

**FINAL STATUS SURVEY REPORT**

**SUBMITTAL NUMBER 3**

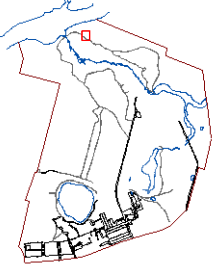
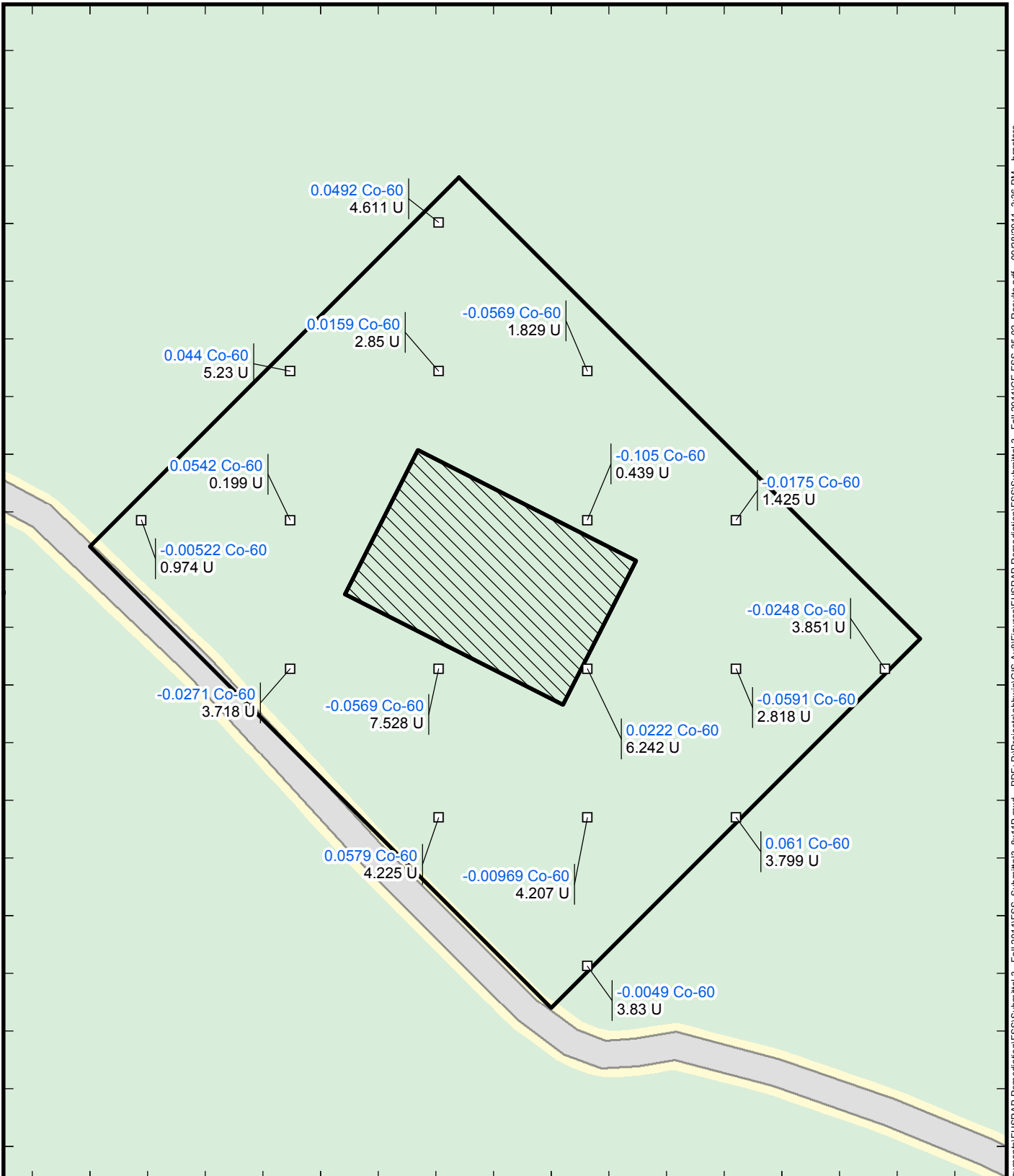
**CE WINDSOR SITE  
WINDSOR, CONNECTICUT**

**APPENDIX B**

**SURVEY UNIT CE-FSS-35-02  
RESULTS AND DATA EVALUATION**







**Legend**

- Co-60 (pCi/g)
- Total U (pCi/g)
- Sample Location
- ▭ CE-FSS-35-02
- Forest
- Open
- Water
- Road

0 15 30 Feet

Prepared/Date: BRP 09/28/11    Checked/Date: GSM 09/28/11

**Sample Results**  
**Survey Unit CE-FSS-35-02**

**Final Status Survey**  
**CE Windsor Site**  
**Windsor, Connecticut**

# Survey Unit CE-FSS-35-02

## Final Status Survey Volumetric Soil Sample Results

Sample ID	Co-60 (pCi/g)				U-235 (pCi/g)				Total U (pCi/g)	Sum of Fraction
	Activity	Uncert.	MDC	Qualifier	Activity	Uncert.	MDC	Qualifier		
FSS-35-02-001	-4.90E-03	1.30E-01	1.84E-01	U	1.24E-01	1.22E-01	1.93E-01	U	3.8	0.006
FSS-35-02-002	5.79E-02	1.27E-01	2.41E-01	U	1.36E-01	1.70E-01	2.85E-01	UI	4.2	0.019
FSS-35-02-003	-9.69E-03	1.37E-01	2.07E-01	U	1.36E-01	1.20E-01	1.95E-01	U	4.2	0.006
FSS-35-02-004	6.10E-02	9.06E-02	1.80E-01	U	1.23E-01	1.18E-01	1.89E-01	U	3.8	0.019
FSS-35-02-005	-2.71E-02	1.08E-01	1.45E-01	U	1.20E-01	9.30E-02	1.52E-01	U	3.7	0.001
FSS-35-02-006	-5.69E-02	1.04E-01	1.07E-01	U	2.43E-01	1.35E-01	2.07E-01		7.5	0.002
FSS-35-02-007	2.22E-02	1.22E-01	2.02E-01	U	2.01E-01	1.16E-01	1.99E-01	U	6.2	0.016
FSS-35-02-008	-1.87E-01	2.11E-01	1.51E-01	U	1.02E-01	1.35E-01	2.10E-01	U	3.2	-0.032
FSS-35-02-008S	6.87E-02	9.27E-02	1.96E-01	U	7.93E-02	1.24E-01	1.92E-01	U	2.5	0.018
FSS-35-02-008AVE	-5.91E-02				9.09E-02				2.8	-0.007
FSS-35-02-009	-2.48E-02	1.17E-01	1.55E-01	U	1.24E-01	1.03E-01	1.65E-01	U	3.9	0.002
FSS-35-02-010	-5.22E-03	1.41E-01	2.10E-01	U	3.14E-02	1.19E-01	1.76E-01	U	1.0	0.001
FSS-35-02-011	5.42E-02	8.69E-02	1.72E-01	U	6.41E-03	1.07E-01	1.53E-01	U	0.2	0.011
FSS-35-02-012	-1.05E-01	1.50E-01	1.81E-01	U	1.42E-02	1.10E-01	1.58E-01	U	0.4	-0.020
FSS-35-02-013	-1.75E-02	1.38E-01	1.98E-01	U	4.60E-02	1.12E-01	1.67E-01	U	1.4	-0.001
FSS-35-02-014	4.40E-02	1.24E-01	2.07E-01	U	1.69E-01	1.09E-01	1.89E-01	U	5.2	0.018
FSS-35-02-015	1.59E-02	1.26E-01	1.84E-01	U	9.20E-02	9.85E-02	1.56E-01		2.9	0.008
FSS-35-02-016	-5.69E-02	1.35E-01	1.84E-01	U	5.90E-02	1.08E-01	1.65E-01	U	1.8	-0.008
FSS-35-02-017	3.65E-02	1.47E-01	2.40E-01	U	1.27E-01	1.33E-01	2.13E-01	U	3.9	0.014
FSS-35-02-017LR	6.19E-02	1.09E-01	2.10E-01	U	1.70E-01	1.31E-01	2.19E-01	U	5.3	0.022
FSS-35-02-017AVE	4.92E-02				1.49E-01				4.6	0.018

## Survey Unit CE-FSS-35-02

### One-Minute Static Field Measurement Results

Sample ID	Static Count Rate (cpm)	Ambient Background (cpm)	Net (cpm)	pCi/g
CE-FSS-35-02-001	2434	2200	234	0.8
CE-FSS-35-02-002	2090	2200	-110	-0.4
CE-FSS-35-02-003	2255	2200	55	0.2
CE-FSS-35-02-004	2504	2200	304	1.0
CE-FSS-35-02-005	2140	2200	-60	-0.2
CE-FSS-35-02-006	2344	2200	144	0.5
CE-FSS-35-02-007	2449	2200	249	0.8
CE-FSS-35-02-008	2481	2200	281	0.9
CE-FSS-35-02-009	2101	2200	-99	-0.3
CE-FSS-35-02-010	1790	2200	-410	-1.4
CE-FSS-35-02-011	2215	2200	15	0.0
CE-FSS-35-02-012	2528	2200	328	1.1
CE-FSS-35-02-013	2301	2200	101	0.3
CE-FSS-35-02-014	2590	2200	390	1.3
CE-FSS-35-02-015	2614	2200	414	1.4
CE-FSS-35-02-016	2580	2200	380	1.3
CE-FSS-35-02-017	2541	2200	341	1.1

## Survey Unit CE-FSS-35-02

### Final Status Survey Sample GPS Coordinates

Sample ID	X Coordinate	Y Coordinate
CE-FSS-35-02-001	1007987.18	886194.80
CE-FSS-35-02-002	1007958.34	886223.65
CE-FSS-35-02-003	1007987.18	886223.65
CE-FSS-35-02-004	1008016.03	886223.65
CE-FSS-35-02-005	1007929.49	886252.50
CE-FSS-35-02-006	1007958.34	886252.50
CE-FSS-35-02-007	1007987.18	886252.50
CE-FSS-35-02-008	1008016.03	886252.50
CE-FSS-35-02-009	1008044.88	886252.50
CE-FSS-35-02-010	1007929.49	886281.34
CE-FSS-35-02-011	1007958.34	886281.34
CE-FSS-35-02-012	1008016.03	886281.34
CE-FSS-35-02-013	1008044.88	886281.34
CE-FSS-35-02-014	1007958.34	886310.19
CE-FSS-35-02-015	1007987.18	886310.19
CE-FSS-35-02-016	1008016.03	886310.19
CE-FSS-35-02-017	1007987.18	886339.04

