Analytical Resources, Incorporated
Analytical Chemists and Consultants

ICP/MS SAMPLE RUN LOG

PE Nexion ICP-MS Serial No. 81DN1050201

Analysis Date: 10/10/18 **Analyst:** MB / TH **Sequence:** ——

All corrections made by analyst unless otherwise noted. TH 10-10-18

Edit Label	Delete Data	ARI Sample ID	Prep Code	Dilution	Comments
		BGJØ258-DUP3	REN	20	Mn only
		↓ -MS3	↓	↓	Mn STL ↓
		SEQ-CCVE			Pb↑ Sc, In, Tb Sl. noisy, analytes ok
		↓ -CCBE			
	✓	18JØØ64-Ø4	REN	5	~~Zn only~~
		18JØØ83-Ø1			
		↓ -Ø3			
		18JØØ93-Ø1			
		-Ø2			
		↓ -Ø3			Ge Sl. noisy
		18JØØ96-Ø1			Sc↑ No Cr, Pb
		18JØØ98-Ø1		2	No Pb
		-Ø3			
		↓ -Ø5	↓	↓	↓
		SEQ-CCVF			
		↓ -CCBF			
		18JØ119-Ø1	REN		Mn, Zn 7LR No Mn, Zn
		-Ø2			Mn, Cd, Zn 7LR Cd, Pb only
		↓ -Ø3			Mn 7LR No Mn
		18JØØ76-Ø1			
		18JØØ97-Ø1			Cd noisy Cr, Zn 7LR No Cd, Cr, Zn
		18JØØ59-Ø3		2	Zn only
		↓ -Ø9		10	Mn, Zn only
		18JØØ68-Ø1	↓	20	Cr, Zn only

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PE Nexion ICP-MS Serial No. 81DN1050201

Analysis Date: 10/10/18 **Analyst:** MB/TH **Sequence:** —

All corrections made by analyst unless otherwise noted.

Edit Label	Delete Data	ARI Sample ID	Prep Code	Dilution	Comments
		18JØØ1Ø-Ø1	REN	2	SCT No Cr
		18JØØ50-Ø1	↓	↓	
		SEQ-CCVG			
		↓ -CCBG			
		18JØØ17-Ø1	REN		
		18JØØ45-Ø1	↓	20	Zn TLR, Cd noisy No Zn, Cd
		18JØØ12-Ø1	SWN	↓	
		↓ -Ø2	↓	↓	
		SEQ-CCVH			
		↓ -CCBH			
		Rinse/DI			
			MB 10/10/18		

Performance Check Report

Sample ID: STD Performance Check
Sample Date/Time: Wednesday, October 10, 2018 08:33:25
Sample Description:
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\STD Performance Check.mth
Dataset File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\DataSet\Default\STD Performance Check.16117
MassCal File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Conditions File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Dual Detector Mode: Pulse
Acq. Dead Time (ns): 35
Current Dead Time (ns): 35
Torch Z position (mm): 0.00

Summary

	Analyte	Mass	Meas. Intens. Mean	Net Intens. Mean	Net Intens. SD	Net Intens. RSD	Mode
	Be	9.0	3490.2	3457.211	62.343	1.8	Standard
	In	114.9	53959.1	-773461.883	439.266	0.1	Standard
	U	238.1	34230.3	34230.306	641.580	1.9	Standard
⌈	CeO	155.9	915.3	0.015	0.000	2.1	Standard
| >	Ce	139.9	62851.3	62851.295	422.249	0.7	Standard
⌊	Ce++	70.0	550.7	0.009	0.000	2.2	Standard
	Bkgd	220.0	0.3	0.333	0.236	70.7	Standard

Current Conditions File Data

Current Value	Description
0.99	Nebulizer Gas Flow STD/KED [NEB]
1.20	Auxiliary Gas Flow
18.00	Plasma Gas Flow
-12.00	Deflector Voltage
1600.00	ICP RF Power
-1700.00	Analog Stage Voltage
1650.00	Pulse Stage Voltage
0.00	Quadrupole Rod Offset STD [QRO]
-8.00	Cell Rod Offset STD [CRO]
7.00	Discriminator Threshold
-2.00	Cell Entrance/Exit Voltage STD
0.00	RPa
0.25	RPq
0.99	DRC Mode NEB
-10.00	DRC Mode QRO
-3.00	DRC Mode CRO
-7.00	DRC Mode Cell Entrance/Exit Voltage
0.60	Cell Gas A
0.00	Cell Gas B
250.00	Axial Field Voltage
-15.50	KED Mode CRO
-12.00	KED Mode QRO
-5.00	KED Mode Cell Entrance Voltage
-31.00	KED Mode Cell Exit Voltage
0.00	KED Cell Gas A
0.00	KED Cell Gas B
0.00	KED RPa
0.25	KED RPq
475.00	KED Mode Axial Field Voltage

SmartTune Wizard - Summary

Optimization Summary

SmartTune file: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Wizard\SmartTune\ARIdaily_UCT.swz

Start Time: 10/10/2018 8:33:22 AM
End Time: 10/10/2018 8:42:24 AM

STD Performance Check - [Passed] Optimum value(s): N/A
Obtained Intensity (Be 9): 3490.23
Obtained Intensity (In 115): 53959.05
Obtained Intensity (U 238): 34230.31
Obtained Intensity (Bkgd 220): 0.33
Obtained Formula (Ce++ 70 / Ce 140): 0.009 (=550.74 / 62851.29)
Obtained Formula (CeO 156 / Ce 140): 0.015 (=915.30 / 62851.29)

Torch Alignment - [Passed]

Vertical	Horizontal	Intensity
0.11 mm	-0.58 mm	62242.30

Nebulizer Gas Flow STD/KED [NEB] - [Passed] Optimum value(s): 1
Obtained Intensity (In 115): 63062.89
Obtained Formula (CeO 156 / Ce 140): 0.0172 (=1081.04 / 62948.38)

Mass Calibration and Resolution - [Passed] Optimum value(s): N/A
Target/Obtained mass (7.016/7.025), Target/Obtained resolution (0.7/0.721)
Target/Obtained mass (23.985/23.975), Target/Obtained resolution (0.7/0.686)
Target/Obtained mass (114.904/114.875), Target/Obtained resolution (0.7/0.689)
Target/Obtained mass (238.05/238.075), Target/Obtained resolution (0.7/0.685)

QID STD/DRC - Optimum value(s): Correlation Coefficient = 0.988; Intercept = -11.76

KED Mode QID - Optimum value(s): Correlation Coefficient = 0.997; Intercept = -11.71

STD Performance Check - [Failed]
[Cancelled]

SmartTune Wizard - Details

```
Optimization Details

SmartTune file: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Wizard\SmartTune\ARIdaily_UCT.swz

Optimization Status

Start Time: 10/10/2018 8:33:22 AM

STD Performance Check
        Optimization Settings:
                Method: STD Performance Check.mth.
                Intensity Criterion: Be 9 > 2000
                Intensity Criterion: In 115 > 40000
                Intensity Criterion: U 238 > 30000
                Intensity Criterion: Bkgd 220 <= 1
                Formula Criterion: Ce++ 70 / Ce 140 <= 0.03
                Formula Criterion: CeO 156 / Ce 140 <= 0.025

        Optimization Results:
        Initial Try
                Obtained Intensity (Be 9): 3490.23
                Obtained Intensity (In 115): 53959.05
                Obtained Intensity (U 238): 34230.31
                Obtained Intensity (Bkgd 220): 0.33
                Obtained Formula (Ce++ 70 / Ce 140): 0.009 (=550.74 / 62851.29)
                Obtained Formula (CeO 156 / Ce 140): 0.015 (=915.30 / 62851.29)

[Passed]  Optimum value(s): N/A

Torch Alignment
        Optimization Settings:
                Method: Torch Alignment.mth.
                Intensity Criterion: In 115 Maximum

        Optimization Results:
                Vertical      Horizontal      Intensity
[Passed]        0.11 mm     -0.58 mm       62242.30

Nebulizer Gas Flow STD/KED [NEB]
        Optimization Settings:
                Method: Optimize.mth.
                        Initial Try - Start/End/Step: 0.92/1/0.01.
                Intensity Criterion: In 115 Maximum
                Formula Criterion: CeO 156 / Ce 140 <= 0.025

        Optimization Results:
        Initial Try

                Obtained Intensity (In 115): 63062.89
                Obtained Formula (CeO 156 / Ce 140): 0.0172 (=1081.04 / 62948.38)
[Passed]  Optimum value(s): 1

Mass Calibration and Resolution
        Optimization Settings:
                Method: Tuning.mth.
                MassCal File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
                Iterations: 6
                Target accuracy (+/- amu): 0.05 for Mass Cal. and 0.03 for Resolution
```

```
                Peak height (%) for Res. Opt.: 10

        Optimization Results:
        Initial Try
                Target/Obtained mass (7.016/7.025), Target/Obtained resolution (0.7/0.721)
                Target/Obtained mass (23.985/23.975), Target/Obtained resolution (0.7/0.686)
                Target/Obtained mass (114.904/114.875), Target/Obtained resolution (0.7/0.689)
                Target/Obtained mass (238.05/238.075), Target/Obtained resolution (0.7/0.685)
[Passed]  Optimum value(s): N/A

QID STD/DRC
        Optimization Settings:
                Method: QID Calibration.mth.
                        Initial Try - Start/End/Step: -16/0/0.5.

        Optimization Results:
        Initial Try

  Optimum value(s): Correlation Coefficient = 0.988; Intercept = -11.76

        Analyte      Mass    Points       DAC   MaxIntensity

             Li         7        33     -12.5        18972.6
             Mg        24        33       -13        24296.6
             In       115        33      -9.5        70895.5
             Ce       140        33        -7        68885.7
             Pb       208        33        -6        31149.9
              U       238        33        -6        52263.4

KED Mode QID
        Optimization Settings:
                Method: QID Calibration.mth.
                        Initial Try - Start/End/Step: -20/0/0.5.

        Optimization Results:
        Initial Try

  Optimum value(s): Correlation Coefficient = 0.997; Intercept = -11.71

        Analyte      Mass    Points       DAC   MaxIntensity

             Li         7        41       -12        10888.1
             Mg        24        41     -12.5        21960.9
             In       115        41      -8.5        49581.9
             Ce       140        41        -8        49915.1
             Pb       208        41      -5.5        22301.4
              U       238        41        -4        39927.7

STD Performance Check
        Optimization Settings:
                Method: STD Performance Check.mth.
                Intensity Criterion: Be 9 > 2000
                Intensity Criterion: In 115 > 40000
                Intensity Criterion: U 238 > 30000
                Intensity Criterion: Bkgd 220 <= 1
                Formula Criterion: Ce++ 70 / Ce 140 <= 0.03
                Formula Criterion: CeO 156 / Ce 140 <= 0.025

        Optimization Results:
```

```
        Initial Try
                [Cancelled]
[Failed]

[Cancelled]

End Time: 10/10/2018 8:42:24 AM
```

Performance Check Report

Sample ID: STD Performance Check
Sample Date/Time: Wednesday, October 10, 2018 08:43:35
Sample Description:
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\STD Performance Check.mth
Dataset File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\DataSet\Default\STD Performance Check.16124
MassCal File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Conditions File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Dual Detector Mode: Pulse
Acq. Dead Time (ns): 35
Current Dead Time (ns): 35
Torch Z position (mm): 0.00

Summary

	Analyte	Mass	Meas. Intens. Mean	Net Intens. Mean	Net Intens. SD	Net Intens. RSD	Mode
	Be	9.0	4851.8	4851.824	88.551	1.8	Standard
	In	114.9	67387.7	67387.668	1152.846	1.7	Standard
	U	238.1	50946.5	50946.489	504.532	1.0	Standard
⌈	CeO	155.9	1398.4	0.019	0.001	4.5	Standard
| >	Ce	139.9	72840.6	72840.571	569.375	0.8	Standard
⌊	Ce++	70.0	1070.3	0.015	0.000	2.1	Standard
	Bkgd	220.0	0.1	0.100	0.149	149.1	Standard

Current Conditions File Data

Current Value	Description
1.00	Nebulizer Gas Flow STD/KED [NEB]
1.20	Auxiliary Gas Flow
18.00	Plasma Gas Flow
-12.00	Deflector Voltage
1600.00	ICP RF Power
-1700.00	Analog Stage Voltage
1650.00	Pulse Stage Voltage
0.00	Quadrupole Rod Offset STD [QRO]
-8.00	Cell Rod Offset STD [CRO]
7.00	Discriminator Threshold
-2.00	Cell Entrance/Exit Voltage STD
0.00	RPa
0.25	RPq
1.00	DRC Mode NEB
-10.00	DRC Mode QRO
-3.00	DRC Mode CRO
-7.00	DRC Mode Cell Entrance/Exit Voltage
0.60	Cell Gas A
0.00	Cell Gas B
250.00	Axial Field Voltage
-15.50	KED Mode CRO
-12.00	KED Mode QRO
-5.00	KED Mode Cell Entrance Voltage
-31.00	KED Mode Cell Exit Voltage
0.00	KED Cell Gas A
0.00	KED Cell Gas B
0.00	KED RPa
0.25	KED RPq
475.00	KED Mode Axial Field Voltage

SmartTune Wizard - Summary

Optimization Summary

SmartTune file: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Wizard\SmartTune\ARIdaily_UCT.swz

Start Time: 10/10/2018 8:42:32 AM
End Time: 10/10/2018 8:45:39 AM

QID STD/DRC - Optimum value(s): Correlation Coefficient = 0.998; Intercept = -12.65

STD Performance Check - [Passed] Optimum value(s): N/A
Obtained Intensity (Be 9): 4851.82
Obtained Intensity (In 115): 67387.67
Obtained Intensity (U 238): 50946.49
Obtained Intensity (Bkgd 220): 0.10
Obtained Formula (Ce++ 70 / Ce 140): 0.015 (=1070.31 / 72840.57)
Obtained Formula (CeO 156 / Ce 140): 0.019 (=1398.40 / 72840.57)

SmartTune Wizard - Details

Optimization Details

SmartTune file: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Wizard\SmartTune\ARIdaily_UCT.swz

Optimization Status

Start Time: 10/10/2018 8:42:32 AM

QID STD/DRC

Optimization Settings:

Method: QID Calibration.mth.

Initial Try - Start/End/Step: -16/0/0.5.

Optimization Results:

Initial Try

Optimum value(s): Correlation Coefficient = 0.998; Intercept = -12.65

Analyte	Mass	Points	DAC	MaxIntensity
Li	7	33	-13	18043.4
Mg	24	33	-13	22726.1
In	115	33	-8.5	67233.8
Ce	140	33	-7	70509.6
Pb	208	33	-6.5	31057.7
U	238	33	-6	50810.2

STD Performance Check

Optimization Settings:

Method: STD Performance Check.mth.

Intensity Criterion: Be 9 > 2000

Intensity Criterion: In 115 > 40000

Intensity Criterion: U 238 > 30000

Intensity Criterion: Bkgd 220 <= 1

Formula Criterion: Ce++ 70 / Ce 140 <= 0.03

Formula Criterion: CeO 156 / Ce 140 <= 0.025

Optimization Results:

Initial Try

Obtained Intensity (Be 9): 4851.82

Obtained Intensity (In 115): 67387.67

Obtained Intensity (U 238): 50946.49

Obtained Intensity (Bkgd 220): 0.10

Obtained Formula (Ce++ 70 / Ce 140): 0.015 (=1070.31 / 72840.57)

Obtained Formula (CeO 156 / Ce 140): 0.019 (=1398.40 / 72840.57)

[Passed] Optimum value(s): N/A

End Time: 10/10/2018 8:45:39 AM

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL1
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 09:44:53
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L				680943	4	Standard
	Be	9		ug/L				8	13	Standard
	C	13		ug/L				13453	3	Standard
	Cl	37		ug/L				3677416	4	Standard
>	Sc	45		ug/L				810285	1	Standard
	Cr	52		ug/L				13691	1	Standard
	Cr	53		ug/L				129	6	Standard
	Fe	54		ug/L				39463	2	Standard
	Fe	57		ug/L				11347	1	Standard
	Mn	55		ug/L				378	6	Standard
>	Ge	72		ug/L				42122	1	KED
	Ni	60		ug/L				10	57	KED
	Ni	62		ug/L				0	173	KED
	Cu	63		ug/L				43	23	KED
	Cu	65		ug/L				22	36	KED
	Zn	66		ug/L				16	35	KED
	Zn	67		ug/L				3	86	KED
	As	75		ug/L				3	18	KED
	Se	78		ug/L				5	9	KED
	Y	89		ug/L				561402	1	Standard
	Kr	83		ug/L				45	23	Standard
>	In-1	115		ug/L				12648	2	KED
	Mo	98		ug/L				4	47	KED
	Cd	111		ug/L				3	17	KED
	Cd	114		ug/L				0	196	KED
>	In	115		ug/L				852951	1	Standard
	Ag	107		ug/L				143	4	Standard
	Sb	121		ug/L				123	20	Standard
	Sb	123		ug/L				104	20	Standard
	Ba	135		ug/L				14	30	Standard
	Ba	137		ug/L				26	31	Standard
>	Tb	159		ug/L				1107766	2	Standard
	Tl	205		ug/L				18	39	Standard
	Pb	208		ug/L				188	9	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL2
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 09:49:56
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	655398	6	Standard
	Be	**9**	**0.200**	ug/L	0.009	4	8	771	3	Standard
	C	**13**		ug/L			13453	18155	4	Standard
	Cl	**37**		ug/L			3677416	3688963	4	Standard
>	**Sc**	**45**		ug/L			810285	818446	2	Standard
	Cr	**52**	**0.500**	ug/L	0.052	10	13691	20838	5	Standard
	Cr	**53**	**0.500**	ug/L	0.031	6	129	1006	3	Standard
	Fe	**54**	**20.000**	ug/L	1.763	8	39463	61274	2	Standard
	Fe	**57**	**20.000**	ug/L	0.970	4	11347	19926	1	Standard
	Mn	**55**	**0.500**	ug/L	0.021	4	378	11327	1	Standard
>	**Ge**	**72**		ug/L			42122	42412	0	KED
	Ni	**60**	**0.500**	ug/L	0.056	11	10	400	10	KED
	Ni	**62**	**0.500**	ug/L	0.070	13	0	71	13	KED
	Cu	**63**	**0.500**	ug/L	0.022	4	43	1100	3	KED
	Cu	**65**	**0.500**	ug/L	0.028	5	22	547	5	KED
	Zn	**66**	**4.000**	ug/L	0.066	1	16	1166	1	KED
	Zn	**67**	**4.000**	ug/L	0.447	11	3	186	11	KED
	As	**75**	**0.200**	ug/L	0.016	7	3	36	7	KED
	Se	**78**	**0.500**	ug/L	0.181	36	5	16	25	KED
	Y	**89**		ug/L			561402	543981	2	Standard
	Kr	**83**		ug/L			45	43	31	Standard
>	**In-1**	**115**		ug/L			12648	12691	2	KED
	Mo	**98**	**0.200**	ug/L	0.017	8	4	121	10	KED
	Cd	**111**	**0.100**	ug/L	0.027	27	3	21	21	KED
	Cd	**114**	**0.100**	ug/L	0.027	26	0	49	24	KED
>	**In**	**115**		ug/L			852951	847437	2	Standard
	Ag	**107**	**0.200**	ug/L	0.013	6	143	2943	4	Standard
	Sb	**121**	**0.200**	ug/L	0.006	2	123	2501	4	Standard
	Sb	**123**	**0.200**	ug/L	0.010	4	104	1958	2	Standard
	Ba	**135**	**0.500**	ug/L	0.031	6	14	1928	4	Standard
	Ba	**137**	**0.500**	ug/L	0.014	2	26	3534	0	Standard
>	**Tb**	**159**		ug/L			1107766	1132671	4	Standard
	Tl	**205**	**0.200**	ug/L	0.010	5	18	6491	0	Standard
	Pb	**208**	**0.100**	ug/L	0.005	5	188	5087	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL3
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 09:54:58
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	688424	3	Standard
	Be	9	10.000	ug/L	0.946	9	8	37296	6	Standard
	C	13		ug/L			13453	19759	8	Standard
	Cl	37		ug/L			3677416	3748523	0	Standard
>	Sc	45		ug/L			810285	826461	2	Standard
	Cr	52	10.002	ug/L	0.658	6	13691	165650	3	Standard
	Cr	53	10.001	ug/L	0.348	3	129	18227	0	Standard
	Fe	54	999.983	ug/L	39.781	3	39463	1076395	2	Standard
	Fe	57	999.991	ug/L	107.394	10	11347	428928	7	Standard
	Mn	55	9.999	ug/L	0.447	4	378	214005	1	Standard
>	Ge	72		ug/L			42122	42014	1	KED
	Ni	60	9.997	ug/L	0.162	1	10	6953	2	KED
	Ni	62	9.994	ug/L	0.374	3	0	1143	4	KED
	Cu	63	9.998	ug/L	0.314	3	43	19525	1	KED
	Cu	65	9.999	ug/L	0.334	3	22	10185	2	KED
	Zn	66	9.854	ug/L	0.483	4	16	2588	6	KED
	Zn	67	10.029	ug/L	0.658	6	3	464	5	KED
	As	75	10.000	ug/L	0.201	2	3	1690	0	KED
	Se	78	9.993	ug/L	0.555	5	5	176	3	KED
	Y	89		ug/L			561402	554043	4	Standard
	Kr	83		ug/L			45	41	11	Standard
>	In-1	115		ug/L			12648	12872	3	KED
	Mo	98	10.000	ug/L	0.558	5	4	6341	3	KED
	Cd	111	10.000	ug/L	0.333	3	3	1879	2	KED
	Cd	114	10.000	ug/L	0.676	6	0	5000	3	KED
>	In	115		ug/L			852951	858355	1	Standard
	Ag	107	10.000	ug/L	0.044	0	143	144056	2	Standard
	Sb	121	10.000	ug/L	0.173	1	123	123839	1	Standard
	Sb	123	10.000	ug/L	0.323	3	104	94505	1	Standard
	Ba	135	10.001	ug/L	0.280	2	14	39920	1	Standard
	Ba	137	9.999	ug/L	0.305	3	26	69438	1	Standard
>	Tb	159		ug/L			1107766	1147824	2	Standard
	Tl	205	10.000	ug/L	0.057	0	18	324147	2	Standard
	Pb	208	10.000	ug/L	0.200	2	188	416477	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL4
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 10:00:15
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	709480	2	Standard
	Be	**9**	**19.882**	ug/L	0.965	4	8	74784	4	Standard
	C	**13**		ug/L			13453	17774	1	Standard
	Cl	**37**		ug/L			3677416	3894287	0	Standard
>	**Sc**	**45**		ug/L			810285	835527	0	Standard
	Cr	**52**	**19.906**	ug/L	0.440	2	13691	314022	1	Standard
	Cr	**53**	**19.792**	ug/L	0.242	1	129	34920	1	Standard
	Fe	**54**	**1980.919**	ug/L	39.445	1	39463	2040778	1	Standard
	Fe	**57**	**1977.720**	ug/L	17.859	0	11347	812143	0	Standard
	Mn	**55**	**19.835**	ug/L	0.268	1	378	415543	1	Standard
>	**Ge**	**72**		ug/L			42122	40722	2	KED
	Ni	**60**	**20.124**	ug/L	1.565	7	10	13881	5	KED
	Ni	**62**	**19.917**	ug/L	1.205	6	0	2169	3	KED
	Cu	**63**	**20.096**	ug/L	0.717	3	43	38726	1	KED
	Cu	**65**	**19.923**	ug/L	0.877	4	22	19337	2	KED
	Zn	**66**	**19.925**	ug/L	0.331	1	16	4988	1	KED
	Zn	**67**	**19.724**	ug/L	1.812	9	3	840	6	KED
	As	**75**	**20.121**	ug/L	0.373	1	3	3373	1	KED
	Se	**78**	**20.167**	ug/L	1.781	8	5	351	8	KED
	Y	**89**		ug/L			561402	555125	4	Standard
	Kr	**83**		ug/L			45	53	7	Standard
>	**In-1**	**115**		ug/L			12648	12752	1	KED
	Mo	**98**	**19.863**	ug/L	0.230	1	4	12154	2	KED
	Cd	**111**	**19.980**	ug/L	0.296	1	3	3705	2	KED
	Cd	**114**	**19.939**	ug/L	0.434	2	0	9770	1	KED
>	**In**	**115**		ug/L			852951	849594	1	Standard
	Ag	**107**	**19.967**	ug/L	0.294	1	143	282675	2	Standard
	Sb	**121**	**20.062**	ug/L	0.885	4	123	248789	2	Standard
	Sb	**123**	**20.021**	ug/L	0.508	2	104	188037	3	Standard
	Ba	**135**	**20.016**	ug/L	0.307	1	14	79335	0	Standard
	Ba	**137**	**20.047**	ug/L	0.592	2	26	139073	1	Standard
>	**Tb**	**159**		ug/L			1107766	1131274	3	Standard
	Tl	**205**	**19.884**	ug/L	0.750	3	18	620490	2	Standard
	Pb	**208**	**19.962**	ug/L	0.631	3	188	812721	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL5
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 10:05:42
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
⌈>	**Li**	**6**		ug/L			680943	666617	3	Standard
⌊	**Be**	**9**	**50.162**	ug/L	4.948	9	8	179980	8	Standard
	C	**13**		ug/L			13453	14648	8	Standard
	Cl	**37**		ug/L			3677416	4084657	0	Standard
⌈>	**Sc**	**45**		ug/L			810285	834543	5	Standard
|	**Cr**	**52**	**49.631**	ug/L	2.040	4	13691	733484	2	Standard
|	**Cr**	**53**	**49.848**	ug/L	2.959	5	129	86161	0	Standard
|	**Fe**	**54**	**4948.241**	ug/L	187.212	3	39463	4784827	6	Standard
|	**Fe**	**57**	**4942.565**	ug/L	283.066	5	11347	1897874	2	Standard
⌊	**Mn**	**55**	**49.888**	ug/L	2.345	4	378	1030309	2	Standard
⌈>	**Ge**	**72**		ug/L			42122	41221	1	KED
|	**Ni**	**60**	**49.790**	ug/L	1.226	2	10	34072	1	KED
|	**Ni**	**62**	**49.722**	ug/L	1.940	3	0	5337	2	KED
|	**Cu**	**63**	**49.622**	ug/L	1.647	3	43	93297	4	KED
|	**Cu**	**65**	**49.678**	ug/L	0.352	0	22	47290	1	KED
|	**Zn**	**66**	**49.706**	ug/L	3.185	6	16	12219	4	KED
|	**Zn**	**67**	**49.912**	ug/L	3.025	6	3	2131	4	KED
|	**As**	**75**	**49.748**	ug/L	0.350	0	3	8232	0	KED
⌊	**Se**	**78**	**49.867**	ug/L	0.850	1	5	862	0	KED
	Y	**89**		ug/L			561402	550818	3	Standard
	Kr	**83**		ug/L			45	57	14	Standard
⌈>	**In-1**	**115**		ug/L			12648	12672	0	KED
|	**Mo**	**98**	**49.883**	ug/L	0.574	1	4	29972	0	KED
|	**Cd**	**111**	**49.850**	ug/L	0.589	1	3	9044	0	KED
⌊	**Cd**	**114**	**49.694**	ug/L	0.388	0	0	23481	0	KED
⌈>	**In**	**115**		ug/L			852951	833717	2	Standard
|	**Ag**	**107**	**49.733**	ug/L	1.257	2	143	672456	1	Standard
|	**Sb**	**121**	**49.336**	ug/L	2.210	4	123	562671	1	Standard
|	**Sb**	**123**	**49.263**	ug/L	1.088	2	104	422542	1	Standard
|	**Ba**	**135**	**49.861**	ug/L	1.622	3	14	191187	1	Standard
⌊	**Ba**	**137**	**49.868**	ug/L	2.657	5	26	334795	2	Standard
⌈>	**Tb**	**159**		ug/L			1107766	1090677	2	Standard
|	**Tl**	**205**	**49.653**	ug/L	1.174	2	18	1443958	1	Standard
⌊	**Pb**	**208**	**50.011**	ug/L	1.994	3	188	1965198	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL6
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 10:12:48
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	691474	5	Standard
	Be	9	99.718	ug/L	5.287	5	8	367593	3	Standard
	C	13		ug/L			13453	15977	6	Standard
	Cl	37		ug/L			3677416	3812146	3	Standard
>	Sc	45		ug/L			810285	839953	1	Standard
	Cr	52	99.345	ug/L	4.318	4	13691	1434351	4	Standard
	Cr	53	99.243	ug/L	1.565	1	129	168593	0	Standard
	Fe	54	9961.390	ug/L	307.670	3	39463	9535707	4	Standard
	Fe	57	9956.129	ug/L	304.171	3	11347	3786313	1	Standard
	Mn	55	98.305	ug/L	1.266	1	378	1936289	0	Standard
>	Ge	72		ug/L			42122	40284	4	KED
	Ni	60	99.429	ug/L	3.898	3	10	65214	4	KED
	Ni	62	100.272	ug/L	5.407	5	0	10600	0	KED
	Cu	63	99.879	ug/L	4.512	4	43	182438	0	KED
	Cu	65	99.441	ug/L	2.165	2	22	90743	2	KED
	Zn	66	99.462	ug/L	8.062	8	16	23421	3	KED
	Zn	67	98.812	ug/L	5.551	5	3	3959	1	KED
	As	75	100.229	ug/L	4.663	4	3	16306	0	KED
	Se	78	99.645	ug/L	5.333	5	5	1657	1	KED
	Y	89		ug/L			561402	559026	0	Standard
	Kr	83		ug/L			45	48	8	Standard
>	In-1	115		ug/L			12648	12203	1	KED
	Mo	98	101.591	ug/L	4.763	4	4	62040	3	KED
	Cd	111	100.405	ug/L	4.276	4	3	17772	2	KED
	Cd	114	100.853	ug/L	1.472	1	0	47231	0	KED
>	In	115		ug/L			852951	842252	1	Standard
	Ag	107	98.417	ug/L	2.998	3	143	1277088	1	Standard
	Sb	121	99.380	ug/L	1.579	1	123	1122594	1	Standard
	Sb	123	99.947	ug/L	1.770	1	104	864644	1	Standard
	Ba	135	99.320	ug/L	1.900	1	14	376441	3	Standard
	Ba	137	99.154	ug/L	2.257	2	26	654607	2	Standard
>	Tb	159		ug/L			1107766	1096984	3	Standard
	Tl	205	101.123	ug/L	2.681	2	18	3074838	5	Standard
	Pb	208	99.158	ug/L	0.755	0	188	3813937	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL1
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 10:20:35
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	679234	2	Standard
	Be	**9**	**0.002**	ug/L	0.002	88	8	15	42	Standard
	C	**13**		ug/L			13453	13635	4	Standard
	Cl	**37**		ug/L			3677416	3736349	1	Standard
>	**Sc**	**45**		ug/L			810285	800100	3	Standard
	Cr	**52**	**-0.005**	ug/L	0.070	1337	13691	13424	3	Standard
	Cr	**53**	**-0.008**	ug/L	0.003	30	129	114	5	Standard
	Fe	**54**	**2.615**	ug/L	3.981	152	39463	41253	5	Standard
	Fe	**57**	**-0.927**	ug/L	1.493	161	11347	10859	3	Standard
	Mn	**55**	**0.000**	ug/L	0.002	1405	378	375	5	Standard
>	**Ge**	**72**		ug/L			42122	40891	1	KED
	Ni	**60**	**0.010**	ug/L	0.007	73	10	16	29	KED
	Ni	**62**	**0.018**	ug/L	0.027	152	0	2	114	KED
	Cu	**63**	**0.006**	ug/L	0.004	72	43	53	14	KED
	Cu	**65**	**0.001**	ug/L	0.018	1242	22	23	68	KED
	Zn	**66**	**-0.019**	ug/L	0.016	85	16	11	33	KED
	Zn	**67**	**-0.013**	ug/L	0.055	431	3	3	69	KED
	As	**75**	**0.013**	ug/L	0.019	143	3	6	51	KED
	Se	**78**	**0.168**	ug/L	0.040	23	5	7	8	KED
	Y	**89**		ug/L			561402	547206	2	Standard
	Kr	**83**		ug/L			45	52	27	Standard
>	**In-1**	**115**		ug/L			12648	12658	1	KED
	Mo	**98**	**0.060**	ug/L	0.003	4	4	42	4	KED
	Cd	**111**	**0.002**	ug/L	0.003	185	3	3	15	KED
	Cd	**114**	**0.007**	ug/L	0.008	124	0	3	104	KED
>	**In**	**115**		ug/L			852951	853654	1	Standard
	Ag	**107**	**0.009**	ug/L	0.002	22	143	255	10	Standard
	Sb	**121**	**0.868**	ug/L	0.052	5	123	10061	7	Standard
	Sb	**123**	**0.887**	ug/L	0.079	8	104	7882	9	Standard
	Ba	**135**	**-0.000**	ug/L	0.002	1036	14	13	56	Standard
	Ba	**137**	**0.001**	ug/L	0.000	44	26	31	7	Standard
>	**Tb**	**159**		ug/L			1107766	1120186	3	Standard
	Tl	**205**	**0.010**	ug/L	0.000	2	18	314	2	Standard
	Pb	**208**	**0.002**	ug/L	0.000	10	188	287	6	Standard

Sample Information

Sample Date/Time: Wednesday, October 10, 2018 10:12:48
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_lo
Mass Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Conditions File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

Calibration

Analyte	Mass	**r Corr Coef**	Slope	Std 1 Conc	Std 2 Conc	Std 3 Conc	Std 4 Conc	Std 5 Conc
Li	6							
Be	9	**1.0000**	0.005	0.20	10	20	50	100
C	13							
Cl	37							
Sc	45							
Cr	52	**0.9999**	0.017	0.50	10	20	50	100
Cr	53	**0.9999**	0.002	0.50	10	20	50	100
Fe	54	**0.9999**	0.001	20.00	1000	2000	5000	10000
Fe	57	**0.9999**	0.000	20.00	1000	2000	5000	10000
Mn	55	**0.9995**	0.023	0.50	10	20	50	100
Ge	72							
Ni	60	**0.9999**	0.016	0.50	10	20	50	100
Ni	62	**1.0000**	0.003	0.50	10	20	50	100
Cu	63	**1.0000**	0.045	0.50	10	20	50	100
Cu	65	**0.9999**	0.023	0.50	10	20	50	100
Zn	66	**0.9999**	0.006	4.00	10	20	50	100
Zn	67	**0.9997**	0.001	4.00	10	20	50	100
As	75	**1.0000**	0.004	0.20	10	20	50	100
Se	78	**1.0000**	0.000	0.50	10	20	50	100
Y	89							
Kr	83							
In-1	115							
Mo	98	**0.9996**	0.050	0.20	10	20	50	100
Cd	111	**1.0000**	0.015	0.10	10	20	50	100
Cd	114	**0.9999**	0.038	0.10	10	20	50	100
In	115							
Ag	107	**0.9996**	0.015	0.20	10	20	50	100
Sb	121	**0.9998**	0.013	0.20	10	20	50	100
Sb	123	**0.9999**	0.010	0.20	10	20	50	100
Ba	135	**0.9999**	0.004	0.50	10	20	50	100
Ba	137	**0.9999**	0.008	0.50	10	20	50	100
Tb	159							
Tl	205	**0.9998**	0.028	0.20	10	20	50	100
Pb	208	**0.9999**	0.035	0.10	10	20	50	100

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-ICV1
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 10:28:22
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	705345	4	Standard
	Be	9	51.050	ug/L	1.576	3	8	192117	1	Standard
	C	13		ug/L			13453	16223	0	Standard
	Cl	37		ug/L			3677416	3881201	4	Standard
>	Sc	45		ug/L			810285	852452	0	Standard
	Cr	52	50.916	ug/L	1.478	2	13691	752988	2	Standard
	Cr	53	50.599	ug/L	0.496	0	129	87321	1	Standard
	Fe	54	5184.370	ug/L	84.461	1	39463	5055296	2	Standard
	Fe	57	5198.065	ug/L	273.968	5	11347	2012358	4	Standard
	Mn	55	51.955	ug/L	1.283	2	378	1039016	3	Standard
>	Ge	72		ug/L			42122	42335	1	KED
	Ni	60	48.926	ug/L	0.639	1	10	33749	0	KED
	Ni	62	47.582	ug/L	3.356	7	0	5292	5	KED
	Cu	63	49.638	ug/L	1.729	3	43	95447	4	KED
	Cu	65	49.485	ug/L	0.827	1	22	47494	1	KED
	Zn	66	47.829	ug/L	0.893	1	16	11871	1	KED
	Zn	67	48.296	ug/L	2.668	5	3	2038	5	KED
	As	75	48.596	ug/L	1.071	2	3	8321	1	KED
	Se	78	74.176	ug/L	1.800	2	5	1299	2	KED
	Y	89		ug/L			561402	587100	0	Standard
	Kr	83		ug/L			45	49	27	Standard
>	In-1	115		ug/L			12648	12541	1	KED
	Mo	98	47.737	ug/L	1.943	4	4	29963	2	KED
	Cd	111	49.880	ug/L	1.460	2	3	9075	1	KED
	Cd	114	49.341	ug/L	1.249	2	0	23742	0	KED
>	In	115		ug/L			852951	860993	6	Standard
	Ag	107	50.332	ug/L	3.216	6	143	666138	0	Standard
	Sb	121	50.728	ug/L	3.423	6	123	584241	0	Standard
	Sb	123	50.933	ug/L	3.116	6	104	449409	0	Standard
	Ba	135	50.058	ug/L	4.734	9	14	193198	3	Standard
	Ba	137	51.270	ug/L	4.104	8	26	344964	2	Standard
>	Tb	159		ug/L			1107766	1135047	4	Standard
	Tl	205	48.236	ug/L	2.518	5	18	1515211	2	Standard
	Pb	208	49.736	ug/L	0.975	1	188	1978233	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-ICB1
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 10:36:09
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	662802	2	Standard
	Be	9	0.003	ug/L	0.002	47	8	19	29	Standard
	C	13		ug/L			13453	13768	4	Standard
	Cl	37		ug/L			3677416	3922471	2	Standard
>	Sc	45		ug/L			810285	823439	3	Standard
	Cr	52	-0.063	ug/L	0.021	33	13691	13030	2	Standard
	Cr	53	-0.007	ug/L	0.001	20	129	120	2	Standard
	Fe	54	0.247	ug/L	0.818	331	39463	40324	2	Standard
	Fe	57	-0.688	ug/L	1.499	217	11347	11264	2	Standard
	Mn	55	0.001	ug/L	0.000	15	378	398	2	Standard
>	Ge	72		ug/L			42122	40865	3	KED
	Ni	60	-0.002	ug/L	0.010	588	10	8	75	KED
	Ni	62	0.023	ug/L	0.019	81	0	3	69	KED
	Cu	63	0.009	ug/L	0.002	22	43	58	3	KED
	Cu	65	0.004	ug/L	0.006	148	22	26	23	KED
	Zn	66	-0.000	ug/L	0.014	4060	16	15	18	KED
	Zn	67	0.018	ug/L	0.098	547	3	4	89	KED
	As	75	0.008	ug/L	0.009	118	3	5	27	KED
	Se	78	0.196	ug/L	0.060	30	5	8	14	KED
	Y	89		ug/L			561402	563850	3	Standard
	Kr	83		ug/L			45	46	17	Standard
>	In-1	115		ug/L			12648	12856	1	KED
	Mo	98	0.032	ug/L	0.017	53	4	25	44	KED
	Cd	111	-0.009	ug/L	0.008	87	3	1	91	KED
	Cd	114	0.005	ug/L	0.006	116	0	3	95	KED
>	In	115		ug/L			852951	849795	1	Standard
	Ag	107	0.005	ug/L	0.002	40	143	208	13	Standard
	Sb	121	0.447	ug/L	0.028	6	123	5216	4	Standard
	Sb	123	0.434	ug/L	0.034	7	104	3889	6	Standard
	Ba	135	0.000	ug/L	0.000	100	14	15	6	Standard
	Ba	137	-0.000	ug/L	0.001	255	26	24	24	Standard
>	Tb	159		ug/L			1107766	1107047	3	Standard
	Tl	205	0.006	ug/L	0.001	8	18	212	11	Standard
	Pb	208	0.001	ug/L	0.000	27	188	244	9	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV1
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 10:44:17
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	671488	7	Standard
	Be	**9**	**52.404**	ug/L	4.362	8	8	187222	3	Standard
	C	**13**		ug/L			13453	13892	5	Standard
	Cl	**37**		ug/L			3677416	3925336	4	Standard
>	**Sc**	**45**		ug/L			810285	808103	2	Standard
	Cr	**52**	**52.445**	ug/L	0.365	0	13691	734909	1	Standard
	Cr	**53**	**52.899**	ug/L	0.790	1	129	86526	2	Standard
	Fe	**54**	**5304.182**	ug/L	31.217	0	39463	4902104	2	Standard
	Fe	**57**	**5341.181**	ug/L	380.048	7	11347	1958194	5	Standard
	Mn	**55**	**54.244**	ug/L	0.259	0	378	1028168	1	Standard
>	**Ge**	**72**		ug/L			42122	43125	2	KED
	Ni	**60**	**48.843**	ug/L	0.277	0	10	34326	2	KED
	Ni	**62**	**47.271**	ug/L	0.670	1	0	5358	1	KED
	Cu	**63**	**49.114**	ug/L	1.658	3	43	96146	1	KED
	Cu	**65**	**49.286**	ug/L	2.844	5	22	48143	3	KED
	Zn	**66**	**47.820**	ug/L	0.842	1	16	12088	1	KED
	Zn	**67**	**49.703**	ug/L	1.940	3	3	2137	4	KED
	As	**75**	**48.631**	ug/L	1.524	3	3	8480	1	KED
	Se	**78**	**48.836**	ug/L	0.677	1	5	873	3	KED
	Y	**89**		ug/L			561402	562725	4	Standard
	Kr	**83**		ug/L			45	62	10	Standard
>	**In-1**	**115**		ug/L			12648	13025	0	KED
	Mo	**98**	**47.112**	ug/L	0.680	1	4	30726	1	KED
	Cd	**111**	**48.915**	ug/L	0.997	2	3	9246	1	KED
	Cd	**114**	**48.795**	ug/L	1.637	3	0	24392	3	KED
>	**In**	**115**		ug/L			852951	856775	1	Standard
	Ag	**107**	**52.000**	ug/L	3.615	6	143	686004	4	Standard
	Sb	**121**	**50.093**	ug/L	1.102	2	123	575514	0	Standard
	Sb	**123**	**48.821**	ug/L	2.112	4	104	429502	2	Standard
	Ba	**135**	**50.865**	ug/L	1.559	3	14	196027	1	Standard
	Ba	**137**	**49.641**	ug/L	0.731	1	26	333354	0	Standard
>	**Tb**	**159**		ug/L			1107766	1095604	3	Standard
	Tl	**205**	**47.965**	ug/L	1.989	4	18	1455242	2	Standard
	Pb	**208**	**50.439**	ug/L	0.234	0	188	1937563	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB1
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 10:51:44
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	712740	2	Standard
	Be	9	0.003	ug/L	0.002	57	8	20	35	Standard
	C	13		ug/L			13453	14129	4	Standard
	Cl	37		ug/L			3677416	3917453	2	Standard
>	Sc	45		ug/L			810285	853909	2	Standard
	Cr	52	-0.084	ug/L	0.059	70	13691	13189	3	Standard
	Cr	53	-0.006	ug/L	0.005	81	129	126	3	Standard
	Fe	54	0.254	ug/L	3.887	1527	39463	41806	8	Standard
	Fe	57	-2.342	ug/L	0.457	19	11347	11057	3	Standard
	Mn	55	-0.001	ug/L	0.001	103	378	387	2	Standard
>	Ge	72		ug/L			42122	42556	3	KED
	Ni	60	0.006	ug/L	0.008	140	10	13	34	KED
	Ni	62	0.011	ug/L	0.017	152	0	1	100	KED
	Cu	63	0.001	ug/L	0.004	454	43	45	12	KED
	Cu	65	-0.002	ug/L	0.001	37	22	20	0	KED
	Zn	66	-0.006	ug/L	0.013	220	16	15	25	KED
	Zn	67	-0.046	ug/L	0.044	96	3	1	100	KED
	As	75	0.004	ug/L	0.003	64	3	4	10	KED
	Se	78	0.187	ug/L	0.107	57	5	8	24	KED
	Y	89		ug/L			561402	567692	1	Standard
	Kr	83		ug/L			45	52	12	Standard
>	In-1	115		ug/L			12648	12918	3	KED
	Mo	98	0.064	ug/L	0.054	84	4	46	77	KED
	Cd	111	0.026	ug/L	0.044	168	3	8	103	KED
	Cd	114	0.045	ug/L	0.051	112	0	23	112	KED
>	In	115		ug/L			852951	858389	2	Standard
	Ag	107	0.006	ug/L	0.001	16	143	226	8	Standard
	Sb	121	0.555	ug/L	0.034	6	123	6517	8	Standard
	Sb	123	0.563	ug/L	0.024	4	104	5074	6	Standard
	Ba	135	0.001	ug/L	0.001	226	14	17	33	Standard
	Ba	137	0.000	ug/L	0.002	448	26	29	45	Standard
>	Tb	159		ug/L			1107766	1159581	3	Standard
	Tl	205	0.009	ug/L	0.001	6	18	296	8	Standard
	Pb	208	0.002	ug/L	0.001	51	188	268	13	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CRL1
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 10:56:47
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	652989	0	Standard
	Be	**9**	**0.210**	ug/L	0.001	0	8	739	1	Standard
	C	**13**		ug/L			13453	13261	3	Standard
	Cl	**37**		ug/L			3677416	3923711	4	Standard
>	**Sc**	**45**		ug/L			810285	825053	1	Standard
	Cr	**52**	**0.428**	ug/L	0.042	9	13691	19946	1	Standard
	Cr	**53**	**0.507**	ug/L	0.016	3	129	977	1	Standard
	Fe	**54**	**22.600**	ug/L	4.539	20	39463	61287	5	Standard
	Fe	**57**	**23.364**	ug/L	0.511	2	11347	20255	0	Standard
	Mn	**55**	**0.542**	ug/L	0.010	1	378	10876	1	Standard
>	**Ge**	**72**		ug/L			42122	41258	2	KED
	Ni	**60**	**0.504**	ug/L	0.059	11	10	349	13	KED
	Ni	**62**	**0.598**	ug/L	0.062	10	0	65	8	KED
	Cu	**63**	**0.548**	ug/L	0.041	7	43	1069	6	KED
	Cu	**65**	**0.520**	ug/L	0.018	3	22	508	5	KED
	Zn	**66**	**4.253**	ug/L	0.100	2	16	1043	0	KED
	Zn	**67**	**3.959**	ug/L	0.505	12	3	166	12	KED
	As	**75**	**0.181**	ug/L	0.012	6	3	34	7	KED
	Se	**78**	**0.698**	ug/L	0.251	35	5	16	23	KED
	Y	**89**		ug/L			561402	556319	2	Standard
	Kr	**83**		ug/L			45	55	41	Standard
>	**In-1**	**115**		ug/L			12648	12707	3	KED
	Mo	**98**	**0.204**	ug/L	0.039	19	4	134	18	KED
	Cd	**111**	**0.119**	ug/L	0.021	17	3	25	12	KED
	Cd	**114**	**0.108**	ug/L	0.039	36	0	53	34	KED
>	**In**	**115**		ug/L			852951	874632	3	Standard
	Ag	**107**	**0.204**	ug/L	0.011	5	143	2886	1	Standard
	Sb	**121**	**0.359**	ug/L	0.019	5	123	4341	6	Standard
	Sb	**123**	**0.351**	ug/L	0.013	3	104	3260	6	Standard
	Ba	**135**	**0.518**	ug/L	0.026	4	14	2050	1	Standard
	Ba	**137**	**0.494**	ug/L	0.022	4	26	3412	1	Standard
>	**Tb**	**159**		ug/L			1107766	1115375	2	Standard
	Tl	**205**	**0.210**	ug/L	0.014	6	18	6495	7	Standard
	Pb	**208**	**0.109**	ug/L	0.008	7	188	4439	5	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IFA1
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 11:02:16
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	688656	2	Standard
	Be	9	0.002	ug/L	0.001	66	8	16	35	Standard
	C	13		ug/L			13453	78240	0	Standard
	Cl	37		ug/L			3677416	9406592	3	Standard
>	Sc	45		ug/L			810285	863956	1	Standard
	Cr	52	0.573	ug/L	0.028	4	13691	23020	1	Standard
	Cr	53	6.014	ug/L	0.027	0	129	10639	1	Standard
	Fe	54	20778.968	ug/L	428.991	2	39463	20404121	1	Standard
	Fe	57	20595.986	ug/L	143.411	0	11347	8045569	1	Standard
	Mn	55	0.075	ug/L	0.003	3	378	1913	3	Standard
>	Ge	72		ug/L			42122	39934	3	KED
	Ni	60	0.037	ug/L	0.012	31	10	33	19	KED
	Ni	62	0.091	ug/L	0.025	27	0	10	28	KED
	Cu	63	0.045	ug/L	0.004	8	43	123	8	KED
	Cu	65	0.050	ug/L	0.004	7	22	66	7	KED
	Zn	66	0.223	ug/L	0.032	14	16	67	14	KED
	Zn	67	0.210	ug/L	0.189	90	3	12	65	KED
	As	75	0.040	ug/L	0.015	38	3	10	21	KED
	Se	78	0.238	ug/L	0.080	33	5	8	11	KED
	Y	89		ug/L			561402	539656	1	Standard
	Kr	83		ug/L			45	75	8	Standard
>	In-1	115		ug/L			12648	12145	2	KED
	Mo	98	401.743	ug/L	9.991	2	4	244226	2	KED
	Cd	111	0.057	ug/L	0.026	45	3	13	32	KED
	Cd	114	0.050	ug/L	0.010	20	0	23	22	KED
>	In	115		ug/L			852951	798860	1	Standard
	Ag	107	0.011	ug/L	0.002	15	143	274	8	Standard
	Sb	121	0.124	ug/L	0.005	3	123	1440	2	Standard
	Sb	123	0.122	ug/L	0.016	13	104	1100	11	Standard
	Ba	135	0.029	ug/L	0.008	26	14	116	22	Standard
	Ba	137	0.027	ug/L	0.002	6	26	193	4	Standard
>	Tb	159		ug/L			1107766	1063550	1	Standard
	Tl	205	0.014	ug/L	0.002	12	18	443	13	Standard
	Pb	208	0.025	ug/L	0.002	6	188	1106	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IFB1
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 11:07:18
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	736036	2	Standard
	Be	**9**	**0.004**	ug/L	0.001	28	8	24	16	Standard
	C	**13**		ug/L			13453	84524	2	Standard
	Cl	**37**		ug/L			3677416	9697963	3	Standard
>	**Sc**	**45**		ug/L			810285	915654	0	Standard
	Cr	**52**	**20.351**	ug/L	0.178	0	13691	332623	0	Standard
	Cr	**53**	**24.731**	ug/L	0.493	1	129	45916	2	Standard
	Fe	**54**	**19584.186**	ug/L	505.683	2	39463	20386358	2	Standard
	Fe	**57**	**20298.369**	ug/L	712.885	3	11347	8403733	3	Standard
	Mn	**55**	**19.841**	ug/L	0.355	1	378	426404	1	Standard
>	**Ge**	**72**		ug/L			42122	40191	1	KED
	Ni	**60**	**20.247**	ug/L	0.242	1	10	13265	0	KED
	Ni	**62**	**19.633**	ug/L	0.480	2	0	2075	3	KED
	Cu	**63**	**19.456**	ug/L	0.501	2	43	35545	3	KED
	Cu	**65**	**19.377**	ug/L	0.255	1	22	17667	0	KED
	Zn	**66**	**18.425**	ug/L	0.682	3	16	4353	4	KED
	Zn	**67**	**17.410**	ug/L	0.321	1	3	700	2	KED
	As	**75**	**18.959**	ug/L	0.191	1	3	3084	1	KED
	Se	**78**	**0.215**	ug/L	0.082	38	5	8	16	KED
	Y	**89**		ug/L			561402	552722	5	Standard
	Kr	**83**		ug/L			45	62	37	Standard
>	**In-1**	**115**		ug/L			12648	12608	1	KED
	Mo	**98**	**385.031**	ug/L	16.065	4	4	242933	2	KED
	Cd	**111**	**18.267**	ug/L	0.696	3	3	3343	2	KED
	Cd	**114**	**17.713**	ug/L	0.357	2	0	8569	0	KED
>	**In**	**115**		ug/L			852951	825771	1	Standard
	Ag	**107**	**19.248**	ug/L	0.574	2	143	244982	1	Standard
	Sb	**121**	**0.076**	ug/L	0.010	13	123	963	12	Standard
	Sb	**123**	**0.072**	ug/L	0.007	10	104	711	8	Standard
	Ba	**135**	**0.029**	ug/L	0.001	4	14	121	2	Standard
	Ba	**137**	**0.021**	ug/L	0.003	12	26	163	10	Standard
>	**Tb**	**159**		ug/L			1107766	1074457	1	Standard
	Tl	**205**	**0.004**	ug/L	0.000	9	18	137	8	Standard
	Pb	**208**	**0.027**	ug/L	0.001	2	188	1185	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-HCV1
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 11:12:21
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	707912	4	Standard
	Be	**9**	**189.842**	ug/L	9.930	5	8	716592	2	Standard
	C	**13**		ug/L			13453	18237	9	Standard
	Cl	**37**		ug/L			3677416	4139755	4	Standard
>	**Sc**	**45**		ug/L			810285	857554	1	Standard
	Cr	**52**	**192.679**	ug/L	5.354	2	13691	2826089	1	Standard
	Cr	**53**	**202.272**	ug/L	2.563	1	129	350760	2	Standard
	Fe	**54**	**20270.212**	ug/L	710.966	3	39463	19755582	2	Standard
	Fe	**57**	**19999.864**	ug/L	573.867	2	11347	7753535	1	Standard
	Mn	**55**	**196.714**	ug/L	4.406	2	378	3955555	2	Standard
>	**Ge**	**72**		ug/L			42122	39828	0	KED
	Ni	**60**	**199.415**	ug/L	0.732	0	10	129398	0	KED
	Ni	**62**	**200.847**	ug/L	5.910	2	0	21027	2	KED
	Cu	**63**	**196.660**	ug/L	2.555	1	43	355599	1	KED
	Cu	**65**	**195.731**	ug/L	1.223	0	22	176680	1	KED
	Zn	**66**	**190.909**	ug/L	7.556	3	16	44532	3	KED
	Zn	**67**	**195.291**	ug/L	6.521	3	3	7746	2	KED
	As	**75**	**198.673**	ug/L	3.177	1	3	31997	1	KED
	Se	**78**	**191.364**	ug/L	6.714	3	5	3147	3	KED
	Y	**89**		ug/L			561402	538439	4	Standard
	Kr	**83**		ug/L			45	58	19	Standard
>	**In-1**	**115**		ug/L			12648	12038	1	KED
	Mo	**98**	**204.243**	ug/L	5.783	2	4	123083	2	KED
	Cd	**111**	**196.964**	ug/L	6.438	3	3	34396	2	KED
	Cd	**114**	**194.824**	ug/L	3.236	1	0	90017	2	KED
>	**In**	**115**		ug/L			852951	800568	1	Standard
	Ag	**107**	**198.710**	ug/L	7.130	3	143	2450379	2	Standard
	Sb	**121**	**197.775**	ug/L	1.059	0	123	2123347	1	Standard
	Sb	**123**	**195.520**	ug/L	4.905	2	104	1607516	1	Standard
	Ba	**135**	**197.296**	ug/L	1.464	0	14	710725	2	Standard
	Ba	**137**	**192.812**	ug/L	5.502	2	26	1209962	3	Standard
>	**Tb**	**159**		ug/L			1107766	1038749	1	Standard
	Tl	**205**	**213.205**	ug/L	1.558	0	18	6136845	1	Standard
	Pb	**208**	**209.858**	ug/L	7.389	3	188	7643011	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-HCV2
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 11:17:24
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	680089	3	Standard
	Be	**9**	**283.848**	ug/L	7.789	2	8	1030202	1	Standard
	C	**13**		ug/L			13453	17928	3	Standard
	Cl	**37**		ug/L			3677416	3894031	2	Standard
>	**Sc**	**45**		ug/L			810285	806147	0	Standard
	Cr	**52**	**295.178**	ug/L	9.279	3	13691	4062868	2	Standard
	Cr	**53**	**308.124**	ug/L	4.121	1	129	502209	2	Standard
	Fe	**54**	**30939.707**	ug/L	459.971	1	39463	28331664	0	Standard
	Fe	**57**	**30881.632**	ug/L	1005.511	3	11347	11250599	3	Standard
	Mn	**55**	**302.313**	ug/L	7.582	2	378	5715379	3	Standard
>	**Ge**	**72**		ug/L			42122	38247	1	KED
	Ni	**60**	**296.943**	ug/L	7.285	2	10	185011	2	KED
	Ni	**62**	**290.620**	ug/L	7.145	2	0	29212	1	KED
	Cu	**63**	**284.351**	ug/L	4.390	1	43	493726	1	KED
	Cu	**65**	**292.477**	ug/L	5.730	1	22	253543	3	KED
	Zn	**66**	**271.840**	ug/L	4.821	1	16	60886	0	KED
	Zn	**67**	**276.471**	ug/L	5.819	2	3	10528	1	KED
	As	**75**	**293.289**	ug/L	1.202	0	3	45359	0	KED
	Se	**78**	**275.233**	ug/L	0.905	0	5	4345	0	KED
	Y	**89**		ug/L			561402	532290	4	Standard
	Kr	**83**		ug/L			45	73	28	Standard
>	**In-1**	**115**		ug/L			12648	11750	1	KED
	Mo	**98**	**301.637**	ug/L	14.771	4	4	177341	3	KED
	Cd	**111**	**285.418**	ug/L	6.772	2	3	48645	0	KED
	Cd	**114**	**277.250**	ug/L	6.640	2	0	125004	1	KED
>	**In**	**115**		ug/L			852951	756865	2	Standard
	Ag	**107**	**304.379**	ug/L	21.565	7	143	3544878	4	Standard
	Sb	**121**	**303.753**	ug/L	14.389	4	123	3080360	1	Standard
	Sb	**123**	**303.953**	ug/L	4.530	1	104	2362338	1	Standard
	Ba	**135**	**288.093**	ug/L	8.035	2	14	980760	2	Standard
	Ba	**137**	**282.754**	ug/L	5.937	2	26	1676869	0	Standard
>	**Tb**	**159**		ug/L			1107766	1011012	1	Standard
	Tl	**205**	**299.406**	ug/L	8.954	2	18	8387948	3	Standard
	Pb	**208**	**306.754**	ug/L	4.778	1	188	10872607	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL2
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 11:25:10
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	709951	9	Standard
	Be	**9**	**0.007**	ug/L	0.003	37	8	36	18	Standard
	C	**13**		ug/L			13453	16272	4	Standard
	Cl	**37**		ug/L			3677416	3929670	5	Standard
>	**Sc**	**45**		ug/L			810285	831874	2	Standard
	Cr	**52**	**-0.059**	ug/L	0.036	60	13691	13210	2	Standard
	Cr	**53**	**0.049**	ug/L	0.006	12	129	215	4	Standard
	Fe	**54**	**0.252**	ug/L	1.337	529	39463	40736	1	Standard
	Fe	**57**	**-1.860**	ug/L	2.042	109	11347	10941	5	Standard
	Mn	**55**	**0.010**	ug/L	0.003	25	378	586	6	Standard
>	**Ge**	**72**		ug/L			42122	41283	1	KED
	Ni	**60**	**0.015**	ug/L	0.018	117	10	20	60	KED
	Ni	**62**	**0.059**	ug/L	0.010	17	0	6	15	KED
	Cu	**63**	**0.023**	ug/L	0.008	33	43	86	16	KED
	Cu	**65**	**0.030**	ug/L	0.003	8	22	50	5	KED
	Zn	**66**	**0.143**	ug/L	0.022	15	16	50	9	KED
	Zn	**67**	**0.033**	ug/L	0.025	78	3	5	21	KED
	As	**75**	**0.008**	ug/L	0.005	63	3	5	15	KED
	Se	**78**	**0.213**	ug/L	0.089	41	5	8	16	KED
	Y	**89**		ug/L			561402	553104	1	Standard
	Kr	**83**		ug/L			45	66	8	Standard
>	**In-1**	**115**		ug/L			12648	12563	2	KED
	Mo	**98**	**0.171**	ug/L	0.028	16	4	112	16	KED
	Cd	**111**	**-0.003**	ug/L	0.003	99	3	2	21	KED
	Cd	**114**	**0.006**	ug/L	0.000	5	0	3	2	KED
>	**In**	**115**		ug/L			852951	850715	1	Standard
	Ag	**107**	**0.015**	ug/L	0.001	3	143	333	1	Standard
	Sb	**121**	**2.387**	ug/L	0.169	7	123	27333	5	Standard
	Sb	**123**	**2.464**	ug/L	0.232	9	104	21614	7	Standard
	Ba	**135**	**0.008**	ug/L	0.002	27	14	45	17	Standard
	Ba	**137**	**0.008**	ug/L	0.002	32	26	77	22	Standard
>	**Tb**	**159**		ug/L			1107766	1105027	4	Standard
	Tl	**205**	**0.063**	ug/L	0.004	6	18	1942	8	Standard
	Pb	**208**	**0.016**	ug/L	0.001	6	188	799	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL3
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 11:32:08
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	727361	2	Standard
	Be	**9**	**0.006**	ug/L	0.002	36	8	31	27	Standard
	C	**13**		ug/L			13453	16739	6	Standard
	Cl	**37**		ug/L			3677416	3935700	2	Standard
>	**Sc**	**45**		ug/L			810285	837422	0	Standard
	Cr	**52**	**-0.051**	ug/L	0.022	43	13691	13419	1	Standard
	Cr	**53**	**0.032**	ug/L	0.009	28	129	188	8	Standard
	Fe	**54**	**-1.633**	ug/L	1.460	89	39463	39241	4	Standard
	Fe	**57**	**-2.588**	ug/L	0.746	28	11347	10749	2	Standard
	Mn	**55**	**0.006**	ug/L	0.001	15	378	513	3	Standard
>	**Ge**	**72**		ug/L			42122	42345	1	KED
	Ni	**60**	**0.018**	ug/L	0.009	46	10	22	25	KED
	Ni	**62**	**0.046**	ug/L	0.062	136	0	5	120	KED
	Cu	**63**	**0.009**	ug/L	0.009	107	43	60	29	KED
	Cu	**65**	**0.015**	ug/L	0.011	74	22	37	28	KED
	Zn	**66**	**0.146**	ug/L	0.005	3	16	52	2	KED
	Zn	**67**	**0.061**	ug/L	0.185	304	3	6	121	KED
	As	**75**	**0.003**	ug/L	0.007	247	3	4	24	KED
	Se	**78**	**0.294**	ug/L	0.251	85	5	10	41	KED
	Y	**89**		ug/L			561402	560443	4	Standard
	Kr	**83**		ug/L			45	48	25	Standard
>	**In-1**	**115**		ug/L			12648	12410	2	KED
	Mo	**98**	**0.027**	ug/L	0.016	57	4	21	45	KED
	Cd	**111**	**-0.008**	ug/L	0.003	37	3	1	34	KED
	Cd	**114**	**0.005**	ug/L	0.005	87	0	3	73	KED
>	**In**	**115**		ug/L			852951	852335	1	Standard
	Ag	**107**	**0.005**	ug/L	0.001	9	143	213	1	Standard
	Sb	**121**	**0.603**	ug/L	0.063	10	123	7009	9	Standard
	Sb	**123**	**0.601**	ug/L	0.047	7	104	5361	6	Standard
	Ba	**135**	**0.005**	ug/L	0.002	38	14	35	22	Standard
	Ba	**137**	**0.005**	ug/L	0.001	26	26	58	13	Standard
>	**Tb**	**159**		ug/L			1107766	1107232	3	Standard
	Tl	**205**	**0.029**	ug/L	0.003	10	18	906	10	Standard
	Pb	**208**	**0.013**	ug/L	0.001	11	188	690	7	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV2
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 11:39:05

