

APPENDIX P-4

FSS SAMPLE & MEASUREMENT LOCATIONS & COORDINATES

Survey Area:	LSA 11	Description:	Plant Open Land Area
Survey Unit:	04	Description:	South of North East Site Creek
Survey Type:	FSS	Classification:	Class 3

Measurement or Sample ID	Surface or CSM	Type	Start Elevation*	End Elevation*	Northing** (Y Axis)	Easting** (X Axis)	Remarks / Notes
L11-04-01-P-S-S-00	Uniform	S	429.6	429.1	865058.0	828071.0	Surface 6-inch grab
L11-04-02-P-R-S-00	Uniform	S	429.1	424.2	865058.0	828071.0	Root 5-foot composite
L11-04-04-P-S-S-00	Uniform	S	428.5	428.0	865099.0	828082.0	Surface 6-inch grab
L11-04-05-P-R-S-00	Uniform	S	428.0	423.1	865099.0	828082.0	Root 5-foot composite
L11-04-07-P-S-S-00	Uniform	S	429.6	429.1	865072.0	828149.0	Surface 6-inch grab
L11-04-08-P-R-S-00	Uniform	S	429.2	424.2	865072.0	828149.0	Root 5-foot composite
L11-04-10-P-S-S-00	Uniform	S	429.5	429.0	865082.0	828164.0	Surface 6-inch grab
L11-04-11-P-R-S-00	Uniform	S	429.0	424.1	865082.0	828164.0	Root 5-foot composite
L11-04-13-P-S-S-00	Uniform	S	428.2	427.7	865110.0	828178.0	Surface 6-inch grab
L11-04-14-P-R-S-00	Uniform	S	427.7	422.8	865110.0	828178.0	Root 5-foot composite
L11-04-16-P-S-S-00	Uniform	S	428.7	428.2	865065.0	828186.0	Surface 6-inch grab
L11-04-17-P-R-S-00	Uniform	S	428.2	423.3	865065.0	828186.0	Root 5-foot composite
L11-04-19-P-S-S-00	Uniform	S	428.0	427.5	865089.0	828212.0	Surface 6-inch grab
L11-04-20-P-R-S-00	Uniform	S	427.5	422.6	865089.0	828212.0	Root 5-foot composite
L11-04-22-P-S-S-00	Uniform	S	427.9	427.4	865093.0	828214.0	Surface 6-inch grab
L11-04-23-P-R-S-00	Uniform	S	427.4	422.5	865093.0	828214.0	Root 5-foot composite
L11-04-08-P-R-Q-00	Uniform	Q	429.2	424.7	865072.0	828149.0	Root 5-foot composite
L11-04-13-P-S-Q-00	Uniform	Q	428.2	427.7	865110.0	828178.0	Surface 6-inch grab
L11-04-25-P-S-B-00	Uniform	B	429.6	429.1	865055.0	828128.0	Surface 6-inch grab

*Elevations are in feet above mean sea level.

** Missouri - East State Plane Coordinates [North American Datum (NAD) 1983]

Surface: Floor = F; Wall = W; Ceiling = C; Roof = R

CSM: Three-Layer (Surface-Root-Excavation) or Uniform Stratum DCGLs used

Type: Systematic = S, Biased = B; QC = Q; Investigation = I

Green shaded samples are the samples at each sample location, for use in WRS test.



HDP-PR-FSS-721 Final Status Survey Data Evaluation
Preliminary Data Review and Calculation of the Sum-of-Fractions (SOF)

