S1377

Westinghouse

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AUG 15 2019

SITE ASSESSMENT, REMEDIATION & REVITALIZATION

Westinghouse Electric Company
Nuclear Fuel
Columbia Fuel Fabrication Facility
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Hopkins, South Carolina 29061

SCDHEC, BLWM
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Your ref:
Our ref: LTR-RAC-19-60

August 1, 2019

Subject: July 2019 CA Progress Report

Ms. Kuhn:

In accordance with Item 19 of Consent Agreement (CA) 19-02-HW, this progress report is being submitted to you, including the following requested information:

(a) a brief description of the actions which Westinghouse has taken toward achieving compliance with the Consent Agreement during the previous month;
(b) results of sampling and tests, in tabular summary format received by Westinghouse during the reporting period;
(c) brief description of all actions which are scheduled for the next month to achieve compliance with the Consent Agreement, and other information relating to the progress of the work as deemed necessary or requested by the Department; and
(d) information regarding the percentage of work completed and any delays encountered or anticipated that may affect the approved schedule for implementation of the terms of the Consent Agreement, and a description of efforts made to mitigate delays or avoid anticipated delays.

In response to the above requirements, the following is being reported to the Department since the last progress report on June 28, 2019:

(a) Actions during the previous month:
Westinghouse began implementation of the Remedial Investigation (RI) work plan on 6/10/19. To comply with **Item 4** of the CA, the following actions were completed this month.
- Performed additional underground utility assessment to identify locations for safe installation of wells W-77, W-78 and W-93
- Completed rotosonic drilling of permanent wells: W-72, W-73, W-76, W-79, W-80, W-81, W-82, W-83, W-84, and W-87
- Vacuum-clearing for installation of permanent wells: W-77, W-93
- Excavation above the installation area of permanent well: W-78
- Installed 4 Staff Gauges in the following locations (**Attachment A**):

109a

1. Gator Pond
2. Upper Sunset Lake
3. Lower Sunset Lake above the spillway
4. Mill Creek below the Lower Sunset Lake spillway

- Performed Bathymetric surveys of the Gator Pond, Lower Sunset Lake
- Initiated bathymetric survey of Upper Sunset Lake (expected completion date of August 2)
- Performed sediment and surface water sampling
- Completed Phase 2 sampling underneath intermodal container C-40 identified in Addendum 1 to the RI Work Plan, entitled "Southern Storage Area (SSA) Operable Unit Sampling Work Plan"
- Also pertaining to the SSAOU, intermodal containers C-44, C-65 and C-35 have all been safely emptied of their contents, with no indication of leaks to the environment. Plans for removal of the empty intermodal containers and subsequent sampling are being developed.
- On July 8th, Westinghouse submitted images to the Department of its site taken by a drone pre and post flood 2015 that visually demonstrated that the floodwaters of the Congaree River did not reach the Gator Pond

(b) Results of sampling and tests:

- On June 4-5, 2019 the groundwater wells associated with the SSA Operable Unit (W-7A, W-10, W-11, 13R, W-15, W-16, and W-32) were sampled. The results were received on June 21, 2019 and subsequently tabulated followed by an independent peer validation in early July. The results of the sampling are included in **Attachment B.**
- On 7/10/2009, Westinghouse received the results of the Phase 2 sampling activities associated with Addendum 1 to the RI Work Plan (SSA Operable Unit) for intermodal container C-40. The results are attached to this report in a tabulated format as **Attachment C**. The results for sample #9 exceeded the stringent, unrestricted use screening level for uranium. Per Westinghouse's remediation procedure, the site removed an additional 24" of soil in the immediate vicinity of this one sample. After soil removal, three additional soil samples were collected and sent offsite for uranium analysis. A complete report of the SSAOU sampling activities and results will be provided to the Department by August 10th.