DEL

Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	775084	5	Standard
	Be	9	44.472	ug/L	3.117	7	8	183630	2	Standard
	C	13		ug/L			13453	15421	2	Standard
	Cl	37		ug/L			3677416	4117916	4	Standard
>	Sc	45		ug/L			810285	859852	2	Standard
	Cr	52	50.627	ug/L	0.693	1	13691	755276	1	Standard
	Cr	53	51.534	ug/L	2.186	4	129	89635	2	Standard
	Fe	54	5095.950	ug/L	104.937	2	39463	5010739	0	Standard
	Fe	57	5024.660	ug/L	107.741	2	11347	1961998	0	Standard
	Mn	55	51.891	ug/L	1.387	2	378	1046160	1	Standard
>	Ge	72		ug/L			42122	42369	0	KED
	Ni	60	48.875	ug/L	1.771	3	10	33742	3	KED
	Ni	62	50.139	ug/L	0.531	1	0	5584	0	KED
	Cu	63	50.091	ug/L	1.193	2	43	96385	2	KED
	Cu	65	50.162	ug/L	1.210	2	22	48181	2	KED
	Zn	66	48.733	ug/L	1.492	3	16	12106	2	KED
	Zn	67	50.972	ug/L	0.551	1	3	2153	0	KED
	As	75	49.060	ug/L	0.734	1	3	8408	1	KED
	Se	78	49.073	ug/L	1.529	3	5	862	3	KED
	Y	89		ug/L			561402	562639	0	Standard
	Kr	83		ug/L			45	53	5	Standard
>	In-1	115		ug/L			12648	13014	2	KED
	Mo	98	47.598	ug/L	0.850	1	4	31013	1	KED
	Cd	111	48.197	ug/L	0.351	0	3	9104	2	KED
	Cd	114	47.501	ug/L	0.745	1	0	23726	2	KED
>	In	115		ug/L			852951	855621	2	Standard
	Ag	107	50.964	ug/L	2.319	4	143	671463	1	Standard
	Sb	121	50.612	ug/L	1.867	3	123	580462	0	Standard
	Sb	123	50.501	ug/L	1.439	2	104	443682	0	Standard
	Ba	135	49.922	ug/L	1.012	2	14	192132	1	Standard
	Ba	137	50.434	ug/L	1.230	2	26	338132	0	Standard
>	Tb	159		ug/L			1107766	1122527	1	Standard
	Tl	205	49.263	ug/L	1.549	3	18	1532633	4	Standard
	Pb	208	51.447	ug/L	0.337	0	188	2024908	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV2
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 11:46:52
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	682495	5	Standard
	Be	**9**	**56.226**	ug/L	3.764	6	8	204508	3	Standard
	C	**13**		ug/L			13453	14502	5	Standard
	Cl	**37**		ug/L			3677416	4233572	1	Standard
>	**Sc**	**45**		ug/L			810285	868628	4	Standard
	Cr	**52**	**51.237**	ug/L	2.804	5	13691	771173	2	Standard
	Cr	**53**	**48.516**	ug/L	2.550	5	129	85209	2	Standard
	Fe	**54**	**5106.259**	ug/L	159.252	3	39463	5071628	3	Standard
	Fe	**57**	**4992.559**	ug/L	172.519	3	11347	1968866	2	Standard
	Mn	**55**	**52.277**	ug/L	2.185	4	378	1063979	0	Standard
>	**Ge**	**72**		ug/L			42122	42343	0	KED
	Ni	**60**	**50.041**	ug/L	1.624	3	10	34521	2	KED
	Ni	**62**	**50.766**	ug/L	0.307	0	0	5651	1	KED
	Cu	**63**	**49.780**	ug/L	0.267	0	43	95728	0	KED
	Cu	**65**	**49.524**	ug/L	2.058	4	22	47550	4	KED
	Zn	**66**	**49.834**	ug/L	0.552	1	16	12372	1	KED
	Zn	**67**	**53.503**	ug/L	2.695	5	3	2259	5	KED
	As	**75**	**49.781**	ug/L	0.203	0	3	8527	0	KED
	Se	**78**	**48.522**	ug/L	2.163	4	5	852	4	KED
	Y	**89**		ug/L			561402	578000	2	Standard
	Kr	**83**		ug/L			45	49	10	Standard
>	**In-1**	**115**		ug/L			12648	12365	0	KED
	Mo	**98**	**50.889**	ug/L	0.667	1	4	31508	0	KED
	Cd	**111**	**50.992**	ug/L	0.831	1	3	9151	1	KED
	Cd	**114**	**51.579**	ug/L	0.894	1	0	24478	1	KED
>	**In**	**115**		ug/L			852951	851061	2	Standard
	Ag	**107**	**52.257**	ug/L	0.730	1	143	685293	1	Standard
	Sb	**121**	**50.388**	ug/L	1.251	2	123	574994	0	Standard
	Sb	**123**	**50.803**	ug/L	0.849	1	104	444090	1	Standard
	Ba	**135**	**49.786**	ug/L	0.465	0	14	190627	1	Standard
	Ba	**137**	**51.154**	ug/L	2.518	4	26	341052	3	Standard
>	**Tb**	**159**		ug/L			1107766	1103618	1	Standard
	Tl	**205**	**49.766**	ug/L	2.016	4	18	1521218	2	Standard
	Pb	**208**	**51.316**	ug/L	1.880	3	188	1984840	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB2
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 11:54:38
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	718042	0	Standard
	Be	9	0.010	ug/L	0.012	112	8	48	92	Standard
	C	13		ug/L			13453	14615	1	Standard
	Cl	37		ug/L			3677416	3991753	1	Standard
>	Sc	45		ug/L			810285	817945	1	Standard
	Cr	52	-0.047	ug/L	0.035	74	13691	13162	4	Standard
	Cr	53	0.018	ug/L	0.008	44	129	160	7	Standard
	Fe	54	0.804	ug/L	0.329	40	39463	40581	1	Standard
	Fe	57	-1.543	ug/L	2.310	149	11347	10888	8	Standard
	Mn	55	0.006	ug/L	0.008	129	378	505	32	Standard
>	Ge	72		ug/L			42122	41104	2	KED
	Ni	60	0.002	ug/L	0.008	382	10	11	50	KED
	Ni	62	0.053	ug/L	0.021	40	0	6	34	KED
	Cu	63	0.008	ug/L	0.005	60	43	57	13	KED
	Cu	65	0.001	ug/L	0.002	142	22	23	9	KED
	Zn	66	0.005	ug/L	0.031	633	16	17	40	KED
	Zn	67	-0.013	ug/L	0.073	574	3	3	91	KED
	As	75	0.004	ug/L	0.008	221	3	4	26	KED
	Se	78	0.099	ug/L	0.123	123	5	6	32	KED
	Y	89		ug/L			561402	566317	0	Standard
	Kr	83		ug/L			45	64	13	Standard
>	In-1	115		ug/L			12648	12565	1	KED
	Mo	98	0.054	ug/L	0.016	30	4	38	27	KED
	Cd	111	-0.010	ug/L	0.006	58	3	1	86	KED
	Cd	114	0.009	ug/L	0.005	50	0	4	43	KED
>	In	115		ug/L			852951	842480	2	Standard
	Ag	107	0.017	ug/L	0.016	97	143	363	61	Standard
	Sb	121	0.697	ug/L	0.037	5	123	7988	2	Standard
	Sb	123	0.700	ug/L	0.031	4	104	6155	1	Standard
	Ba	135	0.005	ug/L	0.011	216	14	34	125	Standard
	Ba	137	0.008	ug/L	0.014	162	26	83	112	Standard
>	Tb	159		ug/L			1107766	1108564	1	Standard
	Tl	205	0.026	ug/L	0.013	50	18	804	47	Standard
	Pb	208	0.011	ug/L	0.012	112	188	605	76	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0106-BLK2
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 12:02:29
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	713737	5	Standard
	Be	9	0.006	ug/L	0.001	12	8	31	3	Standard
	C	13		ug/L			13453	22772	4	Standard
	Cl	37		ug/L			3677416	3951053	0	Standard
>	Sc	45		ug/L			810285	862684	0	Standard
	Cr	52	-0.020	ug/L	0.029	142	13691	14280	2	Standard
	Cr	53	0.052	ug/L	0.014	27	129	227	10	Standard
	Fe	54	0.038	ug/L	1.362	3605	39463	42045	2	Standard
	Fe	57	-2.156	ug/L	1.363	63	11347	11238	3	Standard
	Mn	55	0.165	ug/L	0.003	1	378	3745	1	Standard
>	Ge	72		ug/L			42122	41724	1	KED
	Ni	60	0.030	ug/L	0.013	44	10	30	28	KED
	Ni	62	0.035	ug/L	0.011	30	0	4	24	KED
	Cu	63	0.056	ug/L	0.008	15	43	148	11	KED
	Cu	65	0.057	ug/L	0.004	6	22	76	6	KED
	Zn	66	2.371	ug/L	0.368	15	16	594	13	KED
	Zn	67	2.446	ug/L	0.177	7	3	105	7	KED
	As	75	0.012	ug/L	0.009	76	3	6	27	KED
	Se	78	0.171	ug/L	0.127	74	5	7	25	KED
	Y	89		ug/L			561402	558151	0	Standard
	Kr	83		ug/L			45	48	19	Standard
>	In-1	115		ug/L			12648	12517	4	KED
	Mo	98	0.064	ug/L	0.024	36	4	44	30	KED
	Cd	111	0.002	ug/L	0.004	183	3	3	15	KED
	Cd	114	0.004	ug/L	0.006	137	0	2	107	KED
>	In	115		ug/L			852951	857028	3	Standard
	Ag	107	0.004	ug/L	0.002	42	143	202	11	Standard
	Sb	121	0.239	ug/L	0.029	12	123	2861	8	Standard
	Sb	123	0.236	ug/L	0.025	10	104	2175	7	Standard
	Ba	135	0.094	ug/L	0.010	10	14	376	11	Standard
	Ba	137	0.091	ug/L	0.010	10	26	634	8	Standard
>	Tb	159		ug/L			1107766	1120229	3	Standard
	Tl	205	0.081	ug/L	0.008	9	18	2546	12	Standard
	Pb	208	0.012	ug/L	0.000	2	188	664	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0106-BS2
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 12:07:32
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	733358	2	Standard
	Be	**9**	**25.824**	ug/L	1.295	5	8	101074	3	Standard
	C	**13**		ug/L			13453	27397	2	Standard
	Cl	**37**		ug/L			3677416	4179072	1	Standard
>	**Sc**	**45**		ug/L			810285	853403	1	Standard
	Cr	**52**	**27.196**	ug/L	0.135	0	13691	409414	1	Standard
	Cr	**53**	**27.433**	ug/L	0.184	0	129	47458	2	Standard
	Fe	**54**	**5518.463**	ug/L	83.491	1	39463	5383896	2	Standard
	Fe	**57**	**5652.294**	ug/L	89.449	1	11347	2190000	2	Standard
	Mn	**55**	**27.754**	ug/L	0.444	1	378	555669	0	Standard
>	**Ge**	**72**		ug/L			42122	42198	0	KED
	Ni	**60**	**26.413**	ug/L	0.626	2	10	18166	1	KED
	Ni	**62**	**25.670**	ug/L	1.300	5	0	2848	5	KED
	Cu	**63**	**26.413**	ug/L	1.349	5	43	50650	5	KED
	Cu	**65**	**26.535**	ug/L	1.192	4	22	25395	4	KED
	Zn	**66**	**86.150**	ug/L	2.019	2	16	21302	2	KED
	Zn	**67**	**79.643**	ug/L	2.602	3	3	3349	3	KED
	As	**75**	**26.041**	ug/L	0.103	0	3	4447	0	KED
	Se	**78**	**80.326**	ug/L	0.520	0	5	1402	1	KED
	Y	**89**		ug/L			561402	555259	1	Standard
	Kr	**83**		ug/L			45	55	18	Standard
>	**In-1**	**115**		ug/L			12648	12683	1	KED
	Mo	**98**	**-0.000**	ug/L	0.006	3401	4	4	87	KED
	Cd	**111**	**26.175**	ug/L	0.272	1	3	4819	0	KED
	Cd	**114**	**26.031**	ug/L	0.747	2	0	12668	1	KED
>	**In**	**115**		ug/L			852951	840444	1	Standard
	Ag	**107**	**27.252**	ug/L	0.673	2	143	352969	1	Standard
	Sb	**121**	**0.108**	ug/L	0.011	9	123	1341	9	Standard
	Sb	**123**	**0.109**	ug/L	0.018	16	104	1040	14	Standard
	Ba	**135**	**27.187**	ug/L	0.816	3	14	102789	2	Standard
	Ba	**137**	**26.512**	ug/L	0.686	2	26	174638	1	Standard
>	**Tb**	**159**		ug/L			1107766	1090989	0	Standard
	Tl	**205**	**26.727**	ug/L	0.558	2	18	807997	2	Standard
	Pb	**208**	**28.117**	ug/L	0.228	0	188	1075630	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0313-BLK1
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 12:12:34
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	720374	4	Standard
	Be	9	0.007	ug/L	0.002	28	8	34	22	Standard
	C	13		ug/L			13453	23365	3	Standard
	Cl	37		ug/L			3677416	4095420	3	Standard
>	Sc	45		ug/L			810285	844957	2	Standard
	Cr	52	0.061	ug/L	0.014	23	13691	15163	3	Standard
	Cr	53	0.093	ug/L	0.004	4	129	293	1	Standard
	Fe	54	7.653	ug/L	2.659	34	39463	48452	3	Standard
	Fe	57	-0.212	ug/L	1.265	596	11347	11747	3	Standard
	Mn	55	0.028	ug/L	0.002	7	378	940	2	Standard
>	Ge	72		ug/L			42122	42242	1	KED
	Ni	60	0.018	ug/L	0.003	14	10	22	8	KED
	Ni	62	0.040	ug/L	0.026	65	0	5	57	KED
	Cu	63	0.118	ug/L	0.007	6	43	269	3	KED
	Cu	65	0.152	ug/L	0.027	18	22	168	15	KED
	Zn	66	2.423	ug/L	0.093	3	16	615	3	KED
	Zn	67	1.856	ug/L	0.092	4	3	81	6	KED
	As	75	0.020	ug/L	0.011	54	3	7	26	KED
	Se	78	0.139	ug/L	0.114	82	5	7	25	KED
	Y	89		ug/L			561402	564148	3	Standard
	Kr	83		ug/L			45	38	25	Standard
>	In-1	115		ug/L			12648	12763	1	KED
	Mo	98	0.020	ug/L	0.012	61	4	17	45	KED
	Cd	111	-0.005	ug/L	0.008	146	3	2	65	KED
	Cd	114	0.006	ug/L	0.004	61	0	3	52	KED
>	In	115		ug/L			852951	860369	1	Standard
	Ag	107	0.006	ug/L	0.001	8	143	229	2	Standard
	Sb	121	0.092	ug/L	0.007	7	123	1188	6	Standard
	Sb	123	0.092	ug/L	0.009	9	104	915	10	Standard
	Ba	135	0.009	ug/L	0.001	8	14	49	6	Standard
	Ba	137	0.009	ug/L	0.002	21	26	86	13	Standard
>	Tb	159		ug/L			1107766	1136089	3	Standard
	Tl	205	0.021	ug/L	0.002	11	18	676	14	Standard
	Pb	208	0.008	ug/L	0.001	13	188	493	6	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0313-BS1
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 12:17:37
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	686911	1	Standard
	Be	9	27.285	ug/L	0.657	2	8	100062	1	Standard
	C	13		ug/L			13453	24067	4	Standard
	Cl	37		ug/L			3677416	4122306	1	Standard
>	Sc	45		ug/L			810285	858643	1	Standard
	Cr	52	25.712	ug/L	0.863	3	13691	390177	2	Standard
	Cr	53	26.598	ug/L	0.410	1	129	46291	1	Standard
	Fe	54	5224.259	ug/L	154.422	2	39463	5129307	2	Standard
	Fe	57	5258.430	ug/L	274.913	5	11347	2049983	4	Standard
	Mn	55	26.893	ug/L	0.273	1	378	541797	0	Standard
>	Ge	72		ug/L			42122	41174	1	KED
	Ni	60	26.356	ug/L	1.257	4	10	17681	3	KED
	Ni	62	26.089	ug/L	0.239	0	0	2824	2	KED
	Cu	63	26.638	ug/L	1.198	4	43	49823	4	KED
	Cu	65	26.055	ug/L	0.644	2	22	24336	3	KED
	Zn	66	85.658	ug/L	4.572	5	16	20654	3	KED
	Zn	67	78.572	ug/L	2.827	3	3	3223	3	KED
	As	75	25.416	ug/L	0.476	1	3	4234	0	KED
	Se	78	81.761	ug/L	0.958	1	5	1393	2	KED
	Y	89		ug/L			561402	557986	2	Standard
	Kr	83		ug/L			45	55	17	Standard
>	In-1	115		ug/L			12648	13071	3	KED
	Mo	98	0.020	ug/L	0.010	46	4	18	33	KED
	Cd	111	24.415	ug/L	0.608	2	3	4631	1	KED
	Cd	114	24.040	ug/L	0.782	3	0	12052	0	KED
>	In	115		ug/L			852951	850914	1	Standard
	Ag	107	26.798	ug/L	1.167	4	143	351368	3	Standard
	Sb	121	0.075	ug/L	0.005	6	123	980	6	Standard
	Sb	123	0.076	ug/L	0.004	5	104	764	4	Standard
	Ba	135	25.818	ug/L	0.712	2	14	98825	0	Standard
	Ba	137	26.541	ug/L	0.682	2	26	177010	1	Standard
>	Tb	159		ug/L			1107766	1100893	2	Standard
	Tl	205	26.173	ug/L	1.184	4	18	798172	3	Standard
	Pb	208	27.088	ug/L	0.660	2	188	1045300	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0172-04
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 12:22:39
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	736992	1	Standard
	Be	9	0.004	ug/L	0.001	25	8	26	15	Standard
	C	13		ug/L			13453	25370	8	Standard
	Cl	37		ug/L			3677416	4028846	3	Standard
>	Sc	45		ug/L			810285	860235	2	Standard
	Cr	52	0.642	ug/L	0.083	12	13691	23913	2	Standard
	Cr	53	0.719	ug/L	0.048	6	129	1386	3	Standard
	Fe	54	31.158	ug/L	4.950	15	39463	72228	4	Standard
	Fe	57	37.492	ug/L	2.300	6	11347	26594	1	Standard
	Mn	55	1.077	ug/L	0.022	2	378	22119	2	Standard
>	Ge	72		ug/L			42122	41873	1	KED
	Ni	60	0.460	ug/L	0.045	9	10	323	8	KED
	Ni	62	0.443	ug/L	0.100	22	0	49	23	KED
	Cu	63	2.860	ug/L	0.167	5	43	5477	4	KED
	Cu	65	3.016	ug/L	0.025	0	22	2884	1	KED
	Zn	66	17.293	ug/L	0.829	4	16	4258	6	KED
	Zn	67	17.198	ug/L	1.861	10	3	720	9	KED
	As	75	2.417	ug/L	0.046	1	3	413	0	KED
	Se	78	0.193	ug/L	0.023	11	5	8	5	KED
	Y	89		ug/L			561402	575681	3	Standard
	Kr	83		ug/L			45	46	20	Standard
>	In-1	115		ug/L			12648	12892	0	KED
	Mo	98	2.796	ug/L	0.047	1	4	1809	2	KED
	Cd	111	0.137	ug/L	0.022	15	3	28	14	KED
	Cd	114	0.119	ug/L	0.015	12	0	59	11	KED
>	In	115		ug/L			852951	844036	3	Standard
	Ag	107	0.007	ug/L	0.001	10	143	237	0	Standard
	Sb	121	1.015	ug/L	0.060	5	123	11597	2	Standard
	Sb	123	1.026	ug/L	0.055	5	104	8983	1	Standard
	Ba	135	13.717	ug/L	0.567	4	14	52050	0	Standard
	Ba	137	13.967	ug/L	0.675	4	26	92318	0	Standard
>	Tb	159		ug/L			1107766	1114523	0	Standard
	Tl	205	0.019	ug/L	0.002	12	18	605	13	Standard
	Pb	208	0.064	ug/L	0.002	2	188	2699	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0172-06
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 12:27:42
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	745283	7	Standard
	Be	9	0.003	ug/L	0.001	39	8	22	17	Standard
	C	13		ug/L			13453	26168	3	Standard
	Cl	37		ug/L			3677416	4047749	1	Standard
>	Sc	45		ug/L			810285	833116	2	Standard
	Cr	52	1.528	ug/L	0.061	3	13691	35728	0	Standard
	Cr	53	1.534	ug/L	0.038	2	129	2715	0	Standard
	Fe	54	19.430	ug/L	3.523	18	39463	58893	3	Standard
	Fe	57	12.849	ug/L	0.135	1	11347	16501	2	Standard
	Mn	55	1.107	ug/L	0.036	3	378	22013	1	Standard
>	Ge	72		ug/L			42122	41156	1	KED
	Ni	60	0.387	ug/L	0.012	3	10	269	2	KED
	Ni	62	0.393	ug/L	0.075	19	0	43	19	KED
	Cu	63	2.377	ug/L	0.027	1	43	4484	2	KED
	Cu	65	2.354	ug/L	0.089	3	22	2217	3	KED
	Zn	66	64.851	ug/L	0.163	0	16	15644	1	KED
	Zn	67	61.713	ug/L	1.854	3	3	2532	3	KED
	As	75	0.094	ug/L	0.012	12	3	19	8	KED
	Se	78	0.084	ug/L	0.012	14	5	6	4	KED
	Y	89		ug/L			561402	557550	1	Standard
	Kr	83		ug/L			45	53	8	Standard
>	In-1	115		ug/L			12648	12553	1	KED
	Mo	98	0.217	ug/L	0.014	6	4	141	6	KED
	Cd	111	0.262	ug/L	0.055	21	3	50	18	KED
	Cd	114	0.277	ug/L	0.017	6	0	134	5	KED
>	In	115		ug/L			852951	851316	2	Standard
	Ag	107	0.005	ug/L	0.002	47	143	205	15	Standard
	Sb	121	0.293	ug/L	0.003	1	123	3465	2	Standard
	Sb	123	0.301	ug/L	0.013	4	104	2734	2	Standard
	Ba	135	13.918	ug/L	0.393	2	14	53297	0	Standard
	Ba	137	14.544	ug/L	0.403	2	26	97029	0	Standard
>	Tb	159		ug/L			1107766	1118854	1	Standard
	Tl	205	0.006	ug/L	0.000	3	18	198	2	Standard
	Pb	208	0.048	ug/L	0.002	5	188	2062	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0172-08
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 12:32:45
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	690629	1	Standard
	Be	9	0.003	ug/L	0.002	49	8	20	31	Standard
	C	13		ug/L			13453	24424	6	Standard
	Cl	37		ug/L			3677416	4048590	1	Standard
>	Sc	45		ug/L			810285	845511	1	Standard
	Cr	52	1.432	ug/L	0.096	6	13691	34875	2	Standard
	Cr	53	1.481	ug/L	0.017	1	129	2665	3	Standard
	Fe	54	322.506	ug/L	7.541	2	39463	350584	3	Standard
	Fe	57	321.507	ug/L	6.466	2	11347	134545	0	Standard
	Mn	55	114.154	ug/L	2.586	2	378	2263770	3	Standard
>	Ge	72		ug/L			42122	41934	4	KED
	Ni	60	0.413	ug/L	0.018	4	10	292	8	KED
	Ni	62	0.439	ug/L	0.057	12	0	48	8	KED
	Cu	63	6.159	ug/L	0.386	6	43	11758	5	KED
	Cu	65	6.260	ug/L	0.459	7	22	5958	3	KED
	Zn	66	20.636	ug/L	0.797	3	16	5078	1	KED
	Zn	67	19.648	ug/L	0.440	2	3	823	2	KED
	As	75	1.468	ug/L	0.043	2	3	252	2	KED
	Se	78	0.101	ug/L	0.020	19	5	6	8	KED
	Y	89		ug/L			561402	552555	1	Standard
	Kr	83		ug/L			45	45	28	Standard
>	In-1	115		ug/L			12648	12870	3	KED
	Mo	98	0.580	ug/L	0.061	10	4	377	7	KED
	Cd	111	0.110	ug/L	0.013	11	3	23	12	KED
	Cd	114	0.102	ug/L	0.017	16	0	51	13	KED
>	In	115		ug/L			852951	861589	1	Standard
	Ag	107	0.003	ug/L	0.003	94	143	184	19	Standard
	Sb	121	1.059	ug/L	0.004	0	123	12361	1	Standard
	Sb	123	1.051	ug/L	0.011	1	104	9410	2	Standard
	Ba	135	7.912	ug/L	0.252	3	14	30685	3	Standard
	Ba	137	8.115	ug/L	0.037	0	26	54830	1	Standard
>	Tb	159		ug/L			1107766	1135164	2	Standard
	Tl	205	0.009	ug/L	0.001	11	18	290	10	Standard
	Pb	208	1.368	ug/L	0.024	1	188	54623	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0172-02
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 12:37:47
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	699559	3	Standard
	Be	9	0.004	ug/L	0.001	25	8	24	16	Standard
	C	13		ug/L			13453	26117	3	Standard
	Cl	37		ug/L			3677416	4028119	3	Standard
>	Sc	45		ug/L			810285	862043	0	Standard
	Cr	52	2.151	ug/L	0.048	2	13691	46124	0	Standard
	Cr	53	2.210	ug/L	0.045	2	129	3987	1	Standard
	Fe	54	377.273	ug/L	9.878	2	39463	410876	1	Standard
	Fe	57	372.397	ug/L	15.662	4	11347	156988	3	Standard
	Mn	55	35.656	ug/L	0.339	0	378	721106	0	Standard
>	Ge	72		ug/L			42122	42864	3	KED
	Ni	60	0.157	ug/L	0.015	9	10	120	8	KED
	Ni	62	0.197	ug/L	0.032	16	0	22	16	KED
	Cu	63	2.424	ug/L	0.051	2	43	4758	2	KED
	Cu	65	2.460	ug/L	0.064	2	22	2411	1	KED
	Zn	66	38.526	ug/L	0.298	0	16	9687	4	KED
	Zn	67	34.791	ug/L	0.520	1	3	1488	3	KED
	As	75	2.851	ug/L	0.193	6	3	497	5	KED
	Se	78	0.173	ug/L	0.132	76	5	8	31	KED
	Y	89		ug/L			561402	567159	2	Standard
	Kr	83		ug/L			45	53	20	Standard
>	In-1	115		ug/L			12648	12886	3	KED
	Mo	98	0.137	ug/L	0.004	2	4	93	2	KED
	Cd	111	0.083	ug/L	0.017	20	3	18	16	KED
	Cd	114	0.075	ug/L	0.017	23	0	37	21	KED
>	In	115		ug/L			852951	856131	1	Standard
	Ag	107	0.006	ug/L	0.001	19	143	217	6	Standard
	Sb	121	0.538	ug/L	0.023	4	123	6299	2	Standard
	Sb	123	0.537	ug/L	0.040	7	104	4825	6	Standard
	Ba	135	4.474	ug/L	0.166	3	14	17240	2	Standard
	Ba	137	4.505	ug/L	0.130	2	26	30253	1	Standard
>	Tb	159		ug/L			1107766	1134582	3	Standard
	Tl	205	0.004	ug/L	0.001	19	18	133	15	Standard
	Pb	208	0.254	ug/L	0.015	5	188	10263	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0313-DUP1
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 12:42:50
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	732406	1	Standard
	Be	9	0.022	ug/L	0.027	124	8	93	111	Standard
	C	13		ug/L			13453	24183	5	Standard
	Cl	37		ug/L			3677416	4078000	0	Standard
>	Sc	45		ug/L			810285	855185	3	Standard
	Cr	52	2.139	ug/L	0.041	1	13691	45601	4	Standard
	Cr	53	2.122	ug/L	0.075	3	129	3802	1	Standard
	Fe	54	364.525	ug/L	12.480	3	39463	395046	1	Standard
	Fe	57	359.579	ug/L	15.421	4	11347	150729	2	Standard
	Mn	55	35.007	ug/L	2.115	6	378	701661	3	Standard
>	Ge	72		ug/L			42122	42452	0	KED
	Ni	60	0.158	ug/L	0.022	13	10	119	13	KED
	Ni	62	0.250	ug/L	0.044	17	0	28	17	KED
	Cu	63	3.708	ug/L	0.124	3	43	7188	2	KED
	Cu	65	3.589	ug/L	0.171	4	22	3475	4	KED
	Zn	66	40.099	ug/L	2.426	6	16	9984	6	KED
	Zn	67	33.916	ug/L	1.471	4	3	1437	5	KED
	As	75	2.868	ug/L	0.064	2	3	496	2	KED
	Se	78	0.280	ug/L	0.159	56	5	10	27	KED
	Y	89		ug/L			561402	556649	2	Standard
	Kr	83		ug/L			45	38	30	Standard
>	In-1	115		ug/L			12648	12775	2	KED
	Mo	98	0.148	ug/L	0.040	26	4	98	22	KED
	Cd	111	0.082	ug/L	0.011	12	3	18	7	KED
	Cd	114	0.096	ug/L	0.002	1	0	47	4	KED
>	In	115		ug/L			852951	865181	3	Standard
	Ag	107	0.015	ug/L	0.012	79	143	344	48	Standard
	Sb	121	0.507	ug/L	0.025	5	123	5998	1	Standard
	Sb	123	0.513	ug/L	0.014	2	104	4665	5	Standard
	Ba	135	4.432	ug/L	0.115	2	14	17255	1	Standard
	Ba	137	4.357	ug/L	0.121	2	26	29554	1	Standard
>	Tb	159		ug/L			1107766	1133946	4	Standard
	Tl	205	0.027	ug/L	0.035	130	18	826	124	Standard
	Pb	208	0.265	ug/L	0.043	16	188	10688	11	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0313-MS1
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 12:47:52
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	691097	1	Standard
	Be	9	25.415	ug/L	0.465	1	8	93781	1	Standard
	C	13		ug/L			13453	26674	4	Standard
	Cl	37		ug/L			3677416	4280744	0	Standard
>	Sc	45		ug/L			810285	841768	1	Standard
	Cr	52	28.620	ug/L	0.355	1	13691	424209	0	Standard
	Cr	53	28.344	ug/L	0.744	2	129	48348	1	Standard
	Fe	54	5748.335	ug/L	25.676	0	39463	5530261	1	Standard
	Fe	57	5734.842	ug/L	289.015	5	11347	2191930	5	Standard
	Mn	55	61.739	ug/L	1.649	2	378	1218781	1	Standard
>	Ge	72		ug/L			42122	41151	3	KED
	Ni	60	26.289	ug/L	2.032	7	10	17607	5	KED
	Ni	62	25.704	ug/L	2.045	7	0	2776	4	KED
	Cu	63	28.154	ug/L	0.853	3	43	52596	0	KED
	Cu	65	29.818	ug/L	2.178	7	22	27783	4	KED
	Zn	66	119.634	ug/L	6.483	5	16	28808	2	KED
	Zn	67	109.268	ug/L	2.516	2	3	4479	3	KED
	As	75	27.729	ug/L	0.855	3	3	4614	0	KED
	Se	78	77.938	ug/L	3.756	4	5	1325	1	KED
	Y	89		ug/L			561402	562131	1	Standard
	Kr	83		ug/L			45	45	25	Standard
>	In-1	115		ug/L			12648	12559	3	KED
	Mo	98	0.145	ug/L	0.007	5	4	95	7	KED
	Cd	111	25.359	ug/L	0.802	3	3	4621	0	KED
	Cd	114	24.685	ug/L	1.282	5	0	11887	2	KED
>	In	115		ug/L			852951	838199	0	Standard
	Ag	107	27.055	ug/L	0.961	3	143	349582	3	Standard
	Sb	121	0.510	ug/L	0.009	1	123	5856	2	Standard
	Sb	123	0.505	ug/L	0.008	1	104	4454	1	Standard
	Ba	135	29.854	ug/L	0.588	1	14	112602	2	Standard
	Ba	137	30.995	ug/L	0.132	0	26	203671	0	Standard
>	Tb	159		ug/L			1107766	1109741	2	Standard
	Tl	205	25.339	ug/L	0.787	3	18	779340	4	Standard
	Pb	208	26.658	ug/L	0.631	2	188	1037377	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV3
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 12:54:00
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	703202	5	Standard
	Be	**9**	**50.821**	ug/L	4.292	8	8	190324	3	Standard
	C	**13**		ug/L			13453	15293	1	Standard
	Cl	**37**		ug/L			3677416	4040964	1	Standard
>	**Sc**	**45**		ug/L			810285	831453	1	Standard
	Cr	**52**	**50.792**	ug/L	1.350	2	13691	732630	1	Standard
	Cr	**53**	**51.408**	ug/L	0.807	1	129	86521	1	Standard
	Fe	**54**	**5224.618**	ug/L	82.159	1	39463	4967738	0	Standard
	Fe	**57**	**5184.278**	ug/L	125.890	2	11347	1957459	1	Standard
	Mn	**55**	**54.249**	ug/L	1.255	2	378	1057802	1	Standard
>	**Ge**	**72**		ug/L			42122	41172	1	KED
	Ni	**60**	**51.218**	ug/L	1.511	2	10	34349	1	KED
	Ni	**62**	**49.715**	ug/L	0.650	1	0	5380	0	KED
	Cu	**63**	**51.012**	ug/L	1.397	2	43	95357	1	KED
	Cu	**65**	**49.741**	ug/L	0.206	0	22	46431	2	KED
	Zn	**66**	**49.902**	ug/L	2.120	4	16	12041	2	KED
	Zn	**67**	**48.712**	ug/L	3.056	6	3	1998	4	KED
	As	**75**	**49.848**	ug/L	0.979	1	3	8300	1	KED
	Se	**78**	**48.820**	ug/L	1.446	2	5	833	1	KED
	Y	**89**		ug/L			561402	558614	2	Standard
	Kr	**83**		ug/L			45	57	10	Standard
>	**In-1**	**115**		ug/L			12648	12852	0	KED
	Mo	**98**	**47.205**	ug/L	2.341	4	4	30375	4	KED
	Cd	**111**	**48.284**	ug/L	0.642	1	3	9006	1	KED
	Cd	**114**	**47.198**	ug/L	2.007	4	0	23280	4	KED
>	**In**	**115**		ug/L			852951	851481	2	Standard
	Ag	**107**	**50.013**	ug/L	2.193	4	143	655875	2	Standard
	Sb	**121**	**48.795**	ug/L	1.231	2	123	557089	0	Standard
	Sb	**123**	**48.642**	ug/L	1.128	2	104	425360	0	Standard
	Ba	**135**	**50.483**	ug/L	1.758	3	14	193318	1	Standard
	Ba	**137**	**50.281**	ug/L	0.760	1	26	335564	1	Standard
>	**Tb**	**159**		ug/L			1107766	1089262	2	Standard
	Tl	**205**	**47.878**	ug/L	2.048	4	18	1444394	3	Standard
	Pb	**208**	**51.771**	ug/L	1.585	3	188	1976474	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB3
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 13:01:47
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	722978	6	Standard
	Be	**9**	**0.003**	ug/L	0.001	44	8	19	17	Standard
	C	**13**		ug/L			13453	15964	4	Standard
	Cl	**37**		ug/L			3677416	3973235	3	Standard
>	**Sc**	**45**		ug/L			810285	785586	2	Standard
	Cr	**52**	**0.023**	ug/L	0.076	329	13691	13565	5	Standard
	Cr	**53**	**0.005**	ug/L	0.004	96	129	133	8	Standard
	Fe	**54**	**2.038**	ug/L	1.551	76	39463	40052	0	Standard
	Fe	**57**	**-1.137**	ug/L	1.455	127	11347	10589	2	Standard
	Mn	**55**	**-0.000**	ug/L	0.001	530	378	363	2	Standard
>	**Ge**	**72**		ug/L			42122	40983	1	KED
	Ni	**60**	**0.005**	ug/L	0.013	242	10	13	62	KED
	Ni	**62**	**0.024**	ug/L	0.027	113	0	3	91	KED
	Cu	**63**	**0.012**	ug/L	0.006	48	43	64	15	KED
	Cu	**65**	**0.000**	ug/L	0.009	17685	22	22	35	KED
	Zn	**66**	**0.023**	ug/L	0.038	160	16	21	40	KED
	Zn	**67**	**-0.045**	ug/L	0.046	103	3	1	100	KED
	As	**75**	**-0.005**	ug/L	0.011	219	3	3	63	KED
	Se	**78**	**0.120**	ug/L	0.101	84	5	7	24	KED
	Y	**89**		ug/L			561402	545891	2	Standard
	Kr	**83**		ug/L			45	43	15	Standard
>	**In-1**	**115**		ug/L			12648	12100	4	KED
	Mo	**98**	**0.028**	ug/L	0.003	9	4	21	10	KED
	Cd	**111**	**-0.014**	ug/L	0.003	22	3	0	86	KED
	Cd	**114**	**0.003**	ug/L	0.004	148	0	1	100	KED
>	**In**	**115**		ug/L			852951	826789	3	Standard
	Ag	**107**	**0.008**	ug/L	0.000	5	143	236	5	Standard
	Sb	**121**	**0.526**	ug/L	0.036	6	123	5950	7	Standard
	Sb	**123**	**0.521**	ug/L	0.035	6	104	4522	7	Standard
	Ba	**135**	**0.002**	ug/L	0.001	65	14	20	24	Standard
	Ba	**137**	**0.001**	ug/L	0.001	73	26	34	14	Standard
>	**Tb**	**159**		ug/L			1107766	1100145	2	Standard
	Tl	**205**	**0.007**	ug/L	0.002	22	18	244	21	Standard
	Pb	**208**	**0.004**	ug/L	0.001	34	188	330	17	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0314-BLK2
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 13:08:16
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	685860	4	Standard
	Be	9	0.005	ug/L	0.002	39	8	24	23	Standard
	C	13		ug/L			13453	20400	3	Standard
	Cl	37		ug/L			3677416	3923511	2	Standard
>	Sc	45		ug/L			810285	828600	1	Standard
	Cr	52	0.002	ug/L	0.066	4274	13691	14011	4	Standard
	Cr	53	0.077	ug/L	0.003	3	129	262	2	Standard
	Fe	54	0.045	ug/L	1.727	3845	39463	40378	2	Standard
	Fe	57	-2.139	ug/L	1.292	60	11347	10804	4	Standard
	Mn	55	0.047	ug/L	0.002	3	378	1305	4	Standard
>	Ge	72		ug/L			42122	42398	0	KED
	Ni	60	0.004	ug/L	0.008	182	10	13	42	KED
	Ni	62	0.034	ug/L	0.010	29	0	4	24	KED
	Cu	63	0.158	ug/L	0.016	10	43	348	8	KED
	Cu	65	0.147	ug/L	0.017	11	22	163	10	KED
	Zn	66	2.096	ug/L	0.103	4	16	537	5	KED
	Zn	67	1.867	ug/L	0.400	21	3	82	19	KED
	As	75	-0.002	ug/L	0.003	160	3	3	15	KED
	Se	78	0.280	ug/L	0.072	25	5	10	12	KED
	Y	89		ug/L			561402	539835	4	Standard
	Kr	83		ug/L			45	48	18	Standard
>	In-1	115		ug/L			12648	12300	1	KED
	Mo	98	0.034	ug/L	0.015	42	4	25	33	KED
	Cd	111	-0.001	ug/L	0.014	962	3	2	88	KED
	Cd	114	0.005	ug/L	0.005	91	0	3	73	KED
>	In	115		ug/L			852951	830128	1	Standard
	Ag	107	0.004	ug/L	0.001	33	143	187	8	Standard
	Sb	121	0.141	ug/L	0.013	9	123	1693	9	Standard
	Sb	123	0.141	ug/L	0.012	8	104	1306	9	Standard
	Ba	135	0.008	ug/L	0.004	44	14	43	30	Standard
	Ba	137	0.008	ug/L	0.002	21	26	77	12	Standard
>	Tb	159		ug/L			1107766	1110827	2	Standard
	Tl	205	0.019	ug/L	0.002	10	18	613	12	Standard
	Pb	208	0.005	ug/L	0.001	18	188	368	10	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0314-BS2
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 13:13:19
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	675769	3	Standard
	Be	9	28.005	ug/L	0.841	3	8	101053	4	Standard
	C	13		ug/L			13453	24277	1	Standard
	Cl	37		ug/L			3677416	4118828	2	Standard
>	Sc	45		ug/L			810285	819752	4	Standard
	Cr	52	26.517	ug/L	1.318	4	13691	383331	1	Standard
	Cr	53	26.667	ug/L	1.286	4	129	44257	0	Standard
	Fe	54	5453.346	ug/L	122.769	2	39463	5109052	3	Standard
	Fe	57	5542.235	ug/L	253.153	4	11347	2060229	0	Standard
	Mn	55	27.751	ug/L	1.044	3	378	533270	0	Standard
>	Ge	72		ug/L			42122	40667	2	KED
	Ni	60	26.538	ug/L	0.736	2	10	17585	1	KED
	Ni	62	26.046	ug/L	0.686	2	0	2785	4	KED
	Cu	63	25.913	ug/L	0.379	1	43	47882	2	KED
	Cu	65	26.550	ug/L	0.797	3	22	24480	2	KED
	Zn	66	87.256	ug/L	6.017	6	16	20772	4	KED
	Zn	67	80.809	ug/L	0.855	1	3	3275	2	KED
	As	75	25.976	ug/L	1.015	3	3	4272	1	KED
	Se	78	85.872	ug/L	1.550	1	5	1444	2	KED
	Y	89		ug/L			561402	543878	2	Standard
	Kr	83		ug/L			45	64	28	Standard
>	In-1	115		ug/L			12648	12896	0	KED
	Mo	98	23.473	ug/L	0.565	2	4	15160	2	KED
	Cd	111	24.334	ug/L	0.060	0	3	4556	0	KED
	Cd	114	24.669	ug/L	0.636	2	0	12209	1	KED
>	In	115		ug/L			852951	816962	2	Standard
	Ag	107	27.204	ug/L	1.398	5	143	342332	3	Standard
	Sb	121	27.366	ug/L	0.377	1	123	299876	1	Standard
	Sb	123	26.890	ug/L	0.975	3	104	225611	1	Standard
	Ba	135	26.902	ug/L	0.749	2	14	98886	3	Standard
	Ba	137	26.814	ug/L	0.312	1	26	171716	1	Standard
>	Tb	159		ug/L			1107766	1086079	1	Standard
	Tl	205	26.607	ug/L	1.005	3	18	800491	2	Standard
	Pb	208	26.527	ug/L	0.756	2	188	1009951	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0172-10
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 13:18:22
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	683384	6	Standard
	Be	9	0.004	ug/L	0.002	49	8	21	28	Standard
	C	13		ug/L			13453	26046	6	Standard
	Cl	37		ug/L			3677416	4126997	1	Standard
>	Sc	45		ug/L			810285	901798	2	Standard
	Cr	52	0.103	ug/L	0.018	17	13691	16825	3	Standard
	Cr	53	0.339	ug/L	0.017	4	129	762	2	Standard
	Fe	54	822.009	ug/L	24.815	3	39463	884621	2	Standard
	Fe	57	918.608	ug/L	46.568	5	11347	386394	3	Standard
	Mn	55	870.695	ug/L	15.434	1	378	18407767	1	Standard
>	Ge	72		ug/L			42122	39780	2	KED
	Ni	60	0.366	ug/L	0.018	4	10	246	3	KED
	Ni	62	0.389	ug/L	0.026	6	0	41	5	KED
	Cu	63	0.719	ug/L	0.025	3	43	1339	2	KED
	Cu	65	0.724	ug/L	0.042	5	22	674	4	KED
	Zn	66	20.005	ug/L	0.871	4	16	4672	2	KED
	Zn	67	20.507	ug/L	1.495	7	3	815	6	KED
	As	75	1.924	ug/L	0.053	2	3	313	2	KED
	Se	78	0.280	ug/L	0.182	65	5	9	30	KED
	Y	89		ug/L			561402	558017	2	Standard
	Kr	83		ug/L			45	62	8	Standard
>	In-1	115		ug/L			12648	12392	1	KED
	Mo	98	0.920	ug/L	0.057	6	4	574	4	KED
	Cd	111	0.062	ug/L	0.043	69	3	14	53	KED
	Cd	114	0.098	ug/L	0.080	81	0	46	79	KED
>	In	115		ug/L			852951	844097	2	Standard
	Ag	107	0.007	ug/L	0.001	19	143	233	5	Standard
	Sb	121	0.449	ug/L	0.024	5	123	5204	6	Standard
	Sb	123	0.446	ug/L	0.021	4	104	3971	4	Standard
	Ba	135	12.338	ug/L	0.055	0	14	46869	1	Standard
	Ba	137	12.234	ug/L	0.155	1	26	80970	1	Standard
>	Tb	159		ug/L			1107766	1103492	2	Standard
	Tl	205	0.014	ug/L	0.000	3	18	441	4	Standard
	Pb	208	0.290	ug/L	0.004	1	188	11421	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0172-12
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 13:23:24
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	703035	3	Standard
	Be	9	0.004	ug/L	0.001	28	8	21	13	Standard
	C	13		ug/L			13453	27219	5	Standard
	Cl	37		ug/L			3677416	3993763	3	Standard
>	Sc	45		ug/L			810285	850232	0	Standard
	Cr	52	2.463	ug/L	0.085	3	13691	50009	2	Standard
	Cr	53	2.472	ug/L	0.104	4	129	4383	3	Standard
	Fe	54	113.019	ug/L	6.451	5	39463	150417	4	Standard
	Fe	57	107.488	ug/L	3.361	3	11347	53166	2	Standard
	Mn	55	17.757	ug/L	0.401	2	378	354392	1	Standard
>	Ge	72		ug/L			42122	42253	3	KED
	Ni	60	0.415	ug/L	0.010	2	10	295	4	KED
	Ni	62	0.404	ug/L	0.115	28	0	45	30	KED
	Cu	63	2.923	ug/L	0.036	1	43	5650	3	KED
	Cu	65	2.978	ug/L	0.051	1	22	2875	4	KED
	Zn	66	25.747	ug/L	1.258	4	16	6379	1	KED
	Zn	67	22.620	ug/L	1.800	7	3	954	6	KED
	As	75	0.364	ug/L	0.029	7	3	66	8	KED
	Se	78	0.209	ug/L	0.073	34	5	8	17	KED
	Y	89		ug/L			561402	562062	0	Standard
	Kr	83		ug/L			45	41	16	Standard
>	In-1	115		ug/L			12648	12498	6	KED
	Mo	98	0.579	ug/L	0.108	18	4	364	12	KED
	Cd	111	0.088	ug/L	0.026	29	3	19	22	KED
	Cd	114	0.127	ug/L	0.012	9	0	61	4	KED
>	In	115		ug/L			852951	837441	1	Standard
	Ag	107	0.005	ug/L	0.001	10	143	205	2	Standard
	Sb	121	1.615	ug/L	0.060	3	123	18251	2	Standard
	Sb	123	1.625	ug/L	0.057	3	104	14072	2	Standard
	Ba	135	5.461	ug/L	0.167	3	14	20584	1	Standard
	Ba	137	5.492	ug/L	0.114	2	26	36078	2	Standard
>	Tb	159		ug/L			1107766	1121238	1	Standard
	Tl	205	0.004	ug/L	0.001	25	18	129	20	Standard
	Pb	208	0.263	ug/L	0.007	2	188	10527	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0172-14
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 13:28:27
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	742304	4	Standard
	Be	9	0.003	ug/L	0.001	32	8	21	22	Standard
	C	13		ug/L			13453	25503	3	Standard
	Cl	37		ug/L			3677416	3992395	3	Standard
>	Sc	45		ug/L			810285	850359	1	Standard
	Cr	52	7.824	ug/L	0.016	0	13691	127602	1	Standard
	Cr	53	7.612	ug/L	0.380	4	129	13212	3	Standard
	Fe	54	808.878	ug/L	11.430	1	39463	821656	1	Standard
	Fe	57	786.029	ug/L	26.587	3	11347	313766	4	Standard
	Mn	55	43.503	ug/L	2.033	4	378	867391	3	Standard
>	Ge	72		ug/L			42122	42108	2	KED
	Ni	60	0.262	ug/L	0.010	3	10	189	2	KED
	Ni	62	0.338	ug/L	0.086	25	0	38	25	KED
	Cu	63	1.778	ug/L	0.088	4	43	3443	5	KED
	Cu	65	1.797	ug/L	0.064	3	22	1736	2	KED
	Zn	66	78.281	ug/L	5.095	6	16	19299	4	KED
	Zn	67	68.974	ug/L	2.687	3	3	2894	3	KED
	As	75	1.028	ug/L	0.014	1	3	179	2	KED
	Se	78	0.153	ug/L	0.109	71	5	7	22	KED
	Y	89		ug/L			561402	559542	2	Standard
	Kr	83		ug/L			45	38	35	Standard
>	In-1	115		ug/L			12648	13340	1	KED
	Mo	98	0.421	ug/L	0.031	7	4	285	7	KED
	Cd	111	0.149	ug/L	0.025	16	3	32	13	KED
	Cd	114	0.192	ug/L	0.063	32	0	98	33	KED
>	In	115		ug/L			852951	832987	0	Standard
	Ag	107	0.004	ug/L	0.001	21	143	191	5	Standard
	Sb	121	1.314	ug/L	0.017	1	123	14800	1	Standard
	Sb	123	1.323	ug/L	0.013	1	104	11424	0	Standard
	Ba	135	7.957	ug/L	0.097	1	14	29837	1	Standard
	Ba	137	8.091	ug/L	0.069	0	26	52853	0	Standard
>	Tb	159		ug/L			1107766	1103342	2	Standard
	Tl	205	0.003	ug/L	0.001	34	18	103	28	Standard
	Pb	208	0.115	ug/L	0.003	2	188	4626	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0172-16
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 13:33:29
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	718045	2	Standard
	Be	9	0.008	ug/L	0.006	67	8	41	52	Standard
	C	13		ug/L			13453	23880	4	Standard
	Cl	37		ug/L			3677416	4044143	2	Standard
>	Sc	45		ug/L			810285	839333	1	Standard
	Cr	52	0.239	ug/L	0.027	11	13691	17591	1	Standard
	Cr	53	0.278	ug/L	0.009	3	129	605	2	Standard
	Fe	54	26.040	ug/L	3.674	14	39463	65666	5	Standard
	Fe	57	33.074	ug/L	6.685	20	11347	24265	9	Standard
	Mn	55	5.345	ug/L	0.376	7	378	105527	5	Standard
>	Ge	72		ug/L			42122	41308	2	KED
	Ni	60	0.183	ug/L	0.005	2	10	133	2	KED
	Ni	62	0.187	ug/L	0.031	16	0	20	18	KED
	Cu	63	2.149	ug/L	0.056	2	43	4072	3	KED
	Cu	65	2.214	ug/L	0.072	3	22	2093	1	KED
	Zn	66	34.062	ug/L	0.357	1	16	8253	1	KED
	Zn	67	30.094	ug/L	1.046	3	3	1240	1	KED
	As	75	0.121	ug/L	0.023	19	3	24	14	KED
	Se	78	0.222	ug/L	0.121	54	5	8	22	KED
	Y	89		ug/L			561402	574381	0	Standard
	Kr	83		ug/L			45	44	32	Standard
>	In-1	115		ug/L			12648	12860	2	KED
	Mo	98	0.531	ug/L	0.093	17	4	345	15	KED
	Cd	111	0.184	ug/L	0.028	15	3	37	12	KED
	Cd	114	0.188	ug/L	0.021	11	0	93	10	KED
>	In	115		ug/L			852951	845654	2	Standard
	Ag	107	0.008	ug/L	0.003	39	143	248	17	Standard
	Sb	121	0.193	ug/L	0.005	2	123	2310	3	Standard
	Sb	123	0.191	ug/L	0.008	4	104	1762	4	Standard
	Ba	135	7.198	ug/L	0.295	4	14	27384	2	Standard
	Ba	137	7.088	ug/L	0.045	0	26	47008	1	Standard
>	Tb	159		ug/L			1107766	1138984	4	Standard
	Tl	205	0.006	ug/L	0.004	64	18	192	57	Standard
	Pb	208	0.074	ug/L	0.004	5	188	3158	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0172-01
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 13:38:32
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	722337	7	Standard
	Be	9	0.003	ug/L	0.003	80	8	21	50	Standard
	C	13		ug/L			13453	25153	2	Standard
	Cl	37		ug/L			3677416	4219373	3	Standard
>	Sc	45		ug/L			810285	841557	1	Standard
	Cr	52	2.695	ug/L	0.059	2	13691	52814	1	Standard
	Cr	53	2.708	ug/L	0.047	1	129	4741	2	Standard
	Fe	54	882.698	ug/L	17.641	1	39463	883477	0	Standard
	Fe	57	861.348	ug/L	39.965	4	11347	339034	4	Standard
	Mn	55	39.796	ug/L	2.494	6	378	785183	4	Standard
>	Ge	72		ug/L			42122	43013	2	KED
	Ni	60	0.211	ug/L	0.014	6	10	158	4	KED
	Ni	62	0.252	ug/L	0.036	14	0	29	16	KED
	Cu	63	3.166	ug/L	0.095	2	43	6225	3	KED
	Cu	65	3.353	ug/L	0.083	2	22	3290	2	KED
	Zn	66	46.533	ug/L	2.767	5	16	11731	5	KED
	Zn	67	41.708	ug/L	1.540	3	3	1788	1	KED
	As	75	4.103	ug/L	0.228	5	3	716	2	KED
	Se	78	0.073	ug/L	0.017	23	5	6	6	KED
	Y	89		ug/L			561402	545718	1	Standard
	Kr	83		ug/L			45	53	16	Standard
>	In-1	115		ug/L			12648	12830	5	KED
	Mo	98	0.170	ug/L	0.020	11	4	113	13	KED
	Cd	111	0.134	ug/L	0.042	30	3	27	23	KED
	Cd	114	0.121	ug/L	0.026	21	0	59	16	KED
>	In	115		ug/L			852951	876254	1	Standard
	Ag	107	0.007	ug/L	0.002	23	143	243	8	Standard
	Sb	121	0.590	ug/L	0.011	1	123	7058	0	Standard
	Sb	123	0.578	ug/L	0.019	3	104	5310	1	Standard
	Ba	135	5.911	ug/L	0.043	0	14	23319	1	Standard
	Ba	137	5.833	ug/L	0.167	2	26	40082	1	Standard
>	Tb	159		ug/L			1107766	1114415	2	Standard
	Tl	205	0.003	ug/L	0.000	9	18	99	5	Standard
	Pb	208	0.600	ug/L	0.010	1	188	23652	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0165-01
Sample Dil Factor: 2
Comments:
Sample Date/Time: Wednesday, October 10, 2018 13:43:34
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	717566	1	Standard
	Be	9	0.004	ug/L	0.001	19	8	22	13	Standard
	C	13		ug/L			13453	21269	4	Standard
	Cl	37		ug/L			3677416	3952408	2	Standard
>	Sc	45		ug/L			810285	844663	1	Standard
	Cr	52	2.067	ug/L	0.112	5	13691	43978	2	Standard
	Cr	53	2.047	ug/L	0.034	1	129	3629	0	Standard
	Fe	54	81.357	ug/L	2.252	2	39463	119115	3	Standard
	Fe	57	96.577	ug/L	5.327	5	11347	48651	3	Standard
	Mn	55	19.469	ug/L	0.324	1	378	386003	2	Standard
>	Ge	72		ug/L			42122	42827	0	KED
	Ni	60	0.721	ug/L	0.038	5	10	513	4	KED
	Ni	62	0.682	ug/L	0.015	2	0	77	1	KED
	Cu	63	3.671	ug/L	0.036	0	43	7181	1	KED
	Cu	65	3.929	ug/L	0.093	2	22	3836	1	KED
	Zn	66	172.369	ug/L	4.304	2	16	43241	2	KED
	Zn	67	161.063	ug/L	5.725	3	3	6869	2	KED
	As	75	0.791	ug/L	0.073	9	3	141	9	KED
	Se	78	0.103	ug/L	0.105	101	5	7	27	KED
	Y	89		ug/L			561402	546442	2	Standard
	Kr	83		ug/L			45	48	34	Standard
>	In-1	115		ug/L			12648	12747	1	KED
	Mo	98	0.726	ug/L	0.051	7	4	468	6	KED
	Cd	111	0.438	ug/L	0.030	6	3	84	6	KED
	Cd	114	0.457	ug/L	0.030	6	0	223	5	KED
>	In	115		ug/L			852951	838105	3	Standard
	Ag	107	0.004	ug/L	0.002	47	143	199	16	Standard
	Sb	121	1.229	ug/L	0.010	0	123	13932	3	Standard
	Sb	123	1.149	ug/L	0.022	1	104	9993	2	Standard
	Ba	135	18.049	ug/L	0.829	4	14	68026	3	Standard
	Ba	137	18.350	ug/L	1.029	5	26	120435	2	Standard
>	Tb	159		ug/L			1107766	1101142	0	Standard
	Tl	205	0.007	ug/L	0.001	8	18	217	7	Standard
	Pb	208	0.209	ug/L	0.003	1	188	8240	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0314-DUP2
Sample Dil Factor: 2
Comments:
Sample Date/Time: Wednesday, October 10, 2018 13:48:37
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	674792	5	Standard
	Be	9	0.004	ug/L	0.000	8	8	20	0	Standard
	C	13		ug/L			13453	20947	4	Standard
	Cl	37		ug/L			3677416	4004840	6	Standard
>	Sc	45		ug/L			810285	846715	3	Standard
	Cr	52	2.025	ug/L	0.166	8	13691	43426	2	Standard
	Cr	53	2.027	ug/L	0.066	3	129	3602	0	Standard
	Fe	54	76.680	ug/L	5.088	6	39463	114783	2	Standard
	Fe	57	92.186	ug/L	3.712	4	11347	47123	6	Standard
	Mn	55	19.124	ug/L	0.978	5	378	379634	2	Standard
>	Ge	72		ug/L			42122	41197	1	KED
	Ni	60	0.792	ug/L	0.020	2	10	541	2	KED
	Ni	62	0.763	ug/L	0.048	6	0	83	5	KED
	Cu	63	3.870	ug/L	0.081	2	43	7281	2	KED
	Cu	65	3.983	ug/L	0.119	2	22	3740	2	KED
	Zn	66	178.425	ug/L	5.470	3	16	43053	2	KED
	Zn	67	162.493	ug/L	4.234	2	3	6666	1	KED
	As	75	0.778	ug/L	0.077	9	3	133	8	KED
	Se	78	0.205	ug/L	0.178	86	5	8	34	KED
	Y	89		ug/L			561402	557176	2	Standard
	Kr	83		ug/L			45	59	25	Standard
>	In-1	115		ug/L			12648	12833	2	KED
	Mo	98	0.687	ug/L	0.002	0	4	445	2	KED
	Cd	111	0.541	ug/L	0.104	19	3	103	18	KED
	Cd	114	0.472	ug/L	0.060	12	0	233	14	KED
>	In	115		ug/L			852951	834559	1	Standard
	Ag	107	0.006	ug/L	0.002	29	143	219	12	Standard
	Sb	121	1.200	ug/L	0.016	1	123	13547	2	Standard
	Sb	123	1.143	ug/L	0.012	1	104	9896	1	Standard
	Ba	135	18.462	ug/L	0.138	0	14	69329	1	Standard
	Ba	137	18.683	ug/L	0.721	3	26	122192	2	Standard
>	Tb	159		ug/L			1107766	1101042	2	Standard
	Tl	205	0.007	ug/L	0.000	2	18	221	3	Standard
	Pb	208	0.203	ug/L	0.004	1	188	8040	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0314-MS2
Sample Dil Factor: 2
Comments:
Sample Date/Time: Wednesday, October 10, 2018 13:53:40
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	710624	4	Standard
	Be	9	12.520	ug/L	1.246	9	8	47385	6	Standard
	C	13		ug/L			13453	21012	2	Standard
	Cl	37		ug/L			3677416	4028034	2	Standard
>	Sc	45		ug/L			810285	828076	0	Standard
	Cr	52	15.614	ug/L	0.387	2	13691	234072	2	Standard
	Cr	53	15.314	ug/L	0.509	3	129	25763	3	Standard
	Fe	54	2821.069	ug/L	47.555	1	39463	2690412	1	Standard
	Fe	57	2810.260	ug/L	142.439	5	11347	1062143	4	Standard
	Mn	55	32.864	ug/L	0.662	2	378	638490	1	Standard
>	Ge	72		ug/L			42122	41311	1	KED
	Ni	60	13.823	ug/L	0.427	3	10	9315	4	KED
	Ni	62	13.384	ug/L	0.899	6	0	1452	4	KED
	Cu	63	17.421	ug/L	0.707	4	43	32704	3	KED
	Cu	65	16.937	ug/L	0.653	3	22	15871	2	KED
	Zn	66	210.510	ug/L	2.563	1	16	50942	2	KED
	Zn	67	198.504	ug/L	7.623	3	3	8166	3	KED
	As	75	13.573	ug/L	0.376	2	3	2270	2	KED
	Se	78	40.432	ug/L	1.469	3	5	693	1	KED
	Y	89		ug/L			561402	552469	5	Standard
	Kr	83		ug/L			45	49	11	Standard
>	In-1	115		ug/L			12648	12637	3	KED
	Mo	98	13.584	ug/L	0.820	6	4	8585	2	KED
	Cd	111	13.004	ug/L	0.488	3	3	2385	0	KED
	Cd	114	13.063	ug/L	1.063	8	0	6324	4	KED
>	In	115		ug/L			852951	840703	2	Standard
	Ag	107	13.426	ug/L	0.282	2	143	173999	0	Standard
	Sb	121	14.575	ug/L	0.398	2	123	164368	0	Standard
	Sb	123	14.680	ug/L	0.343	2	104	126837	1	Standard
	Ba	135	31.140	ug/L	0.841	2	14	117755	0	Standard
	Ba	137	31.821	ug/L	0.361	1	26	209757	3	Standard
>	Tb	159		ug/L			1107766	1125135	3	Standard
	Tl	205	12.918	ug/L	0.376	2	18	402588	2	Standard
	Pb	208	13.179	ug/L	0.249	1	188	519940	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV4
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 13:59:47
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	701972	5	Standard
	Be	**9**	**49.694**	ug/L	4.160	8	8	185846	6	Standard
	C	**13**		ug/L			13453	15408	0	Standard
	Cl	**37**		ug/L			3677416	4166342	0	Standard
>	**Sc**	**45**		ug/L			810285	834745	0	Standard
	Cr	**52**	**50.904**	ug/L	1.727	3	13691	737167	2	Standard
	Cr	**53**	**50.592**	ug/L	2.154	4	129	85473	3	Standard
	Fe	**54**	**5115.040**	ug/L	121.347	2	39463	4883771	1	Standard
	Fe	**57**	**5097.552**	ug/L	81.750	1	11347	1932879	1	Standard
	Mn	**55**	**50.187**	ug/L	1.637	3	378	982587	2	Standard
>	**Ge**	**72**		ug/L			42122	42217	2	KED
	Ni	**60**	**48.550**	ug/L	1.977	4	10	33377	1	KED
	Ni	**62**	**48.694**	ug/L	1.772	3	0	5401	1	KED
	Cu	**63**	**49.873**	ug/L	1.626	3	43	95581	2	KED
	Cu	**65**	**50.690**	ug/L	0.956	1	22	48506	2	KED
	Zn	**66**	**47.726**	ug/L	3.915	8	16	11797	5	KED
	Zn	**67**	**50.711**	ug/L	1.716	3	3	2134	1	KED
	As	**75**	**49.462**	ug/L	1.128	2	3	8444	1	KED
	Se	**78**	**48.064**	ug/L	0.962	2	5	841	0	KED
	Y	**89**		ug/L			561402	558258	1	Standard
	Kr	**83**		ug/L			45	50	28	Standard
>	**In-1**	**115**		ug/L			12648	12474	1	KED
	Mo	**98**	**49.699**	ug/L	1.399	2	4	31035	1	KED
	Cd	**111**	**49.496**	ug/L	0.511	1	3	8961	2	KED
	Cd	**114**	**50.000**	ug/L	1.599	3	0	23932	2	KED
>	**In**	**115**		ug/L			852951	823611	2	Standard
	Ag	**107**	**50.398**	ug/L	0.468	0	143	639600	2	Standard
	Sb	**121**	**50.765**	ug/L	1.571	3	123	560492	0	Standard
	Sb	**123**	**50.676**	ug/L	1.507	2	104	428545	0	Standard
	Ba	**135**	**51.174**	ug/L	2.715	5	14	189448	2	Standard
	Ba	**137**	**51.428**	ug/L	2.617	5	26	331734	2	Standard
>	**Tb**	**159**		ug/L			1107766	1100387	2	Standard
	Tl	**205**	**47.268**	ug/L	1.171	2	18	1441142	2	Standard
	Pb	**208**	**50.963**	ug/L	0.784	1	188	1966299	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB4
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 14:07:34
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	676258	3	Standard
	Be	**9**	**0.004**	ug/L	0.002	44	8	22	30	Standard
	C	**13**		ug/L			13453	14917	6	Standard
	Cl	**37**		ug/L			3677416	4135122	1	Standard
>	**Sc**	**45**		ug/L			810285	816278	0	Standard
	Cr	**52**	**-0.053**	ug/L	0.043	81	13691	13060	5	Standard
	Cr	**53**	**-0.004**	ug/L	0.005	116	129	123	6	Standard
	Fe	**54**	**0.074**	ug/L	1.376	1854	39463	39832	4	Standard
	Fe	**57**	**-2.335**	ug/L	0.464	19	11347	10571	2	Standard
	Mn	**55**	**0.001**	ug/L	0.001	120	378	392	3	Standard
>	**Ge**	**72**		ug/L			42122	40718	1	KED
	Ni	**60**	**0.006**	ug/L	0.005	73	10	13	20	KED
	Ni	**62**	**0.024**	ug/L	0.010	41	0	3	34	KED
	Cu	**63**	**0.008**	ug/L	0.006	79	43	56	20	KED
	Cu	**65**	**0.004**	ug/L	0.006	137	22	26	21	KED
	Zn	**66**	**0.029**	ug/L	0.044	152	16	22	46	KED
	Zn	**67**	**-0.044**	ug/L	0.047	105	3	1	100	KED
	As	**75**	**0.007**	ug/L	0.013	174	3	5	43	KED
	Se	**78**	**0.313**	ug/L	0.103	33	5	10	17	KED
	Y	**89**		ug/L			561402	555322	4	Standard
	Kr	**83**		ug/L			45	40	37	Standard
>	**In-1**	**115**		ug/L			12648	12433	0	KED
	Mo	**98**	**0.032**	ug/L	0.013	39	4	24	32	KED
	Cd	**111**	**-0.003**	ug/L	0.020	597	3	2	141	KED
	Cd	**114**	**-0.000**	ug/L	0.002	2305	0	0	207	KED
>	**In**	**115**		ug/L			852951	823288	1	Standard
	Ag	**107**	**0.006**	ug/L	0.001	21	143	213	5	Standard
	Sb	**121**	**0.523**	ug/L	0.046	8	123	5888	8	Standard
	Sb	**123**	**0.510**	ug/L	0.032	6	104	4418	7	Standard
	Ba	**135**	**0.002**	ug/L	0.001	63	14	22	21	Standard
	Ba	**137**	**0.001**	ug/L	0.001	147	26	31	24	Standard
>	**Tb**	**159**		ug/L			1107766	1106167	3	Standard
	Tl	**205**	**0.008**	ug/L	0.001	16	18	253	16	Standard
	Pb	**208**	**0.005**	ug/L	0.001	15	188	369	5	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0172-03
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 14:13:30
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	750341	4	Standard
	Be	9	0.008	ug/L	0.002	27	8	39	18	Standard
	C	13		ug/L			13453	29027	3	Standard
	Cl	37		ug/L			3677416	4135864	6	Standard
>	Sc	45		ug/L			810285	851792	2	Standard
	Cr	52	1.733	ug/L	0.089	5	13691	39488	0	Standard
	Cr	53	1.705	ug/L	0.065	3	129	3069	1	Standard
	Fe	54	243.458	ug/L	7.242	2	39463	276627	1	Standard
	Fe	57	252.220	ug/L	4.931	1	11347	108924	2	Standard
	Mn	55	7.205	ug/L	0.531	7	378	144134	5	Standard
>	Ge	72		ug/L			42122	41728	1	KED
	Ni	60	0.782	ug/L	0.058	7	10	541	5	KED
	Ni	62	0.787	ug/L	0.253	32	0	86	31	KED
	Cu	63	5.445	ug/L	0.135	2	43	10358	2	KED
	Cu	65	5.360	ug/L	0.229	4	22	5089	3	KED
	Zn	66	46.613	ug/L	1.287	2	16	11406	3	KED
	Zn	67	44.900	ug/L	0.799	1	3	1868	0	KED
	As	75	3.245	ug/L	0.099	3	3	551	1	KED
	Se	78	0.148	ug/L	0.083	56	5	7	17	KED
	Y	89		ug/L			561402	555892	0	Standard
	Kr	83		ug/L			45	41	11	Standard
>	In-1	115		ug/L			12648	13247	0	KED
	Mo	98	2.432	ug/L	0.069	2	4	1618	2	KED
	Cd	111	0.482	ug/L	0.006	1	3	95	1	KED
	Cd	114	0.478	ug/L	0.043	8	0	243	8	KED
>	In	115		ug/L			852951	858396	2	Standard
	Ag	107	0.009	ug/L	0.002	21	143	262	7	Standard
	Sb	121	1.678	ug/L	0.067	4	123	19427	1	Standard
	Sb	123	1.644	ug/L	0.067	4	104	14594	2	Standard
	Ba	135	23.815	ug/L	0.943	3	14	91922	1	Standard
	Ba	137	23.819	ug/L	1.390	5	26	160116	3	Standard
>	Tb	159		ug/L			1107766	1133236	0	Standard
	Tl	205	0.023	ug/L	0.001	6	18	735	5	Standard
	Pb	208	1.793	ug/L	0.076	4	188	71435	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0172-05
Sample Dil Factor: 2
Comments:
Sample Date/Time: Wednesday, October 10, 2018 14:18:32
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	696073	4	Standard
	Be	9	0.012	ug/L	0.003	21	8	53	14	Standard
	C	13		ug/L			13453	22668	7	Standard
	Cl	37		ug/L			3677416	3926035	3	Standard
>	Sc	45		ug/L			810285	815927	1	Standard
	Cr	52	2.462	ug/L	0.092	3	13691	47964	1	Standard
	Cr	53	2.294	ug/L	0.081	3	129	3913	2	Standard
	Fe	54	659.867	ug/L	17.670	2	39463	650325	0	Standard
	Fe	57	645.980	ug/L	1.869	0	11347	249402	1	Standard
	Mn	55	19.712	ug/L	0.383	1	378	377552	3	Standard
>	Ge	72		ug/L			42122	41954	1	KED
	Ni	60	1.081	ug/L	0.117	10	10	747	8	KED
	Ni	62	1.140	ug/L	0.067	5	0	126	5	KED
	Cu	63	6.205	ug/L	0.160	2	43	11857	1	KED
	Cu	65	6.383	ug/L	0.222	3	22	6088	2	KED
	Zn	66	112.374	ug/L	5.294	4	16	27610	3	KED
	Zn	67	106.365	ug/L	5.550	5	3	4445	4	KED
	As	75	0.268	ug/L	0.029	10	3	49	9	KED
	Se	78	0.220	ug/L	0.091	41	5	8	18	KED
	Y	89		ug/L			561402	566906	2	Standard
	Kr	83		ug/L			45	55	5	Standard
>	In-1	115		ug/L			12648	13322	0	KED
	Mo	98	0.243	ug/L	0.012	4	4	166	4	KED
	Cd	111	0.525	ug/L	0.025	4	3	104	4	KED
	Cd	114	0.505	ug/L	0.037	7	0	258	7	KED
>	In	115		ug/L			852951	846013	1	Standard
	Ag	107	0.043	ug/L	0.002	5	143	703	5	Standard
	Sb	121	0.569	ug/L	0.022	3	123	6579	2	Standard
	Sb	123	0.562	ug/L	0.010	1	104	4990	0	Standard
	Ba	135	17.853	ug/L	0.372	2	14	67961	1	Standard
	Ba	137	17.953	ug/L	0.244	1	26	119077	1	Standard
>	Tb	159		ug/L			1107766	1105132	0	Standard
	Tl	205	0.005	ug/L	0.001	17	18	176	15	Standard
	Pb	208	2.429	ug/L	0.021	0	188	94307	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0172-07
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 14:23:35
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	703362	3	Standard
	Be	9	0.003	ug/L	0.001	16	8	21	13	Standard
	C	13		ug/L			13453	27165	4	Standard
	Cl	37		ug/L			3677416	4099241	0	Standard
>	Sc	45		ug/L			810285	844279	4	Standard
	Cr	52	2.598	ug/L	0.241	9	13691	51499	3	Standard
	Cr	53	2.454	ug/L	0.152	6	129	4314	0	Standard
	Fe	54	1303.783	ug/L	76.532	5	39463	1287474	1	Standard
	Fe	57	1326.476	ug/L	27.748	2	11347	517118	2	Standard
	Mn	55	126.387	ug/L	6.802	5	378	2498169	1	Standard
>	Ge	72		ug/L			42122	42754	0	KED
	Ni	60	0.485	ug/L	0.045	9	10	347	9	KED
	Ni	62	0.531	ug/L	0.054	10	0	60	9	KED
	Cu	63	4.481	ug/L	0.153	3	43	8740	3	KED
	Cu	65	4.625	ug/L	0.196	4	22	4504	4	KED
	Zn	66	31.432	ug/L	0.686	2	16	7885	2	KED
	Zn	67	29.857	ug/L	3.540	11	3	1274	11	KED
	As	75	1.971	ug/L	0.037	1	3	344	1	KED
	Se	78	0.221	ug/L	0.112	50	5	9	21	KED
	Y	89		ug/L			561402	550680	0	Standard
	Kr	83		ug/L			45	50	16	Standard
>	In-1	115		ug/L			12648	13079	1	KED
	Mo	98	0.546	ug/L	0.026	4	4	362	3	KED
	Cd	111	0.173	ug/L	0.021	12	3	36	12	KED
	Cd	114	0.174	ug/L	0.028	16	0	87	17	KED
>	In	115		ug/L			852951	854442	2	Standard
	Ag	107	0.006	ug/L	0.001	15	143	227	7	Standard
	Sb	121	1.138	ug/L	0.055	4	123	13158	3	Standard
	Sb	123	1.127	ug/L	0.035	3	104	9995	0	Standard
	Ba	135	11.131	ug/L	0.270	2	14	42796	2	Standard
	Ba	137	11.062	ug/L	0.581	5	26	74076	3	Standard
>	Tb	159		ug/L			1107766	1107082	0	Standard
	Tl	205	0.004	ug/L	0.000	8	18	141	6	Standard
	Pb	208	3.357	ug/L	0.054	1	188	130489	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0172-09
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 14:28:37
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	666731	2	Standard
	Be	9	0.009	ug/L	0.009	103	8	40	83	Standard
	C	13		ug/L			13453	29862	4	Standard
	Cl	37		ug/L			3677416	4133811	2	Standard
>	Sc	45		ug/L			810285	874101	3	Standard
	Cr	52	0.551	ug/L	0.090	16	13691	22947	5	Standard
	Cr	53	0.685	ug/L	0.010	1	129	1349	2	Standard
	Fe	54	10171.561	ug/L	405.071	3	39463	10121117	2	Standard
	Fe	57	10052.092	ug/L	266.790	2	11347	3977650	2	Standard
	Mn	55	905.595	ug/L	16.955	1	378	18556163	2	Standard
>	Ge	72		ug/L			42122	41348	1	KED
	Ni	60	0.468	ug/L	0.021	4	10	325	5	KED
	Ni	62	0.415	ug/L	0.060	14	0	45	14	KED
	Cu	63	1.345	ug/L	0.009	0	43	2568	2	KED
	Cu	65	1.372	ug/L	0.090	6	22	1307	6	KED
	Zn	66	27.898	ug/L	1.432	5	16	6772	5	KED
	Zn	67	26.701	ug/L	0.660	2	3	1102	3	KED
	As	75	7.251	ug/L	0.110	1	3	1216	0	KED
	Se	78	0.434	ug/L	0.299	68	5	12	39	KED
	Y	89		ug/L			561402	535404	1	Standard
	Kr	83		ug/L			45	53	32	Standard
>	In-1	115		ug/L			12648	12320	2	KED
	Mo	98	0.931	ug/L	0.054	5	4	578	6	KED
	Cd	111	0.089	ug/L	0.011	12	3	19	13	KED
	Cd	114	0.083	ug/L	0.030	35	0	40	36	KED
>	In	115		ug/L			852951	818422	2	Standard
	Ag	107	0.005	ug/L	0.005	88	143	206	30	Standard
	Sb	121	0.379	ug/L	0.018	4	123	4278	5	Standard
	Sb	123	0.371	ug/L	0.026	6	104	3215	4	Standard
	Ba	135	23.137	ug/L	0.671	2	14	85173	0	Standard
	Ba	137	22.941	ug/L	1.054	4	26	147090	2	Standard
>	Tb	159		ug/L			1107766	1110344	0	Standard
	Tl	205	0.006	ug/L	0.006	94	18	201	85	Standard
	Pb	208	2.450	ug/L	0.081	3	188	95546	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0172-11
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 14:33:40
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	686097	0	Standard
	Be	9	0.005	ug/L	0.001	26	8	26	18	Standard
	C	13		ug/L			13453	27782	0	Standard
	Cl	37		ug/L			3677416	4111087	4	Standard
>	Sc	45		ug/L			810285	837649	2	Standard
	Cr	52	3.012	ug/L	0.093	3	13691	57075	1	Standard
	Cr	53	3.125	ug/L	0.043	1	129	5423	1	Standard
	Fe	54	477.383	ug/L	7.855	1	39463	494320	1	Standard
	Fe	57	484.921	ug/L	25.381	5	11347	194963	2	Standard
	Mn	55	25.648	ug/L	1.093	4	378	504019	4	Standard
>	Ge	72		ug/L			42122	42622	0	KED
	Ni	60	0.562	ug/L	0.022	3	10	400	3	KED
	Ni	62	0.555	ug/L	0.059	10	0	62	10	KED
	Cu	63	4.591	ug/L	0.176	3	43	8927	4	KED
	Cu	65	4.829	ug/L	0.146	3	22	4687	2	KED
	Zn	66	36.814	ug/L	0.606	1	16	9204	1	KED
	Zn	67	34.023	ug/L	1.410	4	3	1447	4	KED
	As	75	0.465	ug/L	0.025	5	3	84	4	KED
	Se	78	0.185	ug/L	0.178	96	5	8	37	KED
	Y	89		ug/L			561402	576488	3	Standard
	Kr	83		ug/L			45	57	11	Standard
>	In-1	115		ug/L			12648	12940	3	KED
	Mo	98	0.690	ug/L	0.038	5	4	451	2	KED
	Cd	111	0.137	ug/L	0.033	23	3	28	18	KED
	Cd	114	0.201	ug/L	0.021	10	0	100	7	KED
>	In	115		ug/L			852951	845945	0	Standard
	Ag	107	0.010	ug/L	0.001	11	143	274	6	Standard
	Sb	121	1.759	ug/L	0.045	2	123	20075	2	Standard
	Sb	123	1.769	ug/L	0.036	2	104	15471	2	Standard
	Ba	135	8.212	ug/L	0.285	3	14	31267	2	Standard
	Ba	137	8.324	ug/L	0.180	2	26	55231	2	Standard
>	Tb	159		ug/L			1107766	1124319	1	Standard
	Tl	205	0.002	ug/L	0.000	18	18	90	12	Standard
	Pb	208	1.370	ug/L	0.007	0	188	54184	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0172-13
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 14:38:42
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	666904	2	Standard
	Be	**9**	**0.003**	ug/L	0.001	34	8	19	20	Standard
	C	**13**		ug/L			13453	26510	1	Standard
	Cl	**37**		ug/L			3677416	4108336	3	Standard
>	**Sc**	**45**		ug/L			810285	877970	0	Standard
	Cr	**52**	**9.742**	ug/L	0.190	1	13691	160408	2	Standard
	Cr	**53**	**9.813**	ug/L	0.228	2	129	17553	2	Standard
	Fe	**54**	**886.601**	ug/L	21.566	2	39463	925914	3	Standard
	Fe	**57**	**921.602**	ug/L	21.339	2	11347	377614	2	Standard
	Mn	**55**	**38.485**	ug/L	0.556	1	378	792697	1	Standard
>	**Ge**	**72**		ug/L			42122	40864	10	KED
	Ni	**60**	**0.336**	ug/L	0.020	5	10	233	7	KED
	Ni	**62**	**0.322**	ug/L	0.046	14	0	34	8	KED
	Cu	**63**	**3.465**	ug/L	0.354	10	43	6424	3	KED
	Cu	**65**	**3.432**	ug/L	0.450	13	22	3169	1	KED
	Zn	**66**	**102.049**	ug/L	15.113	14	16	24170	3	KED
	Zn	**67**	**92.509**	ug/L	7.683	8	3	3744	3	KED
	As	**75**	**1.407**	ug/L	0.211	14	3	233	4	KED
	Se	**78**	**0.174**	ug/L	0.078	44	5	7	13	KED
	Y	**89**		ug/L			561402	575814	4	Standard
	Kr	**83**		ug/L			45	60	3	Standard
>	**In-1**	**115**		ug/L			12648	12920	5	KED
	Mo	**98**	**0.628**	ug/L	0.030	4	4	411	7	KED
	Cd	**111**	**0.287**	ug/L	0.044	15	3	56	12	KED
	Cd	**114**	**0.379**	ug/L	0.053	13	0	187	9	KED
>	**In**	**115**		ug/L			852951	841613	2	Standard
	Ag	**107**	**0.007**	ug/L	0.003	48	143	233	16	Standard
	Sb	**121**	**1.483**	ug/L	0.057	3	123	16844	1	Standard
	Sb	**123**	**1.493**	ug/L	0.037	2	104	13004	2	Standard
	Ba	**135**	**10.530**	ug/L	0.306	2	14	39872	2	Standard
	Ba	**137**	**10.336**	ug/L	0.756	7	26	68131	5	Standard
>	**Tb**	**159**		ug/L			1107766	1129004	3	Standard
	Tl	**205**	**0.002**	ug/L	0.001	25	18	80	21	Standard
	Pb	**208**	**0.511**	ug/L	0.011	2	188	20438	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0172-15
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 14:43:45
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	716754	4	Standard
	Be	9	0.016	ug/L	0.010	61	8	69	56	Standard
	C	13		ug/L			13453	26252	4	Standard
	Cl	37		ug/L			3677416	4094708	2	Standard
>	Sc	45		ug/L			810285	845712	2	Standard
	Cr	52	0.925	ug/L	0.072	7	13691	27592	2	Standard
	Cr	53	0.949	ug/L	0.060	6	129	1755	3	Standard
	Fe	54	1435.889	ug/L	23.769	1	39463	1418522	1	Standard
	Fe	57	1475.642	ug/L	44.041	2	11347	575055	0	Standard
	Mn	55	72.032	ug/L	1.940	2	378	1428328	1	Standard
>	Ge	72		ug/L			42122	42463	3	KED
	Ni	60	0.562	ug/L	0.045	7	10	398	5	KED
	Ni	62	0.551	ug/L	0.063	11	0	62	14	KED
	Cu	63	6.425	ug/L	0.242	3	43	12423	3	KED
	Cu	65	6.509	ug/L	0.205	3	22	6282	0	KED
	Zn	66	67.928	ug/L	2.963	4	16	16889	1	KED
	Zn	67	61.351	ug/L	2.354	3	3	2595	0	KED
	As	75	0.476	ug/L	0.020	4	3	85	7	KED
	Se	78	0.146	ug/L	0.171	116	5	7	36	KED
	Y	89		ug/L			561402	550720	3	Standard
	Kr	83		ug/L			45	46	11	Standard
>	In-1	115		ug/L			12648	12984	0	KED
	Mo	98	0.519	ug/L	0.009	1	4	341	2	KED
	Cd	111	0.697	ug/L	0.045	6	3	134	5	KED
	Cd	114	0.614	ug/L	0.058	9	0	306	10	KED
>	In	115		ug/L			852951	849502	3	Standard
	Ag	107	0.010	ug/L	0.004	44	143	271	19	Standard
	Sb	121	0.225	ug/L	0.009	3	123	2688	5	Standard
	Sb	123	0.217	ug/L	0.007	3	104	1995	3	Standard
	Ba	135	14.037	ug/L	0.278	1	14	53644	1	Standard
	Ba	137	14.015	ug/L	0.203	1	26	93340	2	Standard
>	Tb	159		ug/L			1107766	1111088	1	Standard
	Tl	205	0.007	ug/L	0.008	113	18	229	103	Standard
	Pb	208	2.166	ug/L	0.054	2	188	84563	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0402-03
Sample Dil Factor: 5
Comments:
Sample Date/Time: Wednesday, October 10, 2018 14:48:48
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	707335	2	Standard
	Be	**9**	**0.002**	ug/L	0.002	72	8	16	35	Standard
	C	**13**		ug/L			13453	20800	4	Standard
	Cl	**37**		ug/L			3677416	4138986	2	Standard
>	**Sc**	**45**		ug/L			810285	824601	2	Standard
	Cr	**52**	**0.108**	ug/L	0.041	38	13691	15432	1	Standard
	Cr	**53**	**0.345**	ug/L	0.006	1	129	706	2	Standard
	Fe	**54**	**107.756**	ug/L	4.223	3	39463	140891	0	Standard
	Fe	**57**	**108.277**	ug/L	6.082	5	11347	51824	2	Standard
	Mn	**55**	**13.264**	ug/L	0.227	1	378	256782	1	Standard
>	**Ge**	**72**		ug/L			42122	42242	1	KED
	Ni	**60**	**0.589**	ug/L	0.054	9	10	415	7	KED
	Ni	**62**	**0.640**	ug/L	0.139	21	0	71	21	KED
	Cu	**63**	**4.925**	ug/L	0.137	2	43	9485	2	KED
	Cu	**65**	**4.864**	ug/L	0.193	3	22	4678	3	KED
	Zn	**66**	**107.777**	ug/L	5.570	5	16	26656	3	KED
	Zn	**67**	**101.686**	ug/L	3.226	3	3	4281	5	KED
	As	**75**	**0.153**	ug/L	0.016	10	3	30	8	KED
	Se	**78**	**0.209**	ug/L	0.067	31	5	8	13	KED
	Y	**89**		ug/L			561402	544363	2	Standard
	Kr	**83**		ug/L			45	52	7	Standard
>	**In-1**	**115**		ug/L			12648	12902	1	KED
	Mo	**98**	**0.402**	ug/L	0.013	3	4	264	3	KED
	Cd	**111**	**0.081**	ug/L	0.018	21	3	18	16	KED
	Cd	**114**	**0.093**	ug/L	0.027	28	0	46	29	KED
>	**In**	**115**		ug/L			852951	854045	1	Standard
	Ag	**107**	**0.004**	ug/L	0.001	36	143	194	9	Standard
	Sb	**121**	**0.267**	ug/L	0.006	2	123	3180	3	Standard
	Sb	**123**	**0.264**	ug/L	0.001	0	104	2416	1	Standard
	Ba	**135**	**20.453**	ug/L	0.479	2	14	78611	2	Standard
	Ba	**137**	**20.414**	ug/L	1.005	4	26	136638	3	Standard
>	**Tb**	**159**		ug/L			1107766	1082551	3	Standard
	Tl	**205**	**0.003**	ug/L	0.000	2	18	111	4	Standard
	Pb	**208**	**0.179**	ug/L	0.010	5	188	6988	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0413-03
Sample Dil Factor: 2
Comments:
Sample Date/Time: Wednesday, October 10, 2018 14:53:50
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	641456	4	Standard
	Be	9	0.025	ug/L	0.002	9	8	92	13	Standard
	C	13		ug/L			13453	31498	3	Standard
	Cl	37		ug/L			3677416	50110827	4	Standard
>	Sc	45		ug/L			810285	798625	2	Standard
	Cr	52	1.708	ug/L	0.037	2	13691	36702	0	Standard
	Cr	53	46.087	ug/L	1.214	2	129	74514	3	Standard
	Fe	54	119.387	ug/L	1.646	1	39463	147061	2	Standard
	Fe	57	288.207	ug/L	6.900	2	11347	115114	3	Standard
	Mn	55	22.608	ug/L	0.630	2	378	423675	2	Standard
>	Ge	72		ug/L			42122	29901	1	KED
	Ni	60	0.322	ug/L	0.025	7	10	163	6	KED
	Ni	62	1.110	ug/L	0.158	14	0	87	13	KED
	Cu	63	0.478	ug/L	0.016	3	43	680	1	KED
	Cu	65	0.419	ug/L	0.018	4	22	300	2	KED
	Zn	66	4.415	ug/L	0.360	8	16	784	6	KED
	Zn	67	5.560	ug/L	0.716	12	3	168	13	KED
	As	75	0.232	ug/L	0.021	9	3	30	6	KED
	Se	78	1.213	ug/L	0.355	29	5	18	22	KED
	Y	89		ug/L			561402	463556	4	Standard
	Kr	83		ug/L			45	5612	20	Standard
>	In-1	115		ug/L			12648	9708	3	KED
	Mo	98	0.074	ug/L	0.017	22	4	39	22	KED
	Cd	111	0.039	ug/L	0.030	78	3	7	55	KED
	Cd	114	0.028	ug/L	0.004	13	0	11	15	KED
>	In	115		ug/L			852951	614207	0	Standard
	Ag	107	0.014	ug/L	0.003	22	143	238	12	Standard
	Sb	121	0.045	ug/L	0.003	5	123	461	4	Standard
	Sb	123	0.045	ug/L	0.005	10	104	356	9	Standard
	Ba	135	21.041	ug/L	0.385	1	14	58151	1	Standard
	Ba	137	21.819	ug/L	0.107	0	26	105065	0	Standard
>	Tb	159		ug/L			1107766	817556	3	Standard
	Tl	205	0.013	ug/L	0.008	62	18	311	59	Standard
	Pb	208	0.147	ug/L	0.053	35	188	4343	33	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0086-01
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 14:58:53
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			680943	785088	0	Standard
	Be	9	0.001	ug/L	0.001	78	8	14	27	Standard
	C	13		ug/L			13453	402391	3	Standard
	Cl	37		ug/L			3677416	4479425	2	Standard
>	Sc	45		ug/L			810285	874312	0	Standard
	Cr	52	2.558	ug/L	0.038	1	13691	52828	0	Standard
	Cr	53	1.853	ug/L	0.058	3	129	3415	3	Standard
	Fe	54	368.870	ug/L	11.345	3	39463	408389	2	Standard
	Fe	57	1567.535	ug/L	8.467	0	11347	631026	0	Standard
	Mn	55	8.408	ug/L	0.258	3	378	172797	3	Standard
>	Ge	72		ug/L			42122	36442	1	KED
	Ni	60	5.157	ug/L	0.086	1	10	3070	1	KED
	Ni	62	5.249	ug/L	0.616	11	0	502	10	KED
	Cu	63	3.295	ug/L	0.061	1	43	5488	0	KED
	Cu	65	3.337	ug/L	0.136	4	22	2774	2	KED
	Zn	66	9.919	ug/L	0.496	5	16	2129	3	KED
	Zn	67	10.624	ug/L	1.220	11	3	389	12	KED
	As	75	0.234	ug/L	0.007	3	3	37	4	KED
	Se	78	0.361	ug/L	0.104	28	5	9	14	KED
	Y	89		ug/L			561402	525591	1	Standard
	Kr	83		ug/L			45	71	3	Standard
>	In-1	115		ug/L			12648	10840	2	KED
	Mo	98	2.257	ug/L	0.106	4	4	1227	2	KED
	Cd	111	-0.007	ug/L	0.003	48	3	1	34	KED
	Cd	114	0.015	ug/L	0.005	35	0	6	35	KED
>	In	115		ug/L			852951	698291	1	Standard
	Ag	107	0.003	ug/L	0.002	61	143	150	14	Standard
	Sb	121	0.114	ug/L	0.004	3	123	1169	4	Standard
	Sb	123	0.122	ug/L	0.007	5	104	960	6	Standard
	Ba	135	19.441	ug/L	0.078	0	14	61089	1	Standard
	Ba	137	19.939	ug/L	0.133	0	26	109157	0	Standard
>	Tb	159		ug/L			1107766	971962	2	Standard
	Tl	205	0.001	ug/L	0.000	7	18	49	7	Standard
	Pb	208	0.010	ug/L	0.000	4	188	507	5	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV5
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 15:05:00
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	778434	4	Standard
	Be	**9**	**48.337**	ug/L	2.137	4	8	200686	0	Standard
	C	**13**		ug/L			13453	17726	10	Standard
	Cl	**37**		ug/L			3677416	4238989	5	Standard
>	**Sc**	**45**		ug/L			810285	869321	2	Standard
	Cr	**52**	**49.881**	ug/L	1.149	2	13691	752439	1	Standard
	Cr	**53**	**49.171**	ug/L	1.918	3	129	86480	2	Standard
	Fe	**54**	**5233.350**	ug/L	342.244	6	39463	5196850	3	Standard
	Fe	**57**	**5043.202**	ug/L	297.785	5	11347	1989885	4	Standard
	Mn	**55**	**50.649**	ug/L	1.835	3	378	1032147	1	Standard
>	**Ge**	**72**		ug/L			42122	41872	3	KED
	Ni	**60**	**50.586**	ug/L	2.163	4	10	34488	2	KED
	Ni	**62**	**48.769**	ug/L	1.917	3	0	5364	2	KED
	Cu	**63**	**51.532**	ug/L	1.942	3	43	97914	0	KED
	Cu	**65**	**51.536**	ug/L	2.765	5	22	48874	3	KED
	Zn	**66**	**50.321**	ug/L	3.340	6	16	12336	3	KED
	Zn	**67**	**47.895**	ug/L	3.548	7	3	1997	5	KED
	As	**75**	**48.760**	ug/L	1.263	2	3	8255	1	KED
	Se	**78**	**49.510**	ug/L	1.770	3	5	859	1	KED
	Y	**89**		ug/L			561402	555342	1	Standard
	Kr	**83**		ug/L			45	45	4	Standard
>	**In-1**	**115**		ug/L			12648	13012	2	KED
	Mo	**98**	**47.776**	ug/L	2.000	4	4	31110	2	KED
	Cd	**111**	**48.613**	ug/L	1.417	2	3	9180	3	KED
	Cd	**114**	**47.179**	ug/L	0.822	1	0	23556	0	KED
>	**In**	**115**		ug/L			852951	819410	4	Standard
	Ag	**107**	**50.899**	ug/L	2.390	4	143	641898	1	Standard
	Sb	**121**	**50.567**	ug/L	2.297	4	123	554999	1	Standard
	Sb	**123**	**50.013**	ug/L	2.769	5	104	420302	1	Standard
	Ba	**135**	**50.702**	ug/L	1.484	2	14	186773	2	Standard
	Ba	**137**	**50.703**	ug/L	1.830	3	26	325382	2	Standard
>	**Tb**	**159**		ug/L			1107766	1096228	2	Standard
	Tl	**205**	**50.719**	ug/L	0.773	1	18	1540244	1	Standard
	Pb	**208**	**51.836**	ug/L	1.402	2	188	1991347	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB5
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 15:12:47
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8KED_UCT_BeFe_long.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\System\101018.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			680943	734709	5	Standard
	Be	**9**	**0.001**	ug/L	0.001	79	8	12	22	Standard
	C	**13**		ug/L			13453	15336	7	Standard
	Cl	**37**		ug/L			3677416	4144018	1	Standard
>	**Sc**	**45**		ug/L			810285	821268	3	Standard
	Cr	**52**	**-0.063**	ug/L	0.058	93	13691	12985	3	Standard
	Cr	**53**	**0.293**	ug/L	0.029	9	129	617	4	Standard
	Fe	**54**	**1.245**	ug/L	2.645	212	39463	41106	3	Standard
	Fe	**57**	**-4.687**	ug/L	1.425	30	11347	9761	6	Standard
	Mn	**55**	**0.007**	ug/L	0.002	31	378	510	5	Standard
>	**Ge**	**72**		ug/L			42122	41207	1	KED
	Ni	**60**	**0.031**	ug/L	0.013	41	10	30	28	KED
	Ni	**62**	**0.082**	ug/L	0.017	20	0	9	20	KED
	Cu	**63**	**0.009**	ug/L	0.007	69	43	60	19	KED
	Cu	**65**	**0.005**	ug/L	0.005	116	22	26	18	KED
	Zn	**66**	**0.038**	ug/L	0.015	40	16	25	15	KED
	Zn	**67**	**-0.013**	ug/L	0.027	207	3	3	34	KED
	As	**75**	**0.009**	ug/L	0.010	105	3	5	28	KED
	Se	**78**	**0.073**	ug/L	0.017	23	5	6	4	KED
	Y	**89**		ug/L			561402	541435	4	Standard
	Kr	**83**		ug/L			45	43	21	Standard
>	**In-1**	**115**		ug/L			12648	12419	1	KED
	Mo	**98**	**0.043**	ug/L	0.010	22	4	31	18	KED
	Cd	**111**	**-0.009**	ug/L	0.008	94	3	1	91	KED
	Cd	**114**	**0.005**	ug/L	0.006	122	0	3	99	KED
>	**In**	**115**		ug/L			852951	844879	4	Standard
	Ag	**107**	**0.005**	ug/L	0.001	23	143	206	9	Standard
	Sb	**121**	**0.473**	ug/L	0.052	10	123	5465	6	Standard
	Sb	**123**	**0.451**	ug/L	0.058	12	104	4004	8	Standard
	Ba	**135**	**0.004**	ug/L	0.003	58	14	31	27	Standard
	Ba	**137**	**0.004**	ug/L	0.000	11	26	53	9	Standard
>	**Tb**	**159**		ug/L			1107766	1091779	1	Standard
	Tl	**205**	**0.007**	ug/L	0.002	21	18	237	19	Standard
	Pb	**208**	**0.004**	ug/L	0.000	10	188	331	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV6
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 15:20:16
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	16449	4	Standard
	Cl	**37**		ug/L			3677416	4337980	1	Standard
>	**Sc**	**45**		ug/L			810285	836235	1	Standard
	Cr	**52**	**51.119**	ug/L	0.610	1	13691	741643	1	Standard
	Cr	**53**	**50.817**	ug/L	0.990	1	129	86033	2	Standard
	Mn	**55**	**51.339**	ug/L	1.787	3	378	1006793	2	Standard
>	**Ge**	**72**		ug/L			42122	41935	4	KED
	Ni	**60**	**51.698**	ug/L	3.161	6	10	35275	3	KED
	Ni	**62**	**50.702**	ug/L	1.816	3	0	5585	3	KED
	Cu	**63**	**50.974**	ug/L	1.050	2	43	97027	2	KED
	Cu	**65**	**49.567**	ug/L	2.913	5	22	47040	1	KED
	Zn	**66**	**52.315**	ug/L	3.751	7	16	12836	3	KED
	Zn	**67**	**53.163**	ug/L	1.480	2	3	2222	4	KED
	As	**75**	**50.278**	ug/L	1.927	3	3	8520	1	KED
	Se	**78**	**50.924**	ug/L	2.756	5	5	884	1	KED
	Y	**89**		ug/L			561402	543907	1	Standard
	Kr	**83**		ug/L			45	64	26	Standard
>	**In-1**	**115**		ug/L			12648	12320	3	KED
	Mo	**98**	**51.167**	ug/L	4.400	8	4	31497	4	KED
	Cd	**111**	**50.617**	ug/L	1.841	3	3	9042	0	KED
	Cd	**114**	**51.352**	ug/L	2.280	4	0	24255	0	KED
>	**In**	**115**		ug/L			852951	826148	1	Standard
	Ag	**107**	**52.670**	ug/L	0.765	1	143	670692	3	Standard
	Ba	**135**	**52.675**	ug/L	1.017	1	14	195760	0	Standard
	Ba	**137**	**51.415**	ug/L	0.655	1	26	332938	0	Standard
>	**Tb**	**159**		ug/L			1107766	1118420	1	Standard
	Tl	**205**	**51.055**	ug/L	2.660	5	18	1581751	4	Standard
	Pb	**208**	**52.780**	ug/L	1.103	2	188	2069314	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB6
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 15:27:31
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	15999	8	Standard
	Cl	**37**		ug/L			3677416	4305492	4	Standard
>	**Sc**	**45**		ug/L			810285	803540	4	Standard
	Cr	**52**	**-0.065**	ug/L	0.067	103	13691	12664	3	Standard
	Cr	**53**	**0.166**	ug/L	0.024	14	129	397	6	Standard
	Mn	**55**	**0.009**	ug/L	0.002	21	378	551	2	Standard
>	**Ge**	**72**		ug/L			42122	41228	3	KED
	Ni	**60**	**0.069**	ug/L	0.012	16	10	56	12	KED
	Ni	**62**	**0.070**	ug/L	0.036	50	0	8	48	KED
	Cu	**63**	**0.003**	ug/L	0.004	117	43	48	17	KED
	Cu	**65**	**0.019**	ug/L	0.004	20	22	40	12	KED
	Zn	**66**	**0.028**	ug/L	0.038	134	16	22	38	KED
	Zn	**67**	**0.047**	ug/L	0.089	187	3	5	66	KED
	As	**75**	**0.006**	ug/L	0.006	90	3	4	22	KED
	Se	**78**	**0.239**	ug/L	0.049	20	5	9	12	KED
	Y	**89**		ug/L			561402	541702	6	Standard
	Kr	**83**		ug/L			45	51	6	Standard
>	**In-1**	**115**		ug/L			12648	12692	4	KED
	Mo	**98**	**0.027**	ug/L	0.008	29	4	22	22	KED
	Cd	**111**	**-0.005**	ug/L	0.006	109	3	2	49	KED
	Cd	**114**	**0.001**	ug/L	0.002	184	0	1	90	KED
>	**In**	**115**		ug/L			852951	809390	4	Standard
	Ag	**107**	**0.007**	ug/L	0.001	12	143	225	7	Standard
	Ba	**135**	**0.007**	ug/L	0.004	49	14	40	28	Standard
	Ba	**137**	**0.003**	ug/L	0.000	14	26	45	8	Standard
>	**Tb**	**159**		ug/L			1107766	1116255	4	Standard
	Tl	**205**	**0.008**	ug/L	0.001	5	18	277	4	Standard
	Pb	**208**	**0.004**	ug/L	0.001	24	188	347	10	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0172-13RE1
Sample Dil Factor: 2
Comments:
Sample Date/Time: Wednesday, October 10, 2018 15:32:21
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	22002	6	Standard
	Cl	37		ug/L			3677416	4104230	4	Standard
>	Sc	45		ug/L			810285	839060	4	Standard
	Cr	52	5.077	ug/L	0.150	2	13691	86649	3	Standard
	Cr	53	5.197	ug/L	0.093	1	129	8943	2	Standard
	Mn	55	19.788	ug/L	0.725	3	378	389427	2	Standard
>	Ge	72		ug/L			42122	42473	1	KED
	Ni	60	0.252	ug/L	0.020	8	10	184	8	KED
	Ni	62	0.353	ug/L	0.049	13	0	40	12	KED
	Cu	63	1.735	ug/L	0.033	1	43	3389	2	KED
	Cu	65	1.700	ug/L	0.056	3	22	1659	3	KED
	Zn	66	54.089	ug/L	1.495	2	16	13467	2	KED
	Zn	67	49.769	ug/L	1.557	3	3	2108	4	KED
	As	75	0.743	ug/L	0.060	8	3	131	8	KED
	Se	78	0.150	ug/L	0.124	82	5	7	28	KED
	Y	89		ug/L			561402	551791	3	Standard
	Kr	83		ug/L			45	48	33	Standard
>	In-1	115		ug/L			12648	13461	4	KED
	Mo	98	0.327	ug/L	0.049	15	4	224	12	KED
	Cd	111	0.178	ug/L	0.017	9	3	38	5	KED
	Cd	114	0.146	ug/L	0.011	7	0	75	2	KED
>	In	115		ug/L			852951	871587	1	Standard
	Ag	107	0.006	ug/L	0.003	48	143	227	17	Standard
	Ba	135	5.146	ug/L	0.076	1	14	20193	1	Standard
	Ba	137	5.139	ug/L	0.232	4	26	35117	2	Standard
>	Tb	159		ug/L			1107766	1158863	2	Standard
	Tl	205	0.027	ug/L	0.002	9	18	898	6	Standard
	Pb	208	0.263	ug/L	0.011	4	188	10892	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0175-BLK2
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 15:37:10
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	20754	1	Standard
	Cl	**37**		ug/L			3677416	4030543	2	Standard
>	**Sc**	**45**		ug/L			810285	826019	0	Standard
	Cr	**52**	**-0.070**	ug/L	0.017	24	13691	12977	1	Standard
	Cr	**53**	**0.158**	ug/L	0.010	6	129	395	4	Standard
	Mn	**55**	**0.020**	ug/L	0.001	5	378	774	2	Standard
>	**Ge**	**72**		ug/L			42122	42260	1	KED
	Ni	**60**	**0.071**	ug/L	0.005	7	10	59	5	KED
	Ni	**62**	**0.120**	ug/L	0.043	35	0	13	34	KED
	Cu	**63**	**0.056**	ug/L	0.003	5	43	150	3	KED
	Cu	**65**	**0.039**	ug/L	0.014	34	22	60	20	KED
	Zn	**66**	**4.060**	ug/L	0.164	4	16	1020	2	KED
	Zn	**67**	**3.622**	ug/L	0.068	1	3	156	1	KED
	As	**75**	**0.005**	ug/L	0.010	224	3	4	36	KED
	Se	**78**	**0.119**	ug/L	0.109	92	5	7	25	KED
	Y	**89**		ug/L			561402	554654	2	Standard
	Kr	**83**		ug/L			45	55	7	Standard
>	**In-1**	**115**		ug/L			12648	12862	3	KED
	Mo	**98**	**0.004**	ug/L	0.005	122	4	7	44	KED
	Cd	**111**	**-0.004**	ug/L	0.008	197	3	2	57	KED
	Cd	**114**	**0.002**	ug/L	0.000	7	0	1	1	KED
>	**In**	**115**		ug/L			852951	844294	3	Standard
	Ag	**107**	**0.003**	ug/L	0.001	20	143	179	7	Standard
	Ba	**135**	**0.008**	ug/L	0.001	17	14	45	14	Standard
	Ba	**137**	**0.008**	ug/L	0.002	27	26	78	16	Standard
>	**Tb**	**159**		ug/L			1107766	1136795	2	Standard
	Tl	**205**	**0.002**	ug/L	0.001	28	18	79	22	Standard
	Pb	**208**	**0.007**	ug/L	0.001	9	188	485	7	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0175-BS2
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 15:42:00
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	20514	3	Standard
	Cl	**37**		ug/L			3677416	4163120	1	Standard
>	**Sc**	**45**		ug/L			810285	846864	2	Standard
	Cr	**52**	**24.848**	ug/L	0.459	1	13691	372406	2	Standard
	Cr	**53**	**25.962**	ug/L	0.342	1	129	44579	3	Standard
	Mn	**55**	**25.965**	ug/L	0.864	3	378	515774	1	Standard
>	**Ge**	**72**		ug/L			42122	43313	2	KED
	Ni	**60**	**25.446**	ug/L	1.358	5	10	17945	2	KED
	Ni	**62**	**24.730**	ug/L	1.238	5	0	2816	5	KED
	Cu	**63**	**25.257**	ug/L	0.906	3	43	49679	2	KED
	Cu	**65**	**25.538**	ug/L	1.068	4	22	25076	3	KED
	Zn	**66**	**79.408**	ug/L	3.522	4	16	20139	1	KED
	Zn	**67**	**72.159**	ug/L	3.223	4	3	3112	1	KED
	As	**75**	**23.572**	ug/L	0.971	4	3	4129	1	KED
	Se	**78**	**75.827**	ug/L	1.666	2	5	1358	1	KED
	Y	**89**		ug/L			561402	579854	3	Standard
	Kr	**83**		ug/L			45	59	8	Standard
>	**In-1**	**115**		ug/L			12648	13361	1	KED
	Mo	**98**	**-0.001**	ug/L	0.003	253	4	4	51	KED
	Cd	**111**	**23.163**	ug/L	0.200	0	3	4493	0	KED
	Cd	**114**	**23.153**	ug/L	0.616	2	0	11872	2	KED
>	**In**	**115**		ug/L			852951	843794	3	Standard
	Ag	**107**	**26.066**	ug/L	1.440	5	143	338606	1	Standard
	Ba	**135**	**25.822**	ug/L	1.540	5	14	97911	2	Standard
	Ba	**137**	**25.544**	ug/L	0.882	3	26	168894	3	Standard
>	**Tb**	**159**		ug/L			1107766	1156676	1	Standard
	Tl	**205**	**25.188**	ug/L	0.681	2	18	807158	1	Standard
	Pb	**208**	**26.189**	ug/L	0.255	0	188	1062112	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0087-01
Sample Dil Factor: 50
Comments:
Sample Date/Time: Wednesday, October 10, 2018 15:46:49
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	30189	3	Standard
	Cl	**37**		ug/L			3677416	4214897	1	Standard
>	**Sc**	**45**		ug/L			810285	872601	1	Standard
	Cr	**52**	**74.996**	ug/L	1.660	2	13691	1128260	0	Standard
	Cr	**53**	**73.733**	ug/L	1.777	2	129	130158	1	Standard
	Mn	**55**	**14.887**	ug/L	0.380	2	378	304945	1	Standard
>	**Ge**	**72**		ug/L			42122	42451	0	KED
	Ni	**60**	**9.752**	ug/L	0.379	3	10	6753	3	KED
	Ni	**62**	**9.989**	ug/L	0.433	4	0	1114	3	KED
	Cu	**63**	**20.826**	ug/L	0.235	1	43	40175	0	KED
	Cu	**65**	**21.559**	ug/L	0.453	2	22	20759	1	KED
	Zn	**66**	**181.947**	ug/L	3.682	2	16	45237	1	KED
	Zn	**67**	**173.182**	ug/L	3.007	1	3	7322	1	KED
	As	**75**	**0.413**	ug/L	0.044	10	3	74	9	KED
	Se	**78**	**0.793**	ug/L	0.199	25	5	19	17	KED
	Y	**89**		ug/L			561402	607765	0	Standard
	Kr	**83**		ug/L			45	71	5	Standard
>	**In-1**	**115**		ug/L			12648	13334	2	KED
	Mo	**98**	**0.661**	ug/L	0.058	8	4	446	7	KED
	Cd	**111**	**4.549**	ug/L	0.140	3	3	883	2	KED
	Cd	**114**	**4.543**	ug/L	0.089	1	0	2326	3	KED
>	**In**	**115**		ug/L			852951	876544	1	Standard
	Ag	**107**	**0.052**	ug/L	0.003	5	143	853	2	Standard
	Ba	**135**	**17.829**	ug/L	0.525	2	14	70317	2	Standard
	Ba	**137**	**17.801**	ug/L	0.438	2	26	122306	1	Standard
>	**Tb**	**159**		ug/L			1107766	1171083	0	Standard
	Tl	**205**	**0.058**	ug/L	0.002	3	18	1907	3	Standard
	Pb	**208**	**1.486**	ug/L	0.057	3	188	61220	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0087-02
Sample Dil Factor: 50
Comments:
Sample Date/Time: Wednesday, October 10, 2018 15:51:39
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	30667	2	Standard
	Cl	37		ug/L			3677416	4201026	3	Standard
>	Sc	45		ug/L			810285	861188	1	Standard
	Cr	52	62.675	ug/L	0.756	1	13691	933086	0	Standard
	Cr	53	61.787	ug/L	2.820	4	129	107646	3	Standard
	Mn	55	8.327	ug/L	0.224	2	378	168526	2	Standard
>	Ge	72		ug/L			42122	43576	3	KED
	Ni	60	8.047	ug/L	0.266	3	10	5718	0	KED
	Ni	62	8.050	ug/L	0.319	3	0	923	6	KED
	Cu	63	15.699	ug/L	0.392	2	43	31089	2	KED
	Cu	65	15.315	ug/L	0.632	4	22	15141	4	KED
	Zn	66	153.956	ug/L	5.684	3	16	39285	3	KED
	Zn	67	136.481	ug/L	1.236	0	3	5925	4	KED
	As	75	0.346	ug/L	0.020	5	3	65	7	KED
	Se	78	0.452	ug/L	0.080	17	5	13	11	KED
	Y	89		ug/L			561402	613651	0	Standard
	Kr	83		ug/L			45	57	15	Standard
>	In-1	115		ug/L			12648	12942	7	KED
	Mo	98	0.545	ug/L	0.042	7	4	356	6	KED
	Cd	111	3.929	ug/L	0.364	9	3	737	3	KED
	Cd	114	3.954	ug/L	0.419	10	0	1954	4	KED
>	In	115		ug/L			852951	853224	2	Standard
	Ag	107	0.040	ug/L	0.002	4	143	662	1	Standard
	Ba	135	13.414	ug/L	0.276	2	14	51491	1	Standard
	Ba	137	13.169	ug/L	0.604	4	26	88024	1	Standard
>	Tb	159		ug/L			1107766	1139279	1	Standard
	Tl	205	0.043	ug/L	0.001	2	18	1384	1	Standard
	Pb	208	0.965	ug/L	0.010	1	188	38717	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0039-01
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 15:56:52
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	58658	0	Standard
	Cl	**37**		ug/L			3677416	4253116	2	Standard
>	**Sc**	**45**		ug/L			810285	874033	2	Standard
	Cr	**52**	**14.607**	ug/L	0.436	2	13691	231955	1	Standard
	Cr	**53**	**14.744**	ug/L	0.133	0	129	26186	3	Standard
	Mn	**55**	**154.880**	ug/L	0.685	0	378	3174813	3	Standard
>	**Ge**	**72**		ug/L			42122	43899	4	KED
	Ni	**60**	**8.178**	ug/L	0.839	10	10	5841	6	KED
	Ni	**62**	**8.008**	ug/L	0.979	12	0	921	8	KED
	Cu	**63**	**27.718**	ug/L	2.083	7	43	55182	4	KED
	Cu	**65**	**27.446**	ug/L	1.253	4	22	27290	0	KED
	Zn	**66**	**80.474**	ug/L	5.496	6	16	20663	3	KED
	Zn	**67**	**81.210**	ug/L	5.715	7	3	3546	3	KED
	As	**75**	**1.171**	ug/L	0.095	8	3	211	3	KED
	Se	**78**	**0.452**	ug/L	0.079	17	5	13	11	KED
	Y	**89**		ug/L			561402	644144	0	Standard
	Kr	**83**		ug/L			45	57	16	Standard
>	**In-1**	**115**		ug/L			12648	13158	1	KED
	Mo	**98**	**0.753**	ug/L	0.018	2	4	500	1	KED
	Cd	**111**	**0.094**	ug/L	0.030	31	3	21	26	KED
	Cd	**114**	**0.107**	ug/L	0.036	34	0	54	32	KED
>	**In**	**115**		ug/L			852951	879656	2	Standard
	Ag	**107**	**0.034**	ug/L	0.001	4	143	603	2	Standard
	Ba	**135**	**37.222**	ug/L	0.148	0	14	147323	1	Standard
	Ba	**137**	**36.711**	ug/L	0.816	2	26	253099	1	Standard
>	**Tb**	**159**		ug/L			1107766	1157072	0	Standard
	Tl	**205**	**0.019**	ug/L	0.002	8	18	638	8	Standard
	Pb	**208**	**23.030**	ug/L	0.233	1	188	934418	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0403-02
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 16:01:42
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	25268	4	Standard
	Cl	**37**		ug/L			3677416	4309355	1	Standard
>	**Sc**	**45**		ug/L			810285	917638	2	Standard
	Cr	**52**	**29.673**	ug/L	1.432	4	13691	478547	2	Standard
	Cr	**53**	**30.001**	ug/L	1.205	4	129	55748	1	Standard
	Mn	**55**	**271.987**	ug/L	7.829	2	378	5849683	0	Standard
>	**Ge**	**72**		ug/L			42122	43242	2	KED
	Ni	**60**	**29.076**	ug/L	0.728	2	10	20485	1	KED
	Ni	**62**	**29.184**	ug/L	0.721	2	0	3316	0	KED
	Cu	**63**	**12.789**	ug/L	0.733	5	43	25128	3	KED
	Cu	**65**	**13.086**	ug/L	0.395	3	22	12841	2	KED
	Zn	**66**	**57.941**	ug/L	0.901	1	16	14686	2	KED
	Zn	**67**	**58.389**	ug/L	2.829	4	3	2516	4	KED
	As	**75**	**2.652**	ug/L	0.032	1	3	467	1	KED
	Se	**78**	**0.563**	ug/L	0.156	27	5	15	15	KED
	Y	**89**		ug/L			561402	659882	2	Standard
	Kr	**83**		ug/L			45	73	17	Standard
>	**In-1**	**115**		ug/L			12648	13125	0	KED
	Mo	**98**	**0.122**	ug/L	0.018	14	4	85	13	KED
	Cd	**111**	**0.073**	ug/L	0.010	14	3	17	11	KED
	Cd	**114**	**0.088**	ug/L	0.021	24	0	44	23	KED
>	**In**	**115**		ug/L			852951	846383	1	Standard
	Ag	**107**	**0.029**	ug/L	0.003	8	143	521	5	Standard
	Ba	**135**	**32.007**	ug/L	1.570	4	14	121846	3	Standard
	Ba	**137**	**31.880**	ug/L	1.106	3	26	211475	2	Standard
>	**Tb**	**159**		ug/L			1107766	1150926	1	Standard
	Tl	**205**	**0.027**	ug/L	0.003	9	18	871	9	Standard
	Pb	**208**	**9.743**	ug/L	0.125	1	188	393373	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0175-DUP2
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 16:06:31
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	23326	4	Standard
	Cl	**37**		ug/L			3677416	4084757	0	Standard
>	**Sc**	**45**		ug/L			810285	892722	0	Standard
	Cr	**52**	**19.430**	ug/L	0.722	3	13691	310315	3	Standard
	Cr	**53**	**18.880**	ug/L	0.371	1	129	34206	1	Standard
	Mn	**55**	**271.483**	ug/L	3.587	1	378	5683133	1	Standard
>	**Ge**	**72**		ug/L			42122	44428	2	KED
	Ni	**60**	**24.774**	ug/L	0.616	2	10	17933	0	KED
	Ni	**62**	**24.163**	ug/L	2.000	8	0	2818	5	KED
	Cu	**63**	**12.473**	ug/L	0.619	4	43	25182	2	KED
	Cu	**65**	**12.817**	ug/L	0.120	0	22	12928	2	KED
	Zn	**66**	**50.547**	ug/L	2.628	5	16	13155	2	KED
	Zn	**67**	**50.093**	ug/L	2.327	4	3	2218	3	KED
	As	**75**	**2.403**	ug/L	0.083	3	3	435	1	KED
	Se	**78**	**0.661**	ug/L	0.209	31	5	17	20	KED
	Y	**89**		ug/L			561402	666621	2	Standard
	Kr	**83**		ug/L			45	71	11	Standard
>	**In-1**	**115**		ug/L			12648	13372	3	KED
	Mo	**98**	**0.162**	ug/L	0.016	9	4	113	12	KED
	Cd	**111**	**0.061**	ug/L	0.018	29	3	15	21	KED
	Cd	**114**	**0.078**	ug/L	0.015	19	0	40	16	KED
>	**In**	**115**		ug/L			852951	879142	5	Standard
	Ag	**107**	**0.027**	ug/L	0.001	4	143	516	2	Standard
	Ba	**135**	**28.628**	ug/L	1.380	4	14	113052	1	Standard
	Ba	**137**	**28.413**	ug/L	1.069	3	26	195557	1	Standard
>	**Tb**	**159**		ug/L			1107766	1153538	2	Standard
	Tl	**205**	**0.026**	ug/L	0.001	3	18	855	5	Standard
	Pb	**208**	**9.489**	ug/L	0.205	2	188	383884	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0175-MS2
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 16:11:21
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	22964	7	Standard
	Cl	37		ug/L			3677416	4037756	3	Standard
>	Sc	45		ug/L			810285	906528	0	Standard
	Cr	52	40.123	ug/L	0.669	1	13691	634348	1	Standard
	Cr	53	39.897	ug/L	0.359	0	129	73245	0	Standard
	Mn	55	279.957	ug/L	5.226	1	378	5951662	2	Standard
>	Ge	72		ug/L			42122	43490	2	KED
	Ni	60	46.311	ug/L	0.671	1	10	32813	0	KED
	Ni	62	45.758	ug/L	1.544	3	0	5230	3	KED
	Cu	63	33.977	ug/L	1.221	3	43	67130	4	KED
	Cu	65	33.501	ug/L	1.657	4	22	33014	2	KED
	Zn	66	122.574	ug/L	2.026	1	16	31227	2	KED
	Zn	67	118.144	ug/L	3.647	3	3	5118	3	KED
	As	75	24.885	ug/L	0.538	2	3	4379	1	KED
	Se	78	74.294	ug/L	1.392	1	5	1337	0	KED
	Y	89		ug/L			561402	689649	1	Standard
	Kr	83		ug/L			45	80	23	Standard
>	In-1	115		ug/L			12648	13096	3	KED
	Mo	98	0.109	ug/L	0.029	26	4	76	22	KED
	Cd	111	22.146	ug/L	1.472	6	3	4205	3	KED
	Cd	114	22.532	ug/L	0.926	4	0	11315	1	KED
>	In	115		ug/L			852951	848688	4	Standard
	Ag	107	23.026	ug/L	1.172	5	143	300860	2	Standard
	Ba	135	58.078	ug/L	0.827	1	14	221693	2	Standard
	Ba	137	58.260	ug/L	1.913	3	26	387269	1	Standard
>	Tb	159		ug/L			1107766	1150271	1	Standard
	Tl	205	24.018	ug/L	0.402	1	18	765591	2	Standard
	Pb	208	32.443	ug/L	1.047	3	188	1308304	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0175-MSD2
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 16:16:19
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	22263	3	Standard
	Cl	**37**		ug/L			3677416	4256609	2	Standard
>	**Sc**	**45**		ug/L			810285	889760	2	Standard
	Cr	**52**	**47.042**	ug/L	1.166	2	13691	727170	1	Standard
	Cr	**53**	**46.607**	ug/L	1.591	3	129	83940	3	Standard
	Mn	**55**	**288.728**	ug/L	14.344	4	378	6019662	2	Standard
>	**Ge**	**72**		ug/L			42122	44515	2	KED
	Ni	**60**	**52.182**	ug/L	0.659	1	10	37852	3	KED
	Ni	**62**	**50.403**	ug/L	3.999	7	0	5889	5	KED
	Cu	**63**	**34.406**	ug/L	1.425	4	43	69519	1	KED
	Cu	**65**	**35.703**	ug/L	0.569	1	22	36037	3	KED
	Zn	**66**	**134.488**	ug/L	5.574	4	16	35044	1	KED
	Zn	**67**	**124.177**	ug/L	2.324	1	3	5505	1	KED
	As	**75**	**25.111**	ug/L	0.934	3	3	4521	1	KED
	Se	**78**	**74.153**	ug/L	3.248	4	5	1365	1	KED
	Y	**89**		ug/L			561402	660846	2	Standard
	Kr	**83**		ug/L			45	69	11	Standard
>	**In-1**	**115**		ug/L			12648	13058	1	KED
	Mo	**98**	**0.098**	ug/L	0.019	19	4	68	16	KED
	Cd	**111**	**23.546**	ug/L	0.161	0	3	4464	2	KED
	Cd	**114**	**23.630**	ug/L	0.606	2	0	11839	0	KED
>	**In**	**115**		ug/L			852951	859164	4	Standard
	Ag	**107**	**23.833**	ug/L	1.248	5	143	315192	3	Standard
	Ba	**135**	**57.989**	ug/L	2.071	3	14	223936	2	Standard
	Ba	**137**	**58.086**	ug/L	2.817	4	26	390603	0	Standard