## Descriptive Statistics Report

### Summary Section of SU\_3502\_Co60

Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	Range
17	-3.688823E-03	0.0485257	1.176921E-02	-0.105	0.061	0.166

### Counts Section of SU\_3502\_Co60

Rows	Sum of Frequencies	Missing Values	Distinct Values	Sum	Total Sum Squares	Adjusted Sum Squares
33	17	16	16	-0.06271	3.790722E-02	0.0376759

### Means Section of SU\_3502\_Co60

Parameter	Mean	Median	Geometric Mean	Harmonic Mean	Sum	Mode
Value	-3.688823E-03	-0.00522	3.935728E-02	-3.457352E-02	-0.06271	-0.0569
Std Error	1.176921E-02				0.2000766	
95% LCL	-2.863844E-02	-0.0271			-0.4868534	
95% UCL	2.126079E-02	0.044			0.3614334	
T-Value	-0.3134					
Prob Level	0.758003					
Count	17		7	17		2

### Variation Section of SU\_3502\_Co60

Parameter	Variance	Standard Deviation	Unbiased Std Dev	Std Error of Mean	Interquartile Range	Range
Value	2.354744E-03	0.0485257	4.928937E-02	1.176921E-02	0.0886	0.166
Std Error	6.391244E-04	9.313192E-03		2.258781E-03		
95% LCL	1.306134E-03	3.614048E-02		8.765354E-03		
95% UCL	5.454217E-03	7.385267E-02		0.0179119		

### Skewness and Kurtosis Section of SU\_3502\_Co60

Parameter	Skewness	Kurtosis	Fisher's g1	Fisher's g2	Coefficient of Variation	Coefficient of Dispersion
Value	-0.3139472	2.252369	-0.3451833	-0.5681793	-13.15479	-7.397904
Std Error	0.3500987	0.4583234			40.25296	

### Trimmed Section of SU\_3502\_Co60

Parameter	5% Trimmed	10% Trimmed	15% Trimmed	25% Trimmed	35% Trimmed	45% Trimmed
Trim-Mean	-1.654248E-03	-1.313971E-03	-1.346639E-03	-1.333529E-03	-4.223529E-03	-6.074412E-03
Trim-Std Dev	0.0420882	3.815808E-02	3.439922E-02	2.250862E-02	1.277033E-02	2.875543E-03
Count	15.3	13.6	11.9	8.5	5.1	1.7

### Mean-Deviation Section of SU\_3502\_Co60

Parameter	X-Mean	X-Median	(X-Mean)^2	(X-Mean)^3	(X-Mean)^4
Average	3.884962E-02	3.861706E-02	2.216229E-03	-3.275508E-05	1.10629E-05
Std Error	7.068733E-03		6.015288E-04	4.166903E-05	5.367475E-06



## Descriptive Statistics Report

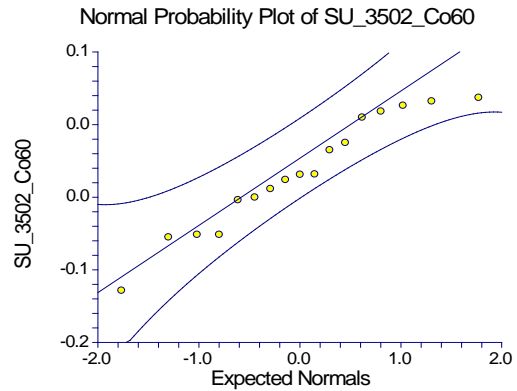
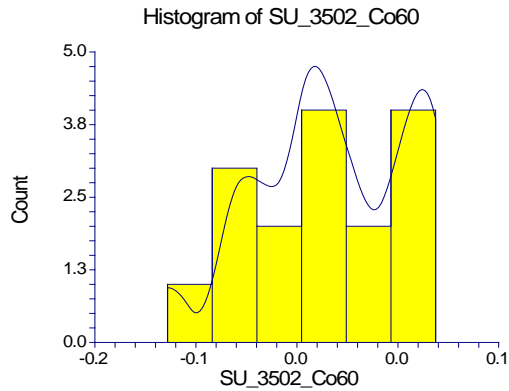
### Quartile Section of SU\_3502\_Co60

	10th	25th	50th	75th	90th
Parameter	Percentile	Percentile	Percentile	Percentile	Percentile
Value	-0.06828	-0.042	-0.00522	0.0466	0.05852
95% LCL		-0.105	-0.0271	-0.00522	
95% UCL		-0.00969	0.044	0.061	

### Normality Test Section of SU\_3502\_Co60

Test Name	Test Value	Prob Level	10% Critical Value	5% Critical Value	Decision (5%)
Shapiro-Wilk W	0.9450408	0.382933			Accept Normality
Anderson-Darling	0.3257592	0.521631			Accept Normality
Martinez-Iglewicz	1.023188		1.252524	1.438767	Accept Normality
Kolmogorov-Smirnov	9.887648E-02		0.19	0.207	Accept Normality
D'Agostino Skewness	-0.6605	0.508914	1.645	1.960	Accept Normality
D'Agostino Kurtosis	-0.4403	0.659726	1.645	1.960	Accept Normality
D'Agostino Omnibus	0.6302	0.729732	4.605	5.991	Accept Normality

### Plots Section of SU\_3502\_Co60



## Descriptive Statistics Report

### Percentile Section of SU\_3502\_Co60

Percentile	Value	95% LCL	95% UCL	Exact Conf. Level
99.0	0.061			
95.0	0.061			
90.0	0.05852			
85.0	0.05531			
80.0	0.0512	-0.0049	0.061	96.6548
75.0	0.0466	-0.00522	0.061	98.0098
70.0	0.03528	-0.00969	0.0579	96.8032
65.0	0.02031	-0.0175	0.0542	95.5248
60.0	0.01174	-0.0175	0.0542	95.2868
55.0	-0.004932	-0.0248	0.0492	95.1454
50.0	-0.00522	-0.0271	0.044	95.0958
45.0	-0.009243	-0.0569	0.0222	95.1454
40.0	-0.015938	-0.0569	0.0159	95.2868
35.0	-0.02261	-0.0591	-0.0049	95.4972
30.0	-0.02618	-0.0591	-0.0049	96.8032
25.0	-0.042	-0.105	-0.00969	95.2246
20.0	-0.0569	-0.105	-0.00969	96.6548
15.0	-0.05756			
10.0	-0.06828			
5.0	-0.105			
1.0	-0.105			

Percentile Formula: Ave X(p[n+1])

### Stem-Leaf Plot Section of SU\_3502\_Co60

Depth	Stem	Leaves
1	-1*	0
1	.	
1	S	
4	F	555
6	T	22
(4)	-0*	1000
7	0*	1
6	T	2
5	F	4455
1	S	6

Unit = .01 Example: 1 |2 Represents 0.12

## Descriptive Statistics Report

### Summary Section of SU\_3502\_Total\_U

Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	Range
17	3.388235	1.991194	0.4829355	0.2	7.5	7.3

### Counts Section of SU\_3502\_Total\_U

Rows	Sum of Frequencies	Missing Values	Distinct Values	Sum	Total Sum Squares	Adjusted Sum Squares
33	17	16	15	57.6	258.6	63.43765

### Means Section of SU\_3502\_Total\_U

Parameter	Mean	Median	Geometric Mean	Harmonic Mean	Sum	Mode
Value	3.388235	3.8	2.520609	1.338022	57.6	
Std Error	0.4829355				8.209903	
95% LCL	2.364458	1.8			40.19579	
95% UCL	4.412013	4.2			75.00422	
T-Value	7.0159					
Prob Level	0.000003					
Count	17		17	17		

### Variation Section of SU\_3502\_Total\_U

Parameter	Variance	Standard Deviation	Unbiased Std Dev	Std Error of Mean	Interquartile Range	Range
Value	3.964853	1.991194	2.02253	0.4829355	2.8	7.3
Std Error	1.191288	0.4230467		0.1026039		
95% LCL	2.199233	1.482981		0.3596758		
95% UCL	9.183661	3.030456		0.7349935		

### Skewness and Kurtosis Section of SU\_3502\_Total\_U

Parameter	Skewness	Kurtosis	Fisher's g1	Fisher's g2	Coefficient of Variation	Coefficient of Dispersion
Value	0.1301316	2.534718	0.1430791	-0.1809585	0.5876787	0.3931889
Std Error	0.3269364	0.5343669			0.1135388	

### Trimmed Section of SU\_3502\_Total\_U

Parameter	5% Trimmed	10% Trimmed	15% Trimmed	25% Trimmed	35% Trimmed	45% Trimmed
Trim-Mean	3.336928	3.329412	3.352101	3.482353	3.617647	3.779412
Trim-Std Dev	1.680548	1.395407	1.156263	0.752981	0.4185957	6.301261E-02
Count	15.3	13.6	11.9	8.5	5.1	1.7

### Mean-Deviation Section of SU\_3502\_Total\_U

Parameter	X-Mean	X-Median	(X-Mean)^2	(X-Mean)^3	(X-Mean)^4
Average	1.555017	1.494118	3.731626	0.938059	35.29603
Std Error	0.290057		1.121212	2.558853	16.49813

## Descriptive Statistics Report

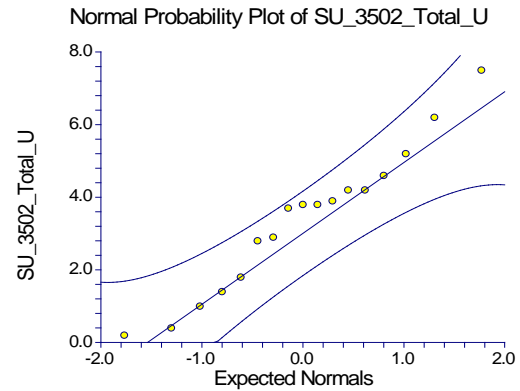
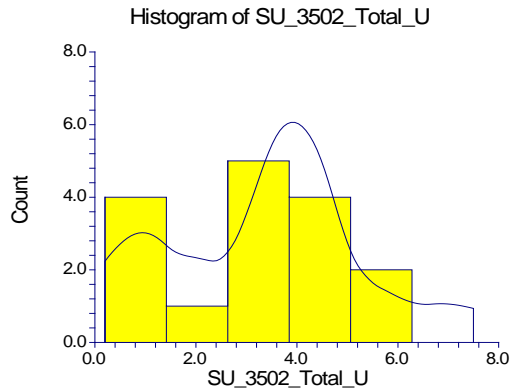
### Quartile Section of SU\_3502\_Total\_U

	10th	25th	50th	75th	90th
Parameter	Percentile	Percentile	Percentile	Percentile	Percentile
Value	0.36	1.6	3.8	4.4	6.46
95% LCL		0.2	1.8	3.8	
95% UCL		3.7	4.2	7.5	