(c) Brief description of all actions which are scheduled for the next month:

- In accordance with **Item 4** of the CA, Westinghouse will continue to implement the Work Plan to include the following actions:
    - Hand auger W-78, as it is co-located with a Tc-99 soil sampling location (SS-14)
    - Complete bathymetric survey of Upper Sunset Lake
    - Continue rotosonic drilling of permanent wells within the controlled access area (CAA): W-74, W-75, W-77, W-78, and W-93 (dependent on drilling company availability)
    - Conduct soil sampling to further assess potential sources of Tc-99

- Conduct off-site well surveys
- With DHEC approval, initiate the proposed additional assessment to the RI Work Plan (dated August 2, 2019) to conduct additional lithologic borings and groundwater screening in the floodplain areas south of Upper Sunset Lake and east of Lower Sunset Lake
- With DHEC approval, initiate Phase 1 sampling identified in Addendum 2 to the RI Work Plan, entitled "Wastewater Treatment Area Operable Unit East Lagoon Sediment Characterization"

(d) Percentage of work completed and any delays encountered or anticipated:

- 20/25 (80%) of wells with known locations are installed
- 5/5 (100%) of remaining permanent wells for installation have been vacuum-cleared or excavated to 5 feet
  - Well installation percentages exclude the 4 wells in flood plain whose locations and screened intervals will be agreed upon by CFFF and DHEC based upon the vertical groundwater profiling analytical results in conjunction with the CSM
- 4/4 (100%) of staff gauge installation
- 2/3 (67%) of Bathymetric surveys
- 100% of surface water and sediment sampling