Sample ID	Sample Depth (ft)	Type (Systematic, Bias, QC)	TestAmerica Analytical Results																												
			Ra-226						Tc-99					Th-232						Inferred U-234				U-235				U-238			
			Result	Uncertainty	MDC	Qualifier	Net Result*	Corrected Result	Result	Corrected Result	Uncertainty	MDC	Qualifier	Result	Uncertainty	MDC	Qualifier	Net Result**	Corrected Result	Result	Uncertainty	MDC	Qualifier	Result	Uncertainty	MDC	Qualifier	Result	Uncertainty	MDC	Qualifier
L11-04-01-P-S-S-00	0.49	S	1.310	0.185	0.084	NA	0.240	0.240	0.462	0.462	0.133	0.262	NA	1.280	0.233	0.152	NA	0.280	0.280	2.277	NA	NA	NA	0.122	0.153	0.267	U	1.080	0.338	0.925	NA
L11-04-02-P-R-S-00	4.9	S	1.110	0.151	0.059	NA	0.040	0.040	0.042	0.042	0.010	0.246	U	1.060	0.160	0.113	NA	0.060	0.060	1.674	NA	NA	NA	0.088	0.147	0.214	U	0.984	0.493	0.773	NA
L11-04-04-P-S-S-00	0.49	S	1.150	0.162	0.075	NA	0.080	0.080	0.236	0.236	0.211	0.273	U	1.090	0.166	0.084	NA	0.090	0.090	3.088	NA	NA	NA	0.163	0.150	0.252	U	1.700	0.727	0.881	NA
L11-04-05-P-R-S-00	4.9	S	1.200	0.176	0.079	NA	0.130	0.130	-0.009	0.000	0.041	0.247	U	1.130	0.183	0.087	NA	0.130	0.130	0.913	NA	NA	NA	0.047	0.154	0.259	U	0.637	0.393	1.140	U
L11-04-07-P-S-S-00	0.49	S	1.220	0.171	0.081	NA	0.150	0.150	0.130	0.130	0.090	0.256	U	1.180	0.180	0.125	NA	0.180	0.180	3.188	NA	NA	NA	0.173	0.156	0.254	U	1.250	0.586	0.913	NA
L11-04-08-P-R-S-00	4.9	S	1.350	0.200	0.088	NA	0.280	0.280	-0.002	0.000	0.055	0.251	U	1.070	0.184	0.170	NA	0.070	0.070	1.255	NA	NA	NA	0.065	0.147	0.278	U	0.826	0.558	0.896	U
L11-04-10-P-S-S-00	0.49	S	1.040	0.141	0.080	NA	-0.030	0.000	0.310	0.310	0.092	0.279	NA	1.170	0.202	0.108	NA	0.170	0.170	2.078	NA	NA	NA	0.113	0.142	0.197	U	0.755	0.292	0.857	U
L11-04-11-P-R-S-00	4.9	S	1.270	0.189	0.086	NA	0.200	0.200	0.042	0.042	0.026	0.248	U	1.210	0.199	0.160	NA	0.210	0.210	0.849	NA	NA	NA	0.000	0.171	0.290	U	0.849	0.333	0.963	U
L11-04-13-P-S-S-00	0.49	S	1.240	0.166	0.075	NA	0.170	0.170	0.104	0.104	0.026	0.260	U	1.220	0.171	0.109	NA	0.220	0.220	2.322	NA	NA	NA	0.126	0.153	0.252	U	0.909	0.276	0.750	NA
L11-04-14-P-R-S-00	4.9	S	1.180	0.162	0.066	NA	0.110	0.110	-0.002	0.000	0.074	0.248	U	1.060	0.161	0.112	NA	0.060	0.060	1.073	NA	NA	NA	0.052	0.140	0.225	U	1.100	0.492	0.758	NA
L11-04-16-P-S-S-00	0.49	S	1.170	0.182	0.087	NA	0.100	0.100	-0.023	0.000	0.049	0.270	U	1.170	0.177	0.096	NA	0.170	0.170	1.112	NA	NA	NA	0.056	0.153	0.253	U	0.929	0.550	0.873	NA
L11-04-17-P-R-S-00	4.9	S	1.120	0.148	0.054	NA	0.050	0.050	0.018	0.018	0.060	0.241	U	1.040	0.155	0.104	NA	0.040	0.040	1.062	NA	NA	NA	0.056	0.138	0.230	U	0.645	0.255	0.730	U
L11-04-19-P-S-S-00	0.49	S	1.180	0.169	0.070	NA	0.110	0.110	-0.004	0.000	0.044	0.250	U	1.110	0.177	0.132	NA	0.110	0.110	1.241	NA	NA	NA	0.059	0.157	0.247	U	1.300	0.514	0.771	NA
L11-04-20-P-R-S-00	4.9	S	1.190	0.188	0.095	NA	0.120	0.120	0.025	0.025	0.066	0.243	U	1.190	0.216	0.106	NA	0.190	0.190	2.381	NA	NA	NA	0.127	0.178	0.281	U	1.170	0.737	0.947	NA
L11-04-22-P-S-S-00	0.49	S	1.320	0.188	0.090	NA	0.250	0.250	0.655	0.655	0.098	0.268	NA	1.310	0.202	0.110	NA	0.310	0.310	1.250	NA	NA	NA	0.000	0.164	0.277	U	1.250	0.342	0.920	NA
L11-04-23-P-R-S-00	4.9	S	1.180	0.157	0.061	NA	0.110	0.110	-0.002	0.000	0.060	0.257	U	1.110	0.173	0.109	NA	0.110	0.110	1.482	NA	NA	NA	0.076	0.096	0.228	U	1.040	0.445	0.682	NA
L11-04-25-P-S-B-00	0.49	B	0.986	0.145	0.061	NA	-0.084	0.000	0.034	0.034	0.020	0.251	U	0.998	0.176	0.120	NA	-0.002	0.000	2.243	NA	NA	NA	0.122	0.137	0.232	U	0.834	0.282	0.765	NA
L11-04-08-P-R-Q-00	4.43	Q	1.150	0.169	0.098	NA	0.080	0.080	0.110	0.110	0.015	0.293	U	1.270	0.201	0.118	NA	0.270	0.270	3.688	NA	NA	NA	0.203	0.138	0.193	NA	0.981	0.338	0.929	NA
L11-04-13-P-S-Q-00	0.49	Q	1.100	0.159	0.077	NA	0.030	0.030	-0.024	0.000	0.066	0.275	U	1.170	0.194	0.096	NA	0.170	0.170	1.830	NA	NA	NA	0.095	0.138	0.253	U	1.190	0.545	0.840	NA
Systematic Minimum					0.000					0.000						0.040					0.849			0.000					0.637		
Systematic Maximum					0.280					0.655						0.310					3.188			0.173					1.700		
Systematic Mean					0.134					0.126						0.150					1.703			0.083					1.027		
Systematic Median					0.115					0.034						0.150					1.368			0.071					1.012		
Systematic Standard Deviation					0.078					0.195						0.080					0.758			0.051					0.274		
With ingrowth, use Ra226 bkg =								1.07						Th232 bkg =		1.0															

