APPENDIX H

Data Quality Assessments

Data Quality Assessment
Collection of Stack Gas in all Isokinetic Sampling Trains

Analyte(s)	Method(s)
Particulate Matter	EPA Method 5
Hydrochloric Acid/Chlorine	EPA Method 26A
PCDD/PCDF	SW-846 Method 0023A
Metals	EPA Method 29

Preliminary Measurements	Sampling Location Measurements	All ports meet the minimum requirements for distance from upstream and downstream disturbances.
	Cyclonic Flow Check	Cyclonic flow demonstrated to be within constraints for isokinetic sampling.
Sample Collection	Minimum Sample Volume	All other runs met QAPP specifications. See table below.
	Minimum Sample Duration	All runs met QAPP specifications. See table below.
	Isokinetic Sampling Rate	All trains met method specifications. See table below.
Sampling Train Operation	Probe Temperature	See table below.
	Filter Temperature	All runs met method specifications. See table below.
	Transfer Line Temperature	All runs met method specifications. See table below.
	Condenser Exit Temperature	See table below.
	Impinger Exit Temperature	All runs met method specifications. See table below.
Leak Checks	Sampling Train – Pre Test	All runs met method specifications. See table below.
	Sampling Train – Port Changes	All runs met method specifications. See table below.
	Sampling Train – Post Test	All runs met method specifications. See table below.
	Pitot Tubes – Pre Test	All runs met method specifications. See table below.
	Pitot Tubes – Post Test	All runs met method specifications. See table below.

Sampling Documentation	Documentation of Calibration	All calibrations documented appropriately; All calibrations meet specifications.
	Correct Calibration Factors Used	Yes.
	Correct Molecular Weight Used	Yes. Spreadsheet links are to corrected values in CEMs spreadsheet
	Completed Data Sheets – Sample Collection	Yes. See table below.
	Completed Data Sheets – Sample Recovery	All required information collected on sampling data sheets. See table below.
Conclusions and Comments	These data are acceptable for the intended purpose.	

Sampling Details

	Particulate Matter EPA Method 5	HCl/Cl_2 EPA Method 26A	PCDD/PCDF EPA Method 23	Metals EPA Method 29
Sample Volume				
Target	30 dscf	30 dscf	88 dscf	60 dscf
Achieved	Yes	Yes	Yes	Yes
Sampling Duration				
Target	1 hour	1 hour	3 hours	2 hours
Achieved	Yes	Yes	Yes	Yes
Isokinetic Sampling Rate between 90&110%	Yes	Yes	Yes	Yes
Temperatures Within Specification				
Probe	Yes	Yes	Yes	Yes
Filter	Yes	Yes	Yes	Yes
Heat-Traced Line	--	--	Yes	--
Condenser Exit	--	--	Yes	--
Impinger Exit	Yes	Yes	Yes	Yes
Data Sheets Complete				
Sample Collection	Yes	Yes	Yes	Yes
Train Recovery	Yes	Yes	Yes	Yes
Train Leak Checks				
pre	Yes	Yes	Yes	Yes
port changes	Yes	Yes	Yes	Yes
Post (at proper vacuum)	Yes	Yes	Yes	Yes
Pitot Leak Checks				
pre	Yes	Yes	Yes	Yes
post	Yes	Yes	Yes	Yes

Data Quality Assessment
Analysis of Stack Gas for Polychlorinated Dibenzodioxins and Dibenzofurans

Parameter	PCDD/PCDF in Stack Gas
Sampling Method	SW-846 Method 0023A
Analytical Method	SW-846 Method 8290
Laboratory Project Number(s)	H3J140408, H3J190407, H3K010401, H3K010402
Preparation Batch Number(s)	3289014, 3289015, 3295023, 3295024, 3308029, 3308030
Sample Shipping and Receipt	All samples received intact and at or below 4°C. QAPP specifies <4°C.
Holding Time(s)	All samples prepared within 13 days of sampling and analyzed within 18 days of preparation. QAPP specifies 30 days until preparation and 45 days from preparation until analysis. See table below.
Blank Results	All target analytes except 2,3,7,8-TCDD were observed in a media check sample, laboratory blank or field blank. The levels observed in the blank samples are very low, typically near the detection limit. See tables below and in the main body of the report.
Laboratory Check Sample (LCS) and Laboratory Check Sample Duplicate (LCSD) Results	Recovery of all species in LCS between 70 and 120%. Relative percent difference (RPD) for all LCS/LCSD pairs were all below 25%. QAPP specifies the performance of a LCS once with recoveries between 70 and 130%. The QAPP has no specification for the performance of LCSD, or for RPD. The laboratory specification is RPD below 50%. See table below.
Surrogate and Internal Standard Spike Results	Recovery of internal standards between 40 and 130% with a pooled relative standard deviation below 25%. Recovery of pre-sampling surrogates between 70 and 115% with a pooled relative standard deviation below 15%. QAPP specifies internal standard recovery of 40-130% for tetra-hexa isomers and 25-130% for hepta and octa isomers, with no specification for pooled RSD. QAPP specifies recovery of surrogates between 70-130% with a pooled RSD below 30%. See tables below.
Data Quality Objectives	These are given in terms of surrogate spikes: Accuracy: 70-130% Recovery. Precisions: <30% pooled RSD. These objectives were met.
Conclusions and Comments	These data are acceptable for the intended purpose. As noted above, many analytes were found in the blank samples. Typically these levels are below the levels observed in the field samples. This indicates a potential positive bias in the field samples, which is conservative relative to the determination of emission rate. No data are qualified based on blank results.

Holding Time

	Sample Date	Extraction Date	Analysis Date	Holding Time (Days)	
				Sampling to Extraction	Extraction to Analysis
VS2-STK-11B-M0023A-PNR/FILT	11-Oct	16-Oct	28-Oct	5	12
VS2-STK-11B-M0023A-CR/XAD	11-Oct	16-Oct	31-Oct	5	15
VS2-STK-13B-M0023A-PNR/FILT	10-Oct	16-Oct	29-Oct	6	13
VS2-STK-13B-M0023A-CR/XAD	10-Oct	16-Oct	31-Oct	6	15
VS2-STK-15B-M0023A-PNR/FILT	30-Oct	4-Nov	20-Nov	5	16
VS2-STK-15B-M0023A-CR/XAD	30-Oct	4-Nov	22-Nov	5	18
VS2-STK-1FB-M0023A-PNR/FILT	8-Oct	16-Oct	28-Oct	8	12
VS2-STK-1FB-M0023A-CR/XAD	8-Oct	16-Oct	29-Oct	8	13
VS2-STK-1FB2-M0023A-PNR/FILT	29-Oct	4-Nov	20-Nov	6	16
VS2-STK-1FB2-M0023A-CR/XAD	29-Oct	4-Nov	20-Nov	6	16
VS3-STK-12B-M0023A-PNR/FILT	16-Oct	22-Oct	1-Nov	6	10
VS3-STK-12B-M0023A-CR/XAD	16-Oct	22-Oct	6-Nov	6	15
VS3-STK-13B-M0023A-PNR/FILT	17-Oct	22-Oct	5-Nov	5	14
VS3-STK-13B-M0023A-CR/XAD	17-Oct	22-Oct	6-Nov	5	15
VS3-STK-14B-M0023A-PNR/FILT	18-Oct	22-Oct	4-Nov	4	13
VS3-STK-14B-M0023A-CR/XAD	18-Oct	22-Oct	6-Nov	4	15
VS3-STK-1FB-M0023A-PNR/FILT	14-Oct	22-Oct	1-Nov	8	10
VS3-STK-1FB-M0023A-CR/XAD	14-Oct	22-Oct	5-Nov	8	14
VS4-STK-11B-M0023A-PNR/FILT	23-Oct	4-Nov	20-Nov	12	16
VS4-STK-11B-M0023A-CR/XAD	23-Oct	4-Nov	22-Nov	12	18
VS4-STK-12B-M0023A-PNR/FILT	24-Oct	4-Nov	20-Nov	11	16
VS4-STK-12B-M0023A-CR/XAD	24-Oct	4-Nov	22-Nov	11	18
VS4-STK-13B-M0023A-PNR/FILT	25-Oct	4-Nov	20-Nov	10	16
VS4-STK-13B-M0023A-CR/XAD	25-Oct	4-Nov	22-Nov	10	18
VS4-STK-1FB-M0023A-PNR/FILT	22-Oct	4-Nov	19-Nov	13	15
VS4-STK-1FB-M0023A-CR/XAD	22-Oct	4-Nov	21-Nov	13	17

Blank Results – Media Check Samples and Laboratory Blanks

	Analytical Result (pg/sample)											
	A-5037 MEDIA CHECK XAD	A-5038 MEDIA CHECK FILTER	A-5074 MEDIA CHECK XAD	A-5075 MEDIA CHECK FILTER	Laboratory Blank; Batch 3289014	Laboratory Blank; Batch 3289015	Laboratory Blank; Batch 3295023	Laboratory Blank; Batch 3295024	Laboratory Blank; Batch 3308029	Laboratory Blank; Batch 3308030	Range of Field Samples	
											PNR/Filt	CR/XAD
2,3,7,8-TCDD	<2.5	<2.4	<3.7	<3.5	<3.4	<2.7	<0.16	<0.24	<4.6	<6.6	--	--
1,2,3,7,8-PeCDD	<1.2	<0.94	<1.4	<1.1	<1.4	<1.3	0.64	<0.11	<1.8	<2.5	0.23 - <2.2	4.8 * - 120 *
1,2,3,4,7,8-HxCDD	<1.1	<0.8	<1.1	<0.79	<1.2	<0.94	<0.16	0.22 *	<1.4	<2.2	<0.15 - 4.3	2.6 - 230
1,2,3,6,7,8-HxCDD	<1.1	<0.78	<1	<0.77	<1.1	<0.91	<0.15	0.34 *	<1.3	<2.1	0.22 * - 16	5.1 * - 990
1,2,3,7,8,9-HxCDD	<1.1	<0.79	<1.1	<0.78	<1.2	<0.93	0.73 *	1.3 *	<1.4	<2.1	0.41 * - 12 *	5.6 - 650
1,2,3,4,6,7,8-HpCDD	<1.5	<0.82	<1.5	<0.86	<1.3	<1.2	1.9	2.1 *	7.2	<2	1.5 * - 160	29 - 6100
OCDD	4.8	2.5 *	3.1	<1	6	3.4 *	6.4	7 *	13	<2.8	5.6 * - 190	28 - 3500
2,3,7,8-TCDF	<1.6	<1.3	<2.5	<2.3	<1.8	<1.9	<0.1	0.2 *	<2.9	<4.3	0.29 - 3.8 *	6.8 * - 78
1,2,3,7,8-PeCDF	<0.98	<0.89	<1.5	<1.1	<1.3	<1.1	0.37	0.55 *	<1.9	<2.9	0.11 * - <2.1	9.1 * - 130 *
2,3,4,7,8-PeCDF	<1	<0.9	<1.5	<1.1	<1.3	<1.1	0.79 *	0.65	<1.9	<3	<0.11 - 4.7 *	16 - 550 *
1,2,3,4,7,8-HxCDF	<0.64	<0.46	<0.87	<0.54	<0.86	<0.61	0.68	0.27 *	8.7	<1.4	0.48 * - 5	25 * - 570 *
1,2,3,6,7,8-HxCDF	<0.57	<0.41	<0.78	<0.48	<0.77	<0.54	0.76 *	0.54	3.5	<1.2	0.22 * - 2.7 *	11 * - 310 *
1,2,3,7,8,9-HxCDF	<0.69	<0.49	<0.95	<0.58	<0.93	<0.66	1.3 *	1.1 *	<1.2	<1.5	0.56 * - <1.4	0.9 * - 38 *
2,3,4,6,7,8-HxCDF	<0.6	<0.43	<0.82	<0.5	<0.81	<0.57	<0.14	1.2	3.1 *	<1.3	0.42 * - 8.4 *	11 * - 600 *
1,2,3,4,6,7,8-HpCDF	<0.84	<0.88	<1.1	<0.59	<1	<0.78	0.87 *	1.2 *	20	<1.9	1.1 * - 17	22 - 760
1,2,3,4,7,8,9-HpCDF	<1.1	<1.2	<1.4	<0.77	<1.4	<1	1 *	1.7	3.4	<2.5	0.48 * - 5.9 *	38 * - 200
OCDF	<2	<1.6	<2.2	<1.4	<1.9	<1.7	2.7 *	4.5	18	<3.6	3.8 - 12 *	5.7 * - 630 *

* - Value reported is Estimated Maximum Possible Concentration (EMPC)

Blank Results – Media Check Samples and Laboratory Blanks

	Analytical Result (pg/sample)									
	VS2-STK-1FB-M0023A-PNR/FILT	VS2-STK-1FB-M0023A-CR/XAD	VS2-STK-1FB2-M0023A-PNR/FILT	VS2-STK-1FB2-M0023A-CR/XAD	VS3-STK-1FB-M0023A-PNR/FILT	VS3-STK-1FB-M0023A-CR/XAD	VS4-STK-1FB-M0023A-PNR/FILT	VS4-STK-1FB-M0023A-CR/XAD	Range of Field Samples	
									PNR/Filt	CR/XAD
2,3,7,8-TCDD	<1.8	<2.2	<3.4	<4.1	<0.16	<0.25	<2.5	<4.5	–	–
1,2,3,7,8-PeCDD	<0.89	<0.99	<1.4	<1.7	<0.12	0.46 *	<0.92	<1.9	0.23 - <2.2	4.3 * - 120 *
1,2,3,4,7,8-HxCDD	<0.85	<0.89	<1.2	<1.7	0.46	<0.23	<0.66	<1.6	<0.15 - 4.3	2.6 - 230
1,2,3,6,7,8-HxCDD	<0.82	<0.86	<1.1	<1.7	<0.17	<0.22	<0.64	<1.6	0.22 * - 16	5.1 * - 990
1,2,3,7,8,9-HxCDD	<0.84	<0.88	<1.1	<1.7	0.47 *	0.54 *	<0.65	<1.6	0.41 * - 12 *	5.6 - 650
1,2,3,4,6,7,8-HpCDD	<1	<1.1	2.1 *	3.3 *	1.2 *	0.61 *	2.1 *	<1.9	1.5 * - 160	29 - 6100
OCDD	6.1 *	4.7	5.7 *	5.6	16	8.3 *	15	10	5.6 * - 190	28 - 3500
2,3,7,8-TCDF	<1.1	<1.6	<2.3	<2.7	<0.12	0.5 *	<1.6	<3	0.29 - 3.8 *	6.8 * - 78
1,2,3,7,8-PeCDF	<0.84	<0.79	<1.4	<1.5	0.24 *	0.33 *	<0.86	<1.7	0.11 * - <2.1	9.1 * - 130 *
2,3,4,7,8-PeCDF	<0.85	<0.8	<1.4	<1.6	<0.13	0.36 *	<0.87	<1.7	<0.11 - 4.7 *	16 - 550 *
1,2,3,4,7,8-HxCDF	2.3	<0.51	<0.8	<1.1	0.84 *	0.47 *	<0.48	<1.1	0.48 * - 5	25 * - 570 *
1,2,3,6,7,8-HxCDF	0.56 *	<0.45	<0.71	<0.95	<0.12	0.36 *	<0.42	<1	0.22 * - 2.7 *	11 * - 310 *
1,2,3,7,8,9-HxCDF	<0.59	<0.55	<0.86	<1.2	0.22 *	<0.18	<0.52	<1.2	0.56 * - <1.4	0.9 * - 38 *
2,3,4,6,7,8-HxCDF	<0.52	<0.48	<0.75	<1	0.76 *	0.41 *	<0.45	<1.1	0.42 * - 8.4 *	11 * - 600 *
1,2,3,4,6,7,8-HpCDF	9.3	<0.75	<1.3	<1.4	1.9 *	0.84 *	<0.65	<1.4	1.1 * - 17	22 - 760
1,2,3,4,7,8,9-HpCDF	1.6 *	<0.97	<1.6	<1.8	1.3 *	0.68 *	<0.85	<1.8	0.48 * - 5.9 *	3.8 * - 200
OCDF	15	<1.6	<2.8	<2.7	5.6	4.8	1.8 *	<1.9	0.48 * - 5	25 * - 570 *

* - Value reported is Estimated Maximum Possible Concentration (EMPC)

Laboratory Check Sample (LCS) and Laboratory Check Sample Duplicate (LCSD) Results

	Laboratory Check Sample and Laboratory Check Sample Duplicate								
	Batch 3289014			Batch 3289015			Batch 3295023		
	LCS Recovery (%)	LCSD Recovery (%)	Relative Percent Difference (%)	LCS Recovery (%)	LCSD Recovery (%)	Relative Percent Difference (%)	LCS Recovery (%)	LCSD Recovery (%)	Relative Percent Difference (%)
2,3,7,8-TCDD	100	104	4.7	96	92	4.4	89	92	2.8
1,2,3,7,8-PeCDD	93	93	0.18	92	91	0.99	98	97	0.94
1,2,3,4,7,8-HxCDD	97	97	0.6	94	89	6	90	95	4.7
1,2,3,6,7,8-HxCDD	87	87	0.95	88	88	0.03	90	87	3
1,2,3,7,8,9-HxCDD	116	105	9.6	105	97	7.3	86	86	0.01
1,2,3,4,6,7,8-HpCDD	94	93	0.71	93	92	1.2	88	91	3
OCDD	90	92	1.3	89	93	3.8	87	90	3.2
2,3,7,8-TCDF	90	84	6.9	86	85	0.92	91	92	1.5
1,2,3,7,8-PeCDF	94	97	3.1	93	93	0.05	94	93	1.3
2,3,4,7,8-PeCDF	91	92	0.4	89	88	0.92	66	66	0.89
1,2,3,4,7,8-HxCDF	98	99	1.4	97	98	1	109	107	2.1
1,2,3,6,7,8-HxCDF	92	93	0.72	87	93	6.2	101	103	1.6
1,2,3,7,8,9-HxCDF	118	107	10	102	101	0.91	109	107	1.2
2,3,4,6,7,8-HxCDF	113	105	7.4	98	103	5.7	99	98	1.4
1,2,3,4,6,7,8-HpCDF	86	90	4.6	84	86	1.8	93	93	0.59
1,2,3,4,7,8,9-HpCDF	105	94	11	91	85	6	96	100	4
OCDF	93	89	4.3	93	94	0.08	74	87	15

	Laboratory Check Sample and Laboratory Check Sample Duplicate								
	Batch 3295024			Batch 3308029			Batch 3308030		
	LCS Recovery (%)	LCSD Recovery (%)	Relative Percent Difference (%)	LCS Recovery (%)	LCSD Recovery (%)	Relative Percent Difference (%)	LCS Recovery (%)	LCSD Recovery (%)	Relative Percent Difference (%)
2,3,7,8-TCDD	93	85	9.1	98	99	0.64	93	99	5.6
1,2,3,7,8-PeCDD	95	93	2	94	96	2.2	96	93	2.9
1,2,3,4,7,8-HxCDD	83	78	5.9	98	101	2.4	93	98	5
1,2,3,6,7,8-HxCDD	99	109	9.2	92	94	2.1	93	93	0.66
1,2,3,7,8,9-HxCDD	89	90	1.4	109	138	23	108	108	0.54
1,2,3,4,6,7,8-HpCDD	90	84	6.7	98	98	0.03	93	96	3
OCDD	81	89	9.6	94	95	1.1	92	93	1.6
2,3,7,8-TCDF	95	89	6.3	95	94	0.89	85	89	5.6
1,2,3,7,8-PeCDF	98	95	3.6	110	107	2.9	97	102	5.1
2,3,4,7,8-PeCDF	85	70	19	101	102	0.88	93	94	2
1,2,3,4,7,8-HxCDF	92	86	6.6	104	109	4.3	99	102	3.3
1,2,3,6,7,8-HxCDF	111	117	5.5	105	101	3.4	98	99	0.36
1,2,3,7,8,9-HxCDF	98	97	0.67	112	142	24	104	112	7.5
2,3,4,6,7,8-HxCDF	101	104	3	113	142	23	103	108	4.9
1,2,3,4,6,7,8-HpCDF	87	91	4.2	108	102	6.2	93	94	0.64
1,2,3,4,7,8,9-HpCDF	84	91	7.3	107	137	25	98	99	1.4
OCDF	79	89	12	87	87	0.23	79	83	4.9

Internal Standard Recovery

	Internal Standard Recovery (%)									
	^{13}C-2,3,7,8-TCDD	^{13}C-2,3,7,8-TCDF	^{13}C-2,3,7,8-TCDF[1]	^{13}C-1,2,3,7,8-PeCDD	^{13}C-1,2,3,7,8-PeCDF	^{13}C-1,2,3,6,7,8-HxCDD	^{13}C-1,2,3,6,7,8-HxCDF	^{13}C-1,2,3,4,6,7,8-HpCDD	^{13}C-1,2,3,4,6,7,8-HpCDF	^{13}C-OCDD
VS2-STK-11B-M0023A-PNR/FILT	88	87	--	93	85	91	81	84	66	51
VS2-STK-11B-M0023A-CR/XAD	84	85	98	96	89	88	77	88	76	68
VS2-STK-13B-M0023A-PNR/FILT	89	85	--	95	88	92	78	80	70	62
VS2-STK-13B-M0023A-CR/XAD	87	87	101	83	80	86	76	87	74	75
VS2-STK-15B-M0023A-PNR/FILT	81	77	--	89	76	83	76	77	69	55
VS2-STK-15B-M0023A-CR/XAD	80	74	76	90	81	80	72	80	68	65
VS3-STK-12B-M0023A-PNR/FILT	75	67	--	89	97	103	96	91	89	78
VS3-STK-12B-M0023A-CR/XAD	63	56	82	98	119	93	94	75	74	62
VS3-STK-13B-M0023A-PNR/FILT	68	68	--	91	105	125	120	97	101	86
VS3-STK-13B-M0023A-CR/XAD	67	66	85	53	69	92	95	78	78	67
VS3-STK-14B-M0023A-PNR/FILT	67	61	--	69	84	105	110	89	87	74
VS3-STK-14B-M0023A-CR/XAD	67	67	87	63	75	92	96	76	77	66
VS4-STK-11B-M0023A-PNR/FILT	72	65	--	85	70	83	76	73	66	49
VS4-STK-11B-M0023A-CR/XAD	81	76	81	92	81	80	73	90	73	83
VS4-STK-12B-M0023A-PNR/FILT	80	76	--	90	76	83	78	83	71	61
VS4-STK-12B-M0023A-CR/XAD	85	78	80	96	83	81	77	91	73	73
VS4-STK-13B-M0023A-PNR/FILT	80	75	--	85	75	78	73	69	62	48
VS4-STK-13B-M0023A-CR/XAD	79	74	82	88	75	78	69	87	67	69
VS2-STK-1FB-M0023A-PNR/FILT	82	86	--	82	77	79	72	76	60	48
VS2-STK-1FB-M0023A-CR/XAD	87	84	--	88	82	92	81	86	76	66
VS2-STK-1FB2-M0023A-PNR/FILT	79	74	--	89	76	84	78	69	65	46

[1] Associated with analysis using the confirmation column

	Internal Standard Recovery (%)									
	^{13}C-2,3,7,8-TCDD	^{13}C-2,3,7,8-TCDF	^{13}C-2,3,7,8-TCDF[1]	^{13}C-1,2,3,7,8-PeCDD	^{13}C-1,2,3,7,8-PeCDF	^{13}C-1,2,3,6,7,8-HxCDD	^{13}C-1,2,3,6,7,8-HxCDF	^{13}C-1,2,3,4,6,7,8-HpCDD	^{13}C-1,2,3,4,6,7,8-HpCDF	^{13}C-OCDD
VS2-STK-1FB2-M0023A-CR/XAD	91	82	--	100	81	86	73	85	68	68
VS3-STK-1FB-M0023A-PNR/FILT	67	62	--	76	87	95	93	85	90	73
VS3-STK-1FB-M0023A-CR/XAD	61	58	--	99	110	104	103	79	79	69
VS4-STK-1FB-M0023A-PNR/FILT	76	74	--	87	78	80	70	85	71	79
VS4-STK-1FB-M0023A-CR/XAD	89	85	--	102	88	96	83	102	82	85
A-5037 MEDIA CHECK XAD	87	84	--	86	80	84	72	75	67	51
A-5038 MEDIA CHECK FILTER	88	89	--	90	82	88	71	90	69	63
A-5074 MEDIA CHECK XAD	80	74	--	87	70	81	64	82	68	65
A-5075 MEDIA CHECK FILTER	58	53	--	79	66	78	66	81	71	65
Laboratory Blank; Batch 3289014	89	85	--	90	80	86	70	88	69	65
Laboratory Blank; Batch 3289015	87	85	--	92	83	86	71	84	74	69
Laboratory Blank; Batch 3295023	71	69	--	80	88	97	86	94	92	76
Laboratory Blank; Batch 3295024	62	59	--	88	107	76	72	73	82	61
Laboratory Blank; Batch 3308029	68	66	--	77	65	74	62	80	68	74
Laboratory Blank; Batch 3308030	86	82	--	99	79	89	67	89	74	69
LCS; Batch 3289014	83	89	--	86	78	74	63	79	62	67
LCSD; Batch 3289014	84	88	--	92	84	83	71	84	70	65
LCS; Batch 3289015	84	84	--	84	77	84	73	76	68	56
LCSD; Batch 3289015	87	83	--	97	87	89	74	78	72	55
LCS; Batch 3295023	61	59	--	79	91	85	74	88	83	78
LCSD; Batch 3295023	74	69	--	94	108	100	90	101	98	89
LCS; Batch 3295024	63	57	--	61	62	80	78	81	89	77
LCSD; Batch 3295024	63	58	--	107	124	80	79	83	84	73
LCS; Batch 3308029	74	70	--	90	70	78	60	88	66	82