### Normality Test Section of SU\_3502\_Total\_U

Test Name	Test Value	Prob Level	10% Critical Value	5% Critical Value	Decision (5%)
Shapiro-Wilk W	0.9651383	0.729054			Accept Normality
Anderson-Darling	0.2869193	0.622150			Accept Normality
Martinez-Iglewicz	0.9460628		1.252524	1.438767	Accept Normality
Kolmogorov-Smirnov	0.1064612		0.19	0.207	Accept Normality
D'Agostino Skewness	0.2757	0.782779	1.645	1.960	Accept Normality
D'Agostino Kurtosis	0.0371	0.970402	1.645	1.960	Accept Normality
D'Agostino Omnibus	0.0774	0.962046	4.605	5.991	Accept Normality

### Plots Section of SU\_3502\_Total\_U



## Descriptive Statistics Report

### Percentile Section of SU\_3502\_Total\_U

Percentile	Value	95% LCL	95% UCL	Exact Conf. Level
99.0	7.5			
95.0	7.5			
90.0	6.46			
85.0	5.5			
80.0	4.84	3.8	7.5	96.6548
75.0	4.4	3.8	7.5	98.0098
70.0	4.2	3.7	6.2	96.8032
65.0	4.11	2.9	5.2	95.5248
60.0	3.88	2.9	5.2	95.2868
55.0	3.8	2.8	4.6	95.1454
50.0	3.8	1.8	4.2	95.0958
45.0	3.71	1.4	4.2	95.1454
40.0	3.06	1	3.9	95.2868
35.0	2.83	0.4	3.8	95.4972
30.0	2.2	0.4	3.8	96.8032
25.0	1.6	0.2	3.7	95.2246
20.0	1.24	0.2	3.7	96.6548
15.0	0.82			
10.0	0.36			
5.0	0.2			
1.0	0.2			

Percentile Formula: Ave X(p[n+1])

### Stem-Leaf Plot Section of SU\_3502\_Total\_U

Depth	Stem	Leaves
2	0	24
5	1	048
7	2	89
(4)	3	7889
6	4	226
3	5	2
2	6	2
1	7	5

Unit = .1 Example: 1 |2 Represents 1.2

## Descriptive Statistics Report

### Summary Section of SU\_3502\_SOF

Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	Range
17	5.352941E-03	1.095412E-02	2.656763E-03	-0.02	0.019	0.039

### Counts Section of SU\_3502\_SOF

Rows	Sum of Frequencies	Missing Values	Distinct Values	Sum	Total Sum Squares	Adjusted Sum Squares
33	17	16	12	0.091	0.002407	1.919882E-03

### Means Section of SU\_3502\_SOF

Parameter	Mean	Median	Geometric Mean	Harmonic Mean	Sum	Mode
Value	5.352941E-03	0.006	6.281715E-03	6.772208E-03	0.091	
Std Error	2.656763E-03				4.516498E-02	
95% LCL	-2.791453E-04	0.001			-4.745471E-03	
95% UCL	1.098503E-02	0.016			0.1867455	
T-Value	2.0148					
Prob Level	0.061045					
Count	17		13	17		

### Variation Section of SU\_3502\_SOF

Parameter	Variance	Standard Deviation	Unbiased Std Dev	Std Error of Mean	Interquartile Range	Range
Value	1.199926E-04	1.095412E-02	1.112651E-02	2.656763E-03	0.017	0.039
Std Error	3.895445E-05	2.514576E-03		6.098744E-04		
95% LCL	6.655778E-05	8.158294E-03		1.978677E-03		
95% UCL	2.779351E-04	1.667139E-02		4.043405E-03		

### Skewness and Kurtosis Section of SU\_3502\_SOF

Parameter	Skewness	Kurtosis	Fisher's g1	Fisher's g2	Coefficient of Variation	Coefficient of Dispersion
Value	-0.5157929	2.791653	-0.5671117	0.1714101	2.046373	1.421569
Std Error	0.3464936	0.616589			1.15475	

### Trimmed Section of SU\_3502\_SOF

Parameter	5% Trimmed	10% Trimmed	15% Trimmed	25% Trimmed	35% Trimmed	45% Trimmed
Trim-Mean	6.003268E-03	6.19853E-03	6.298319E-03	5.735294E-03	4.82353E-03	5.176471E-03
Trim-Std Dev	9.193908E-03	8.096462E-03	7.06322E-03	4.887459E-03	2.76922E-03	2.520504E-03
Count	15.3	13.6	11.9	8.5	5.1	1.7

### Mean-Deviation Section of SU\_3502\_SOF

Parameter	X-Mean	X-Median	(X-Mean)^2	(X-Mean)^3	(X-Mean)^4
Average	8.567474E-03	8.529412E-03	1.129343E-04	-6.190332E-07	3.560515E-08
Std Error	1.595685E-03		3.666302E-05	5.916941E-07	2.033313E-08

## Descriptive Statistics Report

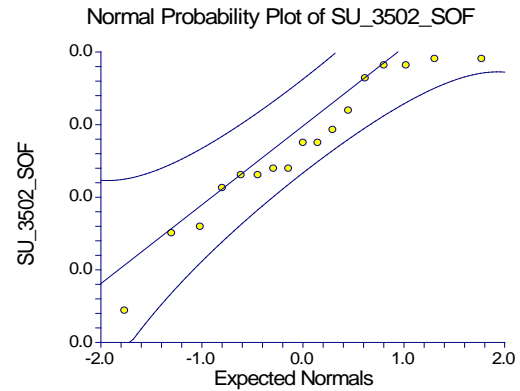
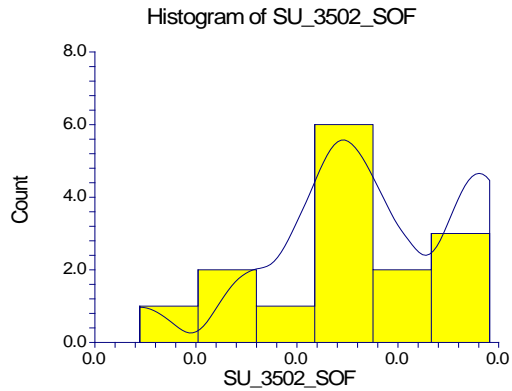
### Quartile Section of SU\_3502\_SOF

	10th	25th	50th	75th	90th
Parameter	Percentile	Percentile	Percentile	Percentile	Percentile
Value	-0.0104	0	0.006	0.017	0.019
95% LCL		-0.02	0.001	0.006	
95% UCL		0.002	0.016	0.019	

### Normality Test Section of SU\_3502\_SOF

Test Name	Test Value	Prob Level	10% Critical Value	5% Critical Value	Decision (5%)
Shapiro-Wilk W	0.93235	0.238207			Accept Normality
Anderson-Darling	0.382668	0.397796			Accept Normality
Martinez-Iglewicz	1.032994		1.252524	1.438767	Accept Normality
Kolmogorov-Smirnov	0.1064118		0.19	0.207	Accept Normality
D'Agostino Skewness	-1.0705	0.284389	1.645	1.960	Accept Normality
D'Agostino Kurtosis	0.3985	0.690287	1.645	1.960	Accept Normality
D'Agostino Omnibus	1.3048	0.520802	4.605	5.991	Accept Normality

### Plots Section of SU\_3502\_SOF



## Descriptive Statistics Report

### Percentile Section of SU\_3502\_SOF

Percentile	Value	95% LCL	95% UCL	Exact Conf. Level
99.0	0.019			
95.0	0.019			
90.0	0.019			
85.0	0.0183			
80.0	0.018	0.006	0.019	96.6548
75.0	0.017	0.006	0.019	98.0098
70.0	0.014	0.002	0.019	96.8032
65.0	0.0101	0.002	0.018	95.5248
60.0	0.0076	0.002	0.018	95.2868
55.0	0.006	0.001	0.018	95.1454
50.0	0.006	0.001	0.016	95.0958
45.0	0.0024	-0.001	0.011	95.1454
40.0	0.002	-0.007	0.008	95.2868
35.0	0.0013	-0.008	0.006	95.4972
30.0	0.001	-0.008	0.006	96.8032
25.0	0	-0.02	0.002	95.2246
20.0	-0.0034	-0.02	0.002	96.6548
15.0	-0.0073			
10.0	-0.0104			
5.0	-0.02			
1.0	-0.02			