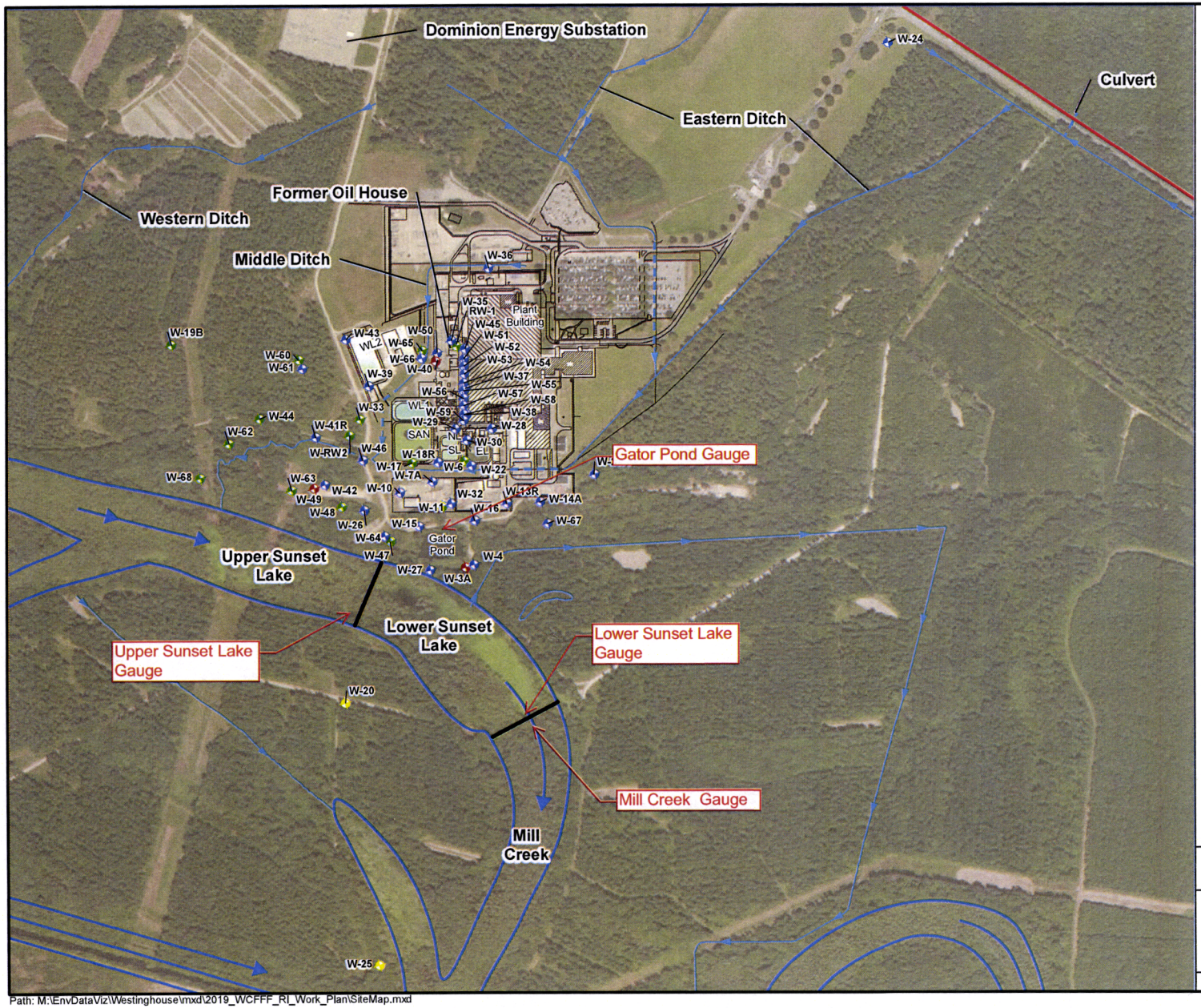
Respectfully,

Diana P. Joyner
Principal Environmental Engineer
Westinghouse Electric Company, CFFF
803.497.7062 (m)

Cc: N. Parr, Environmental Manager
E. Wills, EH&S Manager
J. Grant, AECOM Project Manager
ENOVIA Records

Attachment A

Staff Gauge Installations



Legend

- Ditch
- Culvert
- Mill Creek Flow Direction
- EL East Lagoon
- NL North Lagoon
- SL South Lagoon
- SAN Sanitary Lagoon
- WL1 West Lagoon I
- WL2 West Lagoon II

Groundwater Monitoring Wells

- Upper Surficial Aquifer
- Lower Surficial Aquifer
- Black Mingo Aquifer
- Floodplain Well

- Mill Creek
- Property Line
- SCRDI Bluff Road (Superfund Site)
- Dike Location

0 300 600 Feet

1:7,200

Map Projection: NAD 1983, South Carolina State Plane, FIPS 3900, Feet

Datum: North American 1983

AECOM

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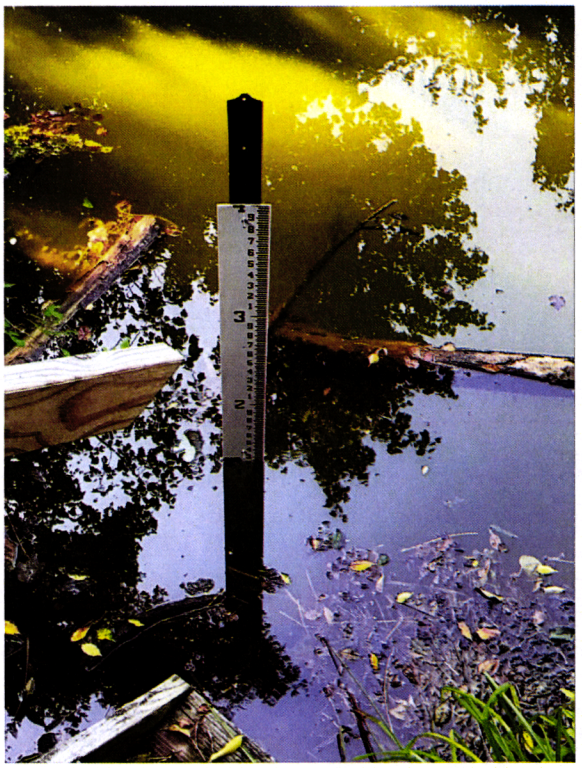
Site Map