		Internal Standard Recovery (%)									
		^{13}C-2,3,7,8-TCDD	^{13}C-2,3,7,8-TCDF	^{13}C-2,3,7,8-TCDF[1]	^{13}C-1,2,3,7,8-PeCDD	^{13}C-1,2,3,7,8-PeCDF	^{13}C-1,2,3,6,7,8-HxCDD	^{13}C-1,2,3,6,7,8-HxCDF	^{13}C-1,2,3,4,6,7,8-HpCDD	^{13}C-1,2,3,4,6,7,8-HpCDF	^{13}C-OCDD
LCSD; Batch 3308029		60	58	--	74	60	53	43	73	45	69
LCS; Batch 3308030		76	71	--	83	71	73	62	82	63	63
LCSD; Batch 3308030		75	70	--	88	70	74	60	78	60	55
Pooled RSD for Internal Standard Recovery (%)	PNR/FILT	10.2	12.1	--	8.7	13.5	16.0	19.5	10.8	17.6	21.9
	CR/XAD	11.6	13.1	9.8	18.8	17.3	7.0	13.4	7.5	5.1	9.1
QAPP Specification	Recovery (%)	40-130	40-130	40-130	40-130	40-130	40-130	25-130	25-130	25-130	

Surrogate Standard Recovery

		Surrogate Standard Recovery				
		^{37}Cl-2,3,7,8-TCDD	^{13}C-2,3,4,7,8-PeCDF	^{13}C-1,2,3,4,7,8-HxCDD	^{13}C-1,2,3,4,7,8-HxCDF	^{13}C-1,2,3,4,7,8,9-HpCDF
VS2-STK-11B-M0023A-PNR/FILT		89	97	96	95	88
VS2-STK-11B-M0023A-CR/XAD		86	95	97	94	97
VS2-STK-13B-M0023A-PNR/FILT		98	105	106	108	109
VS2-STK-13B-M0023A-CR/XAD		84	94	100	96	102
VS2-STK-15B-M0023A-PNR/FILT		94	103	106	100	105
VS2-STK-15B-M0023A-CR/XAD		92	101	106	106	111
VS3-STK-12B-M0023A-PNR/FILT		85	78	100	97	100
VS3-STK-12B-M0023A-CR/XAD		85	79	78	73	96
VS3-STK-13B-M0023A-PNR/FILT		89	91	71	75	88
VS3-STK-13B-M0023A-CR/XAD		86	80	80	79	88
VS3-STK-14B-M0023A-PNR/FILT		83	77	83	79	87
VS3-STK-14B-M0023A-CR/XAD		90	87	81	79	98
VS4-STK-11B-M0023A-PNR/FILT		88	103	101	94	91
VS4-STK-11B-M0023A-CR/XAD		92	100	107	101	108
VS4-STK-12B-M0023A-PNR/FILT		94	105	107	97	101
VS4-STK-12B-M0023A-CR/XAD		89	101	108	99	112
VS4-STK-13B-M0023A-PNR/FILT		90	99	103	98	99
VS4-STK-13B-M0023A-CR/XAD		92	101	112	102	110
VS2-STK-1FB-M0023A-PNR/FILT		89	96	103	98	95
VS2-STK-1FB-M0023A-CR/XAD		87	98	100	98	96
VS2-STK-1FB2-M0023A-PNR/FILT		92	100	102	99	93
VS2-STK-1FB2-M0023A-CR/XAD		87	97	99	99	110
VS3-STK-1FB-M0023A-PNR/FILT		88	79	105	98	94
VS3-STK-1FB-M0023A-CR/XAD		84	79	73	70	94
VS4-STK-1FB-M0023A-PNR/FILT		90	97	99	97	106
VS4-STK-1FB-M0023A-CR/XAD		90	100	98	99	109
Pooled RSD for Surrogate Recovery (%)	PNR/FILT	5.2	11.6	12.6	11.0	8.5
	CR/XAD	3.7	9.7	13.9	13.0	8.1
QAPP Specification	Recovery (%)	70-130	70-130	70-130	70-130	70-130
	RSD (%)	30	30	30	30	30

Data Quality Assessment
Analysis of Waste Feeds for Physical & Chemical Parameters

Parameter	Physical & Chemical Parameters in Waste Feeds
Sampling Method	Tap Sampling
Analytical Method	Ash Content – ASTM D482 Density – ASTM D1963 Heat of Combustion – ASTM D240 or ASTM D5865 Kinematic Viscosity – ASTM D445 Total Chlorine – Knox WC-0016 Moisture/Water – EPA 160.3 or ASTM D4017
Laboratory Job ID Number(s)	H3J140415, H3J140417, H3J150401, H3J150402, H3J190415, H3J190416, H3J190417, H3J190418, H3K010415, H3K010416, H3K010418, H3K010419, H3K020402, H3K020403, H3K020404, H3K020405, H3K020406
Batch Numbers	3288017, 3288047, 3289046, 3291011, 3294014, 3294027, 3294063, 3295017, 3295055, 3296018, 3296033, 3296034, 3297012, 3297044, 3297045, 3298024, 3298026, 3298030, 3301015, 3301016, 3302022, 3304034, 3304036, 3304037, 3305056, 3305057, 3305068, 3308013, 3309013, 3309015, 3309044, 3309045, 3309048, 3310040, 3311015, 3311040, 3311042, 3311046, 3311049, 3312052, 3314010, 3314011, 3315023, 3316017, 3316041, 3316044, 3317013, 3318019, 3318020, 3318021, 3318038, 3319020, 3320010, 3321010, 3322015, 3322032, 3322033, 3322037, 3322038, 3323034, 3323036, 3323037, 3323038, 3323063, 3323064, 3323065, 3324028, 3324029, 3325013, 3328011, 3328012, 3328014, 3328015, 3328016, 3328017, 3330010, 3330011, 3330016
Sample Shipping and Receipt	Samples received intact and at ambient temperature. QAPP has no temperature specification.
Holding Time(s)	All analyses conducted within 29 days of sample collection. QAPP specifies analysis within 30 days of sample collection. See table below.
Blank Results	All laboratory blank results below or very near the detection limit. See table below and in main body of report.
Laboratory Check Sample (LCS) and Laboratory Check Sample Duplicate (LCSD) Results	LCS and LCSD were prepared and analyzed for the various analytical methods, as specified in the QAPP. All LCS and LCSD recoveries and relative percent differences met the laboratory and QAPP specifications. See table below.
Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results	MS and MSD were performed for analysis of chlorine. MS/MSD recoveries were between 80 and 105% recovery. RPDs were below 5%. See table below.

Duplicate Analysis	Selected samples were analyzed in duplicate. 90 of 96 duplicate analyses met the QAPP specifications (see table below). The outliers are: • Ash in VS2-HBW-13B-COMP2B; results of 582 and 646 mg/kg; RPD of 10.4% • Gross Calorific Value in VS2-LBW-15B-COMP2B; results of 178 and 152 BTU/lb; RPD of 15.8% • Chlorine in VS3-CS-11A-COMP 1; results of 253 and 325 mg/kg; RPD of 24.9% • Chlorine in VS4-BS-11A-COMP1; results of 171 and 221 mg/kg; RPD of 25.5% • Ash in VS4-HBW-12B-COMP2B-DUP; results of 943 and 1050 mg/kg; RPD of 10.7% • Ash VS4-HBW-13A-COMP1; results of 1,500 and 928 mg/kg; RPD of 47.1% No duplicate analysis was performed for moisture in solid waste streams. This duplicate analysis was specified in the QAPjP. In addition, samples were collected in duplicate. There are no QAPP specifications for the analysis of duplicate samples. Reproducibility for these samples was good. . See tables below

Quality Assurance Objective	The QAPP specifies quality assurance objectives as follows:
	• Chlorine
	  ○ Precision: 10% RPD for MS/MSD
	  ○ Accuracy: 80-120% Recovery of MS/MSD
	• Ash
	  ○ Precision: 10% RPD for LCS/LCSD
	  ○ Accuracy: 90-110% recovery for LCS
	• Water in liquid waste feed
	  ○ Precision: 10% RPD for results greater than 1%
	  ○ Accuracy: 95-105% recovery of LCS
	• Water in solid waste feed:
	  ○ Precision: 25% RPD for duplicate analysis
	• Heating Value
	  ○ Precision: 10% RPD for laboratory duplicates
	  ○ Accuracy: 98-102% recovery of LCS
	• Density
	  ○ Precision: 10% RPD for analytical duplicates
	  ○ Accuracy: 99-101% recovery for LCS
	• Viscosity
	  ○ Precision: 10% RPD for analytical duplicates
	  ○ Accuracy: 99-101% recovery of LCS
	Except as discussed above, these objectives were met.

Conclusions and Comments	These data are acceptable for the intended purposes. The outliers for duplicate analysis have a negligible impact on the usability of the data. The chlorine carried in containerized solids and bulk solids is negligible (<1%) compared to the chlorine provided by the spiking material. The ash carried in high BTU waste is negligible (<1%) compared to the ash provided by the bulk or containerized solids. The heat input results in low BTU waste are near the detection limit. Increased uncertainty is expected close to the detection limit. Although duplicate analysis was not performed for water in solid waste streams, this has no impact on the usability of the data. Moisture results are used only to characterize the waste feed materials, and are not used in any demonstration of compliance. No data are qualified or invalidated based on duplicate analysis.

Holding Time

	Sample Date	Analysis Date						Holding Time (Days					
		Ash Content	Density	Gross Calorific Value	Kinematic Viscosity	Percent Moisture	Total Chlorine	Ash Content	Density	Gross Calorific Value	Kinematic Viscosity	Percent Moisture	Total Chlorine
VS2-CS-11A-COMP1	8-Oct	24-Oct	--	17-Oct	--	15-Oct	17-Oct	16	--	9	--	7	9
VS2-CS-11B-COMP2A	8-Oct	25-Oct	--	17-Oct	--	15-Oct	17-Oct	17	--	9	--	7	9
VS2-CS-11B-COMP2B	8-Oct	24-Oct	--	17-Oct	--	15-Oct	17-Oct	16	--	9	--	7	9
VS2-CS-11B-COMP2C	8-Oct	24-Oct	--	17-Oct	--	15-Oct	17-Oct	16	--	9	--	7	9
VS2-CS-12A-COMP1	9-Oct	24-Oct	--	17-Oct	--	15-Oct	17-Oct	15	--	8	--	6	8
VS2-CS-13A-COMP1	10-Oct	24-Oct	--	17-Oct	--	15-Oct	17-Oct	14	--	7	--	5	7
VS2-CS-13B-COMP2A	10-Oct	24-Oct	--	17-Oct	--	15-Oct	17-Oct	14	--	7	--	5	7
VS2-CS-13B-COMP2B	10-Oct	24-Oct	--	17-Oct	--	15-Oct	17-Oct	14	--	7	--	5	7
VS2-CS-13B-COMP2C	10-Oct	24-Oct	--	17-Oct	--	15-Oct	17-Oct	14	--	7	--	5	7
VS2-CS-14B-COMP2A	11-Oct	24-Oct	--	17-Oct	--	15-Oct	17-Oct	13	--	6	--	4	6
VS2-CS-14B-COMP2B	11-Oct	24-Oct	--	17-Oct	--	15-Oct	17-Oct	13	--	6	--	4	6
VS2-CS-14B-COMP2C	11-Oct	24-Oct	--	17-Oct	--	15-Oct	17-Oct	13	--	6	--	4	6
VS2-CS-15B-COMP2A	30-Oct	26-Nov	--	26-Nov	--	4-Nov	26-Nov	27	--	27	--	5	27
VS2-CS-15B-COMP2B	30-Oct	26-Nov	--	26-Nov	--	4-Nov	26-Nov	27	--	27	--	5	27
VS2-CS-15B-COMP2C	30-Oct	26-Nov	--	26-Nov	--	4-Nov	26-Nov	27	--	27	--	5	27
VS2-HBW-11A-COMP1	8-Oct	24-Oct	24-Oct	21-Oct		24-Oct	22-Oct	23-Oct	16	16	13	16	14	15
VS2-HBW-11B-COMP2A	8-Oct	24-Oct	24-Oct	21-Oct		24-Oct	22-Oct	23-Oct	16	16	13	16	14	15
VS2-HBW-11B-COMP2B	8-Oct	24-Oct	24-Oct	21-Oct		25-Oct	22-Oct	23-Oct	16	16	13	17	14	15
VS2-HBW-11B-COMP2C	8-Oct	24-Oct	24-Oct	21-Oct		25-Oct	22-Oct	23-Oct	16	16	13	17	14	15
VS2-HBW-12A-COMP1	9-Oct	24-Oct	24-Oct	21-Oct		25-Oct	22-Oct	23-Oct	15	15	12	16	13	14
VS2-HBW-13A-COMP1	10-Oct	24-Oct	24-Oct	21-Oct		25-Oct	22-Oct	23-Oct	14	14	11	15	12	13
VS2-HBW-13B-COMP2A	10-Oct	24-Oct	24-Oct	21-Oct		25-Oct	22-Oct	23-Oct	14	14	11	15	12	13
VS2-HBW-13B-COMP2B	10-Oct	24-Oct	24-Oct	21-Oct		25-Oct	22-Oct	23-Oct	14	14	11	15	12	13
VS2-HBW-13B-COMP2B DUPLICATE	10-Oct	24-Oct	24-Oct	21-Oct		25-Oct	22-Oct	23-Oct	14	14	11	15	12	13
VS2-HBW-13B-COMP2C	10-Oct	24-Oct	24-Oct	21-Oct		25-Oct	22-Oct	23-Oct	14	14	11	15	12	13
VS2-HBW-14B-COMP2A	11-Oct	24-Oct	24-Oct	21-Oct		--	22-Oct	23-Oct	13	13	10	--	11	12
VS2-HBW-14B-COMP2B	11-Oct	24-Oct	24-Oct	21-Oct		--	22-Oct	23-Oct	13	13	10	--	11	12

	Sample Date	Analysis Date						Holding Time (Days					
		Ash Content	Density	Gross Calorific Value	Kinematic Viscosity	Percent Moisture	Total Chlorine	Ash Content	Density	Gross Calorific Value	Kinematic Viscosity	Percent Moisture	Total Chlorine
VS2-HBW-14B-COMP2C	11-Oct 24-Oct	24-Oct	21-Oct		--	22-Oct	23-Oct	13	13	10	--	11	12
VS2-HBW-15B-COMP2A	30-Oct 26-Nov	25-Nov	26-Nov	26-Nov	27-Nov	26-Nov		27	26	27	27	28	27
VS2-HBW-15B-COMP2B	30-Oct 27-Nov	25-Nov	26-Nov	26-Nov	27-Nov	26-Nov		28	26	27	27	28	27
VS2-HBW-15B-COMP2C	30-Oct 27-Nov	25-Nov	26-Nov	26-Nov	27-Nov	26-Nov		28	26	27	27	28	27
VS2-LBW-11A-COMP1	8-Oct 28-Oct	25-Oct	28-Oct		29-Oct	4-Nov	27-Oct	20	17	20	21	27	19
VS2-LBW-11B-COMP2A	8-Oct 28-Oct	25-Oct	28-Oct		30-Oct	4-Nov	27-Oct	20	17	20	22	27	19
VS2-LBW-11B-COMP2B	8-Oct 28-Oct	25-Oct	28-Oct		30-Oct	4-Nov	27-Oct	20	17	20	22	27	19
VS2-LBW-11B-COMP2C	8-Oct 28-Oct	25-Oct	28-Oct		30-Oct	4-Nov	27-Oct	20	17	20	22	27	19
VS2-LBW-12A-COMP1	9-Oct 28-Oct	25-Oct	28-Oct		30-Oct	4-Nov	27-Oct	19	16	19	21	26	18
VS2-LBW-13A-COMP1	10-Oct 28-Oct	25-Oct	28-Oct		30-Oct	5-Nov	27-Oct	18	15	18	20	26	17
VS2-LBW-13B-COMP2A	10-Oct 28-Oct	25-Oct	28-Oct		30-Oct	5-Nov	27-Oct	18	15	18	20	26	17
VS2-LBW-13B-COMP2B	10-Oct 28-Oct	25-Oct	28-Oct		30-Oct	5-Nov	27-Oct	18	15	18	20	26	17
VS2-LBW-13B-COMP2B DUPLICATE	10-Oct 28-Oct	25-Oct	28-Oct		30-Oct	5-Nov	27-Oct	18	15	18	20	26	17
VS2-LBW-13B-COMP2C	10-Oct 28-Oct	25-Oct	28-Oct		30-Oct	5-Nov	27-Oct	18	15	18	20	26	17
VS2-LBW-15B-COMP2A	30-Oct 26-Nov	25-Nov	26-Nov	26-Nov	27-Nov	26-Nov		27	26	27	27	28	27
VS2-LBW-15B-COMP2B	30-Oct 26-Nov	25-Nov	26-Nov	26-Nov	27-Nov	26-Nov		27	26	27	27	28	27
VS2-LBW-15B-COMP2C	30-Oct 26-Nov	25-Nov	26-Nov	26-Nov	27-Nov	26-Nov		27	26	27	27	28	27
VS2-LWF-11A-COMP1	8-Oct 28-Oct	25-Oct	31-Oct		28-Oct	26-Oct	29-Oct	20	17	23	20	18	21
VS2-LWF-11B-COMP2A	8-Oct 28-Oct	25-Oct	31-Oct		28-Oct	26-Oct	29-Oct	20	17	23	20	18	21
VS2-LWF-11B-COMP2B	8-Oct 28-Oct	25-Oct	1-Nov		28-Oct	26-Oct	29-Oct	20	17	24	20	18	21
VS2-LWF-11B-COMP2C	8-Oct 28-Oct	25-Oct	1-Nov		28-Oct	26-Oct	29-Oct	20	17	24	20	18	21
VS2-LWF-12A-COMP1	9-Oct 28-Oct	25-Oct	1-Nov		28-Oct	26-Oct	29-Oct	19	16	23	19	17	20
VS2-LWF-13A-COMP1	10-Oct 28-Oct	25-Oct	1-Nov		28-Oct	26-Oct	29-Oct	18	15	22	18	16	19
VS2-LWF-13B-COMP2A	10-Oct 28-Oct	25-Oct	1-Nov		28-Oct	26-Oct	29-Oct	18	15	22	18	16	19
VS2-LWF-13B-COMP2B	10-Oct 28-Oct	25-Oct	1-Nov		28-Oct	26-Oct	29-Oct	18	15	22	18	16	19
VS2-LWF-13B-COMP2B DUPLICATE	10-Oct 28-Oct	25-Oct	1-Nov		28-Oct	26-Oct	29-Oct	18	15	22	18	16	19
VS2-LWF-13B-COMP2C	10-Oct 28-Oct	25-Oct	1-Nov		28-Oct	26-Oct	29-Oct	18	15	22	18	16	19
VS2-LWF-15B-COMP2A	30-Oct 26-Nov	25-Nov	26-Nov	26-Nov	27-Nov	26-Nov		27	26	27	27	28	27

	Sample Date	Analysis Date						Holding Time (Days					
		Ash Content	Density	Gross Calorific Value	Kinematic Viscosity	Percent Moisture	Total Chlorine	Ash Content	Density	Gross Calorific Value	Kinematic Viscosity	Percent Moisture	Total Chlorine
VS2-LWF-15B-COMP2B	30-Oct 26-Nov	25-Nov	26-Nov	26-Nov	27-Nov	26-Nov		27	26	27	27	28	27
VS2-LWF-15B-COMP2C	30-Oct 26-Nov	25-Nov	26-Nov	26-Nov	27-Nov	26-Nov		27	26	27	27	28	27
VS3-CS-11A-COMP 1	15-Oct 11-Nov		--	9-Nov	--	22-Oct	12-Nov	27	--	25	--	7	28
VS3-CS-12A-COMP 1	16-Oct 11-Nov		--	9-Nov	--	22-Oct	12-Nov	26	--	24	--	6	27
VS3-CS-12B-COMP 2A	16-Oct 11-Nov		--	9-Nov	--	22-Oct	12-Nov	26	--	24	--	6	27
VS3-CS-12B-COMP 2B	16-Oct 11-Nov		--	9-Nov	--	22-Oct	12-Nov	26	--	24	--	6	27
VS3-CS-12B-COMP 2C	16-Oct 11-Nov		--	9-Nov	--	22-Oct	12-Nov	26	--	24	--	6	27
VS3-CS-13A-COMP 1	17-Oct 11-Nov		--	9-Nov	--	22-Oct	12-Nov	25	--	23	--	5	26
VS3-CS-13B-COMP 2A	17-Oct 11-Nov		--	9-Nov	--	22-Oct	12-Nov	25	--	23	--	5	26
VS3-CS-13B-COMP 2B	17-Oct 11-Nov		--	9-Nov	--	22-Oct	12-Nov	25	--	23	--	5	26
VS3-CS-13B-COMP 2C	17-Oct 11-Nov		--	9-Nov	--	22-Oct	12-Nov	25	--	23	--	5	26
VS3-CS-14B-COMP 2A	18-Oct 11-Nov		--	9-Nov	--	22-Oct	12-Nov	24	--	22	--	4	25
VS3-CS-14B-COMP 2B	18-Oct 11-Nov		--	9-Nov	--	22-Oct	12-Nov	24	--	22	--	4	25
VS3-CS-14B-COMP 2C	18-Oct 11-Nov		--	9-Nov	--	22-Oct	12-Nov	24	--	22	--	4	25
VS3-HBW-11A-COMP 1	15-Oct 6-Nov	1-Nov	11-Nov		1-Nov	10-Nov	5-Nov	22	17	27	17	26	21
VS3-HBW-12A-COMP 1	16-Oct 6-Nov	1-Nov	11-Nov		1-Nov	10-Nov	5-Nov	21	16	26	16	25	20
VS3-HBW-12B-COMP 2A	16-Oct 6-Nov	1-Nov	11-Nov		1-Nov	10-Nov	5-Nov	21	16	26	16	25	20
VS3-HBW-12B-COMP 2B	16-Oct 6-Nov	1-Nov	11-Nov		1-Nov	10-Nov	5-Nov	21	16	26	16	25	20
VS3-HBW-12B-COMP 2B-DUP	16-Oct 6-Nov	1-Nov	11-Nov		4-Nov	10-Nov	5-Nov	21	16	26	19	25	20
VS3-HBW-12B-COMP 2C	16-Oct 6-Nov	1-Nov	11-Nov		4-Nov	10-Nov	5-Nov	21	16	26	19	25	20
VS3-HBW-13A-COMP 1	17-Oct 6-Nov	1-Nov	11-Nov		4-Nov	10-Nov	5-Nov	20	15	25	18	24	19
VS3-HBW-13B-COMP 2A	17-Oct 6-Nov	1-Nov	11-Nov		4-Nov	10-Nov	5-Nov	20	15	25	18	24	19
VS3-HBW-13B-COMP 2B	17-Oct 6-Nov	1-Nov	11-Nov		4-Nov	10-Nov	5-Nov	20	15	25	18	24	19
VS3-HBW-13B-COMP 2C	17-Oct 6-Nov	1-Nov	11-Nov		4-Nov	10-Nov	5-Nov	20	15	25	18	24	19
VS3-HBW-14B-COMP 2A	18-Oct 6-Nov	1-Nov	11-Nov		4-Nov	10-Nov	5-Nov	19	14	24	17	23	18
VS3-HBW-14B-COMP 2B	18-Oct 6-Nov	1-Nov	11-Nov		4-Nov	10-Nov	5-Nov	19	14	24	17	23	18
VS3-HBW-14B-COMP 2C	18-Oct 6-Nov	1-Nov	11-Nov		4-Nov	10-Nov	5-Nov	19	14	24	17	23	18
VS3-LBW-11A-COMP 1	15-Oct 6-Nov	6-Nov	11-Nov	13-Nov		8-Nov	5-Nov	22	22	27	29	24	21
VS3-LBW-12A-COMP 1	16-Oct 6-Nov	6-Nov	11-Nov	13-Nov		8-Nov	7-Nov	21	21	26	28	23	22