>	**Tb**	**159**		ug/L			1107766	1158271	1	Standard
	Tl	**205**	**23.910**	ug/L	0.908	3	18	767463	4	Standard
	Pb	**208**	**36.767**	ug/L	0.647	1	188	1492981	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV7
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 16:22:14
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	16102	5	Standard
	Cl	**37**		ug/L			3677416	4156791	4	Standard
>	**Sc**	**45**		ug/L			810285	812257	9	Standard
	Cr	**52**	**53.282**	ug/L	4.988	9	13691	746096	0	Standard
	Cr	**53**	**51.843**	ug/L	3.775	7	129	84893	4	Standard
	Mn	**55**	**53.416**	ug/L	4.901	9	378	1012067	1	Standard
>	**Ge**	**72**		ug/L			42122	42799	3	KED
	Ni	**60**	**50.978**	ug/L	2.944	5	10	35514	3	KED
	Ni	**62**	**49.505**	ug/L	1.397	2	0	5568	3	KED
	Cu	**63**	**51.242**	ug/L	2.273	4	43	99530	3	KED
	Cu	**65**	**51.420**	ug/L	3.222	6	22	49816	2	KED
	Zn	**66**	**51.083**	ug/L	2.369	4	16	12803	1	KED
	Zn	**67**	**50.268**	ug/L	2.534	5	3	2143	1	KED
	As	**75**	**50.816**	ug/L	1.617	3	3	8791	1	KED
	Se	**78**	**53.224**	ug/L	2.946	5	5	943	4	KED
	Y	**89**		ug/L			561402	539975	4	Standard
	Kr	**83**		ug/L			45	55	18	Standard
>	**In-1**	**115**		ug/L			12648	12904	2	KED
	Mo	**98**	**48.016**	ug/L	2.748	5	4	30991	3	KED
	Cd	**111**	**49.232**	ug/L	1.228	2	3	9215	0	KED
	Cd	**114**	**49.490**	ug/L	1.556	3	0	24496	0	KED
>	**In**	**115**		ug/L			852951	803355	6	Standard
	Ag	**107**	**53.255**	ug/L	2.694	5	143	657921	1	Standard
	Ba	**135**	**55.232**	ug/L	2.405	4	14	199345	3	Standard
	Ba	**137**	**54.375**	ug/L	3.393	6	26	341555	1	Standard
>	**Tb**	**159**		ug/L			1107766	1099426	8	Standard
	Tl	**205**	**51.392**	ug/L	3.536	6	18	1559344	2	Standard
	Pb	**208**	**54.200**	ug/L	5.376	9	188	2077210	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB7
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 16:29:48
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	15645	6	Standard
	Cl	**37**		ug/L			3677416	3935828	4	Standard
>	**Sc**	**45**		ug/L			810285	846305	0	Standard
	Cr	**52**	**-0.103**	ug/L	0.018	17	13691	12814	2	Standard
	Cr	**53**	**0.059**	ug/L	0.013	22	129	235	10	Standard
	Mn	**55**	**0.013**	ug/L	0.001	6	378	655	3	Standard
>	**Ge**	**72**		ug/L			42122	42927	2	KED
	Ni	**60**	**0.232**	ug/L	0.034	14	10	172	15	KED
	Ni	**62**	**0.232**	ug/L	0.063	27	0	26	24	KED
	Cu	**63**	**0.010**	ug/L	0.005	51	43	64	14	KED
	Cu	**65**	**-0.002**	ug/L	0.007	440	22	21	30	KED
	Zn	**66**	**0.014**	ug/L	0.017	121	16	20	21	KED
	Zn	**67**	**0.071**	ug/L	0.123	174	3	6	78	KED
	As	**75**	**0.011**	ug/L	0.009	86	3	5	26	KED
	Se	**78**	**0.236**	ug/L	0.093	39	5	9	17	KED
	Y	**89**		ug/L			561402	561009	2	Standard
	Kr	**83**		ug/L			45	45	13	Standard
>	**In-1**	**115**		ug/L			12648	13223	2	KED
	Mo	**98**	**0.027**	ug/L	0.004	16	4	22	13	KED
	Cd	**111**	**-0.007**	ug/L	0.005	68	3	1	50	KED
	Cd	**114**	**0.001**	ug/L	0.004	387	0	1	184	KED
>	**In**	**115**		ug/L			852951	848285	2	Standard
	Ag	**107**	**0.008**	ug/L	0.002	21	143	245	6	Standard
	Ba	**135**	**0.004**	ug/L	0.002	61	14	28	30	Standard
	Ba	**137**	**0.007**	ug/L	0.001	9	26	71	3	Standard
>	**Tb**	**159**		ug/L			1107766	1145970	1	Standard
	Tl	**205**	**0.008**	ug/L	0.001	10	18	278	9	Standard
	Pb	**208**	**0.004**	ug/L	0.000	4	188	364	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV8
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 16:37:56
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	16151	2	Standard
	Cl	**37**		ug/L			3677416	4102705	4	Standard
>	**Sc**	**45**		ug/L			810285	847592	1	Standard
	Cr	**52**	**51.044**	ug/L	0.389	0	13691	750660	1	Standard
	Cr	**53**	**50.621**	ug/L	1.149	2	129	86850	2	Standard
	Mn	**55**	**51.750**	ug/L	2.080	4	378	1028629	3	Standard
>	**Ge**	**72**		ug/L			42122	43391	3	KED
	Ni	**60**	**50.904**	ug/L	1.393	2	10	35970	1	KED
	Ni	**62**	**49.290**	ug/L	1.621	3	0	5618	2	KED
	Cu	**63**	**50.248**	ug/L	1.574	3	43	98958	2	KED
	Cu	**65**	**50.649**	ug/L	0.938	1	22	49804	2	KED
	Zn	**66**	**49.004**	ug/L	1.556	3	16	12457	0	KED
	Zn	**67**	**52.047**	ug/L	5.616	10	3	2246	7	KED
	As	**75**	**50.371**	ug/L	1.524	3	3	8834	0	KED
	Se	**78**	**50.210**	ug/L	1.812	3	5	902	1	KED
	Y	**89**		ug/L			561402	570928	1	Standard
	Kr	**83**		ug/L			45	74	10	Standard
>	**In-1**	**115**		ug/L			12648	13117	4	KED
	Mo	**98**	**49.586**	ug/L	2.273	4	4	32524	0	KED
	Cd	**111**	**49.283**	ug/L	1.637	3	3	9373	1	KED
	Cd	**114**	**48.373**	ug/L	2.280	4	0	24319	0	KED
>	**In**	**115**		ug/L			852951	876395	1	Standard
	Ag	**107**	**49.464**	ug/L	2.013	4	143	667780	2	Standard
	Ba	**135**	**50.315**	ug/L	1.365	2	14	198368	2	Standard
	Ba	**137**	**50.944**	ug/L	0.792	1	26	349938	0	Standard
>	**Tb**	**159**		ug/L			1107766	1139901	1	Standard
	Tl	**205**	**50.823**	ug/L	0.370	0	18	1605442	1	Standard
	Pb	**208**	**51.727**	ug/L	0.582	1	188	2067474	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB8
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 16:45:10
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	16399	2	Standard
	Cl	**37**		ug/L			3677416	4124801	4	Standard
>	**Sc**	**45**		ug/L			810285	830668	1	Standard
	Cr	**52**	**-0.085**	ug/L	0.027	32	13691	12831	2	Standard
	Cr	**53**	**0.041**	ug/L	0.011	26	129	200	8	Standard
	Mn	**55**	**0.010**	ug/L	0.001	12	378	591	4	Standard
>	**Ge**	**72**		ug/L			42122	45494	3	KED
	Ni	**60**	**0.122**	ug/L	0.022	18	10	101	17	KED
	Ni	**62**	**0.160**	ug/L	0.050	31	0	19	27	KED
	Cu	**63**	**0.003**	ug/L	0.003	104	43	53	9	KED
	Cu	**65**	**0.001**	ug/L	0.003	247	22	26	11	KED
	Zn	**66**	**-0.015**	ug/L	0.015	99	16	13	31	KED
	Zn	**67**	**0.033**	ug/L	0.080	238	3	5	66	KED
	As	**75**	**0.003**	ug/L	0.006	175	3	4	24	KED
	Se	**78**	**0.172**	ug/L	0.069	40	5	8	12	KED
	Y	**89**		ug/L			561402	558767	1	Standard
	Kr	**83**		ug/L			45	63	7	Standard
>	**In-1**	**115**		ug/L			12648	13233	0	KED
	Mo	**98**	**0.033**	ug/L	0.005	14	4	26	11	KED
	Cd	**111**	**-0.007**	ug/L	0.005	65	3	1	50	KED
	Cd	**114**	**0.006**	ug/L	0.006	106	0	3	89	KED
>	**In**	**115**		ug/L			852951	870290	0	Standard
	Ag	**107**	**0.007**	ug/L	0.002	30	143	244	12	Standard
	Ba	**135**	**0.004**	ug/L	0.001	14	14	29	7	Standard
	Ba	**137**	**0.004**	ug/L	0.000	11	26	56	5	Standard
>	**Tb**	**159**		ug/L			1107766	1144660	1	Standard
	Tl	**205**	**0.009**	ug/L	0.001	10	18	304	8	Standard
	Pb	**208**	**0.005**	ug/L	0.000	6	188	376	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0207-BLK2
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 16:50:00
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	22832	3	Standard
	Cl	**37**		ug/L			3677416	4082733	2	Standard
>	**Sc**	**45**		ug/L			810285	825970	2	Standard
	Cr	**52**	**0.011**	ug/L	0.044	406	13691	14097	2	Standard
	Cr	**53**	**0.098**	ug/L	0.011	11	129	294	3	Standard
	Mn	**55**	**0.278**	ug/L	0.009	3	378	5765	2	Standard
>	**Ge**	**72**		ug/L			42122	43122	4	KED
	Ni	**60**	**0.162**	ug/L	0.005	3	10	123	1	KED
	Ni	**62**	**0.127**	ug/L	0.082	64	0	15	66	KED
	Cu	**63**	**0.196**	ug/L	0.020	10	43	427	6	KED
	Cu	**65**	**0.192**	ug/L	0.025	12	22	210	8	KED
	Zn	**66**	**2.363**	ug/L	0.044	1	16	613	2	KED
	Zn	**67**	**2.007**	ug/L	0.133	6	3	90	9	KED
	As	**75**	**0.020**	ug/L	0.008	42	3	7	16	KED
	Se	**78**	**0.207**	ug/L	0.108	52	5	8	19	KED
	Y	**89**		ug/L			561402	562336	2	Standard
	Kr	**83**		ug/L			45	72	21	Standard
>	**In-1**	**115**		ug/L			12648	13151	1	KED
	Mo	**98**	**0.040**	ug/L	0.011	27	4	30	22	KED
	Cd	**111**	**-0.006**	ug/L	0.008	138	3	2	65	KED
	Cd	**114**	**-0.000**	ug/L	0.002	780	0	0	189	KED
>	**In**	**115**		ug/L			852951	852733	2	Standard
	Ag	**107**	**0.008**	ug/L	0.002	20	143	243	9	Standard
	Ba	**135**	**0.024**	ug/L	0.004	15	14	106	13	Standard
	Ba	**137**	**0.024**	ug/L	0.003	12	26	184	13	Standard
>	**Tb**	**159**		ug/L			1107766	1127633	1	Standard
	Tl	**205**	**0.025**	ug/L	0.002	6	18	788	8	Standard
	Pb	**208**	**0.006**	ug/L	0.001	19	188	430	9	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0207-BS2
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 16:54:49
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	23767	3	Standard
	Cl	**37**		ug/L			3677416	3996172	2	Standard
>	**Sc**	**45**		ug/L			810285	817832	2	Standard
	Cr	**52**	**27.169**	ug/L	1.680	6	13691	391710	4	Standard
	Cr	**53**	**27.214**	ug/L	1.179	4	129	45091	2	Standard
	Mn	**55**	**27.815**	ug/L	1.218	4	378	533486	2	Standard
>	**Ge**	**72**		ug/L			42122	43611	1	KED
	Ni	**60**	**27.049**	ug/L	0.400	1	10	19224	1	KED
	Ni	**62**	**26.931**	ug/L	1.292	4	0	3087	5	KED
	Cu	**63**	**26.852**	ug/L	0.533	1	43	53198	1	KED
	Cu	**65**	**26.923**	ug/L	1.088	4	22	26618	2	KED
	Zn	**66**	**87.524**	ug/L	2.173	2	16	22364	2	KED
	Zn	**67**	**84.598**	ug/L	2.257	2	3	3677	3	KED
	As	**75**	**25.845**	ug/L	0.264	1	3	4561	1	KED
	Se	**78**	**84.821**	ug/L	2.551	3	5	1530	4	KED
	Y	**89**		ug/L			561402	552039	1	Standard
	Kr	**83**		ug/L			45	57	5	Standard
>	**In-1**	**115**		ug/L			12648	13190	1	KED
	Mo	**98**	**22.762**	ug/L	0.503	2	4	15035	1	KED
	Cd	**111**	**25.855**	ug/L	0.671	2	3	4950	1	KED
	Cd	**114**	**26.155**	ug/L	0.276	1	0	13241	1	KED
>	**In**	**115**		ug/L			852951	858493	5	Standard
	Ag	**107**	**27.665**	ug/L	1.583	5	143	365514	3	Standard
	Ba	**135**	**27.202**	ug/L	1.657	6	14	104859	0	Standard
	Ba	**137**	**26.842**	ug/L	1.695	6	26	180267	1	Standard
>	**Tb**	**159**		ug/L			1107766	1143675	0	Standard
	Tl	**205**	**26.305**	ug/L	0.634	2	18	833631	2	Standard
	Pb	**208**	**27.849**	ug/L	0.267	0	188	1116785	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0126-01
Sample Dil Factor: 2
Comments:
Sample Date/Time: Wednesday, October 10, 2018 16:59:39
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	275292	4	Standard
	Cl	**37**		ug/L			3677416	4425538	0	Standard
>	**Sc**	**45**		ug/L			810285	878397	1	Standard
	Cr	**52**	**191.118**	ug/L	4.623	2	13691	2871383	1	Standard
	Cr	**53**	**197.233**	ug/L	3.369	1	129	350330	2	Standard
	Mn	**55**	**58.357**	ug/L	0.827	1	378	1202207	0	Standard
>	**Ge**	**72**		ug/L			42122	42114	1	KED
	Ni	**60**	**13.162**	ug/L	0.702	5	10	9041	5	KED
	Ni	**62**	**12.994**	ug/L	0.357	2	0	1438	1	KED
	Cu	**63**	**4.928**	ug/L	0.176	3	43	9463	2	KED
	Cu	**65**	**4.789**	ug/L	0.232	4	22	4591	4	KED
	Zn	**66**	**189.979**	ug/L	4.712	2	16	46855	1	KED
	Zn	**67**	**179.890**	ug/L	2.020	1	3	7546	1	KED
	As	**75**	**0.272**	ug/L	0.046	16	3	50	14	KED
	Se	**78**	**0.346**	ug/L	0.132	37	5	11	19	KED
	Y	**89**		ug/L			561402	561281	0	Standard
	Kr	**83**		ug/L			45	67	5	Standard
>	**In-1**	**115**		ug/L			12648	12309	1	KED
	Mo	**98**	**2.857**	ug/L	0.036	1	4	1765	2	KED
	Cd	**111**	**0.994**	ug/L	0.054	5	3	180	5	KED
	Cd	**114**	**1.031**	ug/L	0.124	11	0	487	10	KED
>	**In**	**115**		ug/L			852951	815935	2	Standard
	Ag	**107**	**0.109**	ug/L	0.007	6	143	1508	3	Standard
	Ba	**135**	**11.636**	ug/L	0.316	2	14	42708	0	Standard
	Ba	**137**	**11.484**	ug/L	0.305	2	26	73443	1	Standard
>	**Tb**	**159**		ug/L			1107766	1143745	2	Standard
	Tl	**205**	**0.018**	ug/L	0.001	4	18	583	3	Standard
	Pb	**208**	**0.184**	ug/L	0.004	2	188	7570	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0166-01
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 17:04:28
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	39141	6	Standard
	Cl	**37**		ug/L			3677416	12281828	4	Standard
>	**Sc**	**45**		ug/L			810285	893579	1	Standard
	Cr	**52**	**27.111**	ug/L	0.305	1	13691	427380	0	Standard
	Cr	**53**	**36.253**	ug/L	0.883	2	129	65605	1	Standard
	Mn	**55**	**28.833**	ug/L	1.123	3	378	604442	3	Standard
>	**Ge**	**72**		ug/L			42122	40718	4	KED
	Ni	**60**	**17.871**	ug/L	0.806	4	10	11848	1	KED
	Ni	**62**	**17.957**	ug/L	0.983	5	0	1919	1	KED
	Cu	**63**	**27.396**	ug/L	0.623	2	43	50680	5	KED
	Cu	**65**	**27.563**	ug/L	1.100	3	22	25423	1	KED
	Zn	**66**	**60.837**	ug/L	3.139	5	16	14498	0	KED
	Zn	**67**	**57.418**	ug/L	1.596	2	3	2329	2	KED
	As	**75**	**0.537**	ug/L	0.012	2	3	92	3	KED
	Se	**78**	**0.320**	ug/L	0.147	45	5	10	28	KED
	Y	**89**		ug/L			561402	555795	0	Standard
	Kr	**83**		ug/L			45	214	10	Standard
>	**In-1**	**115**		ug/L			12648	12048	0	KED
	Mo	**98**	**3.067**	ug/L	0.055	1	4	1854	2	KED
	Cd	**111**	**5.958**	ug/L	0.342	5	3	1044	5	KED
	Cd	**114**	**6.118**	ug/L	0.270	4	0	2830	5	KED
>	**In**	**115**		ug/L			852951	811024	1	Standard
	Ag	**107**	**0.038**	ug/L	0.004	11	143	616	7	Standard
	Ba	**135**	**13.829**	ug/L	0.470	3	14	50456	1	Standard
	Ba	**137**	**13.975**	ug/L	0.218	1	26	88850	0	Standard
>	**Tb**	**159**		ug/L			1107766	1126797	1	Standard
	Tl	**205**	**0.009**	ug/L	0.001	5	18	306	6	Standard
	Pb	**208**	**1.571**	ug/L	0.020	1	188	62254	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0403-01
Sample Dil Factor: 50
Comments:
Sample Date/Time: Wednesday, October 10, 2018 17:09:18
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	21652	0	Standard
	Cl	**37**		ug/L			3677416	4256181	5	Standard
>	**Sc**	**45**		ug/L			810285	890599	3	Standard
	Cr	**52**	**9.025**	ug/L	0.575	6	13691	151634	2	Standard
	Cr	**53**	**8.946**	ug/L	0.331	3	129	16231	0	Standard
	Mn	**55**	**106.318**	ug/L	7.241	6	378	2216868	3	Standard
>	**Ge**	**72**		ug/L			42122	44410	2	KED
	Ni	**60**	**12.287**	ug/L	0.486	3	10	8894	1	KED
	Ni	**62**	**12.570**	ug/L	0.708	5	0	1466	3	KED
	Cu	**63**	**9.747**	ug/L	0.584	5	43	19677	3	KED
	Cu	**65**	**9.537**	ug/L	0.271	2	22	9622	4	KED
	Zn	**66**	**36.661**	ug/L	2.568	7	16	9539	4	KED
	Zn	**67**	**33.669**	ug/L	0.636	1	3	1492	3	KED
	As	**75**	**1.256**	ug/L	0.072	5	3	229	5	KED
	Se	**78**	**0.578**	ug/L	0.167	28	5	15	19	KED
	Y	**89**		ug/L			561402	634461	2	Standard
	Kr	**83**		ug/L			45	68	10	Standard
>	**In-1**	**115**		ug/L			12648	13705	2	KED
	Mo	**98**	**0.085**	ug/L	0.021	24	4	63	20	KED
	Cd	**111**	**0.035**	ug/L	0.016	44	3	10	31	KED
	Cd	**114**	**0.031**	ug/L	0.028	92	0	16	90	KED
>	**In**	**115**		ug/L			852951	885053	1	Standard
	Ag	**107**	**0.032**	ug/L	0.001	2	143	586	1	Standard
	Ba	**135**	**15.323**	ug/L	0.307	2	14	61025	1	Standard
	Ba	**137**	**15.459**	ug/L	0.109	0	26	107283	1	Standard
>	**Tb**	**159**		ug/L			1107766	1204404	1	Standard
	Tl	**205**	**0.012**	ug/L	0.002	18	18	428	19	Standard
	Pb	**208**	**253.334**	ug/L	3.816	1	188	10695218	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0403-04
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 17:14:07
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	27365	3	Standard
	Cl	37		ug/L			3677416	4130717	1	Standard
>	Sc	45		ug/L			810285	914790	2	Standard
	Cr	52	33.072	ug/L	1.032	3	13691	530050	0	Standard
	Cr	53	32.928	ug/L	1.562	4	129	60999	4	Standard
	Mn	55	480.109	ug/L	3.130	0	378	10298473	2	Standard
>	Ge	72		ug/L			42122	44601	0	KED
	Ni	60	39.537	ug/L	1.058	2	10	28738	2	KED
	Ni	62	37.928	ug/L	0.695	1	0	4447	2	KED
	Cu	63	30.152	ug/L	1.449	4	43	61078	4	KED
	Cu	65	29.463	ug/L	0.630	2	22	29803	2	KED
	Zn	66	77.551	ug/L	1.184	1	16	20268	0	KED
	Zn	67	71.613	ug/L	0.214	0	3	3183	0	KED
	As	75	4.968	ug/L	0.285	5	3	899	5	KED
	Se	78	0.930	ug/L	0.132	14	5	22	11	KED
	Y	89		ug/L			561402	704096	1	Standard
	Kr	83		ug/L			45	64	25	Standard
>	In-1	115		ug/L			12648	13219	0	KED
	Mo	98	0.421	ug/L	0.016	3	4	283	3	KED
	Cd	111	0.080	ug/L	0.013	16	3	18	12	KED
	Cd	114	0.091	ug/L	0.006	6	0	46	6	KED
>	In	115		ug/L			852951	855572	1	Standard
	Ag	107	0.044	ug/L	0.004	8	143	723	6	Standard
	Ba	135	24.290	ug/L	0.337	1	14	93530	2	Standard
	Ba	137	25.083	ug/L	1.215	4	26	168180	3	Standard
>	Tb	159		ug/L			1107766	1184128	0	Standard
	Tl	205	0.036	ug/L	0.005	14	18	1184	12	Standard
	Pb	208	23.624	ug/L	0.310	1	188	980978	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0039-02
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 17:18:57
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	83778	5	Standard
	Cl	**37**		ug/L			3677416	4074293	4	Standard
>	**Sc**	**45**		ug/L			810285	905157	2	Standard
	Cr	**52**	**13.675**	ug/L	0.449	3	13691	225874	1	Standard
	Cr	**53**	**13.220**	ug/L	0.535	4	129	24315	1	Standard
	Mn	**55**	**169.029**	ug/L	5.064	2	378	3586800	2	Standard
>	**Ge**	**72**		ug/L			42122	44899	1	KED
	Ni	**60**	**10.804**	ug/L	0.178	1	10	7913	2	KED
	Ni	**62**	**11.235**	ug/L	0.262	2	0	1326	1	KED
	Cu	**63**	**26.636**	ug/L	0.518	1	43	54328	0	KED
	Cu	**65**	**26.842**	ug/L	0.258	0	22	27335	1	KED
	Zn	**66**	**108.863**	ug/L	1.141	1	16	28640	2	KED
	Zn	**67**	**107.653**	ug/L	6.202	5	3	4814	4	KED
	As	**75**	**2.393**	ug/L	0.052	2	3	438	3	KED
	Se	**78**	**0.481**	ug/L	0.155	32	5	14	20	KED
	Y	**89**		ug/L			561402	643921	3	Standard
	Kr	**83**		ug/L			45	59	35	Standard
>	**In-1**	**115**		ug/L			12648	13106	2	KED
	Mo	**98**	**1.013**	ug/L	0.044	4	4	669	3	KED
	Cd	**111**	**0.120**	ug/L	0.013	10	3	26	8	KED
	Cd	**114**	**0.121**	ug/L	0.024	19	0	61	19	KED
>	**In**	**115**		ug/L			852951	887407	1	Standard
	Ag	**107**	**0.044**	ug/L	0.004	8	143	756	6	Standard
	Ba	**135**	**63.766**	ug/L	1.681	2	14	254555	1	Standard
	Ba	**137**	**63.141**	ug/L	0.680	1	26	439207	0	Standard
>	**Tb**	**159**		ug/L			1107766	1182805	1	Standard
	Tl	**205**	**0.036**	ug/L	0.001	3	18	1189	3	Standard
	Pb	**208**	**25.478**	ug/L	0.450	1	188	1056576	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0078-01
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 17:24:10
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	31258	3	Standard
	Cl	**37**		ug/L			3677416	14213826	4	Standard
>	**Sc**	**45**		ug/L			810285	878097	0	Standard
	Cr	**52**	**35.908**	ug/L	0.606	1	13691	551466	1	Standard
	Cr	**53**	**44.928**	ug/L	0.817	1	129	79873	1	Standard
	Mn	**55**	**6.029**	ug/L	0.098	1	378	124545	1	Standard
>	**Ge**	**72**		ug/L			42122	39222	0	KED
	Ni	**60**	**13.340**	ug/L	0.484	3	10	8532	3	KED
	Ni	**62**	**13.337**	ug/L	0.793	5	0	1375	5	KED
	Cu	**63**	**14.109**	ug/L	0.423	2	43	25157	2	KED
	Cu	**65**	**13.962**	ug/L	0.430	3	22	12433	3	KED
	Zn	**66**	**22.824**	ug/L	0.930	4	16	5256	3	KED
	Zn	**67**	**22.033**	ug/L	1.767	8	3	864	8	KED
	As	**75**	**0.454**	ug/L	0.025	5	3	75	4	KED
	Se	**78**	**0.283**	ug/L	0.076	26	5	9	13	KED
	Y	**89**		ug/L			561402	557309	3	Standard
	Kr	**83**		ug/L			45	281	9	Standard
>	**In-1**	**115**		ug/L			12648	11876	2	KED
	Mo	**98**	**1.181**	ug/L	0.096	8	4	705	5	KED
	Cd	**111**	**1.215**	ug/L	0.077	6	3	212	4	KED
	Cd	**114**	**1.390**	ug/L	0.093	6	0	633	4	KED
>	**In**	**115**		ug/L			852951	816680	4	Standard
	Ag	**107**	**0.010**	ug/L	0.001	9	143	266	6	Standard
	Ba	**135**	**3.397**	ug/L	0.152	4	14	12480	1	Standard
	Ba	**137**	**3.338**	ug/L	0.208	6	26	21360	2	Standard
>	**Tb**	**159**		ug/L			1107766	1147051	2	Standard
	Tl	**205**	**0.007**	ug/L	0.000	4	18	234	5	Standard
	Pb	**208**	**0.492**	ug/L	0.026	5	188	19970	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0207-DUP2
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 17:29:00
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	31122	1	Standard
	Cl	**37**		ug/L			3677416	13649116	4	Standard
>	**Sc**	**45**		ug/L			810285	891254	2	Standard
	Cr	**52**	**36.913**	ug/L	1.057	2	13691	574688	0	Standard
	Cr	**53**	**46.169**	ug/L	1.201	2	129	83275	1	Standard
	Mn	**55**	**6.801**	ug/L	0.250	3	378	142502	3	Standard
>	**Ge**	**72**		ug/L			42122	40557	1	KED
	Ni	**60**	**12.609**	ug/L	0.499	3	10	8337	2	KED
	Ni	**62**	**12.841**	ug/L	0.538	4	0	1368	2	KED
	Cu	**63**	**13.485**	ug/L	0.410	3	43	24864	2	KED
	Cu	**65**	**13.872**	ug/L	0.053	0	22	12770	1	KED
	Zn	**66**	**21.463**	ug/L	1.149	5	16	5110	3	KED
	Zn	**67**	**20.145**	ug/L	0.721	3	3	817	4	KED
	As	**75**	**0.456**	ug/L	0.010	2	3	78	3	KED
	Se	**78**	**0.304**	ug/L	0.099	32	5	9	15	KED
	Y	**89**		ug/L			561402	566995	4	Standard
	Kr	**83**		ug/L			45	316	5	Standard
>	**In-1**	**115**		ug/L			12648	12015	1	KED
	Mo	**98**	**1.176**	ug/L	0.063	5	4	711	4	KED
	Cd	**111**	**1.256**	ug/L	0.060	4	3	221	4	KED
	Cd	**114**	**1.290**	ug/L	0.064	4	0	595	4	KED
>	**In**	**115**		ug/L			852951	840413	0	Standard
	Ag	**107**	**0.013**	ug/L	0.001	9	143	314	4	Standard
	Ba	**135**	**3.248**	ug/L	0.043	1	14	12296	1	Standard
	Ba	**137**	**3.303**	ug/L	0.028	0	26	21786	1	Standard
>	**Tb**	**159**		ug/L			1107766	1150305	2	Standard
	Tl	**205**	**0.006**	ug/L	0.000	2	18	206	1	Standard
	Pb	**208**	**0.491**	ug/L	0.015	2	188	20006	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0207-MS2
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 17:33:49
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	30774	4	Standard
	Cl	**37**		ug/L			3677416	14156775	2	Standard
>	**Sc**	**45**		ug/L			810285	871564	3	Standard
	Cr	**52**	**63.122**	ug/L	0.827	1	13691	950939	2	Standard
	Cr	**53**	**76.008**	ug/L	3.560	4	129	133908	1	Standard
	Mn	**55**	**30.323**	ug/L	0.883	2	378	619787	1	Standard
>	**Ge**	**72**		ug/L			42122	39814	1	KED
	Ni	**60**	**39.852**	ug/L	0.617	1	10	25857	2	KED
	Ni	**62**	**38.865**	ug/L	1.233	3	0	4066	1	KED
	Cu	**63**	**40.189**	ug/L	0.226	0	43	72678	1	KED
	Cu	**65**	**39.595**	ug/L	0.689	1	22	35750	3	KED
	Zn	**66**	**96.615**	ug/L	2.171	2	16	22533	0	KED
	Zn	**67**	**89.526**	ug/L	1.946	2	3	3551	1	KED
	As	**75**	**26.518**	ug/L	0.667	2	3	4271	1	KED
	Se	**78**	**76.634**	ug/L	1.261	1	5	1262	1	KED
	Y	**89**		ug/L			561402	560781	4	Standard
	Kr	**83**		ug/L			45	383	1	Standard
>	**In-1**	**115**		ug/L			12648	12119	4	KED
	Mo	**98**	**28.750**	ug/L	1.523	5	4	17422	2	KED
	Cd	**111**	**24.377**	ug/L	1.621	6	3	4280	2	KED
	Cd	**114**	**24.508**	ug/L	1.741	7	0	11373	2	KED
>	**In**	**115**		ug/L			852951	810489	3	Standard
	Ag	**107**	**23.441**	ug/L	1.259	5	143	292597	3	Standard
	Ba	**135**	**30.908**	ug/L	1.764	5	14	112614	3	Standard
	Ba	**137**	**31.088**	ug/L	1.218	3	26	197399	2	Standard
>	**Tb**	**159**		ug/L			1107766	1128620	2	Standard
	Tl	**205**	**24.307**	ug/L	0.661	2	18	760099	3	Standard
	Pb	**208**	**25.767**	ug/L	0.730	2	188	1019314	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV9
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 17:39:44
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	16970	6	Standard
	Cl	**37**		ug/L			3677416	4294586	2	Standard
>	**Sc**	**45**		ug/L			810285	850248	1	Standard
	Cr	**52**	**52.587**	ug/L	1.544	2	13691	775198	2	Standard
	Cr	**53**	**50.513**	ug/L	1.548	3	129	86915	1	Standard
	Mn	**55**	**51.888**	ug/L	2.036	3	378	1034483	2	Standard
>	**Ge**	**72**		ug/L			42122	44081	2	KED
	Ni	**60**	**50.798**	ug/L	0.725	1	10	36486	2	KED
	Ni	**62**	**48.901**	ug/L	3.454	7	0	5660	4	KED
	Cu	**63**	**50.477**	ug/L	2.380	4	43	101004	3	KED
	Cu	**65**	**49.968**	ug/L	1.186	2	22	49936	3	KED
	Zn	**66**	**51.268**	ug/L	2.567	5	16	13239	2	KED
	Zn	**67**	**50.892**	ug/L	3.819	7	3	2235	6	KED
	As	**75**	**49.991**	ug/L	1.776	3	3	8909	1	KED
	Se	**78**	**51.654**	ug/L	0.910	1	5	944	2	KED
	Y	**89**		ug/L			561402	574678	1	Standard
	Kr	**83**		ug/L			45	55	3	Standard
>	**In-1**	**115**		ug/L			12648	13193	2	KED
	Mo	**98**	**48.658**	ug/L	1.741	3	4	32125	1	KED
	Cd	**111**	**50.940**	ug/L	1.613	3	3	9748	1	KED
	Cd	**114**	**50.391**	ug/L	1.740	3	0	25499	0	KED
>	**In**	**115**		ug/L			852951	872820	0	Standard
	Ag	**107**	**51.609**	ug/L	1.096	2	143	694234	2	Standard
	Ba	**135**	**51.954**	ug/L	2.120	4	14	204045	4	Standard
	Ba	**137**	**51.354**	ug/L	1.620	3	26	351369	2	Standard
>	**Tb**	**159**		ug/L			1107766	1175676	0	Standard
	Tl	**205**	**49.445**	ug/L	1.710	3	18	1610585	2	Standard
	Pb	**208**	**51.816**	ug/L	2.256	4	188	2135558	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB9
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 17:47:18
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	17170	0	Standard
	Cl	**37**		ug/L			3677416	4167768	2	Standard
>	**Sc**	**45**		ug/L			810285	841311	3	Standard
	Cr	**52**	**-0.051**	ug/L	0.041	80	13691	13484	4	Standard
	Cr	**53**	**0.213**	ug/L	0.007	3	129	497	1	Standard
	Mn	**55**	**0.006**	ug/L	0.001	14	378	507	3	Standard
>	**Ge**	**72**		ug/L			42122	43381	3	KED
	Ni	**60**	**0.037**	ug/L	0.011	28	10	36	18	KED
	Ni	**62**	**0.083**	ug/L	0.016	19	0	10	21	KED
	Cu	**63**	**0.007**	ug/L	0.006	86	43	58	19	KED
	Cu	**65**	**0.006**	ug/L	0.005	85	22	29	13	KED
	Zn	**66**	**0.035**	ug/L	0.016	45	16	26	18	KED
	Zn	**67**	**-0.062**	ug/L	0.049	79	3	1	173	KED
	As	**75**	**0.009**	ug/L	0.002	17	3	5	8	KED
	Se	**78**	**0.228**	ug/L	0.082	35	5	9	13	KED
	Y	**89**		ug/L			561402	559667	1	Standard
	Kr	**83**		ug/L			45	60	27	Standard
>	**In-1**	**115**		ug/L			12648	12782	0	KED
	Mo	**98**	**0.032**	ug/L	0.009	29	4	25	23	KED
	Cd	**111**	**-0.009**	ug/L	0.006	68	3	1	69	KED
	Cd	**114**	**0.010**	ug/L	0.004	36	0	5	32	KED
>	**In**	**115**		ug/L			852951	890552	3	Standard
	Ag	**107**	**0.006**	ug/L	0.001	21	143	232	8	Standard
	Ba	**135**	**0.003**	ug/L	0.001	37	14	27	20	Standard
	Ba	**137**	**0.002**	ug/L	0.001	36	26	44	16	Standard
>	**Tb**	**159**		ug/L			1107766	1142466	3	Standard
	Tl	**205**	**0.007**	ug/L	0.001	16	18	250	13	Standard
	Pb	**208**	**0.006**	ug/L	0.001	13	188	431	5	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0343-BLK1
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 17:52:08
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	22810	2	Standard
	Cl	37		ug/L			3677416	4251919	0	Standard
>	Sc	45		ug/L			810285	845716	0	Standard
	Cr	52	-0.012	ug/L	0.031	249	13691	14109	2	Standard
	Cr	53	0.207	ug/L	0.011	5	129	488	4	Standard
	Mn	55	0.088	ug/L	0.001	1	378	2140	0	Standard
>	Ge	72		ug/L			42122	43909	3	KED
	Ni	60	0.060	ug/L	0.020	32	10	53	23	KED
	Ni	62	0.065	ug/L	0.048	74	0	8	70	KED
	Cu	63	0.439	ug/L	0.021	4	43	919	3	KED
	Cu	65	0.444	ug/L	0.013	2	22	466	5	KED
	Zn	66	2.199	ug/L	0.258	11	16	582	12	KED
	Zn	67	2.257	ug/L	0.602	26	3	102	23	KED
	As	75	-0.004	ug/L	0.004	120	3	3	20	KED
	Se	78	0.134	ug/L	0.149	110	5	7	37	KED
	Y	89		ug/L			561402	574458	2	Standard
	Kr	83		ug/L			45	59	3	Standard
>	In-1	115		ug/L			12648	12845	5	KED
	Mo	98	0.024	ug/L	0.003	12	4	20	14	KED
	Cd	111	0.000	ug/L	0.011	10566	3	3	62	KED
	Cd	114	0.004	ug/L	0.006	141	0	2	112	KED
>	In	115		ug/L			852951	887751	1	Standard
	Ag	107	0.004	ug/L	0.001	37	143	200	9	Standard
	Ba	135	0.007	ug/L	0.001	12	14	41	7	Standard
	Ba	137	0.008	ug/L	0.001	12	26	86	7	Standard
>	Tb	159		ug/L			1107766	1180957	2	Standard
	Tl	205	0.016	ug/L	0.001	5	18	529	7	Standard
	Pb	208	0.003	ug/L	0.000	6	188	344	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0343-BS1
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 17:56:57
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	22554	4	Standard
	Cl	37		ug/L			3677416	4135407	1	Standard
>	Sc	45		ug/L			810285	854266	2	Standard
	Cr	52	27.057	ug/L	0.880	3	13691	407628	0	Standard
	Cr	53	26.992	ug/L	0.669	2	129	46729	1	Standard
	Mn	55	27.347	ug/L	0.834	3	378	547941	0	Standard
>	Ge	72		ug/L			42122	44077	1	KED
	Ni	60	26.773	ug/L	0.934	3	10	19235	3	KED
	Ni	62	27.581	ug/L	0.775	2	0	3195	2	KED
	Cu	63	27.867	ug/L	0.592	2	43	55795	1	KED
	Cu	65	28.113	ug/L	0.702	2	22	28099	1	KED
	Zn	66	89.193	ug/L	4.045	4	16	23029	3	KED
	Zn	67	82.454	ug/L	3.739	4	3	3621	3	KED
	As	75	26.585	ug/L	0.271	1	3	4742	1	KED
	Se	78	85.626	ug/L	2.402	2	5	1561	2	KED
	Y	89		ug/L			561402	566741	2	Standard
	Kr	83		ug/L			45	52	19	Standard
>	In-1	115		ug/L			12648	13734	1	KED
	Mo	98	0.002	ug/L	0.009	558	4	6	100	KED
	Cd	111	25.187	ug/L	0.488	1	3	5021	1	KED
	Cd	114	24.948	ug/L	1.060	4	0	13145	2	KED
>	In	115		ug/L			852951	870184	1	Standard
	Ag	107	27.556	ug/L	0.934	3	143	369530	2	Standard
	Ba	135	27.100	ug/L	0.496	1	14	106108	1	Standard
	Ba	137	27.516	ug/L	0.489	1	26	187693	0	Standard
>	Tb	159		ug/L			1107766	1163680	2	Standard
	Tl	205	27.148	ug/L	0.857	3	18	875002	0	Standard
	Pb	208	28.620	ug/L	0.748	2	188	1167340	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0184-01
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 18:01:47
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	1673369	3	Standard
	Cl	37		ug/L			3677416	12743911	1	Standard
>	Sc	45		ug/L			810285	860796	4	Standard
	Cr	52	98.696	ug/L	6.915	7	13691	1457736	3	Standard
	Cr	53	99.974	ug/L	3.207	3	129	173918	1	Standard
	Mn	55	89.417	ug/L	3.847	4	378	1803001	0	Standard
>	Ge	72		ug/L			42122	30436	2	KED
	Ni	60	53.374	ug/L	1.195	2	10	26463	0	KED
	Ni	62	51.331	ug/L	2.543	4	0	4107	5	KED
	Cu	63	10.096	ug/L	0.309	3	43	13974	1	KED
	Cu	65	10.120	ug/L	0.085	0	22	6997	2	KED
	Zn	66	10.382	ug/L	0.448	4	16	1861	2	KED
	Zn	67	17.696	ug/L	1.971	11	3	538	9	KED
	As	75	0.470	ug/L	0.039	8	3	60	9	KED
	Se	78	0.611	ug/L	0.234	38	5	11	24	KED
	Y	89		ug/L			561402	478546	3	Standard
	Kr	83		ug/L			45	156	13	Standard
>	In-1	115		ug/L			12648	9551	5	KED
	Mo	98	1.678	ug/L	0.148	8	4	803	2	KED
	Cd	111	0.032	ug/L	0.028	89	3	6	51	KED
	Cd	114	0.041	ug/L	0.003	6	0	15	9	KED
>	In	115		ug/L			852951	639239	2	Standard
	Ag	107	0.013	ug/L	0.001	7	143	233	5	Standard
	Ba	135	115.617	ug/L	3.112	2	14	332515	3	Standard
	Ba	137	117.849	ug/L	3.439	2	26	590302	0	Standard
>	Tb	159		ug/L			1107766	946316	1	Standard
	Tl	205	0.011	ug/L	0.002	20	18	309	18	Standard
	Pb	208	0.151	ug/L	0.005	3	188	5161	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0191-01
Sample Dil Factor: 2
Comments:
Sample Date/Time: Wednesday, October 10, 2018 18:06:36
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	344340	4	Standard
	Cl	37		ug/L			3677416	4327659	1	Standard
>	Sc	45		ug/L			810285	901453	3	Standard
	Cr	52	405.774	ug/L	18.257	4	13691	6234234	1	Standard
	Cr	53	416.200	ug/L	8.833	2	129	758134	1	Standard
	Mn	55	85.233	ug/L	3.665	4	378	1800547	2	Standard
>	Ge	72		ug/L			42122	40923	0	KED
	Ni	60	14.414	ug/L	0.368	2	10	9618	2	KED
	Ni	62	13.910	ug/L	0.557	4	0	1496	3	KED
	Cu	63	8.616	ug/L	0.137	1	43	16049	2	KED
	Cu	65	8.539	ug/L	0.148	1	22	7941	2	KED
	Zn	66	286.505	ug/L	9.868	3	16	68654	2	KED
	Zn	67	263.388	ug/L	14.439	5	3	10731	4	KED
	As	75	0.362	ug/L	0.040	11	3	63	9	KED
	Se	78	0.338	ug/L	0.124	36	5	10	18	KED
	Y	89		ug/L			561402	552597	2	Standard
	Kr	83		ug/L			45	60	16	Standard
>	In-1	115		ug/L			12648	11837	1	KED
	Mo	98	2.452	ug/L	0.028	1	4	1457	0	KED
	Cd	111	2.098	ug/L	0.109	5	3	363	5	KED
	Cd	114	2.152	ug/L	0.122	5	0	977	4	KED
>	In	115		ug/L			852951	788698	2	Standard
	Ag	107	0.521	ug/L	0.005	0	143	6460	2	Standard
	Ba	135	11.522	ug/L	0.285	2	14	40890	2	Standard
	Ba	137	11.469	ug/L	0.357	3	26	70899	1	Standard
>	Tb	159		ug/L			1107766	1116311	1	Standard
	Tl	205	0.003	ug/L	0.000	9	18	116	9	Standard
	Pb	208	0.398	ug/L	0.007	1	188	15781	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0191-01RE1
Sample Dil Factor: 10
Comments:
Sample Date/Time: Wednesday, October 10, 2018 18:14:45
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	84570	4	Standard
	Cl	**37**		ug/L			3677416	4298962	2	Standard
>	**Sc**	**45**		ug/L			810285	851940	2	Standard
	Cr	**52**	**93.261**	ug/L	4.199	4	13691	1366020	3	Standard
	Cr	**53**	**90.287**	ug/L	0.554	0	129	155596	2	Standard
	Mn	**55**	**19.716**	ug/L	0.666	3	378	394177	3	Standard
>	**Ge**	**72**		ug/L			42122	43764	1	KED
	Ni	**60**	**2.956**	ug/L	0.153	5	10	2118	6	KED
	Ni	**62**	**3.193**	ug/L	0.295	9	0	368	10	KED
	Cu	**63**	**1.815**	ug/L	0.038	2	43	3651	1	KED
	Cu	**65**	**1.762**	ug/L	0.075	4	22	1771	4	KED
	Zn	**66**	**64.829**	ug/L	2.332	3	16	16635	5	KED
	Zn	**67**	**61.621**	ug/L	0.608	0	3	2688	0	KED
	As	**75**	**0.066**	ug/L	0.018	27	3	15	19	KED
	Se	**78**	**0.199**	ug/L	0.268	134	5	8	53	KED
	Y	**89**		ug/L			561402	559171	0	Standard
	Kr	**83**		ug/L			45	52	11	Standard
>	**In-1**	**115**		ug/L			12648	12506	2	KED
	Mo	**98**	**0.477**	ug/L	0.045	9	4	303	9	KED
	Cd	**111**	**0.410**	ug/L	0.031	7	3	77	7	KED
	Cd	**114**	**0.491**	ug/L	0.018	3	0	236	3	KED
>	**In**	**115**		ug/L			852951	836351	1	Standard
	Ag	**107**	**0.101**	ug/L	0.005	4	143	1436	4	Standard
	Ba	**135**	**2.392**	ug/L	0.044	1	14	9015	1	Standard
	Ba	**137**	**2.322**	ug/L	0.042	1	26	15246	0	Standard
>	**Tb**	**159**		ug/L			1107766	1173678	0	Standard
	Tl	**205**	**0.001**	ug/L	0.000	3	18	67	1	Standard
	Pb	**208**	**0.081**	ug/L	0.001	1	188	3544	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0104-02
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 18:19:35
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	43677	3	Standard
	Cl	37		ug/L			3677416	4410798	3	Standard
>	Sc	45		ug/L			810285	862711	0	Standard
	Cr	52	22.118	ug/L	0.372	1	13691	339347	1	Standard
	Cr	53	22.446	ug/L	0.683	3	129	39273	2	Standard
	Mn	55	66.626	ug/L	1.111	1	378	1348091	1	Standard
>	Ge	72		ug/L			42122	36468	3	KED
	Ni	60	9.675	ug/L	0.453	4	10	5752	3	KED
	Ni	62	9.192	ug/L	0.175	1	0	881	1	KED
	Cu	63	5.528	ug/L	0.324	5	43	9178	3	KED
	Cu	65	5.678	ug/L	0.193	3	22	4710	3	KED
	Zn	66	11.128	ug/L	0.486	4	16	2388	1	KED
	Zn	67	10.616	ug/L	0.961	9	3	387	5	KED
	As	75	0.148	ug/L	0.017	11	3	25	8	KED
	Se	78	0.626	ug/L	0.136	21	5	13	14	KED
	Y	89		ug/L			561402	536394	3	Standard
	Kr	83		ug/L			45	58	18	Standard
>	In-1	115		ug/L			12648	11089	3	KED
	Mo	98	9.644	ug/L	0.108	1	4	5356	2	KED
	Cd	111	0.014	ug/L	0.020	142	3	5	65	KED
	Cd	114	0.037	ug/L	0.006	17	0	16	13	KED
>	In	115		ug/L			852951	734440	1	Standard
	Ag	107	0.013	ug/L	0.001	9	143	271	6	Standard
	Ba	135	1.314	ug/L	0.025	1	14	4352	1	Standard
	Ba	137	1.295	ug/L	0.027	2	26	7476	1	Standard
>	Tb	159		ug/L			1107766	1062769	1	Standard
	Tl	205	0.003	ug/L	0.000	17	18	97	14	Standard
	Pb	208	0.032	ug/L	0.002	5	188	1367	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0104-03
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 18:24:24
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	42996	2	Standard
	Cl	37		ug/L			3677416	4481634	4	Standard
>	Sc	45		ug/L			810285	903185	2	Standard
	Cr	52	155.147	ug/L	1.069	0	13691	2400038	1	Standard
	Cr	53	157.967	ug/L	3.241	2	129	288481	2	Standard
	Mn	55	65.901	ug/L	1.367	2	378	1396009	2	Standard
>	Ge	72		ug/L			42122	36824	0	KED
	Ni	60	11.916	ug/L	0.169	1	10	7156	0	KED
	Ni	62	11.376	ug/L	0.517	4	0	1101	4	KED
	Cu	63	7.183	ug/L	0.064	0	43	12046	1	KED
	Cu	65	7.232	ug/L	0.122	1	22	6054	0	KED
	Zn	66	18.508	ug/L	0.179	0	16	4005	0	KED
	Zn	67	17.557	ug/L	0.400	2	3	646	2	KED
	As	75	0.134	ug/L	0.022	16	3	23	13	KED
	Se	78	0.427	ug/L	0.049	11	5	10	6	KED
	Y	89		ug/L			561402	539214	1	Standard
	Kr	83		ug/L			45	62	15	Standard
>	In-1	115		ug/L			12648	10845	5	KED
	Mo	98	11.044	ug/L	0.653	5	4	5987	1	KED
	Cd	111	0.024	ug/L	0.026	107	3	6	65	KED
	Cd	114	0.027	ug/L	0.009	31	0	11	24	KED
>	In	115		ug/L			852951	745623	2	Standard
	Ag	107	0.011	ug/L	0.001	8	143	249	2	Standard
	Ba	135	1.243	ug/L	0.010	0	14	4181	2	Standard
	Ba	137	1.264	ug/L	0.041	3	26	7408	1	Standard
>	Tb	159		ug/L			1107766	1082969	1	Standard
	Tl	205	0.003	ug/L	0.001	18	18	100	13	Standard
	Pb	208	0.154	ug/L	0.004	2	188	6022	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0104-01
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 18:29:14
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	38870	4	Standard
	Cl	37		ug/L			3677416	4377497	5	Standard
>	Sc	45		ug/L			810285	882278	2	Standard
	Cr	52	67.230	ug/L	2.165	3	13691	1023926	0	Standard
	Cr	53	66.356	ug/L	1.160	1	129	118442	1	Standard
	Mn	55	25.213	ug/L	0.987	3	378	521773	2	Standard
>	Ge	72		ug/L			42122	37475	1	KED
	Ni	60	4.061	ug/L	0.148	3	10	2487	2	KED
	Ni	62	3.902	ug/L	0.271	6	0	384	6	KED
	Cu	63	4.745	ug/L	0.193	4	43	8110	4	KED
	Cu	65	4.821	ug/L	0.168	3	22	4113	2	KED
	Zn	66	12.330	ug/L	0.080	0	16	2720	0	KED
	Zn	67	12.028	ug/L	1.165	9	3	452	9	KED
	As	75	0.101	ug/L	0.024	23	3	18	20	KED
	Se	78	0.342	ug/L	0.132	38	5	9	20	KED
	Y	89		ug/L			561402	529652	1	Standard
	Kr	83		ug/L			45	62	23	Standard
>	In-1	115		ug/L			12648	11084	2	KED
	Mo	98	7.386	ug/L	0.273	3	4	4101	1	KED
	Cd	111	0.003	ug/L	0.009	373	3	3	45	KED
	Cd	114	0.021	ug/L	0.007	31	0	9	31	KED
>	In	115		ug/L			852951	757297	0	Standard
	Ag	107	0.012	ug/L	0.003	26	143	262	13	Standard
	Ba	135	1.061	ug/L	0.021	1	14	3627	2	Standard
	Ba	137	1.076	ug/L	0.024	2	26	6412	2	Standard
>	Tb	159		ug/L			1107766	1083236	2	Standard
	Tl	205	0.003	ug/L	0.001	40	18	104	31	Standard
	Pb	208	0.064	ug/L	0.002	3	188	2617	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0343-DUP1
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 18:34:03
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	39510	5	Standard
	Cl	37		ug/L			3677416	4405181	3	Standard
>	Sc	45		ug/L			810285	880613	4	Standard
	Cr	52	67.112	ug/L	2.619	3	13691	1019629	1	Standard
	Cr	53	66.616	ug/L	3.636	5	129	118527	1	Standard
	Mn	55	25.095	ug/L	0.872	3	378	518062	1	Standard
>	Ge	72		ug/L			42122	37463	1	KED
	Ni	60	4.334	ug/L	0.079	1	10	2653	1	KED
	Ni	62	4.213	ug/L	0.179	4	0	415	2	KED
	Cu	63	4.633	ug/L	0.115	2	43	7916	1	KED
	Cu	65	4.658	ug/L	0.044	0	22	3974	1	KED
	Zn	66	12.974	ug/L	0.462	3	16	2860	3	KED
	Zn	67	11.505	ug/L	0.300	2	3	432	1	KED
	As	75	0.146	ug/L	0.045	31	3	25	25	KED
	Se	78	0.282	ug/L	0.110	38	5	8	18	KED
	Y	89		ug/L			561402	541201	3	Standard
	Kr	83		ug/L			45	59	20	Standard
>	In-1	115		ug/L			12648	11207	1	KED
	Mo	98	6.985	ug/L	0.391	5	4	3924	6	KED
	Cd	111	0.012	ug/L	0.006	48	3	4	20	KED
	Cd	114	0.016	ug/L	0.014	91	0	7	85	KED
>	In	115		ug/L			852951	758502	2	Standard
	Ag	107	0.012	ug/L	0.002	20	143	262	7	Standard
	Ba	135	1.067	ug/L	0.036	3	14	3651	1	Standard
	Ba	137	1.064	ug/L	0.044	4	26	6346	1	Standard
>	Tb	159		ug/L			1107766	1119983	1	Standard
	Tl	205	0.003	ug/L	0.000	11	18	100	7	Standard
	Pb	208	0.062	ug/L	0.004	6	188	2619	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0343-MS1
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 18:38:53
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	39720	3	Standard
	Cl	37		ug/L			3677416	4468576	1	Standard
>	Sc	45		ug/L			810285	890945	1	Standard
	Cr	52	88.941	ug/L	0.821	0	13691	1363810	2	Standard
	Cr	53	90.558	ug/L	2.002	2	129	163193	1	Standard
	Mn	55	49.239	ug/L	0.606	1	378	1029116	2	Standard
>	Ge	72		ug/L			42122	37512	1	KED
	Ni	60	31.102	ug/L	0.411	1	10	19018	3	KED
	Ni	62	30.626	ug/L	1.169	3	0	3020	4	KED
	Cu	63	31.615	ug/L	1.053	3	43	53853	1	KED
	Cu	65	32.116	ug/L	0.215	0	22	27318	1	KED
	Zn	66	90.006	ug/L	0.381	0	16	19783	1	KED
	Zn	67	83.745	ug/L	2.110	2	3	3129	0	KED
	As	75	26.226	ug/L	0.772	2	3	3980	1	KED
	Se	78	80.425	ug/L	0.228	0	5	1248	2	KED
	Y	89		ug/L			561402	534885	4	Standard
	Kr	83		ug/L			45	74	11	Standard
>	In-1	115		ug/L			12648	11139	2	KED
	Mo	98	7.361	ug/L	0.273	3	4	4107	2	KED
	Cd	111	23.757	ug/L	0.505	2	3	3841	0	KED
	Cd	114	24.285	ug/L	0.541	2	0	10380	1	KED
>	In	115		ug/L			852951	752647	1	Standard
	Ag	107	25.026	ug/L	0.350	1	143	290324	0	Standard
	Ba	135	27.996	ug/L	0.224	0	14	94810	0	Standard
	Ba	137	28.322	ug/L	0.378	1	26	167090	0	Standard
>	Tb	159		ug/L			1107766	1104846	4	Standard
	Tl	205	26.525	ug/L	1.523	5	18	810937	3	Standard
	Pb	208	27.223	ug/L	0.826	3	188	1053677	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCVA
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 18:44:47
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	18322	2	Standard
	Cl	**37**		ug/L			3677416	4218746	2	Standard
>	**Sc**	**45**		ug/L			810285	868593	2	Standard
	Cr	**52**	**50.672**	ug/L	2.383	4	13691	763158	2	Standard
	Cr	**53**	**49.938**	ug/L	2.566	5	129	87772	4	Standard
	Mn	**55**	**51.902**	ug/L	1.903	3	378	1056791	0	Standard
>	**Ge**	**72**		ug/L			42122	43099	2	KED
	Ni	**60**	**51.037**	ug/L	1.647	3	10	35821	0	KED
	Ni	**62**	**50.565**	ug/L	0.850	1	0	5728	2	KED
	Cu	**63**	**52.259**	ug/L	1.209	2	43	102325	4	KED
	Cu	**65**	**51.474**	ug/L	2.513	4	22	50278	4	KED
	Zn	**66**	**51.292**	ug/L	2.349	4	16	12951	2	KED
	Zn	**67**	**54.264**	ug/L	0.386	0	3	2332	3	KED
	As	**75**	**50.954**	ug/L	0.902	1	3	8881	2	KED
	Se	**78**	**51.214**	ug/L	0.349	0	5	915	2	KED
	Y	**89**		ug/L			561402	577526	1	Standard
	Kr	**83**		ug/L			45	58	21	Standard
>	**In-1**	**115**		ug/L			12648	12984	2	KED
	Mo	**98**	**48.307**	ug/L	1.430	2	4	31394	1	KED
	Cd	**111**	**49.737**	ug/L	1.295	2	3	9369	0	KED
	Cd	**114**	**48.565**	ug/L	1.306	2	0	24191	0	KED
>	**In**	**115**		ug/L			852951	848399	1	Standard
	Ag	**107**	**50.729**	ug/L	3.109	6	143	663079	5	Standard
	Ba	**135**	**51.859**	ug/L	1.389	2	14	197923	1	Standard
	Ba	**137**	**50.470**	ug/L	0.763	1	26	335622	0	Standard
>	**Tb**	**159**		ug/L			1107766	1177474	1	Standard
	Tl	**205**	**51.866**	ug/L	1.487	2	18	1691794	1	Standard
	Pb	**208**	**54.949**	ug/L	0.647	1	188	2268316	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCBA
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 18:52:22
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	18268	2	Standard
	Cl	**37**		ug/L			3677416	4116533	1	Standard
⌈>	**Sc**	**45**		ug/L			810285	836090	4	Standard
|	**Cr**	**52**	**-0.075**	ug/L	0.051	68	13691	13050	4	Standard
|	**Cr**	**53**	**0.061**	ug/L	0.014	23	129	235	6	Standard
⌊	**Mn**	**55**	**0.004**	ug/L	0.001	30	378	474	3	Standard
⌈>	**Ge**	**72**		ug/L			42122	43981	1	KED
|	**Ni**	**60**	**0.003**	ug/L	0.004	133	10	12	22	KED
|	**Ni**	**62**	**0.021**	ug/L	0.034	156	0	3	124	KED
|	**Cu**	**63**	**0.005**	ug/L	0.007	130	43	56	23	KED
|	**Cu**	**65**	**0.007**	ug/L	0.008	110	22	31	24	KED
|	**Zn**	**66**	**0.029**	ug/L	0.020	66	16	24	20	KED
|	**Zn**	**67**	**-0.019**	ug/L	0.089	460	3	3	124	KED
|	**As**	**75**	**0.006**	ug/L	0.008	122	3	5	24	KED
⌊	**Se**	**78**	**0.147**	ug/L	0.082	55	5	7	18	KED
	Y	**89**		ug/L			561402	549121	1	Standard
	Kr	**83**		ug/L			45	59	9	Standard
⌈>	**In-1**	**115**		ug/L			12648	13441	1	KED
|	**Mo**	**98**	**0.032**	ug/L	0.013	39	4	26	32	KED
|	**Cd**	**111**	**-0.006**	ug/L	0.003	49	3	2	24	KED
⌊	**Cd**	**114**	**0.002**	ug/L	0.003	175	0	1	109	KED
⌈>	**In**	**115**		ug/L			852951	858906	5	Standard
|	**Ag**	**107**	**0.007**	ug/L	0.002	30	143	238	7	Standard
|	**Ba**	**135**	**0.001**	ug/L	0.001	94	14	19	20	Standard
⌊	**Ba**	**137**	**0.002**	ug/L	0.001	36	26	38	7	Standard
⌈>	**Tb**	**159**		ug/L			1107766	1154629	3	Standard
|	**Tl**	**205**	**0.007**	ug/L	0.001	18	18	245	14	Standard
⌊	**Pb**	**208**	**0.005**	ug/L	0.001	17	188	396	5	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0258-BLK2
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 18:58:15
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	24575	4	Standard
	Cl	**37**		ug/L			3677416	4131829	2	Standard
>	**Sc**	**45**		ug/L			810285	858676	4	Standard
	Cr	**52**	**-0.031**	ug/L	0.039	122	13691	14032	0	Standard
	Cr	**53**	**0.092**	ug/L	0.009	9	129	297	8	Standard
	Mn	**55**	**0.062**	ug/L	0.002	3	378	1643	2	Standard
>	**Ge**	**72**		ug/L			42122	43306	1	KED
	Ni	**60**	**0.021**	ug/L	0.009	40	10	25	22	KED
	Ni	**62**	**0.049**	ug/L	0.068	138	0	6	124	KED
	Cu	**63**	**0.054**	ug/L	0.009	17	43	151	13	KED
	Cu	**65**	**0.058**	ug/L	0.008	14	22	80	9	KED
	Zn	**66**	**2.561**	ug/L	0.270	10	16	666	9	KED
	Zn	**67**	**2.501**	ug/L	0.038	1	3	111	0	KED
	As	**75**	**0.007**	ug/L	0.011	166	3	5	36	KED
	Se	**78**	**0.231**	ug/L	0.080	34	5	9	15	KED
	Y	**89**		ug/L			561402	580907	2	Standard
	Kr	**83**		ug/L			45	51	13	Standard
>	**In-1**	**115**		ug/L			12648	13004	9	KED
	Mo	**98**	**0.022**	ug/L	0.006	27	4	18	10	KED
	Cd	**111**	**-0.001**	ug/L	0.016	1304	3	2	88	KED
	Cd	**114**	**0.011**	ug/L	0.001	10	0	6	17	KED
>	**In**	**115**		ug/L			852951	874025	4	Standard
	Ag	**107**	**0.003**	ug/L	0.002	58	143	191	10	Standard
	Ba	**135**	**0.006**	ug/L	0.004	60	14	38	32	Standard
	Ba	**137**	**0.007**	ug/L	0.001	17	26	73	10	Standard
>	**Tb**	**159**		ug/L			1107766	1177038	1	Standard
	Tl	**205**	**0.017**	ug/L	0.001	3	18	570	3	Standard
	Pb	**208**	**0.005**	ug/L	0.000	8	188	393	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0258-BS2
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 19:03:05
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	24753	0	Standard
	Cl	**37**		ug/L			3677416	4186471	4	Standard
>	**Sc**	**45**		ug/L			810285	862268	2	Standard
	Cr	**52**	**25.957**	ug/L	0.711	2	13691	395546	4	Standard
	Cr	**53**	**25.158**	ug/L	0.195	0	129	43977	1	Standard
	Mn	**55**	**27.345**	ug/L	1.032	3	378	552964	1	Standard
>	**Ge**	**72**		ug/L			42122	43785	3	KED
	Ni	**60**	**26.317**	ug/L	0.698	2	10	18790	5	KED
	Ni	**62**	**25.357**	ug/L	0.904	3	0	2917	1	KED
	Cu	**63**	**25.705**	ug/L	0.895	3	43	51125	3	KED
	Cu	**65**	**27.504**	ug/L	0.832	3	22	27297	1	KED
	Zn	**66**	**85.015**	ug/L	0.844	0	16	21809	2	KED
	Zn	**67**	**84.569**	ug/L	3.416	4	3	3690	4	KED
	As	**75**	**25.522**	ug/L	0.579	2	3	4520	0	KED
	Se	**78**	**80.438**	ug/L	2.168	2	5	1458	5	KED
	Y	**89**		ug/L			561402	571792	0	Standard
	Kr	**83**		ug/L			45	64	7	Standard
>	**In-1**	**115**		ug/L			12648	13212	2	KED
	Mo	**98**	**0.005**	ug/L	0.006	125	4	7	48	KED
	Cd	**111**	**25.214**	ug/L	0.389	1	3	4835	1	KED
	Cd	**114**	**24.638**	ug/L	0.101	0	0	12493	1	KED
>	**In**	**115**		ug/L			852951	878224	2	Standard
	Ag	**107**	**26.004**	ug/L	0.550	2	143	351933	0	Standard
	Ba	**135**	**25.486**	ug/L	0.643	2	14	100700	2	Standard
	Ba	**137**	**26.060**	ug/L	0.460	1	26	179403	1	Standard
>	**Tb**	**159**		ug/L			1107766	1183864	1	Standard
	Tl	**205**	**26.933**	ug/L	0.731	2	18	883256	1	Standard
	Pb	**208**	**28.387**	ug/L	1.094	3	188	1177779	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0088-04
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 19:07:54
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	37929	3	Standard
	Cl	37		ug/L			3677416	4207470	3	Standard
>	Sc	45		ug/L			810285	882171	2	Standard
	Cr	52	0.867	ug/L	0.050	5	13691	27918	1	Standard
	Cr	53	1.095	ug/L	0.043	3	129	2091	1	Standard
	Mn	55	56.586	ug/L	1.365	2	378	1170590	1	Standard
>	Ge	72		ug/L			42122	43817	1	KED
	Ni	60	2.144	ug/L	0.033	1	10	1541	0	KED
	Ni	62	2.107	ug/L	0.079	3	0	243	1	KED
	Cu	63	17.363	ug/L	0.137	0	43	34582	2	KED
	Cu	65	17.267	ug/L	0.624	3	22	17169	4	KED
	Zn	66	40.189	ug/L	1.505	3	16	10323	1	KED
	Zn	67	38.292	ug/L	2.478	6	3	1673	4	KED
	As	75	3.219	ug/L	0.069	2	3	574	0	KED
	Se	78	0.257	ug/L	0.118	45	5	9	19	KED
	Y	89		ug/L			561402	574318	1	Standard
	Kr	83		ug/L			45	55	36	Standard
>	In-1	115		ug/L			12648	12832	4	KED
	Mo	98	12.220	ug/L	0.749	6	4	7840	1	KED
	Cd	111	0.174	ug/L	0.017	9	3	35	11	KED
	Cd	114	0.158	ug/L	0.013	8	0	78	5	KED
>	In	115		ug/L			852951	849282	0	Standard
	Ag	107	0.020	ug/L	0.001	2	143	407	2	Standard
	Ba	135	11.489	ug/L	0.193	1	14	43912	1	Standard
	Ba	137	11.110	ug/L	0.411	3	26	73981	3	Standard
>	Tb	159		ug/L			1107766	1185476	0	Standard
	Tl	205	0.015	ug/L	0.001	4	18	503	3	Standard
	Pb	208	0.971	ug/L	0.011	1	188	40546	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0170-01
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 19:12:44
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	61482	2	Standard
	Cl	**37**		ug/L			3677416	4663765	0	Standard
>	**Sc**	**45**		ug/L			810285	1012697	2	Standard
	Cr	**52**	**0.085**	ug/L	0.062	72	13691	18559	3	Standard
	Cr	**53**	**0.850**	ug/L	0.034	3	129	1901	1	Standard
	Mn	**55**	**31.684**	ug/L	0.348	1	378	752681	1	Standard
>	**Ge**	**72**		ug/L			42122	40939	1	KED
	Ni	**60**	**2.071**	ug/L	0.114	5	10	1390	4	KED
	Ni	**62**	**2.136**	ug/L	0.032	1	0	230	2	KED
	Cu	**63**	**19.344**	ug/L	0.300	1	43	35987	1	KED
	Cu	**65**	**19.814**	ug/L	0.104	0	22	18402	1	KED
	Zn	**66**	**26.967**	ug/L	1.346	4	16	6478	4	KED
	Zn	**67**	**24.892**	ug/L	1.575	6	3	1017	5	KED
	As	**75**	**2.545**	ug/L	0.081	3	3	425	1	KED
	Se	**78**	**0.374**	ug/L	0.090	24	5	11	14	KED
	Y	**89**		ug/L			561402	551184	4	Standard
	Kr	**83**		ug/L			45	63	14	Standard
>	**In-1**	**115**		ug/L			12648	11477	2	KED
	Mo	**98**	**1.219**	ug/L	0.170	13	4	703	11	KED
	Cd	**111**	**0.071**	ug/L	0.110	155	3	14	123	KED
	Cd	**114**	**0.062**	ug/L	0.095	151	0	27	148	KED
>	**In**	**115**		ug/L			852951	830267	2	Standard
	Ag	**107**	**0.013**	ug/L	0.002	18	143	307	7	Standard
	Ba	**135**	**4.370**	ug/L	0.211	4	14	16326	2	Standard
	Ba	**137**	**4.402**	ug/L	0.121	2	26	28667	2	Standard
>	**Tb**	**159**		ug/L			1107766	1136651	3	Standard
	Tl	**205**	**0.006**	ug/L	0.000	8	18	194	8	Standard
	Pb	**208**	**3.391**	ug/L	0.077	2	188	135275	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0426-01
Sample Dil Factor: 5
Comments:
Sample Date/Time: Wednesday, October 10, 2018 19:17:34
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	26069	2	Standard
	Cl	**37**		ug/L			3677416	12197920	0	Standard
>	**Sc**	**45**		ug/L			810285	814272	2	Standard
	Cr	**52**	**2.240**	ug/L	0.047	2	13691	44785	1	Standard
	Cr	**53**	**19.424**	ug/L	0.461	2	129	32085	0	Standard
	Mn	**55**	**17.936**	ug/L	0.493	2	378	342683	1	Standard
>	**Ge**	**72**		ug/L			42122	37375	0	KED
	Ni	**60**	**0.165**	ug/L	0.044	26	10	109	24	KED
	Ni	**62**	**0.324**	ug/L	0.033	10	0	32	10	KED
	Cu	**63**	**0.136**	ug/L	0.001	0	43	269	0	KED
	Cu	**65**	**0.141**	ug/L	0.012	8	22	139	6	KED
	Zn	**66**	**43.352**	ug/L	1.744	4	16	9502	4	KED
	Zn	**67**	**39.344**	ug/L	0.663	1	3	1467	1	KED
	As	**75**	**0.271**	ug/L	0.021	7	3	44	7	KED
	Se	**78**	**0.644**	ug/L	0.156	24	5	14	16	KED
	Y	**89**		ug/L			561402	539353	1	Standard
	Kr	**83**		ug/L			45	216	7	Standard
>	**In-1**	**115**		ug/L			12648	11478	3	KED
	Mo	**98**	**0.062**	ug/L	0.019	30	4	39	26	KED
	Cd	**111**	**0.000**	ug/L	0.011	16185	3	2	57	KED
	Cd	**114**	**0.017**	ug/L	0.016	94	0	7	85	KED
>	**In**	**115**		ug/L			852951	758377	1	Standard
	Ag	**107**	**0.005**	ug/L	0.000	10	143	184	4	Standard
	Ba	**135**	**12.299**	ug/L	0.270	2	14	41969	0	Standard
	Ba	**137**	**12.377**	ug/L	0.224	1	26	73585	0	Standard
>	**Tb**	**159**		ug/L			1107766	1071169	2	Standard
	Tl	**205**	**0.003**	ug/L	0.000	8	18	101	9	Standard
	Pb	**208**	**0.061**	ug/L	0.003	4	188	2468	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0426-02
Sample Dil Factor: 5
Comments:
Sample Date/Time: Wednesday, October 10, 2018 19:22:23
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	31889	5	Standard
	Cl	**37**		ug/L			3677416	22103958	6	Standard
>	**Sc**	**45**		ug/L			810285	845493	2	Standard
	Cr	**52**	**2.141**	ug/L	0.064	2	13691	45078	0	Standard
	Cr	**53**	**31.269**	ug/L	0.568	1	129	53556	0	Standard
	Mn	**55**	**33.570**	ug/L	0.685	2	378	665778	1	Standard
>	**Ge**	**72**		ug/L			42122	39171	0	KED
	Ni	**60**	**0.084**	ug/L	0.019	22	10	62	18	KED
	Ni	**62**	**0.488**	ug/L	0.049	10	0	50	9	KED
	Cu	**63**	**0.117**	ug/L	0.017	14	43	248	12	KED
	Cu	**65**	**0.101**	ug/L	0.026	26	22	111	20	KED
	Zn	**66**	**2.944**	ug/L	0.236	8	16	690	8	KED
	Zn	**67**	**3.443**	ug/L	0.217	6	3	137	5	KED
	As	**75**	**0.175**	ug/L	0.021	11	3	31	9	KED
	Se	**78**	**0.677**	ug/L	0.097	14	5	15	9	KED
	Y	**89**		ug/L			561402	536535	2	Standard
	Kr	**83**		ug/L			45	631	8	Standard
>	**In-1**	**115**		ug/L			12648	11622	1	KED
	Mo	**98**	**0.026**	ug/L	0.014	52	4	19	40	KED
	Cd	**111**	**0.002**	ug/L	0.012	733	3	3	62	KED
	Cd	**114**	**0.008**	ug/L	0.010	131	0	4	114	KED
>	**In**	**115**		ug/L			852951	769767	2	Standard
	Ag	**107**	**0.002**	ug/L	0.001	75	143	153	12	Standard
	Ba	**135**	**11.847**	ug/L	0.148	1	14	41039	2	Standard
	Ba	**137**	**11.840**	ug/L	0.231	1	26	71446	0	Standard
>	**Tb**	**159**		ug/L			1107766	1095704	1	Standard
	Tl	**205**	**0.001**	ug/L	0.000	30	18	46	18	Standard
	Pb	**208**	**0.022**	ug/L	0.002	8	188	1032	6	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0426-04
Sample Dil Factor: 2
Comments:
Sample Date/Time: Wednesday, October 10, 2018 19:27:13
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	39564	4	Standard
	Cl	**37**		ug/L			3677416	39837377	8	Standard
>	**Sc**	**45**		ug/L			810285	865858	3	Standard
	Cr	**52**	**3.733**	ug/L	0.081	2	13691	69614	2	Standard
	Cr	**53**	**53.697**	ug/L	2.129	3	129	94034	2	Standard
	Mn	**55**	**54.617**	ug/L	2.667	4	378	1108000	1	Standard
>	**Ge**	**72**		ug/L			42122	34599	1	KED
	Ni	**60**	**0.144**	ug/L	0.021	14	10	89	11	KED
	Ni	**62**	**1.397**	ug/L	0.101	7	0	127	7	KED
	Cu	**63**	**0.204**	ug/L	0.021	10	43	356	8	KED
	Cu	**65**	**0.122**	ug/L	0.041	33	22	114	26	KED
	Zn	**66**	**3.366**	ug/L	0.200	5	16	695	7	KED
	Zn	**67**	**4.595**	ug/L	0.474	10	3	161	8	KED
	As	**75**	**0.247**	ug/L	0.030	12	3	37	9	KED
	Se	**78**	**1.159**	ug/L	0.188	16	5	20	11	KED
	Y	**89**		ug/L			561402	508468	3	Standard
	Kr	**83**		ug/L			45	4032	3	Standard
>	**In-1**	**115**		ug/L			12648	10319	2	KED
	Mo	**98**	**0.033**	ug/L	0.019	57	4	20	44	KED
	Cd	**111**	**0.019**	ug/L	0.010	54	3	5	26	KED
	Cd	**114**	**0.013**	ug/L	0.009	69	0	5	64	KED
>	**In**	**115**		ug/L			852951	693626	2	Standard
	Ag	**107**	**0.005**	ug/L	0.001	23	143	169	9	Standard
	Ba	**135**	**20.109**	ug/L	0.669	3	14	62729	0	Standard
	Ba	**137**	**20.069**	ug/L	0.728	3	26	109070	1	Standard
>	**Tb**	**159**		ug/L			1107766	959594	1	Standard
	Tl	**205**	**0.001**	ug/L	0.000	12	18	35	8	Standard
	Pb	**208**	**0.017**	ug/L	0.001	8	188	751	7	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0134-01
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 19:32:02
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	42553	2	Standard
	Cl	**37**		ug/L			3677416	4874934	3	Standard
>	**Sc**	**45**		ug/L			810285	805892	0	Standard
	Cr	**52**	**0.443**	ug/L	0.012	2	13691	19694	1	Standard
	Cr	**53**	**1.431**	ug/L	0.046	3	129	2458	2	Standard
	Mn	**55**	**941.173**	ug/L	6.721	0	378	17785118	0	Standard
>	**Ge**	**72**		ug/L			42122	36837	0	KED
	Ni	**60**	**4.066**	ug/L	0.063	1	10	2449	1	KED
	Ni	**62**	**4.524**	ug/L	0.556	12	0	438	12	KED
	Cu	**63**	**5.988**	ug/L	0.188	3	43	10052	3	KED
	Cu	**65**	**6.140**	ug/L	0.260	4	22	5146	4	KED
	Zn	**66**	**8.306**	ug/L	0.367	4	16	1805	3	KED
	Zn	**67**	**30.854**	ug/L	1.891	6	3	1134	5	KED
	As	**75**	**2.738**	ug/L	0.047	1	3	411	2	KED
	Se	**78**	**0.557**	ug/L	0.015	2	5	12	2	KED
	Y	**89**		ug/L			561402	510875	2	Standard
	Kr	**83**		ug/L			45	148	15	Standard
>	**In-1**	**115**		ug/L			12648	11530	1	KED
	Mo	**98**	**13.449**	ug/L	0.311	2	4	7766	1	KED
	Cd	**111**	**0.023**	ug/L	0.016	68	3	6	37	KED
	Cd	**114**	**0.022**	ug/L	0.014	65	0	10	62	KED
>	**In**	**115**		ug/L			852951	723838	0	Standard
	Ag	**107**	**0.003**	ug/L	0.001	16	143	160	4	Standard
	Ba	**135**	**285.709**	ug/L	5.318	1	14	930540	2	Standard
	Ba	**137**	**284.297**	ug/L	2.813	0	26	1613064	0	Standard
>	**Tb**	**159**		ug/L			1107766	1070587	2	Standard
	Tl	**205**	**0.001**	ug/L	0.000	19	18	52	15	Standard
	Pb	**208**	**0.049**	ug/L	0.003	6	188	2026	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0258-DUP2
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 19:36:52
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	45121	0	Standard
	Cl	**37**		ug/L			3677416	4893224	5	Standard
>	**Sc**	**45**		ug/L			810285	806875	1	Standard
	Cr	**52**	**0.630**	ug/L	0.079	12	13691	22274	3	Standard
	Cr	**53**	**1.403**	ug/L	0.050	3	129	2416	2	Standard
	Mn	**55**	**965.968**	ug/L	21.431	2	378	18271117	0	Standard
>	**Ge**	**72**		ug/L			42122	36219	1	KED
	Ni	**60**	**4.345**	ug/L	0.197	4	10	2571	3	KED
	Ni	**62**	**4.390**	ug/L	0.042	0	0	418	0	KED
	Cu	**63**	**6.465**	ug/L	0.133	2	43	10670	3	KED
	Cu	**65**	**6.586**	ug/L	0.107	1	22	5425	2	KED
	Zn	**66**	**9.401**	ug/L	0.272	2	16	2008	4	KED
	Zn	**67**	**30.029**	ug/L	1.183	3	3	1085	3	KED
	As	**75**	**2.708**	ug/L	0.105	3	3	400	4	KED
	Se	**78**	**0.498**	ug/L	0.267	53	5	11	32	KED
	Y	**89**		ug/L			561402	531275	4	Standard
	Kr	**83**		ug/L			45	126	6	Standard
>	**In-1**	**115**		ug/L			12648	11753	0	KED
	Mo	**98**	**12.822**	ug/L	0.142	1	4	7548	0	KED
	Cd	**111**	**0.024**	ug/L	0.018	74	3	6	43	KED
	Cd	**114**	**0.020**	ug/L	0.004	22	0	9	21	KED
>	**In**	**115**		ug/L			852951	734229	1	Standard
	Ag	**107**	**0.004**	ug/L	0.000	3	143	164	1	Standard
	Ba	**135**	**281.489**	ug/L	2.607	0	14	929852	0	Standard
	Ba	**137**	**275.494**	ug/L	5.858	2	26	1585394	1	Standard
>	**Tb**	**159**		ug/L			1107766	1067568	2	Standard
	Tl	**205**	**0.001**	ug/L	0.000	7	18	44	2	Standard
	Pb	**208**	**0.056**	ug/L	0.001	1	188	2280	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0258-MS2
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 19:41:51
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	44512	6	Standard
	Cl	**37**		ug/L			3677416	4850599	1	Standard
>	**Sc**	**45**		ug/L			810285	842707	1	Standard
	Cr	**52**	**24.734**	ug/L	0.735	2	13691	368859	1	Standard
	Cr	**53**	**25.015**	ug/L	0.371	1	129	42734	0	Standard
	Mn	**55**	**954.295**	ug/L	17.869	1	378	18852963	0	Standard
>	**Ge**	**72**		ug/L			42122	36209	2	KED
	Ni	**60**	**30.325**	ug/L	0.286	0	10	17895	1	KED
	Ni	**62**	**30.437**	ug/L	0.453	1	0	2897	2	KED
	Cu	**63**	**30.588**	ug/L	0.993	3	43	50291	0	KED
	Cu	**65**	**31.133**	ug/L	0.803	2	22	25555	0	KED
	Zn	**66**	**76.762**	ug/L	1.836	2	16	16283	0	KED
	Zn	**67**	**93.492**	ug/L	0.862	0	3	3373	1	KED
	As	**75**	**29.907**	ug/L	1.104	3	3	4379	1	KED
	Se	**78**	**76.490**	ug/L	2.535	3	5	1145	1	KED
	Y	**89**		ug/L			561402	519529	1	Standard
	Kr	**83**		ug/L			45	113	8	Standard
>	**In-1**	**115**		ug/L			12648	11646	2	KED
	Mo	**98**	**13.126**	ug/L	0.376	2	4	7653	0	KED
	Cd	**111**	**22.590**	ug/L	0.442	1	3	3819	2	KED
	Cd	**114**	**21.987**	ug/L	0.560	2	0	9823	0	KED
>	**In**	**115**		ug/L			852951	739942	2	Standard
	Ag	**107**	**23.184**	ug/L	0.303	1	143	264397	1	Standard
	Ba	**135**	**311.295**	ug/L	7.894	2	14	1035970	0	Standard
	Ba	**137**	**301.752**	ug/L	8.702	2	26	1749466	1	Standard
>	**Tb**	**159**		ug/L			1107766	1075487	1	Standard
	Tl	**205**	**24.684**	ug/L	0.201	0	18	735674	1	Standard
	Pb	**208**	**24.077**	ug/L	0.362	1	188	907942	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCVB
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 19:49:25
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	18691	2	Standard
	Cl	**37**		ug/L			3677416	4273245	2	Standard
⌈>	**Sc**	**45**		ug/L			810285	868370	0	Standard
|	**Cr**	**52**	**50.998**	ug/L	1.471	2	13691	768244	1	Standard
|	**Cr**	**53**	**50.934**	ug/L	0.474	0	129	89536	1	Standard
⌊	**Mn**	**55**	**51.064**	ug/L	0.982	1	378	1040020	0	Standard
⌈>	**Ge**	**72**		ug/L			42122	45768	1	KED
|	**Ni**	**60**	**49.841**	ug/L	2.312	4	10	37165	4	KED
|	**Ni**	**62**	**50.348**	ug/L	1.531	3	0	6055	1	KED
|	**Cu**	**63**	**50.256**	ug/L	1.564	3	43	104446	2	KED
|	**Cu**	**65**	**50.524**	ug/L	0.489	0	22	52419	1	KED
|	**Zn**	**66**	**49.789**	ug/L	1.271	2	16	13359	2	KED
|	**Zn**	**67**	**51.177**	ug/L	2.818	5	3	2334	4	KED
|	**As**	**75**	**49.858**	ug/L	0.312	0	3	9230	1	KED
⌊	**Se**	**78**	**50.967**	ug/L	0.912	1	5	967	0	KED
	Y	**89**		ug/L			561402	575351	4	Standard
	Kr	**83**		ug/L			45	48	17	Standard
⌈>	**In-1**	**115**		ug/L			12648	13668	4	KED
|	**Mo**	**98**	**48.977**	ug/L	3.593	7	4	33445	2	KED
|	**Cd**	**111**	**49.752**	ug/L	3.386	6	3	9849	2	KED
⌊	**Cd**	**114**	**49.260**	ug/L	1.389	2	0	25821	2	KED
⌈>	**In**	**115**		ug/L			852951	883292	2	Standard
|	**Ag**	**107**	**50.233**	ug/L	0.933	1	143	683749	2	Standard
|	**Ba**	**135**	**51.956**	ug/L	1.947	3	14	206417	2	Standard
⌊	**Ba**	**137**	**50.906**	ug/L	0.799	1	26	352421	0	Standard
⌈>	**Tb**	**159**		ug/L			1107766	1233847	1	Standard
|	**Tl**	**205**	**49.737**	ug/L	1.665	3	18	1700030	2	Standard
⌊	**Pb**	**208**	**51.402**	ug/L	0.771	1	188	2223543	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCBB
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 19:57:00
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	17591	6	Standard
	Cl	**37**		ug/L			3677416	4267101	3	Standard
>	**Sc**	**45**		ug/L			810285	832827	0	Standard
	Cr	**52**	**-0.039**	ug/L	0.104	265	13691	13522	11	Standard
	Cr	**53**	**0.245**	ug/L	0.100	40	129	546	31	Standard
	Mn	**55**	**1.545**	ug/L	2.582	167	378	30859	165	Standard
>	**Ge**	**72**		ug/L			42122	36484	7	KED
	Ni	**60**	**-0.003**	ug/L	0.001	39	10	6	15	KED
	Ni	**62**	**0.054**	ug/L	0.019	34	0	5	33	KED
	Cu	**63**	**0.008**	ug/L	0.007	88	43	50	26	KED
	Cu	**65**	**0.006**	ug/L	0.006	102	22	24	15	KED
	Zn	**66**	**0.047**	ug/L	0.030	64	16	24	24	KED
	Zn	**67**	**-0.002**	ug/L	0.035	2035	3	3	34	KED
	As	**75**	**-0.001**	ug/L	0.005	870	3	3	14	KED
	Se	**78**	**0.243**	ug/L	0.223	91	5	7	37	KED
	Y	**89**		ug/L			561402	569852	7	Standard
	Kr	**83**		ug/L			45	53	7	Standard
>	**In-1**	**115**		ug/L			12648	12801	1	KED
	Mo	**98**	**0.020**	ug/L	0.012	58	4	17	44	KED
	Cd	**111**	**-0.007**	ug/L	0.005	69	3	1	50	KED
	Cd	**114**	**0.005**	ug/L	0.002	47	0	3	37	KED
>	**In**	**115**		ug/L			852951	866072	1	Standard
	Ag	**107**	**0.058**	ug/L	0.085	145	143	927	123	Standard
	Ba	**135**	**0.387**	ug/L	0.643	166	14	1541	164	Standard
	Ba	**137**	**0.372**	ug/L	0.617	165	26	2580	164	Standard
>	**Tb**	**159**		ug/L			1107766	1156162	5	Standard
	Tl	**205**	**0.056**	ug/L	0.076	136	18	1820	135	Standard
	Pb	**208**	**0.049**	ug/L	0.067	137	188	2178	125	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0277-BLK2
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 20:01:58
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	21352	2	Standard
	Cl	37		ug/L			3677416	4359178	4	Standard
>	Sc	45		ug/L			810285	920066	2	Standard
	Cr	52	-0.048	ug/L	0.023	47	13691	14785	0	Standard
	Cr	53	0.154	ug/L	0.020	13	129	434	10	Standard
	Mn	55	0.043	ug/L	0.009	21	378	1367	16	Standard
>	Ge	72		ug/L			42122	48092	1	KED
	Ni	60	0.008	ug/L	0.003	36	10	17	12	KED
	Ni	62	0.070	ug/L	0.001	1	0	9	0	KED
	Cu	63	0.051	ug/L	0.003	6	43	161	3	KED
	Cu	65	0.050	ug/L	0.012	24	22	80	15	KED
	Zn	66	3.569	ug/L	0.262	7	16	1024	8	KED
	Zn	67	3.075	ug/L	0.491	15	3	151	16	KED
	As	75	0.001	ug/L	0.011	904	3	4	43	KED
	Se	78	0.165	ug/L	0.188	113	5	9	39	KED
	Y	89		ug/L			561402	618131	3	Standard
	Kr	83		ug/L			45	57	20	Standard
>	In-1	115		ug/L			12648	14242	4	KED
	Mo	98	0.004	ug/L	0.005	138	4	8	49	KED
	Cd	111	-0.007	ug/L	0.005	77	3	2	49	KED
	Cd	114	0.007	ug/L	0.002	33	0	4	26	KED
>	In	115		ug/L			852951	961324	1	Standard
	Ag	107	0.003	ug/L	0.002	71	143	210	17	Standard
	Ba	135	0.008	ug/L	0.002	30	14	50	21	Standard
	Ba	137	0.009	ug/L	0.006	63	26	97	44	Standard
>	Tb	159		ug/L			1107766	1298100	1	Standard
	Tl	205	0.005	ug/L	0.002	30	18	217	26	Standard
	Pb	208	0.011	ug/L	0.002	18	188	702	11	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0277-BS2
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 20:06:48
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	20710	5	Standard
	Cl	**37**		ug/L			3677416	4540254	4	Standard
>	**Sc**	**45**		ug/L			810285	940394	1	Standard
	Cr	**52**	**26.305**	ug/L	1.117	4	13691	436784	3	Standard
	Cr	**53**	**25.068**	ug/L	0.403	1	129	47792	1	Standard
	Mn	**55**	**26.809**	ug/L	0.919	3	378	591370	1	Standard
>	**Ge**	**72**		ug/L			42122	48550	4	KED
	Ni	**60**	**25.474**	ug/L	0.458	1	10	20148	2	KED
	Ni	**62**	**24.431**	ug/L	1.249	5	0	3115	3	KED
	Cu	**63**	**25.579**	ug/L	1.164	4	43	56350	1	KED
	Cu	**65**	**26.153**	ug/L	1.100	4	22	28761	0	KED
	Zn	**66**	**81.295**	ug/L	3.237	3	16	23113	4	KED
	Zn	**67**	**75.270**	ug/L	0.394	0	3	3643	5	KED
	As	**75**	**23.697**	ug/L	0.692	2	3	4652	2	KED
	Se	**78**	**73.995**	ug/L	3.815	5	5	1485	3	KED
	Y	**89**		ug/L			561402	617080	2	Standard
	Kr	**83**		ug/L			45	64	5	Standard
>	**In-1**	**115**		ug/L			12648	14492	2	KED
	Mo	**98**	**0.001**	ug/L	0.003	273	4	6	32	KED
	Cd	**111**	**23.880**	ug/L	0.839	3	3	5022	1	KED
	Cd	**114**	**23.675**	ug/L	0.698	2	0	13164	1	KED
>	**In**	**115**		ug/L			852951	974263	1	Standard
	Ag	**107**	**24.951**	ug/L	0.125	0	143	374715	1	Standard
	Ba	**135**	**25.043**	ug/L	1.056	4	14	109799	4	Standard
	Ba	**137**	**25.008**	ug/L	0.883	3	26	190989	3	Standard
>	**Tb**	**159**		ug/L			1107766	1259294	1	Standard
	Tl	**205**	**27.594**	ug/L	0.995	3	18	962660	2	Standard
	Pb	**208**	**27.814**	ug/L	0.455	1	188	1228032	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0285-02
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 20:11:38
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	33327	5	Standard
	Cl	**37**		ug/L			3677416	4374175	4	Standard
>	**Sc**	**45**		ug/L			810285	983987	0	Standard
	Cr	**52**	**12.937**	ug/L	0.169	1	13691	233280	1	Standard
	Cr	**53**	**12.892**	ug/L	0.533	4	129	25794	3	Standard
	Mn	**55**	**94.287**	ug/L	1.316	1	378	2175820	0	Standard
>	**Ge**	**72**		ug/L			42122	47356	2	KED
	Ni	**60**	**14.081**	ug/L	0.277	1	10	10872	2	KED
	Ni	**62**	**13.700**	ug/L	0.042	0	0	1706	2	KED
	Cu	**63**	**18.399**	ug/L	0.434	2	43	39609	4	KED
	Cu	**65**	**18.786**	ug/L	0.656	3	22	20178	2	KED
	Zn	**66**	**26.942**	ug/L	0.686	2	16	7486	1	KED
	Zn	**67**	**26.133**	ug/L	0.208	0	3	1236	2	KED
	As	**75**	**1.982**	ug/L	0.124	6	3	383	4	KED
	Se	**78**	**0.827**	ug/L	0.129	15	5	21	9	KED
	Y	**89**		ug/L			561402	710916	1	Standard
	Kr	**83**		ug/L			45	74	23	Standard
>	**In-1**	**115**		ug/L			12648	14516	1	KED
	Mo	**98**	**1.504**	ug/L	0.058	3	4	1098	2	KED
	Cd	**111**	**0.275**	ug/L	0.039	14	3	61	12	KED
	Cd	**114**	**0.252**	ug/L	0.033	13	0	141	14	KED
>	**In**	**115**		ug/L			852951	961123	1	Standard
	Ag	**107**	**0.052**	ug/L	0.003	5	143	938	3	Standard
	Ba	**135**	**8.551**	ug/L	0.311	3	14	36981	2	Standard
	Ba	**137**	**8.514**	ug/L	0.316	3	26	64152	2	Standard
>	**Tb**	**159**		ug/L			1107766	1312441	3	Standard
	Tl	**205**	**0.068**	ug/L	0.003	3	18	2489	2	Standard
	Pb	**208**	**4.111**	ug/L	0.137	3	188	189212	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0285-03
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 20:16:27
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	25365	7	Standard
	Cl	**37**		ug/L			3677416	4219544	0	Standard
>	**Sc**	**45**		ug/L			810285	923838	3	Standard
	Cr	**52**	**17.423**	ug/L	0.466	2	13691	289394	1	Standard
	Cr	**53**	**17.155**	ug/L	1.122	6	129	32131	3	Standard
	Mn	**55**	**207.859**	ug/L	13.699	6	378	4496301	3	Standard
>	**Ge**	**72**		ug/L			42122	45263	2	KED
	Ni	**60**	**26.884**	ug/L	0.339	1	10	19832	1	KED
	Ni	**62**	**27.586**	ug/L	2.066	7	0	3280	6	KED
	Cu	**63**	**16.094**	ug/L	1.140	7	43	33083	4	KED
	Cu	**65**	**16.313**	ug/L	0.256	1	22	16753	1	KED
	Zn	**66**	**33.650**	ug/L	1.261	3	16	8934	3	KED
	Zn	**67**	**32.454**	ug/L	3.837	11	3	1464	10	KED
	As	**75**	**1.511**	ug/L	0.026	1	3	280	2	KED
	Se	**78**	**0.794**	ug/L	0.143	17	5	20	10	KED
	Y	**89**		ug/L			561402	761634	2	Standard
	Kr	**83**		ug/L			45	88	12	Standard
>	**In-1**	**115**		ug/L			12648	13904	2	KED
	Mo	**98**	**0.118**	ug/L	0.024	20	4	86	19	KED
	Cd	**111**	**0.091**	ug/L	0.007	7	3	21	4	KED
	Cd	**114**	**0.076**	ug/L	0.028	36	0	41	34	KED
>	**In**	**115**		ug/L			852951	874371	1	Standard
	Ag	**107**	**0.039**	ug/L	0.002	6	143	670	3	Standard
	Ba	**135**	**15.471**	ug/L	0.780	5	14	60839	3	Standard
	Ba	**137**	**15.560**	ug/L	0.279	1	26	106650	0	Standard
>	**Tb**	**159**		ug/L			1107766	1191836	2	Standard
	Tl	**205**	**0.035**	ug/L	0.002	4	18	1177	5	Standard
	Pb	**208**	**3.903**	ug/L	0.067	1	188	163236	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0285-04
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 20:21:17
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	28607	2	Standard
	Cl	**37**		ug/L			3677416	4211062	1	Standard
>	**Sc**	**45**		ug/L			810285	937822	1	Standard
	Cr	**52**	**18.933**	ug/L	0.445	2	13691	317984	1	Standard
	Cr	**53**	**18.987**	ug/L	0.553	2	129	36130	1	Standard
	Mn	**55**	**133.182**	ug/L	2.167	1	378	2929593	3	Standard
>	**Ge**	**72**		ug/L			42122	46354	3	KED
	Ni	**60**	**28.076**	ug/L	1.270	4	10	21199	3	KED
	Ni	**62**	**28.588**	ug/L	0.909	3	0	3481	1	KED
	Cu	**63**	**9.672**	ug/L	0.345	3	43	20384	0	KED
	Cu	**65**	**9.371**	ug/L	0.517	5	22	9857	2	KED
	Zn	**66**	**31.079**	ug/L	0.922	2	16	8448	0	KED
	Zn	**67**	**30.869**	ug/L	2.782	9	3	1426	6	KED
	As	**75**	**1.764**	ug/L	0.065	3	3	334	2	KED
	Se	**78**	**0.615**	ug/L	0.103	16	5	17	8	KED
	Y	**89**		ug/L			561402	701910	3	Standard
	Kr	**83**		ug/L			45	69	24	Standard
>	**In-1**	**115**		ug/L			12648	13608	1	KED
	Mo	**98**	**0.249**	ug/L	0.012	4	4	174	3	KED
	Cd	**111**	**0.103**	ug/L	0.013	12	3	23	10	KED
	Cd	**114**	**0.103**	ug/L	0.009	8	0	54	6	KED
>	**In**	**115**		ug/L			852951	891780	0	Standard
	Ag	**107**	**0.029**	ug/L	0.003	11	143	552	8	Standard
	Ba	**135**	**15.695**	ug/L	0.490	3	14	62985	2	Standard
	Ba	**137**	**15.258**	ug/L	0.307	2	26	106690	2	Standard
>	**Tb**	**159**		ug/L			1107766	1189540	1	Standard
	Tl	**205**	**0.055**	ug/L	0.002	3	18	1824	3	Standard
	Pb	**208**	**2.695**	ug/L	0.045	1	188	112593	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0285-05
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 20:26:06
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	28191	3	Standard
	Cl	**37**		ug/L			3677416	4145443	2	Standard
>	**Sc**	**45**		ug/L			810285	946237	1	Standard
	Cr	**52**	**16.194**	ug/L	0.242	1	13691	276806	2	Standard
	Cr	**53**	**15.708**	ug/L	0.350	2	129	30187	1	Standard
	Mn	**55**	**126.391**	ug/L	2.909	2	378	2804258	1	Standard
>	**Ge**	**72**		ug/L			42122	46727	4	KED
	Ni	**60**	**18.495**	ug/L	0.841	4	10	14070	1	KED
	Ni	**62**	**17.941**	ug/L	1.536	8	0	2198	4	KED
	Cu	**63**	**10.443**	ug/L	0.102	0	43	22198	4	KED
	Cu	**65**	**10.585**	ug/L	0.375	3	22	11220	1	KED
	Zn	**66**	**27.271**	ug/L	1.650	6	16	7466	2	KED
	Zn	**67**	**26.430**	ug/L	1.012	3	3	1233	6	KED
	As	**75**	**1.454**	ug/L	0.125	8	3	278	4	KED
	Se	**78**	**0.840**	ug/L	0.165	19	5	21	16	KED
	Y	**89**		ug/L			561402	704324	3	Standard
	Kr	**83**		ug/L			45	83	14	Standard
>	**In-1**	**115**		ug/L			12648	13909	1	KED
	Mo	**98**	**0.219**	ug/L	0.020	9	4	157	8	KED
	Cd	**111**	**0.085**	ug/L	0.028	33	3	20	26	KED
	Cd	**114**	**0.081**	ug/L	0.024	29	0	43	26	KED
>	**In**	**115**		ug/L			852951	905102	1	Standard
	Ag	**107**	**0.033**	ug/L	0.000	0	143	608	1	Standard
	Ba	**135**	**15.795**	ug/L	0.353	2	14	64325	0	Standard
	Ba	**137**	**15.735**	ug/L	0.211	1	26	111667	1	Standard
>	**Tb**	**159**		ug/L			1107766	1246859	3	Standard
	Tl	**205**	**0.048**	ug/L	0.004	7	18	1660	3	Standard
	Pb	**208**	**3.691**	ug/L	0.103	2	188	161436	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0285-01
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 20:30:56
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	29905	1	Standard
	Cl	**37**		ug/L			3677416	4238376	1	Standard
>	**Sc**	**45**		ug/L			810285	946053	3	Standard
	Cr	**52**	**15.314**	ug/L	0.891	5	13691	262216	1	Standard
	Cr	**53**	**15.346**	ug/L	1.023	6	129	29452	3	Standard
	Mn	**55**	**187.123**	ug/L	12.554	6	378	4144738	3	Standard
>	**Ge**	**72**		ug/L			42122	47057	4	KED
	Ni	**60**	**25.703**	ug/L	2.390	9	10	19661	5	KED
	Ni	**62**	**24.555**	ug/L	1.225	4	0	3033	1	KED
	Cu	**63**	**19.822**	ug/L	0.978	4	43	42338	2	KED
	Cu	**65**	**20.220**	ug/L	0.770	3	22	21562	1	KED
	Zn	**66**	**24.871**	ug/L	0.887	3	16	6863	1	KED
	Zn	**67**	**25.350**	ug/L	1.779	7	3	1189	2	KED
	As	**75**	**1.354**	ug/L	0.135	9	3	261	5	KED
	Se	**78**	**0.936**	ug/L	0.158	16	5	23	9	KED
	Y	**89**		ug/L			561402	743563	4	Standard
	Kr	**83**		ug/L			45	83	23	Standard
>	**In-1**	**115**		ug/L			12648	13278	0	KED
	Mo	**98**	**0.219**	ug/L	0.018	8	4	150	8	KED
	Cd	**111**	**0.083**	ug/L	0.015	17	3	19	15	KED
	Cd	**114**	**0.072**	ug/L	0.024	33	0	37	33	KED
>	**In**	**115**		ug/L			852951	869209	1	Standard
	Ag	**107**	**0.042**	ug/L	0.003	7	143	702	4	Standard
	Ba	**135**	**13.512**	ug/L	0.236	1	14	52848	0	Standard
	Ba	**137**	**13.487**	ug/L	0.407	3	26	91906	2	Standard
>	**Tb**	**159**		ug/L			1107766	1208285	1	Standard
	Tl	**205**	**0.031**	ug/L	0.001	2	18	1056	2	Standard
	Pb	**208**	**1.925**	ug/L	0.053	2	188	81734	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0277-DUP2
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 20:35:46
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	31361	2	Standard
	Cl	**37**		ug/L			3677416	4118700	1	Standard
>	**Sc**	**45**		ug/L			810285	926775	5	Standard
	Cr	**52**	**16.261**	ug/L	0.562	3	13691	271851	2	Standard
	Cr	**53**	**16.336**	ug/L	0.572	3	129	30712	2	Standard
	Mn	**55**	**155.468**	ug/L	10.322	6	378	3370812	1	Standard
>	**Ge**	**72**		ug/L			42122	45071	1	KED
	Ni	**60**	**29.904**	ug/L	0.560	1	10	21964	1	KED
	Ni	**62**	**29.794**	ug/L	1.205	4	0	3530	4	KED
	Cu	**63**	**20.578**	ug/L	0.214	1	43	42145	0	KED
	Cu	**65**	**20.616**	ug/L	0.436	2	22	21080	2	KED
	Zn	**66**	**28.151**	ug/L	0.620	2	16	7445	1	KED
	Zn	**67**	**28.655**	ug/L	1.035	3	3	1290	4	KED
	As	**75**	**1.931**	ug/L	0.014	0	3	356	1	KED
	Se	**78**	**0.765**	ug/L	0.267	34	5	19	26	KED
	Y	**89**		ug/L			561402	713670	2	Standard
	Kr	**83**		ug/L			45	80	20	Standard
>	**In-1**	**115**		ug/L			12648	13508	4	KED
	Mo	**98**	**0.187**	ug/L	0.021	10	4	131	13	KED
	Cd	**111**	**0.078**	ug/L	0.023	29	3	18	23	KED
	Cd	**114**	**0.088**	ug/L	0.021	24	0	45	22	KED
>	**In**	**115**		ug/L			852951	898695	3	Standard
	Ag	**107**	**0.038**	ug/L	0.005	12	143	681	6	Standard
	Ba	**135**	**13.294**	ug/L	0.678	5	14	53715	2	Standard
	Ba	**137**	**13.341**	ug/L	0.462	3	26	93939	0	Standard
>	**Tb**	**159**		ug/L			1107766	1230824	0	Standard
	Tl	**205**	**0.027**	ug/L	0.000	1	18	951	1	Standard
	Pb	**208**	**2.025**	ug/L	0.018	0	188	87582	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0277-MS2
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 20:40:35
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	24777	4	Standard
	Cl	**37**		ug/L			3677416	4110802	1	Standard
>	**Sc**	**45**		ug/L			810285	921999	2	Standard
	Cr	**52**	**36.998**	ug/L	1.118	3	13691	596383	5	Standard
	Cr	**53**	**38.058**	ug/L	1.586	4	129	71021	2	Standard
	Mn	**55**	**194.776**	ug/L	2.232	1	378	4211065	2	Standard
>	**Ge**	**72**		ug/L			42122	44729	1	KED
	Ni	**60**	**48.680**	ug/L	1.698	3	10	35469	1	KED
	Ni	**62**	**47.287**	ug/L	0.772	1	0	5560	2	KED
	Cu	**63**	**42.235**	ug/L	0.449	1	43	85794	0	KED
	Cu	**65**	**42.979**	ug/L	0.956	2	22	43580	1	KED
	Zn	**66**	**101.614**	ug/L	4.874	4	16	26617	3	KED
	Zn	**67**	**94.509**	ug/L	2.493	2	3	4211	1	KED
	As	**75**	**23.504**	ug/L	0.822	3	3	4253	2	KED
	Se	**78**	**72.556**	ug/L	2.261	3	5	1343	1	KED
	Y	**89**		ug/L			561402	754675	1	Standard
	Kr	**83**		ug/L			45	95	31	Standard
>	**In-1**	**115**		ug/L			12648	13783	1	KED
	Mo	**98**	**0.220**	ug/L	0.001	0	4	157	1	KED
	Cd	**111**	**21.752**	ug/L	0.306	1	3	4352	1	KED
	Cd	**114**	**22.537**	ug/L	0.823	3	0	11917	1	KED
>	**In**	**115**		ug/L			852951	873363	1	Standard
	Ag	**107**	**3.544**	ug/L	0.181	5	143	47831	4	Standard
	Ba	**135**	**37.166**	ug/L	1.273	3	14	146033	2	Standard
	Ba	**137**	**37.286**	ug/L	1.492	4	26	255282	4	Standard
>	**Tb**	**159**		ug/L			1107766	1207685	3	Standard
	Tl	**205**	**22.831**	ug/L	0.704	3	18	763723	2	Standard
	Pb	**208**	**26.531**	ug/L	1.123	4	188	1122609	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0277-SRM2
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 20:45:25
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	25888	2	Standard
	Cl	**37**		ug/L			3677416	4024199	3	Standard
>	**Sc**	**45**		ug/L			810285	894917	2	Standard
	Cr	**52**	**81.816**	ug/L	3.975	4	13691	1260155	2	Standard
	Cr	**53**	**80.975**	ug/L	2.543	3	129	146535	1	Standard
	Mn	**55**	**343.823**	ug/L	16.538	4	378	7209381	2	Standard
>	**Ge**	**72**		ug/L			42122	46265	1	KED
	Ni	**60**	**64.297**	ug/L	4.120	6	10	48435	4	KED
	Ni	**62**	**61.169**	ug/L	3.161	5	0	7434	3	KED
	Cu	**63**	**56.021**	ug/L	2.566	4	43	117669	3	KED
	Cu	**65**	**56.529**	ug/L	0.425	0	22	59284	1	KED
	Zn	**66**	**167.097**	ug/L	6.710	4	16	45263	2	KED
	Zn	**67**	**162.900**	ug/L	7.767	4	3	7502	3	KED
	As	**75**	**129.377**	ug/L	3.280	2	3	24200	1	KED
	Se	**78**	**121.979**	ug/L	3.591	2	5	2331	1	KED
	Y	**89**		ug/L			561402	826113	5	Standard
	Kr	**83**		ug/L			45	104	11	Standard
>	**In-1**	**115**		ug/L			12648	13520	2	KED
	Mo	**98**	**58.923**	ug/L	1.915	3	4	39867	0	KED
	Cd	**111**	**57.773**	ug/L	1.577	2	3	11331	0	KED
	Cd	**114**	**58.223**	ug/L	0.913	1	0	30206	1	KED
>	**In**	**115**		ug/L			852951	877903	4	Standard
	Ag	**107**	**45.208**	ug/L	3.508	7	143	610133	3	Standard
	Ba	**135**	**103.304**	ug/L	5.159	4	14	407391	0	Standard
	Ba	**137**	**101.463**	ug/L	4.381	4	26	697287	0	Standard
>	**Tb**	**159**		ug/L			1107766	1243590	1	Standard
	Tl	**205**	**135.047**	ug/L	4.371	3	18	4652362	2	Standard
	Pb	**208**	**97.897**	ug/L	2.423	2	188	4267021	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCVC
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 20:51:19
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	17512	1	Standard
	Cl	**37**		ug/L			3677416	4236594	6	Standard
>	**Sc**	**45**		ug/L			810285	838561	2	Standard
	Cr	**52**	**51.511**	ug/L	1.694	3	13691	748957	1	Standard
	Cr	**53**	**50.393**	ug/L	2.979	5	129	85467	3	Standard
	Mn	**55**	**52.648**	ug/L	3.216	6	378	1034761	4	Standard
>	**Ge**	**72**		ug/L			42122	45500	0	KED
	Ni	**60**	**48.821**	ug/L	1.244	2	10	36195	2	KED
	Ni	**62**	**47.827**	ug/L	0.925	1	0	5720	1	KED
	Cu	**63**	**49.823**	ug/L	2.474	4	43	102984	5	KED
	Cu	**65**	**49.232**	ug/L	1.208	2	22	50779	1	KED
	Zn	**66**	**48.283**	ug/L	2.677	5	16	12876	4	KED
	Zn	**67**	**51.295**	ug/L	3.634	7	3	2327	7	KED
	As	**75**	**49.156**	ug/L	1.335	2	3	9046	1	KED
	Se	**78**	**50.212**	ug/L	1.512	3	5	947	2	KED
	Y	**89**		ug/L			561402	582788	2	Standard
	Kr	**83**		ug/L			45	65	12	Standard
>	**In-1**	**115**		ug/L			12648	12177	13	KED
	Mo	**98**	**54.945**	ug/L	8.955	16	4	33008	3	KED
	Cd	**111**	**53.887**	ug/L	8.990	16	3	9379	2	KED
	Cd	**114**	**53.356**	ug/L	7.742	14	0	24608	0	KED
>	**In**	**115**		ug/L			852951	875788	1	Standard
	Ag	**107**	**47.907**	ug/L	1.018	2	143	646759	3	Standard
	Ba	**135**	**51.363**	ug/L	0.642	1	14	202374	0	Standard
	Ba	**137**	**51.593**	ug/L	0.753	1	26	354149	0	Standard
>	**Tb**	**159**		ug/L			1107766	1229799	2	Standard
	Tl	**205**	**48.166**	ug/L	1.664	3	18	1640539	1	Standard
	Pb	**208**	**50.716**	ug/L	0.269	0	188	2186671	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCBC
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 20:58:54
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	15967	4	Standard
	Cl	**37**		ug/L			3677416	4173299	1	Standard
⌈>	**Sc**	**45**		ug/L			810285	851240	1	Standard
|	**Cr**	**52**	**-0.106**	ug/L	0.042	39	13691	12853	5	Standard
|	**Cr**	**53**	**0.087**	ug/L	0.014	15	129	286	8	Standard
⌊	**Mn**	**55**	**0.002**	ug/L	0.001	78	378	433	6	Standard
⌈>	**Ge**	**72**		ug/L			42122	45145	1	KED
|	**Ni**	**60**	**-0.004**	ug/L	0.006	157	10	8	53	KED
|	**Ni**	**62**	**0.021**	ug/L	0.033	157	0	3	124	KED
|	**Cu**	**63**	**0.003**	ug/L	0.004	119	43	53	16	KED
|	**Cu**	**65**	**0.006**	ug/L	0.007	109	22	31	24	KED
|	**Zn**	**66**	**0.010**	ug/L	0.038	363	16	20	47	KED
|	**Zn**	**67**	**-0.006**	ug/L	0.002	27	3	3	0	KED
|	**As**	**75**	**0.003**	ug/L	0.002	85	3	4	10	KED
⌊	**Se**	**78**	**0.167**	ug/L	0.126	75	5	8	25	KED
	Y	**89**		ug/L			561402	571672	1	Standard
	Kr	**83**		ug/L			45	47	4	Standard
⌈>	**In-1**	**115**		ug/L			12648	13258	4	KED
|	**Mo**	**98**	**0.024**	ug/L	0.008	33	4	21	28	KED
|	**Cd**	**111**	**-0.001**	ug/L	0.007	776	3	3	45	KED
⌊	**Cd**	**114**	**0.007**	ug/L	0.010	140	0	4	117	KED
⌈>	**In**	**115**		ug/L			852951	889781	1	Standard
|	**Ag**	**107**	**0.005**	ug/L	0.002	31	143	218	9	Standard
|	**Ba**	**135**	**0.001**	ug/L	0.001	154	14	18	26	Standard
⌊	**Ba**	**137**	**0.001**	ug/L	0.002	136	26	36	34	Standard
⌈>	**Tb**	**159**		ug/L			1107766	1171743	1	Standard
|	**Tl**	**205**	**0.012**	ug/L	0.001	11	18	419	9	Standard
⌊	**Pb**	**208**	**0.003**	ug/L	0.001	20	188	316	6	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0285-06
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 21:03:44
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	26142	4	Standard
	Cl	**37**		ug/L			3677416	4119028	5	Standard
>	**Sc**	**45**		ug/L			810285	907534	7	Standard
	Cr	**52**	**14.622**	ug/L	1.511	10	13691	240090	2	Standard
	Cr	**53**	**14.934**	ug/L	1.369	9	129	27423	2	Standard
	Mn	**55**	**132.326**	ug/L	10.773	8	378	2805520	1	Standard
>	**Ge**	**72**		ug/L			42122	45823	1	KED
	Ni	**60**	**23.207**	ug/L	0.607	2	10	17330	1	KED
	Ni	**62**	**22.598**	ug/L	0.294	1	0	2722	2	KED
	Cu	**63**	**7.527**	ug/L	0.280	3	43	15708	4	KED
	Cu	**65**	**7.485**	ug/L	0.077	1	22	7797	1	KED
	Zn	**66**	**22.728**	ug/L	0.673	2	16	6116	3	KED
	Zn	**67**	**21.562**	ug/L	1.648	7	3	987	6	KED
	As	**75**	**1.493**	ug/L	0.050	3	3	280	4	KED
	Se	**78**	**0.754**	ug/L	0.245	32	5	19	23	KED
	Y	**89**		ug/L			561402	696157	2	Standard
	Kr	**83**		ug/L			45	80	8	Standard
>	**In-1**	**115**		ug/L			12648	13244	3	KED
	Mo	**98**	**0.167**	ug/L	0.005	2	4	115	0	KED
	Cd	**111**	**0.072**	ug/L	0.017	23	3	17	22	KED
	Cd	**114**	**0.083**	ug/L	0.026	31	0	42	28	KED
>	**In**	**115**		ug/L			852951	842053	5	Standard
	Ag	**107**	**0.028**	ug/L	0.007	23	143	506	13	Standard
	Ba	**135**	**11.552**	ug/L	0.478	4	14	43715	1	Standard
	Ba	**137**	**11.733**	ug/L	0.580	4	26	77329	0	Standard
>	**Tb**	**159**		ug/L			1107766	1156700	4	Standard
	Tl	**205**	**0.083**	ug/L	0.005	6	18	2660	3	Standard
	Pb	**208**	**1.720**	ug/L	0.088	5	188	69867	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0285-37
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 21:08:34
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	25778	3	Standard
	Cl	**37**		ug/L			3677416	4199273	3	Standard
>	**Sc**	**45**		ug/L			810285	991105	1	Standard
	Cr	**52**	**16.698**	ug/L	0.414	2	13691	298381	2	Standard
	Cr	**53**	**16.944**	ug/L	0.258	1	129	34100	1	Standard
	Mn	**55**	**157.991**	ug/L	4.420	2	378	3671905	2	Standard
>	**Ge**	**72**		ug/L			42122	48514	2	KED
	Ni	**60**	**26.766**	ug/L	1.301	4	10	21151	3	KED
	Ni	**62**	**26.955**	ug/L	0.943	3	0	3435	0	KED
	Cu	**63**	**8.078**	ug/L	0.205	2	43	17835	2	KED
	Cu	**65**	**8.011**	ug/L	0.328	4	22	8828	2	KED
	Zn	**66**	**23.975**	ug/L	2.086	8	16	6818	6	KED
	Zn	**67**	**23.066**	ug/L	0.840	3	3	1118	5	KED
	As	**75**	**1.776**	ug/L	0.093	5	3	352	2	KED
	Se	**78**	**0.950**	ug/L	0.112	11	5	24	9	KED
	Y	**89**		ug/L			561402	778760	2	Standard
	Kr	**83**		ug/L			45	68	14	Standard
>	**In-1**	**115**		ug/L			12648	14192	1	KED
	Mo	**98**	**0.194**	ug/L	0.023	12	4	142	10	KED
	Cd	**111**	**0.064**	ug/L	0.006	9	3	16	8	KED
	Cd	**114**	**0.083**	ug/L	0.014	17	0	46	18	KED
>	**In**	**115**		ug/L			852951	936859	1	Standard
	Ag	**107**	**0.030**	ug/L	0.002	7	143	593	3	Standard
	Ba	**135**	**14.825**	ug/L	0.563	3	14	62479	2	Standard
	Ba	**137**	**14.189**	ug/L	0.426	3	26	104197	1	Standard
>	**Tb**	**159**		ug/L			1107766	1279243	0	Standard
	Tl	**205**	**0.084**	ug/L	0.007	8	18	2990	7	Standard
	Pb	**208**	**1.917**	ug/L	0.033	1	188	86160	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0059-11
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 21:13:23
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	16673	1	Standard
	Cl	37		ug/L			3677416	3903368	2	Standard
>	Sc	45		ug/L			810285	854978	1	Standard
	Cr	52	-0.148	ug/L	0.015	9	13691	12288	0	Standard
	Cr	53	0.079	ug/L	0.001	1	129	273	1	Standard
	Mn	55	171.800	ug/L	6.396	3	378	3445483	4	Standard
>	Ge	72		ug/L			42122	45123	1	KED
	Ni	60	0.923	ug/L	0.036	3	10	689	3	KED
	Ni	62	0.932	ug/L	0.093	9	0	111	8	KED
	Cu	63	1.043	ug/L	0.041	3	43	2183	3	KED
	Cu	65	1.082	ug/L	0.090	8	22	1130	6	KED
	Zn	66	23.604	ug/L	0.995	4	16	6254	4	KED
	Zn	67	21.285	ug/L	1.509	7	3	959	5	KED
	As	75	0.014	ug/L	0.004	25	3	6	8	KED
	Se	78	0.349	ug/L	0.128	36	5	11	18	KED
	Y	89		ug/L			561402	580943	4	Standard
	Kr	83		ug/L			45	53	10	Standard
>	In-1	115		ug/L			12648	13219	3	KED
	Mo	98	0.007	ug/L	0.009	119	4	9	59	KED
	Cd	111	0.217	ug/L	0.027	12	3	45	13	KED
	Cd	114	0.242	ug/L	0.022	9	0	123	10	KED
>	In	115		ug/L			852951	906613	2	Standard
	Ag	107	0.005	ug/L	0.000	7	143	224	3	Standard
	Ba	135	1.073	ug/L	0.043	3	14	4391	2	Standard
	Ba	137	1.099	ug/L	0.031	2	26	7834	1	Standard
>	Tb	159		ug/L			1107766	1201548	3	Standard
	Tl	205	0.017	ug/L	0.001	6	18	574	3	Standard
	Pb	208	0.008	ug/L	0.001	6	188	533	5	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0154-DUP2
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 21:18:13
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	17275	8	Standard
	Cl	37		ug/L			3677416	3894073	1	Standard
>	Sc	45		ug/L			810285	865253	2	Standard
	Cr	52	-0.145	ug/L	0.034	23	13691	12477	2	Standard
	Cr	53	0.062	ug/L	0.013	20	129	246	6	Standard
	Mn	55	159.865	ug/L	9.856	6	378	3240104	3	Standard
>	Ge	72		ug/L			42122	46175	2	KED
	Ni	60	0.848	ug/L	0.046	5	10	648	3	KED
	Ni	62	0.834	ug/L	0.156	18	0	101	15	KED
	Cu	63	0.996	ug/L	0.066	6	43	2134	4	KED
	Cu	65	1.036	ug/L	0.066	6	22	1107	3	KED
	Zn	66	21.738	ug/L	1.348	6	16	5892	5	KED
	Zn	67	19.333	ug/L	1.336	6	3	892	5	KED
	As	75	0.011	ug/L	0.011	100	3	6	30	KED
