

Appendix A

As-Left Radiological Survey and Sample Results – BGRR Outside Areas

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

Certificate of Analysis Report for

BRKL006 Brookhaven National Laboratory (178655)

Client SDG: 32061 GEL Work Order: 303059

The Qualifiers in this report are defined as follows:

DL Failed required detection limit.

J Estimated value; the result was greater than the MDA but less than the required detection limit.

U Undetected; sample result < MDA

UI Uncertain identification for gamma spectroscopy.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the detection limit.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Heather Shaffer.

Reviewed by

Heather Shaffer

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: April 30, 2012

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000
Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	32061-001	Project:	BRKL00601
Sample ID:	303059001	Client ID:	BRKL006
Matrix:	S	COC:	32061
Collect Date:	17-APR-12 17:25	Samp Recv.:	
Receive Date:	23-APR-12 09:05	Client Desc.:	Bldg. 701
Collector:	Client	Vol. Recv.:	
Moisture:	4.28%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
7471 Cold Vapor Hg in Solid "Dry Weight Corrected"											
Mercury	J	0.0365	0.00371	0.200	MG/KG	1	BYV1	04/25/12	1029	1206525	1
Metals Analysis-ICP											
6010 TAL Metals Soil "Dry Weight Corrected"											
Beryllium	J	0.201	0.098	0.490	mg/kg	1	HSC	04/25/12	1448	1206481	2
Copper		14.5	0.294	0.980	mg/kg	1					
Nickel		5.52	0.147	0.490	mg/kg	1					
Zinc		30.5	0.392	0.980	mg/kg	1					
Metals Analysis-ICP-MS											
3050S/6020 Lead "Dry Weight Corrected"											
Lead		12.7	0.0939	0.376	mg/kg	2	RMJ	04/25/12	1730	1206484	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	846 3050BS PREP	BXA1	04/24/12	1843	1206480
SW846 3050B	ICP-MS 3050BS PREP	BXA1	04/24/12	1835	1206483
SW846 7471A Prep	EPA 7471A Mercury Prep Soil	AXS5	04/24/12	1705	1206524

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471A	
2	SW846 3050B/6010B	
3	SW846 3050B/6020	

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: April 30, 2012

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	32061-002	Project:	BRKL00601
Sample ID:	303059002	Client ID:	BRKL006
Matrix:	S	COC:	32061
Collect Date:	18-APR-12 15:55	Samp Recv.:	
Receive Date:	23-APR-12 09:05	Client Desc.:	Bldg. 701
Collector:	Client	Vol. Recv.:	
Moisture:	4.51%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
7471 Cold Vapor Hg in Solid "Dry Weight Corrected"											
Mercury	J	0.0266	0.00407	0.200	MG/KG	1	BYV1	04/25/12	1037	1206525	1
Metals Analysis-ICP											
6010 TAL Metals Soil "Dry Weight Corrected"											
Beryllium	J	0.144	0.0889	0.444	mg/kg	1	HSC	04/25/12	1446	1206481	2
Copper		18.6	0.267	0.889	mg/kg	1					
Nickel		4.64	0.133	0.444	mg/kg	1					
Zinc		36.9	0.356	0.889	mg/kg	1					
Metals Analysis-ICP-MS											
3050S/6020 Lead "Dry Weight Corrected"											
Lead		35.2	0.513	2.05	mg/kg	10	RMJ	04/27/12	0128	1206484	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	846 3050BS PREP	BXA1	04/24/12	1843	1206480
SW846 3050B	ICP-MS 3050BS PREP	BXA1	04/24/12	1835	1206483
SW846 7471A Prep	EPA 7471A Mercury Prep Soil	AXS5	04/24/12	1705	1206524

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471A	
2	SW846 3050B/6010B	
3	SW846 3050B/6020	

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: April 30, 2012

Page 1 of 3

Brookhaven National Laboratory

Building 462

Upton, New York

Contact: Mr. John Burke

Workorder: 303059

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1206484										
QC1202642647	303059001	DUP									
Lead		12.7		12.8	mg/kg	0.392		(0%-20%)	RMJ	04/25/12	17:37
QC1202642646	LCS										
Lead	4.76			4.42	mg/kg		92.8	(80%-120%)		04/25/12	17:24
QC1202642645	MB										
Lead			U	ND	mg/kg					04/25/12	17:18
QC1202642648	303059001	MS									
Lead	5.19	12.7		19.8	mg/kg		137 *	(75%-125%)		04/25/12	17:43
QC1202642650	303059001	MSD									
Lead	4.77	12.7		17.5	mg/kg	12.6	99.4	(0%-20%)		04/25/12	17:49
QC1202642649	303059001	SDILT									
Lead		67.8		13.3	ug/L	1.64		(0%-10%)		04/25/12	17:56
Metals Analysis-ICP											
Batch	1206481										
QC1202642641	303059001	DUP									
Beryllium		J	0.201	J	0.203	mg/kg	1.32 ^	(+/-0.471)	HSC	04/25/12	14:50
Copper			14.5		8.88	mg/kg	48.0*	(0%-20%)			
Nickel			5.52		4.28	mg/kg	25.3*	(0%-20%)			
Zinc			30.5		31.6	mg/kg	3.40	(0%-20%)			
QC1202642640	LCS										
Beryllium	48.2			49.0	mg/kg		102	(80%-120%)		04/25/12	14:43
Copper	48.2			48.4	mg/kg		101	(80%-120%)			
Nickel	48.2			46.7	mg/kg		96.9	(80%-120%)			
Zinc	48.2			45.5	mg/kg		94.4	(80%-120%)			
QC1202642639	MB										
Beryllium			U	ND	mg/kg					04/25/12	14:40
Copper			U	ND	mg/kg						
Nickel			U	ND	mg/kg						
Zinc			U	ND	mg/kg						
QC1202642642	303059001	MS									
Beryllium	51.0	J	0.201		50.2	mg/kg	98	(75%-125%)		04/25/12	14:53
Copper	51.0		14.5		61.9	mg/kg	92.9	(75%-125%)			
Nickel	51.0		5.52		53.8	mg/kg	94.6	(75%-125%)			
Zinc	51.0		30.5		84.1	mg/kg	105	(75%-125%)			
QC1202642644	303059001	MSD									
Beryllium	47.1	J	0.201		46.3	mg/kg	7.97	98	(0%-20%)	04/25/12	14:55
Copper	47.1		14.5		57.3	mg/kg	7.74	90.9	(0%-20%)		
Nickel	47.1		5.52		48.4	mg/kg	10.5	91.1	(0%-20%)		
Zinc	47.1		30.5		75.1	mg/kg	11.3	94.6	(0%-20%)		
QC1202642643	303059001	SDILT									
Beryllium		J	2.05	U	ND	ug/L	N/A	(0%-10%)		04/25/12	14:57

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 303059

Page 2 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1206481										
Copper		148		26.3	ug/L	10.9		(0%-10%)			
Nickel		56.3		12.1	ug/L	7.86		(0%-10%)	HSC	04/25/12	14:57
Zinc		312		63.1	ug/L	1.27		(0%-10%)			
Metals Analysis-Mercury											
Batch	1206525										
QC1202642726	303059001	DUP									
Mercury		J	0.0365	J	0.0358	MG/KG	1.88	^	(+/-0.200)	BYV1	04/25/12 10:30
QC1202642725	LCS										
Mercury	0.110		J	0.115	MG/KG		105		(80%-120%)		04/25/12 10:27
QC1202642724	MB										
Mercury		U		ND	MG/KG						04/25/12 10:25
QC1202642727	303059001	MS									
Mercury	0.125	J	0.0365	J	0.171	MG/KG		108	(80%-120%)		04/25/12 10:32
QC1202642729	303059001	MSD									
Mercury	0.109	J	0.0365	J	0.147	MG/KG	15.1	101	(0%-20%)		04/25/12 10:34
QC1202642728	303059001	SDILT									
Mercury		J	0.669	J	0.105	ug/L	21.5		(0%-10%)		04/25/12 10:35

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- DL Failed required detection limit.
- E Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- F Estimated Value
- FB Mercury was found present at quantifiable concentrations in field blanks received with these samples. Data associated with the blank are deemed invalid for reporting to regulatory agencies
- H Analytical holding time was exceeded
- H Holding time exceeded
- J Estimated value; the result was greater than the MDA but less than the required detection limit.
- J Value is estimated
- JN Presumptive evidence of the analyte at an estimated quantity.
- M Matrix Related Failure
- N Metals--The Matrix spike sample recovery is not within specified control limits
- N/A RPD or %Recovery limits do not apply.

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 303059

Page 3 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
N1	See case narrative										
ND	Analyte concentration is not detected above the detection limit										
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.										
R	Sample results are rejected										
R	The data are unusable (radionuclide may or may not be present).										
U	Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.										
U	Undetected; sample result < MDA										
UI	Uncertain identification for gamma spectroscopy.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Y	QC Samples were not spiked with this compound										
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.										
h	Preparation or preservation holding time was exceeded										

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.



SAMPLING CHAIN OF CUSTODY

Requires EDD

Analysis Requested By						Sampling Contractor				Analytical Laboratory			
Name:	R. DESCHAMPS		Name:	P. SULLIVAN		Name:	GEL						
Life No:	J7733	Ext.	Contact:			Address:							
Acct No:	01449/01441	Dept.	Phone:			City:		St:		Zip:			
Email Reports To:			Email/Fax:			Contact:							
DESCHAMPS@BNL.GOV			Sampler:			Phone:							
SCHNEFER@BNL.GOV						Email/Fax:							
			Project Name:										
BERR BIOSHIELD REMOVAL			Project Manager:										

Type		Sample Information				Additional Sample Information				Alpha/B	Tritium	Gamma	Strontium	5242	Nuclide	PCBs	Metals	
UID	Smp	Coil	Site ID/Bldg/Life #	Depth/RW/P	Date	Time	Mark	Name/Description	Cont. Vol/Units	Cont. Type	Preservative							
01EC			0006-701	0-5'	4/17/12	1725	S	SGRR AS LEFT SV3 COMPOSITE #1 1052 gm	500ml	P	N/A	XX	XX		XX	XX	XX	XX
02EC			0006-701	0-5'	4/18/12	1555	S	SGRR AS LEFT SV3 COMPOSITE #2 1198 gm	500ml	P	N/A	XX	XX		XX	XX	XX	XX

1 Relinquished By/Date/Time	2 Relinquished By/Date/Time	3 Relinquished By/Date/Time
Print <i>Patricia J. Sullivan</i> 4/19/12	Print <i>S. Woodburn</i> 4/19/12	Print
Signature <i>Patricia J. Sullivan</i> 4/19/12	Signature <i>S. Woodburn</i> 4/19/12	Signature
1 Received By/Date/Time	2 Received By/Date/Time	3 Received By/Date/Time
Print <i>S. Woodburn</i> 4/19/12	Print <i>H. Taylor</i> 4/13/12	Print
Signature <i>S. Woodburn</i> 4/19/12	Signature <i>H. Taylor</i> 4/13/12	Signature

Contractor Lab Sample Disposal:
☐ Return To Client ☒ Disposal by Lab
☐ Archive For _____ Months

Data Package: ☐ Full ☒ Summary

Turn-Around Time Required:
☐ Rush (1 Day) ☐ 14 Days ☐ 30 Days
☒ 7 Days ☐ Other ()

SAMPLE RECEIPT & REVIEW FORM

Client: <u>BRK</u>		SDG/AR/COC/Work Order: <u>32061</u>	
Received By: <u>H. Taylor</u>		Date Received: <u>23 APR 11</u>	
Suspected Hazard Information	Yes ☒ No ☒	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. <u>100cpm</u>	
COC/Samples marked as radioactive?	☒	Maximum Net Counts Observed* (Observed Counts - Area Background Counts):	
Classified Radioactive II or III by RSO?	☒	If yes, Were swipes taken of sample containers < action levels?	
COC/Samples marked containing PCBs?	☒		
Package, COC, and/or Samples marked as beryllium or asbestos containing?	☒	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.	
Shipped as a DOT Hazardous?	☒	Hazard Class Shipped: UN#:	
Samples identified as Foreign Soil?	☒		

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	☒			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	☒			Preservation Method: Ice bags Blue ice Dry ice <u>None</u> Other (describe) <u>19</u> *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	☒			Temperature Device Serial #: <u>61524600</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	☒			
4 Sample containers intact and sealed?	☒			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	☒			Sample ID's, containers affected and observed pH:
6 VOA vials free of headspace (defined as < 6mm bubble)?	☒			If Preservation added, Lot#: Sample ID's and containers affected:
7 Are Encore containers present?	☒			(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	☒			ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	☒			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	☒			Sample ID's affected:
11 Number of containers received match number indicated on COC?	☒			Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	☒			
13 COC form is properly signed in relinquished/received sections?	☒			
14 Carrier and tracking number.	☒			Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>9860 5400 3490</u>

Comments (Use Continuation Form if needed):

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: April 30, 2012

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	32061-001	Project:	BRKL00601
Sample ID:	303059001	Client ID:	BRKL006
Matrix:	S	COC:	32061
Collect Date:	17-APR-12 17:25	Samp Recv.:	
Receive Date:	23-APR-12 09:05	Client Desc.:	Bldg. 701
Collector:	Client	Vol. Recv.:	
Moisture:	4.28%		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Pu, Solid "Dry Weight Corrected"												
Plutonium-238	U	-0.0182	+/-0.202	0.637	1.00	pCi/g		JXH2	04/26/12	0838	1206361	1
Plutonium-239/240	U	0.0472	+/-0.188	0.503	1.00	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-235/236	U-DL	-0.179	+/-0.283	0.922	0.900	pCi/g		JXH2	04/26/12	0850	1206365	2
Uranium-238	U	0.359	+/-0.457	0.746	0.900	pCi/g						
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.0322	+/-0.0213	0.0351	4.00	pCi/g		MXR1	04/24/12	1418	1206378	3
Beryllium-7	U	0.095	+/-0.125	0.225	0.300	pCi/g						
Cesium-134	UI	0.0439	+/-0.0222	0.0376	0.040	pCi/g						
Cesium-137	J	0.170	+/-0.0325	0.0299	2.30	pCi/g						
Cobalt-57	U	-0.0024	+/-0.00842	0.0153	0.020	pCi/g						
Cobalt-60	U	-0.00337	+/-0.0154	0.0276	0.300	pCi/g						
Europium-152	U	-0.0125	+/-0.0534	0.0715	4.80	pCi/g						
Europium-154	U	0.0203	+/-0.047	0.0848	17.0	pCi/g						
Europium-155	J-UI	0.0997	+/-0.053	0.0575	0.300	pCi/g						
Manganese-54	U	-0.00332	+/-0.0163	0.0282	0.050	pCi/g						
Sodium-22	U	0.000625	+/-0.0169	0.0297	0.050	pCi/g						
Zinc-65	U	-0.0218	+/-0.0393	0.0563	0.500	pCi/g						
Rad Liquid Scintillation Analysis												
LSC, Tritium Dist, Solid "As Received"												
Tritium	U	-16.3	+/-123	226	300	pCi/g		BYS1	04/25/12	0449	1206580	4
Liquid Scint C14, Solid "As Received"												
Carbon-14	U	0.236	+/-0.792	1.35	2.00	pCi/g		EXK2	04/26/12	1336	1206584	5
Liquid Scint Ni63, Solid "Dry Weight Corrected"												
Nickel-63	U	0.231	+/-1.72	3.01	4.00	pCi/g		TYJ1	04/26/12	0946	1206578	6

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	04/23/12	1419	1206359

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: April 30, 2012

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000
Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	32061-001	Project:	BRKL00601
Sample ID:	303059001	Client ID:	BRKL006 32061
		Samp Recv.:	
		Client Desc.:	Bldg. 701
		Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
-----------	-----------	--------	-------------	----	----	-------	----	---------	------	------	-------	--------

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE EML HASL-300, Pu-11-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	DOE HASL 300, 4.5.2.3/Ga-01-R	
4	EPA 906.0 Modified	
5	EPA EERF C-01 Modified	
6	DOE RESL Ni-1, Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Plutonium-242 Tracer	Alphaspec Pu, Solid "Dry Weight Corrected"			80.5	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			70.1	(15%-125%)
Nickel Carrier	Liquid Scint Ni63, Solid "Dry Weight Corrected"			57.8	(25%-125%)

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: April 30, 2012

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	32061-002	Project:	BRKL00601
Sample ID:	303059002	Client ID:	BRKL006
Matrix:	S	COC:	32061
Collect Date:	18-APR-12 15:55	Samp Recv.:	
Receive Date:	23-APR-12 09:05	Client Desc.:	Bldg. 701
Collector:	Client	Vol. Recv.:	
Moisture:	4.51%		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Pu, Solid "Dry Weight Corrected"												
Plutonium-238	U	-0.0388	+/-0.167	0.448	1.00	pCi/g		JXH2	04/26/12	0838	1206361	1
Plutonium-239/240	U	0.0227	+/-0.172	0.494	1.00	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-235/236	U	0.170	+/-0.294	0.549	0.900	pCi/g		JXH2	04/26/12	1522	1206365	2
Uranium-238	J	0.456	+/-0.351	0.323	0.900	pCi/g						
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.000392	+/-0.0275	0.0443	4.00	pCi/g		MXR1	04/24/12	1334	1206378	3
Beryllium-7	U	-0.0035	+/-0.151	0.267	0.300	pCi/g						
Cesium-134	U-DL	0.021	+/-0.0233	0.0427	0.040	pCi/g						
Cesium-137	J	0.254	+/-0.0464	0.0362	2.30	pCi/g						
Cobalt-57	U	-0.00136	+/-0.00967	0.0179	0.020	pCi/g						
Cobalt-60	U	0.0115	+/-0.019	0.0347	0.300	pCi/g						
Europium-152	U	-0.0277	+/-0.0538	0.0833	4.80	pCi/g						
Europium-154	U	0.0184	+/-0.0532	0.0963	17.0	pCi/g						
Europium-155	U	0.0489	+/-0.0386	0.0732	0.300	pCi/g						
Manganese-54	U	-0.0157	+/-0.0192	0.0326	0.050	pCi/g						
Sodium-22	U	0.00745	+/-0.0188	0.034	0.050	pCi/g						
Zinc-65	U	0.0284	+/-0.0457	0.0729	0.500	pCi/g						
Rad Liquid Scintillation Analysis												
LSC, Tritium Dist, Solid "As Received"												
Tritium	U	60.5	+/-132	229	300	pCi/g		BYS1	04/25/12	0510	1206580	4
Liquid Scint C14, Solid "As Received"												
Carbon-14	U	0.543	+/-0.826	1.40	2.00	pCi/g		EXK2	04/26/12	1417	1206584	5
Liquid Scint Ni63, Solid "Dry Weight Corrected"												
Nickel-63	U	-0.359	+/-1.29	2.30	4.00	pCi/g		TYJ1	04/26/12	1003	1206578	6

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	04/23/12	1419	1206359

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: April 30, 2012

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000
Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	32061-002	Project:	BRKL00601
Sample ID:	303059002	Client ID:	BRKL006 32061
		Samp Recv.:	
		Client Desc.:	Bldg. 701
		Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
-----------	-----------	--------	-------------	----	----	-------	----	---------	------	------	-------	--------

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE EML HASL-300, Pu-11-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	DOE HASL 300, 4.5.2.3/Ga-01-R	
4	EPA 906.0 Modified	
5	EPA EERF C-01 Modified	
6	DOE RESL Ni-1, Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Plutonium-242 Tracer	Alphaspec Pu, Solid "Dry Weight Corrected"			85.6	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			99.3	(15%-125%)
Nickel Carrier	Liquid Scint Ni63, Solid "Dry Weight Corrected"			63.1	(25%-125%)

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: April 30, 2012

Page 1 of 5

Brookhaven National Laboratory

Building 462

Upton, New York

Contact: Mr. John Burke

Workorder: 303059

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1206361										
QC1202642357	303059001	DUP									
Plutonium-238	U	-0.0182	U	0.0825	pCi/g	0.00		N/A	JXH2	04/26/12	08:39
	Uncertainty	+/-0.202		+/-0.279							
Plutonium-239/240	U	0.0472	U	-0.055	pCi/g	0.00		N/A			
	Uncertainty	+/-0.188		+/-0.162							
QC1202642359	LCS										
Plutonium-238			U	0.00277	pCi/g			(75%-125%)		04/26/12	08:50
	Uncertainty			+/-0.151							
Plutonium-239/240	16.3			13.6	pCi/g		82.9	(75%-125%)			
	Uncertainty			+/-1.90							
QC1202642356	MB										
Plutonium-238			U	0.00284	pCi/g					04/26/12	08:38
	Uncertainty			+/-0.154							
Plutonium-239/240			U	0.054	pCi/g						
	Uncertainty			+/-0.143							
QC1202642358	303059001	MS									
Plutonium-238	U	-0.0182	U	-0.161	pCi/g			(75%-125%)		04/26/12	08:50
	Uncertainty	+/-0.202		+/-0.222							
Plutonium-239/240	16.3	U	0.0472	16.3	pCi/g		99.5	(75%-125%)			
	Uncertainty	+/-0.188		+/-2.45							
Batch	1206365										
QC1202642365	303059001	DUP									
Uranium-235/236	U-DL	-0.179	U	0.00392	pCi/g	0.00		N/A	JXH2	04/26/12	08:51
	Uncertainty	+/-0.283		+/-0.213							
Uranium-238	U	0.359	U	0.298	pCi/g	0.00		N/A			
	Uncertainty	+/-0.457		+/-0.313							
QC1202642367	LCS										
Uranium-235/236				1.18	pCi/g					04/26/12	08:51
	Uncertainty			+/-0.596							
Uranium-238	24.3			22.4	pCi/g		92.2	(75%-125%)			
	Uncertainty			+/-2.29							
QC1202642364	MB										
Uranium-235/236			U	-0.0203	pCi/g					04/26/12	08:51
	Uncertainty			+/-0.170							
Uranium-238			U	0.120	pCi/g						
	Uncertainty			+/-0.192							
QC1202642366	303059001	MS									
Uranium-235/236	U-DL	-0.179		1.79	pCi/g					04/26/12	08:51
	Uncertainty	+/-0.283		+/-0.817							
Uranium-238	24.7	U	0.359	27.5	pCi/g		110	(75%-125%)			
	Uncertainty	+/-0.457		+/-2.86							

Rad Gamma Spec

Batch 1206378

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 303059

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1206378										
QC1202642391	303059001	DUP									
Americium-241	U	0.0322	U	-0.0046	pCi/g	0.00		N/A	MXR1	04/24/12	13:35
	Uncertainty	+/-0.0213		+/-0.0674							
Beryllium-7	U	0.095	U	0.0984	pCi/g	0.00		N/A			
	Uncertainty	+/-0.125		+/-0.105							
Cesium-134	UI	0.0439	UI	0.0511	pCi/g	15.0		N/A			
	Uncertainty	+/-0.0222		+/-0.0195							
Cesium-137	J	0.170	J	0.177	pCi/g	4.10		(0% - 20%)			
	Uncertainty	+/-0.0325		+/-0.0278							
Cobalt-57	U	-0.0024	U	-0.0105	pCi/g	0.00		N/A			
	Uncertainty	+/-0.00842		+/-0.00741							
Cobalt-60	U	-0.00337	U	-0.00878	pCi/g	0.00		N/A			
	Uncertainty	+/-0.0154		+/-0.0137							
Europium-152	U	-0.0125	U	0.024	pCi/g	0.00		N/A			
	Uncertainty	+/-0.0534		+/-0.0339							
Europium-154	U	0.0203	U	0.0237	pCi/g	0.00		N/A			
	Uncertainty	+/-0.047		+/-0.0416							
Europium-155	J-UI	0.0997	U	0.0416	pCi/g	47.9		N/A			
	Uncertainty	+/-0.053		+/-0.0316							
Manganese-54	U	-0.00332	U	0.001	pCi/g	0.00		N/A			
	Uncertainty	+/-0.0163		+/-0.0133							
Sodium-22	U	0.000625	U	0.0104	pCi/g	0.00		N/A			
	Uncertainty	+/-0.0169		+/-0.0145							
Zinc-65	U	-0.0218	U	-0.0142	pCi/g	0.00		N/A			
	Uncertainty	+/-0.0393		+/-0.0336							
QC1202642392	LCS										
Americium-241	537			576	pCi/g		107	(75%-125%)		04/25/12	06:52
	Uncertainty			+/-52.1							
Beryllium-7			U-DL	2.54	pCi/g						
	Uncertainty			+/-3.90							
Cesium-134			U-DL	0.326	pCi/g						
	Uncertainty			+/-0.639							
Cesium-137	197			199	pCi/g		101	(75%-125%)			
	Uncertainty			+/-19.8							
Cobalt-57				10.8	pCi/g						
	Uncertainty			+/-1.34							
Cobalt-60	234			225	pCi/g		96.2	(75%-125%)			
	Uncertainty			+/-18.1							
Europium-152			U	-0.66	pCi/g						
	Uncertainty			+/-1.10							
Europium-154			U	0.242	pCi/g						
	Uncertainty			+/-0.863							
Europium-155			U-DL	-0.422	pCi/g						
	Uncertainty			+/-0.783							
Manganese-54			U-DL	0.320	pCi/g						

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

Workorder: 303059

Page 3 of 5

[illegible]

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 303059

Page 4 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Liquid Scintillation											
Batch	1206580										
QC1202642868	303059001	DUP									
Tritium		U	-16.3	U	-51.2	pCi/g	0.00		N/A	BYS1	04/25/12 05:53
		Uncertainty	+/-123		+/-127						
QC1202642870	LCS										
Tritium		856			1030	pCi/g		120	(75%-125%)		04/25/12 06:35
		Uncertainty			+/-192						
QC1202642867	MB										
Tritium				U	-75.4	pCi/g					04/25/12 05:31
		Uncertainty			+/-117						
QC1202642869	303059001	MS									
Tritium		868	U	-16.3	872	pCi/g		100	(75%-125%)		04/25/12 06:14
		Uncertainty	+/-123		+/-186						
Batch	1206584										
QC1202642882	303059001	DUP									
Carbon-14		U	0.236	U	0.643	pCi/g	0.00		N/A	EXK2	04/26/12 15:40
		Uncertainty	+/-0.792		+/-0.843						
QC1202642884	LCS										
Carbon-14		53.7			53.0	pCi/g		98.8	(75%-125%)		04/26/12 17:02
		Uncertainty			+/-1.75						
QC1202642881	MB										
Carbon-14				U	0.174	pCi/g					04/26/12 14:58
		Uncertainty			+/-0.792						
QC1202642883	303059001	MS									
Carbon-14		56.8	U	0.236	57.2	pCi/g		101	(75%-125%)		04/26/12 16:21
		Uncertainty	+/-0.792		+/-1.87						

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- DL Failed required detection limit.
- E Metals--%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- F Estimated Value
- FB Mercury was found present at quantifiable concentrations in field blanks received with these samples. Data associated with the blank are deemed invalid for reporting to regulatory agencies
- H Analytical holding time was exceeded
- H Holding time exceeded

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 303059

Page 5 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
J	Estimated value; the result was greater than the MDA but less than the required detection limit.										
J	Value is estimated										
JN	Presumptive evidence of the analyte at an estimated quantity.										
M	Matrix Related Failure										
N	Metals--The Matrix spike sample recovery is not within specified control limits										
N/A	RPD or %Recovery limits do not apply.										
N1	See case narrative										
ND	Analyte concentration is not detected above the detection limit										
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.										
R	Sample results are rejected										
R	The data are unusable (radionuclide may or may not be present).										
U	Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.										
U	Undetected; sample result < MDA										
UI	Uncertain identification for gamma spectroscopy.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Y	QC Samples were not spiked with this compound										
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.										
h	Preparation or preservation holding time was exceeded										

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

ERP GAMMA ANALYSIS SUMMARY

C.O.C. # N/A
P. SULLIVAN 631 897-3202

BGRR AS-LEFT SURVEY UNIT 3

COUNT DATES:
04/17 - 4/19/2012-A

PAGE 1 OF 1

LINE #	SAMPLE #	WEIGHT (GMS)	DESCRIPTION	RESULTS
1	041712-001	927	BGRR AS LEFT SU-3 #1	¹³⁷ Cs (0.11 pCi/gm) + BKGD
2	041712-002	865	BGRR AS LEFT SU-3 #2	¹³⁷ Cs (0.13 pCi/gm) + BKGD
3	041712-003	870	BGRR AS LEFT SU-3 #3	¹³⁷ Cs (0.12 pCi/gm) + BKGD
4	041712-004	885	BGRR AS LEFT SU-3 #4	¹³⁷ Cs (0.08 pCi/gm) + BKGD
5	041712-005	897	BGRR AS LEFT SU-3 #5	¹³⁷ Cs (0.12 pCi/gm) + BKGD
6	041712-006	941	BGRR AS LEFT SU-3 #6	¹³⁷ Cs (0.14 pCi/gm) + BKGD
7	041712-007	939	BGRR AS LEFT SU-3 #7	¹³⁷ Cs (0.07 pCi/gm) + BKGD
8	041712-008	684	BGRR AS LEFT SU-3 #8	¹³⁷ Cs (0.18 pCi/gm) + BKGD
9	041712-009	715	BGRR AS LEFT SU-3 #8 DUP.	¹³⁷ Cs (0.18 pCi/gm) + BKGD
10	041812-001	877	BGRR AS LEFT SU-3 #9	¹³⁷ Cs (0.25 pCi/gm) + BKGD
11	041812-002	854	BGRR AS LEFT SU-3 #10	¹³⁷ Cs (0.18 pCi/gm) + BKGD
12	041812-003	1174	BGRR AS LEFT SU-3 #11	BKGD
13	041812-004	765	BGRR AS LEFT SU-3 #12	¹³⁷ Cs (0.12 pCi/gm) + BKGD
14	041812-005	908	BGRR AS LEFT SU-3 #13	¹³⁷ Cs (0.15 pCi/gm) + BKGD
15	041812-006	995	BGRR AS LEFT SU-3 #14	¹³⁷ Cs (0.17 pCi/gm) + BKGD
16	041812-007	934	BGRR AS LEFT SU-3 #15	¹³⁷ Cs (0.10 pCi/gm) + BKGD
17	041812-008	1052	BGRR AS LEFT SU-3 #16	¹³⁷ Cs (0.22 pCi/gm) + BKGD
18	041712-010	1052	BGRR AS LEFT SU-3 1-8 COMP.	¹³⁷ Cs (0.12 pCi/gm) + BKGD
19	041812-010	1198	BGRR AS LEFT SU-3 9-16 COMP	¹³⁷ Cs (0.17 pCi/gm) + BKGD
20	041912-001	897	BGRR AS LEFT SU-3 BKGD	¹³⁷ Cs (0.09 pCi/gm) + BKGD
21				
22				
23				
24				
25				

19 SAMPLES TOTAL

***** G A M M A S P E C T R U M A N A L Y S I S *****

Filename: DET01

Report Generated On : 4/17/2012 5:09:51 PM

Sample Title : 041712-007
Sample Description : BGRR AS LEFT SU-3 #7
Sample Identification :
Sample Type :
Sample Geometry :

Peak Locate Threshold : 3.00
Peak Locate Range (in channels) : 100 - 4096
Peak Area Range (in channels) : 100 - 4096
Identification Energy Tolerance : 2.000 keV

Sample Size : 9.390E+002 GRAM

Sample Taken On : 4/17/2012 3:35:00 PM
Acquisition Started : 4/17/2012 4:59:38 PM

Live Time : 600.0 seconds
Real Time : 600.2 seconds

Dead Time : 0.04 %

Energy Calibration Used Done On : 10/14/2010
Efficiency Calibration Used Done On : 10/15/2010
Efficiency ID : DET01 500ml Mari

***** N U C L I D E I D E N T I F I C A T I O N R E P O R T *****

Sample Title: 041712-007
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GRAM)	Activity Uncertainty	Coinc Corr
K-40	0.919	1460.75*	10.67	3.97224E+000	6.68879E-001	miss
CS-137	0.984	661.66*	85.21	6.70769E-002	2.59902E-002	miss
PB-212	0.462	74.81	10.50			
		77.11	17.60			
		238.63*	43.60	5.07496E-001	7.41434E-002	miss
PB-214	0.579	77.11	9.90			
		241.98	7.50			
		295.21*	18.50	2.45405E+000	6.59923E-001	miss
		351.92*	35.80	3.31296E+000	5.41107E-001	miss

* = Energy line found in the spectrum.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 2.000 keV
Nuclide confidence index threshold = 0.45
Errors quoted at 1.000 sigma
Coincidence correction performed.
free = No coincidence correction required.
miss = Nuclide energy was not found in the coincidence library.

 ***** I N T E R F E R E N C E C O R R E C T E D R E P O R T *****

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/GRAM)	Wt mean Activity Uncertainty
K-40	0.919	3.972241E+000	6.688789E-001
CS-137	0.984	6.707693E-002	2.599021E-002
PB-212	0.462	5.074959E-001	7.414342E-002
PB-214	0.579	2.997968E+000	4.432402E-001

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

***** U N I D E N T I F I E D P E A K S *****

Peak Locate Performed on: 4/17/2012 5:09:38 PM
 Peak Locate From Channel: 100
 Peak Locate To Channel: 4096

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	Peak Type	Tol. Nuclide
F 4	583.95	1.1118E-001	12.72	Tol.	EU-154
F 5	609.91	1.2591E-001	29.77	Tol.	BI-214
F 7	728.50	3.7318E-002	69.83		
F 8	912.07	1.1743E-001	11.98	Tol.	AC-228

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.000 sigma

***** N U C L I D E M D A R E P O R T *****

Detector Name: DET01
Sample Geometry:
Sample Title: 041712-007
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
	CO-60	1173.24	99.90	5.6142E-002	3.79E-002	1.3214E-002	0.875
		1332.50	99.98	3.7904E-002		-4.3036E-003	0.873
+	CS-137	661.66*	85.21	4.2592E-002	4.26E-002	6.7077E-002	miss
	EU-152	121.78	28.58	1.1990E-001	1.03E-001	-2.4475E-002	0.868
		244.70	7.49	4.6628E-001		-3.6667E-001	0.848
		344.28	26.50	1.0338E-001		-6.2565E-002	0.906
		411.11	2.23	1.6177E+000		6.1659E-002	0.821
		443.98	2.78	1.2068E+000		1.4296E-002	0.850
		778.90	12.94	2.4229E-001		4.3894E-002	0.891
		867.39	4.15	9.0076E-001		-1.3972E-001	0.865
		964.13	14.60	3.2261E-001		1.4957E-002	0.948
		1112.12	13.64	2.6667E-001		1.9832E-002	0.978
		1212.95	1.40	2.2033E+000		-1.0381E+000	0.868
		1299.12	1.63	2.7334E+000		1.3900E-001	0.891
		1408.01	21.00	2.6180E-001		8.6116E-002	0.968
	EU-154	123.07	40.40	8.3225E-002	8.32E-002	-4.0623E-002	0.863
		188.25	0.23	1.3271E+001		-9.7251E-001	free
		247.93	6.83	4.7374E-001		-1.3108E-001	0.817
		401.30	0.19	1.7381E+001		3.5428E+000	miss
		444.39	0.55	5.0136E+000		3.8049E-001	free
		478.26	0.21	1.4279E+001		-4.3492E-001	free
		557.56	0.25	1.0613E+001		-2.4727E+000	free
		582.00	0.89	6.3092E+000		3.5146E+000	free
		591.76	4.91	7.6818E-001		2.3247E-001	0.820
		625.22	0.32	9.1864E+000		-2.9984E-001	free
		676.59	0.14	2.6861E+001		4.7714E+000	free
		692.42	1.78	1.7878E+000		8.7155E-002	0.873
		715.76	0.17	1.8805E+001		2.0741E+000	free
		722.30	20.00	1.7866E-001		-5.4390E-002	0.852
		756.86	4.50	7.2321E-001		-1.1033E-001	0.842
		815.55	0.50	6.6032E+000		-2.9054E-001	miss
		845.39	0.58	5.0912E+000		3.3981E-001	free
		850.64	0.23	1.3869E+001		-7.3755E-001	free
		873.20	12.09	3.5240E-001		8.3290E-003	0.857
		892.73	0.50	7.0885E+000		1.5089E+000	free
		904.05	0.85	4.1633E+000		6.4363E-001	free
		996.30	10.34	2.4525E-001		-6.2724E-002	0.922
		1004.76	17.90	1.3811E-001		-6.1350E-002	0.951
		1128.40	0.29	1.2308E+001		-3.1451E+000	free
		1140.90	0.22	1.7788E+001		4.7299E-001	miss
		1241.60	0.13	3.4897E+001		3.6935E+000	miss
		1246.60	0.80	4.8119E+000		1.8352E-001	free

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
EU-154	1274.51	34.40	1.1795E-001	8.32E-002	5.3981E-003	0.963
	1494.08	0.71	3.4576E+000		-6.7869E-001	miss
	1596.45	1.80	1.3183E+000		-3.7857E-001	1.362
U-235	143.76	10.90	3.0560E-001	6.12E-002	7.8012E-002	miss
	163.33	5.00	6.1792E-001		1.3584E-001	miss
	185.71	57.50	6.1174E-002		2.4676E-002	miss
	205.31	5.00	6.1418E-001		9.0540E-003	miss
U-238	92.60	3.57	1.6142E+000	1.61E+000	1.4400E+000	miss
	1001.03	0.59	7.4563E+000		3.7454E+000	miss
AM-241	59.54	35.90	3.3487E-001	3.35E-001	-1.7772E-002	miss

+ = Nuclide identified during the nuclide identification

* = Energy line found in the spectrum

> = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

Coincidence correction performed.

free = No coincidence correction required.

miss = Nuclide energy was not found in the coincidence library.

***** G A M M A S P E C T R U M A N A L Y S I S *****

Filename: DET02

Report Generated On : 4/17/2012 5:10:48 PM

Sample Title : 041712-008
Sample Description : BGRR AS LEFT SU-3 #8
Sample Identification :
Sample Type :
Sample Geometry :

Peak Locate Threshold : 3.00
Peak Locate Range (in channels) : 100 - 4096
Peak Area Range (in channels) : 100 - 4096
Identification Energy Tolerance : 2.000 keV

Sample Size : 6.840E+002 GRAM

Sample Taken On : 4/17/2012 3:40:00 PM
Acquisition Started : 4/17/2012 5:00:35 PM

Live Time : 600.0 seconds
Real Time : 600.2 seconds

Dead Time : 0.03 %

Energy Calibration Used Done On : 10/14/2010
Efficiency Calibration Used Done On : 10/15/2010
Efficiency ID : DET02 500ml Mari

***** N U C L I D E I D E N T I F I C A T I O N R E P O R T *****

Sample Title: 041712-008
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GRAM)	Activity Uncertainty	Coinc Corr
CS-137	0.932	661.66*	85.21	1.80218E-001	2.64137E-002	miss
PB-212	0.994	74.81*	10.50	1.15758E+000	1.98702E-001	miss
		77.11*	17.60	7.08723E-001	1.19465E-001	miss
		238.63*	43.60	4.68885E-001	6.09806E-002	miss
U-238	0.846	92.60*	3.57	1.04523E+000	5.45312E-001	miss
		1001.03	0.59			

* = Energy line found in the spectrum.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 2.000 keV
Nuclide confidence index threshold = 0.45
Errors quoted at 1.000 sigma
Coincidence correction performed.
free = No coincidence correction required.
miss = Nuclide energy was not found in the coincidence library.

 ***** I N T E R F E R E N C E C O R R E C T E D R E P O R T *****

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/GRAM)	Wt mean Activity Uncertainty
CS-137	0.932	1.802179E-001	2.641369E-002
PB-212	0.994	5.628929E-001	5.239184E-002
U-238	0.846	1.045234E+000	5.453119E-001

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

***** U N I D E N T I F I E D P E A K S *****

Peak Locate Performed on: 4/17/2012 5:10:35 PM
 Peak Locate From Channel: 100
 Peak Locate To Channel: 4096

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	Peak Type	Tol. Nuclide
5	337.53	6.2073E-002	26.06	Tol.	AC-228
6	351.01	1.4104E-001	13.79	Tol.	PB-214
7	582.05	8.2142E-002	17.46	Tol.	EU-154
8	608.09	9.6651E-002	16.00	Tol.	BI-214
10	909.08	5.9274E-002	19.20		
11	1457.51	1.8155E-001	9.90		

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.000 sigma

***** N U C L I D E M D A R E P O R T *****

Detector Name: DET02
Sample Geometry:
Sample Title: 041712-008
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
	CO-60	1173.24	99.90	3.0574E-002	3.06E-002	-1.3058E-002	0.875
		1332.50	99.98	4.8832E-002		1.9441E-003	0.873
+	CS-137	661.66*	85.21	4.2874E-002	4.29E-002	1.8022E-001	miss
	EU-152	121.78	28.58	1.3411E-001	1.24E-001	1.2671E-002	0.868
		244.70	7.49	4.2690E-001		-2.7326E-001	0.848
		344.28	26.50	1.2355E-001		-2.7247E-003	0.906
		411.11	2.23	1.9569E+000		1.6483E-001	0.821
		443.98	2.78	1.0736E+000		-1.9926E-001	0.850
		778.90	12.94	1.7693E-001		-1.7631E-001	0.891
		867.39	4.15	1.1681E+000		5.9164E-002	0.865
		964.13	14.60	3.8337E-001		-3.5567E-001	0.948
		1112.12	13.64	1.9308E-001		-9.3709E-002	0.978
		1212.95	1.40	4.5916E+000		9.1734E-001	0.868
		1299.12	1.63	2.4943E+000		-1.1512E-001	0.891
		1408.01	21.00	1.4897E-001		-5.7839E-002	0.968
	EU-154	123.07	40.40	8.2444E-002	8.24E-002	-4.2935E-002	0.863
		188.25	0.23	1.3153E+001		-7.7742E+000	free
		247.93	6.83	5.0381E-001		-8.1537E-002	0.817
		401.30	0.19	1.7016E+001		-9.0973E-001	miss
		444.39	0.55	4.6157E+000		-9.3887E-001	free
		478.26	0.21	1.6120E+001		3.0453E-001	free
		557.56	0.25	1.3951E+001		8.7932E-001	free
		582.00	0.89	9.8315E+000		1.2745E+001	free
		591.76	4.91	9.1810E-001		3.4478E-001	0.820
		625.22	0.32	8.1646E+000		-8.8486E-001	free
		676.59	0.14	2.2396E+001		-1.2431E+000	free
		692.42	1.78	3.1158E+000		1.4070E+000	0.873
		715.76	0.17	2.3214E+001		8.8339E-001	free
		722.30	20.00	2.4615E-001		-5.6886E-002	0.852
		756.86	4.50	1.0786E+000		-5.1306E-002	0.842
		815.55	0.50	6.1497E+000		-2.6115E+000	miss
		845.39	0.58	5.4254E+000		-4.3199E-001	free
		850.64	0.23	1.1849E+001		-1.2760E+000	free
		873.20	12.09	3.4592E-001		-8.2282E-003	0.857
		892.73	0.50	8.0195E+000		1.2234E+000	free
		904.05	0.85	4.3141E+000		-3.4762E+000	free
		996.30	10.34	3.1697E-001		-8.7773E-002	0.922
		1004.76	17.90	3.2027E-001		8.2062E-002	0.951
		1128.40	0.29	1.4544E+001		6.4865E-001	free
		1140.90	0.22	1.7509E+001		0.0000E+000	miss
		1241.60	0.13	2.7807E+001		-4.7056E+000	miss
		1246.60	0.80	3.4802E+000		-1.8917E+000	free

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
	EU-154	1274.51	34.40	1.0764E-001	8.24E-002	-8.2795E-003	0.963
		1494.08	0.71	1.6393E+000		0.0000E+000	miss
		1596.45	1.80	4.9581E-001		0.0000E+000	1.362
	U-235	143.76	10.90	3.0687E-001	7.95E-002	4.0726E-002	miss
		163.33	5.00	6.5143E-001		2.4466E-001	miss
		185.71	57.50	7.9488E-002		7.5987E-002	miss
		205.31	5.00	7.2504E-001		1.3022E-001	miss
+	U-238	92.60*	3.57	1.7656E+000	1.77E+000	1.0452E+000	miss
		1001.03	0.59	7.2521E+000		-1.4541E+000	miss
	AM-241	59.54	35.90	3.3893E-001	3.39E-001	-9.8996E-002	miss

+ = Nuclide identified during the nuclide identification

* = Energy line found in the spectrum

> = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

Coincidence correction performed.

free = No coincidence correction required.

miss = Nuclide energy was not found in the coincidence library.

***** G A M M A S P E C T R U M A N A L Y S I S *****

Filename: DET01

Report Generated On : 4/17/2012 5:26:17 PM

Sample Title : 041712-009
Sample Description : BGRR AS LEFT SU-3 #8 DUP.
Sample Identification :
Sample Type :
Sample Geometry :

Peak Locate Threshold : 3.00
Peak Locate Range (in channels) : 100 - 4096
Peak Area Range (in channels) : 100 - 4096
Identification Energy Tolerance : 2.000 keV

Sample Size : 7.150E+002 GRAM

Sample Taken On : 4/17/2012 3:42:00 PM
Acquisition Started : 4/17/2012 5:16:03 PM

Live Time : 600.0 seconds
Real Time : 600.2 seconds

Dead Time : 0.03 %

Energy Calibration Used Done On : 10/14/2010
Efficiency Calibration Used Done On : 10/15/2010
Efficiency ID : DET01 500ml Mari

 ***** N U C L I D E I D E N T I F I C A T I O N R E P O R T *****

Sample Title: 041712-009
 Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GRAM)	Activity Uncertainty	Coinc Corr
K-40	0.901	1460.75*	10.67	5.09716E+000	1.21499E+000	miss
CS-137	0.972	661.66*	85.21	1.79537E-001	6.35615E-002	miss
PB-212	0.800	74.81	10.50			
		77.11*	17.60	1.13723E+000	8.80048E-002	miss
		238.63*	43.60	6.41011E-001	1.47980E-001	miss
PB-214	0.762	77.11*	9.90	2.34687E+001	2.74178E+000	miss
		241.98	7.50			
		295.21*	18.50	4.91475E+000	1.21954E+000	miss
		351.92*	35.80	4.29041E+000	7.52105E-001	miss
TH-232	0.945	63.81	0.27			
		968.97*	16.20	5.09209E-001	1.41056E-001	miss

* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 2.000 keV

Nuclide confidence index threshold = 0.45

Errors quoted at 1.000 sigma

Coincidence correction performed.

free = No coincidence correction required.

miss = Nuclide energy was not found in the coincidence library.