	Sample Date	Analysis Date						Holding Time (Days					
		Ash Content	Density	Gross Calorific Value	Kinematic Viscosity	Percent Moisture	Total Chlorine	Ash Content	Density	Gross Calorific Value	Kinematic Viscosity	Percent Moisture	Total Chlorine
VS3-LBW-12B-COMP 2A	16-Oct 6-	Nov 6-Nov	11-Nov 13-	Nov		8-Nov	7-Nov	21	21	26	28	23	22
VS3-LBW-12B-COMP 2B	16-Oct 6-	Nov 6-Nov	11-Nov 13-	Nov		8-Nov	7-Nov	21	21	26	28	23	22
VS3-LBW-12B-COMP 2B DUP	16-Oct 6-	Nov 6-Nov	12-Nov 13-	Nov		8-Nov	7-Nov	21	21	27	28	23	22
VS3-LBW-12B-COMP 2C	16-Oct 6-	Nov 6-Nov	11-Nov 13-	Nov		8-Nov	7-Nov	21	21	26	28	23	22
VS3-LBW-13A-COMP 1	17-Oct 6-	Nov 6-Nov	11-Nov 13-	Nov		8-Nov	7-Nov	20	20	25	27	22	21
VS3-LBW-13B-COMP 2A	17-Oct 6-	Nov 6-Nov	11-Nov 13-	Nov		8-Nov	7-Nov	20	20	25	27	22	21
VS3-LBW-13B-COMP 2B	17-Oct 6-	Nov 6-Nov	12-Nov 13-	Nov		8-Nov	7-Nov	20	20	26	27	22	21
VS3-LBW-13B-COMP 2C	17-Oct 6-	Nov 6-Nov	12-Nov 13-	Nov		8-Nov	7-Nov	20	20	26	27	22	21
VS3-LBW-14B-COMP 2A	18-Oct 6-	Nov 6-Nov	12-Nov 13-	Nov		8-Nov	7-Nov	19	19	25	26	21	20
VS3-LBW-14B-COMP 2B	18-Oct 6-	Nov 6-Nov	12-Nov 13-	Nov		8-Nov	7-Nov	19	19	25	26	21	20
VS3-LBW-14B-COMP 2C	18-Oct 6-	Nov 6-Nov	12-Nov 13-	Nov		8-Nov	7-Nov	19	19	25	26	21	20
VS3-LWF-11A-COMP 1	15-Oct 11	-Nov 11-Nov	12-Nov 1	2-Nov 13-Nov	7-Nov			27	27	28	28	29	23
VS3-LWF-12A-COMP 1	16-Oct 11	-Nov 11-Nov	12-Nov 1	2-Nov 13-Nov	7-Nov			26	26	27	27	28	22
VS3-LWF-12B-COMP 2A	16-Oct 11	-Nov 11-Nov	12-Nov 1	2-Nov 13-Nov	7-Nov			26	26	27	27	28	22
VS3-LWF-12B-COMP 2B	16-Oct 11	-Nov 11-Nov	12-Nov 1	2-Nov 13-Nov	11-Nov			26	26	27	27	28	26
VS3-LWF-12B-COMP 2B-DUP	16-Oct 11	-Nov 11-Nov	12-Nov 1	2-Nov 13-Nov	11-Nov			26	26	27	27	28	26
VS3-LWF-12B-COMP 2C	16-Oct 11	-Nov 11-Nov	12-Nov 1	2-Nov 13-Nov	11-Nov			26	26	27	27	28	26
VS3-LWF-13A-COMP 1	17-Oct 11	-Nov 11-Nov	12-Nov 1	2-Nov 13-Nov	11-Nov			25	25	26	26	27	25
VS3-LWF-13B-COMP 2A	17-Oct 11	-Nov 11-Nov	12-Nov 1	2-Nov 13-Nov	11-Nov			25	25	26	26	27	25
VS3-LWF-13B-COMP 2B	17-Oct 11	-Nov 11-Nov	12-Nov 1	2-Nov 13-Nov	11-Nov			25	25	26	26	27	25
VS3-LWF-13B-COMP 2C	17-Oct 11	-Nov 11-Nov	12-Nov 1	2-Nov 13-Nov	11-Nov			25	25	26	26	27	25
VS3-LWF-14B-COMP 2A	18-Oct 11	-Nov 11-Nov	12-Nov 1	2-Nov 13-Nov	11-Nov			24	24	25	25	26	24
VS3-LWF-14B-COMP 2B	18-Oct 11	-Nov 11-Nov	12-Nov 1	2-Nov 13-Nov	11-Nov			24	24	25	25	26	24
VS3-LWF-14B-COMP 2C	18-Oct 11	-Nov 11-Nov	12-Nov 1	2-Nov 13-Nov	11-Nov			24	24	25	25	26	24
VS4-BS-11A-COMP1	23-Oct 17	-Nov	--	21-Nov	--	5-Nov 18	-Nov	25	--	29	--	13	26
VS4-BS-11B-COMP2A	23-Oct 17	-Nov	--	21-Nov	--	5-Nov 18	-Nov	25	--	29	--	13	26
VS4-BS-11B-COMP2B	23-Oct 17	-Nov	--	21-Nov	--	5-Nov 18	-Nov	25	--	29	--	13	26
VS4-BS-11B-COMP2C	23-Oct 17	-Nov	--	21-Nov	--	5-Nov 18	-Nov	25	--	29	--	13	26

	Sample Date	Analysis Date						Holding Time (Days					
		Ash Content	Density	Gross Calorific Value	Kinematic Viscosity	Percent Moisture	Total Chlorine	Ash Content	Density	Gross Calorific Value	Kinematic Viscosity	Percent Moisture	Total Chlorine
VS4-BS-12A-COMP1	24-Oct	17-Nov	--	21-Nov	--	5-Nov	18-Nov	24	--	28	--	12	25
VS4-BS-12B-COMP2A	24-Oct	17-Nov	--	21-Nov	--	5-Nov	18-Nov	24	--	28	--	12	25
VS4-BS-12B-COMP2B	24-Oct	22-Nov	--	21-Nov	--	5-Nov	18-Nov	29	--	28	--	12	25
VS4-BS-12B-COMP2C	24-Oct	22-Nov	--	21-Nov	--	5-Nov	18-Nov	29	--	28	--	12	25
VS4-BS-13A-COMP1	25-Oct	22-Nov	--	21-Nov	--	5-Nov	18-Nov	28	--	27	--	11	24
VS4-BS-13B-COMP2A	25-Oct	22-Nov	--	21-Nov	--	5-Nov	18-Nov	28	--	27	--	11	24
VS4-BS-13B-COMP2B	25-Oct	22-Nov	--	21-Nov	--	5-Nov	18-Nov	28	--	27	--	11	24
VS4-BS-13B-COMP2C	25-Oct	22-Nov	--	21-Nov	--	5-Nov	18-Nov	28	--	27	--	11	24
VS4-BS-14A-COMP1	25-Oct	22-Nov	--	21-Nov	--	5-Nov	18-Nov	28	--	27	--	11	24
VS4-CS-11A-COMP1	23-Oct	18-Nov	--	20-Nov	--	5-Nov	15-Nov	26	--	28	--	13	23
VS4-CS-11B-COMP2A	23-Oct	17-Nov	--	20-Nov	--	5-Nov	15-Nov	25	--	28	--	13	23
VS4-CS-11B-COMP2B	23-Oct	18-Nov	--	20-Nov	--	5-Nov	15-Nov	26	--	28	--	13	23
VS4-CS-11B-COMP2C	23-Oct	18-Nov	--	20-Nov	--	5-Nov	15-Nov	26	--	28	--	13	23
VS4-CS-12A-COMP1	24-Oct	17-Nov	--	20-Nov	--	5-Nov	15-Nov	24	--	27	--	12	22
VS4-CS-12B-COMP2A	24-Oct	17-Nov	--	20-Nov	--	5-Nov	15-Nov	24	--	27	--	12	22
VS4-CS-12B-COMP2B	24-Oct	18-Nov	--	20-Nov	--	5-Nov	15-Nov	25	--	27	--	12	22
VS4-CS-12B-COMP2C	24-Oct	17-Nov	--	20-Nov	--	5-Nov	15-Nov	24	--	27	--	12	22
VS4-CS-13A-COMP1	25-Oct	18-Nov	--	20-Nov	--	5-Nov	15-Nov	24	--	26	--	11	21
VS4-CS-13B-COMP2A	25-Oct	18-Nov	--	20-Nov	--	5-Nov	15-Nov	24	--	26	--	11	21
VS4-CS-13B-COMP2B	25-Oct	18-Nov	--	21-Nov	--	5-Nov	15-Nov	24	--	27	--	11	21
VS4-CS-13B-COMP2C	25-Oct	18-Nov	--	21-Nov	--	5-Nov	15-Nov	24	--	27	--	11	21
VS4-CS-14A-COMP1	25-Oct	17-Nov	--	21-Nov	--	5-Nov	15-Nov	23	--	27	--	11	21
VS4-HBW-11A-COMP1	23-Oct	17-Nov	18-Nov	19-Nov	20-Nov	19-Nov	14-Nov			25	26	27	28	27	22
VS4-HBW-11B-COMP2A	23-Oct	17-Nov	18-Nov	19-Nov	20-Nov	19-Nov	14-Nov			25	26	27	28	27	22
VS4-HBW-11B-COMP2B	23-Oct	17-Nov	18-Nov	19-Nov	20-Nov	19-Nov	14-Nov			25	26	27	28	27	22
VS4-HBW-11B-COMP2C	23-Oct	18-Nov	18-Nov	19-Nov	20-Nov	19-Nov	14-Nov			26	26	27	28	27	22
VS4-HBW-12A-COMP1	24-Oct	18-Nov	18-Nov	19-Nov	21-Nov	19-Nov	14-Nov			25	25	26	28	26	21
VS4-HBW-12B-COMP2A	24-Oct	18-Nov	18-Nov	19-Nov	21-Nov	19-Nov	14-Nov			25	25	26	28	26	21
VS4-HBW-12B-COMP2B	24-Oct	18-Nov	18-Nov	19-Nov	21-Nov	19-Nov	14-Nov			25	25	26	28	26	21

	Sample Date	Analysis Date						Holding Time (Days					
		Ash Content	Density	Gross Calorific Value	Kinematic Viscosity	Percent Moisture	Total Chlorine	Ash Content	Density	Gross Calorific Value	Kinematic Viscosity	Percent Moisture	Total Chlorine
VS4-HBW-12B-COMP2B-DUP	24-Oct 18	-Nov 18-	Nov 19-Nov 2	1-Nov 19-	Nov 14-Nov			25	25	26	28	26	21
VS4-HBW-12B-COMP2C	24-Oct 17	-Nov 18-	Nov 19-Nov 2	1-Nov 19-	Nov 14-Nov			24	25	26	28	26	21
VS4-HBW-13A-COMP1	25-Oct 18	-Nov 18-	Nov 19-Nov 2	1-Nov 19-	Nov 14-Nov			24	24	25	27	25	20
VS4-HBW-13B-COMP2A	25-Oct 18	-Nov 18-	Nov 19-Nov 2	1-Nov 19-	Nov 14-Nov			24	24	25	27	25	20
VS4-HBW-13B-COMP2B	25-Oct 18	-Nov 18-	Nov 19-Nov 2	1-Nov 19-	Nov 14-Nov			24	24	25	27	25	20
VS4-HBW-13B-COMP2C	25-Oct 18	-Nov 18-	Nov 19-Nov 2	1-Nov 19-	Nov 14-Nov			24	24	25	27	25	20
VS4-HBW-14A-COMP1	25-Oct 17	-Nov 18-	Nov 19-Nov 2	1-Nov 19-	Nov 14-Nov			23	24	25	27	25	20
VS4-LBW-11A-COMP1	23-Oct 18	-Nov 18-	Nov 19-Nov 2	1-Nov 21-	Nov 19-Nov			26	26	27	29	29	27
VS4-LBW-11B-COMP2A	23-Oct 17	-Nov 18-	Nov 19-Nov 2	1-Nov 21-	Nov 19-Nov			25	26	27	29	29	27
VS4-LBW-11B-COMP2B	23-Oct 17	-Nov 18-	Nov 19-Nov 2	1-Nov 21-	Nov 19-Nov			25	26	27	29	29	27
VS4-LBW-11B-COMP2C	23-Oct 18	-Nov 18-	Nov 19-Nov 2	1-Nov 21-	Nov 19-Nov			26	26	27	29	29	27
VS4-LBW-12A-COMP1	24-Oct 18	-Nov 18-	Nov 19-Nov 2	1-Nov 21-	Nov 19-Nov			25	25	26	28	28	26
VS4-LBW-12B-COMP2A	24-Oct 18	-Nov 19-	Nov 20-Nov 2	2-Nov 21-	Nov 19-Nov			25	26	27	29	28	26
VS4-LBW-12B-COMP2B	24-Oct 21	-Nov 19-	Nov 20-Nov 2	2-Nov 21-	Nov 20-Nov			28	26	27	29	28	27
VS4-LBW-12B-COMP2B-DUP	24-Oct 21	-Nov 19-	Nov 20-Nov 2	2-Nov 21-	Nov 20-Nov			28	26	27	29	28	27
VS4-LBW-12B-COMP2C	24-Oct 21	-Nov 19-	Nov 20-Nov 2	2-Nov 21-	Nov 20-Nov			28	26	27	29	28	27
VS4-LBW-13A-COMP1	25-Oct 21	-Nov 19-	Nov 20-Nov 2	2-Nov 21-	Nov 20-Nov			27	25	26	28	27	26
VS4-LBW-13B-COMP2A	25-Oct 21	-Nov 19-	Nov 20-Nov 2	2-Nov 21-	Nov 20-Nov			27	25	26	28	27	26
VS4-LBW-13B-COMP2B	25-Oct 21	-Nov 19-	Nov 20-Nov 2	2-Nov 21-	Nov 20-Nov			27	25	26	28	27	26
VS4-LBW-13B-COMP2C	25-Oct 21	-Nov 19-	Nov 20-Nov 2	2-Nov 21-	Nov 20-Nov			27	25	26	28	27	26
VS4-LBW-14A-COMP1	25-Oct 21	-Nov 19-	Nov 20-Nov 2	2-Nov 21-	Nov 20-Nov			27	25	26	28	27	26
VS4-LWF-11A-COMP1	23-Oct 21	-Nov 19-	Nov 18-Nov 2	0-Nov 18-	Nov 19-Nov			29	27	26	28	26	27
VS4-LWF-11B-COMP2A	23-Oct 21	-Nov 19-	Nov 18-Nov 2	0-Nov 18-	Nov 19-Nov			29	27	26	28	26	27
VS4-LWF-11B-COMP2B	23-Oct 21	-Nov 19-	Nov 18-Nov 2	0-Nov 18-	Nov 19-Nov			29	27	26	28	26	27
VS4-LWF-11B-COMP2C	23-Oct 21	-Nov 19-	Nov 18-Nov 2	0-Nov 18-	Nov 19-Nov			29	27	26	28	26	27
VS4-LWF-12A-COMP1	24-Oct 21	-Nov 19-	Nov 18-Nov 2	0-Nov 18-	Nov 19-Nov			28	26	25	27	25	26
VS4-LWF-12B-COMP2A	24-Oct 21	-Nov 19-	Nov 18-Nov 2	0-Nov 18-	Nov 19-Nov			28	26	25	27	25	26
VS4-LWF-12B-COMP2B	24-Oct 21	-Nov 19-	Nov 18-Nov 2	0-Nov 18-	Nov 19-Nov			28	26	25	27	25	26

	Sample Date	Analysis Date						Holding Time (Days					
		Ash Content	Density	Gross Calorific Value	Kinematic Viscosity	Percent Moisture	Total Chlorine	Ash Content	Density	Gross Calorific Value	Kinematic Viscosity	Percent Moisture	Total Chlorine
VS4-LWF-12B-COMP2B-DUP	24-Oct 21	-Nov 19-Nov	19-Nov 21	-Nov 18-Nov	19-Nov			28	26	26	28	25	26
VS4-LWF-12B-COMP2C	24-Oct 21	-Nov 19-Nov	18-Nov 20	-Nov 18-Nov	19-Nov			28	26	25	27	25	26
VS4-LWF-13A-COMP1	25-Oct 21	-Nov 19-Nov	19-Nov 21	-Nov 18-Nov	19-Nov			27	25	25	27	24	25
VS4-LWF-13B-COMP2A	25-Oct 21	-Nov 19-Nov	19-Nov 21	-Nov 18-Nov	19-Nov			27	25	25	27	24	25
VS4-LWF-13B-COMP2B	25-Oct 21	-Nov 19-Nov	19-Nov 21	-Nov 18-Nov	19-Nov			27	25	25	27	24	25
VS4-LWF-13B-COMP2C	25-Oct 21	-Nov 19-Nov	19-Nov 21	-Nov 18-Nov	19-Nov			27	25	25	27	24	25
VS4-LWF-14A-COMP1	25-Oct 21	-Nov 19-Nov	19-Nov 21	-Nov 18-Nov	19-Nov			27	25	25	27	24	25

Laboratory Blank Results

	Analytical Result (mg/kg)	
	Ash Content	Total Chlorine
Laboratory Blank; Batch 3288047	--	<60
Laboratory Blank; Batch 3291011	--	<60
Laboratory Blank; Batch 3294027	<51	--
Laboratory Blank; Batch 3295055	--	<60
Laboratory Blank; Batch 3296018	<51	--
Laboratory Blank; Batch 3297012	--	<60
Laboratory Blank; Batch 3297044	<51	--
Laboratory Blank; Batch 3297045	<51	--
Laboratory Blank; Batch 3304037	<51	--
Laboratory Blank; Batch 3305056	<51	--
Laboratory Blank; Batch 3305068	--	<60
Laboratory Blank; Batch 3309048	--	<60
Laboratory Blank; Batch 3310040	--	<60
Laboratory Blank; Batch 3311015	--	<60
Laboratory Blank; Batch 3311046	<51	--
Laboratory Blank; Batch 3311049	<51	--
Laboratory Blank; Batch 3316041	--	<60
Laboratory Blank; Batch 3316044	--	<60
Laboratory Blank; Batch 3318019	57	--
Laboratory Blank; Batch 3318020	150	--
Laboratory Blank; Batch 3318038	--	<60
Laboratory Blank; Batch 3319020	--	<60
Laboratory Blank; Batch 3320010	--	<60
Laboratory Blank; Batch 3323036	<51	--
Laboratory Blank; Batch 3323037	<51	--
Laboratory Blank; Batch 3323038	<51	--
Laboratory Blank; Batch 3328014	--	<60
Laboratory Blank; Batch 3328015	--	<60
Laboratory Blank; Batch 3328016	90	--
Laboratory Blank; Batch 3328017	<51	--

Laboratory Check Sample (LCS) and Laboratory Check Sample Duplicate (LCSD) Results

		Ash Content	Density	Gross Calorific Value	Kinematic Viscosity	Percent Water	Total Chlorine
Laboratory (and QAPP) Specifications	Recovery (%)	90-110	99-101	98-102	99-101	95-105	80-120
	RPD (%)	10	--	2		5	--
LCS; Batch 3288047	LCS Recovery, %	--	--	--	--	--	101
LCS/LCSD; Batch 3289046	LCS Recovery, %	--	--	100	--	--	--
	LCSD Recovery, %	--	--	100	--	--	--
	RPD [1], %	--	--	0.23	--	--	--
LCS; Batch 3291011	LCS Recovery, %	--	--	--	--	--	94
LCS/LCSD; Batch 3294014	LCS Recovery, %	--	--	100	--	--	--
	LCSD Recovery, %	--	--	100	--	--	--
	RPD, %	--	--	0.06	--	--	--
LCS/LCSD; Batch 3294027	LCS Recovery, %	99	--	--	--	--	--
	LCSD Recovery, %	99	--	--	--	--	--
	RPD, %	0.3	--	--	--	--	--
LCS/LCSD; Batch 3294063	LCS Recovery, %	--	--	--	--	99	--
	LCSD Recovery, %	--	--	--	--	100	--
	RPD, %	--	--	--	--	0.97	--
LCS; Batch 3295055	LCS Recovery, %	--	--	--	--	--	92
LCS/LCSD; Batch 3296018	LCS Recovery, %	99	--	--	--	--	--
	LCSD Recovery, %	98	--	--	--	--	--
	RPD, %	1.1	--	--	--	--	--
LCS; Batch 3296033	LCS Recovery, %	--	--	--	100	--	--
LCS; Batch 3296034	LCS Recovery, %	--	100	--	--	--	--
LCS; Batch 3297012	LCS Recovery, %	--	--	--	--	--	97
LCS/LCSD; Batch 3297044	LCS Recovery, %	97	--	--	--	--	--
	LCSD Recovery, %	98	--	--	--	--	--
	RPD, %	1.3	--	--	--	--	--
LCS/LCSD; Batch 3297045	LCS Recovery, %	99	--	--	--	--	--
	LCSD Recovery, %	98	--	--	--	--	--
	RPD, %	0.91	--	--	--	--	--
LCS; Batch 3298024	LCS Recovery, %	--	100	--	--	--	--
LCS/LCSD; Batch 3298026	LCS Recovery, %	--	--	100	--	--	--
	LCSD Recovery, %	--	--	100	--	--	--
	RPD, %	--	--	0.05	--	--	--
LCS/LCSD; Batch 3298030	LCS Recovery, %	--	--	--	--	99	--
	LCSD Recovery, %	--	--	--	--	99	--
	RPD, %	--	--	--	--	0.54	--
LCS; Batch 3301015	LCS Recovery, %	--	--	--	100	--	--
LCS; Batch 3301016	LCS Recovery, %	--	--	--	100	--	--
LCS/LCSD; Batch 3302022	LCS Recovery, %	--	--	100	--	--	--
	LCSD Recovery, %	--	--	100	--	--	--
	RPD, %	--	--	0.01	--	--	--
LCS; Batch 3304034	LCS Recovery, %	--	100	--	--	--	--
LCS; Batch 3304036	LCS Recovery, %	--	--	--	100	--	--

[1] RPD – Relative Percent Difference

		Ash Content	Density	Gross Calorific Value	Kinematic Viscosity	Percent Water	Total Chlorine
Laboratory (and QAPP) Specifications	Recovery (%)	90-110	99-101	98-102	99-101	95-105	80-120
	RPD (%)	10	--	2		5	--
LCS/LCSD; Batch 3304037	LCS Recovery, %	100	--	--	--	--	--
	LCSD Recovery, %	100	--	--	--	--	--
	RPD, %	0.22	--	--	--	--	--
LCS/LCSD; Batch 3305056	LCS Recovery, %	101	--	--	--	--	--
	LCSD Recovery, %	100	--	--	--	--	--
	RPD, %	0.59	--	--	--	--	--
LCS/LCSD; Batch 3305057	LCS Recovery, %	--	--	--	--	98	--
	LCSD Recovery, %	--	--	--	--	100	--
	RPD, %	--	--	--	--	1.7	--
LCS; Batch 3305068	LCS Recovery, %	--	--	--	--	--	95
LCS; Batch 3309044	LCS Recovery, %	--	100	--	--	--	--
LCS; Batch 3309045	LCS Recovery, %	--	--	--	100	--	--
LCS; Batch 3309048	LCS Recovery, %	--	--	--	--	--	98
LCS; Batch 3310040	LCS Recovery, %	--	--	--	--	--	95
LCS; Batch 3311015	LCS Recovery, %	--	--	--	--	--	95
LCS/LCSD; Batch 3311040	LCS Recovery, %	--	--	--	--	102	--
	LCSD Recovery, %	--	--	--	--	100	--
	RPD, %	--	--	--	--	1.5	--
LCS/LCSD; Batch 3311042	LCS Recovery, %	--	--	100	--	--	--
	LCSD Recovery, %	--	--	100	--	--	--
	RPD, %	--	--	0.09	--	--	--
LCS/LCSD; Batch 3311046	LCS Recovery, %	101	--	--	--	--	--
	LCSD Recovery, %	100	--	--	--	--	--
	RPD, %	1.1	--	--	--	--	--
LCS/LCSD; Batch 3311049	LCS Recovery, %	102	--	--	--	--	--
	LCSD Recovery, %	101	--	--	--	--	--
	RPD, %	1.1	--	--	--	--	--
LCS/LCSD; Batch 3312052	LCS Recovery, %	--	--	--	--	97	--
	LCSD Recovery, %	--	--	--	--	99	--
	RPD, %	--	--	--	--	1.3	--
LCS/LCSD; Batch 3314010	LCS Recovery, %	--	--	100	--	--	--
	LCSD Recovery, %	--	--	100	--	--	--
	RPD, %	--	--	0.04	--	--	--
LCS/LCSD; Batch 3314011	LCS Recovery, %	--	--	100	--	--	--
	LCSD Recovery, %	--	--	100	--	--	--
	RPD, %	--	--	0.24	--	--	--
LCS; Batch 3315023	LCS Recovery, %	--	100	--	--	--	--
LCS; Batch 3316017	LCS Recovery, %	--	--	--	99	--	--
LCS; Batch 3316041	LCS Recovery, %	--	--	--	--	--	91
LCS; Batch 3316044	LCS Recovery, %	--	--	--	--	--	98
LCS/LCSD; Batch 3317013	LCS Recovery, %	--	--	--	--	98	--
	LCSD Recovery, %	--	--	--	--	99	--
	RPD, %	--	--	--	--	0.97	--
LCS/LCSD; Batch 3318019	LCS Recovery, %	108	--	--	--	--	--
	LCSD Recovery, %	110	--	--	--	--	--
	RPD, %	2	--	--	--	--	--

		Ash Content	Density	Gross Calorific Value	Kinematic Viscosity	Percent Water	Total Chlorine
Laboratory (and QAPP) Specifications	Recovery (%)	90-110	99-101	98-102	99-101	95-105	80-120
	RPD (%)	10	--	2		5	--
LCS/LCSD; Batch 3318020	LCS Recovery, %	103	--	--	--	--	--
	LCSD Recovery, %	105	--	--	--	--	--
	RPD, %	2	--	--	--	--	--
LCS; Batch 3318021	LCS Recovery, %	--	100	--	--	--	--
LCS; Batch 3318038	LCS Recovery, %	--	--	--	--	--	96
LCS; Batch 3319020	LCS Recovery, %	--	--	--	--	--	97
LCS; Batch 3320010	LCS Recovery, %	--	--	--	--	--	97
LCS/LCSD; Batch 3321010	LCS Recovery, %	--	--	--	--	101	--
	LCSD Recovery, %	--	--	--	--	100	--
	RPD, %	--	--	--	--	1.2	--
LCS/LCSD; Batch 3322015	LCS Recovery, %	--	--	100	--	--	--
	LCSD Recovery, %	--	--	100	--	--	--
	RPD, %	--	--	0.05	--	--	--
LCS; Batch 3322032	LCS Recovery, %	--	100	--	--	--	--
LCS; Batch 3322033	LCS Recovery, %	--	100	--	--	--	--
LCS/LCSD; Batch 3322037	LCS Recovery, %	--	--	100	--	--	--
	LCSD Recovery, %	--	--	100	--	--	--
	RPD, %	--	--	0.06	--	--	--
LCS/LCSD; Batch 3322038	LCS Recovery, %	--	--	--	--	102	--
	LCSD Recovery, %	--	--	--	--	101	--
	RPD, %	--	--	--	--	1.1	--
LCS; Batch 3323034	LCS Recovery, %	--	--	--	100	--	--
LCS/LCSD; Batch 3323036	LCS Recovery, %	103	--	--	--	--	--
	LCSD Recovery, %	103	--	--	--	--	--
	RPD, %	0.12	--	--	--	--	--
LCS/LCSD; Batch 3323037	LCS Recovery, %	103	--	--	--	--	--
	LCSD Recovery, %	103	--	--	--	--	--
	RPD, %	0.12	--	--	--	--	--
LCS/LCSD; Batch 3323038	LCS Recovery, %	103	--	--	--	--	--
	LCSD Recovery, %	101	--	--	--	--	--
	RPD, %	1.8	--	--	--	--	--
LCS/LCSD; Batch 3323063	LCS Recovery, %	--	--	99	--	--	--
	LCSD Recovery, %	--	--	100	--	--	--
	RPD, %	--	--	0.3	--	--	--
LCS/LCSD; Batch 3323064	LCS Recovery, %	--	--	99	--	--	--
	LCSD Recovery, %	--	--	100	--	--	--
	RPD, %	--	--	0.26	--	--	--
LCS/LCSD; Batch 3323065	LCS Recovery, %	--	--	100	--	--	--
	LCSD Recovery, %	--	--	100	--	--	--
	RPD, %	--	--	0.12	--	--	--
LCS; Batch 3324028	LCS Recovery, %	--	--	--	100	--	--
LCS; Batch 3324029	LCS Recovery, %	--	--	--	100	--	--
LCS/LCSD; Batch 3325013	LCS Recovery, %	--	--	--	--	101	--
	LCSD Recovery, %	--	--	--	--	99	--
	RPD, %	--	--	--	--	1.8	--
LCS; Batch 3328011	LCS Recovery, %	--	--	--	99	--	--
LCS; Batch 3328012	LCS Recovery, %	--	100	--	--	--	--

