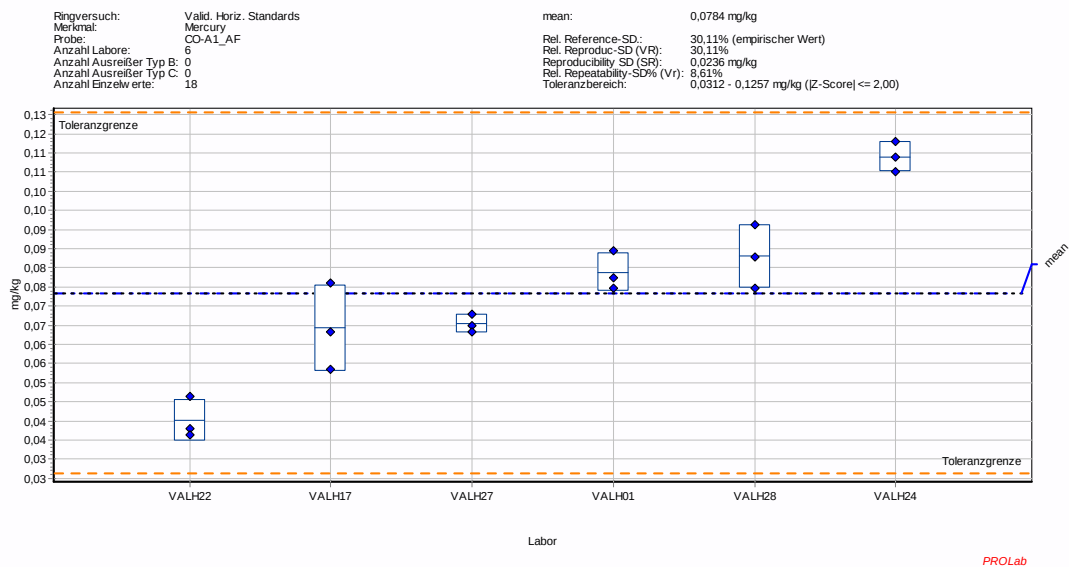
B1: CEN 16174, aqua regia digestion; Method A (open reflux)

B2: CEN 16174, aqua regia digestion; Method B (microwave, 175 °C, 10 min)

4.2.1 Biowaste, CV-AFS: Mercury

CV-AFS: Mercury	CO-A1_AF	Z-Score		CO-B1_AF	Z-Score		CO-B2_AF	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	0,0838	0,23		0,0857	-0,13		0,0875	0,2	
VALH17	0,0692	-0,39		0,1467	1,86		0,1157	1,64	
VALH22	0,0452	-1,41		0,0796	-0,33		0,0627	-1,07	
VALH24	0,114	1,51		0,0881	-0,05		0,0802	-0,17	
VALH27	0,0704	-0,34		0,0784	-0,37		0,0756	-0,41	
VALH28	0,088	0,41		0,0597	-0,98		0,0798	-0,19	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	6			6			6		
No. labs with val.	6			6			6		
Mean	0,0784			0,0897			0,0836		
SR Reprod. SD	0,0236			0,0307			0,0196		
Sr Repeat. SD	0,0068			0,0096			0,0102		
RSD % VR	30,11%			34,19%			23,43%		
RSD % Vr	8,61%			10,73%			12,21%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	0			0			0		
No. labs accept.	6			6			6		
No .values accept.	18			18			18		