	Se	78	0.259	ug/L	0.115	44	5	10	22	KED
	Y	89		ug/L			561402	589120	2	Standard
	Kr	83		ug/L			45	59	25	Standard
>	In-1	115		ug/L			12648	13396	2	KED
	Mo	98	0.000	ug/L	0.004	1369	4	5	45	KED
	Cd	111	0.198	ug/L	0.046	23	3	41	23	KED
	Cd	114	0.198	ug/L	0.024	12	0	102	14	KED
>	In	115		ug/L			852951	895553	1	Standard
	Ag	107	0.004	ug/L	0.001	29	143	201	8	Standard
	Ba	135	1.046	ug/L	0.027	2	14	4230	3	Standard
	Ba	137	1.054	ug/L	0.043	4	26	7427	3	Standard
>	Tb	159		ug/L			1107766	1199237	1	Standard
	Tl	205	0.015	ug/L	0.001	8	18	511	7	Standard
	Pb	208	0.008	ug/L	0.001	8	188	524	5	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0154-MS2
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 21:23:03
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units		Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L				13453	15997	5	Standard
	Cl	37		ug/L				3677416	4004455	3	Standard
>	Sc	45		ug/L				810285	883519	2	Standard
	Cr	52	1.156	ug/L		0.029	2	13691	32311	1	Standard
	Cr	53	1.399	ug/L		0.019	1	129	2639	1	Standard
	Mn	55	157.361	ug/L	STL	6.475	4	378	3258380	1	Standard
>	Ge	72		ug/L				42122	46738	1	KED
	Ni	60	2.186	ug/L		0.044	1	10	1675	2	KED
	Ni	62	2.064	ug/L		0.236	11	0	253	9	KED
	Cu	63	2.377	ug/L		0.050	2	43	5091	2	KED
	Cu	65	2.334	ug/L		0.114	4	22	2497	5	KED
	Zn	66	25.736	ug/L	STL	1.266	4	16	7058	4	KED
	Zn	67	25.279	ug/L		1.231	4	3	1179	2	KED
	As	75	1.311	ug/L		0.063	4	3	252	6	KED
	Se	78	4.146	ug/L		0.253	6	5	85	4	KED
	Y	89		ug/L				561402	595958	0	Standard
	Kr	83		ug/L				45	60	5	Standard
>	In-1	115		ug/L				12648	12860	1	KED
	Mo	98	-0.000	ug/L		0.002	12910	4	4	28	KED
	Cd	111	1.747	ug/L		0.091	5	3	329	5	KED
	Cd	114	1.649	ug/L		0.121	7	0	813	5	KED
>	In	115		ug/L				852951	912259	3	Standard
	Ag	107	1.306	ug/L		0.066	5	143	18508	4	Standard
	Ba	135	2.401	ug/L		0.064	2	14	9868	1	Standard
	Ba	137	2.419	ug/L		0.052	2	26	17323	2	Standard
>	Tb	159		ug/L				1107766	1211125	1	Standard
	Tl	205	1.438	ug/L		0.043	3	18	48279	1	Standard
	Pb	208	1.459	ug/L		0.033	2	188	62159	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0154-MSD2
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 21:27:52
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units		Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L				13453	16638	4	Standard
	Cl	37		ug/L				3677416	3941744	1	Standard
>	Sc	45		ug/L				810285	833942	4	Standard
	Cr	52	1.338	ug/L		0.177	13	13691	33007	3	Standard
	Cr	53	1.448	ug/L		0.069	4	129	2571	2	Standard
	Mn	55	171.469	ug/L	STL	8.459	4	378	3348824	1	Standard
>	Ge	72		ug/L				42122	45183	1	KED
	Ni	60	2.210	ug/L		0.127	5	10	1636	4	KED
	Ni	62	2.274	ug/L		0.261	11	0	270	10	KED
	Cu	63	2.328	ug/L		0.044	1	43	4820	0	KED
	Cu	65	2.395	ug/L		0.011	0	22	2476	1	KED
	Zn	66	26.597	ug/L	STL	0.879	3	16	7051	1	KED
	Zn	67	24.091	ug/L		0.269	1	3	1087	1	KED
	As	75	1.347	ug/L		0.094	6	3	250	5	KED
	Se	78	4.583	ug/L		0.368	8	5	90	8	KED
	Y	89		ug/L				561402	574743	6	Standard
	Kr	83		ug/L				45	62	18	Standard
>	In-1	115		ug/L				12648	13655	0	KED
	Mo	98	0.002	ug/L		0.011	450	4	6	111	KED
	Cd	111	1.581	ug/L		0.092	5	3	316	5	KED
	Cd	114	1.509	ug/L		0.086	5	0	791	6	KED
>	In	115		ug/L				852951	899899	2	Standard
	Ag	107	1.322	ug/L		0.023	1	143	18474	1	Standard
	Ba	135	2.437	ug/L		0.084	3	14	9875	0	Standard
	Ba	137	2.409	ug/L		0.050	2	26	17013	1	Standard
>	Tb	159		ug/L				1107766	1186666	4	Standard
	Tl	205	1.447	ug/L		0.133	9	18	47464	4	Standard
	Pb	208	1.486	ug/L		0.105	7	188	61879	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0419-03
Sample Dil Factor: 50
Comments:
Sample Date/Time: Wednesday, October 10, 2018 21:32:42
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	17170	2	Standard
	Cl	**37**		ug/L			3677416	4195124	4	Standard
>	**Sc**	**45**		ug/L			810285	890680	2	Standard
	Cr	**52**	**-0.082**	ug/L	0.069	84	13691	13790	5	Standard
	Cr	**53**	**0.102**	ug/L	0.016	15	129	325	10	Standard
	Mn	**55**	**10.842**	ug/L	0.067	0	378	226816	1	Standard
>	**Ge**	**72**		ug/L			42122	46802	3	KED
	Ni	**60**	**94.293**	ug/L	3.543	3	10	71846	0	KED
	Ni	**62**	**90.416**	ug/L	3.529	3	0	11114	0	KED
	Cu	**63**	**0.082**	ug/L	0.003	3	43	223	3	KED
	Cu	**65**	**0.088**	ug/L	0.023	25	22	118	23	KED
	Zn	**66**	**1.703**	ug/L	0.115	6	16	484	4	KED
	Zn	**67**	**1.479**	ug/L	0.359	24	3	73	21	KED
	As	**75**	**0.019**	ug/L	0.002	8	3	7	6	KED
	Se	**78**	**0.215**	ug/L	0.123	57	5	9	22	KED
	Y	**89**		ug/L			561402	605183	4	Standard
	Kr	**83**		ug/L			45	55	7	Standard
>	**In-1**	**115**		ug/L			12648	14056	0	KED
	Mo	**98**	**0.005**	ug/L	0.008	166	4	8	66	KED
	Cd	**111**	**-0.005**	ug/L	0.007	147	3	2	57	KED
	Cd	**114**	**0.009**	ug/L	0.004	41	0	5	36	KED
>	**In**	**115**		ug/L			852951	906577	2	Standard
	Ag	**107**	**0.004**	ug/L	0.002	47	143	207	13	Standard
	Ba	**135**	**0.292**	ug/L	0.021	7	14	1205	6	Standard
	Ba	**137**	**0.277**	ug/L	0.017	6	26	1999	6	Standard
>	**Tb**	**159**		ug/L			1107766	1237186	0	Standard
	Tl	**205**	**0.014**	ug/L	0.002	16	18	508	16	Standard
	Pb	**208**	**0.005**	ug/L	0.001	17	188	445	9	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0419-05
Sample Dil Factor: 50
Comments:
Sample Date/Time: Wednesday, October 10, 2018 21:37:31
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	17461	7	Standard
	Cl	**37**		ug/L			3677416	4049175	1	Standard
>	**Sc**	**45**		ug/L			810285	889062	2	Standard
	Cr	**52**	**-0.078**	ug/L	0.015	19	13691	13838	2	Standard
	Cr	**53**	**0.106**	ug/L	0.022	20	129	331	9	Standard
	Mn	**55**	**8.796**	ug/L	0.515	5	378	183630	3	Standard
>	**Ge**	**72**		ug/L			42122	46291	1	KED
	Ni	**60**	**94.395**	ug/L	1.108	1	10	71199	2	KED
	Ni	**62**	**93.766**	ug/L	2.032	2	0	11408	1	KED
	Cu	**63**	**0.105**	ug/L	0.011	10	43	269	8	KED
	Cu	**65**	**0.106**	ug/L	0.004	3	22	135	2	KED
	Zn	**66**	**1.792**	ug/L	0.185	10	16	504	11	KED
	Zn	**67**	**1.618**	ug/L	0.029	1	3	78	1	KED
	As	**75**	**0.011**	ug/L	0.006	58	3	6	18	KED
	Se	**78**	**0.120**	ug/L	0.025	21	5	7	4	KED
	Y	**89**		ug/L			561402	585722	1	Standard
	Kr	**83**		ug/L			45	47	10	Standard
>	**In-1**	**115**		ug/L			12648	13914	1	KED
	Mo	**98**	**0.000**	ug/L	0.005	1823	4	5	62	KED
	Cd	**111**	**-0.006**	ug/L	0.012	185	3	2	107	KED
	Cd	**114**	**0.009**	ug/L	0.004	39	0	5	33	KED
>	**In**	**115**		ug/L			852951	916154	1	Standard
	Ag	**107**	**0.003**	ug/L	0.002	84	143	192	17	Standard
	Ba	**135**	**0.172**	ug/L	0.005	3	14	724	4	Standard
	Ba	**137**	**0.176**	ug/L	0.002	1	26	1290	2	Standard
>	**Tb**	**159**		ug/L			1107766	1220723	3	Standard
	Tl	**205**	**0.004**	ug/L	0.001	20	18	171	17	Standard
	Pb	**208**	**0.005**	ug/L	0.001	25	188	403	10	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0419-06
Sample Dil Factor: 100
Comments:
Sample Date/Time: Wednesday, October 10, 2018 21:42:21
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	16805	0	Standard
	Cl	**37**		ug/L			3677416	3914445	2	Standard
>	**Sc**	**45**		ug/L			810285	888251	0	Standard
	Cr	**52**	**-0.067**	ug/L	0.040	60	13691	13997	4	Standard
	Cr	**53**	**0.075**	ug/L	0.002	2	129	277	1	Standard
	Mn	**55**	**4.480**	ug/L	0.080	1	378	93731	1	Standard
>	**Ge**	**72**		ug/L			42122	46888	3	KED
	Ni	**60**	**181.233**	ug/L	8.775	4	10	138317	3	KED
	Ni	**62**	**173.024**	ug/L	9.971	5	0	21294	1	KED
	Cu	**63**	**0.162**	ug/L	0.036	22	43	393	19	KED
	Cu	**65**	**0.169**	ug/L	0.018	10	22	205	12	KED
	Zn	**66**	**1.366**	ug/L	0.139	10	16	392	5	KED
	Zn	**67**	**1.203**	ug/L	0.102	8	3	60	6	KED
	As	**75**	**-0.008**	ug/L	0.006	75	3	3	39	KED
	Se	**78**	**0.137**	ug/L	0.112	82	5	8	29	KED
	Y	**89**		ug/L			561402	599592	1	Standard
	Kr	**83**		ug/L			45	64	17	Standard
>	**In-1**	**115**		ug/L			12648	13363	2	KED
	Mo	**98**	**0.007**	ug/L	0.009	115	4	9	58	KED
	Cd	**111**	**-0.001**	ug/L	0.008	945	3	3	45	KED
	Cd	**114**	**0.011**	ug/L	0.008	77	0	6	70	KED
>	**In**	**115**		ug/L			852951	926759	2	Standard
	Ag	**107**	**0.002**	ug/L	0.001	29	143	181	5	Standard
	Ba	**135**	**0.074**	ug/L	0.007	10	14	323	6	Standard
	Ba	**137**	**0.069**	ug/L	0.005	7	26	529	4	Standard
>	**Tb**	**159**		ug/L			1107766	1207144	2	Standard
	Tl	**205**	**0.003**	ug/L	0.001	19	18	133	18	Standard
	Pb	**208**	**0.007**	ug/L	0.001	9	188	521	7	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18I0419-07
Sample Dil Factor: 50
Comments:
Sample Date/Time: Wednesday, October 10, 2018 21:47:11
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	16902	5	Standard
	Cl	**37**		ug/L			3677416	3847258	2	Standard
>	**Sc**	**45**		ug/L			810285	841584	4	Standard
	Cr	**52**	**-0.087**	ug/L	0.049	56	13691	12961	2	Standard
	Cr	**53**	**0.103**	ug/L	0.005	5	129	309	1	Standard
	Mn	**55**	**7.832**	ug/L	0.378	4	378	154737	0	Standard
>	**Ge**	**72**		ug/L			42122	45181	2	KED
	Ni	**60**	**154.976**	ug/L	3.609	2	10	114069	3	KED
	Ni	**62**	**154.207**	ug/L	6.641	4	0	18303	2	KED
	Cu	**63**	**0.057**	ug/L	0.017	30	43	163	19	KED
	Cu	**65**	**0.054**	ug/L	0.016	30	22	80	22	KED
	Zn	**66**	**1.492**	ug/L	0.111	7	16	412	6	KED
	Zn	**67**	**1.405**	ug/L	0.191	13	3	67	13	KED
	As	**75**	**0.032**	ug/L	0.008	25	3	10	12	KED
	Se	**78**	**0.227**	ug/L	0.094	41	5	9	16	KED
	Y	**89**		ug/L			561402	567925	2	Standard
	Kr	**83**		ug/L			45	53	25	Standard
>	**In-1**	**115**		ug/L			12648	13558	1	KED
	Mo	**98**	**0.012**	ug/L	0.005	38	4	13	22	KED
	Cd	**111**	**0.007**	ug/L	0.010	141	3	4	40	KED
	Cd	**114**	**0.002**	ug/L	0.004	171	0	1	108	KED
>	**In**	**115**		ug/L			852951	900581	2	Standard
	Ag	**107**	**0.001**	ug/L	0.002	123	143	169	14	Standard
	Ba	**135**	**0.160**	ug/L	0.012	7	14	663	9	Standard
	Ba	**137**	**0.168**	ug/L	0.007	3	26	1213	1	Standard
>	**Tb**	**159**		ug/L			1107766	1202419	3	Standard
	Tl	**205**	**0.003**	ug/L	0.000	6	18	123	7	Standard
	Pb	**208**	**0.003**	ug/L	0.001	30	188	315	9	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCVD
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 21:53:05
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	17296	3	Standard
	Cl	**37**		ug/L			3677416	4107666	1	Standard
>	**Sc**	**45**		ug/L			810285	840858	3	Standard
	Cr	**52**	**51.016**	ug/L	3.132	6	13691	743348	2	Standard
	Cr	**53**	**50.566**	ug/L	1.644	3	129	86013	0	Standard
	Mn	**55**	**50.781**	ug/L	1.663	3	378	1000973	1	Standard
>	**Ge**	**72**		ug/L			42122	45100	2	KED
	Ni	**60**	**49.538**	ug/L	1.823	3	10	36388	1	KED
	Ni	**62**	**48.397**	ug/L	2.611	5	0	5733	3	KED
	Cu	**63**	**49.695**	ug/L	0.870	1	43	101791	2	KED
	Cu	**65**	**49.008**	ug/L	1.699	3	22	50090	2	KED
	Zn	**66**	**48.938**	ug/L	3.209	6	16	12929	4	KED
	Zn	**67**	**51.797**	ug/L	2.194	4	3	2330	5	KED
	As	**75**	**49.175**	ug/L	1.672	3	3	8967	1	KED
	Se	**78**	**48.838**	ug/L	1.536	3	5	913	2	KED
	Y	**89**		ug/L			561402	554095	1	Standard
	Kr	**83**		ug/L			45	58	7	Standard
>	**In-1**	**115**		ug/L			12648	13106	2	KED
	Mo	**98**	**48.637**	ug/L	2.183	4	4	31898	2	KED
	Cd	**111**	**49.112**	ug/L	0.737	1	3	9343	3	KED
	Cd	**114**	**49.163**	ug/L	2.808	5	0	24709	3	KED
>	**In**	**115**		ug/L			852951	860367	0	Standard
	Ag	**107**	**50.847**	ug/L	1.670	3	143	674089	2	Standard
	Ba	**135**	**51.983**	ug/L	0.341	0	14	201236	0	Standard
	Ba	**137**	**52.410**	ug/L	1.808	3	26	353416	2	Standard
>	**Tb**	**159**		ug/L			1107766	1177820	1	Standard
	Tl	**205**	**51.014**	ug/L	0.914	1	18	1665177	2	Standard
	Pb	**208**	**52.553**	ug/L	1.522	2	188	2169635	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCBD
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 22:00:39
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	17056	5	Standard
	Cl	**37**		ug/L			3677416	3998040	4	Standard
>	**Sc**	**45**		ug/L			810285	846627	1	Standard
	Cr	**52**	**-0.098**	ug/L	0.043	43	13691	12886	3	Standard
	Cr	**53**	**0.044**	ug/L	0.006	13	129	211	4	Standard
	Mn	**55**	**0.002**	ug/L	0.001	41	378	434	3	Standard
>	**Ge**	**72**		ug/L			42122	45955	1	KED
	Ni	**60**	**0.008**	ug/L	0.002	29	10	17	11	KED
	Ni	**62**	**0.026**	ug/L	0.016	61	0	3	50	KED
	Cu	**63**	**0.001**	ug/L	0.005	309	43	50	17	KED
	Cu	**65**	**0.004**	ug/L	0.010	245	22	29	35	KED
	Zn	**66**	**-0.005**	ug/L	0.025	459	16	16	40	KED
	Zn	**67**	**-0.035**	ug/L	0.023	65	3	2	43	KED
	As	**75**	**-0.000**	ug/L	0.010	3281	3	4	44	KED
	Se	**78**	**0.234**	ug/L	0.040	17	5	10	7	KED
	Y	**89**		ug/L			561402	591007	2	Standard
	Kr	**83**		ug/L			45	54	31	Standard
>	**In-1**	**115**		ug/L			12648	12899	4	KED
	Mo	**98**	**0.024**	ug/L	0.009	37	4	20	29	KED
	Cd	**111**	**0.005**	ug/L	0.009	177	3	4	35	KED
	Cd	**114**	**0.006**	ug/L	0.000	8	0	3	2	KED
>	**In**	**115**		ug/L			852951	902018	1	Standard
	Ag	**107**	**0.005**	ug/L	0.002	36	143	219	12	Standard
	Ba	**135**	**0.000**	ug/L	0.000	107	14	17	11	Standard
	Ba	**137**	**-0.000**	ug/L	0.001	391	26	26	21	Standard
>	**Tb**	**159**		ug/L			1107766	1179782	1	Standard
	Tl	**205**	**0.006**	ug/L	0.002	28	18	208	26	Standard
	Pb	**208**	**0.003**	ug/L	0.000	3	188	309	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0033-01
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 22:05:29
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	38712	0	Standard
	Cl	**37**		ug/L			3677416	4180612	1	Standard
>	**Sc**	**45**		ug/L			810285	888346	1	Standard
	Cr	**52**	**2.404**	ug/L	0.187	7	13691	51344	5	Standard
	Cr	**53**	**2.448**	ug/L	0.087	3	129	4536	2	Standard
	Mn	**55**	**9.843**	ug/L	0.116	1	378	205434	1	Standard
>	**Ge**	**72**		ug/L			42122	45281	2	KED
	Ni	**60**	**0.912**	ug/L	0.077	8	10	682	6	KED
	Ni	**62**	**0.887**	ug/L	0.135	15	0	106	13	KED
	Cu	**63**	**12.756**	ug/L	0.313	2	43	26267	3	KED
	Cu	**65**	**12.710**	ug/L	0.293	2	22	13061	0	KED
	Zn	**66**	**257.358**	ug/L	9.063	3	16	68226	2	KED
	Zn	**67**	**234.450**	ug/L	10.555	4	3	10565	2	KED
	As	**75**	**1.495**	ug/L	0.011	0	3	277	2	KED
	Se	**78**	**0.512**	ug/L	0.007	1	5	15	2	KED
	Y	**89**		ug/L			561402	591557	1	Standard
	Kr	**83**		ug/L			45	55	22	Standard
>	**In-1**	**115**		ug/L			12648	13417	0	KED
	Mo	**98**	**0.329**	ug/L	0.033	10	4	225	9	KED
	Cd	**111**	**0.167**	ug/L	0.012	7	3	35	6	KED
	Cd	**114**	**0.156**	ug/L	0.016	10	0	80	10	KED
>	**In**	**115**		ug/L			852951	910224	0	Standard
	Ag	**107**	**0.022**	ug/L	0.001	4	143	467	3	Standard
	Ba	**135**	**6.896**	ug/L	0.170	2	14	28257	2	Standard
	Ba	**137**	**7.024**	ug/L	0.170	2	26	50138	2	Standard
>	**Tb**	**159**		ug/L			1107766	1234807	1	Standard
	Tl	**205**	**0.025**	ug/L	0.002	6	18	874	7	Standard
	Pb	**208**	**0.444**	ug/L	0.008	1	188	19417	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0046-01
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 22:10:19
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	40304	1	Standard
	Cl	37		ug/L			3677416	4274642	2	Standard
>	Sc	45		ug/L			810285	933904	0	Standard
	Cr	52	2.424	ug/L	0.091	3	13691	54302	2	Standard
	Cr	53	2.613	ug/L	0.049	1	129	5081	1	Standard
	Mn	55	692.540	ug/L	5.560	0	378	15166130	1	Standard
>	Ge	72		ug/L			42122	43089	2	KED
	Ni	60	4.894	ug/L	0.141	2	10	3447	5	KED
	Ni	62	4.636	ug/L	0.059	1	0	525	2	KED
	Cu	63	6.732	ug/L	0.133	1	43	13214	3	KED
	Cu	65	6.745	ug/L	0.287	4	22	6604	2	KED
	Zn	66	34.794	ug/L	0.774	2	16	8792	0	KED
	Zn	67	43.347	ug/L	2.883	6	3	1861	4	KED
	As	75	3.873	ug/L	0.252	6	3	678	4	KED
	Se	78	0.508	ug/L	0.097	19	5	14	11	KED
	Y	89		ug/L			561402	569711	2	Standard
	Kr	83		ug/L			45	65	6	Standard
>	In-1	115		ug/L			12648	12653	1	KED
	Mo	98	4.286	ug/L	0.081	1	4	2719	2	KED
	Cd	111	0.076	ug/L	0.014	18	3	17	16	KED
	Cd	114	0.100	ug/L	0.012	11	0	49	12	KED
>	In	115		ug/L			852951	856832	1	Standard
	Ag	107	0.013	ug/L	0.001	8	143	309	2	Standard
	Ba	135	126.292	ug/L	3.868	3	14	486716	1	Standard
	Ba	137	126.899	ug/L	2.394	1	26	852146	0	Standard
>	Tb	159		ug/L			1107766	1183182	4	Standard
	Tl	205	0.008	ug/L	0.001	12	18	297	15	Standard
	Pb	208	3.123	ug/L	0.061	1	188	129665	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0051-01
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 22:15:09
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	37113	6	Standard
	Cl	37		ug/L			3677416	4787689	3	Standard
>	Sc	45		ug/L			810285	876009	1	Standard
	Cr	52	0.464	ug/L	0.033	7	13691	21716	1	Standard
	Cr	53	1.241	ug/L	0.024	1	129	2337	3	Standard
	Mn	55	21.181	ug/L	0.738	3	378	435315	1	Standard
>	Ge	72		ug/L			42122	44798	2	KED
	Ni	60	0.851	ug/L	0.049	5	10	631	4	KED
	Ni	62	0.901	ug/L	0.038	4	0	106	1	KED
	Cu	63	4.041	ug/L	0.300	7	43	8254	4	KED
	Cu	65	4.189	ug/L	0.090	2	22	4274	0	KED
	Zn	66	34.628	ug/L	0.959	2	16	9098	2	KED
	Zn	67	32.601	ug/L	1.928	5	3	1456	3	KED
	As	75	1.459	ug/L	0.035	2	3	268	3	KED
	Se	78	0.363	ug/L	0.215	59	5	12	34	KED
	Y	89		ug/L			561402	573219	2	Standard
	Kr	83		ug/L			45	44	25	Standard
>	In-1	115		ug/L			12648	12961	1	KED
	Mo	98	3.649	ug/L	0.104	2	4	2372	1	KED
	Cd	111	0.030	ug/L	0.020	64	3	8	40	KED
	Cd	114	0.033	ug/L	0.022	66	0	16	64	KED
>	In	115		ug/L			852951	863594	0	Standard
	Ag	107	0.007	ug/L	0.000	6	143	243	2	Standard
	Ba	135	12.443	ug/L	0.236	1	14	48364	2	Standard
	Ba	137	12.516	ug/L	0.342	2	26	84737	1	Standard
>	Tb	159		ug/L			1107766	1221887	3	Standard
	Tl	205	0.007	ug/L	0.000	1	18	248	4	Standard
	Pb	208	0.586	ug/L	0.033	5	188	25267	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0051-02
Sample Dil Factor: 10 DEL
Comments:
Sample Date/Time: Wednesday, October 10, 2018 22:19:58
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	23970	3	Standard
	Cl	**37**		ug/L			3677416	45912665	1	Standard
>	**Sc**	**45**		ug/L			810285	823470	2	Standard
	Cr	**52**	**0.844**	ug/L	0.101	11	13691	25722	3	Standard
	Cr	**53**	**50.170**	ug/L	1.708	3	129	83588	1	Standard
	Mn	**55**	**1.619**	ug/L	0.036	2	378	31627	1	Standard
>	**Ge**	**72**		ug/L			42122	34581	3	KED
	Ni	**60**	**0.098**	ug/L	0.023	23	10	63	22	KED
	Ni	**62**	**0.505**	ug/L	0.094	18	0	46	17	KED
	Cu	**63**	**0.252**	ug/L	0.013	5	43	430	2	KED
	Cu	**65**	**0.217**	ug/L	0.036	16	22	188	14	KED
	Zn	**66**	**1.653**	ug/L	0.094	5	16	348	7	KED
	Zn	**67**	**1.806**	ug/L	0.279	15	3	65	16	KED
	As	**75**	**0.598**	ug/L	0.115	19	3	86	19	KED
	Se	**78**	**0.989**	ug/L	0.119	12	5	18	6	KED
	Y	**89**		ug/L			561402	484448	0	Standard
	Kr	**83**		ug/L			45	1422	7	Standard
>	**In-1**	**115**		ug/L			12648	10633	1	KED
	Mo	**98**	**1.015**	ug/L	0.025	2	4	544	4	KED
	Cd	**111**	**-0.001**	ug/L	0.008	1010	3	2	43	KED
	Cd	**114**	**0.015**	ug/L	0.012	75	0	6	70	KED
>	**In**	**115**		ug/L			852951	677721	1	Standard
	Ag	**107**	**0.001**	ug/L	0.002	185	143	125	16	Standard
	Ba	**135**	**6.942**	ug/L	0.064	0	14	21176	0	Standard
	Ba	**137**	**7.219**	ug/L	0.080	1	26	38368	1	Standard
>	**Tb**	**159**		ug/L			1107766	980626	0	Standard
	Tl	**205**	**0.011**	ug/L	0.001	10	18	314	9	Standard
	Pb	**208**	**0.021**	ug/L	0.002	10	188	876	8	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0051-03
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 22:24:48
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	82796	3	Standard
	Cl	37		ug/L			3677416	7396687	2	Standard
>	Sc	45		ug/L			810285	971604	3	Standard
	Cr	52	4.416	ug/L	0.181	4	13691	89383	1	Standard
	Cr	53	7.787	ug/L	0.356	4	129	15431	1	Standard
	Mn	55	84.890	ug/L	1.920	2	378	1933722	2	Standard
>	Ge	72		ug/L			42122	46789	1	KED
	Ni	60	8.167	ug/L	0.140	1	10	6235	0	KED
	Ni	62	8.674	ug/L	0.240	2	0	1067	2	KED
	Cu	63	49.500	ug/L	1.389	2	43	105196	3	KED
	Cu	65	49.196	ug/L	1.400	2	22	52171	1	KED
	Zn	66	908.647	ug/L	33.491	3	16	248865	2	KED
	Zn	67	840.993	ug/L	30.816	3	3	39163	2	KED
	As	75	1.905	ug/L	0.106	5	3	364	5	KED
	Se	78	0.648	ug/L	0.043	6	5	18	5	KED
	Y	89		ug/L			561402	648441	3	Standard
	Kr	83		ug/L			45	86	5	Standard
>	In-1	115		ug/L			12648	13350	2	KED
	Mo	98	3.601	ug/L	0.132	3	4	2410	3	KED
	Cd	111	0.321	ug/L	0.027	8	3	65	5	KED
	Cd	114	0.285	ug/L	0.024	8	0	146	9	KED
>	In	115		ug/L			852951	907276	1	Standard
	Ag	107	0.026	ug/L	0.001	5	143	509	1	Standard
	Ba	135	91.249	ug/L	2.519	2	14	372397	1	Standard
	Ba	137	89.736	ug/L	2.415	2	26	638069	1	Standard
>	Tb	159		ug/L			1107766	1264626	2	Standard
	Tl	205	0.016	ug/L	0.001	6	18	591	4	Standard
	Pb	208	12.044	ug/L	0.111	0	188	534099	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0059-07
Sample Dil Factor: 10
Comments:
Sample Date/Time: Wednesday, October 10, 2018 22:29:38
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	19979	4	Standard
	Cl	**37**		ug/L			3677416	4285947	1	Standard
>	**Sc**	**45**		ug/L			810285	928853	1	Standard
	Cr	**52**	**-0.128**	ug/L	0.060	46	13691	13661	6	Standard
	Cr	**53**	**0.588**	ug/L	0.020	3	129	1251	1	Standard
	Mn	**55**	**202.936**	ug/L	7.456	3	378	4418444	2	Standard
>	**Ge**	**72**		ug/L			42122	48150	2	KED
	Ni	**60**	**1.399**	ug/L	0.085	6	10	1109	7	KED
	Ni	**62**	**1.668**	ug/L	0.405	24	0	212	24	KED
	Cu	**63**	**2.018**	ug/L	0.060	2	43	4460	3	KED
	Cu	**65**	**1.971**	ug/L	0.097	4	22	2174	2	KED
	Zn	**66**	**31.289**	ug/L	1.181	3	16	8835	1	KED
	Zn	**67**	**29.927**	ug/L	0.944	3	3	1438	3	KED
	As	**75**	**0.025**	ug/L	0.012	47	3	9	24	KED
	Se	**78**	**0.136**	ug/L	0.050	36	5	8	9	KED
	Y	**89**		ug/L			561402	618078	3	Standard
	Kr	**83**		ug/L			45	51	3	Standard
>	**In-1**	**115**		ug/L			12648	13500	1	KED
	Mo	**98**	**-0.000**	ug/L	0.007	1526	4	4	98	KED
	Cd	**111**	**0.305**	ug/L	0.053	17	3	63	16	KED
	Cd	**114**	**0.287**	ug/L	0.037	12	0	148	11	KED
>	**In**	**115**		ug/L			852951	914956	0	Standard
	Ag	**107**	**0.002**	ug/L	0.002	70	143	188	13	Standard
	Ba	**135**	**2.235**	ug/L	0.029	1	14	9216	0	Standard
	Ba	**137**	**2.277**	ug/L	0.096	4	26	16357	3	Standard
>	**Tb**	**159**		ug/L			1107766	1218392	2	Standard
	Tl	**205**	**0.016**	ug/L	0.001	8	18	563	10	Standard
	Pb	**208**	**0.012**	ug/L	0.002	15	188	734	8	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0061-06
Sample Dil Factor: 5
Comments:
Sample Date/Time: Wednesday, October 10, 2018 22:34:27
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	28790	6	Standard
	Cl	**37**		ug/L			3677416	25814149	1	Standard
>	**Sc**	**45**		ug/L			810285	893951	1	Standard
	Cr	**52**	**0.732**	ug/L	0.036	4	13691	26251	3	Standard
	Cr	**53**	**28.924**	ug/L	0.713	2	129	52403	2	Standard
	Mn	**55**	**17.162**	ug/L	0.590	3	378	360075	2	Standard
>	**Ge**	**72**		ug/L			42122	39634	2	KED
	Ni	**60**	**0.576**	ug/L	0.027	4	10	380	2	KED
	Ni	**62**	**0.987**	ug/L	0.057	5	0	103	6	KED
	Cu	**63**	**1.431**	ug/L	0.013	0	43	2616	2	KED
	Cu	**65**	**1.460**	ug/L	0.035	2	22	1332	0	KED
	Zn	**66**	**11.928**	ug/L	0.781	6	16	2781	5	KED
	Zn	**67**	**11.824**	ug/L	0.792	6	3	469	5	KED
	As	**75**	**0.280**	ug/L	0.019	6	3	48	5	KED
	Se	**78**	**0.578**	ug/L	0.031	5	5	14	1	KED
	Y	**89**		ug/L			561402	557356	0	Standard
	Kr	**83**		ug/L			45	608	5	Standard
>	**In-1**	**115**		ug/L			12648	12002	1	KED
	Mo	**98**	**1.446**	ug/L	0.040	2	4	873	1	KED
	Cd	**111**	**0.006**	ug/L	0.012	179	3	4	48	KED
	Cd	**114**	**0.008**	ug/L	0.006	78	0	4	68	KED
>	**In**	**115**		ug/L			852951	799552	2	Standard
	Ag	**107**	**0.002**	ug/L	0.001	74	143	153	7	Standard
	Ba	**135**	**8.777**	ug/L	0.321	3	14	31575	2	Standard
	Ba	**137**	**8.690**	ug/L	0.064	0	26	54483	1	Standard
>	**Tb**	**159**		ug/L			1107766	1153747	2	Standard
	Tl	**205**	**0.002**	ug/L	0.000	9	18	74	5	Standard
	Pb	**208**	**0.121**	ug/L	0.007	5	188	5074	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0134-01RE1
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 22:39:17
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	20757	1	Standard
	Cl	**37**		ug/L			3677416	4705919	1	Standard
>	**Sc**	**45**		ug/L			810285	938127	3	Standard
	Cr	**52**	**-0.043**	ug/L	0.065	152	13691	15142	3	Standard
	Cr	**53**	**0.519**	ug/L	0.017	3	129	1133	1	Standard
	Mn	**55**	**53.114**	ug/L	1.333	2	378	1168223	1	Standard
>	**Ge**	**72**		ug/L			42122	47975	2	KED
	Ni	**60**	**0.226**	ug/L	0.021	9	10	188	10	KED
	Ni	**62**	**0.270**	ug/L	0.108	40	0	34	40	KED
	Cu	**63**	**0.348**	ug/L	0.029	8	43	806	5	KED
	Cu	**65**	**0.352**	ug/L	0.011	3	22	408	4	KED
	Zn	**66**	**1.638**	ug/L	0.069	4	16	478	3	KED
	Zn	**67**	**3.173**	ug/L	0.640	20	3	156	21	KED
	As	**75**	**0.147**	ug/L	0.013	8	3	33	8	KED
	Se	**78**	**0.195**	ug/L	0.124	63	5	9	26	KED
	Y	**89**		ug/L			561402	612119	1	Standard
	Kr	**83**		ug/L			45	59	28	Standard
>	**In-1**	**115**		ug/L			12648	13650	1	KED
	Mo	**98**	**0.653**	ug/L	0.070	10	4	450	9	KED
	Cd	**111**	**-0.009**	ug/L	0.003	28	3	1	34	KED
	Cd	**114**	**0.006**	ug/L	0.007	127	0	3	106	KED
>	**In**	**115**		ug/L			852951	913805	0	Standard
	Ag	**107**	**0.002**	ug/L	0.001	40	143	180	5	Standard
	Ba	**135**	**13.672**	ug/L	0.310	2	14	56230	2	Standard
	Ba	**137**	**13.617**	ug/L	0.287	2	26	97563	1	Standard
>	**Tb**	**159**		ug/L			1107766	1269780	0	Standard
	Tl	**205**	**0.001**	ug/L	0.000	13	18	60	9	Standard
	Pb	**208**	**0.007**	ug/L	0.001	18	188	531	10	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0258-DUP3
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 22:44:06
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	19931	3	Standard
	Cl	**37**		ug/L			3677416	4653187	1	Standard
>	**Sc**	**45**		ug/L			810285	868025	3	Standard
	Cr	**52**	**-0.009**	ug/L	0.026	297	13691	14532	1	Standard
	Cr	**53**	**0.394**	ug/L	0.002	0	129	830	3	Standard
	Mn	**55**	**52.906**	ug/L	2.443	4	378	1076208	1	Standard
>	**Ge**	**72**		ug/L			42122	45330	2	KED
	Ni	**60**	**0.215**	ug/L	0.021	9	10	170	11	KED
	Ni	**62**	**0.299**	ug/L	0.063	21	0	36	18	KED
	Cu	**63**	**0.371**	ug/L	0.006	1	43	809	2	KED
	Cu	**65**	**0.378**	ug/L	0.030	7	22	412	7	KED
	Zn	**66**	**1.740**	ug/L	0.092	5	16	480	7	KED
	Zn	**67**	**2.808**	ug/L	0.185	6	3	130	6	KED
	As	**75**	**0.107**	ug/L	0.012	11	3	23	9	KED
	Se	**78**	**0.264**	ug/L	0.117	44	5	10	20	KED
	Y	**89**		ug/L			561402	587195	2	Standard
	Kr	**83**		ug/L			45	54	14	Standard
>	**In-1**	**115**		ug/L			12648	12949	2	KED
	Mo	**98**	**0.671**	ug/L	0.017	2	4	439	0	KED
	Cd	**111**	**-0.000**	ug/L	0.008	1586	3	3	45	KED
	Cd	**114**	**0.009**	ug/L	0.004	46	0	4	41	KED
>	**In**	**115**		ug/L			852951	878783	1	Standard
	Ag	**107**	**0.002**	ug/L	0.002	88	143	172	11	Standard
	Ba	**135**	**13.290**	ug/L	0.167	1	14	52563	2	Standard
	Ba	**137**	**13.461**	ug/L	0.217	1	26	92738	1	Standard
>	**Tb**	**159**		ug/L			1107766	1214209	1	Standard
	Tl	**205**	**0.001**	ug/L	0.000	28	18	50	15	Standard
	Pb	**208**	**0.007**	ug/L	0.000	4	188	502	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BGJ0258-MS3
Sample Dil Factor: 20
Comments:
Sample Date/Time: Wednesday, October 10, 2018 22:48:56
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	19073	1	Standard
	Cl	**37**		ug/L			3677416	4614041	2	Standard
>	**Sc**	**45**		ug/L			810285	879076	0	Standard
	Cr	**52**	**1.238**	ug/L	0.061	4	13691	33377	2	Standard
	Cr	**53**	**1.575**	ug/L	0.045	2	129	2938	2	Standard
	Mn	**55**	**54.899**	ug/L STL	0.676	1	378	1132037	1	Standard
>	**Ge**	**72**		ug/L			42122	43534	1	KED
	Ni	**60**	**1.675**	ug/L	0.017	1	10	1198	2	KED
	Ni	**62**	**1.646**	ug/L	0.181	11	0	189	12	KED
	Cu	**63**	**1.699**	ug/L	0.073	4	43	3400	2	KED
	Cu	**65**	**1.773**	ug/L	0.049	2	22	1772	1	KED
	Zn	**66**	**6.343**	ug/L	0.351	5	16	1634	6	KED
	Zn	**67**	**7.466**	ug/L	0.754	10	3	327	10	KED
	As	**75**	**1.428**	ug/L	0.075	5	3	255	3	KED
	Se	**78**	**4.451**	ug/L	0.475	10	5	85	8	KED
	Y	**89**		ug/L			561402	564734	3	Standard
	Kr	**83**		ug/L			45	53	22	Standard
>	**In-1**	**115**		ug/L			12648	12808	3	KED
	Mo	**98**	**0.683**	ug/L	0.084	12	4	441	8	KED
	Cd	**111**	**1.348**	ug/L	0.079	5	3	253	1	KED
	Cd	**114**	**1.321**	ug/L	0.118	8	0	648	5	KED
>	**In**	**115**		ug/L			852951	855578	0	Standard
	Ag	**107**	**1.346**	ug/L	0.038	2	143	17882	2	Standard
	Ba	**135**	**15.445**	ug/L	0.067	0	14	59470	1	Standard
	Ba	**137**	**15.275**	ug/L	0.251	1	26	102479	2	Standard
>	**Tb**	**159**		ug/L			1107766	1198955	0	Standard
	Tl	**205**	**1.434**	ug/L	0.032	2	18	47648	2	Standard
	Pb	**208**	**1.475**	ug/L	0.010	0	188	62220	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCVE
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 22:54:50
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	17733	4	Standard
	Cl	**37**		ug/L			3677416	4207869	2	Standard
>	**Sc**	**45**		ug/L			810285	795850	8	Standard
	Cr	**52**	**52.310**	ug/L	3.930	7	13691	718916	2	Standard
	Cr	**53**	**52.120**	ug/L	4.229	8	129	83566	1	Standard
	Mn	**55**	**54.492**	ug/L	4.775	8	378	1012208	2	Standard
>	**Ge**	**72**		ug/L			42122	43356	0	KED
	Ni	**60**	**49.617**	ug/L	0.858	1	10	35054	1	KED
	Ni	**62**	**48.624**	ug/L	0.840	1	0	5542	1	KED
	Cu	**63**	**50.054**	ug/L	1.276	2	43	98554	2	KED
	Cu	**65**	**48.383**	ug/L	2.273	4	22	47555	4	KED
	Zn	**66**	**50.380**	ug/L	0.256	0	16	12807	0	KED
	Zn	**67**	**51.460**	ug/L	1.826	3	3	2224	3	KED
	As	**75**	**50.245**	ug/L	0.847	1	3	8812	1	KED
	Se	**78**	**48.764**	ug/L	0.810	1	5	877	1	KED
	Y	**89**		ug/L			561402	525427	3	Standard
	Kr	**83**		ug/L			45	52	22	Standard
>	**In-1**	**115**		ug/L			12648	12890	1	KED
	Mo	**98**	**47.729**	ug/L	0.802	1	4	30808	2	KED
	Cd	**111**	**49.157**	ug/L	1.121	2	3	9195	2	KED
	Cd	**114**	**48.176**	ug/L	0.656	1	0	23834	2	KED
>	**In**	**115**		ug/L			852951	818079	8	Standard
	Ag	**107**	**52.026**	ug/L	4.842	9	143	652352	0	Standard
	Ba	**135**	**54.753**	ug/L	5.581	10	14	200357	2	Standard
	Ba	**137**	**53.682**	ug/L	4.788	8	26	342534	2	Standard
>	**Tb**	**159**		ug/L			1107766	1132686	6	Standard
	Tl	**205**	**54.702**	ug/L	4.540	8	18	1710429	1	Standard
	Pb	**208**	**57.796**	ug/L	5.094	8	188	2286038	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCBE
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 23:02:25
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	16770	2	Standard
	Cl	**37**		ug/L			3677416	4241854	2	Standard
⌈>	**Sc**	**45**		ug/L			810285	808321	0	Standard
|	**Cr**	**52**	**-0.113**	ug/L	0.037	32	13691	12106	3	Standard
|	**Cr**	**53**	**0.180**	ug/L	0.014	8	129	423	5	Standard
⌊	**Mn**	**55**	**0.001**	ug/L	0.001	73	378	400	3	Standard
⌈>	**Ge**	**72**		ug/L			42122	43895	0	KED
|	**Ni**	**60**	**-0.004**	ug/L	0.008	191	10	7	75	KED
|	**Ni**	**62**	**0.038**	ug/L	0.009	24	0	5	21	KED
|	**Cu**	**63**	**0.002**	ug/L	0.001	90	43	48	5	KED
|	**Cu**	**65**	**-0.001**	ug/L	0.013	1379	22	22	57	KED
|	**Zn**	**66**	**-0.003**	ug/L	0.023	845	16	16	35	KED
|	**Zn**	**67**	**0.040**	ug/L	0.044	109	3	5	33	KED
|	**As**	**75**	**-0.004**	ug/L	0.008	224	3	3	41	KED
⌊	**Se**	**78**	**0.187**	ug/L	0.118	63	5	8	24	KED
	Y	**89**		ug/L			561402	547251	3	Standard
	Kr	**83**		ug/L			45	59	19	Standard
⌈>	**In-1**	**115**		ug/L			12648	12219	3	KED
|	**Mo**	**98**	**0.032**	ug/L	0.013	41	4	23	31	KED
|	**Cd**	**111**	**-0.001**	ug/L	0.010	1042	3	2	57	KED
⌊	**Cd**	**114**	**0.010**	ug/L	0.007	67	0	5	57	KED
⌈>	**In**	**115**		ug/L			852951	854601	3	Standard
|	**Ag**	**107**	**0.006**	ug/L	0.001	18	143	226	6	Standard
|	**Ba**	**135**	**0.001**	ug/L	0.002	319	14	16	35	Standard
⌊	**Ba**	**137**	**0.001**	ug/L	0.001	144	26	31	18	Standard
⌈>	**Tb**	**159**		ug/L			1107766	1153017	1	Standard
|	**Tl**	**205**	**0.007**	ug/L	0.000	1	18	258	0	Standard
⌊	**Pb**	**208**	**0.002**	ug/L	0.001	38	188	295	11	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0064-04
Sample Dil Factor: 5 DEL
Comments:
Sample Date/Time: Wednesday, October 10, 2018 23:07:15
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	25398	3	Standard
	Cl	**37**		ug/L			3677416	4946554	3	Standard
>	**Sc**	**45**		ug/L			810285	824078	2	Standard
	Cr	**52**	**0.846**	ug/L	0.093	11	13691	25767	3	Standard
	Cr	**53**	**1.958**	ug/L	0.113	5	129	3388	2	Standard
	Mn	**55**	**89.974**	ug/L	2.785	3	378	1737995	0	Standard
>	**Ge**	**72**		ug/L			42122	44254	2	KED
	Ni	**60**	**1.291**	ug/L	0.104	8	10	939	5	KED
	Ni	**62**	**1.352**	ug/L	0.104	7	0	158	10	KED
	Cu	**63**	**7.290**	ug/L	0.228	3	43	14682	1	KED
	Cu	**65**	**7.510**	ug/L	0.303	4	22	7551	2	KED
	Zn	**66**	**110.821**	ug/L	4.100	3	16	28714	1	KED
	Zn	**67**	**104.334**	ug/L	1.198	1	3	4600	2	KED
	As	**75**	**0.278**	ug/L	0.033	11	3	53	9	KED
	Se	**78**	**0.319**	ug/L	0.096	30	5	11	18	KED
	Y	**89**		ug/L			561402	559306	2	Standard
	Kr	**83**		ug/L			45	61	4	Standard
>	**In-1**	**115**		ug/L			12648	12701	1	KED
	Mo	**98**	**2.147**	ug/L	0.070	3	4	1370	3	KED
	Cd	**111**	**0.060**	ug/L	0.032	53	3	14	41	KED
	Cd	**114**	**0.058**	ug/L	0.009	15	0	28	14	KED
>	**In**	**115**		ug/L			852951	846420	1	Standard
	Ag	**107**	**0.005**	ug/L	0.002	43	143	210	15	Standard
	Ba	**135**	**4.073**	ug/L	0.088	2	14	15526	3	Standard
	Ba	**137**	**4.045**	ug/L	0.096	2	26	26860	1	Standard
>	**Tb**	**159**		ug/L			1107766	1171666	2	Standard
	Tl	**205**	**0.013**	ug/L	0.002	15	18	455	12	Standard
	Pb	**208**	**0.453**	ug/L	0.012	2	188	18802	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0083-01
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 23:12:05
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	32965	4	Standard
	Cl	**37**		ug/L			3677416	4467422	0	Standard
>	**Sc**	**45**		ug/L			810285	928752	1	Standard
	Cr	**52**	**3.915**	ug/L	0.125	3	13691	77557	1	Standard
	Cr	**53**	**4.579**	ug/L	0.109	2	129	8743	1	Standard
	Mn	**55**	**73.682**	ug/L	1.249	1	378	1604851	0	Standard
>	**Ge**	**72**		ug/L			42122	38225	1	KED
	Ni	**60**	**7.234**	ug/L	0.256	3	10	4515	4	KED
	Ni	**62**	**6.925**	ug/L	0.547	7	0	696	8	KED
	Cu	**63**	**1.202**	ug/L	0.091	7	43	2125	7	KED
	Cu	**65**	**1.201**	ug/L	0.025	2	22	1060	1	KED
	Zn	**66**	**14.883**	ug/L	0.311	2	16	3346	2	KED
	Zn	**67**	**20.082**	ug/L	0.208	1	3	767	0	KED
	As	**75**	**0.668**	ug/L	0.013	1	3	106	2	KED
	Se	**78**	**0.272**	ug/L	0.144	52	5	8	26	KED
	Y	**89**		ug/L			561402	543769	0	Standard
	Kr	**83**		ug/L			45	68	26	Standard
>	**In-1**	**115**		ug/L			12648	11126	5	KED
	Mo	**98**	**0.367**	ug/L	0.010	2	4	208	3	KED
	Cd	**111**	**0.025**	ug/L	0.017	69	3	6	37	KED
	Cd	**114**	**0.040**	ug/L	0.017	41	0	17	46	KED
>	**In**	**115**		ug/L			852951	747886	1	Standard
	Ag	**107**	**0.009**	ug/L	0.002	26	143	224	11	Standard
	Ba	**135**	**89.249**	ug/L	2.450	2	14	300260	1	Standard
	Ba	**137**	**89.051**	ug/L	1.390	1	26	522010	0	Standard
>	**Tb**	**159**		ug/L			1107766	1098080	1	Standard
	Tl	**205**	**0.011**	ug/L	0.001	8	18	367	7	Standard
	Pb	**208**	**3.329**	ug/L	0.082	2	188	128304	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0083-03
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 23:16:54
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	27887	1	Standard
	Cl	**37**		ug/L			3677416	4913623	3	Standard
>	**Sc**	**45**		ug/L			810285	961220	2	Standard
	Cr	**52**	**1.254**	ug/L	0.085	6	13691	36730	1	Standard
	Cr	**53**	**2.515**	ug/L	0.068	2	129	5037	0	Standard
	Mn	**55**	**0.430**	ug/L	0.023	5	378	10129	3	Standard
>	**Ge**	**72**		ug/L			42122	41252	1	KED
	Ni	**60**	**0.825**	ug/L	0.052	6	10	564	5	KED
	Ni	**62**	**0.720**	ug/L	0.067	9	0	78	9	KED
	Cu	**63**	**0.646**	ug/L	0.046	7	43	1251	6	KED
	Cu	**65**	**0.663**	ug/L	0.013	1	22	642	2	KED
	Zn	**66**	**3.336**	ug/L	0.206	6	16	821	5	KED
	Zn	**67**	**7.477**	ug/L	0.916	12	3	310	10	KED
	As	**75**	**1.030**	ug/L	0.036	3	3	175	2	KED
	Se	**78**	**1.537**	ug/L	0.264	17	5	31	13	KED
	Y	**89**		ug/L			561402	547057	4	Standard
	Kr	**83**		ug/L			45	52	7	Standard
>	**In-1**	**115**		ug/L			12648	11841	1	KED
	Mo	**98**	**0.297**	ug/L	0.014	4	4	180	6	KED
	Cd	**111**	**0.051**	ug/L	0.020	38	3	11	28	KED
	Cd	**114**	**0.047**	ug/L	0.020	42	0	21	40	KED
>	**In**	**115**		ug/L			852951	786981	0	Standard
	Ag	**107**	**0.016**	ug/L	0.003	19	143	328	11	Standard
	Ba	**135**	**55.590**	ug/L	0.682	1	14	196845	1	Standard
	Ba	**137**	**55.323**	ug/L	0.817	1	26	341288	0	Standard
>	**Tb**	**159**		ug/L			1107766	1174864	2	Standard
	Tl	**205**	**0.004**	ug/L	0.000	8	18	134	4	Standard
	Pb	**208**	**0.130**	ug/L	0.007	5	188	5567	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0093-01
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 23:21:44
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	30028	6	Standard
	Cl	37		ug/L			3677416	4321372	0	Standard
>	Sc	45		ug/L			810285	897818	2	Standard
	Cr	52	3.016	ug/L	0.158	5	13691	61223	1	Standard
	Cr	53	3.309	ug/L	0.145	4	129	6145	3	Standard
	Mn	55	321.727	ug/L	12.518	3	378	6769616	2	Standard
>	Ge	72		ug/L			42122	43710	1	KED
	Ni	60	1.316	ug/L	0.086	6	10	947	7	KED
	Ni	62	1.234	ug/L	0.279	22	0	142	21	KED
	Cu	63	5.959	ug/L	0.150	2	43	11866	1	KED
	Cu	65	6.007	ug/L	0.197	3	22	5973	3	KED
	Zn	66	57.120	ug/L	1.693	2	16	14632	1	KED
	Zn	67	52.997	ug/L	1.197	2	3	2310	2	KED
	As	75	2.466	ug/L	0.102	4	3	439	2	KED
	Se	78	0.349	ug/L	0.032	9	5	11	6	KED
	Y	89		ug/L			561402	587748	1	Standard
	Kr	83		ug/L			45	55	7	Standard
>	In-1	115		ug/L			12648	12815	1	KED
	Mo	98	0.852	ug/L	0.085	10	4	551	8	KED
	Cd	111	0.251	ug/L	0.035	13	3	49	13	KED
	Cd	114	0.234	ug/L	0.014	5	0	115	4	KED
>	In	115		ug/L			852951	857093	0	Standard
	Ag	107	0.065	ug/L	0.004	6	143	998	5	Standard
	Ba	135	14.664	ug/L	0.157	1	14	56563	1	Standard
	Ba	137	14.745	ug/L	0.092	0	26	99086	0	Standard
>	Tb	159		ug/L			1107766	1193116	1	Standard
	Tl	205	0.004	ug/L	0.000	11	18	144	9	Standard
	Pb	208	1.141	ug/L	0.014	1	188	47938	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0093-02
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 23:26:34
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	35714	5	Standard
	Cl	37		ug/L			3677416	4496147	0	Standard
>	Sc	45		ug/L			810285	924213	2	Standard
	Cr	52	0.823	ug/L	0.054	6	13691	28551	2	Standard
	Cr	53	1.324	ug/L	0.013	0	129	2620	1	Standard
	Mn	55	473.314	ug/L	24.607	5	378	10248581	2	Standard
>	Ge	72		ug/L			42122	43637	1	KED
	Ni	60	1.560	ug/L	0.094	6	10	1119	5	KED
	Ni	62	1.576	ug/L	0.209	13	0	181	14	KED
	Cu	63	3.635	ug/L	0.245	6	43	7243	5	KED
	Cu	65	3.687	ug/L	0.020	0	22	3669	0	KED
	Zn	66	41.542	ug/L	0.572	1	16	10631	1	KED
	Zn	67	38.663	ug/L	2.257	5	3	1683	6	KED
	As	75	1.800	ug/L	0.123	6	3	321	6	KED
	Se	78	0.316	ug/L	0.299	94	5	10	49	KED
	Y	89		ug/L			561402	588119	3	Standard
	Kr	83		ug/L			45	60	14	Standard
>	In-1	115		ug/L			12648	12101	1	KED
	Mo	98	1.147	ug/L	0.043	3	4	699	4	KED
	Cd	111	0.068	ug/L	0.005	7	3	14	7	KED
	Cd	114	0.079	ug/L	0.029	36	0	37	37	KED
>	In	115		ug/L			852951	842902	3	Standard
	Ag	107	0.010	ug/L	0.001	9	143	275	4	Standard
	Ba	135	20.648	ug/L	0.665	3	14	78269	0	Standard
	Ba	137	20.505	ug/L	0.744	3	26	135432	2	Standard
>	Tb	159		ug/L			1107766	1186798	0	Standard
	Tl	205	0.003	ug/L	0.000	3	18	107	2	Standard
	Pb	208	0.265	ug/L	0.005	1	188	11222	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0093-03
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 23:31:23
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	36935	2	Standard
	Cl	37		ug/L			3677416	4292804	2	Standard
>	Sc	45		ug/L			810285	916278	3	Standard
	Cr	52	0.660	ug/L	0.047	7	13691	25756	2	Standard
	Cr	53	0.982	ug/L	0.023	2	129	1964	3	Standard
	Mn	55	6.605	ug/L	0.199	3	378	142296	3	Standard
>	Ge	72		ug/L			42122	42323	9	KED
	Ni	60	1.558	ug/L	0.162	10	10	1078	6	KED
	Ni	62	1.448	ug/L	0.039	2	0	161	11	KED
	Cu	63	7.254	ug/L	0.686	9	43	13905	3	KED
	Cu	65	7.212	ug/L	0.700	9	22	6899	1	KED
	Zn	66	33.463	ug/L	3.911	11	16	8251	3	KED
	Zn	67	30.554	ug/L	1.425	4	3	1287	4	KED
	As	75	0.647	ug/L	0.101	15	3	113	7	KED
	Se	78	0.353	ug/L	0.197	55	5	11	20	KED
	Y	89		ug/L			561402	599212	3	Standard
	Kr	83		ug/L			45	51	22	Standard
>	In-1	115		ug/L			12648	13222	2	KED
	Mo	98	0.198	ug/L	0.016	8	4	136	7	KED
	Cd	111	0.385	ug/L	0.057	14	3	77	15	KED
	Cd	114	0.423	ug/L	0.055	13	0	214	12	KED
>	In	115		ug/L			852951	884750	1	Standard
	Ag	107	0.098	ug/L	0.003	2	143	1482	4	Standard
	Ba	135	6.350	ug/L	0.190	2	14	25284	1	Standard
	Ba	137	6.424	ug/L	0.082	1	26	44571	1	Standard
>	Tb	159		ug/L			1107766	1207146	1	Standard
	Tl	205	0.006	ug/L	0.000	2	18	207	3	Standard
	Pb	208	4.111	ug/L	0.093	2	188	174164	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0096-01
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 23:36:13
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	64425	2	Standard
	Cl	37		ug/L			3677416	4913552	0	Standard
>	Sc	45		ug/L			810285	1064563	1	Standard
	Cr	52	0.041	ug/L	0.027	66	13691	18726	3	Standard
	Cr	53	1.034	ug/L	0.046	4	129	2395	3	Standard
	Mn	55	39.054	ug/L	0.689	1	378	975473	2	Standard
>	Ge	72		ug/L			42122	42671	1	KED
	Ni	60	1.314	ug/L	0.037	2	10	923	3	KED
	Ni	62	1.217	ug/L	0.070	5	0	137	6	KED
	Cu	63	23.724	ug/L	0.833	3	43	45990	3	KED
	Cu	65	23.843	ug/L	0.746	3	22	23071	1	KED
	Zn	66	33.255	ug/L	0.527	1	16	8325	1	KED
	Zn	67	31.624	ug/L	0.723	2	3	1347	3	KED
	As	75	2.577	ug/L	0.144	5	3	448	4	KED
	Se	78	0.366	ug/L	0.071	19	5	11	12	KED
	Y	89		ug/L			561402	581986	2	Standard
	Kr	83		ug/L			45	53	10	Standard
>	In-1	115		ug/L			12648	12056	4	KED
	Mo	98	1.268	ug/L	0.012	0	4	769	3	KED
	Cd	111	-0.003	ug/L	0.003	91	3	2	21	KED
	Cd	114	0.012	ug/L	0.003	24	0	6	19	KED
>	In	115		ug/L			852951	812124	2	Standard
	Ag	107	0.010	ug/L	0.002	16	143	266	8	Standard
	Ba	135	8.845	ug/L	0.443	5	14	32312	3	Standard
	Ba	137	8.793	ug/L	0.272	3	26	55971	0	Standard
>	Tb	159		ug/L			1107766	1194229	3	Standard
	Tl	205	0.002	ug/L	0.000	12	18	95	7	Standard
	Pb	208	3.866	ug/L	0.162	4	188	161873	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0098-01
Sample Dil Factor: 2
Comments:
Sample Date/Time: Wednesday, October 10, 2018 23:41:03
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	25120	3	Standard
	Cl	**37**		ug/L			3677416	4087209	1	Standard
>	**Sc**	**45**		ug/L			810285	759725	1	Standard
	Cr	**52**	**1.234**	ug/L	0.014	1	13691	28788	2	Standard
	Cr	**53**	**1.588**	ug/L	0.039	2	129	2559	0	Standard
	Mn	**55**	**16.579**	ug/L	0.406	2	378	295617	0	Standard
>	**Ge**	**72**		ug/L			42122	33798	2	KED
	Ni	**60**	**3.924**	ug/L	0.122	3	10	2167	0	KED
	Ni	**62**	**3.959**	ug/L	0.357	9	0	351	6	KED
	Cu	**63**	**5.575**	ug/L	0.002	0	43	8588	2	KED
	Cu	**65**	**5.403**	ug/L	0.275	5	22	4152	2	KED
	Zn	**66**	**22.058**	ug/L	0.991	4	16	4375	1	KED
	Zn	**67**	**23.464**	ug/L	1.171	4	3	792	5	KED
	As	**75**	**1.850**	ug/L	0.077	4	3	256	5	KED
	Se	**78**	**1.349**	ug/L	0.098	7	5	22	6	KED
	Y	**89**		ug/L			561402	483848	1	Standard
	Kr	**83**		ug/L			45	95	8	Standard
>	**In-1**	**115**		ug/L			12648	10137	3	KED
	Mo	**98**	**0.118**	ug/L	0.023	19	4	63	19	KED
	Cd	**111**	**0.002**	ug/L	0.007	313	3	2	33	KED
	Cd	**114**	**0.023**	ug/L	0.002	8	0	9	5	KED
>	**In**	**115**		ug/L			852951	688134	1	Standard
	Ag	**107**	**0.028**	ug/L	0.002	7	143	413	5	Standard
	Ba	**135**	**22.040**	ug/L	0.366	1	14	68243	1	Standard
	Ba	**137**	**21.779**	ug/L	0.442	2	26	117483	1	Standard
>	**Tb**	**159**		ug/L			1107766	992399	1	Standard
	Tl	**205**	**0.030**	ug/L	0.001	2	18	830	4	Standard
	Pb	**208**	**22.238**	ug/L	0.410	1	188	773702	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0098-03
Sample Dil Factor: 2
Comments:
Sample Date/Time: Wednesday, October 10, 2018 23:45:52
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	25732	4	Standard
	Cl	37		ug/L			3677416	4005367	1	Standard
>	Sc	45		ug/L			810285	739265	1	Standard
	Cr	52	1.212	ug/L	0.064	5	13691	27740	1	Standard
	Cr	53	1.450	ug/L	0.029	1	129	2284	2	Standard
	Mn	55	17.310	ug/L	0.185	1	378	300379	0	Standard
>	Ge	72		ug/L			42122	33602	0	KED
	Ni	60	8.205	ug/L	0.150	1	10	4499	1	KED
	Ni	62	7.830	ug/L	0.372	4	0	692	4	KED
	Cu	63	8.014	ug/L	0.060	0	43	12259	0	KED
	Cu	65	8.245	ug/L	0.014	0	22	6296	0	KED
	Zn	66	39.227	ug/L	1.008	2	16	7730	2	KED
	Zn	67	43.735	ug/L	1.786	4	3	1466	4	KED
	As	75	57.383	ug/L	0.381	0	3	7799	0	KED
	Se	78	1.605	ug/L	0.303	18	5	26	15	KED
	Y	89		ug/L			561402	471961	0	Standard
	Kr	83		ug/L			45	100	16	Standard
>	In-1	115		ug/L			12648	10138	0	KED
	Mo	98	286.883	ug/L	5.095	1	4	145604	0	KED
	Cd	111	0.067	ug/L	0.024	36	3	12	27	KED
	Cd	114	0.040	ug/L	0.004	8	0	16	7	KED
>	In	115		ug/L			852951	684196	2	Standard
	Ag	107	0.021	ug/L	0.001	6	143	333	2	Standard
	Ba	135	118.026	ug/L	4.226	3	14	363173	1	Standard
	Ba	137	116.935	ug/L	1.865	1	26	627037	0	Standard
>	Tb	159		ug/L			1107766	967421	0	Standard
	Tl	205	0.235	ug/L	0.010	4	18	6311	4	Standard
	Pb	208	45.416	ug/L	0.063	0	188	1540467	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0098-05
Sample Dil Factor: 2
Comments:
Sample Date/Time: Wednesday, October 10, 2018 23:50:42
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	25599	3	Standard
	Cl	**37**		ug/L			3677416	3909042	0	Standard
>	**Sc**	**45**		ug/L			810285	730640	1	Standard
	Cr	**52**	**0.875**	ug/L	0.044	5	13691	23216	0	Standard
	Cr	**53**	**1.081**	ug/L	0.013	1	129	1713	2	Standard
	Mn	**55**	**9.873**	ug/L	0.227	2	378	169453	1	Standard
>	**Ge**	**72**		ug/L			42122	33587	1	KED
	Ni	**60**	**7.858**	ug/L	0.377	4	10	4305	3	KED
	Ni	**62**	**8.086**	ug/L	0.654	8	0	713	6	KED
	Cu	**63**	**5.855**	ug/L	0.127	2	43	8962	2	KED
	Cu	**65**	**5.915**	ug/L	0.422	7	22	4516	5	KED
	Zn	**66**	**20.304**	ug/L	1.384	6	16	4003	5	KED
	Zn	**67**	**29.433**	ug/L	2.114	7	3	987	7	KED
	As	**75**	**50.785**	ug/L	1.536	3	3	6897	1	KED
	Se	**78**	**1.475**	ug/L	0.381	25	5	24	23	KED
	Y	**89**		ug/L			561402	476289	2	Standard
	Kr	**83**		ug/L			45	99	6	Standard
>	**In-1**	**115**		ug/L			12648	9986	1	KED
	Mo	**98**	**327.539**	ug/L	4.570	1	4	163734	0	KED
	Cd	**111**	**0.075**	ug/L	0.008	10	3	13	7	KED
	Cd	**114**	**0.034**	ug/L	0.006	16	0	13	15	KED
>	**In**	**115**		ug/L			852951	673568	1	Standard
	Ag	**107**	**0.018**	ug/L	0.000	0	143	304	1	Standard
	Ba	**135**	**127.489**	ug/L	3.381	2	14	386321	2	Standard
	Ba	**137**	**127.046**	ug/L	2.128	1	26	670789	2	Standard
>	**Tb**	**159**		ug/L			1107766	947706	0	Standard
	Tl	**205**	**0.221**	ug/L	0.002	0	18	5807	0	Standard
	Pb	**208**	**44.367**	ug/L	0.436	0	188	1474266	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCVF
Sample Dil Factor:
Comments:
Sample Date/Time: Wednesday, October 10, 2018 23:56:36
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	17960	6	Standard
	Cl	**37**		ug/L			3677416	4182879	1	Standard
>	**Sc**	**45**		ug/L			810285	842187	1	Standard
	Cr	**52**	**50.387**	ug/L	1.631	3	13691	736209	1	Standard
	Cr	**53**	**51.605**	ug/L	1.171	2	129	87990	3	Standard
	Mn	**55**	**52.122**	ug/L	2.918	5	378	1029122	4	Standard
>	**Ge**	**72**		ug/L			42122	45752	4	KED
	Ni	**60**	**50.181**	ug/L	1.115	2	10	37405	3	KED
	Ni	**62**	**46.610**	ug/L	1.752	3	0	5601	1	KED
	Cu	**63**	**50.474**	ug/L	1.852	3	43	104801	2	KED
	Cu	**65**	**48.988**	ug/L	3.816	7	22	50708	3	KED
	Zn	**66**	**49.723**	ug/L	2.192	4	16	13324	1	KED
	Zn	**67**	**51.172**	ug/L	0.783	1	3	2334	2	KED
	As	**75**	**48.979**	ug/L	1.418	2	3	9060	2	KED
	Se	**78**	**50.232**	ug/L	1.091	2	5	952	1	KED
	Y	**89**		ug/L			561402	567746	0	Standard
	Kr	**83**		ug/L			45	55	11	Standard
>	**In-1**	**115**		ug/L			12648	13410	2	KED
	Mo	**98**	**49.724**	ug/L	1.490	2	4	33374	1	KED
	Cd	**111**	**49.591**	ug/L	0.384	0	3	9650	1	KED
	Cd	**114**	**50.389**	ug/L	2.132	4	0	25917	1	KED
>	**In**	**115**		ug/L			852951	866406	2	Standard
	Ag	**107**	**49.938**	ug/L	2.685	5	143	666192	2	Standard
	Ba	**135**	**54.162**	ug/L	2.481	4	14	210979	1	Standard
	Ba	**137**	**53.477**	ug/L	2.018	3	26	362972	1	Standard
>	**Tb**	**159**		ug/L			1107766	1223398	1	Standard
	Tl	**205**	**50.666**	ug/L	2.233	4	18	1717018	3	Standard
	Pb	**208**	**52.111**	ug/L	0.644	1	188	2234965	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCBF
Sample Dil Factor:
Comments:
Sample Date/Time: Thursday, October 11, 2018 00:04:10
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	16339	3	Standard
	Cl	**37**		ug/L			3677416	4160284	2	Standard
⌈>	**Sc**	**45**		ug/L			810285	850562	1	Standard
|	**Cr**	**52**	**-0.128**	ug/L	0.007	5	13691	12516	1	Standard
|	**Cr**	**53**	**0.020**	ug/L	0.006	30	129	170	4	Standard
⌊	**Mn**	**55**	**0.036**	ug/L	0.002	5	378	1121	1	Standard
⌈>	**Ge**	**72**		ug/L			42122	45255	2	KED
|	**Ni**	**60**	**-0.004**	ug/L	0.003	83	10	8	26	KED
|	**Ni**	**62**	**0.027**	ug/L	0.017	63	0	3	50	KED
|	**Cu**	**63**	**0.001**	ug/L	0.006	845	43	48	21	KED
|	**Cu**	**65**	**0.003**	ug/L	0.009	341	22	27	34	KED
|	**Zn**	**66**	**0.002**	ug/L	0.042	2360	16	18	63	KED
|	**Zn**	**67**	**0.007**	ug/L	0.062	918	3	4	65	KED
|	**As**	**75**	**0.004**	ug/L	0.010	232	3	5	37	KED
⌊	**Se**	**78**	**0.247**	ug/L	0.097	39	5	10	18	KED
	Y	**89**		ug/L			561402	553960	2	Standard
	Kr	**83**		ug/L			45	58	25	Standard
⌈>	**In-1**	**115**		ug/L			12648	14025	1	KED
|	**Mo**	**98**	**0.019**	ug/L	0.016	82	4	18	58	KED
|	**Cd**	**111**	**0.001**	ug/L	0.005	336	3	3	25	KED
⌊	**Cd**	**114**	**0.001**	ug/L	0.002	235	0	1	98	KED
⌈>	**In**	**115**		ug/L			852951	882064	4	Standard
|	**Ag**	**107**	**0.012**	ug/L	0.006	55	143	304	24	Standard
|	**Ba**	**135**	**0.021**	ug/L	0.033	160	14	93	133	Standard
⌊	**Ba**	**137**	**0.011**	ug/L	0.018	163	26	102	118	Standard
⌈>	**Tb**	**159**		ug/L			1107766	1198434	4	Standard
|	**Tl**	**205**	**0.009**	ug/L	0.004	44	18	313	36	Standard
⌊	**Pb**	**208**	**0.008**	ug/L	0.009	115	188	528	67	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0119-01
Sample Dil Factor:
Comments:
Sample Date/Time: Thursday, October 11, 2018 00:09:01
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	26338	4	Standard
	Cl	37		ug/L			3677416	3634735	1	Standard
>	Sc	45		ug/L			810285	866252	1	Standard
	Cr	52	0.076	ug/L	0.008	10	13691	15749	0	Standard
	Cr	53	0.326	ug/L	0.017	5	129	708	5	Standard
	Mn	55	3262.042	ug/L	104.498	3	378	66256878	3	Standard
>	Ge	72		ug/L			42122	37948	1	KED
	Ni	60	25.750	ug/L	0.264	1	10	15928	1	KED
	Ni	62	25.086	ug/L	1.526	6	0	2501	5	KED
	Cu	63	62.404	ug/L	1.603	2	43	107559	3	KED
	Cu	65	62.293	ug/L	1.035	1	22	53595	3	KED
	Zn	66	2669.976	ug/L	38.818	1	16	593270	1	KED
	Zn	67	2466.240	ug/L	28.317	1	3	93165	0	KED
	As	75	0.469	ug/L	0.015	3	3	75	4	KED
	Se	78	0.761	ug/L	0.139	18	5	16	13	KED
	Y	89		ug/L			561402	776553	3	Standard
	Kr	83		ug/L			45	95	17	Standard
>	In-1	115		ug/L			12648	10793	1	KED
	Mo	98	0.013	ug/L	0.007	53	4	11	33	KED
	Cd	111	5.820	ug/L	0.301	5	3	913	4	KED
	Cd	114	6.063	ug/L	0.204	3	0	2511	2	KED
>	In	115		ug/L			852951	624106	0	Standard
	Ag	107	0.011	ug/L	0.003	22	143	214	11	Standard
	Ba	135	15.071	ug/L	0.409	2	14	42329	2	Standard
	Ba	137	14.896	ug/L	0.200	1	26	72896	1	Standard
>	Tb	159		ug/L			1107766	966788	0	Standard
	Tl	205	0.128	ug/L	0.005	4	18	3439	4	Standard
	Pb	208	0.164	ug/L	0.007	4	188	5732	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0119-02
Sample Dil Factor:
Comments:
Sample Date/Time: Thursday, October 11, 2018 00:13:51
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	30863	3	Standard
	Cl	37		ug/L			3677416	4016430	0	Standard
>	Sc	45		ug/L			810285	922705	2	Standard
	Cr	52	-0.079	ug/L	0.007	8	13691	14347	1	Standard
	Cr	53	0.164	ug/L	0.011	6	129	453	6	Standard
	Mn	55	820.580	ug/L	23.492	2	378	17750866	2	Standard
>	Ge	72		ug/L			42122	39555	2	KED
	Ni	60	3.757	ug/L	0.084	2	10	2430	1	KED
	Ni	62	5.098	ug/L	0.146	2	0	530	4	KED
	Cu	63	512.241	ug/L	15.311	2	43	919417	0	KED
	Cu	65	512.847	ug/L	15.455	3	22	459503	0	KED
	Zn	66	7153.293	ug/L	212.165	2	16	1656137	1	KED
	Zn	67	6698.345	ug/L	159.709	2	3	263699	1	KED
	As	75	0.115	ug/L	0.006	5	3	22	6	KED
	Se	78	0.771	ug/L	0.072	9	5	17	8	KED
	Y	89		ug/L			561402	676439	4	Standard
	Kr	83		ug/L			45	96	8	Standard
>	In-1	115		ug/L			12648	11149	2	KED
	Mo	98	0.039	ug/L	0.024	61	4	25	49	KED
	Cd	111	21.558	ug/L	0.783	3	3	3488	1	KED
	Cd	114	21.046	ug/L	0.867	4	0	8999	1	KED
>	In	115		ug/L			852951	753669	2	Standard
	Ag	107	0.016	ug/L	0.003	19	143	308	10	Standard
	Ba	135	14.921	ug/L	0.553	3	14	50586	1	Standard
	Ba	137	14.889	ug/L	0.376	2	26	87967	2	Standard
>	Tb	159		ug/L			1107766	1113871	2	Standard
	Tl	205	0.115	ug/L	0.005	3	18	3566	1	Standard
	Pb	208	13.391	ug/L	0.292	2	188	522992	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0119-03
Sample Dil Factor:
Comments:
Sample Date/Time: Thursday, October 11, 2018 00:18:40
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	30173	1	Standard
	Cl	37		ug/L			3677416	4239816	1	Standard
>	Sc	45		ug/L			810285	905016	2	Standard
	Cr	52	0.055	ug/L	0.061	111	13691	16122	3	Standard
	Cr	53	0.201	ug/L	0.013	6	129	512	6	Standard
	Mn	55	678.815	ug/L	17.280	2	378	14400496	0	Standard
>	Ge	72		ug/L			42122	37643	0	KED
	Ni	60	1.662	ug/L	0.010	0	10	1027	0	KED
	Ni	62	1.586	ug/L	0.091	5	0	157	5	KED
	Cu	63	0.788	ug/L	0.025	3	43	1386	3	KED
	Cu	65	0.716	ug/L	0.006	0	22	631	1	KED
	Zn	66	19.992	ug/L	0.268	1	16	4421	2	KED
	Zn	67	18.668	ug/L	0.846	4	3	702	4	KED
	As	75	0.021	ug/L	0.021	95	3	6	46	KED
	Se	78	0.421	ug/L	0.113	26	5	11	16	KED
	Y	89		ug/L			561402	523445	2	Standard
	Kr	83		ug/L			45	95	9	Standard
>	In-1	115		ug/L			12648	10867	5	KED
	Mo	98	0.173	ug/L	0.033	19	4	97	13	KED
	Cd	111	0.027	ug/L	0.006	22	3	6	7	KED
	Cd	114	0.031	ug/L	0.010	32	0	13	30	KED
>	In	115		ug/L			852951	743082	0	Standard
	Ag	107	0.002	ug/L	0.002	87	143	145	11	Standard
	Ba	135	6.179	ug/L	0.091	1	14	20669	1	Standard
	Ba	137	6.012	ug/L	0.069	1	26	35042	1	Standard
>	Tb	159		ug/L			1107766	1108560	1	Standard
	Tl	205	0.004	ug/L	0.000	7	18	153	6	Standard
	Pb	208	0.024	ug/L	0.001	2	188	1127	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0076-01
Sample Dil Factor:
Comments:
Sample Date/Time: Thursday, October 11, 2018 00:23:30
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	29385	2	Standard
	Cl	37		ug/L			3677416	4321173	2	Standard
>	Sc	45		ug/L			810285	930871	2	Standard
	Cr	52	13.491	ug/L	0.505	3	13691	229322	0	Standard
	Cr	53	13.758	ug/L	0.241	1	129	26032	2	Standard
	Mn	55	5.052	ug/L	0.241	4	378	110614	2	Standard
>	Ge	72		ug/L			42122	45283	2	KED
	Ni	60	65.767	ug/L	3.844	5	10	48499	4	KED
	Ni	62	63.252	ug/L	1.737	2	0	7527	1	KED
	Cu	63	17.275	ug/L	0.778	4	43	35544	3	KED
	Cu	65	17.897	ug/L	0.315	1	22	18385	0	KED
	Zn	66	82.082	ug/L	4.859	5	16	21764	3	KED
	Zn	67	72.735	ug/L	3.419	4	3	3281	2	KED
	As	75	0.152	ug/L	0.023	14	3	32	12	KED
	Se	78	2.114	ug/L	0.055	2	5	44	3	KED
	Y	89		ug/L			561402	592151	3	Standard
	Kr	83		ug/L			45	50	39	Standard
>	In-1	115		ug/L			12648	12940	0	KED
	Mo	98	0.177	ug/L	0.030	16	4	119	16	KED
	Cd	111	0.018	ug/L	0.005	27	3	6	14	KED
	Cd	114	0.022	ug/L	0.010	45	0	11	43	KED
>	In	115		ug/L			852951	867436	1	Standard
	Ag	107	0.013	ug/L	0.003	21	143	314	12	Standard
	Ba	135	2.117	ug/L	0.031	1	14	8275	1	Standard
	Ba	137	2.073	ug/L	0.028	1	26	14125	2	Standard
>	Tb	159		ug/L			1107766	1213158	0	Standard
	Tl	205	0.002	ug/L	0.000	20	18	82	15	Standard
	Pb	208	0.599	ug/L	0.022	3	188	25697	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0097-01
Sample Dil Factor:
Comments:
Sample Date/Time: Thursday, October 11, 2018 00:28:19
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	599977	3	Standard
	Cl	37		ug/L			3677416	4963062	1	Standard
>	Sc	45		ug/L			810285	924791	0	Standard
	Cr	52	877.570	ug/L	13.697	1	13691	13828274	1	Standard
	Cr	53	892.117	ug/L	11.877	1	129	1667590	0	Standard
	Mn	55	45.585	ug/L	0.924	2	378	988838	1	Standard
>	Ge	72		ug/L			42122	40071	0	KED
	Ni	60	57.190	ug/L	2.008	3	10	37342	3	KED
	Ni	62	54.684	ug/L	0.941	1	0	5760	1	KED
	Cu	63	9.875	ug/L	0.241	2	43	18004	2	KED
	Cu	65	9.922	ug/L	0.418	4	22	9031	4	KED
	Zn	66	295.037	ug/L	6.549	2	16	69245	2	KED
	Zn	67	267.398	ug/L	7.983	2	3	10669	2	KED
	As	75	0.603	ug/L	0.039	6	3	101	6	KED
	Se	78	0.329	ug/L	0.123	37	5	10	19	KED
	Y	89		ug/L			561402	546696	0	Standard
	Kr	83		ug/L			45	89	16	Standard
>	In-1	115		ug/L			12648	11678	1	KED
	Mo	98	5.455	ug/L	0.155	2	4	3193	2	KED
	Cd	111	1.639	ug/L	0.163	9	3	280	11	KED
	Cd	114	1.547	ug/L	0.090	5	0	693	5	KED
>	In	115		ug/L			852951	792938	2	Standard
	Ag	107	0.572	ug/L	0.032	5	143	7121	6	Standard
	Ba	135	32.441	ug/L	0.927	2	14	115701	1	Standard
	Ba	137	32.257	ug/L	0.208	0	26	200499	1	Standard
>	Tb	159		ug/L			1107766	1119501	1	Standard
	Tl	205	0.002	ug/L	0.000	15	18	80	11	Standard
	Pb	208	0.262	ug/L	0.007	2	188	10461	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0059-03
Sample Dil Factor: 2
Comments:
Sample Date/Time: Thursday, October 11, 2018 00:33:09
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	32007	3	Standard
	Cl	**37**		ug/L			3677416	4460949	2	Standard
>	**Sc**	**45**		ug/L			810285	925291	1	Standard
	Cr	**52**	**-0.047**	ug/L	0.030	64	13691	14895	1	Standard
	Cr	**53**	**0.126**	ug/L	0.007	5	129	383	1	Standard
	Mn	**55**	**0.069**	ug/L	0.003	3	378	1940	4	Standard
>	**Ge**	**72**		ug/L			42122	47985	1	KED
	Ni	**60**	**0.231**	ug/L	0.012	5	10	192	6	KED
	Ni	**62**	**0.281**	ug/L	0.037	13	0	36	13	KED
	Cu	**63**	**0.241**	ug/L	0.007	2	43	575	3	KED
	Cu	**65**	**0.227**	ug/L	0.015	6	22	273	6	KED
	Zn	**66**	**153.584**	ug/L	8.012	5	16	43155	4	KED
	Zn	**67**	**142.761**	ug/L	6.085	4	3	6821	3	KED
	As	**75**	**0.204**	ug/L	0.025	12	3	44	11	KED
	Se	**78**	**0.162**	ug/L	0.051	31	5	9	11	KED
	Y	**89**		ug/L			561402	615502	1	Standard
	Kr	**83**		ug/L			45	45	34	Standard
>	**In-1**	**115**		ug/L			12648	13172	2	KED
	Mo	**98**	**0.431**	ug/L	0.030	7	4	289	8	KED
	Cd	**111**	**0.009**	ug/L	0.010	111	3	5	39	KED
	Cd	**114**	**0.024**	ug/L	0.006	24	0	12	23	KED
>	**In**	**115**		ug/L			852951	890174	2	Standard
	Ag	**107**	**0.003**	ug/L	0.001	36	143	192	8	Standard
	Ba	**135**	**3.193**	ug/L	0.037	1	14	12806	3	Standard
	Ba	**137**	**3.271**	ug/L	0.129	3	26	22841	2	Standard
>	**Tb**	**159**		ug/L			1107766	1211569	1	Standard
	Tl	**205**	**0.002**	ug/L	0.001	33	18	71	24	Standard
	Pb	**208**	**0.007**	ug/L	0.001	14	188	486	10	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0059-09
Sample Dil Factor: 10
Comments:
Sample Date/Time: Thursday, October 11, 2018 00:37:59
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	22508	1	Standard
	Cl	37		ug/L			3677416	4214469	3	Standard
>	Sc	45		ug/L			810285	896550	1	Standard
	Cr	52	-0.061	ug/L	0.064	104	13691	14207	5	Standard
	Cr	53	0.083	ug/L	0.008	9	129	293	6	Standard
	Mn	55	145.684	ug/L	4.383	3	378	3062329	1	Standard
>	Ge	72		ug/L			42122	44327	6	KED
	Ni	60	1.475	ug/L	0.127	8	10	1072	4	KED
	Ni	62	1.360	ug/L	0.209	15	0	158	8	KED
	Cu	63	2.578	ug/L	0.178	6	43	5218	2	KED
	Cu	65	2.505	ug/L	0.080	3	22	2536	3	KED
	Zn	66	77.521	ug/L	4.466	5	16	20088	1	KED
	Zn	67	69.531	ug/L	5.168	7	3	3063	2	KED
	As	75	0.031	ug/L	0.017	55	3	9	33	KED
	Se	78	0.099	ug/L	0.070	71	5	7	23	KED
	Y	89		ug/L			561402	615790	5	Standard
	Kr	83		ug/L			45	55	29	Standard
>	In-1	115		ug/L			12648	13439	1	KED
	Mo	98	0.004	ug/L	0.001	26	4	7	9	KED
	Cd	111	0.243	ug/L	0.020	8	3	50	7	KED
	Cd	114	0.253	ug/L	0.028	11	0	131	9	KED
>	In	115		ug/L			852951	886020	2	Standard
	Ag	107	0.002	ug/L	0.003	136	143	179	23	Standard
	Ba	135	3.263	ug/L	0.101	3	14	13016	0	Standard
	Ba	137	3.268	ug/L	0.037	1	26	22717	1	Standard
>	Tb	159		ug/L			1107766	1218449	1	Standard
	Tl	205	0.009	ug/L	0.001	8	18	326	8	Standard
	Pb	208	0.014	ug/L	0.000	2	188	794	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0068-01
Sample Dil Factor: 20
Comments:
Sample Date/Time: Thursday, October 11, 2018 00:42:48
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	63155	0	Standard
	Cl	37		ug/L			3677416	4374988	2	Standard
>	Sc	45		ug/L			810285	918764	2	Standard
	Cr	52	127.956	ug/L	1.604	1	13691	2016012	0	Standard
	Cr	53	130.383	ug/L	1.881	1	129	242280	2	Standard
	Mn	55	6.568	ug/L	0.053	0	378	141915	1	Standard
>	Ge	72		ug/L			42122	46156	2	KED
	Ni	60	1.728	ug/L	0.049	2	10	1311	5	KED
	Ni	62	1.669	ug/L	0.040	2	0	203	2	KED
	Cu	63	1.617	ug/L	0.108	6	43	3433	4	KED
	Cu	65	1.677	ug/L	0.116	6	22	1779	7	KED
	Zn	66	176.141	ug/L	8.387	4	16	47590	2	KED
	Zn	67	162.706	ug/L	0.624	0	3	7480	2	KED
	As	75	0.046	ug/L	0.017	37	3	12	23	KED
	Se	78	0.293	ug/L	0.130	44	5	11	20	KED
	Y	89		ug/L			561402	616049	1	Standard
	Kr	83		ug/L			45	68	14	Standard
>	In-1	115		ug/L			12648	13145	3	KED
	Mo	98	0.151	ug/L	0.008	5	4	103	2	KED
	Cd	111	0.601	ug/L	0.078	13	3	117	11	KED
	Cd	114	0.641	ug/L	0.026	4	0	323	5	KED
>	In	115		ug/L			852951	908929	0	Standard
	Ag	107	0.072	ug/L	0.009	12	143	1164	11	Standard
	Ba	135	2.507	ug/L	0.043	1	14	10269	1	Standard
	Ba	137	2.432	ug/L	0.036	1	26	17355	0	Standard
>	Tb	159		ug/L			1107766	1233545	2	Standard
	Tl	205	0.000	ug/L	0.000	39	18	36	19	Standard
	Pb	208	0.101	ug/L	0.002	2	188	4561	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0010-01
Sample Dil Factor: 2
Comments:
Sample Date/Time: Thursday, October 11, 2018 00:47:38
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	25317	3	Standard
	Cl	37		ug/L			3677416	4261841	1	Standard
>	Sc	45		ug/L			810285	1038720	2	Standard
	Cr	52	23.449	ug/L	1.034	4	13691	431743	1	Standard
	Cr	53	23.371	ug/L	0.989	4	129	49192	1	Standard
	Mn	55	339.101	ug/L	9.861	2	378	8255251	1	Standard
>	Ge	72		ug/L			42122	46894	0	KED
	Ni	60	18.629	ug/L	0.257	1	10	14242	1	KED
	Ni	62	18.286	ug/L	0.433	2	0	2254	2	KED
	Cu	63	37.890	ug/L	1.358	3	43	80702	3	KED
	Cu	65	38.460	ug/L	0.918	2	22	40894	2	KED
	Zn	66	44.297	ug/L	0.348	0	16	12181	0	KED
	Zn	67	39.771	ug/L	1.406	3	3	1861	3	KED
	As	75	0.188	ug/L	0.016	8	3	40	7	KED
	Se	78	0.699	ug/L	0.128	18	5	19	12	KED
	Y	89		ug/L			561402	924803	2	Standard
	Kr	83		ug/L			45	106	4	Standard
>	In-1	115		ug/L			12648	13319	2	KED
	Mo	98	1.664	ug/L	0.089	5	4	1113	2	KED
	Cd	111	0.009	ug/L	0.007	79	3	5	28	KED
	Cd	114	0.038	ug/L	0.006	14	0	19	16	KED
>	In	115		ug/L			852951	861524	1	Standard
	Ag	107	0.019	ug/L	0.001	7	143	395	3	Standard
	Ba	135	2.860	ug/L	0.038	1	14	11097	0	Standard
	Ba	137	2.856	ug/L	0.049	1	26	19313	3	Standard
>	Tb	159		ug/L			1107766	1199280	1	Standard
	Tl	205	0.006	ug/L	0.000	4	18	215	5	Standard
	Pb	208	0.382	ug/L	0.011	2	188	16249	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0050-01
Sample Dil Factor: 2
Comments:
Sample Date/Time: Thursday, October 11, 2018 00:52:28
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	337506	1	Standard
	Cl	37		ug/L			3677416	4372978	2	Standard
>	Sc	45		ug/L			810285	917322	3	Standard
	Cr	52	237.753	ug/L	7.343	3	13691	3724798	1	Standard
	Cr	53	247.864	ug/L	14.218	5	129	459030	1	Standard
	Mn	55	70.775	ug/L	2.003	2	378	1521648	0	Standard
>	Ge	72		ug/L			42122	42976	2	KED
	Ni	60	15.077	ug/L	0.286	1	10	10562	1	KED
	Ni	62	14.632	ug/L	0.563	3	0	1652	2	KED
	Cu	63	4.957	ug/L	0.189	3	43	9711	3	KED
	Cu	65	5.038	ug/L	0.130	2	22	4927	1	KED
	Zn	66	218.867	ug/L	5.204	2	16	55070	1	KED
	Zn	67	193.764	ug/L	5.558	2	3	8290	1	KED
	As	75	0.342	ug/L	0.015	4	3	63	1	KED
	Se	78	0.296	ug/L	0.152	51	5	10	25	KED
	Y	89		ug/L			561402	582027	3	Standard
	Kr	83		ug/L			45	67	30	Standard
>	In-1	115		ug/L			12648	13030	0	KED
	Mo	98	3.361	ug/L	0.126	3	4	2197	3	KED
	Cd	111	0.864	ug/L	0.075	8	3	166	9	KED
	Cd	114	0.867	ug/L	0.053	6	0	434	5	KED
>	In	115		ug/L			852951	867135	2	Standard
	Ag	107	0.252	ug/L	0.006	2	143	3509	0	Standard
	Ba	135	11.872	ug/L	0.370	3	14	46318	1	Standard
	Ba	137	11.866	ug/L	0.377	3	26	80656	2	Standard
>	Tb	159		ug/L			1107766	1209741	0	Standard
	Tl	205	0.001	ug/L	0.000	52	18	41	26	Standard
	Pb	208	0.157	ug/L	0.002	1	188	6874	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCVG
Sample Dil Factor:
Comments:
Sample Date/Time: Thursday, October 11, 2018 00:57:18
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	22862	8	Standard
	Cl	**37**		ug/L			3677416	4362158	4	Standard
>	**Sc**	**45**		ug/L			810285	892188	1	Standard
	Cr	**52**	**50.514**	ug/L	0.351	0	13691	782073	0	Standard
	Cr	**53**	**49.973**	ug/L	1.544	3	129	90237	2	Standard
	Mn	**55**	**51.131**	ug/L	1.610	3	378	1069970	2	Standard
>	**Ge**	**72**		ug/L			42122	47184	1	KED
	Ni	**60**	**49.495**	ug/L	0.487	0	10	38053	0	KED
	Ni	**62**	**49.807**	ug/L	0.375	0	0	6177	0	KED
	Cu	**63**	**50.032**	ug/L	0.416	0	43	107220	1	KED
	Cu	**65**	**48.394**	ug/L	1.634	3	22	51768	3	KED
	Zn	**66**	**48.073**	ug/L	1.516	3	16	13296	1	KED
	Zn	**67**	**50.002**	ug/L	2.327	4	3	2353	5	KED
	As	**75**	**48.186**	ug/L	0.264	0	3	9197	0	KED
	Se	**78**	**49.041**	ug/L	0.606	1	5	959	0	KED
	Y	**89**		ug/L			561402	600099	2	Standard
	Kr	**83**		ug/L			45	55	10	Standard
>	**In-1**	**115**		ug/L			12648	13270	2	KED
	Mo	**98**	**49.914**	ug/L	0.932	1	4	33163	2	KED
	Cd	**111**	**50.755**	ug/L	2.065	4	3	9770	2	KED
	Cd	**114**	**49.158**	ug/L	0.354	0	0	25036	2	KED
>	**In**	**115**		ug/L			852951	925980	3	Standard
	Ag	**107**	**48.054**	ug/L	3.273	6	143	684741	3	Standard
	Ba	**135**	**49.739**	ug/L	0.879	1	14	207165	1	Standard
	Ba	**137**	**48.450**	ug/L	0.934	1	26	351559	1	Standard
>	**Tb**	**159**		ug/L			1107766	1236954	1	Standard
	Tl	**205**	**51.999**	ug/L	1.043	2	18	1782034	1	Standard
	Pb	**208**	**53.672**	ug/L	0.304	0	188	2327763	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCBG
Sample Dil Factor:
Comments:
Sample Date/Time: Thursday, October 11, 2018 01:04:53
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	19789	3	Standard
	Cl	**37**		ug/L			3677416	4293560	1	Standard
⌈>	**Sc**	**45**		ug/L			810285	875836	2	Standard
|	**Cr**	**52**	**-0.039**	ug/L	0.127	329	13691	14225	13	Standard
|	**Cr**	**53**	**0.064**	ug/L	0.094	146	129	253	66	Standard
⌊	**Mn**	**55**	**0.040**	ug/L	0.054	137	378	1226	92	Standard
⌈>	**Ge**	**72**		ug/L			42122	47080	2	KED
|	**Ni**	**60**	**-0.002**	ug/L	0.003	203	10	10	21	KED
|	**Ni**	**62**	**0.025**	ug/L	0.031	123	0	3	100	KED
|	**Cu**	**63**	**0.002**	ug/L	0.003	137	43	53	9	KED
|	**Cu**	**65**	**0.004**	ug/L	0.012	289	22	29	41	KED
|	**Zn**	**66**	**0.000**	ug/L	0.023	13340	16	18	31	KED
|	**Zn**	**67**	**-0.037**	ug/L	0.022	59	3	2	43	KED
|	**As**	**75**	**0.003**	ug/L	0.007	256	3	4	24	KED
⌊	**Se**	**78**	**0.148**	ug/L	0.148	100	5	8	33	KED
	Y	**89**		ug/L			561402	594011	1	Standard
	Kr	**83**		ug/L			45	52	27	Standard
⌈>	**In-1**	**115**		ug/L			12648	13126	1	KED
|	**Mo**	**98**	**0.012**	ug/L	0.012	99	4	12	59	KED
|	**Cd**	**111**	**-0.002**	ug/L	0.005	227	3	2	33	KED
⌊	**Cd**	**114**	**-0.001**	ug/L	0.002	398	0	0	354	KED
⌈>	**In**	**115**		ug/L			852951	911917	1	Standard
|	**Ag**	**107**	**0.013**	ug/L	0.015	109	143	339	58	Standard
|	**Ba**	**135**	**0.014**	ug/L	0.025	172	14	73	134	Standard
⌊	**Ba**	**137**	**0.015**	ug/L	0.025	173	26	130	135	Standard
⌈>	**Tb**	**159**		ug/L			1107766	1227668	1	Standard
|	**Tl**	**205**	**0.017**	ug/L	0.020	111	18	612	107	Standard
⌊	**Pb**	**208**	**0.013**	ug/L	0.018	138	188	763	100	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0017-01
Sample Dil Factor:
Comments:
Sample Date/Time: Thursday, October 11, 2018 01:09:43
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	1002819	3	Standard
	Cl	37		ug/L			3677416	4239217	1	Standard
>	Sc	45		ug/L			810285	867086	1	Standard
	Cr	52	10.465	ug/L	0.155	1	13691	169062	1	Standard
	Cr	53	6.799	ug/L	0.277	4	129	12050	2	Standard
	Mn	55	68.071	ug/L	0.851	1	378	1384175	0	Standard
>	Ge	72		ug/L			42122	32894	2	KED
	Ni	60	16.124	ug/L	0.271	1	10	8645	0	KED
	Ni	62	16.358	ug/L	0.684	4	0	1414	4	KED
	Cu	63	1.403	ug/L	0.018	1	43	2129	2	KED
	Cu	65	1.461	ug/L	0.068	4	22	1106	3	KED
	Zn	66	22.803	ug/L	1.003	4	16	4401	2	KED
	Zn	67	28.384	ug/L	0.686	2	3	932	0	KED
	As	75	0.516	ug/L	0.039	7	3	71	6	KED
	Se	78	0.415	ug/L	0.041	9	5	9	4	KED
	Y	89		ug/L			561402	488482	3	Standard
	Kr	83		ug/L			45	119	8	Standard
>	In-1	115		ug/L			12648	9611	6	KED
	Mo	98	1.370	ug/L	0.163	11	4	659	5	KED
	Cd	111	0.104	ug/L	0.010	9	3	16	3	KED
	Cd	114	0.102	ug/L	0.017	16	0	38	21	KED
>	In	115		ug/L			852951	672296	3	Standard
	Ag	107	0.011	ug/L	0.002	20	143	226	6	Standard
	Ba	135	125.908	ug/L	5.124	4	14	380517	0	Standard
	Ba	137	126.452	ug/L	5.205	4	26	665855	1	Standard
>	Tb	159		ug/L			1107766	1010133	1	Standard
	Tl	205	0.014	ug/L	0.001	8	18	400	7	Standard
	Pb	208	1.452	ug/L	0.025	1	188	51590	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0045-01
Sample Dil Factor: 20
Comments:
Sample Date/Time: Thursday, October 11, 2018 01:14:33
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	170512	2	Standard
	Cl	37		ug/L			3677416	4869716	3	Standard
>	Sc	45		ug/L			810285	930666	0	Standard
	Cr	52	52.560	ug/L	1.424	2	13691	848172	2	Standard
	Cr	53	50.898	ug/L	0.783	1	129	95887	1	Standard
	Mn	55	36.754	ug/L	0.629	1	378	802511	1	Standard
>	Ge	72		ug/L			42122	46330	2	KED
	Ni	60	31.431	ug/L	0.724	2	10	23725	0	KED
	Ni	62	31.403	ug/L	0.253	0	0	3824	1	KED
	Cu	63	2.376	ug/L	0.070	2	43	5043	1	KED
	Cu	65	2.340	ug/L	0.053	2	22	2480	1	KED
	Zn	66	352.101	ug/L	19.939	5	16	95473	4	KED
	Zn	67	327.123	ug/L	7.587	2	3	15094	3	KED
	As	75	0.088	ug/L	0.021	23	3	20	19	KED
	Se	78	0.243	ug/L	0.180	73	5	10	31	KED
	Y	89		ug/L			561402	609983	1	Standard
	Kr	83		ug/L			45	58	8	Standard
>	In-1	115		ug/L			12648	13139	0	KED
	Mo	98	0.616	ug/L	0.019	3	4	409	2	KED
	Cd	111	0.958	ug/L	0.135	14	3	186	14	KED
	Cd	114	0.997	ug/L	0.063	6	0	503	5	KED
>	In	115		ug/L			852951	899916	1	Standard
	Ag	107	0.004	ug/L	0.001	28	143	211	8	Standard
	Ba	135	8.224	ug/L	0.183	2	14	33307	1	Standard
	Ba	137	8.081	ug/L	0.081	1	26	57027	0	Standard
>	Tb	159		ug/L			1107766	1210227	0	Standard
	Tl	205	0.002	ug/L	0.001	24	18	95	18	Standard
	Pb	208	0.323	ug/L	0.001	0	188	13922	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0012-01
Sample Dil Factor: 20
Comments:
Sample Date/Time: Thursday, October 11, 2018 01:19:23
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	29664	2	Standard
	Cl	37		ug/L			3677416	4200570	5	Standard
>	Sc	45		ug/L			810285	1004636	2	Standard
	Cr	52	28.111	ug/L	0.787	2	13691	497427	1	Standard
	Cr	53	27.880	ug/L	1.271	4	129	56728	2	Standard
	Mn	55	272.054	ug/L	14.478	5	378	6402738	2	Standard
>	Ge	72		ug/L			42122	47599	3	KED
	Ni	60	41.867	ug/L	0.895	2	10	32472	3	KED
	Ni	62	42.674	ug/L	2.193	5	0	5334	2	KED
	Cu	63	14.563	ug/L	0.425	2	43	31505	2	KED
	Cu	65	14.257	ug/L	0.458	3	22	15396	2	KED
	Zn	66	34.232	ug/L	1.468	4	16	9551	1	KED
	Zn	67	37.664	ug/L	2.695	7	3	1787	5	KED
	As	75	3.196	ug/L	0.107	3	3	619	1	KED
	Se	78	0.967	ug/L	0.208	21	5	24	18	KED
	Y	89		ug/L			561402	779505	1	Standard
	Kr	83		ug/L			45	82	8	Standard
>	In-1	115		ug/L			12648	13066	3	KED
	Mo	98	0.088	ug/L	0.010	11	4	61	6	KED
	Cd	111	0.056	ug/L	0.005	9	3	13	10	KED
	Cd	114	0.080	ug/L	0.005	5	0	40	3	KED
>	In	115		ug/L			852951	899055	3	Standard
	Ag	107	0.033	ug/L	0.006	18	143	612	11	Standard
	Ba	135	51.000	ug/L	2.241	4	14	206130	1	Standard
	Ba	137	50.464	ug/L	2.239	4	26	355332	1	Standard
>	Tb	159		ug/L			1107766	1186954	3	Standard
	Tl	205	0.065	ug/L	0.002	3	18	2144	3	Standard
	Pb	208	7.333	ug/L	0.099	1	188	305280	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 18J0012-02
Sample Dil Factor: 20
Comments:
Sample Date/Time: Thursday, October 11, 2018 01:24:12
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			13453	29299	2	Standard
	Cl	37		ug/L			3677416	4243437	2	Standard
>	Sc	45		ug/L			810285	985546	1	Standard
	Cr	52	27.550	ug/L	1.276	4	13691	478617	3	Standard
	Cr	53	26.683	ug/L	0.583	2	129	53301	1	Standard
	Mn	55	243.591	ug/L	7.828	3	378	5628354	2	Standard
>	Ge	72		ug/L			42122	46879	2	KED
	Ni	60	38.967	ug/L	0.567	1	10	29776	3	KED
	Ni	62	38.394	ug/L	0.831	2	0	4730	1	KED
	Cu	63	13.127	ug/L	0.378	2	43	27984	3	KED
	Cu	65	13.096	ug/L	0.722	5	22	13926	3	KED
	Zn	66	34.291	ug/L	0.819	2	16	9427	0	KED
	Zn	67	36.859	ug/L	0.858	2	3	1723	1	KED
	As	75	2.858	ug/L	0.127	4	3	545	3	KED
	Se	78	1.028	ug/L	0.207	20	5	25	13	KED
	Y	89		ug/L			561402	799014	3	Standard
	Kr	83		ug/L			45	77	13	Standard
>	In-1	115		ug/L			12648	13028	2	KED
	Mo	98	0.067	ug/L	0.008	12	4	48	9	KED
	Cd	111	0.078	ug/L	0.044	56	3	18	48	KED
	Cd	114	0.088	ug/L	0.008	9	0	44	11	KED
>	In	115		ug/L			852951	896646	1	Standard
	Ag	107	0.033	ug/L	0.004	10	143	603	9	Standard
	Ba	135	47.959	ug/L	1.324	2	14	193462	1	Standard
	Ba	137	47.701	ug/L	0.398	0	26	335282	0	Standard
>	Tb	159		ug/L			1107766	1243049	1	Standard
	Tl	205	0.054	ug/L	0.001	0	18	1895	1	Standard
	Pb	208	3.125	ug/L	0.043	1	188	136372	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCVH
Sample Dil Factor:
Comments:
Sample Date/Time: Thursday, October 11, 2018 01:29:03
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	19710	3	Standard
	Cl	**37**		ug/L			3677416	4443101	5	Standard
>	**Sc**	**45**		ug/L			810285	900945	0	Standard
	Cr	**52**	**49.051**	ug/L	0.962	1	13691	767331	1	Standard
	Cr	**53**	**49.657**	ug/L	0.397	0	129	90567	0	Standard
	Mn	**55**	**50.498**	ug/L	0.305	0	378	1067205	0	Standard
>	**Ge**	**72**		ug/L			42122	45869	1	KED
	Ni	**60**	**51.239**	ug/L	0.362	0	10	38296	0	KED
	Ni	**62**	**49.644**	ug/L	1.863	3	0	5986	3	KED
	Cu	**63**	**50.629**	ug/L	2.216	4	43	105455	4	KED
	Cu	**65**	**50.850**	ug/L	1.110	2	22	52881	2	KED
	Zn	**66**	**49.282**	ug/L	0.936	1	16	13253	2	KED
	Zn	**67**	**51.675**	ug/L	3.130	6	3	2364	6	KED
	As	**75**	**50.619**	ug/L	0.175	0	3	9392	0	KED
	Se	**78**	**49.779**	ug/L	0.991	1	5	947	3	KED
	Y	**89**		ug/L			561402	592380	1	Standard
	Kr	**83**		ug/L			45	57	18	Standard
>	**In-1**	**115**		ug/L			12648	13253	2	KED
	Mo	**98**	**50.579**	ug/L	2.412	4	4	33542	2	KED
	Cd	**111**	**49.909**	ug/L	2.234	4	3	9594	2	KED
	Cd	**114**	**50.240**	ug/L	1.362	2	0	25547	1	KED
>	**In**	**115**		ug/L			852951	882185	1	Standard
	Ag	**107**	**49.582**	ug/L	0.196	0	143	674136	1	Standard
	Ba	**135**	**50.175**	ug/L	0.845	1	14	199172	2	Standard
	Ba	**137**	**51.653**	ug/L	1.338	2	26	357192	2	Standard
>	**Tb**	**159**		ug/L			1107766	1217797	1	Standard
	Tl	**205**	**50.889**	ug/L	1.094	2	18	1716836	0	Standard
	Pb	**208**	**53.572**	ug/L	0.395	0	188	2287135	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCBH
Sample Dil Factor:
Comments:
Sample Date/Time: Thursday, October 11, 2018 01:36:37
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	19243	4	Standard
	Cl	**37**		ug/L			3677416	4248326	3	Standard
>	**Sc**	**45**		ug/L			810285	892789	1	Standard
	Cr	**52**	**-0.122**	ug/L	0.035	28	13691	13219	2	Standard
	Cr	**53**	**0.016**	ug/L	0.006	35	129	171	6	Standard
	Mn	**55**	**0.004**	ug/L	0.001	23	378	492	4	Standard
>	**Ge**	**72**		ug/L			42122	46934	0	KED
	Ni	**60**	**-0.003**	ug/L	0.003	87	10	8	24	KED
	Ni	**62**	**0.015**	ug/L	0.024	159	0	2	114	KED
	Cu	**63**	**0.000**	ug/L	0.007	39515	43	48	29	KED
	Cu	**65**	**0.004**	ug/L	0.004	111	22	29	13	KED
	Zn	**66**	**-0.002**	ug/L	0.024	1006	16	17	37	KED
	Zn	**67**	**-0.010**	ug/L	0.070	723	3	3	86	KED
	As	**75**	**0.005**	ug/L	0.008	150	3	5	26	KED
	Se	**78**	**0.354**	ug/L	0.265	74	5	12	40	KED
	Y	**89**		ug/L			561402	590082	2	Standard
	Kr	**83**		ug/L			45	53	22	Standard
>	**In-1**	**115**		ug/L			12648	13533	3	KED
	Mo	**98**	**0.024**	ug/L	0.009	39	4	20	27	KED
	Cd	**111**	**-0.011**	ug/L	0.007	67	3	1	114	KED
	Cd	**114**	**0.007**	ug/L	0.002	29	0	4	25	KED
>	**In**	**115**		ug/L			852951	905398	3	Standard
	Ag	**107**	**0.007**	ug/L	0.002	33	143	243	9	Standard
	Ba	**135**	**0.000**	ug/L	0.002	538	14	17	50	Standard
	Ba	**137**	**0.000**	ug/L	0.001	1899	26	28	29	Standard
>	**Tb**	**159**		ug/L			1107766	1212214	2	Standard
	Tl	**205**	**0.006**	ug/L	0.001	11	18	223	8	Standard
	Pb	**208**	**0.002**	ug/L	0.000	14	188	291	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: RINSE
Sample Dil Factor:
Comments:
Sample Date/Time: Thursday, October 11, 2018 01:41:27
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	24478	3	Standard
	Cl	**37**		ug/L			3677416	4465069	2	Standard
>	**Sc**	**45**		ug/L			810285	1055992	1	Standard
	Cr	**52**	**-0.091**	ug/L	0.029	32	13691	16209	1	Standard
	Cr	**53**	**0.021**	ug/L	0.006	26	129	213	6	Standard
	Mn	**55**	**0.040**	ug/L	0.003	7	378	1475	3	Standard
>	**Ge**	**72**		ug/L			42122	50027	2	KED
	Ni	**60**	**0.173**	ug/L	0.004	2	10	153	1	KED
	Ni	**62**	**0.197**	ug/L	0.025	12	0	26	14	KED
	Cu	**63**	**0.025**	ug/L	0.012	47	43	107	25	KED
	Cu	**65**	**0.033**	ug/L	0.007	19	22	64	13	KED
	Zn	**66**	**0.516**	ug/L	0.060	11	16	170	10	KED
	Zn	**67**	**0.443**	ug/L	0.107	24	3	26	21	KED
	As	**75**	**-0.001**	ug/L	0.004	322	3	4	22	KED
	Se	**78**	**0.211**	ug/L	0.128	60	5	10	26	KED
	Y	**89**		ug/L			561402	662472	2	Standard
	Kr	**83**		ug/L			45	68	7	Standard
>	**In-1**	**115**		ug/L			12648	14729	2	KED
	Mo	**98**	**0.012**	ug/L	0.013	109	4	14	65	KED
	Cd	**111**	**-0.006**	ug/L	0.007	120	3	2	57	KED
	Cd	**114**	**0.010**	ug/L	0.007	68	0	6	59	KED
>	**In**	**115**		ug/L			852951	983820	2	Standard
	Ag	**107**	**0.008**	ug/L	0.001	14	143	288	7	Standard
	Ba	**135**	**0.019**	ug/L	0.002	9	14	99	6	Standard
	Ba	**137**	**0.016**	ug/L	0.002	15	26	151	10	Standard
>	**Tb**	**159**		ug/L			1107766	1315131	1	Standard
	Tl	**205**	**0.019**	ug/L	0.001	4	18	721	2	Standard
	Pb	**208**	**0.014**	ug/L	0.002	12	188	845	7	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: RINSE
Sample Dil Factor:
Comments:
Sample Date/Time: Thursday, October 11, 2018 01:46:17
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	22678	1	Standard
	Cl	**37**		ug/L			3677416	4258662	4	Standard
>	**Sc**	**45**		ug/L			810285	1055466	1	Standard
	Cr	**52**	**-0.067**	ug/L	0.017	25	13691	16631	3	Standard
	Cr	**53**	**0.018**	ug/L	0.008	42	129	206	6	Standard
	Mn	**55**	**0.041**	ug/L	0.001	1	378	1506	2	Standard
>	**Ge**	**72**		ug/L			42122	50446	2	KED
	Ni	**60**	**0.175**	ug/L	0.011	6	10	156	7	KED
	Ni	**62**	**0.224**	ug/L	0.038	16	0	30	16	KED
	Cu	**63**	**0.029**	ug/L	0.002	6	43	120	5	KED
	Cu	**65**	**0.023**	ug/L	0.005	23	22	53	12	KED
	Zn	**66**	**0.417**	ug/L	0.008	1	16	142	3	KED
	Zn	**67**	**0.426**	ug/L	0.099	23	3	26	21	KED
	As	**75**	**0.003**	ug/L	0.003	95	3	5	13	KED
	Se	**78**	**0.188**	ug/L	0.063	33	5	10	11	KED
	Y	**89**		ug/L			561402	674623	2	Standard
	Kr	**83**		ug/L			45	45	12	Standard
>	**In-1**	**115**		ug/L			12648	14662	3	KED
	Mo	**98**	**0.005**	ug/L	0.001	30	4	8	14	KED
	Cd	**111**	**-0.010**	ug/L	0.007	72	3	1	91	KED
	Cd	**114**	**0.005**	ug/L	0.007	135	0	3	109	KED
>	**In**	**115**		ug/L			852951	1004036	1	Standard
	Ag	**107**	**0.004**	ug/L	0.002	43	143	238	13	Standard
	Ba	**135**	**0.016**	ug/L	0.004	23	14	91	20	Standard
	Ba	**137**	**0.015**	ug/L	0.001	7	26	150	7	Standard
>	**Tb**	**159**		ug/L			1107766	1336812	2	Standard
	Tl	**205**	**0.003**	ug/L	0.000	9	18	130	9	Standard
	Pb	**208**	**0.013**	ug/L	0.000	2	188	821	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: RINSE
Sample Dil Factor:
Comments:
Sample Date/Time: Thursday, October 11, 2018 01:51:06
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	23966	1	Standard
	Cl	**37**		ug/L			3677416	4404782	3	Standard
>	**Sc**	**45**		ug/L			810285	1026609	3	Standard
	Cr	**52**	**-0.065**	ug/L	0.036	54	13691	16199	3	Standard
	Cr	**53**	**0.017**	ug/L	0.009	54	129	199	6	Standard
	Mn	**55**	**0.043**	ug/L	0.003	6	378	1520	2	Standard
>	**Ge**	**72**		ug/L			42122	53046	2	KED
	Ni	**60**	**0.155**	ug/L	0.019	12	10	146	10	KED
	Ni	**62**	**0.185**	ug/L	0.032	17	0	26	18	KED
	Cu	**63**	**0.025**	ug/L	0.006	22	43	115	9	KED
	Cu	**65**	**0.019**	ug/L	0.005	25	22	52	11	KED
	Zn	**66**	**0.417**	ug/L	0.079	18	16	149	14	KED
	Zn	**67**	**0.340**	ug/L	0.116	34	3	22	28	KED
	As	**75**	**0.005**	ug/L	0.007	152	3	6	27	KED
	Se	**78**	**0.197**	ug/L	0.252	127	5	10	48	KED
	Y	**89**		ug/L			561402	644887	3	Standard
	Kr	**83**		ug/L			45	67	28	Standard
>	**In-1**	**115**		ug/L			12648	15298	1	KED
	Mo	**98**	**0.006**	ug/L	0.002	23	4	10	10	KED
	Cd	**111**	**-0.006**	ug/L	0.011	188	3	2	94	KED
	Cd	**114**	**0.005**	ug/L	0.003	66	0	3	52	KED
>	**In**	**115**		ug/L			852951	982812	5	Standard
	Ag	**107**	**0.004**	ug/L	0.001	23	143	226	4	Standard
	Ba	**135**	**0.021**	ug/L	0.005	23	14	107	15	Standard
	Ba	**137**	**0.017**	ug/L	0.002	11	26	158	4	Standard
>	**Tb**	**159**		ug/L			1107766	1300821	2	Standard
	Tl	**205**	**0.001**	ug/L	0.000	11	18	62	8	Standard
	Pb	**208**	**0.013**	ug/L	0.001	8	188	813	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: DI
Sample Dil Factor:
Comments:
Sample Date/Time: Thursday, October 11, 2018 01:55:56
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	19616	2	Standard
	Cl	**37**		ug/L			3677416	4390812	0	Standard
>	**Sc**	**45**		ug/L			810285	913898	0	Standard
	Cr	**52**	**-0.063**	ug/L	0.027	43	13691	14459	2	Standard
	Cr	**53**	**0.031**	ug/L	0.012	39	129	203	11	Standard
	Mn	**55**	**0.200**	ug/L	0.005	2	378	4717	1	Standard
>	**Ge**	**72**		ug/L			42122	46396	2	KED
	Ni	**60**	**0.065**	ug/L	0.022	33	10	60	25	KED
	Ni	**62**	**0.057**	ug/L	0.016	28	0	7	25	KED
	Cu	**63**	**0.008**	ug/L	0.010	116	43	66	30	KED
	Cu	**65**	**0.011**	ug/L	0.013	120	22	36	38	KED
	Zn	**66**	**0.865**	ug/L	0.022	2	16	253	4	KED
	Zn	**67**	**0.765**	ug/L	0.417	54	3	39	47	KED
	As	**75**	**0.009**	ug/L	0.015	172	3	6	48	KED
	Se	**78**	**0.241**	ug/L	0.124	51	5	10	21	KED
	Y	**89**		ug/L			561402	601813	1	Standard
	Kr	**83**		ug/L			45	52	20	Standard
>	**In-1**	**115**		ug/L			12648	13423	1	KED
	Mo	**98**	**0.020**	ug/L	0.011	56	4	18	40	KED
	Cd	**111**	**0.004**	ug/L	0.015	392	3	4	70	KED
	Cd	**114**	**0.008**	ug/L	0.007	88	0	4	77	KED
>	**In**	**115**		ug/L			852951	928336	2	Standard
	Ag	**107**	**0.004**	ug/L	0.003	92	143	208	21	Standard
	Ba	**135**	**0.005**	ug/L	0.002	46	14	36	26	Standard
	Ba	**137**	**0.007**	ug/L	0.001	15	26	83	9	Standard
>	**Tb**	**159**		ug/L			1107766	1205865	1	Standard
	Tl	**205**	**0.001**	ug/L	0.000	17	18	54	10	Standard
	Pb	**208**	**-0.000**	ug/L	0.001	887	188	201	15	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: DI
Sample Dil Factor:
Comments:
Sample Date/Time: Thursday, October 11, 2018 02:00:46
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	21945	2	Standard
	Cl	**37**		ug/L			3677416	5533687	1	Standard
>	**Sc**	**45**		ug/L			810285	1611	0	Standard
	Cr	**52**	**661.850**	ug/L	28.100	4	13691	18174	3	Standard
	Cr	**53**	**80.862**	ug/L	6.579	8	129	263	7	Standard
	Mn	**55**	**138.407**	ug/L	11.173	8	378	5227	7	Standard
>	**Ge**	**72**		ug/L			42122	43	15	KED
	Ni	**60**	**151.933**	ug/L	32.992	21	10	106	15	KED
	Ni	**62**	**119.590**	ug/L	19.167	16	0	13	31	KED
	Cu	**63**	**41.625**	ug/L	8.872	21	43	81	12	KED
	Cu	**65**	**38.668**	ug/L	9.575	24	22	37	10	KED
	Zn	**66**	**1542.755**	ug/L	80.666	5	16	393	10	KED
	Zn	**67**	**1167.916**	ug/L	59.393	5	3	50	13	KED
	As	**75**	**20.884**	ug/L	3.380	16	3	3	7	KED
	Se	**78**	**630.906**	ug/L	73.033	11	5	11	27	KED
	Y	**89**		ug/L			561402	346	3	Standard
	Kr	**83**		ug/L			45	55	18	Standard
>	**In-1**	**115**		ug/L			12648	10	60	KED
	Mo	**98**	**33.066**	ug/L	34.266	103	4	12	65	KED
	Cd	**111**	**18.664**	ug/L	4.030	21	3	2	43	KED
	Cd	**114**	**8.305**	ug/L	15.145	182	0	2	186	KED
>	**In**	**115**		ug/L			852951	571	6	Standard
	Ag	**107**	**7.069**	ug/L	0.353	4	143	62	1	Standard
	Ba	**135**	**28.063**	ug/L	5.527	19	14	71	15	Standard
	Ba	**137**	**25.230**	ug/L	3.574	14	26	112	7	Standard
>	**Tb**	**159**		ug/L			1107766	622	5	Standard
	Tl	**205**	**1.318**	ug/L	0.359	27	18	22	30	Standard
	Pb	**208**	**18.850**	ug/L	3.293	17	188	409	13	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: DI
Sample Dil Factor:
Comments:
Sample Date/Time: Thursday, October 11, 2018 02:05:36
Number of Replicates: 3
Method File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Method\200.8nomin_KED_UCT_BeLongg.mth
Tuning File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\MassCal\Default.tun
Optimization File: C:\Users\metals\Documents\PerkinElmer Syngistix\ICPMS_metals\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			13453	22071	1	Standard
	Cl	**37**		ug/L			3677416	5523138	2	Standard
>	**Sc**	**45**		ug/L			810285	1483	1	Standard
	Cr	**52**	**726.626**	ug/L	30.019	4	13691	18375	4	Standard
	Cr	**53**	**84.708**	ug/L	2.308	2	129	254	3	Standard
	Mn	**55**	**147.136**	ug/L	6.226	4	378	5119	4	Standard
>	**Ge**	**72**		ug/L			42122	38	8	KED
	Ni	**60**	**137.392**	ug/L	5.662	4	10	85	4	KED
	Ni	**62**	**170.189**	ug/L	17.340	10	0	17	19	KED
	Cu	**63**	**43.368**	ug/L	5.911	13	43	74	14	KED
	Cu	**65**	**39.672**	ug/L	2.351	5	22	34	11	KED
	Zn	**66**	**1731.215**	ug/L	97.534	5	16	385	6	KED
	Zn	**67**	**1336.817**	ug/L	326.184	24	3	50	18	KED
	As	**75**	**22.805**	ug/L	5.594	24	3	3	20	KED
	Se	**78**	**744.101**	ug/L	149.326	20	5	11	16	KED
	Y	**89**		ug/L			561402	296	11	Standard
	Kr	**83**		ug/L			45	53	11	Standard
>	**In-1**	**115**		ug/L			12648	4	44	KED
	Mo	**98**	**49.062**	ug/L	28.481	58	4	10	32	KED
	Cd	**111**	**29.428**	ug/L	10.422	35	3	1		KED
	Cd	**114**	**25.494**	ug/L	0.317	1	0	4	45	KED
>	**In**	**115**		ug/L			852951	541	4	Standard
	Ag	**107**	**8.212**	ug/L	1.812	22	143	68	21	Standard
	Ba	**135**	**24.253**	ug/L	4.257	17	14	59	17	Standard
	Ba	**137**	**24.748**	ug/L	5.716	23	26	104	20	Standard
>	**Tb**	**159**		ug/L			1107766	613	5	Standard
	Tl	**205**	**1.144**	ug/L	0.673	58	18	19	52	Standard
	Pb	**208**	**16.693**	ug/L	2.062	12	188	357	6	Standard

