Appendix C. Characterization Data, Technical Background Document: Mercury Wastes, Evaluation of Treatment of Bulk Elemental Mercury, Final Report

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Submitted to:

U.S. Environmental Protection Agency
Ariel Rios Building
Office of Solid Waste
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Submitted by:

Science Applications International Corporation
Engineering and Environmental Management Group
11251 Roger Bacon Drive
Reston, Virginia 20190

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APPENDIX C. CHARACTERIZATION DATA

Surrogate										
Vendor	pH[1]	OM (%)	Potassium (ppm)	Calcium (ppm)	Magnesium (ppm)	Sodium (ppm)	AE pH[2]	CEC (meq/ 100 g)	Sand (%)	Memo
ALTER Raw Surrogate	1.7	0.55	15	1	20	19,392	2.47	128.8	19.3	
	1.6	0.13	15	1	20	18,786	2.40	127.0	18.8	duplicate
A Raw Surrogate	1.9	0.35	64	210	110	28,886	2.48	171.9	50.4	
	1.9	0.12	61	170	90	28,886	2.50	171.3	6.8	duplicate
B Raw Surrogate	1.3	0.11	65	210	120	25,452	2.20	159.4	1.8	
	1.4	0.14	51	150	90	22,826	2.30	146.4	2.0	duplicate
C Raw Surrogate	1.8	0.42	35	390	2,660	24,038	2.79	170.4	3.0	
	1.8	0.52	39	470	3,570	28,886	2.80	199.8	9.2	duplicate
D Raw Surrogate	1.5	0.19	184	170	140	17,574	2.33	124.3	2.4	
	1.6	0.12	149	120	120	19,493	2.40	131.7	4.2	duplicate
A Monolith	7.2	3.56	101	80	1	21,513	8.00	94.2	80.6	
	6.9	2.46	202	47	10	48,682	7.90	213.3	78.9	duplicate
A Pellets	7.0	3.84	101	6	1	17,271	8.00	75.4	83.0	
	7.1	3.93	101	56	1	20,099	8.00	87.9	78.6	duplicate
B Phase I	6.4	0.71	303	21,200	20	37,875	7.30	277.2	37.3	
	6.4	0.55	303	22,400	20	39,390	7.30	289.8	40.0	duplicate
B Phase I	6.2	0.87	202	22,800	600	36,662	7.30	284.5	34.3	
	6.0	0.57	404	22,300	120	40,097	7.20	294.3	37.6	duplicate
B Phase II	6.4	8.39	202	18,300	6	15,453	7.30	164.9	60.0	
	6.4	8.45	202	19,700	7	46,157	7.40	304.6	60.6	duplicate
C Batch 1	8.9	2.27	808	900	8,120	95,041		487.5	28.3	
	9.0	1.20	303	700	8,300	103,626		524.0	28.5	duplicate
C Batch 2	9.0	1.18	202	600	10,700	53,631		325.9	26.2	
	9.0	2.40	303	700	11,320	75,548		427.1	26.3	duplicate
C Batch 3	8.8	2.12	303	3,200	820	8,484		60.5	77.2	
	8.0	2.40	202	3,700	30	7,171		50.4	75.5	duplicate
D Batch 1	9.7	1.49	1,616	19,300	180	34,643		252.8	73.5	
	9.9	2.44	1,313	20,700	60	28,280		230.3	69.8	duplicate
D Batch 2	9.6	1.53	1,515	19,800	90	31,815		242.0	71.2	
	9.9	2.51	1,313	21,200	380	28,886		238.1	70.4	duplicate