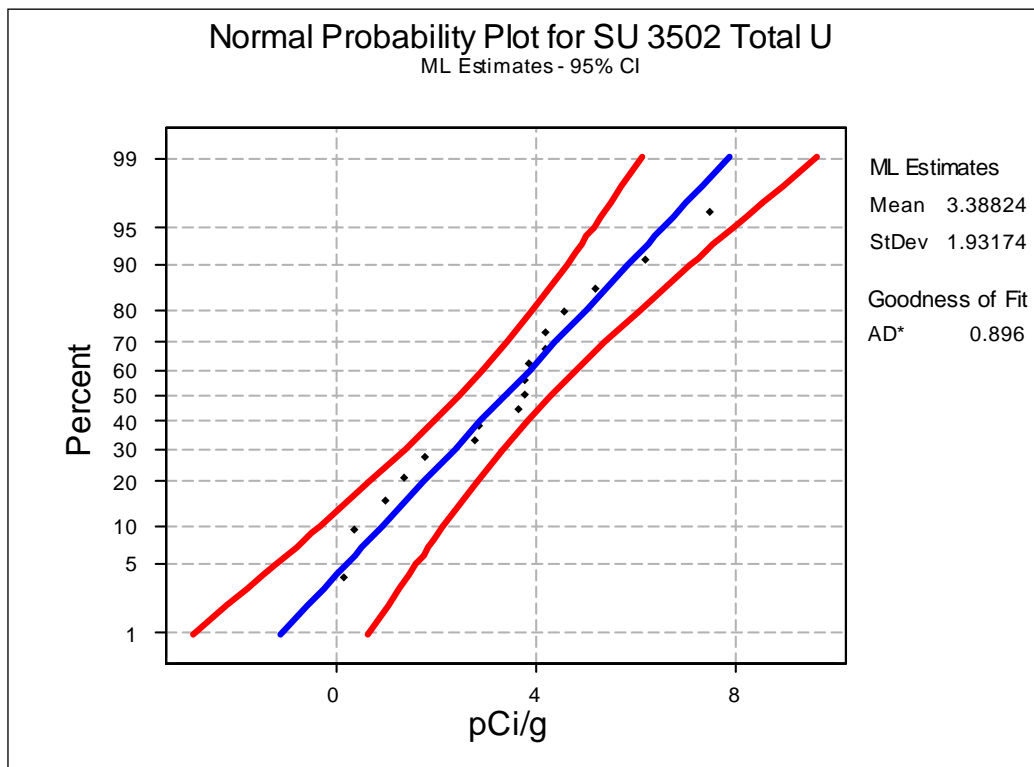
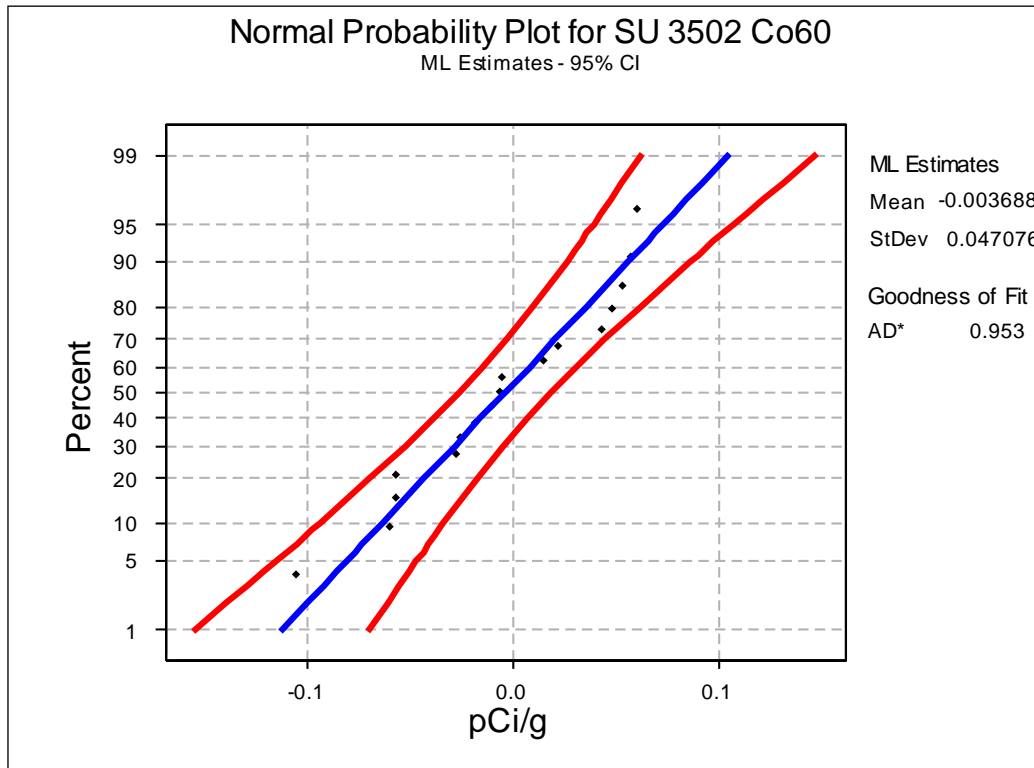
Percentile Formula: Ave X(p[n+1])

### Stem-Leaf Plot Section of SU\_3502\_SOF

Depth	Stem	Leaves
1	-2*	0
1	-1.	
1	-1*	
3	.	87
4	-0*	1
8	0*	1122
(3)	.	668
6	1*	1
5	.	68899

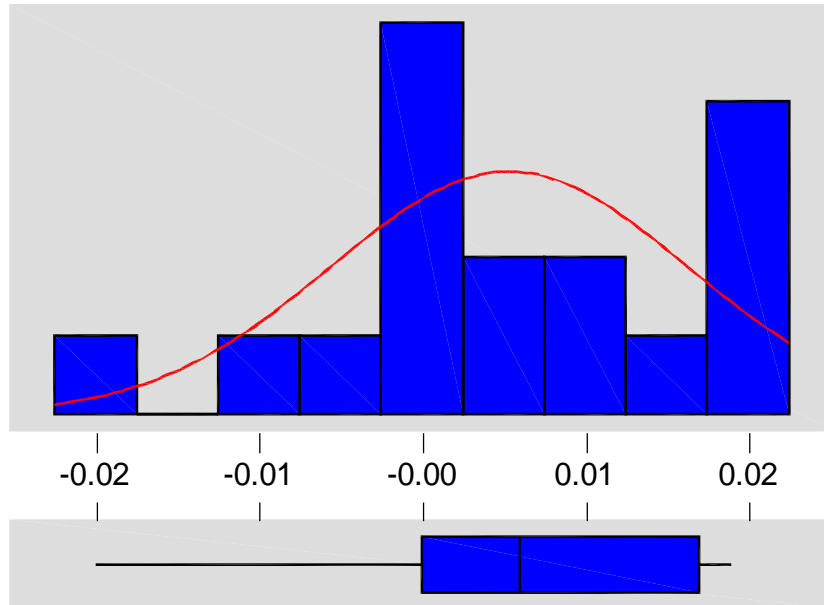
Unit = .001    Example: 1 |2 Represents 0.012





# Descriptive Statistics

Variable: SU 3502 SOF



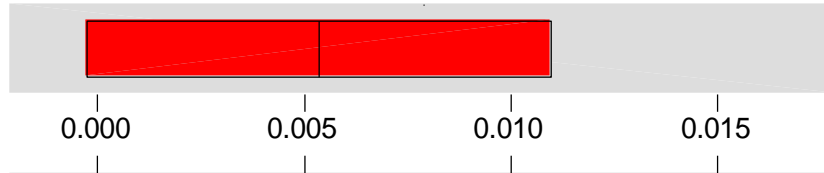
## Anderson-Darling Normality Test

A-Squared: 0.380  
P-Value: 0.364

Mean: 5.35E-03  
StDev: 1.10E-02  
Variance: 1.20E-04  
Skewness: -5.7E-01  
Kurtosis: 0.171410  
N: 17

Minimum: -2.0E-02  
1st Quartile: 0.00E+00  
Median: 6.00E-03  
3rd Quartile: 1.70E-02  
Maximum: 1.90E-02

### 95% Confidence Interval for Mu



### 95% Confidence Interval for Mu

-2.8E-04      1.10E-02

### 95% Confidence Interval for Sigma

8.16E-03      1.67E-02

### 95% Confidence Interval for Median

1.00E-03      1.59E-02

### 95% Confidence Interval for Median



## One-Sample T-Test Report

Variable SU\_3502\_SOF

### Descriptive Statistics Section

Variable	Count	Mean	Standard Deviation	Standard Error	95% LCL of Mean	95% UCL of Mean
SU_3502_SOF	17	5.352941E-03	1.095412E-02	2.656763E-03	-2.791453E-04	1.098503E-02

T for Confidence Limits = 2.1199

### Tests of Assumptions Section

Assumption	Value	Probability	Decision(5%)
Skewness Normality	-1.0705	0.284389	Cannot reject normality
Kurtosis Normality	0.3985	0.690287	Cannot reject normality
Omnibus Normality	1.3048	0.520802	Cannot reject normality
Correlation Coefficient			

### T-Test For Difference Between Mean and Value Section

Alternative Hypothesis	T-Value	Prob Level	Decision (5%)	Power (Alpha=.05)	Power (Alpha=.01)
SU_3502_SOF<>1	-374.3830	0.000000	Reject Ho	1.000000	1.000000
SU_3502_SOF<1	-374.3830	0.000000	Reject Ho	1.000000	1.000000
SU_3502_SOF>1	-374.3830	1.000000	Accept Ho	0.000000	0.000000

### Nonparametric Tests Section

#### Quantile (Sign) Test

Hypothesized Value	Quantile	Number Lower	Number Higher	Prob Lower	Prob Higher	Prob Both
1	0.5	17	0	1.000000	0.000008	0.000015

#### Wilcoxon Signed-Rank Test for Difference in Medians

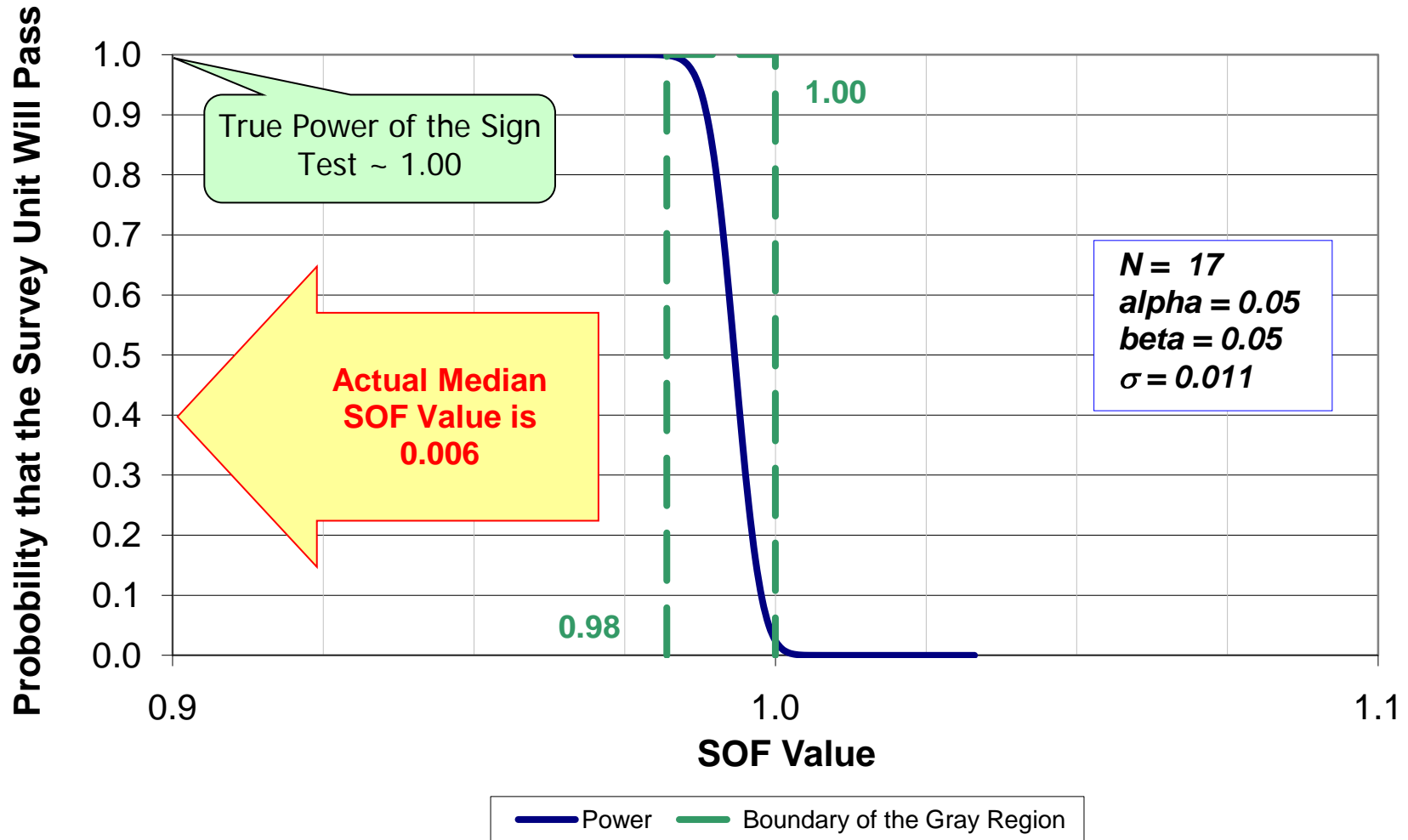
W Sum Ranks	Mean of W	Std Dev of W	Number of Zeros	Number Sets of Ties	Multiplicity Factor
0	76.5	21.10983	0	5	30

