APPENDIX C
TABLES

Table C1: Aquifer Stratigraphy and Hydrology of the Shapiro Brothers Salvage Site

Shaprio Brother Salvage Site, Festus, Missouri

System	Stratigraphic Unit	Thickness (feet)	Lithology	Nature of Porosity and Permeability	Hydraulic Conductivity (cm/sec)	Hydrologic Unit
Post Ordovician	**Soil and Residuum**	50 - 65	Silt and silty clay	Intergranular space throughout matrix; Moderate permeability	1.4×10^{-3} - 4.0×10^{-4}	**None**
Ordovician	**St. Peter Sandstone**	30 - 45	Sandstone	Bedding seperations, fractures, and dissolution features; Moderate permeability	1×10^{-4} - 1×10^{-5}	**Ozark Aquifer**
	Powell Dolomite	80 - 90	Dolomite, cherty dolomite, sandstone, dolomitic sandstone, argillaceous dolomite, and minor shales			
	Jefferson City/Cotter Dolomite	360 - 380				
	Roubidoux Formation	130 - 140				
	Gasconade Dolomite	250 - 260				
Cambrian	**Eminence and Potosi Dolomites**	430 - 450	Medium-crystalline dolomite with sandstone beds			
	Derby-Doe Run Dolomites and Davis Shale	>50	Medium-crystalline dolomite with beds of silt, shale, and sand	Bedding seperations and fractures; Low permeability	1×10^{-8}	**St. Francois Confining Unit**

Data is from Davis, 1969; Imes and Smith, 1990; Imes and Emmett, 1994; and MDNR/DGLS well log records.

Table C2. Selected Analytical Results for Surface Water Samples Collected April 9, 2012
Shapiro Brothers Salvage, Festus, Missouri

- All values listed in parts per billion (ug/l) unless otherwise noted.
- NL denotes benchmark value not listed in reference source.
- NA denotes not analyzed
- Sample results in bold are significantly[1] above background concentrations
- Sample results in shaded cells exceed the lowest SCDM benchmark value

Sample Tag Number	1201180	1201183	1201181	1201182	1201185	SCDM[2]			MO WQS[3]			
Sample ID	SW01	SW01 dup	SW02	SW03	SW04							
Location	12th St. Bridge	12th St. Bridge	6th St. Bridge	Baily Road Bridge	Sunset Pk (Bkgnd)							
Date Collected	04/09/12	04/09/12	04/09/12	04/09/12	04/09/12	MCL	SC	CMC/CCC	DW / GW	Aq. Life	Fish Consmp	Irr. / Lvstock
Laboratory Number	AB70470	AB70473	AB70471	AB70472	AB70475							
Water Quality Indicators												
Dissolved Oxygen	8.0	NA	8.6	7.4	8.3							
Field Temperature	16.5	NA	17.4	18.0	14.6							
Hardness, as CaCO3 Dissolved-N	529.0	505.0	268.0	340.0	440.0	NL	NL	NL	NL	NL	NL	NL
Hardness, as CaCO3-TR-N	485.0	513.0	247.0	337.0	415.0	NL	NL	NL	NL	NL	NL	NL
Oxidation Reduction Potential	54.0	NA	64.0	32.0	.0							
pH	7.51	NA	7.78	7.66	7.88	NL	NL	NL	NL	NL	NL	NL
Specific Conductivity, umhos/cm	1,190.0	NA	734.0	829.0	989.0	NL	NL	NL	NL	NL	NL	NL
Turbidity	1.54	NA	2.03	4.83	1.21							
Metals												
Arsenic	.72 (e)	.84 (e)	1.87	1.7	1.36	10	0.057	NL	50	20	NL	100
Arsenic, dissolved	.99 (e)	1.07	2.04	1.92	1.45	10	0.057	150	50	20	NL	100
Cadmium	**1.02**	**1.39**	**.12 (e)**	<0.1	<0.1	5	18	NL	5	9.1	NL	NL
Cadmium, dissolved	.65	.65	<0.1	<0.1	<0.1	5	18	0.25	5	9.1	NL	NL
Calcium	125.0	119.0	58.5	77.6	101.0	NL	NL	NL	NL	NL	NL	NL
Calcium, dissolved	115.0	121.0	53.8	76.4	95.5	NL	NL	NL	NL	NL	NL	NL
Copper	**25.6**	**29.3**	2.81	5.66	2.41	1300	NL	NL	1300	19	NL	500
Copper, dissolved	**13.2**	**12.7**	2.44	3.92	2.41	1300	NL	9	1300	19	NL	500
Lead	**34.3**	**56.1**	3.26	2.29	3.1	15	NL	NL	15	9	NL	NL
Lead, dissolved	1.25	1.12	<0.5	<0.5	<0.5	15	NL	2.5	15	9	NL	NL
Magnesium	52.6	50.4	29.6	35.5	45.6	NL	NL	NL	NL	NL	NL	NL
Magnesium, dissolved	48.0	51.1	27.4	35.6	42.9	NL	NL	NL	NL	9	NL	NL
Zinc	**59.8**	**69.3**	12.9	12.2	15.3	NL	11000	NL	5000	241	NL	NL
Zinc, dissolved	**40.9**	**40.8**	10.6	12.3	12.6	NL	11000	120	5000	241	NL	NL

[1] Three times the background concentration when contaminant is detected in background sample or three times the method detection limit (MDL) when the background concentration is < MDL.

[2] SCDM - Superfund Chemical Data Matrix, January 28, 2004, maximum contaminant level (MCL), lowest of reference dose and cancer risk screening concentrations (SC) for groundwater/surface water pathway, drinking water , and lower of criteria maximum concentration and criteria continuous concentration (CMC/CCC)

[3] MO WQS - Missouri Water Quality Standards, benchmarks for drinking water, groundwater, protection of aquatic life, fish consumption, and irrigation/livestock watering use categories, Missouri Code of State Regulations, 10 CSR 20-7.031, October 31, 1999.

e - Estimated value, detected below PQL

Table C3: Selected Analytical Results for mSediment Samples Collected April 9, 2012
Shapiro Brothers Salvage Site, Festus, Missouri

- All values listed in parts per million (mg/kg) unless otherwise noted.
- Sample results in bold are significantly[1] above background concentrations
- Sample results in shaded cells exceed the PEC

Sample Tag Number	H100015	H100016	H100017	H100018	H100019	Sediment Quality Guidelines		
Sample ID	SD01	SD dup.	SD02	SD03	SD04			
Date Collected	04/09/12	04/09/12	04/09/12	04/09/12	04/09/12	USGS TEC [2]	USGS PEC [2]	EPA EcoTox [3]
Location	12th St. Bridge	12th St. Bridge	6th St. Bridge	Baily Road Bridge	Sunset Pk (Bkgnd)			
Laboratory Number	AB79149	AB79150	AB79151	AB79152	AB79153			
Metals								
Arsenic	10.0	9.25	9.96	9.58	7.14	9.79	33	8.2
Cadmium	**15.3**	**16.6**	**5.64**	**4.03**	.965	0.99	4.98	1.2
Copper	**446.0**	**388.0**	**125.0**	**138.0**	34.8	31.6	149	34
Lead	**1,560.0**	**1,510.0**	568.0	552.0	387.0	35.8	149	47
Zinc	785.0	788.0	508.0	498.0	1,080.0	121	459	150

[1] Three times the background concentration when contaminant is detected in background sample or three times the method detection limit (MDL) when the background concentration is < MDL.

[2] TEC and PEC - Threshold Effects Concentration and Probable Effects Concentration (TEC and PEC), U.S. Geological Survey Consensus-Based Sediment Quality Guidelines, June 2000

[3] EcoTox - Ecotox Thresholds, EPA Bulletin, EPA/540/F-95/038, January, 1996

Table C4. Summary of XRF Lead Results From Replicate Analyses of Bagged Incremental Composite Samples
Shaprio Brothers Salvage Site, Festus, Missouri

This spreadsheet summarizes replicate XRF analyses on individual bagged soil samples and calculates means, standard deviations, percent relative standard deviations and upper and lower 95% confidence limits. Field Replicate data are summarized in the far right-most columns.

Sample ID & Bagged Replicate Readings — Instrmnt Result (ppm Pb)

Information: **120** Loc ID **1** SU 1 Rep

Bag reading 1	5/10/2012	895
2		861
3		916
4		
	Mean	890.7
	SD	27.8
	%RSD	3.1
	n =	3
2-sided CLs	Section 95%LCL =	822
	Section 95%UCL =	960

Information: **120** Loc ID **2** SU 1 Rep

Bag reading 1	5/10/2012	239
2		208
3		231
4		
	Mean	226.0
	SD	16.1
	%RSD	7.1
	n =	3
	Section 95%LCL =	186
	Section 95%UCL =	266

Information: **175** **1**

Bag reading 1	5/10/2012	140
2		153
3		144
4		
	Mean	145.7
	SD	6.7
	%RSD	4.6
	n =	3
	Section 95%LCL =	129
	Section 95%UCL =	162

Information: **159** **1**

Bag reading 1	5/11/2012	484
2		490
3		487
4		
	Mean	487.0
	SD	3.0
	%RSD	0.6
	n =	3
	Section 95%LCL =	480
	Section 95%UCL =	494

Information: **215** **1**

Bag reading 1	5/11/2012	348
2		362
3		339
4		
	Mean	349.7
	SD	11.6
	%RSD	3.3
	n =	3
	Section 95%LCL =	321
	Section 95%UCL =	378

Information: **121**

Bag reading 1	5/11/2012	248
2		252
3		259
4		
	Mean	253.0
	SD	5.6
	%RSD	2.2
	n =	3
	Section 95%LCL =	239
	Section 95%UCL =	267

Information: **221** **2** 1

Bag reading 1	5/11/2012	123
2		121
3		126
4		
	Mean	123.3
	SD	2.5
	%RSD	2.0
	n =	3
	Section 95%LCL =	117
	Section 95%UCL =	130

Information: **180** **2**

Bag reading 1	5/11/2012	102
2		100
3		109
4		
	Mean	103.7
	SD	4.7
	%RSD	4.6
	n =	3
	Section 95%LCL =	92
	Section 95%UCL =	115

Sample ID & Bagged Replicate Readings — Instrmnt Result (ppm Pb)

Information: 120 Loc ID 1 SU 2 Rep

Bag reading 1	#####	962
2		935
3		940
4		
	Mean	945.7
	SD	14.4
	%RSD	1.5
	n =	3
2-sided CLs	Section 95%LCL =	910
	Section 95%UCL =	981

Information: **120** 2 2

Bag reading 1	#####	237
2		242
3		253
4		
	Mean	244.0
	SD	8.2
	%RSD	3.4
	n =	3
	Section 95%LCL =	224
	Section 95%UCL =	264

Information: 221 2 1

Bag reading 1		123
2		121
3		126
4		
	Mean	123.3
	SD	2.5
	%RSD	2.0
	n =	3
	Section 95%LCL =	117
	Section 95%UCL =	130

Information: **175** 2

Bag reading 1	#####	136
2		130
3		136
4		
	Mean	134.0
	SD	3.5
	%RSD	2.6
	n =	3
	Section 95%LCL =	125
	Section 95%UCL =	143

Information: **159** 2

Bag reading 1	#####	178
2		179
3		185
4		
	Mean	180.7
	SD	3.8
	%RSD	2.1
	n =	3
	Section 95%LCL =	171
	Section 95%UCL =	190

Information: **215** 2

Bag reading 1	#####	217
2		221
3		211
4		
	Mean	216.3
	SD	5.0
	%RSD	2.3
	n =	3
	Section 95%LCL =	204
	Section 95%UCL =	229

Information: **221** 2 2

Bag reading 1	#####	122.7
2		124
3		114
4		
	Mean	122.7
	SD	8.1
	%RSD	6.6
	n =	3
	Section 95%LCL =	103
	Section 95%UCL =	143

Information: **179** 2

Bag reading 1	#####	165
2		168
3		170
4		
	Mean	167.7
	SD	2.5
	%RSD	1.5
	n =	3
	Section 95%LCL =	161
	Section 95%UCL =	174

Sample ID & Bagged Replicate Readings — Instrmnt Result (ppm Pb)

Information: **120** Loc ID 1 SU 3 Rep

Bag reading 1	#####	782
2		824
3		812
4		
	Mean	806.0
	SD	21.6
	%RSD	2.7
	n =	3
2-sided CLs	Section 95%LCL =	752
	Section 95%UCL =	860

Information: 120 2 3

Bag reading 1	#####	251
2		268
3		256
4		
	Mean	258.3
	SD	8.7
	%RSD	3.4
	n =	3
	Section 95%LCL =	237
	Section 95%UCL =	280

Information: 221 2 2

Bag reading 1		130
2		124
3		114
4		
	Mean	122.7
	SD	8.1
	%RSD	6.6
	n =	3
	Section 95%LCL =	103
	Section 95%UCL =	143

Information: **221** 2 3

Bag reading 1		174
2		187
3		161
4		
	Mean	174.0
	SD	13.0
	%RSD	7.5
	n =	3
	Section 95%LCL =	142
	Section 95%UCL =	206

Information: 221 2 3 recisionCheck

Bag reading 1	#####	176
2		173
3		182
4		170
5		175
6		167
7		171
	Mean	173.4
	SD	4.9
	%RSD	2.8
	n =	7
	Section 95%LCL =	169
	Section 95%UCL =	178

Information: 133 1

Bag reading 1		218
2		185
3		202
4		
	Mean	201.7
	SD	16.5
	%RSD	8.2
	n =	3
	Section 95%LCL =	161
	Section 95%UCL =	243

Information: 133 2

Bag reading 1		214
2		206
3		216
4		
	Mean	212.0
	SD	5.3
	%RSD	2.5
	n =	3
	Section 95%LCL =	199
	Section 95%UCL =	225

Information: 221 2 3

Bag reading 1	#####	174
2		187
3		161
4		
	Mean	174.0
	SD	13.0
	%RSD	7.5
	n =	3
	Section 95%LCL =	142
	Section 95%UCL =	206

Information:

Bag reading 1		
2		
3		
4		
	Mean	
	SD	
	%RSD	
	n =	
	Section 95%LCL =	
	Section 95%UCL =	

Information: **120** **SU1** **SU Total**

Rep1		891
Rep2		946
Rep3		806
	Mean	881.0
	SD	70.5
	%RSD	8.0
	n =	3
	Section 95%LCL =	706
	Section 95%UCL =	1056

Information: **120** **SU2** **SU Total**

Rep1		226
Rep2		244
Rep3		258
	Mean	242.7
	SD	16.0
	%RSD	6.6
	n =	3
	Section 95%LCL =	203
	Section 95%UCL =	283

Information: **221** **Su2** **SU totals**

Rep1		123
Rep2		123
Rep3		174
	Mean	140.0
	SD	29.4
	%RSD	21.0
	n =	3
	Section 95%LCL =	67
	Section 95%UCL =	213

Information: **221** **SU2** **SU Total**

Rep1		123
Rep2		123
Rep3		174
	Mean	140.0
	SD	29.4
	%RSD	21.0
	n =	3
	Section 95%LCL =	67
	Section 95%UCL =	213

Table C4. Summary of XRF Lead Results From Replicate Analyses of Bagged Incremental Composite Samples
Shaprio Brothers Salvage Site, Festus, Missouri

This spreadsheet summarizes replicate XRF analyses on individual bagged soil samples and calculates means, standard deviations, percent relative standard deviations and upper and lower 95% confidence limits. Field Replicate data are summarized in the far right-most columns.