		Ash Content	Density	Gross Calorific Value	Kinematic Viscosity	Percent Water	Total Chlorine
Laboratory (and QAPP) Specifications	Recovery (%)	90-110	99-101	98-102	99-101	95-105	80-120
	RPD (%)	10	--	2		5	--
LCS; Batch 3328014	LCS Recovery, %	--	--	--	--	--	95
LCS; Batch 3328015	LCS Recovery, %	--	--	--	--	--	94
LCS/LCSD; Batch 3328016	LCS Recovery, %	107	--	--	--	--	--
	LCSD Recovery, %	102	--	--	--	--	--
	RPD, %	5.2	--	--	--	--	--
LCS/LCSD; Batch 3328017	LCS Recovery, %	105	--	--	--	--	--
	LCSD Recovery, %	110	--	--	--	--	--
	RPD, %	4.5	--	--	--	--	--
LCS/LCSD; Batch 3330010	LCS Recovery, %	--	--	100	--	--	--
	LCSD Recovery, %	--	--	100	--	--	--
	RPD, %	--	--	0.22	--	--	--
LCS/LCSD; Batch 3330011	LCS Recovery, %	--	--	100	--	--	--
	LCSD Recovery, %	--	--	100	--	--	--
	RPD, %	--	--	0.09	--	--	--
LCS/LCSD; Batch 3330016	LCS Recovery, %	--	--	--	--	101	--
	LCSD Recovery, %	--	--	--	--	99	--
	RPD, %	--	--	--	--	1.8	--
LCS; Batch 3288047	LCS Recovery, %	--	--	--	--	--	101

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results

		Total Chlorine
Laboratory and QAPP Specification	Recovery (%)	80-120
	RPD (%)	10
VS2-CS-11B-COMP2B	Sample Result (mg/kg)	167
	Spike Amount (mg/kg)	9900
	MS Result (mg/kg)	9610
	MSD Result (mg/kg)	9570
	MS Recovery (%)	95
	MSD Recovery (%)	95
	RPD (%) [1]	0.49
VS2-CS-15B-COMP2B	Sample Result (mg/kg)	396
	Spike Amount (mg/kg)	9930
	MS Result (mg/kg)	9250
	MSD Result (mg/kg)	9560
	MS Recovery (%)	89
	MSD Recovery (%)	92
	RPD (%)	3.3
VS2-HBW-13B-COMP2B	Sample Result (mg/kg)	3210
	Spike Amount (mg/kg)	11000
	MS Result (mg/kg)	13600
	MSD Result (mg/kg)	13800
	MS Recovery (%)	95
	MSD Recovery (%)	95
	RPD (%)	1.5
VS2-HBW-15B-COMP2B	Sample Result (mg/kg)	3580
	Spike Amount (mg/kg)	9840
	MS Result (mg/kg)	12800
	MSD Result (mg/kg)	13000
	MS Recovery (%)	94
	MSD Recovery (%)	94
	RPD (%)	1.3
VS2-LBW-13B-COMP2B	Sample Result (mg/kg)	364
	Spike Amount (mg/kg)	9970
	MS Result (mg/kg)	9820
	MSD Result (mg/kg)	9710
	MS Recovery (%)	95
	MSD Recovery (%)	94
	RPD (%)	1.2

[1] RPD – Relative Percent Difference

		Total Chlorine
Laboratory and QAPP Specification	Recovery (%)	80-120
	RPD (%)	10
VS2-LBW-15B-COMP2B	Sample Result (mg/kg)	357
	Spike Amount (mg/kg)	9,850
	MS Result (mg/kg)	9,600
	MSD Result (mg/kg)	9,800
	MS Recovery (%)	94
	MSD Recovery (%)	95
	RPD (%)	2.1
VS2-LWF-13B-COMP2B	Sample Result (mg/kg)	124
	Spike Amount (mg/kg)	9,890
	MS Result (mg/kg)	10,100
	MSD Result (mg/kg)	9,630
	MS Recovery (%)	101
	MSD Recovery (%)	96
	RPD (%)	4.8
VS2-LWF-15B-COMP2B	Sample Result (mg/kg)	92.4
	Spike Amount (mg/kg)	9,960
	MS Result (mg/kg)	9,400
	MSD Result (mg/kg)	9,430
	MS Recovery (%)	93
	MSD Recovery (%)	94
	RPD (%)	0.37
VS3-CS-12B-COMP 2B	Sample Result (mg/kg)	195
	Spike Amount (mg/kg)	9,930
	MS Result (mg/kg)	9,540
	MSD Result (mg/kg)	9,530
	MS Recovery (%)	94
	MSD Recovery (%)	93
	RPD (%)	0.1
VS3-HBW-12B-COMP 2B	Sample Result (mg/kg)	2,720
	Spike Amount (mg/kg)	10,000
	MS Result (mg/kg)	12,300
	MSD Result (mg/kg)	12,400
	MS Recovery (%)	96
	MSD Recovery (%)	96
	RPD (%)	0.4
VS3-LBW-13B-COMP 2B	Sample Result (mg/kg)	429
	Spike Amount (mg/kg)	9,980
	MS Result (mg/kg)	9,750
	MSD Result (mg/kg)	9,640
	MS Recovery (%)	93
	MSD Recovery (%)	93
	RPD (%)	1.1

		Total Chlorine
Laboratory and QAPP Specification	Recovery (%)	80-120
	RPD (%)	10
VS3-LWF-12B-COMP 2B	Sample Result (mg/kg)	696
	Spike Amount (mg/kg)	9,930
	MS Result (mg/kg)	10,000
	MSD Result (mg/kg)	9,960
	MS Recovery (%)	94
	MSD Recovery (%)	95
	RPD (%)	0.71
VS4-BS-14A-COMP1	Sample Result (mg/kg)	164
	Spike Amount (mg/kg)	9,920
	MS Result (mg/kg)	9,110
	MSD Result (mg/kg)	8,980
	MS Recovery (%)	90
	MSD Recovery (%)	88
	RPD (%)	1.4
VS4-CS-13B-COMP2A	Sample Result (mg/kg)	207
	Spike Amount (mg/kg)	9,990
	MS Result (mg/kg)	8,520
	MSD Result (mg/kg)	8,540
	MS Recovery (%)	83
	MSD Recovery (%)	83
	RPD (%)	0.31
VS4-HBW-13A-COMP1	Sample Result (mg/kg)	1,350
	Spike Amount (mg/kg)	9,970
	MS Result (mg/kg)	10,800
	MSD Result (mg/kg)	10,800
	MS Recovery (%)	95
	MSD Recovery (%)	95
	RPD (%)	0.37
VS4-LBW-12B-COMP2C	Sample Result (mg/kg)	422
	Spike Amount (mg/kg)	9,950
	MS Result (mg/kg)	9,480
	MSD Result (mg/kg)	9,580
	MS Recovery (%)	91
	MSD Recovery (%)	92
	RPD (%)	1
VS4-LWF-12B-COMP2A	Sample Result (mg/kg)	1,260
	Spike Amount (mg/kg)	10,000
	MS Result (mg/kg)	10,600
	MSD Result (mg/kg)	10,600
	MS Recovery (%)	93
	MSD Recovery (%)	93
	RPD (%)	0.35

Results for Duplicate Analysis

			Ash Content (mg/kg)	Density (g/cm^3)	Gross Calorific Value (BTU/lb)	Kinematic Viscosity (cSt)	Water (%)	Total Chlorine (mg/kg)
QAPP Specification	Relative Percent Difference (%)		10	10	10	10	10	10
VS2-CS-11B-COMP2B	Analytical Result	First Analysis	708,000	--	<130	--	--	--
		Duplicate Analysis	760,000	--	<130	--	--	--
	RPD [1] (%)		7.1	--	NC [2]	--	--	--
VS2-CS-13B-COMP2C	Analytical Result	First Analysis	637,000	--	--	--	--	--
		Duplicate Analysis	645,000	--	--	--	--	--
	RPD (%)		1.2	--	--	--	--	--
VS2-CS-14B-COMP2C	Analytical Result	First Analysis	--	--	--	--	--	159
		Duplicate Analysis	--	--	--	--	--	186
	RPD (%)		--	--	--	--	--	15.7
VS2-CS-15B-COMP2A	Analytical Result	First Analysis	--	--	--	--	--	346
		Duplicate Analysis	--	--	--	--	--	326
	RPD (%)		--	--	--	--	--	6.0
VS2-CS-15B-COMP2B	Analytical Result	First Analysis	688,000	--	<130	--	--	--
		Duplicate Analysis	695,000	--	<130	--	--	--
	RPD (%)		1.0	--	NC	--	--	--
VS2-HBW-11A-COMP1	Analytical Result	First Analysis	1,350	0.88	--	1.31	--	--
		Duplicate Analysis	1,360	0.88	--	1.32	--	--
	RPD (%)		0.7	0.0	--	0.8	--	--
VS2-HBW-13B-COMP2B	Analytical Result	First Analysis	582	0.869	9,130	1.18	20.2	3,210
		Duplicate Analysis	646	0.869	9,170	1.17	20.2	3,260
	RPD (%)		10.4	0.0	0.4	0.9	0.0	1.5
VS2-HBW-15B-COMP2B	Analytical Result	First Analysis	1,210	0.883	8,630	1.62	28.1	--
		Duplicate Analysis	1,140	0.886	8,680	1.63	28	--
	RPD (%)		6.0	0.3	0.6	0.6	0.4	--
VS2-LBW-13B-COMP2B	Analytical Result	First Analysis	3,180	1	<130	0.932	96.6	--
		Duplicate Analysis	3,000	1	<130	0.933	97.7	--
	RPD (%)		5.8	0.0	NC	0.1	1.1	--
VS2-LBW-15B-COMP2B	Analytical Result	First Analysis	3,100	1	178	0.929	99	--
		Duplicate Analysis	3,030	1	152	0.929	98	--
	RPD (%)		2.3	0.0	15.8	0.0	1.0	--
VS2-LWF-13B-COMP2B	Analytical Result	First Analysis	592	0.997	<130	0.897	98.7	--
		Duplicate Analysis	592	1.01	<130	0.9	98.6	--
	RPD (%)		0.0	1.3	NC	0.3	0.1	--
VS2-LWF-15B-COMP2B	Analytical Result	First Analysis	832	0.998	<130	0.907	101	--
		Duplicate Analysis	883	0.995	<130	0.905	101	--
	RPD (%)		5.9	0.3	NC	0.2	0.0	--
VS3-CS-11A-COMP 1	Analytical Result	First Analysis	--	--	<130	--	--	253
		Duplicate Analysis	--	--	<130	--	--	325
	RPD (%)		--	--	NC	--	--	24.9

[1] RPD – Relative Percent Difference
[2] NC – Not Calculated At least one result is below the detection limit.

			Ash Content (mg/kg)	Density (g/cm^3)	Gross Calorific Value (BTU/lb)	Kinematic Viscosity (cSt)	Water (%)	Total Chlorine (mg/kg)
QAPP Specification	Relative Percent Difference (%)		10	10	10	10	10	10
VS3-CS-12B-COMP 2B	Analytical Result	First Analysis	775,000	--	<130	--	--	--
		Duplicate Analysis	781,000	--	<130	--	--	--
	RPD (%)		0.8	--	NC	--	--	--
VS3-CS-14B-COMP 2C	Analytical Result	First Analysis	698,000	--	--	--	--	--
		Duplicate Analysis	700,000	--	--	--	--	--
	RPD (%)		0.3	--	--	--	--	--
VS3-HBW-11A-COMP 1	Analytical Result	First Analysis	--	0.879	--	1.33	--	--
		Duplicate Analysis	--	0.879	--	1.32	--	--
	RPD (%)		--	0.0	--	0.8	--	--
VS3-HBW-12B-COMP 2B	Analytical Result	First Analysis	1,160	0.877	8,700	1.31	24.1	--
		Duplicate Analysis	1,090	0.878	8,800	1.3	24.1	--
	RPD (%)		6.2	0.1	1.1	0.8	0.0	--
VS3-HBW-14B-COMP 2B	Analytical Result	First Analysis	--	--	--	--	--	1,810
		Duplicate Analysis	--	--	--	--	--	1,810
	RPD (%)		--	--	--	--	--	0.0
VS3-HBW-14B-COMP 2C	Analytical Result	First Analysis	--	--	8,560	--	--	--
		Duplicate Analysis	--	--	8,550	--	--	--
	RPD (%)		--	--	0.1	--	--	--
VS3-LBW-11A-COMP 1	Analytical Result	First Analysis	3,090	--	--	--	--	--
		Duplicate Analysis	3,160	--	--	--	--	--
	RPD (%)		2.2	--	--	--	--	--
VS3-LBW-12A-COMP 1	Analytical Result	First Analysis	--	1	--	--	--	--
		Duplicate Analysis	--	1.01	--	--	--	--
	RPD (%)		--	1.0	--	--	--	--
VS3-LBW-12B-COMP 2C	Analytical Result	First Analysis	--	--	--	--	--	408
		Duplicate Analysis	--	--	--	--	--	432
	RPD (%)		--	--	--	--	--	5.7
VS3-LBW-13B-COMP 2B	Analytical Result	First Analysis	3,200	1	181	0.933	100	--
		Duplicate Analysis	3,160	1	196	0.936	99.7	--
	RPD (%)		1.3	0.0	8.0	0.3	0.3	--
VS3-LWF-11A-COMP 1	Analytical Result	First Analysis	--	--	--	0.901	--	--
		Duplicate Analysis	--	--	--	0.899	--	--
	RPD (%)		--	--	--	0.2	--	--
VS3-LWF-12B-COMP 2B	Analytical Result	First Analysis	713	0.999	<130	0.903	98.7	--
		Duplicate Analysis	738	1	<130	0.9	98.3	--
	RPD (%)		3.4	0.1	NC	0.3	0.4	--
VS3-LWF-13B-COMP 2A	Analytical Result	First Analysis	--	--	--	--	--	101
		Duplicate Analysis	--	--	--	--	--	107
	RPD (%)		--	--	--	--	--	5.8
VS3-LWF-14B-COMP 2C	Analytical Result	First Analysis	--	1	--	--	--	--
		Duplicate Analysis	--	1	--	--	--	--
	RPD (%)		--	0.0	--	--	--	--

			Ash Content (mg/kg)	Density (g/cm^3)	Gross Calorific Value (BTU/lb)	Kinematic Viscosity (cSt)	Water (%)	Total Chlorine (mg/kg)
QAPP Specification	Relative Percent Difference (%)		10	10	10	10	10	10
VS4-BS-11A-COMP1	Analytical Result	First Analysis	--	--	<130	--	--	171
		Duplicate Analysis	--	--	<130	--	--	221
	RPD (%)		--	--	NC	--	--	25.5
VS4-BS-14A-COMP1	Analytical Result	First Analysis	710,000	--	<130	--	--	--
		Duplicate Analysis	758,000	--	<130	--	--	--
	RPD (%)		6.5	--	NC	--	--	--
VS4-CS-11A-COMP1	Analytical Result	First Analysis	758,000	--	--	--	--	--
		Duplicate Analysis	736,000	--	--	--	--	--
	RPD (%)		2.9	--	--	--	--	--
VS4-CS-13B-COMP2A	Analytical Result	First Analysis	74,9000	--	<130	--	--	207
		Duplicate Analysis	75,9000	--	<130	--	--	193
	RPD (%)		1.3	--	NC	--	--	7.0
VS4-HBW-11B-COMP2A	Analytical Result	First Analysis	--	--	8,700	--	--	--
		Duplicate Analysis	--	--	8,680	--	--	--
	RPD (%)		--	--	0.2	--	--	--
VS4-HBW-11B-COMP2B	Analytical Result	First Analysis	--	--	--	1.28	--	--
		Duplicate Analysis	--	--	--	1.29	--	--
	RPD (%)		--	--	--	0.8	--	--
VS4-HBW-12B-COMP2B-DUP	Analytical Result	First Analysis	943	0.876	--	--	--	--
		Duplicate Analysis	1050	0.877	--	--	--	--
	RPD (%)		10.7	0.1	--	--	--	--
VS4-HBW-13A-COMP1	Analytical Result	First Analysis	1,500	0.877	8,760	1.38	25.2	1,350
		Duplicate Analysis	928	0.877	8,820	1.37	25.2	1,360
	RPD (%)		47.1	0.0	0.7	0.7	0.0	0.7
VS4-LBW-12B-COMP2C	Analytical Result	First Analysis	2,940	1	166	0.929	97.3	--
		Duplicate Analysis	3,120	1	171	0.928	98	--
			5.9	0.0	3.0	0.1	0.7	--
VS4-LBW-14A-COMP1	Analytical Result	First Analysis	--	--	--	--	--	530
		Duplicate Analysis	--	--	--	--	--	493
	RPD (%)		--	--	--	--	--	7.2
VS4-LWF-11A-COMP1	Analytical Result	First Analysis	--	--	--	--	--	1,250
		Duplicate Analysis	--	--	--	--	--	1,240
	RPD (%)		--	--	--	--	--	0.8
VS4-LWF-12B-COMP2A	Analytical Result	First Analysis	694	0.879	8760	1.53	26.9	--
		Duplicate Analysis	701	0.878	8,770	1.53	27	--
	RPD (%)		1.0	0.1	0.1	0.0	0.4	--
VS4-LWF-13B-COMP2A	Analytical Result	First Analysis	--	0.877	--	--	--	--
		Duplicate Analysis	--	0.878	--	--	--	--
	RPD (%)		--	0.1	--	--	--	--
VS4-LWF-14A-COMP1	Analytical Result	First Analysis	743	--	--	1.52	--	--
		Duplicate Analysis	742	--	--	1.52	--	--
	RPD (%)		0.1	--	--	0.0	--	--

Results for Analysis of Duplicate Samples

			Ash Content (mg/kg)	Density (g/cm^3)	Gross Calorific Value (BTU/lb)	Kinematic Viscosity (cSt)	Water (%)	Total Chlorine (mg/kg)
QAPP Specification	Relative Percent Difference (%)		10	10	10	10	10	10
VS2-HBW-13B-COMP2B	Analytical Result	Sample	582	0.869	9,130	1.18	20.2	3,210
		Duplicate	524	0.869	9,130	1.18	20.2	3,240
	Relative Percent Difference (%)		10.5	0.0	0.0	0.0	0.0	0.9
VS2-LBW-13B-COMP2B	Analytical Result	Sample	3,180	1	<130	0.932	96.6	364
		Duplicate	2,980	1	<130	0.931	98.2	362
	Relative Percent Difference (%)		6.5	0.0	NC [1]	0.1	1.6	0.6
VS2-LWF-13B-COMP2B	Analytical Result	Sample	592	0.997	<130	0.897	98.7	124
		Duplicate	589	0.998	<130	0.898	98.5	115
	Relative Percent Difference (%)		0.5	0.1	NC	0.1	0.2	7.5
VS3-HBW-12B-COMP 2B	Analytical Result	Sample	1,160	0.877	8,700	1.31	24.1	2,720
		Duplicate	645	0.878	8,770	1.31	24.1	2,370
	Relative Percent Difference (%)		57.1	0.1	0.8	0.0	0.0	13.8
VS3-LBW-12B-COMP 2B	Analytical Result	Sample	3,700	1	256	0.932	99.8	419
		Duplicate	3,260	1.02	<130	0.935	99	443
	Relative Percent Difference (%)		12.6	2.0	NC	0.3	0.8	5.6
VS3-LWF-12B-COMP 2B	Analytical Result	Sample	713	0.999	<130	0.903	98.7	696
		Duplicate	711	0.998	<130	0.898	97.1	612
	Relative Percent Difference (%)		0.3	0.1	NC	0.6	1.6	12.8
VS4-HBW-12B-COMP2B	Analytical Result	Sample	1,010	0.877	8,760	1.37	24.9	1,360
		Duplicate	943	0.876	8,810	1.38	24.8	1,370
	Relative Percent Difference (%)		6.9	0.1	0.6	0.7	0.4	0.7
VS4-LBW-12B-COMP2B	Analytical Result	Sample	3,260	1	157	0.933	95.8	393
		Duplicate	3,420	1	<130	0.931	99.1	465
	Relative Percent Difference (%)		4.8	0.0	NC	0.2	3.4	16.8
VS4-LWF-12B-COMP2B	Analytical Result	Sample	673	0.878	8,800	1.52	26.7	2,500
		Duplicate	650	0.878	8,840	1.52	26.4	1,250
	Relative Percent Difference (%)		3.5	0.0	0.5	0.0	1.1	66.7

[1] NC – Not Calculated At least one result is below the detection limit.

Data Quality Assessment
Stack Gas Continuous Emission Monitors

Parameter(s)	Oxygen, Carbon Dioxide, Total Hydrocarbon
Method(s)	EPA Methods 3A, 25A
Calibration Gas	Spans were set appropriately; gases were of appropriate and documented quality. Correct values of all calibration gases used in all calculations. See CEM data in appendix.
Interference	All analyzers used met the interference check criteria.
Stratification Check	Stratification check performed using one analyte (oxygen). Results of stratification check used to determine number of sampling points. See table below.
Calibration Error	All calibration error checks met method specifications. See tables below.
System Bias	All system bias checks met method specifications. See tables below.
Drift	All drift checks for oxygen and carbon dioxide met the method specifications. 70 of 72 drift checks for total hydrocarbons met method specifications. The two outliers were both during Unit 2 Run 1B. A drift of 8.0% was seen at 1800, and a drift of 8.3% was observed at 1909. See tables below
Data Quality Objectives	QAPP specifies these for THC only: Precision: Span and zero drift within 3% of span Accuracy: Calibration error within 5% of calibration gas value Except as noted, these specifications were achieved.

Conclusions and Comments	These data are acceptable for the intended purpose. In accordance with EPA Method 25A, the total hydrocarbon analyzer was immediately re-calibrated following each of the drift excursions. The data from the run was then recalculated using both calibration curves and the higher (more conservative) result reported. As the average THC was well below the standard, and that the conservative recalculation approach specified in the method was implemented, any uncertainty in these data has no impact on the conclusion of the report and the demonstration of compliance. No data are flagged or invalidated based on the calibration drift results.