Alternative Hypothesis	Exact Probability		Approximation Without Continuity Correction		Approximation With Continuity Correction			
	Prob Level	Decision (5%)	Z-Value	Prob Level	Decision (5%)	Z-Value	Prob Level	Decision (5%)
Median<>1			3.6239	0.000290	Reject Ho	3.6002	0.000318	Reject Ho
Median<1			-3.6239	0.000145	Reject Ho	-3.6002	0.000159	Reject Ho
Median>1			-3.6239	0.999855	Accept Ho	-3.6476	0.999868	Accept Ho

# Retrospective Power of the Sign Test

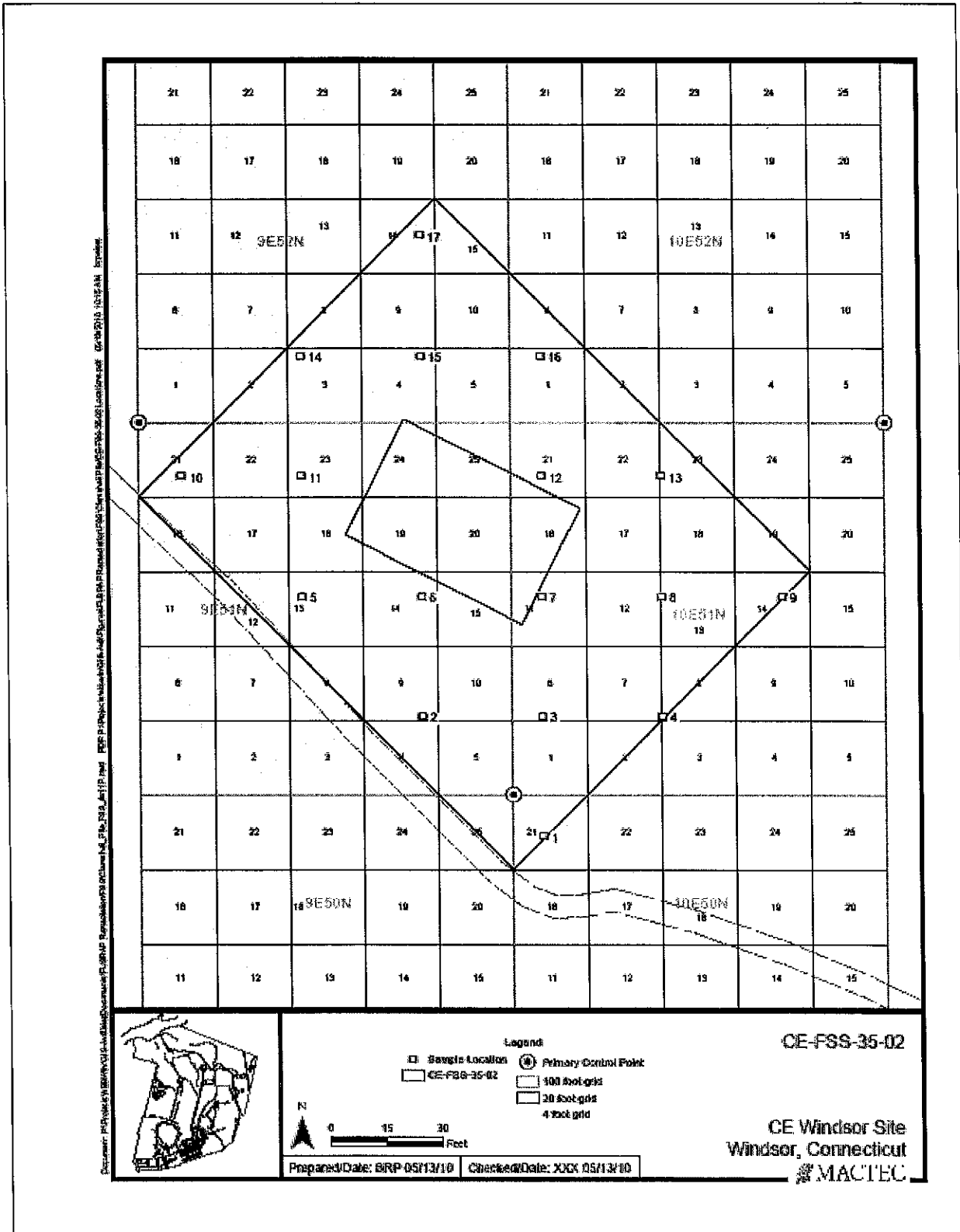
## Surface Soil Volumetric Measurements SOF Values

### Survey Unit CE-FSS-35-02





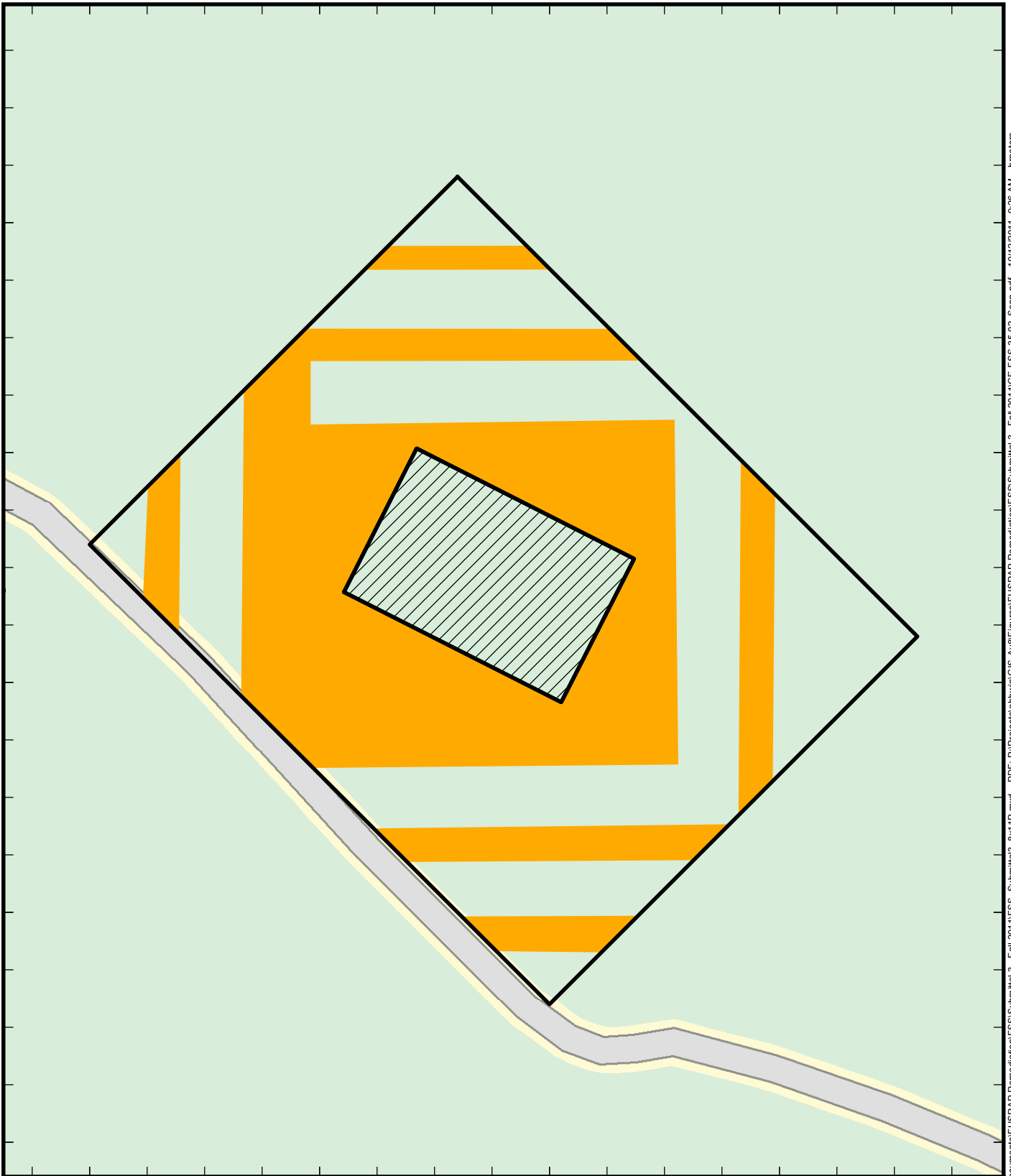
Total Area 13,170 m2



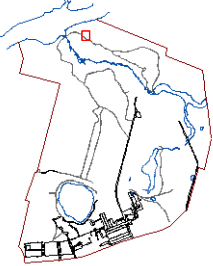
Highlighted areas indicate gamma scanned performed  
 - Performed a gamma scan ( $\geq 10\%$ ) of CE-FSS-35-02 area, results are no detected activity greater than action level  
 # indicate where 60 sec. static readings were taken and soil samples were collected.