Sample ID & Bagged Replicate Readings		Instrmnt Result (ppm Pb)
Information: 218		2
Bag reading 1	5/11/2012	181
2		171
3		173
4		
Mean		175.0
SD		5.3
%RSD		3.0
n =		3
Section 95%LCL =		162
Section 95%UCL =		188

Sample ID & Bagged Replicate Readings		Instrmnt Result (ppm Pb)
Information: 222		2
Bag reading 1	#####	89
2		93
3		98
4		
Mean		93.3
SD		4.5
%RSD		4.8
n =		3
Section 95%LCL =		82
Section 95%UCL =		105

Sample ID & Bagged Replicate Readings		Instrmnt Result (ppm Pb)
Information: 157		2
Bag reading 1	######	99
2		99
3		93
4		
Mean		97.0
SD		3.5
%RSD		3.6
n =		3
Section 95%LCL =		88
Section 95%UCL =		106

Information: 158		2
Bag reading 1	5/11/2012	163
2		167
3		146
4		
Mean		158.7
SD		11.2
%RSD		7.0
n =		3
Section 95%LCL =		131
Section 95%UCL =		186

Information: 161		2
Bag reading 1	#####	78
2		86
3		94
4		
Mean		86.0
SD		8.0
%RSD		9.3
n =		3
Section 95%LCL =		66
Section 95%UCL =		106

Information: 164		2
Bag reading 1	######	115
2		119
3		121
4		
Mean		118.3
SD		3.1
%RSD		2.6
n =		3
Section 95%LCL =		111
Section 95%UCL =		126

Information: 224		2
Bag reading 1		128
2		151
3		141
4		
Mean		140.0
SD		11.5
%RSD		8.2
n =		3
Section 95%LCL =		111
Section 95%UCL =		169

Information: ty street sweeping		
Bag reading 1	#####	182
2		182
3		190
4		
Mean		184.7 #DIV/0!
SD		4.6 #DIV/0!
%RSD		2.5
n =		3 0
Section 95%LCL =		173 #DIV/0!
Section 95%UCL =		196 #DIV/0!

Information: 129		1
Bag reading 1		177
2		172
3		180
4		
Mean		176.3
SD		4.0
%RSD		2.3
n =		3
Section 95%LCL =		166
Section 95%UCL =		186

Information: 148		1
Bag reading 1		184
2		193
3		193
4		
Mean		190.0
SD		5.2
%RSD		2.7
n =		3
Section 95%LCL =		177
Section 95%UCL =		203

Information: 148		2
Bag reading 1		130
2		139
3		130
4		
Mean		133.0
SD		5.2
%RSD		3.9
n =		3
Section 95%LCL =		120
Section 95%UCL =		146

Information: 106		1
Bag reading 1		531
2		597
3		554
4		
Mean		560.7
SD		33.5
%RSD		6.0
n =		3
Section 95%LCL =		477
Section 95%UCL =		644

Information: 129		2
Bag reading 1		161
2		169
3		165
4		
Mean		165.0
SD		4.0
%RSD		2.4
n =		3
Section 95%LCL =		155
Section 95%UCL =		175

Information: 176		2
Bag reading 1		257
2		244
3		251
4		
Mean		250.7
SD		6.5
%RSD		2.6
n =		3
Section 95%LCL =		235
Section 95%UCL =		267

Information: 106		2	Information: 116	1	SU Total
Bag reading 1		210	Rep1		1957
2		212	Rep2		1801
3		195	Rep3		1970
4					
Mean		205.7		Mean	1909.3
SD		9.3		SD	94.0
%RSD		4.5		%RSD	4.9
n =		3		n =	3
Section 95%LCL =		183		Section 95%LCL =	1676
Section 95%UCL =		229		Section 95%UCL =	2143

Information: 155		1
Bag reading 1		269
2		250
3		263
4		
Mean		260.7
SD		9.7
%RSD		3.7
n =		3
Section 95%LCL =		237
Section 95%UCL =		285

Information: 155		2
Bag reading 1		189
2		212
3		208
4		
Mean		203.0
SD		12.3
%RSD		6.1
n =		3
Section 95%LCL =		172
Section 95%UCL =		234

Information: 135		1
Bag reading 1		282
2		288
3		307
4		
Mean		292.3
SD		13.1
%RSD		4.5
n =		3
Section 95%LCL =		260
Section 95%UCL =		325

Information: 116		2	SU Total
Rep1			238
Rep2			239
Rep3			222
		Mean	233.0
		SD	9.5
		%RSD	4.1
		n =	3
		Section 95%LCL =	209
		Section 95%UCL =	257

Information: 135		2
Bag reading 1		135
2		132
3		128
4		
Mean		131.7
SD		3.5
%RSD		2.7
n =		3
Section 95%LCL =		123
Section 95%UCL =		140

Information: 116	Y1	1
Bag reading 1		318
2		338
3		329
4		
Mean		328.3
SD		10.0
%RSD		3.1
n =		3
Section 95%LCL =		303
Section 95%UCL =		353

Information: 116	Y1	2
Bag reading 1		293
2		297
3		265
4		
Mean		285.0
SD		17.4
%RSD		6.1
n =		3
Section 95%LCL =		242
Section 95%UCL =		328

Information: 116	Y1	Y Totals
Rep1		328
Rep2		285
Rep3		329
	Mean	314.0
	SD	25.1
	%RSD	8.0
	n =	3
	Section 95%LCL =	252
	Section 95%UCL =	376

Information: 116	Y1	3
Bag reading 1		328
2		335
3		324
4		
Mean		329.0
SD		5.6
%RSD		1.7
n =		3
Section 95%LCL =		315
Section 95%UCL =		343

Information: 116	Y2	1
Bag reading 1		227
2		243
3		242
4		229
Mean		235.3
SD		8.4
%RSD		3.6
n =		4
Section 95%LCL =		222
Section 95%UCL =		249

Information: 116	Y2	2
Bag reading 1		173
2		184
3		175
4		
Mean		177.3
SD		5.9
%RSD		3.3
n =		3
Section 95%LCL =		163
Section 95%UCL =		192

Information: 116	Y2	Y Totals
Rep1		235
Rep2		177
Rep3		210
	Mean	207.3
	SD	29.1
	%RSD	14.0
	n =	3
	Section 95%LCL =	135
	Section 95%UCL =	280

Information: 116	Loc ID Y2	SU	Rep 3
Bag reading 1			210
2			218
3			202
4			
Mean			210.0
SD			8.0
%RSD			3.8
n =			3
Section 95%LCL =			190
Section 95%UCL =			230

Information: 146	Loc ID 1	SU 1	Rep 1
Bag reading 1			390
2			397
3			398
4			391
5			412
6			382
Mean			395.0
SD			10.1
%RSD			2.6
n =			6
Section 95%LCL =			384
Section 95%UCL =			406

Information: 146	Loc ID 1	SU 1	Rep 2
Bag reading 1			380
2			399
3			380
4			
Mean			386.3
SD			11.0
%RSD			2.8
n =			3
Section 95%LCL =			359
Section 95%UCL =			414

Information: 146	Su2	SU totals
Rep1		578
Rep2		479
Rep3		415
	Mean	490.7
	SD	82.1
	%RSD	16.7
	n =	3
	Section 95%LCL =	287
	Section 95%UCL =	695

Information: 146	1	3
Bag reading 1		386
2		387
3		390
4		
Mean		387.7
SD		2.1
%RSD		0.5
n =		3
Section 95%LCL =		382
Section 95%UCL =		393

Information: 146	Y1	1
Bag reading 1		369
2		347
3		352
4		
Mean		356.0
SD		11.5
%RSD		3.2
n =		3
Section 95%LCL =		327
Section 95%UCL =		385

Information: 146	Y1	2
Bag reading 1		300
2		286
3		296
4		
Mean		294.0
SD		7.2
%RSD		2.5
n =		3
Section 95%LCL =		276
Section 95%UCL =		312

Information: 146	SU1	SU totals
Rep1		395
Rep2		386
Rep3		388
	Mean	389.7
	SD	4.7
	%RSD	1.2
	n =	3
	Section 95%LCL =	378
	Section 95%UCL =	401

Table C4. Summary of XRF Lead Results From Replicate Analyses of Bagged Incremental Composite Samples
Shaprio Brothers Salvage Site, Festus, Missouri

This spreadsheet summarizes replicate XRF analyses on individual bagged soil samples and calculates means, standard deviations, percent relative standard deviations and upper and lower 95% confidence limits. Field Replicate data are summarized in the far right-most columns.

Sample ID & Bagged Replicate Readings	Instrmnt Result (ppm Pb)
Information: 146 Y1 3	
Bag reading 1	305
2	289
3	289
4	
Mean	294.3
SD	9.2
%RSD	3.1
n =	3
Section 95%LCL =	271
Section 95%UCL =	317

Sample ID & Bagged Replicate Readings	Instrmnt Result (ppm Pb)
Information: 146 Y2 1	
Bag reading 1	442
2	424
3	442
4	
Mean	436.0
SD	10.4
%RSD	2.4
n =	3
Section 95%LCL =	410
Section 95%UCL =	462

Sample ID & Bagged Replicate Readings	Instrmnt Result (ppm Pb)
Information: 146 Y2 2	
Bag reading 1	401
2	409
3	400
4	391
5	376
6	411
7	428
8	437
9	406
Mean	406.6
SD	18.2
%RSD	4.5
n =	9
Section 95%LCL =	393
Section 95%UCL =	421

Information: 146 Y1	Y totals
Rep1	356
Rep2	294
Rep3	294
Mean	314.7
SD	35.8
%RSD	11.4
n =	3
Section 95%LCL =	226
Section 95%UCL =	404

Information: 146 Y2 3	
Bag reading 1	423
2	418
3	404
4	
Mean	415.0
SD	9.8
%RSD	2.4
n =	3
Section 95%LCL =	391
Section 95%UCL =	439

Information: 146 2 1	
Bag reading 1	575
2	588
3	571
4	
Mean	578.0
SD	8.9
%RSD	1.5
n =	3
Section 95%LCL =	556
Section 95%UCL =	600

Information: 146 2 2	
Bag reading 1	480
2	478
3	478
4	
Mean	478.7
SD	1.2
%RSD	0.2
n =	3
Section 95%LCL =	476
Section 95%UCL =	482

Information: 146 Y2	Y totals
Rep1	436
Rep2	406
Rep3	415
Mean	419.0
SD	15.4
%RSD	3.7
n =	3
Section 95%LCL =	381
Section 95%UCL =	457

Information: 146	Loc ID 2	SU 3	Rep
Bag reading 1	568		
2	557		
3	565		
4			
Mean	563.3		
SD	5.7		
%RSD	1.0		
n =	3		
Section 95%LCL =	549		
Section 95%UCL =	577		

Information: 146	Loc ID 1	SU 1	Rep QC1
Bag reading 1	399		
2	412		
3	392		
4	407		
5	395		
6	399		
7	427		
Mean	404.4		
SD	12.1		
%RSD	3.0		
n =	7		
Section 95%LCL =	393		
Section 95%UCL =	416		

Information: 125 1 1	
Bag reading 1	1205
2	1264
3	1229
4	
Mean	1232.7
SD	29.7
%RSD	2.4
n =	3
Section 95%LCL =	1159
Section 95%UCL =	1306

Information: 125 1 2	
Bag reading 1	1196
2	1214
3	1166
4	1199
5	1157
6	1138
Mean	1178.3
SD	29.1
%RSD	2.5
n =	6
Section 95%LCL =	1148
Section 95%UCL =	1209

Information: 125 1 3	
Bag reading 1	1093
2	1131
3	1192
4	
Mean	1138.7
SD	49.9
%RSD	4.4
n =	3
Section 95%LCL =	1015
Section 95%UCL =	1263

Information: 125 SU1	Su total
Rep1	1233
Rep2	1178
Rep3	1139
Mean	1183.3
SD	47.2
%RSD	4.0
n =	3
Section 95%LCL =	1066
Section 95%UCL =	1301

Information: 125 2 1	
Bag reading 1	314
2	333
3	318
4	
Mean	321.7
SD	10.0
%RSD	3.1
n =	3
Section 95%LCL =	297
Section 95%UCL =	347

Information: 125 2 2	
Bag reading 1	328
2	312
3	308
4	
Mean	316.0
SD	10.6
%RSD	3.3
n =	3
Section 95%LCL =	299
Section 95%UCL =	342

Information: 125 2 3	
Bag reading 1	312
2	330
3	325
4	
Mean	322.3
SD	9.3
%RSD	2.9
n =	3
Section 95%LCL =	299
Section 95%UCL =	345

Information: 125 2	SU Total
Rep1	322
Rep2	316
Rep3	322
Mean	320.0
SD	3.5
%RSD	1.1
n =	3
Section 95%LCL =	311
Section 95%UCL =	329

Information: 125 Y1 1	
Bag reading 1	620
2	659
3	587
4	
Mean	622.0
SD	36.0
%RSD	5.8
n =	3
2-sided CLs Section 95%LCL =	532
Section 95%UCL =	712

Information: 125 Y1 2	
Bag reading 1	382
2	368
3	373
4	
Mean	374.3
SD	7.1
%RSD	1.9
n =	3
2-sided CLs Section 95%LCL =	357
Section 95%UCL =	392

Information: 125 Y1 3	
Bag reading 1	875
2	855
3	857
4	
Mean	862.3
SD	11.0
%RSD	1.3
n =	3
2-sided CLs Section 95%LCL =	835
Section 95%UCL =	890

Information: 125 Y1	Y Totals
Rep1	622
Rep2	374
Rep3	862
Mean	619.3
SD	244.0
%RSD	39.4
n =	3
Section 95%LCL =	13
Section 95%UCL =	1225

Information: 125 Y2 1	
Bag reading 1	201
2	193
3	174
4	
Mean	189.3
SD	13.9
%RSD	7.3
n =	3
Section 95%LCL =	155
Section 95%UCL =	224

Information: 125 Y2 2	
Bag reading 1	221
2	212
3	210
4	
Mean	214.3
SD	5.9
%RSD	2.7
n =	3
Section 95%LCL =	200
Section 95%UCL =	229

Information: 125 Y2 3	
Bag reading 1	244
2	247
3	259
4	
Mean	250.0
SD	7.9
%RSD	3.2
n =	3
Section 95%LCL =	230
Section 95%UCL =	270

Information: 125 Y2	Y Totals
Rep1	189
Rep2	214
Rep3	250
Mean	217.7
SD	30.7
%RSD	14.1
n =	3
Section 95%LCL =	141
Section 95%UCL =	294

Information: 125 Y3 1	
Bag reading 1	290
2	326
3	316
4	
Mean	310.7
SD	18.6
%RSD	6.0
n =	3
Section 95%LCL =	265
Section 95%UCL =	357

Information: 125 Y3 2	
Bag reading 1	271
2	270
3	267
4	
Mean	269.3
SD	2.1
%RSD	0.8
n =	3
Section 95%LCL =	264
Section 95%UCL =	275

Information: 125 Y3 3	
Bag reading 1	324
2	315
3	325
4	
Mean	321.3
SD	5.5
%RSD	1.7
n =	3
Section 95%LCL =	308
Section 95%UCL =	335

Information: 125 Y3	Y Totals
Rep1	311
Rep2	269
Rep3	321
Mean	300.3
SD	27.6
%RSD	9.2
n =	3
Section 95%LCL =	232
Section 95%UCL =	369

Information: 115 1 1	
Bag reading 1	2093
2	2268
3	2057
4	
Mean	2139.3
SD	112.9
%RSD	5.3
n =	3
Section 95%LCL =	1859
Section 95%UCL =	2420

Information: 115 1 1 QC1	
Bag reading 1	2001
2	1999
3	2090
4	2088
5	2068
6	2050
7	2006
Mean	2043.1
SD	40.8
%RSD	2.0
n =	7
Section 95%LCL =	2005
Section 95%UCL =	2081

Information: 115 1 2	
Bag reading 1	2105
2	2018
3	2045
4	
Mean	2056.0
SD	44.5
%RSD	2.2
n =	3
Section 95%LCL =	1945
Section 95%UCL =	2167

Table C4. Summary of XRF Lead Results From Replicate Analyses of Bagged Incremental Composite Samples
Shaprio Brothers Salvage Site, Festus, Missouri

This spreadsheet summarizes replicate XRF analyses on individual bagged soil samples and calculates means, standard deviations, percent relative standard deviations and upper and lower 95% confidence limits. Field Replicate data are summarized in the far right-most columns.