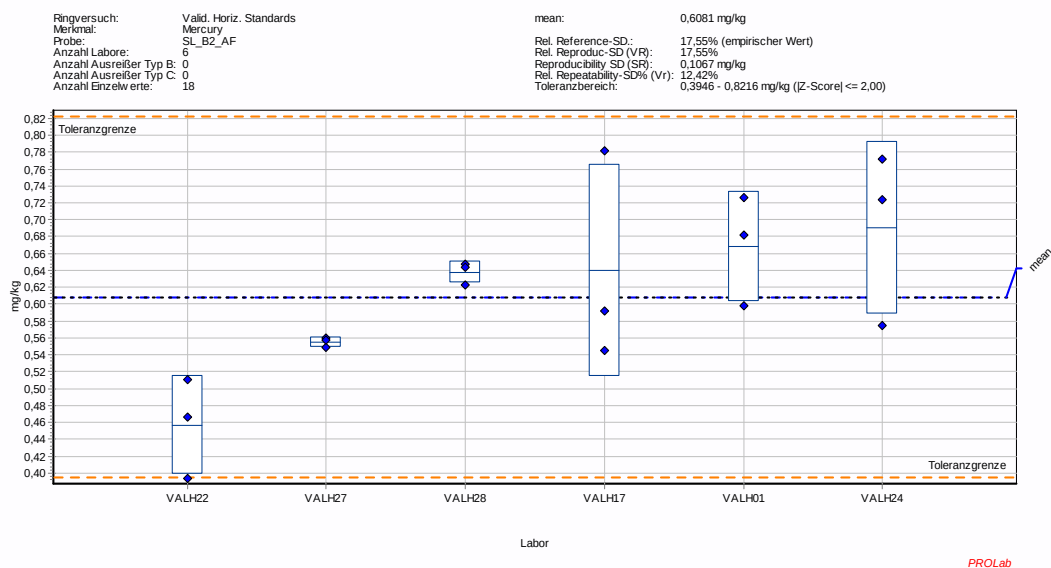
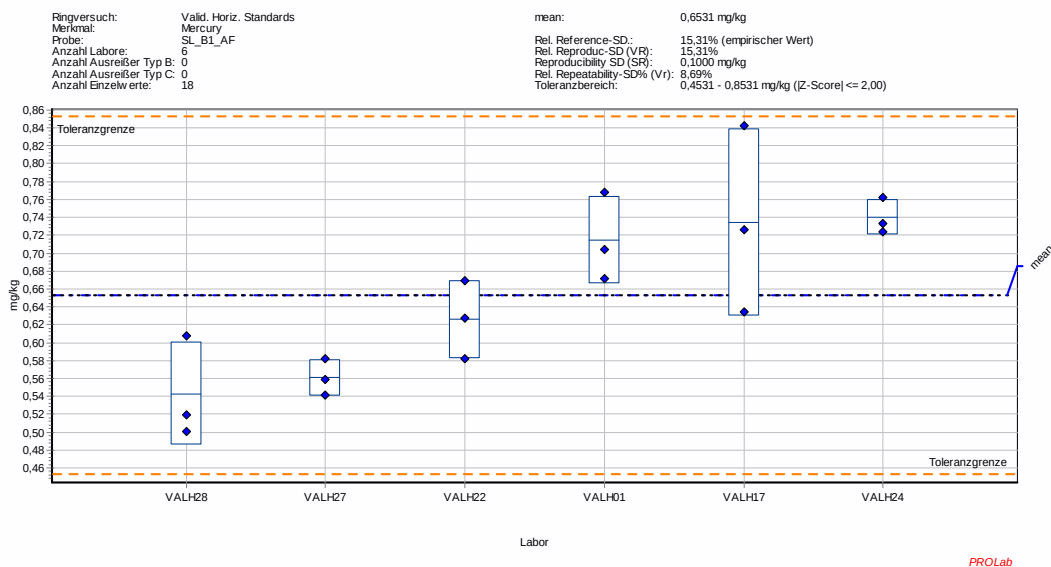
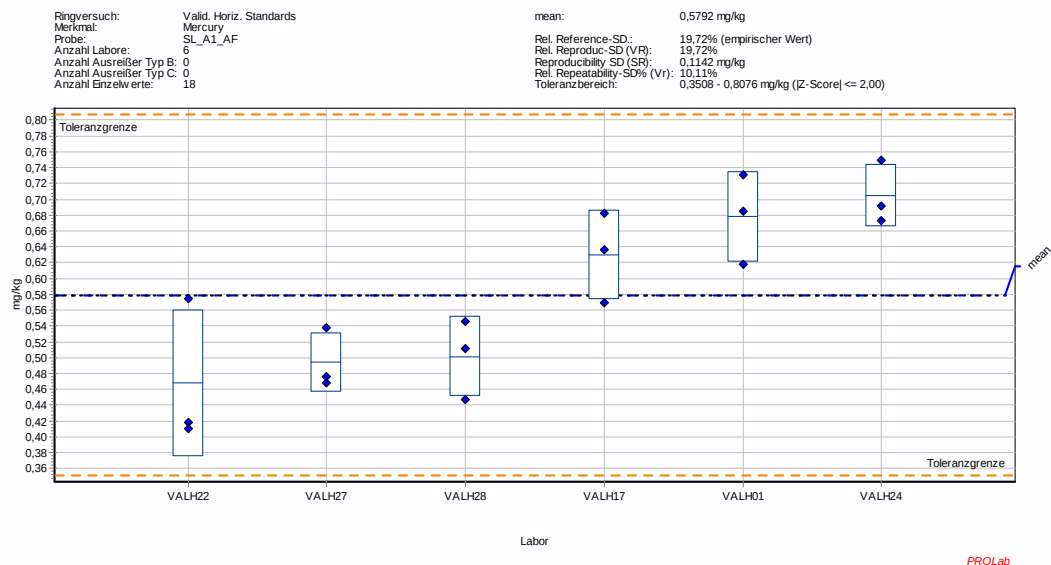
UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