1007900 1007950 1008000 1008050

886350  
886300  
886250  
886200  
886150



CT State Plane NAD 83 Feet



**Legend**

CE-FSS-35-02	Forest
Not in Survey Unit	Open
Extent of Gamma Walkover Survey	Water
	Road

N  
 0 15 30 Feet

Prepared/Date: BRP 10/12/11 | Checked/Date: GSM 10/12/11

**Scan Survey**  
**Survey Unit CE-FSS-35-02**  
  
**Final Status Survey**  
**CE Windsor Site**  
**Windsor, Connecticut**



Document: P:\Projects\ABBWIN\GIS-Av8\MapDocuments\FUSRAP Remediation\FSS\Submittal 3 - Fall 2011\FSS\_Submittal3\_8x11P.mxd PDF: P:\Projects\ABBWIN\GIS-Av8\Figures\FUSRAP Remediation\FSS\Submittal 3 - Fall 2011\FSS-35-02\_Scan.pdf 10/12/2011 9:26 AM bjpeters

FSS INTERNAL CHAIN OF CUSTODY FORM



Project Info		Laboratory Info			INVOICE (if other than MACTEC contact)	
MACTEC Contact	Project No.	Laboratory Name	Phone	Laboratory Name	Phone	
Project Title	Purchase Order No.	Lab Contact	Fax	Lab Contact	Fax	
Address		Address		Address		
City/State/Zip		City/State/Zip		City/State/Zip		
Special Handling Instructions						
						<b>Analysis</b>
Sample ID No.	Date Collected	time	Type <sup>1</sup>	Media	Volume	Description if necessary
SS-FSS-35-02- 001	6-1-10	1320	Rad	Soil	1 pint	
SS-FSS-35-02- 002	6-1-10	1330	Rad	Soil	1 pint	
SS-FSS-35-02- 003	6-1-10	1340	Rad	Soil	1 pint	
SS-FSS-35-02- 004	6-1-10	1420	Rad	Soil	1 pint	
SS-FSS-35-02- 005	6-1-10	1450	Rad	Soil	1 pint	
SS-FSS-35-02- 006	6-1-10	1455	Rad	Soil	1 pint	
SS-FSS-35-02- 007	6-1-10	1512	Rad	Soil	1 pint	
SS-FSS-35-02- 008	6-1-10	1516	Rad	Soil	1 pint	
SS-FSS-35-02- 008S	6-1-10	1516	Rad	Soil	1 pint	
SS-FSS-35-02- 009	6-1-10	1519	Rad	Soil	1 pint	
SS-FSS-35-02- 010	6-1-10	1523	Rad	Soil	1 pint	
SS-FSS-35-02- 011	6-1-10	1527	Rad	Soil	1 pint	
SS-FSS-35-02- 012	6-1-10	1532	Rad	Soil	1 pint	
SS-FSS-35-02- 013	6-1-10	1536	Rad	Soil	1 pint	
SS-FSS-35-02- 014	6-1-10	1540	Rad	Soil	1 pint	
Relinquished By:	L. Fitzsimmons		Received By:			
Signed/Date/Time	[Signature] 6-1-10 16:40		Signed/Date/Time			
Received By:	[Signature] 6-1-10 16:40		Relinquished By:			
Signed/Date/Time	Harold Schwann		Signed/Date/Time			
Relinquished By:			Received By:			
Signed/Date/Time			Signed/Date/Time			



FSS INTERNAL CHAIN OF CUSTODY FORM



Project Info		Laboratory Info			INVOICE (if other than MACTEC contact)	
MACTEC Contact	Project No.	Laboratory Name	Phone	Laboratory Name	Phone	
Project Title	Purchase Order No.	Lab Contact	Fax	Lab Contact	Fax	
Address		Address		Address		
City/State/Zip		City/State/Zip		City/State/Zip		
Special Handling Instructions						
						<b>Analysis</b>
Sample ID No.	Date Collected	time	Type <sup>1</sup>	Media	Volume	Description if necessary
SS-FSS-35-02- 015	6-1-10	1545	Rad	Soil	1 pint	
SS-FSS-35-02- 016	6-1-10	1549	Rad	Soil	1 pint	
SS-FSS-35-02- 017	6-1-10	1555	Rad	Soil	1 pint	
SS-FSS-35-02-			Rad	Soil	1 pint	
SS-FSS-35-02-			Rad	Soil	1 pint	
SS-FSS-35-02-			Rad	Soil	1 pint	
SS-FSS-35-02-			Rad	Soil	1 pint	
SS-FSS-35-02-			Rad	Soil	1 pint	
SS-FSS-35-02-			Rad	Soil	1 pint	
SS-FSS-35-02-			Rad	Soil	1 pint	
SS-FSS-35-02-			Rad	Soil	1 pint	
SS-FSS-35-02-			Rad	Soil	1 pint	
SS-FSS-35-02-			Rad	Soil	1 pint	
SS-FSS-35-02-			Rad	Soil	1 pint	
SS-FSS-35-02-			Rad	Soil	1 pint	
SS-FSS-35-02-			Rad	Soil	1 pint	
Relinquished By:	L. Fitzsimmons		Received By:			<sup>1</sup> Type
Signed/Date/Time	[Signature] 6-1-10 @ 1640		Signed/Date/Time			RS-Radioactive
Received By:	H. Schwenn		Relinquished By:			Chem-Chemical
Signed/Date/Time			Signed/Date/Time			Mix-Rad+Chemical
Relinquished By:			Received By:			
Signed/Date/Time			Signed/Date/Time			

\*\*\*\*\*  
 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
 \*\*\*\*\*

Site Location: CE Windsor  
 Sample ID: FSS-35-02-001  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-001  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 5.569E+002 g  
 Sample Taken On: 6/1/2010 1:20:00 PM  
 Acquisition Started: 6/1/2010 5:52:19 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.4 seconds  
 Dead Time: 0.04 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		2.09E+001	3.25E+000	1.78E+000
CO-60	U	-4.90E-003	1.30E-001	1.84E-001
SB-125	U	-1.63E-001	2.90E-001	4.08E-001
CS-137		1.05E-001	7.34E-002	1.04E-001
Ra-226		1.17E+000	1.79E-001	2.36E-001
TH-230	U	8.15E+000	3.44E+001	4.56E+001
PA-231	U	1.22E+000	3.41E+000	5.09E+000
Th-231	U	1.42E+000	1.27E+000	2.03E+000
Th-232		8.56E-001	1.98E-001	2.43E-001
PA-234M	U	-5.57E+000	1.69E+001	2.30E+001
U-234	U	-4.29E+001	1.63E+002	2.01E+002
U-235	U	1.24E-001	1.22E-001	1.93E-001
U-238		1.49E+000	1.46E+000	2.69E+000
AM-241	U	-8.81E-002	4.33E-001	5.43E-001

Uncertainty reported at 1.9600 sigma

\*\*\*\*\*  
 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
 \*\*\*\*\*

Site Location: CE Windsor  
 Sample ID: FSS-35-02-002  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-002  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 3.993E+002 g  
 Sample Taken On: 6/1/2010 1:30:00 PM  
 Acquisition Started: 6/1/2010 6:22:47 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.3 seconds  
 Dead Time: 0.03 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		2.09E+001	3.93E+000	2.89E+000
CO-60	U	5.79E-002	1.27E-001	2.41E-001
SB-125	U	1.85E-002	3.96E-001	5.84E-001
CS-137		4.81E-001	1.79E-001	2.23E-001
Ra-226		7.34E-001	1.89E-001	3.91E-001
TH-230	U	-3.30E+001	4.31E+001	4.94E+001
PA-231	U	-3.21E+000	5.08E+000	6.48E+000
Th-231		1.50E+000	1.58E+000	2.62E+000
Th-232		6.63E-001	1.79E-001	3.11E-001
PA-234M	U	9.76E+000	1.24E+001	2.59E+001
U-234	U	-2.23E+001	1.89E+002	2.36E+002
U-235	UI	1.36E-001	1.70E-001	2.85E-001
U-238	U	2.65E+000	1.96E+000	3.30E+000
AM-241	U	2.18E-001	4.78E-001	6.66E-001

Uncertainty reported at 1.9600 sigma

\*\*\*\*\*  
 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
 \*\*\*\*\*

Site Location: CE Windsor  
 Sample ID: FSS-35-02-003  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-003  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 5.180E+002 g  
 Sample Taken On: 6/1/2010 1:40:00 PM  
 Acquisition Started: 6/1/2010 6:48:39 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.3 seconds  
 Dead Time: 0.03 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		1.88E+001	3.15E+000	1.63E+000
CO-60	U	-9.69E-003	1.37E-001	2.07E-001
SB-125	U	2.08E-001	2.72E-001	4.62E-001
CS-137		3.88E-001	1.26E-001	1.32E-001
Ra-226		9.43E-001	1.77E-001	3.13E-001
TH-230	U	-7.69E+000	3.48E+001	4.31E+001
PA-231	U	7.66E-001	3.43E+000	5.16E+000
Th-231	U	1.61E+000	1.15E+000	1.92E+000
Th-232		8.54E-001	1.75E-001	4.29E-001
PA-234M	U	-3.02E+000	1.41E+001	2.00E+001
U-234	U	7.50E+001	1.16E+002	1.92E+002
U-235	U	1.36E-001	1.20E-001	1.95E-001
U-238	U	1.65E+000	1.65E+000	2.67E+000
AM-241	U	9.08E-002	4.25E-001	5.67E-001

Uncertainty reported at 1.9600 sigma

\*\*\*\*\*  
 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
 \*\*\*\*\*

Site Location: CE Windsor  
 Sample ID: FSS-35-02-004  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-004  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 5.673E+002 g  
 Sample Taken On: 6/1/2010 2:20:00 PM  
 Acquisition Started: 6/1/2010 7:07:52 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.3 seconds  
 Dead Time: 0.03 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		1.91E+001	3.07E+000	1.69E+000
CO-60	U	6.10E-002	9.06E-002	1.80E-001
SB-125	U	-9.04E-002	2.55E-001	3.34E-001
CS-137	U	-4.71E-002	1.35E-001	1.86E-001
Ra-226		7.62E-001	1.51E-001	1.97E-001
TH-230	U	-2.41E+000	3.03E+001	3.88E+001
PA-231	U	4.47E-001	3.16E+000	4.61E+000
Th-231	U	9.25E-001	1.21E+000	1.90E+000
Th-232		9.63E-001	2.05E-001	1.90E-001
PA-234M	U	2.66E+000	1.35E+001	2.20E+001
U-234	U	-9.55E+001	1.53E+002	1.70E+002
U-235	U	1.23E-001	1.18E-001	1.89E-001
U-238	U	1.94E+000	1.49E+000	2.46E+000
AM-241	U	-1.93E-001	3.94E-001	4.69E-001

Uncertainty reported at 1.9600 sigma

\*\*\*\*\*  
 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
 \*\*\*\*\*

Site Location: CE Windsor  
 Sample ID: FSS-35-02-005  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-005  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 7.065E+002 g  
 Sample Taken On: 6/1/2010 2:50:00 PM  
 Acquisition Started: 6/1/2010 7:26:20 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.3 seconds  
 Dead Time: 0.03 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		1.86E+001	2.63E+000	2.37E-001
CO-60	U	-2.71E-002	1.08E-001	1.45E-001
SB-125		3.12E-001	2.17E-001	2.89E-001
CS-137	U	6.76E-002	1.05E-001	1.72E-001
Ra-226		5.07E-001	1.09E-001	2.06E-001
TH-230	U	-1.27E+001	2.78E+001	3.36E+001
PA-231	U	1.21E-001	2.96E+000	4.24E+000
Th-231	U	6.64E-001	9.16E-001	1.45E+000
Th-232		6.00E-001	1.16E-001	1.91E-001
PA-234M	U	1.18E+000	9.67E+000	1.52E+001
U-234	U	3.22E+001	1.10E+002	1.50E+002
U-235	U	1.20E-001	9.30E-002	1.52E-001
U-238	U	1.36E+000	1.24E+000	2.02E+000
AM-241	U	1.92E-001	2.89E-001	4.11E-001