Sample ID & Bagged Replicate Readings — Instrmnt Result (ppm Pb)

Information: 115	1	3
Bag reading 1	2073	
2	2186	
3	2195	
4		
Mean	2151.3	
SD	68.0	
%RSD	3.2	
n =	3	
Section 95%LCL =	1982	
Section 95%UCL =	2320	

Information: 115	2	1
Bag reading 1	478	
2	497	
3	488	
4		
Mean	487.7	
SD	9.5	
%RSD	1.9	
n =	3	
Section 95%LCL =	464	
Section 95%UCL =	511	

Information: 115	2	2	Information: 115	1	SU Total
Bag reading 1	463		Rep1		2139
2	466		Rep2		2056
3	481		Rep3		2151
4					
Mean	470.0			Mean	2115.3
SD	9.6			SD	51.7
%RSD	2.1			%RSD	2.4
n =	3			n =	3
Section 95%LCL =	446			Section 95%LCL =	1987
Section 95%UCL =	494			Section 95%UCL =	2244

Information: 115	2	3
Bag reading 1	506	
2	491	
3	523	
4		
Mean	506.7	
SD	16.0	
%RSD	3.2	
n =	3	
Section 95%LCL =	467	
Section 95%UCL =	546	

Information: 143	1
Bag reading 1	270
2	261
3	274
4	
Mean	268.3
SD	6.7
%RSD	2.5
n =	3
Section 95%LCL =	252
Section 95%UCL =	285

Information: 143	2	Information: 115	2	SU Total
Bag reading 1	435	Rep1		488
2	462	Rep2		470
3	438	Rep3		507
4				
Mean	445.0		Mean	488.3
SD	14.8		SD	18.5
%RSD	3.3		%RSD	3.8
n =	3		n =	3
Section 95%LCL =	408		Section 95%LCL =	442
Section 95%UCL =	482		Section 95%UCL =	534

Information: 143	3
Bag reading 1	364
2	356
3	357
4	
Mean	359.0
SD	4.4
%RSD	1.2
n =	3
Section 95%LCL =	348
Section 95%UCL =	370

Information: 117	1
Bag reading 1 #####	1677
2	1708
3	1678
4	
Mean	1687.7
SD	17.6
%RSD	1.0
n =	3
Section 95%LCL =	1644
Section 95%UCL =	1731

Information: 108	2
Bag reading 1	230
2	235
3	226
4	
Mean	230.3
SD	4.5
%RSD	2.0
n =	3
Section 95%LCL =	219
Section 95%UCL =	242

Information: 109	2
Bag reading 1	298
2	281
3	285
4	
Mean	288.0
SD	8.9
%RSD	3.1
n =	3
Section 95%LCL =	266
Section 95%UCL =	310

Information: 111	2
Bag reading 1	166
2	176
3	165
4	
Mean	169.0
SD	6.1
%RSD	3.6
n =	3
Section 95%LCL =	154
Section 95%UCL =	184

Information: 216	2
Bag reading 1	440
2	457
3	431
4	
Mean	442.7
SD	13.2
%RSD	3.0
n =	3
Section 95%LCL =	410
Section 95%UCL =	475

Information: 133	Y1
Bag reading 1	159
2	148
3	150
4	
Mean	152.3
SD	5.9
%RSD	3.8
n =	3
Section 95%LCL =	138
Section 95%UCL =	167

Information: 133	Y2
Bag reading 1	296
2	294
3	298
4	
Mean	296.0
SD	2.0
%RSD	0.7
n =	3
Section 95%LCL =	291
Section 95%UCL =	301

Information: 133	Y3
Bag reading 1	166
2	155
3	196
4	
Mean	172.3
SD	21.2
%RSD	12.3
n =	3
Section 95%LCL =	120
Section 95%UCL =	225

Information: 116	1	1
Bag reading 1	2002	
2	1958	
3	1910	
4		
Mean	1956.7	
SD	46.0	
%RSD	2.4	
n =	3	
Section 95%LCL =	1842	
Section 95%UCL =	2071	

Information: 116	1	2
Bag reading 1	1821	
2	1734	
3	1847	
4		
Mean	1800.7	
SD	59.2	
%RSD	3.3	
n =	3	
Section 95%LCL =	1654	
Section 95%UCL =	1948	

Information: 116	1	3
Bag reading 1	1982	
2	1991	
3	1937	
4		
Mean	1970.0	
SD	28.9	
%RSD	1.5	
n =	3	
Section 95%LCL =	1898	
Section 95%UCL =	2042	

	Loc ID	SU	Rep
Information: 116	2	1	
Bag reading 1		239	
2		236	
3		239	
4			
Mean		238.0	
SD		1.7	
%RSD		0.7	
n =		3	
2-sided CLs Section 95%LCL =		234	
Section 95%UCL =		242	

	Loc ID	SU	Rep
Information: 116	2	2	
Bag reading 1		239	
2		239	
3		240	
4			
Mean		239.3	
SD		0.6	
%RSD		0.2	
n =		3	
2-sided CLs Section 95%LCL =		238	
Section 95%UCL =		241	

	Loc ID	SU	Rep
Information: 116	2	3	
Bag reading 1		238	
2		212	
3		217	
4			
Mean		222.3	
SD		13.8	
%RSD		6.2	
n =		3	
2-sided CLs Section 95%LCL =		188	
Section 95%UCL =		257	

Information: 124	Y1	1
Bag reading 1	228	
2	217	
3	224	
4		
Mean	223.0	
SD	5.6	
%RSD	2.5	
n =	3	
Section 95%LCL =	209	
Section 95%UCL =	237	

Information: 124	Y1	2
Bag reading 1	195	
2	181	
3	192	
4		
Mean	189.3	
SD	7.4	
%RSD	3.9	
n =	3	
Section 95%LCL =	171	
Section 95%UCL =	208	

Information: 124	Y1	3	Information: 124	Y1	Y Totals
Bag reading 1	225		Rep1		223
2	220		Rep2		189
3	229		Rep3		225
4					
Mean	224.7			Mean	212.3
SD	4.5			SD	20.2
%RSD	2.0			%RSD	9.5
n =	3			n =	3
Section 95%LCL =	213			Section 95%LCL =	162
Section 95%UCL =	236			Section 95%UCL =	263

Information: 124	Y2	1
Bag reading 1	275	
2	268	
3	258	
4		
Mean	267.0	
SD	8.5	
%RSD	3.2	
n =	3	
Section 95%LCL =	246	
Section 95%UCL =	288	

Information: 124	Y2	2
Bag reading 1	331	
2	319	
3	320	
4	304	
5	327	
6	333	
7	318	
8	336	
Mean	323.5	
SD	10.4	
%RSD	3.2	
n =	8	
Section 95%LCL =	315	
Section 95%UCL =	332	

Information: 124	Y2	Y Totals
Rep1		267
Rep2		323
Rep3		261
	Mean	283.7
	SD	34.2
	%RSD	12.1
	n =	3
	Section 95%LCL =	199
	Section 95%UCL =	369

Information: 124	Y2	3
Bag reading 1	235	
2	279	
3	268	
4	261	
Mean	260.8	
SD	18.7	
%RSD	7.2	
n =	4	
Section 95%LCL =	231	
Section 95%UCL =	291	

Information: 124	P1	1
Bag reading 1	415	
2	415	
3	437	
4		
Mean	422.3	
SD	12.7	
%RSD	3.0	
n =	3	
Section 95%LCL =	391	
Section 95%UCL =	454	

Information: 124	P1	2	Information: 124	P1/SU4	P Totals
Bag reading 1	396		Rep1	Note: P1 same as SU4	477
2	388		Rep2		429
3	439		Rep3		392
4	422				
5	415				
6	407				
7	404			Mean	432.7
8	431			SD	42.6
9	433			%RSD	9.9
10	425			n =	3
Mean	416.0			Section 95%LCL =	327
SD	16.9			Section 95%UCL =	539
%RSD	4.1				
n =	10				
Section 95%LCL =	404				
Section 95%UCL =	428				

Table C4. Summary of XRF Lead Results From Replicate Analyses of Bagged Incremental Composite Samples
Shaprio Brothers Salvage Site, Festus, Missouri

This spreadsheet summarizes replicate XRF analyses on individual bagged soil samples and calculates means, standard deviations, percent relative standard deviations and upper and lower 95% confidence limits. Field Replicate data are summarized in the far right-most columns.

Sample ID & Bagged Replicate Readings	Instrmnt Result (ppm Pb)
Information: 124 P1 3	
Bag reading 1	488
2	485
3	503
4	
Mean	492.0
SD	9.6
%RSD	2.0
n =	3
Section 95%LCL =	468
Section 95%UCL =	516

Sample ID & Bagged Replicate Readings	Instrmnt Result (ppm Pb)
Information: 124 P1 3 QC1	
Bag reading 1	470
2	475
3	476
4	499
5	482
6	502
7	475
Mean	482.7
SD	12.7
%RSD	2.6
n =	7
Section 95%LCL =	471
Section 95%UCL =	494

Sample ID & Bagged Replicate Readings	Instrmnt Result (ppm Pb)
Information: 124 2 1	
Bag reading 1	252
2	241
3	249
4	
Mean	247.3
SD	123.3
%RSD	49.8
n =	3
Section 95%LCL =	-59
Section 95%UCL =	554

Information: 124 2 2	
Bag reading 1	233
2	246
3	249
4	
Mean	242.7
SD	8.5
%RSD	3.5
n =	3
Section 95%LCL =	222
Section 95%UCL =	264

Information: 124 2 3	
Bag reading 1	264
2	286
3	305
4	
Mean	285.0
SD	20.5
%RSD	7.2
n =	3
Section 95%LCL =	234
Section 95%UCL =	336

Information: 124 4 1	
Bag reading 1	474
2	482
3	475
4	
Mean	477.0
SD	4.4
%RSD	0.9
n =	3
Section 95%LCL =	466
Section 95%UCL =	488

Information: 124 SU2 SU Total	
Rep1	247
Rep2	243
Rep3	285
Mean	258.3
SD	23.2
%RSD	9.0
n =	3
Section 95%LCL =	201
Section 95%UCL =	316

Information: 124 4 2	
Bag reading 1	428
2	428
3	431
4	
Mean	429.0
SD	1.7
%RSD	0.4
n =	3
Section 95%LCL =	425
Section 95%UCL =	433

Information: 124 4 3	
Bag reading 1	378
2	385
3	409
4	407
5	396
6	388
7	399
8	387
9	382
Mean	392.3
SD	11.0
%RSD	2.8
n =	9
Section 95%LCL =	384
Section 95%UCL =	401

Information:	
Bag reading 1	
2	
3	
4	
Mean	
SD	
%RSD	
n =	
Section 95%LCL =	
Section 95%UCL =	

Information: 120 1 1	
Bag reading 1	895
2	861
3	916
4	
Mean	890.7
SD	27.8
%RSD	3.1
n =	3
Section 95%LCL =	822
Section 95%UCL =	960

Information: 120 1 2	
Bag reading 1	962
2	935
3	940
4	
Mean	945.7
SD	14.4
%RSD	1.5
n =	3
Section 95%LCL =	910
Section 95%UCL =	981

Information: 120 1 3	
Bag reading 1	782
2	824
3	812
4	
Mean	806.0
SD	21.6
%RSD	2.7
n =	3
Section 95%LCL =	752
Section 95%UCL =	860

Information: 120 SU1 SU Total	
Rep1	891
Rep2	946
Rep3	806
Mean	881.0
SD	70.5
%RSD	8.0
n =	3
Section 95%LCL =	706
Section 95%UCL =	1056

Information: 120 2 1	
Bag reading 1	239
2	208
3	231
4	
Mean	226.0
SD	16.1
%RSD	7.1
n =	3
Section 95%LCL =	186
Section 95%UCL =	266

Information: 120 2 2	
Bag reading 1	237
2	242
3	253
4	
Mean	244.0
SD	8.2
%RSD	3.4
n =	3
Section 95%LCL =	224
Section 95%UCL =	264

Information: 120 2 3	
Bag reading 1	251
2	268
3	256
4	
Mean	258.3
SD	8.7
%RSD	3.4
n =	3
Section 95%LCL =	237
Section 95%UCL =	280

Information: 120 SU2 SU Total	
Rep1	226
Rep2	244
Rep3	258
Mean	242.7
SD	16.0
%RSD	6.6
n =	3
Section 95%LCL =	203
Section 95%UCL =	283

Information: 175 1	
Bag reading 1	140
2	153
3	144
4	
Mean	145.7
SD	6.7
%RSD	4.6
n =	3
Section 95%LCL =	129
Section 95%UCL =	162

Information: 175 2	
Bag reading 1	136
2	130
3	136
4	
Mean	134.0
SD	3.5
%RSD	2.6
n =	3
Section 95%LCL =	125
Section 95%UCL =	143

Information: Sed 1	
Bag reading 1	1340
2	1499
3	1480
4	
Mean	1439.7
SD	86.8
%RSD	6.0
n =	3
Section 95%LCL =	1224
Section 95%UCL =	1655

Information: Sed 1 Dup	
Bag reading 1	1466
2	1452
3	1431
4	1459
5	1416
6	1446
7	1414
8	1460
9	1491
10	1212
Mean	1424.7
SD	78.3
%RSD	5.5
n =	10
Section 95%LCL =	1369
Section 95%UCL =	1481

Information: Sed 2	
Bag reading 1	454
2	362
3	460
4	422
5	406
6	382
Mean	414.3
SD	38.9
%RSD	9.4
n =	6
Section 95%LCL =	373
Section 95%UCL =	455

Information: Sed 3	
Bag reading 1	549
2	592
3	476
4	518
5	553
6	488
Mean	529.3
SD	43.7
%RSD	8.3
n =	6
Section 95%LCL =	483
Section 95%UCL =	575