Stratification Check Results– Oxygen

Unit and Date	Traverse Point	Oxygen Concentration (%)	Difference from Mean (%)	% Difference from Mean
Unit 2 10/8/2013	1	6.23	0.16	2.48
	2	6.29	0.10	1.55
	3	6.65	0.26	4.03
Mean Concentration of all Traverse Points		6.39		
Do the concentrations at each traverse point differ from the mean concentration by no more than (a) ±5.0% of the mean or (b) ±0.5 ppm (whichever is less restrictive)?		YES	Use 1 point	
Unit and Date	**Traverse Point**	**Oxygen Concentration (%)**	**Difference from Mean (%)**	**% Difference from Mean**
Unit 3 10/15/2013	1	15.47	0	0
	2	15.37	0.10	0.6
	3	15.58	0.11	0.7
Mean Concentration of all Traverse Points		6.39		
Do the concentrations at each traverse point differ from the mean concentration by no more than (a) ±5.0% of the mean or (b) ±0.5 ppm (whichever is less restrictive)?		YES	Use 1 point	
Unit and Date	**Traverse Point**	**Oxygen Concentration (%)**	**Difference from Mean (%)**	**% Difference from Mean**
Unit 4 10/22/2013	1	12.16	0.06	0.49
	2	12.37	0.15	1.20
	3	12.14	0.09	0.71
Mean Concentration of all Traverse Points		12.22		
Do the concentrations at each traverse point differ from the mean concentration by no more than (a) ±5.0% of the mean or (b) ±0.5 ppm (whichever is less restrictive)?		YES	Use 1 point	

Calibration Error Test Results – Oxygen – Method 3A

	Cylinder ID	Certified Value (%)	Time	CEM Response (%)	Absolute Difference (%)	Calibration Error (% of Span) 2% Limit
8 October 2013 Unit 2 Runs 1A and 1B	EEP443	0.00	07:40	-0.03	0.03	0.1%
	CC189665	22.50	07:42	22.33	0.17	0.7%
	CC43355	10.10	07:44	10.01	0.09	0.4%
9 October 2013 Unit 2 Run 2A	EEP443	0.00	07:24	-0.04	0.04	0.2%
	CC189665	22.50	07:20	22.50	0.00	0.0%
	CC43355	10.10	07:22	10.07	0.03	0.1%
10 October 2013 Unit 2 Runs 3A and 3B	EEP443	0.00	07:12	-0.04	0.04	0.2%
	CC189665	22.50	07:14	22.64	0.14	0.6%
	CC43355	10.10	07:16	10.14	0.04	0.2%
11 October 2013 Unit 2 Run 4B	EEP443	0.00	07:12	-0.03	0.03	0.1%
	CC189665	22.50	07:13	22.46	0.04	0.2%
	CC43355	10.10	07:16	10.05	0.05	0.2%
30 October 2013 Unit 2 Run 5B	52-400193157-1A	0.00	08:30	-0.01	0.01	0.0%
	CC189665	22.50	08:32	22.50	0.00	0.0%
	CC196768	9.52	08:33	9.54	0.02	0.1%
15 October 2013 Unit 3 Runs 1A and 1B	52-400193157-1A	0.00	7:43	0.02	0.02	0.1%
	cc189665	22.50	7:45	22.54	0.04	0.2%
	cc43355	10.10	7:46	10.12	0.02	0.1%
16 October 2013 Unit 3 Runs 2A and 2B	52-400193157-1A	0.00	8:24	0.03	0.03	0.1%
	cc189665	22.50	8:26	22.50	0.00	0.0%
	cc43355	10.10	8:27	10.11	0.01	0.0%
17 October 2013 Unit 3 Runs 3A and 3B	52-400193157-1A	0.00	7:46	0.01	0.01	0.0%
	cc189665	22.50	7:47	22.51	0.01	0.0%
	cc43355	10.10	7:48	10.10	0.00	0.0%
18 October 2013 Unit 3 Run 4B	52-400193157-1A	0.00	07:50	0.02	0.02	0.1%
	CC189665	22.50	07:52	22.49	0.01	0.0%
	CC43355	10.10	07:53	10.09	0.01	0.0%
23 October 2013 Unit 4 Runs 1A and 1B	52-400193157-1A	0.00	07:54	0.01	0.01	0.0%
	CC189665	22.50	07:56	22.57	0.07	0.3%
	CC43355	10.10	07:58	10.12	0.02	0.1%
24 October 2013 Unit 4 Runs 2A and 2B	52-400193157-1A	0.00	07:42	-0.01	0.01	0.0%
	CC189665	22.50	07:44	22.55	0.05	0.2%
	CC43355	10.10	07:45	10.10	0.00	0.0%
25 October 2013 Unit 4 Runs 3A, 4A, and 3B	52-400193157-1A	0.00	07:27	-0.02	0.02	0.1%
	CC189665	22.50	07:24	22.58	0.08	0.4%
	CC43355	10.10	07:25	10.12	0.02	0.1%

Calibration Error Test Results – Carbon Dioxide – Method 3A

	Cylinder ID	Certified Value (%)	Time	CEM Response (%)	Absolute Difference (%)	Calibration Error (% of Span) 2% Limit
8 October 2013 Unit 2 Runs 1A and 1B	EEP443	0.00	07:40	0.04	0.04	0.2%
	CC189665	19.20	07:42	19.23	0.03	0.2%
	CC43355	10.00	07:44	10.13	0.13	0.7%
9 October 2013 Unit 2 Run 2A	EEP443	0.00	07:24	0.10	0.10	0.5%
	CC189665	19.20	07:20	19.08	0.12	0.6%
	CC43355	10.00	07:22	10.06	0.06	0.3%
10 October 2013 Unit 2 Runs 3A and 3B	EEP443	0.00	07:12	0.04	0.04	0.2%
	CC189665	19.20	07:14	19.29	0.09	0.5%
	CC43355	10.00	07:16	10.18	0.18	0.9%
11 October 2013 Unit 2 Run 4B	EEP443	EEP443	0.00	07:12	0.06	0.06
	CC189665	CC189665	19.20	07:13	18.99	0.21
	CC43355	CC43355	10.00	07:16	10.03	0.03
30 October 2013 Unit 2 Run 5B	52-400193157-1A	0.00	08:30	0.01	0.01	0.1%
	CC189665	19.20	08:32	19.23	0.03	0.1%
	CC196768	9.53	08:33	9.64	0.11	0.6%
15 October 2013 Unit 3 Runs 1A and 1B	52-400193157-1A	0.00	7:43	0.02	0.02	0.1%
	cc189665	19.20	7:45	19.22	0.02	0.1%
	cc43355	10.00	7:46	10.10	0.10	0.5%
16 October 2013 Unit 3 Runs 2A and 2B	52-400193157-1A	0.00	8:24	0.05	0.05	0.2%
	cc189665	19.20	8:26	19.22	0.02	0.1%
	cc43355	10.00	8:27	10.10	0.10	0.5%
17 October 2013 Unit 3 Runs 3A and 3B	52-400193157-1A	0.00	7:46	0.04	0.04	0.2%
	cc189665	19.20	7:47	19.21	0.01	0.0%
	cc43355	10.00	7:48	10.10	0.10	0.5%
18 October 2013 Unit 3 Run 4B	52-400193157-1A	0.00	07:50	0.01	0.01	0.0%
	CC189665	19.20	07:52	19.15	0.05	0.2%
	CC43355	10.00	07:53	10.06	0.06	0.3%
23 October 2013 Unit 4 Runs 1A and 1B	52-400193157-1A	0.00	07:54	0.02	0.02	0.1%
	CC189665	19.20	07:56	19.24	0.04	0.2%
	CC43355	10.00	07:58	10.11	0.11	0.6%
24 October 2013 Unit 4 Runs 2A and 2B	52-400193157-1A	0.00	07:42	0.04	0.04	0.2%
	CC189665	19.20	07:44	19.22	0.02	0.1%
	CC43355	10.00	07:45	10.06	0.06	0.3%
25 October 2013 Unit 4 Runs 3A, 4A, and 3B	52-400193157-1A	0.00	07:27	0.04	0.04	0.2%
	CC189665	19.20	07:24	19.24	0.04	0.2%
	CC43355	10.00	07:25	10.05	0.05	0.3%

System Bias– Oxygen, Method 3A

Run No.	Cylinder Value (%)	CEMS Response during Calibration Error Test (%)	Time	CEMs Response (%)	Bias (% of Span) 5% Limit
8 October 2013 Unit 2 Runs 1A and 1B	0.00	-0.03	07:48	-0.02	0.0%
	10.10	10.01	07:50	9.91	-0.4%
	0.00	-0.03	14:18	-0.05	-0.1%
	10.10	10.01	14:21	9.88	-0.6%
9 October 2013 Unit 2; Run 2A	0.00	-0.04	07:33	-0.03	0.1%
	10.10	10.07	07:36	10.04	-0.1%
10 October 2013 Unit 2 Runs 3A and 3B	0.00	-0.04	07:33	-0.01	0.1%
	10.10	10.14	07:35	9.94	-0.9%
	0.00	-0.04	10:25	0.09	0.6%
	10.10	10.14	10:27	9.95	-0.9%
	0.00	-0.04	11:32	-0.05	-0.1%
	10.10	10.14	11:34	9.94	-0.9%
11 October 2013 Unit 2; Run 4B	0.00	-0.03	07:20	0.05	0.3%
	10.10	10.05	07:22	9.94	-0.5%
30 October 2013 Unit 2; Run 5B	0.00	-0.01	12:02	0.00	0.0%
	9.52	9.54	12:04	9.40	-0.6%
15 October 2013 Unit 3 Runs 1A and 1B	0.00	0.02	12:41	0.05	0.1%
	10.10	10.12	12:43	9.98	-0.6%
	0.00	0.02	14:32	0.05	0.1%
	10.10	10.12	14:34	9.95	-0.8%
16 October 2013 Unit 3 Runs 2A and 2B	0.00	0.03	8:31	0.07	0.2%
	10.10	10.11	8:29	10.04	-0.3%
	0.00	0.03	13:49	0.12	0.4%
	10.10	10.11	13:51	9.98	-0.6%
17 October 2013 Unit 3 Runs 3A and 3B	0.00	0.01	7:51	0.04	0.1%
	10.10	10.10	7:50	10.00	-0.4%
	0.00	0.01	11:10	0.06	0.2%
	10.10	10.10	11:12	9.93	-0.7%
18 October 2013 Unit 3; Run 4B	0.00	0.02	08:27	0.06	0.2%
	10.10	10.09	08:24	10.02	-0.3%
23 October 2013 Unit 4 Runs 1A and 1B	0.00	0.01	08:02	0.05	0.2%
	10.10	10.12	08:04	10.09	-0.1%
	0.00	0.01	10:48	0.02	0.1%
	10.10	10.12	10:50	10.08	-0.2%
24 October 2013 Unit 4 Runs 2A and 2B	0.00	-0.01	07:51	0.02	0.2%
	10.10	10.10	07:53	10.07	-0.1%
	0.00	-0.01	10:43	0.09	0.4%
	10.10	10.10	10:44	10.01	-0.4%
25 October 2013 Unit 4 Runs 3A, 4A, and 3B	0.00	-0.02	07:31	0.08	0.5%
	10.10	10.12	07:33	9.97	-0.7%
	0.00	-0.02	10:43	0.08	0.4%
	10.10	10.12	10:44	9.96	-0.7%
	0.00	-0.02	11:58	0.05	0.3%
	10.10	10.12	11:59	9.96	-0.7%

System Bias– Carbon Dioxide, Method 3A

Run No.	Cylinder Value (%)	CEMS Response during Calibration Error Test (%)	Time	CEMs Response (%)	Bias (% of Span) 5% Limit
8 October 2013 Unit 2 Runs 1A and 1B	0.00	0.04	07:48	0.06	0.1%
	10.00	10.13	07:50	10.00	-0.7%
	0.00	0.04	14:18	0.09	0.2%
	10.00	10.13	14:21	9.99	-0.7%
9 October 2013 Unit 2; Run 2A	0.00	0.10	07:33	0.05	-0.3%
	10.00	10.06	07:36	9.99	-0.4%
10 October 2013 Unit 2 Runs 3A and 3B	0.00	0.04	07:33	0.04	0.0%
	10.00	10.18	07:35	9.92	-1.3%
	0.00	0.04	10:25	0.22	0.9%
	10.00	10.18	10:27	9.97	-1.1%
	0.00	0.04	11:32	0.09	0.3%
	10.00	10.18	11:34	9.95	-1.2%
11 October 2013 Unit 2; Run 4B	0.00	0.06	07:20	0.07	0.1%
	10.00	10.03	07:22	9.89	-0.7%
30 October 2013 Unit 2; Run 5B	0.00	0.01	12:02	0.05	0.2%
	9.53	9.64	12:04	9.49	-0.8%
15 October 2013 Unit 3 Runs 1A and 1B	0.00	0.02	12:41	0.04	0.1%
	10.00	10.10	12:43	9.89	-1.1%
	0.00	0.02	14:32	0.04	0.1%
	10.00	10.10	14:34	9.87	-1.2%
16 October 2013 Unit 3 Runs 2A and 2B	0.00	0.05	8:31	0.06	0.1%
	10.00	10.10	8:29	9.93	-0.9%
	0.00	0.05	13:49	0.03	-0.1%
	10.00	10.10	13:51	9.88	-1.1%
17 October 2013 Unit 3 Runs 3A and 3B	0.00	0.04	7:51	0.06	0.1%
	10.00	10.10	7:50	9.89	-1.1%
	0.00	0.04	11:10	0.05	0.0%
	10.00	10.10	11:12	9.88	-1.1%
18 October 2013 Unit 3; Run 4B	0.00	0.01	08:27	0.07	0.3%
	10.00	10.06	08:24	9.90	-0.9%
23 October 2013 Unit 4 Runs 1A and 1B	0.00	0.02	08:02	0.03	0.1%
	10.00	10.11	08:04	10.07	-0.2%
	0.00	0.02	10:48	0.05	0.2%
	10.00	10.11	10:50	10.09	-0.1%
24 October 2013 Unit 4 Runs 2A and 2B	0.00	0.04	07:51	0.06	0.1%
	10.00	10.06	07:53	10.04	-0.1%
	0.00	0.04	10:43	0.07	0.2%
	10.00	10.06	10:44	10.01	-0.3%
25 October 2013 Unit 4 Runs 3A, 4A, and 3B	0.00	0.04	07:31	0.03	-0.1%
	10.00	10.05	07:33	9.81	-1.2%
	0.00	0.04	10:43	0.10	0.3%
	10.00	10.05	10:44	9.82	-1.2%
	0.00	0.04	11:58	0.08	0.2%
	10.00	10.05	11:59	9.86	-1.0%

Drift Tests – Oxygen, Method 3A

Run No.	Cylinder Value (%)	Pre Test		Post test		Drift (% of Span) 3% Limit
		Time	CEMs Response (%)	Time	CEMs Response (%)	
8 October 2013 Unit 2 Runs 1A and 1B	0.00	07:48	-0.02	14:18	-0.05	-0.1%
	10.10	07:50	9.91	14:21	9.88	-0.1%
	0.00	14:18	-0.05	19:03	0.04	0.4%
	10.10	14:21	9.88	19:07	9.85	-0.1%
9 October 2013 Unit 2; Run 2A	0.00	07:33	-0.03	10:55	0.00	0.1%
	10.10	07:36	10.04	10:57	9.98	-0.3%
10 October 2013 Unit 2 Runs 3A and 3B	0.00	07:33	-0.01	10:25	0.09	0.4%
	10.10	07:35	9.94	10:27	9.95	0.0%
	0.00	10:25	0.09	11:32	-0.05	-0.6%
	10.10	10:27	9.95	11:34	9.94	0.0%
	0.00	11:32	-0.05	15:43	-0.01	0.2%
	10.10	11:34	9.94	15:45	9.89	-0.2%
11 October 2013 Unit 2; Run 4B	0.00	07:20	0.05	13:06	-0.08	-0.6%
	10.10	07:22	9.94	13:08	9.89	-0.2%
30 October 2013 Unit 2; Run 5B	0.00	12:02	0.00	16:05	0.03	0.2%
	9.52	12:04	9.40	16:07	9.37	-0.2%
15 October 2013 Unit 3 Runs 1A and 1B	0.00	12:41	0.05	14:32	0.05	0.0%
	10.10	12:43	9.98	14:34	9.95	-0.1%
	0.00	14:32	0.05	19:38	0.08	0.1%
	10.10	14:34	9.95	19:40	9.94	-0.1%
16 October 2013 Unit 3 Runs 2A and 2B	0.00	8:31	0.07	12:28	0.10	0.1%
	10.10	8:29	10.04	12:31	9.96	-0.4%
	0.00	13:49	0.12	17:26	0.08	-0.2%
	10.10	13:51	9.98	17:28	9.97	0.0%
17 October 2013 Unit 3 Runs 3A and 3B	0.00	7:51	0.04	11:10	0.06	0.1%
	10.10	7:50	10.00	11:12	9.93	-0.3%
	0.00	11:10	0.06	16:03	0.07	0.0%
	10.10	11:12	9.93	16:05	9.90	-0.1%
18 October 2013 Unit 3; Run 4B	0.00	08:27	0.06	12:54	0.07	0.0%
	10.10	08:24	10.02	12:56	9.93	-0.4%
23 October 2013 Unit 4 Runs 1A and 1B	0.00	08:02	0.05	10:48	0.02	-0.1%
	10.10	08:04	10.09	10:50	10.08	-0.1%
	0.00	10:48	0.02	15:57	0.05	0.1%
	10.10	10:50	10.08	15:59	9.90	-0.8%
24 October 2013 Unit 4 Runs 2A and 2B	0.00	07:51	0.02	10:43	0.09	0.3%
	10.10	07:53	10.07	10:44	10.01	-0.2%
	0.00	10:43	0.09	15:53	0.07	-0.1%
	10.10	10:44	10.01	15:55	10.00	0.0%
25 October 2013 Unit 4 Runs 3A, 4A, and 3B	0.00	07:31	0.08	10:43	0.08	0.0%
	10.10	07:33	9.97	10:44	9.96	0.0%
	0.00	10:43	0.08	11:58	0.05	-0.1%
	10.10	10:44	9.96	11:59	9.96	0.0%
	0.00	11:58	0.05	16:54	0.02	-0.1%
	10.10	11:59	9.96	16:56	9.87	-0.4%

Drift Tests – Carbon Dioxide, Method 3A

Run No.	Cylinder Value (%)	Pre Test		Post test		Drift (% of Span) 3% Limit
		Time	CEMs Response (%)	Time	CEMs Response (%)	
8 October 2013 Unit 2 Runs 1A and 1B	0.00	07:48	0.06	14:18	0.09	0.1%
	10.00	07:50	10.00	14:21	9.99	-0.1%
	0.00	14:18	0.09	19:03	0.11	0.1%
	10.00	14:21	9.99	19:07	9.96	-0.2%
9 October 2013 Unit 2; Run 2A	0.00	07:33	0.05	10:55	0.14	0.5%
	10.00	07:36	9.99	10:57	9.98	-0.1%
10 October 2013 Unit 2 Runs 3A and 3B	0.00	07:33	0.04	10:25	0.22	0.9%
	10.00	07:35	9.92	10:27	9.97	0.2%
	0.00	10:25	0.22	11:32	0.09	-0.7%
	10.00	10:27	9.97	11:34	9.95	-0.1%
	0.00	11:32	0.09	15:43	0.14	0.3%
	10.00	11:34	9.95	15:45	9.90	-0.3%
11 October 2013 Unit 2; Run 4B	0.00	07:20	0.07	13:06	0.09	0.1%
	10.00	07:22	9.89	13:08	9.89	0.0%
30 October 2013 Unit 2; Run 5B	0.00	12:02	0.05	16:05	0.04	0.0%
	9.53	12:04	9.49	16:07	9.43	-0.3%
15 October 2013 Unit 3 Runs 1A and 1B	0.00	12:41	0.04	14:32	0.04	0.0%
	10.00	12:43	9.89	14:34	9.87	-0.1%
	0.00	14:32	0.04	19:38	0.09	0.2%
	10.00	14:34	9.87	19:40	9.86	0.0%
16 October 2013 Unit 3 Runs 2A and 2B	0.00	8:31	0.06	12:28	0.07	0.0%
	10.00	8:29	9.93	12:31	9.92	0.0%
	0.00	13:49	0.03	17:26	0.08	0.3%
	10.00	13:51	9.88	17:28	9.89	0.0%
17 October 2013 Unit 3 Runs 3A and 3B	0.00	7:51	0.06	11:10	0.05	-0.1%
	10.00	7:50	9.89	11:12	9.88	0.0%
	0.00	11:10	0.05	16:03	0.07	0.1%
	10.00	11:12	9.88	16:05	9.85	-0.2%
18 October 2013 Unit 3; Run 4B	0.00	08:27	0.07	12:54	0.07	0.0%
	10.00	08:24	9.90	12:56	9.89	-0.1%
23 October 2013 Unit 4 Runs 1A and 1B	0.00	08:02	0.03	10:48	0.05	0.1%
	10.00	08:04	10.07	10:50	10.09	0.1%
	0.00	10:48	0.05	15:57	0.06	0.0%
	10.00	10:50	10.09	15:59	9.92	-0.9%
24 October 2013 Unit 4 Runs 2A and 2B	0.00	07:51	0.06	10:43	0.07	0.1%
	10.00	07:53	10.04	10:44	10.01	-0.1%
	0.00	10:43	0.07	15:53	0.06	-0.1%
	10.00	10:44	10.01	15:55	10.01	0.0%
25 October 2013 Unit 4 Runs 3A, 4A, and 3B	0.00	07:31	0.03	10:43	0.10	0.4%
	10.00	07:33	9.81	10:44	9.82	0.1%
	0.00	10:43	0.10	11:58	0.08	-0.1%
	10.00	10:44	9.82	11:59	9.86	0.2%
	0.00	11:58	0.08	16:54	0.04	-0.2%
	10.00	11:59	9.86	16:56	9.70	-0.8%

Calibration Error Tests – Total Hydrocarbon, Method 25A

	Cylinder ID	Certified Value (ppm)	Time	CEM Response (ppm)	Absolute Difference (ppm)	Cal Error [1] (% of Span) 5% Limit
8 October 2013 Unit 2 THC Run 1B	EEP443	0.00	15:16	-0.18	0.18	n/c
	CC111534	21.30	15:19	20.98	0.32	1.5%
	AL899	12.90	15:21	12.41	0.49	3.8%
	CC250309	7.58	15:23	7.54	0.04	0.5%
	EEP443	0.00	18:21	0.11	0.11	n/c
	CC111534	21.30	18:24	21.02	0.28	1.3%
	AL899	12.90	18:28	12.78	0.12	0.9%
	CC250309	7.58	18:26	7.92	0.34	4.5%
10 October 2013 Unit 2 Run 3B	EEP443	0.00	11:43	0.24	0.24	n/c
	AAL4460	21.10	11:37	21.37	0.27	1.3%
	AL899	12.90	11:39	12.69	0.21	1.6%
	CC250309	7.58	11:41	7.73	0.15	2.0%
11 October 2013 Unit 2 Run 4B	EEP443	0.00	09:13	0.06	0.06	n/c
	AAL4460	21.10	09:15	21.00	0.10	0.5%
	AL899	12.90	09:19	12.50	0.40	3.1%
	CC250309	7.58	09:17	7.63	0.05	0.7%
30 October 2013 Unit 2 Run 5B	52-400193157-1A	0.00	12:10	0.03	0.03	n/c
	ALM025456	24.70	12:06	24.63	0.07	0.3%
	ALM028646	14.80	12:07	14.98	0.18	1.2%
	ALM057529	8.43	12:08	8.55	0.12	1.4%
15 October 2013 Unit 3 Run 1B	52-400193157-1A	0.00	15:11	-0.05	0.05	n/c
	alm025456	24.70	15:13	24.64	0.06	0.4%
	alm028646	14.80	15:15	14.92	0.12	2.5%
	alm057529	8.43	15:17	8.42	0.01	2.2%
16 October 2013 Unit 3 Run 2B	52-400193157-1A	0.00	13:49	-0.08	0.08	n/c
	alm025456	24.70	13:44	24.79	0.09	0.0
	alm028646	14.80	13:45	15.17	0.37	0.0
	alm057529	8.43	13:47	8.61	0.18	0.0
17 October 2013 Unit 3 Run 3B	52-400193157-1A	0.00	12:16	-0.07	0.07	n/c
	alm025456	24.70	12:18	24.93	0.23	0.9%
	alm028646	14.80	12:19	15.09	0.29	2.0%
	alm057529	8.43	12:21	8.54	0.11	1.3%
18 October 2013 Unit 3 Run 4B	52-400193157-1A	0.00	09:25	0.00	0.00	n/c
	ALM025456	24.70	09:26	24.86	0.16	0.7%
	ALM028646	14.80	09:28	15.17	0.37	2.5%
	ALM057529	8.43	09:30	8.61	0.18	2.1%
23 October 2013 Unit 4 Runs 1B	52-400193157-1A	0.00	11:38	-0.05	0.05	n/c
	ALM025456	24.70	11:32	24.79	0.09	0.4%
	ALM028646	14.80	11:36	15.23	0.43	2.9%
	ALM057529	8.43	11:34	8.60	0.17	2.1%
24 October 2013 Unit 4 Run 2B	52-400193157-1A	0.00	11:18	-0.02	0.02	n/c
	ALM025456	24.70	11:20	24.64	0.06	0.3%
	ALM028646	14.80	11:21	14.96	0.16	1.1%
	ALM057529	8.43	11:24	8.51	0.08	1.0%
25 October 2013 Unit 4 Run 3B	52-400193157-1A	0.00	11:58	0.00	0.00	n/c
	ALM025456	24.70	12:02	24.67	0.03	0.1%
	ALM028646	14.80	12:04	15.03	0.23	1.5%
	ALM057529	8.43	12:06	8.54	0.11	1.4%

[1] Calibration Error can not be calculated for the zero gases. The specification is in percent of the certified value. These are indicated as n/c – not calculated.