NOTES:
Gross results in units of pCi/g
* Background with ingrowth (1.07 pCi/g) subtracted from gross result
**Background (1.0 pCi/g) subtracted from gross result
U Qualifier: Result is less than the sample detection limit.
All uncertainty values are reported at the 2-sigma confidence level.
Italicized values assume natural uranium, setting negative value of U-235 to zero and U=234 = U-238.

HDP-PR-FSS-721 Final Status Survey Data Evaluation
Preliminary Data Review and Calculation of the Sum-of-Fractions (SOF)

Use corrected net results for all DE calcs.

Enr. (%)	SOF	Root Stratum SOF Verification (unexcavated/not backfilled only)				
		is Sample in the Root Stratum?	is ROOT Sample SOF > 0.5?	root count	excavation count	surface count
1.8	0.31	SURFACE	good			1
1.4	0.07	ROOT	good	1		
1.5	0.13	SURFACE	good			1
1.2	0.14	ROOT	good	1		
2.2	0.20	SURFACE	good			1
1.3	0.19	ROOT	good	1		
2.3	0.11	SURFACE	good			1
0.7	0.22	ROOT	good	1		
2.2	0.22	SURFACE	good			1
0.8	0.10	ROOT	good	1		
1.0	0.15	SURFACE	good			1
1.4	0.06	ROOT	good	1		
0.7	0.13	SURFACE	good			1
1.7	0.18	ROOT	good	1		
0.7	0.33	SURFACE	good			1
1.2	0.13	ROOT	good	1		
2.3	0.02		good			
3.2	0.21		good			
1.3	0.12		good			
1.4	0.06					
	0.33			16	8	0
	0.17			count tot		8
	0.15					
	0.08					