Information: Sed 4	
Bag reading 1	339
2	297
3	279
4	
Mean	305.0
SD	30.8
%RSD	10.1
n =	3
Section 95%LCL =	229
Section 95%UCL =	381

Loc ID	SU	Rep
Information: 160	**1**	1
Bag reading 1		645
2		634
3		637
Mean		638.7
SD		5.7
%RSD		0.9
n =		3
Section 95%LCL =		625
Section 95%UCL =		653

Loc ID	SU	Rep
Information:	160 1	2
Bag reac	5/10/2012	770
2		731
3		661
4		
Mean		720.7
SD		55.2
%RSD		7.7
n =		3
2-sided CLs	Section 95%LCL =	583
	Section 95%UCL =	858

Loc ID	SU	Rep
Information:	160 1	3
Bag reac	5/10/2012	669
2		614
3		680
4		
Mean		654.3
SD		35.4
%RSD		5.4
n =		3
2-sided CLs	Section 95%LCL =	566
	Section 95%UCL =	742

Information: 160 1 SU Total	
Rep1	639
Rep2	721
Rep3	654
Mean	671.3
SD	43.7
%RSD	6.5
n =	3
Section 95%LCL =	563
Section 95%UCL =	780

Information: 160 Y1 1	
Bag reading 1	431
2	426
3	440
Mean	432.3
SD	7.1
%RSD	1.6
n =	3
Section 95%LCL =	415
Section 95%UCL =	450

Information: 160 Y1 3	
Bag reading 1	432
2	399
3	414
4	
Mean	312.0
SD	206.4
%RSD	66.2
n =	3
Section 95%LCL =	-201
Section 95%UCL =	825

Information: 160 Y1 2	
Bag reading 1	373
2	360
3	352
4	
Mean	361.7
SD	10.6
%RSD	2.9
n =	3
Section 95%LCL =	335
Section 95%UCL =	388

Information: 160 2 SU Total	
Rep1	257
Rep2	261
Rep3	279
Mean	265.7
SD	11.7
%RSD	4.4
n =	3
Section 95%LCL =	237
Section 95%UCL =	295

Information: 160 2 1	
Bag reading 1	244
2	258
3	270
Mean	257.3
SD	13.0
%RSD	5.1
n =	3
Section 95%LCL =	225
Section 95%UCL =	290

Information: 160 2 2	
Bag reac	5/10/2012 258
2	265
3	259
4	
Mean	260.7
SD	3.8
%RSD	1.5
n =	3
Section 95%LCL =	251
Section 95%UCL =	270

Information: 160 3	
Bag reac	5/10/2012 281
2	279
3	277
4	
Mean	279.0
SD	2.0
%RSD	0.7
n =	3
Section 95%LCL =	274
Section 95%UCL =	284

Information: 160 Y1 Y Totals	
Rep1	432
Rep2	361
Rep3	312
Mean	368.3
SD	60.3
%RSD	16.4
n =	3
Section 95%LCL =	218
Section 95%UCL =	518

Information: 121 2	
Bag reading 1	248
2	252
3	259
Mean	253.0
SD	5.6
%RSD	2.2
n =	3
Section 95%LCL =	239
Section 95%UCL =	267

Information: 215 1	
Bag reading 1	348
2	362
3	339
Mean	349.7
SD	11.6
%RSD	3.3
n =	3
Section 95%LCL =	321
Section 95%UCL =	378

Information: 215 2	
Bag reading 1	217
2	221
3	211
Mean	216.3
SD	5.0
%RSD	2.3
n =	3
Section 95%LCL =	204
Section 95%UCL =	229

Information: 160 Y2 Y Totals	
Rep1	216
Rep2	218
Rep3	516
Mean	316.7
SD	172.6
%RSD	54.5
n =	3
Section 95%LCL =	-112
Section 95%UCL =	746

Table C4. Summary of XRF Lead Results From Replicate Analyses of Bagged Incremental Composite Samples
Shaprio Brothers Salvage Site, Festus, Missouri

This spreadsheet summarizes replicate XRF analyses on individual bagged soil samples and calculates means, standard deviations, percent relative standard deviations and upper and lower 95% confidence limits. Field Replicate data are summarized in the far right-most columns.

Sample ID & Bagged Replicate Readings — Instrmnt Result (ppm Pb)

Information:			
160	Y2	1	
Bag reading 1		213	
2		217	
3		217	
	Mean	215.7	
	SD	2.3	
	%RSD	1.1	
	n =	3	
	Section 95%LCL =	210	
	Section 95%UCL =	221	
160	Y2	2	
Bag reading 1		226	
2		220	
3		209	
4			
	Mean	218.3	
	SD	8.6	
	%RSD	3.9	
	n =	3	
	Section 95%LCL =	197	
	Section 95%UCL =	240	
160	Y2	3	
Bag reading 1		509	
2		499	
3		540	
4			
	Mean	516.0	
	SD	21.4	
	%RSD	4.1	
	n =	3	
	Section 95%LCL =	463	
	Section 95%UCL =	569	
119		1	
Bag reading 1		408	
2		403	
3		406	
4			
	Mean	405.7	
	SD	2.5	
	%RSD	0.6	
	n =	3	
	Section 95%LCL =	399	
	Section 95%UCL =	412	
119		2	
Bag reading 1		174	
2		170	
3		169	
4			
	Mean	171.0	
	SD	2.6	
	%RSD	1.5	
	n =	3	
	Section 95%LCL =	164	
	Section 95%UCL =	178	
159		1	
Bag reading 1		484	
2		490	
3		487	
4			
	Mean	487.0	
	SD	3.0	
	%RSD	0.6	
	n =	3	
	Section 95%LCL =	480	
	Section 95%UCL =	494	
159		2	
Bag reading 1		178	
2		179	
3		185	
4			
	Mean	180.7	
	SD	3.8	
	%RSD	2.1	
	n =	3	
	Section 95%LCL =	171	
	Section 95%UCL =	190	
163	y1	1	
Bag reading 1		111	
2		104	
3		119	
	Mean	111.3	
	SD	7.5	
	%RSD	6.7	
	n =	3	
	Section 95%LCL =	93	
	Section 95%UCL =	130	
163	y1	2	
Bag reac	5/11/2012	118	
2		129	
3		130	
4			
	Mean	125.7	
	SD	6.7	
	%RSD	5.3	
	n =	3	
	Section 95%LCL =	109	
	Section 95%UCL =	142	
163	y1	3	
Bag reac	5/11/2012	136	
2		138	
3		136	
4			
	Mean	136.7	
	SD	1.2	
	%RSD	0.8	
	n =	3	
	Section 95%LCL =	134	
	Section 95%UCL =	140	
163	y1	Y totals	
Rep1		111	
Rep2		126	
Rep3		137	
	Mean	124.7	
	SD	13.1	
	%RSD	10.5	
	n =	3	
	Section 95%LCL =	92	
	Section 95%UCL =	157	
163	y2	1	
Bag reading 1		91	
2		105	
3		97	
	Mean	97.7	
	SD	7.0	
	%RSD	7.2	
	n =	3	
	Section 95%LCL =	80	
	Section 95%UCL =	115	
163	y2	2	grind
Bag reac	5/11/2012	110	
2		103	
3		104	
4			
	Mean	105.7	
	SD	3.8	
	%RSD	3.6	
	n =	3	
2-sided CLs	Section 95%LCL =	96	
	Section 95%UCL =	115	
163	y2		
Bag reac	5/11/2012	139	
2		133	
3		132	
4			
	Mean	134.7	
	SD	3.8	
	%RSD	2.8	
	n =	3	
2-sided CLs	Section 95%LCL =	125	
	Section 95%UCL =	144	
163	Y2	Y totals	
Rep1		98	
Rep2		106	
Rep3		135	
	Mean	113.0	
	SD	19.5	
	%RSD	17.2	
	n =	3	
	Section 95%LCL =	65	
	Section 95%UCL =	161	
163	su1	e845	
Bag reading 1		73	
2		74	
3		73	
	Mean	73.3	
	SD	0.6	
	%RSD	0.8	
	n =	3	
	Section 95%LCL =	72	
	Section 95%UCL =	75	
163	su1	2	
Bag reac	5/11/2012	87	
2		91	
3		91	
4			
	Mean	89.7	
	SD	2.3	
	%RSD	2.6	
	n =	3	
	Section 95%LCL =	84	
	Section 95%UCL =	95	
163	su1	3	
Bag reac	5/11/2012	84	
2		84	
3		91	
4			
	Mean	86.3	
	SD	4.0	
	%RSD	4.7	
	n =	3	
	Section 95%LCL =	76	
	Section 95%UCL =	96	
163	SU1	SU Totals	
Rep1		73	
Rep2		90	
Rep3		86	
	Mean	83.0	
	SD	8.9	
	%RSD	10.7	
	n =	3	
	Section 95%LCL =	61	
	Section 95%UCL =	105	
163	su2	1	
Bag reading 1		136	
2		129	
3		130	
	Mean	131.7	
	SD	3.8	
	%RSD	2.9	
	n =	3	
	Section 95%LCL =	122	
	Section 95%UCL =	141	
163	su2	2	
Bag reac	5/11/2012	140	
2		136	
3		129	
4			
	Mean	135.0	
	SD	5.6	
	%RSD	4.1	
	n =	3	
	Section 95%LCL =	121	
	Section 95%UCL =	149	
163	su2	3	
Bag reac	5/11/2012	126	
2		131	
3		124	
4			
	Mean	127.0	
	SD	3.6	
	%RSD	2.8	
	n =	3	
	Section 95%LCL =	118	
	Section 95%UCL =	136	
163	SU2	SU Totals	
Rep1		132	
Rep2		135	
Rep3		127	
	Mean	131.3	
	SD	4.0	
	%RSD	3.1	
	n =	3	
	Section 95%LCL =	121	
	Section 95%UCL =	141	
217	su	1	
Bag reading 1		385	
2		390	
3		406	
4		392	
5		390	
6		367	
7		379	
8		367	
9		386	
	Mean	384.7	
	SD	12.4	
	%RSD	3.2	
	n =	9	
	Section 95%LCL =	375	
	Section 95%UCL =	394	
217	su	2	
Bag reac	5/21/2012	264	
2		271	
3		257	
4			
	Mean	264.0	
	SD	7.0	
	%RSD	2.7	
	n =	3	
	Section 95%LCL =	247	
	Section 95%UCL =	281	
123	su	2	
Bag reac	5/21/2012	221	
2		230	
3		225	
4			
	Mean	225.3	
	SD	4.5	
	%RSD	2.0	
	n =	3	
	Section 95%LCL =	214	
	Section 95%UCL =	237	
vine telephone pole			
Bag reading 1		1134	
2		1165	
3		1232	
4		1127	
5		1164	
6		1203	
7		1180	
8		1187	
9		1188	
10		1221	
	Mean	1180.1	
	SD	34.0	
	%RSD	2.9	
	n =	10	
	Section 95%LCL =	1156	
	Section 95%UCL =	1204	
139	su	3	
Bag reac	5/21/2012	393	
2		408	
3		381	
4		384	
5		393	
6		432	
7		417	
8		396	
9		422	
#		412	
	Mean	403.8	
	SD	17.0	
	%RSD	4.2	
	n =	10	
	Section 95%LCL =	392	
	Section 95%UCL =	416	
133	su	2	
Bag reading 1		214	
2		206	
3		216	
	Mean	212.0	
	SD	5.3	
	%RSD	2.5	
	n =	3	
	Section 95%LCL =	199	
	Section 95%UCL =	225	
133	su	1	
Bag reac	5/21/2012	218	
2		185	
3		202	
4			
	Mean	201.7	
	SD	16.5	
	%RSD	8.2	
	n =	3	
	Section 95%LCL =	161	
	Section 95%UCL =	243	
134	su	2	
Bag reac	5/21/2012	138	
2		142	
3		143	
4			
	Mean	141.0	
	SD	2.6	
	%RSD	1.9	
	n =	3	
	Section 95%LCL =	134	
	Section 95%UCL =	148	
134	su	1	
Bag reading 1		161	
2		140	
3		145	
	Mean	148.7	
	SD	11.0	
	%RSD	7.4	
	n =	3	
	Section 95%LCL =	121	
	Section 95%UCL =	176	
		1	
174	su	3	
Bag reac	5/21/2012	1007	
2		936	
3		913	
4			
	Mean	952.0	
	SD	49.0	
	%RSD	5.1	
	n =	3	
	Section 95%LCL =	830	
	Section 95%UCL =	1074	

Table C4. Summary of XRF Lead Results From Replicate Analyses of Bagged Incremental Composite Samples
Shaprio Brothers Salvage Site, Festus, Missouri

This spreadsheet summarizes replicate XRF analyses on individual bagged soil samples and calculates means, standard deviations, percent relative standard deviations and upper and lower 95% confidence limits. Field Replicate data are summarized in the far right-most columns.

Sample ID & Bagged Replicate Readings | Instrmnt Result (ppm Pb)

Information: 174 su 2

Bag reading 1	301
2	309
3	304
Mean	304.7
SD	4.0
%RSD	1.3
n =	3
Section 95%LCL =	295
Section 95%UCL =	315

Information: 302 porter park

Bag reading 1	54
2	48
3	47
Mean	49.7
SD	3.8
%RSD	7.6
n =	3
Section 95%LCL =	40
Section 95%UCL =	59

Information: 300 st city Park

Bag reading 1	36
2	40
3	51
Mean	42.3
SD	7.8
%RSD	18.3
n =	3
Section 95%LCL =	23
Section 95%UCL =	62

Information: 110 su 2

Bag reading 1	476
2	479
3	463
Mean	472.7
SD	8.5
%RSD	1.8
n =	3
Section 95%LCL =	452
Section 95%UCL =	494

Information: 154 y1 rep3

Bag reading 1	182
2	187
3	173
Mean	180.7
SD	7.1
%RSD	3.9
n =	3
Section 95%LCL =	163
Section 95%UCL =	198

Information: 154 y2 rep3

Bag reading 1	417
2	408
3	391
Mean	405.3
SD	13.2
%RSD	3.3
n =	3
Section 95%LCL =	373
Section 95%UCL =	438

Information: 154 y3 rep3

Bag reading 1	312
2	314
3	321
Mean	315.7
SD	4.7
%RSD	1.5
n =	3
Section 95%LCL =	304
Section 95%UCL =	327

Information: 154 su1 rep3

Bag reading 1	229
2	211
3	208
Mean	216.0
SD	11.4
%RSD	5.3
n =	3
Section 95%LCL =	188
Section 95%UCL =	244

Sample ID & Bagged Replicate Readings | Instrmnt Result (ppm Pb)

Information: 174 su 1

Bag reac	5/21/2012	324
2		361
3		358
4		
Mean		347.7 #DIV/0!
SD		20.6 #DIV/0!
%RSD		5.9
n =		0 0
Section 95%LCL =		#NUM! #DIV/0!
Section 95%UCL =		#NUM! #DIV/0!