***** I N T E R F E R E N C E C O R R E C T E D R E P O R T *****

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/GRAM)	Wt mean Activity Uncertainty
K-40	0.901	5.097158E+000	1.214988E+000
CS-137	0.972	1.795366E-001	6.356146E-002
PB-212	0.800	8.568904E-001	7.054432E-002
PB-214	0.762	4.606259E+000	6.798654E-001
TH-232	0.945	5.092088E-001	1.410563E-001

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

***** U N I D E N T I F I E D P E A K S *****

Peak Locate Performed on: 4/17/2012 5:26:03 PM
Peak Locate From Channel: 100
Peak Locate To Channel: 4096

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	Peak Type	Tol. Nuclide
F 5	583.70	9.9171E-002	34.36	Tol.	EU-154
F 6	610.06	1.0056E-001	12.61	Tol.	BI-214
F 8	912.57	6.2576E-002	38.31	Tol.	AC-228

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 1.000 sigma

***** N U C L I D E M D A R E P O R T *****

Detector Name: DET01
Sample Geometry:
Sample Title: 041712-009
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
	CO-60	1173.24	99.90	4.5564E-002	4.56E-002	-1.7989E-002	0.875
		1332.50	99.98	6.0623E-002		1.4592E-002	0.873
+	CS-137	661.66*	85.21	6.1960E-002	6.20E-002	1.7954E-001	miss
	EU-152	121.78	28.58	1.3934E-001	1.39E-001	-4.9970E-002	0.868
		244.70	7.49	5.8722E-001		-5.6389E-001	0.848
		344.28	26.50	1.6887E-001		-5.4332E-002	0.906
		411.11	2.23	2.2370E+000		6.3515E-001	0.821
		443.98	2.78	1.6862E+000		9.0652E-002	0.850
		778.90	12.94	2.6128E-001		-9.1019E-003	0.891
		867.39	4.15	1.0075E+000		-1.1533E-001	0.865
		964.13	14.60	3.2944E-001		-1.0122E-001	0.948
		1112.12	13.64	3.2087E-001		8.3480E-003	0.978
		1212.95	1.40	4.6792E+000		6.1209E-001	0.868
		1299.12	1.63	2.5426E+000		-1.6733E-001	0.891
		1408.01	21.00	2.2210E-001		-5.5019E-002	0.968
	EU-154	123.07	40.40	9.9921E-002	9.99E-002	-4.3082E-002	0.863
		188.25	0.23	1.7097E+001		-4.1786E+000	free
		247.93	6.83	6.2216E-001		-7.0359E-002	0.817
		401.30	0.19	1.9287E+001		-3.7222E+000	miss
		444.39	0.55	7.6568E+000		1.1816E+000	free
		478.26	0.21	2.0519E+001		5.8096E+000	free
		557.56	0.25	1.2389E+001		-3.4931E+000	free
		582.00	0.89	8.8350E+000		8.3156E+000	free
		591.76	4.91	8.6966E-001		2.3639E-002	0.820
		625.22	0.32	9.9687E+000		-1.2384E+000	free
		676.59	0.14	2.9733E+001		2.0497E+000	free
		692.42	1.78	1.5460E+000		-8.4283E-001	0.873
		715.76	0.17	2.1952E+001		-1.0377E+000	free
		722.30	20.00	1.8768E-001		-9.2776E-002	0.852
		756.86	4.50	1.3140E+000		4.1658E-001	0.842
		815.55	0.50	5.3627E+000		-1.7686E+000	miss
		845.39	0.58	7.6584E+000		1.3388E+000	free
		850.64	0.23	1.5513E+001		-3.3095E+000	free
		873.20	12.09	3.5037E-001		1.4585E-002	0.857
		892.73	0.50	8.1275E+000		-1.4414E+000	free
		904.05	0.85	4.3736E+000		-3.1860E-001	free
		996.30	10.34	3.7337E-001		-5.7807E-002	0.922
		1004.76	17.90	2.5607E-001		7.5199E-002	0.951
		1128.40	0.29	1.4810E+001		-4.1613E+000	free
		1140.90	0.22	1.7832E+001		-1.0353E+000	miss
		1241.60	0.13	5.3165E+001		7.1723E+000	miss
		1246.60	0.80	7.6480E+000		1.8227E+000	free

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
EU-154	1274.51	34.40	1.5490E-001	9.99E-002	3.1508E-002	0.963
	1494.08	0.71	6.6426E+000		5.0279E-001	miss
	1596.45	1.80	2.2394E+000		1.4501E-001	1.362
U-235	143.76	10.90	3.8964E-001	7.80E-002	3.2528E-002	miss
	163.33	5.00	7.6850E-001		2.0467E-002	miss
	185.71	57.50	7.8032E-002		3.7685E-002	miss
	205.31	5.00	7.6415E-001		-1.0999E-001	miss
U-238	92.60	3.57	1.9558E+000	1.96E+000	1.4739E+000	miss
	1001.03	0.59	5.2201E+000		-9.1349E-001	miss
AM-241	59.54	35.90	3.6552E-001	3.66E-001	-1.2246E-001	miss

+ = Nuclide identified during the nuclide identification

* = Energy line found in the spectrum

> = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

Coincidence correction performed.

free = No coincidence correction required.

miss = Nuclide energy was not found in the coincidence library.

***** G A M M A S P E C T R U M A N A L Y S I S *****

Filename: DET01

Report Generated On : 4/17/2012 5:40:29 PM

Sample Title : 041712-010
Sample Description : BGRR AS LEFT SU-3 1-8 COMP
Sample Identification :
Sample Type :
Sample Geometry :

Peak Locate Threshold : 3.00
Peak Locate Range (in channels) : 100 - 4096
Peak Area Range (in channels) : 100 - 4096
Identification Energy Tolerance : 2.000 keV

Sample Size : 1.052E+003 GRAM

Sample Taken On : 4/17/2012 5:25:00 PM
Acquisition Started : 4/17/2012 5:30:11 PM

Live Time : 600.0 seconds
Real Time : 600.2 seconds

Dead Time : 0.04 %

Energy Calibration Used Done On : 10/14/2010
Efficiency Calibration Used Done On : 10/15/2010
Efficiency ID : DET01 500ml Mari

***** N U C L I D E I D E N T I F I C A T I O N R E P O R T *****

Sample Title: 041712-010
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GRAM)	Activity Uncertainty	Coinc Corr
K-40	0.910	1460.75*	10.67	4.73501E+000	7.69505E-001	miss
CS-137	0.971	661.66*	85.21	1.16785E-001	1.68470E-002	miss
PB-212	0.803	74.81	10.50			
		77.11*	17.60	2.07651E-001	1.26737E-001	miss
		238.63*	43.60	4.56800E-001	1.06003E-001	miss
BI-214	0.451	609.31*	44.80	4.78177E-001	5.80436E-002	0.876
		1120.29	14.80			
		1764.49	15.36			
PB-214	0.813	77.11*	9.90	4.73911E-001	2.89635E-001	miss
		241.98	7.50			
		295.21*	18.50	3.38385E-001	8.20053E-002	miss
		351.92*	35.80	4.13701E-001	7.02678E-002	miss
TH-232	0.939	63.81	0.27			
		968.97*	16.20	4.74173E-001	2.42324E-001	miss

* = Energy line found in the spectrum.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 2.000 keV
Nuclide confidence index threshold = 0.45
Errors quoted at 1.000 sigma
Coincidence correction performed.
free = No coincidence correction required.
miss = Nuclide energy was not found in the coincidence library.

***** I N T E R F E R E N C E C O R R E C T E D R E P O R T *****

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/GRAM)	Wt mean Activity Uncertainty
K-40	0.910	4.735008E+000	7.695054E-001
CS-137	0.971	1.167848E-001	1.684698E-002
PB-212	0.803	2.899719E-001	8.138966E-002
BI-214	0.451	4.781766E-001	5.804355E-002
PB-214	0.813	3.631647E-001	5.269753E-002
TH-232	0.939	4.741731E-001	2.423244E-001

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

***** U N I D E N T I F I E D P E A K S *****

Peak Locate Performed on: 4/17/2012 5:40:12 PM
Peak Locate From Channel: 100
Peak Locate To Channel: 4096

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	Peak Type	Tol. Nuclide
F 5	583.85	1.1254E-001	19.82	Tol.	EU-154
F 8	912.23	8.5413E-002	14.17	Tol.	AC-228

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 1.000 sigma

***** N U C L I D E M D A R E P O R T *****

Detector Name: DET01
Sample Geometry:
Sample Title: 041712-010
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
	CO-60	1173.24	99.90	3.4554E-002	3.46E-002	-6.0231E-003	0.875
		1332.50	99.98	4.7193E-002		6.2857E-003	0.873
+	CS-137	661.66*	85.21	4.3680E-002	4.37E-002	1.1678E-001	miss
	EU-152	121.78	28.58	1.2258E-001	1.08E-001	-1.5169E-002	0.868
		244.70	7.49	4.2171E-001		-6.0966E-001	0.848
		344.28	26.50	1.0787E-001		-3.1653E-002	0.906
		411.11	2.23	1.5204E+000		2.5804E-002	0.821
		443.98	2.78	9.2142E-001		-4.7482E-001	0.850
		778.90	12.94	1.9815E-001		-8.6090E-002	0.891
		867.39	4.15	8.5605E-001		9.2640E-002	0.865
		964.13	14.60	2.7655E-001		-9.7242E-002	0.948
		1112.12	13.64	3.0256E-001		6.1276E-002	0.978
		1212.95	1.40	3.1802E+000		-9.5682E-001	0.868
		1299.12	1.63	2.4397E+000		-1.4474E-001	0.891
		1408.01	21.00	1.6843E-001		-1.0907E-002	0.968
	EU-154	123.07	40.40	8.8712E-002	8.64E-002	-1.2698E-002	0.863
		188.25	0.23	1.3310E+001		2.2759E+000	free
		247.93	6.83	5.1407E-001		1.4919E-001	0.817
		401.30	0.19	1.5196E+001		3.7000E-001	miss
		444.39	0.55	4.1412E+000		-1.8238E+000	free
		478.26	0.21	1.0902E+001		-4.1640E+000	free
		557.56	0.25	8.9657E+000		-3.8140E+000	free
		582.00	0.89	5.7588E+000		3.5105E+000	free
		591.76	4.91	5.5512E-001		-2.4273E-001	0.820
		625.22	0.32	6.7752E+000		-2.7907E+000	free
		676.59	0.14	2.2187E+001		4.6967E+000	free
		692.42	1.78	1.7953E+000		-1.7680E-002	0.873
		715.76	0.17	1.5886E+001		9.2566E-001	free
		722.30	20.00	1.6849E-001		-1.1283E-002	0.852
		756.86	4.50	8.5772E-001		9.6017E-002	0.842
		815.55	0.50	5.1456E+000		-1.1284E+000	miss
		845.39	0.58	6.5249E+000		9.0269E-001	free
		850.64	0.23	1.0543E+001		-4.3065E+000	free
		873.20	12.09	2.3813E-001		2.9737E-002	0.857
		892.73	0.50	5.5238E+000		-1.6222E+000	free
		904.05	0.85	3.2443E+000		1.5467E-001	free
		996.30	10.34	2.8315E-001		-4.8619E-002	0.922
		1004.76	17.90	1.7404E-001		7.6332E-003	0.951
		1128.40	0.29	1.2583E+001		2.0950E-001	free
		1140.90	0.22	1.8761E+001		3.0647E+000	miss
		1241.60	0.13	3.4567E+001		3.8894E+000	miss
		1246.60	0.80	3.9352E+000		-3.4809E-001	free

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
EU-154	1274.51	34.40	8.6446E-002	8.64E-002	-3.7475E-002	0.963
	1494.08	0.71	3.0862E+000		-7.4557E-001	miss
	1596.45	1.80	1.3640E+000		1.4079E-001	1.362
U-235	143.76	10.90	3.0237E-001	5.94E-002	7.3448E-002	miss
	163.33	5.00	6.3062E-001		2.1253E-001	miss
	185.71	57.50	5.9396E-002		3.4711E-002	miss
	205.31	5.00	5.9122E-001		-8.6558E-002	miss
U-238	92.60	3.57	1.3485E+000	1.35E+000	6.0405E-001	miss
	1001.03	0.59	6.3669E+000		1.7671E+000	miss
AM-241	59.54	35.90	2.8958E-001	2.90E-001	-7.6271E-002	miss

+ = Nuclide identified during the nuclide identification

* = Energy line found in the spectrum

> = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

Coincidence correction performed.

free = No coincidence correction required.

miss = Nuclide energy was not found in the coincidence library.

***** G A M M A S P E C T R U M A N A L Y S I S *****

Filename: DET01

Report Generated On : 4/18/2012 3:00:05 PM

Sample Title : 041812-001
Sample Description : BGRR AS LEFT SU-3 #9
Sample Identification :
Sample Type :
Sample Geometry :

Peak Locate Threshold : 3.00
Peak Locate Range (in channels) : 100 - 4096
Peak Area Range (in channels) : 100 - 4096
Identification Energy Tolerance : 2.000 keV

Sample Size : 8.770E+002 GRAM

Sample Taken On : 4/18/2012 9:30:00 AM
Acquisition Started : 4/18/2012 2:49:51 PM

Live Time : 600.0 seconds
Real Time : 600.2 seconds

Dead Time : 0.03 %

Energy Calibration Used Done On : 10/14/2010
Efficiency Calibration Used Done On : 10/15/2010
Efficiency ID : DET01 500ml Mari

***** N U C L I D E I D E N T I F I C A T I O N R E P O R T *****

Sample Title: 041812-001
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GRAM)	Activity Uncertainty	Coinc Corr
K-40	0.988	1460.75*	10.67	4.21542E+000	7.73813E-001	miss
CS-137	0.993	661.66*	85.21	2.53103E-001	5.92013E-002	miss
PB-212	0.461	74.81	10.50			
		77.11	17.60			
		238.63*	43.60	7.43968E-001	1.59869E-001	miss

* = Energy line found in the spectrum.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 2.000 keV
Nuclide confidence index threshold = 0.45
Errors quoted at 1.000 sigma
Coincidence correction performed.
free = No coincidence correction required.
miss = Nuclide energy was not found in the coincidence library.

 ***** I N T E R F E R E N C E C O R R E C T E D R E P O R T *****

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/GRAM)	Wt mean Activity Uncertainty
K-40	0.988	4.215423E+000	7.738126E-001
CS-137	0.993	2.531035E-001	5.920127E-002
PB-212	0.461	7.439676E-001	1.598692E-001

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

***** U N I D E N T I F I E D P E A K S *****

Peak Locate Performed on: 4/18/2012 2:59:52 PM
 Peak Locate From Channel: 100
 Peak Locate To Channel: 4096

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	Peak Type	Tol. Nuclide
F 2	295.27	8.0934E-002	17.66	Tol.	PB-214
F 3	338.41	8.6591E-002	15.20	Tol.	AC-228
F 4	351.99	1.4615E-001	11.14	Tol.	PB-214
F 5	583.44	1.2767E-001	11.57	Tol.	EU-154
F 6	609.52	9.5698E-002	13.85	Tol.	BI-214
F 8	911.72	1.0307E-001	32.45	Tol.	AC-228
F 9	1120.70	4.2891E-002	21.91	Tol.	BI-214

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.000 sigma

***** N U C L I D E M D A R E P O R T *****

Detector Name: DET01
Sample Geometry:
Sample Title: 041812-001
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
	CO-60	1173.24	99.90	5.1821E-002	4.53E-002	1.2448E-002	0.875
		1332.50	99.98	4.5287E-002		4.8175E-003	0.873
+	CS-137	661.66*	85.21	5.2040E-002	5.20E-002	2.5310E-001	miss
	EU-152	121.78	28.58	1.3570E-001	1.29E-001	-4.6992E-002	0.868
		244.70	7.49	4.3456E-001		-4.8689E-001	0.848
		344.28	26.50	1.2939E-001		-3.8992E-002	0.906
		411.11	2.23	2.1102E+000		7.4337E-001	0.821
		443.98	2.78	1.4888E+000		2.5057E-001	0.850
		778.90	12.94	2.9715E-001		5.8659E-002	0.891
		867.39	4.15	1.0850E+000		2.5218E-001	0.865
		964.13	14.60	3.1737E-001		-6.3483E-003	0.948
		1112.12	13.64	2.8553E-001		-4.3015E-002	0.978
		1212.95	1.40	3.3306E+000		-4.4459E-001	0.868
		1299.12	1.63	2.4031E+000		3.2246E-001	0.891
		1408.01	21.00	2.2053E-001		3.5512E-002	0.968
	EU-154	123.07	40.40	9.7767E-002	2.61E-002	-1.0071E-002	0.863
		188.25	0.23	1.5848E+001		2.4905E-001	free
		247.93	6.83	4.9841E-001		-1.2502E-001	0.817
		401.30	0.19	1.6173E+001		-3.9086E+000	miss
		444.39	0.55	6.2427E+000		6.8061E-001	free
		478.26	0.21	1.5289E+001		3.0183E-001	free
		557.56	0.25	1.3482E+001		4.3487E-001	free
		582.00	0.89	8.5756E+000		1.0540E+001	free
		591.76	4.91	6.1903E-001		-9.4437E-002	0.820
		625.22	0.32	9.8362E+000		1.0849E+000	free
		676.59	0.14	1.4188E+001		-3.0558E+000	free
		692.42	1.78	2.1536E+000		7.4231E-002	0.873
		715.76	0.17	1.3661E+001		-3.4370E+000	free
		722.30	20.00	1.5302E-001		-1.2580E-001	0.852
		756.86	4.50	9.3717E-001		1.6428E-001	0.842
		815.55	0.50	7.0702E+000		6.4741E-001	miss
		845.39	0.58	4.4762E+000		-4.1582E-001	free
		850.64	0.23	1.1335E+001		2.1937E-001	free
		873.20	12.09	3.1178E-001		2.5565E-002	0.857
		892.73	0.50	6.0712E+000		-6.9499E-001	free
		904.05	0.85	3.5658E+000		-8.0711E-001	free
		996.30	10.34	3.0441E-001		1.8852E-002	0.922
		1004.76	17.90	1.9128E-001		9.9530E-004	0.951
		1128.40	0.29	1.5095E+001		1.2566E-001	free
		1140.90	0.22	1.7705E+001		2.2959E+000	miss
		1241.60	0.13	3.5093E+001		0.0000E+000	miss
		1246.60	0.80	5.9014E+000		1.0597E+000	free

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
EU-154	1274.51	34.40	2.6068E-002	2.61E-002	0.0000E+000	0.963
	1494.08	0.71	3.7022E+000		-5.0309E-001	miss
	1596.45	1.80	4.1133E-001		0.0000E+000	1.362
U-235	143.76	10.90	3.2485E-001	7.65E-002	5.1781E-002	miss
	163.33	5.00	6.6726E-001		1.3948E-001	miss
	185.71	57.50	7.6541E-002		7.9408E-002	miss
	205.31	5.00	6.0855E-001		-2.7875E-001	miss
U-238	92.60	3.57	1.6776E+000	1.68E+000	1.3848E+000	miss
	1001.03	0.59	5.5050E+000		2.1483E-001	miss
AM-241	59.54	35.90	3.5113E-001	3.51E-001	-1.1063E-002	miss

+ = Nuclide identified during the nuclide identification

* = Energy line found in the spectrum

> = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

Coincidence correction performed.

free = No coincidence correction required.

miss = Nuclide energy was not found in the coincidence library.

***** G A M M A S P E C T R U M A N A L Y S I S *****

Filename: DET02

Report Generated On : 4/18/2012 3:01:00 PM

Sample Title : 041812-002
Sample Description : BGRR AS LEFT SU-3 #10
Sample Identification :
Sample Type :
Sample Geometry :

Peak Locate Threshold : 3.00
Peak Locate Range (in channels) : 100 - 4096
Peak Area Range (in channels) : 100 - 4096
Identification Energy Tolerance : 2.000 keV

Sample Size : 8.540E+002 GRAM

Sample Taken On : 4/18/2012 9:35:00 AM
Acquisition Started : 4/18/2012 2:50:46 PM

Live Time : 600.0 seconds
Real Time : 600.3 seconds

Dead Time : 0.05 %

Energy Calibration Used Done On : 10/14/2010
Efficiency Calibration Used Done On : 10/15/2010
Efficiency ID : DET02 500ml Mari

***** N U C L I D E I D E N T I F I C A T I O N R E P O R T *****

Sample Title: 041812-002
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GRAM)	Activity Uncertainty	Coinc Corr
K-40	0.991	1460.75*	10.67	4.55373E+000	7.65420E-001	miss
CS-137	1.000	661.66*	85.21	1.77946E-001	2.71117E-002	miss
PB-212	0.794	74.81	10.50			
		77.11*	17.60	1.01741E+000	2.34630E-001	miss
		238.63*	43.60	7.00254E-001	8.19839E-002	miss
TH-232	1.000	63.81	0.27			
		968.97*	16.20	3.36749E-001	1.24571E-001	miss

* = Energy line found in the spectrum.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 2.000 keV
Nuclide confidence index threshold = 0.45
Errors quoted at 1.000 sigma
Coincidence correction performed.
free = No coincidence correction required.
miss = Nuclide energy was not found in the coincidence library.

 ***** I N T E R F E R E N C E C O R R E C T E D R E P O R T *****

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/GRAM)	Wt mean Activity Uncertainty
K-40	0.991	4.553729E+000	7.654203E-001
CS-137	1.000	1.779464E-001	2.711169E-002
PB-212	0.794	7.347638E-001	7.739533E-002
TH-232	1.000	3.367490E-001	1.245710E-001

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

***** U N I D E N T I F I E D P E A K S *****

Peak Locate Performed on: 4/18/2012 3:00:47 PM
 Peak Locate From Channel: 100
 Peak Locate To Channel: 4096

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	Peak Type	Tol. Nuclide
3	295.10	1.0032E-001	19.97	Tol.	PB-214
4	337.95	6.8402E-002	23.75	Tol.	AC-228
5	351.87	1.4940E-001	14.25	Tol.	PB-214
6	583.07	1.2120E-001	14.21	Tol.	EU-154
7	609.23	1.4693E-001	11.84	Tol.	BI-214
9	910.95	7.3487E-002	19.37	Tol.	AC-228

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.000 sigma

***** N U C L I D E M D A R E P O R T *****

Detector Name: DET02
Sample Geometry:
Sample Title: 041812-002
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
	CO-60	1173.24	99.90	5.2800E-002	3.91E-002	1.2123E-002	0.875
		1332.50	99.98	3.9114E-002		5.1907E-003	0.873
+	CS-137	661.66*	85.21	5.9606E-002	5.96E-002	1.7795E-001	miss
	EU-152	121.78	28.58	1.1869E-001	1.19E-001	1.1447E-003	0.868
		244.70	7.49	4.3604E-001		-1.4467E-001	0.848
		344.28	26.50	1.3109E-001		2.7124E-002	0.906
		411.11	2.23	1.7150E+000		2.4136E-001	0.821
		443.98	2.78	9.8489E-001		-2.8578E-001	0.850
		778.90	12.94	3.0554E-001		1.9257E-002	0.891
		867.39	4.15	9.9621E-001		2.3152E-001	0.865
		964.13	14.60	3.7065E-001		-3.6477E-002	0.948
		1112.12	13.64	2.9639E-001		9.3071E-002	0.978
		1212.95	1.40	1.8023E+000		-1.9943E+000	0.868
		1299.12	1.63	3.0341E+000		4.7127E-001	0.891
		1408.01	21.00	1.9476E-001		5.3854E-002	0.968
	EU-154	123.07	40.40	9.5177E-002	9.52E-002	5.1208E-002	0.863
		188.25	0.23	1.0178E+001		-1.0105E+001	free
		247.93	6.83	4.6434E-001		-1.8930E-002	0.817
		401.30	0.19	1.4639E+001		-2.9865E-001	miss
		444.39	0.55	4.6994E+000		-3.2900E-001	free
		478.26	0.21	1.5585E+001		2.5827E+000	free
		557.56	0.25	1.2774E+001		4.3539E+000	free
		582.00	0.89	8.8781E+000		1.2991E+001	free
		591.76	4.91	5.5672E-001		-1.9312E-001	0.820
		625.22	0.32	9.6385E+000		5.5687E-001	free
		676.59	0.14	1.6077E+001		-8.2141E+000	free
		692.42	1.78	2.1035E+000		-8.5625E-002	0.873
		715.76	0.17	2.0634E+001		1.0319E+000	free
		722.30	20.00	1.8660E-001		-8.8465E-002	0.852
		756.86	4.50	1.0022E+000		1.6493E-001	0.842
		815.55	0.50	4.2490E+000		-5.8831E-001	miss
		845.39	0.58	4.8488E+000		-4.3252E-001	free
		850.64	0.23	1.5347E+001		3.7962E+000	free
		873.20	12.09	3.0240E-001		3.4271E-002	0.857
		892.73	0.50	6.4234E+000		3.0798E-001	free
		904.05	0.85	3.4554E+000		-9.2468E-002	free
		996.30	10.34	3.5843E-001		-5.1556E-002	0.922
		1004.76	17.90	1.6571E-001		-1.0263E-002	0.951
		1128.40	0.29	1.1649E+001		2.3899E+000	free
		1140.90	0.22	1.5648E+001		-4.1874E-001	miss
		1241.60	0.13	2.8810E+001		-8.3947E+000	miss
		1246.60	0.80	4.9661E+000		5.1950E-001	free

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
EU-154	1274.51	34.40	1.1152E-001	9.52E-002	1.5916E-002	0.963
	1494.08	0.71	4.5057E+000		1.2130E-001	miss
	1596.45	1.80	1.3628E+000		1.8345E-002	1.362
U-235	143.76	10.90	3.0443E-001	6.97E-002	1.9727E-001	miss
	163.33	5.00	6.4760E-001		3.2298E-001	miss
	185.71	57.50	6.9664E-002		8.6448E-002	miss
	205.31	5.00	5.3459E-001		-2.7611E-001	miss
U-238	92.60	3.57	1.3484E+000	1.35E+000	1.0916E+000	miss
	1001.03	0.59	8.0359E+000		2.6181E+000	miss
AM-241	59.54	35.90	2.7487E-001	2.75E-001	-8.8647E-003	miss

+ = Nuclide identified during the nuclide identification

* = Energy line found in the spectrum

> = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

Coincidence correction performed.

free = No coincidence correction required.

miss = Nuclide energy was not found in the coincidence library.

***** G A M M A S P E C T R U M A N A L Y S I S *****

Filename: DET01

Report Generated On : 4/18/2012 3:13:12 PM

Sample Title : 041812-003
Sample Description : BGRR AS LEFT SU-3 #11
Sample Identification :
Sample Type :
Sample Geometry :

Peak Locate Threshold : 3.00
Peak Locate Range (in channels) : 100 - 4096
Peak Area Range (in channels) : 100 - 4096
Identification Energy Tolerance : 2.000 keV

Sample Size : 1.174E+003 GRAM

Sample Taken On : 4/18/2012 9:40:00 AM
Acquisition Started : 4/18/2012 3:02:58 PM

Live Time : 600.0 seconds
Real Time : 600.2 seconds

Dead Time : 0.04 %

Energy Calibration Used Done On : 10/14/2010
Efficiency Calibration Used Done On : 10/15/2010
Efficiency ID : DET01 500ml Mari

***** N U C L I D E I D E N T I F I C A T I O N R E P O R T *****

Sample Title: 041812-003
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

..... IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GRAM)	Activity Uncertainty	Coinc Corr
K-40	0.978	1460.75*	10.67	5.18317E+000	1.02327E+000	miss
PB-212	0.802	74.81	10.50			
		77.11*	17.60	8.10279E-001	5.87847E-002	miss
		238.63*	43.60	5.85416E-001	8.40090E-002	miss

* = Energy line found in the spectrum.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 2.000 keV
Nuclide confidence index threshold = 0.45
Errors quoted at 1.000 sigma
Coincidence correction performed.
free = No coincidence correction required.
miss = Nuclide energy was not found in the coincidence library.

 ***** I N T E R F E R E N C E C O R R E C T E D R E P O R T *****

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/GRAM)	Wt mean Activity Uncertainty
K-40	0.978	5.183166E+000	1.023266E+000
PB-212	0.802	7.363680E-001	4.816436E-002

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

***** U N I D E N T I F I E D P E A K S *****

Peak Locate Performed on: 4/18/2012 3:12:59 PM
 Peak Locate From Channel: 100
 Peak Locate To Channel: 4096

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	Peak Type	Tol. Nuclide
F 3	295.32	7.4925E-002	19.64	Tol.	PB-214
F 4	338.43	9.7063E-002	13.79	Tol.	AC-228
F 5	351.96	1.2314E-001	12.95	Tol.	PB-214
F 6	583.73	1.1010E-001	11.24	Tol.	EU-154
F 7	609.67	1.1648E-001	12.26	Tol.	BI-214
F 8	911.73	8.2719E-002	47.87	Tol.	AC-228

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.000 sigma

***** N U C L I D E M D A R E P O R T *****

Detector Name: DET01
Sample Geometry:
Sample Title: 041812-003
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
CO-60	1173.24	99.90	4.2960E-002	3.97E-002	8.0204E-003	0.875
	1332.50	99.98	3.9720E-002		7.4062E-003	0.873
CS-137	661.66	85.21	4.2201E-002	4.22E-002	1.5255E-002	miss
EU-152	121.78	28.58	1.2568E-001	7.46E-002	7.0224E-002	0.868
	244.70	7.49	3.5238E-001		-5.8047E-001	0.848
	344.28	26.50	7.4559E-002		-7.3407E-002	0.906
	411.11	2.23	1.4889E+000		-7.8041E-002	0.821
	443.98	2.78	1.0562E+000		1.8183E-001	0.850
	778.90	12.94	2.0848E-001		-4.4347E-002	0.891
	867.39	4.15	7.2047E-001		-5.7472E-002	0.865
	964.13	14.60	2.7717E-001		-4.4459E-002	0.948
	1112.12	13.64	2.8341E-001		9.6805E-002	0.978
	1212.95	1.40	2.0430E+000		-2.0164E+000	0.868
	1299.12	1.63	2.6459E+000		1.1118E+000	0.891
	1408.01	21.00	1.6474E-001		2.8762E-002	0.968
EU-154	123.07	40.40	7.8365E-002	5.72E-002	-5.5710E-004	0.863
	188.25	0.23	1.1838E+001		-2.2536E+000	free
	247.93	6.83	4.7109E-001		1.9954E-001	0.817
	401.30	0.19	1.1041E+001		-1.7688E+000	miss
	444.39	0.55	4.1504E+000		-2.1304E-001	free
	478.26	0.21	1.2833E+001		2.0838E+000	free
	557.56	0.25	9.7045E+000		-1.1326E+000	free
	582.00	0.89	5.9900E+000		5.5768E+000	free
	591.76	4.91	5.2966E-001		-1.6269E-001	0.820
	625.22	0.32	7.7175E+000		-3.8226E-001	free
	676.59	0.14	1.9882E+001		1.5409E+000	free
	692.42	1.78	1.6088E+000		5.7037E-002	0.873
	715.76	0.17	1.5798E+001		3.0415E+000	free
	722.30	20.00	1.4290E-001		-5.2851E-002	0.852
	756.86	4.50	8.3059E-001		2.5464E-001	0.842
	815.55	0.50	5.5805E+000		1.3080E+000	miss
	845.39	0.58	4.6644E+000		-7.5438E-001	free
	850.64	0.23	1.1811E+001		2.3176E+000	free
	873.20	12.09	3.3441E-001		6.6065E-002	0.857
	892.73	0.50	5.6698E+000		5.6637E-001	free
	904.05	0.85	2.3873E+000		-7.3922E-001	free
	996.30	10.34	5.7163E-002		0.0000E+000	0.922
	1004.76	17.90	1.1047E-001		-2.8253E-002	0.951
	1128.40	0.29	1.3081E+001		4.1302E+000	free
	1140.90	0.22	2.0294E+001		2.7384E+000	miss
	1241.60	0.13	3.4990E+001		5.2280E-001	miss
	1246.60	0.80	5.5263E+000		1.3823E+000	free

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
EU-154	1274.51	34.40	1.1992E-001	5.72E-002	1.2349E-002	0.963
	1494.08	0.71	3.4899E+000		-3.7582E-001	miss
	1596.45	1.80	8.3559E-001		-1.8925E-001	1.362
U-235	143.76	10.90	2.6619E-001	5.60E-002	9.3969E-002	miss
	163.33	5.00	4.9423E-001		-1.1485E-001	miss
	185.71	57.50	5.5993E-002		4.0064E-002	miss
	205.31	5.00	5.0118E-001		-3.1920E-001	miss
U-238	92.60	3.57	1.2084E+000	1.21E+000	3.5834E-001	miss
	1001.03	0.59	4.4883E+000		1.6262E-001	miss
AM-241	59.54	35.90	2.9876E-001	2.99E-001	5.4654E-002	miss

+ = Nuclide identified during the nuclide identification

* = Energy line found in the spectrum

> = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

Coincidence correction performed.

free = No coincidence correction required.

miss = Nuclide energy was not found in the coincidence library.

***** G A M M A S P E C T R U M A N A L Y S I S *****

Filename: DET02

Report Generated On : 4/18/2012 3:13:58 PM

Sample Title : 041812-004
Sample Description : BGRR AS LEFT SU-3 #12
Sample Identification :
Sample Type :
Sample Geometry :

Peak Locate Threshold : 3.00
Peak Locate Range (in channels) : 100 - 4096
Peak Area Range (in channels) : 100 - 4096
Identification Energy Tolerance : 2.000 keV

Sample Size : 7.650E+002 GRAM

Sample Taken On : 4/18/2012 9:45:00 AM
Acquisition Started : 4/18/2012 3:03:44 PM

Live Time : 600.0 seconds
Real Time : 600.3 seconds

Dead Time : 0.04 %

Energy Calibration Used Done On : 10/14/2010
Efficiency Calibration Used Done On : 10/15/2010
Efficiency ID : DET02 500ml Mari

***** N U C L I D E I D E N T I F I C A T I O N R E P O R T *****

Sample Title: 041812-004
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GRAM)	Activity Uncertainty	Coinc Corr
K-40	0.998	1460.75*	10.67	4.66955E+000	7.89411E-001	miss
CS-137	0.999	661.66*	85.21	1.16381E-001	2.24098E-002	miss
PB-212	0.794	74.81	10.50			
		77.11*	17.60	1.22824E+000	2.49916E-001	miss
		238.63*	43.60	6.23411E-001	7.79237E-002	miss

* = Energy line found in the spectrum.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 2.000 keV
Nuclide confidence index threshold = 0.45
Errors quoted at 1.000 sigma
Coincidence correction performed.
free = No coincidence correction required.
miss = Nuclide energy was not found in the coincidence library.

***** I N T E R F E R E N C E C O R R E C T E D R E P O R T *****

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/GRAM)	Wt mean Activity Uncertainty
K-40	0.998	4.669550E+000	7.894110E-001
CS-137	0.999	1.163809E-001	2.240978E-002
PB-212	0.794	6.770022E-001	7.439149E-002

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

***** U N I D E N T I F I E D P E A K S *****

Peak Locate Performed on: 4/18/2012 3:13:45 PM
Peak Locate From Channel: 100
Peak Locate To Channel: 4096

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	Peak Type	Tol. Nuclide
3	295.00	6.4677E-002	32.47	Tol.	PB-214
4	338.07	6.5586E-002	27.13	Tol.	AC-228
5	351.86	1.7100E-001	11.32	Tol.	PB-214
6	510.61	5.0752E-002	27.68		
7	583.06	8.9622E-002	18.13	Tol.	EU-154
8	609.13	1.5314E-001	12.04	Tol.	BI-214
10	768.04	1.1285E-002	67.82		
11	911.01	6.4048E-002	19.00	Tol.	AC-228

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 1.000 sigma

***** N U C L I D E M D A R E P O R T *****

Detector Name: DET02
Sample Geometry:
Sample Title: 041812-004
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
	CO-60	1173.24	99.90	3.9992E-002	3.77E-002	-1.0614E-003	0.875
		1332.50	99.98	3.7666E-002		2.3178E-003	0.873
+	CS-137	661.66*	85.21	5.0422E-002	5.04E-002	1.1638E-001	miss
	EU-152	121.78	28.58	1.1843E-001	1.01E-001	-3.8673E-003	0.868
		244.70	7.49	3.9259E-001		-1.6943E-001	0.848
		344.28	26.50	1.0150E-001		-4.0605E-002	0.906
		411.11	2.23	1.4967E+000		-3.6424E-001	0.821
		443.98	2.78	1.0326E+000		-1.9525E-001	0.850
		778.90	12.94	2.8183E-001		-6.3776E-002	0.891
		867.39	4.15	1.0445E+000		1.2167E-001	0.865
		964.13	14.60	3.5832E-001		-7.1995E-002	0.948
		1112.12	13.64	3.3087E-001		4.0219E-002	0.978
		1212.95	1.40	2.0120E+000		-1.4452E+000	0.868
		1299.12	1.63	1.7674E+000		-2.7448E-001	0.891
		1408.01	21.00	2.3730E-001		7.2402E-002	0.968
	EU-154	123.07	40.40	8.5029E-002	8.50E-002	-5.7808E-003	0.863
		188.25	0.23	1.2699E+001		-6.9288E+000	free
		247.93	6.83	4.7434E-001		-5.7996E-002	0.817
		401.30	0.19	1.5215E+001		7.1176E-001	miss
		444.39	0.55	3.3889E+000		-2.0463E+000	free
		478.26	0.21	1.5067E+001		1.6722E+000	free
		557.56	0.25	1.3696E+001		2.0966E-001	free
		582.00	0.89	9.4017E+000		1.2276E+001	free
		591.76	4.91	8.2092E-001		-2.5870E-002	0.820
		625.22	0.32	8.8908E+000		-3.1196E+000	free
		676.59	0.14	2.1857E+001		2.5564E+000	free
		692.42	1.78	2.0873E+000		-1.4800E-001	0.873
		715.76	0.17	2.5071E+001		1.0158E+001	free
		722.30	20.00	1.8186E-001		-3.9305E-002	0.852
		756.86	4.50	1.0190E+000		3.4120E-001	0.842
		815.55	0.50	6.1356E+000		-1.3135E+000	miss
		845.39	0.58	3.3162E+000		0.0000E+000	free
		850.64	0.23	1.2282E+001		5.4331E-001	free
		873.20	12.09	4.0856E-001		1.4623E-001	0.857
		892.73	0.50	8.2133E+000		2.2772E+000	free
		904.05	0.85	2.3632E+000		-1.2387E+000	free
		996.30	10.34	3.6660E-001		2.1801E-003	0.922
		1004.76	17.90	1.5958E-001		-8.5923E-002	0.951
		1128.40	0.29	1.4193E+001		3.2479E+000	free
		1140.90	0.22	1.7468E+001		-3.1164E-001	miss
		1241.60	0.13	3.2161E+001		-9.1801E+000	miss
		1246.60	0.80	5.5438E+000		-2.5372E-001	free

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
EU-154	1274.51	34.40	1.1157E-001	8.50E-002	-1.0364E-002	0.963
	1494.08	0.71	3.9859E+000		-4.7395E-001	miss
	1596.45	1.80	1.2056E+000		-1.0239E-001	1.362
U-235	143.76	10.90	3.1873E-001	6.75E-002	1.8502E-001	miss
	163.33	5.00	6.5346E-001		2.5414E-001	miss
	185.71	57.50	6.7456E-002		4.6055E-002	miss
	205.31	5.00	5.8771E-001		2.4090E-002	miss
U-238	92.60	3.57	1.4715E+000	1.47E+000	1.4098E+000	miss
	1001.03	0.59	7.4270E+000		1.9784E+000	miss
AM-241	59.54	35.90	3.1798E-001	3.18E-001	8.9064E-003	miss

+ = Nuclide identified during the nuclide identification

* = Energy line found in the spectrum

> = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

Coincidence correction performed.

free = No coincidence correction required.

miss = Nuclide energy was not found in the coincidence library.

***** G A M M A S P E C T R U M A N A L Y S I S *****

Filename: DET01

Report Generated On : 4/18/2012 3:27:17 PM

Sample Title : 041812-005
Sample Description : BGRR AS LEFT SU-3 #13
Sample Identification :
Sample Type :
Sample Geometry :

Peak Locate Threshold : 3.00
Peak Locate Range (in channels) : 100 - 4096
Peak Area Range (in channels) : 100 - 4096
Identification Energy Tolerance : 2.000 keV

Sample Size : 9.080E+002 GRAM

Sample Taken On : 4/18/2012 9:50:00 AM
Acquisition Started : 4/18/2012 3:17:03 PM

Live Time : 600.0 seconds
Real Time : 600.2 seconds

Dead Time : 0.03 %

Energy Calibration Used Done On : 10/14/2010
Efficiency Calibration Used Done On : 10/15/2010
Efficiency ID : DET01 500ml Mari

***** N U C L I D E I D E N T I F I C A T I O N R E P O R T *****

Sample Title: 041812-005
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GRAM)	Activity Uncertainty	Coinc Corr
K-40	0.975	1460.75*	10.67	3.65367E+000	9.16164E-001	miss
CS-137	0.998	661.66*	85.21	1.51350E-001	1.94818E-002	miss
PB-212	0.461	74.81	10.50			
		77.11	17.60			
		238.63*	43.60	5.36063E-001	8.06441E-002	miss
TH-232	0.944	63.81	0.27			
		968.97*	16.20	4.59861E-001	2.30389E-001	miss
U-235	0.567	143.76	10.90			
		163.33	5.00			
		185.71*	57.50	5.98249E-002	1.37830E-002	miss
		205.31	5.00			

* = Energy line found in the spectrum.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 2.000 keV
Nuclide confidence index threshold = 0.45
Errors quoted at 1.000 sigma
Coincidence correction performed.
free = No coincidence correction required.
miss = Nuclide energy was not found in the coincidence library.

***** I N T E R F E R E N C E C O R R E C T E D R E P O R T *****

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/GRAM)	Wt mean Activity Uncertainty
K-40	0.975	3.653675E+000	9.161635E-001
CS-137	0.998	1.513499E-001	1.948178E-002
PB-212	0.461	5.360631E-001	8.064406E-002
TH-232	0.944	4.598607E-001	2.303893E-001
U-235	0.567	5.982488E-002	1.378300E-002

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

***** U N I D E N T I F I E D P E A K S *****

Peak Locate Performed on: 4/18/2012 3:27:04 PM
Peak Locate From Channel: 100
Peak Locate To Channel: 4096

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	Peak Type	Tol. Nuclide
F 3	338.17	7.7005E-002	58.64	Tol.	AC-228
F 4	352.13	1.5057E-001	10.86	Tol.	PB-214
F 5	510.88	7.0271E-002	50.67		
F 6	583.56	1.0387E-001	13.01	Tol.	EU-154
F 7	609.44	9.6576E-002	13.61	Tol.	BI-214
F 9	911.80	8.0451E-002	14.82	Tol.	AC-228

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 1.000 sigma

***** N U C L I D E M D A R E P O R T *****

Detector Name: DET01
Sample Geometry:
Sample Title: 041812-005
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
	CO-60	1173.24	99.90	4.7008E-002	3.92E-002	-8.3330E-004	0.875
		1332.50	99.98	3.9201E-002		1.3487E-004	0.873
+	CS-137	661.66*	85.21	3.8962E-002	3.90E-002	1.5135E-001	miss
	EU-152	121.78	28.58	1.2759E-001	1.28E-001	3.8126E-002	0.868
		244.70	7.49	4.0437E-001		-6.1465E-001	0.848
		344.28	26.50	1.2771E-001		-2.7226E-002	0.906
		411.11	2.23	2.3100E+000		9.4177E-001	0.821
		443.98	2.78	1.3278E+000		1.6474E-002	0.850
		778.90	12.94	2.2958E-001		9.5565E-003	0.891
		867.39	4.15	4.8606E-001		-4.2108E-001	0.865
		964.13	14.60	2.9185E-001		-4.3687E-002	0.948
		1112.12	13.64	2.7578E-001		-2.7347E-002	0.978
		1212.95	1.40	2.9474E+000		-8.5883E-001	0.868
		1299.12	1.63	2.5899E+000		5.3905E-002	0.891
		1408.01	21.00	1.7490E-001		-2.8884E-002	0.968
	EU-154	123.07	40.40	8.6945E-002	8.69E-002	6.5463E-003	0.863
		188.25	0.23	1.2784E+001		-2.7235E+000	free
		247.93	6.83	5.6764E-001		1.2446E-001	0.817
		401.30	0.19	1.5188E+001		-3.5592E-001	miss
		444.39	0.55	6.1827E+000		1.2351E+000	free
		478.26	0.21	1.8964E+001		8.6296E+000	free
		557.56	0.25	1.3916E+001		2.8166E+000	free
		582.00	0.89	7.2966E+000		6.4774E+000	free
		591.76	4.91	6.4318E-001		-3.6920E-002	0.820
		625.22	0.32	9.9784E+000		0.0000E+000	free
		676.59	0.14	1.9347E+001		-4.2428E+000	free
		692.42	1.78	1.7188E+000		-1.5405E-001	0.873
		715.76	0.17	1.1382E+001		-5.7456E+000	free
		722.30	20.00	1.9522E-001		-1.2305E-002	0.852
		756.86	4.50	7.4793E-001		-1.1410E-001	0.842
		815.55	0.50	5.4625E+000		-2.2738E-001	miss
		845.39	0.58	6.0308E+000		1.3627E-001	free
		850.64	0.23	1.6948E+001		4.6613E+000	free
		873.20	12.09	2.1330E-001		-7.1781E-002	0.857
		892.73	0.50	5.2553E+000		-2.4003E+000	free
		904.05	0.85	4.0438E+000		-3.4647E-001	free
		996.30	10.34	4.1013E-001		6.0966E-002	0.922
		1004.76	17.90	2.0165E-001		-5.2680E-002	0.951
		1128.40	0.29	1.5405E+001		1.7143E+000	free
		1140.90	0.22	1.5668E+001		2.2827E+000	miss
		1241.60	0.13	3.3895E+001		-7.6609E+000	miss
		1246.60	0.80	4.9764E+000		9.5846E-001	free

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
	EU-154	1274.51	34.40	1.3122E-001	8.69E-002	2.3606E-002	0.963
		1494.08	0.71	4.5123E+000		-1.0798E-001	miss
		1596.45	1.80	1.0804E+000		-2.6100E-001	1.362
+	U-235	143.76	10.90	3.0915E-001	6.23E-002	7.6890E-003	miss
		163.33	5.00	6.1667E-001		-4.5318E-002	miss
		185.71*	57.50	6.2313E-002		5.9825E-002	miss
		205.31	5.00	6.5432E-001		-6.0535E-002	miss
	U-238	92.60	3.57	1.5624E+000	1.56E+000	9.7245E-001	miss
		1001.03	0.59	7.7108E+000		1.5106E+000	miss
	AM-241	59.54	35.90	3.0867E-001	3.09E-001	-1.7474E-001	miss

+ = Nuclide identified during the nuclide identification

* = Energy line found in the spectrum

> = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

Coincidence correction performed.

free = No coincidence correction required.

miss = Nuclide energy was not found in the coincidence library.