MDC SOF Step 8.1.1.c
0.17
0.13
0.13
0.13
0.15
0.18
0.13
0.18
0.14
0.13
0.14
0.12
0.15
0.15
0.13
0.13
0.15
0.13

Infer U-234 MDC using U-235 MDC * ratio of U-234:U-235 @ that sample's enrichment
4.983609525
4.081294126
4.774503412
5.022501834
4.681107646
5.342645393
3.622214019
6.077984892
4.644248531
4.626136766
5.022831564
4.386437612
5.176766442
5.267645743
5.8055235
4.421352966
4.265754581
3.506233527
4.86219167

DCLG _w , Measure Tc-99, All SEAs	
	Uniform
U-234	195.4
U-235	51.6
U-238	168.8
Tc-99	25.1
Th-232	2.0
Ra-226	1.9

Infer U234 Step 8.3.4			
U-238/U235	U-234/U235	U-234	%
8.9	18.7	2.3	1.8
11.2	19.1	1.7	1.4
10.4	18.9	3.1	1.5
13.5	19.4	0.9	1.2
7.2	18.4	3.2	2.2
12.6	19.2	1.3	1.3
6.7	18.4	2.1	2.3
21.4	21.0	0.8	0.7
7.2	18.4	2.3	2.2
21.1	20.6	1.1	0.8
16.6	19.9	1.1	1.0
11.6	19.1	1.1	1.4
22.0	21.0	1.2	0.7
9.2	18.7	2.4	1.7
21.4	21.0	1.3	0.7
13.6	19.4	1.5	1.2
6.8	18.4	2.2	2.3
4.8	18.2	3.7	3.2
12.5	19.2	1.8	1.3
Average Enrichment (%)			1.39

Very low U-235 result below MDC, set enrichment to natural uranium.

Negative U-235 result, set enrichment to natural uranium.

weighted SOF_{MEAN}	0.17
fractions	SS 0.5 RS 0.5 ES 0
SOF _{MEAN} Re-use Backfill Material	0 Unexcavated Class 3 SU, no backfill.
SOF _{MEAN} Groundwater	0.16
SOF _{TOT} (<=1)	SOF_{MEAN, SU} 0.33 PASS

Calculate the dose contribution for the SU by multiplying SOF_{MEAN, SU} (including contribution from Re-use backfill and Groundwater) by 25 mrem.
8.2 mrem

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Preliminary Data Review and Calculation of the Sum-of-Fractions (SOF)

Ave Conc. Ra-226, SS	Ave Conc. Tc-99, SS	Ave Conc. Th-232, SS	Ave Conc. U-234, SS	Ave Conc. U-235, SS	Ave Conc. U-238, SS
0.240	0.462	0.280	2.277	0.122	1.080
-	-	-	-	-	-
0.080	0.236	0.090	3.088	0.163	1.700
-	-	-	-	-	-
0.150	0.130	0.180	3.188	0.173	1.250
-	-	-	-	-	-
0.000	0.310	0.170	2.078	0.113	0.755
-	-	-	-	-	-
0.170	0.104	0.220	2.322	0.126	0.909
-	-	-	-	-	-
0.100	0.000	0.170	1.112	0.056	0.929
-	-	-	-	-	-
0.110	0.000	0.110	1.241	0.059	1.300
-	-	-	-	-	-
0.250	0.655	0.310	1.250	0.000	1.250
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
0.138	0.237	0.191	2.070	0.102	1.147
Ave Conc. Ra-226, RS	Ave Conc. Tc-99, RS	Ave Conc. Th-232, RS	Ave Conc. U-234, RS	Ave Conc. U-235, RS	Ave Conc. U-238, RS
-	-	-	-	-	-
0.040	0.042	0.060	1.674	0.088	0.984
-	-	-	-	-	-
0.130	0.000	0.130	0.913	0.047	0.637
-	-	-	-	-	-
0.280	0.000	0.070	1.255	0.065	0.826
-	-	-	-	-	-
0.200	0.042	0.210	0.849	0.000	0.849
-	-	-	-	-	-
0.110	0.000	0.060	1.073	0.052	1.100
-	-	-	-	-	-
0.050	0.018	0.040	1.062	0.056	0.645
-	-	-	-	-	-
0.120	0.025	0.190	2.381	0.127	1.170
-	-	-	-	-	-
0.110	0.000	0.110	1.482	0.076	1.040
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
0.130	0.016	0.109	1.336	0.064	0.906
Ave Conc. Ra-226, ES	Ave Conc. Tc-99, ES	Ave Conc. Th-232, ES	Ave Conc. U-234, ES	Ave Conc. U-235, ES	Ave Conc. U-238, ES
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
0.000	0.000	0.000	0.000	0.000	0.000