Information: 176 su 4

Bag reac	5/21/2012	283
2		296
3		322
4		
Mean		300.3
SD		19.9
%RSD		6.6
n =		3
Section 95%LCL =		251
Section 95%UCL =		350

Information: 117 su 2

Bag reac	5/21/2012	302
2		303
3		305
4		
Mean		303.3
SD		1.5
%RSD		0.5
n =		3
Section 95%LCL =		300
Section 95%UCL =		307

Information: 154 y1 rep1

Bag reac	5/21/2012	190
2		154
3		154
4		
Mean		166.0
SD		20.8
%RSD		12.5
n =		3
Section 95%LCL =		114
Section 95%UCL =		218

Information: 154 y2 rep1

Bag reac	5/21/2012	292
2		282
3		272
4		
Mean		282.0
SD		10.0
%RSD		3.5
n =		3
2-sided CLs	Section 95%LCL =	257
	Section 95%UCL =	307

Information: 154 y3 rep1

Bag reac	5/21/2012	344
2		330
3		343
4		
Mean		339.0
SD		7.8
%RSD		2.3
n =		3
Section 95%LCL =		320
Section 95%UCL =		358

Information: 154 su1 rep1

Bag reac	5/21/2012	201
2		225
3		197
4		
Mean		207.7
SD		15.1
%RSD		7.3
n =		3
Section 95%LCL =		170
Section 95%UCL =		245

Information: 154 su2 rep1

Bag reac	5/21/2012	255
2		257
3		243
4		
Mean		251.7
SD		7.6
%RSD		3.0
n =		3
Section 95%LCL =		233
Section 95%UCL =		270

Sample ID & Bagged Replicate Readings | Instrmnt Result (ppm Pb)

Information: 301 unset park

Bag reac	5/21/2012	84
2		90
3		94
4		
Mean		89.3
SD		5.0
%RSD		5.6
n =		3
Section 95%LCL =		77
Section 95%UCL =		102

Information: 180 2

Bag reac	5/21/2012	102
2		100
3		109
4		
Mean		103.7
SD		4.7
%RSD		4.6
n =		3
Section 95%LCL =		92
Section 95%UCL =		115

Information: 110 su 1

Bag reac	5/21/2012	1571
2		1600
3		1557
4		
Mean		1576.0
SD		21.9
%RSD		1.4
n =		3
Section 95%LCL =		1522
Section 95%UCL =		1630

Information: 154 y1 rep2

Bag reac	5/21/2012	176
2		180
3		182
4		
Mean		179.3
SD		3.1
%RSD		1.7
n =		3
Section 95%LCL =		172
Section 95%UCL =		187

Information: 154 y2 rep2

Bag reac	5/21/2012	232
2		234
3		237
4		
Mean		234.3
SD		2.5
%RSD		1.1
n =		3
2-sided CLs	Section 95%LCL =	228
	Section 95%UCL =	241

Information: 154 y3 rep2

Bag reac	5/21/2012	361
2		362
3		356
4		
Mean		359.7
SD		3.2
%RSD		0.9
n =		3
Section 95%LCL =		352
Section 95%UCL =		368

Information: 154 su1 rep2

Bag reac	5/21/2012	225
2		233
3		241
4		
Mean		233.0
SD		8.0
%RSD		3.4
n =		3
Section 95%LCL =		213
Section 95%UCL =		253

Information: 154 su2 rep2

Bag reac	5/21/2012	281
2		295
3		288
4		
Mean		288.0
SD		7.0
%RSD		2.4
n =		3
Section 95%LCL =		271
Section 95%UCL =		305

Information: 154 Y1 Y totals

Rep1	166
Rep2	179
Rep3	181
Mean	175.3
SD	8.1
%RSD	4.6
n =	3
Section 95%LCL =	155
Section 95%UCL =	196

Information: 154 Y2 Y totals

Rep1	181
Rep2	234
Rep3	405
Mean	273.3
SD	117.1
%RSD	42.8
n =	3
Section 95%LCL =	-17
Section 95%UCL =	564

Information: 154 Y3 Y totals

Rep1	339
Rep2	360
Rep3	316
Mean	338.3
SD	22.0
%RSD	6.5
n =	3
Section 95%LCL =	284
Section 95%UCL =	393

Information: 154 su1 SU Totals

Rep1	208
Rep2	233
Rep3	216
Mean	219.0
SD	12.8
%RSD	5.8
n =	3
Section 95%LCL =	187
Section 95%UCL =	251

Information: 154 Su2 SU Totals

Rep1	251
Rep2	288
Rep3	286
Mean	275.0
SD	20.8
%RSD	7.6
n =	3
Section 95%LCL =	223
Section 95%UCL =	327

Table C4. Summary of XRF Lead Results From Replicate Analyses of Bagged Incremental Composite Samples
Shaprio Brothers Salvage Site, Festus, Missouri

This spreadsheet summarizes replicate XRF analyses on individual bagged soil samples and calculates means, standard deviations, percent relative standard deviations and upper and lower 95% confidence limits. Field Replicate data are summarized in the far right-most columns.

Sample ID & Bagged Replicate Readings — Instrmnt Result (ppm Pb)

Information: 154 su2 rep3

Bag reading 1	281
2	295
3	282
Mean	286.0
SD	7.8
%RSD	2.7
n =	3
Section 95%LCL =	267
Section 95%UCL =	305

Information: 105 y1 rep3

Bag reading 1	504
2	519
3	529
Mean	517.3
SD	12.6
%RSD	2.4
n =	3
Section 95%LCL =	486
Section 95%UCL =	549

Information: 105 y2 rep2

Bag reading 1	650
2	692
3	690
Mean	677.3
SD	23.7
%RSD	3.5
n =	3
Section 95%LCL =	618
Section 95%UCL =	736

Information: 127 su 1

Bag reading 1	687
2	664
3	681
Mean	677.3
SD	11.9
%RSD	1.8
n =	3
Section 95%LCL =	648
Section 95%UCL =	707

Information: 103 su1 rep3

Bag reading 1	1043
2	1035
3	1126
Mean	1068.0
SD	50.4
%RSD	4.7
n =	3
Section 95%LCL =	943
Section 95%UCL =	1193

Information: 103 su3

Bag reading 1	495
2	487
3	523
Mean	501.7
SD	18.9
%RSD	3.8
n =	3
Section 95%LCL =	455
Section 95%UCL =	549

Information: 103 Y1 1

Bag reading 1	465
2	438
3	452
Mean	451.7
SD	13.5
%RSD	3.0
n =	3
Section 95%LCL =	418
Section 95%UCL =	485

Information: 103 y2 rep2 grind

Bag reading 1	400
2	378
3	390
	397
	399
	447
	374
	408
	379
	382
	395
Mean	395.4
SD	20.2
%RSD	5.1
n =	11
Section 95%LCL =	382
Section 95%UCL =	409

Loc ID SU Rep

Information: 105 2 QCI

Bag reading 1	407
2	410
3	395
4	389
5	430
6	418
7	380
Mean	404.1
SD	17.3
%RSD	4.3
n =	7
Section 95%LCL =	388
Section 95%UCL =	420

Loc ID SU Rep

Information: 105 3

Bag reading 1	1512
2	1595
3	1498
Mean	1535.0
SD	52.4
%RSD	3.4
n =	3
Section 95%LCL =	1405
Section 95%UCL =	1665

Sample ID & Bagged Replicate Readings — Instrmnt Result (ppm Pb)

Information: 105 y2 rep3

Bag reading 1	5/21/2012
2	695
3	682
4	744
Mean	707.0
SD	32.7
%RSD	4.6
n =	3
Section 95%LCL =	626
Section 95%UCL =	788

Information: 105 y1 rep1

Bag reading 1	5/21/2012
2	563
3	570
4	551
Mean	561.3
SD	9.6
%RSD	1.7
n =	3
Section 95%LCL =	537
Section 95%UCL =	585

Information: 139 su 1

Bag reading 1	5/21/2012	
2	222	
3	221	
4	244	
Mean	229.0	#DIV/0!
SD	13.0	#DIV/0!
%RSD	5.7	
n =	0	0
Section 95%LCL =	#NUM!	#DIV/0!
Section 95%UCL =	#NUM!	#DIV/0!

Information: 127 su 2

Bag reading 1	5/21/2012
2	209
3	212
4	193
Mean	204.7
SD	10.2
%RSD	5.0
n =	3
Section 95%LCL =	179
Section 95%UCL =	230

Information: 103 su2 rep1

Bag reading 1	5/21/2012
2	333
3	357
4	333
Mean	341.0
SD	13.9
%RSD	4.1
n =	3
Section 95%LCL =	307
Section 95%UCL =	375

Information: 103 y2 rep1

Bag reading 1	5/21/2012
2	692
3	719
4	682
Mean	697.7
SD	19.1
%RSD	2.7
n =	3
Section 95%LCL =	650
Section 95%UCL =	745

Information: 103 Y1 2

Bag reading 1	299
2	295
3	300
Mean	298.0
SD	2.6
%RSD	0.9
n =	3
Section 95%LCL =	291
Section 95%UCL =	305

Information: 103 su1 rep2 grind

Bag reading 1	5/21/2012
2	1168
3	1172
4	1200
5	1181
6	1174
7	1216
8	1216
9	1220
#	1202
#	1202
	1215
Mean	1196.9
SD	19.7
%RSD	1.6
n =	11
Section 95%LCL =	1184
Section 95%UCL =	1210

Loc ID SU

Information: 105 1

Bag reading 1	1145
2	1102
3	1058
Mean	1101.7
SD	468.1
%RSD	42.5
n =	6
Section 95%LCL =	610
Section 95%UCL =	1593

Sample ID & Bagged Replicate Readings — Instrmnt Result (ppm Pb)

Information: 105 y1 rep2

Bag reading 1	5/21/2012
2	624
3	560
4	560
Mean	581.3
SD	37.0
%RSD	6.4
n =	3
Section 95%LCL =	490
Section 95%UCL =	673

Information: 105 y2 rep1

Bag reading 1	5/21/2012
2	524
3	521
4	519
Mean	521.3
SD	2.5
%RSD	0.5
n =	3
Section 95%LCL =	515
Section 95%UCL =	528

Information: 139 su 2

Bag reading 1	5/21/2012
2	176
3	151
4	152
Mean	159.7
SD	14.2
%RSD	8.9
n =	3
Section 95%LCL =	125
Section 95%UCL =	195

Information: 103 su1 rep1

Bag reading 1	5/21/2012
2	1153
3	1125
4	1131
Mean	1136.3
SD	14.7
%RSD	1.3
n =	3
Section 95%LCL =	1100
Section 95%UCL =	1173

Information: 103 su2 rep2

Bag reading 1	41050
2	330
3	339
4	325
Mean	331.3
SD	7.1
%RSD	2.1
n =	3
Section 95%LCL =	314
Section 95%UCL =	349

Information: 103 y2 rep3

Bag reading 1	5/21/2012
2	582
3	613
4	601
Mean	598.7
SD	15.6
%RSD	2.6
n =	3
Section 95%LCL =	560
Section 95%UCL =	637

Information: 103 Y1 3

Bag reading 1	334
2	343
3	332
4	
Mean	336.3
SD	5.9
%RSD	1.7
n =	3
Section 95%LCL =	322
Section 95%UCL =	351

Information: 103 su2 rep3

Bag reading 1	5/21/2012
2	363
3	362
4	355
Mean	360.0
SD	4.4
%RSD	1.2
n =	3
Section 95%LCL =	349
Section 95%UCL =	371

Loc ID SU Rep

Information: 105 2

Bag reading 1	405
2	408
3	399
4	419
5	385
6	408
7	416
8	396
9	396
#	402
Mean	403.4
SD	10.1
%RSD	2.5
n =	10
Section 95%LCL =	396
Section 95%UCL =	411

Information: 105 Y1 Y totals

Rep1	561
Rep2	581
Rep3	517
Mean	553.0
SD	32.7
%RSD	5.9
n =	3
Section 95%LCL =	472
Section 95%UCL =	634

Information: 105 Y2 Y totals

Rep1	521
Rep2	677
Rep3	707
Mean	635.0
SD	99.9
%RSD	15.7
n =	3
Section 95%LCL =	387
Section 95%UCL =	883

Information: 103 su1 SU Totals

Rep1	1136
Rep2	1195
Rep3	1068
Mean	1133.0
SD	63.6
%RSD	5.6
n =	3
Section 95%LCL =	975
Section 95%UCL =	1291

Information: 103 SU2 SU Totals

Rep1	341
Rep2	331
Rep3	360
Mean	344.0
SD	14.7
%RSD	4.3
n =	3
Section 95%LCL =	307
Section 95%UCL =	381

Information: 103 Y2 Y Totals

Rep1	698
Rep2	395
Rep3	599
Mean	564.0
SD	154.5
%RSD	27.4
n =	3
Section 95%LCL =	180
Section 95%UCL =	948

Information: 103 Y1 Y Totals

Rep1	452
Rep2	298
Rep3	336
Mean	362.0
SD	80.2
%RSD	22.2
n =	3
Section 95%LCL =	163
Section 95%UCL =	561

Table C5. Summary of Selected Lead Results, Yard Samples
Shapiro Brothers Salvage Site, Jefferson County, Missouri

Residence Loc ID	SU	Area, square feet	Lead Concentration, mg/kg				
			Max[1]	Pb, Lab mg/kg	UCL[2]	Yard-Wide UCL[3]	Wipe, Pb ug/ft[2]
103	1	1100	--	1250	1240	**670**	--
	2	1950	--	--	370		--
	Drip Zone	--	540	--	--		--
115	1	1200	--	2360	2200	**650**	--
	2	13870	--	--	520		--
	Drip Zone	--	1360	--	--		--
	Wipe, table	--	--	--	--		4,000
	Wipe siding	--	--	--	--		950
116	1	900	--	--	2070	**410**	--
	2	8400	--	--	250		--
	Drip Zone	--	240	--	--		--
120	1	700	--	--	1000	**560**	--
	2	960	--	--	270		--
	Drip Zone	--	410	--	--		--
121	2	--		--	290	290	--
	Drip Zone	--	300	--	--		--
124	2	NA	--	--	300	300	--
	4 (Play Area)			--	510		--
	Drip Zone	--	250	--	--		--
125	1	950	--	--	1263	**500**	--
	2	4100	--	--	326		--
	Drip Zone	--	620	--	--		--
146	1	100	--	450	400	**630**	--
	2	5430	--	--	630		--
	Drip Zone	--	510	--	--		--
154	1	120	--	--	240	310	--
	2	6250	--	--	310		--
	Drip Zone	--	290	--	--		--
160	1	450	--	990	750	310	--
	2	6250	--	--	290		--
	Drip Zone	--	210	--	--		--
163	1	80	--	--	100	140	--
	2	6090	--	--	140		--
	Drip Zone	--	100	--	--		--
114	Wipe, siding	--	--	--	--	--	140
105	1	600	--	--	1210	**520**	--
	2	4430	--	500	440		--
	Drip Zone	--	830	--	--		--
	Wipe, chair	--	--	--	--		1,700
	Wipe, siding	--	--	--	--		4,900
106	1	320	--	680	580	260	--
	2	5150	--	--	240		--
	Drip Zone	--	630	--	--		--
108	2	NA	--	--	270	270	--
	Drip Zone	--	110	--			--
109	2	NA	--	--	320	320	--
	Drip Zone	--	280	--	--		--

Table C5. Summary of Selected Lead Results, Yard Samples
Shapiro Brothers Salvage Site, Jefferson County, Missouri