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 18I0285
Client: Anchor QEA, LLC
Project: Port Gamble - OMMP LTM
Instrument ID: ICPMS2
Calibration: BI00061
Control Limt: +/- 10.00%
Sequence: SGI0356

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SGI0356-ICV1	Cadmium-111	50.000	48.2	96.4	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	48.2	96.4	ug/L	PA 6020A UCT-KE
SGI0356-CCV1	Cadmium-111	50.000	49.6	99.1	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	49.1	98.2	ug/L	PA 6020A UCT-KE
SGI0356-CCV2	Cadmium-111	50.000	51.3	103	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	51.3	103	ug/L	PA 6020A UCT-KE
SGI0356-CCV3	Cadmium-111	50.000	51.6	103	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	51.6	103	ug/L	PA 6020A UCT-KE
SGI0356-CCV4	Cadmium-111	50.000	50.2	100	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	50.9	102	ug/L	PA 6020A UCT-KE
SGI0356-CCV5	Cadmium-111	50.000	50.1	100	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	50.0	100	ug/L	PA 6020A UCT-KE
SGI0356-CCV6	Cadmium-111	50.000	50.3	101	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	50.3	101	ug/L	PA 6020A UCT-KE
SGI0356-CCV7	Cadmium-111	50.000	50.6	101	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	50.5	101	ug/L	PA 6020A UCT-KE
SGI0356-CCV8	Cadmium-111	50.000	50.8	102	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	52.2	104	ug/L	PA 6020A UCT-KE
SGI0356-CCV9	Cadmium-111	50.000	49.4	98.9	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	50.7	101	ug/L	PA 6020A UCT-KE
SGI0356-CCVA	Cadmium-111	50.000	49.7	99.4	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	50.8	102	ug/L	PA 6020A UCT-KE
SGI0356-CCVB	Cadmium-111	50.000	53.3	107	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	54.0	108	ug/L	PA 6020A UCT-KE
SGI0356-CCVC	Cadmium-111	50.000	52.6	105	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	52.6	105	ug/L	PA 6020A UCT-KE

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 18I0285
Client: Anchor QEA, LLC
Project: Port Gamble - OMMP LTM
Instrument ID: ICPMS2
Calibration: BJ00029
Control Limt: +/- 10.00%
Sequence: SGJ0179

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SGJ0179-ICV1	Cadmium-111	50.000	49.9	99.8	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	49.3	98.7	ug/L	PA 6020A UCT-KE
SGJ0179-CCV1	Cadmium-111	50.000	48.9	97.8	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	48.8	97.6	ug/L	PA 6020A UCT-KE
SGJ0179-CCV2	Cadmium-111	50.000	51.0	102	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	51.6	103	ug/L	PA 6020A UCT-KE
SGJ0179-CCV3	Cadmium-111	50.000	48.3	96.6	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	47.2	94.4	ug/L	PA 6020A UCT-KE
SGJ0179-CCV4	Cadmium-111	50.000	49.5	99.0	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	50.0	100	ug/L	PA 6020A UCT-KE
SGJ0179-CCV5	Cadmium-111	50.000	48.6	97.2	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	47.2	94.4	ug/L	PA 6020A UCT-KE
SGJ0179-CCV6	Cadmium-111	50.000	50.6	101	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	51.4	103	ug/L	PA 6020A UCT-KE
SGJ0179-CCV7	Cadmium-111	50.000	49.2	98.5	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	49.5	99.0	ug/L	PA 6020A UCT-KE
SGJ0179-CCV8	Cadmium-111	50.000	49.3	98.6	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	48.4	96.7	ug/L	PA 6020A UCT-KE
SGJ0179-CCV9	Cadmium-111	50.000	50.9	102	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	50.4	101	ug/L	PA 6020A UCT-KE
SGJ0179-CCVA	Cadmium-111	50.000	49.7	99.5	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	48.6	97.1	ug/L	PA 6020A UCT-KE
SGJ0179-CCVB	Cadmium-111	50.000	49.8	99.5	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	49.3	98.5	ug/L	PA 6020A UCT-KE
SGJ0179-CCVC	Cadmium-111	50.000	53.9	108	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	53.4	107	ug/L	PA 6020A UCT-KE
SGJ0179-CCVD	Cadmium-111	50.000	49.1	98.2	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	49.2	98.3	ug/L	PA 6020A UCT-KE
SGJ0179-CCVE	Cadmium-111	50.000	49.2	98.3	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	48.2	96.4	ug/L	PA 6020A UCT-KE
SGJ0179-CCVF	Cadmium-111	50.000	49.6	99.2	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	50.4	101	ug/L	PA 6020A UCT-KE
SGJ0179-CCVG	Cadmium-111	50.000	50.8	102	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	49.2	98.3	ug/L	PA 6020A UCT-KE

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 18I0285
Client: Anchor QEA, LLC
Project: Port Gamble - OMMP LTM
Instrument ID: ICPMS2
Calibration: BJ00029
Control Limt: +/- 10.00%
Sequence: SGJ0179

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SGJ0179-CCVH	Cadmium-111	50.000	49.9	99.8	ug/L	PA 6020A UCT-KE
	Cadmium-114	50.000	50.2	100	ug/L	PA 6020A UCT-KE

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 6020A UCT-KED

Laboratory:	Analytical Resources, Inc.	SDG:	18I0285
Client:	Anchor QEA, LLC	Project:	Port Gamble - OMMP LTM
Sequence:	SGI0356	Instrument:	ICPMS2
		Calibration:	BI00061

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
CAL 0	SGI0356-CAL1	XDT_m2180921-006	NA	09/21/18 10:28
CAL 1 - LOW CHECK	SGI0356-CAL2	XDT_m2180921-007	NA	09/21/18 10:32
CAL 2	SGI0356-CAL3	XDT_m2180921-008	NA	09/21/18 10:37
CAL 3	SGI0356-CAL4	XDT_m2180921-009	NA	09/21/18 10:42
CAL 4	SGI0356-CAL5	XDT_m2180921-010	NA	09/21/18 10:47
CAL 5	SGI0356-CAL6	XDT_m2180921-011	NA	09/21/18 10:53
RINSE	SGI0356-IBL1	XDT_m2180921-012	NA	09/21/18 11:01
Initial Cal Check	SGI0356-ICV1	XDT_m2180921-014	NA	09/21/18 11:08
Initial Cal Blank	SGI0356-ICB1	XDT_m2180921-015	NA	09/21/18 11:15
Calibration Check	SGI0356-CCV1	XDT_m2180921-016	NA	09/21/18 11:20
Calibration Blank	SGI0356-CCB1	XDT_m2180921-017	NA	09/21/18 11:27
Instrument Blank	SGI0356-IBL2	XDT_m2180921-023	NA	09/21/18 12:10
Instrument Blank	SGI0356-IBL3	XDT_m2180921-024	NA	09/21/18 12:16
Instrument Blank	SGI0356-IBL4	XDT_m2180921-025	NA	09/21/18 12:21
Instrument Blank	SGI0356-IBL5	XDT_m2180921-026	NA	09/21/18 12:30
Instrument Blank	SGI0356-IBL6	XDT_m2180921-027	NA	09/21/18 12:36
Calibration Check	SGI0356-CCV2	XDT_m2180921-028	NA	09/21/18 12:41
Calibration Blank	SGI0356-CCB2	XDT_m2180921-029	NA	09/21/18 12:48
Instrument Blank	SGI0356-IBL7	XDT_m2180921-030	NA	09/21/18 12:55
Instrument Blank	SGI0356-IBL8	XDT_m2180921-031	NA	09/21/18 13:00
Instrument Blank	SGI0356-IBL9	XDT_m2180921-032	NA	09/21/18 13:04
Instrument Blank	SGI0356-IBLA	XDT_m2180921-033	NA	09/21/18 13:10
Instrument Blank	SGI0356-IBLB	XDT_m2180921-034	NA	09/21/18 13:15
Instrument Blank	SGI0356-IBLC	XDT_m2180921-035	NA	09/21/18 13:19
Calibration Check	SGI0356-CCV3	XDT_m2180921-037	NA	09/21/18 13:29
Calibration Blank	SGI0356-CCB3	XDT_m2180921-038	NA	09/21/18 13:36
Instrument RL Check	SGI0356-CRL1	XDT_m2180921-039	NA	09/21/18 13:40
Interference Check A	SGI0356-IFA1	XDT_m2180921-040	NA	09/21/18 13:45
Interference Check B	SGI0356-IFB1	XDT_m2180921-041	NA	09/21/18 13:50
LR200	SGI0356-HCV1	XDT_m2180921-042	NA	09/21/18 13:55

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 6020A UCT-KED

Laboratory:	Analytical Resources, Inc.	SDG:	18I0285
Client:	Anchor QEA, LLC	Project:	Port Gamble - OMMP LTM
Sequence:	SGI0356	Instrument:	ICPMS2
		Calibration:	BI00061

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
LR300	SGI0356-HCV2	XDT_m2180921-043	NA	09/21/18 13:59
Instrument Blank	SGI0356-IBLD	XDT_m2180921-044	NA	09/21/18 14:07
Calibration Check	SGI0356-CCV4	XDT_m2180921-045	NA	09/21/18 14:11
Calibration Blank	SGI0356-CCB4	XDT_m2180921-046	NA	09/21/18 14:18
Calibration Check	SGI0356-CCV5	XDT_m2180921-057	NA	09/21/18 15:12
Calibration Blank	SGI0356-CCB5	XDT_m2180921-058	NA	09/21/18 15:19
Calibration Check	SGI0356-CCV6	XDT_m2180921-065	NA	09/21/18 15:52
Calibration Blank	SGI0356-CCB6	XDT_m2180921-066	NA	09/21/18 15:59
ZZZZZ	18I0286-02	XDT_m2180921-070	Water	09/21/18 16:17
ZZZZZ	18I0286-02	XDT_m2180921-070	Water	09/21/18 16:17
ZZZZZ	18I0286-26	XDT_m2180921-072	Water	09/21/18 16:27
ZZZZZ	18I0286-26	XDT_m2180921-072	Water	09/21/18 16:27
ZZZZZ	18I0286-02RE1	XDT_m2180921-074	Water	09/21/18 16:36
Calibration Check	SGI0356-CCV7	XDT_m2180921-077	NA	09/21/18 16:52
Calibration Blank	SGI0356-CCB7	XDT_m2180921-078	NA	09/21/18 16:59
Blank	BGI0575-BLK1	XDT_m2180921-079	Water	09/21/18 17:05
ZZZZZ	18I0284-01	XDT_m2180921-086	Water	09/21/18 17:37
LCS	BGI0575-BS1	XDT_m2180921-088	Water	09/21/18 17:46
Calibration Check	SGI0356-CCV8	XDT_m2180921-089	NA	09/21/18 17:52
Calibration Blank	SGI0356-CCB8	XDT_m2180921-090	NA	09/21/18 17:59
ZZZZZ	18I0152-05	XDT_m2180921-095	Water	09/21/18 18:22
ZZZZZ	18I0152-06	XDT_m2180921-096	Water	09/21/18 18:27
ZZZZZ	18I0152-06	XDT_m2180921-096	Water	09/21/18 18:27
ZZZZZ	18I0152-06	XDT_m2180921-096	Water	09/21/18 18:27
ZZZZZ	18I0152-01	XDT_m2180921-098	Water	09/21/18 18:36
ZZZZZ	18I0152-01	XDT_m2180921-098	Water	09/21/18 18:36
ZZZZZ	18I0152-01	XDT_m2180921-098	Water	09/21/18 18:36
Calibration Check	SGI0356-CCV9	XDT_m2180921-101	NA	09/21/18 18:51
Calibration Blank	SGI0356-CCB9	XDT_m2180921-102	NA	09/21/18 18:58
ZZZZZ	18I0152-08	XDT_m2180921-103	Water	09/21/18 19:03

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 6020A UCT-KED

Laboratory:	Analytical Resources, Inc.	SDG:	18I0285
Client:	Anchor QEA, LLC	Project:	Port Gamble - OMMP LTM
Sequence:	SGI0356	Instrument:	ICPMS2
		Calibration:	BI00061

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
ZZZZZ	18I0152-08	XDT_m2180921-103	Water	09/21/18 19:03
ZZZZZ	18I0152-08	XDT_m2180921-103	Water	09/21/18 19:03
ZZZZZ	18I0152-09	XDT_m2180921-104	Water	09/21/18 19:07
ZZZZZ	18I0152-09	XDT_m2180921-104	Water	09/21/18 19:07
ZZZZZ	18I0152-09	XDT_m2180921-104	Water	09/21/18 19:07
ZZZZZ	18I0152-10	XDT_m2180921-105	Water	09/21/18 19:12
ZZZZZ	18I0152-10	XDT_m2180921-105	Water	09/21/18 19:12
ZZZZZ	18I0152-10	XDT_m2180921-105	Water	09/21/18 19:12
ZZZZZ	18I0152-11	XDT_m2180921-106	Water	09/21/18 19:16
ZZZZZ	18I0152-11	XDT_m2180921-106	Water	09/21/18 19:16
ZZZZZ	18I0152-11	XDT_m2180921-106	Water	09/21/18 19:16
ZZZZZ	18I0152-13	XDT_m2180921-107	Water	09/21/18 19:21
ZZZZZ	18I0152-13	XDT_m2180921-107	Water	09/21/18 19:21
ZZZZZ	18I0152-13	XDT_m2180921-107	Water	09/21/18 19:21
ZZZZZ	18I0152-12	XDT_m2180921-108	Water	09/21/18 19:26
ZZZZZ	18I0152-02	XDT_m2180921-109	Water	09/21/18 19:30
ZZZZZ	18I0152-07	XDT_m2180921-110	Water	09/21/18 19:35
ZZZZZ	18I0152-07	XDT_m2180921-110	Water	09/21/18 19:35
ZZZZZ	18I0152-07	XDT_m2180921-110	Water	09/21/18 19:35
PGLTM-RB-180919	18I0285-38	XDT_m2180921-112	Water	09/21/18 19:44
Calibration Check	SGI0356-CCVA	XDT_m2180921-113	NA	09/21/18 19:50
Calibration Blank	SGI0356-CCBA	XDT_m2180921-114	NA	09/21/18 19:57
Calibration Check	SGI0356-CCVB	XDT_m2180921-124	NA	09/21/18 20:44
Calibration Blank	SGI0356-CCBB	XDT_m2180921-125	NA	09/21/18 20:51
Calibration Check	SGI0356-CCVC	XDT_m2180921-132	NA	09/21/18 21:24
Calibration Blank	SGI0356-CCBC	XDT_m2180921-133	NA	09/21/18 21:32

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 6020A UCT-KED

Laboratory:	Analytical Resources, Inc.	SDG:	18I0285
Client:	Anchor QEA, LLC	Project:	Port Gamble - OMMP LTM
Sequence:	SGI0375	Instrument:	ICPMS2
		Calibration:	BI00063

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
ZZZZZ	18I0152-02	XDT_m2180924-048	Water	09/24/18 14:16
ZZZZZ	18I0152-02	XDT_m2180924-048	Water	09/24/18 14:16
ZZZZZ	18I0152-12	XDT_m2180924-049	Water	09/24/18 14:21
ZZZZZ	18I0152-12	XDT_m2180924-049	Water	09/24/18 14:21
ZZZZZ	18I0152-03	XDT_m2180924-050	Water	09/24/18 14:26
ZZZZZ	18I0152-03	XDT_m2180924-050	Water	09/24/18 14:26
ZZZZZ	18I0152-03	XDT_m2180924-050	Water	09/24/18 14:26
ZZZZZ	18I0152-04	XDT_m2180924-051	Water	09/24/18 14:31
ZZZZZ	18I0152-04	XDT_m2180924-051	Water	09/24/18 14:31
ZZZZZ	18I0152-04	XDT_m2180924-051	Water	09/24/18 14:31
ZZZZZ	18I0152-05	XDT_m2180924-052	Water	09/24/18 14:36
ZZZZZ	18I0152-05	XDT_m2180924-052	Water	09/24/18 14:36

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 6020A UCT-KED

Laboratory:	Analytical Resources, Inc.	SDG:	18I0285
Client:	Anchor QEA, LLC	Project:	Port Gamble - OMMP LTM
Sequence:	SGJ0165	Instrument:	ICPMS2
		Calibration:	BJ00024

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
ZZZZZ	18I0403-02	XDT_m2181009A-039	Solid	10/09/18 17:42
ZZZZZ	18I0403-02	XDT_m2181009A-039	Solid	10/09/18 17:42
ZZZZZ	18I0403-02	XDT_m2181009A-039	Solid	10/09/18 17:42
ZZZZZ	18J0087-01	XDT_m2181009A-052	Solid	10/09/18 18:50
ZZZZZ	18J0087-01	XDT_m2181009A-052	Solid	10/09/18 18:50
ZZZZZ	18J0087-02	XDT_m2181009A-053	Solid	10/09/18 18:55
ZZZZZ	18J0087-02	XDT_m2181009A-053	Solid	10/09/18 18:55

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 6020A UCT-KED

Laboratory:	Analytical Resources, Inc.	SDG:	18I0285
Client:	Anchor QEA, LLC	Project:	Port Gamble - OMMP LTM
Sequence:	SGJ0179	Instrument:	ICPMS2
		Calibration:	BJ00029

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
CAL 0	SGJ0179-CAL1	XDT_m2181010-006	NA	10/10/18 09:44
CAL 1 - LOW CHECK	SGJ0179-CAL2	XDT_m2181010-007	NA	10/10/18 09:49
CAL 2	SGJ0179-CAL3	XDT_m2181010-008	NA	10/10/18 09:54
CAL 3	SGJ0179-CAL4	XDT_m2181010-009	NA	10/10/18 10:00
CAL 4	SGJ0179-CAL5	XDT_m2181010-010	NA	10/10/18 10:05
CAL 5	SGJ0179-CAL6	XDT_m2181010-011	NA	10/10/18 10:12
RINSE	SGJ0179-IBL1	XDT_m2181010-012	NA	10/10/18 10:20
Initial Cal Check	SGJ0179-ICV1	XDT_m2181010-014	NA	10/10/18 10:28
Initial Cal Blank	SGJ0179-ICB1	XDT_m2181010-015	NA	10/10/18 10:36
Calibration Check	SGJ0179-CCV1	XDT_m2181010-016	NA	10/10/18 10:44
Calibration Blank	SGJ0179-CCB1	XDT_m2181010-017	NA	10/10/18 10:51
Instrument RL Check	SGJ0179-CRL1	XDT_m2181010-018	NA	10/10/18 10:56
Interference Check A	SGJ0179-IFA1	XDT_m2181010-019	NA	10/10/18 11:02
Interference Check B	SGJ0179-IFB1	XDT_m2181010-020	NA	10/10/18 11:07
LR200	SGJ0179-HCV1	XDT_m2181010-021	NA	10/10/18 11:12
LR300	SGJ0179-HCV2	XDT_m2181010-022	NA	10/10/18 11:17
Instrument Blank	SGJ0179-IBL2	XDT_m2181010-023	NA	10/10/18 11:25
Instrument Blank	SGJ0179-IBL3	XDT_m2181010-024	NA	10/10/18 11:32
Calibration Check	SGJ0179-CCV2	XDT_m2181010-026	NA	10/10/18 11:46
Calibration Blank	SGJ0179-CCB2	XDT_m2181010-027	NA	10/10/18 11:54
Calibration Check	SGJ0179-CCV3	XDT_m2181010-038	NA	10/10/18 12:54
Calibration Blank	SGJ0179-CCB3	XDT_m2181010-039	NA	10/10/18 13:01
Calibration Check	SGJ0179-CCV4	XDT_m2181010-050	NA	10/10/18 13:59
Calibration Blank	SGJ0179-CCB4	XDT_m2181010-051	NA	10/10/18 14:07
Calibration Check	SGJ0179-CCV5	XDT_m2181010-062	NA	10/10/18 15:05
Calibration Blank	SGJ0179-CCB5	XDT_m2181010-063	NA	10/10/18 15:12
Calibration Check	SGJ0179-CCV6	XDT_m2181010-064	NA	10/10/18 15:20
Calibration Blank	SGJ0179-CCB6	XDT_m2181010-065	NA	10/10/18 15:27
ZZZZZ	BGJ0175-BLK2	XDT_m2181010-067	Solid	10/10/18 15:37
ZZZZZ	BGJ0175-BS2	XDT_m2181010-068	Solid	10/10/18 15:42

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 6020A UCT-KED

Laboratory:	Analytical Resources, Inc.	SDG:	18I0285
Client:	Anchor QEA, LLC	Project:	Port Gamble - OMMP LTM
Sequence:	SGJ0179	Instrument:	ICPMS2
		Calibration:	BJ00029

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
ZZZZZ	18J0087-01	XDT_m2181010-069	Solid	10/10/18 15:46
ZZZZZ	18J0087-02	XDT_m2181010-070	Solid	10/10/18 15:51
ZZZZZ	18I0403-02	XDT_m2181010-072	Solid	10/10/18 16:01
Calibration Check	SGJ0179-CCV7	XDT_m2181010-076	NA	10/10/18 16:22
Calibration Blank	SGJ0179-CCB7	XDT_m2181010-077	NA	10/10/18 16:29
Calibration Check	SGJ0179-CCV8	XDT_m2181010-078	NA	10/10/18 16:37
Calibration Blank	SGJ0179-CCB8	XDT_m2181010-079	NA	10/10/18 16:45
ZZZZZ	18I0403-01	XDT_m2181010-084	Solid	10/10/18 17:09
ZZZZZ	18I0403-01	XDT_m2181010-084	Solid	10/10/18 17:09
ZZZZZ	18I0403-01	XDT_m2181010-084	Solid	10/10/18 17:09
ZZZZZ	18I0403-04	XDT_m2181010-085	Solid	10/10/18 17:14
ZZZZZ	18I0403-04	XDT_m2181010-085	Solid	10/10/18 17:14
ZZZZZ	18I0403-04	XDT_m2181010-085	Solid	10/10/18 17:14
Calibration Check	SGJ0179-CCV9	XDT_m2181010-090	NA	10/10/18 17:39
Calibration Blank	SGJ0179-CCB9	XDT_m2181010-091	NA	10/10/18 17:47
Calibration Check	SGJ0179-CCVA	XDT_m2181010-102	NA	10/10/18 18:44
Calibration Blank	SGJ0179-CCBA	XDT_m2181010-103	NA	10/10/18 18:52
ZZZZZ	18I0426-01	XDT_m2181010-108	Water	10/10/18 19:17
ZZZZZ	18I0426-02	XDT_m2181010-109	Water	10/10/18 19:22
ZZZZZ	18I0426-04	XDT_m2181010-110	Water	10/10/18 19:27
Calibration Check	SGJ0179-CCVB	XDT_m2181010-114	NA	10/10/18 19:49
Calibration Blank	SGJ0179-CCBB	XDT_m2181010-115	NA	10/10/18 19:57
Blank	BGJ0277-BLK2	XDT_m2181010-116	Solid	10/10/18 20:01
LCS	BGJ0277-BS2	XDT_m2181010-117	Solid	10/10/18 20:06
SMA1-ST-0-10-Comp-180917	18I0285-02	XDT_m2181010-118	Solid	10/10/18 20:11
SMA2A-IT-0-10-Comp-180919	18I0285-03	XDT_m2181010-119	Solid	10/10/18 20:16
SMA2A-ST-0-10-Comp-180918	18I0285-04	XDT_m2181010-120	Solid	10/10/18 20:21
SMA2B-IT-0-10-Comp-180918	18I0285-05	XDT_m2181010-121	Solid	10/10/18 20:26
SMA1A-IT-0-10-Comp-180917	18I0285-01	XDT_m2181010-122	Solid	10/10/18 20:30
SMA1A-IT-0-10-Comp-180917	BGJ0277-DUP2	XDT_m2181010-123	Solid	10/10/18 20:35

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 6020A UCT-KED

Laboratory:	Analytical Resources, Inc.	SDG:	18I0285
Client:	Anchor QEA, LLC	Project:	Port Gamble - OMMP LTM
Sequence:	SGJ0179	Instrument:	ICPMS2
		Calibration:	BJ00029

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
SMA1A-IT-0-10-Comp-180917	BGJ0277-MS2	XDT_m2181010-124	Solid	10/10/18 20:40
Reference	BGJ0277-SRM2	XDT_m2181010-125	Solid	10/10/18 20:45
Calibration Check	SGJ0179-CCVC	XDT_m2181010-126	NA	10/10/18 20:51
Calibration Blank	SGJ0179-CCBC	XDT_m2181010-127	NA	10/10/18 20:58
SMA2B-ST-0-10-Comp-180918	18I0285-06	XDT_m2181010-128	Solid	10/10/18 21:03
SMA102B-ST-0-10-Comp-180918	18I0285-37	XDT_m2181010-129	Solid	10/10/18 21:08
Calibration Check	SGJ0179-CCVD	XDT_m2181010-138	NA	10/10/18 21:53
Calibration Blank	SGJ0179-CCBD	XDT_m2181010-139	NA	10/10/18 22:00
Calibration Check	SGJ0179-CCVE	XDT_m2181010-150	NA	10/10/18 22:54
Calibration Blank	SGJ0179-CCBE	XDT_m2181010-151	NA	10/10/18 23:02
Calibration Check	SGJ0179-CCVF	XDT_m2181010-162	NA	10/10/18 23:56
Calibration Blank	SGJ0179-CCBF	XDT_m2181010-163	NA	10/11/18 00:04
Calibration Check	SGJ0179-CCVG	XDT_m2181010-174	NA	10/11/18 00:57
Calibration Blank	SGJ0179-CCBG	XDT_m2181010-175	NA	10/11/18 01:04
Calibration Check	SGJ0179-CCVH	XDT_m2181010-180	NA	10/11/18 01:29
Calibration Blank	SGJ0179-CCBH	XDT_m2181010-181	NA	10/11/18 01:36

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ICP INTERFERENCE CHECK SAMPLE

EPA 6020A UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 18I0285
Client: Anchor QEA, LLC
Project: Port Gamble - OMMP LTM
Instrument ID: ICPMS2
Calibration: BI00061
Sequence: SGI0356
Standard ID: G007606

Lab Sample ID	Analyte	True	Found	%R	Units
SGI0356-IFA1	Cadmium-111	0	0.0500		ug/L
	Cadmium-114	0	0.0330		ug/L

* Indicates %R outside of QC limits

NOTE: True value and %R are populated only for analytes found in the interference check standards, and will be seen only if those analytes were requested.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ICP INTERFERENCE CHECK SAMPLE

EPA 6020A UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 18I0285
Client: Anchor QEA, LLC
Project: Port Gamble - OMMP LTM
Instrument ID: ICPMS2
Calibration: BI00061
Sequence: SGI0356
Standard ID: G007606

Lab Sample ID	Analyte	True	Found	%R	Units
SGI0356-IFB1	Cadmium-111	20.000	19.283	96.4	ug/L
	Cadmium-114	20.000	19.311	96.6	ug/L

* Indicates %R outside of QC limits

NOTE: True value and %R are populated only for analytes found in the interference check standards, and will be seen only if those analytes were requested.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ICP INTERFERENCE CHECK SAMPLE

EPA 6020A UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 18I0285
Client: Anchor QEA, LLC
Project: Port Gamble - OMMP LTM
Instrument ID: ICPMS2
Calibration: BJ00029
Sequence: SGJ0179
Standard ID: G009085

Lab Sample ID	Analyte	True	Found	%R	Units
SGJ0179-IFA1	Cadmium-111	0	0.0570		ug/L
	Cadmium-114	0	0.0500		ug/L

* Indicates %R outside of QC limits

NOTE: True value and %R are populated only for analytes found in the interference check standards, and will be seen only if those analytes were requested.

Analytical Resources, Incorporated
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ICP INTERFERENCE CHECK SAMPLE

EPA 6020A UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 18I0285
Client: Anchor QEA, LLC
Project: Port Gamble - OMMP LTM
Instrument ID: ICPMS2
Calibration: BJ00029
Sequence: SGJ0179
Standard ID: G009085

Lab Sample ID	Analyte	True	Found	%R	Units
SGJ0179-IFB1	Cadmium-111	20.000	18.267	91.3	ug/L
	Cadmium-114	20.000	17.713	88.6	ug/L

* Indicates %R outside of QC limits

NOTE: True value and %R are populated only for analytes found in the interference check standards, and will be seen only if those analytes were requested.

Analytical Resources, Incorporated
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DETECTION LEVEL STANDARD
EPA 6020A UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 18I0285
Client: Anchor QEA, LLC
Project: Port Gamble - OMMP LTM
Instrument ID: ICPMS2
Calibration: BI00061
Sequence: SGI0356
Lab Sample ID: SGI0356-CRL1

Analyte	True	Found	%R	Units	QC Limts
Cadmium-111	0.10000	0.123	123	ug/L	50 - 150
Cadmium-114	0.10000	0.106	106	ug/L	50 - 150

* Values outside of QC limits

Analytical Resources, Incorporated
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DETECTION LEVEL STANDARD
EPA 6020A UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 18I0285
Client: Anchor QEA, LLC
Project: Port Gamble - OMMP LTM
Instrument ID: ICPMS2
Calibration: BJ00029
Sequence: SGJ0179
Lab Sample ID: SGJ0179-CRL1

Analyte	True	Found	%R	Units	QC Limts
Cadmium-111	0.10000	0.119	119	ug/L	50 - 150
Cadmium-114	0.10000	0.108	108	ug/L	50 - 150

* Values outside of QC limits

Analytical Resources, Incorporated
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HIGH-CONCENTRATION CALIBRATION VERIFICATION

EPA 6020A UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 18I0285
Client: Anchor QEA, LLC
Project: Port Gamble - OMMP LTM
Calibration: BI00061
Laboratory ID: SGI0356-HCV1
Sequence: SGI0356
Standard ID: G008161

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Cadmium-111	200.00	202	1.2	10.00
Cadmium-114	200.00	204	1.8	10.00

* Values outside of QC limits

Analytical Resources, Incorporated
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HIGH-CONCENTRATION CALIBRATION VERIFICATION

EPA 6020A UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 18I0285
Client: Anchor QEA, LLC
Project: Port Gamble - OMMP LTM
Calibration: BI00061
Laboratory ID: SGI0356-HCV2
Sequence: SGI0356
Standard ID: G008416

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Cadmium-111	300.00	296	-1.3	10.00
Cadmium-114	300.00	299	-0.5	10.00

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

HIGH-CONCENTRATION CALIBRATION VERIFICATION

EPA 6020A UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 18I0285
Client: Anchor QEA, LLC
Project: Port Gamble - OMMP LTM
Calibration: BJ00029
Laboratory ID: SGJ0179-HCV1
Sequence: SGJ0179
Standard ID: G008973

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Cadmium-111	200.00	197	-1.5	10.00
Cadmium-114	200.00	195	-2.6	10.00

* Values outside of QC limits

Analytical Resources, Incorporated
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HIGH-CONCENTRATION CALIBRATION VERIFICATION

EPA 6020A UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 18I0285
Client: Anchor QEA, LLC
Project: Port Gamble - OMMP LTM
Calibration: BJ00029
Laboratory ID: SGJ0179-HCV2
Sequence: SGJ0179
Standard ID: G009141

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Cadmium-111	300.00	285	-4.9	10.00
Cadmium-114	300.00	277	-7.6	10.00

* Values outside of QC limits

Analytical Resources, Incorporated
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HOLDING TIME SUMMARY

Analysis: EPA 6020A UCT-KED

Laboratory: Analytical Resources, Inc. SDG: 18I0285

Client: Anchor QEA, LLC Project: Port Gamble - OMMP LTM

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
SMA1A-IT-0-10-Comp-180917 18I0285-01	09/17/18 15:10	09/19/18 17:00	10/08/18 09:49	20	180	10/10/18 20:30	23	180	
SMA1-ST-0-10-Comp-180917 18I0285-02	09/17/18 12:05	09/19/18 17:00	10/08/18 09:49	20	180	10/10/18 20:11	23	180	
SMA2A-IT-0-10-Comp-180919 18I0285-03	09/19/18 10:25	09/19/18 17:00	10/08/18 09:49	18	180	10/10/18 20:16	21	180	
SMA2A-ST-0-10-Comp-180918 18I0285-04	09/18/18 11:00	09/19/18 17:00	10/08/18 09:49	19	180	10/10/18 20:21	22	180	
SMA2B-IT-0-10-Comp-180918 18I0285-05	09/18/18 15:10	09/19/18 17:00	10/08/18 09:49	19	180	10/10/18 20:26	22	180	
SMA2B-ST-0-10-Comp-180918 18I0285-06	09/18/18 16:35	09/19/18 17:00	10/08/18 09:49	19	180	10/10/18 21:03	22	180	
SMA102B-ST-0-10-Comp-180918 18I0285-37	09/18/18 16:40	09/19/18 17:00	10/08/18 09:49	19	180	10/10/18 21:08	22	180	
PGLTM-RB-180919 18I0285-38	09/19/18 11:20	09/19/18 17:00	09/21/18 04:52	1	180	09/21/18 19:44	2	180	
Duplicate BGJ0277-DUP2	09/17/18 15:10	09/19/18 17:00	10/08/18 09:49	20	180	10/10/18 20:35	23	180	
Matrix Spike BGJ0277-MS2	09/17/18 15:10	09/19/18 17:00	10/08/18 09:49	20	180	10/10/18 20:40	23	180	

* Indicates hold time exceedance.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

METHOD DETECTION AND REPORTING LIMITS

EPA 6020A UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 18I0285
Client: Anchor QEA, LLC
Project: Port Gamble - OMMP LTM
Matrix: Solid
Instrument: ICPMS2

Analyte	MDL	RL	Units
Cadmium-111	0.03	0.10	mg/kg
Cadmium-114	0.04	0.10	mg/kg

Analytical Resources, Incorporated
Analytical Chemists and Consultants

METHOD DETECTION AND REPORTING LIMITS

EPA 6020A UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 18I0285
Client: Anchor QEA, LLC
Project: Port Gamble - OMMP LTM
Matrix: Water
Instrument: ICPMS2

Analyte	MDL	RL	Units
Cadmium-111	0.0300	0.100	ug/L
Cadmium-114	0.0400	0.100	ug/L

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
SM 2540 G-97

SMA1A-IT-0-10-Comp-180917

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Port Gamble - OMMP LTM				
Matrix:	Sediment	Laboratory ID:	18I0285-01	SDG:	18I0285
Sampled:	09/17/18 15:10	Prepared:	09/25/18 06:40	File ID:	
% Solids:	79.39	Preparation:	No Prep Wet Chem	Analyzed:	09/25/18 07:00
Batch:	BGI0657	Sequence:		Initial/Final:	10 g Wet / 10 g
Instrument:	BAL2			Calibration:	

CAS NO.	Analyte	Concentration (%)	Dilution Factor	MDL	MRL	Q
	Total Solids	79.39	1	0.04	0.04	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
SM 2540 G-97

SMA1-ST-0-10-Comp-180917

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Port Gamble - OMMP LTM				
Matrix:	Sediment	Laboratory ID:	18I0285-02	SDG:	18I0285
Sampled:	09/17/18 12:05	Prepared:	09/25/18 06:40	File ID:	
% Solids:	49.28	Preparation:	No Prep Wet Chem	Analyzed:	09/25/18 07:00
Batch:	BGI0657	Sequence:		Initial/Final:	10 g Wet / 10 g
Instrument:	BAL2			Calibration:	

CAS NO.	Analyte	Concentration (%)	Dilution Factor	MDL	MRL	Q
	Total Solids	49.28	1	0.04	0.04	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
SM 2540 G-97

SMA2A-IT-0-10-Comp-180919

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Port Gamble - OMMP LTM				
Matrix:	Sediment	Laboratory ID:	18I0285-03	SDG:	18I0285
Sampled:	09/19/18 10:25	Prepared:	09/25/18 06:40	File ID:	
% Solids:	83.61	Preparation:	No Prep Wet Chem	Analyzed:	09/25/18 07:00
Batch:	BGI0657	Sequence:		Initial/Final:	10 g Wet / 10 g
Instrument:	BAL2			Calibration:	

CAS NO.	Analyte	Concentration (%)	Dilution Factor	MDL	MRL	Q
	Total Solids	83.61	1	0.04	0.04	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
SM 2540 G-97

SMA2A-ST-0-10-Comp-180918

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Port Gamble - OMMP LTM				
Matrix:	Sediment	Laboratory ID:	18I0285-04	SDG:	18I0285
Sampled:	09/18/18 11:00	Prepared:	09/25/18 06:40	File ID:	
% Solids:	76.51	Preparation:	No Prep Wet Chem	Analyzed:	09/25/18 07:00
Batch:	BGI0657	Sequence:		Initial/Final:	10 g Wet / 10 g
Instrument:	BAL2			Calibration:	

CAS NO.	Analyte	Concentration (%)	Dilution Factor	MDL	MRL	Q
	Total Solids	76.51	1	0.04	0.04	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
SM 2540 G-97

SMA2B-IT-0-10-Comp-180918

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Port Gamble - OMMP LTM				
Matrix:	Sediment	Laboratory ID:	18I0285-05	SDG:	18I0285
Sampled:	09/18/18 15:10	Prepared:	09/25/18 06:40	File ID:	
% Solids:	79.59	Preparation:	No Prep Wet Chem	Analyzed:	09/25/18 07:00
Batch:	BGI0657	Sequence:		Initial/Final:	10 g Wet / 10 g
Instrument:	BAL2			Calibration:	

CAS NO.	Analyte	Concentration (%)	Dilution Factor	MDL	MRL	Q
	Total Solids	79.59	1	0.04	0.04	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
SM 2540 G-97

SMA2B-ST-0-10-Comp-180918

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Port Gamble - OMMP LTM				
Matrix:	Sediment	Laboratory ID:	18I0285-06	SDG:	18I0285
Sampled:	09/18/18 16:35	Prepared:	09/25/18 06:40	File ID:	
% Solids:	78.01	Preparation:	No Prep Wet Chem	Analyzed:	09/25/18 07:00
Batch:	BGI0657	Sequence:		Initial/Final:	10 g Wet / 10 g
Instrument:	BAL2			Calibration:	

CAS NO.	Analyte	Concentration (%)	Dilution Factor	MDL	MRL	Q
	Total Solids	78.01	1	0.04	0.04	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
SM 2540 G-97

SMA102B-ST-0-10-Comp-180918

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Port Gamble - OMMP LTM				
Matrix:	Sediment	Laboratory ID:	18I0285-37	SDG:	18I0285
Sampled:	09/18/18 16:40	Prepared:	09/25/18 06:40	File ID:	
% Solids:	81.95	Preparation:	No Prep Wet Chem	Analyzed:	09/25/18 07:00
Batch:	BGI0657	Sequence:		Initial/Final:	10 g Wet / 10 g
Instrument:	BAL2			Calibration:	

CAS NO.	Analyte	Concentration (%)	Dilution Factor	MDL	MRL	Q
	Total Solids	81.95	1	0.04	0.04	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

PREPARATION BATCH SUMMARY

SM 2540 G-97

Laboratory:	Analytical Resources, Inc.	SDG:	18I0285
Client:	Anchor QEA, LLC	Project:	Port Gamble - OMMP LTM
Batch:	BGI0657 Batch Matrix: Solid	Preparation:	No Prep Wet Chem

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
SMA1A-IT-0-10-Comp-180917	18I0285-01		09/25/18 06:40	
SMA1-ST-0-10-Comp-180917	18I0285-02		09/25/18 06:40	
SMA2A-IT-0-10-Comp-180919	18I0285-03		09/25/18 06:40	
SMA2A-ST-0-10-Comp-180918	18I0285-04		09/25/18 06:40	
SMA2B-IT-0-10-Comp-180918	18I0285-05		09/25/18 06:40	
SMA2B-ST-0-10-Comp-180918	18I0285-06		09/25/18 06:40	
SMA102B-ST-0-10-Comp-180918	18I0285-37		09/25/18 06:40	
Blank	BGI0657-BLK1		09/25/18 06:40	
SMA1A-IT-0-10-Comp-180917	BGI0657-DUP1		09/25/18 06:40	

TOTAL SOLIDS/VOLATILE SOLIDS (TS / TVS) BENCHSHEET for Solid samples

Method: PSEP 1986, SM2540, EPA 160.1

(dry at 104 (12-24 hr) then combust at 550 (30 min))

Batch:	BGI0657
Date:	9/25/2018 7:00
Analyst:	KLE

Instrumentation

Drying Ovens:	12	**Analytical Balance:**	BAL2
Muffle Furnace:	N / A		

Batch drying time

record times as mm/dd/yy hh:mm

date/time in oven:	9/25/2018 7:00	
date/time out:	9/26/2018 7:46	
elapsed hrs =	24.8	> 24 hr

TS (%) calculated as:
Final dry wt (g) = (Dry Wt - Tare Wt)
TS = (Final Dry Wt)/ (grams Sample-Tare)

TVS (mg/kg dry wt) calculated as:
Final ash wt (g) = (min ash wt - tare wt)
TVS (mg/kg) = [(Dry wt-Ash wt)/ (dry weight)] *1,000,000
if ash wt > dry wt, "Chk for Err"
if dry wt-ash wt < 0.001 g, "< (1/dry wt)*1,000,000

Balance Calibration Check

Record weights to 4 places

Cal Weight ID:		CV-02	CV-02	CV-02	CV-02	CV-02				CV-02	CV-02	CV-02			
Date & Time:		9/25/18 6:48	9/25/18 6:52	9/26/18 8:46											
Cal Wt (g):	10.0000	9.9999	9.9999	9.9999											
		Cal OK!	Cal OK!	Cal OK!											

Sample ID	Dish #	Tare Wt. (g)	Dish & Sample (g)	Dry Wt 104C (grams) 1	2	3	dry Wt (g)	TS (%)	Notes	ASH WT 550C (grams) 1	2	3	Ash Wt (g)	TVS (mg/kg)	(%)	Notes
BGI0657-BLK1	1	1.1268	0.0000	1.1268			0.0000	0.00%								
18I0285-01	2	1.1536	7.2230	5.9722			4.8186	79.39%								
BGI0657-DUP1	3	1.1560	8.2109	6.6920			5.5360	78.47%	RPD=1.2							
18I0285-02	4	1.1633	6.6686	3.8762			2.7129	49.28%								
18I0285-03	5	1.1262	6.2849	5.4392			4.3130	83.61%								
18I0285-04	6	1.1220	7.6243	6.0971			4.9751	76.51%								
18I0285-05	7	1.1464	7.3960	6.1203			4.9739	79.59%								
18I0285-06	8	1.0772	5.8070	4.7671			3.6899	78.01%								
18I0285-37	9	1.1731	7.6511	6.4819			5.3088	81.95%								
18I0309-03	10	1.0470	7.6984	2.6474			1.6004	24.06%								

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I

METHOD BLANK DATA SHEET

SM 2540 G-97

TotalAnalytes

Blank

Batch: BGI0657 Laboratory ID: BGI0657-BLK1 Prepared: 09/25/18 06:40

Matrix: Solid Preparation: No Prep Wet Chem Analyzed: 09/25/18 07:00

Sequence: Calibration: Instrument: BAL2

CAS NO.	Analyte	Concentration (%)	Dilution Factor	MDL	MRL	Q
	Total Solids	ND	1	0.04	0.04	U

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SMA1A-IT-0-10-Comp-180917

DUPLICATES
SM 2540 G-97

Laboratory: Analytical Resources, Inc.
SDG: 18I0285
Client: Anchor QEA, LLC
Project: Port Gamble - OMMP LTM
Matrix: Solid
Laboratory ID: BGI0657-DUP1
Batch: BGI0657
Lab Source ID: 18I0285-01
Preparation: No Prep Wet Chem
Initial/Final: 10 g / 10 g
Source Sample Name: SMA1A-IT-0-10-Comp-180917
% Solids: 79.39

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (%)	C	DUPLICATE CONCENTRATION (%)	C	RPD %	Q
Total Solids	20	79.39		78.47		1.17	

*: Values outside of QC limits
L: Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to Dup = +/- RL instead of 20% RPD

Analytical Resources, Incorporated
Analytical Chemists and Consultants

HOLDING TIME SUMMARY

Analysis: SM 2540 G-97

Laboratory: Analytical Resources, Inc. SDG: 18I0285

Client: Anchor QEA, LLC Project: Port Gamble - OMMP LTM

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
SMA1A-IT-0-10-Comp-180917 18I0285-01	09/17/18 15:10	09/19/18 17:00	09/25/18 06:40	7	28	09/25/18 07:00	8	28	
SMA1-ST-0-10-Comp-180917 18I0285-02	09/17/18 12:05	09/19/18 17:00	09/25/18 06:40	7	28	09/25/18 07:00	8	28	
SMA2A-IT-0-10-Comp-180919 18I0285-03	09/19/18 10:25	09/19/18 17:00	09/25/18 06:40	5	28	09/25/18 07:00	6	28	
SMA2A-ST-0-10-Comp-180918 18I0285-04	09/18/18 11:00	09/19/18 17:00	09/25/18 06:40	6	28	09/25/18 07:00	7	28	
SMA2B-IT-0-10-Comp-180918 18I0285-05	09/18/18 15:10	09/19/18 17:00	09/25/18 06:40	6	28	09/25/18 07:00	7	28	
SMA2B-ST-0-10-Comp-180918 18I0285-06	09/18/18 16:35	09/19/18 17:00	09/25/18 06:40	6	28	09/25/18 07:00	7	28	
SMA102B-ST-0-10-Comp-180918 18I0285-37	09/18/18 16:40	09/19/18 17:00	09/25/18 06:40	6	28	09/25/18 07:00	7	28	
Duplicate BGI0657-DUP1	09/17/18 15:10	09/19/18 17:00	09/25/18 06:40	7	28	09/25/18 07:00	8	28	

* Indicates hold time exceedance.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

METHOD DETECTION AND REPORTING LIMITS

SM 2540 G-97

Laboratory: Analytical Resources, Inc.
SDG: 18I0285
Client: Anchor QEA, LLC
Project: Port Gamble - OMMP LTM
Matrix: Solid
Instrument:

Analyte	MDL	RL	Units
Total Solids	0.04	0.04	%

Appendix E
Data Validation Report

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor Environmental, LLC
720 Olive Way, Suite 1900
Seattle, WA 98101
ATTN: Ms. Cindy Fields

November 30, 2018

SUBJECT: REVISED Port Gamble, Sediments, Data Validation

Dear Ms. Fields,

Enclosed are the revised validation reports for the fractions listed below. This SDG was received on October 16, 2018. Attachment 1 is a summary of the samples that were reviewed for each analysis.

- Revision: Added the qualifier due to matrix interference.

LDC Project #43388_RV1:

SDG #	Fraction
18I0285	Polynuclear Aromatic Hydrocarbons, Cadmium-111, Total Solids, Polychlorinated Dioxins/Dibenzofurans

The data validation was performed under Stage 2B & 4 guidelines. The analyses were validated using the following documents, as applicable to each method:

- Operations, Maintenance, and Monitoring Plan for Port Gamble Bay Cleanup Project; January 2018
- USEPA, National Functional Guidelines for Organic Superfund Methods Data Review; January 2017
- USEPA, National Functional Guidelines for Inorganic Superfund Methods Data Review; January 2017
- USEPA National Functional Guidelines for High Resolution Superfund Methods Data Review; April 2016
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007, update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink

Christina Rink
Project Manager/Senior Chemist

1,723 pages-ADV (Dioxins Stage 4)

Attachment 1

EDD Stage 2B/4

LDC #43388 (Anchor Environmental-Seattle WA / Port Gamble, Sediments)

LDC	SDG#	DATE REC'D	(3) DATE DUE	PAHs (8270D)		Cd (6020A)		Dioxins (1613B)		Total Solids (2540G)																											
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	18I0285	10/16/18	11/06/18	1	8	1	7	1	7	0	7																										
Total	T/CR			1	8	1	7	1	7	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS, MSD, or DUPs.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Port Gamble, Sediments

LDC Report Date: November 1, 2018

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): 18I0285

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
SMA1A-IT-0-10-Comp-180917	18I0285-01	Sediment	09/17/18
SMA1-ST-0-10-Comp-180917	18I0285-02	Sediment	09/17/18
SMA1-ST-0-10-Comp-180917RE	18I0285-02RE	Sediment	09/17/18
SMA2A-IT-0-10-Comp-180919	18I0285-03	Sediment	09/19/18
SMA2A-ST-0-10-Comp-180918	18I0285-04	Sediment	09/18/18
SMA2B-IT-0-10-Comp-180918	18I0285-05	Sediment	09/18/18
SMA2B-ST-0-10-Comp-180918	18I0285-06	Sediment	09/18/18
SMA102B-ST-0-10-Comp-180918	18I0285-37	Sediment	09/18/18
PGLTM-RB-180919	18I0285-38	Water	09/19/18
SMA2A-IT-0-10-Comp-180919MS	18I0285-03MS	Sediment	09/19/18
SMA2A-IT-0-10-Comp-180919MSD	18I0285-03MSD	Sediment	09/19/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Operations, Maintenance, and Monitoring Plan for Port Gamble Bay Cleanup Project (January 2018) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Associated Samples
BGI0618-BLK1	09/24/18	Naphthalene	0.07 ug/L	All water samples in SDG 18I0285

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
PGLTM-RB-180919	Naphthalene	0.09 ug/L	0.10U ug/L

VI. Field Blanks

Sample PGLTM-RB-180919 was identified as a rinsate blank. No contaminants were found with the following exceptions:

Blank ID	Compound	Concentration (ug/L)
PGLTM-RB-180919	Naphthalene	0.09

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
BGI0618-BS1/BSD1 (All water samples in SDG 18I0285)	Naphthalene 2-Methylnaphthalene Acenaphthylene 1-Methylnaphthalene Acenaphthene	59.8 (60-140) 59.1 (60-140) 50.5 (60-140) - -	55.6 (60-140) 56.0 (60-140) 47.8 (60-140) 56.7 (60-140) 59.4 (60-140)	J (all detects) UJ (all non-detects)	P

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
BGI0618-BS1/BSD1 (All water samples in SDG 18I0285)	Dibenzo(a,h)anthracene	32.7 (≤30)	J (all detects) UJ (all non-detects)	P

Standard reference materials (SRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

SRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
BGI0708-SRM1	Acenaphthylene Acenaphthene Fluorene Anthracene Pyrene	22.6 (42-158) 48.7 (68-132) 57.4 (58-142) 12.4 (34-166) 71.1 (72-128)	All sediment samples in SDG 18I0285	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P

X. Field Duplicates

Samples SMA2B-ST-0-10-Comp-180918 and SMA102B-ST-0-10-Comp-180918 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD
	SMA2B-ST-0-10-Comp-180918	SMA102B-ST-0-10-Comp-180918	
Anthracene	10.6	15.6	38
Pyrene	31.5	46.1	38
Benzo(g,h,i)perylene	6.17	15.1	84
Indeno(1,2,3-c,d)pyrene	4.93U	10.8	Not calculable
Benzo(j)fluoranthene	2.41	10.1	123
Benzo(b)fluoranthene	4.44	26	142
Fluoranthene	34.9	43.4	22
Benzo(k)fluoranthene	2.51	14.8	142
Acenaphthylene	10.8	20.2	61

Compound	Concentration (ug/Kg)		RPD
	SMA2B-ST-0-10-Comp-180918	SMA102B-ST-0-10-Comp-180918	
Chrysene	10.4	19.1	59
Benzo(a)pyrene	4.14	24.6	142
Dibenzo(a,h)anthracene	4.93U	3.41	Not calculable
Benzo(a)anthracene	5.2	11.1	72
Acenaphthene	7.41	11	39
Phenanthrene	31.7	46	37
Fluorene	5.97	8.53	35
1-Methylnaphthalene	4.8	5.64	16
Naphthalene	57.1	112	65
2-Methylnaphthalene	7.65	9.41	21
Benzo(b,j,k)fluoranthenes	9.42	50.7	137

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIV. System Performance

Raw data were not reviewed for Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed not reportable as follows:

Sample	Compound	Finding	Flag	A or P
SMA1-ST-0-10-Comp-180917	Naphthalene Phenanthrene Fluoranthene Pyrene	Results exceeded calibration range.	Not reportable	-
SMA1-ST-0-10-Comp-180917RE	All compounds except Naphthalene Phenanthrene Fluoranthene Pyrene	Results from undiluted analyses were more usable.	Not reportable	-

Due to LCS/LCSD %R and RPD and SRM %R, data were qualified as estimated in nine samples.

Due to laboratory blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Port Gamble, Sediments
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 18I0285

Sample	Compound	Flag	A or P	Reason
PGLTM-RB-180919	Naphthalene 2-Methylnaphthalene Acenaphthylene 1-Methylnaphthalene Acenaphthene	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)
PGLTM-RB-180919	Dibenzo(a,h)anthracene	J (all detects) UJ (all non-detects)	P	Laboratory control samples (RPD)
SMA1A-IT-0-10-Comp-180917 SMA2A-IT-0-10-Comp-180919 SMA2A-ST-0-10-Comp-180918 SMA2B-IT-0-10-Comp-180918 SMA2B-ST-0-10-Comp-180918 SMA102B-ST-0-10-Comp-180918	Acenaphthylene Acenaphthene Fluorene Anthracene Pyrene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Standard reference materials (%R)
SMA1-ST-0-10-Comp-180917	Acenaphthylene Acenaphthene Fluorene Anthracene	J (all detects) J (all detects) J (all detects) J (all detects)	P	Standard reference materials (%R)
SMA1-ST-0-10-Comp-180917RE	Pyrene	J (all detects)	P	Standard reference materials (%R)
SMA1-ST-0-10-Comp-180917	Naphthalene Phenanthrene Fluoranthene Pyrene	Not reportable	-	Overall assessment of data
SMA1-ST-0-10-Comp-180917RE	All compounds except Naphthalene Phenanthrene Fluoranthene Pyrene	Not reportable	-	Overall assessment of data

Port Gamble, Sediments
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 18I0285

Sample	Compound	Modified Final Concentration	A or P
PGLTM-RB-180919	Naphthalene	0.10U ug/L	A

LDC #: 43388A2a

SDG #: 18I0285

Laboratory: Analytical Resources, Inc.