**HDP-PR-FSS-721 Final Status Survey Data Evaluation
Performance of Statistical Tests**

WRS TEST					
SAMPLE ID	AREA (Reference, Survey Unit)	Gross SOF ($X_{i,ref}$, $Y_{i,su}$)	ADJUSTED SOF (Z_i)	RANKS	REFERENCE AREA RANKS
9574-SS-140910-01-01	Reference	1.19	2.188	40	40
9574-SS-140910-01-02	Reference	0.76	1.757	18	18
9574-SS-140910-01-03	Reference	1.02	2.023	27	27
9574-SS-140910-01-04	Reference	1.02	2.018	26	26
9574-SS-140910-01-05	Reference	1.00	2.002	23	23
9574-SS-140910-01-07	Reference	0.87	1.873	20	20
9574-SS-140910-01-08	Reference	1.04	2.040	30	30
9574-SS-140910-01-09	Reference	0.96	1.959	22	22
9574-SS-140910-01-10	Reference	1.20	2.204	41	41
9574-SS-140910-01-11	Reference	1.01	2.007	25	25
9574-SS-140910-01-12	Reference	1.22	2.223	42	42
9574-SS-140910-01-13	Reference	1.03	2.035	29	29
9574-SS-140910-01-14	Reference	1.00	2.005	24	24
9574-SS-140910-01-15	Reference	0.86	1.865	19	19
9574-SS-140910-01-16	Reference	1.24	2.238	44	44
9574-SS-140910-01-17	Reference	1.19	2.185	39	39
9574-SS-140910-01-18	Reference	1.31	2.310	46	46
9574-SS-140910-01-20	Reference	1.18	2.179	37	37
9574-SS-140910-01-21	Reference	1.06	2.064	32	32
9574-SS-140910-01-22	Reference	1.10	2.101	33	33
9574-SS-140910-01-23	Reference	1.29	2.293	45	45
9574-SS-140910-01-24	Reference	1.34	2.339	47	47
9574-SS-140910-01-25	Reference	1.15	2.154	36	36
9574-SS-140910-01-26	Reference	1.18	2.182	38	38
9574-SS-140910-01-27	Reference	1.23	2.227	43	43
9574-SS-140910-01-28	Reference	1.38	2.380	48	48
9574-SS-140910-01-29	Reference	1.05	2.055	31	31
9574-SS-140910-01-30	Reference	0.94	1.941	21	21
9574-SS-140910-01-31	Reference	1.12	2.119	34	34
9574-SS-140910-01-32	Reference	1.15	2.152	35	35
9574-SS-140910-01-33	Reference	1.03	2.028	28	28
9574-SS-140910-01-34	Reference	0.44	1.443	17	17
L11-04-01-P-S-S-00	Survey Unit	1.37	1.368	15	0
L11-04-02-P-R-S-00	Survey Unit	1.13	1.132	2	0
L11-04-04-P-S-S-00	Survey Unit	1.19	1.189	5	0
L11-04-05-P-R-S-00	Survey Unit	1.21	1.206	8	0
L11-04-07-P-S-S-00	Survey Unit	1.26	1.264	12	0
L11-04-08-P-R-S-00	Survey Unit	1.26	1.258	11	0
L11-04-10-P-S-S-00	Survey Unit	1.16	1.162	3	0
L11-04-11-P-R-S-00	Survey Unit	1.28	1.284	13	0
L11-04-13-P-S-S-00	Survey Unit	1.29	1.286	14	0
L11-04-14-P-R-S-00	Survey Unit	1.16	1.164	4	0
L11-04-16-P-S-S-00	Survey Unit	1.21	1.213	9	0
L11-04-17-P-R-S-00	Survey Unit	1.12	1.121	1	0
L11-04-19-P-S-S-00	Survey Unit	1.19	1.191	6	0
L11-04-20-P-R-S-00	Survey Unit	1.24	1.244	10	0
L11-04-22-P-S-S-00	Survey Unit	1.39	1.390	16	0
L11-04-23-P-R-S-00	Survey Unit	1.19	1.191	7	0
Rank Sums				1176	1040
# Reference Area Measurements				m	32
# Survey Unit Measurements				n	16
Total Number of Measurements				N	48
(1-α) percentile of a standard normal distribution (MARSSIM Pg. I-10)				z	1.645
WRS Critical Value (MARSSIM Pg. I-10, Eq. I.1)				CV	860