Residence Loc ID	SU	Area, square feet	Lead Concentration, mg/kg				
			Max[1]	Pb, Lab mg/kg	UCL[2]	Yard-Wide UCL[3]	Wipe, Pb ug/ft[2]
110	1	560	--	1620	1680	**570**	--
	2	8600	--	--	510		--
	Wipe, window	--	--	--	--		180
	Drip Zone	--	300	--	--		--
111	2	NA	--	--	200	200	--
117	1	300	--	--	1790	380	--
	2	9320	--	--	340		--
119	1	2010	--	450	420	270	--
	2	4020	--		210		--
123	2	NA	--	--	260	260	--
	Drip Zone	--	220	--	--		--
127	1	400	--	--	690	270	--
	2	5460	--	--	240		--
	Drip Zone	--	470	--	--		--
129	1	110	--	--	190	200	--
	2	7380	--	--	200		--
	Drip Zone	--	940	--	--		--
133	1	70	--		220	250	--
	2	3090	--	240	250		--
	Drip Zone	--	310	--	--		--
134	1	150	--	--	170	176	--
	2	9430	--	--	180		--
	Drip Zone	--	250	--	--		--
135	1	210	--	--	310	170	--
	2	9310	--	--	170		--
	Drip Zone	--	270	--	--		--
139	1	70		--	250	200	--
	2	5740	--	--	200		--
	Drip Zone	--	180	--	--		--
143	1	85	--	--	280	**480**	--
	2	3400	--	--	480		--
	Drip Zone	--	400	--	--		--
148	1	90	--	--	230	170	--
	2	5600	--	--	170		--
	Drip Zone	--	650	--	--		--
155	1	70	--	--	280	240	--
	2	2360	--	--	240		--
	Drip Zone	--	210	--	--		--
157	2	NA	--	--	130	130	--
	Drip Zone	--	80	--	--		--
158	2	NA	--	--	190	190	--
	Drip Zone	--	280	--	--		--
159	1	120	--	--	500	220	--
	2	4550	--	--	220		--
	Drip Zone	--	360	--	--		--
161	2	NA	--	--	120	120	--
164	2	NA	--	--	150	150	--
	Drip Zone	--	320	--	--		--

Table C5. Summary of Selected Lead Results, Yard Samples
Shapiro Brothers Salvage Site, Jefferson County, Missouri

Residence Loc ID	SU	Area, square feet	Lead Concentration, mg/kg				
			Max[1]	Pb, Lab mg/kg	UCL[2]	Yard-Wide UCL[3]	Wipe, Pb ug/ft^2
174	1	210	--	--	360	340	--
	2	6170	--	--	340		--
	Drip Zone	--	730	--	--		--
175	1	100	--	--	180	170	--
	2	5980	--	--	170		--
	Drip Zone	--	331	--	--		--
176	2	4920	--	--	290	290	--
	4 (Play Area)	80	--	--	340		--
	Drip Zone	--	330	--	--		--
179	2	NA	--	--	200	200	--
	Wipe, table	--	--	--	--		30
	Wipe, window	--	--	--	--		620
	Drip Zone	--	170	--	--		--
180	2	NA	--	--	140	140	--
	Drip Zone	--	130	--	--		--
215	1	200	--	--	370	260	--
	2	5550	--	--	250		--
	Drip Zone	--	680	--	--		--
216	2	NA	--	--	480	**480**	--
	Wipe, siding	--	--	--	--		190
	Drip Zone	--	580	--	--		--
217	1	70	--	420	430	310	--
	2	3480	--	--	300		--
	Drip Zone	--	430	--	--		--

All XRF data >1,000 mg/kg rounded to 3 significant digits; data <1,000 mg/kg rounded to 2 significant digits

[1] Maximum lead concentration measured in the drip zone via in-situ XRF analyses.

[2] 95% Upper confidence limit of lead concentration in SU calculated from field replicate samples using the Student's t method (Table C6)

[3] Yard-wide area-weighted 95% upper confidence limit of lead concentration in yard soil calculated from field replicate samples using the Student's t method (Tables C7 & C8)

Table C6. Calculation of UCLs for Yard Sampling Units (SUs)

Shapiro Brothers Site, Jefferson County, Missouri

Statistics for SUs With Replicates

Loc ID	103	103	115	115	116	116	120	120	124	124	125	125	146	146	154	154	160	160	163	163	221
SU	1	2	1	2	1	2	1	2	2	4	1	2	1	2	1	2	1	2	1	2	2
Rep 1	1136	341	2139	488	1957	238	891	226	247	477	1233	322	395	578	208	251	639	257	73	132	123
Rep 2	1195	331	2056	470	1801	239	946	244	243	429	1178	316	386	479	233	288	721	261	90	135	123
Rep 3	1068	360	2151	507	1970	222	806	258	285	392	1139	322	388	415	216	286	654	279	86	127	174
arithmetic mean	1133	344	2115	488	1909	233	881	243	258	433	1183	320	390	491	219	275	671	266	83	131	140
standard deviation	63.6	14.7	51.7	18.5	94.0	9.5	70.5	16.0	23.2	42.6	47.2	3.5	4.7	82.1	12.8	20.8	43.7	11.7	8.9	4.0	29.4
CV = SD / mean	0.056	0.043	0.024	0.038	0.049	0.041	0.080	0.066	0.090	0.099	0.040	0.011	0.012	0.167	0.058	0.076	0.065	0.044	0.107	0.031	0.210
count (r)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
alpha (95% = 0.05)	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
t(alpha, df=r-1)	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92
Student's t 95%UCL	1240	369	2203	520	2068	249	1000	270	297	505	1263	326	398	629	241	310	745	285	98	138	190
Chebychev 95%UCL	1293	381	2246	535	2146	257	1059	283	317	540	1302	329	402	697	251	327	781	295	105	142	214

Deriving Measure of Variability Using SD For SU1

	Hi Conc. SD	Low Conc. SD
	64	12.8
	52	8.9
	94	4.7
	71	
	47	
	44	
Mean SD for SU1	62	9

Deriving Measure of Variability Using SD For SU2

	SU2 SD
	15
	19
	9.5
	16
	23
	3.5
	82
	21
	12
	4
Mean SD for SU2	21

Since the Pb concentrations in SU1 had a wide range, the measure of variability for that SU was broken into 2 categories; high (>600 ppm and low <600ppm). The SDs for each category were averaged. The average SD for each category was then used in the tables below as the measure of variablity for SU1 at yards where no replicates were collected based on the Pb conc. measured in each SU1.

Since the range of Pb concentrations for SU2 was narrower, a single measure of variability (mean SD) was used for calculating UCLs for all SU2s

Discrete sampling data from in-situ measurements in SU1 (Figure C6) showed that the distribution of lead was not normal, but did have a low coefficient of variation (was not highly skewed) justifying the use of the Student's t UCL calculation method.

Student's t UCL :

$$UCL = \overline{X} + t_{(1-\alpha)*(r-1)} * \frac{S_{\overline{X}}}{\sqrt{r}}$$

Statistics For SUs With No Replicates Using Variability Derived From SUs With Replicates

Loc ID	105	105	106	106	108	109	110	110	111	121	117	117	119	119	123	127	127	129	129	133	133	134	134	135	135	139	139
SU	1	2	1	2	2	2	1	2	2	2	1	2	1	2	2	1	2	1	2	1	2	1	2	1	2	1	2
arithmetic mean	1102	403	561	206	230	288	1576	473	169	253	1688	303	406	171	225	677	205	176	165	202	212	149	141	292	132	229	160
standard deviation	62	21	9	21	21	21	62	21	21	21	62	21	9	21	21	9	21	9	21	11	21	11	21	11	21	11	21
CV = SD / mean	0.056	0.052	0.016	0.102	0.091	0.073	0.039	0.044	0.124	0.083	0.037	0.069	0.022	0.123	0.093	0.013	0.102	0.051	0.127	0.054	0.099	0.074	0.149	0.038	0.159	0.048	0.131
count (r)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
alpha (95% = 0.05)	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
t(alpha, df=r-1)	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92
Student's t 95%UCL	1207	438	576	241	265	323	1681	508	204	288	1,793	338	421	206	260	692	240	191	200	221	247	168	176	311	167	248	195
Chebychev 95%UCL	1258	456	584	259	283	341	1732	526	222	306	1,844	356	429	224	278	700	258	199	218	230	265	177	194	320	185	257	213

Statistics For SUs With No Replicates Using Variability Derived From SUs With Replicates (cont.)

Loc ID	143	143	148	148	155	155	157	158	159	159	161	164	174	174	176	176	179	180	180	215	215	216	217	217	175	175
SU	1	2	1	2	1	2	2	2	1	2	2	2	1	2	2	4	2	2	2	1	2	2	1	2	1	2
arithmetic mean	268	445	190	133	261	203	97	159	487	180	86	118	348	305	251	300	168	104	104	350	216	443	385	264	146	134
standard deviation	9	21	21	21	9	21	21	21	9	21	21	21	9	21	21	21	21	21	21	9	21	21	24	21	21	21
CV = SD / mean	0.034	0.047	0.111	0.158	0.034	0.103	0.216	0.132	0.018	0.117	0.244	0.178	0.026	0.069	0.084	0.070	0.125	0.202	0.202	0.026	0.097	0.047	0.062	0.080	0.144	0.157
count (r)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
alpha (95% = 0.05)	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
t(alpha, df=r-1)	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92	2.92
Student's t 95%UCL	283	480	225	168	276	238	132	194	502	215	121	153	363	340	286	335	203	139	139	365	251	478	425	299	181	169
Chebychev 95%UCL	291	498	243	186	284	256	150	212	510	233	139	171	371	358	304	353	221	157	157	373	269	496	445	317	199	187

Values in blue shaded cells are user-entered

Values in green are recommended 95% UCLs

Table C7. Calculation of Area-Weighted 95% UCLs for Yard Decision Units (DUs) Where Replicates Were Collected

Shapiro Brothers Site, Jefferson County, Missouri

SAMPLING UNITS WHERE REPLICATES WERE COLLECTED

SU	Loc ID	SU Area (ft^2)	Replicate concentration Rep 1	Rep 2	Rep 3	Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	Chebychev
1	103	1100.00	1136	1195	1068	3	0.36	1133.0	63.6	36.7	1240.1	1292.9
2		1950.00	341	331	360	3	0.64	344.0	14.7	8.5	368.8	381.1
Combined DUs Weighted by Area		**3050.00**	--	--	--	**6**	**1.00**	**628.6**	**24.8**	**14.3**	**670.3**	**690.9**

Degrees of freedom by Welch-Satterthwaite approximation **2.66**

SU	Loc ID	SU Area (ft^2)	Replicate concentration Rep 1	Rep 2	Rep 3	Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	Chebychev
1	116	900.00	1957	1801	1970	3	0.10	1909.3	94.0	54.3	2067.9	2146.0
2		8400.00	238	239	222	3	0.90	233.0	9.5	5.5	249.1	257.0
Combined DUs Weighted by Area		**9300.00**	--	--	--	**6**	**1.00**	**395.2**	**12.5**	**7.2**	**412.3**	**426.8**

Degrees of freedom by Welch-Satterthwaite approximation **3.99**

SU	Loc ID	SU Area (ft^2)	Replicate concentration Rep 1	Rep 2	Rep 3	Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	Chebychev
1	115	1200.00	2139	2056	2151	3	0.08	2115.3	51.7	29.9	2202.5	2245.5
2		13870.00	488	470	507	3	0.92	488.3	18.5	10.7	519.5	534.9
Combined DUs Weighted by Area		**15070.00**	--	--	--	**6**	**1.00**	**617.9**	**17.5**	**10.1**	**647.4**	**662.0**

Degrees of freedom by Welch-Satterthwaite approximation **2.23**

SU	Loc ID	SU Area (ft^2)	Replicate concentration Rep 1	Rep 2	Rep 3	Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	Chebychev
1	120	700.00	891	946	806	3	0.42	881.0	70.5	40.7	999.9	1058.5
2		960.00	226	244	258	3	0.58	242.7	16.0	9.3	269.7	283.0
Combined DUs Weighted by Area		**1660.00**	--	--	--	**6**	**1.00**	**511.8**	**31.2**	**18.0**	**564.4**	**590.3**

Degrees of freedom by Welch-Satterthwaite approximation **2.39**

SU	Loc ID	SU Area (ft^2)	Replicate concentration Rep 1	Rep 2	Rep 3	Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	Chebychev
2	124	1.00	247	243	285	3	1.00	258.3	23.2	13.4	297.4	316.7
		0.00										
Combined DUs Weighted by Area		**1.00**	--	--	--	**3**	**1.00**	**258.3**	**23.2**	**13.4**	**297.4**	**316.7**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Replicate concentration Rep 1	Rep 2	Rep 3	Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	Chebychev
1	125	950.00	1233	1178	1139	3	0.19	1183.3	47.2	27.3	1263.0	1302.2
2		4100.00	322	316	322	3	0.81	320.0	3.5	2.0	325.8	328.7
Combined DUs Weighted by Area		**5050.00**	--	--	--	**6**	**1.00**	**482.4**	**9.3**	**5.4**	**498.1**	**505.9**

Degrees of freedom by Welch-Satterthwaite approximation **2.40**

SU	Loc ID	SU Area (ft^2)	564 Rep 1	Rep 2	Rep 3	Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	Chebychev
1	146	100.00	395	386	388	3	0.02	389.7	4.7	2.7	397.6	401.6
2		5430.00	578	479	415	3	0.98	490.7	82.1	47.4	629.1	697.3
Combined DUs Weighted by Area		**5530.00**	--	--	--	**6**	**1.00**	**488.8**	**80.6**	**46.6**	**624.8**	**691.8**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Replicate concentration Rep 1	Rep 2	Rep 3	Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	Chebychev
1	154	120.00	208	233	216	3	0.02	219.0	12.8	7.4	240.5	251.1
2		6250.00	251	288	286	3	0.98	275.0	20.8	12.0	310.1	327.4
Combined DUs Weighted by Area		**6370.00**	--	--	--	**6**	**1.00**	**273.9**	**20.4**	**11.8**	**308.4**	**325.3**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Replicate concentration Rep 1	Rep 2	Rep 3	Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	Chebychev
1	160	450.00	639	721	654	3	0.07	671.3	43.7	25.2	744.9	781.2
2		6250.00	257	261	279	3	0.93	265.7	11.7	6.8	285.4	295.2
Combined DUs Weighted by Area		**6700.00**	--	--	--	**6**	**1.00**	**292.9**	**11.3**	**6.5**	**312.0**	**321.4**

Degrees of freedom by Welch-Satterthwaite approximation **2.29**

Table C7. Calculation of Area-Weighted 95% UCLs for Yard Decision Units (DUs) Where Replicates Were Collected

Shapiro Brothers Site, Jefferson County, Missouri

SAMPLING UNITS WHERE REPLICATES WERE COLLECTED

SU	Loc ID	SU Area (ft^2)	Replicate concentration			Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL	
			Rep 1	Rep 2	Rep 3						Student's-t	Chebychev
1	163	80.00	73	90	86	3	0.01	83.0	8.9	5.1	98.0	105.4
2		6090.00	132	135	127	3	0.99	131.3	4.0	2.3	138.1	141.5
Combined DUs Weighted by Area		**6170.00**	--	--	--	**6**	**1.00**	**130.7**	**4.0**	**2.3**	**137.4**	**140.7**

Degrees of freedom by Welch-Satterthwaite approximation	**2.00**

Values in yellow cells are user-entered

Values in green cells are recommended UCLs

Notes

DU Decision unit

SD Standard deviation

SE Standard errror

UCL Upper confidence limit

References

ITRC. 2012. Technical and Regulatory Guidance, Incremental Sampling Methodology. February.