Drift Tests – Total Hydrocarbon, Method 25A

Run No.	CEMs Response from Calibration Error Test (ppm)	Time	CEMs Response (ppm)	Drift (% of Span) 3% Limit
8 October 2013 Unit 2 THC Run 1B	-0.18	16:52	-0.14	0.2
	12.41	16:48	12.25	-0.7
	-0.18	17:58	-0.63	-1.8
	12.41	18:00	10.40	-8.0
	0.11	19:03	1.10	3.9
	12.78	19:09	14.86	8.3
10 October 2013 Unit 2 Run 3B	0.24	11:34	0.02	-0.9
	12.69	11:36	12.56	-0.5
	0.24	13:34	0.02	-0.9
	12.69	13:36	12.56	-0.5
	0.24	14:44	0.01	-0.9
	12.69	14:47	12.55	-0.6
	0.24	15:43	-0.02	-1.0
	12.69	15:47	12.50	-0.7
11 October 2013 Unit 2 Run 4B	0.06	10:49	0.09	0.1
	12.50	10:52	12.38	-0.5
	0.06	11:54	0.07	0.1
	12.50	11:57	12.19	-1.3
	0.06	13:06	0.07	0.0
	12.50	13:10	12.39	-0.4
30 October 2013 Unit 2 Run 5B	0.03	13:49	0.05	0.1
	14.98	13:50	14.99	0.0
	0.03	14:56	0.05	0.1
	14.98	14:57	15.00	0.1
	0.03	16:05	0.06	0.1
	14.98	16:09	15.01	0.1
15 October 2013 Unit 3 Run 1B	-0.05	16:04	-0.01	0.1
	14.92	16:06	14.89	-0.1
	-0.05	17:18	-0.01	0.1
	14.92	17:20	14.58	-1.1
	-0.05	18:21	0.00	0.2
	14.92	18:23	14.69	-0.8
	-0.05	19:38	0.00	0.1
	14.92	19:42	14.77	-0.5
16 October 2013 Unit 3 Run 2B	-0.08	15:03	0.01	0.3
	15.17	15:05	14.95	-0.7
	-0.08	16:16	0.03	0.3
	15.17	16:17	14.88	-1.0
	-0.08	17:26	-0.02	0.2
	15.17	17:29	15.25	0.3

Run No.	CEMs Response from Calibration Error Test (ppm)	Time	CEMs Response (ppm)	Drift (% of Span) 3% Limit
17 October 2013 Unit 3 Run 3B	-0.07	13:37	-0.02	0.2
	15.09	13:39	14.80	-1.0
	-0.07	14:40	-0.05	0.1
	15.09	14:42	14.58	-1.7
	-0.07	16:03	-0.04	0.1
	15.09	16:07	14.96	-0.4
18 October 2013 Unit 3 Run 4B	0.00	10:39	0.06	0.2
	15.17	10:41	14.88	-0.9
	0.00	11:58	0.07	0.3
	15.17	12:00	14.94	-0.8
	0.00	12:54	0.07	0.2
	15.17	12:58	14.98	-0.6
23 October 2013 Unit 4 Runs 1B	-0.05	13:39	0.00	0.2
	15.23	13:47	14.78	-1.5
	-0.05	15:04	-0.02	0.1
	15.23	15:12	14.70	-1.8
	-0.05	15:57	-0.04	0.0
	15.23	16:01	14.80	-1.4
24 October 2013 Unit 4 Run 2B	-0.02	12:13	-0.04	-0.1
	14.96	12:15	14.94	-0.1
	-0.02	13:38	-0.04	0.0
	14.96	13:39	14.90	-0.2
	-0.02	14:46	-0.02	0.0
	14.96	14:48	14.75	-0.7
	-0.02	15:53	-0.02	0.0
	14.96	15:56	14.73	-0.8
25 October 2013 Unit 4 Run 3B	0.00	13:14	-0.01	0.0
	15.03	13:16	14.88	-0.5
	0.00	14:37	-0.01	0.0
	15.03	14:39	14.93	-0.3
	0.00	15:45	-0.02	-0.1
	15.03	15:47	14.86	-0.6
	0.00	16:54	-0.05	-0.2
	15.03	16:58	15.00	-0.1

Data Quality Assessment
Analysis of Waste Feeds for Metals

Parameter	Selected Metals in Waste Feeds
Sampling Method	Tap Sampling
Analytical Method	ICPES, SW-846 Method 6010B; CVAA, SW-846 Method 7471A
Work Order Number(s)	H3J140415, H3J140417, H3J150401, H3J150402, H3J150403, H3J190414, H3J190415, H3J190416, H3J190417, H3J190418, H3K010415, H3K010416, H3K010418, H3K010419, H3K010420, H3K010424, H3K020402, H3K020403, H3K020404, H3K020405, H3K020406
Preparation Batch Number(s)	3294020, 3294021, 3294022, 3294026, 3295019, 3295020, 3295059, 3296030, 3308021, 3308023, 3308024, 3308025, 3310018, 3310020, 3311018
Sample Shipping and Receipt	Samples received intact and at ambient temperature. QAPP has no temperature specification.
Holding Time(s)	All analyses conducted within 19 days of sample collection. QAPP specifies 28-day hold time for mercury, 6 months for all other analytes. See table below.
Blank Results	All method blanks below the detection limit. See table below.
Laboratory Check Sample (LCS) and Laboratory Check Sample Duplicate (LCSD) Results	All recoveries between 90 and 110%. This met the QAPP specification of recovery between 80 and 120%. All RPDs below 5%. There is no QAPP requirement for LCSD or specification for RPD. This met the laboratory specification of RPD below 20%. See table below.
Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results	QAPP specifications are 75-125% recovery, 0-20% RPD for mercury and 70-130% recovery, 20% RPD for others. 187 of 204 MS or MSD met the specifications for recovery. 100 of 102 MS/MSD pairs met the specification for RPD. The following samples were outside the specification: • VS2-CS-11B-COMP2B: Arsenic recovery 67% in MS, arsenic RPD 23%, chromium recovery 149% and 172% in MS/MSD. • VS2-CS-15B-COMP2B: chromium recovery 150% in MSD • VS3-CS-12B-COMP 2B: chromium recovery 131 and 145% in MS/MSD • VS4-BS-13B-COMP2B: chromium recovery 132 and 134% in MS/MSD, lead recovery 208% in MSD • VS4-CS-13B-COMP2B: chromium recovery 164 and 186% in MS/MSD, lead recovery 406% in MS, lead RPD 49%, mercury recovery 61 and 45% in MS/MSD • VS4-LBW-12B-COMP2B: cadmium recovery 145% in MSD, mercury recovery 71 and 66% in MS/MSD. See table below.
Duplicate Results	Selected samples were analyzed in duplicate. Duplicate samples were collected and analyzed. The QAPP presents no specifications for duplicate analysis or analysis of duplicate samples. Good reproducibility was observed. See table below.

Conclusions and Comments	These data are acceptable for the intended purpose. Metals feed rates are developed as a sum of totals fed to the system as LVM (arsenic, beryllium and chromium) SVM (cadmium and lead) and mercury. The MS/MSD outliers detailed above indicate increased uncertainty in the concentrations of the metals in those streams. The contribution of these streams to the total feed rates of LVM, SVM and mercury are negligible, and the increased uncertainty in these concentrations has no impact on the conclusions of the report. No data are qualified or invalidated based on MS/MSD results.

Holding Time

	Sample Date	Analysis Date		Holding time	
		Metals Excluding Mercury – ICPES	Mercury – CVAA	Metals Excluding Mercury – ICPES	Mercury – CVAA
VS2-CR-11B-GRAB1	8-Oct	25-Oct	--	17	--
VS2-CR-11B-GRAB2	8-Oct	25-Oct	--	17	--
VS2-CR-11B-GRAB3	8-Oct	25-Oct	--	17	--
VS2-CR-13B-GRAB1	10-Oct	25-Oct	--	15	--
VS2-CR-13B-GRAB2	10-Oct	25-Oct	--	15	--
VS2-CR-13B-GRAB3	10-Oct	25-Oct	--	15	--
VS2-CR-14B-GRAB1	11-Oct	25-Oct	--	14	--
VS2-CR-14B-GRAB2	11-Oct	25-Oct	--	14	--
VS2-CR-14B-GRAB3	11-Oct	25-Oct	--	14	--
VS2-CR-15B-GRAB1	30-Oct	11-Nov	--	12	--
VS2-CR-15B-GRAB2	30-Oct	11-Nov	--	12	--
VS2-CR-15B-GRAB3	30-Oct	11-Nov	--	12	--
VS2-CS-11B-COMP2B	8-Oct	24-Oct	23-Oct	16	15
VS2-CS-13B-COMP2B	10-Oct	24-Oct	23-Oct	14	13
VS2-CS-14B-COMP2B	11-Oct	24-Oct	23-Oct	13	12
VS2-CS-15B-COMP2B	30-Oct	8-Nov	8-Nov	9	9
VS2-HBW-11B-COMP2B	8-Oct	24-Oct	23-Oct	16	15
VS2-HBW-13B-COMP2B	10-Oct	24-Oct	23-Oct	14	13
VS2-HBW-13B-COMP2B DUPLICATE	10-Oct	24-Oct	23-Oct	14	13
VS2-HBW-14B-COMP2B	11-Oct	24-Oct	23-Oct	13	12
VS2-HBW-15B-COMP2B	30-Oct	8-Nov	8-Nov	9	9
VS2-HG-11B-GRAB1	8-Oct	--	23-Oct	--	15
VS2-HG-11B-GRAB2	8-Oct	--	23-Oct	--	15
VS2-HG-11B-GRAB3	8-Oct	--	23-Oct	--	15
VS2-HG-13B-GRAB1	10-Oct	--	23-Oct	--	13
VS2-HG-13B-GRAB2	10-Oct	--	23-Oct	--	13
VS2-HG-13B-GRAB3	10-Oct	--	23-Oct	--	13
VS2-HG-14B-GRAB2	11-Oct	--	23-Oct	--	12
VS2-HG-14B-GRAB3	11-Oct	--	23-Oct	--	12
VS2-HG-15B-GRAB1	30-Oct	--	8-Nov	--	9
VS2-HG-15B-GRAB2	30-Oct	--	8-Nov	--	9

	Sample Date	Analysis Date		Holding time	
		Metals Excluding Mercury – ICPES	Mercury – CVAA	Metals Excluding Mercury – ICPES	Mercury – CVAA
VS2-HG-15B-GRAB3	30-Oct	--	8-Nov	--	9
VS2-LBW-11B-COMP2B	8-Oct	24-Oct	23-Oct	16	15
VS2-LBW-13B-COMP2B	10-Oct	24-Oct	23-Oct	14	13
VS2-LBW-13B-COMP2B DUPLICATE	10-Oct	24-Oct	23-Oct	14	13
VS2-LBW-15B-COMP2A	30-Oct	8-Nov	8-Nov	9	9
VS2-LBW-15B-COMP2B	30-Oct	8-Nov	8-Nov	9	9
VS2-LBW-15B-COMP2C	30-Oct	8-Nov	8-Nov	9	9
VS2-LWF-11B-COMP2B	8-Oct	24-Oct	23-Oct	16	15
VS2-LWF-13B-COMP2B	10-Oct	24-Oct	23-Oct	14	13
VS2-LWF-13B-COMP2B DUPLICATE	10-Oct	24-Oct	23-Oct	14	13
VS2-LWF-15B-COMP2B	30-Oct	8-Nov	8-Nov	9	9
VS3-CR-12B-GRAB 1	16-Oct	25-Oct	--	9	--
VS3-CR-12B-GRAB 2	16-Oct	25-Oct	--	9	--
VS3-CR-12B-GRAB 3	16-Oct	25-Oct	--	9	--
VS3-CR-13B-GRAB 1	17-Oct	25-Oct	--	8	--
VS3-CR-13B-GRAB 2	17-Oct	25-Oct	--	8	--
VS3-CR-13B-GRAB 3	17-Oct	25-Oct	--	8	--
VS3-CR-14B-GRAB 1	18-Oct	25-Oct	--	7	--
VS3-CR-14B-GRAB 2	18-Oct	25-Oct	--	7	--
VS3-CR-14B-GRAB 3	18-Oct	25-Oct	--	7	--
VS3-CS-12B-COMP 2B	16-Oct	24-Oct	23-Oct	8	7
VS3-CS-13B-COMP 2B	17-Oct	24-Oct	23-Oct	7	6
VS3-CS-14B-COMP 2B	18-Oct	24-Oct	23-Oct	6	5
VS3-HBW-12B-COMP 2B	16-Oct	24-Oct	23-Oct	8	7
VS3-HBW-12B-COMP 2B-DUP	16-Oct	24-Oct	23-Oct	8	7
VS3-HBW-13B-COMP 2B	17-Oct	24-Oct	23-Oct	7	6
VS3-HBW-14B-COMP 2B	18-Oct	24-Oct	23-Oct	6	5
VS3-HG-12B-GRAB 1	16-Oct	--	23-Oct	--	7
VS3-HG-12B-GRAB 2	16-Oct	--	23-Oct	--	7
VS3-HG-12B-GRAB 3	16-Oct	--	23-Oct	--	7
VS3-HG-13B-GRAB 1	17-Oct	--	23-Oct	--	6
VS3-HG-13B-GRAB 2	17-Oct	--	23-Oct	--	6
VS3-HG-13B-GRAB 3	17-Oct	--	23-Oct	--	6
VS3-HG-14B-GRAB 1	18-Oct	--	23-Oct	--	5
VS3-HG-14B-GRAB 2	18-Oct	--	23-Oct	--	5
VS3-HG-14B-GRAB 3	18-Oct	--	23-Oct	--	5
VS3-LBW-12B-COMP 2B	16-Oct	24-Oct	23-Oct	8	7
VS3-LBW-12B-COMP 2B DUP	16-Oct	24-Oct	23-Oct	8	7
VS3-LBW-13B-COMP 2B	17-Oct	24-Oct	23-Oct	7	6
VS3-LBW-14B-COMP 2B	18-Oct	24-Oct	23-Oct	6	5
VS3-LWF-12B-COMP 2B	16-Oct	24-Oct	23-Oct	8	7
VS3-LWF-12B-COMP 2B-DUP	16-Oct	24-Oct	23-Oct	8	7

	Sample Date	Analysis Date		Holding time	
		Metals Excluding Mercury – ICPES	Mercury – CVAA	Metals Excluding Mercury – ICPES	Mercury – CVAA
VS3-LWF-13B-COMP 2B	17-Oct	24-Oct	23-Oct	7	6
VS3-LWF-14B-COMP 2B	18-Oct	24-Oct	23-Oct	6	5
VS4-BS-11B-COMP2B	23-Oct	8-Nov	8-Nov	16	16
VS4-BS-12B-COMP2B	24-Oct	8-Nov	8-Nov	15	15
VS4-BS-13B-COMP2B	25-Oct	8-Nov	8-Nov	14	14
VS4-CR-11B-GRAB1	23-Oct	11-Nov	--	19	--
VS4-CR-11B-GRAB2	23-Oct	11-Nov	--	19	--
VS4-CR-11B-GRAB3	23-Oct	11-Nov	--	19	--
VS4-CR-12B-GRAB1	24-Oct	11-Nov	--	18	--
VS4-CR-12B-GRAB2	24-Oct	11-Nov	--	18	--
VS4-CR-12B-GRAB3	24-Oct	11-Nov	--	18	--
VS4-CR-13B-GRAB1	25-Oct	11-Nov	--	17	--
VS4-CR-13B-GRAB2	25-Oct	11-Nov	--	17	--
VS4-CR-13B-GRAB3	25-Oct	11-Nov	--	17	--
VS4-CR-13B-GRAB4	25-Oct	11-Nov	--	17	--
VS4-CS-11B-COMP2B	23-Oct	8-Nov	8-Nov	16	16
VS4-CS-12B-COMP2B	24-Oct	8-Nov	8-Nov	15	15
VS4-CS-13B-COMP2B	25-Oct	8-Nov	8-Nov	14	14
VS4-HBW-11B-COMP2B	23-Oct	8-Nov	8-Nov	16	16
VS4-HBW-12B-COMP2B	24-Oct	8-Nov	8-Nov	15	15
VS4-HBW-12B-COMP2B-DUP	24-Oct	8-Nov	8-Nov	15	15
VS4-HBW-13B-COMP2B	25-Oct	8-Nov	8-Nov	14	14
VS4-HG-11B-GRAB1	23-Oct	--	8-Nov	--	16
VS4-HG-11B-GRAB2	23-Oct	--	8-Nov	--	16
VS4-HG-11B-GRAB3	23-Oct	--	8-Nov	--	16
VS4-HG-12B-GRAB1	24-Oct	--	8-Nov	--	15
VS4-HG-12B-GRAB2	24-Oct	--	8-Nov	--	15
VS4-HG-12B-GRAB3	24-Oct	--	8-Nov	--	15
VS4-HG-13B-GRAB1	25-Oct	--	8-Nov	--	14
VS4-HG-13B-GRAB2	25-Oct	--	8-Nov	--	14
VS4-HG-13B-GRAB3	25-Oct	--	8-Nov	--	14
VS4-LBW-11B-COMP2B	23-Oct	8-Nov	8-Nov	16	16
VS4-LBW-12B-COMP2B	24-Oct	8-Nov	8-Nov	15	15
VS4-LBW-12B-COMP2B-DUP	24-Oct	8-Nov	8-Nov	15	15
VS4-LBW-13B-COMP2B	25-Oct	8-Nov	8-Nov	14	14
VS4-LWF-11B-COMP2B	23-Oct	8-Nov	8-Nov	16	16
VS4-LWF-12B-COMP2B	24-Oct	8-Nov	8-Nov	15	15
VS4-LWF-12B-COMP2B-DUP	24-Oct	8-Nov	8-Nov	15	15
VS4-LWF-13B-COMP2B	25-Oct	8-Nov	8-Nov	14	14

Laboratory Blank Results

	Analytical Result (mg/kg)					
	Arsenic	Beryllium	Cadmium	Chromium	Lead	Mercury
Laboratory Blank; Batch 3294020	--	--	--	--	--	<0.01
Laboratory Blank; Batch 3294021	--	--	--	--	--	<0.01
Laboratory Blank; Batch 3294022	--	--	--	--	--	<0.01
Laboratory Blank; Batch 3294026	--	--	--	--	--	<0.01
Laboratory Blank; Batch 3295019	<0.33	<0.1	<0.079	<0.22	<0.28	--
Laboratory Blank; Batch 3295020	<0.33	<0.1	<0.079	<0.22	<0.28	--
Laboratory Blank; Batch 3295059	<0.33	<0.1	<0.079	<0.22	<0.28	--
Laboratory Blank; Batch 3296030	--	--	--	<0.22	--	--
Laboratory Blank; Batch 3308021	--	--	--	--	--	<0.01
Laboratory Blank; Batch 3308023	--	--	--	--	--	<0.01
Laboratory Blank; Batch 3308024	--	--	--	--	--	<0.01
Laboratory Blank; Batch 3308025	--	--	--	--	--	<0.01
Laboratory Blank; Batch 3310018	<0.33	<0.1	<0.079	<0.22	<0.28	--
Laboratory Blank; Batch 3310020	<0.33	<0.1	<0.079	<0.22	<0.28	--
Laboratory Blank; Batch 3311018	--	--	--	<0.22	--	--

Laboratory Check Sample (LCS) and Laboratory Check Sample Duplicate (LCSD) Results

		Arsenic	Beryllium	Cadmium	Chromium	Lead	Mercury
LCS; Batch 3294020	LCS Recovery, %	--	--	--	--	--	94
LCS; Batch 3294021	LCS Recovery, %	--	--	--	--	--	102
LCS; Batch 3294022	LCS Recovery, %	--	--	--	--	--	100
LCS; Batch 3294026	LCS Recovery, %	--	--	--	--	--	102
LCS; Batch 3295019	LCS Recovery, %	95	104	100	101	99	--
LCS; Batch 3295020	LCS Recovery, %	99	107	103	104	101	--
LCS; Batch 3295059	LCS Recovery, %	95	103	99	99	97	--
LCS/LCSD; Batch 3296030	LCS Recovery, %	--	--	--	102	--	--
	LCSD Recovery, %	--	--	--	102	--	--
	Relative Percent Difference, %	--	--	--	0.07	--	--
LCS; Batch 3308021	LCS Recovery, %	--	--	--	--	--	100
LCS; Batch 3308023	LCS Recovery, %	--	--	--	--	--	97
LCS/LCSD; Batch 3308023	LCS Recovery, %	--	--	--	--	--	96
	LCSD Recovery, %	--	--	--	--	--	1
	Relative Percent Difference, %	--	--	--	--	--	96
LCS; Batch 3308025	LCS Recovery, %	--	--	--	--	--	95
LCS; Batch 3310018	LCS Recovery, %	95	103	100	101	100	--
LCS; Batch 3310020	LCS Recovery, %	95	104	100	102	100	--
LCS/LCSD; Batch 3311018	LCS Recovery, %	--	--	--	99	--	--
	LCSD Recovery, %	--	--	--	101	--	--
	Relative Percent Difference, %	--	--	--	1.6	--	--

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results

		Arsenic	Beryllium	Cadmium	Chromium	Lead	Mercury
QAPP Specification	MS/MSD Recovery (%)	70-130	70-130	70-130	70-130	70-130	75-125
	RPD (%)	20	20	20	20	20	20
VS2-CS-11B-COMP2B	Sample Result (mg/kg)	8.8	0.48	0.082	12.8	11.6	0.045
	Spike Amount (mg/kg)	9.56	4.78	4.78	19.1	9.56	0.161
	MS Result (mg/kg)	15.2	5.19	4.33	41.3	19.7	0.192
	MSD Result (mg/kg)	19.2	5.35	4.35	44.4	22.2	0.202
	MS Recovery (%)	67	99	89	149	85	91
	MSD Recovery (%)	113	106	93	172	116	94
	RPD (%)	23	3	0.34	7.2	12	4.9
VS2-CS-15B-COMP2B	Sample Result (mg/kg)	8.8	0.73	0.084	16.7	13.5	0.016
	Spike Amount (mg/kg)	9.77	4.88	4.88	19.5	9.77	0.155
	MS Result (mg/kg)	18.5	5.29	4.46	42.1	22.6	0.18
	MSD Result (mg/kg)	19	5.27	4.42	45.6	23.3	0.179
	MS Recovery (%)	100	93	90	130	93	106
	MSD Recovery (%)	106	94	90	150	102	108
	RPD (%)	2.4	0.29	0.77	8	2.9	0.74
VS2-HBW-13B-COMP2B	Sample Result (mg/kg)	2.8	<0.099	<0.078	<0.22	0.67	0.021
	Spike Amount (mg/kg)	9.19	4.6	4.6	18.4	9.19	0.153
	MS Result (mg/kg)	11.8	4.74	4.56	18.3	9.4	0.146
	MSD Result (mg/kg)	12.5	5.05	4.89	19.5	10	0.145
	MS Recovery (%)	98	103	99	100	95	82
	MSD Recovery (%)	101	105	101	101	97	79
	RPD (%)	6	6.4	6.9	6.1	6.6	0.39
VS2-HBW-15B-COMP2B	Sample Result (mg/kg)	<0.32	<0.096	<0.076	<0.21	6.7	0.096
	Spike Amount (mg/kg)	9.58	4.79	4.79	19.2	9.58	0.16
	MS Result (mg/kg)	9.48	5.03	4.87	19.7	15.4	0.252
	MSD Result (mg/kg)	9.54	4.98	4.84	19.5	15.3	0.248
	MS Recovery (%)	99	105	102	103	90	98
	MSD Recovery (%)	99	104	101	102	89	97
	RPD (%)	0.61	0.92	0.74	1.2	0.54	1.6
VS2-LBW-13B-COMP2B	Sample Result (mg/kg)	3.2	<0.096	9	0.88	1.7	0.042
	Spike Amount (mg/kg)	9.86	4.93	4.93	19.7	9.86	0.152
	MS Result (mg/kg)	12.8	5.19	14.1	20.9	11.6	0.199
	MSD Result (mg/kg)	12.8	5.3	13.7	21.4	11.8	0.194
	MS Recovery (%)	97	105	103	101	100	103
	MSD Recovery (%)	96	106	95	103	101	98
	RPD (%)	0.39	2	2.6	2.2	1.4	2.5
VS2-LBW-15B-COMP2B	Sample Result (mg/kg)	2.1	<0.097	7	0.74	1.1	0.052
	Spike Amount (mg/kg)	9.92	4.96	4.96	19.8	9.92	0.161
	MS Result (mg/kg)	11.7	5.15	12.2	21	11.2	0.197
	MSD Result (mg/kg)	11.3	4.94	13	20.1	10.7	0.194
	MS Recovery (%)	97	104	106	102	102	90
	MSD Recovery (%)	97	104	127	102	101	91
	RPD (%)	2.7	4.3	6.1	4.2	4.6	1.2

		Arsenic	Beryllium	Cadmium	Chromium	Lead	Mercury
QAPP Specification	MS/MSD Recovery (%)	70-130	70-130	70-130	70-130	70-130	75-125
	RPD (%)	20	20	20	20	20	20
VS2-LWF-13B-COMP2B	Sample Result (mg/kg)	<0.3	<0.092	<0.073	<0.2	<0.26	<0.0086
	Spike Amount (mg/kg)	9.73	4.86	4.86	19.5	9.73	0.148
	MS Result (mg/kg)	9.36	5.12	4.9	19.8	9.68	0.136
	MSD Result (mg/kg)	9.14	4.98	4.78	19.3	9.51	0.138
	MS Recovery (%)	96	105	101	102	99	92
	MSD Recovery (%)	96	105	100	101	100	93
	RPD (%)	2.3	2.7	2.6	2.6	1.8	1.4
VS2-LWF-15B-COMP2B	Sample Result (mg/kg)	<0.31	<0.093	<0.073	<0.2	<0.26	<0.0099
	Spike Amount (mg/kg)	9.47	4.74	4.74	18.9	9.47	0.152
	MS Result (mg/kg)	8.95	4.86	4.71	19	9.44	0.145
	MSD Result (mg/kg)	9.1	4.97	4.82	19.7	9.75	0.152
	MS Recovery (%)	95	103	99	100	100	96
	MSD Recovery (%)	95	104	101	103	102	95
	RPD (%)	1.7	2.3	2.3	3.5	3.2	4.6
VS3-CS-12B-COMP 2B	Sample Result (mg/kg)	7.5	0.58	<0.071	13.6	11.1	0.028
	Spike Amount (mg/kg)	9.24	4.62	4.62	18.5	9.24	0.159
	MS Result (mg/kg)	14.9	5	4.25	37.8	19.2	0.197
	MSD Result (mg/kg)	14.8	5.18	4.43	42.1	19.9	0.199
	MS Recovery (%)	80	96	92	131	87	106
	MSD Recovery (%)	74	93	90	145	88	103
	RPD (%)	0.32	3.6	4	11	3.4	0.93
VS3-HBW-12B-COMP 2B	Sample Result (mg/kg)	2.9	<0.095	<0.075	<0.21	1.8	0.027
	Spike Amount (mg/kg)	9.65	4.83	4.83	19.3	9.65	0.16
	MS Result (mg/kg)	12.4	5	4.9	19.4	11.5	0.183
	MSD Result (mg/kg)	12.7	5.24	5.08	20.3	12	0.183
	MS Recovery (%)	99	104	101	100	101	97
	MSD Recovery (%)	99	105	102	102	103	97
	RPD (%)	2.3	4.7	3.7	4.7	3.5	0
VS3-LBW-13B-COMP 2B	Sample Result (mg/kg)	3.2	<0.097	9.4	0.87	1.9	0.049
	Spike Amount (mg/kg)	9.69	4.84	4.84	19.4	9.69	0.146
	MS Result (mg/kg)	12.9	5.18	14.9	21.1	11.9	0.186
	MSD Result (mg/kg)	12.6	5.05	14.8	20.4	11.5	0.186
	MS Recovery (%)	101	107	114	104	103	93
	MSD Recovery (%)	97	104	111	101	99	95
	RPD (%)	2.9	2.5	0.98	3.5	3.3	0.4
VS3-LWF-12B-COMP 2B	Sample Result (mg/kg)	<0.32	<0.098	<0.077	<0.22	<0.27	<0.0088
	Spike Amount (mg/kg)	9.71	4.85	4.85	19.4	9.71	0.153
	MS Result (mg/kg)	9.3	5.05	4.85	19.5	9.71	0.144
	MSD Result (mg/kg)	9.26	4.96	4.79	19.1	9.52	0.133
	MS Recovery (%)	96	104	100	101	100	94
	MSD Recovery (%)	97	104	101	101	100	91
	RPD (%)	0.45	1.8	1.1	2	2	8