Uncertainty reported at 1.9600 sigma

\*\*\*\*\*  
 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
 \*\*\*\*\*

Site Location: CE Windsor  
 Sample ID: FSS-35-02-006  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-006  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 5.308E+002 g  
 Sample Taken On: 6/1/2010 2:55:00 PM  
 Acquisition Started: 6/1/2010 7:54:55 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.3 seconds  
 Dead Time: 0.03 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		1.69E+001	2.88E+000	9.55E-001
CO-60	U	-5.69E-002	1.04E-001	1.07E-001
SB-125	U	-3.64E-003	2.32E-001	3.49E-001
CS-137		5.11E-001	1.47E-001	1.59E-001
Ra-226		5.14E-001	1.08E-001	2.43E-001
TH-230	U	2.50E+001	3.10E+001	4.44E+001
PA-231		1.76E+000	1.38E+000	4.08E+000
Th-231		1.44E+000	1.16E+000	1.89E+000
Th-232		8.01E-001	1.49E-001	2.80E-001
PA-234M	U	5.86E+000	1.45E+001	2.35E+001
U-234	U	7.40E+001	1.33E+002	1.88E+002
U-235		2.43E-001	1.35E-001	2.07E-001
U-238	U	1.10E+000	1.45E+000	2.34E+000
AM-241	U	1.27E-001	4.03E-001	5.39E-001

Uncertainty reported at 1.9600 sigma

\*\*\*\*\*  
 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
 \*\*\*\*\*

Site Location: CE Windsor  
 Sample ID: FSS-35-02-007  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-007  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 5.528E+002 g  
 Sample Taken On: 6/1/2010 3:12:00 PM  
 Acquisition Started: 6/1/2010 8:13:51 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.3 seconds  
 Dead Time: 0.03 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		1.78E+001	2.90E+000	9.86E-001
CO-60	U	2.22E-002	1.22E-001	2.02E-001
SB-125	U	1.19E-001	2.95E-001	4.54E-001
CS-137		3.69E-001	1.24E-001	1.40E-001
Ra-226		7.79E-001	1.65E-001	2.34E-001
TH-230	U	3.48E+000	2.85E+001	3.78E+001
PA-231	U	2.86E-001	3.23E+000	4.73E+000
Th-231		1.89E+000	1.27E+000	2.05E+000
Th-232		7.27E-001	1.61E-001	3.40E-001
PA-234M	U	-1.98E+000	1.65E+001	2.31E+001
U-234	U	-4.06E+001	1.52E+002	1.89E+002
U-235	U	2.01E-001	1.16E-001	1.99E-001
U-238	U	2.55E+000	1.54E+000	2.59E+000
AM-241	U	2.21E-002	3.70E-001	4.87E-001

Uncertainty reported at 1.9600 sigma



\*\*\*\*\*  
 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
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Site Location: CE Windsor  
 Sample ID: FSS-35-02-008  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-008  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 4.876E+002 g  
 Sample Taken On: 6/1/2010 3:16:00 PM  
 Acquisition Started: 6/1/2010 8:34:23 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.3 seconds  
 Dead Time: 0.03 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		2.12E+001	3.42E+000	1.45E+000
CO-60	U	-1.87E-001	2.11E-001	1.51E-001
SB-125	U	-7.63E-002	2.66E-001	3.46E-001
CS-137		5.27E-001	1.62E-001	1.86E-001
Ra-226		6.08E-001	1.48E-001	2.91E-001
TH-230	U	-7.96E+000	3.54E+001	4.44E+001
PA-231	U	-3.15E+000	4.30E+000	5.03E+000
Th-231		1.62E+000	5.61E-001	1.58E+000
Th-232		6.94E-001	1.65E-001	3.49E-001
PA-234M	U	-2.27E+000	1.39E+001	1.95E+001
U-234	U	-3.86E+001	1.54E+002	1.91E+002
U-235	U	1.02E-001	1.35E-001	2.10E-001
U-238	U	1.04E+000	1.75E+000	2.76E+000
AM-241	U	1.35E-001	4.06E-001	5.52E-001

Uncertainty reported at 1.9600 sigma

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 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
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Site Location: CE Windsor  
 Sample ID: FSS-35-02-008S  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-008S  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 4.978E+002 g  
 Sample Taken On: 6/1/2010 3:16:00 PM  
 Acquisition Started: 6/1/2010 8:52:50 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.3 seconds  
 Dead Time: 0.02 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		1.80E+001	3.07E+000	1.11E+000
CO-60	U	6.87E-002	9.27E-002	1.96E-001
SB-125	U	-7.03E-002	3.07E-001	4.30E-001
CS-137		6.47E-001	1.67E-001	1.68E-001
Ra-226		5.78E-001	1.38E-001	2.81E-001
TH-230	U	8.31E+000	3.20E+001	4.31E+001
PA-231	U	-2.71E+000	4.00E+000	5.14E+000
Th-231	UI	1.54E+000	1.89E+000	3.16E+000
Th-232		8.13E-001	1.65E-001	2.56E-001
PA-234M	U	-2.65E+000	1.71E+001	2.37E+001
U-234		1.03E+002	9.79E+001	1.56E+002
U-235	U	7.93E-002	1.24E-001	1.92E-001
U-238	U	1.64E+000	1.59E+000	2.61E+000
AM-241	U	-2.33E-001	4.26E-001	5.08E-001

Uncertainty reported at 1.9600 sigma

## QC Analysis Comparison

Table B-1

FSS Quality Control Accuracy and Precision Comparison										
Isotope	Sample ID CE- FSS-35-02-008				Sample ID CE- FSS-35-02-008S					
	Activity Value (pCi/g)	Uncert.	Resolution	Agreement Range	Activity Value (pCi/g)	Uncert.	Agreement Ratio (Accuracy)	% Deviation (Precision)	Acceptable	Comments
Ra-226	6.08E-01	7.53E-02	8	0.6 - 1.66	5.78E-01	7.05E-02	0.95	2.6	Yes	N/A
Th-232	6.94E-01	8.44E-02	8	0.6 - 1.66	8.13E-01	8.39E-02	1.17	-7.9	Yes	N/A
K-40	2.12E+01	1.74E+00	12	0.6 - 1.66	1.80E+01	1.57E+00	0.85	8.2	Yes	N/A
Note:							Resolution = Standard Activity Value /Standard Error			
							Resolution	Agreement Range		
							<4	No Comparison		
							4 - 7	0.4 - 2.0		
							8 - 15	0.6 - 1.66		
							16 - 50	0.75 - 1.33		
							51 - 200	0.80 - 1.25		
							> 200	0.85 - 1.18		

Prepared/Date: GSM 08/19/11

Checked/Date: HTD 08/19/11

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 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
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Site Location: CE Windsor  
 Sample ID: FSS-35-02-009  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-009  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 6.596E+002 g  
 Sample Taken On: 6/1/2010 3:19:00 PM  
 Acquisition Started: 6/1/2010 9:10:59 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.3 seconds  
 Dead Time: 0.03 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		1.51E+001	2.49E+000	1.18E+000
CO-60	U	-2.48E-002	1.17E-001	1.55E-001
SB-125	U	-5.22E-002	2.11E-001	2.69E-001
CS-137		3.13E-001	1.23E-001	1.65E-001
Ra-226		5.35E-001	9.98E-002	1.96E-001
TH-230	U	-6.91E+000	2.52E+001	3.13E+001
PA-231	U	-2.55E+000	3.15E+000	3.96E+000
Th-231	U	1.34E+000	9.20E-001	1.53E+000
Th-232		7.15E-001	9.98E-002	1.89E-001
PA-234M	U	4.94E+000	1.34E+001	2.16E+001
U-234	U	-7.46E+001	1.19E+002	1.36E+002
U-235	U	1.24E-001	1.03E-001	1.65E-001
U-238	U	1.52E+000	1.28E+000	2.10E+000
AM-241	U	2.46E-001	2.74E-001	4.08E-001

Uncertainty reported at 1.9600 sigma

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 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
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Site Location: CE Windsor  
 Sample ID: FSS-35-02-010  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-010  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 5.104E+002 g  
 Sample Taken On: 6/1/2010 3:23:00 PM  
 Acquisition Started: 6/1/2010 9:30:01 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.3 seconds  
 Dead Time: 0.03 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		1.84E+001	3.22E+000	2.08E+000
CO-60	U	-5.22E-003	1.41E-001	2.10E-001
SB-125	U	3.37E-002	2.64E-001	4.00E-001
CS-137		5.52E-001	1.55E-001	1.65E-001
Ra-226		5.79E-001	1.45E-001	3.25E-001
TH-230	U	-9.86E+000	3.44E+001	4.25E+001
PA-231	U	-4.03E+000	3.92E+000	4.29E+000
Th-231	U	2.69E+000	1.34E+000	2.26E+000
Th-232		8.82E-001	1.74E-001	2.95E-001
PA-234M	U	-4.48E+000	1.56E+001	2.18E+001
U-234	U	1.22E+001	1.44E+002	1.89E+002
U-235	U	3.14E-002	1.19E-001	1.76E-001
U-238	U	8.46E-001	1.68E+000	2.63E+000
AM-241	U	-5.05E-001	4.79E-001	5.27E-001

Uncertainty reported at 1.9600 sigma

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 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
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Site Location: CE Windsor  
 Sample ID: FSS-35-02-011  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-011  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 6.229E+002 g  
 Sample Taken On: 6/1/2010 3:27:00 PM  
 Acquisition Started: 6/1/2010 9:47:57 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.3 seconds  
 Dead Time: 0.03 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		1.55E+001	2.60E+000	1.32E+000
CO-60	U	5.42E-002	8.69E-002	1.72E-001
SB-125	UI	2.15E-001	2.12E-001	3.75E-001
CS-137		3.64E-001	1.08E-001	1.05E-001
Ra-226		4.95E-001	1.10E-001	1.99E-001
TH-230	U	3.62E+000	2.74E+001	3.60E+001
PA-231	U	-6.29E-001	3.19E+000	4.40E+000
Th-231	U	5.63E-001	1.05E+000	1.64E+000
Th-232		6.54E-001	1.32E-001	2.30E-001
PA-234M	U	9.92E+000	8.74E+000	1.90E+001
U-234	U	-2.42E+001	1.16E+002	1.47E+002
U-235	U	6.41E-003	1.07E-001	1.53E-001
U-238	U	1.07E+000	1.36E+000	2.17E+000
AM-241	U	-2.69E-002	3.25E-001	4.19E-001