EPA. 2010. "ProUCL Version 4.1.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. May. Available online at: http://www.epa.gov/osp/hstl/tsc/ProUCL_v4.1_user.pdf

When there are multiple samples in each strata, the overall mean of the larger DU can be estimated using the following formulae. Let n_i represent the number of samples from region *i*, *x*-bar represent the mean of the ISM samples from region *i*, s_i represent the SD of the replicate ISM samples from region *i*, and w_i represent the weight, i.e., the relative size associated with region *i*. Note that if all strata are of the same size, the w_i are equal, and these equations simplify to the more common calculation methods for the mean and standard deviation. The relative size is the percentage of the larger DU that is made up of region *i*. The weighted mean is thus:

$$\text{Weighted Mean} = \sum_i w_i \bar{x}_i$$

The standard error associated with the weighted mean is:

$$\text{Standard Error} = \sqrt{\sum_i w_i^2 \frac{s_i^2}{n_i}}$$

which has degrees of freedom approximated by the Welch-Satterthwaite approximation (Cochran, 1977):

$$df \approx \frac{\left(\sum_i \frac{w_i^2}{n_i} s_i^2\right)^2}{\sum_i \frac{\left(\frac{w_i^2}{n_i} s_i^2\right)^2}{n_i - 1}}$$

Table C8. Calculation of Area-Weighted 95% UCLs for Yard Decision Units (DUs) Where Replicates Were Not Collected

Shapiro Brothers Site, Jefferson County, Missouri

SAMPLING UNITS WHERE NO REPLICATES WERE COLLECTED

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	105	600.00	1102		3	0.12	1102.0	62.0	35.8	1206.5	1258.0
2		4430.00	403		3	0.88	403.0	21.0	12.1	438.4	455.8
Combined SUs Weighted by Area		**5030.00**	--	--	**6**	**1.00**	**486.4**	**19.9**	**11.5**	**520.0**	**536.5**

Degrees of freedom by Welch-Satterthwaite approximation **2.62**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	106	320.00	561		3	0.06	561.0	9.0	5.2	576.2	583.6
2		5150.00	206		3	0.94	206.0	21.0	12.1	241.4	258.8
Combined SUs Weighted by Area		**5470.00**	--	--	**6**	**1.00**	**226.8**	**19.8**	**11.4**	**260.1**	**276.5**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
2	108	1.00	230		3	1.00	230.0	21.0	12.1	265.4	282.8
		0.00			3		0.0				
Combined SUs Weighted by Area		**1.00**	--	--	**6**	**1.00**	**230.0**	**21.0**	**12.1**	**265.4**	**282.8**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
2	109	1.00	288		3	1.00	288.0	21.0	12.1	323.4	340.8
		0.00	0		3		0.0				
Combined SUs Weighted by Area		**1.00**	--	--	**6**	**1.00**	**288.0**	**21.0**	**12.1**	**323.4**	**340.8**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	110	560.00	1576		3	0.06	1576.0	62.0	35.8	1680.5	1732.0
2		8600.00	473		3	0.94	473.0	21.0	12.1	508.4	525.8
Combined SUs Weighted by Area		**9160.00**	--	--	**6**	**1.00**	**540.4**	**20.1**	**11.6**	**574.3**	**591.0**

Degrees of freedom by Welch-Satterthwaite approximation **2.15**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
2	111	1.00	169		3	1.00	169.0	21.0	12.1	204.4	221.8
		0.00			3		0.0				
Combined SUs Weighted by Area		**1.00**	--	--	**6**	**1.00**	**169.0**	**21.0**	**12.1**	**204.4**	**221.8**

Degrees of freedom by Welch-Satterthwaite approximation **2.0**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
2	121	1.00	253		3	1.00	253.0	21.0	12.1	288.4	305.8
					3		0.0				
Combined SUs Weighted by Area		**1.00**	--	--	**6**	**1.00**	**253.0**	**21.0**	**12.1**	**288.4**	**305.8**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	117	300.00	1688		3	0.03	1688.0	62.0	35.8	1792.5	1844.0
2		9320.00	303		3	0.97	303.0	21.0	12.1	338.4	355.8
Combined SUs Weighted by Area		**9620.00**	--	--	**6**	**1.00**	**346.2**	**20.4**	**11.8**	**380.6**	**397.6**

Degrees of freedom by Welch-Satterthwaite approximation **2.04**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	119	2010.00	406		3	0.33	406.0	9.0	5.2	421.2	428.6
2		4020.00	171		3	0.67	171.0	21.0	12.1	206.4	223.8
Combined SUs Weighted by Area		**6030.00**	--	--	**6**	**1.00**	**249.3**	**14.3**	**8.3**	**273.5**	**285.4**

Degrees of freedom by Welch-Satterthwaite approximation **2.18**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
2	123	1.00	225		3	1.00	225.0	21.0	12.1	260.4	277.8
0		0.00			3		0.0				
Combined SUs Weighted by Area		**1.00**	--	--	**6**	**1.00**	**225.0**	**21.0**	**12.1**	**260.4**	**277.8**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	127	400.00	677		3	0.07	677.0	9.0	5.2	692.2	699.6
2		5460.00	205		3	0.93	205.0	21.0	12.1	240.4	257.8
Combined SUs Weighted by Area		**5860.00**	--	--	**6**	**1.00**	**237.2**	**19.6**	**11.3**	**270.2**	**286.5**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

Table C8. Calculation of Area-Weighted 95% UCLs for Yard Decision Units (DUs) Where Replicates Were Not Collected

Shapiro Brothers Site, Jefferson County, Missouri

SAMPLING UNITS WHERE NO REPLICATES WERE COLLECTED

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	129	110.00	176		3	0.01	176.0	9.0	5.2	191.2	198.6
2		7380.00	165		3	0.99	165.0	21.0	12.1	200.4	217.8
Combined SUs Weighted by Area		**7490.00**	--	--	**6**	**1.00**	**165.2**	**20.7**	**11.9**	**200.0**	**217.2**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	133	70.00	202		3	0.02	202.0	9.0	5.2	217.2	224.6
2		3090.00	212		3	0.98	212.0	21.0	12.1	247.4	264.8
Combined SUs Weighted by Area		**3160.00**	--	--	**6**	**1.00**	**211.8**	**20.5**	**11.9**	**246.4**	**263.5**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	134	150.00	149		3	0.02	149.0	9.0	5.2	164.2	171.6
2		9430.00	141		3	0.98	141.0	21.0	12.1	176.4	193.8
Combined SUs Weighted by Area		**9580.00**	--	--	**6**	**1.00**	**141.1**	**20.7**	**11.9**	**176.0**	**193.1**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	135	210.00	292		3	0.02	292.0	9.0	5.2	307.2	314.6
2		9310.00	132		3	0.98	132.0	21.0	12.1	167.4	184.8
Combined SUs Weighted by Area		**9520.00**	--	--	**6**	**1.00**	**135.5**	**20.5**	**11.9**	**170.2**	**187.2**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	139	70.00	229		3	0.01	229.0	9.0	5.2	244.2	251.6
2		5740.00	160		3	0.99	160.0	21.0	12.1	195.4	212.8
Combined SUs Weighted by Area		**5810.00**	--	--	**6**	**1.00**	**160.8**	**20.7**	**12.0**	**195.8**	**213.0**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	143	85.00	268		3	0.02	268.0	9.0	5.2	283.2	290.6
2		3400.00	445		3	0.98	445.0	21.0	12.1	480.4	497.8
Combined SUs Weighted by Area		**3485.00**	--	--	**6**	**1.00**	**440.7**	**20.5**	**11.8**	**475.2**	**492.2**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	148	90.00	190		3	0.02	190.0	9.0	5.2	205.2	212.6
2		5600.00	133		3	0.98	133.0	21.0	12.1	168.4	185.8
Combined SUs Weighted by Area		**5690.00**	--	--	**6**	**1.00**	**133.9**	**20.7**	**11.9**	**168.7**	**185.9**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	155	70.00	261		3	0.03	261.0	9.0	5.2	276.2	283.6
2		2360.00	203		3	0.97	203.0	21.0	12.1	238.4	255.8
Combined SUs Weighted by Area		**2430.00**	--	--	**6**	**1.00**	**204.7**	**20.4**	**11.8**	**239.1**	**256.0**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
2	157	1.00	97		3	1.00	97.0	21.0	12.1	132.4	149.8
		0.00			3		0.0				
Combined SUs Weighted by Area		**1.00**	--	--	**6**	**1.00**	**97.0**	**21.0**	**12.1**	**132.4**	**149.8**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
2	158	1.00	159		3	1.00	159.0	21.0	12.1	194.4	211.8
		0.00			3		0.0				
Combined SUs Weighted by Area		**1.00**	--	--	**6**	**1.00**	**159.0**	**21.0**	**12.1**	**194.4**	**211.8**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	159	120.00	487		3	0.03	487.0	9.0	5.2	502.2	509.6
2		4550.00	180		3	0.97	180.0	21.0	12.1	215.4	232.8
Combined SUs Weighted by Area		**4670.00**	--	--	**6**	**1.00**	**187.9**	**20.5**	**11.8**	**222.4**	**239.4**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

Table C8. Calculation of Area-Weighted 95% UCLs for Yard Decision Units (DUs) Where Replicates Were Not Collected

Shapiro Brothers Site, Jefferson County, Missouri

SAMPLING UNITS WHERE NO REPLICATES WERE COLLECTED

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
2	161	1.00	86		3	1.00	86.0	21.0	12.1	121.4	138.8
		0.00			3		0.0				
Combined SUs Weighted by Area		**1.00**	--	--	**6**	**1.00**	**86.0**	**21.0**	**12.1**	**121.4**	**138.8**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
2	164	1.00	118		3	1.00	118.0	21.0	12.1	153.4	170.8
		0.00									
Combined SUs Weighted by Area		**1.00**	--	--	**3**	**1.00**	**118.0**	**21.0**	**12.1**	**153.4**	**170.8**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	174	210.00	348		3	0.03	348.0	9.0	5.2	363.2	370.6
2		6170.00	305		3	0.97	305.0	21.0	12.1	340.4	357.8
Combined SUs Weighted by Area		**6380.00**	--	--	**6**	**1.00**	**306.4**	**20.3**	**11.7**	**340.7**	**357.5**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	175	100.00	146		3	0.02	146.0	9.0	5.2	161.2	168.6
2		5980.00	134		3	0.98	134.0	21.0	12.1	169.4	186.8
Combined SUs Weighted by Area		**6080.00**	--	--	**6**	**1.00**	**134.2**	**20.7**	**11.9**	**169.0**	**186.2**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
2	176	4920.00	251		3	0.98	251.0	21.0	12.1	286.4	303.8
4		80.00	300		3	0.02	300.0	21.0	12.1	335.4	352.8
Combined SUs Weighted by Area		**5000.00**	--	--	**6**	**1.00**	**251.8**	**20.7**	**11.9**	**286.6**	**303.8**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
2	179	1.00	168		3	1.00	168.0	21.0	12.1	203.4	220.8
		0.00			3		0.0				
Combined SUs Weighted by Area		**1.00**	--	--	**6**	**1.00**	**168.0**	**21.0**	**12.1**	**203.4**	**220.8**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
2	180	1.00	104		3	1.00	104.0	21.0	12.1	139.4	156.8
		0.00			3		0.0				
Combined SUs Weighted by Area		**1.00**	--	--	**6**	**1.00**	**104.0**	**21.0**	**12.1**	**139.4**	**156.8**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	215	220.00	350		3	0.04	350.0	9.0	5.2	365.2	372.6
2		5550.00	216		3	0.96	216.0	21.0	12.1	251.4	268.8
Combined SUs Weighted by Area		**5770.00**	--	--	**6**	**1.00**	**221.1**	**20.2**	**11.7**	**255.2**	**272.0**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
2	216	1.00	443		3	1.00	443.0	21.0	12.1	478.4	495.8
		0.00			3		0.0				
Combined SUs Weighted by Area		**1.00**	--	--	**6**	**1.00**	**443.0**	**21.0**	**12.1**	**478.4**	**495.8**

Degrees of freedom by Welch-Satterthwaite approximation **2.00**

SU	Loc ID	SU Area (ft^2)	Estimate of Mean		Number of Replicates	Weight	Arithmetic Mean	SD of replicates	SE of DU	95% UCL Student's-t	95% UCL Chebychev
1	217	700.00	385		3	0.17	385.0	9.0	5.2	400.2	407.6
2		3480.00	264		3	0.83	264.0	21.0	12.1	299.4	316.8
Combined SUs Weighted by Area		**4180.00**	--	--	**6**	**1.00**	**284.3**	**17.5**	**10.1**	**313.8**	**328.4**

Degrees of freedom by Welch-Satterthwaite approximation **2.03**

Values in yellow cells are user-entered

Values in green cells are recommended UCLs

Table C8. Calculation of Area-Weighted 95% UCLs for Yard Decision Units (DUs) Where Replicates Were Not Collected

Shapiro Brothers Site, Jefferson County, Missouri

SAMPLING UNITS WHERE NO REPLICATES WERE COLLECTED

Notes

DU Decision unit
SD Standard deviation
SE Standard errror
UCL Upper confidence limit
User-entered SD of replicates obtained from SUs in which replicates were collected (see Table C6)

References

ITRC. 2012. Technical and Regulatory Guidance, Incremental Sampling Methodology. February.
EPA. 2010. "ProUCL Version 4.1.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. May. Available online at:

When there are multiple samples in each strata, the overall mean of the larger DU can be estimated using the following formulae. Let n_i represent the number of samples from region i, x–bar$i$ represent the mean of the ISM samples from region i, s_i represent the SD of the replicate ISM samples from region i, and w_i represent the weight, i.e., the relative size associated with region i. Note that if all strata are of the same size, the w_i are equal, and these equations simplify to the more common calculation methods for the mean and standard deviation. The relative size is the percentage of the larger DU that is made up of region i. The weighted mean is thus:

$$\textbf{Weighted Mean} = \sum_i w_i \bar{x}_i$$

The standard error associated with the weighted mean is:

$$\textbf{Standard Error} = \sqrt{\sum_i w_i^2 \frac{s_i^2}{n_i}}$$

which has degrees of freedom approximated by the Welch-Satterthwaite approximation (Cochran, 1977):

$$df \approx \frac{\left(\sum_i \frac{w_i^2}{n_i} s_i^2\right)^2}{\sum_i \frac{\left(\frac{w_i^2}{n_i} s_i^2\right)^2}{n_i - 1}}$$

Table C9. Summary of Selected Lead Results, Background Samples
Shapiro Brothers Salvage Site, Jefferson County, Missouri

Loc ID	SU	Area, square feet	Lead Concentration, mg/kg			
			Max[1]	Pb, Lab mg/kg	Average[2]	Wipe, Pb ug/ft^2
218 (Background Yard)	2	NA	--	--	180	--
	Wipe, siding	--	--	--	--	<20
	Drip Zone	--	350	--	--	--
221 (Background Yard)	2	NA	--	--	140	--
	Drip Zone	--	170	--	--	--
222 (Background Yard)	2	NA	--	--	90	--
	Drip Zone	--	100	--	--	--
224 (Background Yard)	2	NA	--	--	140	--
	Wipe, chair	--	--	--	--	28
	Wipe, siding	--	--	--	--	<20
	Drip Zone	--	530	--	--	--
300 (Park Background)	---	10,000	---	45	42	--
301 (Park Background)	---	10,000	---	55	50	--
302 (Park Background)	---	10,000	---	99	89	--
Street Sweepings (Background)	---	NA	---	--	190	--

[1] Maximum lead concentration measured in the drip zone via in-situ XRF analyses.