		Arsenic	Beryllium	Cadmium	Chromium	Lead	Mercury
QAPP Specification	MS/MSD Recovery (%)	70-130	70-130	70-130	70-130	70-130	75-125
	RPD (%)	20	20	20	20	20	20
VS4-BS-13B-COMP2B	Sample Result (mg/kg)	2.2	0.26	0.3	29.8	26.6	0.077
	Spike Amount (mg/kg)	9.26	4.63	4.63	18.5	9.26	0.151
	MS Result (mg/kg)	10.8	4.61	4.02	54.2	38	0.236
	MSD Result (mg/kg)	10.9	4.74	4.18	54.8	45.9	0.234
	MS Recovery (%)	93	94	80	132	124	106
	MSD Recovery (%)	94	96	83	134	208	105
	RPD (%)	1.1	2.7	3.7	0.94	19	1.2
VS4-CS-13B-COMP2B	Sample Result (mg/kg)	2.1	<0.1	0.45	35.1	25.4	0.26
	Spike Amount (mg/kg)	9.36	4.68	4.68	18.7	9.36	0.154
	MS Result (mg/kg)	11.7	4.66	4.56	65.9	63.3	0.352
	MSD Result (mg/kg)	12.2	4.98	4.92	72.2	38.2	0.326
	MS Recovery (%)	103	100	88	164	406	61
	MSD Recovery (%)	102	100	90	186	129	45
	RPD (%)	4.2	6.6	7.5	9.1	49	7.8
VS4-HBW-13B-COMP2B	Sample Result (mg/kg)	<0.32	<0.097	<0.077	<0.21	<0.27	0.018
	Spike Amount (mg/kg)	9.62	4.81	4.81	19.2	9.62	0.162
	MS Result (mg/kg)	9.35	4.97	4.86	19.3	9.78	0.172
	MSD Result (mg/kg)	9.41	4.95	4.84	19.4	9.76	0.172
	MS Recovery (%)	97	103	101	100	102	95
	MSD Recovery (%)	99	104	102	102	102	98
	RPD (%)	0.64	0.43	0.35	0.46	0.23	0.11
VS4-LBW-12B-COMP2B	Sample Result (mg/kg)	4.9	<0.098	12.1	1.2	2.9	0.14
	Spike Amount (mg/kg)	9.45	4.73	4.73	18.9	9.45	0.152
	MS Result (mg/kg)	15.1	4.87	17.6	20.3	12.8	0.246
	MSD Result (mg/kg)	15.7	4.84	18.8	20.2	13	0.24
	MS Recovery (%)	108	103	115	101	104	71
	MSD Recovery (%)	116	104	145	102	109	66
	RPD (%)	3.9	0.56	7	0.56	2.1	2.6
VS4-LWF-12B-COMP2B	Sample Result (mg/kg)	<0.32	<0.098	<0.077	<0.22	<0.27	0.019
	Spike Amount (mg/kg)	9.75	4.87	4.87	19.5	9.75	0.161
	MS Result (mg/kg)	9.45	5.01	4.91	19.7	9.91	0.171
	MSD Result (mg/kg)	9	4.8	4.66	18.7	9.4	0.178
	MS Recovery (%)	97	103	101	101	102	94
	MSD Recovery (%)	97	103	100	101	101	96
	RPD (%)	4.8	4.3	5.3	5.1	5.3	3.9

Results of Duplicate Analysis of Selected Samples

	Chromium			Mercury		
	Analytical Result (mg/kg)		Relative Percent Difference (%)	Analytical Result (mg/kg)		Relative Percent Difference (%)
	First Analysis	Second Analysis		First Analysis	Second Analysis	
VS2-CR-13B-GRAB2	174,000	175,000	0.72	--	--	--
VS2-CR-15B-GRAB1	174,000	178,000	1.8	--	--	--
VS2-HG-13B-GRAB2	--	--	--	2,150	2,270	5.2
VS2-HG-15B-GRAB3	--	--	--	2,250	2,140	5
VS3-CR-13B-GRAB 2	179,000	176,000	1.7	--	--	--
VS3-HG-14B-GRAB 2	--	--	--	2,500	2,410	3.6
VS4-CR-12B-GRAB1	173,000	172,000	0.43	--	--	--
VS4-HG-12B-GRAB2	--	--	--	19,900	19,800	0.88

Results of Analysis of Duplicate Samples

	Arsenic			Beryllium		
	Analytical Result (mg/kg)		Relative Percent Difference (%)	Analytical Result (mg/kg)		Relative Percent Difference (%)
	Sample	Duplicate		Sample	Duplicate	
VS2-HBW-13B-COMP2B	2.8	3	6.9	<0.099	<0.097	NC [1]
VS2-LBW-13B-COMP2B	3.2	3	6.5	<0.096	<0.095	NC
VS2-LWF-13B-COMP2B	<0.3	<0.31	NC	<0.092	<0.095	NC
VS3-HBW-12B-COMP 2B	2.9	3	3.4	<0.095	<0.098	NC
VS3-LBW-12B-COMP 2B	4.8	4	18.2	<0.096	<0.1	NC
VS3-LWF-12B-COMP 2B	<0.32	<0.32	NC	<0.098	<0.096	NC
VS4-HBW-12B-COMP2B	0.37	0.39	5.3	<0.093	<0.094	NC
VS4-LBW-12B-COMP2B	4.9	4.8	2.1	<0.098	<0.094	NC
VS4-LWF-12B-COMP2B	<0.32	<0.3	NC	<0.098	<0.092	NC
VS2-HBW-13B-COMP2B	2.8	3	6.9	<0.099	<0.097	NC
VS2-LBW-13B-COMP2B	3.2	3	6.5	<0.096	<0.095	NC
VS2-LWF-13B-COMP2B	<0.3	<0.31	NC	<0.092	<0.095	NC

[1] NC: Not Calculated; at least one result is below the detection limit.

	Cadmium			Chromium		
	Analytical Result (mg/kg)		Relative Percent Difference (%)	Analytical Result (mg/kg)		Relative Percent Difference (%)
	Sample	Duplicate		Sample	Duplicate	
VS2-HBW-13B-COMP2B	<0.078	<0.077	NC	<0.22	<0.21	NC
VS2-LBW-13B-COMP2B	9	8.5	5.7	0.88	0.83	5.8
VS2-LWF-13B-COMP2B	<0.073	<0.075	NC	<0.2	<0.21	NC
VS3-HBW-12B-COMP 2B	<0.075	<0.077	NC	<0.21	<0.22	NC
VS3-LBW-12B-COMP 2B	15.2	13	15.6	1.3	1.1	16.7
VS3-LWF-12B-COMP 2B	<0.077	<0.076	NC	<0.22	<0.21	NC
VS4-HBW-12B-COMP2B	<0.073	<0.074	NC	<0.2	<0.21	NC
VS4-LBW-12B-COMP2B	12.1	13.1	7.9	1.2	1.2	0.0
VS4-LWF-12B-COMP2B	<0.077	<0.073	NC	<0.22	<0.2	NC
VS2-HBW-13B-COMP2B	<0.078	<0.077	NC	<0.22	<0.21	NC
VS2-LBW-13B-COMP2B	9	8.5	5.7	0.88	0.83	5.8
VS2-LWF-13B-COMP2B	<0.073	<0.075	NC	<0.2	<0.21	NC
	Lead			Mercury		
	Analytical Result (mg/kg)		Relative Percent Difference (%)	Analytical Result (mg/kg)		Relative Percent Difference (%)
	Sample	Duplicate		Sample	Duplicate	
VS2-HBW-13B-COMP2B	0.67	0.5	29.1	0.021	<0.0095	NC
VS2-LBW-13B-COMP2B	1.7	1.6	6.1	0.042	0.045	6.9
VS2-LWF-13B-COMP2B	<0.26	<0.27	NC	<0.0086	<0.0091	NC
VS3-HBW-12B-COMP 2B	1.8	1.9	5.4	0.027	0.028	3.6
VS3-LBW-12B-COMP 2B	3.1	2.8	10.2	0.065	0.083	24.3
VS3-LWF-12B-COMP 2B	<0.27	<0.27	NC	<0.0088	<0.0092	NC
VS4-HBW-12B-COMP2B	0.4	0.41	2.5	0.021	0.021	0.0
VS4-LBW-12B-COMP2B	2.9	3	3.4	0.14	0.13	7.4
VS4-LWF-12B-COMP2B	<0.27	<0.26	NC	0.019	0.014	30.3
VS2-HBW-13B-COMP2B	0.67	0.5	29.1	0.021	<0.0095	NC
VS2-LBW-13B-COMP2B	1.7	1.6	6.1	0.042	0.045	6.9
VS2-LWF-13B-COMP2B	<0.26	<0.27	NC	<0.0086	<0.0091	NC

Data Quality Assessment
Analysis of Stack Gas for Metals

Parameter	Selected Metals in Stack Gas
Sampling Method	EPA Method 29
Analytical Method	ICPES, SW-846 Method 6010B CVAA, SW846 Method 7470A
Laboratory Job ID Number(s)	H3J150406, H3J190412, H3K010412, H3K010422
Preparation Batch Number(s)	3302012, 3302013, 3302049, 3302051, 3302053, 3308026, 3308027, 3308028, 3311021, 3311022, 3311038, 3311039
Sample Shipping and Receipt	Samples received intact and at ambient temperature. QAPP has no specification for temperature.
Holding Time(s)	All samples analyzed within 28 days of sample collection. QAPP specifies analysis within 28 days for mercury and 180 days for all other analytes. See table below.
Blank Results	29 of 31 laboratory blank analyses were below the detection limit. The outliers were for arsenic in batches associated with analysis of PNR/filter samples. Cadmium and mercury were each found in one field blank sample. Chromium was consistently observed in field blanks and media check samples. See tables below and in the main body of the report.
Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD) Results	All recoveries are between 90 and 110%. All relative percent deviations are below 10%. The QAPP specifies LCS recovery between 80 and 120%. The QAPP has no specification for RPD; the laboratory specifications are for RPD below 20%. See tables below.
Matrix Spike (MS) and Matrix Spike (MSD) Results Post Digestion Spike (PDS) and Post Digestion Spike Duplicate (PDSD) Results	QAPP specifications are MS/MSD at 70-130% recovery, <20% RPD for everything except mercury, 75-125% recovery and 20% RPD for mercury. PDS/PDSD are to show recovery between 75 and 125% for metals excluding mercury and 80-120% recovery for mercury. There are no specifications for RPD on PDS/PDSD. . All MS/MSD and PDS/PDSD results met these criteria. Results are summarized in tables below.
Date Quality Objectives	These are given in terms of matrix spike/matrix spike duplicate. Precision: <20% relative percent difference. Accuracy: 75-125% recovery. For stack samples this is applied to the post-digestion spike and post-digestion spike duplicates. These data quality objectives were all met.

Conclusions and Comments	These data are acceptable for the intended purpose. The blank results for arsenic in the laboratory blanks are near the detection limit, and similar or below the results for the field samples. This may indicate a slight positive bias in the field results. The single positive result for cadmium in one field blank is similar in magnitude to the field results. This may indicate a positive bias or false identification of cadmium in the field samples. The single positive result for mercury in one field blank is near the detection limit, and well below many of the field results. This may indicate a slight positive bias in the field samples. The consistent observation of chromium in field blank and media check samples is at a lower level than the field samples. This may indicate a slight positive bias in the results for the field samples. Any positive bias in these results is conservative in the demonstration of compliance. No results are invalidated or qualified based on blank results.

Holding Time

	Sample Date	Metals Excluding Mercury by ICPES		Mercury by CVAA	
		Analysis Date	Holding Time (days)	Analysis Date	Holding Time (days)
VS2-STK-11B-M29 PNR/FILT	8-Oct	5-Nov	5-Nov	28	28
VS2-STK-11B-M29 NPI	8-Oct	5-Nov	5-Nov	28	28
VS2-STK-11B-M29 NPI4	8-Oct	5-Nov	5-Nov	28	28
VS2-STK-11B-M29 PERM1	8-Oct	5-Nov	5-Nov	28	28
VS2-STK-11B-M29 PERM2	8-Oct	--	5-Nov	--	28
VS2-STK-11B-M29 HCLRNS	8-Oct	--	5-Nov	--	28
VS2-STK-13B-M29 PNR/FILT	10-Oct	5-Nov	5-Nov	26	26
VS2-STK-13B-M29 NPI	10-Oct	5-Nov	5-Nov	26	26
VS2-STK-13B-M29 EIR	10-Oct	--	5-Nov	--	26
VS2-STK-13B-M29 PERM	10-Oct	--	5-Nov	--	26
VS2-STK-13B-M29 HCLRNS	10-Oct	--	5-Nov	--	26
VS2-STK-15B-M29-PNR/FILT	30-Oct	14-Nov	14-Nov	15	15
VS2-STK-15B-M29-NPI/NPIB	30-Oct	14-Nov	14-Nov	15	15
VS2-STK-15B-M29-EIR	30-Oct	--	14-Nov	--	15
VS2-STK-15B-M29-PERM	30-Oct	--	14-Nov	--	15
VS2-STK-15B-M29-HCLRNS	30-Oct	--	14-Nov	--	15
VS3-STK-12B-M29-PNR/FILT	16-Oct	5-Nov	5-Nov	20	20
VS3-STK-12B-M29-NPI	16-Oct	5-Nov	5-Nov	20	20
VS3-STK-12B-M29-EIR	16-Oct	--	5-Nov	--	20
VS3-STK-12B-M29-PERM	16-Oct	--	5-Nov	--	20
VS3-STK-12B-M29-HCLRNS	16-Oct	--	5-Nov	--	20
VS3-STK-13B-M29-PNR/FILT	17-Oct	5-Nov	5-Nov	19	19
VS3-STK-13B-M29-NPI	17-Oct	5-Nov	5-Nov	19	19
VS3-STK-13B-M29-EIR	17-Oct	--	5-Nov	--	19
VS3-STK-13B-M29-PERM	17-Oct	--	5-Nov	--	19
VS3-STK-13B-M29-HCLRNS	17-Oct	--	5-Nov	--	19
VS3-STK-14B-M29-PNR/FILT	18-Oct	5-Nov	5-Nov	18	18
VS3-STK-14B-M29-NPI	18-Oct	5-Nov	5-Nov	18	18
VS3-STK-14B-M29-EIR	18-Oct	--	5-Nov	--	18
VS3-STK-14B-M29-PERM	18-Oct	--	5-Nov	--	18
VS3-STK-14B-M29-HCLRNS	18-Oct	--	5-Nov	--	18
VS4-STK-11B-M29-PNR/FILT	23-Oct	14-Nov	14-Nov	22	22
VS4-STK-11B-M29-NPI/NPIB	23-Oct	14-Nov	14-Nov	22	22
VS4-STK-11B-M29-EIR	23-Oct	--	14-Nov	--	22
VS4-STK-11B-M29-PERM	23-Oct	--	14-Nov	--	22
VS4-STK-11B-M29-HCLRNS	23-Oct	--	14-Nov	--	22
VS4-STK-12B-M29-PNR/FILT	24-Oct	14-Nov	14-Nov	21	21
VS4-STK-12B-M29-NPI/NPIB	24-Oct	14-Nov	14-Nov	21	21
VS4-STK-12B-M29-EIR	24-Oct	--	14-Nov	--	21

	Sample Date	Metals Excluding Mercury by ICPES		Mercury by CVAA	
		Analysis Date	Holding Time (days)	Analysis Date	Holding Time (days)
VS4-STK-12B-M29-PERM	24-Oct	--	14-Nov	--	21
VS4-STK-12B-M29-HCLRNS	24-Oct	--	14-Nov	--	21
VS4-STK-13B-M29-PNR/FILT	25-Oct	14-Nov	14-Nov	20	20
VS4-STK-13B-M29-NPI/NPIB	25-Oct	14-Nov	14-Nov	20	20
VS4-STK-13B-M29-EIR	25-Oct	--	14-Nov	--	20
VS4-STK-13B-M29-PERM	25-Oct	--	14-Nov	--	20
VS4-STK-13B-M29-HCLRNS	25-Oct	--	14-Nov	--	20
VS2-STK-1FB2-M29-PNR/FILT	29-Oct	14-Nov	14-Nov	16	16
VS2-STK-1FB2-M29-NPI	29-Oct	14-Nov	14-Nov	16	16
VS2-STK-1FB2-M29-EIR	29-Oct	--	14-Nov	--	16
VS2-STK-1FB2-M29-PERM	29-Oct	--	14-Nov	--	16
VS2-STK-1FB2-M29-HCLRNS	29-Oct	--	14-Nov	--	16
VS2-STK-1FB-M29 PNR/FILT	8-Oct	5-Nov	5-Nov	28	28
VS2-STK-1FB-M29 NPI	8-Oct	5-Nov	5-Nov	28	28
VS2-STK-1FB-M29 EIR	8-Oct	--	5-Nov	--	28
VS2-STK-1FB-M29 PERM	8-Oct	--	5-Nov	--	28
VS2-STK-1FB-M29 HLCRNS	8-Oct	--	5-Nov	--	28
VS2-STK-1RB-M29 PERM SOLN	11-Oct	14-Nov	--	34	--
VS3-STK-1FB-M29-PNR/FILT	14-Oct	5-Nov	5-Nov	22	22
VS3-STK-1FB-M29-NPI	14-Oct	5-Nov	5-Nov	22	22
VS3-STK-1FB-M29-EIR	14-Oct	--	5-Nov	--	22
VS3-STK-1FB-M29-PERM	14-Oct	--	5-Nov	--	22
VS3-STK-1FB-M29-HCLRNS	14-Oct	--	5-Nov	--	22
VS4-STK-1FB-M29-PNR/FILT	23-Oct	14-Nov	14-Nov	22	22
VS4-STK-1FB-M29-NPI	23-Oct	14-Nov	14-Nov	22	22
VS4-STK-1FB-M29-EIR	23-Oct	--	14-Nov	--	22
VS4-STK-1FB-M29-PERM	23-Oct	--	14-Nov	--	22
VS4-STK-1FB-M29-HCLRNS	23-Oct	--	14-Nov	--	22
VS2-AUDIT-MET-IMP	11-Oct	5-Nov	--	25	--
VS2-AUDIT-MET-FILT	11-Oct	5-Nov	--	25	--
VS2-AUDIT-HG-1	11-Oct	--	5-Nov	--	25

Blank Results – Metals Excluding Mercury

		Blank Results (µg/sample)				
		Arsenic	Beryllium	Cadmium	Chromium	Lead
VS2-STK-1FB2-M29-PNR/FILT		<0.74	<0.015	<0.021	1.8	<1
VS2-STK-1FB2-M29-NPI		<0.25	<0.015	<0.021	0.18	<0.27
VS2-STK-1FB-M29 PNR/FILT		<0.74	<0.015	<0.021	1.8	<1
VS2-STK-1FB-M29 NPI		<0.25	<0.015	<0.021	0.27	<0.27
VS3-STK-1FB-M29-PNR/FILT		<0.74	<0.015	<0.021	1.7	<1
VS3-STK-1FB-M29-NPI		<0.25	<0.015	<0.021	0.25	<0.27
VS4-STK-1FB-M29-PNR/FILT		<0.74	<0.015	0.24	1.8	<1
VS4-STK-1FB-M29-NPI		<0.25	<0.015	<0.021	0.26	<0.27
MEDIA CHECK A 5040		<0.74	<0.015	<0.021	1.3	<1
A-5078 MEDIA CHECK		<0.74	<0.015	<0.021	1.5	<1
A-5060 MEDIA CHECK		<0.74	<0.015	<0.021	1.4	<1
Laboratory Blank; Batch 3302012		0.55	<0.015	<0.021	<0.32	<0.52
Laboratory Blank; Batch 3302013		<0.25	<0.015	<0.021	<0.14	<0.27
Laboratory Blank; Batch 3311021		0.53	<0.015	<0.021	<0.32	<0.52
Laboratory Blank; Batch 3311022		<0.25	<0.015	<0.021	<0.14	<0.27
Range of Field Samples	Filter	<0.37 - 9.1		<0.021 - 0.91	2.3 - 13.7	<0.37 - 9.1
	NPI				0.55 - 0.82	

Blank Results – Mercury

	Mercury (µg/sample)
VS2-STK-1FB2-M29-PNR/FILT	<0.08
VS2-STK-1FB2-M29-NPI	<0.12
VS2-STK-1FB2-M29-EIR	<0.12
VS2-STK-1FB2-M29-PERM	<0.012
VS2-STK-1FB2-M29-HCLRNS	<0.045
VS2-STK-1FB-M29 PNR/FILT	<0.08
VS2-STK-1FB-M29 NPI	<0.12
VS2-STK-1FB-M29 EIR	<0.12
VS2-STK-1FB-M29 PERM	<0.047
VS2-STK-1FB-M29 HLCRNS	0.12
VS3-STK-1FB-M29-PNR/FILT	<0.08
VS3-STK-1FB-M29-NPI	<0.12
VS3-STK-1FB-M29-EIR	<0.11
VS3-STK-1FB-M29-PERM	<0.045
VS3-STK-1FB-M29-HCLRNS	<0.082
VS4-STK-1FB-M29-PNR/FILT	<0.08
VS4-STK-1FB-M29-NPI	<0.12
VS4-STK-1FB-M29-EIR	<0.11
VS4-STK-1FB-M29-PERM	<0.012
VS4-STK-1FB-M29-HCLRNS	<0.045
MEDIA CHECK A 5040	<0.08
A-5078 MEDIA CHECK	<0.08
A-5060 MEDIA CHECK	<0.08
Laboratory Blank; Batch 3302053	<0.006
Laboratory Blank; Batch 3302053	<0.015
Laboratory Blank; Batch 3302049	<0.08
Laboratory Blank; Batch 3302051	<0.12
Laboratory Blank; Batch 3302051	<0.06
Laboratory Blank; Batch 3308026	<0.08
Laboratory Blank; Batch 3308027	<0.12
Laboratory Blank; Batch 3311038	<0.06
Laboratory Blank; Batch 3308028	<0.006
Laboratory Blank; Batch 3311039	<0.015
Laboratory Blank; MW5WM1AD	<0.015
Range of Field Samples (HCl Rinse)	<0.082 – 17.2

Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD) Results – Metals Excluding Mercury

		Arsenic	Beryllium	Cadmium	Chromium	Lead
LCS/LCSD Recovery; Batch 3302012	LCS Recovery (%)	102	105	102	103	104
	LCSD Recovery (%)	102	102	100	102	103
	Relative Percent Difference (%)	0.5	2.4	1.8	1.1	1.3
LCS/LCSD Recovery; Batch 3302013	LCS Recovery (%)	92	105	99	100	99
	LCSD Recovery (%)	93	104	98	100	98
	Relative Percent Difference (%)	0.72	1.2	0.46	0.07	1.1
LCS/LCSD Recovery; Batch 3311021	LCS Recovery (%)	102	105	103	104	104
	LCSD Recovery (%)	102	103	102	103	103
	Relative Percent Difference (%)	0.19	1.9	1.4	0.81	0.78
LCS/LCSD Recovery; Batch 3311022	LCS Recovery (%)	94	108	101	103	105
	LCSD Recovery (%)	92	102	97	100	98
	Relative Percent Difference (%)	1.9	5.2	4.1	3.4	7.3

Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD) Results –Mercury

LCS/LCSD; Batch 3302049	LCS Recovery (%)	99
	LCSD Recovery (%)	96
	Relative Percent Difference (%)	2.9
LCS; Batch 3302051	LCS Recovery (%)	98
LCS; Batch 3302053	LCS Recovery (%)	98
LCS/LCSD; Batch 3308026	LCS Recovery (%)	105
	LCSD Recovery (%)	106
	Relative Percent Difference (%)	1.1
LCS; Batch 3308027	LCS Recovery (%)	95
LCS; Batch 3308028	LCS Recovery (%)	104
LCS; Batch 3311038	LCS Recovery (%)	101
LCS; Batch 3311039	LCS Recovery (%)	97

Matrix Spike (MS) and Matrix Spike (MSD) Results

		Mercury
VS2-STK-13B-M29 EIR	Sample Result (µg/L)	0.57
	Spike Amount (µg/sample)	2
	MS Result (µg/sample)	2.6
	MSD Result (µg/sample)	2.64
	MS Recovery (%)	102
	MSD Recovery (%)	104
	Relative Percent Difference (%)	1.5
VS2-STK-13B-M29 HCLRNS	Sample Result (µg/sample)	17.2
	Spike Amount (µg/sample)	1.38
	MS Result (µg/sample)	19.4
	MSD Result (µg/sample)	18.6
	MS Recovery (%)	N/C [1]
	MSD Recovery (%)	N/C
	Relative Percent Difference (%)	N/C
VS2-STK-13B-M29 NPI	Sample Result (µg/sample)	182
	Spike Amount (µg/sample)	2
	MS Result (µg/sample)	182
	MSD Result (µg/sample)	200
	MS Recovery (%)	N/C
	MSD Recovery (%)	N/C
	Relative Percent Difference (%)	N/C
VS2-STK-13B-M29 PERM	Sample Result (µg/sample)	0.5
	Spike Amount (µg/sample)	0.81
	MS Result (µg/sample)	1.3
	MSD Result (µg/sample)	1.19
	MS Recovery (%)	100
	MSD Recovery (%)	86
	Relative Percent Difference (%)	9.1
VS2-STK-15B-M29-EIR	Sample Result (µg/sample)	<0.15
	Spike Amount (µg/sample)	2.5
	MS Result (µg/sample)	2.65
	MSD Result (µg/sample)	2.62
	MS Recovery (%)	106
	MSD Recovery (%)	105
	Relative Percent Difference (%)	0.94
VS2-STK-15B-M29-HCLRNS	Sample Result (µg/sample)	14.3
	Spike Amount (µg/sample)	1.35
	MS Result (µg/sample)	15.1
	MSD Result (µg/sample)	15.1
	MS Recovery (%)	N/C
	MSD Recovery (%)	N/C
	Relative Percent Difference (%)	N/C

[1] N/C – Not Calculated; Spiking level is less than 25% of native level.