***** G A M M A S P E C T R U M A N A L Y S I S *****

Filename: DET02

Report Generated On : 4/18/2012 3:27:49 PM

Sample Title : 041812-006
Sample Description : BGRR AS LEFT SU-3 #14
Sample Identification :
Sample Type :
Sample Geometry :

Peak Locate Threshold : 3.00
Peak Locate Range (in channels) : 100 - 4096
Peak Area Range (in channels) : 100 - 4096
Identification Energy Tolerance : 2.000 keV

Sample Size : 9.950E+002 GRAM

Sample Taken On : 4/18/2012 9:55:00 AM
Acquisition Started : 4/18/2012 3:17:35 PM

Live Time : 600.0 seconds
Real Time : 600.3 seconds

Dead Time : 0.05 %

Energy Calibration Used Done On : 10/14/2010
Efficiency Calibration Used Done On : 10/15/2010
Efficiency ID : DET02 500ml Mari

***** N U C L I D E I D E N T I F I C A T I O N R E P O R T *****

Sample Title: 041812-006
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GRAM)	Activity Uncertainty	Coinc Corr
K-40	0.992	1460.75*	10.67	3.97088E+000	6.69350E-001	miss
CS-137	0.997	661.66*	85.21	1.73316E-001	2.32543E-002	miss
PB-212	0.794	74.81	10.50			
		77.11*	17.60	9.05152E-001	2.10222E-001	miss
		238.63*	43.60	5.02484E-001	6.45818E-002	miss
TH-232	0.972	63.81	0.27			
		968.97*	16.20	3.26506E-001	1.02743E-001	miss

* = Energy line found in the spectrum.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 2.000 keV
Nuclide confidence index threshold = 0.45
Errors quoted at 1.000 sigma
Coincidence correction performed.
free = No coincidence correction required.
miss = Nuclide energy was not found in the coincidence library.

 ***** I N T E R F E R E N C E C O R R E C T E D R E P O R T *****

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/GRAM)	Wt mean Activity Uncertainty
K-40	0.992	3.970879E+000	6.693497E-001
CS-137	0.997	1.733159E-001	2.325433E-002
PB-212	0.794	5.372085E-001	6.173439E-002
TH-232	0.972	3.265060E-001	1.027432E-001

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

***** U N I D E N T I F I E D P E A K S *****

Peak Locate Performed on: 4/18/2012 3:27:36 PM
 Peak Locate From Channel: 100
 Peak Locate To Channel: 4096

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	Peak Type	Tol. Nuclide
3	295.43	6.5000E-002	29.35	Tol.	PB-214
4	351.96	1.4746E-001	14.50	Tol.	PB-214
5	583.02	9.8500E-002	15.23	Tol.	EU-154
6	609.18	1.3370E-001	13.73	Tol.	BI-214
8	911.14	8.6571E-002	16.94	Tol.	AC-228

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.000 sigma

***** N U C L I D E M D A R E P O R T *****

Detector Name: DET02
Sample Geometry:
Sample Title: 041812-006
Nuclide Library Used: C:\GENIE2K\CAMFILES\BNL_Soil.NLB

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
	CO-60	1173.24	99.90	5.1806E-002	4.40E-002	1.9475E-002	0.875
		1332.50	99.98	4.3981E-002		9.3558E-003	0.873
+	CS-137	661.66*	85.21	4.4257E-002	4.43E-002	1.7332E-001	miss
	EU-152	121.78	28.58	9.6628E-002	8.49E-002	-3.4810E-003	0.868
		244.70	7.49	3.5427E-001		-1.9048E-001	0.848
		344.28	26.50	8.4935E-002		-2.6139E-002	0.906
		411.11	2.23	1.3890E+000		4.6035E-002	0.821
		443.98	2.78	1.0210E+000		1.2282E-001	0.850
		778.90	12.94	2.3310E-001		-4.9585E-002	0.891
		867.39	4.15	6.8396E-001		-4.0673E-003	0.865
		964.13	14.60	3.1812E-001		-7.9237E-002	0.948
		1112.12	13.64	2.7086E-001		3.2394E-002	0.978
		1212.95	1.40	2.9646E+000		5.0050E-001	0.868
		1299.12	1.63	1.9878E+000		-2.6379E-002	0.891
		1408.01	21.00	1.0241E-001		-5.9642E-003	0.968
	EU-154	123.07	40.40	7.0774E-002	7.08E-002	-2.1083E-003	0.863
		188.25	0.23	1.0036E+001		-7.1626E+000	free
		247.93	6.83	4.4398E-001		3.2727E-002	0.817
		401.30	0.19	1.0748E+001		-2.1140E+000	miss
		444.39	0.55	4.2162E+000		0.0000E+000	free
		478.26	0.21	1.4927E+001		7.8076E+000	free
		557.56	0.25	1.0530E+001		-3.0225E-001	free
		582.00	0.89	6.7044E+000		7.9863E+000	free
		591.76	4.91	7.2152E-001		1.0427E-001	0.820
		625.22	0.32	6.8356E+000		-1.7728E+000	free
		676.59	0.14	2.4129E+001		5.6970E+000	free
		692.42	1.78	2.0639E+000		3.2241E-001	0.873
		715.76	0.17	1.1441E+001		-2.9521E+000	free
		722.30	20.00	1.5042E-001		-8.0288E-002	0.852
		756.86	4.50	8.2288E-001		1.1888E-002	0.842
		815.55	0.50	5.5386E+000		-1.4026E-001	miss
		845.39	0.58	4.1617E+000		-6.0633E-001	free
		850.64	0.23	1.3172E+001		3.6521E+000	free
		873.20	12.09	2.7921E-001		3.8653E-002	0.857
		892.73	0.50	5.5131E+000		-3.3643E-001	free
		904.05	0.85	3.4822E+000		6.3491E-001	free
		996.30	10.34	3.3094E-001		-1.1733E-002	0.922
		1004.76	17.90	1.5870E-001		-2.7368E-002	0.951
		1128.40	0.29	2.2525E+000		0.0000E+000	free
		1140.90	0.22	1.5769E+001		4.2596E+000	miss
		1241.60	0.13	2.2161E+001		-7.6462E+000	miss
		1246.60	0.80	5.1584E+000		1.6024E+000	free

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Coinc Corr
EU-154	1274.51	34.40	8.5781E-002	7.08E-002	1.2143E-002	0.963
	1494.08	0.71	3.0646E+000		5.2056E-002	miss
	1596.45	1.80	3.4085E-001		0.0000E+000	1.362
U-235	143.76	10.90	2.4081E-001	5.98E-002	6.2430E-002	miss
	163.33	5.00	4.4782E-001		-8.6337E-003	miss
	185.71	57.50	5.9792E-002		5.4012E-002	miss
	205.31	5.00	4.1504E-001		-3.3502E-001	miss
U-238	92.60	3.57	1.2012E+000	1.20E+000	1.0411E+000	miss
	1001.03	0.59	5.7102E+000		5.9757E-001	miss
AM-241	59.54	35.90	2.7586E-001	2.76E-001	3.6433E-002	miss

+ = Nuclide identified during the nuclide identification

* = Energy line found in the spectrum

> = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

Coincidence correction performed.

free = No coincidence correction required.

miss = Nuclide energy was not found in the coincidence library.

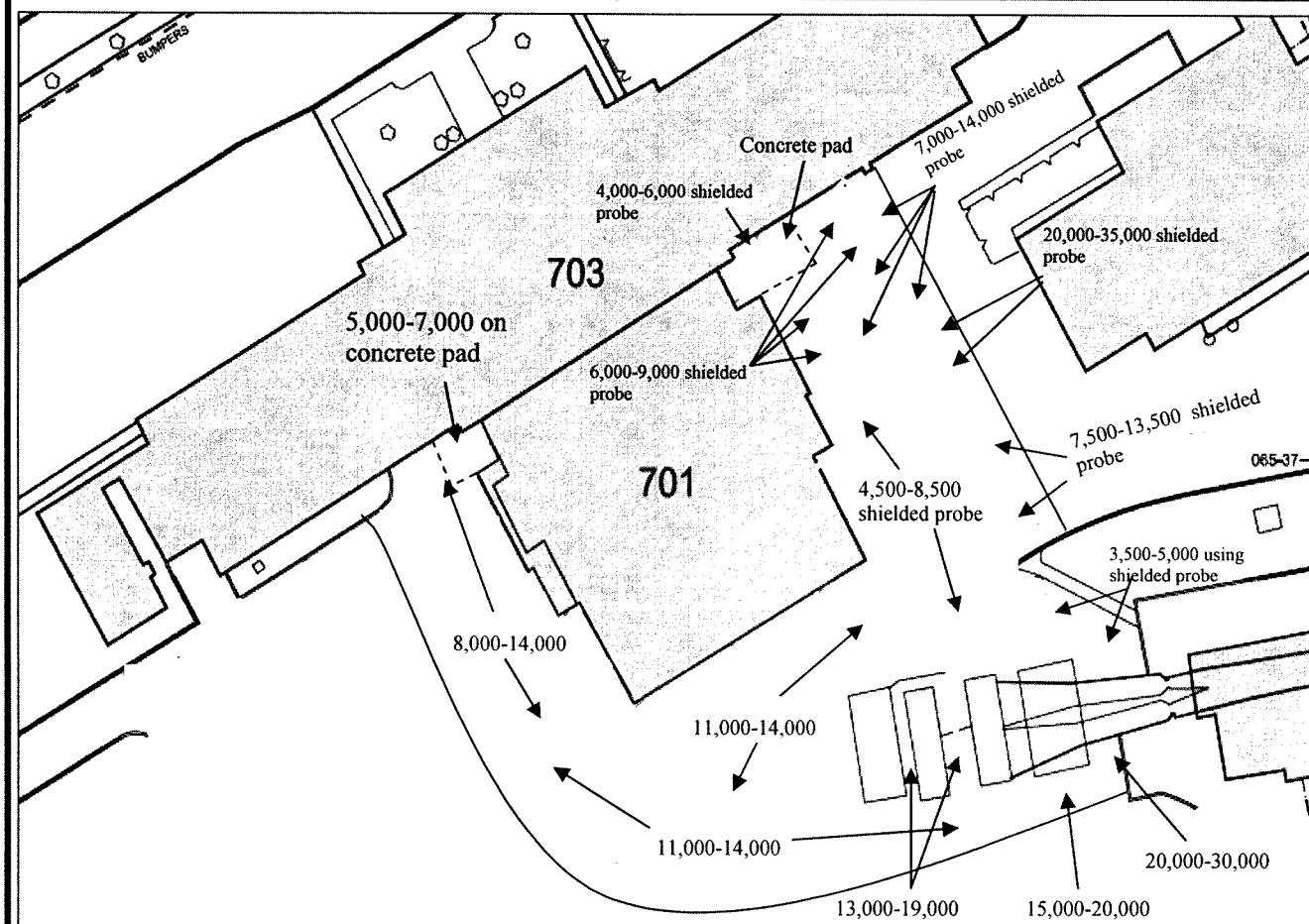
RADIOLOGICAL SURVEY FORM **FS-SOP-1000**

LOCATION / EQUIPMENT: **BGRR EXTERIOR AREAS**

ROUTINE _____ ☐ SPECIAL _____
☐ RWP# _____ ☐ WP# _____

DATE: **05/14/12** TIME: **0900**

BGRR Engineering Cap Verification Survey



INSTRUMENT		
Model #	Serial #	CAL DUE
LUD-2221	211784	03-09-2013
N/A	N/A	N/A
↓	↓	↓

LEGEND	
○ - SMEAR SURVEY LOCATION	△ - AIR SAMPLE LOCATION
□ - MASSLINN SURVEY LOCATION	# - DIRECT FRISK LOCATION
XXXY ZZZ XXX = contact reading Y = radiation type ZZZ = reading @ 30cm	

AIRBORNE ACTIVITY SURVEY					
Sample #	Duration	Flow Rate	Field Analysis		% DAC
			cpm	μCi/cc	
N/A					

DOSE RATE (HIGHEST)	
CONTACT READING	N/A
GENERAL AREA READING	N/A

MASSLINN SURVEY RESULTS (in dpm)			
1. N/A	5. N/A	9. N/A	13. N/A
2. ↓	6. ↓	10. ↓	14. ↓
3. ↓	7. ↓	11. ↓	15. ↓
4. ↓	8. ↓	12. ↓	16. ↓

SMEAR SURVEY RESULTS (dpm/100cm ²) α, β-γ, ³ H					
1. N/A	8. N/A	15. N/A	2. N/A	9. N/A	16. N/A
3. ↓	10. ↓	17. ↓	4. ↓	11. ↓	18. ↓
5. ↓	12. ↓	19. ↓	6. ↓	13. ↓	20. ↓
7. ↓	14. ↓	21. ↓			

The survey values above the screening level of 20,400 cpm unshielded and 9,000 cpm shielded were due to changes in background readings due to the BLGD 801.

Surveyed By: William Calash Date: 05/17/2012 Reviewed By: [Signature] Date: 5/17/12

Appendix B

As-Left Radiological Survey Forms – Building 701 Inside Areas

RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT					
☐ ROUTINE ☐ SPECIAL ☐ RWP# ☐ WPH <u>314-35</u>					Model #	Serial #	CAL DUE		
LOCATION / EQUIPMENT: 701 BGRR		Date: 04-27-2012		Time: 0830		LUD-3	44141	02-10-13	
BLDG. 701—110' Final Status survey							S5-XLB	67705	04-20-13
SURVEY IS OF HIGH BAY 110 LEVEL FLOOR AND UP TO 6ft OF THE WALLS. SMEAR RESULTS ARE ON THE ATTACHED SHEETS. North section E1-20 West section F21-40 South section G41-60 East section includes the bio-shield surface. I61-80, I1-20 Dose rates are in Micro R/HR, Lud-12 floorwalker #72717 cal due. 06-03-12 used to Perform survey of accessible floor surfaces with exception of bio-shield footprint. Lud-12 background 1200ccpm/frisk. Found a large percentage of the floor to have elevated readings with the Lud-12. Verified elevated readings with a lud-3 probe. South area up to 1200 ccpm, West area up to 5000 ccpm, North area up to 10000 ccpm, and east area up to 25000 ccpm.							LB-5100	32487	09-30-12
							Bicron	A885S	08-01-12
							LEGEND ○ - SMEAR SURVEY LOCATION △ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCATION XXX XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ		
							AIRBORNE ACTIVITY SURVEY		
Sample #	Duration	Flow Rate	Field Analysis						
			cpm	µCi/cc	% DAC				
N/A									
DOSE RATE (HIGHEST)									
CONTACT READING			N/A						
General area READING			5-15						
MASSLINN SURVEY RESULTS (in dpm)									
1. N/A			5. N/A						
2.			6.						
3.			7.						
4.			8.						
SMEAR SURVEY RESULTS (dpm/100cm²) (α, β-γ) ³H									
1. See		8. Batch		15. 31642-45					
2.		9.		16.					
3.		10.		17.					
4.		11.		18.					
5.		12.		19.					
6.		13.		20.					
7.		14.		21.					
Survey: William Calash/Dettermann Date: 4/27/12 Reviewed By: <i>[Signature]</i> Date: 4/30/12 FS-SOP-1000 Attachment 9.2 Page <u>1</u> of <u>16</u>									

Activity Report

4/27/12
8:44:28AM

North
EAST 110
Eggs

Batch Name:	31,642	Acquisition Date:	4/27/12
Batch ID:	1 Minute Smear Analysis - 201204270818	Acquisition Time:	1.0
Group:	E	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,350.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

<u>Sample ID</u>	<u>Quantity</u>	<u>Alpha</u> <u>(DPM)</u>	<u>2σ</u>	<u>Alpha MDA</u> <u>(DPM)</u>	<u>Beta Activity</u> <u>(DPM)</u>	<u>2σ</u>	<u>Beta MDA</u> <u>(DPM)</u>
20120427081834-E1	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120427082004-E2	0.00	-0.19	0.37	12.78	21.39	25.76	38.35
20120427082124-E3	0.00	-0.21	0.37	12.78	78.77	43.14	38.35
20120427082244-E4	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120427082355-E5	0.00	-0.20	0.37	12.78	52.69	36.29	38.35
20120427082514-E6	0.00	-0.21	0.37	12.78	78.77	43.14	38.35
20120427082635-E7	0.00	-0.26	0.37	12.78	209.17	67.73	38.35
20120427082745-E8	0.00	-0.20	0.37	12.78	37.04	31.46	38.35
20120427082905-E9	0.00	-0.21	0.37	12.78	68.34	40.54	38.35
20120427083025-E10	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120427083135-E11	0.00	-0.21	0.37	12.78	68.34	40.54	38.35
20120427083255-E12	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120427083405-E13	0.00	3.48	7.40	12.78	78.63	43.14	38.35
20120427083525-E14	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120427083645-E15	0.00	3.35	7.40	12.78	433.31	96.37	38.35
20120427083755-E16	0.00	3.49	7.40	12.78	47.33	34.75	38.35
20120427083915-E17	0.00	-0.26	0.37	12.78	209.17	67.73	38.35
20120427084035-E18	0.00	3.43	7.40	12.78	229.89	70.88	38.35
20120427084145-E19	0.00	-0.22	0.37	12.78	89.20	45.60	38.35
20120427084305-E20	0.00	3.47	7.40	12.78	120.35	52.28	38.35

Reviewed by:



Activity Report

4/27/12
9:09:57AM

WEST 110

Batch Name:	31,643	Acquisition Date:	4/27/12
Batch ID:	1 Minute Smear Analysis - 201204270825	Acquisition Time:	1.0
Group:	F	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,350.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20120427082531-F21	0.00	10.83	12.81	12.78	187.88	64.43	38.35
20120427084543-F22	0.00	-0.19	0.37	12.78	26.61	27.79	38.35
20120427084653-F23	0.00	-0.23	0.37	12.78	115.28	51.23	38.35
20120427084813-F24	0.00	3.44	7.40	12.78	188.16	64.43	38.35
20120427084933-F25	0.00	3.47	7.40	12.78	115.14	51.23	38.35
20120427085043-F26	0.00	-0.20	0.37	12.78	31.82	29.68	38.35
20120427085203-F27	0.00	-0.26	0.37	12.78	219.60	69.32	38.35
20120427085323-F28	0.00	-0.27	0.37	12.78	235.25	71.65	38.35
20120427085433-F29	0.00	-0.20	0.37	12.78	42.26	33.15	38.35
20120427085553-F30	0.00	-0.19	0.37	12.78	26.61	27.79	38.35
20120427085713-F31	0.00	-0.20	0.37	12.78	31.82	29.68	38.35
20120427085823-F32	0.00	-0.23	0.37	12.78	136.14	55.32	38.35
20120427085944-F33	0.00	3.51	7.40	12.78	10.82	21.11	38.35
20120427090104-F34	0.00	-0.21	0.37	12.78	78.77	43.14	38.35
20120427090214-F35	0.00	-0.25	0.37	12.78	193.52	65.27	38.35
20120427090334-F36	0.00	-0.22	0.37	12.78	89.20	45.60	38.35
20120427090454-F37	0.00	-0.20	0.37	12.78	31.82	29.68	38.35
20120427090604-F38	0.00	-0.20	0.37	12.78	37.04	31.46	38.35
20120427090724-F39	0.00	-0.21	0.37	12.78	78.77	43.14	38.35
20120427090834-F40	0.00	-0.19	0.37	12.78	16.18	23.55	38.35

Reviewed by:



Activity Report

4/27/12
9:35:30AM

SOUTH 110

Batch Name:	31,644	Acquisition Date:	4/27/12
Batch ID:	1 Minute Smear Analysis - 201204270829	Acquisition Time:	1.0
Group:	G	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,350.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20120427082933-G41	0.00	-0.21	0.37	12.78	73.55	41.86	38.35
20120427091115-G42	0.00	3.48	7.40	12.78	78.63	43.14	38.35
20120427091226-G43	0.00	-0.21	0.37	12.78	63.12	39.17	38.35
20120427091346-G44	0.00	-0.25	0.37	12.78	167.44	60.95	38.35
20120427091506-G45	0.00	-0.20	0.37	12.78	47.47	34.75	38.35
20120427091616-G46	0.00	-0.22	0.37	12.78	99.63	47.93	38.35
20120427091736-G47	0.00	3.50	7.40	12.78	26.47	27.79	38.35
20120427091856-G48	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120427092006-G49	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120427092126-G50	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120427092246-G51	0.00	-0.20	0.37	12.78	42.26	33.15	38.35
20120427092356-G52	0.00	-0.19	0.37	12.78	21.39	25.76	38.35
20120427092516-G53	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120427092636-G54	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120427092746-G55	0.00	-0.25	0.37	12.78	172.66	61.83	38.35
20120427092906-G56	0.00	3.47	7.40	12.78	115.14	51.23	38.35
20120427093026-G57	0.00	-0.20	0.37	12.78	42.26	33.15	38.35
20120427093136-G58	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120427093257-G59	0.00	-0.21	0.37	12.78	73.55	41.86	38.35
20120427093407-G60	0.00	-0.21	0.37	12.78	78.77	43.14	38.35

Reviewed by:



Activity Report

4/27/12
10:26:37AM

EAST 110

Batch Name:	31,645	Acquisition Date:	4/27/12
Batch ID:	1 Minute Smear Analysis - 201204270842	Acquisition Time:	1.0
Group:	I	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,350.0
		(volts)	
Selected Geometry: 1/8" Stainless Steel			

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20120427084207-I61	0.00	-0.22	0.37	12.78	110.06	50.15	38.35
20120427093650-I62	0.00	-0.21	0.37	12.78	57.90	37.76	38.35
20120427093800-I63	0.00	3.46	7.40	12.78	130.79	54.32	38.35
20120427093920-I64	0.00	3.47	7.40	12.78	120.35	52.28	38.35
20120427094040-I65	0.00	-0.22	0.37	12.78	89.20	45.60	38.35
20120427094150-I66	0.00	-0.21	0.37	12.78	68.34	40.54	38.35
20120427094310-I67	0.00	7.14	10.46	12.78	167.15	60.95	38.35
20120427094430-I68	0.00	-0.30	0.37	12.78	323.92	83.61	38.35
20120427094540-I69	0.00	-0.21	0.37	12.78	68.34	40.54	38.35
20120427094700-I70	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120427094820-I71	0.00	3.50	7.40	12.78	26.47	27.79	38.35
20120427094930-I72	0.00	-0.26	0.37	12.78	198.74	66.10	38.35
20120427095050-I73	0.00	-0.23	0.37	12.78	136.14	55.32	38.35
20120427095200-I74	0.00	-0.25	0.37	12.78	172.66	61.83	38.35
20120427095321-I75	0.00	-0.23	0.37	12.78	120.50	52.28	38.35
20120427095441-I76	0.00	-0.20	0.37	12.78	37.04	31.46	38.35
20120427095551-I77	0.00	-0.25	0.37	12.78	188.30	64.43	38.35
20120427095711-I78	0.00	7.17	10.46	12.78	94.13	46.78	38.35
20120427095831-I79	0.00	3.48	7.40	12.78	89.06	45.60	38.35
20120427095941-I80	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120427100101-I1	0.00	-0.22	0.37	12.78	94.42	46.78	38.35
20120427100221-I2	0.00	-0.24	0.37	12.78	146.58	57.26	38.35
20120427100331-I3	0.00	-0.19	0.37	12.78	26.61	27.79	38.35
20120427100451-I4	0.00	-0.22	0.37	12.78	110.06	50.15	38.35
20120427100611-I5	0.00	3.43	7.40	12.78	224.67	70.11	38.35
20120427100721-I6	0.00	-0.25	0.37	12.78	172.66	61.83	38.35
20120427100841-I7	0.00	-0.20	0.37	12.78	52.69	36.29	38.35
20120427101001-I8	0.00	-0.27	0.37	12.78	240.46	72.40	38.35
20120427101111-I9	0.00	-0.21	0.37	12.78	78.77	43.14	38.35
20120427101232-I10	0.00	-0.24	0.37	12.78	146.58	57.26	38.35
20120427101352-I11	0.00	-0.24	0.37	12.78	151.79	58.20	38.35
20120427101502-I12	0.00	-0.21	0.37	12.78	57.90	37.76	38.35
20120427101622-I13	0.00	-0.33	0.38	12.78	407.38	93.49	38.35
20120427101732-I14	0.00	-0.22	0.37	12.78	104.85	49.05	38.35
20120427101852-I15	0.00	-0.24	0.37	12.78	146.58	57.26	38.35

Activity Report

4/27/12
10:26:37AM

Efficiency Factors

Alpha
Efficiency:
(%)

0.27

±

0.00

Beta Efficiency:
(%)

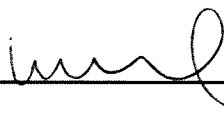
0.19

±

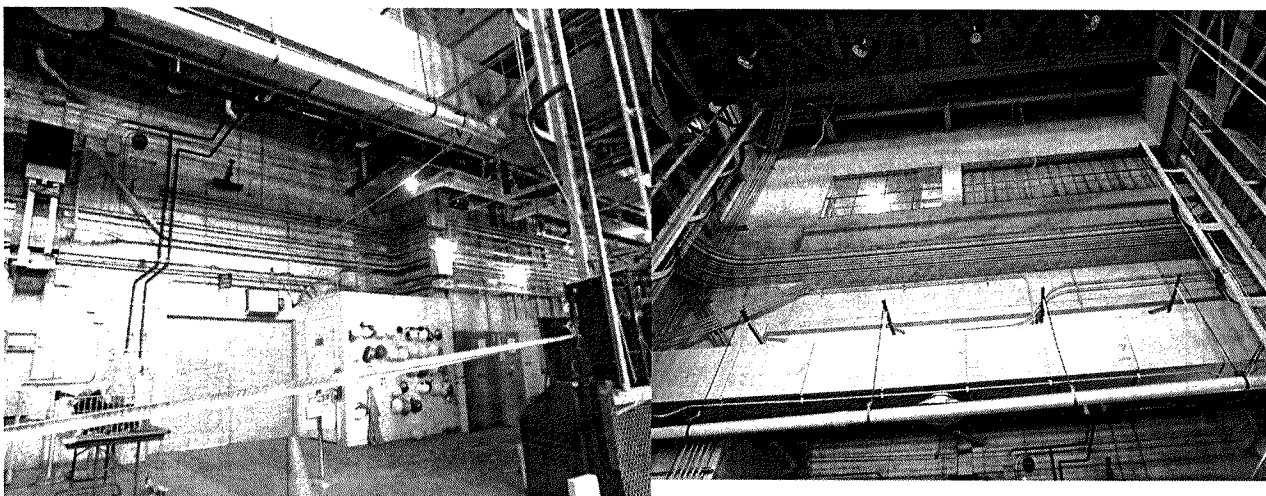
0.00

Sample ID	Quantity	<u>Alpha</u> (DPM)	<u>2σ</u>	<u>Alpha MDA</u> (DPM)	<u>Beta Activity</u> (DPM)	<u>2σ</u>	<u>Beta MDA</u> (DPM)
20120427102012-I16	0.00	3.48	7.40	12.78	89.06	45.60	38.35
20120427102122-I17	0.00	-0.19	0.37	12.78	26.61	27.79	38.35
20120427102242-I18	0.00	-0.23	0.37	12.78	120.50	52.28	38.35
20120427102402-I19	0.00	-0.22	0.37	12.78	94.42	46.78	38.35
20120427102512-I20	0.00	3.44	7.40	12.78	188.16	64.43	38.35

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT																
LOCATION & EQUIPT. 701 Building		☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # 2012-030 ☐ WP # _____		Model #	Serial #	CAL DUE														
		Date 4/24/12 TIME: 11:00		S5-XLB	67705	04/20/13														
High Bay				Bicron	A885S	8/11/12														
				N/A		→														
				N/A		→														
A smear survey of the South wall from 6 feet to the ceiling was done all results are on the attached sheet. General area dose rates are 5-15 micro R/HR.		LEGEND ○ - SMEAR SURVEY LOCATION ▲ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCA- C - CONTAMINATION * - CONTACT XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ																		
		AIRBORNE ACTIVITY SURVEY																		
		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="2">Field Analysis</th> <th rowspan="2">% DAC</th> </tr> <tr> <th>cpm</th> <th>µCi/cc</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td>→</td> </tr> </tbody> </table>					Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A					→
		Sample #	Duration	Flow Rate	Field Analysis					% DAC										
					cpm	µCi/cc														
		N/A					→													
		DOSE RATE (HIGHEST) Micro R/hr																		
		CONTACT READING			N/A															
		GENERAL AREA READING			5-15															
		MASSLINN SURVEY RESULTS (in dpm)																		
1. N/A		5. N/A																		
2.		6.																		
3.		7.																		
4.		8.																		
SMEAR SURVEY RESULTS (dpm/100cm²) α β γ ³H																				
1. SEE		8. Attachment		15. 31615																
2.		9.		16.																
3.		10.		17.																
4.		11.		18.																
5.		12.		19.																
6.		13.		20.																
7.		14.		21.																
Surveyed By WilliamCalash FS-SOP-1000 Attachment 9.2 Date: 4/24/12 Reviewed By: Date: 4/24/12																				
Page <u>1</u> of <u>2</u>																				



Activity Report

4/24/12
11:05:27AM

SOUTH WALL ABOVE 6FT

Batch Name:	31,615	Acquisition Date:	4/24/12
Batch ID:	1 Minute Smear Analysis - 201204240952	Acquisition Time:	1.0
Group:	I	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,350.0
		(volts)	

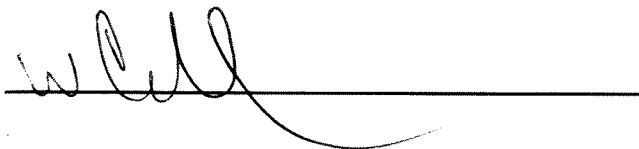
Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency: (%)	0.27	±	0.00	Beta Efficiency: (%)	0.19	±	0.00
-----------------------	------	---	------	----------------------	------	---	------

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
20120424095210-I1	0.00	3.36	7.40	12.78	422.88	95.23	38.35
20120424104103-I2	0.00	7.03	10.46	12.78	469.68	100.27	38.35
20120424104223-I3	0.00	-0.30	0.37	12.78	313.49	82.29	38.35
20120424104343-I4	0.00	14.52	14.79	12.78	198.16	66.10	38.35
20120424104453-I5	0.00	-0.23	0.37	12.78	136.14	55.32	38.35
20120424104613-I6	0.00	-0.22	0.37	12.78	99.63	47.93	38.35
20120424104724-I7	0.00	-0.26	0.37	12.78	219.60	69.32	38.35
20120424104844-I8	0.00	3.24	7.40	12.78	756.71	126.84	38.35
20120424105004-I9	0.00	3.48	7.40	12.78	94.27	46.78	38.35
20120424105114-I10	0.00	10.78	12.81	12.78	318.28	82.95	38.35
20120424105234-I11	0.00	3.43	7.40	12.78	219.46	69.32	38.35
20120424105354-I12	0.00	21.64	18.11	12.78	959.41	142.77	38.35
20120424105504-I13	0.00	7.13	10.46	12.78	219.31	69.32	38.35
20120424105624-I14	0.00	7.10	10.46	12.78	287.12	78.90	38.35
20120424105744-I15	0.00	-0.27	0.37	12.78	224.82	70.11	38.35
20120424105854-I16	0.00	7.08	10.46	12.78	339.28	85.55	38.35
20120424110014-I17	0.00	10.64	12.81	12.78	714.69	123.33	38.35
20120424110134-I18	0.00	6.99	10.46	12.78	589.65	112.14	38.35
20120424110244-I19	0.00	10.79	12.81	12.78	313.06	82.29	38.35
20120424110404-I20	0.00	-0.30	0.37	12.78	323.92	83.61	38.35

Reviewed by:



Sample Report

Batch ID: 1min. Smear - 201204240939
Group: G
Device: HFBR
Batch Key: 4,335
Selected Geometry: 1/8" Stainless Steel

Count Date: 4/24/2012
Count Minutes: 1.0
Count Mode: Simultaneous
Operating Volts: 1350

Efficiency (%)				Spillover (%)			
Alpha:	27.51	±	0.10	Alpha to Beta:	5.94	±	0.00
Beta:	19.49	±	0.10	Beta to Alpha:	0.08	±	0.00

<u>Sample ID</u>	<u>Sample Type</u>	<u>Alpha</u> <u>(dpm)</u>	<u>Unc</u>	<u>Alpha MDA</u> <u>(dpm)</u>	<u>Beta</u> <u>(dpm)</u>	<u>Unc</u>	<u>Beta MDA</u> <u>(dpm)</u>	<u>(dpm)</u>
20120424093904-G1	Unknown	-0.04	0.01	9.84	71.85	19.20	13.89	
20120424094035-G2	Unknown	-0.09	0.02	9.84	159.09	28.58	13.89	
20120424094155-G3	Unknown	3.50	3.64	9.84	240.89	35.20	13.89	
20120424094305-G4	Unknown	7.23	5.14	9.84	76.37	19.88	13.89	
20120424094425-G5	Unknown	-0.09	0.02	9.84	169.35	29.49	13.89	
20120424094545-G6	Unknown	-0.08	0.02	9.84	148.82	27.65	13.89	
20120424094655-G7	Unknown	-0.05	0.02	9.84	97.50	22.37	13.89	
20120424094815-G8	Unknown	-0.03	0.01	9.84	46.19	15.40	13.89	
20120424094925-G9	Unknown	3.56	3.64	9.84	138.25	26.68	13.89	
20120424095045-G10	Unknown	-0.08	0.02	9.84	148.82	27.65	13.89	
20120424095155-G11	Unknown	-0.07	0.02	9.84	128.29	25.67	13.89	
20120424095315-G12	Unknown	7.23	5.14	9.84	81.50	20.54	13.89	
20120424095435-G13	Unknown	-0.08	0.02	9.84	138.56	26.67	13.89	
20120424095545-G14	Unknown	-0.06	0.02	9.84	107.77	23.52	13.89	
20120424095705-G15	Unknown	-0.15	0.03	9.84	266.85	37.03	13.89	
20120424095815-G16	Unknown	3.57	3.64	9.84	117.73	24.62	13.89	
20120424095935-G17	Unknown	-0.04	0.01	9.84	76.98	19.88	13.89	
20120424100045-G18	Unknown	3.59	3.64	9.84	81.80	20.53	13.89	
20120424100205-G19	Unknown	7.23	5.14	9.84	71.23	19.21	13.89	
20120424100315-G20	Unknown	7.15	5.14	9.84	209.79	32.88	13.89	
20120424100435-G21	Unknown	-0.07	0.02	9.84	118.03	24.62	13.89	
20120424100555-G22	Unknown	-0.09	0.02	9.84	153.95	28.12	13.89	
20120424100705-G23	Unknown	14.47	7.27	9.84	121.94	25.16	13.89	
20120424100825-G24	Unknown	-0.02	0.01	9.84	35.92	13.58	13.89	
20120424100935-G25	Unknown	-0.05	0.01	9.84	87.24	21.16	13.89	
20120424101055-G26	Unknown	3.62	3.64	9.84	35.62	13.58	13.89	
20120424101205-G27	Unknown	3.57	3.64	9.84	117.73	24.62	13.89	
20120424101325-G28	Unknown	3.59	3.64	9.84	76.67	19.88	13.89	
20120424101445-G29	Unknown	3.58	3.64	9.84	92.07	21.78	13.89	
20120424101555-G30	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120424101715-G31	Unknown	7.17	5.14	9.84	173.87	29.94	13.89	
20120424101825-G32	Unknown	3.53	3.64	9.84	194.70	31.65	13.89	
20120424101945-G33	Unknown	3.56	3.64	9.84	143.39	27.17	13.89	
20120424102055-G34	Unknown	-0.04	0.01	9.84	76.98	19.88	13.89	
20120424102215-G35	Unknown	-0.07	0.02	9.84	123.16	25.15	13.89	

RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT															
LOCATION & EQUIPT. 701 Building		☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # 2012-030 ☐ WP # _____		Model #	Serial #														
		Date 4/24/12 TIME: 11:00		LB-5100	32487														
High Bay				Bicron	A885S														
				N/A															
				N/A															
A smear survey of the west wall from the 6 feet to the ceiling was done all results are on the attached sheet. General area dose rates are 5-15 micro R/HR. 		LEGEND ○ - SMEAR SURVEY LOCATION ▲ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCA- C - CONTAMINATION * CONTACT XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ																	
		AIRBORNE ACTIVITY SURVEY																	
		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="2">Field Analysis</th> <th rowspan="2">% DAC</th> </tr> <tr> <th>cpm</th> <th>µCi/cc</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A					
		Sample #	Duration	Flow Rate	Field Analysis				% DAC										
					cpm	µCi/cc													
		N/A																	
		DOSE RATE (HIGHEST) Micro R/hr																	
		CONTACT READING		N/A															
		GENERAL AREA READING		5-15															
		MASSLINN SURVEY RESULTS (in dpm)																	
		1. N/A		5. N/A															
		2.		6.															
		3.		7.															
		4.		8.															
		SMEAR SURVEY RESULTS (dpm/100cm² α β γ ³H)																	
1. SEE		8. Attachment																	
2.		15. 4336																	
3.		16.																	
4.		17.																	
5.		18.																	
6.		19.																	
7.		20.																	
14.		21.																	