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 10/31/18

Page: 1 of 1

Reviewer:

2nd Reviewer:

METHOD: GC/MS ~~Semivolatiles~~ PAH (EPA SW 846 Method 8270D) - SIM

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	% RSD ≤ 20, r² ; ICV ≤ 30
IV.	Continuing calibration	A	CCV ≤ 20
V.	Laboratory Blanks	SW	
VI.	Field blanks SW	~~RB~~	RB = 9
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples / SRM	SW / SW	LCS ID SRM
X.	Field duplicates	SW	D = 1, 8
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	SW	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	SW	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	SMA1A-IT-0-10-Comp-180917	18I0285-01	Sediment	09/17/18
2	SMA1-ST-0-10-Comp-180917	18I0285-02	Sediment	09/17/18
3	SMA1-ST-0-10-Comp-180917RE	18I0285-02RE	Sediment	09/17/18
4	SMA2A-IT-0-10-Comp-180919	18I0285-03	Sediment	09/19/18
5	SMA2A-ST-0-10-Comp-180918	18I0285-04	Sediment	09/18/18
6	SMA2B-IT-0-10-Comp-180918	18I0285-05	Sediment	09/18/18
7	SMA2B-ST-0-10-Comp-180918	18I0285-06	Sediment	09/18/18
8	SMA102B-ST-0-10-Comp-180918	18I0285-37	Sediment	09/18/18
9 2	PGLTM-RB-180919	18I0285-38	Water	09/19/18
10	SMA2A-IT-0-10-Comp-180919MS	18I0285-03MS	Sediment	09/19/18
11	SMA2A-IT-0-10-Comp-180919MSD	18I0285-03MSD	Sediment	09/19/18
12	BG I0708			
13	BG I0619			

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	AA. 2-Chloronaphthalene	AAA. Butylbenzylphthalate	AAAA. Dibenzothiophene	A1. N-Nitrosodiethylamine
B. Bis (2-chloroethyl) ether	BB. 2-Nitroaniline	BBB. 3,3'-Dichlorobenzidine	BBBB. Benzo(a)fluoranthene	B1. N-Nitrosodi-n-butylamine
C. 2-Chlorophenol	CC. Dimethylphthalate	CCC. Benzo(a)anthracene	CCCC. Benzo(b)fluorene	C1. N-Nitrosomethylethylamine
D. 1,3-Dichlorobenzene	DD. Acenaphthylene	DDD. Chrysene	DDDD. cis/trans-Decalin	D1. N-Nitrosomorpholine
E. 1,4-Dichlorobenzene	EE. 2,6-Dinitrotoluene	EEE. Bis(2-ethylhexyl)phthalate	EEEE. Biphenyl	E1. N-Nitrosopyrrolidine
F. 1,2-Dichlorobenzene	FF. 3-Nitroaniline	FFF. Di-n-octylphthalate	FFFF. Retene	F1. Phenacetin
G. 2-Methylphenol	GG. Acenaphthene	GGG. Benzo(b)fluoranthene	GGGG. C30-Hopane	G1. 2-Acetylaminofluorene
H. 2,2'-Oxybis(1-chloropropane)	HH. 2,4-Dinitrophenol	HHH. Benzo(k)fluoranthene	HHHH. 1-Methylphenanthrene	H1. Pronamide
I. 4-Methylphenol	II. 4-Nitrophenol	III. Benzo(a)pyrene	IIII. 1,4-Dioxane	I1. Methyl methanesulfonate
J. N-Nitroso-di-n-propylamine	JJ. Dibenzofuran	JJJ. Indeno(1,2,3-cd)pyrene	JJJJ. Acetophenone	J1. Ethyl methanesulfonate
K. Hexachloroethane	KK. 2,4-Dinitrotoluene	KKK. Dibenz(a,h)anthracene	KKKK. Atrazine	K1. o,o',o''-Triethylphosphorothioate
L. Nitrobenzene	LL. Diethylphthalate	LLL. Benzo(g,h,i)perylene	LLLL. Benzaldehyde	L1. n-Phenylene diamine
M. Isophorone	MM. 4-Chlorophenyl-phenyl ether	MMM. Bis(2-Chloroisopropyl)ether	MMMM. Caprolactam	M1. 1,4-Naphthoquinone
N. 2-Nitrophenol	NN. Fluorene	NNN. Aniline	NNNN. 2,6-Dichlorophenol	N1. N-Nitro-o-toluidine
O. 2,4-Dimethylphenol	OO. 4-Nitroaniline	OOO. N-Nitrosodimethylamine	OOOO. 1,2-Diphenylhydrazine	O1. 1,3,5-Trinitrobenzene
P. Bis(2-chloroethoxy)methane	PP. 4,6-Dinitro-2-methylphenol	PPP. Benzoic Acid	PPPP. 3-Methylphenol	P1. Pentachlorobenzene
Q. 2,4-Dichlorophenol	QQ. N-Nitrosodiphenylamine	QQQ. Benzyl alcohol	QQQQ. 3&4-Methylphenol	Q1. 4-Aminobiphenyl
R. 1,2,4-Trichlorobenzene	RR. 4-Bromophenyl-phenylether	RRR. Pyridine	RRRR. 4-Dimethyldibenzothiophene (4MDT)	R1. 2-Naphthylamine
S. Naphthalene	SS. Hexachlorobenzene	SSS. Benzidine	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	S1. Triphenylene
T. 4-Chloroaniline	TT. Pentachlorophenol	TTT. 1-Methylnaphthalene	TTTT. 1-Methyldibenzothiophene (1MDT)	T1. Octachlorostyrene
U. Hexachlorobutadiene	UU. Phenanthrene	UUU.Benzo(b)thiophene	UUUU.. 2,3,4,6-Tetrachlorophenol	U1. Famphur
V. 4-Chloro-3-methylphenol	VV. Anthracene	VVV.Benzonaphthothiophene	VVVV. 1,2,4,5-Tetrachlorobenzene	V1. 1,4-phenylenediamine
W. 2-Methylnaphthalene	WW. Carbazole	WWW.Benzo(e)pyrene	WWWW.. 2-Picoline	W1. Methapyrilene
X. Hexachlorocyclopentadiene	XX. Di-n-butylphthalate	XXX. 2,6-Dimethylnaphthalene	XXXX. 3-Methylcholanthrene	X1. Pentachloroethane
Y. 2,4,6-Trichlorophenol	YY. Fluoranthene	YYY. 2,3,5-Trimethylnaphthalene	YYYY. a,a-Dimethylphenethylamine	Y1. 3,3'-Dimethylbenzidine
Z. 2,4,5-Trichlorophenol	ZZ. Pyrene	ZZZ. Perylene	ZZZZ. Hexachloropropene	Z1. o-Toluidine

LDC #: 43388A2a

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/24/18 **Blank analysis date:** 9/27/18
Conc. units: ug/L Associated Samples: all water

Compound	Blank ID								
	BGI0618-BLK1		9						
$	0.07		0.09/0.104						

Blank extraction date:_____ **Blank analysis date:**_____
Conc. units:_____ Associated Samples:_____

Compound	Blank ID								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 43388A2a

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: FT
2nd reviewer: [illegible]

METHOD: GC/MS PAH (EPA SW 846 Method 8270D)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Sample: RB = 9 Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units (ug/L)
S	0.09

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ( )

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ( )

LDC #: 43388 A2a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 7
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	BGI0618 – BS1/BSD1	S	59.8 (60-140)	55.6 (60-140)	( )	all water	J/UJ/P ND+Det
		W	59.1 ( )	56.0 ( )	( )		
		DD	50.5 ( )	47.8 ( )	( )		
		TTT	( )	56.7 ( )	( )		
		GG	( )	59.4 ( )	( )		
		KKK	( )	( )	32.7 (30)		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 43388 A2a

VALIDATION FINDINGS WORKSHEET
SRM

Reviewer: FT
2nd Reviewer: a

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the SRM percent recoveries (%R) limits?

#	SRM ID	Compound	SRM%R (Limits)	Associated Samples	Qualifications
	BGI0708-SRM1	DD	22.6 (42-158)	all sediments	J/UJ/P all Rt
		GG	48.7 (68-132)		
		NN	57.4 (58-142)		
		VV	12.4 (34-166)		
		ZZ	71.1 (72-128)		

LDC #: 43388 A2a

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and CRQLs

Page: 1 of 1
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS SVOA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?

Y N N/A Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?

#	Sample ID	Compound	Finding	Qualifications
	2	S, UU, YY, ZZ	x'd cal Range	Jdet /Δ

Comments: See sample calculation verification worksheet for recalculations

LDC #: 433WAda

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

#	Sample ID	Compound	Finding	Qualifications
	2	S, UU, YY, ZZ	x'd cal Range	NR
	3	all except above	diluted	NR

Comments: _____

LDC#: 43388A2a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: FT
2nd Reviewer: [illegible]

Method 8270D SIM

Compound	Concentration unit ug/Kg		RPD
	7	8	
Anthracene	10.6	15.6	38
Pyrene	31.5	46.1	38
Benzo(g,h,i)perylene	6.17	15.1	84
Indeno(1,2,3-c,d)pyrene	4.93U	10.8	NC
Benzo(j)fluoranthene	2.41	10.1	123
Benzo(b)fluoranthene	4.44	26	142
Fluoranthene	34.9	43.4	22
Benzo(k)fluoranthene	2.51	14.8	142
Acenaphthylene	10.8	20.2	61
Chrysene	10.4	19.1	59
Benzo(a)pyrene	4.14	24.6	142
Dibenzo(a,h)anthracene	4.93U	3.41	NC
Benzo(a)anthracene	5.2	11.1	72
Acenaphthene	7.41	11	39
Phenanthrene	31.7	46	37
Fluorene	5.97	8.53	35
1-Methylnaphthalene	4.8	5.64	16
Naphthalene	57.1	112	65
2-Methylnaphthalene	7.65	9.41	21
Benzo(b,j,k)fluoranthenes	9.42	50.7	137

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Port Gamble, Sediments

LDC Report Date: October 29, 2018

Parameters: Cadmium-111

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): 18I0285

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
SMA1A-IT-0-10-Comp-180917	18I0285-01	Sediment	09/17/18
SMA1-ST-0-10-Comp-180917	18I0285-02	Sediment	09/17/18
SMA2A-IT-0-10-Comp-180919	18I0285-03	Sediment	09/19/18
SMA2A-ST-0-10-Comp-180918	18I0285-04	Sediment	09/18/18
SMA2B-IT-0-10-Comp-180918	18I0285-05	Sediment	09/18/18
SMA2B-ST-0-10-Comp-180918	18I0285-06	Sediment	09/18/18
SMA102B-ST-0-10-Comp-180918	18I0285-37	Sediment	09/18/18
PGLTM-RB-180919	18I0285-38	Water	09/19/18
SMA1A-IT-0-10-Comp-180917MS	18I0285-01MS	Sediment	09/17/18
SMA1A-IT-0-10-Comp-180917DUP	18I0285-01DUP	Sediment	09/17/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Operations, Maintenance, and Monitoring Plan for Port Gamble Bay Cleanup Project (January 2018) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Cadmium-111 by Environmental Protection Agency (EPA) SW 846 Method 6020A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample PGLTM-RB-180919 was identified as a rinsate blank. No contaminants were found.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

Standard reference material (SRM) samples were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

Samples SMA2B-ST-0-10-Comp-180918 and SMA102B-ST-0-10-Comp-180918 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD (Limits)
	SMA2B-ST-0-10-Comp-180918	SMA102B-ST-0-10-Comp-180918	
Cadmium	0.09	0.07	25 (≤50)

XII. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

XIII. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

Port Gamble, Sediments
Cadmium-111 - Data Qualification Summary - SDG 18I0285

No Sample Data Qualified in this SDG

Port Gamble, Sediments
Cadmium-111 - Laboratory Blank Data Qualification Summary - SDG 18I0285

No Sample Data Qualified in this SDG

LDC #: 43388A4a
SDG #: 18I0285
Laboratory: Analytical Resources, Inc.

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 10/26/18
Page: 1 of 1
Reviewer: ATL
2nd Reviewer:

METHOD: Cadmium-111 (EPA SW 846 Method 6020A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	A	
VI.	Field Blanks	ND	RB=8
VII.	Matrix Spike/Matrix Spike Duplicates	A	9
VIII.	Duplicate sample analysis	A	10
IX.	Serial Dilution	N	
X.	Laboratory control samples	A	LCS/SRM
XI.	Field Duplicates	SW	(6,7)
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	SMA1A-IT-0-10-Comp-180917	18I0285-01	Sediment	09/17/18
2	SMA1-ST-0-10-Comp-180917	18I0285-02	Sediment	09/17/18
3	SMA2A-IT-0-10-Comp-180919	18I0285-03	Sediment	09/19/18
4	SMA2A-ST-0-10-Comp-180918	18I0285-04	Sediment	09/18/18
5	SMA2B-IT-0-10-Comp-180918	18I0285-05	Sediment	09/18/18
6	SMA2B-ST-0-10-Comp-180918	18I0285-06	Sediment	09/18/18
7	SMA102B-ST-0-10-Comp-180918	18I0285-37	Sediment	09/18/18
8	PGLTM-RB-180919	18I0285-38	Water	09/19/18
9	SMA1A-IT-0-10-Comp-180917MS	18I0285-01MS	Sediment	09/17/18
10	SMA1A-IT-0-10-Comp-180917DUP	18I0285-01DUP	Sediment	09/17/18
11				
12				

Notes:

LDC#: 43388A4a

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: ATL

2nd Reviewer:

METHOD: Metals (EPA Method 6010B/6020/7000/200.8)

Analyte	Concentration (mg/kg)		RPD (≤50)	
	6	7		
Cadmium	0.09	0.07	25	

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2018\43388A4a.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Port Gamble, Sediments

LDC Report Date: October 29, 2018

Parameters: Total Solids

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): 18I0285

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
SMA1A-IT-0-10-Comp-180917	18I0285-01	Sediment	09/17/18
SMA1-ST-0-10-Comp-180917	18I0285-02	Sediment	09/17/18
SMA2A-IT-0-10-Comp-180919	18I0285-03	Sediment	09/19/18
SMA2A-ST-0-10-Comp-180918	18I0285-04	Sediment	09/18/18
SMA2B-IT-0-10-Comp-180918	18I0285-05	Sediment	09/18/18
SMA2B-ST-0-10-Comp-180918	18I0285-06	Sediment	09/18/18
SMA102B-ST-0-10-Comp-180918	18I0285-37	Sediment	09/18/18
SMA1A-IT-0-10-Comp-180917DUP	18I0285-01DUP	Sediment	09/17/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Operations, Maintenance, and Monitoring Plan for Port Gamble Bay Cleanup Project (January 2018) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Solids by Standard Method 2540G

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were not required by the method.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were not required by the method.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples are not required by the method.

IX. Field Duplicates

Samples SMA2B-ST-0-10-Comp-180918 and SMA102B-ST-0-10-Comp-180918 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (%)		RPD (Limits)
	SMA2B-ST-0-10-Comp-180918	SMA102B-ST-0-10-Comp-180918	
Total solids	78.01	81.95	5 (≤50)

X. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

Port Gamble, Sediments
Total Solids - Data Qualification Summary - SDG 18I0285

No Sample Data Qualified in this SDG

Port Gamble, Sediments
Total Solids - Laboratory Blank Data Qualification Summary - SDG 18I0285

No Sample Data Qualified in this SDG

LDC #: 43388A6
SDG #: 18I0285
Laboratory: Analytical Resources, Inc.

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 10/26/18
Page: 1 of 1
Reviewer: ATL
2nd Reviewer: [illegible]

METHOD: (Analyte) Total Solids (SM2540G)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A, A	
II	Initial calibration	N	not required
III.	Calibration verification	N	↓
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	not required
VII.	Duplicate sample analysis	A	8
VIII.	Laboratory control samples	N	not required
IX.	Field duplicates	SW	(6,7)
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	SMA1A-IT-0-10-Comp-180917	18I0285-01	Sediment	09/17/18
2	SMA1-ST-0-10-Comp-180917	18I0285-02	Sediment	09/17/18
3	SMA2A-IT-0-10-Comp-180919	18I0285-03	Sediment	09/19/18
4	SMA2A-ST-0-10-Comp-180918	18I0285-04	Sediment	09/18/18
5	SMA2B-IT-0-10-Comp-180918	18I0285-05	Sediment	09/18/18
6	SMA2B-ST-0-10-Comp-180918	18I0285-06	Sediment	09/18/18
7	SMA102B-ST-0-10-Comp-180918	18I0285-37	Sediment	09/18/18
8	SMA1A-IT-0-10-Comp-180917DUP	18I0285-01DUP	Sediment	09/17/18
9				
10				
11				
12				
13				
14				

Notes:

LDC# 43388A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: ATL
2nd Reviewer:

Inorganics: Method See Cover

Analyte	Concentration (%)		RPD (≤50)	
	6	7		
Total Solids	78.01	81.95	5	

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2018\43388A6.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Port Gamble, Sediments

LDC Report Date: November 30, 2018

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 4

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): 18I0285

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
SMA1A-IT-0-10-Comp-180917	18I0285-01	Sediment	09/17/18
SMA1-ST-0-10-Comp-180917	18I0285-02	Sediment	09/17/18
SMA2A-IT-0-10-Comp-180919	18I0285-03	Sediment	09/19/18
SMA2A-ST-0-10-Comp-180918	18I0285-04	Sediment	09/18/18
SMA2B-IT-0-10-Comp-180918	18I0285-05	Sediment	09/18/18
SMA2B-ST-0-10-Comp-180918	18I0285-06	Sediment	09/18/18
SMA102B-ST-0-10-Comp-180918	18I0285-37	Sediment	09/18/18
PGLTM-RB-180919	18I0285-38	Water	09/19/18
SMA1A-IT-0-10-Comp-180917DUP	18I0285-01DUP	Sediment	09/17/18
PGLTM-RB-180919DUP	18I0285-38DUP	Water	09/19/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Operations, Maintenance, and Monitoring Plan for Port Gamble Bay Cleanup Project (January 2018) and a modified outline of the USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (April 2016). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) Method 1613B

All sample results were subjected to Stage 4 data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each unlabeled compound and labeled compound.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds with the following exceptions:

Date	Standard	Compound	%D	Associated Samples	Flag	A or P
08/20/18	ICV	2,3,7,8-TCDD	20.1	SMA1-ST-0-10-Comp-180917 SMA2A-IT-0-10-Comp-180919 SMA2A-ST-0-10-Comp-180918 SMA2B-IT-0-10-Comp-180918 SMA2B-ST-0-10-Comp-180918 SMA102B-ST-0-10-Comp-180918	J (all detects)	P
08/20/18	ICV	2,3,7,8-TCDD	20.1	SMA1A-IT-0-10-Comp-180917 PGLTM-RB-180919	NA	-

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for unlabeled compounds and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each unlabeled compound and labeled compound.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Associated Samples
BGI0793-BLK1	10/02/18	1,2,3,7,8-PeCDF 1,2,3,4,6,7,8-HpCDF OCDD Total PeCDF Total HpCDF	0.0508 ng/Kg 0.0406 ng/Kg 0.188 ng/Kg 0.0508 ng/Kg 0.0406 ng/Kg	All sediment samples in SDG 18I0285
BGI0677-BLK2	09/26/18	OCDD	2.28 pg/L	All water samples in SDG 18I0285

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
SMA1A-IT-0-10-Comp-180917	1,2,3,7,8-PeCDF	0.086 ng/Kg	0.086U ng/Kg
SMA2A-ST-0-10-Comp-180918	1,2,3,7,8-PeCDF	0.172 ng/Kg	0.172U ng/Kg
SMA2B-ST-0-10-Comp-180918	1,2,3,7,8-PeCDF	0.106 ng/Kg	0.106U ng/Kg
SMA102B-ST-0-10-Comp-180918	1,2,3,7,8-PeCDF	0.098 ng/Kg	0.098U ng/Kg
PGLTM-RB-180919	OCDD	1.60 pg/L	1.60U pg/L

VI. Field Blanks

Sample PGLTM-RB-180919 was identified as a rinsate blank. No contaminants were found with the following exceptions:

Blank ID	Compound	Concentration (pg/L)
PGLTM-RB-180919	OCDD	1.60

VII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
SMA1A-IT-0-10-Comp-180917DUP (SMA1A-IT-0-10-Comp-180917)	OCDD Total HxCDD Total HpCDD	99.8 (≤35) 78.2 (≤35) 106 (≤35)	J (all detects) J (all detects) J (all detects)	A

VIII. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

SRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
BGI0793-SRM1	2,3,4,6,7,8-HxCDF	46 (50-150)	All sediment samples in SDG 18I0285	J (all detects) UJ (all non-detects)	P
BGI0793-SRM1	1,2,3,7,8,9-HxCDF	161 (50-150)	SMA1-ST-0-10-Comp-180917 SMA2A-IT-0-10-Comp-180919 SMA2A-ST-0-10-Comp-180918 SMA2B-IT-0-10-Comp-180918 SMA2B-ST-0-10-Comp-180918 SMA102B-ST-0-10-Comp-180918	J (all detects)	P
BGI0793-SRM1	1,2,3,7,8,9-HxCDF	161 (50-150)	SMA1A-IT-0-10-Comp-180917	NA	-

IX. Field Duplicates

Samples SMA2B-ST-0-10-Comp-180918 and SMA102B-ST-0-10-Comp-180918 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/Kg)		RPD
	SMA2B-ST-0-10-Comp-180918	SMA102B-ST-0-10-Comp-180918	
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.131	0.184	34
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	0.152	0.112	30
Total Tetrachlorodibenzofuran (TCDF)	3.03	3.25	7
Total Pentachlorodibenzofuran (PeCDF)	0.805	0.866	7
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	49.1	75.1	42
Total Hexachlorodibenzo-p-dioxin (HxCDD)	4.09	4.52	10
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	5.47	6.65	19
Total Pentachlorodibenzo-p-dioxin (PeCDD)	1.23	1.68	31
Total Heptachlorodibenzo-p-dioxin (HpCDD)	25.7	36	33
Total Heptachlorodibenzofuran (HpCDF)	1.88	1.97	5
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.56	1.88	19
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.059	0.053U	Not calculable
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.142	0.077	59
Total Tetrachlorodibenzo-p-dioxin (TCDD)	2.2	6.52	99
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	0.204	0.193	6
Total Hexachlorodibenzofuran (HxCDF)	0.854	0.839	2
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.042U	0.055	Not calculable
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.106	0.098	8
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.031U	0.04	Not calculable
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.294	0.255	14
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.031U	0.054	Not calculable
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	0.721	0.697	3

Compound	Concentration (ng/Kg)		RPD
	SMA2B-ST-0-10-Comp-180918	SMA102B-ST-0-10-Comp-180918	
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	0.057	0.058	2

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target compounds were within QC limits.

XI. Compound Quantitation

All compound quantitations were within validation criteria with the following exceptions:

Sample	Compound	Flag	A or P
All sediment samples in SDG 18I0285	All compounds reported as estimated maximum possible concentration (EMPC).	J (all detects)	A
SMA1-ST-0-10-Comp-180917	All compounds flagged "X" due to chlorinated diphenyl either interference	J (all detects)	A

XII. Target Compound Identifications

All target compound identifications met validation criteria.

XIII. System Performance

The system performance was acceptable.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to ICV %D, DUP RPD, SRM %R, results reported by the laboratory as EMPCs, and matrix interference, data were qualified as estimated in eight samples.

Due to laboratory blank contamination, data were qualified as not detected in five samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Port Gamble, Sediments
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 18I0285

Sample	Compound	Flag	A or P	Reason
SMA1-ST-0-10-Comp-180917 SMA2A-IT-0-10-Comp-180919 SMA2A-ST-0-10-Comp-180918 SMA2B-IT-0-10-Comp-180918 SMA2B-ST-0-10-Comp-180918 SMA102B-ST-0-10-Comp-180918	2,3,7,8-TCDD	J (all detects)	P	Initial calibration verification (%D)
SMA1A-IT-0-10-Comp-180917	OCDD Total HxCDD Total HpCDD	J (all detects) J (all detects) J (all detects)	A	Duplicate sample analysis (RPD)
SMA1A-IT-0-10-Comp-180917 SMA1-ST-0-10-Comp-180917 SMA2A-IT-0-10-Comp-180919 SMA2A-ST-0-10-Comp-180918 SMA2B-IT-0-10-Comp-180918 SMA2B-ST-0-10-Comp-180918 SMA102B-ST-0-10-Comp-180918	2,3,4,6,7,8-HxCDF	J (all detects) UJ (all non-detects)	P	Standard reference materials (%R)
SMA1-ST-0-10-Comp-180917 SMA2A-IT-0-10-Comp-180919 SMA2A-ST-0-10-Comp-180918 SMA2B-IT-0-10-Comp-180918 SMA2B-ST-0-10-Comp-180918 SMA102B-ST-0-10-Comp-180918	1,2,3,7,8,9-HxCDF	J (all detects)	P	Standard reference materials (%R)
SMA1A-IT-0-10-Comp-180917 SMA1-ST-0-10-Comp-180917 SMA2A-IT-0-10-Comp-180919 SMA2A-ST-0-10-Comp-180918 SMA2B-IT-0-10-Comp-180918 SMA2B-ST-0-10-Comp-180918 SMA102B-ST-0-10-Comp-180918	All compounds reported as estimated maximum possible concentration (EMPC).	J (all detects)	A	Compound quantitation (EMPC)
SMA1-ST-0-10-Comp-180917	All compounds flagged "X" due to chlorinated diphenyl either interference	J (all detects)	A	Compound quantitation (matrix interference)

Port Gamble, Sediments
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 18I0285

Sample	Compound	Modified Final Concentration	A or P
SMA1A-IT-0-10-Comp-180917	1,2,3,7,8-PeCDF	0.086U ng/Kg	A
SMA2A-ST-0-10-Comp-180918	1,2,3,7,8-PeCDF	0.172U ng/Kg	A

Sample	Compound	Modified Final Concentration	A or P
SMA2B-ST-0-10-Comp-180918	1,2,3,7,8-PeCDF	0.106U ng/Kg	A
SMA102B-ST-0-10-Comp-180918	1,2,3,7,8-PeCDF	0.098U ng/Kg	A
PGLTM-RB-180919	OCDD	1.60U pg/L	A

LDC #: 43388A21 **VALIDATION COMPLETENESS WORKSHEET** Date: 10/31/18
SDG #: 18I0285 Stage 4 Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer:
2nd Reviewer:

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A/SW	% RSD ≤ 20 icv ≤ 20/30
IV.	Continuing calibration	A	ccv = QC limits
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	RB = ~~10~~ 8
VII.	Matrix spike/Matrix spike duplicates /DUP	N/SW	CS
VIII.	Laboratory control samples /SRM	A/SW	LCS / SRM
IX.	Field duplicates	SW	D = 6, 7
X.	Labeled Compounds	A	
XI.	Compound quantitation RL/LOQ/LODs	A	
XII.	Target compound identification	A	
XIII.	System performance	A	
XIV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1 2	SMA1A-IT-0-10-Comp-180917	18I0285-01	Sediment	09/17/18
2 2	SMA1-ST-0-10-Comp-180917	18I0285-02	Sediment	09/17/18
3 2	SMA2A-IT-0-10-Comp-180919	18I0285-03	Sediment	09/19/18
4 2	SMA2A-ST-0-10-Comp-180918	18I0285-04	Sediment	09/18/18
5 2	SMA2B-IT-0-10-Comp-180918	18I0285-05	Sediment	09/18/18
6 2	SMA2B-ST-0-10-Comp-180918	18I0285-06	Sediment	09/18/18
7 2	SMA102B-ST-0-10-Comp-180918	18I0285-37	Sediment	09/18/18
8 1	PGLTM-RB-180919	18I0285-38	Water	09/19/18
9 2	SMA1A-IT-0-10-Comp-180917DUP	18I0285-01DUP	Sediment	09/17/18
10 1	PGLTM-RB-180919DUP	18I0285-38DUP	Water	09/19/18
11				
12 1	BGI0677-BLK2			
13 2	BGI0793-BLK1			
14				

LDC #: 43348A21

VALIDATION FINDINGS CHECKLIST

Reviewer:
2nd Reviewer:

Method: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Was PFK exact mass 380.9760 verified?	✓			
Were the retention time windows established for all homologues?	✓			
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers ≤ 25% ?	✓			
Is the static resolving power at least 10,000 (10% valley definition)?	✓			
Was the mass resolution adequately check with PFK?	✓			
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?	✓			
IIIa. Initial calibration				
Was the initial calibration performed at 5 concentration levels?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% for unlabeled compounds and for labeled compounds ?	✓			
Did all calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound ≥ 2.5 and for each recovery and internal standard ≥ 10?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20% for unlabeled and 30% for labeled compounds?		✓		
IV. Continuing calibration				
Was a contiuning calibration performed at the beginning and end of each 12 hour period?	✓			
Were all compound's concentrations within QC limits?	✓			
Did all routine calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound and for each recovery and internal standard > 10?	✓			
V. Laboratory Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank performed for each matrix and whenever a sample extraction was performed?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation findings worksheet?	✓			
VI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.	✓			

LDC #: 43348A21

VALIDATION FINDINGS CHECKLIST

Reviewer: B
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VIII. Laboratory control samples				
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓	N		
Target compounds were detected in the field duplicates.	✓		N	
X. Internal standards				
Were internal standard recoveries within QC criteria?	✓			
Was the minimum S/N ratio of all internal standard peaks ≥ 10?	✓			
XI. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. Target compound identification				
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?	✓			
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?	✓			
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	✓			
Did compound spectra contain all characteristic ions listed in the table attached?	✓			
Was the Ion Abundance Ratio for the two quantitation ions within criteria?	✓			
Was the signal to noise ratio for each target compound and labeled standard ≥ 2.5?	✓			
Does the maximum intensity of each specified characteristic ion coincide within ± 2 seconds (includes labeled standards)?	✓			
For PCDF identification, was any signal (S/N ≥ 2.5, at ± seconds RT) detected in the corresponding PCDPE channel?	✓			
Was an acceptable lock mass recorded and monitored?	✓			
XIII. System performance				
System performance was found to be acceptable.	✓			
XIV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:

LDC #: 43388A21

VALIDATION FINDINGS WORKSHEET
Initial Calibration verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y (N) N/A Were all percent differences (%D) of RRFs ≤ 20% for unlabeled compounds and ≤ 30% for labeled?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20/30.0%)	Finding Ion Abundance Ratio	Associated Samples	Qualifications
	8/20/18 2138	ICV	A	20.1 (≤20)		All	Jdet / P ND+Det
							1,8 = ND

	PCDDs	Selected ions (m/z)	Ion Abundance Ratio		PCDFs	Selected ions (m/z)	Ion Abundance Ratio
	Tetra-	M/M+2	0.65-0.89		Tetra-	M/M+2	0.65-0.89
	Penta-	M+2/M+4	1.32-1.78		Penta-	M+2/M+4	1.32-1.78
	Hexa-	M+2/M+4	1.05-1.43		Hexa-	M+2/M+4	1.05-1.43
	Hexa-^{13}C-HxCDF (IS) only	M/M+2	0.43-0.59		Hexa-^{13}C-HxCDF (IS) only	M/M+2	0.43-0.59
	Hepta-^{13}C-HpCDF (IS) only	M/M+2	0.37-0.51		Hepta-^{13}C-HpCDF (IS) only	M/M+2	0.37-0.51
	Hepta-	M+2/M+4	0.88-1.20		Hepta-	M+2/M+4	0.88-1.20
	Octa-	M+2/M+4	0.76-1.02		Octa-	M+2/M+4	0.76-1.02

LDC #: 43358A21

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 7
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 10/2/18 **Blank analysis date:** 10/05/18 **Associated samples:** All soils
Conc. units: ng/kg

Compound	Blank ID	5X	Sample Identification							
	BGI079	3-BLK1	1	4	6	7				
I	0.0508	0.254	0.086U	0.172U	0.106U	0.098U				
O	0.0406	0.203	-							
G	~~0.015~~ 0.188	0.94	-							
W	0.0508	0.254	-							
Y	0.0406	0.203								

Blank extraction date: 9/26/18 **Blank analysis date:** 9/27/18
Conc. units: pg/L Associated Samples: all water

Compound	Blank ID	5X	Sample Identification							
	BGI067	7-BLK2	8							
G	2.28	11.4	1.60U							

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 43358A21

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: FT
2nd reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Sample: RB =1~~0~~8 Field Blank / Rinsate Blank/ Equipment Blank / Rinsate (circle one)

Compound	Concentration Units (pg/L)
G	1.60

Sample: _____ Field Blank / Rinsate Blank/ Equipment Blank / Rinsate (circle one)

Compound	Concentration Units (pg/L)

LDC #: 43388A21

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: 1613B

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?
Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 35 ?

#	Duplicate ID	Matrix	Compound	RPD (Limits)	Associated Samples	Qualifications
	1+9	Sediment	G	99.8 (≤ 35)	1	Jdet / A Det
			T	78.2 (↓)	↓	↓ ↓
			U	106 (↓)	↓	↓ ↓

Comments:

DUP_r1.wpd

LDC #: Y3388A21

VALIDATION FINDINGS WORKSHEET
SRM

Reviewer: FT
2nd Reviewer: Q

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a SRM analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y (N) N/A Were theSRM percent recoveries (%R) within the QC limits?

#	Date	SRM ID/Reference	Compound	SRM %R (Limits)		Associated Samples	Qualifications	
		BGI0793-SRM1	M	46	(50-150)	All sediment	J/UJ/P	All Det
			N	161	(50-150)	↓	J det/P	2,3,4,5,6,7 (Det)
					( )			
					( )			
					( )			
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LDC#: 43388A21

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: FT
2nd Reviewer: ✓

Method 1613B

Compound	Concentration unit ng/Kg		RPD
	6	7	
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.131	0.184	34
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	0.152	0.112	30
Total Tetrachlorodibenzofuran (TCDF)	3.03	3.25	7
Total Pentachlorodibenzofuran (PeCDF)	0.805	0.866	7
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	49.1	75.1	42
Total Hexachlorodibenzo-p-dioxin (HxCDD)	4.09	4.52	10
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	5.47	6.65	19
Total Pentachlorodibenzo-p-dioxin (PeCDD)	1.23	1.68	31
Total Heptachlorodibenzo-p-dioxin (HpCDD)	25.7	36	33
Total Heptachlorodibenzofuran (HpCDF)	1.88	1.97	5
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.56	1.88	19
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.059	0.053U	NC
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.142	0.077	59
Total Tetrachlorodibenzo-p-dioxin (TCDD)	2.2	6.52	99
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	0.204	0.193	6
Total Hexachlorodibenzofuran (HxCDF)	0.854	0.839	2
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.042U	0.055	NC
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.106	0.098	8
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.031U	0.04	NC
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.294	0.255	14
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.031U	0.054	NC
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	0.721	0.697	3
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	0.057	0.058	2

LDC #: 43388A21

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer:
2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		All sediments	all compounds reported as estimated maximum possible concentration (EMPC)		Jdet/A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 43388A2a

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		2	Indicate possible CDPE interference		Jdet/A
			(compounds qualified X)		

Comments: See sample calculation verification worksheet for recalculations

LDC #: 43388A21

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer:
2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported RRF (CS3 std)	Recalculated RRF (CS3 std)	Reported %RSD	Recalculated %RSD
1	ICAL	8/20/18	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.833718	0.833718	0.82347	0.82347	8.6	8.6
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	0.981918	0.981918	0.9432766	0.9432766	9.0	9.0
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.9039972	0.9039972	0.9593941	0.9593941	9.1	9.1
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.046496	1.046496	1.07465	1.07465	8.5	8.5
			OCDF (^{13}C-OCDD)	1.144995	1.144995	1.178055	1.178055	10.5	10.5
2			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43388A21

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV 1018	10/5/18	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	10.0	10.1	10.1		
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	10.0	9.98	9.98		
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	50.0	53.3	53.3		
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	50.0	53.2	53.2		
			OCDF (^{13}C-OCDD)	100.0	108	108		
2	CCV 1920	10/5/18	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)		10.3	10.3		
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)		10.4	10.4		
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)		52.7	52.7		
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)		54.6	54.6		
			OCDF (^{13}C-OCDD)		109	109		
3	CCV 2332	9/27/18	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	10.0	10.0	10.0		
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	10.0	10.4	10.4		
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	50.0	51.2	51.2		
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	50.0	53.5	53.5		
			OCDF (^{13}C-OCDD)	100.0	109	109		

Comments: Refer to Routine Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43388A21

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration
SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: BGI0793-BS1

Compound	Spike Added (ng/kg)		Spiked Sample Concentration (ng/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
2,3,7,8-TCDD	20.0	NA	20.4	NA	102	102				
1,2,3,7,8-PeCDD	100		112		112	112				
1,2,3,4,7,8-HxCDD	100		104		104	104				
1,2,3,4,7,8,9-HpCDF	100		102		102	102				
OCDF	200		216		108	108				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43388A21

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT
2nd reviewer: ✓

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
RRF	=	Relative Response Factor (average) from the initial calibration
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.

Example:

Sample I.D. #1, OCDD:

Conc. = $\frac{(1.420\times10^5 + 1.533\times10^5)(200)(20)}{(4.83\times10^5 + 5.441\times10^5)(0.948)(12.63)(0.793)}$

= 116.56

#	Sample ID	Compound	Reported Concentration (ng/kg)	Calculated Concentration (ng/kg)	Qualification
	#1	OCDD	P7 ~~116.56~~ 117	116.56	

LDC #: 43383

EDD POPULATION COMPLETENESS WORKSHEET

Anchor

Date: 11/6/18
Page: 1 of 1
2nd Reviewer: OB

The LDC job number listed above was entered by FM
Entered from Body or Summary

	EDD Process	Y/N	Initial	Comments/Action
I.	EDD Completeness	y	FM	
Ia.	- All methods present?	y	↓	
Ib.	- All samples present/match report?	y	↓	
Ic.	- All reported analytes present?	y	↓	
Id.	10% or 100% verification of EDD?	y	↓	
II.	EDD Preparation/Entry	y	FM	
IIa.	- QC Level applied? (EPAStage2B or EPAStage4)	y	↓	
IIb.	- Laboratory EMPC qualified results qualified (J with reason code 23)?	y	↓	
III.	Reasonableness Checks	y	FM	
IIIa.	- Do all qualified ND results have ND qualifier (e.g. UJ)?	y	↓	
IIIb.	- Do all qualified detect results have detect qualifier (e.g. J)?	y	↓	
IIIc.	- If reason codes are used, do all qualified results have reason code field populated, and vice versa?	y	↓	
IIId.	- Do blank concentrations in report match EDD, where data was qualified due to blank?	y	↓	
IIIe.	- Is the detect flag set to "N" for all "U" qualified blank results?	y	↓	
IIIf.	- Were there multiple results due to dilutions/reanalysis? If so, were results qualified appropriately?	N/A	↓	
IIIg.	-Are all results marked reportable "Yes" unless rejected for overall assessment in the data validation report?	y	↓	
IIIh.	-Are there any lab "R" qualified data? / Are the entry columns blank for these results?	N/A	↓	
IIIi.	-Are there any discrepancies between the data packet and the EDD?	N	↓	

Notes: *see discrepancy sheet

Appendix F
Quality Assurance Project Plan

APPENDIX F
OPERATIONS, MAINTENANCE, AND MONITORING PLAN

TABLE OF CONTENTS

1 INTRODUCTION 1
1.1 Purpose and Scope of the OMMP 1
1.2 Organization of the OMMP 3
2 PROJECT ROLES AND RESPONSIBILITIES 4
2.1 Washington State Department of Ecology 4
2.2 Pope Resources, LP/OPG Properties, LLC 4
3 CAP MONITORING AND POTENTIAL CORRECTIVE ACTIONS 5
3.1 Physical Integrity Performance Monitoring 5
3.1.1 Bathymetric Survey Methods 6
3.1.2 Topographic Survey and Cap Surface Visual Inspection Methods 7
3.1.3 Sediment Coring Methods 7
3.2 Sediment Quality Confirmation Monitoring in Sentinel Cap Locations 8
3.2.1 Sediment Sampling and Analysis Methods 9
3.3 Confirmation Monitoring in Nearshore Wood Debris Cap Locations 9
3.3.1 Sediment Sampling and Analysis Methods 11
3.4 Corrective Actions 11
4 NATURAL RECOVERY SEDIMENT QUALITY EVALUATION AND MONITORING 13
4.1 Baseline Sampling 13
4.2 Natural Recovery Modeling 14
4.2.1 Model Framework 14
4.2.2 Model Input Parameters 17
4.2.2.1 Initial Surface Sediment cPAH Concentrations 17
4.2.2.2 Remediation Effects on Surface Sediment Concentrations 17
4.2.2.3 Net Sedimentation Rate 18
4.2.2.4 cPAH Concentrations in Depositing Sediment 18
4.2.3 Model Results 19
4.3 Sediment Sampling and Analysis Methods 19
4.4 Corrective Actions 20
5 REPORTING 21
6 REFERENCES 22

List of Tables

Table F-1 Baseline Sediment Recovery Grab Sample Results
Table F-2 Natural Recovery Model Input Parameters

List of Figures

Figure F-1 Site Vicinity Map
Figure F-2 Capping and EMNR Areas in SMA-1, SMA-2, and SMA-3
Figure F-3a Sediment Sampling Stations (SMA-1)
Figure F-3b Sediment Sampling (SMA-1) Transect A
Figure F-4a Sediment Sampling Stations (SMA-2)
Figure F-4b Sediment Sampling (SMA-2) Transect B
Figure F-4c Sediment Sampling (SMA-2) Transect C
Figure F-4d Sediment Sampling (SMA-2) Transect D
Figure F-5 Baseline (2010) Surface Sediment cPAH TEQ
Figure F-6 Baseline (2010) Surface Sediment Dioxin/Furan TEQ
Figure F-7 Radioisotope Core Data: Central Port Gamble Bay
Figure F-8 Comparison of Near-Surface Sediment cPAH Concentrations in SMA-5
Figure F-9 Schematic Depicting Bounding Natural Recovery Calculations
Figure F-10 Example Bounding Calculation Model Results
Figure F-11 SMA-specific Model Results Assuming 5 µg/kg on Depositing Sediment
Figure F-12 SMA-specific Model Results Assuming 10 µg/kg on Depositing Sediment
Figure F-13 Modeled Site-wide Surface Sediment cPAH Concentrations
Figure F-14 Surface Sediment Sampling Stations, Port Gamble Bay

List of Attachments

Attachment F-1 Sampling and Analysis Plan
Attachment F-2 Quality Assurance Project Plan

LIST OF ACRONYMS AND ABBREVIATIONS

µg/kg	micrograms per kilogram
CAP	*Cleanup Action Plan*
CD	Consent Decree
cm	centimeter
CoC	chemical of concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CQAP	*Construction Quality Assurance Plan*
DGT	*diffusive gradient thin sheet*
Ecology	Washington State Department of Ecology
EDR	*Engineering Design Report*
EMNR	enhanced monitored natural recovery
H_2S	hydrogen sulfide
mg/L	milligram per liter
MLLW	mean lower low water
MNR	monitored natural recovery
MTCA	Model Toxics Control Act
ng/kg	nanograms per kilogram
OMMP	*Operations, Maintenance, and Monitoring Plan*
PR/OPG	Pope Resources, LP/OPG Properties, LLC
QA	quality assurance
QAPP	*Quality Assurance Project Plan*
QC	quality control
RI/FS	remedial investigation/feasibility study
SAP	*Sampling and Analysis Plan*
SMA	sediment management area
SMS	Sediment Management Standards
SRZ	sediment recovery zone
SWAC	surface weighted average concentration
TEQ	toxicity equivalent quotient
WAC	Washington Administrative Code

1 INTRODUCTION

This *Operations, Maintenance, and Monitoring Plan* (OMMP) describes long-term monitoring and adaptive management of engineered caps in Port Gamble Bay ("Site"; Figure F-1) to ensure their long-term integrity and protectiveness, and also describes long-term monitoring to document recovery over time of sediments throughout the Site. This OMMP builds on the accompanying *Engineering Design Report* (EDR), which describes the approach and criteria for the engineering design of sediment cleanup actions at the Site, as set forth in the *Final Cleanup Action Plan* (CAP; Ecology 2013), and in accordance with the requirements of Consent Decree (CD) 13-2-02720-0 between the Washington State Department of Ecology (Ecology) and Pope Resources, LP/OPG Properties, LLC (PR/OPG), entered in December 2013. The actions described in this OMMP will be performed by PR/OPG under Ecology oversight, consistent with CD requirements.

Implementation of this OMMP will be performed consistent with the requirements of the Model Toxics Control Act (MTCA), Chapter 70.105D in the Revised Code of Washington, as administered by Ecology under the MTCA Cleanup Regulation, Chapter 173-340 of the Washington Administrative Code (WAC). Implementation of this OMMP will also comply with the Sediment Management Standards (SMS) Chapter 173-204 WAC.

1.1 Purpose and Scope of the OMMP

As described in the EDR, engineered caps have been placed over approximately 10 acres of the Site, and clean silt/sand enhanced monitored natural recovery (EMNR) layers have been placed over an additional approximately 68 acres to address thin deposits of relatively low concentration sediment as well as dredging residuals. Capping and EMNR placement was conducted over two construction seasons, beginning in fall 2015 and continuing into January 2017. The extent of remedial actions in sediment management areas (SMAs) at the Site is shown in Figure F-2.

Long-term monitoring of engineered caps installed in SMA-1 and SMA-2 will be performed to ensure their long-term integrity and protectiveness. However, EMNR layers (placed either as the primary remedy or as a post-dredge residuals management technique) do not require long-term monitoring or maintenance, consistent with CAP requirements.

As described in more detail in Section 3, the long-term monitoring of engineered caps will primarily include physical survey methods (e.g., bathymetry) to monitor the integrity, surface elevation, and thickness of the caps, beginning in Year 1 following completion of construction (cap monitoring is currently targeted to begin in 2018, continuing in Year 3 (2020), and then approximately every 5 years thereafter through 2030. Focused follow-on chemical and/or biological monitoring may be performed in targeted cap areas identified by the physical surveys to further evaluate the protectiveness of the caps. Cap repairs will be performed as needed based on the results of the monitoring. The need for and scope of long-term cap monitoring and maintenance beyond 2030 will be developed as a collaborative effort between PR/OPG and Ecology based on the results of monitoring through 2030, and may be triggered by specific storm or seismic events (e.g., a wind event with a recurrence interval of 20 years or more, or a seismic event greater than a magnitude of 5.5).

As discussed in the CAP, monitored natural recovery (MNR) is the selected remedy throughout SMA-5. Natural recovery processes are expected to result in a reduction of surface sediment concentrations throughout SMA-5 over time, particularly after ongoing sources such as decaying creosote-treated piles are removed during the remedial action. Recovery of surface sediments will be monitored after completion of remedial construction, and will continue as needed, as discussed in Section 4. A mathematical model has been developed as an evaluation tool for the MNR remedy; the model has been used to integrate Site data and forecast timeframes over which Site-wide average surface sediment concentrations will achieve sediment cleanup standards. The model can also be used as tool to evaluate progress based on future monitoring data.

Long-term performance and confirmation monitoring activities will inform Ecology's 5-year reviews of the effectiveness of remedial actions at the Site, consistent with MTCA and SMS requirements. Sampling events will be scheduled to facilitate Ecology's 5-year reviews, beginning in approximately 2020.

Subsequent sections of this OMMP describe post-construction environmental monitoring activities that will be performed at the Site, including the details of post-construction monitoring and maintenance of capped areas to ensure the cap remains physically stable and chemically protective over time, as well as long-term surface sediment monitoring to verify

that cleanup actions accelerate natural recovery processes. The overall objective of this OMMP is to confirm that remedial actions at the Site achieve the performance standards specified in the CAP.

1.2 Organization of the OMMP

The remainder of this OMMP is organized as follows:

- Section 2 – Project Roles and Responsibilities
- Section 3 – Cap Monitoring and Potential Corrective Actions
- Section 4 – Natural Recovery Sediment Quality Evaluation and Monitoring
- Section 5 – Reporting
- Section 6 – References

The accompanying *Sampling and Analysis Plan* (SAP; Attachment F-1) and *Quality Assurance Project Plan* (QAPP; Attachment F-2) specify procedures to ensure that sample collection, handling, and analysis will result in data of sufficient quality to evaluate the effectiveness of remedial actions at the Site.

2 PROJECT ROLES AND RESPONSIBILITIES

2.1 Washington State Department of Ecology

Ecology is the regulatory authority and responsible agency for overseeing and authorizing the remedial action. In this capacity, Ecology reviews monitoring plans developed during the remedial design phase and will review information described in this OMMP to ensure that the project is constructed in a manner consistent with the remedial design. Artie Kapell has been designated as the Ecology site manager to exercise project oversight for Ecology and to coordinate with PR/OPG. Ecology will make final decisions to resolve unforeseen problems, which may change the project components, or the manner in which the OMMP is undertaken.

2.2 Pope Resources, LP/OPG Properties, LLC

The operation, maintenance, and monitoring work on this project will be managed by PR/OPG and executed by PR/OPG or by one or more consultants specializing in this work. The Project Coordinator for PR/OPG is Clay Patmont of Anchor QEA, who will be responsible for implementation of the OMMP, including required monitoring, sampling, testing, and reporting. Included within this responsibility will be the monitoring or quality control (QC) activities to ensure that activities described in this OMMP are conducted in accordance with the requirements described herein. These activities may also be assigned to other consultants with the requisite expertise and experience.

3 CAP MONITORING AND POTENTIAL CORRECTIVE ACTIONS

Long-term cap monitoring in SMA-1 and SMA-2 will encompass three broad categories:

- Physical integrity performance monitoring (Section 3.1)
- Sediment quality confirmation monitoring in sentinel cap locations (Section 3.2)
- Confirmation monitoring in nearshore wood debris cap locations (Section 3.3)

Physical integrity monitoring will be conducted visually or by using a high-resolution hydrographic survey (i.e., multi-beam bathymetric survey) conducted at the start of each OMMP monitoring event. The bathymetric survey data will be used to evaluate cap thicknesses by comparing the measured surface elevation of the cap with the final as-built survey described in the *Construction Quality Assurance Plan* (CQAP; Appendix E of the accompanying EDR). Based on the results of the survey, cap areas of relatively greater erosion or settlement will be targeted as locations to conduct follow-on sediment quality monitoring, as needed. Visual inspections of the caps, at low tide and/or by divers, may also be required to further detail the physical integrity of the caps and locate potential follow-on sediment core sampling locations, as necessary.

Surface sediment quality monitoring will be conducted at designated sentinel sampling stations on the SMA-1 and SMA-2 caps, and in nearshore wood debris cap locations, one each in SMA-1 and SMA-2. Additional surface sediment sampling stations may be selected following completion and interpretation of the hydrographic survey and/or follow-on sediment core sampling, as described below.

3.1 Physical Integrity Performance Monitoring

Following the initial post-construction (as-built) surveys of engineered cap areas as described in the CQAP, long-term OMMP monitoring of the capping areas will be performed, including bathymetric surveys of SMA-1 and SMA-2 cap areas (Figure F-2). Bathymetric surveys will cover areas deeper than approximately +0 feet mean lower low water (MLLW), while intertidal areas above +0 feet MLLW will be surveyed “in the dry” using upland topographic surveying methods. The final cap areas have been delineated in as-built construction drawings. SMA-1 and SMA-2 cap areas are depicted in Figures F-3a and F-4a, respectively.

Post-construction bathymetric surveys will begin in Year 1 following completion of construction (cap monitoring is currently targeted to begin in 2018), continuing in Year 3 (2020), and then approximately every 5 years thereafter through 2030. As discussed above, the need for and scope of long-term cap monitoring beyond 2030 will be developed as a collaborative effort between PR/OPG and Ecology based on the results of monitoring through 2030, and may be triggered by specific storm or seismic events (e.g., a wind event with a recurrence interval of 20 years or more, or a seismic event greater than a magnitude of 5.5).

Survey methods will be similar between the as-built and each long-term monitoring survey to allow detailed comparisons. Changes in bathymetry will be evaluated to identify areas of net settlement, erosion, or deposition relative to post-construction conditions. A potential cap area of concern for potential settlement or erosion will be identified when the apparent total cap thickness relative to as-built conditions is less than the minimum specification defined in the EDR for the specific cap area. A potential cap area of concern may trigger visual inspection of the cap surface (Section 3.1.2) and/or sediment sampling in that area to more accurately characterize (through coring) the in-place cap layer thicknesses (Section 3.1.3).

3.1.1 Bathymetric Survey Methods

Bathymetric surveying was used during construction to verify that the target thicknesses of the engineered caps in SMA-1 and SMA-2, as defined in the EDR, were achieved at the completion of construction activities. Multi-beam bathymetric surveys will be performed, using the same surveying transects to the extent practicable, as part of long-term monitoring to identify changes in mudline elevations. Multi-beam surveys will be conducted by a licensed surveyor and will meet or exceed the accuracy standards for a USACE Navigation and Dredging Support Survey as referenced in the USACE Hydrographic Survey Manual, April 2004 Revision (USACE 2004). Additional details about bathymetric surveys are defined in the accompanying SAP in Attachment F-1.

3.1.2 Topographic Survey and Cap Surface Visual Inspection Methods

For intertidal cap areas not included in the bathymetric survey, both an upland topographic survey and concurrent visual inspection will be performed to evaluate the integrity of caps relative to as-built post-construction conditions. Topographic surveys will be performed using established control points as part of long-term monitoring to identify changes in shoreline sloping cap elevations. Topographic surveys will be conducted by a licensed surveyor and will meet or exceed the accuracy standards for a USACE Total Station Topographic Survey as referenced in the USACE Control and Topographic Surveying Manual (USACE 2007). Additional details about upland topographic surveys are defined in the accompanying SAP in Attachment F-1. Concurrent with the topographic survey, cap inspections will be performed at low tide and/or by a diver to further detail the physical integrity of the armored areas and toe of armored slope. Inspections shall include documentation of each of the following:

- Description of the cap surface conditions
- Indications of settlement, seepage, or other unanticipated conditions
- Sediment core locations may also be identified as necessary to more accurately characterize the in-place layer thickness

3.1.3 Sediment Coring Methods

Sediment cores may be performed at locations identified in the bathymetric/topographic surveys or inspections where possible cap settlement and/or erosion of cap thicknesses are below the EDR-defined cap design criteria. If necessary, cores will be advanced to a minimum depth of approximately 1 foot below the minimum required cap thickness. The cores will be processed in the uplands and visually inspected to determine the thicknesses of the cap material.

If the coring verifies the cap thickness specification in that area (e.g., reductions in cap surface elevations are primarily attributable to sub-grade settlement), no further cap monitoring in that area will be required during that event. Conversely, if the coring reveals that cap thickness specifications in that area have not been maintained, additional contingency evaluations—including surface sediment chemistry, and/or bioassay analyses,

and/or cap maintenance or repair—may be performed as appropriate, subject to Ecology approval (see Section 3.2).

Detailed procedures for field sampling, location control, sample handling, and decontamination are provided in the accompanying SAP (Attachment F-1). Detailed field and laboratory quality assurance (QA) and QC criteria, including method specifications, detection limits, accuracy and precision requirements, are provided in the accompanying QAPP (Attachment F-2).

3.2 Sediment Quality Confirmation Monitoring in Sentinel Cap Locations

As discussed above, surface sediment quality monitoring will be conducted at six designated sentinel intertidal and subtidal sampling stations composed of 5-point aliquots on the SMA-1 and SMA-2 caps, as depicted in Figures F-3a and F-4a, respectively. As practicable, all sediment sampling performed under this OMMP will be conducted in September to correspond with seasonally lower dissolved oxygen levels and higher temperatures, while also optimizing daylight low-tide intertidal sampling windows and the availability of larval bioassay organisms. Samples will be collected from the 0- to 10-centimeter (cm) biologically active zone. SMS larval bioassays and analyses of Site chemicals of concern (CoCs; including carcinogenic polycyclic aromatic hydrocarbons [cPAHs], dioxins/furans, and cadmium) will be performed on the six sentinel intertidal and subtidal surface sediment samples.

Additional targeted surface sediment sampling may be performed following completion and interpretation of the bathymetric/topographic surveys and/or follow-on core sampling (see Section 3.1). The decision on whether to collect and analyze additional surface grab samples and/or sediment core samples in these area, along with the specific bioassay and/or chemical analyses, will be a collaborative decision made by PR/OPG and Ecology based on field observations.

If the larval bioassay and chemical analyses confirm that cleanup standards are being maintained, then no further cap monitoring and/or repair in that area will be required during that event. Conversely, if the larval bioassay and/or chemical analyses reveal that cleanup standards may be exceeded, further focused monitoring and/or cap

maintenance/repair will be performed as appropriate (Section 3.4), subject to Ecology approval.

3.2.1 Sediment Sampling and Analysis Methods

Surface sediment samples from each sentinel sample location shown in Figure F-3a and Figure F-4a will comprise aliquots as discussed in Attachment F-1. The sample aliquots will be collected using a van Veen grab sampler or equivalent device deployed from a winch line on a sampling vessel. As practicable, sample aliquots in intertidal areas may be collected directly from the cap surface, during low tide, using hand tools (e.g., stainless-steel trowel, spoons or scoops). The sediment samples collected will be 5-point aliquots composited in the intertidal and subtidal areas and submitted for larval bioassays and/or chemical analyses. Detailed procedures for field sampling, location control, sample handling, and decontamination are provided in the SAP and QAPP included in Attachments F-1 and F-2, respectively.

3.3 Confirmation Monitoring in Nearshore Wood Debris Cap Locations

Surface sediment quality monitoring will also be conducted within two areas where buried nearshore wood debris deposits that could not be practicably removed were capped along the shoreline (i.e., within the North Basin in SMA-1 and the Former Pier 4 Area in SMA-2). As discussed in Section 3.2, as practicable, all sediment sampling performed under this OMMP will be conducted in September to correspond with seasonally lower dissolved oxygen levels and higher temperatures, while also optimizing daylight low-tide intertidal sampling windows and the availability of larval bioassay organisms. Nearshore sediment sampling locations for capped wood debris in SMA-1 and SMA-2 are depicted in Figures F-3a and F-4a, respectively.

Sediment monitoring in nearshore wood debris cap locations will consist of initial passive in situ diffusive gradient thin sheet (DGT) monitoring of porewater total free sulfide (including hydrogen sulfide [H_2S], hydrosulfide, and disulfide) concentrations. Following calculation of the H_2S fraction of the total free sulfide concentration based on concurrent temperature, pH, and salinity sampling, locations with porewater H_2S concentrations exceeding the risk-based

benchmark of 0.07 milligram per liter (mg/L) will be sampled for confirmatory surface sediment bioassay analyses.

Shortly prior to sediment sampling, DGT probes will be advanced at three locations along a single transect in SMA-1 (total of three locations), and at three locations along three parallel transects in SMA-2 (total of nine locations). At each of these twelve DGT sampling locations, probes will be installed at two depth intervals, approximately 6 and 24 inches below the mudline, respectively, for a total of six sample points in SMA-1 and 18 sample points in SMA-2. If the probe encounters refusal above the 24-inch depth, two additional attempts will be conducted within approximately 3 feet of the original sample location; if all three attempts are unsuccessful, the attempts will be documented, and no deep DGT deployment will be conducted at that location.

Following an approximate 24-hour DGT deployment period, representative surface sediment (approximately 6 inches below mudline) porewater temperature, pH, and salinity measurements will be conducted at all twelve porewater sampling locations during low tide conditions (i.e., at the time the DGTs are retrieved). Surface sediment (6-inch depth) temperature, pH, and salinity will also be representative of the underlying shallow subsurface (24-inch depth) interval. Porewater H_2S concentrations will be calculated based on field optical densitometry of the DGT gels and concurrent temperature, pH, and salinity data, as described in more detail in the SAP and QAPP included in Attachments F-1 and F-2, respectively.

Bioassay sampling at discrete surface sample locations will be conducted following DGT retrieval and calculation of porewater H_2S concentrations as outlined above. Surface sediment samples for bioassay analyses will be collected at all sample locations with a surface (6-inch depth) or subsurface (24-inch depth) porewater H_2S concentration greater than 0.07 mg/L, the risk-based sediment porewater H_2S benchmark developed by Ecology for Port Gamble Bay. If all surface or shallow subsurface porewater H_2S concentrations along a transect are less than 0.07 mg/L, then a single bioassay sample will be collected from each transect (one in SMA-1 and three in SMA-2) at the transect location with the highest porewater H_2S concentration. If all porewater H_2S concentrations within a transect are below detection limits, the location along the transect with the lowest porewater salinity

measurement will be selected for bioassay analysis. In any event, a minimum of one surface sediment bioassay sample will be collected from each of the four transects (one in SMA-1 and three in SMA-2).

Figures F-3b and F-4b through F4d depict cross-sections through the targeted areas in SMA-1 and SMA-2, respectively. These cross-sections show the locations of the samples relative to the capped wood debris. Bioassay samples will be collected from the 0- to 10-cm biologically active zone. A suite of SMS bioassays (two acute and one chronic) will be performed on bioassay samples.

If the bioassay analyses confirm that cleanup standards are being maintained in the capped areas of wood debris, then no further cap monitoring and/or repair in that area will be required during that event. Conversely, if the bioassay analyses reveal that cleanup standards may be exceeded, further focused monitoring and/or cap maintenance/repair will be performed as appropriate (Section 3.4), subject to Ecology approval.

3.3.1 Sediment Sampling and Analysis Methods

DGT sampling probes will be advanced along four transects (A through D; Figures F3a and F4a), within SMA-1 and SMA-2, at mudline elevations ranging from approximately +5 feet MLLW to approximately -3 feet MLLW. Probes will be installed by hand during low tide conditions to confirm proper installation. After an approximate 24-hour equilibration period, the probes will be removed. As summarized above, surface sediment bioassay sampling at targeted sample locations will be conducted following the DGT sampling. Detailed procedures for field sampling, sample processing, location control, sample handling, and decontamination are provided in the SAP and QAPP included in Attachments F-1 and F-2, respectively.

3.4 Corrective Actions

In the event that monitoring indicates that remedial action performance standards may not be achieved, PR/OPG will submit recommendations for further monitoring or corrective actions to Ecology for review, consistent with the requirements described in the CD and CAP. While bioassay standards are applied on a single sample (nearshore wood debris cap

locations) or sample composite (sentinel cap locations) basis, chemical criteria (i.e., for cPAHs, dioxins/furans and cadmium) will be applied as a surface weighted average concentration (SWAC) across the entire 700-acre Site defined in the CAP and CD, consistent with SMS requirements. Chemical monitoring data collected in all SMAs (see Section 4.3) will be used to calculate the SWAC.

If monitoring data reveal that cap performance standards are not being achieved, a response plan will describe additional response actions to be taken to ensure the successful performance of the work. In conjunction with Ecology, PR/OPG will evaluate the extent and significance of the exceedance or trigger. The need for additional response actions will take into consideration all monitoring results relative to an overall assessment of the successful performance of the remedial action. Through these discussions, an appropriate course of action will be developed and implemented, as necessary. The specific problem causing the need for a contingency will dictate which additional response actions may be most appropriate. Possible additional response actions may include, but are not limited to, those listed for the following scenarios:

- Erosion of cap material
  - Perform additional monitoring to further assess erosion and to determine the extent, cause, and potential solution to the verified erosion
  - Perform additional sediment quality sampling within those erosion areas where there may be a potential for underlying material to be exposed
  - Discuss operations that might contribute to erosion and modifications to these operations that may be required to maintain remedy effectiveness
  - Place additional material with less erosion potential to supplement caps
- Sediment cleanup standard exceedance
  - Conduct confirmation biological sediment toxicity testing to confirm or refute the occurrence of adverse ecological impacts
  - Conduct a source control evaluation in coordination with Ecology (as necessary)
  - Place additional capping material

4 NATURAL RECOVERY SEDIMENT QUALITY EVALUATION AND MONITORING

As discussed in the CAP (Ecology 2013), subsurface sediment cleanup levels must be achieved 10 years after completion of remedial construction. Since construction was completed in 2017, cleanup standards are targeted to be achieved by 2027. The point of compliance for Site human health CoCs including cPAH toxicity equivalent quotient (TEQ), dioxin/furan TEQ, and cadmium is the SWAC over all subtidal areas of the Site (730 acres, including all SMAs; Figure F-1) across the 0- to 10-cm depth interval.

Long-term monitoring of surface sediment quality will be conducted as part of this OMMP to verify that natural recovery processes at the Site continue during the 10-year post-construction period to achieve sediment cleanup standards described in the CAP. Recovery of surface sediments at sentinel monitoring locations throughout the Site will be monitored beginning approximately 3 years after completion of remedial construction (long-term monitoring is currently targeted to begin in 2020) and every 5 years thereafter as needed (see Section 4.3). Baseline sampling data, natural recovery modeling, sediment sampling/analysis methods, and potential corrective actions are discussed in Sections 4.1 through 4.4.

4.1 Baseline Sampling

The remedial investigation/feasibility study (RI/FS; Ecology 2012) that formed the basis for the CAP (Ecology 2013) included extensive sampling and analysis of surface sediment CoCs throughout the Site, and thus forms the primary baseline data set for this OMMP evaluation. Most of the surface sediment baseline data were collected between 2008 and 2011 (average 2010). Baseline (2010) surface sediment cPAH and dioxin/furan TEQs are depicted in Figures F-5 and F-6, respectively. The baseline cPAH and dioxin/furan TEQ SWACs are approximately 42 µg/kg (see Section 4.2.2; above the 16 µg/kg cleanup level) and 3 nanograms per kilogram (ng/kg; below the 5 ng/kg cleanup level), respectively. (As discussed in the CAP, the baseline surface sediment cadmium SWAC is also below the cleanup level of 3 milligrams per kilogram.)

The RI/FS (Ecology 2012) also included baseline radioisotope analyses to characterize net sedimentation rates and mixing layer thicknesses in Port Gamble Bay. Representative sediment cores from central Port Gamble Bay are depicted in Figure F-7, and are consistent

with recent (last 20 years) net sedimentation rates ranging from approximately 0.40 to 0.48 cm per year. The radioisotope gradients within these cores also reveal that there is relatively little sediment mixing in the 0- to 10-cm layer.

Consistent with the Ecology-approved SAP, additional surface sediment data were collected in 2014 at six representative stations across the Site to provide an early indication of recovery and to obtain data to refine model projections (see Section 4.2). Surface sediment was sectioned into 0- to 2-cm and 2- to 10-cm sub-sampling intervals, and analyzed using the same cPAH, dioxin/furan, and cadmium analytical methods used in the RI/FS. The 2014 data are summarized in Table F-1.

In areas of Port Gamble Bay that contain higher cPAH TEQs, the 0- to 2-cm layer contained significantly lower concentrations than underlying sediments, indicative of recent cPAH source controls and natural recovery processes (Figure F-8). Consistent with the radioisotope data summarized in Figure F-7, cPAH gradients within these surface sediments confirm that there is relatively little sediment mixing in the 0- to 10-cm layer. The Figure F-8 regression relationship (y-axis intercept) also suggests that current cPAH TEQs in depositing sediment at the Site likely range from approximately 5 to 10 µg/kg. As discussed in Section 4.2, the 2014 cPAH data were used to refine model inputs of cPAH natural recovery. The 2014 data also further verify that the current dioxin/furan TEQ and cadmium SWACs are below cleanup levels.

4.2 Natural Recovery Modeling

A mathematical model of sediment natural recovery was developed as an evaluation tool for the Site. The theoretical basis and framework for the model, the data and input parameters used in the model, and the results from the model predictions (i.e., timeframes over which the Site-wide SWAC will achieve the cPAH TEQ sediment cleanup standard) are presented in the subsections that follow.

4.2.1 Model Framework

Use of mathematical models to project future conditions for MNR evaluations is recommended in the U.S. Environmental Protection Agency's contaminated sediment

guidance (USEPA 2005) and in various technical support documents (e.g., Magar et al. 2009). The goal of such modeling is to project changes in surface sediment concentration over time resulting from new deposition of material with lower concentration than the existing surface, as well as other processes that can result in concentration reductions, such as dilution and dispersion.

Several models are available for MNR projections, ranging in complexity and calculation methods. Most MNR models use a one-dimensional framework to simulate concentration changes in the surface sediment layer over depth and time, as a function of deposition as well as other recovery processes including bioturbation (mixing), porewater diffusion/dispersion, and groundwater/porewater advection. Example models include RECOVERY (USACE 2001), Boudreau (1997), and AQFATE (Connolly et al. 2000; Arcadis et al. 2010). Given the relatively high sediment partition coefficients of cPAHs in Port Gamble Bay (see Appendix B of the EDR), deposition and bioturbation are the driving processes in these models; dissolved phase processes are negligible. Changes in the sediment surface layer concentration over time for a model driven by these two processes depend on the following parameters:

- Starting surface sediment concentration
- Concentration in depositing sediment
- Net sedimentation rate
- Depth and rate of bioturbation
- Averaging depth of the surface layer for compliance evaluation

For the limiting case of sediment natural recovery being driven by particulate phase processes (i.e., deposition and bioturbation), analytical solutions can be developed to simulate changes in surface concentration over time based on mass balance formulations. For example, two simplified cases that bound any other more complex case (including the numerical models described previously) are as follows:

1. **Complete mixing** within the entire surface sediment layer (i.e., mixing is instantaneous and complete over the entire depth of sediment being evaluated)
2. **No mixing**, in which the surface layer being evaluated contains layers of new (lower concentration) material that "build up" atop the existing (higher concentration) surface sediment, with no interaction between layers

The mathematical equations governing these two cases are discussed in basic environmental modeling textbooks (e.g., Chapra 1997). Conceptually, these two cases can be illustrated by the diagram shown in Figure F-9, and their associated behavior in terms of change in concentration over time is shown in Figure F-10 (for an example case of a starting surface sediment concentration of 25 µg/kg with depositing sediment at a concentration of 10 µg/kg).

For the Port Gamble Bay analysis, concepts from these two bounding cases were combined to develop a modeling approach representative of the mixing regime observed at the Site. As discussed in Section 4.1, the lead-210 profile data from radionuclide cores (Figure F-7) and cPAH data from the 0- to 2-cm and 2- to 10-cm sections of sediment cores collected in 2014 (Figure F-8) indicate that there is relatively little mixing within the upper 10 cm of sediment. Thus, the MNR model developed for the Site consisted of a two-zone modeling approach to simulate the upper 10-cm compliance depth:

1. The 0- to 2-cm depth interval was assumed to be completely mixed. Mass entering the interval is a function of the rate of sediment deposition and concentration of depositing material, and mass exiting is based on the mixed concentration within the interval and the rate of deposition. The mass exiting from this 0- to 2-cm interval was used as input to the model simulation of the underlying 2- to 10-cm interval.
2. The 2- to 10-cm depth interval was assumed to have no mixing, and was discretized into computational layers. A LaGrangian solution scheme was applied in which the sediment exiting the 0- to 2-cm interval (having a concentration as per the first zone described above) via deposition was "reassigned" to the first discrete layer within the 2- to 10-cm interval, and all subsequent discrete layers within that interval were then "reassigned" to the next layer down. This process was repeated over time as new sediment continues to deposit on the surface, causing the sediments initially present within this interval of the model to be transported downward over time.

The cPAH concentrations simulated by the model were vertically averaged to calculate the 0- to 10-cm concentration for comparison to the Site cleanup standard of 16 µg/kg.

The basic model framework described above was applied to each SMA at the Site separately, and the anticipated timing of remediation activities within individual SMAs, including short-term impacts associated with dredging (i.e., residuals), were incorporated into the model.

The parameters used for the model, the approach used to simulate the effects of remediation within applicable SMAs, and the model results (i.e., predictions of the Site-wide SWAC) are described in Sections 4.2.2 and 4.2.3, respectively.

4.2.2 Model Input Parameters

Model input parameters were derived from Site sampling efforts described in previous sections. Key parameters in the model are the mixed layer depth, sedimentation rate, and cPAH TEQ in depositing sediment. These parameters and others used in the model are summarized in Table F-2 and are discussed in Sections 4.2.2.1 through 4.2.2.4.

4.2.2.1 Initial Surface Sediment cPAH Concentrations

The baseline surface sediment cPAH data collected from 2008 to 2011 were contoured using inverse-distance-weighting methods (see Figure F-5) and used to calculate the current SWAC within each SMA. These concentrations were used for the initial condition (specified to correspond to year 2010) in the model. The 2010 cPAH TEQ Site-wide subtidal sediment SWAC is approximately 42 µg/kg. SMA-specific SWACs were used in the modeling (Table F-2).

4.2.2.2 Remediation Effects on Surface Sediment Concentrations

Sediment concentrations in SMA-1 and SMA-2 were adjusted in the model to account for short-term increases in surface sediment cPAH concentrations resulting from dredging. Residuals from dredging in portions of the SMAs were conservatively assumed to affect the entire SMA. Based on dredging case studies summarized in Bridges et al. (2010), and given the volume of sediments to be dredged, the full 10-cm simulated thickness was assumed to be at the residual concentration immediately following dredging. The surface sediment cPAH concentration of the dredge residuals, and thus, the average surface sediment cPAH TEQ during dredging was set to 430 µg/kg, the average concentration within the SMA-1 and SMA-2 dredge prisms.

In addition, following the above-described increase in concentration associated with the dredge residuals, sediment concentrations were simulated in the model to reflect the post-dredge placement of engineered sediment caps, and EMNR/residual management cover

layers. For the purposes of modeling, it was assumed that the post-cap/cover surface sediment cPAH TEQ in SMA-1 and SMA-2 would be 8 µg/kg over the entire 10-cm simulated thickness, corresponding to one-half the cleanup standard. The same assumption was made for the simulation of the EMNR layer in SMA-3.

The specified timeframes of these concentration changes to represent active remediation in the model were as follows:

- **SMA-1**: Linear increase in concentration to 430 µg/kg cPAH TEQ applied from November 2016 to January 2017; linear decrease to a concentration of 8 µg/kg cPAH TEQ applied in January 2017
- **SMA-2**: Linear increase in concentration to 430 µg/kg cPAH TEQ applied from November 2015 to January 2016; linear decrease to a concentration of 8 µg/kg cPAH TEQ applied in January 2016
- **SMA-3**: Linear decrease to a concentration of 8 µg/kg cPAH TEQ in January 2017 (same timeframe as SMA-1)

4.2.2.3 Net Sedimentation Rate

Radioisotope analyses conducted as part of the baseline monitoring concluded that net sedimentation rates in Port Gamble Bay are in the range of 0.40 to 0.48 cm per year (Figure F-7). The model conservatively used a net sedimentation rate at the low end of that range (0.4 cm per year).

4.2.2.4 cPAH Concentrations in Depositing Sediment

As shown in Figure F-8, the regression between surface (0- to 2-cm) and subsurface (2- to 10-cm) sediment cPAH TEQ collected in 2014 suggests that concentrations in sediment depositing from the water column are in the range of 5 to 10 µg/kg. Supplemental watershed loading-based calculations based on regional measurements of diffuse non-point sources of cPAHs in regional stormwater for different land use classifications (Herrera 2011) produce depositing sediment cPAH concentration estimates in this same range, further corroborating this input concentration range. Modeling was conducted for the two cases bounding this depositing sediment cPAH TEQ range.

4.2.3 Model Results

Model simulations were performed for each SMA separately, incorporating the remediation schedule described in the previous subsection. These simulations were conducted for two scenarios: assuming 5 and 10 µg/kg cPAH TEQ in depositing sediment. Results of the modeling for each individual SMA are shown in Figure F-11 (5 µg/kg cPAH TEQ depositing sediment) and Figure F-12 (10 µg/kg cPAH TEQ depositing sediment). These graphics illustrate the likely effects of remediation and rate of recovery in each SMA. Because the point of compliance for the 16 µg/kg cPAH TEQ cleanup standard is the SWAC over all subtidal areas of the Site, the subtidal area results were calculated as a Site-wide SWAC based on the SMA-specific results in Figures F-11 and F-12 and respective SMA areas. Figure F-13 shows the predicted decline in the Site-wide SWAC for cPAH TEQ. Based on the simulated range of depositing sediment cPAH TEQ concentration (i.e., 5 and 10 µg/kg), the predicted Site-wide SWAC is anticipated to achieve the 16 µg/kg cPAH TEQ cleanup standard between approximately 2026 and 2029.

The model developed and presented herein will be refined as additional data become available from long-term monitoring of surface sediment quality conducted as part of this OMMP to verify that natural recovery is progressing towards the cleanup standard.

4.3 Sediment Sampling and Analysis Methods

To verify model predictions and document the rate of recovery following completion of sediment cleanup actions, surface sediment samples will be collected from 12 representative sediment monitoring locations throughout the Site: nine located in SMA-5, two in SMA-4, and one in SMA-3 (see Figure F-14). As discussed above, long-term monitoring will begin approximately 3 years after completion of remedial construction (monitoring is currently targeted to begin in 2020) and every 5 years thereafter as needed (see Section 4.4). The SMA-3 to SMA-5 data will be combined with data collected in SMA-1 and SMA-2 (see Sections 3 and 4.2.3) to calculate the SWAC over all subtidal areas of the Site.

Field and analytical techniques and procedures to be used in the long-term monitoring program will be consistent with those used in the CAP (and the 2014 monitoring program) to ensure comparability of data. The accompanying SAP (Attachment F-1) and QAPP (Attachment F-2)

specify procedures to ensure that sample collection, handling, and analysis will result in data of sufficient quality to evaluate the effectiveness of remedial actions at the Site.

4.4 Corrective Actions

The evaluation and implementation of corrective actions would be performed consistent with the requirements of the CD and CAP. Where monitored natural recovery does not achieve cleanup standards within 10 years following completion of remedial construction, PR/OPG will comply with sediment recovery zone (SRZ) requirements as defined under the SMS.

Following the first post-construction monitoring event (3 years after construction, anticipated in 2020), natural recovery modeling will be updated to refine projections of recovery through 2027. If the combined monitoring data in Year 3 post-construction (2020) and modeling projections summarized in Section 4.2 continue to confirm that the SWAC will be reduced to the 16 µg/kg cPAH TEQ cleanup standard by 2027, follow-on sediment recovery monitoring will be performed in Years 5 and 10 (2022 and 2027 respectively) to update and refine model projections.

Ecology will initiate a review of factors listed in SRZ criteria (WAC 173-204-590(3)) as part of a Focused Feasibility Study to evaluate remedial options including, but not limited to, implementation of a SRZ within 6 months after the first determination that the target of 16 µg/kg cPAH TEQ cleanup standard will not be met by 2027 (or 10 years after remediation). If the monitoring data indicate that MNR is not likely to achieve the cleanup level in this timeframe, the SRZ process will be initiated, including a Focused Feasibility Study for the Site including MNR and EMNR areas.

The Focused Feasibility Study will include but not be limited to the following:

- Consideration of further source controls, MNR, and EMNR to achieve cleanup standards
- Congener fingerprinting analysis to evaluate potential sources of cPAH, and to understand whether additional source controls might be necessary to achieve the 16 µg/kg cPAH TEQ cleanup standard

5 REPORTING

Subsequent to each OMMP monitoring event described in the sections above, PR/OPG's Project Coordinator will submit a detailed report to Ecology outlining the actions taken and the results, which will include survey maps and chemical analysis data. A recommendation for modifications to the scope of future monitoring efforts (e.g., reduction or elimination of cap and/or natural recovery monitoring) and/or corrective actions will be described in detail if warranted.

6 REFERENCES

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TABLES

Table F-1
Baseline Sediment Recovery Grab Sample Results

	Task	2014RemedialDesign	2014RemedialDesign	2014RemedialDesign	2014RemedialDesign	2014RemedialDesign	2014RemedialDesign	2014RemedialDesign
	Location ID	BW-01	BW-01	BW-01	BW-15	BW-15	BW-21	Bw-21
	Sample ID	BW-01-SG-0-2-140811	BW-01-SG-2-10-140811	BW-101-SG-2-10-140811	BW-15-SG-0-2-140811	BW-15-SG-2-10-140811	BW-21-SG-0-2-140811	BW-21-SG-2-10-140811
	Sample Date	8/11/2014	8/11/2014	8/11/2014	8/11/2014	8/11/2014	8/11/2014	8/11/2014
	Depth	0 to 2 cm	2 to 10 cm	2 to 10 cm	0 to 2 cm	2 to 10 cm	0 to 2 cm	2 to 10 cm
	Sample Type	N	N	FD	N	N	N	N
	Matrix	SE	SE	SE	SE	SE	SE	SE
	Site-specific Criteria							
Conventional Parameters (mg/kg)								
Total organic carbon		0.764	1.56	0.768	3.17	3.48	2.83	2.93
Total solids		63.97	71.42	69.69	24.5	29.21	20.38	24.3
Grain Size (%)								
Gravel		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Sand, very coarse		0.2	0.2	0.2	0.1 U	0.7	0.2	0.1
Sand, coarse		2	2	2	1.4	1.7	6.6	0.2
Sand, medium		21.4	21.9	22.5	2.8	2	0.9	0.5
Sand, fine		56.4	56.7	56	2	1.7	0.2	0.5
Sand, very fine		6	5.6	5.7	7.1	6.9	0.7	1.8
Silt, coarse		3.1	2.6	2.9	11.8	12.4	10.4	8.9
Silt, medium		2.7	2.1	2.1	16.6	15.6	25.7	21.1
Silt, fine		2.1	1.8	2	15.9	14.8	21.4	20.2
Silt, very fine		1.4	1.4	1.9	11.9	12.5	8.2	14.9
Total fines (Reported, not calculated)		--	--	--	--	--	--	--
Clay, coarse		1.1	1.4	1.4	8.5	10.4	5.6	9.3
Clay, medium		0.9	1.4	1	5.6	6.4	3.4	5.5
Clay, fine		2.6	2.9	2.3	16.3	14.8	16.7	17
Metals (mg/kg)								
Cadmium	3	0.6	0.6	0.6	2.3	2.3	3	3.2
Polycyclic Aromatic Hydrocarbons (µg/kg)								
2-Methylnaphthalene		8.5	7.1	8.5 J	5.3	8.1	9.8	7.1
Acenaphthene		9.4 J	10 J	13 J	5.4	7.8 J	8 J	5.9 J
Acenaphthylene		34	42	49	18	27	25	16
Anthracene		12 J	13 J	16 J	9.1	15 J	14 J	10 J
Benzo(a)anthracene		7.7 J	8 J	10 J	13	13 J	12 J	8.8 J
Benzo(a)pyrene		8	8	11	14	14	14	9.8
Benzo(b,j,k)fluoranthenes		14	15	20	29	28	26	18
Benzo(g,h,i)perylene		8.7	8.4	11	11	13	15	9.8
Chrysene		12	10	12	18	20	15	11
Dibenzo(a,h)anthracene		4.9 UJ	4.7 UJ	4.7 UJ	5 U	4.9 UJ	4.9 UJ	4.9 UJ
Fluoranthene		52 J	62 J	76 J	50	74 J	72 J	48 J
Fluorene		7.2 J	6.9 J	8.8 J	5.8	8.2 J	11 J	8.2 J
Indeno(1,2,3-c,d)pyrene		4.8 J	4.5 J	5.7	6.7	7.6	8	5.9
Naphthalene		110	120	140 J	65	91	110	78
Phenanthrene		49 J	57 J	68 J	34	57 J	59 J	40 J
Pyrene		50 J	61 J	77 J	44	69 J	70 J	46 J
cPAH TEQ (U=1/2)	16	11.02 J	11.09 J	14.93 J	19.3 J	19.305 J	18.995 J	13.425 J
Dioxin Furans (ng/kg)								
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)		0.392 J	0.342 J	0.334 J	0.844 J	0.458 J	0.665 J	0.705 J

Table F-1
Baseline Sediment Recovery Grab Sample Results

	Task	2014RemedialDesign	2014RemedialDesign	2014RemedialDesign	2014RemedialDesign	2014RemedialDesign	2014RemedialDesign	2014RemedialDesign
	Location ID	BW-01	BW-01	BW-01	BW-15	BW-15	BW-21	Bw-21
	Sample ID	BW-01-SG-0-2-140811	BW-01-SG-2-10-140811	BW-101-SG-2-10-140811	BW-15-SG-0-2-140811	BW-15-SG-2-10-140811	BW-21-SG-0-2-140811	BW-21-SG-2-10-140811
	Sample Date	8/11/2014	8/11/2014	8/11/2014	8/11/2014	8/11/2014	8/11/2014	8/11/2014
	Depth	0 to 2 cm	2 to 10 cm	2 to 10 cm	0 to 2 cm	2 to 10 cm	0 to 2 cm	2 to 10 cm
	Sample Type	N	N	FD	N	N	N	N
	Matrix	SE	SE	SE	SE	SE	SE	SE
	Site-specific Criteria							
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)		1.08	0.571 J	0.594 J	2.34	1.28	1.63	1.79
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)		0.771 J	0.332 J	0.378 J	1.47	1.98	1.09	1.35
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)		1.44	1.09	1.08	4.7	3.45	3.54	4.85
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)		0.993 J	0.723 J	0.716 J	3.24	2.42	2.32	3.4
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)		16.8	14	13.4	66.1	36.4	48.5	66
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)		123	104	99.7	497	257	361	345
Total Tetrachlorodibenzo-p-dioxin (TCDD)		63.1 J	18.5 J	17.3 J	64 J	52.8 J	39.3 J	67.4 J
Total Pentachlorodibenzo-p-dioxin (PeCDD)		36.9	12.3	12.9 J	46.5	67.5	30.5	67.9
Total Hexachlorodibenzo-p-dioxin (HxCDD)		27	18	18.4	76.7	87.1	53.5	150
Total Heptachlorodibenzo-p-dioxin (HpCDD)		71.8	60.5	55	276	146	178	203
2,3,7,8-Tetrachlorodibenzofuran (TCDF)		1.08	1.24 J	1.09	4.26	1.7 J	2.93	2.88 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)		0.597 J	0.589 J	0.455 J	1.7 J	0.84 J	1.16	1.34
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)		0.573 J	0.438 J	0.406 J	1.99	0.886 J	1.39	1.47
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)		0.474 J	0.396 J	0.364 J	1.63 J	0.876 J	1.27 J	1.27 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)		0.426 J	0.438 J	0.237 J	1.25	0.724 J	0.937 J	1.03
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)		0.356 J	0.186 J	0.0815 U	0.349 J	0.626 J	0.313 J	0.402 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)		0.523 J	0.396 J	0.235 J	1.52 J	0.8 J	1.24 J	1.21
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)		2.81	2.54	2.61	11.5	5.47	9.02	9.35
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)		0.482 J	0.112 J	0.101 J	0.717 J	0.844 J	0.627 J	0.61 J
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)		5.03	4.48	4.68	18.8	10	14.2	15
Total Tetrachlorodibenzofuran (TCDF)		19.9	21.3 J	18.9	72	27.2 J	51.7	49.3 J
Total Pentachlorodibenzofuran (PeCDF)		8.55 J	7.78 J	7.26 J	33.2	13 J	23.5	25.5
Total Hexachlorodibenzofuran (HxCDF)		6.13 J	5.91 J	4.84 J	22.4 J	11.1 J	17.7 J	19.3 J
Total Heptachlorodibenzofuran (HpCDF)		7.5	6.57 J	6.94 J	30.2	14.8 J	22.9 J	22.8 J
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)	5	2.507439 J	1.741234 J	1.669949 J	6.61181 J	3.79384 J	4.80483 J	5.483 J

Table F-1
Baseline Sediment Recovery Grab Sample Results

	Task	2014RemedialDesign	2014RemedialDesign	2014RemedialDesign	2014RemedialDesign	2014RemedialDesign	2014RemedialDesign
	Location ID	PGSS-29	PGSS-29	PGST-1	PGST-1	PGST-5	PGST-5
	Sample ID	PGSS-29-SG-0-2-140811	PGSS-29-SG-2-10-140811	PGST-1-SG-0-2-140811	PGST-1-SG-2-10-140811	PGST-5-SG-0-2-140811	PGST-5-SG-2-10-140811
	Sample Date	8/11/2014	8/11/2014	8/11/2014	8/11/2014	8/11/2014	8/11/2014
	Depth	0 to 2 cm	2 to 10 cm	0 to 2 cm	2 to 10 cm	0 to 2 cm	2 to 10 cm
	Sample Type	N	N	N	N	N	N
	Matrix	SE	SE	SE	SE	SE	SE
	Site-specific Criteria						
Conventional Parameters (mg/kg)							
Total organic carbon		0.798	1.46	3.59	2.03	2.5	3.65
Total solids		64.7	67.49	26.88	30.17	27.48	32.23
Grain Size (%)							
Gravel		0.2	0.5	0.1 U	0.1 U	0.2	0.9
Sand, very coarse		1.3	1.2	0.1 U	0.1	0.8	0.1 U
Sand, coarse		5	5.3	0.2	1.8	1.6	2.8
Sand, medium		19.7	19.3	1.8	1.3	2	2.3
Sand, fine		40.2	39.9	1.2	1	3.8	4.2
Sand, very fine		19.4	19.3	4.8	4.8	13.1	12.7
Silt, coarse		3.9	3.5	13.4	15.9	12.7	11
Silt, medium		2.8	3.1	24.5	16.4	17	16.8
Silt, fine		1.8	2.1	16.1	15.8	13.7	13.4
Silt, very fine		1.3	1.4	11.1	12.3	11.2	11.5
Total fines (Reported, not calculated)		--	--	--	--	--	--
Clay, coarse		0.9	0.9	7.3	9.5	5.4	6.3
Clay, medium		0.8	1	6	7.1	4.9	5.5
Clay, fine		2.7	2.5	13.6	14	13.7	12.6
Metals (mg/kg)							
Cadmium	3	0.8	0.8	2.5	2.5	2	2
Polycyclic Aromatic Hydrocarbons (µg/kg)							
2-Methylnaphthalene		8	9.2	10	12	16	26
Acenaphthene		8.2 J	8.4 J	10 J	11 J	21 J	35 J
Acenaphthylene		20	21	26	29	69	120
Anthracene		16 J	17 J	21 J	24 J	31 J	50 J
Benzo(a)anthracene		11 J	9.2 J	23 J	33 J	32 J	47 J
Benzo(a)pyrene		12	9.6	26	31	29	44
Benzo(b,j,k)fluoranthenes		22	18	57	68	61	88
Benzo(g,h,i)perylene		11	10	20	24	23	36
Chrysene		12	12	32	69	81	63
Dibenzo(a,h)anthracene		5 UJ	4.9 UJ	2.7 J	3.2 J	2.8 J	3.9 J
Fluoranthene		84 J	76 J	94 J	120 J	140 J	200 J
Fluorene		11 J	11 J	12 J	14 J	19 J	28 J
Indeno(1,2,3-c,d)pyrene		6.1	4.9 J	13	16	14	22
Naphthalene		130	120	89	100	190	370
Phenanthrene		69 J	71 J	67 J	80 J	120 J	180 J
Pyrene		87 J	77 J	85 J	110 J	130 J	190 J
cPAH TEQ (U=1/2)	16	16.28 J	13.175 J	35.89 J	43.71 J	40.79 J	60.72 J
Dioxin Furans (ng/kg)							
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)		0.304 J	1.14 J	0.648 J	0.691 J	0.76 J	0.826 J

Table F-1
Baseline Sediment Recovery Grab Sample Results

	Task	2014RemedialDesign	2014RemedialDesign	2014RemedialDesign	2014RemedialDesign	2014RemedialDesign	2014RemedialDesign
	Location ID	PGSS-29	PGSS-29	PGST-1	PGST-1	PGST-5	PGST-5
	Sample ID	PGSS-29-SG-0-2-140811	PGSS-29-SG-2-10-140811	PGST-1-SG-0-2-140811	PGST-1-SG-2-10-140811	PGST-5-SG-0-2-140811	PGST-5-SG-2-10-140811
	Sample Date	8/11/2014	8/11/2014	8/11/2014	8/11/2014	8/11/2014	8/11/2014
	Depth	0 to 2 cm	2 to 10 cm	0 to 2 cm	2 to 10 cm	0 to 2 cm	2 to 10 cm
	Sample Type	N	N	N	N	N	N
	Matrix	SE	SE	SE	SE	SE	SE
	Site-specific Criteria						
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)		0.536 J	1.97 J	1.58	1.94	2.03	2.12
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)		0.393 J	1.27 J	1.11 J	1.45	1.41	1.42
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)		1.09	2.26 J	4.38	5.41	4.45	4.96
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)		0.895 J	2.52 J	2.78	3.07	2.88	3.08
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)		16.7	16.1	75.1	99.8	79.4	74.6
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)		125	112	631	858	664	584
Total Tetrachlorodibenzo-p-dioxin (TCDD)		9.38 J	12.7 J	48.2 J	47.5	64.7	58 J
Total Pentachlorodibenzo-p-dioxin (PeCDD)		8.07	12.7 J	40	37	40.8	42.2
Total Hexachlorodibenzo-p-dioxin (HxCDD)		18.4 J	20.8 J	78.5 J	92.7	73.4	82.3
Total Heptachlorodibenzo-p-dioxin (HpCDD)		76.1	64.60	358	512	388	325
2,3,7,8-Tetrachlorodibenzofuran (TCDF)		0.846 J	2.17 J	2.78	2.91	3.73	4.31
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)		0.419 J	1.89 J	1.1 J	1.16 J	1.4	1.6
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)		0.383 J	1.72 J	1.22	1.29	1.4 J	1.76 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)		0.245 J	1.2 J	1.15 J	1.24	1.36 J	1.42 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)		0.261 J	1.14 J	0.776 J	0.932 J	0.945 J	1.19
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)		0.117 J	2.07 J	0.299 J	0.337 J	0.339 J	0.409 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)		0.259 J	0.956 J	1.06 J	1.17 J	1.29 J	1.41 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)		2.07	3.41 J	10.6	12.7	11	11.7 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)		0.148 J	1.83 J	0.516 J	0.649 J	0.684 J	0.691 J
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)		3.64	4.86 J	21.2	25	22.3	23
Total Tetrachlorodibenzofuran (TCDF)		14.3	19.7 J	42.9	49.9	59	76.6
Total Pentachlorodibenzofuran (PeCDF)		6.49 J	9.63 J	20.6 J	24.5 J	26.4 J	29.6 J
Total Hexachlorodibenzofuran (HxCDF)		4.19 J	10.7 J	18.8 J	21.7 J	20.5 J	22.3 J
Total Heptachlorodibenzofuran (HpCDF)		5.33 J	9.41 J	29.2 J	35.9 J	30.8	32.8 J
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)	5	1.605842 J	5.289758 J	5.11832 J	6.10109 J	6.00913 J	6.39391 J

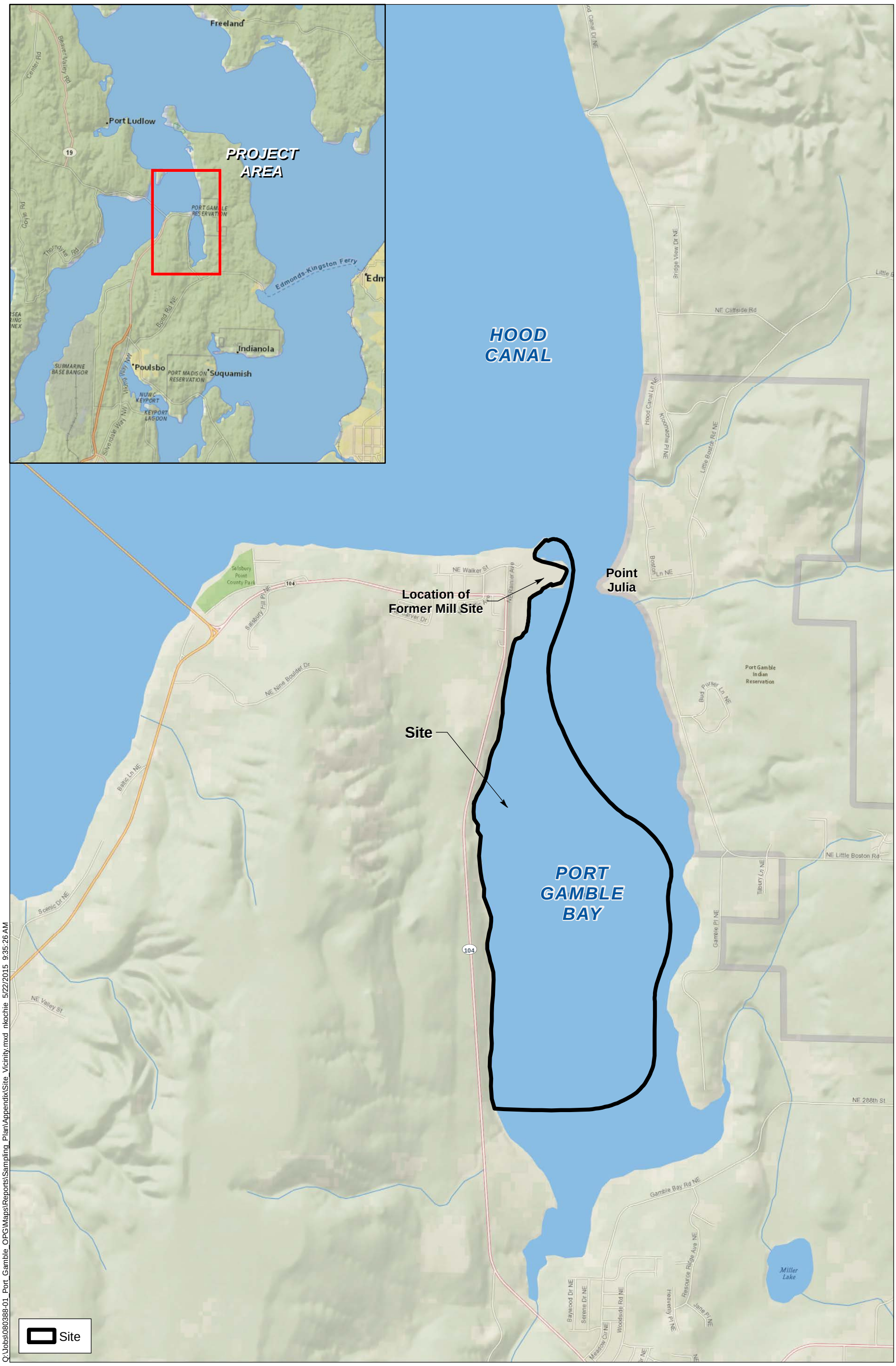
Notes:
µg/kg = micograms per kilogram
cm = centimeter
cPAH = carcinogenic polycyclic aromatic hydrocarbon
FD = field duplicate
J = estimated value
mg/kg = mliligrams per kilogram
N= normal
ng/kg = nanograms per kilogram
SE = sediment
TEQ = Toxic Equivalents Quotient
U = not detected above reporting limit

Table F-2
Natural Recovery Model Input Parameters

Model Parameter	SMA-1	SMA-2	SMA-3	SMA-4	SMA-5	Comments
Starting Surface Sediment cPAH (µg/kg)	525	162	39	32	35	SWAC based on 10-cm surface data (2008 – 2011)
Depositing Particle cPAH (µg/kg)	5 and 10					Estimated based on multiple lines of evidence, including 0 to 2 cm core data
Net sedimentation rate (cm/yr)	0.4					Dated lead-210 cores (range of 0.3 to 0.5 cm/yr)
Model domain and mixing depth						Model framework is based on a 2-cm completely mixed zone overlying an 8-cm-thick zone with no mixing (for total thickness of 10 cm for assessing compliance)
Area (acres)	6	19	61	19	609	
Post-Capping/Thin Layer Capping cPAH (µg/kg)	8			NA	NA	1/2 cleanup level
cPAH Dredge Residual (µg/kg)	430		NA	NA	NA	Average concentration in dredge areas (SMA-1 and SMA-2)

Notes:
Model framework is based on a 2-cm completely mixed zone overlying an 8-cm-thick zone with no mixing (for total thickness of 10 cm for assessing compliance).
NA - not applicable
µg/kg - microgram per kilogram
cm/yr - centimeters per year

FIGURES



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Feet
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Figure F-1
Site Vicinity Map
Appendix F: Operations, Maintenance, and Monitoring Plan
Port Gamble Bay Cleanup