		Mercury
VS2-STK-15B-M29-NPI/NPIB	Sample Result (µg/sample)	142
	Spike Amount (µg/sample)	2
	MS Result (µg/sample)	145
	MSD Result (µg/sample)	147
	MS Recovery (%)	N/C
	MSD Recovery (%)	N/C
	Relative Percent Difference (%)	N/C
VS2-STK-15B-M29-PERM	Sample Result (µg/sample)	3.4
	Spike Amount (µg/sample)	0.8
	MS Result (µg/sample)	4.22
	MSD Result (µg/sample)	4.3
	MS Recovery (%)	100
	MSD Recovery (%)	110
	Relative Percent Difference (%)	1.9
VS3-STK-13B-M29-EIR	Sample Result (µg/sample)	0.25
	Spike Amount (µg/sample)	2
	MS Result (µg/sample)	2.3
	MSD Result (µg/sample)	2.26
	MS Recovery (%)	102
	MSD Recovery (%)	100
	Relative Percent Difference (%)	1.8
VS3-STK-13B-M29-HCLRNS	Sample Result (µg/sample)	2.6
	Spike Amount (µg/sample)	1.38
	MS Result (µg/sample)	4.04
	MSD Result (µg/sample)	3.93
	MS Recovery (%)	107
	MSD Recovery (%)	99
	Relative Percent Difference (%)	2.8
VS3-STK-13B-M29-NPI	Sample Result (µg/sample)	52.2
	Spike Amount (µg/sample)	2
	MS Result (µg/sample)	53.6
	MSD Result (µg/sample)	53.6
	MS Recovery (%)	N/C
	MSD Recovery (%)	N/C
	Relative Percent Difference (%)	N/C
VS3-STK-13B-M29-PERM	Sample Result (µg/sample)	<0.048
	Spike Amount (µg/sample)	0.8
	MS Result (µg/sample)	0.848
	MSD Result (µg/sample)	0.864
	MS Recovery (%)	106
	MSD Recovery (%)	108
	Relative Percent Difference (%)	1.9
VS4-STK-12B-M29-EIR	Sample Result (µg/sample)	<0.12
	Spike Amount (µg/sample)	1.96
	MS Result (µg/sample)	2.02
	MSD Result (µg/sample)	1.98
	MS Recovery (%)	103
	MSD Recovery (%)	101
	Relative Percent Difference (%)	2

		Mercury
VS4-STK-12B-M29-HCLRNS	Sample Result (µg/sample)	<0.082
	Spike Amount (µg/sample)	1.38
	MS Result (µg/sample)	1.47
	MSD Result (µg/sample)	1.4
	MS Recovery (%)	107
	MSD Recovery (%)	102
	Relative Percent Difference (%)	4.8
VS4-STK-12B-M29-NPI/NPIB	Sample Result (µg/sample)	10.4
	Spike Amount (µg/sample)	2
	MS Result (µg/sample)	12.2
	MSD Result (µg/sample)	12.3
	MS Recovery (%)	88
	MSD Recovery (%)	92
	Relative Percent Difference (%)	0.65
VS4-STK-12B-M29-PERM	Sample Result (µg/sample)	<0.047
	Spike Amount (µg/sample)	0.79
	MS Result (µg/sample)	0.78
	MSD Result (µg/sample)	0.784
	MS Recovery (%)	99
	MSD Recovery (%)	99
	Relative Percent Difference (%)	0.6
QAPP Specification	Recovery (%)	75-125
	Relative Percent Difference (%)	20

Post Digestion Spike (PDS) and Post Digestion Spike Duplicate (PDSD) Results

		Arsenic	Beryllium	Cadmium	Chromium	Lead	Mercury
VS2-STK-13B-M29 PNR/FILT	Sample Result (µg/L)	1.96	0	0	12.6	3.27	
	Spike Amount (µg/L)	100	50	50	200	100	
	PDS Result (µg/L)	96.66	50.49	48.22	210.63	98.35	
	PDSD Result (µg/L)	98.97	52.19	49.74	218.81	106.79	
	PDS Recovery (%)	94.7	101	96.4	99	95.1	
	PDSD Recovery (%)	97	104.4	99.5	103.1	103.5	
	Relative Percent Difference (%)	2.4	3.3	3.1	3.8	8.2	
VS2-STK-13B-M29 NPI	Sample Result (µg/L)	0	0	0	5.54	2.72	
	Spike Amount (µg/L)	100	50	50	200	100	
	PDS Result (µg/L)	90.63	50.46	47.92	199.95	96.5	
	PDSD Result (µg/L)	93.24	50.94	48.93	202.3	97.68	
	PDS Recovery (%)	90.6	100.9	95.8	97.2	93.8	
	PDSD Recovery (%)	93.2	101.9	97.9	98.4	95	
	Relative Percent Difference (%)	2.8	0.9	2.1	1.2	1.2	
VS2-STK-15B-M29-PNR/FILT	Sample Result (µg/L)	3.84	0	0	23.31	0	0
	Spike Amount (µg/L)	100	50	50	200	100	1
	PDS Result (µg/L)	99.11	50.86	47.16	226.83	95.98	0.97
	PDSD Result (µg/L)	100.79	50.72	46.46	222.84	100.51	0.96
	PDS Recovery (%)	95.3	101.7	94.3	101.8	96	96.6
	PDSD Recovery (%)	97	101.4	29.9	99.8	100.5	95.7
	Relative Percent Difference (%)	1.7	0.3	1.5	1.8	4.6	1.0
VS2-STK-15B-M29-NPI/NPIB	Sample Result (µg/L)	0	0	0.09	8.11	6.61	
	Spike Amount (µg/L)	100	50	50	200	100	
	PDS Result (µg/L)	90.55	50.61	49.15	203.87	100.93	
	PDSD Result (µg/L)	91.8	51.47	49.39	209.66	104.56	
	PDS Recovery (%)	90.6	101.2	98.1	97.9	94.3	
	PDSD Recovery (%)	91.8	102.9	98.6	100.8	98	
	Relative Percent Difference (%)	1.4	1.7	0.5	2.8	3.5	
VS3-STK-13B-M29-PNR/FILT	Sample Result (µg/L)	0	0	0	109.93	201.4	0
	Spike Amount (µg/L)	100	50	50	200	100	1
	PDS Result (µg/L)	84.82	49.9	47.23	304.97	279.87	1.07
	PDSD Result (µg/L)	83.63	50.36	47.45	303.64	284.71	1.07
	PDS Recovery (%)	84.8	99.8	94.5	97.5	78.5	107
	PDSD Recovery (%)	83.6	100.7	94.9	96.9	83.3	107
	Relative Percent Difference (%)	1.4	0.9	0.5	0.4	1.7	0.0
VS3-STK-13B-M29-PNR/FILT	Sample Result (µg/L)	0	0	0	56.86	97.14	
	Spike Amount (µg/L)	100	50	50	200	100	
	PDS Result (µg/L)	90.34	49.66	48.07	249.36	188.42	
	PDSD Result (µg/L)	92.16	51.4	49.74	254.91	194.95	
	PDS Recovery (%)	90.3	99.3	96.1	96.3	91.3	
	PDSD Recovery (%)	92.2	102.1	99.5	99	97.8	
	Relative Percent Difference (%)	2.0	3.4	3.4	2.2	3.4	

		Arsenic	Beryllium	Cadmium	Chromium	Lead	Mercury
VS3-STK-13B-M29-NPI	Sample Result (µg/L)	0	0	0.08	7.92	1.57	
	Spike Amount (µg/L)	100	50	50	200	100	
	PDS Result (µg/L)	90.28	51.2	48.78	206.47	100.82	
	PDSD Result (µg/L)	91.4	51.33	49.47	206.04	99.77	
	PDS Recovery (%)	90.3	102.4	97.4	99.3	99.3	
	PDSD Recovery (%)	91.4	102.7	98.8	99.1	98.2	
	Relative Percent Difference (%)	1.2	0.3	1.4	0.2	1.0	
VS4-STK-12B-M29-PNR/FILT	Sample Result (µg/L)	39.57	0	1.52	41.75	26.82	0
	Spike Amount (µg/L)	100	50	50	200	100	1
	PDS Result (µg/L)	134.99	52.2	51.49	252.68	122.8	0.97
	PDSD Result (µg/L)	134.39	50.28	50.31	241.36	123.87	0.96
	PDS Recovery (%)	95.4	104.4	99.9	105.5	96	96.9
	PDSD Recovery (%)	94.8	100.6	97.6	99.8	97	96
	Relative Percent Difference (%)	0.4	3.7	2.3	4.6	0.9	1.0
VS4-STK-12B-M29-NPI/NPIB	Sample Result (µg/L)	0	0	0.17	6.65	4.19	
	Spike Amount (µg/L)	100	50	50	200	100	
	PDS Result (µg/L)	91.18	51.03	48.79	206.53	102.04	
	PDSD Result (µg/L)	90.38	50.79	48.31	203.9	102.96	
	PDS Recovery (%)	91.2	102.1	97.2	99.9	97.9	
	PDSD Recovery (%)	90.4	101.6	96.3	98.6	98.8	
	Relative Percent Difference (%)	0.9	0.5	1.0	1.3	0.9	

Data Quality Assessment
Analysis of Stack Gas for Hydrogen Chloride and Chlorine

Parameter	Hydrogen Chloride and Chlorine in Stack Gas
Sampling Method	EPA Method 26A
Analytical Method	Ion Chromatography, EPA Method 26A
Laboratory Project ID Number(s)	H3J140410, H3J190409, H3K010414, H3K020401
Preparation Batch Number(s)	3295039, 3295058, 3301068, 3302015, 3312042, 3312045, 3316053
Sample Shipping and Receipt	Sample received intact and at ambient temperature. QAPP has no specification for preservation.
Holding Time(s)	All samples prepared and analyzed within 20 days of sample collection. QAPP specifies analysis within 28 days. See table below.
Blank Results	Nothing detected in laboratory blanks. Hydrogen chloride consistently detected in field blanks. See table below.
Laboratory Check Sample (LCS) and Laboratory Check Sample (LCSD) Results	All LCS recoveries are between 95 and 105%. All RPDs are below 5%. The QAPP specifies LCS recovery between 90 and 110%. There are no QAPP specifications for LCSD or for precision. See table below.
Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results	All recoveries are between 85 and 120%: all RPDs are less than 10%. QAPP specifies recovery between 75 and 125%. There are no QAPP specifications for RPD. See table below.
Duplicate Analyses	All samples analyzed in duplicate. RPD for all samples below 5%. QAPP specifies RPD below 10%. See table below.
Data Quality Objective	These are given as follows: • Accuracy: matrix spike recovery between 75 and 125%. • Precision: RPD for duplicate analysis of each sample less than 10%. These objectives were met.
Conclusions and Comments	These data are acceptable for the intended purpose. The levels of hydrogen chloride observed in the field blank samples (approximately 60 µg per sample) are well below the levels observed in the field samples (all greater than 1800 µg per sample). These negligible levels have no impact on the data. No data are qualified or invalidated based on blank results.

Holding Time

	Sample Date	Analysis Date	Holding Time (Days)
VS2-STK-11B-M26A-ACDIMP	8-Oct	22-Oct	14
VS2-STK-11B-M26A-ALKIMP	8-Oct	21-Oct	13
VS2-STK-13B-M26A-ACDIMP	10-Oct	22-Oct	12
VS2-STK-13B-M26A-ALKIMP	10-Oct	21-Oct	11
VS2-STK-14B-M26A-ACDIMP	11-Oct	22-Oct	11
VS2-STK-14B-M26A-ALKIMP	11-Oct	21-Oct	10
VS2-STK-15B-M26A-ACDIMP	30-Oct	6-Nov	7
VS2-STK-15B-M26A-ALKIMP	30-Oct	7-Nov	8
VS3-STK-12B-M26A-ACDIMP	16-Oct	28-Oct	12
VS3-STK-12B-M26A-ALKIMP	16-Oct	27-Oct	11
VS3-STK-13B-M26A-ACDIMP	17-Oct	28-Oct	11
VS3-STK-13B-M26A-ALKIMP	17-Oct	27-Oct	10
VS3-STK-14B-M26A-ACDIMP	18-Oct	28-Oct	10
VS3-STK-14B-M26A-ALKIMP	18-Oct	27-Oct	9
VS4-STK-11B-M26A-ACDIMP	23-Oct	11-Nov	19
VS4-STK-11B-M26A-ALKIMP	23-Oct	7-Nov	15
VS4-STK-12B-M26A-ACDIMP	24-Oct	11-Nov	18
VS4-STK-12B-M26A-ALKIMP	24-Oct	7-Nov	14
VS4-STK-13B-M26A-ACDIMP	25-Oct	11-Nov	17
VS4-STK-13B-M26A-ALKIMP	25-Oct	7-Nov	13
VS2-STK-1FB-M26A-ACDIMP	8-Oct	22-Oct	14
VS2-STK-1FB-M26A-ALKIMP	8-Oct	21-Oct	13
VS2-STK-1FB2-M26A-ACDIMP	29-Oct	6-Nov	8
VS2-STK-1FB2-M26A-ALKIMP	29-Oct	7-Nov	9
VS3-STK-1FB-M26A-ACDIMP	15-Oct	28-Oct	13
VS3-STK-1FB-M26A-ALKIMP	15-Oct	27-Oct	12
VS4-STK-1FB-M26A-ACDIMP	22-Oct	11-Nov	20
VS4-STK-1FB-M26A-ALKIMP	22-Oct	7-Nov	16

Blank Results

	Analytical Result (µg/sample)	
	Hydrogen Chloride	Chlorine
VS2-STK-1FB-M26A-ACDIMP	60.4	--
VS2-STK-1FB-M26A-ALKIMP	--	<42
VS2-STK-1FB2-M26A-ACDIMP	61.5	--
VS2-STK-1FB2-M26A-ALKIMP	--	<42
VS3-STK-1FB-M26A-ACDIMP	58.9	--
VS3-STK-1FB-M26A-ALKIMP	--	<42
VS4-STK-1FB-M26A-ACDIMP	65.8	--
VS4-STK-1FB-M26A-ALKIMP	--	<42
Laboratory Blank; Batch 3295039	--	<42
Laboratory Blank; Batch 3295058	<43	--
Laboratory Blank; Batch 3301068	--	<42
Laboratory Blank; Batch 3302015	<43	--
Laboratory Blank; Batch 3312042	<43	--
Laboratory Blank; Batch 3312045	--	<42
Laboratory Blank; Batch 3316053	<43	--

Laboratory Check Sample (LCS) and Laboratory Check Sample Duplicate (LCSD) Results

		Hydrogen Chloride	Chlorine
LCS/LCSD; Batch 3295039	LCS Recovery (%)	--	102
	LCSD Recovery (%)	--	102
	Relative Percent Difference (%)	--	0.13
LCS/LCSD; Batch 3295058	LCS Recovery (%)	105	--
	LCSD Recovery (%)	104	--
	Relative Percent Difference (%)	0.39	--
LCS/LCSD; Batch 3301068	LCS Recovery (%)	--	98
	LCSD Recovery (%)	--	98
	Relative Percent Difference (%)	--	0.32
LCS/LCSD; Batch 3302015	LCS Recovery (%)	98	--
	LCSD Recovery (%)	98	--
	Relative Percent Difference (%)	0.07	--
LCS/LCSD; Batch 3312042	LCS Recovery (%)	99	--
	LCSD Recovery (%)	98	--
	Relative Percent Difference (%)	0.87	--
LCS/LCSD; Batch 3312045	LCS Recovery (%)	--	100
	LCSD Recovery (%)	--	100
	Relative Percent Difference (%)	--	0.01
LCS/LCSD; Batch 3316053	LCS Recovery (%)	101	--
	LCSD Recovery (%)	102	--
	Relative Percent Difference (%)	0.92	--

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results

		Hydrogen Chloride	Chlorine
VS2-STK-13B-M26A-ACDIMP	Sample Result (µg/sample)	15,500	--
	Spike Amount (µg/sample)	2,310	--
	MS Result (µg/sample)	17,700	--
	MSD Result (µg/sample)	17,500	--
	MS Recovery (%)	94	--
	MSD Recovery (%)	85	--
	Relative Percent Difference (%)	1.2	--
VS2-STK-13B-M26A-ALKIMP	Sample Result (µg/sample)	--	<180
	Spike Amount (µg/sample)	--	850
	MS Result (µg/sample)	--	989
	MSD Result (µg/sample)	--	915
	MS Recovery (%)	--	116
	MSD Recovery (%)	--	108
	Relative Percent Difference (%)	--	7.8
VS2-STK-15B-M26A-ACDIMP	Sample Result (µg/sample)	21,600	--
	Spike Amount (µg/sample)	4,450	--
	MS Result (µg/sample)	26,300	--
	MSD Result (µg/sample)	26,100	--
	MS Recovery (%)	105	--
	MSD Recovery (%)	102	--
	Relative Percent Difference (%)	0.48	--
VS2-STK-15B-M26A-ALKIMP	Sample Result (µg/sample)	--	<180
	Spike Amount (µg/sample)	--	860
	MS Result (µg/sample)	--	948
	MSD Result (µg/sample)	--	954
	MS Recovery (%)	--	110
	MSD Recovery (%)	--	111
	Relative Percent Difference (%)	--	0.61
VS3-STK-13B-M26A-ACDIMP	Sample Result (µg/sample)	4,720	--
	Spike Amount (µg/sample)	1,970	--
	MS Result (µg/sample)	6,920	--
	MSD Result (µg/sample)	6,970	--
	MS Recovery (%)	111	--
	MSD Recovery (%)	114	--
	Relative Percent Difference (%)	0.82	--
VS3-STK-13B-M26A-ALKIMP	Sample Result (µg/sample)	--	<120
	Spike Amount (µg/sample)	--	550
	MS Result (µg/sample)	--	592
	MSD Result (µg/sample)	--	642
	MS Recovery (%)	--	108
	MSD Recovery (%)	--	117
	Relative Percent Difference (%)	--	8

		Hydrogen Chloride	Chlorine
VS4-STK-12B-M26A-ACDIMP	Sample Result (µg/sample)	8,150	–
	Spike Amount (µg/sample)	1,890	–
	MS Result (µg/sample)	10,100	–
	MSD Result (µg/sample)	10,200	–
	MS Recovery (%)	103	–
	MSD Recovery (%)	106	–
	Relative Percent Difference (%)	0.7	--
VS4-STK-12B-M26A-ALKIMP	Sample Result (µg/sample)	--	<120
	Spike Amount (µg/sample)	--	580
	MS Result (µg/sample)	--	611
	MSD Result (µg/sample)	--	636
	MS Recovery (%)	–	105
	MSD Recovery (%)	–	110
	Relative Percent Difference (%)	–	4
Laboratory Specification	Recovery (%)	75-125	75-125
	Relative Percent Difference (%)	20	20

Duplicate Analysis

	Analytical Result (µg/sample)		Relative Percent Difference (%)
	First Analysis	Duplicate Analysis	
VS2-STK-11B-M26A-ACDIMP	36,600	36,300	0.8
VS2-STK-11B-M26A-ALKIMP	<160	<160	NC [1]
VS2-STK-13B-M26A-ACDIMP	15,500	15,400	0.6
VS2-STK-13B-M26A-ALKIMP	<180	<180	NC
VS2-STK-14B-M26A-ACDIMP	15,900	16,200	1.9
VS2-STK-14B-M26A-ALKIMP	<190	<190	NC
VS2-STK-15B-M26A-ACDIMP	21,600	21,400	0.9
VS2-STK-15B-M26A-ALKIMP	<180	<180	NC
VS3-STK-12B-M26A-ACDIMP	4,740	4,790	1.0
VS3-STK-12B-M26A-ALKIMP	<130	<130	NC
VS3-STK-13B-M26A-ACDIMP	4,720	4,900	3.7
VS3-STK-13B-M26A-ALKIMP	<120	<120	NC
VS3-STK-14B-M26A-ACDIMP	1,810	1,820	0.6
VS3-STK-14B-M26A-ALKIMP	<140	<140	NC
VS4-STK-11B-M26A-ACDIMP	11,100	11,000	0.9
VS4-STK-11B-M26A-ALKIMP	<130	<130	NC
VS4-STK-12B-M26A-ACDIMP	8,150	8,050	1.2
VS4-STK-12B-M26A-ALKIMP	<120	<120	NC
VS4-STK-13B-M26A-ACDIMP	23,600	23,700	0.4
VS4-STK-13B-M26A-ALKIMP	<140	<140	NC

[1] NC – Not Calculated. At least one result is below the detection limit.

Data Quality Assessment
Analysis of Stack Gas for Particulate Matter

Parameter	Particulate Loading in Stack Gas
Sampling Method	EPA Method 5
Analytical Method	Gravimetric Analysis – EPA Method 5
Laboratory ID Number(s)	H3J140413, H3J190410, H3K010423
Preparation Batch Number(s)	3293010, 3303016, 3312021
Sample Shipping and Receipt	Sample received intact and at ambient temperature. QAPP has no specification for preservation of these samples.
Holding Time(s)	All samples prepared and analyzed within 20 days of sampling. QAPP specifies analysis within 28 days. See table below.
Blank Results	Field blank PNR sample had observable levels near the detection limit. No particulate matter detected in media check samples. Field Blank below actual results. See tables below and in main body of report.
Results of Multiple Weighings	Final weighing stable within < 0.5 mg
Balance Calibration	Performed daily during applicable periods
Conclusions and Comments	These data are acceptable for the intended purpose. The levels of particulate material observed in the PNR samples were very low, and near the detection limit. Levels in the field samples were similar to these results, and may have a positive bias. As a positive bias is conservative relative to the estimation of emissions, no data are qualified or invalidated based on field blank results.

Holding Time

	Sample Date	Analysis Date	Holding Time (Days)
VS2-STK-11A-M5-FILT	8-Oct	23-Oct	15
VS2-STK-11A-M5-PNR	8-Oct	23-Oct	15
VS2-STK-12A-M5-FILT	9-Oct	23-Oct	14
VS2-STK-12A-M5-PNR	9-Oct	23-Oct	14
VS2-STK-13A-M5-FILT	10-Oct	23-Oct	13
VS2-STK-13A-M5-PNR	10-Oct	23-Oct	13
VS3-STK-11A-M5-FILT	15-Oct	31-Oct	16
VS3-STK-11A-M5-PNR	15-Oct	31-Oct	16
VS3-STK-12A-M5-FILT	16-Oct	31-Oct	15
VS3-STK-12A-M5-PNR	16-Oct	31-Oct	15
VS3-STK-13A-M5-FILT	17-Oct	31-Oct	14
VS3-STK-13A-M5-PNR	17-Oct	31-Oct	14
VS4-STK-11A-M5-FILT	23-Oct	11-Nov	19
VS4-STK-11A-M5-PNR	23-Oct	11-Nov	19
VS4-STK-13A-M5-FILT	25-Oct	11-Nov	17
VS4-STK-13A-M5-PNR	25-Oct	11-Nov	17
VS4-STK-14A-M5-FILT	25-Oct	11-Nov	17
VS4-STK-14A-M5-PNR	25-Oct	11-Nov	17
VS2-STK-1FB-M5-FILT	7-Oct	23-Oct	16
VS2-STK-1FB-M5-PNR	7-Oct	23-Oct	16
VS3-STK-1FB-M5-FILT	14-Oct	31-Oct	17
VS3-STK-1FB-M5-PNR	14-Oct	31-Oct	17
VS4-STK-1FB-M5-FILT	22-Oct	11-Nov	20
VS4-STK-1FB-M5-PNR	22-Oct	11-Nov	20

Blank Results

		Particulates (total) (mg/sample)
VS2-STK-1FB-M5-FILT		<0.5
VS2-STK-1FB-M5-PNR		1.2
VS3-STK-1FB-M5-FILT		<0.5
VS3-STK-1FB-M5-PNR		1.4
VS4-STK-1FB-M5-FILT		<0.5
VS4-STK-1FB-M5-PNR		1.25
A-5076 MEDIA CHECK		<0.5
A-5058 MEDIA CHECK		<0.5
A-5039 MEDIA CHECK		<0.5
Range of Field Samples	PNR	<0.5 - 1.35
	Filter	0.55 – 2.5