WESTINGHOUSE COLUMBIA FUEL FABRICATION FACILITY
HOPKINS, SOUTH CAROLINA

PROJECT NO.	PREPARED BY	DATE	
60595649	LJG	February 2019	**FIGURE 3**

Path: M:\EnvDataViz\Westinghouse\mxd\2019_WCFFF_RI_Work_Plan\SiteMap.mxd



Gator Pond

Upper Sunset Lake

Lower Sunset Lake above spillway

Mill Creek below the Lower Sunset Lake spillway

Attachment B

June 2019 Groundwater Well Results SSAOU

		Volatiles/Semivolatiles										Inorganics					Radionuclides-Alpha Spec (Activity)							Radionuclides-ICPMS (concentration)										Rad-Beta/Tc-99		
Well	Sample Date		Tetrachloroethene µg/L		Trichloroethene µg/L		cis-1,2-dichloroethene µg/L		Vinlyl Chloride		Fluoride mg/L		Ammonia NH3(N) mg/L		Nitrate NO3 mg/L		Gross Alpha pCi/L		Isotopic $U_{233/234}$ pCi/L		Isotopic $U_{235/236}$ pCi/L		Isotopic U_{238} pCi/L		Isotopic U_{234} µg/L		Isotopic U_{235} µg/L		Isotopic U_{238} µg/L		Total U ug/L		Gross Beta pCi/L		Tc-99 pCi/L
			MCL=5		MCL=5		MCL=70				MCL=4				MCL=10		action level = 15		MCL=84		MCL=84		MCL=84		MCL = 30 µg/L		MCL = 30 µg/L		MCL = 30 µg/L		MCL = 30 µg/L		action level = 50*		MCL=900
W7A	Oct/Nov-18	=	1.8	<	1.0	<	1.0			=	6.86	=	65	=	370	<	3.96		Not Analyzed		Not Analyzed		Not Analyzed	<	0.010	<	0.010	=	0.691	=	0.691	=	110	=	175
	Jan-19	=	1.7	<	1.0	<	1.0	<	1.0	=	6.6	=	62.5	=	350	=	8.92	=	0.559	<	0.264	=	0.558	<	0.010	<	0.010	=	0.719	=	0.719	=	122.5	=	160
	6/4/19	=	2.1	<	1.0	<	1.0	<	1.0	=	6.49	=	65.5	=	350	=	13.3	=	0.378	<	0.343	<	0.319	<	0.010	<	0.010	=	0.812	=	0.812	=	141.5	=	176
W10	Oct/Nov-18	<	1.0	<	1.0	<	1.0			=	3.46	=	2.21	=	21	<	4.78		Not Analyzed		Not Analyzed		Not Analyzed	<	0.010	<	0.010	E	0.0841	E	0.0841	=	68.7	=	90.0
	Jan-19	<	1.0	<	1.0	<	1.0	<	1.0	=	3.42	=	4.62	=	15	<	4.64	<	0.399	<	0.322	<	0.364	<	0.010	<	0.010	E	0.0854	E	0.0854	=	50.9	=	80.9
	6/4/19	<	1.0	<	1.0	<	1.0	<	1.0	=	3.59	=	7.41	=	22	=	4.50	<	0.384	<	0.309	<	0.275	<	0.010	<	0.010	E	0.114	E	0.114	=	66.4	=	88.7
W11	Oct/Nov-18	<	5.0	<	5.0	<	5.0			=	0.01	=	4.59	=	57	=	7.82	<	0.315	<	0.153	<	0.198	<	0.010	<	0.010	<	0.067	<	0.067	=	2,160	=	3570
	12/5/2018	<	5.0	<	5.0	<	5.0			=	0.00	=	6.4	=	32	=	14.2	<	0.272	<	0.340	<	0.275	<	0.010	<	0.010	<	0.067	<	0.067	=	2,450	=	3640
	Jan-19	=	2.0	<	1.0	<	1.0	<	1.0	=	0.018	=	6.42	=	64	=	17.0	=	0.497	<	0.260	<	0.368	<	0.010	<	0.010	E	0.192	E	0.192	=	1,810	=	4200
	6/5/19	=	1.9	=	1.3	<	1.0	<	1.0	=	0.005	=	4.37	=	50	=	20.9	<	0.177	<	0.156	<	0.126	<	0.010	<	0.010	E	0.0696	E	0.0696	=	2,060	=	2660
W13R	Oct/Nov-18	=	39	=	3.1	=	1.4			=	8.79	=	38.8	=	24	<	4.87		Not Analyzed		Not Analyzed		Not Analyzed	<	0.010	<	0.010	E	0.131	E	0.131	=	97.6	=	149
	Jan-19	=	46	=	3.7	=	1.3	<	1.0	=	8.29	=	31.8	=	21	=	4.28	<	0.387	<	0.288	<	0.211	<	0.010	<	0.010	E	0.149	E	0.149	=	73.5	=	111
	6/6/19	=	14	=	1.3	<	1.0	<	1.0	=	7.95	=	28.1	=	16	<	4.65	<	0.337	<	0.284	<	0.180	<	0.010	<	0.010	E	0.128	E	0.128	=	48.9	=	60.9
W15	Oct/Nov-18	=	11	=	2.0		1.2			=	1.86	=	13.1	=	44	<	4.99		Not Analyzed		Not Analyzed		Not Analyzed	<	0.010	<	0.010	<	0.067	<	0.067	=	194.5	=	265
	Jan-19	=	8.4	=	1.6	<	1.0	<	1.0	=	2.26	=	18.4	=	49	=	4.48	<	0.304	<	0.287	<	0.296	<	0.010	<	0.010	<	0.067	<	0.067	=	145.5	=	233
	6/4/19	=	13	=	2.3	=	1.2	<	1.0	=	1.92	=	13.4	=	44	<	4.99	<	0.337	<	0.258	<	0.113	<	0.010	<	0.010	E	0.103	E	0.103	=	186	=	281
W16	Oct/Nov-18	=	11	=	2.9	=	3.2			=	8.62	=	18.2	=	4.6	<	4.97		Not Analyzed		Not Analyzed		Not Analyzed	<	0.010	<	0.010	<	0.067	<	0.067	=	17.2		Not Analyzed
	Jan-19	=	6.4	=	1.7	=	1.2	<	1.0	=	7.61	=	15.3	=	3.0	=	5.21	<	0.401	<	0.305	<	0.380	<	0.010	<	0.010	E	0.113	E	0.113	=	15.4	<	30.5
	6/4/19	=	9.6	=	2.4	=	1.5	<	1.0	=	8.36	=	17.1	=	3.8	<	4.47	<	0.412	<	0.346	<	0.243	<	0.010	<	0.010	E	0.0846	E	0.0846	=	18.3	<	35.9
W32	Oct/Nov-18	=	1.5	<	1.0	<	1.0			=	3.61	=	62.5	=	240	=	4.23		Not Analyzed		Not Analyzed		Not Analyzed	<	0.010	<	0.010	=	0.223	=	0.223	=	127	=	259
	Jan-19	=	1.3	<	1.0	<	1.0	<	1.0	=	3.26	=	54.5	=	210	=	8.41	=	0.360	<	0.210	<	0.307	<	0.010	<	0.010	=	0.296	=	0.296	=	176	=	307
	6/5/16	=	1.6	<	1.0	<	1.0	<	1.0	=	3.56	=	53.5	=	210	=	8.88	<	0.325	<	0.158	<	0.261	<	0.010	<	0.010	=	0.310	=	0.310	=	206	=	273