[2] Result from incremental composite sample collected from the sampling unit

Table C10: Selected Analytical Results for Soil and Waste Samples
Shapiro Brothers Salvage Site, Festus, Missouri

- All values listed in parts per million (mg/kg) unless otherwise noted.
- NL denotes benchmark value not listed in reference source.
- NA denotes not analyzed

Sample Tag Number	1201151 / 1201152	1201153 / 1201154	1201155 / 1201156	1201157 / 1201158	1201159 / 1201160	1201161 / 1201162	1201163 / 1201164	1201165 / 1201166	1201167 / 1201168	1201170 / 1201170	1201171 / 1201172	H1000001	H1000003	H1000014	SCDM[1]	MRBCA RBTL[2]			EPA SL[3]		
Sample ID	Truck Wash Solids TW 1-4	Truck Wash Solids TW 5-8	Truck Wash Solids TW 9-12	Street Sweepings Sacks A,B,C,D	N. End RR Spur	E. Roadway near Maint. Bldg	Scrap Pile East Edge Near Shear	E. Roadway T-junctn. Between Scrap Piles 1&2	Head of E. Roadway N. or Shredder	Fluff Material from Fluff Pile	Soil From Under Fluff Pile	Loc_ID 110	Loc_ID 103	Soil Under Transformer							
Date Collected	01/11/12	01/11/12	01/11/12	01/11/12	01/11/12	01/11/12	01/11/12	01/11/12	01/11/12	01/11/12	01/11/12	04/10/12	04/09/12	04/10/12							
Depth of Sample, in	--	--	--	--	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1		Res.	Non-Res	Migrn to GW	Res.	Ind.	Migrn to GW
Laboratory Number	AB65031/AB65042	AB65032/AB65043	AB65044/AB65033	AB65045/AB65034	AB65046/AB65035	AB65047/AB65036	AB65048/AB65037	AB65038/AB65038	AB65039/AB65050	AB65040/AB65051	AB65071/AB65071	AB76419	AB76421	AB76432							
Metals																					
Antimony	6.58	10.7	9.96	8.17	10.7	14.9	84.4	10.6 (f)	6.66	24.8	47.5	NA	NA	NA	31	30.4	383	6.67	31	410	0.66
Arsenic	5.98	7.93	9.72	6.81	12.2	14.1	74.0	25.6 (f)	5.55	13.1	19.1	5.22	4.69	NA	0.43	3.89	15.9	7.22	0.39	1.6	0.0013
Barium	436.0	427.0	476.0	436.0	446.0	365.0	333.0	219.0	274.0	1,360.0	2,140.0	NA	NA	NA	5500	15000	181000	2040	15000	190000	300
Beryllium	.15 (e)	.155 (e)	.161 (e)	.176 (e)	.16 (e)	.246 (e)	.159 (e)	.243 (e)	.132 (e)	.118 (e)	.115 (e)	NA	NA	NA	160	0.737	3.19	78.4	160	2000	58
Cadmium	17.1	18.1	19.5	17.1	21.6	43.9	480.0	41.9	21.1	30.5	35.1	16.2	10.5	NA	39	16.8	74.8	9.32	70	80	1.4
Chromium	49.9	52.1	62.6	72.1	213.0	130.0	1,130.0	85.7	43.5	337.0	443.0	NA	NA	NA	230	74600	472000	4E+06	120000	1500000	9.9E+07
Copper	210.0	588.0	6,620.0	885.0	536.0	3,820.0	1,940.0	1,260.0	587.0	1,880.0	2,240.0	NA	NA	NA	NL	3040	38100	618	3100	41000	51
Lead	2,170.0	3,980.0	2,470.0	2,440.0	3,480.0	10,500.0	37,400.0	16,200.0	1,620.0	1,890.0	4,420.0	1,620.0	1,250.0	NA	NL	260	660	3.76	400	800	NL
Mercury	.17	.195	.15	.134	.102	.835	.583	.235	.342	.292	1.28 (f)	NA	NA	NA	23	46.3	630	NL	5.6	34	0.03
Nickel	35.3	40.0	50.6	41.0	181.0	109.0	428.0	115.0	58.0	193.0	1,260.0	NA	NA	NA	1600	1510	18600	505	1500	20000	48
Selenium	<1	<1	<1	<1	<1	<1	1.84 (e)	<1	<1	1.12 (e)	<1	NA	NA	NA	390	380	4780	6.34	390	5100	0.95
Silver	1.27 (k)	.827 (k)	1.27	1.71	.876	2.93	11.7	12.0	.687	1.16	1.94	NA	NA	NA	390	374	4480	16.3	390	5100	1.6
Thallium	1.07 (e)	1.59 (e)	1.25 (e)	1.85 (e)	1.06 (e)	1.4 (e)	3.26	1.49 (e)	2.31 (e)	1.43 (e)	<1	NA	NA	NA	NL	6.09	76.7	2.2	NL	NL	NL
Zinc	607.0	981.0	1,170.0	939.0	1,360.0	1,350.0	4,460.0	2,130.0	1,860.0	13,700.0	15,500.0	NA	NA	NA	23000	22800	288000	7220	23000	310000	680
Semi-Volatile Organic Compounds (SVOCs)																					
2-Methylnaphthalene	<0.595	<0.62	<0.565	<0.57	<0.725	<0.565	<0.59	<0.57	<0.555	.936 (e)	NA	<0.05	NA	NA	NL	273	3590	7.56	NL	NL	NL
4-Chloro-3-methylphenol	<0.595	<0.62	<0.565	<0.57	.753 (e)	<0.565	13.2	<0.57	<0.555	<0.585	NA	<0.05	NA	NA	NL	NL	NL	NL	6100	62000	4.3
Benzo(a)anthracene	<0.595	<0.62	<0.565	<0.57	<0.725	<0.565	<0.59	<0.57	<0.555	<0.585	NA	.833 (c)	NA	NA	0.88	6.2	21.1	6.12	0.15	2.1	0.01
Benzo(a)pyrene	<0.595	<0.62	<0.565	.577 (e)	<0.725	<0.565	<0.59	<0.57	<0.555	<0.585	NA	1.59 (c)	NA	NA	0.088	0.62	2.11	30.4	0.015	0.21	0.0035
Benzo(b)fluoranthene	<0.595	<0.62	<0.565	.592 (e)	<0.725	<0.565	<0.59	<0.57	<0.555	<0.585	NA	1.2 (c)	NA	NA	NL	6.19	21	11.5	0.15	2.1	0.035
Benzo(g,h,i)perylene	<0.595	<0.62	<0.565	<0.57	<0.725	<0.565	<0.59	<0.57	<0.555	<0.585	NA	.852 (c)	NA	NA	NL	1720	16500	6210	NL	NL	NL
bis(2-Ethylhexyl) phthalate (DEHP)	<1.19	<1.24	1.6 (e)	1.94 (e)	5.93	<1.13	4.63	1.99 (e)	6.19	58.7	NA	<0.1	NA	NA	46	347	1230	13500	35	120	1.1
Chrysene	<0.595	<0.62	<0.565	.686 (e)	<0.725	<0.565	<0.59	<0.57	<0.555	<0.585	NA	1.18 (c)	NA	NA	88	605	2020	612	15	210	1.1
Dimethyl phthalate	<0.595	<0.62	<0.565	<0.57	24.8	<0.565	<0.59	<0.57	<0.555	.988 (e)	NA	<0.05	NA	NA	NL	574000	5680000	1350	NL	NL	NL
Di-n-butyl phthalate	<0.595	<0.62	<0.565	.994 (e)	<0.725	<0.565	<0.59	<0.57	<0.555	.986 (e)	NA	<0.05	NA	NA	7800	6110	61600	5470	6100	62000	9.2
Fluoranthene	<0.595	<0.62	<0.565	1.62	.948 (e)	<0.565	.74 (e)	<0.57	<0.555	<0.585	NA	2.0 (c)	NA	NA	3100	2280	21800	2610	2300	22000	160
Indeno(1,2,3-cd)pyrene	<0.595	<0.62	<0.565	<0.57	<0.725	<0.565	<0.59	<0.57	<0.555	<0.585	NA	1.13 (c)	NA	NA	0.88	3.77	12.8	19.7	0.15	2.1	0.12
Phenanthrene	<0.595	<0.62	<0.565	.688 (e)	<0.725	<0.565	<0.59	<0.57	<0.555	<0.585	NA	<0.05	NA	NA	NL	2220	27500	158	NL	NL	NL
Phenol	<0.595	<0.62	<0.565	<0.57	.788 (e)	<0.565	.661 (e)	<0.57	<0.555	.771 (e)	NA	<0.05	NA	NA	23000	11800	128000	32.4	18000	180000	6.3
Pyrene	<0.595	<0.62	<0.565	1.24	.834 (e)	<0.565	.653 (e)	<0.57	<0.555	<0.585	NA	1.64	NA	NA	2300	1710	16400	1500	1700	17000	120
PBDE-209	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.8	NA	NA	NA	NL	NL	NL	NL	428	NL	NL
PBDE-47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.3	NA	NA	NA	NL	NL	NL	NL	6.11	NL	NL
PBDE-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.6	NA	NA	NA	NL	NL	NL	NL	6.11	NL	NL
Dioxin, ug/pg (ppt)																					
1,2,3,4,6,7,8,9-OCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	11,000.0 (h)	NA	NA	NA	NL	NL	NL	NL	NL	NL	NL
1,2,3,4,6,7,8,9-OCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	320.0 (h)	NA	NA	NA	NL	NL	NL	NL	NL	NL	NL
1,2,3,4,6,7,8-HpCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,200.0 (h)	NA	NA	NA	4300	NL	NL	NL	NL	NL	NL
1,2,3,4,6,7,8-HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	120.0 (h,k)	NA	NA	NA	4300	NL	NL	NL	NL	NL	NL
1,2,3,4,7,8-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.4 (e)	NA	NA	NA	110	NL	NL	NL	NL	NL	NL
1,2,3,4,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	23.0 (h)	NA	NA	NA	430	NL	NL	NL	NL	NL	NL
1,2,3,6,7,8-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	38.0 (h)	NA	NA	NA	110	NL	NL	NL	NL	NL	NL
1,2,3,6,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	13.0 (h)	NA	NA	NA	430	NL	NL	NL	NL	NL	NL
1,2,3,7,8,9-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	28.0 (h)	NA	NA	NA	110	NL	NL	NL	NL	NL	NL
2,3,4,6,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10.0 (h)	NA	NA	NA	430	NL	NL	NL	NL	NL	NL
2,3,7,8-TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.6 (k)	NA	NA	NA	4.3	NL	NL	NL	4.5	18	15
2,3,7,8-TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.7	NA	NA	NA	43	NL	NL	NL	NL	NL	NL
Pesticides/Herbicides																					
Toxaphene	<0.6	2.5	<0.565	<0.57	<0.725	<0.565	<0.585	<0.57	<0.555	<0.585	NA	NA	<0.0508	NA	0.58	4.41	15.7	115	0.44	1.6	0.0094
Polychlorinated Biphenyls (PCBs)																					
Aroclor-1242	.686	<0.124	<.559	<.371	<0.145	<.232	<0.117	<0.114	<2.09	<7.6	NA	NA	NA	<0.01008	NL	1.03	6.94	0.0558	0.22	0.74	0.0053

[1] SCDM - Superfund Chemical Data Matrix, January 28, 2004, lower of reference dose and cancer risk benchmarks for soil pathway

[2] MRBCA RBTL- Missouri Risk-Based Corrective Action Risk-Based Target Level, June 2006. RBTLs are for soil type 2 (silty), residential and non-residential land use, and soil concentrations protective of groundwater.

[3] EPA SL - EPA Regional Screening Levels, November, 2010, residential and industrial use, and migration to groundwater (DAF=1).

c - Exceeded holding time
e - Estimated value, detected below PQL
f - Estimated value, QC data outside limits
i - PQL elevated due to sample dilution
k - Estimated value, matrix interference

Table C11. Overal Soil Sampling and Analysis Precision
Shapiro Brothers Salvage, Festus, Missouri

Location ID / Sampling Unit	%RSD of Lead Concentration Between 3 Field Replicate Samples
103 / SU1	5.6
103 / SU2	4.3
115 / SU1	2.4
115 / SU2	3.8
116 / SU1	4.9
116 / SU2	4.1
120 / SU1	8
120 / SU2	6.6
124 / SU2	9
124 / SU4	9.9
125 / SU1	4
125 / SU2	1.1
125 / SU3	9.2
146 / SU1	1.2
146 / SU2	16.7
154 / SU1	5.8
154 / SU2	7.6
160 / SU1	6.5
160 / SU2	4.4
163 / SU1	10.7
163 / SU2	3.1
221 / SU2	21

Table C12: Surface Water Sampling Precision Relative Percent Difference (RPD) Between Duplicate Samples Samples Collected April 9, 2012 Shaprio Brothers Salvage, Festus, Missouri			
All results are in ug/l unless otherwise noted			
Sample Tag Number	**1201180**	**1201183**	**RPD**
Sample ID	**SW01**	**SW01 dup**	
Location	**12th St. Bridge**	**12th St. Bridge**	
Laboratory Number	**AB79149**	**AB79150**	
Water Quality Indicators			
Hardness, as CaCO3 Dissolved-N	529.0	505.0	4.6
Hardness, as CaCO3-TR-N	485.0	513.0	5.6
Metals			
Arsenic	.72 (e)	.84 (e)	15.4
Arsenic, dissolved	.99 (e)	1.07	7.8
Cadmium	1.02	1.39	30.7
Cadmium, dissolved	.65	.65	0.0
Calcium	125.0	119.0	4.9
Calcium, dissolved	115.0	121.0	5.1
Copper	25.6	29.3	13.5
Copper, dissolved	13.2	12.7	3.9
Lead	34.3	56.1	48.2
Lead, dissolved	1.25	1.12	11.0
Magnesium	52.6	50.4	4.3
Magnesium, dissolved	48.0	51.1	6.3
Zinc	59.8	69.3	14.7
Zinc, dissolved	40.9	40.8	0.2

Table C13: Sediment Sampling Precision Relative Percent Difference (RPD) Between Duplicate Samples Samples Collected April 9, 2012 Shaprio Brothers Salvage, Festus, Missouri			
All results are in mg/kg			
Sample Tag Number	**H100015**	**H100016**	**RPD**
Sample ID	**SD01**	**SD dup.**	
Location	**12th St. Bridge**	**12th St. Bridge**	
Laboratory Number	**AB79149**	**AB79150**	
Arsenic	10.0	9.25	7.8
Cadmium	15.3	16.6	8.2
Copper	446.0	388.0	13.9
Lead	1,560.0	1,510.0	3.3
Zinc	785.0	788.0	0.4