4.2.2 Sludge, CV-AFS: Mercury

CV-AFS: Mercury	SL_A1_AF	Z-Score		SL_B1_AF	Z-Score		SL_B2_AF	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	0,6779	0,86		0,7147	0,62		0,6686	0,57	
VALH17	0,63	0,44		0,7343	0,81		0,6397	0,3	
VALH22	0,4675	-0,98		0,6261	-0,27		0,4568	-1,42	
VALH24	0,7043	1,1		0,7397	0,87		0,6903	0,77	
VALH27	0,4939	-0,75		0,5608	-0,92		0,5554	-0,49	
VALH28	0,5015	-0,68		0,543	-1,1		0,6377	0,28	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	6			6			6		
No. labs with val.	6			6			6		
Mean	0,5792			0,6531			0,6081		
SR Reprod. SD	0,1142			0,1000			0,1067		
Sr Repeat. SD	0,0586			0,0567			0,0755		
RSD % VR	19,72%			15,31%			17,55%		
RSD % Vr	10,11%			8,69%			12,42%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	0			0			0		
No. labs accept.	6			6			6		
No. values accept.	18			18			18		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)



4.2.3 Soil, CV-AFS: Mercury

CV-AFS: Mercury	SO-A1_AF	Z-Score		SO-B1_AF	Z-Score		SO-B2_AF	Z-Score	
Unit	mg/kg			mg/kg			mg/kg		
VALH01	0,9103	0,29		0,8596	-0,27		0,8757	-0,08	
VALH17	0,7123	-1,47		0,8643	-0,16		0,922	0,39	
VALH22	0,8266	-0,45		0,8325	-0,91	C	0,783	-1,01	
VALH24	0,9583	0,71		0,8967	0,61		0,8637	-0,2	
VALH27	0,84	-0,34		0,9194	1,14		0,8041	-0,8	
VALH28	1,0191	1,25		0,815	-1,32		1,0514	1,7	
Method	ISO 5725-2			ISO 5725-2			ISO 5725-2		
Z-Score	Z <=2,0			Z <=2,0			Z <=2,0		
No. labs	6			6			6		
No. labs with val.	6			6			6		
Mean	0,8778			0,8710			0,8833		
SR Reprod. SD	0,1127			0,0424			0,0988		
Sr Repeat. SD	0,0371			0,018			0,0263		
RSD % VR	12,84%			4,86%			11,19%		
RSD % Vr	4,23%			2,07%			2,97%		
No. A outliers	0			0			0		
No. B outliers	0			0			0		
No. C outliers	0			1			0		
No. labs accept.	6			5			6		
No. values accept.	18			15			18		

UBA Texte Validierung von Analysenverfahren aus dem Projekt HORIZONTAL, Anhang 1 (Teilprojekt „Anorganische Parameter“)