		Chem Lab-Field Data				Field Instrument Data											
Well	Sample Date		Chem Lab pH		Chem Lab Cond		Field pH		Field Specific Conductivity µS/cm		DO mg/L		ORP mV		Field Turbidity NTU		Depth to water table feet
W7A	Oct/Nov-18	=	7.22	=	3305		6.86		329		0.44		215.3		1.94		11
	Jan-19	=	7.32	=	3240	=	6.96	=	3270	=	0.31	=	209.4	=	0.49	=	10.5
	6/4/19	=	6.98	=	3235	=	6.98	=	3186	=	2.0	=	190.2	=	1.29	=	11.55
W10	Oct/Nov-18	=	6.22	=	493		5.89		488		0.4		214.5		0.68		15.45
	Jan-19	=	7.57	=	442	=	6.18	=	436	=	0.44	=	192.9	=	0.63	=	14.72
	6/4/19	=	6.32	=	576	=	6.26	=	584	=	2.7	=	187.2	=	0.43	=	15.84
W11	Oct/Nov-18	=	5.67	=	563		5.37		560		0.65		261.7		8.7		17.95
	12/5/2018	=	7.15	=	612.5		5.45		610		0.73		259.3		5.43		17.51
	Jan-19	=	6.95	=	601	=	5.35	=	585	=	1.00	=	247.5	=	25.63	=	16.9
	6/5/19	=	5.22	=	504.5	=	4.98	=	478.4	=	4.8	=	256.5	=	7.58	=	18.19
W13R	Oct/Nov-18	=	6.48	=	783		6.12		760		0.49		184		6.63		11.7
	Jan-19	=	7.71	=	788	=	6.31	=	790	=	0.48	=	132.5	=	4.32	=	10.48
	6/6/19	=	6.29	=	718.2	=	6.00	=	600	=	2.1	=	196.3	=	7.47	=	11.85
W15	Oct/Nov-18	=	6.29	=	600		5.75		590		0.24		225.9		5.12		12.1
	Jan-19	=	7.1	=	634	=	6.07	=	51.0	=	0.55	=	201.7	=	3.20	=	11.03
	6/4/19	=	6.06	=	574	=	6.03	=	543.0	=	3.3	=	202.9	=	4.60	=	12.3
W16	Oct/Nov-18	=	6.35	=	412		6.14		412		0.37		138.7		1.26		3.6
	Jan-19	=	6.4	=	350	=	6.04	=	267	=	0.47	=	166.1	=	10.03	=	1.73
	6/4/19	=	6.27	=	381	=	6.26	=	385.5	=	1.5	=	38.6	=	7.97	=	2.95
W32	Oct/Nov-18	=	6.9	=	2160		6.83		2370		0.38		231.3		3.2		18.35
	Jan-19	=	7.65	=	1940	=	6.77	=	2220	=	0.60	=	217.3	=	8.08	=	17.68
	6/5/16	=	6.79	=	2080	=	6.84	=	2141	=	3.2	=	233.2	=	1.9	=	18.9