Surveyed By **WilliamCalash**

Date: **4/24/12**

Reviewed By: *[Signature]*

Date: **4/24/12**

Sample Report

Batch ID: 1min. Smear - 201204241018
Group: H
Device: HFBR
Batch Key: 4,336
Selected Geometry: 1/8" Stainless Steel

Count Date: 4/24/2012
Count Minutes: 1.0
Count Mode: Simultaneous
Operating Volts: 1350

Efficiency (%)				Spillover (%)			
Alpha:	27.51	±	0.10	Alpha to Beta:	5.94	±	0.00
Beta:	19.49	±	0.10	Beta to Alpha:	0.08	±	0.00

Sample ID	Sample Type	Alpha (dpm)	Unc	Alpha MDA (dpm)	Beta (dpm)	Unc	Beta MDA (dpm)	(dpm)
20120424101827-H1	Unknown	-0.04	0.01	9.84	71.85	19.20	13.89	
20120424102447-H2	Unknown	-0.13	0.03	9.84	236.06	34.83	13.89	
20120424102607-H3	Unknown	3.49	3.64	9.84	261.42	36.67	13.89	
20120424102717-H4	Unknown	-0.03	0.01	9.84	51.32	16.23	13.89	
20120424102837-H5	Unknown	3.61	3.64	9.84	45.88	15.40	13.89	
20120424102947-H6	Unknown	-0.09	0.02	9.84	153.95	28.12	13.89	
20120424103107-H7	Unknown	-0.07	0.02	9.84	128.29	25.67	13.89	
20120424103217-H8	Unknown	-0.04	0.01	9.84	66.71	18.51	13.89	
20120424103337-H9	Unknown	3.60	3.64	9.84	56.14	17.03	13.89	
20120424103447-H10	Unknown	10.87	6.30	9.84	60.67	17.79	13.89	
20120424103607-H11	Unknown	-0.04	0.01	9.84	71.85	19.20	13.89	
20120424103727-H12	Unknown	3.60	3.64	9.84	66.41	18.51	13.89	
20120424103837-H13	Unknown	3.59	3.64	9.84	86.94	21.17	13.89	
20120424103957-H14	Unknown	-0.05	0.01	9.84	82.11	20.53	13.89	
20120424104107-H15	Unknown	-0.04	0.01	9.84	71.85	19.20	13.89	
20120424104227-H16	Unknown	-0.05	0.01	9.84	87.24	21.16	13.89	
20120424104337-H17	Unknown	7.18	5.14	9.84	158.48	28.59	13.89	
20120424104457-H18	Unknown	-0.08	0.02	9.84	148.82	27.65	13.89	
20120424104617-H19	Unknown	-0.05	0.01	9.84	92.37	21.78	13.89	
20120424104727-H20	Unknown	10.78	6.30	9.84	230.02	34.45	13.89	
20120424104847-H21	Unknown	7.22	5.14	9.84	86.63	21.17	13.89	
20120424104957-H22	Unknown	7.01	5.14	9.84	461.25	48.74	13.89	
20120424105117-H23	Unknown	-0.04	0.01	9.84	76.98	19.88	13.89	
20120424105227-H24	Unknown	-0.06	0.02	9.84	102.64	22.96	13.89	
20120424105347-H25	Unknown	-0.03	0.01	9.84	56.45	17.02	13.89	

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT																						
LOCATION & EQUIPT. 701 Building		☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # 2012-030 ☐ WP # _____		Model #	Serial #																					
		Date 4/26/12 TIME: 11:00		LB-5100	32487																					
High Bay				Bicron	A885S																					
A smear survey of the East wall from 6 feet to the ceiling was done all results are on the attached sheet. General area dose rates are 5-15 micro R/HR.				N/A	→																					
				N/A	→																					
		LEGEND ○ - SMEAR SURVEY LOCATION ▲ - AIR SAMPLE LOCATION ☐ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCA- C - CONTAMINATION * CONTACT XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ																								
		AIRBORNE ACTIVITY SURVEY <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="2">Field Analysis</th> <th rowspan="2">% DAC</th> </tr> <tr> <th>cpm</th> <th>µCi/cc</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td>→</td> </tr> </tbody> </table>				Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A					→							
Sample #	Duration	Flow Rate	Field Analysis		% DAC																					
			cpm	µCi/cc																						
N/A					→																					
		DOSE RATE (HIGHEST) Micro R/hr <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>CONTACT READING</td> <td>N/A</td> </tr> <tr> <td>GENERAL AREA READING</td> <td>5-15</td> </tr> </table>				CONTACT READING	N/A	GENERAL AREA READING	5-15																	
CONTACT READING	N/A																									
GENERAL AREA READING	5-15																									
		MASSLINN SURVEY RESULTS (in dpm) <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>1. N/A</td> <td>5. N/A</td> </tr> <tr> <td>2.</td> <td>6.</td> </tr> <tr> <td>3.</td> <td>7.</td> </tr> <tr> <td>4.</td> <td>8.</td> </tr> </table>				1. N/A	5. N/A	2.	6.	3.	7.	4.	8.													
1. N/A	5. N/A																									
2.	6.																									
3.	7.																									
4.	8.																									
		SMEAR SURVEY RESULTS (dpm/100cm²) α β γ ³H <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>1. SEE</td> <td>8. Attachment</td> <td>15. 4347</td> </tr> <tr> <td>2.</td> <td>9.</td> <td>16.</td> </tr> <tr> <td>3.</td> <td>10.</td> <td></td> </tr> <tr> <td>4.</td> <td>11.</td> <td>18.</td> </tr> <tr> <td></td> <td>12.</td> <td>19.</td> </tr> <tr> <td>6.</td> <td>13.</td> <td>20.</td> </tr> <tr> <td>7.</td> <td>14.</td> <td>21.</td> </tr> </table>				1. SEE	8. Attachment	15. 4347	2.	9.	16.	3.	10.		4.	11.	18.		12.	19.	6.	13.	20.	7.	14.	21.
1. SEE	8. Attachment	15. 4347																								
2.	9.	16.																								
3.	10.																									
4.	11.	18.																								
	12.	19.																								
6.	13.	20.																								
7.	14.	21.																								
		Surveyed By <u>William Calash</u> Date: <u>4/26/12</u>																								
		Reviewed By: <u>[Signature]</u> Date: <u>4/26/12</u>																								
		FS-SOP-1000 Attachment 9.2																								
		Page <u>1</u> of <u>2</u>																								

Sample Report

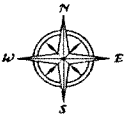
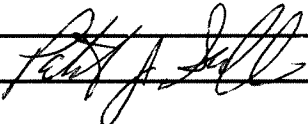
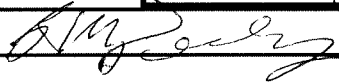
Batch ID: 1min. Smear - 201204260954
Group: G
Device: HFBR
Batch Key: 4,347
Selected Geometry: 1/8" Stainless Steel

Count Date: 4/26/2012
Count Minutes: 1.0
Count Mode: Simultaneous
Operating Volts: 1350

Efficiency (%)				Spillover (%)			
Alpha:	27.51	±	0.10	Alpha to Beta:	5.94	±	0.00
Beta:	19.49	±	0.10	Beta to Alpha:	0.08	±	0.00

Sample ID	Sample Type	Alpha (dpm)	Unc	Alpha MDA (dpm)	Beta (dpm)	Unc	Beta MDA (dpm)	(dpm)
20120426095425-G31	Unknown	-0.04	0.01	9.84	66.71	18.51	13.89	
20120426101325-G32	Unknown	-0.03	0.01	9.84	56.45	17.02	13.89	
20120426101435-G33	Unknown	-0.05	0.01	9.84	82.11	20.53	13.89	
20120426101555-G34	Unknown	-0.03	0.01	9.84	61.58	17.78	13.89	
20120426101715-G35	Unknown	-0.04	0.01	9.84	71.85	19.20	13.89	
20120426101825-G36	Unknown	3.62	3.64	9.84	20.22	10.27	13.89	
20120426101945-G37	Unknown	-0.05	0.02	9.84	97.50	22.37	13.89	
20120426102055-G38	Unknown	-0.03	0.01	9.84	46.19	15.40	13.89	
20120426102215-G39	Unknown	-0.01	0.01	9.84	25.66	11.48	13.89	
20120426102325-G40	Unknown	7.25	5.14	9.84	40.44	14.52	13.89	
20120426102445-G21	Unknown	-0.02	0.01	9.84	30.79	12.57	13.89	
20120426102555-G22	Unknown	-0.05	0.01	9.84	87.24	21.16	13.89	
20120426102715-G23	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120426102835-G24	Unknown	7.23	5.14	9.84	66.10	18.51	13.89	
20120426102945-G25	Unknown	-0.05	0.01	9.84	87.24	21.16	13.89	
20120426103105-G26	Unknown	3.56	3.64	9.84	138.25	26.68	13.89	
20120426103215-G27	Unknown	3.60	3.64	9.84	56.14	17.03	13.89	
20120426103335-G28	Unknown	-0.04	0.01	9.84	76.98	19.88	13.89	
20120426103445-G29	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120426103605-G30	Unknown	3.61	3.64	9.84	45.88	15.40	13.89	
20120426103725-G42	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120426103835-G43	Unknown	-0.01	0.01	9.84	15.40	8.89	13.89	
20120426103955-G44	Unknown	-0.02	0.01	9.84	30.79	12.57	13.89	
20120426104105-G45	Unknown	-0.04	0.01	9.84	66.71	18.51	13.89	
20120426104225-G46	Unknown	-0.07	0.02	9.84	128.29	25.67	13.89	
20120426104335-G1	Unknown	-0.01	0.01	9.84	25.66	11.48	13.89	
20120426104455-G2	Unknown	-0.02	0.01	9.84	30.79	12.57	13.89	
20120426104605-G3	Unknown	-0.01	0.01	9.84	15.40	8.89	13.89	
20120426104725-G4	Unknown	-0.11	0.03	9.84	200.14	32.06	13.89	
20120426104845-G5	Unknown	-0.03	0.01	9.84	46.19	15.40	13.89	

Reviewed by: _____

RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT																																																	
LOCATION & EQUIPT. Building 701 Inside Bio-Shield		☐ ROUTINE _____ ☐ SPECIAL _____ ☒ RWP # 2011-ERP-043 ☐ WP # _____		Model # Serial # CAL DUE Bicron A885S 08-01-2012																																																	
		DATE: 03-30-2012		TIME: 1500																																																	
Survey after final concrete pour on Pile, Plenum and Bioshield Wall areas																																																					
All Dose rates shown in microrem/hr., at CONTACT / 1 FOOT / WAIST LEVEL.																																																					
 Dose Rate Survey of Pile / Bioshield footprint after final concrete application. Grid shown on survey are actual expansion joint lines in concrete. Dose rates taken at contact, 1 foot, and waist level , with approximate location of highest reading in each grid denoted by • <u>All dose rate shown in microrem/hr.</u>		<table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr> <td>$\frac{30}{20}$ $\frac{20}{20}$</td> <td>$\frac{90}{60}$ $\frac{60}{30}$</td> <td>$\frac{10}{10}$ $\frac{10}{10}$</td> <td>$\frac{160}{90}$ $\frac{90}{40}$</td> <td>$\frac{30}{30}$ $\frac{30}{30}$</td> </tr> <tr> <td>$\frac{20}{15}$ $\frac{15}{10}$</td> <td>$\frac{160}{80}$ $\frac{80}{50}$</td> <td>$\frac{70}{60}$ $\frac{60}{50}$</td> <td>$\frac{200}{130}$ $\frac{130}{70}$</td> <td>$\frac{20}{20}$ $\frac{20}{20}$</td> </tr> <tr> <td>$\frac{35}{35}$ $\frac{35}{30}$</td> <td>$\frac{120}{90}$ $\frac{90}{75}$</td> <td>$\frac{140}{120}$ $\frac{120}{80}$</td> <td>$\frac{120}{90}$ $\frac{90}{45}$</td> <td>$\frac{50}{45}$ $\frac{45}{30}$</td> </tr> <tr> <td>$\frac{90}{50}$ $\frac{50}{30}$</td> <td>$\frac{120}{120}$ $\frac{120}{80}$</td> <td>$\frac{160}{120}$ $\frac{120}{70}$</td> <td>$\frac{100}{80}$ $\frac{80}{70}$</td> <td>$\frac{120}{70}$ $\frac{70}{30}$</td> </tr> <tr> <td>$\frac{15}{10}$ $\frac{10}{10}$</td> <td>$\frac{60}{50}$ $\frac{50}{30}$</td> <td>$\frac{100}{50}$ $\frac{50}{20}$</td> <td>$\frac{60}{55}$ $\frac{55}{50}$</td> <td>$\frac{30}{20}$ $\frac{20}{15}$</td> </tr> <tr> <td>$\frac{15}{10}$ $\frac{10}{10}$</td> <td>$\frac{15}{10}$ $\frac{10}{10}$</td> <td>$\frac{20}{10}$ $\frac{10}{10}$</td> <td>$\frac{15}{10}$ $\frac{10}{10}$</td> <td>$\frac{20}{12}$ $\frac{12}{10}$</td> </tr> <tr> <td>$\frac{15}{10}$ $\frac{10}{10}$</td> <td>$\frac{15}{15}$ $\frac{15}{10}$</td> <td>$\frac{20}{15}$ $\frac{15}{10}$</td> <td>$\frac{20}{20}$ $\frac{20}{15}$</td> <td>$\frac{15}{10}$ $\frac{10}{10}$</td> </tr> </table>					$\frac{30}{20}$ $\frac{20}{20}$	$\frac{90}{60}$ $\frac{60}{30}$	$\frac{10}{10}$ $\frac{10}{10}$	$\frac{160}{90}$ $\frac{90}{40}$	$\frac{30}{30}$ $\frac{30}{30}$	$\frac{20}{15}$ $\frac{15}{10}$	$\frac{160}{80}$ $\frac{80}{50}$	$\frac{70}{60}$ $\frac{60}{50}$	$\frac{200}{130}$ $\frac{130}{70}$	$\frac{20}{20}$ $\frac{20}{20}$	$\frac{35}{35}$ $\frac{35}{30}$	$\frac{120}{90}$ $\frac{90}{75}$	$\frac{140}{120}$ $\frac{120}{80}$	$\frac{120}{90}$ $\frac{90}{45}$	$\frac{50}{45}$ $\frac{45}{30}$	$\frac{90}{50}$ $\frac{50}{30}$	$\frac{120}{120}$ $\frac{120}{80}$	$\frac{160}{120}$ $\frac{120}{70}$	$\frac{100}{80}$ $\frac{80}{70}$	$\frac{120}{70}$ $\frac{70}{30}$	$\frac{15}{10}$ $\frac{10}{10}$	$\frac{60}{50}$ $\frac{50}{30}$	$\frac{100}{50}$ $\frac{50}{20}$	$\frac{60}{55}$ $\frac{55}{50}$	$\frac{30}{20}$ $\frac{20}{15}$	$\frac{15}{10}$ $\frac{10}{10}$	$\frac{15}{10}$ $\frac{10}{10}$	$\frac{20}{10}$ $\frac{10}{10}$	$\frac{15}{10}$ $\frac{10}{10}$	$\frac{20}{12}$ $\frac{12}{10}$	$\frac{15}{10}$ $\frac{10}{10}$	$\frac{15}{15}$ $\frac{15}{10}$	$\frac{20}{15}$ $\frac{15}{10}$	$\frac{20}{20}$ $\frac{20}{15}$	$\frac{15}{10}$ $\frac{10}{10}$												
$\frac{30}{20}$ $\frac{20}{20}$	$\frac{90}{60}$ $\frac{60}{30}$	$\frac{10}{10}$ $\frac{10}{10}$	$\frac{160}{90}$ $\frac{90}{40}$	$\frac{30}{30}$ $\frac{30}{30}$																																																	
$\frac{20}{15}$ $\frac{15}{10}$	$\frac{160}{80}$ $\frac{80}{50}$	$\frac{70}{60}$ $\frac{60}{50}$	$\frac{200}{130}$ $\frac{130}{70}$	$\frac{20}{20}$ $\frac{20}{20}$																																																	
$\frac{35}{35}$ $\frac{35}{30}$	$\frac{120}{90}$ $\frac{90}{75}$	$\frac{140}{120}$ $\frac{120}{80}$	$\frac{120}{90}$ $\frac{90}{45}$	$\frac{50}{45}$ $\frac{45}{30}$																																																	
$\frac{90}{50}$ $\frac{50}{30}$	$\frac{120}{120}$ $\frac{120}{80}$	$\frac{160}{120}$ $\frac{120}{70}$	$\frac{100}{80}$ $\frac{80}{70}$	$\frac{120}{70}$ $\frac{70}{30}$																																																	
$\frac{15}{10}$ $\frac{10}{10}$	$\frac{60}{50}$ $\frac{50}{30}$	$\frac{100}{50}$ $\frac{50}{20}$	$\frac{60}{55}$ $\frac{55}{50}$	$\frac{30}{20}$ $\frac{20}{15}$																																																	
$\frac{15}{10}$ $\frac{10}{10}$	$\frac{15}{10}$ $\frac{10}{10}$	$\frac{20}{10}$ $\frac{10}{10}$	$\frac{15}{10}$ $\frac{10}{10}$	$\frac{20}{12}$ $\frac{12}{10}$																																																	
$\frac{15}{10}$ $\frac{10}{10}$	$\frac{15}{15}$ $\frac{15}{10}$	$\frac{20}{15}$ $\frac{15}{10}$	$\frac{20}{20}$ $\frac{20}{15}$	$\frac{15}{10}$ $\frac{10}{10}$																																																	
LEGEND ○ - SMEAR SURVEY LOCATION △ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCATION XXX XXX = contact reading Y = radiation type ZZZ = reading @ 30cm AIRBORNE ACTIVITY SURVEY <table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="2">Field Analysis</th> <th rowspan="2">% DAC</th> </tr> <tr> <th>cpm</th> <th>µCi/cc</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> DOSE RATE (HIGHEST) microRem/Hr. <table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr> <td>CONTACT READING</td> <td>200</td> </tr> <tr> <td>GENERAL AREA (1 foot)</td> <td>130</td> </tr> </table> MASSLINN SURVEY RESULTS (in dpm) <table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr> <td>1. N/A</td> <td>5. N/A</td> </tr> <tr> <td>2.</td> <td>6.</td> </tr> <tr> <td>3.</td> <td>7.</td> </tr> <tr> <td>4.</td> <td>8.</td> </tr> </table> SMEAR SURVEY RESULTS (dpm/100cm²) (α, β-γ ³H) <table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr> <td>1. N/A</td> <td>8. N/A</td> <td>15. N/A</td> </tr> <tr> <td>2.</td> <td>9.</td> <td>16.</td> </tr> <tr> <td>3.</td> <td>10.</td> <td>17.</td> </tr> <tr> <td>4.</td> <td>11.</td> <td>18.</td> </tr> <tr> <td>5.</td> <td>12.</td> <td>19.</td> </tr> <tr> <td>6.</td> <td>13.</td> <td>20.</td> </tr> <tr> <td>7.</td> <td>14.</td> <td>21.</td> </tr> </table>							Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A						CONTACT READING	200	GENERAL AREA (1 foot)	130	1. N/A	5. N/A	2.	6.	3.	7.	4.	8.	1. N/A	8. N/A	15. N/A	2.	9.	16.	3.	10.	17.	4.	11.	18.	5.	12.	19.	6.	13.	20.	7.	14.	21.
Sample #	Duration	Flow Rate	Field Analysis		% DAC																																																
			cpm	µCi/cc																																																	
N/A																																																					
CONTACT READING	200																																																				
GENERAL AREA (1 foot)	130																																																				
1. N/A	5. N/A																																																				
2.	6.																																																				
3.	7.																																																				
4.	8.																																																				
1. N/A	8. N/A	15. N/A																																																			
2.	9.	16.																																																			
3.	10.	17.																																																			
4.	11.	18.																																																			
5.	12.	19.																																																			
6.	13.	20.																																																			
7.	14.	21.																																																			
Surveyed By  P. Sullivan FS-SOP-1000 Attachment 9.2 Date: 03-30-12 Reviewed By:  Date: 4/2/12 Page <u>1</u> of <u>1</u>																																																					

RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT		
LOCATION & EQUIPT. 701 high bay		☐ ROUTINE _____ ☐ SPECIAL _____		Model #	Serial #	
		☐ RWP # 2011-043 ☐ WP # _____				
Date 3/27/12		TIME: 17:00		S5-XLB	67705	
Pile top				Lud-3	92741	
				N/A		
				N/A		
A survey taken of the pile top prior to the final cap being poured is in the attached sheet. An las of the floor showed no hot particles.		LEGEND				
		☐ - SMEAR SURVEY LOCATION ☐ - AIR SAMPLE LOCATION				
		☐ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCA-				
		☐ - CONTAMINATION * CONTACT				
		XXXX XXX = contact reading Y = radiation type ZZZ = reading @ 30cm				
		ZZZ				
		AIRBORNE ACTIVITY SURVEY				
		Field Analysis				
		Sample #	Duration	Flow Rate	cpm	µCi/cc
		N/A				
		DOSE RATE (HIGHEST) mr/hr				
		CONTACT READING		N/A		
		GENERAL AREA READING		N/A		
		MASSLINN SURVEY RESULTS (in dpm)				
		1. N/A		5. N/A		
2.		6.				
3.		7.				
4.		8.				
SMEAR SURVEY RESULTS (dpm/100cm²) α β γ ³H						
1. NA		8. NA				
2.		15. 31452				
3.		16. N/A				
4.		17.				
5.		18.				
6.		19.				
7.		20.				
8.		21.				
9.		22.				
10.		23.				
11.		24.				
12.		25.				
13.		26.				
14.		27.				
15.		28.				
16.		29.				
17.		30.				
18.		31.				
19.		32.				
20.		33.				
21.		34.				
22.		35.				
23.		36.				
24.		37.				
25.		38.				
26.		39.				
27.		40.				
28.		41.				
29.		42.				
30.		43.				
31.		44.				
32.		45.				
33.		46.				
34.		47.				
35.		48.				
36.		49.				
37.		50.				
38.		51.				
39.		52.				
40.		53.				
41.		54.				
42.		55.				
43.		56.				
44.		57.				
45.		58.				
46.		59.				
47.		60.				
48.		61.				
49.		62.				
50.		63.				
51.		64.				
52.		65.				
53.		66.				
54.		67.				
55.		68.				
56.		69.				
57.		70.				
58.		71.				
59.		72.				
60.		73.				
61.		74.				
62.		75.				
63.		76.				
64.		77.				
65.		78.				
66.		79.				
67.		80.				
68.		81.				
69.		82.				
70.		83.				
71.		84.				
72.		85.				
73.		86.				
74.		87.				
75.		88.				
76.		89.				
77.		90.				
78.		91.				
79.		92.				
80.		93.				
81.		94.				
82.		95.				
83.		96.				
84.		97.				
85.		98.				
86.		99.				
87.		100.				
88.		101.				
89.		102.				
90.		103.				
91.		104.				
92.		105.				
93.		106.				
94.		107.				
95.		108.				
96.		109.				
97.		110.				
98.		111.				
99.		112.				
100.		113.				
101.		114.				
102.		115.				
103.		116.				
104.		117.				
105.		118.				
106.		119.				
107.		120.				
108.		121.				
109.		122.				
110.		123.				
111.		124.				
112.		125.				
113.		126.				
114.		127.				
115.		128.				
116.		129.				
117.		130.				
118.		131.				
119.		132.				
120.		133.				
121.		134.				
122.		135.				
123.		136.				
124.		137.				
125.		138.				
126.		139.				
127.		140.				
128.		141.				
129.		142.				
130.		143.				
131.		144.				
132.		145.				
133.		146.				
134.		147.				
135.		148.				
136.		149.				
137.		150.				
138.		151.				
139.		152.				
140.		153.				
141.		154.				
142.		155.				
143.		156.				
144.		157.				
145.		158.				
146.		159.				
147.		160.				
148.		161.				
149.		162.				
150.		163.				
151.		164.				
152.		165.				
153.		166.				
154.		167.				
155.		168.				
156.		169.				
157.		170.				
158.		171.				
159.		172.				
160.		173.				
161.		174.				
162.		175.				
163.		176.				
164.		177.				
165.		178.				
166.		179.				
167.		180.				
168.		181.				
169.		182.				
170.		183.				
171.		184.				
172.		185.				
173.		186.				
174.		187.				
175.		188.				
176.		189.				
177.		190.				
178.		191.				
179.		192.				
180.		193.				
181.		194.				
182.		195.				
183.		196.				
184.		197.				
185.		198.				
186.		199.				
187.		200.				
188.		201.				
189.		202.				
190.		203.				
191.		204.				
192.		205.				
193.		206.				
194.		207.				
195.		208.				
196.		209.				
197.		210.				
198.		211.				
199.		212.				
200.		213.				
201.		214.				
202.		215.				
203.		216.				
204.		217.				
205.		218.				
206.		219.				
207.		220.				
208.		221.				
209.		222.				
210.		223.				
211.		224.				
212.		225.				
213.		226.				
214.		227.				
215.		228.				
216.		229.				
217.		230.				
218.		231.				
219.		232.				
220.		233.				
221.		234.				
222.		235.				
223.		236.				
224.		237.				
225.		238.				
226.		239.				
227.		240.				
228.		241.				
229.		242.				
230.		243.				
231.		244.				
232.		245.				
233.		246.				
234.		247.				
235.		248.				
236.		249.				
237.		250.				
238.		251.				
239.		252.				
240.		253.				
241.		254.				
242.		255.				
243.		256.				
244.		257.				
245.		258.				
246.		259.				
247.		260.				
248.		261.				
249.		262.				
250.		263.				
251.		264.				
252.		265.				
253.		266.				
254.		267.				
255.		268.				
256.		269.				
257.		270.				
258.		271.				
259.		272.				
260.		273.				
261.		274.				
262.		275.				
263.		276.				
264.		277.				
265.		278.				
266.		279.				
267.		280.				
268.		281.				
269.		282.				
270.		283.				
271.		284.				
272.		285.				
273.		286.				
274.		287.				
275.		288.				
276.		289.				
277.		290.				
278.		291.				
279.		292.				
280.		293.				
281.		294.				
282.		295.				
283.		296.				
284.		297.				
285.		298.				
286.		299.				
287.		300.				
288.		301.				
289.		302.				
290.		303.				
291.		304.				
292.		305.				
293.		306.				
294.		307.				
295.		308.				
296.		309.				
297.		310.				
298.		311.				
299.		312.				
300.		313.				
301.		314.				
302.		315.				
303.		316.				
304.		317.				
305.		318.				
306.		319.				
307.		320.				
308.		321.				
309.		322.				
310.		323.				
311.		324.				
312.		325.				
313.		326.				
314.		327.				
315.		328.				
316.		329.				
317.		330.				
318.		331.				
319.		332.				
320.		333.				
321.		334.				
322.		335.				
323.		336.				
324.		337.				
325.		338.				
326.		339.				
327.		340.				
328.		341.				
329.		342.				
330.		343.				
331.		344.				
332.		345.				
333.		346.				
334.		347.				
335.		348.				
336.		349.				
337.		350.				
338.		351.				
339.		352.				
340.		353.				
341.		354.				
342.		355.				
343.		356.				
344.		357.				
345.		358.				
346.		359.				
347.		360.				
348.		361.				
349.		362.				
350.		363.				
351.		364.				
352.		365.				
353.		366.				
354.		367.				
355.		368.				
356.		369.				
357.		370.				
358.		371.				
359.		372.				
360.		373.				
361.		374.				
362.		375.				
363.		376.				
364.		377.				
365.		378.				
366.		379.				
367.		380.				
368.		381.				
369.		382.				
370.		383.				
371.		384.				
372.		385.				
373.		386.				
374.		387.				
375.		388.				
376.		389.				
377.		390.				
378.		391.				
379.		392.				
380.		393.				
381.		394.				
382.		395.				
383.		396.				
384.		397.				
385.		398.				
386.		399.				
387.		400.				
388.		401.				
389.		402.				
390.		403.				
391.		404.				
392.		405.				
393.		406.				
394.		407.				
395.		408.				
396.		409.				
397.		410.				
398.		411.				
399.		412.				
400.		413.				
401.		414.				
402.		415.				
403.		416.				
404.		417.				
405.		418.				
406.		419.				
407.		420.				
408.		421.				
409.		422.				
410.		423.				
411.		424.				
412.		425.				
413.		426.				
414.		427.				
415.		428.				
416.		429.				
417.		430.				
418.		431.				
419.		432.				
420.		433.				
421.		434.				
422.		435.				
423.		436.				
424.		437.				
425.		438.				
426.		439.				
427.		440.				
428.		441.				
429.		442.				
430.		443.				
431.		444.				
432.		445.				
433.		446.				
434.		447.				
435.		448.				
436.		449.				
437.		450.				
438.		451.				
439.		452.				
440.		453.				
441.		454.				
442.		455.				
443.		456.				
444.		457.				
445.		458.				
446.		459.				
447.		460.				
448.		461.				
449.		462.				
450.						

Activity Report

3/27/12
5:54:30PM

110 PILE FLOOR POST VAC

Batch Name:	31,452	Acquisition Date:	3/27/12
Batch ID:	1 Minute Smear Analysis - 201203271733	Acquisition Time:	1.0
Group:	E	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	

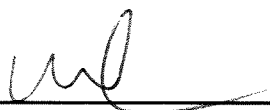
Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency: (%)	0.27	±	0.00	Beta Efficiency: (%)	0.19	±	0.00
-----------------------	------	---	------	----------------------	------	---	------

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
20120327173337-E1	0.00	-0.58	0.64	14.79	76.91	41.50	32.73
20120327173637-E2	0.00	3.10	7.40	14.79	92.30	45.22	32.73
20120327173757-E3	0.00	-0.58	0.64	14.79	87.26	44.01	32.73
20120327173917-E4	0.00	-0.59	0.64	14.79	118.33	50.81	32.73
20120327174027-E5	0.00	3.09	7.40	14.79	133.72	53.89	32.73
20120327174147-E6	0.00	3.12	7.40	14.79	45.70	32.84	32.73
20120327174308-E7	0.00	-0.58	0.64	14.79	71.73	40.19	32.73
20120327174418-E8	0.00	-0.61	0.64	14.79	185.63	63.07	32.73
20120327174538-E9	0.00	6.75	10.45	14.79	200.88	65.58	32.73
20120327174658-E10	0.00	3.08	7.40	14.79	159.60	58.66	32.73
20120327174808-E11	0.00	-0.58	0.64	14.79	87.26	44.01	32.73
20120327174928-E12	0.00	-0.57	0.64	14.79	61.37	37.42	32.73
20120327175038-E13	0.00	-0.57	0.64	14.79	40.66	31.17	32.73
20120327175158-E14	0.00	-0.56	0.64	14.79	30.31	27.51	32.73
20120327175318-E15	0.00	-0.58	0.64	14.79	87.26	44.01	32.73

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT																			
LOCATION & EQUIPT. Bldg 701 South Catwalk		☐ ROUTINE ☐ SPECIAL ☒ RWP # 2011-ERP-043 ☒ WP # 314-35		Model #	Serial #	CAL DUE																	
		DATE: 04/10/12 TIME: 0930		S5-XLB	67705	04-25-12																	
Final Status survey of conditions on the South Catwalk located above overhead Bldg. Crane.				Lud-3	74871	06-02-12																	
2 Fixed Contamination Areas on floor 200ccpm/probe 2000ccpm/probe Note: catwalk floor not surveyed for fixed contamination Dose rates are in microR/hr. Masslins 1-4 were taken on catwalk floor. Masslins 5-8 were taken on handrails and midrails. Batch 31530 smears 1-10 were taken on catwalk floor after masslin survey Smears 11-20 were taken on handrails and midrails.				Bicron	A885S	08-01-12																	
				N/A	N/A	N/A																	
				LEGEND ○ - SMEAR SURVEY LOCATION △ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOC.- C - CONTAMINATION * CONTACT XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ																			
				AIRBORNE ACTIVITY SURVEY <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="2">Field Analysis</th> <th rowspan="2">% DAC</th> </tr> <tr> <th>cpm</th> <th>µCi/cc</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A								
Sample #	Duration	Flow Rate	Field Analysis		% DAC																		
			cpm	µCi/cc																			
N/A																							
DOSE RATE (HIGHEST) <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>CONTACT READING</td> <td>N/A</td> </tr> <tr> <td>GENERAL AREA READING</td> <td>10</td> </tr> </table>			CONTACT READING	N/A	GENERAL AREA READING	10																	
CONTACT READING	N/A																						
GENERAL AREA READING	10																						
MASSLINN SURVEY RESULTS (in dpm) <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>1. 1k dpm/las</td> <td>5. <1k dpm/las</td> </tr> <tr> <td>2. ↓</td> <td>6. ↓</td> </tr> <tr> <td>3. ↓</td> <td>7. ↓</td> </tr> <tr> <td>4. ↓</td> <td>8. ↓</td> </tr> </table>			1. 1k dpm/las	5. <1k dpm/las	2. ↓	6. ↓	3. ↓	7. ↓	4. ↓	8. ↓													
1. 1k dpm/las	5. <1k dpm/las																						
2. ↓	6. ↓																						
3. ↓	7. ↓																						
4. ↓	8. ↓																						
SMEAR SURVEY RESULTS (dpm/100cm²) α, X β-γ ³H <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>1. See</td> <td>8. Attached</td> <td>15. Results</td> </tr> <tr> <td>2. Batch</td> <td>9. Number</td> <td>16. 31530</td> </tr> <tr> <td>3. ↓</td> <td>10. ↓</td> <td>17. ↓</td> </tr> <tr> <td>4. ↓</td> <td>11. ↓</td> <td>18. ↓</td> </tr> <tr> <td>5. ↓</td> <td>12. ↓</td> <td>19. ↓</td> </tr> <tr> <td>6. ↓</td> <td>13. ↓</td> <td>20. ↓</td> </tr> <tr> <td>7. ↓</td> <td>14. ↓</td> <td>21. ↓</td> </tr> </table>			1. See	8. Attached	15. Results	2. Batch	9. Number	16. 31530	3. ↓	10. ↓	17. ↓	4. ↓	11. ↓	18. ↓	5. ↓	12. ↓	19. ↓	6. ↓	13. ↓	20. ↓	7. ↓	14. ↓	21. ↓
1. See	8. Attached	15. Results																					
2. Batch	9. Number	16. 31530																					
3. ↓	10. ↓	17. ↓																					
4. ↓	11. ↓	18. ↓																					
5. ↓	12. ↓	19. ↓																					
6. ↓	13. ↓	20. ↓																					
7. ↓	14. ↓	21. ↓																					
Surveyed By Detterman		Date: 04/11/12		Reviewed By:		Date: 4/11/12																	
FS-SOP-1000 Attachment 9.2																							

Activity Report

4/10/12
11:09:45AM

SO CWALK ABV BLD CRANE

Batch Name:	31,530	Acquisition Date:	4/10/12
Batch ID:	1 Minute Smear Analysis - 201204101026	Acquisition Time:	1.0
Group:	F	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20120410102658-F1	0.00	-0.57	0.64	14.79	51.02	34.44	32.73
20120410102828-F2	0.00	-0.58	0.64	14.79	71.73	40.19	32.73
20120410102948-F3	0.00	3.11	7.40	14.79	76.76	41.51	32.73
20120410103108-F4	0.00	-0.57	0.64	14.79	45.84	32.84	32.73
20120410103218-F5	0.00	3.11	7.40	14.79	71.59	40.19	32.73
20120410103338-F6	0.00	3.11	7.40	14.79	61.23	37.43	32.73
20120410103458-F7	0.00	-0.57	0.64	14.79	45.84	32.84	32.73
20120410103608-F8	0.00	-0.58	0.64	14.79	92.44	45.22	32.73
20120410103728-F9	0.00	3.10	7.40	14.79	92.30	45.22	32.73
20120410103848-F10	0.00	-0.57	0.64	14.79	40.66	31.17	32.73
20120410103959-F11	0.00	3.08	7.40	14.79	169.96	60.46	32.73
20120410104119-F12	0.00	-0.61	0.64	14.79	170.10	60.46	32.73
20120410104229-F13	0.00	10.45	12.79	14.79	159.32	58.66	32.73
20120410104349-F14	0.00	10.41	12.79	14.79	273.22	76.20	32.73
20120410104509-F15	0.00	-0.62	0.64	14.79	211.52	67.20	32.73
20120410104619-F16	0.00	-0.60	0.64	14.79	139.04	54.87	32.73
20120410104739-F17	0.00	-0.59	0.64	14.79	97.62	46.39	32.73
20120410104859-F18	0.00	-0.64	0.64	14.79	258.12	74.05	32.73
20120410105009-F19	0.00	-0.60	0.64	14.79	149.39	56.80	32.73
20120410105129-F20	0.00	-0.63	0.64	14.79	242.59	71.84	32.73

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT															
		☐ ROUTINE _____ ☐ SPECIAL _____		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Model #</td> <td style="width:33%;">Serial #</td> <td style="width:33%;">CAL DUE</td> </tr> <tr> <td>S5-XLB</td> <td>67705</td> <td>04-25-12</td> </tr> <tr> <td>Bicron</td> <td>A885S</td> <td>08-01-12</td> </tr> <tr> <td>Lud-3</td> <td>74871</td> <td>06-01-12</td> </tr> <tr> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> </table>			Model #	Serial #	CAL DUE	S5-XLB	67705	04-25-12	Bicron	A885S	08-01-12	Lud-3	74871	06-01-12	N/A
Model #	Serial #	CAL DUE																	
S5-XLB	67705	04-25-12																	
Bicron	A885S	08-01-12																	
Lud-3	74871	06-01-12																	
N/A	N/A	N/A																	
LOCATION & EQUIPT. Bldg. 701 North Catwalk		DATE: 04/11/12		TIME: 1600															

N ↑

Access to North Catwalk via
Bldg crane posted
RBA, controlled area, RWP

Ladder to the Roof

Dose rates are in microR/hr.

Masslins 1-4 were taken on catwalk floor.
Masslins 5-8 were taken on handrails and midrails.

Batch 31530 smears 1-10 were taken on catwalk floor after masslin survey
Smears 11-20 were taken on handrails and midrails.

LEGEND

○ - SMEAR SURVEY LOCATION △ - AIR SAMPLE LOCATION

□ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCA-

⊖ - CONTAMINATION * CONTACT

XXX XXX = contact reading Y = radiation type ZZZ = reading @ 30cm

ZZZ

AIRBORNE ACTIVITY SURVEY

Sample #	Duration	Flow Rate	Field Analysis		% DAC
			cpm	μCi/cc	
N/A					

DOSE RATE (HIGHEST)

CONTACT READING	N/A
GENERAL AREA READING	6-8 microR/hr

MASSLINN SURVEY RESULTS (in dpm)

1. 1K dpm/las	5. NA
2.	6.
3.	7.
4.	8.

SMEAR SURVEY RESULTS (dpm/100cm²) α, β-γ, ³H

1. See	8. Attached	15. Results
2. Batch	9. Number	16. 31547
3.	10.	17.
4.	11.	18.
5.	12.	19.
6.	13.	20.
7.	14.	21.

Surveyed By Detterman	Date: 04/11/12	Reviewed By: <i>[Signature]</i>
FS-SOP-1000 Attachment 9.2		
Page <u>1</u> of <u>2</u>		

Activity Report

4/11/12
5:06:25PM

NORTH CATWALK ABOVE CRANE

Batch Name:	31,547	Acquisition Date:	4/11/12
Batch ID:	1 Minute Smear Analysis - 201204111638	Acquisition Time:	1.0
Group:	E	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20120411163901-E1	0.00	-0.58	0.64	14.79	76.91	41.50	32.73
20120411164201-E2	0.00	-0.58	0.64	14.79	66.55	38.83	32.73
20120411164322-E3	0.00	3.12	7.40	14.79	50.88	34.44	32.73
20120411164442-E4	0.00	3.11	7.40	14.79	61.23	37.43	32.73
20120411164552-E5	0.00	-0.59	0.64	14.79	118.33	50.81	32.73
20120411164712-E6	0.00	-0.59	0.64	14.79	113.15	49.74	32.73
20120411164832-E7	0.00	-0.58	0.64	14.79	82.08	42.78	32.73
20120411164942-E8	0.00	-0.59	0.64	14.79	107.97	48.65	32.73
20120411165102-E9	0.00	-0.59	0.64	14.79	107.97	48.65	32.73
20120411165222-E10	0.00	-0.59	0.64	14.79	97.62	46.39	32.73
20120411165332-E11	0.00	-0.60	0.64	14.79	133.86	53.89	32.73
20120411165452-E12	0.00	3.07	7.40	14.79	180.31	62.22	32.73
20120411165602-E13	0.00	-0.60	0.64	14.79	149.39	56.80	32.73
20120411165722-E14	0.00	14.14	14.76	14.79	164.35	59.57	32.73
20120411165842-E15	0.00	-0.59	0.64	14.79	113.15	49.74	32.73
20120411165952-E16	0.00	3.07	7.40	14.79	180.31	62.22	32.73
20120411170112-E17	0.00	14.13	14.76	14.79	190.24	63.92	32.73
20120411170233-E18	0.00	-0.60	0.64	14.79	149.39	56.80	32.73
20120411170343-E19	0.00	3.08	7.40	14.79	169.96	60.46	32.73
20120411170503-E20	0.00	-0.62	0.64	14.79	211.52	67.20	32.73

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT																	
		☐ ROUTINE ☐ SPECIAL		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width: 33%;">Model #</th> <th style="width: 33%;">Serial #</th> <th style="width: 33%;">CAL DUE</th> </tr> <tr> <td>S5-xlb</td> <td>67705</td> <td>04-25-2012</td> </tr> <tr> <td>Lud-3</td> <td>74871</td> <td>06-01-2012</td> </tr> <tr> <td>Bicron</td> <td>A885S</td> <td>8-01-12</td> </tr> <tr> <td>N/a</td> <td></td> <td></td> </tr> </table>			Model #	Serial #	CAL DUE	S5-xlb	67705	04-25-2012	Lud-3	74871	06-01-2012	Bicron	A885S	8-01-12	N/a		
		Model #	Serial #				CAL DUE														
S5-xlb	67705	04-25-2012																			
Lud-3	74871	06-01-2012																			
Bicron	A885S	8-01-12																			
N/a																					
LOCATION & EQUIPT. Bldg. 701 BLDG crane		RWP # 2011-ERP-030 ☒ WP # 314-35																			
		DATE: 04-19-12 TIME 0900																			
Building Crane catwalk and ceiling support structures																					
Performed final status survey of BLDG 701 overhead crane catwalk and ceiling support structures. Access to overhead catwalks posted "RBA, Controlled Area, RWP required for entry" just inside the top access door of west stairwell. General area dose rates are 6-8 microR/hr. Peformed LAS survey of catwalk/handrails and top of trolley covers. Batch # 31586 smears 1-10 taken on catwalk floor. Batch # 31586 smears 11-20 taken on handrails, covers and crane beams.																					
LEGEND ○ - SMEAR SURVEY LOCATION △ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCATION XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ																					
AIRBORNE ACTIVITY SURVEY																					
				Field Analysis																	
Sample #	Duration	Flow Rate	cpm	µCi/cc	% DAC																
N/A																					
DOSE RATE (HIGHEST)																					
CONTACT READING				N/A																	
GENERAL AREA READING				6-8 microR/hr																	
MASSLINN SURVEY RESULTS (in dpm)																					
1. <1-K dpm/las		5. <1-K dpm/las																			
2.		6.																			
3.		7.																			
4.		8.																			
SMEAR SURVEY RESULTS (dpm/100cm²) α, ~~β~~ -γ ³ H																					
1. See		8. Attached		15. Results																	
2. Batch		9. Number		16. 31586																	
3.		10.		17.																	
4.		11.		18.																	
5.		12.		19.																	
6.		13.		20.																	
7.		14.		21.																	
<table border="0" style="width:100%;"> <tr> <td style="width: 33%;"> Surveyed By Detterman </td> <td style="width: 33%;"> Date: 04-19-12 </td> <td style="width: 33%;"> Reviewed By: </td> </tr> <tr> <td colspan="3"> Date: 4-19-12 </td> </tr> </table>							Surveyed By Detterman	Date: 04-19-12	Reviewed By:	Date: 4-19-12											
Surveyed By Detterman	Date: 04-19-12	Reviewed By:																			
Date: 4-19-12																					
FS-SOP-1000 Attachment 9.2																					
Page <u> 1 </u> of <u> 2 </u>																					

Activity Report

4/19/12
9:29:08AM

701 BLDG OVHD CRANE

Batch Name:	31,586	Acquisition Date:	4/19/12
Batch ID:	1 Minute Smear Analysis - 201204190901	Acquisition Time:	1.0
Group:	E	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20120419090143-E1	0.00	10.46	12.79	14.79	138.61	54.88	32.73
20120419090443-E2	0.00	-0.67	0.65	14.79	361.67	87.39	32.73
20120419090603-E3	0.00	-0.62	0.64	14.79	211.52	67.20	32.73
20120419090723-E4	0.00	-0.61	0.64	14.79	175.28	61.35	32.73
20120419090833-E5	0.00	-0.60	0.64	14.79	154.57	57.74	32.73
20120419090953-E6	0.00	10.43	12.79	14.79	226.63	69.56	32.73
20120419091113-E7	0.00	-0.64	0.64	14.79	263.30	74.78	32.73
20120419091223-E8	0.00	2.96	7.40	14.79	522.03	104.79	32.73
20120419091343-E9	0.00	-0.60	0.64	14.79	144.21	55.84	32.73
20120419091503-E10	0.00	-0.58	0.64	14.79	76.91	41.50	32.73
20120419091614-E11	0.00	-0.62	0.64	14.79	190.81	63.92	32.73
20120419091734-E12	0.00	6.80	10.45	14.79	71.44	40.19	32.73
20120419091844-E13	0.00	-0.58	0.64	14.79	76.91	41.50	32.73
20120419092004-E14	0.00	-0.66	0.65	14.79	335.78	84.26	32.73
20120419092124-E15	0.00	-0.61	0.64	14.79	159.75	58.66	32.73
20120419092234-E16	0.00	3.03	7.40	14.79	299.40	79.66	32.73
20120419092354-E17	0.00	-0.63	0.64	14.79	216.70	68.00	32.73
20120419092514-E18	0.00	3.08	7.40	14.79	164.78	59.57	32.73
20120419092624-E19	0.00	3.08	7.40	14.79	164.78	59.57	32.73
20120419092744-E20	0.00	-0.70	0.65	14.79	449.68	97.32	32.73

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT															
LOCATION & EQUIPT. 701 Building		☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # 2012-030 ☐ WP # _____		Model #	Serial #														
		Date 4/26/12 TIME: 11:00		LB-5100	32487														
High Bay				Bicron	A885S														
				N/A	8/11/12														
				N/A															
A smear survey of the Fan room was done all results are on the attached sheet. Gen- eral area dose rates are 3-8 micro R/HR.		LEGEND ○ - SMEAR SURVEY LOCATION ▲ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCA- C - CONTAMINATION * CONTACT XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ																	
		AIRBORNE ACTIVITY SURVEY																	
		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="2">Field Analysis</th> <th rowspan="2">% DAC</th> </tr> <tr> <th>cpm</th> <th>µCi/cc</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A					
		Sample #	Duration	Flow Rate	Field Analysis				% DAC										
					cpm	µCi/cc													
		N/A																	
		DOSE RATE (HIGHEST) Micro R/hr																	
		CONTACT READING		N/A															
		GENERAL AREA READING		3-8															
		MASSLINN SURVEY RESULTS (in dpm)																	
1. N/A		5. N/A																	
2.		6.																	
3.		7.																	
4.		8.																	
SMEAR SURVEY RESULTS (dpm/100cm²) α β γ ³H																			
1. SEE		8. Attachment																	
2.		15. 4346																	
3.		16.																	
4.		17.																	
5.		18.																	
6.		19.																	
7.		20.																	
8.		21.																	
Surveyed By WilliamCalash		Date: 4/26/12		Reviewed By:															
FS-SOP-1000 Attachment 9.2				Date: 4/26/12															
				Page <u>1</u> of <u>2</u>															



Sample Report

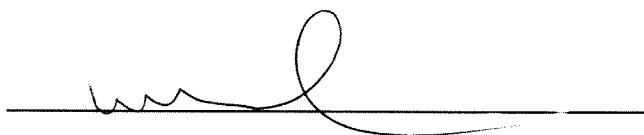
Batch ID: 1min. Smear - 201204260933
Group: H
Device: HFBR
Batch Key: 4,346
Selected Geometry: 1/8" Stainless Steel

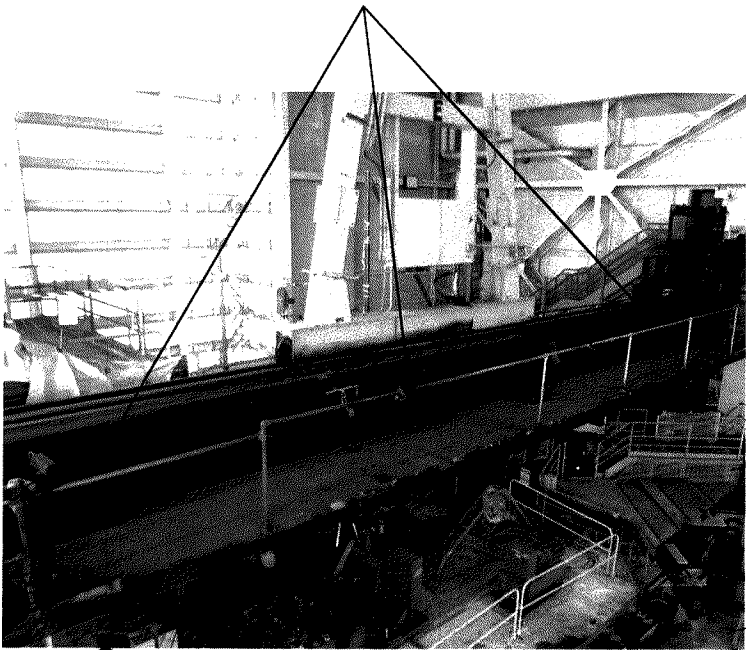
Count Date: 4/26/2012
Count Minutes: 1.0
Count Mode: Simultaneous
Operating Volts: 1350

Efficiency (%)				Spillover (%)			
Alpha:	27.51	±	0.10	Alpha to Beta:	5.94	±	0.00
Beta:	19.49	±	0.10	Beta to Alpha:	0.08	±	0.00

<u>Sample ID</u>	<u>Sample Type</u>	<u>Alpha</u> <u>(dpm)</u>	<u>Unc</u>	<u>Alpha MDA</u> <u>(dpm)</u>	<u>Beta</u> <u>(dpm)</u>	<u>Unc</u>	<u>Beta MDA</u> <u>(dpm)</u>	<u>(dpm)</u>
20120426094813-H2	Unknown	-0.01	0.01	9.84	26.17	12.60	30.17	
20120426094923-H3	Unknown	-0.03	0.01	9.84	51.83	17.05	30.17	
20120426095043-H4	Unknown	3.62	3.64	9.84	31.00	13.61	30.17	
20120426095153-H5	Unknown	-0.01	0.01	9.84	15.91	10.30	30.17	
20120426095313-H6	Unknown	-0.01	0.01	9.84	15.40	8.89	13.89	
20120426095423-H7	Unknown	-0.03	0.01	9.84	61.58	17.78	13.89	
20120426095543-H8	Unknown	-0.01	0.01	9.84	15.40	8.89	13.89	
20120426095653-H9	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120426095813-H10	Unknown	-0.02	0.01	9.84	30.79	12.57	13.89	
20120426095933-H11	Unknown	-0.02	0.01	9.84	30.79	12.57	13.89	
20120426100043-H12	Unknown	-0.03	0.01	9.84	46.19	15.40	13.89	
20120426100203-H13	Unknown	-0.01	0.01	9.84	25.66	11.48	13.89	
20120426100313-H14	Unknown	-0.01	0.00	9.84	10.26	7.26	13.89	
20120426100433-H15	Unknown	-0.03	0.01	9.84	46.19	15.40	13.89	
20120426100543-H16	Unknown	-0.03	0.01	9.84	51.32	16.23	13.89	
20120426100703-H17	Unknown	-0.03	0.01	9.84	56.45	17.02	13.89	
20120426100823-H18	Unknown	-0.02	0.01	9.84	30.79	12.57	13.89	
20120426100933-H19	Unknown	3.59	3.64	9.84	76.67	19.88	13.89	
20120426101053-H20	Unknown	-0.03	0.01	9.84	56.45	17.02	13.89	
20120426093323-H1		-0.03	0.01	9.84	56.96	17.80	30.17	

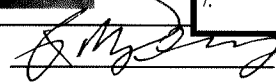
Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT		CAL DUE															
LOCATION & EQUIPT. 701 high bay		☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # 2011-043 ☐ WP # _____		Model #		Serial #															
		Date 04/10/12 TIME: 09:30		S5-XLB		67705															
East catwalk				BICRON		A885S															
				N/A																	
				N/A																	
A survey was done on the east catwalk inside the 701 high bay. The smears were taken on all accessible areas. The smears were taken from the south to north. General area dose rates are 10-20 Micro R/HR. 				LEGEND ○ - SMEAR SURVEY LOCATION ▲ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOC- C - CONTAMINATION * CONTACT XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ																	
				AIRBORNE ACTIVITY SURVEY																	
				<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="2">Field Analysis</th> <th rowspan="2">% DAC</th> </tr> <tr> <th>cpm</th> <th>µCi/cc</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A					
				Sample #	Duration	Flow Rate	Field Analysis				% DAC										
							cpm	µCi/cc													
N/A																					
DOSE RATE (HIGHEST) microR/hr																					
CONTACT READING		N/A																			
GENERAL AREA READING		10-20																			
MASSLINN SURVEY RESULTS (in dpm)																					
1. N/A		5. N/A																			
2.		6.																			
3.		7.																			
4.		8.																			
SMEAR SURVEY RESULTS (dpm/100cm²) α β γ ³H																					
1. NA		8. NA		15. 31537																	
2.		9.		16.																	
3.		10.		17.																	
4.		11.		18.																	
5.		12.		19.																	
6.		13.		20.																	
7.		14.		21.																	