Uncertainty reported at 1.9600 sigma

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 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
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Site Location: CE Windsor  
 Sample ID: FSS-35-02-012  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-012  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 6.137E+002 g  
 Sample Taken On: 6/1/2010 3:32:00 PM  
 Acquisition Started: 6/1/2010 10:07:27 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.3 seconds  
 Dead Time: 0.03 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		1.81E+001	2.84E+000	1.33E+000
CO-60	U	-1.05E-001	1.50E-001	1.81E-001
SB-125		2.49E-001	2.93E-001	3.75E-001
CS-137		3.02E-001	1.08E-001	1.25E-001
Ra-226		7.78E-001	1.33E-001	1.97E-001
TH-230	U	-6.90E+000	2.90E+001	3.62E+001
PA-231	U	-1.20E+000	3.81E+000	5.09E+000
Th-231	UI	1.50E+000	1.91E+000	1.32E+000
Th-232		9.40E-001	1.15E-001	1.74E-001
PA-234M	U	1.88E+001	1.36E+001	2.66E+001
U-234	U	-6.29E+001	1.45E+002	1.74E+002
U-235	U	1.42E-002	1.10E-001	1.58E-001
U-238	U	2.49E+000	1.46E+000	2.44E+000
AM-241	U	2.31E-001	3.28E-001	4.71E-001

Uncertainty reported at 1.9600 sigma

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 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
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Site Location: CE Windsor  
 Sample ID: FSS-35-02-013  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-013  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 5.835E+002 g  
 Sample Taken On: 6/1/2010 3:36:00 PM  
 Acquisition Started: 6/1/2010 10:25:47 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.3 seconds  
 Dead Time: 0.02 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		1.80E+001	2.92E+000	1.55E+000
CO-60	U	-1.75E-002	1.38E-001	1.98E-001
SB-125	U	-3.41E-001	2.53E-001	2.66E-001
CS-137		3.59E-001	1.29E-001	1.61E-001
Ra-226		5.32E-001	1.36E-001	2.30E-001
TH-230	U	3.54E+001	3.03E+001	4.45E+001
PA-231	U	-1.66E+000	3.13E+000	4.11E+000
Th-231		8.55E-001	5.22E-001	1.43E+000
Th-232		7.61E-001	1.45E-001	2.34E-001
PA-234M	U	-1.85E+000	1.29E+001	1.90E+001
U-234	U	1.11E+002	1.38E+002	1.89E+002
U-235	U	4.60E-002	1.12E-001	1.67E-001
U-238	U	1.54E-001	1.59E+000	2.37E+000
AM-241	U	1.91E-001	3.34E-001	4.75E-001

Uncertainty reported at 1.9600 sigma



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 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
 \*\*\*\*\*

Site Location: CE Windsor  
 Sample ID: FSS-35-02-014  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-014  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 5.164E+002 g  
 Sample Taken On: 6/1/2010 3:40:00 PM  
 Acquisition Started: 6/2/2010 12:57:44 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.3 seconds  
 Dead Time: 0.03 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		2.15E+001	3.41E+000	1.85E+000
CO-60	U	4.40E-002	1.24E-001	2.07E-001
SB-125	UI	-7.59E-002	2.98E-001	3.95E-001
CS-137		3.32E-001	1.28E-001	1.57E-001
Ra-226		7.64E-001	1.37E-001	2.99E-001
TH-230	U	1.19E+001	2.95E+001	4.04E+001
PA-231	U	-8.34E-001	3.47E+000	4.86E+000
Th-231	U	1.26E+000	1.30E+000	2.08E+000
Th-232		9.56E-001	1.21E-001	2.07E-001
PA-234M	U	-2.91E-001	1.72E+001	2.54E+001
U-234	U	2.73E+001	1.42E+002	1.91E+002
U-235	U	1.69E-001	1.09E-001	1.89E-001
U-238	U	2.36E+000	1.71E+000	2.82E+000
AM-241	U	-1.75E-001	4.43E-001	5.42E-001

Uncertainty reported at 1.9600 sigma

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 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
 \*\*\*\*\*

Site Location: CE Windsor  
 Sample ID: FSS-35-02-015  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-015  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 5.299E+002 g  
 Sample Taken On: 6/1/2010 3:45:00 PM  
 Acquisition Started: 6/2/2010 1:15:56 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.3 seconds  
 Dead Time: 0.03 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		1.48E+001	2.93E+000	2.36E+000
CO-60	U	1.59E-002	1.26E-001	1.84E-001
SB-125	U	-2.57E-002	2.48E-001	3.50E-001
CS-137		4.89E-001	1.51E-001	1.75E-001
Ra-226		6.35E-001	1.47E-001	3.03E-001
TH-230	U	4.53E+001	2.97E+001	4.58E+001
PA-231	U	-1.86E+000	3.92E+000	5.03E+000
Th-231	U	1.37E+000	1.19E+000	1.94E+000
Th-232		8.24E-001	1.89E-001	4.32E-001
PA-234M	U	1.24E+001	1.50E+001	2.74E+001
U-234	U	-7.93E+001	1.66E+002	2.00E+002
U-235		9.20E-002	9.85E-002	1.56E-001
U-238	U	1.05E+000	1.66E+000	2.61E+000
AM-241	U	-3.52E-001	4.29E-001	4.90E-001

Uncertainty reported at 1.9600 sigma

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 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
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Site Location: CE Windsor  
 Sample ID: FSS-35-02-016  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-016  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 6.052E+002 g  
 Sample Taken On: 6/1/2010 3:49:00 PM  
 Acquisition Started: 6/2/2010 1:41:14 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.3 seconds  
 Dead Time: 0.03 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		2.08E+001	3.17E+000	1.99E+000
CO-60	U	-5.69E-002	1.35E-001	1.84E-001
SB-125	U	-1.65E-001	3.24E-001	3.76E-001
CS-137		3.41E-001	1.20E-001	1.44E-001
Ra-226		7.18E-001	1.48E-001	1.69E-001
TH-230	U	2.76E+000	3.09E+001	3.99E+001
PA-231	U	-9.74E-001	3.48E+000	4.80E+000
Th-231	U	2.13E+000	1.06E+000	1.80E+000
Th-232		8.84E-001	1.42E-001	2.64E-001
PA-234M	U	1.10E+001	1.13E+001	2.22E+001
U-234	U	2.34E+001	1.24E+002	1.66E+002
U-235	U	5.90E-002	1.08E-001	1.65E-001
U-238	U	8.25E-001	1.37E+000	2.17E+000
AM-241	U	-1.20E-001	3.80E-001	4.58E-001

Uncertainty reported at 1.9600 sigma

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 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
 \*\*\*\*\*

Site Location: CE Windsor  
 Sample ID: FSS-35-02-017  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-017  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 4.634E+002 g  
 Sample Taken On: 6/1/2010 3:55:00 PM  
 Acquisition Started: 6/2/2010 2:20:00 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.3 seconds  
 Dead Time: 0.03 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		1.94E+001	3.34E+000	1.51E+000
CO-60	U	3.65E-002	1.47E-001	2.40E-001
SB-125	U	-1.47E-001	3.33E-001	4.48E-001
CS-137		4.69E-001	1.57E-001	1.84E-001
Ra-226		7.46E-001	1.61E-001	2.79E-001
TH-230	U	-5.41E+000	3.81E+001	4.82E+001
PA-231	U	-1.86E+000	4.16E+000	5.47E+000
Th-231		1.80E+000	5.66E-001	1.78E+000
Th-232		1.07E+000	1.32E-001	2.30E-001
PA-234M	U	2.63E+000	1.70E+001	2.69E+001
U-234	U	4.95E+001	1.43E+002	2.01E+002
U-235	U	1.27E-001	1.33E-001	2.13E-001
U-238	U	9.44E-001	1.81E+000	2.82E+000
AM-241	U	2.27E-001	4.42E-001	6.18E-001

Uncertainty reported at 1.9600 sigma

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 \*\*\*\*\* C E R T I F I C A T E O F A N A L Y S I S \*\*\*\*\*  
 \*\*\*\*\*

Site Location: CE Windsor  
 Sample ID: FSS-35-02-017LR  
 Sample Title: CE-FSS-35-02  
 Sample Description: FSS-35-02-017LR  
 Detector Name: 25%HPGE  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\FUSRAP\_R4.NLB  
 Sample Size: 4.634E+002 g  
 Sample Taken On: 6/1/2010 3:55:00 PM  
 Acquisition Started: 6/2/2010 2:56:57 PM  
 Live Time: 1000.0 seconds  
 Real Time: 1000.3 seconds  
 Dead Time: 0.03 %  
 Efficiency ID: 1316-45\_04-30-10

Nuclide Name	Qualifier	Nuclide Activity (pCi/g )	Activity Uncert. (pCi/g )	Nuclide MDA (pCi/g )
K-40		1.72E+001	3.10E+000	1.19E+000
CO-60	U	6.19E-002	1.09E-001	2.10E-001
SB-125	U	2.64E-001	2.67E-001	4.84E-001
CS-137		6.21E-001	1.73E-001	1.85E-001
Ra-226		6.07E-001	1.53E-001	2.88E-001
TH-230	U	-1.50E+001	3.54E+001	4.31E+001
PA-231	U	-3.42E+000	4.61E+000	5.58E+000
Th-231		1.91E+000	1.80E+000	1.64E+000
Th-232		8.20E-001	1.65E-001	3.58E-001
PA-234M	U	-1.64E+000	1.58E+001	2.32E+001
U-234	U	1.06E+002	1.52E+002	2.20E+002
U-235	U	1.70E-001	1.31E-001	2.19E-001
U-238	U	1.80E+000	1.61E+000	2.68E+000
AM-241	U	-8.23E-002	4.58E-001	5.81E-001

Uncertainty reported at 1.9600 sigma

## QC Analysis Comparison

Table B-2

FSS Quality Control Accuracy and Precision Comparison										
Isotope	Sample ID CE- FSS-35-02-017				Sample ID CE- FSS-35-02-017LR					
	Activity Value (pCi/g)	Uncert.	Resolution	Agreement Range	Activity Value (pCi/g)	Uncert.	Agreement Ratio (Accuracy)	% Deviation (Precision)	Acceptable	Comments
Ra-226	7.46E-01	8.20E-02	9	0.6 - 1.66	6.07E-01	7.80E-02	0.81	10.3	Yes	N/A
Th-232	1.07E+00	6.71E-02	16	0.6 - 1.66	8.20E-01	8.42E-02	0.77	13.0	Yes	N/A
K-40	1.94E+01	1.70E+00	11	0.6 - 1.66	1.72E+01	1.58E+00	0.89	6.0	Yes	N/A
Note:							Resolution = Standard Activity Value /Standard Error			
							Resolution	Agreement Range		
							<4	No Comparison		
							4 - 7	0.4 - 2.0		
							8 - 15	0.6 - 1.66		
							16 - 50	0.75 - 1.33		
							51 - 200	0.80 - 1.25		
							> 200	0.85 - 1.18		

Prepared/Date: GSM 08/19/11

Checked/Date: HTD 08/19/11