indicates the value is being monitored, as it conflicts with other existing data

Attachment C

Addendum 1 to RI Work Plan
Phase 2 Soil Sampling Results (Under C-40)

Phase 2 Southern Storage Area Operable Unit - Soil Sampling - Beneath Sea-land C-40

	1 mg/kg = 1 ppm				1 ug/g = 1 ppm				pCi/g			
	Fluoride	Ammonia	Nitrate	pH (H)	U238	U234	U235	Total U	U238	U234	U235	Total U
C-40-1	1.52	28.8	2.05	4.76	0.763	*0.00212*	0.00727	0.772	0.2	*13*	0.0	13
C-40-2	0.593	37.6	1.77	4.75	2.77	*0.00218*	0.0925	2.86	0.8	*14*	0.2	15
C-40-3	1.00	50.2	2.60	4.95	0.706	*0.00207*	0.00618	0.714	0.2	*13*	0.0	13
C-40-4	1.36	33.3	1.75	5.52	0.768	*0.00206*	0.0059	0.776	0.2	*13*	0.0	13
C-40-5	0.851	35.9	2.14	4.73	0.630	*0.00218*	0.00532	0.638	0.2	*14*	0.0	14
C-40-6	*0.396*	76.9	2.23	4.84	2.46	*0.00228*	0.0513	2.51	0.7	*14*	1.6	17
C-40-7	0.900	49.9	5.00	4.52	0.660	*0.00211*	0.00508	0.667	0.2	*13*	0.0	13
C-40-8	*0.375*	50.0	1.95	4.66	1.15	*0.00207*	0.0193	1.17	0.3	*13*	0.0	13
C-40-9	*0.391*	81.3	2.18	4.53	20.4	0.00881	0.905	21.31	6.1	55	2.0	63
C-40-10	0.658	38.2	3.23	4.63	6.46	0.00238	0.240	6.70	1.9	15	0.5	17
C-40-11	1.98	36.3	15.4	4.15	2.20	*0.00213*	0.0641	2.27	0.7	*13*	0.1	14
C-40-12	*0.366*	42.3	1.26	4.79	1.27	*0.00216*	0.0215	1.29	0.4	*13*	0.0	14
C-40-13	*0.374*	44.9	2.27	4.66	1.46	*0.00221*	0.019	1.48	0.4	*14*	0.0	14
C-40-14	1.06	91.0	2.43	4.74	6.63	*0.00218*	0.179	6.81	2.0	*14*	0.4	16
C-40-15	0.495	87.8	2.69	4.60	4.47	*0.0021*	0.118	4.59	1.3	*13*	0.3	15
C-40-16	0.957	56.5	2.22	4.65	2.87	*0.00217*	0.0439	2.92	0.9	*13*	0.1	14
C-40-17	*0.391*	88.6	2.58	4.75	3.83	*0.00225*	0.0838	3.92	1.1	*14*	0.2	15
C-40-18	1.1	46.1	2.69	4.85	7.14	0.00258	0.248	7.39	2.1	16	0.5	19

NOTE: *italicized = non-detectable, reported at detection limit*

(H): out of holding

Conversion Factors		
1 ug U238	0.3	pCi
1 ug U234	6220	pCi
1 ug U235	2.2	pCi

initial Chem Lab samples

systematic samples

bias samples

C-40 REAR

6.81	4.59	2.92	3.92	7.39
#14	#15	#16	#17	#18
		#13		
		1.48		
#11				#12
2.27				1.29
		#10		
3.85		6.70		
#7		#8		#9
0.667		1.17		21.31
		2.93		
#5				#6
0.638				2.51
		#4		
2.91		0.776		
#1		#2		#3
0.772		2.86		0.714

C-40 FRONT

SAMPLE RESULTS ARE IN PPM U