Surrogate (Continued)										
Vendor	Silt (%)	Clay (%)	Textural Classification	Redox Potential (mv)@20°C	Bulk Density (g/cc)	Infiltration Rate (cm/hr)	Chloride (ppm)	CEC by Na	1/3 Bar[3]	Memo
ALTER Raw Surrogate	65.3	15.4	Silt Loam	543.5	0.63	0.46	55,440			
	51.7	29.5	Silty Clay Loam	515.8	0.56	1.08	58,240			duplicate
A Raw Surrogate	22.8	26.8	Sandy Clay Loam	521.5	0.76	0.16	99,400			
	77.6	15.6	Silt Loam	526.3	0.69	0.13	91,560		81.8	duplicate
B Raw Surrogate	79.9	18.3	Silt Loam	553.8	0.64	0.05	103,580		79.5	
	80.4	17.6	Silt Loam	541.5	0.64	0.04	91,560		95.8	duplicate
C Raw Surrogate	74.8	22.2	Silt Loam	584.5	0.68	0.02	91,560		93.8	
	68.5	22.3	Silt Loam	583.2	0.67	0.05	103,580			duplicate
D Raw Surrogate	67.3	30.3	Silty Clay Loam	578.3	0.59	0.08	68,660			
	81.4	14.4	Silt Loam	590.0	0.50	0.12	58,340		91.6	duplicate
A Monolith	7.6	11.8	Sandy Loam	–29.9	1.15	10.12	24,760	11.4	106.5	
	9.9	11.2	Sandy Loam	–60.0	1.17	3.99	20,820	8.4	26.4	duplicate
A Pellets	3.6	13.4	Sandy Loam	–30.5	1.15	48.41	20,400	5.9	21.9	
	11.3	10.1	Sandy Loam	–51.9	1.16	1.45	23,560	5.3	27.6	duplicate
B Phase I	47.3	15.4	Loam	58.6	0.65	1.07	50,220	11.6	19.1	
	45.7	14.3	Loam	61.9	0.64		47,420	11.1	111.8	duplicate
B Phase I	54.3	11.4	Silt Loam	118.7	0.66	2.72	47,420	10.5	93.1	
	51.1	11.3	Silt Loam	122.9	0.64	1.55	49,400	10.7	91.8	duplicate
B Phase II	29.0	11.0	Sandy Loam	87.1	0.78	1.84	55,900	10.3	85.7	
	30.4	9.0	Sandy Loam	78.5	0.81	0.79	60,680	10.3	73.3	duplicate
C Batch 1	49.7	22.0	Loam	27.8	0.68	0.26	50,860	17.2	71.4	
	51.5	20.0	Silt Loam	NA[4]	0.69		NA[4]	NA[4]	84.2	duplicate
C Batch 2	51.8	22.0	Silt Loam	7.9	0.72	0.47	53,420	18.5		
	52.3	21.4	Silt Loam	–108.5	0.71		47,420	14.3	82.2	duplicate
C Batch 3	9.8	13.0	Sandy Loam	128.0	1.27	0.25	7,860	9.8	69.8	
	15.3	9.2	Sandy Loam	208.3	1.30		4,020	8.7	24.2	duplicate
D Batch 1	18.7	7.8	Sandy Loam	–24.1	0.49	4.13	29,800	68.7	19.9	
	22.6	7.6	Sandy Loam	NA[4]	0.54		NA[4]	NA[4]	165.1	duplicate
D Batch 2	22.0	6.8	Sandy Loam	–36.3	0.49	2.15	28,240	67.4		
	22.4	7.2	Sandy Loam	–93.8	0.58		40,220	62.4	159.3	duplicate

[1] pH measured according to AGVISE SOP: NUT.02.05.08.
[2] AE pH measured according to AGVISE SOP: NUT.02.11.09, using the Adam-Evans method to determine the acidity of a solid sample.
[3] Water holding capacity: the % water at ½ bar.
[4] Duplicate not run due to low waste volume.

Elemental Mercury										
Vendor	pH[1]	OM (%)	Potassium (ppm)	Calcium (ppm)	Magnesium (ppm)	Sodium (ppm)	AE pH[2]	CEC (meq/ 100 gm)	Sand (%)	Memo
A Elemental Monolith	11.0	2.75	101	1	1	18,483		80.6	73.9	
	11.0	2.74	101	1	1	15,958		69.7	72.0	duplicate
A Elemental Pellets	11.0	3.11	101	46	1	10,100		44.4	77.6	
	11.0	2.70	101	200	10	15,453		68.5	79.0	duplicate
B Elemental Phase I	8.1	0.79	202	9,000	230	1,515		54.0	31.6	
	8.1	0.68	202	9,100	240	1,212		53.3	31.0	duplicate
B Elemental Phase II	7.0	4.81	303	7,300	50	1,313	8.0	43.4	74.6	
	6.9	4.88	202	7,400	40	1,313	7.9	44.4	75.3	duplicate
C Elemental	9.9	0.725	202	200	8,180	17,271		144.8	79.9	
	10.0	1.91	202	200	8,500	31,329		208.6	83.3	duplicate

Elemental Mercury										
Vendor	Silt (%)	Clay (%)	Textural Classification	Redox Potential mv@20°C	Bulk Density (g/cc)	Infiltration Rate (cm/hr)	Chloride (ppm)	CEC by Na	1/3 Bar[3]	Memo
A Elemental Monolith	24.7	1.4	Loamy Sand	–459.6	1.48	2.03	1,240	0.7	14.9	
	28.0	0.0	Loamy Sand	–453.7	1.46	0.30	3,400	0.4	14.7	duplicate
A Elemental Pellets	19.8	2.6	Loamy Sand	–466.1	1.41	0.70	1,000	1.2	13.2	
	20.8	0.2	Loamy Sand	–468.1	1.51	0.79	1,240	0.7	9.2	duplicate
B Elemental Phase I	66.0	2.4	Silt Loam	–82.3	2.10	0.19	900	2.4	13.6	
	61.6	7.4	Silt Loam	–51.9	2.11	0.17	1,100	2.3	14.8	duplicate
B Elemental Phase II	20.2	5.2	Sandy Loam	–28.3	1.69	1.45	300	3.5	21.7	
	21.3	3.4	Loamy Sand	–12.3	1.69	2.76	280	3.6	20.3	duplicate
C Elemental	12.9	7.2	Loamy Sand	–651.1	2.64	0.66	440	3.2	18.1	
	16.1	0.6	Loamy Sand	–851.0	2.56	0.54	460	3.2	21.2	duplicate

[1] pH measured according to AGVISE SOP: NUT.02.05.08.
[2] AE pH measured according to AGVISE SOP: NUT.02.11.09, using the Adam-Evans method to determine the acidity of a solid sample.
[3] Water holding capacity: the % water at ½ bar.

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