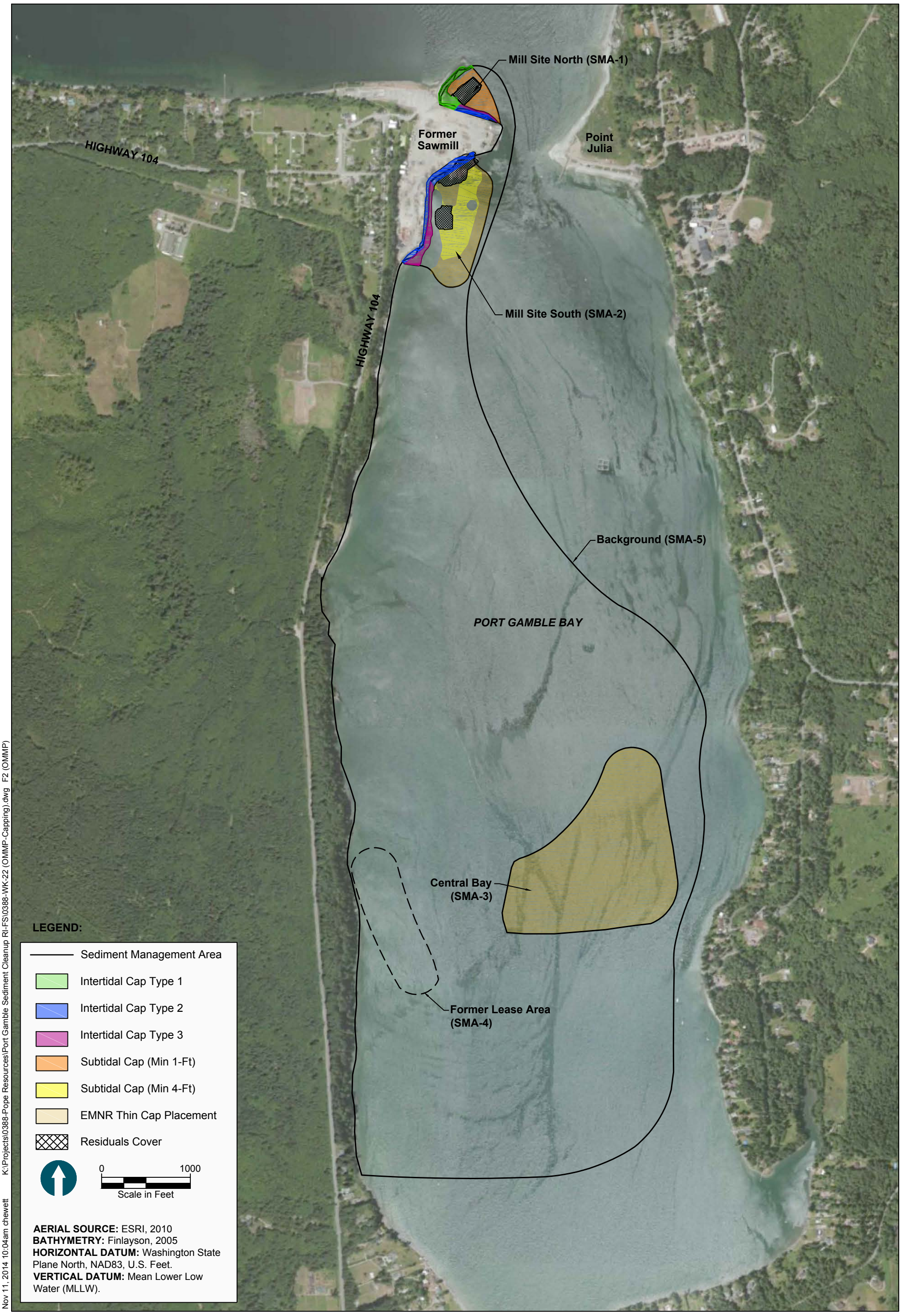

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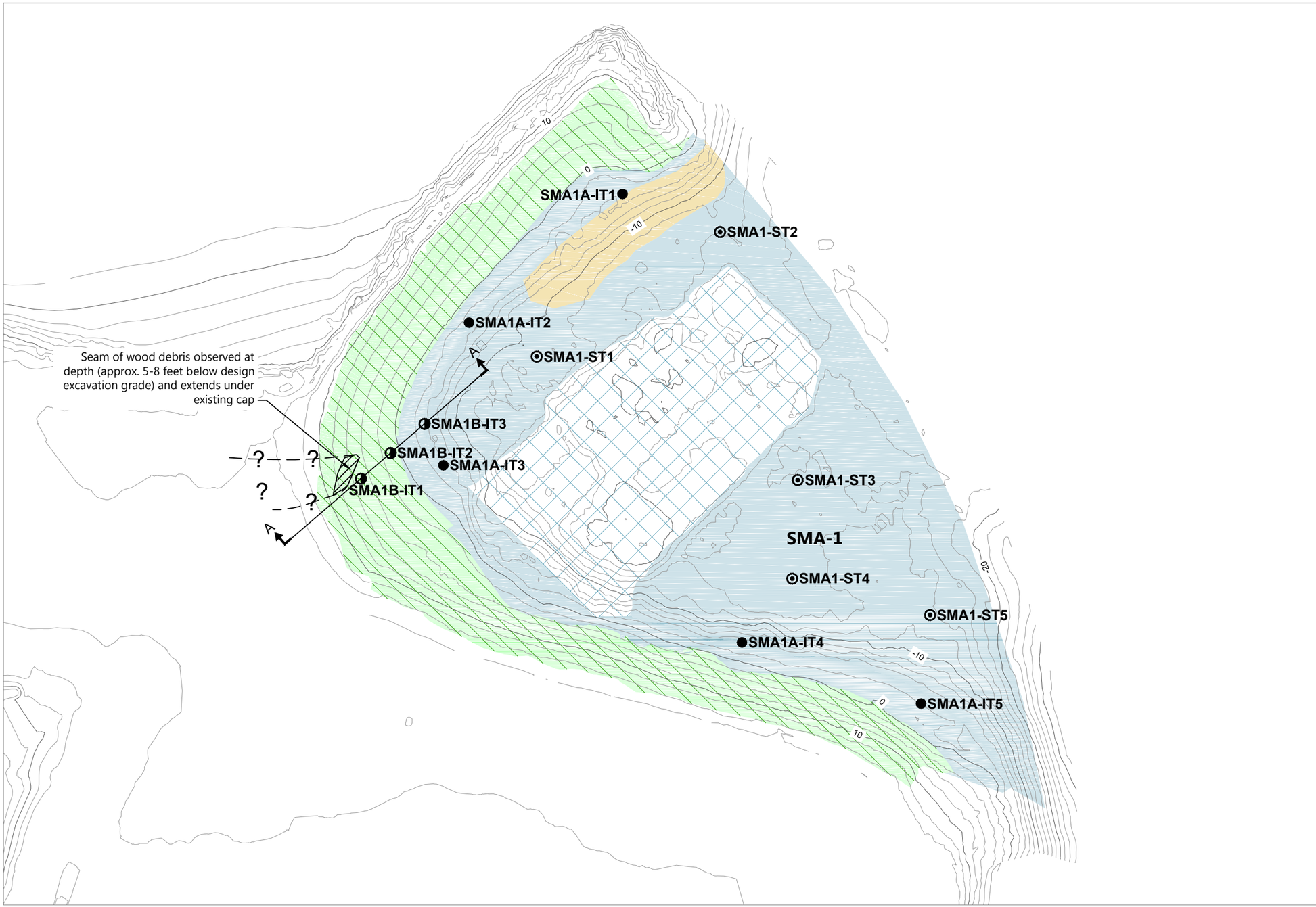
Figure F-2
Capping and EMNR Areas in SMA-1, SMA-2, and SMA-3
Appendix F: Operations, Maintenance, and Monitoring Plan
Port Gamble Bay Cleanup



LEGEND:

- 10 — Post-construction Contours (2' Intervals)
- SMA — Sediment Management Area
- Subtidal Dredge Sediment/Wood Debris Deposit With Residuals Cover
- Intertidal Cap (Approx. 2'-3'-Thick)
- Intertidal Excavation
- Subtidal Cap (Approx. 1.5'-Thick)
- EMNR (Approx. 6" Sand and/or Silt)
- Approximate Area of Wood Debris Under Cap
- Proposed Subtidal Sentinel Surface Sediment Sample Aliquot Location
- Proposed Intertidal Sentinel Surface Sediment Sample Aliquot Location
- Proposed Intertidal DGT (and Potential Bioassay) Sediment Sample Location - Capped Wood Debris

SOURCE: Topography from Triad, dated 2012. Bathymetry from eTrac, dated January 19, 2017.
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

0 100
Feet

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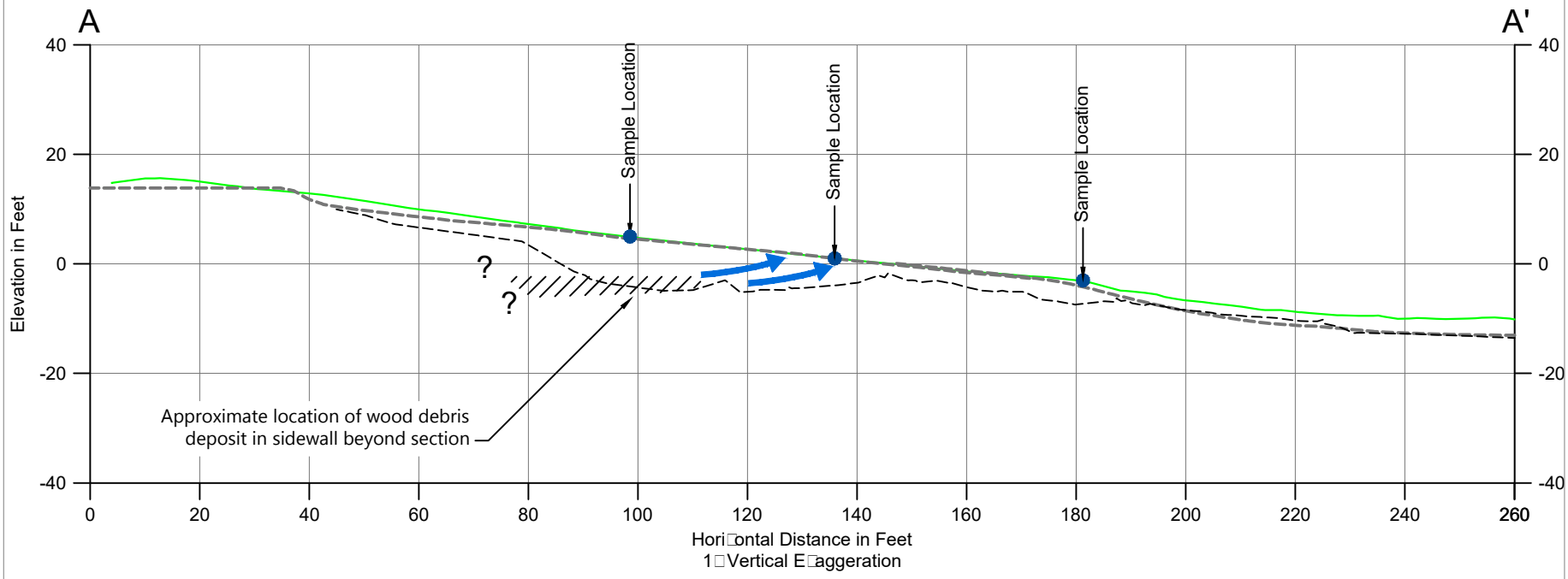
Figure F-3a
Sediment Sampling Stations (SMA-1)

Appendix F: Operations, Maintenance, and Monitoring Plan
Port Gamble Bay Cleanup



SOURCE: Pre-construction bathymetry from eTrac, dated August 27, 2014. Post-dredge bathymetry from Orion. Post-cap and -backfill bathymetry from eTrac, dated January 19, 2017.
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- Pre-construction Grade
- Post-dredge Grade
- Post-cap and -backfill Grade
- Approximate Wood Debris Seam Under Cap
- Approximate Groundwater Flow
- Proposed Sample Location

0 30
Feet

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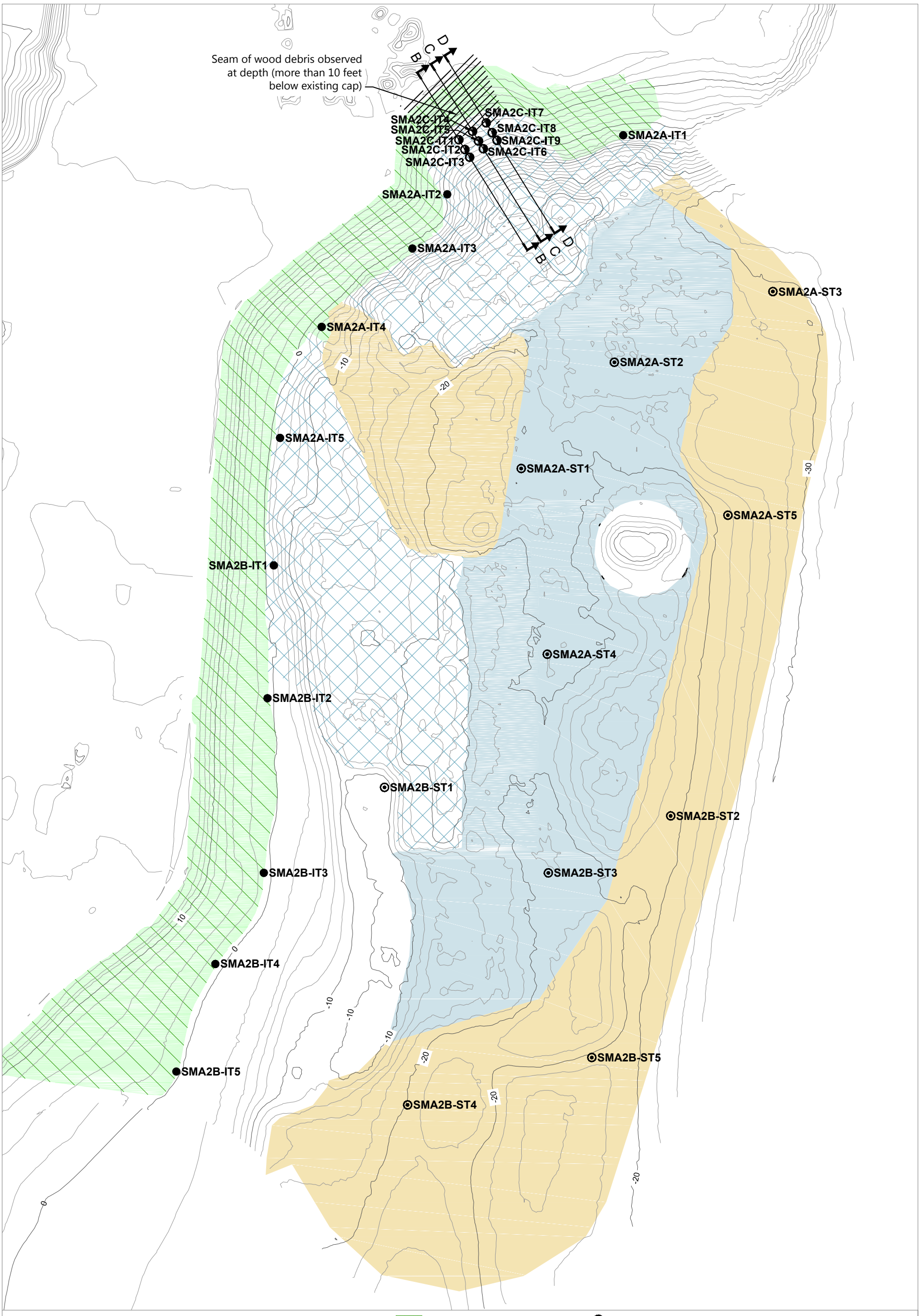
Figure F-3b
Sediment Sampling Cross Section (SMA-1)

Appendix F: Operations, Maintenance, and Monitoring Plan
Port Gamble Bay Cleanup



SOURCE: Topography from Triad, dated 2012. Bathymetry from eTrac, dated January 19, 2017.
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- 10 — Post-construction Contours (2' Intervals)
- *SMA* — Sediment Management Area
- Subtidal Dredge Sediment/ Wood Debris Deposit With Residuals Cover
- Intertidal Cap (Approx. 2'-3'-Thick)
- Intertidal Excavation
- Sand Cap (Approx. 4'-Thick)
- EMNR (Approx. 6" Sand and/or Silt)
- Approximate Area of Wood Debris Under Cap
- Proposed Subtidal Sentinel Surface Sediment Sample Aliquot Location
- Proposed Intertidal Sentinel Surface Sediment Sample Aliquot Location
- Proposed Intertidal DGT (and Potential Bioassay) Sediment Sample Location - Capped Wood Debris

0 120
Feet

Publish Date: 2018/01/04 10:22 AM | User: chewett
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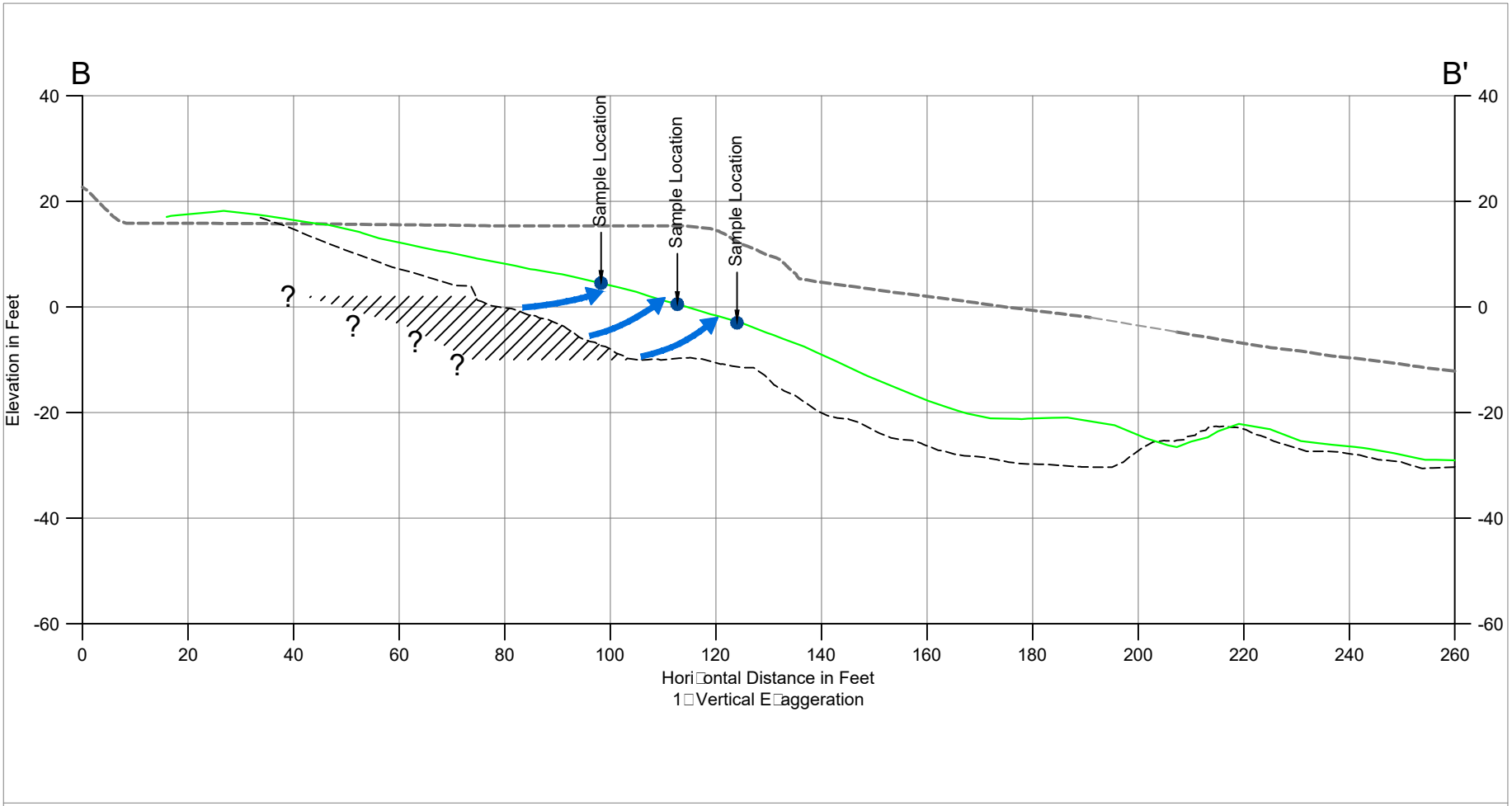
Figure 4a
Sediment Sampling Stations (SMA-2)

Appendix F: Operations, Maintenance, and Monitoring Plan
Port Gamble Bay Cleanup



SOURCE: Pre-construction bathymetry from eTrac, dated August 27, 2014. Post-dredge bathymetry from Orion. Post-cap and -backfill bathymetry from eTrac, dated January 19, 2017.
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- Pre-construction Grade
- Post-dredge Grade
- Post-cap and -backfill Grade
- Approximate Wood Debris Seam Under Cap
- Approximate Groundwater Flow
- Proposed Sample Location

0 30
Feet

Publish Date: 2017/12/19 9:06 AM | User: chewett
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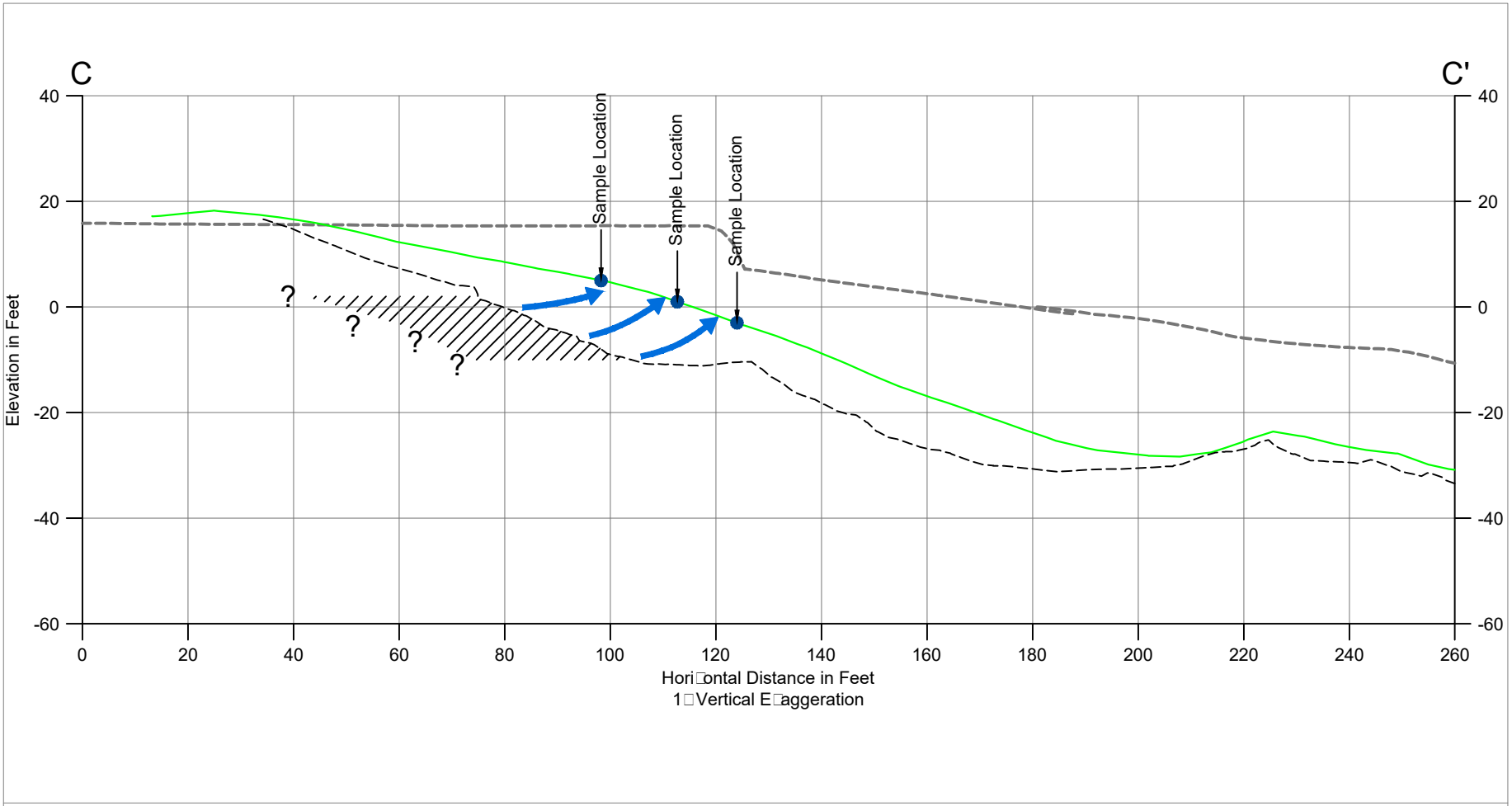
Figure F-4b
Sediment Sampling Cross Section (SMA-2)

Appendix F: Operations, Maintenance, and Monitoring Plan
Port Gamble Bay Cleanup



SOURCE: Pre-construction bathymetry from eTrac, dated August 27, 2014. Post-dredge bathymetry from Orion. Post-cap and -backfill bathymetry from eTrac, dated January 19, 2017.
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- Pre-construction Grade
- Post-dredge Grade
- Post-cap and -backfill Grade
- Approximate Wood Debris Seam Under Cap
- Approximate Groundwater Flow
- Proposed Sample Location

0 30
Feet

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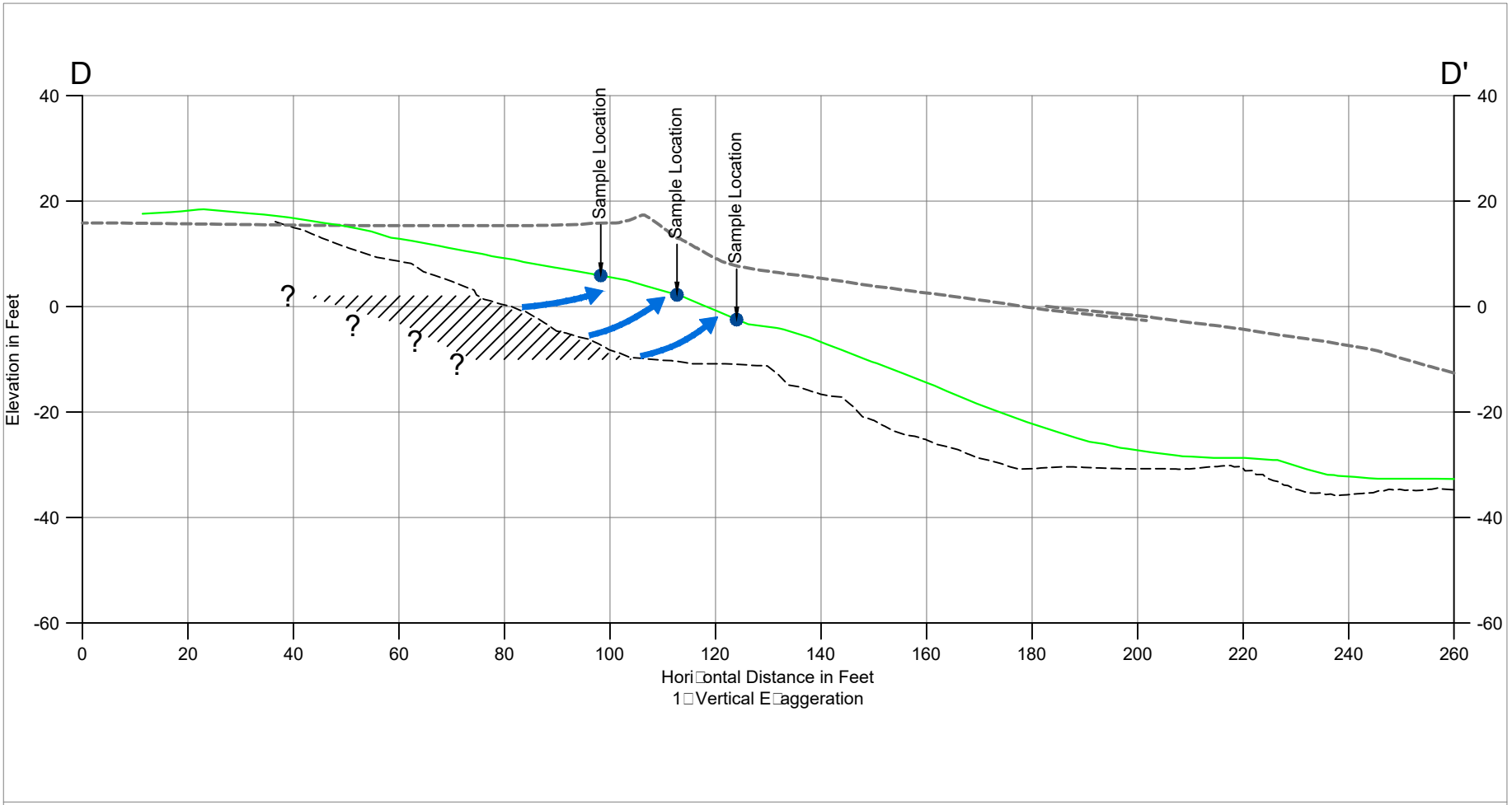
Figure F-4c
Sediment Sampling Cross Section (SMA-2)

Appendix F: Operations, Maintenance, and Monitoring Plan
Port Gamble Bay Cleanup



SOURCE: Pre-construction bathymetry from eTrac, dated August 27, 2014. Post-dredge bathymetry from Orion. Post-cap and -backfill bathymetry from eTrac, dated January 19, 2017.
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- Pre-construction Grade
- Post-dredge Grade
- Post-cap and -backfill Grade
- Approximate Wood Debris Seam Under Cap
- Approximate Groundwater Flow
- Proposed Sample Location

0 30
Feet

Publish Date: 2017/12/19 9:06 AM | User: chewett
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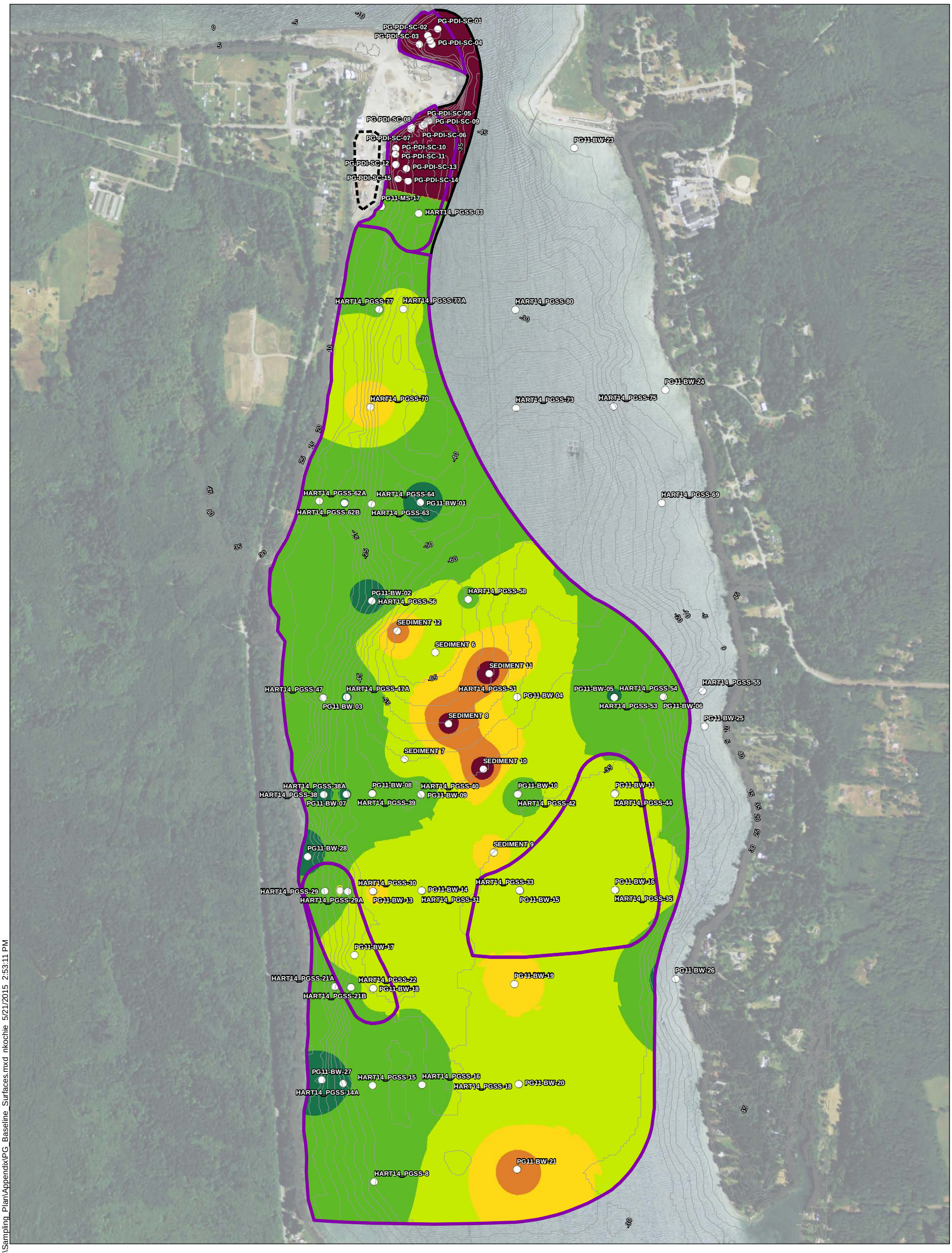
Figure F-4d
Sediment Sampling Cross Section (SMA-2)

Appendix F: Operations, Maintenance, and Monitoring Plan
Port Gamble Bay Cleanup



Sample Locations

Port Gamble SMA

- Sediment Management Area (SMA)
- Proposed Upland Re-handling/Beneficial Reuse Area
- SWAC Area

cPAH TEQ (U=1/2 µg/kg)

- < 16
- 16 - 32
- 32 - 48
- 48 - 64
- 64 - 80
- > 80

NOTE:
Site-wide area-weighted average cPAH TEQ = 42.4 µg/kg

Feet
0 500 1,000

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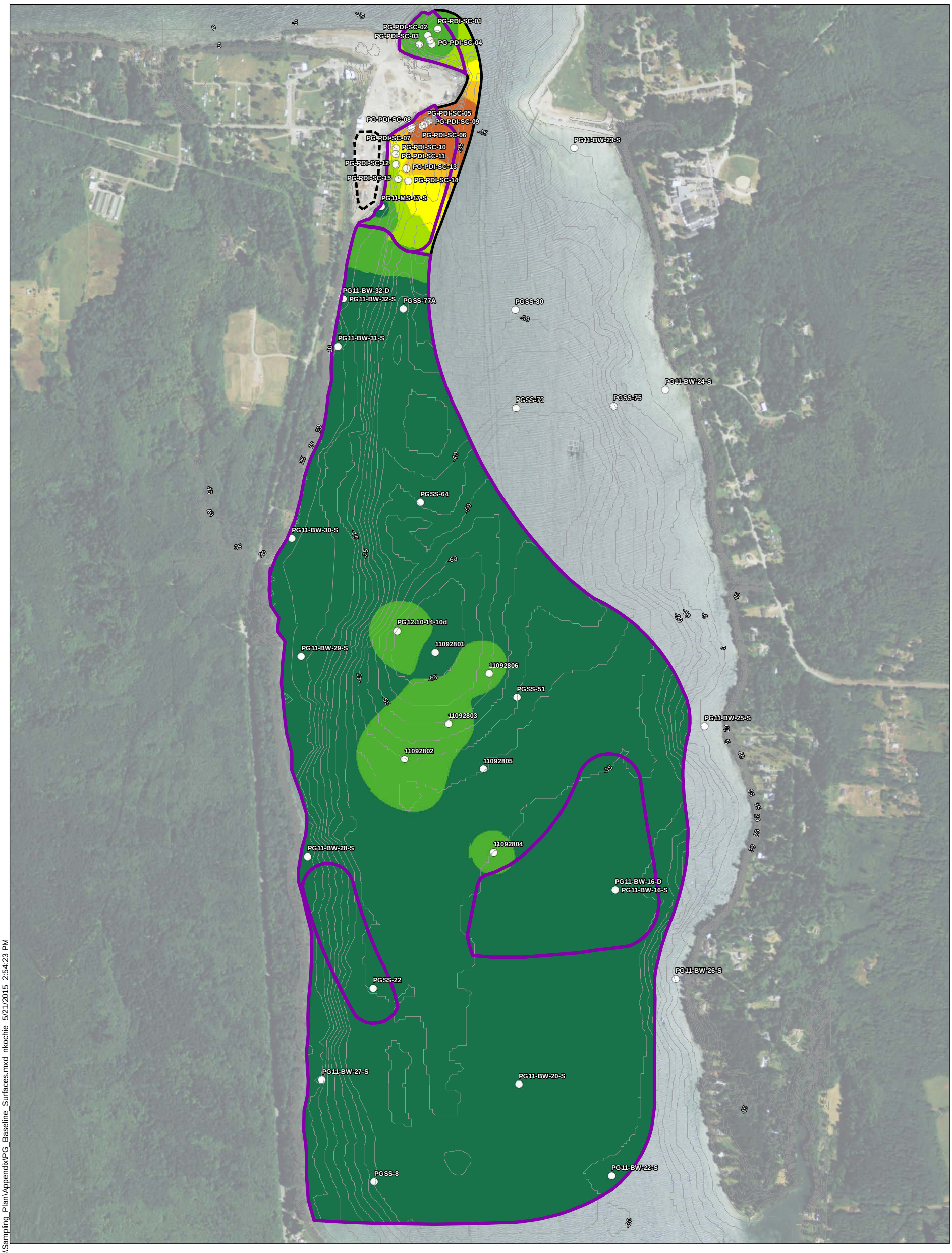
Figure F-5
Baseline (2010) Surface Sediment TEQ
Appendix F: Operations, Maintenance, and Monitoring Plan
Port Gamble Bay Cleanup



Sample Locations

Port Gamble SMA

- Sediment Management Area (SMA)
- Proposed Upland Re-handling/Beneficial Reuse Area
- SWAC Area

DF TEQ (U=1/2 Mammal)

- < 5
- 5 - 10
- 10 - 15
- 15 - 20
- 20 - 25
- 25 - 50
- > 50

NOTE:
Site-wide area-weighted average dioxin/furan TEQ = 2.9 ng/kg

Feet
0 500 1,000

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Figure F-6
Baseline (2010) Surface Sediment Dioxin/Furan TEQ
Appendix F: Operations, Maintenance, and Monitoring Plan
Port Gamble Bay Cleanup

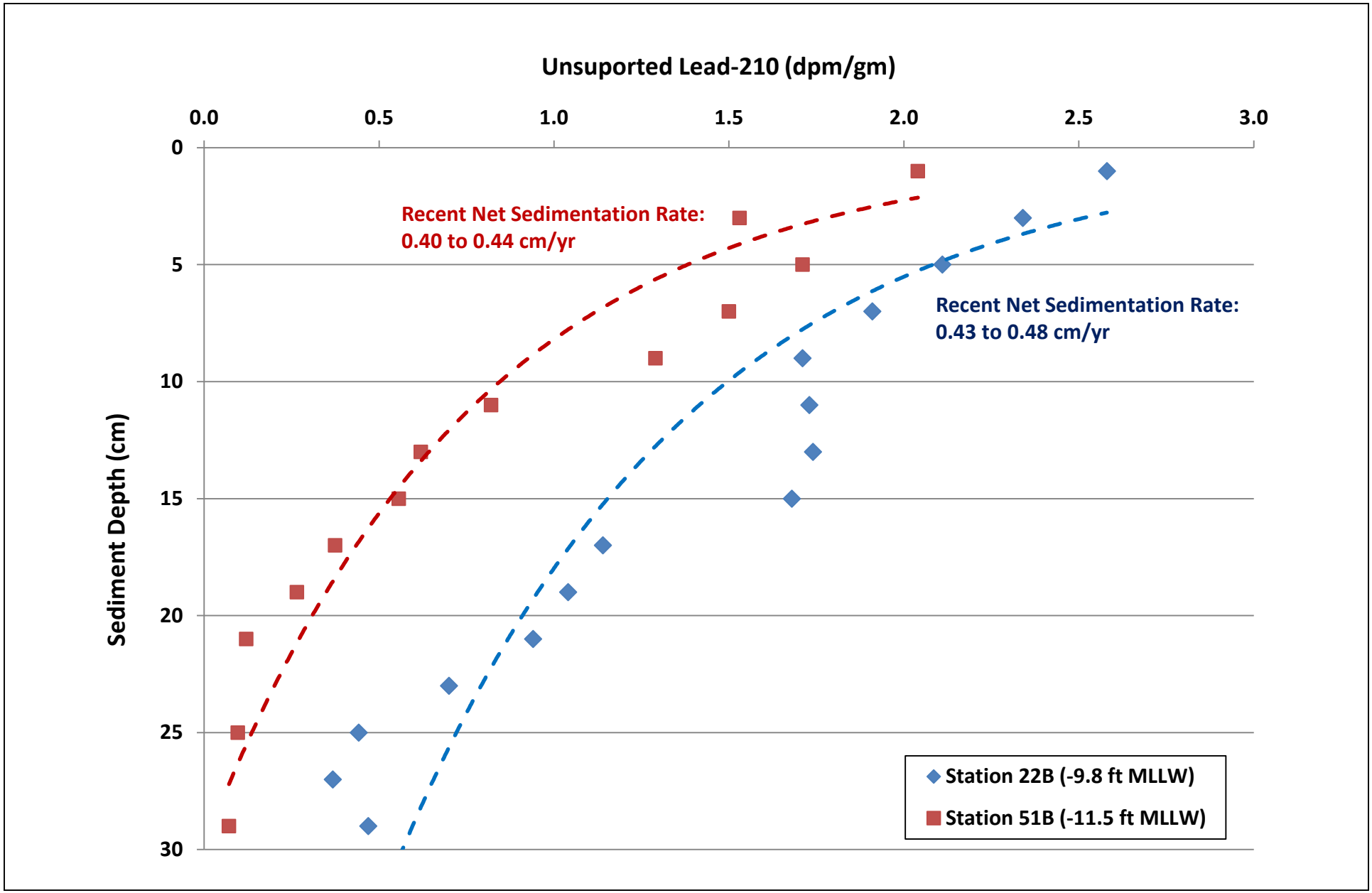

Figure F-7
Radioisotope Core Data: Central Port Gamble Bay
Appendix F: Operations, Maintenance, and Monitoring Plan
Port Gamble Bay Cleanup

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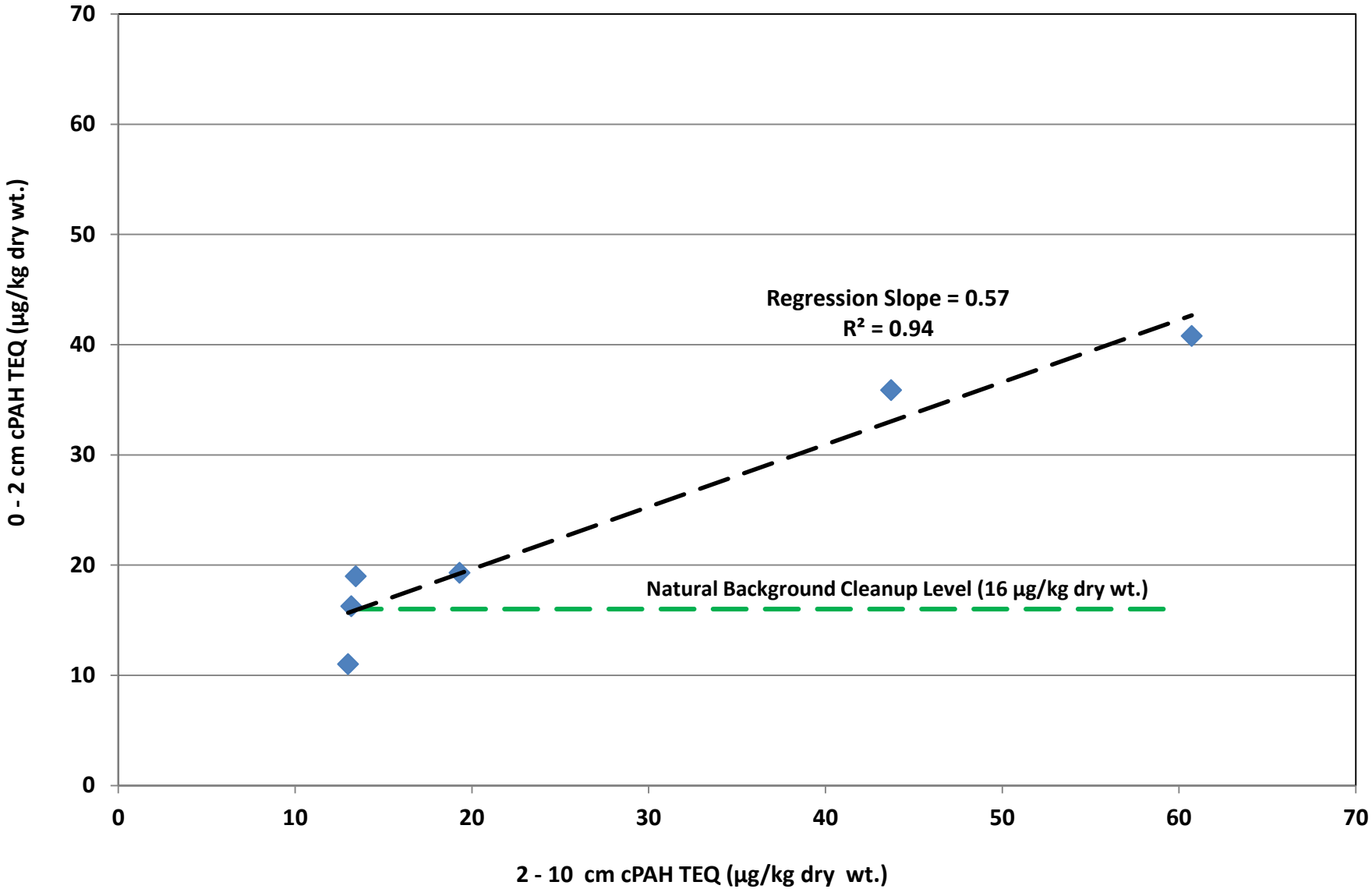

Figure F-8
Comparison of Near-Surface Sediment cPAH Concentrations in SMA-5
Appendix F: Operations, Maintenance, and Monitoring Plan
Port Gamble Bay Cleanup

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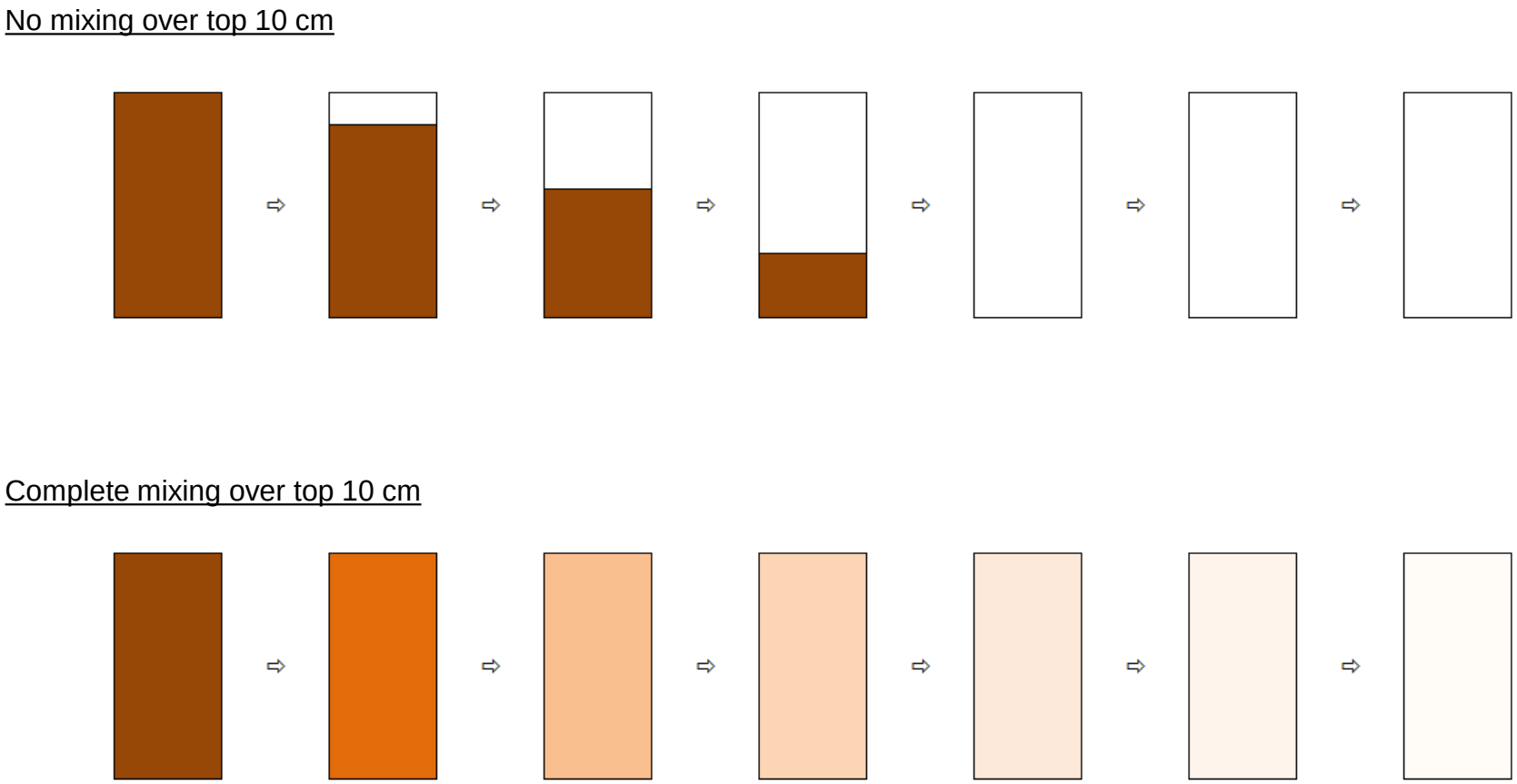

Figure F-9
Schematic Depicting Bounding Natural Recovery Calculations
Appendix F: Operations, Maintenance, and Monitoring Plan
Port Gamble Bay Cleanup

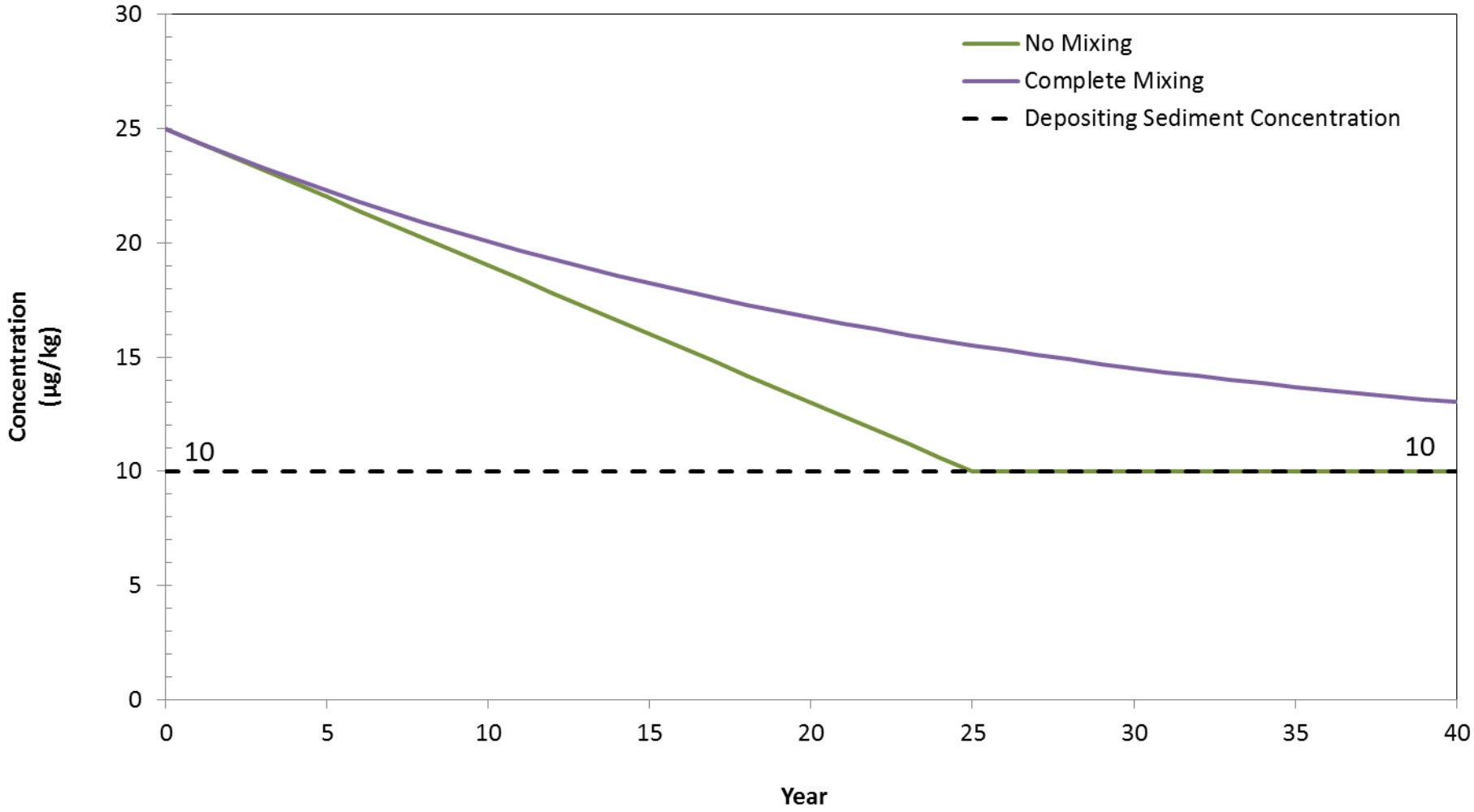

Figure F-10
Example Bounding Calculation Model Results
Appendix F: Operations, Maintenance, and Monitoring Plan
Port Gamble Bay Cleanup

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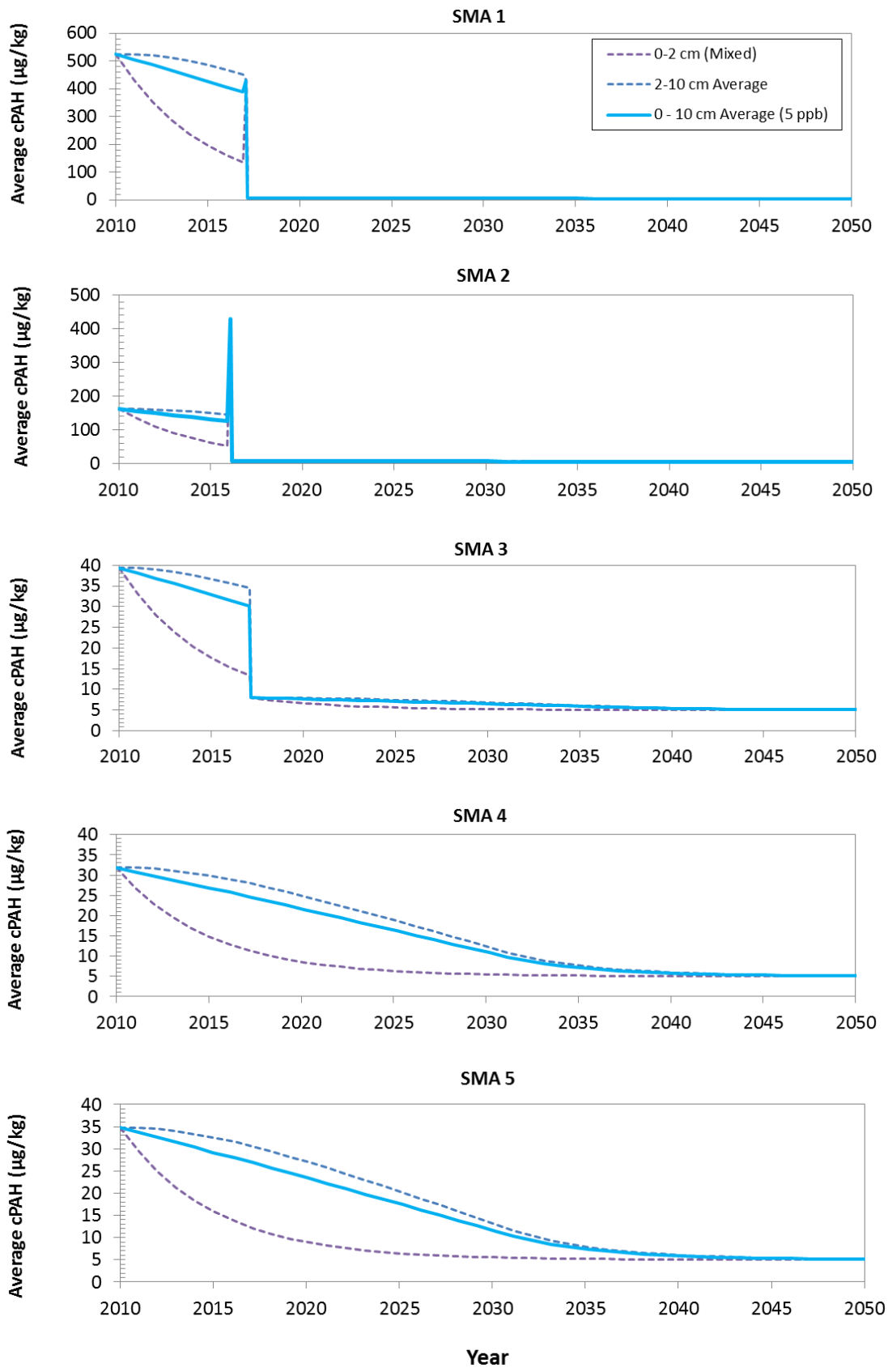

Figure F-11
SMA-specific Model Results Assuming 5 µg/kg on Depositing Sediment
Appendix F: Operations, Maintenance, and Monitoring Plan
Port Gamble Bay Cleanup

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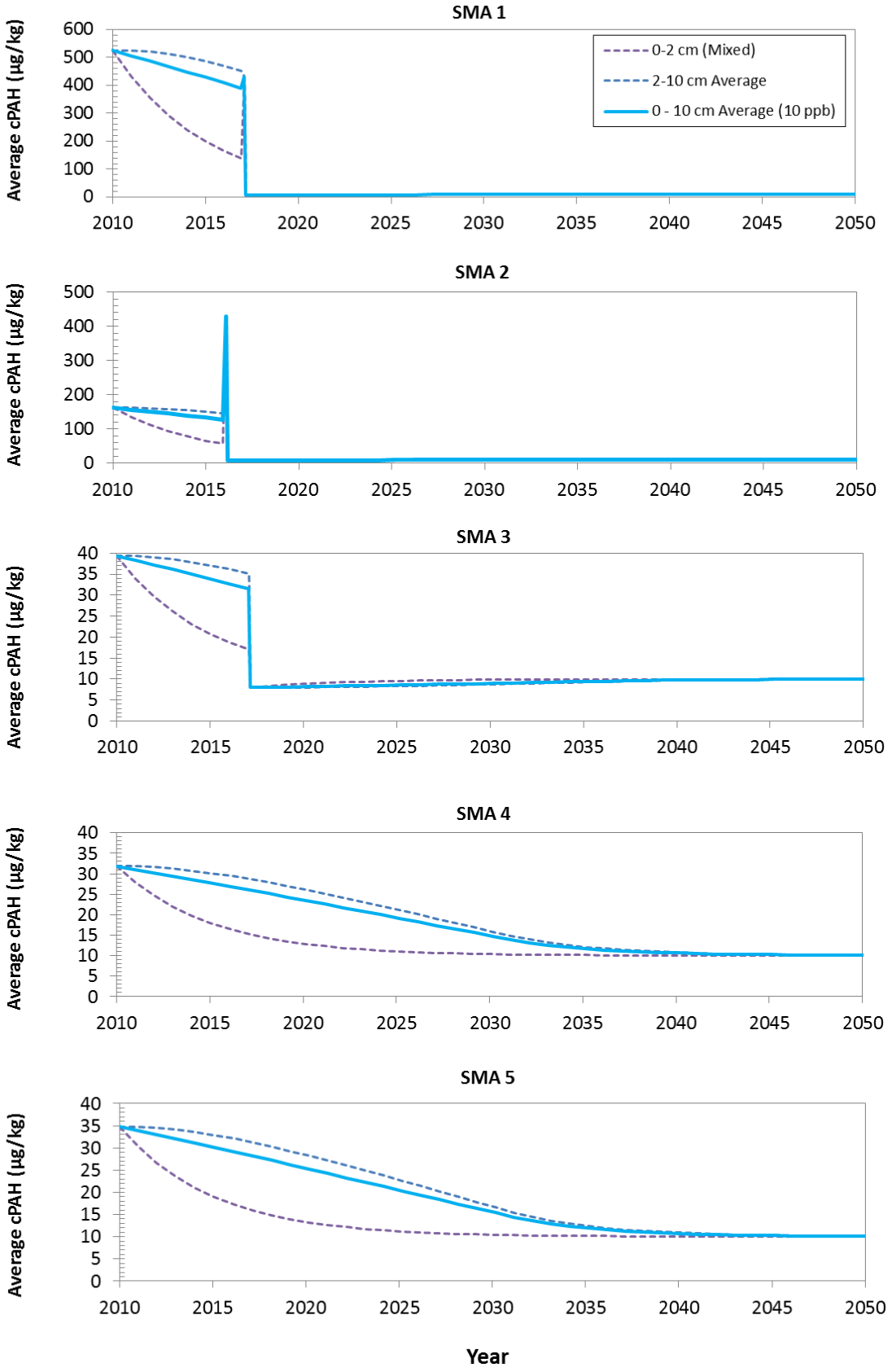

Figure F-12
SMA-specific Model Results Assuming 10 µg/kg on Depositing Sediment
Appendix F: Operations, Maintenance, and Monitoring Plan
Port Gamble Bay Cleanup

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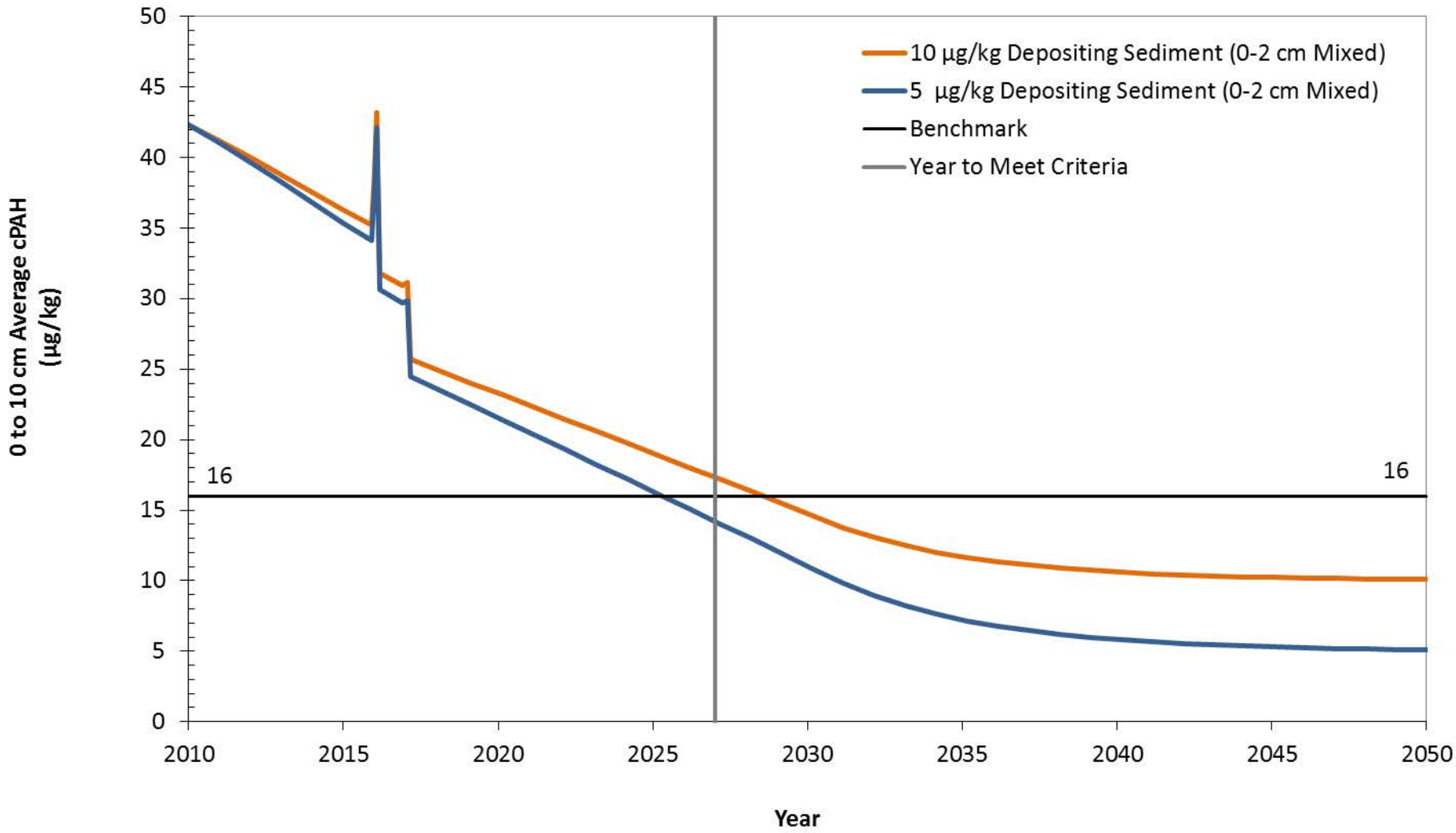

Figure F-13
Modeled Site-wide Surface Sediment cPAH Concentrations
Appendix F: Operations, Maintenance, and Monitoring Plan
Port Gamble Bay Cleanup

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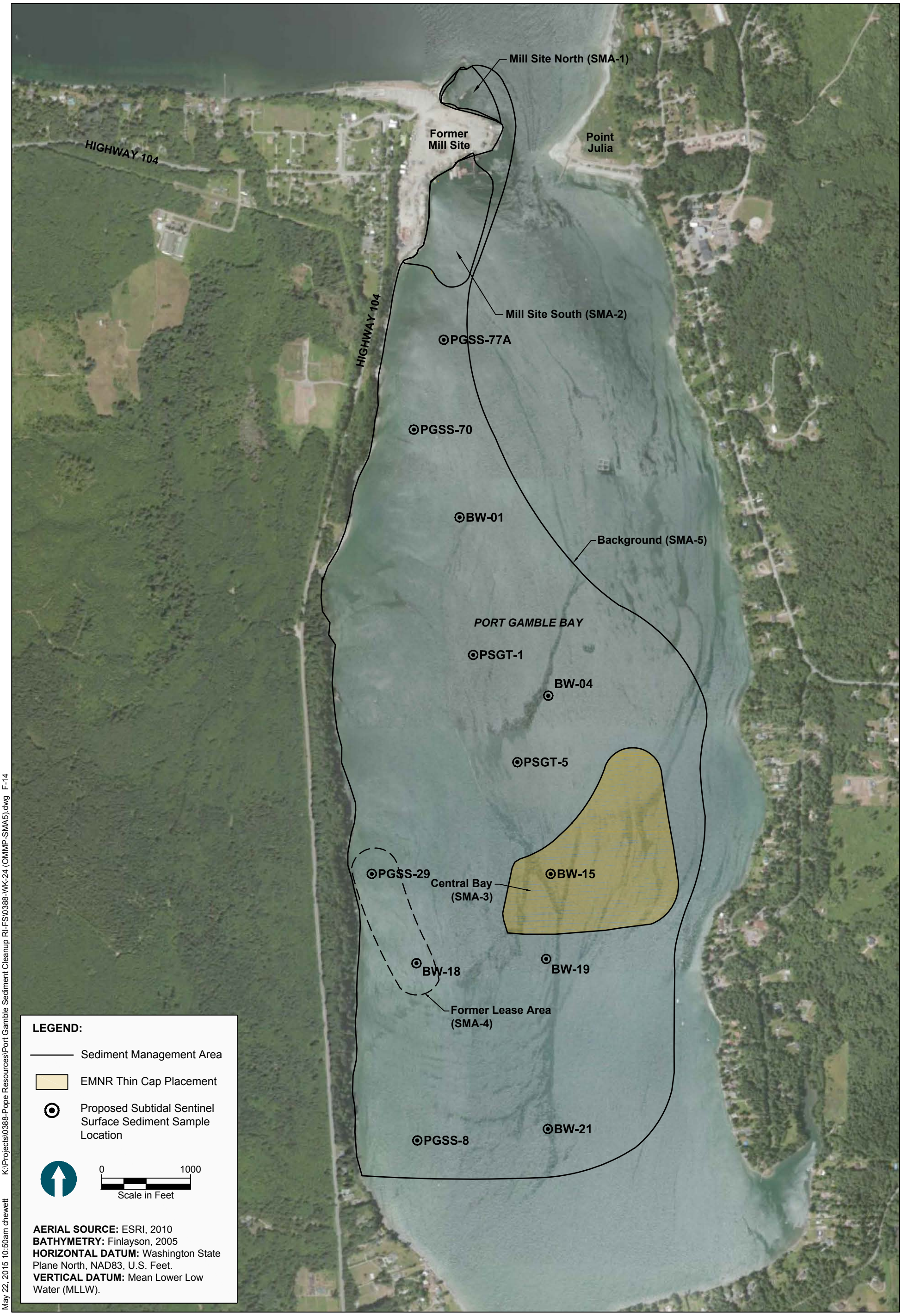

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Figure F-14
Surface Sediment Sampling Stations, Port Gamble Bay
Appendix F: Operations, Maintenance and Monitoring Plan
Port Gamble Bay Cleanup

ATTACHMENT F-1
SAMPLING AND ANALYSIS PLAN

TABLE OF CONTENTS

1 INTRODUCTION 1

2 SAMPLE PROCESS DESIGN 2

2.1 Field Surveys 2

2.2 Sediment Cap Physical Integrity Core Collection and Processing 3

2.3 Sediment Quality Confirmation Monitoring at Sentinel Cap Locations 3

2.4 Confirmation Monitoring in Nearshore Wood Debris Cap Locations 3

2.5 Natural Recovery Sediment Quality Monitoring 5

3 SAMPLING METHOD REQUIREMENTS 6

3.1 Sediment Cap Physical Integrity Core Collection and Processing 6

3.1.1 Sediment Cap Physical Integrity Core Collection Procedures 6

3.1.2 Sediment Cap Physical Integrity Core Processing Procedures 7

3.2 Sediment Cap Quality Confirmation Monitoring Collection and Processing 9

3.2.1 Sediment Cap Quality Confirmation Monitoring Sample Collection Procedures – Sentinel Locations 9

3.2.2 Sediment Cap Quality Confirmation Sample Processing Procedures – Sentinel Locations 10

3.2.3 Sediment Cap Quality Confirmation Monitoring Sample Collection Procedures – Nearshore Wood Debris Cap Locations 12

3.2.4 Sediment Cap Quality Confirmation Sample Processing Procedures – Nearshore Wood Debris Cap Locations 12

3.3 Natural Recovery Sediment Quality Monitoring Collection and Processing 13

3.3.1 Natural Recovery Surface Sediment Sample Collection Procedures 13

3.3.2 Natural Recovery Surface Sediment Sample Processing Procedures 14

3.4 Sampling Schedule and Platform 15

3.5 Horizontal Positioning and Vertical Control 16

3.6 Field Documentation 16

3.7 Sample Station Locations and Sample Identification 17

3.8 Equipment Decontamination Procedures 18

3.9 Sample Containers for Analysis 18

3.10 Sample Transport and Chain-of-Custody Procedures 19

3.10.1 Sample Custody Procedures 19
3.10.2 Sample Shipping and Receipt Requirements 19
3.11 Waste Management 21

4 PHYSICAL AND CHEMICAL ANALYTICAL METHODS 22
4.1 Quality Assurance/Quality Control 22
4.1.1 Laboratory Instrument Calibration and Frequency 23
4.1.2 Laboratory Duplicates/Replicates 23
4.1.3 Matrix Spikes/Matrix Spike Duplicates 23
4.1.4 Method Blanks 24
4.1.5 Laboratory Control Samples 24
4.2 Laboratory Report 24

5 BIOLOGICAL TESTING 26
5.1 Biological Testing Procedures 26
5.2 Test Quality Assurance/Quality Control 27
5.2.1 Negative Controls 27
5.2.2 Positive Controls 27
5.2.3 Reference Sediment 27
5.2.4 Replicates 28
5.2.5 Water Quality Monitoring 28
5.3 Interpretation 28
5.4 Bioassay Retest 28
5.5 Data Deliverables 28

6 SAMPLING AND ANALYSIS RESULTS REPORT 30

7 REFERENCES 31

List of Tables

Table F-1-1 Station Locations and Sample Matrix Summary for Samples
Table F-1-2 Guidelines for Sample Handling and Storage

List of Attachments

Attachment F-1-1	Sample Collection Forms
Attachment F-1-2	Method Development and Verification Study for Sulfide Measurement in Porewater Using Diffusive-Gradients-in-Thin-Films (DGT)

LIST OF ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
AgI	silver iodide
Ag_2S	silver sulfide
ASTM	American Society for Testing and Materials
CCV	continuing calibration verifications
cm	centimeter
COC	chain-of-custody
cPAH	carcinogenic polycyclic aromatic hydrocarbon
DGPS	differential global positioning system
DGT	diffusive gradient thin sheet
DMMP	Dredge Material Management Program
Ecology	Washington State Department of Ecology
FC	Field Coordinator
GC/MS	gas chromatograph/mass spectrometer
H_2S	hydrogen sulfide
HDPE	high-density polyethylene
mL	milliliter
MLLW	mean lower low water
MSS	Marine Sampling Systems
NAD83	North American Datum 1983
OD	optical densitometer
OMMP	*Operations, Maintenance, and Monitoring Plan*
PSEP	Puget Sound Estuary Program
QA/QC	quality assurance/quality control
QAPP	*Quality Assurance Project Plan*
SAP	*Sampling and Analysis Plan*
Site	Port Gamble Bay Cleanup Project Site
SMA	Sediment Management Area
SMS	Sediment Management Standards
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency

1 INTRODUCTION

This *Sampling and Analysis Plan* (SAP) describes sampling and analysis activities for long-term monitoring in Port Gamble Bay, Washington (the "Site"). This SAP is appended to the *Operations, Maintenance, and Monitoring Plan* (OMMP). Attachment F-2 of the OMMP is the *Quality Assurance Project Plan* (QAPP). This SAP provides information specific to the collection and analysis of intertidal and subtidal sediment core samples, and collection of surface sediment grab samples for Site-specific chemicals of concern (carcinogenic polycyclic aromatic hydrocarbons [cPAHs], dioxins/furans, and cadmium) and bioassays.

This document summarizes the sampling plan, field sampling methods, and analytical and biological laboratory procedures. This SAP was prepared following the Washington State Department of Ecology (Ecology) *Sediment Sampling and Analysis Plan Appendix* guidance document (Ecology 2008). Analytical quality assurance/quality control (QA/QC) procedures were also developed based on the analytical protocols and QA guidance of the Puget Sound Estuary Program (PSEP) and U.S. Environmental Protection Agency's (USEPA's) *EPA Contract Laboratory Program National Functional Guidelines for Data Review* (USEPA 1999, 2004). All sample handling and biological analyses will follow the most recent PSEP protocols (PSEP 1986 as updated in 1989, 1991, 1995, and 1997). Biological analyses will follow Sediment Management Standards (SMS) Clarification Paper *Bioassay Endpoint Refinements: Bivalve Larval and Neanthes Growth Bioassays* (Kendall 2013).

2 SAMPLE PROCESS DESIGN

Long-term surveys and sampling and analysis plans for the Site are summarized in Sections 2.1 through 2.4.

2.1 Field Surveys

Field surveys will be conducted in the subtidal, intertidal, and upland areas to determine the stability of the Site following construction. Immediately following construction completion, a comprehensive survey was performed to document post-construction elevations. The post-construction survey will be subsequently compared to monitoring surveys. Bathymetric and topographic survey elements will be integrated into a single elevation contour surface to allow for comparison of the post-construction elevations. For consistency, the bathymetric and topographic surveys will be performed in accordance with applicable guidance.

Bathymetric survey will be performed using multi-beam survey equipment in subtidal and lower intertidal areas to determine mudline elevations. The multi-beam surveys will be conducted by a licensed surveyor and will meet or exceed the accuracy standards of +/- 0.2 feet as referenced in the U.S. Army Corp of Engineers (USACE) Hydrographic Survey Manual, April 2004 Revision (USACE 2004).

Topographic surveys will be conducted in the upper intertidal and upland Site areas to identify changes in elevations. For upper intertidal cap areas not included in the bathymetric survey, a topographic survey will be performed using established control points as part of long-term monitoring to identify changes in shoreline sloping cap elevations. The topographic surveys will be conducted by a licensed surveyor and will meet or exceed the accuracy standards of +/- 0.1 foot as referenced in the USACE Control and Topographic Surveying Manual, January 2007 (USACE 2007).

Following the completion of the bathymetric and topographic surveys, a licensed surveyor will integrate the bathymetric and topographic elevation contours into a single set of elevation contours. These contours will then be evaluated by Computer Aided Drafting isopach methodology. This comparison will be used to identify zones of accretion, settlement, or erosion.

2.2 Sediment Cap Physical Integrity Core Collection and Processing

As discussed in the OMMP, sediment core sampling may be performed in the intertidal and/or subtidal cap areas where topographic and/or bathymetric survey data suggest possible cap settlement and/or erosion of cap thicknesses. At these locations, cores would be advanced to a minimum depth of 1 foot below the cap thicknesses described in the Engineering Design Report.

2.3 Sediment Quality Confirmation Monitoring at Sentinel Cap Locations

Surface sediment quality monitoring will be conducted at six designated sentinel intertidal and subtidal sampling stations composed of 5-point aliquots representative of the sediment management area (SMA)-1 and SMA-2 cap areas (see Figures F-3a and F-4a of the accompanying OMMP). Samples will be collected using a van Veen grab sampler or equivalent deployed from a winch line on a sampling vessel. Sample aliquots in intertidal areas may be collected directly from the cap surface during low tide using hand tools (e.g., hand auger steel spoons or scoops). The sediment samples will be collected from the 0- to 10-centimeter (cm) biologically active zone, composited, and submitted for analysis of cPAHs, dioxin/furans, cadmium, and larval bioassays.

2.4 Confirmation Monitoring in Nearshore Wood Debris Cap Locations

Surface sediment quality monitoring will also be conducted within two areas where buried nearshore wood debris deposits that could not be practicably removed were capped along the shoreline (i.e., within the North Basin in SMA-1 and the Former Pier 4 Area in SMA-2). Sediment monitoring in nearshore wood debris cap locations will consist of initial passive in situ diffusive gradient thin sheet (DGT) monitoring of porewater total free sulfide. DGT probes will be advanced at three locations along a single transect in SMA-1 (total of three locations), and at three locations along three parallel transects in SMA-2 (total of nine locations). At each of these twelve DGT sampling locations, probes will be installed at two depth intervals, approximately 6 and 24 inches below the mudline, respectively, for a total of six sample points in SMA-1 and 18 sample points in SMA-2. If the probe encounters refusal above the 24-inch depth, two additional attempts will be conducted within approximately 3 feet of the original sample location; if all three attempts are unsuccessful, the attempts will be documented, and no deep DGT deployment will be conducted at that location.

Following an approximate 24-hour DGT deployment period, representative surface sediment (approximately 6 inches below mudline) porewater temperature, pH, and salinity measurements will be conducted at all twelve porewater sampling locations during low tide conditions (i.e., at the time the DGTs are retrieved). Surface sediment (6-inch depth) temperature, pH, and salinity will also be representative of the underlying shallow subsurface (24-inch depth) interval. Porewater H_2S concentrations will be calculated based on field optical densitometry of the DGT gels and concurrent temperature, pH, and salinity data.

Bioassay sampling at discrete surface sample locations will be conducted following DGT retrieval and calculation of porewater H_2S concentrations. Surface sediment samples for bioassay analyses will be collected at all sample locations with a surface (6-inch depth) or subsurface (24-inch depth) porewater H_2S concentration greater than 0.07 mg/L, the risk-based sediment porewater H_2S benchmark developed by Ecology for Port Gamble Bay. If all surface or shallow subsurface porewater H_2S concentrations along a transect are less than 0.07 mg/L, then a single bioassay sample will be collected from each transect (one in SMA-1 and three in SMA-2) at the transect location with the highest porewater H_2S concentration. If all porewater H_2S concentrations within a transect are below detection limits, the location along the transect with the lowest porewater salinity measurement will be selected for bioassay analysis. In any event, a minimum of one surface sediment bioassay sample will be collected from each of the four transects (one in SMA-1 and three in SMA-2).

The bioassay testing that will be performed on targeted surface sediment samples collected from within the targeted nearshore wood debris cap locations will include the following suite of SMS bioassays (two acute and one chronic test):

- Larval Development Acute Test (using the SMS resuspension method, either with bivalve or echinoderm organisms, depending on seasonal availability)
- 10-day Amphipod Survival Acute Test
- 20-day Juvenile Polychaete Growth Chronic Test

2.5 Natural Recovery Sediment Quality Monitoring

Surface sediment recovery sampling will be performed at a total of 12 sentinel monitoring locations in SMA-3, SMA-4, and SMA-5 (see Figure F-14 of the accompanying OMMP) to verify natural recovery at the Site. Samples will be collected using a van Veen grab sampler or equivalent deployed from a winch line on a sampling vessel. The sediment samples will be collected from the 0- to 2-cm and 2- to 10-cm intervals; homogenized; submitted for cPAH, dioxin/furan, and cadmium analysis; and compared to baseline (2014) concentrations to characterize surface sediment natural recovery trends. The frequency of the long-term natural recovery monitoring at the Site is defined in the OMMP.

3 SAMPLING METHOD REQUIREMENTS

This section addresses the sample collection and processing procedures that will be used to ensure data quality from sample collection to sample processing. Specifically, this section describes collection, subsampling, compositing, sample scheduling, positioning, identification, field QA, and waste management.

3.1 Sediment Cap Physical Integrity Core Collection and Processing

Sections 3.1.1 and 3.1.2 describe the collection, processing, and handling procedures for the collection of sediment core samples.

3.1.1 Sediment Cap Physical Integrity Core Collection Procedures

As discussed in the OMMP, sediment cores will be collected using vibracore or other similar methods at intertidal and/or subtidal locations as may be identified from the topographic/bathymetric surveys. The vibracore will use a rigid external tube approximately 4 inches in diameter and may use either polycarbonate liners or a dedicated aluminum tube. The vibracore will be lowered to the cap surface, where the unit will then be energized and allowed to penetrate. The cores will be advanced to a minimum depth of approximately 1 foot below the below the cap design thickness. Acceptance criteria for a sediment core sample are as follows:

- The core penetrated and retained sediment material underlying the cap. If core refusal occurs before the required depth, an additional core will be advanced within 6 inches of the original position. Relocations will be made along depth contours generally parallel to the shore.
- Recovery was at least 75% of the length of core penetration.
- Cored material did not extend out the top of the core tube or contact any part of the sampling apparatus at the top of the core tube.
- There were no obstructions in the cored material that might have blocked the subsequent entry of sediment into the core tube and resulted in incomplete core collection.

The following procedure will be used to decontaminate core sample tubes prior to use:

- Rinse and pre-clean with tap water
- Wash and scrub in a solution of laboratory grade, non-phosphate-based soap and tap water
- Rinse with tap water
- Rinse three times with distilled water
- Seal both ends of each core tube with aluminum foil

The core tube caps will be removed immediately prior to placement into the coring device. Care will be taken during sampling to avoid contact of the sample tube with potentially contaminated surfaces. Extra sample tubes will be available during sampling operations for uninterrupted sampling in the event of a potential core tube breakage or contamination. Core tubes suspected to have been accidentally contaminated will not be used. Logs and field notes of all core samples will be maintained as samples are collected and correlated to the sampling location map. The following information will be included in the logs:

- Elevation of each station sampled as measured from mean lower low water (MLLW)
- Location of each station as determined by differential global positioning system (DGPS)
- Date and time of collection of each sediment core sample
- Names of Field Coordinator (FC) and person(s) collecting and handling the sample
- Observations made during sample collection including complications and other details associated with the sampling effort
- The sample station identification
- Length and depth intervals of each core section and estimated recovery for each sediment sample as measured from MLLW
- Qualitative notation of apparent resistance of sediment column to coring
- Any deviation from the approved SAP

3.1.2 Sediment Cap Physical Integrity Core Processing Procedures

The core processing station will either be located at an upland location adjacent to the Site or at the analytical laboratory. Transported cores will be handled consistent with American Society for Testing and Materials (ASTM 2007) procedures (ASTM D 4220) and stored

upright in the analytical laboratory refrigerators or on site until processed. Filled sample containers will be stored in coolers containing ice to maintain the samples at 4 degrees Celsius (°C) ±2°C until delivery or shipping to the analytical laboratory.

All working surfaces and instruments will be thoroughly cleaned, decontaminated, and covered with aluminum foil to minimize outside contamination between sampling events. Disposable gloves will be discarded after processing each station and replaced prior to handling decontaminated instruments or work surfaces.

The steps for processing the samples are as follows:

1. Cut core longitudinally using a circular saw or power shears, taking care not to penetrate the sediment while cutting.
2. Use decontaminated utensils to split the core to expose the center of the two halves for sampling.
3. Photograph the entire length of the core.
4. Record the description of the core sample on the core log form for the following parameters as appropriate and present:
   - Sample recovery (depth in feet of penetration and sample compaction)
   - Physical soil description in accordance with the Unified Soil Classification System (includes soil type, density/consistency of soil, and color)
   - Odor (e.g., hydrogen sulfide or petroleum)
   - Vegetation
   - Debris
   - Biological activity (e.g., detritus, shells, tubes, bioturbation, or live or dead organisms)
   - Visual stratification, structure, and texture
   - Presence of oil sheen
   - Any other distinguishing characteristics or features

3.2 Sediment Cap Quality Confirmation Monitoring Collection and Processing

Sections 3.2.1 and 3.2.2 describe the collection, processing, and handling procedures for the collection of surface sediment samples for bioassay recovery and chemicals of concern monitoring.

3.2.1 Sediment Cap Quality Confirmation Monitoring Sample Collection Procedures – Sentinel Locations

As discussed in the OMMP, surface sediment grab samples will be conducted at six designated sentinel intertidal and subtidal stations in SMA-1 and SMA-2, each composed of 5-point aliquots from the 0- to 10-cm interval. Samples from each location will be archived and also composited for each sentinel location and submitted for chemical (i.e., cPAHs, dioxins/furans, and cadmium) and larval bioassay analyses. In addition, location BW-15 within SMA-3 will be submitted for larval bioassay analyses, which will be collected from a single 0- to 10-cm grab sample (not a 5-point composite). Samples will be collected using a van Veen type hydraulic power grab sampler, in accordance with PSEP protocols (1997). Sample aliquots in intertidal areas may be collected directly from the cap surface, during low tide, using hand tools (e.g., hand auger steel spoons or scoops). The target locations and coordinates for each sentinel station are included in Table F-1-1. Samples will be collected in the following manner in accordance with the PSEP protocols:

- The vessel will be maneuvered to the proposed location.
- The sampler will be decontaminated.
- The sampler will be deployed to the bottom.
- The winch cable to the grab sampler will be drawn taut and vertical.
- Location coordinates of the cable hoist will be recorded by the location control person.
- The sediment sample will be retrieved aboard the vessel and evaluated against the following PSEP acceptability criteria:
  - Grab sampler is not overfilled (i.e., sediment surface is not against the top of the sampler).
  - Sediment surface is relatively flat, indicating minimal disturbance or winnowing.
  - Overlying water is present, indicating minimal leakage.
  - Overlying water has low turbidity, indicating minimal sample disturbance.

  - Desired penetration depth of at least 10 cm is achieved.

- Overlying water will be siphoned off.
- Observations (i.e., texture, odor, presence/absence of vegetation, debris, and any other distinguishing characteristics) will be recorded on the sample collection forms (Attachment F-1-1).
- A stainless steel trowel or similar device will be used to collect the top 10 cm of sediment, taking care not to collect sediment in contact with the sides of the sampling device, and placed in a stainless steel bowl.

Sediment samples that meet the above collection criteria will be processed as described below.

3.2.2 Sediment Cap Quality Confirmation Sample Processing Procedures – Sentinel Locations

Sediment grab processing will be conducted aboard the sampling vessel. All working surfaces and instruments will be thoroughly cleaned, decontaminated, and covered with aluminum foil to minimize outside contamination between sampling stations. Disposable gloves will be discarded after processing each station and replaced prior to handling decontaminated instruments or work surfaces. The steps for processing the samples are as follows:

- Place the grab on a stable surface. Remove any overlying water using a syphon hose or turkey baster. Following grab acceptance criteria listed in Section 3.2.1, determine whether the grab is acceptable.
- After noting their presence, remove any large objects or debris from the sediment surface.
- Prior to sampling, color photographs may be taken, and a sediment description of each grab will be recorded on a grab sampling log form (Attachment F-1-1). Record the description of the grab sample on the grab log form for the following parameters as appropriate and present:
  - Sample recovery (depth in inches or centimeters of recovery in the grab sampler.

  - Physical soil description of the grab in accordance with the Unified Soil Classification System (includes soil type, density/consistency of soil, moisture, and color)
  - Odor (e.g., hydrogen sulfide and petroleum)
  - Note any vegetation
  - Debris
  - Biological activity (e.g., detritus, shells, tubes, bioturbation, or live or dead organisms)
  - Presence of oil sheen
  - Any other distinguishing characteristics or features

- Using a clean spoon, place sample material from the top 10 cm for chemical and larval bioassay testing into a clean, stainless steel bowl or high-density polyethylene (HDPE) bucket. To avoid cross contamination, take care to remove only sediment that has not come into contact with the sides or bottom of the grab. Cover bowl with aluminum foil until each aliquot station has been collected.
- After material has been collected from each aliquot station, the material will combined and homogenized until a uniform color and consistency is achieved.
- Immediately after filling the sample container with sediment, place the screw cap on the sample container and tighten.
- Thoroughly check all sample containers for proper identification, analysis type, and lid tightness.
- Pack each container carefully to prevent breakage and place inside of a cooler with ice for storage at the proper temperature (4°C ±2°C for all samples).

Samples will be submitted for testing as presented in Table F-1-1. In addition, sample mass will be collected at location BW-15 from within SMA-3, and submitted for larval bioassay analysis. The BW-15 bioassay sample will be collected from a single 0- to 10-cm grab sample (not a 5-point composite).

3.2.3 Sediment Cap Quality Confirmation Monitoring Sample Collection Procedures – Nearshore Wood Debris Cap Locations

As discussed in the OMMP, DGT sampling probes will be advanced along four transects (A through D; Figures F3a and F4a), within SMA-1 and SMA-2, at mudline elevations ranging from approximately +5 feet MLLW to approximately -3 feet MLLW. The target coordinates for each station are included in Table F-1-1, but may be adjusted in the field based on accessibility.

Probes will be installed by hand during low tide conditions to confirm proper installation. After an approximate 24-hour equilibration period, visual confirmation will be made to verify the DGT has remained embedded in the sediments prior to retrieval. The extracted sampling assemblies will be flushed with deionized water and placed in a cool environment until analysis. Representative surficial porewater temperature, pH, and salinity will be measured using probes inserted along the each transect as the tide recedes prior to retrieval of the DGT sample probes.

Surface sediment bioassay sampling at discrete sample locations will be conducted following the DGT sampling, as discussed in Section 2.4. Bioassay sample collection will follow the same collection procedures as described in Section 3.2.1 for collection of surface sediment grab samples at sentinel cap locations.

3.2.4 Sediment Cap Quality Confirmation Sample Processing Procedures – Nearshore Wood Debris Cap Locations

The DGT sampling method uses silver iodide (AgI), a white powder, impregnated in a gel. The AgI reacts with dissolved total free sulfide (sulfide; including hydrogen sulfide [H_2S], hydrosulfide, and disulfide) in porewater to form silver sulfide (Ag_2S), which is a black solid. The intensity of the resulting gray-scale color change, from white to black, is proportional to the amount of sulfide in the gel. The amount of total free sulfide in the gel can be quantified using an optical densitometer (OD). The details of this method and a laboratory verification study demonstrating that quantification of sulfide accumulated in DGT gel using OD provides accurate and reproducible results are provided in *Method Development and*

Verification Study for Sulfide Measurement in Porewater Using Diffusive-Gradients-in-Thin-Films (DGT) (Attachment F-1-2).

The DGT sample assemblies will be analyzed using the OD method described above to measure the accumulated total free sulfide in each DGT. Using location-specific surficial porewater measurements of temperature, pH and salinity the H_2S fraction of the total free sulfide result will be calculated following Millero (1998). As discussed in Section 2.4, H_2S concentrations greater than 0.07 mg/L will be targeted for bioassay sample collection.

Bioassay samples from areas of capped wood debris will be processed following the same procedures described in Section 3.2.2 for processing surface sediment grab samples at sentinel cap locations.

3.3 Natural Recovery Sediment Quality Monitoring Collection and Processing

Sections 3.3.1 and 3.3.2 describe the collection, processing, and handling procedures for the collection of surface sediment samples to evaluate natural recovery.

3.3.1 Natural Recovery Surface Sediment Sample Collection Procedures

The target locations and coordinates for each sentinel station are included in Table F-1-1. Samples will be collected in the following manner in accordance with the PSEP protocols:

- The vessel will be maneuvered to the proposed location.
- The sampler will be decontaminated.
- The sampler will be deployed to the bottom.
- The winch cable to the grab sampler will be drawn taut and vertical.
- Location coordinates of the cable hoist will be recorded by the location control person.
- The sediment sample will be retrieved aboard the vessel and evaluated against the following PSEP acceptability criteria:
  - Grab sampler is not overfilled (i.e., sediment surface is not against the top of the sampler).
  - Sediment surface is relatively flat, indicating minimal disturbance or winnowing.

  - Overlying water is present, indicating minimal leakage.
  - Overlying water has low turbidity, indicating minimal sample disturbance.
  - Desired penetration depth of at least 10 cm is achieved.

- Overlying water will be siphoned off.
- Observations (i.e., texture, odor, presence/absence of vegetation, debris, and any other distinguishing characteristics) will be recorded on the sample collection forms (Attachment F-1-1).
- A stainless steel trowel or similar device will be used to collect the top 0- to 2-cm and 5-to 10-cm of sediment, taking care not to collect sediment in contact with the sides of the sampling device, and placed in a stainless steel bowl.

Sediment samples that meet the above collection criteria will be processed as described below.

3.3.2 Natural Recovery Surface Sediment Sample Processing Procedures

Sediment grab processing will be conducted aboard the sampling vessel. All working surfaces and instruments will be thoroughly cleaned, decontaminated, and covered with aluminum foil to minimize outside contamination between sampling stations. Disposable gloves will be discarded after processing each station and replaced prior to handling decontaminated instruments or work surfaces. The steps for processing the samples are as follows:

- Place the grab on a stable surface. Remove any overlying water using a syphon hose or turkey baster. Following grab acceptance criteria listed in Section 3.3.1, determine whether the grab is acceptable.
- After noting their presence, remove any large objects or debris from the sediment surface.
- Prior to sampling, color photographs may be taken, and a sediment description of each grab will be recorded on a grab sampling log form (Attachment F-1-1). Record the description of the grab sample on the grab log form for the following parameters as appropriate and present:
  - Sample recovery (depth in inches or centimeters of recovery in the grab sampler.

  - Physical soil description of the grab in accordance with the Unified Soil Classification System (includes soil type, density/consistency of soil, moisture, and color)
  - Odor (e.g., hydrogen sulfide and petroleum)
  - Note any vegetation
  - Debris
  - Biological activity (e.g., detritus, shells, tubes, bioturbation, or live or dead organisms)
  - Presence of oil sheen
  - Any other distinguishing characteristics or features

- Using a clean spoon, place sample material from the 0- to 2-cm and 2- to 10-cm depths for chemical analyses in both intervals into separate clean, stainless steel bowls or HDPE buckets. To avoid cross contamination, take care to remove only sediment that has not come into contact with the sides or bottom of the grab. Cover bowl with aluminum foil until each aliquot station has been collected.
- After material has been collected from each aliquot station, the material will combined and homogenized until a uniform color and consistency is achieved.
- Immediately after filling the sample container with sediment, place the screw cap on the sample container and tighten.
- Thoroughly check all sample containers for proper identification, analysis type, and lid tightness.
- Pack each container carefully to prevent breakage and place inside of a cooler with ice for storage at the proper temperature (4°C ±2°C for all samples).

Samples will be submitted for testing as presented in Table F-1-1.

3.4 Sampling Schedule and Platform

Sampling will occur after approval of this SAP by Ecology as described in the OMMP. The preferred timeframe for sampling is September through October. It is anticipated that mobilization, field sampling, sample processing, and demobilization will require approximately 3 to 5 days.

Collection of subsurface sediment cores and surface sediment grab samples will be conducted by Marine Sampling Systems (MSS) and overseen by Anchor QEA from a vessel properly equipped to deploy and recover a vibracorer and power grab and to provide the required navigation. The vibracore equipment is hydraulically driven, low-frequency, spring-loaded, and mounted on a sampling platform to ensure a vertical drive into the sediment. The vibracore is equipped with a piston device fitted into the upper portion of the core barrel to assist in recovery of soft surface material. The vibracore is also equipped with an inverse fathometer that displays real-time penetration within the wheelhouse to monitor penetration progress and determine refusal depth. The vessel will be operated by a licensed captain and will conform to U.S. Coast Guard regulations. The vessel captain and crew have extensive experience in subsurface core and surface grab collection in Puget Sound.