Min adjusted bkg SOF
1.44

No WRS test necessary
No WRS test necessary
No WRS test necessary
No WRS test necessary
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No WRS test necessary
No WRS test necessary
No WRS test necessary
No WRS test necessary
No WRS test necessary

W_r

TEST: **PASS**

HDP-PR-FSS-721 *Final Status Survey Data Evaluation*
Performance of Statistical Tests

$\alpha = 0.05$

**HDP-PR-FSS-721 Final Status Survey Data Evaluation
Retrospective Sample Size Verification**

Uniform DCGL Criteria Evaluation	
N/2 Value Verification	
Isotope(s)	SOF (Ra/Tc/Th/Iso U)
St. Dev.	0.08
DCGL _{SOF}	1
LBGR (Mean)	0.17
Shift	0.83
Relative Shift (Δ/σ)	10.93
MARSSIM Table 5.1 (P_r)	1.000000
N	12
N + 20%	14.4
N/2	8
FSS N/2	8
Verification Check	SUFFICIENT MEASUREMENTS
"N/2" Corresponds to the number of survey unit measurement locations required for the WRS Test	

MARSSIM Table 5.1

Δ/σ	P_r
0.1	0.528182
0.2	0.556223
0.3	0.583985
0.4	0.611335
0.5	0.638143
0.6	0.664290
0.7	0.689665
0.8	0.714167
0.9	0.737710
1.0	0.760217
1.1	0.781627
1.2	0.801892
1.3	0.820978
1.4	0.838864
1.5	0.855541
1.6	0.871014
1.7	0.885299
1.8	0.898420
1.9	0.910413
2.0	0.921319
2.25	0.944167
2.5	0.961428
2.75	0.974067
3.0	0.983039
3.5	0.993329
4.0	0.997658
4.01	1.000000

MARSSIM Table 5.2, $\alpha = 0.05$, $\beta = 0.10$

α (or β)	$Z_{1-\alpha}$ (or $Z_{1-\beta}$)
0.005	2.576
0.01	2.326
0.015	2.241
0.025	1.960
0.05	1.645
0.10	1.282
0.15	1.036
0.2	0.842
0.25	0.674
0.30	0.524

α
 β

Hematite Decommissioning Project	Procedure: HDP-PR-FSS-703, Final Status Survey Quality Control										
										Revision: 2	Page 1 of 1