Surveyed By **WilliamCalash**

Date: **04/10 /2012**

Reviewed By: 

Date: **4/10/12**

Activity Report

4/11/12
9:57:50AM

EAST CATWALK

Batch Name:	31,537	Acquisition Date:	4/11/12
Batch ID:	1 Minute Smear Analysis - 201204110926	Acquisition Time:	1.0
Group:	F	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

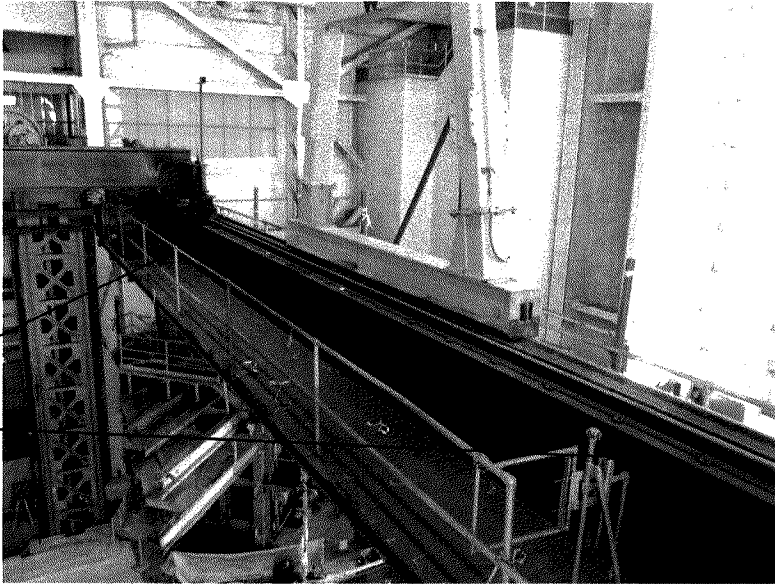
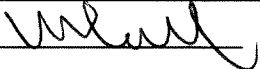
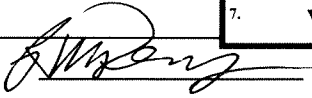
Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20120411092654-F1	0.00	-0.63	0.64	14.79	237.41	71.09	32.73
20120411092824-F2	0.00	-0.77	0.67	14.79	661.96	117.90	32.73
20120411092944-F3	0.00	2.94	7.40	14.79	568.62	109.34	32.73
20120411093104-F4	0.00	2.94	7.40	14.79	578.98	110.32	32.73
20120411093214-F5	0.00	6.26	10.46	14.79	1,080.01	188.34	32.73
20120411093335-F6	0.00	2.77	7.41	14.79	1,006.37	150.99	32.73
20120411093455-F7	0.00	-0.75	0.66	14.79	589.48	111.29	32.73
20120411093605-F8	0.00	24.57	19.53	14.79	2,045.93	236.43	32.73
20120411093725-F9	0.00	3.01	7.40	14.79	361.53	87.39	32.73
20120411093845-F10	0.00	16.72	16.53	14.79	3,462.26	271.21	32.73
20120411093955-F11	0.00	-0.65	0.65	14.79	299.54	79.66	32.73
20120411094115-F12	0.00	-0.67	0.65	14.79	340.96	84.89	32.73
20120411094225-F13	0.00	-0.64	0.64	14.79	268.47	75.49	32.73
20120411094345-F14	0.00	-0.70	0.65	14.79	444.51	96.76	32.73
20120411094505-F15	0.00	24.94	21.17	14.79	11,909.12	518.55	32.73
20120411094615-F16	0.00	-0.63	0.64	14.79	232.23	70.33	32.73
20120411094735-F17	0.00	6.17	10.46	14.79	1,935.33	201.86	32.73
20120411094855-F18	0.00	6.74	10.45	14.79	242.30	71.84	32.73
20120411095005-F19	0.00	2.62	7.41	14.79	1,552.34	180.62	32.73
20120411095125-F20	0.00	14.06	16.85	14.79	11,456.27	506.04	32.73
20120411095246-F21	0.00	-0.80	0.68	14.79	744.80	125.03	32.73
20120411095356-F22	0.00	-0.82	0.68	14.79	791.40	128.87	32.73
20120411095516-F23	0.00	10.15	12.79	14.79	1,055.02	148.81	32.73
20120411095636-F24	0.00	6.68	10.45	14.79	418.34	93.93	32.73

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT																						
LOCATION & EQUIPT. 701 high bay		☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # 2011-043 ☐ WP # _____		Model #	Serial #																					
		Date 04/10/12 TIME: 09:30		S5-XLB	67705																					
West Catwalk 701High Bay				BICRON	A885S																					
A survey was done on the west catwalk inside the 701 high bay. The smears were taken on all accessible areas. The smears were taken from the south to north. General area dose rates are 10-20 Micro R/HR 				04/25/12																						
				08/11/12																						
		N/A																								
		N/A																								
		LEGEND ○ - SMEAR SURVEY LOCATION ▲ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOC- C - CONTAMINATION * CONTACT XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ																								
		AIRBORNE ACTIVITY SURVEY <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="2">Field Analysis</th> <th rowspan="2">% DAC</th> </tr> <tr> <th>cpm</th> <th>µCi/cc</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A												
Sample #	Duration	Flow Rate	Field Analysis		% DAC																					
			cpm	µCi/cc																						
N/A																										
		DOSE RATE (HIGHEST) mr/hr <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>CONTACT READING</td> <td>N/A</td> </tr> <tr> <td>GENERAL AREA READING</td> <td>N/A</td> </tr> </table>				CONTACT READING	N/A	GENERAL AREA READING	N/A																	
CONTACT READING	N/A																									
GENERAL AREA READING	N/A																									
		MASSLINN SURVEY RESULTS (in dpm) <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>1. N/A</td> <td>5. N/A</td> </tr> <tr> <td>2.</td> <td>6.</td> </tr> <tr> <td>3.</td> <td>7.</td> </tr> <tr> <td>4.</td> <td>8.</td> </tr> </table>				1. N/A	5. N/A	2.	6.	3.	7.	4.	8.													
1. N/A	5. N/A																									
2.	6.																									
3.	7.																									
4.	8.																									
		SMEAR SURVEY RESULTS (dpm/100cm²) α β γ ³H <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>1. NA</td> <td>8. NA</td> <td>15. 31538</td> </tr> <tr> <td>2.</td> <td>9.</td> <td>16.</td> </tr> <tr> <td>3.</td> <td>10.</td> <td></td> </tr> <tr> <td>4.</td> <td>11.</td> <td>18.</td> </tr> <tr> <td></td> <td>12.</td> <td>19.</td> </tr> <tr> <td>6.</td> <td>13.</td> <td>20.</td> </tr> <tr> <td>7.</td> <td>14.</td> <td>21.</td> </tr> </table>				1. NA	8. NA	15. 31538	2.	9.	16.	3.	10.		4.	11.	18.		12.	19.	6.	13.	20.	7.	14.	21.
1. NA	8. NA	15. 31538																								
2.	9.	16.																								
3.	10.																									
4.	11.	18.																								
	12.	19.																								
6.	13.	20.																								
7.	14.	21.																								
Surveyed By WilliamCalash  Date: 04/10/2012		Reviewed By:  Date: 4/11/12																								
FS-SOP-1000 Attachment 9.2		Page <u>1</u> of <u>2</u>																								

Activity Report

4/11/12
10:29:52AM

WEST CATWALK

Batch Name:	31,538	Acquisition Date:	4/11/12
Batch ID:	1 Minute Smear Analysis - 201204110933	Acquisition Time:	1.0
Group:	G	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

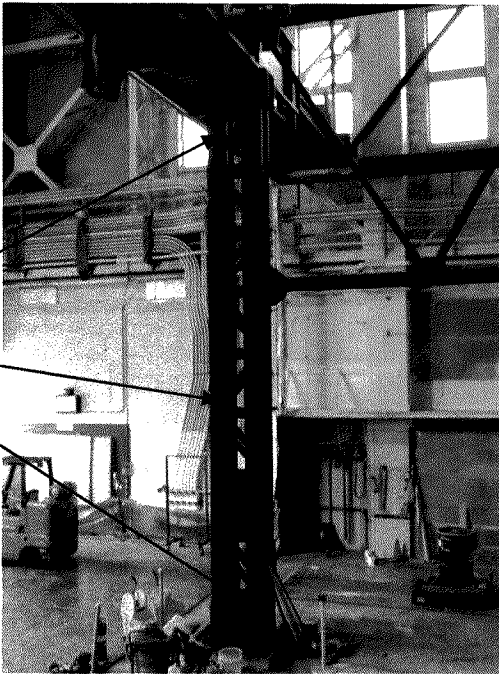
Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20120411093305-G25	0.00	-0.68	0.65	14.79	366.84	88.01	32.73
20120411095907-G26	0.00	3.07	7.40	14.79	190.67	63.92	32.73
20120411100027-G27	0.00	10.22	12.79	14.79	863.46	134.63	32.73
20120411100137-G28	0.00	3.00	7.40	14.79	397.77	91.61	32.73
20120411100257-G29	0.00	-0.68	0.65	14.79	387.55	90.42	32.73
20120411100417-G30	0.00	-0.68	0.65	14.79	366.84	88.01	32.73
20120411100527-G31	0.00	6.74	10.45	14.79	237.12	71.09	32.73
20120411100647-G32	0.00	2.99	7.40	14.79	418.48	93.93	32.73
20120411100807-G33	0.00	-0.57	0.64	14.79	51.02	34.44	32.73
20120411100918-G34	0.00	-0.62	0.64	14.79	206.34	66.40	32.73
20120411101038-G35	0.00	3.01	7.40	14.79	361.53	87.39	32.73
20120411101148-G36	0.00	3.01	7.40	14.79	366.70	88.01	32.73
20120411101308-G37	0.00	3.06	7.40	14.79	206.20	66.40	32.73
20120411101428-G38	0.00	2.84	7.40	14.79	868.92	135.04	32.73
20120411101538-G39	0.00	14.08	14.76	14.79	324.86	82.97	32.73
20120411101658-G40	0.00	2.98	7.40	14.79	470.25	99.51	32.73
20120411101818-G41	0.00	-0.61	0.64	14.79	185.63	63.07	32.73
20120411101928-G42	0.00	-0.62	0.64	14.79	211.52	67.20	32.73
20120411102048-G43	0.00	-0.65	0.64	14.79	284.01	77.60	32.73
20120411102208-G44	0.00	3.05	7.40	14.79	237.27	71.09	32.73
20120411102318-G45	0.00	10.36	12.79	14.79	438.90	96.20	32.73
20120411102438-G46	0.00	6.73	10.45	14.79	263.01	74.78	32.73
20120411102558-G47	0.00	3.07	7.40	14.79	190.67	63.92	32.73
20120411102708-G48	0.00	17.54	16.50	14.79	1023.67	146.61	32.73
20120411102829-G49	0.00	6.64	10.45	14.79	532.24	105.82	32.73

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY ☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # <u>2011-043</u> ☐ WP # _____		INSTRUMENT <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Model #</td> <td style="width:33%;">Serial #</td> <td style="width:33%;">CAL DUE</td> </tr> <tr> <td>S5-XLB</td> <td>67705</td> <td>04/25/12</td> </tr> <tr> <td>BICRON</td> <td>A885S</td> <td>08/11/12</td> </tr> <tr> <td>N/A</td> <td></td> <td>→</td> </tr> <tr> <td>N/A</td> <td></td> <td>→</td> </tr> </table>		Model #	Serial #	CAL DUE	S5-XLB	67705	04/25/12	BICRON	A885S	08/11/12	N/A		→	N/A		→																																													
Model #	Serial #	CAL DUE																																																															
S5-XLB	67705	04/25/12																																																															
BICRON	A885S	08/11/12																																																															
N/A		→																																																															
N/A		→																																																															
LOCATION & EQUIPT. 701 high bay		Date 04/10/12		TIME: 09:30																																																													
A survey was done on the North West column inside the 701 high bay. The smears were taken on all accessible areas. The smears were taken from the top to bottom. General area dose rates are 10-20 Micro R/HR. 																																																																	
LEGEND ○ - SMEAR SURVEY LOCATION ▲ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOC- C - CONTAMINATION * CONTACT XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="6">AIRBORNE ACTIVITY SURVEY</th> </tr> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="2">Field Analysis</th> <th rowspan="2">% DAC</th> </tr> <tr> <th>cpm</th> <th>µCi/cc</th> </tr> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td>→</td> </tr> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">DOSE RATE (HIGHEST) MicroR/hr</th> </tr> <tr> <td>CONTACT READING</td> <td>N/A</td> </tr> <tr> <td>GENERAL AREA READING</td> <td>10-20</td> </tr> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">MASSLINN SURVEY RESULTS (in dpm)</th> </tr> <tr> <td>1. N/A</td> <td>5. N/A</td> </tr> <tr> <td>2.</td> <td>6.</td> </tr> <tr> <td>3.</td> <td>7.</td> </tr> <tr> <td>4.</td> <td>8.</td> </tr> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="3">SMEAR SURVEY RESULTS (dpm/100cm² α β γ ³H)</th> </tr> <tr> <td>1. NA</td> <td>8. NA</td> <td>15. 31541</td> </tr> <tr> <td>2.</td> <td>9.</td> <td>16.</td> </tr> <tr> <td>3.</td> <td>10.</td> <td></td> </tr> <tr> <td>4.</td> <td>11.</td> <td>18.</td> </tr> <tr> <td></td> <td>12.</td> <td>19.</td> </tr> <tr> <td>6.</td> <td>13.</td> <td>20.</td> </tr> <tr> <td>7.</td> <td>14.</td> <td>21.</td> </tr> </table>						AIRBORNE ACTIVITY SURVEY						Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A					→	DOSE RATE (HIGHEST) MicroR/hr		CONTACT READING	N/A	GENERAL AREA READING	10-20	MASSLINN SURVEY RESULTS (in dpm)		1. N/A	5. N/A	2.	6.	3.	7.	4.	8.	SMEAR SURVEY RESULTS (dpm/100cm ² α β γ ³ H)			1. NA	8. NA	15. 31541	2.	9.	16.	3.	10.		4.	11.	18.		12.	19.	6.	13.	20.	7.	14.	21.
AIRBORNE ACTIVITY SURVEY																																																																	
Sample #	Duration	Flow Rate	Field Analysis		% DAC																																																												
			cpm	µCi/cc																																																													
N/A					→																																																												
DOSE RATE (HIGHEST) MicroR/hr																																																																	
CONTACT READING	N/A																																																																
GENERAL AREA READING	10-20																																																																
MASSLINN SURVEY RESULTS (in dpm)																																																																	
1. N/A	5. N/A																																																																
2.	6.																																																																
3.	7.																																																																
4.	8.																																																																
SMEAR SURVEY RESULTS (dpm/100cm ² α β γ ³ H)																																																																	
1. NA	8. NA	15. 31541																																																															
2.	9.	16.																																																															
3.	10.																																																																
4.	11.	18.																																																															
	12.	19.																																																															
6.	13.	20.																																																															
7.	14.	21.																																																															
Surveyed By <u>WilliamCalash</u> <i>WCalash</i>		Date: <u>04/10/2012</u>		Reviewed By: <i>[Signature]</i> Date: <u>4/10/12</u>																																																													
FS-SOP-1000 Attachment 9.2																																																																	
Page <u>1</u> of <u>2</u>																																																																	

Activity Report

4/11/12
11:40:02AM

NORTH/WEST BEAM

Batch Name:	31,541	Acquisition Date:	4/11/12
Batch ID:	1 Minute Smear Analysis - 201204111014	Acquisition Time:	1.0
Group:	J	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

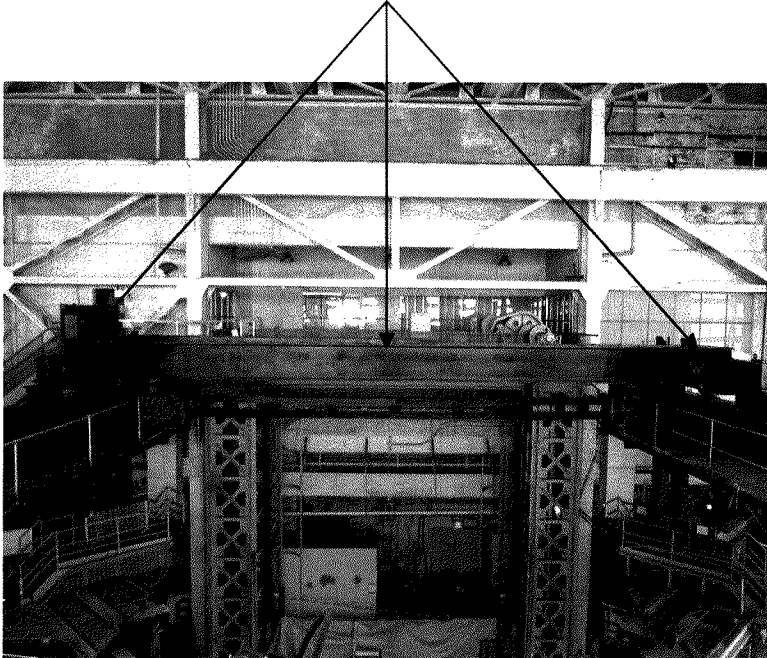
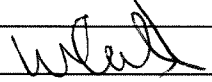
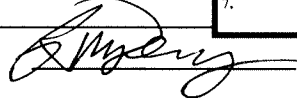
Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20120411101416-J16	0.00	3.10	7.40	14.79	92.30	45.22	32.73
20120411112209-J17	0.00	-0.59	0.64	14.79	118.33	50.81	32.73
20120411112330-J18	0.00	-0.57	0.64	14.79	61.37	37.42	32.73
20120411112440-J19	0.00	-0.58	0.64	14.79	76.91	41.50	32.73
20120411112600-J20	0.00	6.77	10.45	14.79	149.11	56.80	32.73
20120411112720-J21	0.00	-0.57	0.64	14.79	51.02	34.44	32.73
20120411112830-J22	0.00	3.02	7.40	14.79	330.46	83.61	32.73
20120411112950-J23	0.00	-0.58	0.64	14.79	71.73	40.19	32.73
20120411113110-J24	0.00	-0.55	0.64	14.79	4.42	14.85	32.73
20120411113220-J25	0.00	-0.56	0.64	14.79	14.78	20.86	32.73
20120411113340-J26	0.00	-0.56	0.64	14.79	19.95	23.29	32.73
20120411113450-J27	0.00	-0.61	0.64	14.79	175.28	61.35	32.73
20120411113610-J28	0.00	-0.57	0.64	14.79	56.20	35.96	32.73
20120411113730-J29	0.00	6.47	10.45	14.79	147.35	147.35	32.73
20120411113840-J30	0.00	-0.62	0.64	14.79	201.17	65.58	32.73

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT	
LOCATION & EQUIPT. 701 high bay		☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # 2011-043 ☐ WP # _____		Model #	Serial #
		Date 04/10/12 TIME: 09:30		S5-XLB	67705
Gradall Bridge				Bicron	A885S
A survey was done on the Gradall bridge inside the 701 high bay. The smears were taken on all accessible areas. The smears were taken from the east to west. General area dose rates are 10-20 Micro R/HR. 				N/A	
				N/A	
LEGEND ○ - SMEAR SURVEY LOCATION □ - MASSLINN SURVEY LOCATION ⊖ - CONTAMINATION XXX - contact reading YYY - radiation type ZZZ = reading @ 30cm ▲ - AIR SAMPLE LOCATION # - DIRECT FRISK LOC * CONTACT					
AIRBORNE ACTIVITY SURVEY					
Sample #	Duration	Flow Rate	Field Analysis		% DAC
N/A			cpm	µCi/cc	
DOSE RATE (HIGHEST) Micro R/hr					
CONTACT READING			N/A		
GENERAL AREA READING			10-20		
MASSLINN SURVEY RESULTS (in dpm)					
1. N/A			5. N/A		
2.			6.		
3.			7.		
4.			8.		
SMEAR SURVEY RESULTS (dpm/100cm ²) α β γ ³ H					
1. NA	8. NA	15. 31541			
2.	9.	16.			
3.	10.	17.			
4.	11.	18.			
	12.	19.			
6.	13.	20.			
7.	14.	21.			
Surveyed By <u>WilliamCalash</u>  Date: <u>04/10 /2012</u> Reviewed By:  Date: <u>4/11/12</u>					
FS-SOP-1000 Attachment 9.2					
Page <u>1</u> of <u>2</u>					

Activity Report

4/11/12
11:01:38AM

GRADALL

Batch Name:	31,539	Acquisition Date:	4/11/12
Batch ID:	1 Minute Smear Analysis - 201204110941	Acquisition Time:	1.0
Group:	H	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	
Selected Geometry: 1/8" Stainless Steel			

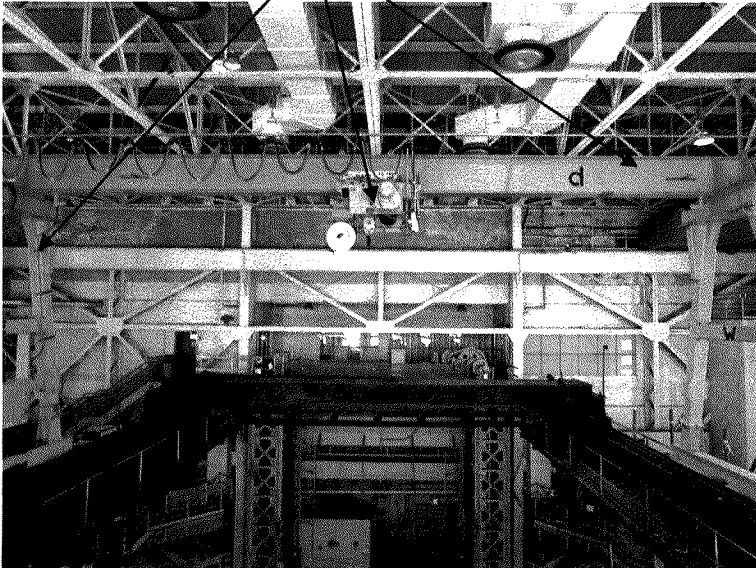
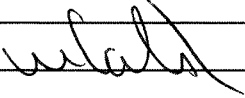
Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20120411094141-H50	0.00	-0.59	0.64	14.79	123.50	51.86	32.73
20120411103104-H51	0.00	3.12	7.40	14.79	50.88	34.44	32.73
20120411103224-H52	0.00	-0.59	0.64	14.79	107.97	48.65	32.73
20120411103334-H53	0.00	-0.66	0.65	14.79	309.89	81.00	32.73
20120411103454-H54	0.00	-0.57	0.64	14.79	45.84	32.84	32.73
20120411103614-H55	0.00	-0.61	0.64	14.79	170.10	60.46	32.73
20120411103724-H56	0.00	-0.58	0.64	14.79	92.44	45.22	32.73
20120411103844-H57	0.00	-0.78	0.67	14.79	672.32	118.81	32.73
20120411103954-H58	0.00	3.10	7.40	14.79	87.12	44.02	32.73
20120411104114-H59	0.00	-0.58	0.64	14.79	66.55	38.83	32.73
20120411104234-H60	0.00	3.03	7.40	14.79	314.93	81.66	32.73
20120411104344-H61	0.00	-0.58	0.64	14.79	71.73	40.19	32.73
20120411104505-H62	0.00	-0.63	0.64	14.79	232.23	70.33	32.73
20120411104625-H63	0.00	-0.58	0.64	14.79	66.55	38.83	32.73
20120411104735-H64	0.00	-0.59	0.64	14.79	118.33	50.81	32.73
20120411104855-H65	0.00	-0.66	0.65	14.79	325.43	82.97	32.73
20120411105015-H66	0.00	-0.59	0.64	14.79	113.15	49.74	32.73
20120411105125-H67	0.00	2.97	7.40	14.79	485.78	101.12	32.73
20120411105245-H68	0.00	-0.62	0.64	14.79	201.17	65.58	32.73
20120411105405-H69	0.00	-0.60	0.64	14.79	133.86	53.89	32.73
20120411105515-H70	0.00	-0.63	0.64	14.79	242.59	71.84	32.73
20120411105635-H71	0.00	-0.57	0.64	14.79	56.20	35.96	32.73
20120411105755-H72	0.00	6.75	10.45	14.79	206.06	66.40	32.73
20120411105905-H73	0.00	10.36	12.79	14.79	449.26	97.32	32.73
20120411110025-H74	0.00	-0.59	0.64	14.79	107.97	48.65	32.73

Reviewed by:

UC

RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY ☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # <u>2011-043</u> ☐ WP # _____		INSTRUMENT <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width: 30%;">Model #</th> <th style="width: 30%;">Serial #</th> <th style="width: 40%;">CAL DUE</th> </tr> <tr> <td>S5-XLB</td> <td>67705</td> <td>04/25/12</td> </tr> <tr> <td>BICRON</td> <td>A885S</td> <td></td> </tr> <tr> <td>N/A</td> <td></td> <td></td> </tr> <tr> <td>N/A</td> <td></td> <td></td> </tr> </table>		Model #	Serial #	CAL DUE	S5-XLB	67705	04/25/12	BICRON	A885S		N/A			N/A																																															
Model #	Serial #	CAL DUE																																																															
S5-XLB	67705	04/25/12																																																															
BICRON	A885S																																																																
N/A																																																																	
N/A																																																																	
LOCATION & EQUIPT. <u>701 high bay</u> Gantry Crane		Date <u>04/11/12</u> TIME: <u>09:00</u>		LEGEND ☐ - SMEAR SURVEY LOCATION ☐ - MASSLINN SURVEY LOCATION ☐ - CONTAMINATION <u>XXX</u> <u>ZZZ</u> <input type="triangle-up"/> - AIR SAMPLE LOCATION # - DIRECT FRISK LOCA- * CONTACT XXX = contact reading Y = radiation type ZZZ = reading @ 30cm																																																													
A survey was done on the Gantry crane inside the 701 high bay. The smears were taken on all accessible areas. Smears 31-42 were taken on the A-frames. Smears 43-54 were taken on the cable, festoon and trolley. smears 55-61 were taken on the crane body.																																																																	
																																																																	
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="6" style="text-align: center;">AIRBORNE ACTIVITY SURVEY</th> </tr> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="2">Field Analysis</th> <th rowspan="2">% DAC</th> </tr> <tr> <th>cpm</th> <th>µCi/cc</th> </tr> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2" style="text-align: center;">DOSE RATE (HIGHEST) micro R/hr</th> </tr> <tr> <td style="width: 50%;">CONTACT READING</td> <td style="text-align: center;">N/A</td> </tr> <tr> <td>GENERAL AREA READING</td> <td style="text-align: center;">10-20</td> </tr> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2" style="text-align: center;">MASSLINN SURVEY RESULTS (in dpm)</th> </tr> <tr> <td style="width: 50%;">1. N/A</td> <td style="width: 50%;">5. N/A</td> </tr> <tr> <td>2.</td> <td>6.</td> </tr> <tr> <td>3.</td> <td>7.</td> </tr> <tr> <td>4.</td> <td>8.</td> </tr> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="3" style="text-align: center;">SMEAR SURVEY RESULTS (dpm/100cm²) α β γ ³H</th> </tr> <tr> <td style="width: 33%;">1. NA</td> <td style="width: 33%;">8. NA</td> <td style="width: 33%;">15. 31542</td> </tr> <tr> <td>2.</td> <td>9.</td> <td>16.</td> </tr> <tr> <td>3.</td> <td>10.</td> <td></td> </tr> <tr> <td>4.</td> <td>11.</td> <td>18.</td> </tr> <tr> <td></td> <td>12.</td> <td>19.</td> </tr> <tr> <td>6.</td> <td>13.</td> <td>20.</td> </tr> <tr> <td>7.</td> <td>14.</td> <td>21.</td> </tr> </table>						AIRBORNE ACTIVITY SURVEY						Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A						DOSE RATE (HIGHEST) micro R/hr		CONTACT READING	N/A	GENERAL AREA READING	10-20	MASSLINN SURVEY RESULTS (in dpm)		1. N/A	5. N/A	2.	6.	3.	7.	4.	8.	SMEAR SURVEY RESULTS (dpm/100cm²) α β γ ³H			1. NA	8. NA	15. 31542	2.	9.	16.	3.	10.		4.	11.	18.		12.	19.	6.	13.	20.	7.	14.	21.
AIRBORNE ACTIVITY SURVEY																																																																	
Sample #	Duration	Flow Rate	Field Analysis		% DAC																																																												
			cpm	µCi/cc																																																													
N/A																																																																	
DOSE RATE (HIGHEST) micro R/hr																																																																	
CONTACT READING	N/A																																																																
GENERAL AREA READING	10-20																																																																
MASSLINN SURVEY RESULTS (in dpm)																																																																	
1. N/A	5. N/A																																																																
2.	6.																																																																
3.	7.																																																																
4.	8.																																																																
SMEAR SURVEY RESULTS (dpm/100cm²) α β γ ³H																																																																	
1. NA	8. NA	15. 31542																																																															
2.	9.	16.																																																															
3.	10.																																																																
4.	11.	18.																																																															
	12.	19.																																																															
6.	13.	20.																																																															
7.	14.	21.																																																															
Surveyed By <u>William Calash</u>  FS-SOP-1000 Attachment 9.2		Date: <u>04/11 /2012</u> Reviewed By:  Date: <u>4/11/12</u> Page <u>1</u> of <u>2</u>																																																															

Activity Report

4/11/12
12:19:38PM

GANTRY

Batch Name:	31,542	Acquisition Date:	4/11/12
Batch ID:	1 Minute Smear Analysis - 201204111056	Acquisition Time:	1.0
Group:	E	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	

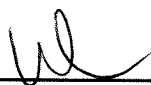
Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

<u>Sample ID</u>	<u>Quantity</u>	<u>Alpha</u> <u>(DPM)</u>	<u>2σ</u>	<u>Alpha MDA</u> <u>(DPM)</u>	<u>Beta Activity</u> <u>(DPM)</u>	<u>2σ</u>	<u>Beta MDA</u> <u>(DPM)</u>
20120411105629-E31	0.00	2.98	7.40	14.79	449.54	97.32	32.73
20120411114122-E32	0.00	5.73	10.49	14.79	3,281.47	263.87	32.73
20120411114232-E33	0.00	-0.72	0.66	14.79	501.46	102.71	32.73
20120411114352-E34	0.00	2.93	7.40	14.79	604.87	112.74	32.73
20120411114512-E35	0.00	6.62	10.45	14.79	609.90	113.22	32.73
20120411114622-E36	0.00	13.38	14.78	14.79	2,447.62	227.34	32.73
20120411114742-E37	0.00	-0.77	0.67	14.79	656.78	117.44	32.73
20120411114902-E38	0.00	-0.61	0.64	14.79	164.92	59.57	32.73
20120411115013-E39	0.00	3.07	7.40	14.79	201.02	65.58	32.73
20120411115133-E40	0.00	3.08	7.40	14.79	164.78	59.57	32.73
20120411115253-E41	0.00	3.10	7.40	14.79	92.30	45.22	32.73
20120411115403-E42	0.00	-0.62	0.64	14.79	206.34	66.40	32.73
20120411115523-E43	0.00	33.72	23.44	14.79	7,764.02	411.74	32.73
20120411115643-E44	0.00	2.78	7.41	14.79	1,060.48	149.18	32.73
20120411115753-E45	0.00	6.55	10.45	14.79	822.18	131.37	32.73
20120411115913-E46	0.00	-0.61	0.64	14.79	180.46	62.22	32.73
20120411120023-E47	0.00	-0.56	0.64	14.79	9.60	18.11	32.73
20120411120143-E48	0.00	5.73	10.49	14.79	3,260.76	263.02	32.73
20120411120303-E49	0.00	27.29	20.91	14.79	4,932.23	325.21	32.73
20120411120413-E50	0.00	2.98	7.40	14.79	449.54	97.32	32.73
20120411120533-E51	0.00	-0.68	0.65	14.79	377.20	89.22	32.73
20120411120653-E52	0.00	6.29	10.46	14.79	1,578.09	182.13	32.73
20120411120803-E53	0.00	9.51	12.82	14.79	2,975.86	251.05	32.73
20120411120924-E54	0.00	16.92	16.52	14.79	2,861.67	246.12	32.73
20120411121044-E55	0.00	3.01	7.40	14.79	361.53	87.39	32.73
20120411121154-E56	0.00	-0.63	0.64	14.79	232.23	70.33	32.73
20120411121314-E57	0.00	3.07	7.40	14.79	190.67	63.92	32.73
20120411121434-E58	0.00	-0.63	0.64	14.79	216.70	68.00	32.73
20120411121544-E59	0.00	-0.61	0.64	14.79	159.75	58.66	32.73
20120411121704-E60	0.00	20.88	18.08	14.79	2,043.49	207.51	32.73
20120411121824-E61	0.00	-0.65	0.64	14.79	278.83	76.91	32.73

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY ☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # <u>2011-043</u> ☐ WP # _____		INSTRUMENT <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Model #</td> <td style="width:33%;">Serial #</td> <td style="width:33%;">CAL DUE</td> </tr> <tr> <td>S5-XLB</td> <td>67705</td> <td>04/25/12</td> </tr> <tr> <td>BICRON</td> <td>A885S</td> <td>08/11/12</td> </tr> <tr> <td>N/A</td> <td></td> <td></td> </tr> <tr> <td>N/A</td> <td></td> <td></td> </tr> </table>		Model #	Serial #	CAL DUE	S5-XLB	67705	04/25/12	BICRON	A885S	08/11/12	N/A			N/A		
Model #	Serial #	CAL DUE																		
S5-XLB	67705	04/25/12																		
BICRON	A885S	08/11/12																		
N/A																				
N/A																				
LOCATION & EQUIPT. <u>701 high bay</u>		Date <u>04/10/12</u>		TIME: <u>09:30</u>																

A survey was done on the #2 trust inside the 701 high bay. The smears were taken on all accessible areas. The smears were taken from the west to east. General area dose rates are 10-20 Micro R/HR.



LEGEND

○ - SMEAR SURVEY LOCATION ▲ - AIR SAMPLE LOCATION
□ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOC-
C - CONTAMINATION * CONTACT
XXX XXX = contact reading Y = radiation type ZZZ = reading @ 30cm
ZZZ

AIRBORNE ACTIVITY SURVEY					
Sample #	Duration	Flow Rate	Field Analysis		% DAC
			cpm	µCi/cc	
N/A					

DOSE RATE (HIGHEST) microR/hr	
CONTACT READING	N/A
GENERAL AREA READING	10-20

MASSLINN SURVEY RESULTS (in dpm)	
1. N/A	5. N/A
2.	6.
3.	7.
4.	8.

SMEAR SURVEY RESULTS (dpm/100cm²) α β-γ ³H		
1. NA	8. NA	15. 31540
2.	9.	16.
3.	10.	17.
4.	11.	18.
5.	12.	19.
6.	13.	20.
7.	14.	21.

Surveyed By <u>WilliamCalash</u> <i>WCalash</i>	Date: <u>04/10/2012</u>	Reviewed By: <i>[Signature]</i>	Date: <u>4/11/12</u>
---	-------------------------	---------------------------------	----------------------

FS-SOP-1000
 Attachment 9.2

Page 1 of 2

Activity Report

4/11/12
11:20:51AM

#2 TRUSS

Batch Name:	31,540	Acquisition Date:	4/11/12
Batch ID:	1 Minute Smear Analysis - 201204111007	Acquisition Time:	1.0
Group:	I	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20120411100735-I1	0.00	-1.53	1.09	14.79	2,934.87	249.27	32.73
20120411110258-I2	0.00	-0.70	0.65	14.79	439.33	96.20	32.73
20120411110418-I3	0.00	33.43	23.47	14.79	8,633.84	435.39	32.73
20120411110528-I4	0.00	3.01	7.40	14.79	371.88	88.62	32.73
20120411110648-I5	0.00	3.02	7.40	14.79	330.46	83.61	32.73
20120411110808-I6	0.00	13.75	14.76	14.79	1,324.11	166.77	32.73
20120411110918-I7	0.00	6.67	10.45	14.79	439.05	96.20	32.73
20120411111038-I8	0.00	-0.62	0.64	14.79	201.17	65.58	32.73
20120411111158-I9	0.00	-0.61	0.64	14.79	185.63	63.07	32.73
20120411111308-I10	0.00	-0.61	0.64	14.79	170.10	60.46	32.73
20120411111428-I11	0.00	3.08	7.40	14.79	149.25	56.80	32.73
20120411111548-I12	0.00	-0.57	0.64	14.79	51.02	34.44	32.73
20120411111658-I13	0.00	3.01	7.40	14.79	356.35	86.78	32.73
20120411111819-I14	0.00	-0.70	0.65	14.79	449.68	97.32	32.73
20120411111939-I15	0.00	-0.65	0.64	14.79	278.83	76.91	32.73

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT																																																																														
LOCATION & EQUIPT. Bldg 701 123' Balcony		☐ ROUTINE _____ ☐ RWP # _____		☐ SPECIAL _____ ☐ WP # 314-35																																																																														
		DATE: 04-24-2012		TIME: 0930																																																																														
Survey includes 114' east window well																																																																																		
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3" style="text-align: center;">LEGEND</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">○</td> <td>- SMEAR SURVEY LOCATION</td> <td style="text-align: center;">△</td> <td>- AIR SAMPLE LOCATION</td> </tr> <tr> <td style="text-align: center;">□</td> <td>- MASSLINN SURVEY LOCATION</td> <td style="text-align: center;">#</td> <td>- DIRECT FRISK LOCATION</td> </tr> <tr> <td colspan="4"> XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ </td> </tr> </tbody> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="6" style="text-align: center;">AIRBORNE ACTIVITY SURVEY</th> </tr> </thead> <tbody> <tr> <th rowspan="2" style="text-align: center;">Sample #</th> <th rowspan="2" style="text-align: center;">Duration</th> <th rowspan="2" style="text-align: center;">Flow Rate</th> <th colspan="3" style="text-align: center;">Field Analysis</th> </tr> <tr> <th style="text-align: center;">cpm</th> <th style="text-align: center;">µCi/cc</th> <th style="text-align: center;">% DAC</th> </tr> <tr> <td style="text-align: center;">←</td> <td></td> <td style="text-align: center;">NA</td> <td></td> <td></td> <td style="text-align: center;">→</td> </tr> </tbody> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">DOSE RATE (HIGHEST)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">CONTACT READING</td> <td style="text-align: center;">NA</td> </tr> <tr> <td style="text-align: center;">GENERAL AREA READING</td> <td style="text-align: center;">12 microR/hr</td> </tr> </tbody> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">MASSLINN SURVEY RESULTS (in dpm)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1. N/A</td> <td style="text-align: center;">5. N/A</td> </tr> <tr> <td style="text-align: center;">2.</td> <td style="text-align: center;">6.</td> </tr> <tr> <td style="text-align: center;">3.</td> <td style="text-align: center;">7.</td> </tr> <tr> <td style="text-align: center;">4.</td> <td style="text-align: center;">8.</td> </tr> </tbody> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3" style="text-align: center;">SMEAR SURVEY RESULTS (dpm/100cm²) α, β-γ, ³H</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1. See</td> <td style="text-align: center;">8. Attached</td> <td style="text-align: center;">15. Results</td> </tr> <tr> <td style="text-align: center;">2. Batch</td> <td style="text-align: center;">9. Number</td> <td style="text-align: center;">16. 31611/31614</td> </tr> <tr> <td style="text-align: center;">3.</td> <td style="text-align: center;">10.</td> <td style="text-align: center;">17. 31619</td> </tr> <tr> <td style="text-align: center;">4.</td> <td style="text-align: center;">11.</td> <td style="text-align: center;">18.</td> </tr> <tr> <td style="text-align: center;">5.</td> <td style="text-align: center;">12.</td> <td style="text-align: center;">19.</td> </tr> <tr> <td style="text-align: center;">6.</td> <td style="text-align: center;">13.</td> <td style="text-align: center;">20.</td> </tr> <tr> <td style="text-align: center;">7.</td> <td style="text-align: center;">14.</td> <td style="text-align: center;">21.</td> </tr> </tbody> </table>							LEGEND			○	- SMEAR SURVEY LOCATION	△	- AIR SAMPLE LOCATION	□	- MASSLINN SURVEY LOCATION	#	- DIRECT FRISK LOCATION	XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ				AIRBORNE ACTIVITY SURVEY						Sample #	Duration	Flow Rate	Field Analysis			cpm	µCi/cc	% DAC	←		NA			→	DOSE RATE (HIGHEST)		CONTACT READING	NA	GENERAL AREA READING	12 microR/hr	MASSLINN SURVEY RESULTS (in dpm)		1. N/A	5. N/A	2.	6.	3.	7.	4.	8.	SMEAR SURVEY RESULTS (dpm/100cm ²) α, β-γ, ³ H			1. See	8. Attached	15. Results	2. Batch	9. Number	16. 31611/31614	3.	10.	17. 31619	4.	11.	18.	5.	12.	19.	6.	13.	20.	7.	14.	21.
LEGEND																																																																																		
○	- SMEAR SURVEY LOCATION	△	- AIR SAMPLE LOCATION																																																																															
□	- MASSLINN SURVEY LOCATION	#	- DIRECT FRISK LOCATION																																																																															
XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ																																																																																		
AIRBORNE ACTIVITY SURVEY																																																																																		
Sample #	Duration	Flow Rate	Field Analysis																																																																															
			cpm	µCi/cc	% DAC																																																																													
←		NA			→																																																																													
DOSE RATE (HIGHEST)																																																																																		
CONTACT READING	NA																																																																																	
GENERAL AREA READING	12 microR/hr																																																																																	
MASSLINN SURVEY RESULTS (in dpm)																																																																																		
1. N/A	5. N/A																																																																																	
2.	6.																																																																																	
3.	7.																																																																																	
4.	8.																																																																																	
SMEAR SURVEY RESULTS (dpm/100cm ²) α, β-γ, ³ H																																																																																		
1. See	8. Attached	15. Results																																																																																
2. Batch	9. Number	16. 31611/31614																																																																																
3.	10.	17. 31619																																																																																
4.	11.	18.																																																																																
5.	12.	19.																																																																																
6.	13.	20.																																																																																
7.	14.	21.																																																																																
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Surveyed By <u>Detterman</u></td> <td style="width: 33%;">Date: 04-24-12</td> <td style="width: 33%;">Reviewed By: <u>EMC</u></td> </tr> <tr> <td colspan="3">Date: 4/25/12</td> </tr> </table>							Surveyed By <u>Detterman</u>	Date: 04-24-12	Reviewed By: <u>EMC</u>	Date: 4/25/12																																																																								
Surveyed By <u>Detterman</u>	Date: 04-24-12	Reviewed By: <u>EMC</u>																																																																																
Date: 4/25/12																																																																																		

FS-SOP-1000
Attachment 9.2

Page 1 of 4

Activity Report

4/24/12
10:01:25AM

123 FINAL STATUS

Batch Name:	31,611	Acquisition Date:	4/24/12
Batch ID:	1 Minute Smear Analysis - 201204240921	Acquisition Time:	1.0
Group:	E	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,350.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