3.5 Horizontal Positioning and Vertical Control

Horizontal positioning will be determined using DGPS based on target coordinates shown in Table F-1-1. The horizontal datum will be North American Datum 1983 (NAD83), Washington State Plane, North Zone. Measured station positions will be converted to latitudinal and longitudinal NAD83 coordinates to the nearest 0.01 second. The accuracy of measured and recorded horizontal coordinates is typically less than 1 meter and will be within ±3 meters following Ecology guidance.

The vertical elevation of each sediment sample or probe location will be measured using a fathometer or lead line and converted to MLLW correcting for the tidal elevation. Tidal elevations will be determined after sample collection using National Oceanic and Atmospheric Administration's Bangor tide station.

3.6 Field Documentation

Field documentation will consist of a daily field log and sample collection forms (Attachment F-1-1). The daily field log is intended to provide sufficient data and observations to enable readers to reconstruct events that occurred during the sampling period. All data entries will be made using indelible ink pen. Corrections will be made by drawing a single line through the error, writing in the correct information, then dating and initialing the change. Examples of information to be recorded are field personnel, weather

conditions, complications encountered, field communications, and other general details associated with the sampling effort. At a minimum, the following information will be included in this log:

- Names of the FC and person(s) collecting and logging the sample
- The sample station number
- Date and collection time of each sediment sample
- Observations made during sample collection including weather conditions, complications, communications, and other details associated with the sampling effort
- Qualitative notation of apparent resistance of sediment column to sampling, including notes on debris
- Any deviations from the approved SAP

In addition to maintaining a daily field log, sample collection forms will be completed for each sample. The sample collection forms will include standard entries for station identifiers, station coordinates, date and time of sample location, type of samples collected, type of analyses for each sample, and specific information pertaining to the matrix being collected. For sediment core samples, the collection form will include information regarding penetration of the sampler and physical characteristics of the sediment such as texture, color, odor, stratification, and sheens.

3.7 Sample Station Locations and Sample Identification

Figures F-3a, F-4a, and F-5 of the accompanying OMMP show the locations of the proposed surface sediment sampling locations. Table F-1-1 includes a list of all station locations, sample identifiers, and analysis and/or testing required for each location. The sample identification schemes are described below:

- Individual core samples are identified by alphanumeric ID used to identify the core location SMA, ITC to depict intertidal core location or STC to depict subtidal core location, followed by the number of feet below mudline (0-5) and appended with the date collected in the format YYMMDD (e.g., SMA1-ITC1-0-5-190901 for a core collected from SMA-1 on September 1, 2019 in the intertidal area from the 0- to 5-foot increment).

- Surface sediment grabs will be identified by alphanumeric ID used to identify the core location SMA; IT to depict intertidal, ST to depict subtidal, or NR to depict natural recovery location; followed by the depth below mudline (0-10); followed by Comp for composite; and appended with the date collected in the format YYMMDD (e.g., SMA1-IT-0-10-Comp-190901 or SMA5-NR-2-10-Comp).

3.8 Equipment Decontamination Procedures

Sample containers, instruments, working surfaces, technician protective gear, and other items that may come into contact with sediment sample material must meet high standards of cleanliness. All equipment and instruments used that are in direct contact with the sediment collected for analysis must be made of glass, stainless steel, or HDPE and will be cleaned prior to each day's use and between sampling or compositing events. Decontamination of all items will follow PSEP protocols. The decontamination procedure is:

- Scrub until free of visible sediment and rinse with site water
- Pre-wash rinse with tap water
- Wash with solution of tap water and Alconox soap (brush)
- Rinse with tap water
- Rinse three times with distilled water
- Cover (no contact) all decontaminated items with aluminum foil
- Store in clean, closed container for next use if not used immediately

3.9 Sample Containers for Analysis

The contract laboratory will provide certified, pre-cleaned, USEPA-approved containers for all chemistry samples. Sediment for bioassay testing will be placed in commercially available HDPE buckets that have been decontaminated as described in Section 3.8. Table F-1-2 lists container size, holding times, and preservation for the categories of analytes. At a minimum, each sample container will be labelled with the following information:

- Project name and number
- Sample identifier
- Date of collection
- Initials of field personnel responsible for sample collection

- Analyses required
- Preservative (if applicable)

3.10 Sample Transport and Chain-of-Custody Procedures

This section addresses the sampling program requirements for maintaining custody of the samples throughout the sample collection and shipping process and provides specific procedures for sample shipping.

3.10.1 Sample Custody Procedures

Samples are considered to be in one's custody if they are: 1) in the custodian's possession or view; 2) in a secured location (under lock) with restricted access; or 3) in a container that is secured with an official seal(s) such that the sample cannot be reached without breaking the seal(s).

Chain-of-custody (COC) procedures will be followed for all samples throughout the collection, handling, and analysis process. The principal document used to track possession and transfer of samples is the laboratory-provided COC form. Each sample will be represented on a COC form the day it is collected. All data entries will be made using indelible ink pen. Corrections will be made by drawing a single line through the error, writing in the correct information, then dating and initialing the change. Blank lines/spaces on the COC form will be lined-out and dated and initialed by the individual maintaining custody.

A COC form will accompany each cooler of samples to the analytical laboratories. Each person who has custody of the samples will sign the COC form and ensure that the samples are not left unattended unless properly secured. Copies of all COC forms will be retained in the project files.

3.10.2 Sample Shipping and Receipt Requirements

All samples will be shipped or hand delivered to the analytical laboratory no later than the day after collection. If samples are collected on Friday, they may be held until the following

Monday for shipment, provided that this does not adversely impact holding time requirements. Specific sample shipping procedures are as follows:

- Each cooler or container containing the samples for analysis will be shipped via overnight delivery to the appropriate analytical laboratory. In the event that Saturday delivery is required, the FC will contact the analytical laboratory before 3 p.m. on Friday to ensure that the laboratory is aware of the number of coolers shipped and the airbill tracking numbers for those coolers. Following each shipment, the FC will call the laboratory and verify the shipment from the day before has been received and is in good condition.
- Coolant ice will be sealed in separate double plastic bags and placed in the shipping containers.
- Individual sample containers will be placed in a sealable plastic bag, packed to prevent breakage, and transported in a sealed ice chest or other suitable container.
- Glass jars will be separated in the shipping container by shock-absorbent material (e.g., bubble wrap) to prevent breakage.
- The shipping containers will be clearly labeled with sufficient information (name of project, time and date container was sealed, person sealing the container and consultant's office name and address) to enable positive identification.
- The shipping waybill number will be documented on all COC forms accompanying the samples.
- A sealed envelope containing COC forms will be enclosed in a plastic bag and taped to the inside lid of the cooler.
- A minimum of two signed and dated COC seals will be placed on adjacent sides of each cooler prior to shipping.
- Each cooler will be wrapped securely with strapping tape, labeled "Glass – Fragile" and "This End Up," and will be clearly labeled with the laboratory's shipping address and the consultant's return address.

Upon transfer of sample possession to the analytical laboratory, the persons transferring custody of the sample container will sign the COC form. Upon receipt of samples at the laboratory, the shipping container seal will be broken and the receiver will record the condition of the samples on a sample receipt form. COC forms will be used internally in the laboratory to track sample handling and final disposition.

3.11 Waste Management

All sediment remaining after sampling will be washed overboard at the collection site prior to moving to the next sampling station. Any sediment spilled on the deck of the sampling vessel will be washed into the surface waters at the collection site.

All disposable sampling materials and personnel protective equipment used in sample processing, such as disposable coveralls, gloves, and paper towels, will be placed in heavy-duty garbage bags or other appropriate containers.

Sediment remaining after core processing and sampling will be collected in 55-gallon drums and consolidated. The 55-gallon drum area will be located in a secure area and labeled appropriately. After core processing is completed, a composite sample will be collected and analyzed to obtain representative data for sediment disposal profiling.

4 PHYSICAL AND CHEMICAL ANALYTICAL METHODS

This section summarizes the target physical and chemical analyses for the various media sampled. All sample analyses will be conducted in accordance with Ecology-approved methods. Prior to analysis, all samples will be maintained according to the appropriate holding times and temperatures for each analysis (Table F-1-2). Table F-2-1 of the accompanying QAPP (Attachment F-2) presents the proposed analytes, screening criteria, the analytical methods to be used, and the targeted detection limits for the evaluation of sediment.

Prior to the analysis of the samples, the laboratory will calculate method detection limits for each analyte of interest, where applicable. Method detection limits will be below the sediment criteria specified in Table F-2-1 of the accompanying QAPP (Attachment F-2), if technically feasible. To achieve the required detection limits, some modifications to the methods may be necessary. These modifications from the specified analytical methods will be provided by the laboratory at the time of establishing the laboratory contract and must be approved by Ecology prior to implementation.

4.1 Quality Assurance/Quality Control

Laboratory QC procedures, where applicable, include initial and continuing instrument calibrations, standard reference materials, laboratory control samples, matrix replicates, matrix spikes, surrogate spikes (for organic analyses), and method blanks. Table F-2-2 of the accompanying QAPP (Attachment F-2) summarizes the data quality objectives for precision, accuracy, and completeness. Table F-2-3 of the accompanying QAPP lists the frequency of analysis for laboratory QA/QC samples.

Results of the QC samples from each sample group will be reviewed by the analyst immediately after a sample group has been analyzed. All samples will be diluted and reanalyzed if target compounds are detected at levels that exceed their respective established calibration ranges. Any cleanups will be conducted prior to the dilutions. The QC sample results will be evaluated to determine if control limits have been exceeded. If control limits are exceeded in the sample group, the QA/QC Manager will be contacted immediately, and

corrective action (e.g., method modifications followed by reprocessing the affected samples) will be initiated prior to processing a subsequent group of samples.

4.1.1 Laboratory Instrument Calibration and Frequency

An initial calibration will be performed on each laboratory instrument to be used at the start of the project, after each major interruption to the analytical instrument, and when any ongoing calibration does not meet method control criteria. Calibration verification will be analyzed following each initial calibration and will meet method criteria prior to analysis of samples. Continuing calibration verifications (CCV) will be performed daily prior to any sample analysis to track instrument performance. The frequency of CCVs varies with method. For gas chromatograph/mass spectrometer (GC/MS) methods, one will be analyzed every 12 hours. For GC, metals, and inorganic methods, one will be analyzed for every ten field samples, or daily, whichever is more frequent. If the ongoing continuing calibration is out of control, the analysis must come to a halt until the source of the control failure is eliminated or reduced to meet control specifications. All project samples analyzed while instrument calibration was out of control will be reanalyzed.

Instrument blanks or continuing calibration blanks provide information on the stability of the baseline established. Continuing calibration blanks will be analyzed immediately prior to or immediately following continuing calibration verification at the instrument for each type of applicable analysis.

4.1.2 Laboratory Duplicates/Replicates

Analytical duplicates provide information on the precision of the analysis and are useful in assessing potential sample heterogeneity and matrix effects. Analytical duplicates and replicates are subsamples of the original sample that are prepared and analyzed as a separate sample.

4.1.3 Matrix Spikes/Matrix Spike Duplicates

Analysis of matrix spike samples provides information on the extraction efficiency of the method on the sample matrix. By performing duplicate matrix spike analyses, information on the precision of the method is also provided for organic analyses.

4.1.4 Method Blanks

Method blanks are analyzed to assess possible laboratory contamination at all stages of sample preparation and analysis. The method blank for all analyses must be less than the method reporting limit of any single target analyte/compound. If a laboratory method blank exceeds this criterion for any analyte/compound, and the concentration of the analyte/compound in any of the samples is less than five times the concentration found in the blank (10 times for common contaminants), analyses must stop and the source of contamination must be eliminated or reduced.

4.1.5 Laboratory Control Samples

Laboratory control samples are analyzed to assess possible laboratory bias at all stages of sample preparation and analysis. The laboratory control sample is a matrix-dependent spiked sample prepared at the time of sample extraction along with the preparation of sample and matrix spikes. The laboratory control sample will provide information on the precision of the analytical process and, when analyzed in duplicate, will provide accuracy information as well.

4.2 Laboratory Report

The analytical laboratory will prepare detailed laboratory reports documenting all activities associated with the sample analyses. Included in this report will be:

- **Project Narrative:** A detailed report that describes the samples received, analyses performed, and corrective actions undertaken.
- **COC Documentation:** Laboratory policy requires that COC documentation be available for all samples received. The COC form will document basic sample demographics such as client and project names, sample identification, analyses requested, and special instructions.
- **Data Summary Form:** A tabular listing of concentrations and/or detection limits for all target analytes. The data report will also list other pertinent information such as amount of sample analyzed, dilution factors, sample processing dates, extract cleanups, and surrogate recoveries.

- **QA Summary:** Includes results of all QC analyses, specifically recovery information. Laboratory control samples are reported with each batch. Additional QC analyses may include laboratory replicates, matrix spikes, and standard reference materials.
- **Instrument Calibration Forms and Raw Data:** Includes initial and continuing calibration summaries and instrument tuning data, laboratory bench sheets, and logbook pages.

In completing chemical analyses for this project, the contract laboratory is expected to meet the following minimum requirements:

- Adhere to the methods outlined in this SAP, including methods referenced for each analytical procedure (Table F-2-1 of the accompanying QAPP [Attachment F-2])
- Deliver facsimile, hard copy, and electronic data as specified
- Meet reporting requirements for deliverables
- Meet turnaround times for deliverables
- Implement QA/QC procedures, including laboratory QC requirements (Table F-2-3 of the accompanying QAPP) and data quality objectives (Table F-2-2 of the accompanying QAPP), and performance evaluation testing requirements
- Notify the project QA/QC Manager of any QAPP QA/QC problems when they are identified to allow for quick resolution
- Allow laboratory and data audits to be performed, if deemed necessary

Laboratory data will be provided in the EQuIS electronic format. Laboratory data, which will be electronically provided and loaded into the database, will undergo a 10% check against the laboratory hard copy data. Data will be validated or reviewed manually, and qualifiers, if assigned, will be entered manually. The accuracy of all manually entered data will be verified by a second party. Data tables and reports will be exported from EQuIS to Microsoft Excel tables.

5 BIOLOGICAL TESTING

Bioassay testing will be performed by NewFields. Biological testing will be performed in accordance with *Recommended Protocols for Conducting Laboratory Bioassays on Puget Sound Sediments* (PSEP 1995) for the larval abnormality/mortality test using the resuspension modifications described in 2013 Dredge Material Management Program (DMMP)/SMS clarification paper (Kendall 2013). All bioassay analyses, including retests, are required to commence within 56 days after collection to meet holding times.

Bioassay testing requires that test sediments be matched and conducted simultaneously with appropriate reference sediment in order to factor out sediment grain size effects on bioassay organisms. The selection of the reference sediment will be based on the percent fines determined from the analytical laboratory's grain-size analysis of the test sediments. The laboratory determination of grain size will be performed on an expedited schedule in order to select the appropriate reference sediment prior to bioassay initiation.

The samples for bioassay testing will be placed into lidded HDPE buckets with no head space and stored in coolers at approximately 4°C ± 2°C until transported to the laboratory. Temperature within the coolers will be monitored, and COC procedures will be followed throughout sample handling by the laboratory.

5.1 Biological Testing Procedures

Sediment bioassay testing will be conducted in accordance with PSEP (2015), except where applicable SMS clarification papers (e.g., Bioassay Endpoint Refinements: Larval and Neanthes Growth Bioassays) are applicable. Sediment bioassay testing at sentinel locations in SMA-1 and SMA-2 will be for larval bioassays only. Sediment bioassay testing in nearshore wood debris cap locations within SMA-1 and SMA-2 will include three standard SMS tests (two acute and one chronic), as summarized in Section 2.4. Testing methodologies and results will be summarized in a data report (Section 6).

5.2 Test Quality Assurance/Quality Control

Sediment toxicity tests will incorporate standard QA/QC procedures to ensure that the test results are valid. Standard QA/QC procedures include the use of negative controls, positive controls, reference sediment samples, replicates, and measurements of water quality during testing.

5.2.1 Negative Controls

The negative control to be used for the sediment toxicity tests will be a clean control, which consists of using the same seawater used in testing sediment toxicity. For the tests to be used in this study, the negative control will be a seawater control. For the sediment test results to be valid, the seawater control shall have a 70% normal survivorship at time-final.

5.2.2 Positive Controls

A positive control will be run for each bioassay using the same batch of organisms used in the test. The positive control to be used for the sediment toxicity test will be a toxic control in which a reference toxicant is used to establish the relative sensitivity of the test organism. The positive control for sediment tests is typically conducted with diluent seawater and without sediment. Copper sulfate will be used as the reference toxicant for the bivalve larval test.

5.2.3 Reference Sediment

Reference sediment will also be included with each bioassay, tested concurrently with test sediments to provide data that can be used to separate toxicant effects from unrelated effects, such as those of sediment grain size. Reference sediment samples should be collected from an area documented to be free from chemical contamination and should represent the range of important characteristics of the test sediments (e.g., sediment grain size). For this study, reference sediment samples will be collected from Carr Inlet in Puget Sound, Washington (PSEP 1995). All bioassays have performance standards for reference sediments as mentioned above. Failure to meet these standards may result in the requirement to retest.

5.2.4 Replicates

Five replicate chambers for each test sediment, reference sediment, and negative controls treatment will be run for each bioassay. A water quality replicate will also be run for each treatment.

5.2.5 Water Quality Monitoring

Water quality monitoring will be conducted for the amphipod, larval, and juvenile polychaete bioassay and reference toxicant tests. This monitoring consists of daily measurements in the water quality replicate of salinity, temperature, pH, and dissolved oxygen for the larval tests. Ammonia and sulfides in the overlying water will be determined at test initiation and termination for all three tests. Monitoring will be conducted for all test and reference sediments and negative controls (including seawater controls). Measurements for each treatment will be made on a separate test chamber that is set up identically to the other replicates within the treatment group, including the addition of test organisms.

5.3 Interpretation

Test interpretation consists of endpoint comparisons of test sediments to the measurements observed in the controls and in reference sediments on an absolute percentage basis, as well as statistical comparison between the test and reference endpoints, where appropriate. The SMS criteria for the larval test are exceeded if the larval test sediment has a mean survivorship of normal larvae that is significantly less (t-test, P=0.1) than the mean normal survivorship in the reference sediment, and the mean normal survivorship in the test sediment is less than 85% of the mean normal survivorship in the reference sediment.

5.4 Bioassay Retest

Any bioassay retests must be fully coordinated with and approved by Ecology.

5.5 Data Deliverables

The laboratory conducting the bioassay tests will be responsible for internal checks on data reporting and will correct errors identified during the QA review. The bioassay laboratory

for this study will be required to report results that include all information recommended by PSEP protocols for QA review, as follows:

- A description of any deviations from the methodology or problems with the process and procedures of analyses
- Test methods used for bioassay testing and statistical analyses
- Results for mortality and abnormalities, water quality parameters, reference toxicant, and statistical analyses
- Original data sheets for water quality, mortality and abnormalities, reference toxicant, and statistical analyses
- COC records

Close contact with the laboratory will be maintained to resolve any QA/QC problems in a timely manner.

6 SAMPLING AND ANALYSIS RESULTS REPORT

A final sampling and analysis results report will be prepared by Anchor QEA documenting all activities associated with collecting, compositing, transporting, and chemically and biologically analyzing sediment samples. The laboratory reports will be included as appendices and the chemistry report will be submitted in both hard copy and electronic formats. At a minimum, the following will be included in the final report:

- Summary of all field activities including a description of any deviations from the approved SAP
- Locations of sediment sampling stations in state plane coordinates to the nearest foot (Washington North Zone), and in latitude and longitude in degrees and minutes to four decimal places NAD83; all vertical elevations of mudline and water surface will be reported to the nearest 0.1-foot relative to MLLW
- A project map with actual sampling locations
- A QA/QC narrative for chemical, and if appropriate, biological testing
- Summary data results tables
- Summary of comparison of chemical and toxicity test results with DMMP interpretive criteria
- Print copies of field data will be provided with the data report; laboratory analysis results and associated QA/QC data will be available
- Results will be submitted to the Ecology in EIM format
- Source sampling and/or supplier locations for all bioassay testing species utilized for testing

7 REFERENCES

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TABLES

Table F-1-1
Station Locations and Sample Matrix Summary for Samples

	Archive	(Washington SP NAD 83 North Zone)		Parameter	Dissolved Sulfides	Cadmium	PAHs	Dioxin/Furan	Larval Bioassay	Full Suite Bioassay*
	8-oz glass			Container	DGT	4-oz glass	16-oz glass	8-oz glass	1-Gallon	1-Gallon
	4° C			Preservative	4° C	4° C	4° C	4° C	4° C	4° C
Location ID		Easting	Northing	Sample ID						
Capping Areas										
SMA1A-IT1	X	1211536.9	317657.5	SMA1A-IT-0-10-Comp	--	X	X	X	X	--
SMA1A-IT2	X	1211387.1	317532.1							
SMA1A-IT3	X	1211362.1	317392.9							
SMA1A-IT4	X	1211653.4	317220.0							
SMA1A-IT5	X	1211828.0	317160.3							
SMA1B-IT1	X	1211281.7	317379.8	SMA1B-IT1-0-6	X	--	--	--	--	TBD
	X			SMA1B-IT1-24	X					--
SMA1B-IT2	X	1211310.7	317404.8	SMA1B-IT2-0-6	X					TBD
	X			SMA1B-IT2-24	X					--
SMA1B-IT3	X	1211343.9	317433.2	SMA1B-IT3-0-6	X					TBD
	X			SMA1B-IT3-24	X					--
SMA1-ST1	X	1211453.2	317498.9	SMA1-ST-0-10-Comp	--	X	X	X	X	--
SMA1-ST2	X	1211632.0	317620.4							
SMA1-ST3	X	1211707.7	317378.5							
SMA1-ST4	X	1211702.4	317282.3							
SMA1-ST5	X	1211836.8	317246.7							
SMA2A-IT1	X	1211603.1	316658.1	SMA2A-IT-0-10-Comp	--	X	X	X	X	--
SMA2A-IT2	X	1211497.5	316592.4							
SMA2A-IT3	X	1211352.5	316505.4							
SMA2A-IT4	X	1211227.8	316419.7							
SMA2A-IT5	X	1211176.0	316281.5							
SMA2A-ST1	X	1211476.2	316243.4	SMA2A-ST-0-10-Comp	--	X	X	X	X	--
SMA2A-ST2	X	1211592.1	316375.6							
SMA2A-ST3	X	1211789.4	316463.6							
SMA2A-ST4	X	1211508.5	316012.2							
SMA2A-ST5	X	1211733.4	316185.2							
SMA2B-IT1	X	1211168.2	316122.8	SMA2B-IT-0-10-Comp	--	X	X	X	X	--
SMA2B-IT2	X	1211160.4	315957.5							
SMA2B-IT3	X	1211155.9	315740.1							
SMA2B-IT4	X	1211095.5	315626.6							
SMA2B-IT5	X	1211047.0	315492.7							
SMA2B-ST1	X	1211306.1	315846.5	SMA2B-ST-0-10-Comp	--	X	X	X	X	--
SMA2B-ST2	X	1211662.2	315810.9							
SMA2B-ST3	X	1211509.9	315740.0							
SMA2B-ST4	X	1211334.8	315451.2							
SMA2B-ST5	X	1211564.0	315510.2							

Table F-1-1
Station Locations and Sample Matrix Summary for Samples

Location ID	Archive	(Washington SP NAD 83 North Zone)		Parameter	Dissolved Sulfides	Cadmium	PAHs	Dioxin/Furan	Larval Bioassay	Full Suite Bioassay*
	8-oz glass			Container	DGT	4-oz glass	16-oz glass	8-oz glass	1-Gallon	1-Gallon
	4° C			Preservative	4° C	4° C	4° C	4° C	4° C	4° C
		Easting	Northing	Sample ID						
SMA2C-IT1	X	1211398.5	316652.6	SMA2C-IT1-0-6	X	--	--	--	--	TBD
	X			SMA2C-IT1-24	X					--
SMA2C-IT2	X	1211406.1	316640.4	SMA2C-IT2-0-6	X					TBD
	X			SMA2C-IT2-24	X					--
SMA2C-IT3	X	1211412.0	316630.8	SMA2C-IT3-0-6	X					TBD
	X			SMA2C-IT3-24	X					--
SMA2C-IT4	X	1211415.6	316663.1	SMA2C-IT4-0-6	X					TBD
	X			SMA2C-IT4-24	X					--
SMA2C-IT5	X	1211423.1	316651.0	SMA2C-IT5-0-6	X					TBD
	X			SMA2C-IT5-24	X					--
SMA2C-IT6	X	1211429.0	316641.3	SMA2C-IT6-0-6	X					TBD
	X			SMA2C-IT6-24	X					--
SMA2C-IT7	X	1211432.6	316673.6	SMA2C-IT7-0-6	X					TBD
	X			SMA2C-IT7-24	X					--
SMA2C-IT8	X	1211440.1	316661.5	SMA2C-IT8-0-6	X					TBD
	X			SMA2C-IT8-24	X					--
SMA2C-IT9	X	1211446.0	316651.9	SMA2C-IT9-0-6	X					TBD
	X			SMA2C-IT9-24	X					--
Natural Recovery										
BW-01	--	1211482.1	312628.3	BW-01-0-2	--	X	X	X	--	--
				BW-01-2-10	--	X	X	X	--	--
BW-04	--	1212480.62	310620.97	BW-01-0-2	--	X	X	X	--	--
				BW-01-2-10	--	X	X	X	--	--
BW-15	--	1212507.8	308614.9	BW-15-0-2	--	X	X	X	X	--
				BW-15-2-10	--	X	X	X	(Sample ID: BW-15-0-10)	--
BW-18	--	1210996.74	307610.05	BW-01-0-2	--	X	X	X	--	--
				BW-01-2-10	--	X	X	X	--	--
BW-19	--	1212456.51	307658.08	BW-01-0-2	--	X	X	X	--	--
				BW-01-2-10	--	X	X	X	--	--
BW-21	--	1212475.8	305744.0	BW-21-0-2	--	X	X	X	--	--
				BW-21-2-10	--	X	X	X	--	--
PGSS-29	--	1210493.1	309872.8	PGSS-29-0-2	--	X	X	X	--	--
				PGSS-29-2-10	--	X	X	X	--	--
PGSS-70	--	1210966.3	313616.1	BW-01-0-2	--	X	X	X	--	--
				BW-01-2-10	--	X	X	X	--	--
PGSS-77A	--	1211303.7	314627	BW-01-0-2	--	X	X	X	--	--
				BW-01-2-10	--	X	X	X	--	--
PGSS-8	--	1211006	305614.9	BW-01-0-2	--	X	X	X	--	--
				BW-01-2-10	--	X	X	X	--	--

Table F-1-1
Station Locations and Sample Matrix Summary for Samples

Location ID	Archive	(Washington SP NAD 83 North Zone)		Parameter	Dissolved Sulfides	Cadmium	PAHs	Dioxin/Furan	Larval Bioassay	Full Suite Bioassay*
	8-oz glass			Container	DGT	4-oz glass	16-oz glass	8-oz glass	1-Gallon	1-Gallon
	4° C			Preservative	4° C	4° C	4° C	4° C	4° C	4° C
		Easting	Northing	Sample ID						
PGST-1	--	1211635.1	312628.3	PGST-1-0-2	--	X	X	X	--	--
				PGST-1-2-10	--	X	X	X	--	--
PGST-5	--	1212132.5	308615.3	PGST-2-0-2	--	X	X	X	--	--
				PGST-2-2-10	--	X	X	X	--	--

Notes:
IT = Intertidal
PAHs = polycyclic aromatic hydrocarbons
ST = Subtidal
* Full suite bioassay sampling will be performed at sample locations where DGT porewater sulfide results are greater than 0.07 milligrams per liter (mg/L). Bioassay samples will only be collected from surface sediment.
TBD = To be determined.

Table F-1-2
Guidelines for Sample Handling and Storage

Parameter	Sample Size	Container Size and Type[a]	Holding Time	Preservative
Total metals	50 g	4-oz Glass	6 months; 28 days for Hg	Cool/4° C
			3 years; 28 days for Hg	Freeze[a]/-18° C
Polycyclic aromatic hydrocarbons	150 g	16-oz glass	14 days until extraction	Cool/4° C
			1 year until extraction	Freeze/-18° C
			40 days after extraction	Cool/4° C
Dioxins/Furans	150 g	8-oz Glass	1 year to extraction	Freeze -18° C
			1 year after extraction	Freeze -18° C
Bivalve larvae bioassay	1,000 g	1-gallon HDPE	56 days	Cool/4° C/Dark
Full suite bioassay	1,000 g	1-gallon HDPE	56 days	Cool/4° C/Dark

Note:
a. All sample containers will have lids with Teflon inserts.

ATTACHMENT F-1-1
SAMPLE COLLECTION FORMS

ANCHOR QEA

Sediment Core Collection Log

Job: _____ **Station ID:** _____

Job No: _____ **Attempt No.** _____

Field Staff: _____ **Date:** _____

Contractor: _____ **Logged By:** _____

Vertical Datum: _____ **Horizontal Datum:** _____

Field Collection Coordinates:

Lat/Northing: _____ Long/Easting: _____

A. Water Depth

DTM Depth Sounder: _____

DTM Lead Line: _____

B. Water Level Measurements

Time: _____

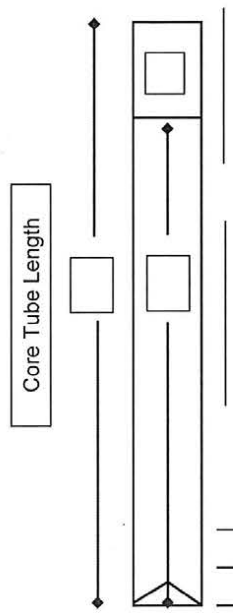
Height: _____

Source: _____

C. Mudline Elevation

_____

Recovery Measurements (prior to cuts)



Core Collection Recovery Details:

Core Accepted: Yes / No

Core Tube Length: _____

Drive Penetration: _____

Headspace Measurement: _____

Recovery Measurement: _____

Recovery Percentage: _____

Total Length of Core To Process: _____

Drive Notes:

Sections To Process:

A: _____

B: _____

C: _____

D: _____

Core Field Observations and Description:

Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

Notes:

Sediment Core Processing Log

ANCHOR QEA

Job:	Station ID:
Job No.	Date/Time:
No. of Sections:	Core Logged By:
Drive Length:	Attempt #:
Recovery:	Type of Core ☐ Mudmole ☐ Vibracore ☐ Other
% Recovery:	Diameter of Core (inches)
Notes:	Core Quality ☐ Good ☐ Fair ☐ Poor ☐ Disturbed

Recovered Length (ft)	Size % G	Size % S	Size % F	PID	**Classification and Remarks** (Density, Moisture, Color, Minor Constituent, MAJOR Constituent, with Additional Constituents, Sheen, Odor)	Sample	Subsample	Summary Sketch

Page _____ of _____

ANCHOR QEA

Surface Sediment Field Log

Job: Station:

Job No: Date:

Field Staff: Sample Method:

Contractor: Target Coordinates: Lat.

Horizontal Datum: Long.

Water Height

DTM Depth Sounder: _____

DTM Lead Line: _____

Tide Measurements

Time: _____

Height: _____

Sample Acceptability Criteria:

1) Overlying water is present
2) Water has low turbidity
3) Sampler is not overfilled
4) Surface is flat
5) Desired penetration depth

Notes: Mudline Elevation (lower low water-large tides): calculated after sampling

Grab #	Time	Actual Coordinates		Sample Accept (Y/N)	Recovery Depth (cm)	Comments: jaws close, good seal, winnowing, overlying water, surface intact, etc
		Longitude/Easting	Lattidue/ Northing			

Sample Description: surface cover, (density), moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

Sample Containers:

Analyses:

ATTACHMENT F-1-2 METHOD DEVELOPMENT AND VERIFICATION STUDY FOR SULFIDE MEASUREMENT IN POREWATER USING DIFFUSIVE-GRADIENTS-IN-THIN-FILMS (DGT)

DRAFT

421 SW 6th Avenue, Suite 750
Portland, Oregon 97204
503.688.5057

ANCHOR QEA

Memorandum

November 10, 2017

To: Clay Patmont

From: Masa Kanematsu, PhD; Dimitri Vlassopoulos, PhD

Re: Method Development and Verification Study for Sulfide Measurement in Porewater Using Diffusive-Gradients-in-Thin-Films (DGT)

This document presents the results of a laboratory verification study of a passive porewater sampling technique for dissolved sulfide using Diffusive Gradients in Thin-films (DGT). The method, developed over the last two decades (Teasdale et al. 1999; Rearick et al. 2005), is finding increasing use as a reliable in situ technique for quantifying sulfide levels in sediment porewater. The method is based on the reaction of sulfide with silver iodide (AgI), a white powder impregnated in a gel to produce silver sulfide (Ag_2S), a black solid. The intensity of the color developed is proportional to the amount of sulfide accumulated in the gel.

For this study, we developed a calibration curve using optical densitometry (OD) to quantify the amount of sulfide accumulated in the DGT device over a dissolved sulfide concentration range of 0 to 6 mg/L sulfide. To verify the DGT technique, sulfide was extracted from exposed DGTs and quantified using two different extraction and analysis methods:

- Extraction of chromium reducible sulfur (CRS) from the DGT gel and analysis by sulfide ion-specific electrode
- Extraction of the DGT gel by nitric acid/hydrogen peroxide (commonly used in selective sequential extraction schemes to quantify metals associated with sulfides) and analysis of total sulfur released by ICP-MS

Results from both methods were in excellent agreement and quantitative recovery of sulfide from the DGT gels was confirmed by comparison with the theoretical mass of accumulated sulfide calculated using a mass-transfer model. Sulfide recoveries from the DGT gels averaged 101.0% and 96.9% for the CRS and nitric acid/peroxide extraction methods, respectively.

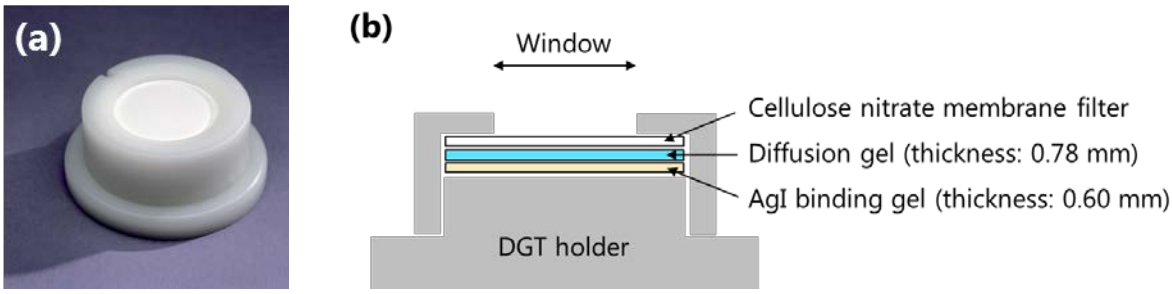
Materials and Methods

DGT Samplers

DGT piston devices for deployment in soil were obtained from DGT® Research (http://www.dgtresearch.com). The DGT samplers were preloaded for sulfide measurement and

consist of a standard DGT holder containing a 0.6 mm thick silver iodide (AgI) impregnated binding gel layer, overlain by a 0.78 mm thick polyacrylamide diffusive gel, and held in place by a 0.45 µm cellulose nitrate membrane filter (Figure 1). The window size of the DGT sampler is 2.54 cm^2. Prior to use, the DGT assemblies were deoxygenated by immersion in 0.01 M sodium nitrate purged with high-purity nitrogen gas for at least 2 days to remove any residual oxygen.

Figure 1
DGT piston assembly (a) and cross-section view (b)



* DGT® Research: http://www.dgtresearch.com/

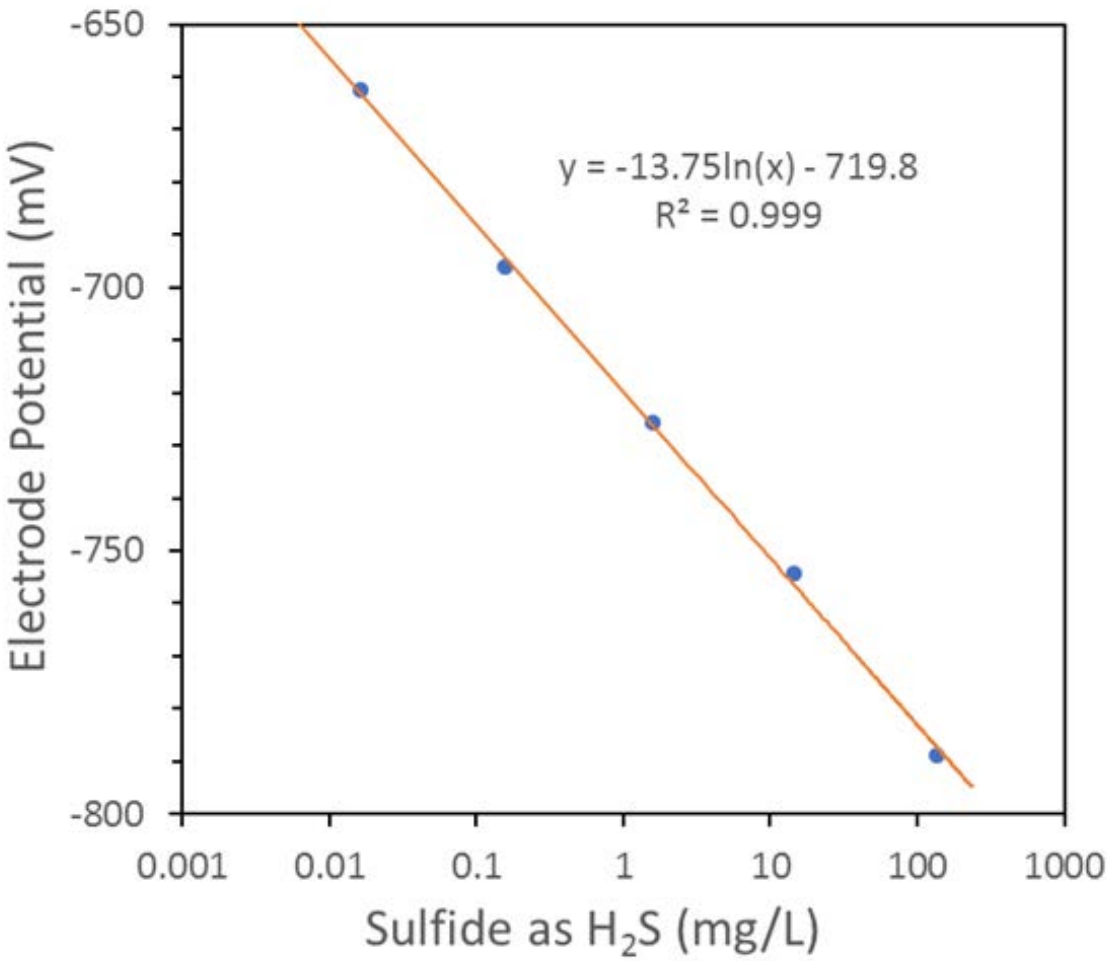
Preparation of Stock Sulfide Solutions

All sulfide solutions were prepared from a stock solution of approximately 1,000 mg/L as S (1,063 mg/L as H_2S). The stock solution was prepared by first washing a crystal of sodium sulfide nonahydrate ($Na_2S{\cdot}9H_2O$) with deionized (DI) water to remove oxidation products, blotting it dry on tissue paper, accurately weighing it, and dissolving it in deoxygenated DI water. Between uses, the stock solution was stored under nitrogen sealed in a Mylar bag with oxygen absorber packets to minimize exposure to oxygen. The sulfide stock solution was standardized daily by iodometric titration (Standard Method 4500-S2-F; APHA 2005).

Sulfide Measurement by Ion Selective Electrode

Dissolved sulfide concentrations were measured by Standard Method 4500-S2-G (APHA 2005) using a Thermo Scientific silver sulfide solid-state ion selective electrode (ISE) connected to a Thermo Scientific Orion Star A211 potentiometer. Alkaline anti-oxidant buffer (Thermo Scientific Orion 941609) was added to samples and standards to inhibit oxidation of sulfide by oxygen and to provide a constant ionic strength and pH during analysis. A five-point calibration curve was developed daily (Figure 2).

Figure 2
Example calibration curve for sulfide ISE



Calibration Curve for the Densitometric Determination of Sulfide

DGT sampler assemblies were exposed in duplicate to test solutions prepared at 8 different sulfide concentrations (0 to 6 mg/L as H_2S) for 24 hours. The solutions were prepared in 0.7 M sodium chloride to simulate seawater ionic strength. To minimize sulfide loss, tests were prepared in glass jars with cone seal caps, all solutions were purged with N_2 gas before addition of the sulfide stock solution, and headspace in the glass containers was minimized. Sulfide concentrations in the standard solutions were monitored by ISE before and after deploying the DGT assemblies.

Following the 24-hour exposure period, the DGT assemblies were retrieved and rinsed with DI water. The binding gel layers were removed and placed on blotting paper. The binding gels were then laid on a thin cellophane sheet (Bio-Rad), and covered with a second cellophane sheet. The sheet assembly was then placed in a vacuum gel dryer (Bio-Rad, Model 583) and dried for 2 hours at 60°C. The dried sheet was digitally scanned (Konica Minolta BizHub-C364) and saved as a gray-scale image. Gel analysis software (UN-SCAN-IT Gel Version 7.1) was used to measure and record the gray-scale intensity of each binding gel on the scanned image.

Extraction and Quantification of Sulfide in DGT Binding Gels

Sulfide was extracted from the exposed DGT binding gels by a modified CRS method (Burton et al., 2008) as well as a nitric acid/peroxide extraction method. Six replicate sulfide-exposed DGT samplers were prepared by exposing the devices to a 3.00 mg/L H_2S solution for 24 hours. Three DGTs were extracted by each method to quantitatively assess sulfide recovery and method reproducibility.

The modified CRS method developed by Burton et al. (2008) was adopted to this study. Briefly, an acidic chromium(II) solution was added to a gas-tight reaction vessel containing the sulfide-reacted binding gel to convert sulfide to hydrogen sulfide gas, which was trapped in an alkaline zinc acetate solution contained in a small centrifuge tube placed inside the reaction vessel. On completion of the extraction, dissolved sulfide concentrations in the trapping solutions were immediately measured by ISE.

A nitric acid/peroxide extraction is one of the steps employed in some selective sequential extraction procedures to quantify metals associated with organic matter and/or sulfides in soil and sediment (Tessier et al. 1979, Zimmerman and Weindorf 2010) and was used to extract sulfur from the DGT. In brief, the sulfide-reacted binding gel is extracted in acidic hydrogen peroxide followed by nitric acid. A detailed description of the procedure is provided in Appendix A. Sulfide released form the gel to the extraction fluid is oxidized to sulfate which is analyzed as total sulfur by Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES). ICP-OES analysis of the extracts was performed in the analytical geochemistry laboratory of the Geology Department at Portland State University. A procedural blank was also prepared and analyzed and sample results were blank corrected.

Results

Determination of Sulfide in DGT Samplers by Optical Densitometry

Dissolved sulfide concentrations in test solutions were measured before and after deployment of the DGT assemblies (Table 1). Sulfide losses from the solutions over the 24-hour exposure period ranged from 13 to 26 % and averaged 20 %. This is comparable to losses reported by Rearick et al. (2005)

due to oxidation, volatilization, or adsorption. The digital images of the sulfide-accumulated binding gels are shown in Figure 3 and the measured gray-scale intensities of the gels are given in Table 1.

Figure 3
Gray-scale images of DGT binding gels exposed to sulfide standard solutions for 24 hours

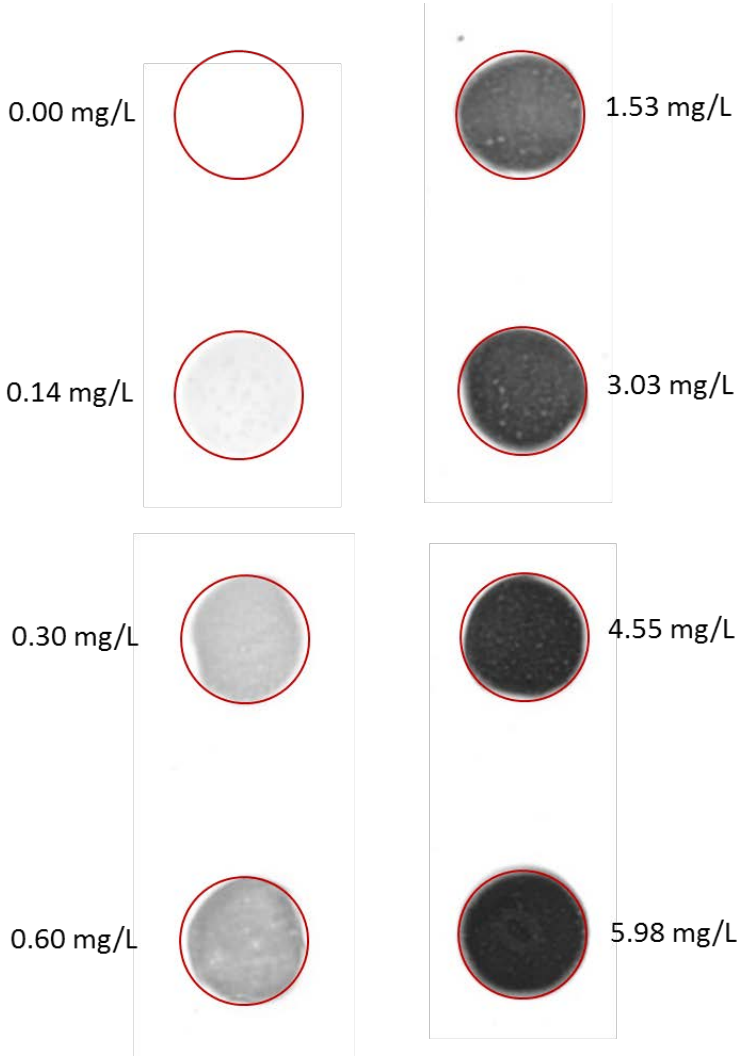


Table 1
Sulfide Mass Balance and Optical Densitometry Results

Solution	Target Concentration (mg/L as H_2S)	Measured Sulfide Concentration (mg/L as H_2S)[1]			Sulfide Loss[2] (%)	Gray-Scale Intensity[3]		
		Initial	Final	Average		1	2	Average
1	0.00	0.00	0.00	0.00	-	0	0	0 (0)
2	0.17	0.16	0.12	0.14	26%	6	14	10 (4)
3	0.34	0.33	0.26	0.30	23%	33	52	43 (10)
4	0.68	0.67	0.52	0.60	23%	100	77	89 (12)
5	1.70	1.70	1.35	1.53	21%	147	138	142 (5)
6	3.40	3.28	2.77	3.03	15%	171	155	163 (8)
7	5.10	4.86	4.24	4.55	13%	183	195	189 (6)
8	6.80	6.64	5.31	5.98	20%	194	193	194 (1)

Notes:

1. Measured by ISE.
2. Sulfide loss (%) during the experiments may be attributed to oxidation, volatilization, or adsorption.
3. Two DGTs were exposed at each sulfide concentration.

A calibration curve was developed by plotting the gray-scale intensity dissolved sulfide exposure concentrations and fitting the data to a function relating intensity to exposure sulfide concentration. As shown in Figure 4, the data were well fit by an exponential function (Equation 1) over the entire range of sulfide concentrations tested (0 – 6 mg/L as H_2S).

Equation 1 is useful for gray-scale intensities greater than about 10 (corresponding to sulfide concentrations greater than 0.15 mg/L). For lower concentrations, a three-point calibration curve was developed using the lowest concentration gel data. For the low range calibration, a power function was found to fit the data best (Equation 2).

Equation 1 is recommended for estimating porewater sulfide concentrations from DGT gels for gray-scale intensity greater than 10 and Equation 2 is appropriate for gray-scale intensity less than or equal to 10.

Equation 1. DGT calibration curve for sulfide concentration using optical densitometry (24-hour exposure)

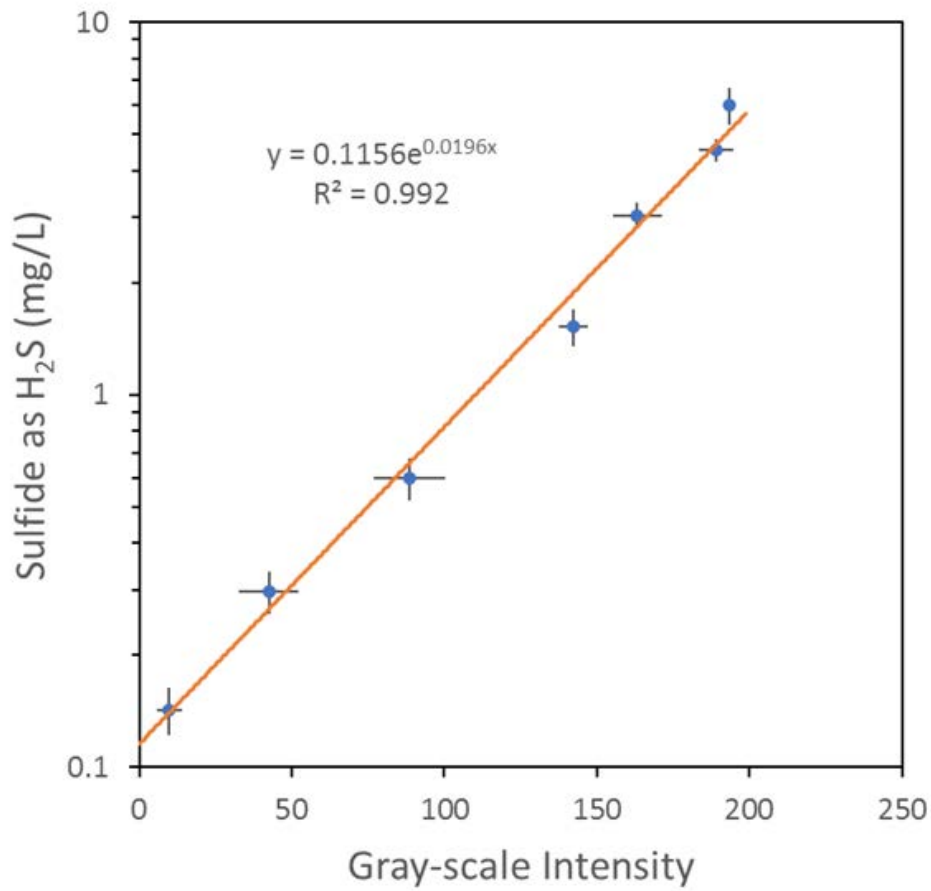
$$S = 0.1156 \times \exp\{0.0196 \times I\}$$

$$R^2 = 0.992$$

where:

S	=	sulfide concentration (mg/L as H_2S)
I	=	gray-scale intensity of binding gel image (10-256)

Figure 4
DGT calibration curve for a 24-hour exposure period



Equation 2. Low-range DGT calibration curve for sulfide concentration using optical densitometry (24-hour exposure)

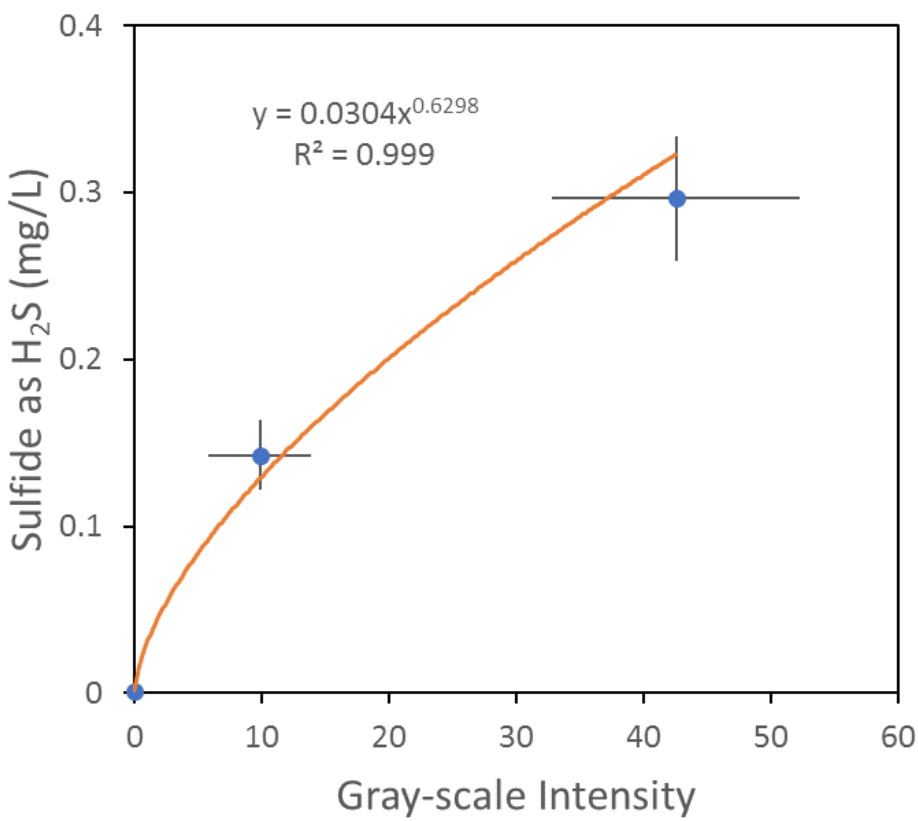
$$S = 0.0304 \times I^{0.6298}$$

$$R^2 = 0.999$$

where:

S	=	sulfide concentration (mg/L as H_2S)
I	=	gray-scale intensity of binding gel image (0-10)

Figure 5
Low-range DGT calibration curve for a 24-hour exposure period



Verification of Sulfide Accumulation in DGT Samplers

Sulfide recovered from DGT binding gels after exposure to 3.00 mg/L H_2S solution for 24 hours by the CRS and nitric acid/peroxide extraction methods are summarized in Table 2. The sulfide mass extracted by the two methods is in very good agreement and excellent sulfide mass recoveries were obtained.

Table 2
Verification of Sulfide Accumulation in DGT

Extraction Method	Measured Sulfide Concentration (mg/L as H_2S)[1]			Mass of Sulfide Extracted from DGT (µg as H_2S)		Theoretical Mass of Sulfide Accumulated in DGT (µg as H_2S)[2]	Recovery (%)[3]
	Initial	Final	Average				
Chromium Reducible Sulfur	3.65 ±0.11	2.34 ±0.04	2.99	1	13.5	13.9	97
				2	13.6		98
				3	15.2		109
				Average	14.1		101
Nitric acid /Peroxide	3.65 ±0.11	2.36 ±0.01	3.00	1	12.9	13.9	92
				2	14.5		104
				3	13.4		96
				Average	13.6		98

Notes:

1. Measured by iodometric titration.
2. Calculated with Equation 2 using the average sulfide concentration, $D=1.65\times10^{-6}$ cm^2/s (derived from data in Teasdale et al. 1999), t=86,400 s, A=2.54 cm^2, and Δg=0.078 cm.
3. Recovery=100×(mass of sulfide extracted)/(theoretical mass of sulfide accumulated)

The extracted sulfide masses were compared to the theoretical amount accumulated calculated using the mass-transfer equation for sulfide accumulation in the DGT assembly (Equation 3) and used to calculate percent recoveries (Table 2).

Equation 3. Model equation for calculating sulfide mass accumulation in DGT binding gel (Teasdale et al. 1999)

$$\mathrm{M} = \frac{CDtA}{\Delta g}$$

where:

M	=	mass of sulfide accumulated in binding gel (mg as H_2S)
C	=	sulfide concentration in solution (mg/cm^3 as H_2S)
D	=	effective diffusion coefficient of sulfide in DGT (cm^2/s)
t	=	exposure time (s)
A	=	cross-sectional area of DGT window (cm^2)
Δg	=	thickness of diffusion layer (cm)

The sulfide mass recoveries were in excellent agreement with the theoretical sulfide mass accumulated calculated by equation 3 and averaged 101 % of theoretical for the CRS method and 98 % for the nitric acid/peroxide extraction (Table 2).

Summary

The present study verified the DGT method for passive sampling of dissolved sulfide by establishing a quantitative relationship between dissolved sulfide concentrations in the range of 0 to 6 mg/L and the gray-scale intensity developed by the DGT binding gel after a 24-hour exposure period, and confirmed that the sulfide accumulated in the DGT gel agreed with the amount expected from theory. The results of this study show that the DGT method with quantification by optical densitometry gives accurate and reproducible results for dissolved sulfide concentrations and calibration curves were developed for field application of the DGT devices.

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Appendix A

Nitric acid/peroxide extraction procedure

Fluid 1: 0.02 M nitric acid
Fluid 2: 30% hydrogen peroxide adjusted to pH 2 with nitric acid
Fluid 3: 3.2 M ammonium acetate in 20% v/v nitric acid

1. Place a sulfide exposed DGT binding gel in a 50 mL centrifuge tube
2. Add 3 mL of fluid 1 and 5 mL of fluid 2 and heat in shaker-water bath at 85 ± 2 °C for 2 hours
3. 3. Add 3 mL of fluid 2 and heat for an additional 3 hours
4. After cooling, add 5 mL of fluid 3, dilute to 20 mL and agitate for 30 minutes at room temperature
5. Centrifuge at 10,000 rpm for 25 minutes (if solid is present)
6. Decant fluid
7. Repeat steps 3-6 with DI water (if solid is present)
8. Combine all decanted fluid, acidify with nitric acid to pH <2
9. Dilute with DI water to a final volume of 50 mL and submit for analysis

ATTACHMENT F-2
QUALITY ASSURANCE PROJECT PLAN

TABLE OF CONTENTS

1 INTRODUCTION F-2-1

2 SAMPLE CUSTODY AND SHIPPING REQUIREMENTS F-2-2

3 OVERVIEW OF DATA GENERATION AND ACQUISITION F-2-4

3.1 Chemical Analytical Methods F-2-4

4 QUALITY ASSURANCE/QUALITY CONTROL F-2-6

4.1 Data Quality Objectives and Criteria F-2-6

4.1.1 Precision F-2-6

4.1.2 Accuracy F-2-7

4.1.3 Representativeness F-2-8

4.1.4 Comparability F-2-8

4.1.5 Completeness F-2-8

4.1.6 Sensitivity F-2-9

4.2 Field and Laboratory Quality Assurance and Quality Control F-2-9

4.2.1 Field Quality Control F-2-10

4.2.2 Laboratory Quality Control F-2-11

4.3 Bioassay Test Quality Assurance/Quality Control F-2-14

4.3.1 Negative Controls F-2-14

4.3.2 Positive Controls F-2-14

4.3.3 Reference Sediment F-2-15

4.3.4 Replicates F-2-15

4.3.5 Water Quality Monitoring F-2-15

5 DOCUMENTATION, RECORD KEEPING, AND REPORTING REQUIREMENTS F-2-17

5.1 Documentation and Records F-2-17

5.1.1 Field Records F-2-17

5.1.2 Analytical and Chemistry Records F-2-18

5.1.3 Data Reduction F-2-21

5.2 Bioassay Data Deliverables F-2-21

5.3 Data Management F-2-21

6 DATA VALIDATION AND USABILITY F-2-23
6.1 Data Review, Validation, and Verification F-2-23
6.2 Validation and Verification Methods F-2-23
6.3 Reconciliation with User Requirements F-2-25
7 REFERENCES F-2-26

List of Tables

Table F-2-1 Parameters for Analysis, Screening Criteria, Analytical Methods, and Target Quantitation Limits
Table F-2-2 Data Quality Objectives
Table F-2-3 Field and Laboratory QA/QC Requirements

LIST OF ACRONYMS AND ABBREVIATIONS

ARI	Analytical Resources, Inc.
ASTM	American Society of Testing and Materials
COC	chain-of-custody
DQO	data quality objective
EC_{50}	concentration of test substance in dilution water calculated to affect 50% of a test population during continuous exposure over a specified period of time
Ecology	Washington State Department of Ecology
FC	Field Coordinator
GC	gas chromatograph
HDPE	high-density polyethylene
LC_{50}	lethal concentration of toxicant killing 50% of exposed organisms
MDL	method detection limit
MS	mass spectrometer
OMMP	*Operations, Maintenance, and Monitoring Plan*
PCB	polychlorinated biphenyl
PSEP	Puget Sound Estuary Program
QA	quality assurance
QAPP	*Quality Assurance Project Plan*
QC	quality control
RL	reporting limit
RPD	relative percent difference
SAP	*Sampling and Analysis Plan*
SDG	sample delivery group
SRM	standard reference material
USEPA	U.S. Environmental Protection Agency

1 INTRODUCTION

This *Quality Assurance Project Plan* (QAPP) establishes quality assurance (QA) objectives for sampling and analysis activities in Port Gamble Bay, as described in the accompanying *Sampling and Analysis Plan* (SAP; Attachment F-1 to the *Operations, Maintenance, and Monitoring Plan* [OMMP]). The methods and QA procedures described here will be followed by Anchor QEA and its contractors during long-term monitoring data collection activities beginning in 2019.

The goal of the QAPP is to ensure that data of sufficiently high quality are generated to support the project data quality objectives (DQOs). The QAPP will address project management responsibilities, sampling and analytical procedures, assessment and oversight, and data reduction, validation, and reporting.

Analytical QA/quality control (QC) procedures were developed based on the analytical protocols and quality assurance guidance of the Puget Sound Estuary Program (PSEP; 1986, 1995, 1997a, 1997b), the *Dredged Material Evaluation and Disposal Procedures* (DMMO 2013) and the *EPA Contract Laboratory Program National Functional Guidelines for Data Review* (USEPA 1999, 2004, 2005, 2008).

2 SAMPLE CUSTODY AND SHIPPING REQUIREMENTS

Samples are considered to be in one's custody if they are: 1) in the custodian's possession or view; 2) in a secured location (under lock) with restricted access; or 3) in a container that is secured with an official seal(s) such that the sample cannot be reached without breaking the seal(s).

Chain-of-custody (COC) procedures will be followed for all samples throughout the collection, handling, and analysis process. The principal document used to track possession and transfer of samples is the COC form. Each sample will be represented on a COC form the day it is collected. All data entries will be made using indelible ink pen. Corrections will be made by drawing a single line through the error, writing in the correct information, then dating and initialing the change. Blank lines and spaces on the COC form will be lined-out, dated, and initialed by the individual maintaining custody.

A COC form will accompany each shipment of samples to the analytical laboratory. Each person who has custody of the samples will sign the COC form and ensure that the samples are not left unattended unless properly secured. Copies of all COC forms will be retained in the project files.

All samples will be shipped, couriered, or hand-delivered to the analytical laboratory as soon as possible. Samples collected on Friday may be held until the following Monday for shipment provided that this delay does not jeopardize any hold time requirements. Specific sample shipping procedures are as follows:

- Each sample cooler or container will be shipped via overnight delivery to the appropriate analytical laboratory or picked up by the laboratory courier. In the event that Saturday delivery is required, the Field Coordinator (FC) will contact the analytical laboratory before 3 p.m. on Friday to ensure that the laboratory is aware of the number of containers shipped and the airbill tracking numbers for those containers. Following each shipment, the FC or QA/QC Manager will verify the shipment from the day before has been received and is in good condition.
- The samples for bioassay testing will be placed into lidded high-density polyethylene (HDPE) buckets with no head space and stored in coolers at approximately 4° ± 2°C

until transported to the laboratory. Temperature within the coolers will be monitored, and COC procedures will be followed throughout sample handling by the laboratory.

- Ice will be sealed in separate plastic bags and placed in the shipping containers.
- Individual sample containers or groups of containers will be placed in sealable plastic bags, packed to prevent breakage, and transported in a sealed ice chest or other suitable container.
- Glass jars will be separated in the shipping container by shock-absorbent material (e.g., bubble wrap) to prevent breakage.
- Shipping containers will be clearly labeled with sufficient information (name of project, time and date container was sealed, person sealing the container, and consultant's office name and address) to enable positive identification.
- COC forms will be enclosed in a plastic bag and taped to the inside lid of the cooler.
- Each cooler will be wrapped securely with strapping tape, labeled "Glass – Fragile" and "This End Up," and will be clearly labeled with the laboratory's shipping address and the consultant's return address.

Upon transfer of sample possession to the analytical laboratory, the persons transferring custody of the sample container will sign the COC form. Upon receipt of samples at the laboratory, the receiver will record the condition of the samples on a sample receipt form. COC forms will be used internally in the laboratory to track sample handling and final disposition.

3 OVERVIEW OF DATA GENERATION AND ACQUISITION

The rationale for the sampling design and design assumptions for locating and selecting environmental samples is detailed in the accompanying SAP (Attachment F-1). The methods and procedures for collection of field samples are also provided in the accompanying SAP.

3.1 Chemical Analytical Methods

This section summarizes the target chemical analyses for the sediment samples. All sample analyses will be conducted in accordance with U.S. Environmental Protection Agency (USEPA)-approved methods. Prior to analysis, all samples will be maintained according to the appropriate holding times and temperatures for each analysis as defined in Table F-1-2 of the accompanying SAP (Attachment F-1). Table F-2-1 of this QAPP presents the proposed analytes, the analytical methods to be used, and the targeted reporting limits for the sediment chemical testing. The analytical laboratory will prepare detailed reports in accordance with this QAPP.

Prior to the analysis of the samples, the laboratory will calculate method detection limits for each analyte of interest, where applicable. Method detection limits will be below the values specified in Table F-2-1.

Chemical testing will be conducted at Analytical Resources, Inc. (ARI). ARI is accredited under the Washington State Department of Ecology (Ecology) and the National Environmental Laboratories Accreditation Program. In completing chemical analyses for this project, the contract laboratory is expected to meet the following minimum requirements:

- Adhere to the methods outlined in this QAPP, including methods referenced for each analytical procedure (Table F-2-1)
- Deliver PDF and electronic data as specified
- Meet reporting requirements for deliverables
- Meet turnaround times for deliverables
- Implement QA/QC procedures including DQOs, laboratory QC requirements, and performance evaluation testing requirements

- Notify the project QA/QC Manager of any QA/QC problems when they are identified to allow for quick resolution
- Allow laboratory and data audits to be performed, if deemed necessary

4 QUALITY ASSURANCE/QUALITY CONTROL

This section describes DQOs and field and laboratory QA/QC requirements. The equipment calibration and maintenance requirements and the assessment of compliance and response actions are also discussed.

4.1 Data Quality Objectives and Criteria

The DQO for this project is to ensure that the data collected are of known and acceptable quality for project objectives described in the accompanying SAP (Attachment F-1) to be achieved. The quality of laboratory data is assessed by precision, accuracy, representativeness, comparability, and completeness (the "PARCC" parameters). Definitions of these parameters and the applicable QC procedures are presented below. Applicable quantitative goals for these data quality parameters are listed in Table F-2-2.

4.1.1 Precision

Precision is the ability of an analytical method or instrument to reproduce its own measurement. It is a measure of the variability, or random error, in sampling, sample handling, and laboratory analysis. The American Society of Testing and Materials (ASTM) recognizes two levels of precision: repeatability—the random error associated with measurements made by a single test operator on identical aliquots of test material in a given laboratory, with the same apparatus, under constant operating conditions—and reproducibility—the random error associated with measurements made by different test operators, in different laboratories, using the same method but different equipment to analyze identical samples of test material (ASTM 2002).

In the laboratory, "within-batch" precision is measured using replicate sample or QC analyses and is expressed as the relative percent difference (RPD) between the measurements. The "batch-to-batch" precision is determined from the variance observed in the analysis of standard solutions or laboratory control samples from multiple analytical batches.

Field precision will be evaluated by the collection of blind field duplicates for chemistry samples at a frequency of one in 20 samples. Field chemistry duplicate precision will be

screened against a RPD of 50% for sediment samples; however, no data will be qualified based solely on field homogenization duplicate precision.

Precision measurements can be affected by the nearness of a chemical concentration to the method detection limit (MDL), where the percent error (expressed as RPD) increases. The equation used to express precision is as follows:

$$\text{RPD} = \frac{(C_1 - C_2) \times 100\%}{(C_1 + C_2)/2} \qquad \text{(Equation 4-1)}$$

where:

RPD	=	relative percent difference
C_1	=	larger of the two observed values
C_2	=	smaller of the two observed values

4.1.2 Accuracy

Accuracy is a measure of the closeness of an individual measurement (or an average of multiple measurements) to the true or expected value. Accuracy is determined by calculating the mean value of results from ongoing analyses of laboratory-fortified blanks, standard reference materials, and standard solutions. In addition, laboratory-fortified (i.e., matrix-spiked) samples are also measured, which indicates the accuracy or bias in the actual sample matrix. Accuracy is expressed as percent recovery of the measured value, relative to the true or expected value. If a measurement process produces results for which the mean is not the true or expected value, the process is said to be biased. Bias is the systematic error either inherent in a method of analysis (e.g., extraction efficiencies) or caused by an artifact of the measurement system (e.g., contamination). Analytical laboratories use several QC measures to eliminate analytical bias, including systematic analysis of method blanks, laboratory control samples, and independent calibration verification standards. Because bias can be positive or negative, and because several types of bias can occur simultaneously, only the net, or total, bias can be evaluated in a measurement.

Laboratory accuracy will be evaluated against quantitative matrix spike and surrogate spike recovery performance criteria provided by the laboratory. Accuracy can be expressed as a percentage of the true or reference value, or as a percent recovery in those analyses where reference materials are not available and spiked samples are analyzed. The equation used to express accuracy is as follows:

$$\%R = 100\% \times (S-U)/C_{sa} \qquad \text{(Equation 4-2)}$$

where:

%R	=	percent recovery
S	=	measured concentration in the spiked aliquot
U	=	measured concentration in the unspiked aliquot
C_{sa}	=	actual concentration of spike added

Field accuracy will be controlled by adherence to sample collection procedures outlined in the SAP.

4.1.3 Representativeness

Representativeness expresses the degree to which data accurately and precisely represent an environmental condition. For the Site, the list of analytes is inclusive of those that may be identified as contaminants of concern.

4.1.4 Comparability

Comparability expresses the confidence with which one dataset can be evaluated in relation to another dataset. For this program, comparability of data will be established through the use of standard analytical methodologies, reporting formats, and common traceable calibration and reference materials.

4.1.5 Completeness

Completeness is a measure of the amount of data that is determined to be valid in proportion to the amount of data collected. Completeness will be calculated as follows:

$$C = \frac{\text{(Number of acceptable data points)} \times 100}{\text{(Total number of data points)}} \qquad \text{(Equation 4-3)}$$

The DQO for completeness for all components of this project is 95%. Data that have been qualified as estimated because the QC criteria were not met will be considered valid for the purpose of assessing completeness. Data that have been rejected will not be considered valid for the purpose of assessing completeness.

4.1.6 Sensitivity

Analytical sensitivities must be consistent with or lower than reporting limits listed in Table F-2-1 in order to demonstrate compliance with this QAPP.

The MDL is defined as the minimum concentration at which a given target analyte can be measured and reported with 99% confidence that the analyte concentration is greater than zero. Laboratory reporting limits (RLs) are defined as the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. Laboratory RLs will be used to evaluate the method sensitivity or applicability prior to the acceptance of a method for this program.

The sample-specific RLs will be reported by the laboratory and will take into account any factors relating to the sample analysis that might decrease or increase the RL (e.g., dilution factor, percent moisture, sample volume, sparge volume). In the event that the RLs are elevated for a sample due to matrix interferences and subsequent dilution or reduction in the sample aliquot, the data will be evaluated by QA/QC Manager and the laboratory to determine if an alternative course of action is required or possible.

4.2 Field and Laboratory Quality Assurance and Quality Control

Field and laboratory activities must be conducted in such a manner that results meet specified quality objectives and are fully defensible. Guidance for QA/QC is derived from the protocols developed for Sediment Management Standards (Ecology 2013) and the Model Toxics Control Act (Ecology 2007), the USEPA Test Methods (1986), National Functional Guidelines (USEPA 1999, 2004, 2005, 2008), and the cited methods.

4.2.1 Field Quality Control

Anchor QEA personnel will identify and label samples in a consistent manner to ensure that field samples are traceable and that labels provide all information necessary for the laboratory to conduct required analyses properly. Samples will be placed in appropriate containers and preserved for shipment to the laboratory.

4.2.1.1 Sample Containers

Sample containers and preservatives will be provided by the laboratory. The laboratory will maintain documentation certifying the cleanliness of bottles and the purity of preservatives provided. Specific container requirements are included in the accompanying SAP (Attachment F-1).

4.2.1.2 Sample Identification and Labels

Each sample will have an adhesive plastic or waterproof paper label affixed to the container and will be labeled at the time of collection. The following information will be recorded on the container label at the time of collection:

- Project name
- Sample identification
- Date and time of sample collection
- Preservative type (if applicable)
- Analysis to be performed

Samples will be uniquely identified with a sample identification number. Specific sample identification schemes are provided in the accompanying SAP (Attachment F-1).

4.2.1.3 Field Quality Assurance Sampling

Field QA procedures will consist of following acceptable practices for collecting and handling samples. Adherence to these procedures will be complemented by periodic and routine equipment inspection.

Field QA samples will be collected along with environmental samples. Field QA samples are useful in identifying possible problems resulting from sample collection or sample processing in the field. Field QA samples will be homogenization duplicates collected at a frequency of one in 20 samples processed.

Field QA samples will also include the collection of additional sample volume to ensure that the laboratory has sufficient sample volume to run the program-required analytical QA/QC samples for analysis, as specified in Table F-2-3. Additional sample volume to meet this requirement will be collected at a frequency of one in 20 samples processed.

Equipment rinsate blanks will be collected at a frequency of one per sample collection equipment type per event as a part of these collection events.

All field QA samples will be documented in the field logbook and verified by the QA/QC Manager or a designee.

4.2.2 Laboratory Quality Control

Laboratory QC procedures, where applicable, include initial and continuing instrument calibrations, standard reference materials, laboratory control samples, matrix replicates, matrix spikes, method blanks, internal standards, and surrogate spikes. Table F-2-3 lists the frequency of analysis for laboratory QA/QC samples, and Table F-2-2 summarizes the DQOs for precision, accuracy, and completeness.

Results of the QC samples from each sample group will be reviewed by the analyst immediately after a sample group has been analyzed. The QC sample results will then be evaluated to determine if control limits have been exceeded. If control limits are exceeded in the sample group, the QA/QC Manager will be contacted immediately, and corrective action (e.g., method modifications followed by reprocessing the affected samples) will be initiated prior to processing a subsequent group of samples.

4.2.2.1 Laboratory Instrument Calibration and Frequency

An initial calibration will be performed at the frequencies outlined in Table F-2-3 for each analysis and laboratory instrument to be used and when any ongoing calibration does not meet method control criteria. A calibration verification will be analyzed following each initial calibration and will meet method criteria prior to analysis of samples. Continuing calibrations will be performed as required by the analytical method and as outlined in Table F-2-3. If the ongoing continuing calibration is out of control, the analysis must come to a halt until the source of the control failure is eliminated or reduced to meet control specifications. All project samples analyzed while the instrument calibration was out of control will be reanalyzed.

Instrument blanks or continuing calibration blanks provide information on the stability of the baseline established. Continuing calibration blanks will be analyzed immediately prior to or following continuing calibration verification at the instrument for each type of applicable analysis.

4.2.2.2 Standard Reference Materials

Standard reference materials (SRMs) are substances of the same or similar matrix to the project samples and contain a known concentration of target analyte(s). These materials are prepared and analyzed in the same manner as routine samples and in the same preparation and analytical batch. The recovery of the target analyte(s) provide information on interferences caused by the sample matrix. The Puget Sound SRM will be analyzed for carcinogenic polycyclic aromatic hydrocarbons, dioxin/furans, and cadmium for this project. SRM results will be evaluated using the DQOs outlined in Table F-2-2.

4.2.2.3 Laboratory Duplicates/Replicates

Analytical duplicates provide information on the precision of the analysis and are useful in assessing potential sample heterogeneity and matrix effects. Analytical duplicates and replicates are aliquots of the original samples that are prepared and analyzed as separate samples.

4.2.2.4 Matrix Spikes and Matrix Spike Duplicates

Analyses of matrix spike samples provide information on the preparation efficiency of the method on the sample matrix. By performing duplicate matrix spike analyses, information on the precision of the method is also provided.

4.2.2.5 Method Blanks

Method blanks are analyzed to assess possible laboratory contamination at all stages of sample preparation and analysis. The method blank for all analyses must contain less than the quantitation limit of any single target analyte/compound. Sample results may be reported if they are below detection or greater than five times the concentration detected in the method blank. If a laboratory method blank exceeds these criteria for any analyte/compound, analyses must stop, the source of contamination must be eliminated or reduced, and the affected samples must be reanalyzed.

4.2.2.6 Laboratory Control Samples

Laboratory control samples are analyzed to assess possible laboratory bias at all stages of sample preparation and analysis. The laboratory control sample is a matrix-dependent spiked sample prepared at the time of sample extraction along with the preparation of sample and matrix spikes and/or duplicates. The laboratory control sample will provide information on the accuracy of the analytical process and, when analyzed in duplicate, will provide precision information as well.

4.2.2.7 Laboratory Deliverables

Data packages will be checked for completeness immediately upon receipt from the laboratory to ensure that data and QA/QC information requested are present. Data quality will be assessed on the following based on this QAPP and National Functional Guidelines (USEPA 1999, 2004, 2005, 2008):

- Holding times and sample receipt conditions
- All compounds of interest reported
- RLs
- Matrix spike/matrix spike duplicate results

- Laboratory control samples/laboratory control sample duplicates
- SRM results
- Method blanks
- Internal standard recoveries
- Surrogate standard recoveries
- Initial calibrations
- Calibration verifications
- Instrument performance checks
- Dual-column confirmation results

4.3 Bioassay Test Quality Assurance/Quality Control

Sediment toxicity tests will incorporate standard QA/QC procedures to ensure that the test results are valid. Standard QA/QC procedures include the use of negative controls, positive controls, reference sediment samples, replicates, and measurements of water quality during testing.

4.3.1 Negative Controls

The negative control to be used for both sediment toxicity tests will be a clean control, which consists of clean, inert material and the same seawater used in testing sediment toxicity. For the tests to be used in this study, the negative control will be the amphipod collection site sediment, which will most likely be clean sand. The negative control for the bivalve larval test will be a seawater control.

4.3.2 Positive Controls

An appropriate reference toxicant will be run with each batch of test sediments as a positive control to establish the relative sensitivity of the test organisms. The positive control for sediment tests is typically conducted with diluent seawater and without sediment. The LC_{50}

or the EC_{50} must be within the 95% confidence interval of responses expected for the toxicant used[1].

4.3.3 Reference Sediment

Reference sediment will also be included with each bioassay, tested concurrently with test sediments to provide data that can be used to separate toxicant effects from unrelated effects, such as those of sediment grain size. Reference sediment samples should be collected from an area documented to be free from chemical contamination and should represent the range of important natural, physical, and chemical characteristics of the test sediments (e.g., sediment grain size and total organic carbon). For this study, reference sediment samples will be collected from Carr Inlet in Puget Sound, Washington (PSEP 1995). All bioassays have performance standards for reference sediments as mentioned above. Failure to meet these standards may result in the requirement to retest.

4.3.4 Replicates

Five replicate chambers for each test sediment, reference sediment, and negative control treatments will be run for each bioassay. A water quality replicate will also be run for each treatment.

4.3.5 Water Quality Monitoring

Water quality monitoring will be conducted for the amphipod, larval, and juvenile polychaete bioassays and reference toxicant tests. This monitoring consists of daily measurements in the water quality replicate of salinity, temperature, pH, and dissolved oxygen for the amphipod and larval tests. These measurements will be made every three days for the juvenile polychaete bioassay, with the exception of dissolved oxygen, which will be measured daily. Ammonia and sulfides in the overlying water will be determined at test initiation and termination for all three tests. Monitoring will be conducted for all test and reference sediments and negative controls (including seawater controls). Measurements for

[1] LC_{50} is the lethal concentration of toxicant killing 50% of exposed organisms. EC_{50} is the concentration of test substance in dilution water that is calculated to affect 50% of a test population during continuous exposure over a specified period of time.

each treatment will be made on a separate test chamber that is set up identically to the other replicates within the treatment group, including the addition of test organisms.

5 DOCUMENTATION, RECORD KEEPING, AND REPORTING REQUIREMENTS

This section describes field and laboratory documentation and record keeping, data validation, and data report requirements.

5.1 Documentation and Records

This project will require central project files to be maintained at Anchor QEA. Project records will be stored and maintained in a secure manner. Each project team member is responsible for filing all necessary project information or providing it to the person responsible for the filing system. Individual team members may maintain files for individual tasks, but must provide such files to the central project files upon completion of each task. A project-specific index of file contents is to be kept with the project files. Hard copy documents, when necessary, will be kept on file at Anchor QEA throughout the duration of the project, and all electronic data will be maintained in the database at Anchor QEA.

5.1.1 Field Records

All documents generated during the field effort are controlled documents that become part of the project file.

5.1.1.1 Field Logs

Field team members will keep a daily record of significant events, observations, and measurements in a field log. All field activities will be recorded in a bound, paginated field logbook maintained by the FC or a designee for each activity. Field logbooks will be the main source of field documentation for all field activities. The on-site field representative will record information pertinent to the investigation program in the field logbook. The sampling documentation may be recorded manually or electronically and will contain information on each sample collected including, at a minimum, the following information:

- Project name
- Field personnel on site
- Site visitors
- Weather conditions
- Field observations

- Maps and/or drawings
- Date and time sample collected
- Sampling method and description of activities
- Identification or serial numbers of instruments or equipment used
- Deviations from the QAPP and SAP
- Conferences associated with field sampling activities

The person recording information must enter the date and time and initial each entry. Additional specific field reporting requirements are defined in the SAP. In general, sufficient information will be recorded during sample collection so that reconstruction of the event can occur without relying on the memory of the field personnel.

The field logbooks will be permanently bound and durable for adverse field conditions. All pages will be numbered consecutively. Notes will be taken in indelible, waterproof blue or black ink. Errors will be corrected by crossing out with a single line, dating, and initialing.

5.1.2 Analytical and Chemistry Records

Analytical data records will be retained by the laboratory and in the Anchor QEA central project files. For all analyses, the data reporting requirements will include those items necessary to complete data validation, including electronic copies of all raw data. The analytical laboratory will be required, where applicable, to report the following:

- **Project Narrative.** This summary, in the form of a cover letter, will discuss problems, if any, encountered during any aspect of analysis. This summary should discuss, but is not limited to, QC, sample shipment, sample storage, and analytical difficulties. Any problems encountered, actual or perceived, and their resolutions will be documented in as much detail as appropriate.
- **COC Records.** Legible copies of the COC forms will be provided as part of the data package. This documentation will include the time of receipt and condition of each sample received by the laboratory. Additional internal tracking of sample custody by the laboratory will also be documented on a sample receipt form. The form must include all sample shipping container temperatures measured at the time of sample receipt.

- **Sample Results.** The data package will summarize the results for each sample analyzed. The summary will include the following information when applicable:
  - Field sample identification code and the corresponding laboratory identification code
  - Sample matrix
  - Date of sample extraction/preparation
  - Date and time of analysis
  - Weight and/or volume used for extraction/preparation/analysis
  - Final dilution volumes or concentration factor for the sample
  - Identification of the instrument used for analysis
  - MDLs and quantitation limits accounting for sample-specific factors (e.g., dilution, total solids)
  - Analytical results with reporting units identified
  - Data qualifiers and their definitions
- **QA/QC Summaries.** This will contain the results of the laboratory QA/QC procedures. Each QA/QC sample analysis will be documented with the same information required for the sample results (see above). No recovery or blank corrections will be made by the laboratory. The required summaries are listed below; additional information may be requested.
  - **Method Blank Results.** The method blank results associated with each sample and the concentration of all compounds of interest identified in these blanks will be reported.
  - **Matrix Spike Recovery.** All matrix spike recovery data will be included. The name and concentration of all compounds added, percent recoveries, and range of recoveries will be listed. The RPD for all matrix spike duplicate analyses will be reported.
  - **Matrix Duplicate.** The RPD for all matrix duplicate analyses will be reported.
  - **Laboratory Control Sample.** All laboratory control sample recovery data will be included. The names and concentrations of all compounds added, percent recoveries will be reported. The RPDs for all duplicate analyses will be included.

- **Internal Standard Area Summary.** The area counts of internal standard areas or their concentrations will be reported for all analyses that require internal standards.
- **Surrogate Spike Recovery.** The names and concentrations of all surrogate spike compounds added, the spiked concentrations, the percent recoveries, and the range of acceptable recoveries will be reported for organic analyses.
- **Calibration Data Summary.** This summary will report the concentrations of the initial calibration and calibration verification standards, and the date and time of analyses. The response factor, percent relative standard deviation, percent difference, and retention time for each analyte will be reported, as applicable.
- **Relative Retention Time.** The relative retention times for each analyte detected in the samples for both primary and confirmation analyses for applicable methods will be reported along with the acceptable retention time ranges.
- **Original Data.** Legible copies of the original data generated by the laboratory will include the following:
  - Sample preparation, identification of preparation method used, and cleanup logs
  - Instrument specifications and analysis logs for all instruments used on days of calibration and analysis
  - Calculation worksheets for inorganic analyses
  - Printouts of full scan chromatograms and quantitation reports for all gas chromatograph (GC) and GC/mass spectrometer (MS) sample, standard, blank, calibration, spike, replicate, and reference material results
  - Enhanced spectra of detected compounds with associated best-match spectra for each sample for GC/MS analyses

All instrument data shall be fully restorable at the laboratory from electronic backup. Data validation reports will be maintained in the central project files with the analytical data reports.

5.1.3 Data Reduction

Data reduction is the process by which original data (analytical measurements) are converted or reduced to a specified format or unit to facilitate analysis of the data. Data reduction requires that all aspects of sample preparation that could affect the test result, such as sample volume analyzed or dilutions required, be taken into account in the final result. It is the laboratory analyst's responsibility to reduce the data, which are subjected to further review by the Laboratory Manager, the project manager, the QA/QC Manager, and independent reviewers. Data reduction may be performed manually or electronically. If performed electronically, all software used must be demonstrated to be true and free from unacceptable error.

5.2 Bioassay Data Deliverables

The laboratory conducting the bioassay tests will be responsible for internal checks on data reporting and will correct errors identified during the QA review. The bioassay laboratory for this study will be required to report results that include all information recommended by PSEP protocols for QA review, as follows:

- A description of any deviations from the methodology or problems with the process and procedures of analyses
- Test methods used for bioassay testing and statistical analyses
- Results for survival, growth, reburial, abnormalities, water quality parameters, reference toxicant, and statistical analyses
- Original data sheets for water quality, survival, growth, reburial, abnormalities, reference toxicant, and statistical analyses
- COC records

Close contact with the laboratory will be maintained to resolve any QA/QC problems in a timely manner.

5.3 Data Management

Field data sheets will be checked for completeness and accuracy by the FC prior to delivery to the data manager. All data generated in the field will be documented and provided to the office data manager, who is responsible for the data's entry into the database. All manually

entered data will be checked by a second party. Field documentation will be filed in the main project file after data entry and checking are complete.

Laboratory data will be provided to the data manager in the EQuIS electronic format. The laboratory data that are provided electronically and loaded into the database will undergo a 10% check against the laboratory hard copy data. Data will be validated or reviewed manually and qualifiers, if assigned, will be entered manually. The accuracy of all manually entered data will be verified by a second party.

6 DATA VALIDATION AND USABILITY

This section describes the processes that will be used to review project data quality.

6.1 Data Review, Validation, and Verification

Stage 2B data validations (USEPA 2009) will be performed on most data and Stage 4 data validations will be performed on the dioxin/furan data. During the validation process, analytical data will be evaluated for method QC and laboratory QC compliance, and their validity and applicability for program purposes will be determined. Based on the findings of the validation process, data validation qualifiers may be assigned. The validated project data, including qualifiers, will be entered into the project database, thus enabling this information to be retained or retrieved, as needed.

6.2 Validation and Verification Methods

Data validation includes signed entries by the field and laboratory technicians on field data forms and laboratory datasheets, respectively, review for completeness and accuracy by the FC and Laboratory Manager, review by the QA/QC Manager (or designee) for outliers and omissions, and the use of QC criteria to accept or reject specific data. All data will be entered into the project database.

All laboratory data will be reviewed and verified to determine whether DQOs have been met and that appropriate corrective actions have been taken, when necessary. The project QA/QC Manager or designee will be responsible for the final review of all data generated from analyses of samples.

The first level of review will take place in the laboratory as the data are generated. The Laboratory Manager or designee will be responsible for ensuring that the data generated meet minimum QA/QC requirements and that the instruments were operating under acceptable conditions during generation of data. DQOs will also be assessed at this point by comparing the results of QC measurements with pre-established criteria as a measure of data acceptability.

The analysts and/or laboratory department manager will prepare a preliminary QC checklist for each analytical parameter and for each sample delivery group (SDG) as soon as analysis of a SDG has been completed. Any deviations from the DQOs listed on the checklist will be brought to the attention of the Laboratory Manager to determine whether corrective action is needed, and to determine the impact on the reporting schedule.

Data packages will be checked for completeness immediately upon receipt from the laboratory to ensure that data and QA/QC information requested are present. Data quality will be assessed for all data by a reviewer using this QAPP and National Functional Guidelines (USEPA 1999, 2004, 2005, 2008), by considering the following:

- Laboratory sample receipt
- Holding times
- Instrument performance checks
- Initial calibrations
- Continuing calibrations
- Method blanks
- Surrogate recoveries
- Internal standard results
- Detection limits
- Quantitation limits
- Dual-column confirmation results
- Laboratory control samples
- Matrix spike/matrix spike duplicate samples
- Laboratory replicates
- SRMs

The data will be validated in accordance with the project-specific DQOs described above, analytical method criteria, and the laboratory's internal performance standards based on their Standard Operating Procedures.

6.3 Reconciliation with User Requirements

The QA/QC Manager will review data after each survey to determine if DQOs have been met. If data do not meet the project's specifications, the QA/QC Manager will review the errors and determine if the problem is due to calibration/maintenance, sampling techniques, or other factors and will suggest corrective action as necessary. It is expected that any problem would be able to be corrected by retraining, revision of techniques, or replacement of supplies/equipment; if not, the DQOs will be reviewed for feasibility. If specific DQOs are not achievable, the QA/QC Manager will recommend appropriate modifications.

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TABLES

Table F-2-1
Parameters for Analysis, Screening Criteria, Analytical Methods, and Target Quantitation Limits

Parameter	Management Standards		Model Toxics Control Act	Analytical Method	Quantitation Limit
	Sediment Cleanup Objective	Cleanup Screening Level	Method A for Unrestricted Land Uses		
Metals					
Cadmium	260	270	2000	6010B/6020	0.5
Polycyclic Aromatic Hydrocarbons, µg/kg dry weight					
Total LPAH[a]	---	---	---	8270D SIM	---
Naphthalene	---	---	---	8270D SIM	5.0
Acenaphthylene	---	---	---	8270D SIM	5.0
Acenaphthene	---	---	---	8270D SIM	5.0
Fluorene	---	---	---	8270D SIM	5.0
Phenanthrene	---	---	---	8270D SIM	5.0
Anthracene	---	---	---	8270D SIM	5.0
2-Methylnaphthalene	---	---	---	8270D SIM	5.0
Total HPAHs[b]	---	---	---	8270D SIM	---
Fluoranthene	---	---	---	8270D SIM	5.0
Pyrene	---	---	---	8270D SIM	5.0
Benzo(a)anthracene	---	---	---	8270D SIM	5.0
Chrysene	---	---	---	8270D SIM	5.0
Total benzo(b,j,k)fluoranthenes	---	---	---	8270D SIM	5.0
Benzo(a)pyrene	---	---	10	8270D SIM	5.0
Indeno(1,2,3-cd)pyrene	---	---	---	8270D SIM	5.0
Dibenz(a,h)anthracene	---	---	---	8270D SIM	5.0
Benzo(g,h,i)perylene	---	---	---	8270D SIM	5.0
Total naphthalenes[c]	---	---	5,000	8270D SIM	---
cPAH TEQ	---	---	---	8270D SIM	---
Polycyclic Aromatic Hydrocarbons, mg/kg-OC					
Total LPAH[a]	370	780	---	8270D SIM	---
Naphthalene	99	170	---	8270D SIM	Various
Acenaphthylene	66	66	---	8270D SIM	Various
Acenaphthene	16	57	---	8270D SIM	Various
Fluorene	23	79	---	8270D SIM	Various
Phenanthrene	100	480	---	8270D SIM	Various
Anthracene	220	1,200	---	8270D SIM	Various
2-Methylnaphthalene	38	64	---	8270D SIM	Various
Total HPAHs[b]	960	5,300	---	8270D SIM	---
Fluoranthene	160	1,200	---	8270D SIM	Various
Pyrene	1,000	1,400	---	8270D SIM	Various
Benzo(a)anthracene	110	270	---	8270D SIM	Various
Chrysene	110	460	---	8270D SIM	Various
Total benzo(b,j,k)fluoranthenes	230	450	---	8270D SIM	Various

Table F-2-1
Parameters for Analysis, Screening Criteria, Analytical Methods, and Target Quantitation Limits

Parameter	Management Standards		Model Toxics Control Act	Analytical Method	Quantitation Limit
	Sediment Cleanup Objective	Cleanup Screening Level	Method A for Unrestricted Land Uses		
Benzo(a)pyrene	99	210	---	8270D SIM	Various
Indeno(1,2,3-cd)pyrene	34	88	---	8270D SIM	Various
Dibenz(a,h)anthracene	12	33	---	8270D SIM	Various
Dioxin/Furans, ng/kg dry weight					
Dioxins					
2,3,7,8-TCDD	---	---	---	1613B	1.0
1,2,3,7,8-PeCDD	---	---	---	1613B	5.0
1,2,3,4,7,8-HxCDD	---	---	---	1613B	5.0
1,2,3,6,7,8-HxCDD	---	---	---	1613B	5.0
1,2,3,7,8,9-HxCDD	---	---	---	1613B	5.0
1,2,3,4,6,7,8-HpCDD	---	---	---	1613B	5.0
OCDD	---	---	---	1613B	10
Furans					
2,3,7,8-TCDF	---	---	---	1613B	1.0
1,2,3,7,8-PeCDF	---	---	---	1613B	5.0
2,3,4,7,8,-PeCDF	---	---	---	1613B	5.0
1,2,3,4,7,8-HxCDF	---	---	---	1613B	5.0
1,2,3,6,7,8-HxCDF	---	---	---	1613B	5.0
1,2,3,7,8,9-HxCDF	---	---	---	1613B	5.0
2,3,4,6,7,8-HxCDF	---	---	---	1613B	5.0
1,2,3,4,6,7,8-HpCDF	---	---	---	1613B	5.0
1,2,3,4,7,8,9-HpCDF	---	---	---	1613B	5.0
OCDF	---	---	---	1613B	10

Notes:

a Total LPAH consists of the sum of naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene.

b Total HPAH consists of the sum of fluoranthene, pyrene, benz(a)anthracene, chrysene, benzo(b,j,k)fluoranthenes, benzo(a)pyrene, indeno(1,2,3,-c,d)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene.

c Total naphthalenes consists of the sum of 1-methylnaphthalene, 2-methylnaphthalene, and napthalene.

µg/kg = micrograms per kilogram

cPAH = carcinogenic polycyclic aromatic hydrocarbon

mg/kg = mliligrams per kilogram

ng/kg = nanograms per kilogram

TEQ = Toxic Equivalents Quotient

Table F-2-2
Data Quality Objectives

Parameter	Precision	Accuracy	Completeness
Sediments			
Total metals	± 30% RPD	75-125% R	95%
Semi-volatile organic compounds	± 35% RPD	70-150% R	95%
Dioxin/Furans	± 35% RPD	50-150% R	95%

Notes:

R = Recovery

RPD = Relative percent difference

Table F-2-3
Field and Laboratory QA/QC Requirements

Analysis Type	Field Quality Assurance Samples				Laboratory Quality Control Elements								
	Rinsate Blank	Field Blank	Trip Blank	Homogenization duplicate	Initial Calibration	Ongoing Calibration	Replicates	LCS/OPR	Matrix Spikes	SRM	Matrix Spike Duplicates	Method Blanks	Surrogate Spikes
Metals	1 per equipment type	1 per equipment type	NA	1 per 20 samples collected for analyses	Daily	1 per 10 samples	1 per 20 samples or 1 per batch, whichever is more frequent	1 per 20 samples	1 per 20 samples or 1 per batch, whichever is more frequent	1 per sampling event	NA	1 per 20 samples or 1 per batch, whichever is more frequent	NA
SVOCs/PAHs	1 per equipment type	1 per equipment type	NA	1 per 20 samples collected for analyses	As needed[a]	Every 12 hours	NA	1 per 20 samples	1 per 20 samples or 1 per batch, whichever is more frequent	1 per sampling event	1 per 20 samples or 1 per batch, whichever is more frequent	1 per 20 samples or 1 per batch, whichever is more frequent	Every sample
Dioxin/Furans	1 per equipment type	1 per equipment type	NA	1 per 20 samples collected for analyses	As needed[a]	Every 12 hours	1 per 20 samples or 1 per batch, whichever is more frequent	1 per 20 samples or 1 per batch, whichever is more frequent	NA[b]	1 per sampling event	NA	1 per 20 samples or 1 per batch, whichever is more frequent	Every sample[b]

Notes:

a Initial calibrations are considered valid until the ongoing continuing calibration no longer meets method specifications. At that point, a new initial calibration is performed.

b Isotope dilution with labeled compounds required in every sample.

LCS = laboratory control sample

NA = not applicable

OPR = ongoing precision and recovery

PAH = polycyclic aromatic hydrocarbons

SVOC = semivolatile organic compounds

SRM = standard reference material