**FORM HDP-PR-FSS-703-1
FIELD DUPLICATE SAMPLE ASSESSMENT**

Survey Unit No.:	11-04				Survey Unit Description:	Plant Open Land Area south of Northeast Site Creek						
Sample ID	Field Duplicate Sample ID	Radionuclide	Sample (pCi/g)		Field Duplicate Sample (pCi/g)		Average Activity (\bar{x}) (pCi/g)	Nuclide DCGL (pCi/g)	Statistic ²	Warning Limit	Control Limit	Statistic Exceeds Limit? (Y/N)
			Activity (x _i)	MDC	Activity (x _i)	MDC						
L11-04-08-P-R-S-00	L11-04-08-P-R-Q-00	Ra-226	1.35	0.0882	1.15	0.098	1.250	1.9	0.2	0.269	0.403	N
L11-04-08-P-R-S-00	L11-04-08-P-R-Q-00	Tc-99	-0.002	0.251	0.11	0.293	0.054	25.1	NA	3.552	5.321	NA
L11-04-08-P-R-S-00	L11-04-08-P-R-Q-00	Th-232	1.07	0.17	1.27	0.118	1.170	2.0	0.2	0.283	0.424	N
L11-04-08-P-R-S-00	L11-04-08-P-R-Q-00	U-234 ¹	1.255	NA	3.688	NA	2.471	195.4	2.43	27.649	41.425	N
L11-04-08-P-R-S-00	L11-04-08-P-R-Q-00	U-235	0.0653	0.278	0.203	0.193	0.134	51.6	NA	7.301	10.939	NA
L11-04-08-P-R-S-00	L11-04-08-P-R-Q-00	U-238	0.826	0.896	0.981	0.929	0.904	168.8	NA	23.885	35.786	NA

Comments:

- U-234 is inferred, no MDC available.
- Duplicate assessment is not necessary if the result of either sample is < MDC.

Performed by: Thomas Yardy _____

Reviewed by: Clark Evers _____

Date: _____

Date: _____

Quality Record

Hematite Decommissioning Project	Procedure: HDP-PR-FSS-703, Final Status Survey Quality Control		
			Revision: 2 Page 1 of 1

**FORM HDP-PR-FSS-703-1
FIELD DUPLICATE SAMPLE ASSESSMENT**

Survey Unit No.:	11-04				Survey Unit Description:	Plant Open Land Area south of Northeast Site Creek						
Sample ID	Field Duplicate Sample ID	Radionuclide	Sample (pCi/g)		Field Duplicate Sample (pCi/g)		Average Activity (\bar{x}) (pCi/g)	Nuclide DCGL (pCi/g)	Statistic ²	Warning Limit	Control Limit	Statistic Exceeds Limit? (Y/N)
			Activity (x _i)	MDC	Activity (x _i)	MDC						
L11-04-13-P-S-S-00	L11-04-13-P-S-Q-00	Ra-226	1.24	0.0747	1.1	0.0767	1.170	1.9	0.14	0.269	0.403	N
L11-04-13-P-S-S-00	L11-04-13-P-S-Q-00	Tc-99	0.104	0.26	-0.0242	0.275	0.040	25.1	NA	3.552	5.321	NA
L11-04-13-P-S-S-00	L11-04-13-P-S-Q-00	Th-232	1.22	0.109	1.17	0.0957	1.195	2.0	0.05	0.283	0.424	N
L11-04-13-P-S-S-00	L11-04-13-P-S-Q-00	U-2341	2.32	NA	1.83	NA	2.076	195.4	0.49	27.649	41.425	N
L11-04-13-P-S-S-00	L11-04-13-P-S-Q-00	U-235	0.126	0.252	0.0952	0.253	0.111	51.6	NA	7.301	10.939	NA
L11-04-13-P-S-S-00	L11-04-13-P-S-Q-00	U-238	0.909	0.75	1.19	0.84	1.050	168.8	0.281	23.885	35.786	N

Comments:

- U-234 is inferred, no MDC available.
- Duplicate assessment is not necessary if the result of either sample is < MDC.