<u>Sample ID</u>	<u>Quantity</u>	<u>Alpha</u> <u>(DPM)</u>	<u>2σ</u>	<u>Alpha MDA</u> <u>(DPM)</u>	<u>Beta Activity</u> <u>(DPM)</u>	<u>2σ</u>	<u>Beta MDA</u> <u>(DPM)</u>
20120424092120-E1	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120424092420-E2	0.00	-0.21	0.37	12.78	57.90	37.76	38.35
20120424092541-E3	0.00	-0.19	0.37	12.78	21.39	25.76	38.35
20120424092701-E4	0.00	-0.20	0.37	12.78	42.26	33.15	38.35
20120424092811-E5	0.00	-0.20	0.37	12.78	42.26	33.15	38.35
20120424092931-E6	0.00	-0.21	0.37	12.78	57.90	37.76	38.35
20120424093051-E7	0.00	3.50	7.40	12.78	31.68	29.68	38.35
20120424093201-E8	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120424093321-E9	0.00	-0.21	0.37	12.78	57.90	37.76	38.35
20120424093431-E10	0.00	-0.20	0.37	12.78	37.04	31.46	38.35
20120424093551-E11	0.00	-0.21	0.37	12.78	63.12	39.17	38.35
20120424093711-E12	0.00	-0.19	0.37	12.78	26.61	27.79	38.35
20120424093821-E13	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120424093941-E14	0.00	-0.20	0.37	12.78	37.04	31.46	38.35
20120424094101-E15	0.00	-0.19	0.37	12.78	21.39	25.76	38.35
20120424094211-E16	0.00	7.19	10.46	12.78	52.40	36.29	38.35
20120424094331-E17	0.00	-0.19	0.37	12.78	26.61	27.79	38.35
20120424094452-E18	0.00	-0.19	0.37	12.78	21.39	25.76	38.35
20120424094602-E19	0.00	-0.21	0.37	12.78	57.90	37.76	38.35
20120424094722-E20	0.00	-0.25	0.37	12.78	167.44	60.95	38.35
20120424094842-E21	0.00	* 21.98	18.11	12.78	4.89	18.37	38.35
20120424094952-E22	0.00	-0.20	0.37	12.78	31.82	29.68	38.35
20120424095112-E23	0.00	* 29.37	20.91	12.78	9.82	21.13	38.35
20120424095232-E24	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120424095342-E25	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120424095502-E26	0.00	-0.21	0.37	12.78	57.90	37.76	38.35
20120424095622-E27	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120424095732-E28	0.00	3.51	7.40	12.78	10.82	21.11	38.35
20120424095852-E29	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120424100002-E30	0.00	10.90	12.81	12.78	5.32	18.36	38.35

* See Batch* 31619 smears 1-10 for follow up survey

Reviewed by:



Activity Report

4/24/12
1:28:33PM

123 TRAILER

Batch Name:	31,619	Acquisition Date:	4/24/12
Batch ID:	1 Minute Smear Analysis - 201204241313	Acquisition Time:	1.0
Group:	E	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,350.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20120424131400-E1	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120424131701-E2	0.00	-0.20	0.37	12.78	37.04	31.46	38.35
20120424131821-E3	0.00	3.50	7.40	12.78	26.47	27.79	38.35
20120424131941-E4	0.00	-0.20	0.37	12.78	31.82	29.68	38.35
20120424132051-E5	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120424132211-E6	0.00	3.50	7.40	12.78	26.47	27.79	38.35
20120424132331-E7	0.00	-0.22	0.37	12.78	83.98	44.39	38.35
20120424132441-E8	0.00	-0.20	0.37	12.78	37.04	31.46	38.35
20120424132601-E9	0.00	-0.19	0.37	12.78	21.39	25.76	38.35
20120424132721-E10	0.00	-0.20	0.37	12.78	52.69	36.29	38.35

Reviewed by:



Activity Report

4/24/12
10:39:44AM

EAST WINDOW WELL

Batch Name:	31,614	Acquisition Date:	4/24/12
Batch ID:	1 Minute Smear Analysis - 201204240928	Acquisition Time:	1.0
Group:	H	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,350.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency: (%)	0.27	±	0.00	Beta Efficiency: (%)	0.19	±	0.00
-----------------------	------	---	------	----------------------	------	---	------

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
20120424092818-H51	1	0.00	0.37	12.78	73.55	41.86	38.35
20120424102822-H52	2	0.00	0.37	12.78	21.39	25.76	38.35
20120424102932-H53	3	0.00	0.37	12.78	57.90	37.76	38.35
20120424103052-H54	4	0.00	0.37	12.78	68.34	40.54	38.35
20120424103212-H55	5	0.00	0.37	12.78	52.69	36.29	38.35
20120424103322-H56	6	0.00	0.37	12.78	78.77	43.14	38.35
20120424103442-H57	7	0.00	0.37	12.78	94.42	46.78	38.35
20120424103602-H58	8	0.00	0.37	12.78	42.26	33.15	38.35
20120424103712-H59	9	0.00	0.37	12.78	42.26	33.15	38.35
20120424103832-H60	10	0.00	7.40	12.78	42.11	33.15	38.35

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT																		
LOCATION & EQUIPT. Bldg 701 Sample Room		☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # _____ ☐ WP # 314-35		Model #	Serial #	CAL DUE																
		DATE: 04-27-12 TIME: 0715		S5-XLB	67705	04-20-13																
BGRR - 110' Sample room and mezzanine area final status survey				BICRON	A885S	08-01-12																
				LUD-3	44141	02-10-13																
				N/A	N/A	N/A																
				LEGEND																		
				○ - SMEAR SURVEY LOCATION △ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCATION XXXY / ZZZ XXX = contact reading Y = radiation type ZZZ = reading @ 30cm																		
All dose rates taken at waist level and shown in micro-rem/hr. Performed survey of floor with lud-12 floorwalker of accessible surfaces on 110' elev., background 800-1200cpm with no indication of counts above background. See attached sheet for smear results page 2 of 2.				AIRBORNE ACTIVITY SURVEY																		
				<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="2">Field Analysis</th> <th rowspan="2">% DAC</th> </tr> <tr> <th>cpm</th> <th>uCi/cc</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	uCi/cc	N/A								
Sample #	Duration	Flow Rate	Field Analysis		% DAC																	
			cpm	uCi/cc																		
N/A																						
Masslins and smears 11-30 taken in sample room on floor, walls (below 6') and horizontal surfaces.				DOSE RATE (HIGHEST)																		
				<table border="1" style="width:100%; border-collapse: collapse;"> <tbody> <tr> <td>CONTACT READING</td> <td>100 microR/hr</td> </tr> <tr> <td>GENERAL AREA READING</td> <td>40 microR/hr</td> </tr> </tbody> </table>		CONTACT READING	100 microR/hr	GENERAL AREA READING	40 microR/hr													
CONTACT READING	100 microR/hr																					
GENERAL AREA READING	40 microR/hr																					
Masslins and smears 11-30 taken in sample room on floor, walls (below 6') and horizontal surfaces.				MASSLINN SURVEY RESULTS (in dpm)																		
				<table border="1" style="width:100%; border-collapse: collapse;"> <tbody> <tr> <td>1. <1k dpm/las</td> <td>5. <1k dpm/las</td> </tr> <tr> <td>2. ↓</td> <td>6. ↓</td> </tr> <tr> <td>3. ↓</td> <td>7. ↓</td> </tr> <tr> <td>4. ↓</td> <td>8. ↓</td> </tr> </tbody> </table>		1. <1k dpm/las	5. <1k dpm/las	2. ↓	6. ↓	3. ↓	7. ↓	4. ↓	8. ↓									
1. <1k dpm/las	5. <1k dpm/las																					
2. ↓	6. ↓																					
3. ↓	7. ↓																					
4. ↓	8. ↓																					
Masslins and smears 11-30 taken in sample room on floor, walls (below 6') and horizontal surfaces.				SMEAR SURVEY RESULTS (dpm/100cm ²) α β-γ ³ H																		
				<table border="1" style="width:100%; border-collapse: collapse;"> <tbody> <tr> <td>1. See</td> <td>8. Attached</td> <td>15. Results</td> </tr> <tr> <td>2. Batch</td> <td>9. Number</td> <td>16. 31641</td> </tr> <tr> <td>3. ↓</td> <td>10. ↓</td> <td>17. ↓</td> </tr> <tr> <td>4. ↓</td> <td>11. ↓</td> <td>18. ↓</td> </tr> <tr> <td>5. ↓</td> <td>12. ↓</td> <td>19. ↓</td> </tr> <tr> <td>6. ↓</td> <td>13. ↓</td> <td>20. ↓</td> </tr> <tr> <td>7. ↓</td> <td>14. ↓</td> <td>21. ↓</td> </tr> </tbody> </table>		1. See	8. Attached	15. Results	2. Batch	9. Number	16. 31641	3. ↓	10. ↓	17. ↓	4. ↓	11. ↓	18. ↓	5. ↓	12. ↓	19. ↓	6. ↓	13. ↓
1. See	8. Attached	15. Results																				
2. Batch	9. Number	16. 31641																				
3. ↓	10. ↓	17. ↓																				
4. ↓	11. ↓	18. ↓																				
5. ↓	12. ↓	19. ↓																				
6. ↓	13. ↓	20. ↓																				
7. ↓	14. ↓	21. ↓																				
Surveyed By Detterman		Date: 4-30-12		Reviewed By: <i>[Signature]</i>		Date: 4-30-12																
FS-SOP-1000 Attachment 9.2		Page <u>1</u> of <u>2</u>																				

Activity Report

4/27/12
7:53:54AM

701 SAMPLE ROOM

Batch Name:	31,641	Acquisition Date:	4/27/12
Batch ID:	1 Minute Smear Analysis - 201204270650	Acquisition Time:	1.0
Group:	F	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,350.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
20120427065017-F21	1	0.00	0.37	12.78	42.26	33.15	38.35
20120427071658-F22	2	0.00	0.37	12.78	5.74	18.35	38.35
20120427071808-F23	3	0.00	0.37	12.78	21.39	25.76	38.35
20120427071928-F24	4	0.00	0.37	12.78	37.04	31.46	38.35
20120427072048-F25	5	0.00	0.37	12.78	10.96	21.11	38.35
20120427072158-F26	4	0.00	0.37	12.78	10.96	21.11	38.35
20120427072318-F27	1	0.00	0.37	12.78	5.74	18.35	38.35
20120427072429-F28	8	0.00	0.37	12.78	21.39	25.76	38.35
20120427072549-F29	9	0.00	0.37	12.78	5.74	18.35	38.35
20120427072709-F30	10	0.00	7.40	12.78	5.60	18.35	38.35
20120427072819-F31	11	0.00	0.37	12.78	21.39	25.76	38.35
20120427072939-F32	12	0.00	10.46	12.78	41.97	33.15	38.35
20120427073059-F33	13	0.00	0.37	12.78	21.39	25.76	38.35
20120427073209-F34	14	0.00	0.37	12.78	5.74	18.35	38.35
20120427073329-F35	15	0.00	0.37	12.78	5.74	18.35	38.35
20120427073449-F36	16	0.00	0.37	12.78	5.74	18.35	38.35
20120427073559-F37	17	0.00	0.37	12.78	16.18	23.55	38.35
20120427073719-F38	18	0.00	7.40	12.78	36.90	31.47	38.35
20120427073839-F39	19	0.00	0.37	12.78	10.96	21.11	38.35
20120427073949-F40	20	0.00	0.37	12.78	21.39	25.76	38.35
20120427074109-F41	21	0.00	0.37	12.78	16.18	23.55	38.35
20120427074229-F42	22	0.00	0.37	12.78	16.18	23.55	38.35
20120427074339-F43	23	0.00	0.37	12.78	21.39	25.76	38.35
20120427074500-F44	24	0.00	0.37	12.78	26.61	27.79	38.35
20120427074610-F45	25	0.00	0.37	12.78	16.18	23.55	38.35
20120427074730-F46	26	0.00	7.40	12.78	16.03	23.55	38.35
20120427074850-F47	27	0.00	7.40	12.78	21.25	25.76	38.35
20120427075000-F48	28	0.00	0.37	12.78	10.96	21.11	38.35
20120427075120-F49	29	0.00	0.37	12.78	5.74	18.35	38.35
20120427075240-F50	30	0.00	0.37	12.78	16.18	23.55	38.35

4-27-12

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT		
LOCATION & EQUIPT. Bldg 701 Source Vault		☐ ROUTINE	☐ SPECIAL	Model #	Serial #	CAL DUE
		☐ RWP #	☐ WP # 314-35	S5-XLB	67705	04-20-13
DATE: 04-27-12		TIME: 0700		Bicron	A885S	08-01-12
BGR - Source Vault & Mezzanine Final status				Lud-3	44141	02-10-13
Lud-12 used to survey accessible portions of floor. Background= 1200ccpm. Elevated readings were found in a large percentage of the vault. Readings were quantified with a Lud-3 probe and were up to 500ccpm/probe.				N/A	N/A	N/A
				LEGEND		
				○ - SMEAR SURVEY LOCATION △ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCATION		
				XXXX ZZZ XXX = contact reading Y = radiation type ZZZ = reading @ 30cm		
				AIRBORNE ACTIVITY SURVEY		
Sample #		Duration	Flow Rate	Field Analysis		% DAC
N/A				cpm	μCi/cc	
DOSE RATE (HIGHEST)						
CONTACT READING				NA		
GENERAL AREA READING				12		
MASSLINN SURVEY RESULTS (in dpm)						
1. <1k dpm/las		5. <1k dpm/las				
2.		6.				
3.		7.				
4.		8.				
SMEAR SURVEY RESULTS (dpm/100cm ²) (α, ~~β~~ -γ) ³ H						
1. See		8. Attached		15. Results		
2. Batch		9. Number		16. 31640		
3.		10.		17.		
4.		11.		18.		
5.		12.		19.		
6.		13.		20.		
7.		14.		21.		
Surveyed By Detterman		Date: 04-27-12		Reviewed By:		Date:
FS-SOP-1000						
Attachment 9.2						
						Page 1 of 2

Activity Report

4/27/12
7:15:43AM

701 VAULT

Batch Name:	31,640	Acquisition Date:	4/27/12
Batch ID:	1 Minute Smear Analysis - 201204270649	Acquisition Time:	1.0
Group:	E	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,350.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

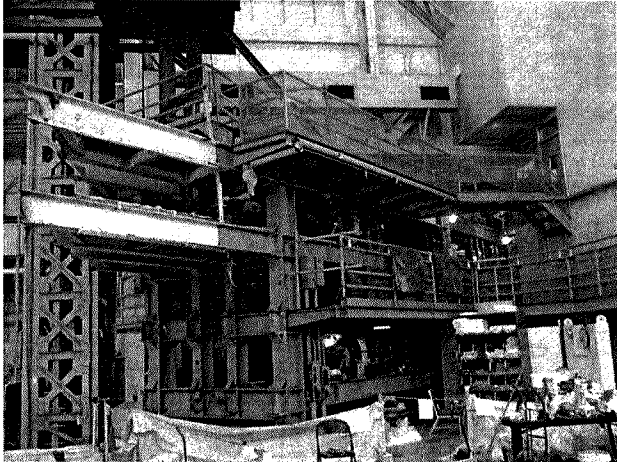
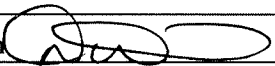
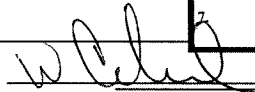
Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20120427064948-E1	0.00	-0.18	0.37	12.78	-9.90	3.22	38.35
20120427065118-E2	0.00	-0.20	0.37	12.78	31.82	29.68	38.35
20120427065238-E3	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120427065358-E4	0.00	3.50	7.40	12.78	16.03	23.55	38.35
20120427065508-E5	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120427065628-E6	0.00	3.50	7.40	12.78	21.25	25.76	38.35
20120427065748-E7	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120427065858-E8	0.00	-0.19	0.37	12.78	26.61	27.79	38.35
20120427070018-E9	0.00	-0.22	0.37	12.78	110.06	50.15	38.35
20120427070129-E10	0.00	-0.22	0.37	12.78	110.06	50.15	38.35
20120427070249-E11	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120427070409-E12	0.00	-0.20	0.37	12.78	37.04	31.46	38.35
20120427070519-E13	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120427070639-E14	0.00	3.50	7.40	12.78	26.47	27.79	38.35
20120427070759-E15	0.00	7.21	10.46	12.78	-4.97	10.92	38.35
20120427070909-E16	0.00	-0.20	0.37	12.78	31.82	29.68	38.35
20120427071029-E17	0.00	-0.19	0.37	12.78	26.61	27.79	38.35
20120427071149-E18	0.00	-0.18	0.37	12.78	-4.69	10.92	38.35
20120427071259-E19	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120427071419-E20	0.00	-0.19	0.37	12.78	26.61	27.79	38.35

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY ☐ ROUTINE _____ ☐ SPECIAL _____ ☒ RWP # 2011-043 ☐ WP # _____		INSTRUMENT																						
LOCATION & EQUIPT. 701 high bay		Date 4/20/12		TIME: 09:00																						
West CRD's		Model # LB-5100		Serial # 32487																						
		Lud-3		74871																						
		Bicron		A885S																						
		N/A																								
Performed survey of west crd's top and mid levels of accessible areas.		LEGEND ○ - SMEAR SURVEY LOCATION ▲ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCA- C - CONTAMINATION * CONTACT XXX XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ																								
General area dose rates 5-10 micro R/hr.		AIRBORNE ACTIVITY SURVEY																								
LAS's taken on crd covers in middle of platforms.		<table><tr><th rowspan="2">Sample #</th><th rowspan="2">Duration</th><th rowspan="2">Flow Rate</th><th colspan="2">Field Analysis</th><th rowspan="2">% DAC</th></tr><tr><th>cpm</th><th>µCi/cc</th></tr><tr><td>N/A</td><td></td><td></td><td></td><td></td><td></td></tr></table>				Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A												
Sample #	Duration	Flow Rate	Field Analysis		% DAC																					
			cpm	µCi/cc																						
N/A																										
Batch 4322 smears 1-10 taken on top level covers		DOSE RATE (HIGHEST) ur/hr																								
Smears 11-20 taken on top level floor/grating		CONTACT READING N/A																								
Smears 21-30 taken on top level handrails		GENERAL AREA READING 5-10 microR/hr																								
Batch 4323 smears 1-10 taken on mid level covers		MASSLINN SURVEY RESULTS (in dpm)																								
Smears 11-20 taken on mid level floors/grating		<table><tr><td>1. <1K-1k dpm/las</td><td>5. <1k-1k dpm/las</td></tr><tr><td>2.</td><td>6.</td></tr><tr><td>3.</td><td>7.</td></tr><tr><td>4.</td><td>8.</td></tr></table>				1. <1K-1k dpm/las	5. <1k-1k dpm/las	2.	6.	3.	7.	4.	8.													
1. <1K-1k dpm/las	5. <1k-1k dpm/las																									
2.	6.																									
3.	7.																									
4.	8.																									
Smears 21-30 taken on mid level handrails		SMEAR SURVEY RESULTS (dpm/100cm²) α β γ ³H																								
		<table><tr><td>1. NA</td><td>8. NA</td><td>15. 4322/4323</td></tr><tr><td>2.</td><td>9.</td><td>16.</td></tr><tr><td>3.</td><td>10.</td><td></td></tr><tr><td>4.</td><td>11.</td><td>18.</td></tr><tr><td></td><td>12.</td><td>19.</td></tr><tr><td>6.</td><td>13.</td><td>20.</td></tr><tr><td>7.</td><td>14.</td><td>21.</td></tr></table>				1. NA	8. NA	15. 4322/4323	2.	9.	16.	3.	10.		4.	11.	18.		12.	19.	6.	13.	20.	7.	14.	21.
1. NA	8. NA	15. 4322/4323																								
2.	9.	16.																								
3.	10.																									
4.	11.	18.																								
	12.	19.																								
6.	13.	20.																								
7.	14.	21.																								
		Surveyed By Detterman  Date: 4/20/12 Reviewed By:  Date: 4-24-12																								
FS-SOP-1000		Page 1 of 3																								
Attachment 9.2																										

Sample Report

Batch ID: 1min. Smear - 201204201202
Group: D
Device: HFBR
Batch Key: 4,323
Selected Geometry: 1/8" Stainless Steel

Count Date: 4/20/2012
Count Minutes: 1.0
Count Mode: Simultaneous
Operating Volts: 1350

Efficiency (%)				Spillover (%)			
Alpha:	27.51	±	0.10	Alpha to Beta:	5.94	±	0.00
Beta:	19.49	±	0.10	Beta to Alpha:	0.08	±	0.00

<u>Sample ID</u>	<u>Sample Type</u>	<u>Alpha</u> <u>(dpm)</u>	<u>Unc</u>	<u>Alpha MDA</u> <u>(dpm)</u>	<u>Beta</u> <u>(dpm)</u>	<u>Unc</u>	<u>Beta MDA</u> <u>(dpm)</u>	<u>(dpm)</u>
20120420120232-D1	Unknown	-0.15	0.03	9.84	271.99	37.39	13.89	
20120420120402-D2	Unknown	-0.12	0.03	9.84	215.54	33.28	13.89	
20120420120522-D3	Unknown	-0.02	0.01	9.84	35.92	13.58	13.89	
20120420120632-D4	Unknown	3.57	3.64	9.84	122.86	25.15	13.89	
20120420120752-D5	Unknown	-0.03	0.01	9.84	51.32	16.23	13.89	
20120420120912-D6	Unknown	-0.03	0.01	9.84	61.58	17.78	13.89	
20120420121022-D7	Unknown	-0.04	0.01	9.84	71.85	19.20	13.89	
20120420121142-D8	Unknown	3.56	3.64	9.84	143.39	27.17	13.89	
20120420121252-D9	Unknown	3.61	3.64	9.84	40.75	14.52	13.89	
20120420121412-D10	Unknown	-0.03	0.01	9.84	46.19	15.40	13.89	
20120420121522-D11	Unknown	-0.01	0.01	9.84	25.66	11.48	13.89	
20120420121642-D12	Unknown	-0.03	0.01	9.84	61.58	17.78	13.89	
20120420121802-D13	Unknown	3.61	3.64	9.84	45.88	15.40	13.89	
20120420121912-D14	Unknown	-0.08	0.02	9.84	148.82	27.65	13.89	
20120420122032-D15	Unknown	-0.10	0.02	9.84	174.48	29.94	13.89	
20120420122142-D16	Unknown	3.54	3.64	9.84	174.18	29.94	13.89	
20120420122302-D17	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120420122412-D18	Unknown	-0.03	0.01	9.84	46.19	15.40	13.89	
20120420122532-D19	Unknown	-0.09	0.02	9.84	169.35	29.49	13.89	
20120420122642-D20	Unknown	3.60	3.64	9.84	66.41	18.51	13.89	
20120420122802-D21	Unknown	-0.03	0.01	9.84	56.45	17.02	13.89	
20120420122922-D22	Unknown	-0.03	0.01	9.84	51.32	16.23	13.89	
20120420123032-D23	Unknown	3.61	3.64	9.84	40.75	14.52	13.89	
20120420123152-D24	Unknown	-0.03	0.01	9.84	56.45	17.02	13.89	
20120420123302-D25	Unknown	-0.03	0.01	9.84	46.19	15.40	13.89	
20120420123422-D26	Unknown	-0.05	0.01	9.84	87.24	21.16	13.89	
20120420123532-D27	Unknown	-0.06	0.02	9.84	107.77	23.52	13.89	
20120420123652-D28	Unknown	-0.10	0.02	9.84	174.48	29.94	13.89	
20120420123812-D29	Unknown	3.59	3.64	9.84	76.67	19.88	13.89	
20120420123922-D30	Unknown	3.57	3.64	9.84	112.59	24.08	13.89	

1-10 MID Level Covers
 11-20 MID Level Grating / Floor
 21-30 MID Level Handrails

Reviewed by:



20 of 3

Sample Report

Batch ID: 1min. Smear - 201204201117
Group: D
Device: HFBR
Batch Key: 4,322
Selected Geometry: 1/8" Stainless Steel

Count Date: 4/20/2012
Count Minutes: 1.0
Count Mode: Simultaneous
Operating Volts: 1350

Efficiency (%)				Spillover (%)			
Alpha:	27.51	±	0.10	Alpha to Beta:	5.94	±	0.00
Beta:	19.49	±	0.10	Beta to Alpha:	0.08	±	0.00

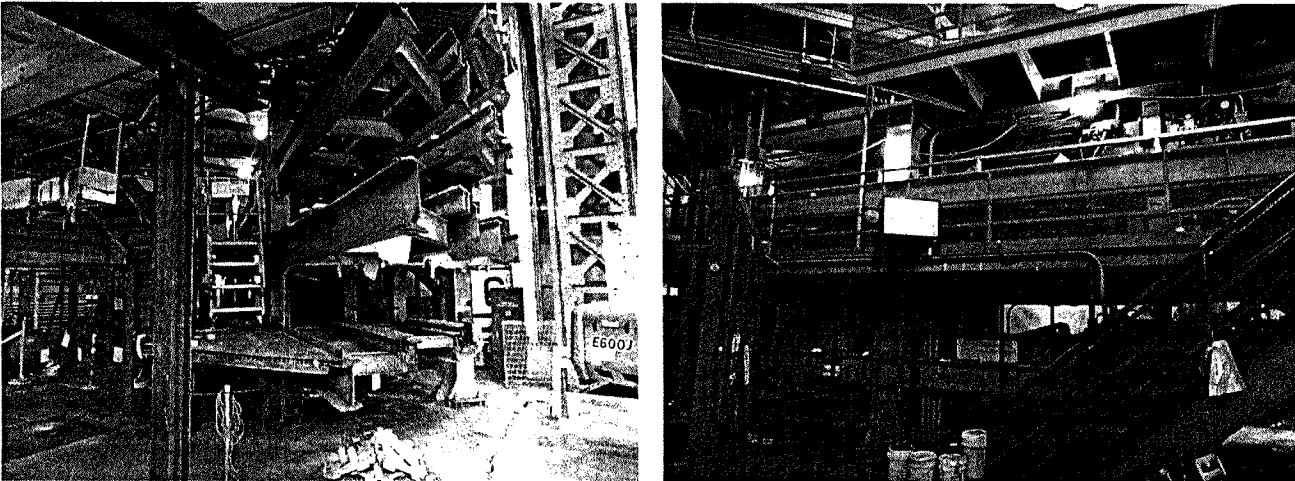
<u>Sample ID</u>	<u>Sample Type</u>	<u>Alpha</u> <u>(dpm)</u>	<u>Unc</u>	<u>Alpha MDA</u> <u>(dpm)</u>	<u>Beta</u> <u>(dpm)</u>	<u>Unc</u>	<u>Beta MDA</u> <u>(dpm)</u>	<u>(dpm)</u>
20120420111710-D1	Unknown	10.81	6.30	9.84	178.70	30.38	13.89	
20120420111841-D2	Unknown	-0.03	0.01	9.84	56.45	17.02	13.89	
20120420112001-D3	Unknown	3.56	3.64	9.84	143.39	27.17	13.89	
20120420112111-D4	Unknown	3.59	3.64	9.84	81.80	20.53	13.89	
20120420112231-D5	Unknown	3.57	3.64	9.84	122.86	25.15	13.89	
20120420112351-D6	Unknown	-0.03	0.01	9.84	56.45	17.02	13.89	
20120420112501-D7	Unknown	-0.03	0.01	9.84	56.45	17.02	13.89	
20120420112621-D8	Unknown	-0.13	0.03	9.84	225.80	34.06	13.89	
20120420112731-D9	Unknown	3.58	3.64	9.84	92.07	21.78	13.89	
20120420112851-D10	Unknown	-0.07	0.02	9.84	133.43	26.18	13.89	
20120420113001-D11	Unknown	-0.01	0.01	9.84	25.66	11.48	13.89	
20120420113121-D12	Unknown	-0.04	0.01	9.84	66.71	18.51	13.89	
20120420113241-D13	Unknown	-0.03	0.01	9.84	51.32	16.23	13.89	
20120420113351-D14	Unknown	-0.02	0.01	9.84	30.79	12.57	13.89	
20120420113511-D15	Unknown	-0.12	0.03	9.84	215.54	33.28	13.89	
20120420113621-D16	Unknown	-0.18	0.04	9.84	328.43	41.09	13.89	
20120420113741-D17	Unknown	-0.16	0.03	9.84	287.38	38.43	13.89	
20120420113851-D18	Unknown	-0.12	0.03	9.84	215.54	33.28	13.89	
20120420114011-D19	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120420114121-D20	Unknown	-0.08	0.02	9.84	138.56	26.67	13.89	
20120420114241-D30	Unknown	-0.02	0.01	9.84	30.79	12.57	13.89	
20120420114401-D21	Unknown	-0.02	0.01	9.84	30.79	12.57	13.89	
20120420114511-D22	Unknown	-0.08	0.02	9.84	148.82	27.65	13.89	
20120420114631-D23	Unknown	3.56	3.64	9.84	127.99	25.67	13.89	
20120420114741-D24	Unknown	3.54	3.64	9.84	169.04	29.49	13.89	
20120420114901-D25	Unknown	-0.09	0.02	9.84	164.22	29.04	13.89	
20120420115011-D26	Unknown	-0.08	0.02	9.84	138.56	26.67	13.89	
20120420115131-D27	Unknown	3.53	3.64	9.84	194.70	31.65	13.89	
20120420115251-D28	Unknown	3.61	3.64	9.84	51.01	16.23	13.89	
20120420115401-D29	Unknown	-0.10	0.02	9.84	174.48	29.94	13.89	

1-10 Top Level covers
 11-20 Top Level Floor/Grating
 21-30 Top Level Handrails

Reviewed by:



30f3

RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT																																									
LOCATION & EQUIPT. 701 high bay		☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # 2012-030 ☐ WP # _____		Model #	Serial #																																								
		Date 4/23/12 TIME: 09:00		LB-5100	32847																																								
East Control Rod Drives					CAL DUE																																								
				Lud-3	92741																																								
				Bicron	A885S																																								
				N/A																																									
General area dose rates were 5-10 micro R/HR. Las's of the area were <1k. Smears 1-15 were on the lower level. Smears 16-30 were on the mid level. Smears 31-45 were on the upper level.																																													
 LEGEND ○ - SMEAR SURVEY LOCATION ▲ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCA- ⊖ - CONTAMINATION * - CONTACT XXX ZZZ XXX = contact reading Y = radiation type ZZZ = reading @ 30cm																																													
AIRBORNE ACTIVITY SURVEY <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="2">Field Analysis</th> <th rowspan="2">% DAC</th> </tr> <tr> <th>cpm</th> <th>µCi/cc</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A																															
Sample #	Duration	Flow Rate	Field Analysis		% DAC																																								
			cpm	µCi/cc																																									
N/A																																													
DOSE RATE (HIGHEST) micro R/hr <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>CONTACT READING</td> <td>N/A</td> </tr> <tr> <td>GENERAL AREA READING</td> <td>5-10</td> </tr> </table>						CONTACT READING	N/A	GENERAL AREA READING	5-10																																				
CONTACT READING	N/A																																												
GENERAL AREA READING	5-10																																												
MASSLINN SURVEY RESULTS (in dpm) <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>1. <1K</td> <td>5. N/A</td> </tr> <tr> <td>2.</td> <td>6.</td> </tr> <tr> <td>3.</td> <td>7.</td> </tr> <tr> <td>4.</td> <td>8.</td> </tr> </table>						1. <1K	5. N/A	2.	6.	3.	7.	4.	8.																																
1. <1K	5. N/A																																												
2.	6.																																												
3.	7.																																												
4.	8.																																												
SMEAR SURVEY RESULTS (dpm/100cm²) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2"></th> <th>α</th> <th>β-γ</th> <th>³H</th> </tr> </thead> <tbody> <tr> <td>1. NA</td> <td>8. NA</td> <td>15.</td> <td>4328</td> <td></td> </tr> <tr> <td>2.</td> <td>9.</td> <td>16.</td> <td></td> <td></td> </tr> <tr> <td>3.</td> <td>10.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4.</td> <td>11.</td> <td>18.</td> <td></td> <td></td> </tr> <tr> <td></td> <td>12.</td> <td>19.</td> <td></td> <td></td> </tr> <tr> <td>6.</td> <td>13.</td> <td>20.</td> <td></td> <td></td> </tr> <tr> <td>7.</td> <td>14.</td> <td>21.</td> <td></td> <td></td> </tr> </tbody> </table>								α	β-γ	³ H	1. NA	8. NA	15.	4328		2.	9.	16.			3.	10.				4.	11.	18.				12.	19.			6.	13.	20.			7.	14.	21.		
		α	β-γ	³ H																																									
1. NA	8. NA	15.	4328																																										
2.	9.	16.																																											
3.	10.																																												
4.	11.	18.																																											
	12.	19.																																											
6.	13.	20.																																											
7.	14.	21.																																											
Surveyed By <u>WilliamCalash</u> <i>[Signature]</i> Date: <u>4/23/12</u> FS-SOP-1000 Attachment 9.2 Reviewed By: <i>[Signature]</i> Date: <u>4/24/12</u> Page <u>1</u> of <u>3</u>																																													

Sample Report

Batch ID: 1min. Smear - 201204230909
Group: D
Device: HFBR
Batch Key: 4,328
Selected Geometry: 1/8" Stainless Steel

Count Date: 4/23/2012
Count Minutes: 1.0
Count Mode: Simultaneous
Operating Volts: 1350

Efficiency (%)				Spillover (%)			
Alpha:	27.51	±	0.10	Alpha to Beta:	5.94	±	0.00
Beta:	19.49	±	0.10	Beta to Alpha:	0.08	±	0.00

<u>Sample ID</u>	<u>Sample Type</u>	<u>Alpha</u> <u>(dpm)</u>	<u>Unc</u>	<u>Alpha MDA</u> <u>(dpm)</u>	<u>Beta</u> <u>(dpm)</u>	<u>Unc</u>	<u>Beta MDA</u> <u>(dpm)</u>	<u>(dpm)</u>
20120423090950-D1	Unknown	-0.12	0.03	9.84	210.40	32.88	13.89	
20120423091120-D2	Unknown	-0.07	0.02	9.84	118.03	24.62	13.89	
20120423091240-D3	Unknown	-0.10	0.02	9.84	174.48	29.94	13.89	
20120423091350-D4	Unknown	-0.07	0.02	9.84	123.16	25.15	13.89	
20120423091510-D5	Unknown	-0.02	0.01	9.84	35.92	13.58	13.89	
20120423091630-D6	Unknown	-0.08	0.02	9.84	138.56	26.67	13.89	
20120423091740-D7	Unknown	10.59	6.30	9.84	568.71	54.15	13.89	
20120423091900-D8	Unknown	3.52	3.64	9.84	199.83	32.07	13.89	
20120423092010-D9	Unknown	3.50	3.64	9.84	251.15	35.95	13.89	
20120423092130-D10	Unknown	-0.07	0.02	9.84	118.03	24.62	13.89	
20120423092240-D11	Unknown	3.38	3.64	9.84	451.29	48.20	13.89	
20120423092400-D12	Unknown	-0.06	0.02	9.84	107.77	23.52	13.89	
20120423092520-D13	Unknown	-0.07	0.02	9.84	133.43	26.18	13.89	
20120423092630-D14	Unknown	7.20	5.14	9.84	122.55	25.15	13.89	
20120423092750-D15	Unknown	-0.15	0.03	9.84	271.99	37.39	13.89	
20120423092900-D16	Unknown	-0.05	0.01	9.84	92.37	21.78	13.89	
20120423093020-D17	Unknown	-0.09	0.02	9.84	164.22	29.04	13.89	
20120423093130-D18	Unknown	3.22	3.64	9.84	748.94	62.12	13.89	
20120423093250-D19	Unknown	3.40	3.64	9.84	430.77	47.08	13.89	
20120423093400-D20	Unknown	-0.09	0.02	9.84	159.09	28.58	13.89	
20120423093520-D21	Unknown	-0.07	0.02	9.84	133.43	26.18	13.89	
20120423093640-D22	Unknown	-0.22	0.05	9.84	400.28	45.37	13.89	
20120423093750-D23	Unknown	14.45	7.27	9.84	163.00	29.05	13.89	
20120423093910-D24	Unknown	10.75	6.30	9.84	281.33	38.09	13.89	
20120423094020-D25	Unknown	3.36	3.64	9.84	487.22	50.08	13.89	
20120423094140-D26	Unknown	6.66	5.14	9.84	1,097.59	75.28	13.89	
20120423094250-D27	Unknown	3.46	3.64	9.84	323.00	40.77	13.89	
20120423094410-D28	Unknown	-0.35	0.07	9.84	626.08	56.77	13.89	
20120423094530-D29	Unknown	3.41	3.64	9.84	410.24	45.95	13.89	
20120423094640-D30	Unknown	-0.04	0.01	9.84	71.85	19.20	13.89	
20120423094800-D31	Unknown	6.92	5.14	9.84	625.47	56.77	13.89	
20120423094910-D32	Unknown	3.31	3.64	9.84	574.46	54.39	13.89	
20120423095030-D33	Unknown	3.40	3.64	9.84	415.37	46.23	13.89	
20120423095140-D34	Unknown	3.40	3.64	9.84	420.50	46.52	13.89	
20120423095300-D35	Unknown	28.81	10.28	9.84	485.08	50.09	13.89	
20120423095410-D36	Unknown	-0.27	0.05	9.84	487.52	50.08	13.89	

Sample Report

Efficiency (%)

Alpha: 27.51 ± 0.10
Beta: 19.49 ± 0.10

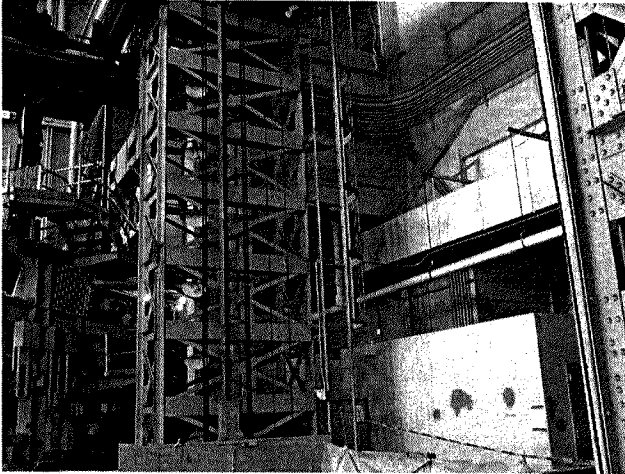
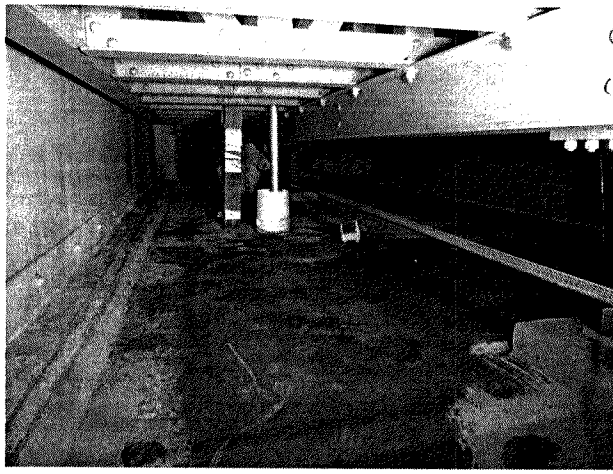
Spillover (%)

Alpha to Beta: 5.94 ± 0.00
Beta to Alpha: 0.08 ± 0.00

Sample ID	Sample Type	Alpha (dpm)	Unc	Alpha MDA (dpm)	Beta (dpm)	Unc	Beta MDA (dpm)	(dpm)
20120423095530-D37	Unknown	-0.03	0.01	9.84	46.19	15.40	13.89	
20120423095650-D38	Unknown	-0.19	0.04	9.84	338.70	41.73	13.89	
20120423095800-D39	Unknown	-0.18	0.04	9.84	323.30	40.76	13.89	
20120423095920-D40	Unknown	7.09	5.14	9.84	327.82	41.09	13.89	
20120423100030-D42	Unknown	-0.07	0.02	9.84	133.43	26.18	13.89	
20120423100150-D43	Unknown	-0.05	0.01	9.84	87.24	21.16	13.89	
20120423100300-D44	Unknown	-0.02	0.01	9.84	41.05	14.52	13.89	
20120423100420-D45	Unknown	-0.05	0.01	9.84	92.37	21.78	13.89	
20120423100540-D46	Unknown	-0.07	0.02	9.84	123.16	25.15	13.89	

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY ☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # <u>2012-020</u> ☐ WP # _____		INSTRUMENT <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Model #</td> <td style="width: 33%;">Serial #</td> <td style="width: 33%;">CAL DUE</td> </tr> <tr> <td>S5-XLB</td> <td>67705</td> <td>04/25/12</td> </tr> <tr> <td>Lud-3</td> <td>92741</td> <td>02/09/13</td> </tr> <tr> <td>Bicron</td> <td>A885S</td> <td>08/01/12</td> </tr> <tr> <td>N/A</td> <td></td> <td></td> </tr> </table>		Model #	Serial #	CAL DUE	S5-XLB	67705	04/25/12	Lud-3	92741	02/09/13	Bicron	A885S	08/01/12	N/A																	
Model #	Serial #	CAL DUE																																	
S5-XLB	67705	04/25/12																																	
Lud-3	92741	02/09/13																																	
Bicron	A885S	08/01/12																																	
N/A																																			
LOCATION & EQUIPT. 701 High Bay		Date 4/19/12		TIME: 09:00																															
Charging elevator An as left survey was done on and beneath the charging elevator. The smear results are on the attached sheets. All dose rates were between 10-20 MICRO-R/HR <table style="width:100%;"> <tr> <td style="width: 50%;"> West support → 23-32 Below 6ft East support → 33-42 Below 6ft Elevator → 43-52 Beneath Elevator → 53-62 </td> <td style="width: 50%;"> West support → 121-130 Above 6ft East support → 131-140 Above 6ft Top Cross → 141-145 Over </td> </tr> </table>						West support → 23-32 Below 6ft East support → 33-42 Below 6ft Elevator → 43-52 Beneath Elevator → 53-62	West support → 121-130 Above 6ft East support → 131-140 Above 6ft Top Cross → 141-145 Over																												
West support → 23-32 Below 6ft East support → 33-42 Below 6ft Elevator → 43-52 Beneath Elevator → 53-62	West support → 121-130 Above 6ft East support → 131-140 Above 6ft Top Cross → 141-145 Over																																		
																																			
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="6" style="text-align: center;">LEGEND</th> </tr> <tr> <td style="text-align: center;">○</td> <td>- SMEAR SURVEY LOCATION</td> <td style="text-align: center;">▲</td> <td>- AIR SAMPLE LOCATION</td> <td style="text-align: center;">#</td> <td>- DIRECT FRISK LOCA-</td> </tr> <tr> <td style="text-align: center;">□</td> <td>- MASSLINN SURVEY LOCATION</td> <td style="text-align: center;">*</td> <td>- CONTACT</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">C</td> <td>- CONTAMINATION</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="6"> XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm </td> </tr> </table>						LEGEND						○	- SMEAR SURVEY LOCATION	▲	- AIR SAMPLE LOCATION	#	- DIRECT FRISK LOCA-	□	- MASSLINN SURVEY LOCATION	*	- CONTACT			C	- CONTAMINATION					XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm					
LEGEND																																			
○	- SMEAR SURVEY LOCATION	▲	- AIR SAMPLE LOCATION	#	- DIRECT FRISK LOCA-																														
□	- MASSLINN SURVEY LOCATION	*	- CONTACT																																
C	- CONTAMINATION																																		
XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm																																			
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="6" style="text-align: center;">AIRBORNE ACTIVITY SURVEY</th> </tr> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="2">Field Analysis</th> <th rowspan="2">% DAC</th> </tr> <tr> <th>cpm</th> <th>µCi/cc</th> </tr> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>						AIRBORNE ACTIVITY SURVEY						Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A															
AIRBORNE ACTIVITY SURVEY																																			
Sample #	Duration	Flow Rate	Field Analysis		% DAC																														
			cpm	µCi/cc																															
N/A																																			
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2" style="text-align: center;">DOSE RATE (HIGHEST) Micro-R/hr</th> </tr> <tr> <td style="text-align: center;">CONTACT READING</td> <td style="text-align: center;">N/A</td> </tr> <tr> <td style="text-align: center;">GENERAL AREA READING</td> <td style="text-align: center;">10-20</td> </tr> </table>						DOSE RATE (HIGHEST) Micro-R/hr		CONTACT READING	N/A	GENERAL AREA READING	10-20																								
DOSE RATE (HIGHEST) Micro-R/hr																																			
CONTACT READING	N/A																																		
GENERAL AREA READING	10-20																																		
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2" style="text-align: center;">MASSLINN SURVEY RESULTS (in dpm)</th> </tr> <tr> <td style="width: 50%;">1. N/A</td> <td style="width: 50%;">5. N/A</td> </tr> <tr> <td>2.</td> <td>6.</td> </tr> <tr> <td>3.</td> <td>7.</td> </tr> <tr> <td>4.</td> <td>8.</td> </tr> </table>						MASSLINN SURVEY RESULTS (in dpm)		1. N/A	5. N/A	2.	6.	3.	7.	4.	8.																				
MASSLINN SURVEY RESULTS (in dpm)																																			
1. N/A	5. N/A																																		
2.	6.																																		
3.	7.																																		
4.	8.																																		
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="3" style="text-align: center;">SMEAR SURVEY RESULTS (dpm/100cm²) α β γ ³H</th> </tr> <tr> <td style="width: 33%;">1. NA</td> <td style="width: 33%;">8. NA</td> <td style="width: 33%;">15. 31580</td> </tr> <tr> <td>2.</td> <td>9.</td> <td>16. 31587</td> </tr> <tr> <td>3.</td> <td>10.</td> <td></td> </tr> <tr> <td>4.</td> <td>11.</td> <td>18.</td> </tr> <tr> <td></td> <td>12.</td> <td>19.</td> </tr> <tr> <td>6.</td> <td>13.</td> <td>20.</td> </tr> <tr> <td>7.</td> <td>14.</td> <td>21.</td> </tr> </table>						SMEAR SURVEY RESULTS (dpm/100cm ²) α β γ ³ H			1. NA	8. NA	15. 31580	2.	9.	16. 31587	3.	10.		4.	11.	18.		12.	19.	6.	13.	20.	7.	14.	21.						
SMEAR SURVEY RESULTS (dpm/100cm ²) α β γ ³ H																																			
1. NA	8. NA	15. 31580																																	
2.	9.	16. 31587																																	
3.	10.																																		
4.	11.	18.																																	
	12.	19.																																	
6.	13.	20.																																	
7.	14.	21.																																	
<table style="width:100%;"> <tr> <td style="width: 33%;"> Surveyed By <u>WilliamCalash</u> </td> <td style="width: 33%;"> Date: <u>4/19/12</u> </td> <td style="width: 33%;"> Reviewed By: <u>[Signature]</u> </td> </tr> <tr> <td colspan="3"> FS-SOP-1000 Attachment 9.2 </td> </tr> </table>						Surveyed By <u>WilliamCalash</u>	Date: <u>4/19/12</u>	Reviewed By: <u>[Signature]</u>	FS-SOP-1000 Attachment 9.2																										
Surveyed By <u>WilliamCalash</u>	Date: <u>4/19/12</u>	Reviewed By: <u>[Signature]</u>																																	
FS-SOP-1000 Attachment 9.2																																			
Page <u>1</u> of <u>3</u>																																			

Activity Report

4/18/12
10:26:09AM

CHARGING ELEVATOR

Batch Name:	31,580	Acquisition Date:	4/18/12
Batch ID:	1 Minute Smear Analysis - 201204180907	Acquisition Time:	1.0
Group:	H	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
20120418090801-H23	0.00	-0.58	0.64	14.79	87.26	44.01	32.73
20120418093623-H24	0.00	6.78	10.45	14.79	123.22	51.86	32.73
20120418093743-H25	0.00	14.04	14.76	14.79	454.29	97.87	32.73
20120418093853-H26	0.00	10.23	12.79	14.79	822.04	131.37	32.73
20120418094013-H27	0.00	14.11	14.76	14.79	236.84	71.09	32.73
20120418094133-H28	0.00	3.11	7.40	14.79	61.23	37.43	32.73
20120418094243-H29	0.00	-0.69	0.65	14.79	423.80	94.51	32.73
20120418094403-H30	0.00	-0.65	0.64	14.79	278.83	76.91	32.73
20120418094523-H31	0.00	-0.59	0.64	14.79	107.97	48.65	32.73
20120418094633-H32	0.00	-0.59	0.64	14.79	123.50	51.86	32.73
20120418094753-H33	0.00	-0.63	0.64	14.79	221.88	68.78	32.73
20120418094913-H34	0.00	-0.60	0.64	14.79	149.39	56.80	32.73
20120418095023-H35	0.00	-0.59	0.64	14.79	97.62	46.39	32.73
20120418095143-H36	0.00	-0.61	0.64	14.79	159.75	58.66	32.73
20120418095303-H37	0.00	-0.56	0.64	14.79	30.31	27.51	32.73
20120418095414-H38	0.00	3.06	7.40	14.79	216.56	68.00	32.73
20120418095534-H39	0.00	3.10	7.40	14.79	102.65	47.53	32.73
20120418095654-H40	0.00	-0.61	0.64	14.79	164.92	59.57	32.73
20120418095804-H41	0.00	-0.58	0.64	14.79	66.55	38.83	32.73
20120418095925-H42	0.00	3.07	7.40	14.79	185.49	63.07	32.73
20120418100034-H43	0.00	-0.57	0.64	14.79	51.02	34.44	32.73
20120418100154-H44	0.00	-0.61	0.64	14.79	164.92	59.57	32.73
20120418100314-H45	0.00	-0.57	0.64	14.79	56.20	35.96	32.73
20120418100424-H46	0.00	6.75	10.45	14.79	200.88	65.58	32.73
20120418100544-H47	0.00	3.01	7.40	14.79	356.35	86.78	32.73
20120418100704-H48	0.00	-0.59	0.64	14.79	123.50	51.86	32.73
20120418100814-H49	0.00	-0.64	0.64	14.79	263.30	74.78	32.73
20120418100934-H50	0.00	6.62	10.45	14.79	604.72	112.74	32.73
20120418101054-H51	0.00	3.02	7.40	14.79	345.99	85.53	32.73
20120418101204-H52	0.00	-0.61	0.64	14.79	164.92	59.57	32.73
20120418101324-H53	0.00	-0.65	0.65	14.79	304.72	80.33	32.73
20120418101445-H54	0.00	-0.62	0.64	14.79	195.99	64.76	32.73
20120418101555-H55	0.00	10.29	12.79	14.79	635.65	115.58	32.73
20120418101715-H56	0.00	17.73	16.50	14.79	438.62	96.20	32.73
20120418101825-H57	0.00	-0.62	0.64	14.79	195.99	64.76	32.73

Activity Report

4/18/12
10:26:09AM

Efficiency Factors

Alpha
Efficiency:
(%)

0.27

±

0.00

Beta Efficiency:
(%)

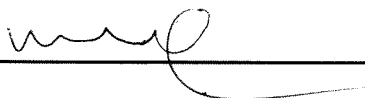
0.19

±

0.00

Sample ID	<u>Quantity</u>	<u>Alpha</u> <u>(DPM)</u>	<u>2σ</u>	<u>Alpha MDA</u> <u>(DPM)</u>	<u>Beta Activity</u> <u>(DPM)</u>	<u>2σ</u>	<u>Beta MDA</u> <u>(DPM)</u>
20120418101945-H58	0.00	6.65	10.45	14.79	516.71	104.28	32.73
20120418102105-H59	0.00	-0.64	0.64	14.79	258.12	74.05	32.73
20120418102215-H60	0.00	17.70	16.50	14.79	516.28	104.28	32.73
20120418102335-H61	0.00	10.29	12.79	14.79	640.82	116.05	32.73
20120418102455-H62	0.00	14.06	14.76	14.79	392.16	91.02	32.73

Reviewed by:



Activity Report

4/19/12
10:00:56AM

CHARGING ELEVATOR

Batch Name:	31,587	Acquisition Date:	4/19/12
Batch ID:	1 Minute Smear Analysis - 201204190914	Acquisition Time:	1.0
Group:	I	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

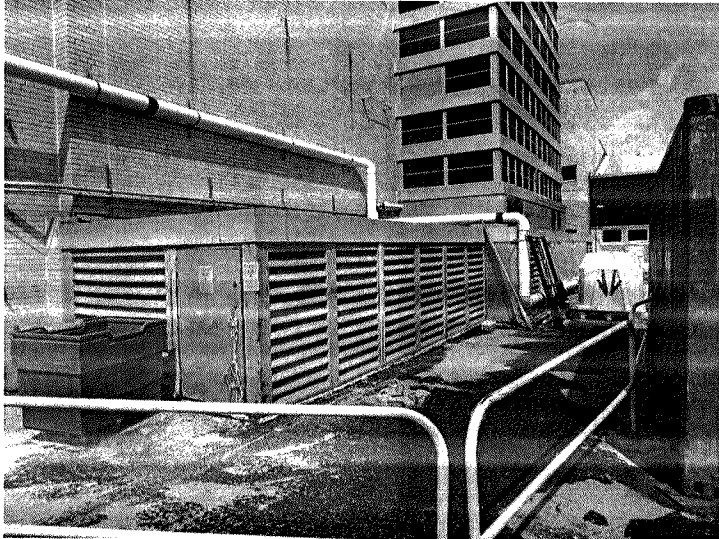
Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20120419091430-I21	0.00	-0.57	0.64	14.79	40.66	31.17	32.73
20120419093021-I22	0.00	6.70	10.45	14.79	361.38	87.39	32.73
20120419093131-I23	0.00	6.80	10.45	14.79	66.27	38.83	32.73
20120419093251-I24	0.00	-0.61	0.64	14.79	159.75	58.66	32.73
20120419093411-I25	0.00	14.00	14.76	14.79	568.20	109.34	32.73
20120419093521-I26	0.00	6.49	10.45	14.79	982.68	143.61	32.73
20120419093641-I27	0.00	-0.80	0.68	14.79	739.62	124.60	32.73
20120419093801-I30	0.00	-0.63	0.64	14.79	216.70	68.00	32.73
20120419093911-I28	0.00	6.78	10.45	14.79	128.40	52.88	32.73
20120419094031-I29	0.00	3.09	7.40	14.79	128.54	52.88	32.73
20120419094152-I31	0.00	6.77	10.45	14.79	133.57	53.89	32.73
20120419094301-I32	0.00	43.20	25.55	14.79	1,421.34	172.88	32.73
20120419094422-I33	0.00	-0.61	0.64	14.79	170.10	60.46	32.73
20120419094542-I34	0.00	42.75	25.56	14.79	2,788.19	242.93	32.73
20120419094652-I35	0.00	10.45	12.79	14.79	169.67	60.47	32.73
20120419094812-I36	0.00	3.11	7.40	14.79	66.41	38.83	32.73
20120419094932-I37	0.00	3.07	7.40	14.79	185.49	63.07	32.73
20120419095042-I38	0.00	14.10	14.76	14.79	273.08	76.21	32.73
20120419095202-I39	0.00	2.96	7.40	14.79	516.85	104.28	32.73
20120419095312-I40	0.00	47.01	26.59	14.79	1,048.42	148.45	32.73
20120419095432-I41	0.00	32.23	22.13	14.79	1,173.25	157.00	32.73
20120419095552-I42	0.00	-0.61	0.64	14.79	175.28	61.35	32.73
20120419095702-I43	0.00	-0.57	0.64	14.79	56.20	35.96	32.73
20120419095822-I44	0.00	-0.58	0.64	14.79	66.55	38.83	32.73
20120419095942-I45	0.00	10.35	12.79	14.79	469.97	99.51	32.73

Reviewed by: _____

WC

RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT															
LOCATION & EQUIPT. 701 Building		☐ ROUTINE _____ ☐ SPECIAL _____		Model #	Serial #														
		☐ RWP # 2012-030 ☐ WP # _____		S5-XLB	67705														
Date 4/24/12		TIME: 11:00		Bicron	A885S														
East parking lot				N/A															
				N/A															
A survey was done inside the East air intake. General area dose rates are 5-15 Micro R/HR inside and the smear results are on the attached sheet. 				LEGEND															
				○ - SMEAR SURVEY LOCATION ▲ - AIR SAMPLE LOCATION															
				□ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOC.															
				C - CONTAMINATION * CONTACT															
				XXX = contact reading Y = radiation type ZZZ = reading @ 30cm															
				AIRBORNE ACTIVITY SURVEY															
				<table border="1"><thead><tr><th rowspan="2">Sample #</th><th rowspan="2">Duration</th><th rowspan="2">Flow Rate</th><th colspan="2">Field Analysis</th><th rowspan="2">% DAC</th></tr><tr><th>cpm</th><th>µCi/cc</th></tr></thead><tbody><tr><td>N/A</td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>		Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A					
				Sample #	Duration				Flow Rate	Field Analysis		% DAC							
						cpm	µCi/cc												
				N/A															
DOSE RATE (HIGHEST) Micro R/hr																			
CONTACT READING																			
GENERAL AREA READING																			
MASSLINN SURVEY RESULTS (in dpm)																			
1. N/A																			
2. N/A																			
3. N/A																			
4. N/A																			
5. N/A																			
6. N/A																			
7. N/A																			
8. N/A																			
SMEAR SURVEY RESULTS (dpm/100cm²)																			
1. SEE																			
2. Attachment																			
3. 31618																			
4. Attachment																			
5. 31618																			
6. Attachment																			
7. 31618																			
8. Attachment																			
9. 31618																			
10. Attachment																			
11. 31618																			
12. Attachment																			
13. 31618																			
14. Attachment																			
15. 31618																			
16. Attachment																			
17. 31618																			
18. Attachment																			
19. 31618																			
20. Attachment																			
21. 31618																			

Surveyed By WilliamCalash
FS-SOP-1000
Attachment 9.2

Date: 4/24/12

Reviewed By: [Signature]
Date: 4/24/12

Page 1 of 2

Activity Report

4/24/12
12:22:13PM

EAST AIR INTAKE

Batch Name:	31,618	Acquisition Date:	4/24/12
Batch ID:	1 Minute Smear Analysis - 201204241135	Acquisition Time:	1.0
Group:	F	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,350.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

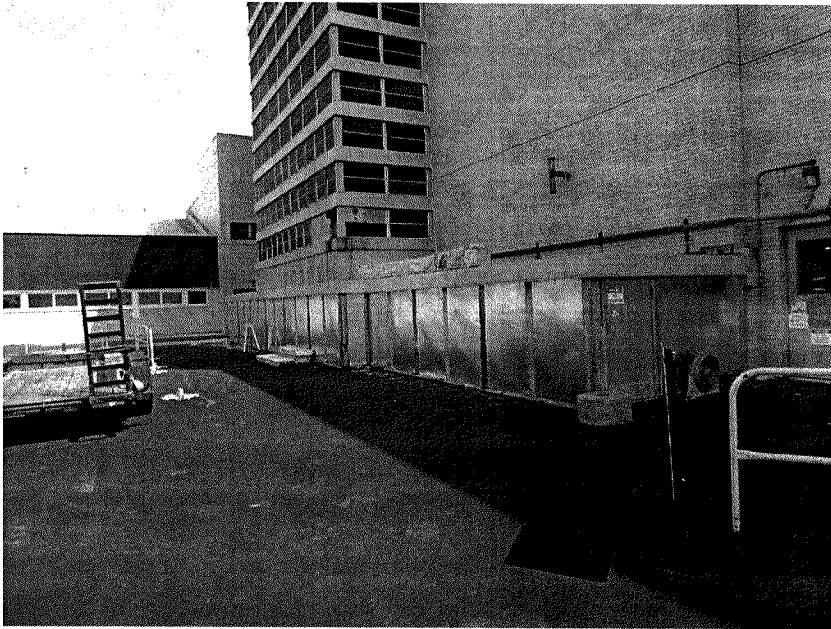
Efficiency Factors

Alpha Efficiency: (%)	0.27	±	0.00	Beta Efficiency: (%)	0.19	±	0.00
-----------------------	------	---	------	----------------------	------	---	------

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
20120424113527-F21	0.00	-0.19	0.37	12.78	21.39	25.76	38.35
20120424115759-F22	0.00	-0.19	0.37	12.78	26.61	27.79	38.35
20120424115919-F23	0.00	-0.19	0.37	12.78	21.39	25.76	38.35
20120424120029-F24	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120424120149-F25	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120424120309-F26	0.00	-0.18	0.37	12.78	-4.69	10.92	38.35
20120424120419-F27	0.00	-0.18	0.37	12.78	-4.69	10.92	38.35
20120424120539-F28	0.00	3.51	7.40	12.78	-10.05	3.23	38.35
20120424120659-F29	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120424120809-F30	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120424120929-F31	0.00	3.51	7.40	12.78	10.82	21.11	38.35
20120424121050-F32	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120424121200-F33	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120424121320-F34	0.00	3.50	7.40	12.78	21.25	25.76	38.35
20120424121440-F35	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120424121550-F36	0.00	-0.18	0.37	12.78	-9.90	3.22	38.35
20120424121710-F37	0.00	-0.19	0.37	12.78	21.39	25.76	38.35
20120424121830-F38	0.00	-0.20	0.37	12.78	31.82	29.68	38.35
20120424121940-F39	0.00	-0.19	0.37	12.78	26.61	27.79	38.35
20120424122100-F40	0.00	3.51	7.40	12.78	5.60	18.35	38.35

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY ☐ ROUTINE ☐ SPECIAL ☐ RWP # 2012-030 ☐ WP #		INSTRUMENT		
LOCATION & EQUIPT. 701 Building		Date 4/24/12		TIME: 11:00		
West parking lot		Model # S5-XLB		Serial # 67705		
A survey was done inside the West air intake. General area dose rates are 5-15 Micro R/HR inside and the smear results are on the attached sheet.		Bicron		A885S		
		N/A				
		N/A				
		LEGEND ○ - SMEAR SURVEY LOCATION ▲ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCATION C - CONTAMINATION * CONTACT XXX/YYY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm				
		AIRBORNE ACTIVITY SURVEY				
		Field Analysis				
		Sample #	Duration	Flow Rate	cpm	µCi/cc
		N/A				
		DOSE RATE (HIGHEST) Micro R/hr				
		CONTACT READING N/A				
		GENERAL AREA READING 5-15				
		MASSLINN SURVEY RESULTS (in dpm)				
		1. N/A 5. N/A				
2. 6.						
3. 7.						
4. 8.						
SMEAR SURVEY RESULTS (dpm/100cm²) α β γ ³H						
1. SEE 8. Attachment 15. 31617						
2. 9.						
3. 10.						
4. 11.						
5. 12.						
6. 13.						
7. 14.						
8. 15.						
9. 16.						
10. 17.						
11. 18.						
12. 19.						
13. 20.						
14. 21.						
Surveyed By WilliamCalash		Date: 4/24/12		Reviewed By: [Signature]		
FS-SOP-1000				Date: 4/24/12		
Attachment 9.2				Page 1 of 2		

WEST
EAST AIR INTAKE

Activity Report

4/24/12
11:56:48AM

Batch Name:	31,617	Acquisition Date:	4/24/12
Batch ID:	1 Minute Smear Analysis - 201204241130	Acquisition Time:	1.0
Group:	E	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,350.0
		(volts)	

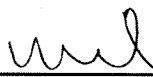
Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency: (%)	0.27	±	0.00	Beta Efficiency: (%)	0.19	±	0.00
-----------------------	------	---	------	----------------------	------	---	------

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
20120424113054-E1	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120424113224-E2	0.00	-0.20	0.37	12.78	31.82	29.68	38.35
20120424113344-E3	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120424113504-E4	0.00	3.51	7.40	12.78	5.60	18.35	38.35
20120424113614-E5	0.00	-0.20	0.37	12.78	31.82	29.68	38.35
20120424113734-E6	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120424113854-E7	0.00	-0.20	0.37	12.78	31.82	29.68	38.35
20120424114004-E8	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120424114124-E9	0.00	-0.19	0.37	12.78	21.39	25.76	38.35
20120424114244-E10	0.00	3.51	7.40	12.78	-4.83	10.92	38.35
20120424114355-E11	0.00	-0.19	0.37	12.78	26.61	27.79	38.35
20120424114515-E12	0.00	-0.20	0.37	12.78	42.26	33.15	38.35
20120424114625-E13	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120424114745-E14	0.00	3.51	7.40	12.78	0.39	15.10	38.35
20120424114905-E15	0.00	-0.20	0.37	12.78	31.82	29.68	38.35
20120424115015-E16	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120424115135-E17	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120424115255-E18	0.00	3.51	7.40	12.78	-4.83	10.92	38.35
20120424115405-E19	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120424115525-E20	0.00	-0.18	0.37	12.78	0.53	15.10	38.35

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT																			
LOCATION & EQUIPT. 701 high bay		☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # 2011-043 ☐ WP # _____		Model #	Serial #	CAL DUE																	
		Date 03/26/12 TIME: 21:00		S5-XLB	67705	04/25/12																	
98 ft Deep Pit transfer canal access				Lud-3	92741	02/09/13																	
				RO20	3838	04/04/12																	
				N/A																			
				LEGEND ○ - SMEAR SURVEY LOCATION □ - MASSLINN SURVEY LOCATION Ⓒ - CONTAMINATION XXXX ZZZ XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ▲ - AIR SAMPLE LOCATION # - DIRECT FRISK LOCATIONS * CONTACT																			
AIRBORNE ACTIVITY SURVEY <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="3">Field Analysis</th> </tr> <tr> <th>cpm</th> <th>µCi/cc</th> <th>% DAC</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Sample #	Duration	Flow Rate	Field Analysis			cpm	µCi/cc	% DAC	N/A											
Sample #	Duration	Flow Rate				Field Analysis																	
			cpm	µCi/cc	% DAC																		
N/A																							
↑ W 0.5 0.4 0.4 0.2 0.2 0.6 Concrete covers 0.6 0.5 0.5 0.6 0.6 0.6 0.5 1.0 0.8 0.6 0.6 0.6 0.5 0.4 0.4 0.4 0.4 0.2 0.2 ← Canal walls → ← grating → Smears 1-5 south stairs 6-15 floor 16-20 crane 21-30 south wall 31-40 north wall 41-45 west wall 46-50 north stairs 51-60 canal covers E1-5 east wall				DOSE RATE (HIGHEST) mr/hr <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>CONTACT READING</td> <td>N/A</td> </tr> <tr> <td>GENERAL AREA READING</td> <td>1</td> </tr> </table>			CONTACT READING	N/A	GENERAL AREA READING	1													
				CONTACT READING	N/A																		
				GENERAL AREA READING	1																		
				MASSLINN SURVEY RESULTS (in dpm) <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>1. N/A</td> <td>5. N/A</td> </tr> <tr> <td>2.</td> <td>6.</td> </tr> <tr> <td>3.</td> <td>7.</td> </tr> <tr> <td>4.</td> <td>8.</td> </tr> </table>			1. N/A	5. N/A	2.	6.	3.	7.	4.	8.									
1. N/A	5. N/A																						
2.	6.																						
3.	7.																						
4.	8.																						
SMEAR SURVEY RESULTS (dpm/100cm²) α β γ ³H <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>1. NA</td> <td>8. NA</td> <td>15. 31389</td> </tr> <tr> <td>2.</td> <td>9.</td> <td>16. 31462</td> </tr> <tr> <td>3.</td> <td>10.</td> <td>N/A</td> </tr> <tr> <td>4.</td> <td>11.</td> <td></td> </tr> <tr> <td></td> <td>12.</td> <td></td> </tr> <tr> <td>6.</td> <td>13.</td> <td></td> </tr> <tr> <td>7.</td> <td>14.</td> <td></td> </tr> </table>			1. NA	8. NA	15. 31389	2.	9.	16. 31462	3.	10.	N/A	4.	11.			12.		6.	13.		7.	14.	
1. NA	8. NA	15. 31389																					
2.	9.	16. 31462																					
3.	10.	N/A																					
4.	11.																						
	12.																						
6.	13.																						
7.	14.																						
Surveyed By William Calash <i>[Signature]</i> Date: 03/26/2012		Reviewed By: <i>[Signature]</i> Date: 3/26/12		Page <u>1</u> of <u>2</u>																			

Activity Report

3/26/12
2:56:43PM

DEEP PIT UPPER LEVEL

Batch Name:	31,445	Acquisition Date:	3/26/12
Batch ID:	1 Minute Smear Analysis - 201203261338	Acquisition Time:	1.0
Group:	E	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
20120326133813-E1	0.00	21.12	18.07	14.79	1,339.36	167.75	32.73
20120326134113-E2	0.00	2.90	7.40	14.79	687.71	120.17	32.73
20120326134233-E3	0.00	-0.70	0.65	14.79	428.97	95.07	32.73
20120326134353-E4	0.00	-0.79	0.67	14.79	698.20	121.07	32.73
20120326134503-E5	0.00	-0.80	0.68	14.79	739.62	124.60	32.73
20120326134624-E6	0.00	-0.59	0.64	14.79	97.62	46.39	32.73
20120326134744-E7	0.00	-0.67	0.65	14.79	351.31	86.15	32.73
20120326134854-E8	0.00	6.67	10.45	14.79	454.58	97.87	32.73
20120326135014-E9	0.00	-0.59	0.64	14.79	118.33	50.81	32.73
20120326135134-E10	0.00	-0.57	0.64	14.79	61.37	37.42	32.73
20120326135244-E11	0.00	-0.57	0.64	14.79	61.37	37.42	32.73
20120326135404-E12	0.00	-0.57	0.64	14.79	61.37	37.42	32.73
20120326135514-E13	0.00	-0.58	0.64	14.79	87.26	44.01	32.73
20120326135634-E14	0.00	-0.78	0.67	14.79	687.85	120.17	32.73
20120326135754-E15	0.00	-0.58	0.64	14.79	76.91	41.50	32.73
20120326135904-E16	0.00	10.37	12.79	14.79	402.66	92.20	32.73
20120326140024-E17	0.00	2.92	7.40	14.79	630.75	115.12	32.73
20120326140144-E18	0.00	17.00	16.52	14.79	2,618.33	235.25	32.73
20120326140254-E19	0.00	20.88	18.08	14.79	2,053.85	208.04	32.73
20120326140414-E20	0.00	119.56	43.26	14.79	15,625.18	598.80	32.73
20120326140535-E21	0.00	-0.59	0.64	14.79	123.50	51.86	32.73
20120326140645-E22	0.00	-0.58	0.64	14.79	87.26	44.01	32.73
20120326140805-E23	0.00	3.05	7.40	14.79	247.62	72.59	32.73
20120326140925-E24	0.00	-0.55	0.64	14.79	4.42	14.85	32.73
20120326141035-E25	0.00	-0.57	0.64	14.79	45.84	32.84	32.73
20120326141155-E26	0.00	-0.56	0.64	14.79	19.95	23.29	32.73
20120326141315-E27	0.00	-0.57	0.64	14.79	61.37	37.42	32.73
20120326141425-E28	0.00	-0.56	0.64	14.79	35.49	29.40	32.73
20120326141545-E29	0.00	-0.96	0.74	14.79	1,210.77	159.41	32.73
20120326141655-E30	0.00	-0.58	0.64	14.79	71.73	40.19	32.73
20120326141815-E31	0.00	-0.56	0.64	14.79	25.13	25.49	32.73
20120326141935-E32	0.00	-0.57	0.64	14.79	40.66	31.17	32.73
20120326142045-E33	0.00	-0.56	0.64	14.79	9.60	18.11	32.73
20120326142205-E34	0.00	-0.56	0.64	14.79	14.78	20.86	32.73
20120326142325-E35	0.00	-0.55	0.64	14.79	4.42	14.85	32.73

Activity Report

3/26/12
2:56:43PM

Efficiency Factors

Alpha Efficiency: 0.27 ± 0.00
(%)

Beta Efficiency: 0.19 ± 0.00
(%)

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
20120326142436-E36	0.00	-0.55	0.64	14.79	-0.76	10.65	32.73
20120326142556-E37	0.00	-0.56	0.64	14.79	19.95	23.29	32.73
20120326142716-E38	0.00	-0.56	0.64	14.79	19.95	23.29	32.73
20120326142826-E39	0.00	-0.56	0.64	14.79	9.60	18.11	32.73
20120326142946-E40	0.00	-0.55	0.64	14.79	-0.76	10.65	32.73
20120326143106-E41	0.00	-0.56	0.64	14.79	25.13	25.49	32.73
20120326143216-E42	0.00	-0.66	0.65	14.79	330.60	83.61	32.73
20120326143336-E43	0.00	-0.56	0.64	14.79	30.31	27.51	32.73
20120326143456-E44	0.00	-0.56	0.64	14.79	14.78	20.86	32.73
20120326143606-E45	0.00	-0.56	0.64	14.79	9.60	18.11	32.73
20120326143726-E46	0.00	-0.59	0.64	14.79	107.97	48.65	32.73
20120326143836-E47	0.00	-0.56	0.64	14.79	19.95	23.29	32.73
20120326143956-E48	0.00	-0.57	0.64	14.79	61.37	37.42	32.73
20120326144116-E49	0.00	-0.57	0.64	14.79	56.20	35.96	32.73
20120326144226-E50	0.00	-0.56	0.64	14.79	25.13	25.49	32.73
20120326144346-E51	0.00	-0.57	0.64	14.79	56.20	35.96	32.73
20120326144507-E52	0.00	-0.58	0.64	14.79	76.91	41.50	32.73
20120326144617-E53	0.00	-0.56	0.64	14.79	35.49	29.40	32.73
20120326144737-E54	0.00	-0.60	0.64	14.79	144.21	55.84	32.73
20120326144857-E55	0.00	-0.58	0.64	14.79	66.55	38.83	32.73
20120326145007-E56	0.00	-0.57	0.64	14.79	61.37	37.42	32.73
20120326145127-E57	0.00	-0.56	0.64	14.79	35.49	29.40	32.73
20120326145247-E58	0.00	-0.58	0.64	14.79	71.73	40.19	32.73
20120326145357-E59	0.00	-0.62	0.64	14.79	211.52	67.20	32.73
20120326145517-E60	0.00	39.08	24.48	14.79	2.731.38	240.40	32.73

Reviewed by:

we

Activity Report

3/29/12
7:02:42AM

97 EAST WALL

Batch Name:	31,462	Acquisition Date:	3/29/12
Batch ID:	1 Minute Smear Analysis - 201203290654	Acquisition Time:	1.0
Group:	E	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	
Selected Geometry: 1/8" Stainless Steel			

Efficiency Factors

Alpha Efficiency: (%)	0.27	±	0.00	Beta Efficiency: (%)	0.19	±	0.00
-----------------------	------	---	------	----------------------	------	---	------

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
20120329065429-E1	0.00	-0.56	0.64	14.79	19.95	23.29	32.73
20120329065730-E2	0.00	6.79	10.45	14.79	76.62	41.51	32.73
20120329065850-E3	0.00	-0.56	0.64	14.79	35.49	29.40	32.73
20120329070010-E4	0.00	-0.56	0.64	14.79	25.13	25.49	32.73
20120329070120-E5	0.00	-0.56	0.64	14.79	14.78	20.86	32.73

post decon of crane rails

Reviewed by:



Activity Report

4/9/12
10:12:41AM

DEEP PIT AREA

Batch Name:	31,521	Acquisition Date:	4/9/12
Batch ID:	1 Minute Smear Analysis - 201204090957	Acquisition Time:	1.0
Group:	F	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	<u>Alpha</u> (DPM)	<u>2σ</u>	<u>Alpha MDA</u> (DPM)	<u>Beta Activity</u> (DPM)	<u>2σ</u>	<u>Beta MDA</u> (DPM)
20120409095708-F1	0.00	-0.60	0.64	14.79	149.39	56.80	32.73
20120409095838-F2	0.00	3.11	7.40	14.79	56.05	35.96	32.73
20120409095958-F3	0.00	-0.57	0.64	14.79	40.66	31.17	32.73
20120409100119-F4	0.00	6.80	10.45	14.79	61.09	37.43	32.73
20120409100229-F5	0.00	-0.57	0.64	14.79	56.20	35.96	32.73
20120409100349-F6	0.00	-0.58	0.64	14.79	82.08	42.78	32.73
20120409100509-F7	0.00	-0.62	0.64	14.79	195.99	64.76	32.73
20120409100619-F8	0.00	-0.56	0.64	14.79	14.78	20.86	32.73
20120409100739-F9	0.00	-0.56	0.64	14.79	25.13	25.49	32.73
20120409100849-F10	0.00	3.12	7.40	14.79	24.99	25.49	32.73
20120409101009-F11	0.00	3.11	7.40	14.79	81.94	42.78	32.73
20120409101129-F12	0.00	-0.57	0.64	14.79	45.84	32.84	32.73

we 4-9-12

post decon of North & East
stairs and Areas of concrete
not painted

Reviewed by:

we

RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT																							
LOCATION & EQUIPT. 701 high bay		☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # 043 ☐ WP # _____		Model #	Serial #	CAL DUE																					
		Date 03/28/12 TIME: 12:30		S5-XLB	67705	04/25/12																					
Transfer canal Smear locations 1-10 Floor 11-15 East wall 16-25 South wall 26-35 North wall 36-40 Roof S ↑ CANAL NOTE: <u>Contact</u> <u>30cm</u> <u>Waist</u>				LB-5100	32487	9/30/12																					
				RO20	3838	04/04/12																					
				N/A																							
				LEGEND ○ - SMEAR SURVEY LOCATION ▲ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCATIONS C - CONTAMINATION * - CONTACT XXX/YYY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm AIRBORNE ACTIVITY SURVEY <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="2">Field Analysis</th> <th rowspan="2">% DAC</th> </tr> <tr> <th>cpm</th> <th>µCi/cc</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>							Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A								
Sample #	Duration	Flow Rate	Field Analysis		% DAC																						
			cpm	µCi/cc																							
N/A																											
DOSE RATE (HIGHEST) mr/hr <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>CONTACT READING</td> <td>22</td> </tr> <tr> <td>GENERAL AREA READING</td> <td>8</td> </tr> </table>							CONTACT READING	22	GENERAL AREA READING	8																	
CONTACT READING	22																										
GENERAL AREA READING	8																										
MASSLINN SURVEY RESULTS (in dpm) <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>1. N/A</td> <td>5. N/A</td> </tr> <tr> <td>2.</td> <td>6.</td> </tr> <tr> <td>3.</td> <td>7.</td> </tr> <tr> <td>4.</td> <td>8.</td> </tr> </table>							1. N/A	5. N/A	2.	6.	3.	7.	4.	8.													
1. N/A	5. N/A																										
2.	6.																										
3.	7.																										
4.	8.																										
SMEAR SURVEY RESULTS (dpm/100cm²) α β γ ³H <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>1. NA</td> <td>8. NA</td> <td>15. 4252</td> </tr> <tr> <td>2.</td> <td>9.</td> <td>16. N/A</td> </tr> <tr> <td>3.</td> <td>10.</td> <td></td> </tr> <tr> <td>4.</td> <td>11.</td> <td>18.</td> </tr> <tr> <td>6.</td> <td>12.</td> <td>19.</td> </tr> <tr> <td>7.</td> <td>13.</td> <td>20.</td> </tr> <tr> <td></td> <td>14.</td> <td>21.</td> </tr> </table>							1. NA	8. NA	15. 4252	2.	9.	16. N/A	3.	10.		4.	11.	18.	6.	12.	19.	7.	13.	20.		14.	21.
1. NA	8. NA	15. 4252																									
2.	9.	16. N/A																									
3.	10.																										
4.	11.	18.																									
6.	12.	19.																									
7.	13.	20.																									
	14.	21.																									
Surveyed By WilliamCalash		Date: 03/28/12		Reviewed By: <i>[Signature]</i>		Date: 3/28/12																					
FS-SOP-1000 Attachment 9.2		Page <u>1</u> of <u>2</u>																									

Sample Report

Batch ID: 1min. Smear - 201203281553
Group: H
Device: HFBR
Batch Key: 4,252
Selected Geometry: 1/8" Stainless Steel

Count Date: 3/28/2012
Count Minutes: 1.0
Count Mode: Simultaneous
Operating Volts: 1350

	Efficiency (%)			Spillover (%)		
Alpha:	27.51	±	0.10	Alpha to Beta:	5.94	± 0.00
Beta:	19.49	±	0.10	Beta to Alpha:	0.08	± 0.00

Sample ID	Sample Type	Alpha (dpm)	Unc	Alpha MDA (dpm)	Beta (dpm)	Unc	Beta MDA (dpm)	(dpm)
20120328155311-H1	Unknown	3.61	3.64	9.84	51.01	16.23	13.89	
20120328155441-H2	Unknown	10.34	6.30	9.84	1,015.18	72.39	13.89	
20120328155601-H3	Unknown	-0.18	0.04	9.84	323.30	40.76	13.89	
20120328155711-H4	Unknown	-0.03	0.01	9.84	56.45	17.02	13.89	
20120328155831-H5	Unknown	-0.02	0.01	9.84	35.92	13.58	13.89	
20120328155951-H6	Unknown	-0.06	0.02	9.84	112.90	24.08	13.89	
20120328160101-H7	Unknown	-0.06	0.02	9.84	102.64	22.96	13.89	
20120328160221-H8	Unknown	-0.09	0.02	9.84	153.95	28.12	13.89	
20120328160331-H9	Unknown	3.56	3.64	9.84	133.12	26.18	13.89	
20120328160451-H10	Unknown	3.38	3.64	9.84	456.42	48.47	13.89	
20120328160601-H11	Unknown	0.00	0.00	9.84	5.13	5.13	13.89	
20120328160721-H12	Unknown	-0.02	0.01	9.84	30.79	12.57	13.89	
20120328160841-H13	Unknown	-0.02	0.01	9.84	35.92	13.58	13.89	
20120328160951-H14	Unknown	0.00	0.00	9.84	5.13	5.13	13.89	
20120328161111-H15	Unknown	-0.01	0.01	9.84	15.40	8.89	13.89	
20120328161221-H16	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120328161341-H17	Unknown	-0.05	0.01	9.84	92.37	21.78	13.89	
20120328161451-H18	Unknown	-0.02	0.01	9.84	35.92	13.58	13.89	
20120328161611-H19	Unknown	7.23	5.14	9.84	76.37	19.88	13.89	
20120328161721-H20	Unknown	-0.02	0.01	9.84	41.05	14.52	13.89	
20120328161841-H21	Unknown	-0.01	0.00	9.84	10.26	7.26	13.89	
20120328162001-H22	Unknown	3.62	3.64	9.84	25.35	11.48	13.89	
20120328162111-H23	Unknown	-0.03	0.01	9.84	46.19	15.40	13.89	
20120328162231-H24	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120328162341-H25	Unknown	-0.03	0.01	9.84	61.58	17.78	13.89	
20120328162501-H26	Unknown	-0.21	0.04	9.84	384.88	44.48	13.89	
20120328162611-H27	Unknown	-0.03	0.01	9.84	56.45	17.02	13.89	
20120328162731-H28	Unknown	-0.02	0.01	9.84	35.92	13.58	13.89	
20120328162851-H29	Unknown	-0.02	0.01	9.84	41.05	14.52	13.89	
20120328163001-H30	Unknown	-0.01	0.01	9.84	15.40	8.89	13.89	
20120328163121-H31	Unknown	-0.02	0.01	9.84	41.05	14.52	13.89	
20120328163231-H32	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120328163351-H33	Unknown	-0.01	0.00	9.84	10.26	7.26	13.89	
20120328163501-H34	Unknown	-0.02	0.01	9.84	30.79	12.57	13.89	
20120328163621-H35	Unknown	-0.01	0.01	9.84	15.40	8.89	13.89	
20120328163731-H36	Unknown	-0.01	0.01	9.84	25.66	11.48	13.89	

Sample Report

Efficiency (%)				Spillover (%)			
Alpha:	27.51	±	0.10	Alpha to Beta:	5.94	±	0.00
Beta:	19.49	±	0.10	Beta to Alpha:	0.08	±	0.00

Sample ID	Sample Type	<u>Alpha</u> <u>(dpm)</u>	<u>Unc</u>	<u>Alpha MDA</u> <u>(dpm)</u>	<u>Beta</u> <u>(dpm)</u>	<u>Unc</u>	<u>Beta MDA</u> <u>(dpm)</u>	<u>(dpm)</u>
20120328163851-H37	Unknown	-0.01	0.01	9.84	25.66	11.48	13.89	
20120328164011-H38	Unknown	3.63	3.64	9.84	15.09	8.89	13.89	
20120328164121-H39	Unknown	-0.01	0.01	9.84	25.66	11.48	13.89	
20120328164241-H40	Unknown	-0.03	0.01	9.84	56.45	17.02	13.89	

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT		
LOCATION & EQUIPT. 701 high bay		☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # 2011-043 ☐ WP # _____		Model #	Serial #	CAL DUE
		Date 3/28/12 TIME: 12:30		S5-XLB	67705	04/25/12
79 ft deep pit				Lud-3	92741	02/09/13
				RO20	3838	04/04/12
				N/A		
				LEGEND ○ - SMEAR SURVEY LOCATION ▲ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCATION C - CONTAMINATION * - CONTACT XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ		
PLENUM *25 *30 *30 1000B⁻ 471B⁻ 377B⁻ 440B⁻ W ↑ 48B⁻ Wall Wall contact dose rates are 30 mr/hr And 90B⁻ Contact 30CM waist 120B⁻ wall 90B⁻ 660B⁻ Hole in floor Wall contact dose rates are 30 mr/hr And 90B⁻ 22B⁻ wall 48B⁻ wall 125B⁻ wall 270/80 @30cm Drain on 40 25 15 480B⁻ 34 20 15 220B⁻ 30 20 15 25 18 15 110B⁻ 21 15 15 40 32 15 240B⁻ 10 10 10 32B⁻ 10 8 8 6 8 8 6 8 8 67B⁻ 125B⁻ 28B⁻ 60 30 15 35 20 15 20 15 12						

Surveyed By William Calash Date: 3/28/12
 FS-SOP-1000
 Attachment 9.2

Reviewed By: [Signature] Date: 3/28/12

 Page 1 of 3

Activity Report

3/28/12
3:37:53PM

DEEP PIT LOWER LEVEL

Batch Name:	31,458	Acquisition Date:	3/28/12
Batch ID:	1 Minute Smear Analysis - 201203281410	Acquisition Time:	1.0
Group:	F	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	<u>Alpha</u> <u>(DPM)</u>	<u>2σ</u>	<u>Alpha MDA</u> <u>(DPM)</u>	<u>Beta Activity</u> <u>(DPM)</u>	<u>2σ</u>	<u>Beta MDA</u> <u>(DPM)</u>
20120328141056-F1	0.00	27.63	20.90	14.79	3,917.45	288.91	32.73
20120328151340-F2	0.00	53.95	28.57	14.79	2,368.39	223.65	32.73
20120328151450-F3	0.00	24.14	19.54	14.79	3,317.01	265.35	32.73
20120328151610-F4	0.00	2.90	7.40	14.79	713.59	122.40	32.73
20120328151730-F5	0.00	9.96	12.79	14.79	1,629.72	185.11	32.73
20120328151840-F6	0.00	64.20	31.32	14.79	4,791.02	320.42	32.73
20120328152000-F7	0.00	6.35	10.45	14.79	1,396.88	171.29	32.73
20120328152120-F8	0.00	303.86	68.52	14.79	26,697.71	809.13	32.73
20120328152230-F9	0.00	101.16	39.05	14.79	4,489.30	309.93	32.73
20120328152350-F10	0.00	38.41	24.50	14.79	4,750.59	318.99	32.73
20120328152510-F11	0.00	2.59	7.42	14.79	1,640.36	185.71	32.73
20120328152620-F12	0.00	-0.73	0.66	14.79	542.88	106.84	32.73
20120328152740-F13	0.00	-0.61	0.64	14.79	175.28	61.35	32.73
20120328152900-F14	0.00	-0.57	0.64	14.79	61.37	37.42	32.73
20120328153011-F15	0.00	98.22	38.33	14.79	2,237.25	217.38	32.73
20120328153131-F16	0.00	-0.59	0.64	14.79	107.97	48.65	32.73
20120328153251-F17	0.00	3.04	7.40	14.79	268.33	75.49	32.73
20120328153401-F18	0.00	6.75	10.45	14.79	195.70	64.76	32.73
20120328153521-F19	0.00	-0.57	0.64	14.79	40.66	31.17	32.73
20120328153631-F20	0.00	724.42	103.79	14.79	3,466.03	272.43	32.73

Handwritten notes:
 - A bracket on the left side of rows F1 through F10 is labeled "Floor".
 - A bracket on the left side of rows F11 through F20 is labeled "South wall Above 6 FT".