Performed by: Thomas Yardy _____

Reviewed by: Clark Evers _____

Date: _____

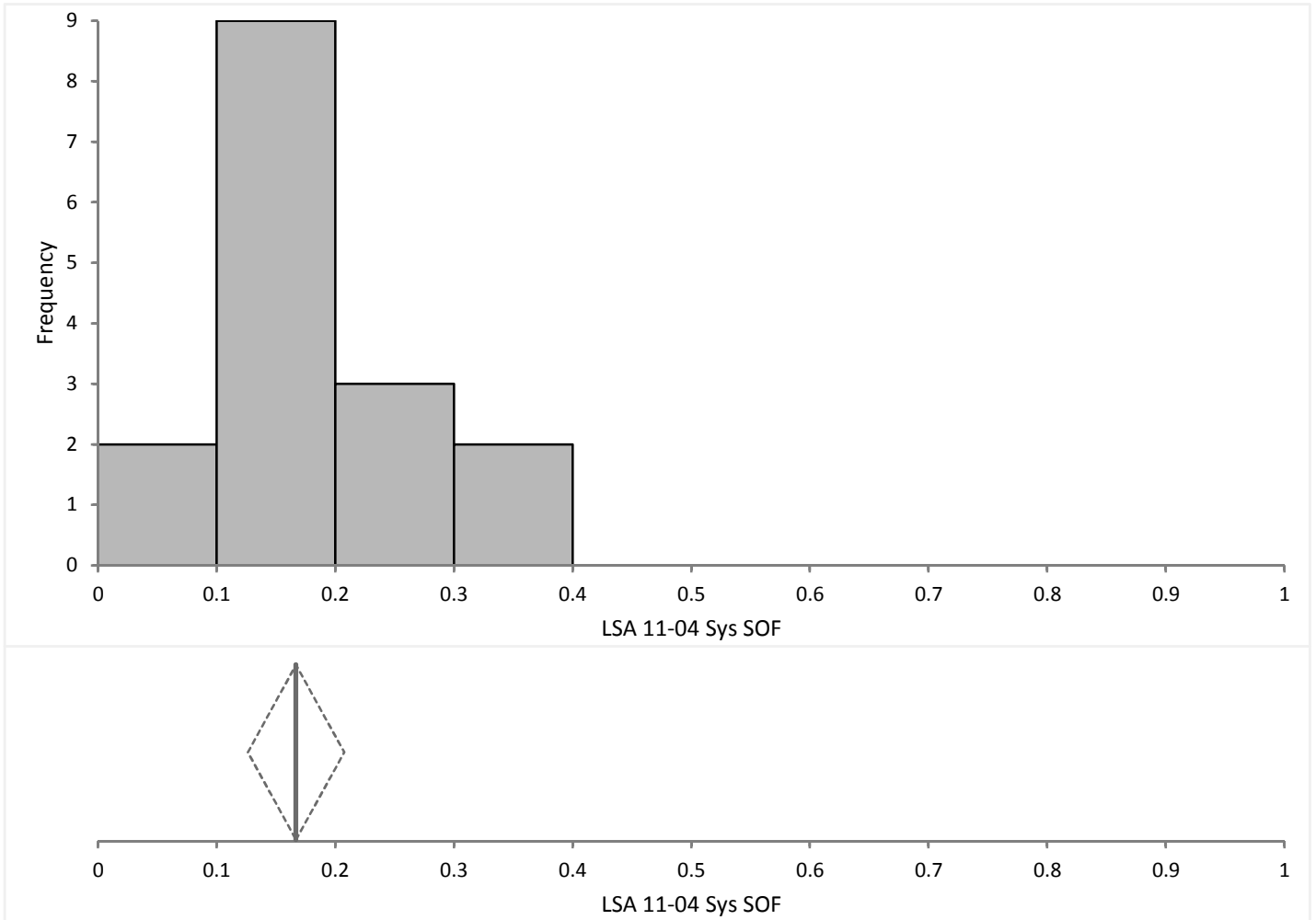
Date: _____

Quality Record

LSA 11-04 Sys SOF

- 0.3
- 0.1
- 0.1
- 0.1
- 0.2
- 0.2
- 0.1
- 0.2
- 0.2
- 0.1
- 0.1
- 0.1
- 0.1
- 0.2
- 0.3
- 0.1

Descriptives



N | 16

	Mean	95% CI	Mean SE	SD	Variance
LSA 11-04 Sys SOF	0.17	0.13 to 0.21	0.019	0.08	0.01
	Minimum	1st quartile	Median	97.87% CI	3rd quartile
LSA 11-04 Sys SOF	0.1	0.12	0.15	0.11 to 0.22	0.21

Skewness	Kurtosis
0.7	0.15
Maximum	IQR
0.3	0.09