Reviewed by: _____

Handwritten signature

Activity Report

3/28/12
3:12:30PM

THE PIT LOWER LEVEL

Batch Name:	31,457	Acquisition Date:	3/28/12
Batch ID:	1 Minute Smear Analysis - 201203281336	Acquisition Time:	1.0
Group:	E	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
20120328133608-E1	0.00	13.52	14.77	14.79	2,012.71	205.91	32.73
20120328133908-E2	0.00	17.68	16.50	14.79	604.30	112.74	32.73
20120328134028-E3	0.00	90.19	36.90	14.79	4,230.86	300.62	32.73
20120328134148-E4	0.00	-0.94	0.73	14.79	1,174.53	157.00	32.73
20120328134259-E5	0.00	3.05	7.40	14.79	237.27	71.09	32.73
20120328134419-E6	0.00	-0.62	0.64	14.79	195.99	64.76	32.73
20120328134539-E7	0.00	129.61	45.21	14.79	18,674.28	660.75	32.73
20120328134649-E8	0.00	10.01	12.79	14.79	1,474.40	176.02	32.73
20120328134809-E9	0.00	2.69	7.41	14.79	1,334.89	167.42	32.73
20120328134929-E10	0.00	13.89	14.76	14.79	909.91	138.21	32.73
20120328135039-E11	0.00	-0.71	0.66	14.79	485.93	101.12	32.73
20120328135159-E12	0.00	98.70	38.33	14.79	792.74	129.30	32.73
20120328135309-E13	0.00	190.05	53.21	14.79	3,212.24	261.30	32.73
20120328135429-E14	0.00	10.42	12.79	14.79	262.87	74.78	32.73
20120328135549-E15	0.00	81.92	35.43	14.79	6,913.07	387.51	32.73
20120328135659-E16	0.00	17.26	16.51	14.79	1,852.07	197.45	32.73
20120328135819-E17	0.00	65.12	31.30	14.79	2,015.90	206.18	32.73
20120328135939-E18	0.00	3.02	7.40	14.79	325.28	82.97	32.73
20120328140049-E19	0.00	6.65	10.45	14.79	521.88	104.79	32.73
20120328140209-E20	0.00	10.17	12.79	14.79	998.07	144.74	32.73
20120328140330-E21	0.00	127.25	43.65	14.79	3,613.32	277.35	32.73
20120328140440-E22	0.00	104.34	39.76	14.79	6,006.16	360.19	32.73
20120328140600-E23	0.00	79.61	34.60	14.79	2,771.24	242.24	32.73
20120328140720-E24	0.00	6.24	10.46	14.79	1,733.41	190.95	32.73
20120328140830-E25	0.00	130.06	44.30	14.79	6,232.97	367.22	32.73
20120328140950-E26	0.00	72.26	32.99	14.79	2,724.93	240.16	32.73
20120328141110-E27	0.00	138.24	45.49	14.79	3,830.35	285.76	32.73
20120328141220-E28	0.00	23.86	19.56	14.79	4,160.93	297.97	32.73
20120328141340-E29	0.00	61.35	30.42	14.79	2,264.56	218.65	32.73
20120328141450-E30	0.00	68.87	32.15	14.79	1,844.90	197.18	32.73
20120328141610-E31	0.00	-0.99	0.75	14.79	1,324.68	166.77	32.73
20120328141730-E32	0.00	-0.60	0.64	14.79	154.57	57.74	32.73
20120328141840-E33	0.00	2.88	7.40	14.79	770.54	127.18	32.73
20120328142000-E34	0.00	54.52	29.71	14.79	11,703.22	511.89	32.73
20120328142120-E35	0.00	-0.57	0.64	14.79	56.20	35.96	32.73

Activity Report

3/28/12
3:12:30PM

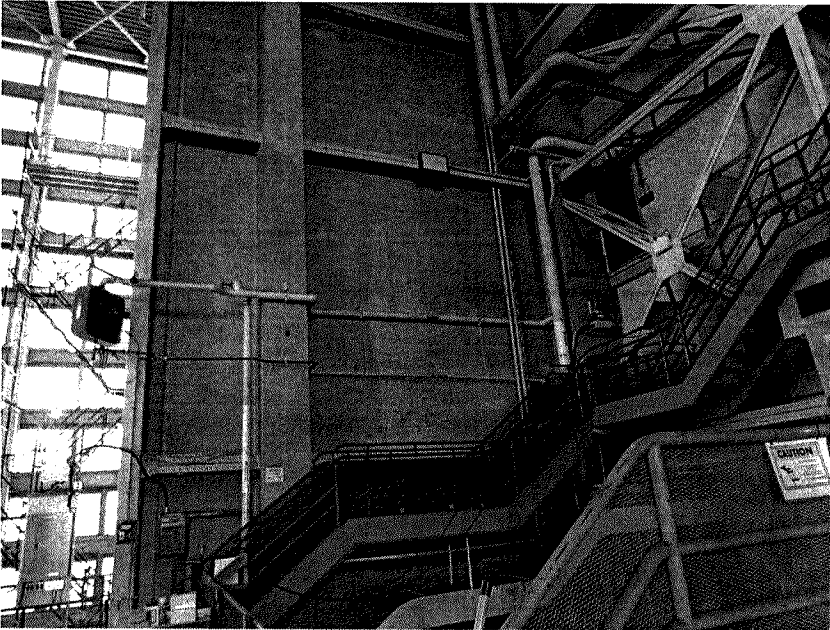
Efficiency Factors

Alpha Efficiency: 0.27 ± 0.00 Beta Efficiency: 0.19 ± 0.00
(%) (%)

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
20120328142231-E36	0.00	36.10	23.33	14.79	608.76	113.22	32.73
20120328142351-E37	0.00	17.53	16.50	14.79	1,054.74	148.81	32.73
20120328142511-E38	0.00	16.76	16.53	14.79	3,348.35	266.61	32.73
20120328142621-E39	0.00	39.75	24.46	14.79	738.06	124.60	32.73
20120328142741-E40	0.00	6.20	10.46	14.79	1,868.03	198.29	32.73
20120328142901-E41	0.00	2.97	7.40	14.79	480.61	100.59	32.73
20120328143011-E42	0.00	-0.59	0.64	14.79	102.79	47.53	32.73
20120328143131-E43	0.00	-0.62	0.64	14.79	201.17	65.58	32.73
20120328143251-E44	0.00	-0.59	0.64	14.79	107.97	48.65	32.73
20120328143401-E45	0.00	-0.58	0.64	14.79	71.73	40.19	32.73
20120328143521-E46	0.00	6.74	10.45	14.79	247.48	72.59	32.73
20120328143631-E47	0.00	6.12	10.46	14.79	2,101.01	210.42	32.73
20120328143751-E48	0.00	28.47	20.87	14.79	1,396.02	171.29	32.73
20120328143911-E49	0.00	27.02	20.93	14.79	5,755.45	352.22	32.73
20120328144021-E50	0.00	61.16	30.42	14.79	2,854.79	245.89	32.73
20120328144141-E51	0.00	357.86	73.13	14.79	8,440.12	430.53	32.73
20120328144302-E52	0.00	16.69	16.53	14.79	3,565.81	275.32	32.73
20120328144412-E53	0.00	24.84	19.52	14.79	1,225.31	160.44	32.73
20120328144532-E54	0.00	21.14	18.07	14.79	1,277.23	163.80	32.73
20120328144652-E55	0.00	42.55	25.57	14.79	3,388.78	268.29	32.73
20120328144802-E56	0.00	3.08	7.40	14.79	154.43	57.74	32.73
20120328144922-E57	0.00	91.46	36.88	14.79	415.07	93.94	32.73
20120328145042-E58	0.00	-0.56	0.64	14.79	25.13	25.49	32.73
20120328145152-E59	0.00	-0.66	0.65	14.79	309.89	81.00	32.73
20120328145312-E60	0.00	3.12	7.40	14.79	24.99	25.49	32.73
20120328145432-E62	0.00	-0.58	0.64	14.79	71.73	40.19	32.73
20120328145542-E63	0.00	3.06	7.40	14.79	221.73	68.78	32.73
20120328145702-E64	0.00	-0.69	0.65	14.79	423.80	94.51	32.73
20120328145812-E65	0.00	3.06	7.40	14.79	216.56	68.00	32.73
20120328145932-E66	0.00	-0.60	0.64	14.79	144.21	55.84	32.73
20120328150052-E67	0.00	-0.58	0.64	14.79	92.44	45.22	32.73
20120328150202-E68	0.00	-0.59	0.64	14.79	113.15	49.74	32.73
20120328150323-E69	0.00	-0.59	0.64	14.79	97.62	46.39	32.73
20120328150443-E70	0.00	6.79	10.45	14.79	97.33	46.39	32.73
20120328150553-E71	0.00	-0.59	0.64	14.79	113.15	49.74	32.73
20120328150713-E72	0.00	-0.56	0.64	14.79	19.95	23.29	32.73
20120328150833-E73	0.00	-0.58	0.64	14.79	87.26	44.01	32.73
20120328150943-E74	0.00	-0.60	0.64	14.79	128.68	52.88	32.73
20120328151103-E75	0.00	-0.58	0.64	14.79	87.26	44.01	32.73

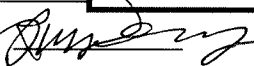
Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY ☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # _____ ☐ WP # 314-35		INSTRUMENT <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width: 33%;">Model #</th> <th style="width: 33%;">Serial #</th> <th style="width: 34%;">CAL DUE</th> </tr> <tr> <td>S5-XLB</td> <td>67705</td> <td>04/20/13</td> </tr> <tr> <td>Bicron</td> <td>A885S</td> <td>8/01/12</td> </tr> <tr> <td>N/A</td> <td></td> <td style="text-align: center;">→</td> </tr> <tr> <td>N/A</td> <td></td> <td style="text-align: center;">→</td> </tr> </table>		Model #	Serial #	CAL DUE	S5-XLB	67705	04/20/13	Bicron	A885S	8/01/12	N/A		→	N/A		→
Model #	Serial #	CAL DUE																		
S5-XLB	67705	04/20/13																		
Bicron	A885S	8/01/12																		
N/A		→																		
N/A		→																		
LOCATION & EQUIPT. 701 Building		Date 4/24/12		TIME: 10:00																
High Bay Performed survey of the South stairs from 123' to 140'. General area dose rates are 5-10 microR/HR. Batch #31613 smears taken on steps and handrails.																				
																				
LEGEND ☐ - SMEAR SURVEY LOCATION ☐ - MASSLINN SURVEY LOCATION C - CONTAMINATION XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ ☐ - AIR SAMPLE LOCATION # - DIRECT FRISK LOCA- * CONTACT																				
AIRBORNE ACTIVITY SURVEY																				
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th rowspan="2" style="width: 15%;">Sample #</th> <th rowspan="2" style="width: 15%;">Duration</th> <th rowspan="2" style="width: 15%;">Flow Rate</th> <th colspan="2" style="width: 30%;">Field Analysis</th> <th rowspan="2" style="width: 15%;">% DAC</th> </tr> <tr> <th style="width: 15%;">cpm</th> <th style="width: 15%;">µCi/cc</th> </tr> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">→</td> </tr> </table>						Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A					→	
Sample #	Duration	Flow Rate	Field Analysis		% DAC															
			cpm	µCi/cc																
N/A					→															
DOSE RATE (HIGHEST) Micro R/hr																				
CONTACT READING			N/A																	
GENERAL AREA READING			5-10																	
MASSLINN SURVEY RESULTS (in dpm)																				
1. N/A		5. N/A																		
2.		6.																		
3.		7.																		
4.		8.																		
↓		↓																		
SMEAR SURVEY RESULTS (dpm/100cm²) α β,γ ³H																				
1. SEE		8. Attachment		15. 31613																
2.		9.		16.																
3.		10.		17.																
4.		11.		18.																
5.		12.		19.																
6.		13.		20.																
7.		14.		21.																
↓		↓		↓																

Surveyed By **Detterman** 

Date: **4/24/12**

Reviewed By:  **Date:** **4/25/12**

FS-SOP-1000
 Attachment 9.2

Page 1 of 2

Activity Report

4/24/12
10:27:02AM

140 SOUTH STAIRS

Batch Name:	31,613	Acquisition Date:	4/24/12
Batch ID:	1 Minute Smear Analysis - 201204240925	Acquisition Time:	1.0
Group:	G	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,350.0
		(volts)	

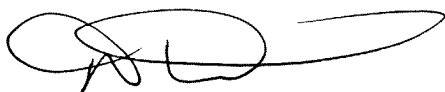
Selected Geometry: 1/8" Stainless Steel

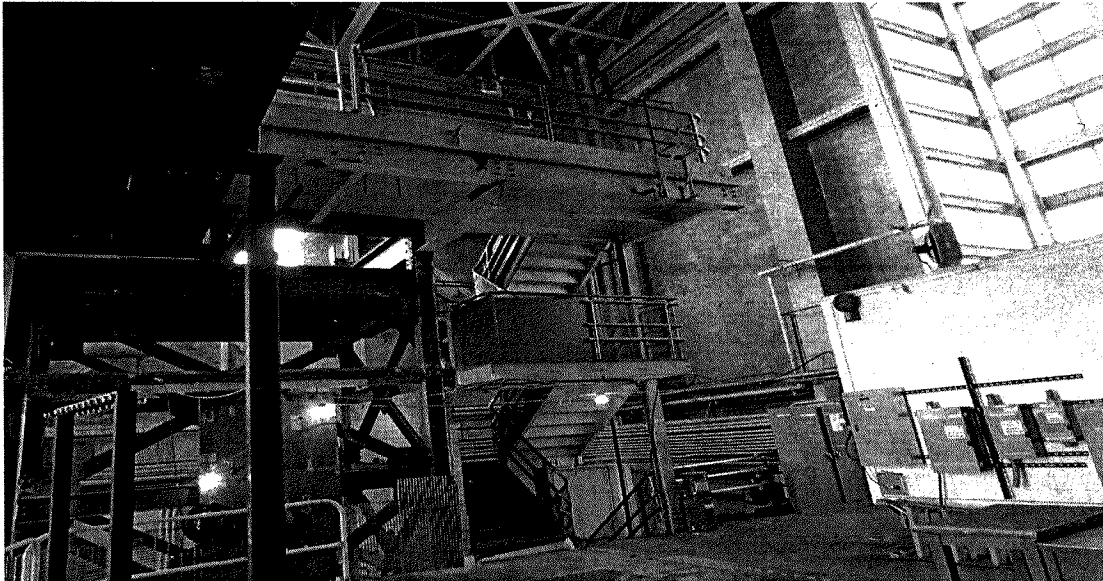
Efficiency Factors

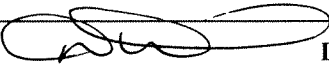
Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

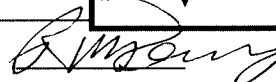
Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20120424092557-G41 1	0.00	3.46	7.40	12.78	146.43	57.26	38.35
20120424101530-G42 2	0.00	3.50	7.40	12.78	21.25	25.76	38.35
20120424101650-G43 3	0.00	-0.22	0.37	12.78	110.06	50.15	38.35
20120424101800-G44 4	0.00	3.50	7.40	12.78	36.90	31.47	38.35
20120424101920-G45 5	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120424102040-G46 6	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120424102150-G47 7	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120424102310-G48 8	0.00	-0.21	0.37	12.78	68.34	40.54	38.35
20120424102430-G49 9	0.00	7.20	10.46	12.78	15.89	23.55	38.35
20120424102541-G50 10	0.00	3.51	7.40	12.78	5.60	18.35	38.35

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT																		
LOCATION & EQUIPT. 701 Building		☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # _____ ☐ WP # 314-35		Model #	Serial #																	
		Date 4/24/12 TIME: 10:00		S5-XLB	67705																	
High Bay				Bicron	A885S																	
				N/A																		
				N/A																		
Performed survey of the old elev. stairs from 110' to 140'. General area dose rates are 6-10 microR/HR. Batch #31612 smears taken on steps and handrails. 		LEGEND ☐ - SMEAR SURVEY LOCATION ▲ - AIR SAMPLE LOCATION ☐ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCA- ☐ - CONTAMINATION * - CONTACT XXX ZZZ XXX = contact reading Y = radiation type ZZZ = reading @ 30cm																				
		AIRBORNE ACTIVITY SURVEY																				
		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="2">Field Analysis</th> <th rowspan="2">% DAC</th> </tr> <tr> <th>cpm</th> <th>µCi/cc</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A										
		Sample #	Duration				Flow Rate	Field Analysis		% DAC												
				cpm	µCi/cc																	
		N/A																				
		DOSE RATE (HIGHEST) Micro R/hr																				
		CONTACT READING																				
		N/A																				
		GENERAL AREA READING																				
6-10																						
MASSLINN SURVEY RESULTS (in dpm)																						
<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td>1. N/A</td> <td>5. N/A</td> </tr> <tr> <td>2.</td> <td>6.</td> </tr> <tr> <td>3.</td> <td>7.</td> </tr> <tr> <td>4.</td> <td>8.</td> </tr> </tbody> </table>		1. N/A	5. N/A	2.	6.	3.	7.	4.	8.													
1. N/A	5. N/A																					
2.	6.																					
3.	7.																					
4.	8.																					
SMEAR SURVEY RESULTS (dpm/100cm²)																						
<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td>1. SEE</td> <td>8. Attachment</td> <td>15. 31612</td> </tr> <tr> <td>2.</td> <td>9.</td> <td>16.</td> </tr> <tr> <td>3.</td> <td>10.</td> <td></td> </tr> <tr> <td>4.</td> <td>11.</td> <td>18.</td> </tr> <tr> <td></td> <td>12.</td> <td>19.</td> </tr> <tr> <td>6.</td> <td>13.</td> <td>20.</td> </tr> <tr> <td>7.</td> <td>14.</td> <td>21.</td> </tr> </tbody> </table>		1. SEE	8. Attachment	15. 31612	2.	9.	16.	3.	10.		4.	11.	18.		12.	19.	6.	13.	20.	7.	14.	21.
1. SEE	8. Attachment	15. 31612																				
2.	9.	16.																				
3.	10.																					
4.	11.	18.																				
	12.	19.																				
6.	13.	20.																				
7.	14.	21.																				

Surveyed By Detterman  Date: 4/24/12
 FS-SOP-1000
 Attachment 9.2

Reviewed By:  Date: 4/25/12

Page 1 of 2

Activity Report

4/24/12
10:14:13AM

OLD ELEV. STAIRWELL

Batch Name: 31,612
Batch ID: 1 Minute Smear Analysis - 201204240923
Group: F
Device: S5 XLB

Acquisition Date: 4/24/12
Acquisition Time: 1.0
(minutes)
Operating Voltage: 1,350.0
(volts)

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency: 0.27 ± 0.00
(%)

Beta Efficiency: 0.19 ± 0.00
(%)

Sample ID	Quantity	<u>Alpha</u> (DPM)	<u>2σ</u>	<u>Alpha MDA</u> (DPM)	<u>Beta Activity</u> (DPM)	<u>2σ</u>	<u>Beta MDA</u> (DPM)
20120424092338-F31	0.00	7.20	10.46	12.78	21.11	25.76	38.35
20120424100241-F32	0.00	10.85	12.81	12.78	140.93	56.30	38.35
20120424100401-F33	0.00	-0.19	0.37	12.78	21.39	25.76	38.35
20120424100511-F34	0.00	3.50	7.40	12.78	16.03	23.55	38.35
20120424100631-F35	0.00	-0.20	0.37	12.78	52.69	36.29	38.35
20120424100751-F36	0.00	3.49	7.40	12.78	52.55	36.29	38.35
20120424100901-F37	0.00	3.50	7.40	12.78	21.25	25.76	38.35
20120424101021-F38	0.00	-0.19	0.37	12.78	26.61	27.79	38.35
20120424101141-F39	0.00	-0.20	0.37	12.78	31.82	29.68	38.35
20120424101251-F40	0.00	-0.19	0.37	12.78	16.18	23.55	38.35

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT	
LOCATION & EQUIPT.: BGRR - CUT HOUSE		☐ ROUTINE ☐ SPECIAL ☒ RWP # <u>011 ERP 45</u> ☐ WP # _____		Model #	Serial #
		DATE: <u>9-23-12</u> TIME: <u>1430</u>		RO-20	3858
SOUTH BELOW GROUND DUCT ~~ENTRY~~ SURVEY <u>AS LEFT SURVEY</u>				Tennelec	67705
				N/A	N/A
ALL DOSE RATES TAKEN AT WAIST HEIGHT AND SHOWN IN mR/hr UNLESS OTHERWISE NOTED SEE ATTACHED SMEAR RESULTS (TENNELEC BATCH #2 9913,29915)		LEGEND			
		☐ - SMEAR SURVEY LOCATION <input type="triangle"/> - AIR SAMPLE LOCATION ☐ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOC-			
		XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ			
		AIRBORNE ACTIVITY SURVEY			
		Sample #	Duration	Flow Rate	Field Analysis
N/A			cpm $\mu\text{Ci/cc}$		
DOSE RATE (HIGHEST)					
CONTACT READING		140 ^{KF} 25.0 mR/hr (Y)			
GENERAL AREA READING		50 ^{KF} 20.0 mR/hr (Y)			
MASSLINN SURVEY RESULTS (in dpm)					
1.	N/A	5.	N/A		
2.		6.			
3.		7.			
4.		8.			
SMEAR SURVEY RESULTS (dpm/100cm ²) (α , β - γ , ³ H)					
SEE ATTACHED SMEAR RESULTS					
TENNELEC BATCH #S 29913,29915					
3.		10.		17.	
4.		11.		18.	
5.		12.		19.	
6.		13.		20.	
7.		14.		21.	
Surveyed By: <u>[Signature]</u> Date: <u>9-27-12</u> Reviewed By: <u>[Signature]</u> Date: <u>9-27-11</u>					
FS-SOP-1000 Attachment 9.2					

Activity Report

9/24/11
3:15:13PM

SOUTH BELOW GROUND DUCT

Batch Name:	29,913	Acquisition Date:	9/24/11
Batch ID:	1 Minute Smear Analysis - 201109241444	Acquisition Time:	1.0
Group:	D	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	
Selected Geometry: 1/8" Stainless Steel			

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

<u>Sample ID</u>	<u>Quantity</u>	<u>Alpha</u> <u>(DPM)</u>	<u>2σ</u>	<u>Alpha MDA</u> <u>(DPM)</u>	<u>Beta Activity</u> <u>(DPM)</u>	<u>2σ</u>	<u>Beta MDA</u> <u>(DPM)</u>
110924144419-D1	0.00	6.63	10.45	14.79	573.66	109.83	32.73
110924144550-D2	0.00	6.73	10.45	14.79	268.19	75.49	32.73
110924144710-D3	0.00	35.56	23.33	14.79	2,239.67	217.38	32.73
110924144830-D4	0.00	27.01	20.93	14.79	5,770.98	352.71	32.73
110924144940-D5	0.00	-0.61	0.64	14.79	164.92	59.57	32.73
110924145100-D6	0.00	6.77	10.45	14.79	159.46	58.66	32.73
110924145220-D7	0.00	2.62	7.41	14.79	1,552.34	180.62	32.73
110924145330-D8	0.00	-1.31	0.94	14.79	2,282.51	219.41	32.73
110924145450-D9	0.00	-0.72	0.66	14.79	506.64	103.24	32.73
110924145600-D10	0.00	-0.66	0.65	14.79	315.07	81.66	32.73
110924145720-D11	0.00	3.06	7.40	14.79	232.09	70.33	32.73
110924145840-D12	0.00	2.81	7.41	14.79	967.29	142.47	32.73
110924145951-D13	0.00	13.90	14.76	14.79	878.85	135.84	32.73
110924150111-D14	0.00	-0.60	0.64	14.79	133.86	53.89	32.73
110924150231-D15	0.00	24.70	19.52	14.79	1,644.68	186.00	32.73
110924150341-D16	0.00	6.63	10.45	14.79	578.84	110.32	32.73
110924150501-D17	0.00	-0.68	0.65	14.79	377.20	89.22	32.73
110924150621-D18	0.00	-0.93	0.72	14.79	1,127.93	153.85	32.73
110924150731-D19	0.00	3.04	7.40	14.79	273.51	76.20	32.73
110924150851-D20	0.00	1.18	7.60	14.79	5,870.35	355.82	32.73
110924151011-D21	0.00	3.04	7.40	14.79	294.22	78.98	32.73
110924151121-D22	0.00	4.16	10.71	14.79	7,987.79	417.90	32.73
110924151241-D23	0.00	-0.68	0.65	14.79	392.73	91.02	32.73
110924151401-D24	0.00	-0.72	0.66	14.79	511.81	103.76	32.73

Reviewed by:



Activity Report

9/24/11
4:17:35PM

SOUTH BELOW GROUND DUCT #2

Batch Name:	29,915	Acquisition Date:	9/24/11
Batch ID:	1 Minute Smear Analysis - 201109241531	Acquisition Time:	1.0
Group:	D	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	
Selected Geometry: 1/8" Stainless Steel			

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20110924153119-D25	0.00	2.99	7.40	14.79	434.01	95.64	32.73
20110924153249-D26	0.00	3.04	7.40	14.79	273.51	76.20	32.73
20110924153409-D27	0.00	2.80	7.41	14.79	993.18	144.36	32.73
20110924153520-D28	0.00	-0.64	0.64	14.79	258.12	74.05	32.73
20110924153640-D29	0.00	-0.63	0.64	14.79	216.70	68.00	32.73
20110924153800-D30	0.00	-0.65	0.65	14.79	299.54	79.66	32.73
20110924153910-D31	0.00	3.04	7.40	14.79	294.22	78.98	32.73
20110924154030-D32	0.00	-0.59	0.64	14.79	118.33	50.81	32.73
20110924154150-D33	0.00	10.49	12.79	14.79	35.06	29.40	32.73
20110924154300-D34	0.00	-0.60	0.64	14.79	144.21	55.84	32.73
20110924154420-D35	0.00	3.04	7.40	14.79	283.86	77.60	32.73
20110924154540-D36	0.00	4.77	10.60	14.79	6,139.44	364.20	32.73
20110924154650-D37	0.00	-0.59	0.64	14.79	113.15	49.74	32.73
20110924154810-D38	0.00	5.21	10.55	14.79	4,845.07	322.20	32.73
20110924154930-D39	0.00	-0.58	0.64	14.79	71.73	40.19	32.73
20110924155040-D40	0.00	4.96	10.58	14.79	5,590.62	346.93	32.73
20110924155200-D41	0.00	3.01	7.40	14.79	371.88	88.62	32.73
20110924155320-D42	0.00	8.99	12.86	14.79	4,544.63	311.76	32.73
20110924155430-D43	0.00	-0.60	0.64	14.79	128.68	52.88	32.73
20110924155551-D44	0.00	-0.64	0.64	14.79	273.65	76.20	32.73
20110924155701-D45	0.00	3.09	7.40	14.79	118.18	50.81	32.73
20110924155821-D46	0.00	15.34	18.91	14.79	18,678.69	660.76	32.73
20110924155941-D47	0.00	20.09	18.12	14.79	4,435.48	307.90	32.73
20110924160051-D48	0.00	48.04	32.91	14.79	42,244.95	1,062.51	32.73
20110924160211-D49	0.00	20.70	19.94	14.79	13,651.25	556.21	32.73
20110924160331-D50	0.00	-0.72	0.66	14.79	491.10	101.66	32.73
20110924160441-D51	0.00	10.44	12.79	14.79	195.56	64.76	32.73
20110924160601-D52	0.00	132.47	53.47	14.79	76,479.8-	1,554.41	32.73
20110924160721-D53	0.00	2.91	7.40	14.79	682.53	119.72	32.73
20110924160831-D54	0.00	-1.13	0.82	14.79	1,728.52	190.66	32.73
20110924160951-D55	0.00	20.01	18.12	14.79	4,668.47	316.12	32.73
20110924161111-D56	0.00	12.51	14.84	14.79	5,057.06	329.41	32.73
20110924161221-D57	0.00	88.96	38.03	14.79	18,976.1-	666.65	32.73
20110924161342-D58	0.00	30.20	22.23	14.79	7,272.31	397.85	32.73
20110924161502-D59	0.00	25.69	22.98	14.79	20,811.38	701.97	32.73

John F. L.

3 of 4

Activity Report

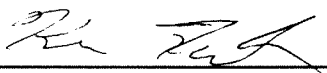
9/24/11
4:17:35PM

Efficiency Factors

Alpha Efficiency: (%)	0.27	±	0.00	Beta Efficiency: (%)	0.19	±	0.00
--------------------------	------	---	------	-------------------------	------	---	------

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
0110924161612-D60	0.00	58.92	31.89	14.79	20,639.2-	698.72	32.73

Reviewed by:



4 of 4

RADIOLOGICAL SURVEY FORM **FS-SOP-1000**

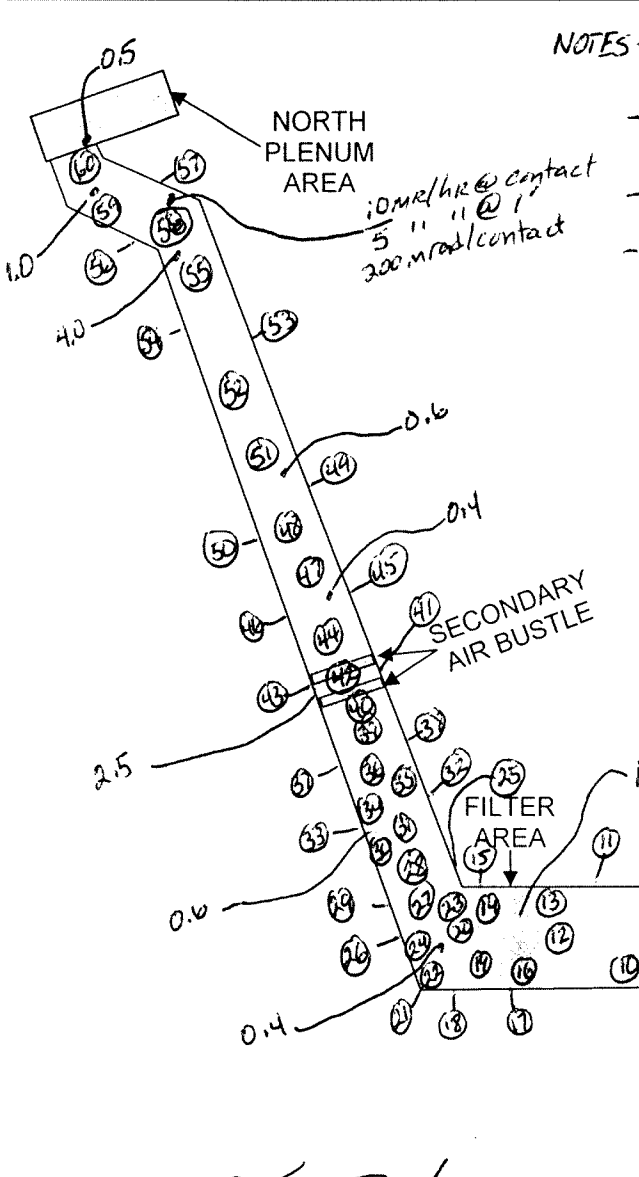
REASON FOR SURVEY
☐ _____ ☐ _____ ROUTINE
☒ **RWP 011 ERP 45** ☐ _____

LOCATION / EQUIPMENT: **BGRR CUT HOUSE BGD**

DATE: **9-23-12**

TIME: **1330**

BGRR NORTH BELOW GROUND DUCT ENTRY SURVEY - AS LEFT SURVEY



NOTES - All dose rates in mR/hr and general area unless otherwise noted.
 - Smear #5 Taken on Rubber walkway ON INCLINE,
 - Map NOT TO Scale,
 - Cuthouse Posted:
 CAUTION
 RADIATION AREA
 CONTAMINATION AREA
 RWP REQUIRED
 CONTACT HP FOR RWP

INSTRUMENT		
Model #	Serial #	CAL DUE
S5XLB	67705	04/05/2012
RO20	3858	04/25/2012
N/A		
N/A		

LEGEND	
○ - SMEAR SURVEY LOCATION	△ - AIR SAMPLE LOCATION
□ - MASSLINN SURVEY LOCATION	# - DIRECT FRISK LOCATIONS
XXX ZZZ	XXX = contact reading Y = radiation type ZZZ = reading @ 30cm

AIRBORNE ACTIVITY SURVEY					
Sample #	Duration	Flow Rate	Field Analysis		% DAC
			cpm	µCi/cc	
N/A					

DOSE RATE (HIGHEST)	
CONTACT READING	10 ~~N/A~~ ^{HF}
GENERAL AREA READING	5

MASSLINN SURVEY RESULTS (in dpm)	
1. N/A	5. N/A
2.	6.
3.	7.
4.	8.

SMEAR SURVEY RESULTS (dpm/100cm ²) (α, β-γ, ³ H)		
See	8. Attached	15. Results
Tennelec	9. Batch #	16. 29892, 29960
	10.	17.
	11.	18.
	12.	19.
	13.	20.
	14.	21.

Surveyed By: *K. Fort*
 FS-SOP-1000
 Attachment 9.2

Date: 9-27-12 Reviewed By: *Will [Signature]* Date: 9-27-12
 Page 1 of 4

Activity Report

9/23/11
6:58:02PM

NORTH BELOW GROUND DUCT

Batch Name:	29,892	Acquisition Date:	9/23/11
Batch ID:	1 Minute Smear Analysis - 201109231753	Acquisition Time:	1.0
Group:	D	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
Selected Geometry:	1/8" Stainless Steel	(volts)	

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

<u>Sample ID</u>	<u>Quantity</u>	<u>Alpha</u> <u>(DPM)</u>	<u>2σ</u>	<u>Alpha MDA</u> <u>(DPM)</u>	<u>Beta Activity</u> <u>(DPM)</u>	<u>2σ</u>	<u>Beta MDA</u> <u>(DPM)</u>
20110923175355-D1	0.00	3.01	7.40	14.79	377.06	89.22	32.73
20110923175525-D2	0.00	-0.64	0.64	14.79	252.94	73.32	32.73
20110923175645-D3	0.00	10.08	12.79	14.79	1,262.12	162.80	32.73
20110923175805-D4	0.00	6.65	10.45	14.79	511.53	103.76	32.73
20110923175915-D5	0.00	207.61	56.42	14.79	16,864.30	624.52	32.73
20110923180035-D6	0.00	17.69	16.50	14.79	552.52	107.84	32.73
20110923180155-D7	0.00	6.57	10.45	14.79	754.87	125.89	32.73
20110923180305-D8	0.00	-0.63	0.64	14.79	242.59	71.84	32.73
20110923180425-D9	0.00	-0.60	0.64	14.79	139.04	54.87	32.73
20110923180545-D10	0.00	113.83	41.85	14.79	10,706.87	488.13	32.73
20110923180656-D11	0.00	-0.63	0.64	14.79	242.59	71.84	32.73
20110923180816-D12	0.00	13.64	14.77	14.79	1,665.82	187.18	32.73
20110923180926-D13	0.00	3.05	7.40	14.79	237.27	71.09	32.73
20110923181046-D14	0.00	3.04	7.40	14.79	283.86	77.60	32.73
20110923181206-D15	0.00	-0.60	0.64	14.79	154.57	57.74	32.73
20110923181316-D16	0.00	-1.00	0.76	14.79	1,345.39	168.08	32.73
20110923181436-D17	0.00	-0.62	0.64	14.79	206.34	66.40	32.73
20110923181556-D18	0.00	-0.64	0.64	14.79	273.65	76.20	32.73
20110923181706-D19	0.00	35.92	23.33	14.79	1,162.75	156.31	32.73
20110923181826-D20	0.00	-0.62	0.64	14.79	201.17	65.58	32.73
20110923181946-D21 31	0.00	-0.61	0.64	14.79	180.46	62.22	32.73
20110923182057-D22 32	0.00	-0.58	0.64	14.79	82.08	42.78	32.73
20110923182216-D23 33	0.00	-0.59	0.64	14.79	123.50	51.86	32.73
20110923182336-D24 34	0.00	-0.61	0.64	14.79	180.46	62.22	32.73
20110923182446-D25 35	0.00	-0.57	0.64	14.79	56.20	35.96	32.73
20110923182606-D26 36	0.00	-0.59	0.64	14.79	107.97	48.65	32.73
20110923182717-D27 37	0.00	-0.56	0.64	14.79	25.13	25.49	32.73
20110923182837-D28 38	0.00	-0.56	0.64	14.79	19.95	23.29	32.73
20110923182957-D29 39	0.00	-0.59	0.64	14.79	113.15	49.74	32.73
20110923183107-D30 40	0.00	-0.61	0.64	14.79	175.28	61.35	32.73
20110923183227-D31 41	0.00	-0.58	0.64	14.79	71.73	40.19	32.73
20110923183347-D32 42	0.00	6.63	10.45	14.79	568.48	109.34	32.73
20110923183457-D33 43	0.00	-0.60	0.64	14.79	154.57	57.74	32.73
20110923183617-D34 44	0.00	-0.62	0.64	14.79	190.81	63.92	32.73
20110923183737-D35 45	0.00	-0.57	0.64	14.79	40.66	31.17	32.73

Ken Sub

Pg 2 of 4

Activity Report

9/23/11
6:58:02PM

Efficiency Factors

Alpha Efficiency: (%)	0.27	±	0.00	Beta Efficiency: (%)	0.19	±	0.00
--------------------------	------	---	------	-------------------------	------	---	------

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
110923183847-D3646	0.00	-0.59	0.64	14.79	97.62	46.39	32.73
110923184007-D3747	0.00	-0.59	0.64	14.79	113.15	49.74	32.73
110923184127-D3848	0.00	6.72	10.45	14.79	299.25	79.66	32.73
110923184237-D3949	0.00	-0.56	0.64	14.79	35.49	29.40	32.73
110923184357-D4050	0.00	-0.58	0.64	14.79	92.44	45.22	32.73
110923184517-D4151	0.00	6.52	10.45	14.79	884.31	136.24	32.73
110923184628-D4252	0.00	-0.79	0.67	14.79	713.74	122.40	32.73
110923184748-D4353	0.00	-0.61	0.64	14.79	170.10	60.46	32.73
110923184858-D4454	0.00	-0.60	0.64	14.79	139.04	54.87	32.73
110923185018-D4555	0.00	-0.56	0.64	14.79	14.78	20.86	32.73
110923185138-D4656	0.00	-1.67	1.19	14.79	3,364.60	267.24	32.73
110923185248-D4757	0.00	2.99	7.40	14.79	418.48	93.93	32.73
110923185408-D4858	0.00	3.09	7.40	14.79	118.18	50.81	32.73
110923185528-D4959	0.00	-0.61	0.64	14.79	159.75	58.66	32.73
110923185638-D5060	0.00	-0.60	0.64	14.79	144.21	55.84	32.73

Reviewed by:



Pg 3 of 4

21-30
N. DUCT ~~11-20~~

Activity Report

9/27/11
8:52:48AM

Batch Name:	29,960	Acquisition Date:	9/27/11
Batch ID:	1 Minute Smear Analysis - 201109270839	Acquisition Time:	1.0
Group:	E	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
		(volts)	
Selected Geometry: 1/8" Stainless Steel			

Efficiency Factors

Alpha Efficiency: (%)	0.27	±	0.00	Beta Efficiency: (%)	0.19	±	0.00
---------------------------------	------	---	------	--------------------------------	------	---	------

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
20110927083946-E1 21	0.00	6.73	10.45	14.79	252.66	73.33	32.73
20110927084116-E2 22	0.00	-0.58	0.64	14.79	87.26	44.01	32.73
20110927084237-E3 23	0.00	17.04	16.51	14.79	2,499.25	229.76	32.73
20110927084357-E4 24	0.00	2.32	7.44	14.79	2,442.87	227.10	32.73
20110927084507-E5 25	0.00	-0.68	0.65	14.79	372.02	88.62	32.73
20110927084627-E6 26	0.00	1.92	7.48	14.79	3,638.86	278.17	32.73
20110927084737-E7 27	0.00	6.43	10.45	14.79	1,179.42	157.35	32.73
20110927084857-E8 28	0.00	-0.57	0.64	14.79	61.37	37.42	32.73
20110927085017-E9 29	0.00	-0.57	0.64	14.79	56.20	35.96	32.73
20110927085127-E10 30	0.00	-0.70	0.65	14.79	444.51	96.76	32.73

Reviewed by:

He Zut

Pg 4 of 4

RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY ☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # _____ ☐ WP # <u>314-35</u>	
LOCATION & EQUIPT. Bldg 701 143' Level Offices		DATE: <u>04-26-2012</u> TIME: <u>1200</u>	
BGRR - 143' Level Offices and Hallways Weekly routine survey.			
Note: (A) LAS taken on tile floors, carpet, offices, Hallway, & Kitchen, all <100ccpm/frisk. (B) Direct frisk taken on 10% of the accessible floor surface areas [tile and /or carpet], all were < 100ccpm, except where fixed contamination noted. (C) Smears taken, see page 2-4 of 4 [batch key #31636] for results and below schematic for location. (D) Dose rates taken are in μ rem/hr. and are underlined.			
(E) Model 239-1F floor walker used to survey 100% of accessible areas in hallways and 10% of accessible areas in all other rooms. The background ranged from 800 to 1200ccpm except where fixed contamination spots were identified and quantified with a Lud-3.			

INSTRUMENT					
Model #	Serial #	CAL DUE			
S5-XLB	67705	04-20-2013			
LUD-3	44141	02-10-2013			
Lud-12	72717	06-03-2012			
Bicron	A885S	08-01-2012			

LEGEND					
- SMEAR SURVEY LOCATION		- AIR SAMPLE LOCATION			
- MASSLINN SURVEY LOCATION		# - DIRECT FRISK LOCATION			
XXXY ZZZ XXX = contact reading Y = radiation type ZZZ = reading @ 30cm					

AIRBORNE ACTIVITY SURVEY					
Sample #	Duration	Flow Rate	Field Analysis		
			cpm	μ Ci/cc	% DAC
N/A					

DOSE RATE (HIGHEST)	
CONTACT READING	N/A
GENERAL AREA READING	4-10

MASSLINN SURVEY RESULTS (in dpm)	
1. N/A	5. N/A
2.	6.
3.	7.
4.	8.

SMEAR SURVEY RESULTS (dpm/100cm ²) (a, (b-g) ³ H		
1. See	8. Attached	15. Results
2. Batch	9. Number	16. 31636
3.	10.	17.
4.	11.	18.
5.	12.	19.
6.	13.	20.
7.	14.	21.

Surveyed By: [Signature] Date: 04-26-12
 FS-SOP-1000 Attachment 9.2
 Page 1 of 4

Surveyed By _____ **Detterman**

Date: 04-26-12

Reviewed By:

~~_____~~ **Date**

Activity Report

4/26/12
5:13:05PM

143' OFFICES

Batch Name:	31,636	Acquisition Date:	4/26/12
Batch ID:	1 Minute Smear Analysis - 201204261503	Acquisition Time:	1.0
Group:	E	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,350.0
		(volts)	
Selected Geometry: 1/8" Stainless Steel			

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
20120426150338-E1	0.00	-0.19	0.37	12.78	21.39	25.76	38.35
20120426150638-E2	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426150759-E3	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426150919-E4	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426151029-E5	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426151149-E6	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120426151309-E7	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120426151419-E8	0.00	-0.19	0.37	12.78	26.61	27.79	38.35
20120426151539-E9	0.00	-0.19	0.37	12.78	26.61	27.79	38.35
20120426151659-E10	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426151809-E11	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426151929-E12	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426152039-E13	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120426152159-E14	0.00	3.51	7.40	12.78	-4.83	10.92	38.35
20120426152319-E15	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426152429-E16	0.00	-0.18	0.37	12.78	-9.90	3.22	38.35
20120426152549-E17	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426152710-E18	0.00	-0.18	0.37	12.78	-4.69	10.92	38.35
20120426152820-E19	0.00	-0.18	0.37	12.78	-4.69	10.92	38.35
20120426152940-E20	0.00	-0.18	0.37	12.78	-9.90	3.22	38.35
20120426153100-E21	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120426153210-E22	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120426153330-E23	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120426153450-E24	0.00	-0.18	0.37	12.78	-4.69	10.92	38.35
20120426153600-E25	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426153720-E26	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426153840-E27	0.00	-0.18	0.37	12.78	-9.90	3.22	38.35
20120426153950-E28	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426154110-E29	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120426154220-E30	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120426154340-E31	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426154500-E32	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426154610-E33	0.00	-0.18	0.37	12.78	-4.69	10.92	38.35
20120426154731-E34	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120426154851-E35	0.00	-0.18	0.37	12.78	0.53	15.10	38.35

2 of 4

Activity Report

4/26/12
5:13:05PM

Efficiency Factors

Alpha
Efficiency:
(%)

0.27

±

0.00

Beta Efficiency:
(%)

0.19

±

0.00

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
20120426155001-E36	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120426155121-E37	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426155241-E38	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426155351-E39	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426155511-E40	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426155631-E41	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426155741-E42	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120426155901-E43	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120426160021-E44	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426160131-E45	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426160251-E46	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426160401-E47	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426160521-E48	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426160641-E49	0.00	-0.18	0.37	12.78	-4.69	10.92	38.35
20120426160752-E50	0.00	3.51	7.40	12.78	5.60	18.35	38.35
20120426160912-E51	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120426161032-E52	0.00	-0.18	0.37	12.78	-9.90	3.22	38.35
20120426161142-E53	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120426161302-E54	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426161422-E55	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120426161532-E56	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426161652-E57	0.00	-0.18	0.37	12.78	-9.90	3.22	38.35
20120426161812-E58	0.00	-0.18	0.37	12.78	-4.69	10.92	38.35
20120426161922-E59	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426162042-E60	0.00	-0.18	0.37	12.78	-4.69	10.92	38.35
20120426162202-E61	0.00	-0.18	0.37	12.78	-4.69	10.92	38.35
20120426162312-E62	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426162432-E63	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426162543-E64	0.00	-0.18	0.37	12.78	-4.69	10.92	38.35
20120426162703-E65	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120426162823-E66	0.00	-0.20	0.37	12.78	31.82	29.68	38.35
20120426162933-E67	0.00	-0.18	0.37	12.78	-9.90	3.22	38.35
20120426163053-E68	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426163213-E69	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120426163323-E70	0.00	-0.19	0.37	12.78	21.39	25.76	38.35
20120426163443-E71	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426163603-E72	0.00	-0.18	0.37	12.78	-4.69	10.92	38.35
20120426163713-E73	0.00	-0.18	0.37	12.78	-4.69	10.92	38.35
20120426163833-E74	0.00	3.51	7.40	12.78	-4.83	10.92	38.35
20120426163953-E75	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120426164103-E76	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426164223-E77	0.00	-0.18	0.37	12.78	-4.69	10.92	38.35
20120426164343-E78	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426164453-E79	0.00	-0.18	0.37	12.78	-9.90	3.22	38.35

3 of 4 29

Activity Report

4/26/12
5:13:05PM

Efficiency Factors

Alpha
Efficiency:
(%)

0.27

±

0.00

Beta Efficiency:
(%)

0.19

±

0.00

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
20120426164614-E80	0.00	3.51	7.40	12.78	10.82	21.11	38.35
20120426164734-E1	0.00	-0.18	0.37	12.78	-4.69	10.92	38.35
20120426164844-E2	0.00	-0.20	0.37	12.78	31.82	29.68	38.35
20120426165004-E3	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426165114-E4	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426165234-E5	0.00	-0.19	0.37	12.78	21.39	25.76	38.35
20120426165354-E6	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426165504-E7	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426165624-E8	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426165744-E9	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426165854-E10	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120426170014-E11	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120426170134-E12	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120426170244-E13	0.00	-0.18	0.37	12.78	-9.90	3.22	38.35
20120426170404-E14	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120426170525-E15	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426170635-E16	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120426170755-E17	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120426170915-E18	0.00	-0.18	0.37	12.78	-4.69	10.92	38.35
20120426171025-E19	0.00	3.51	7.40	12.78	5.60	18.35	38.35
20120426171145-E20	0.00	-0.18	0.37	12.78	0.53	15.10	38.35

Reviewed by:



4 of 4
3/10

RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENTS		
LOCATION & EQUIPT. Bldg 701 133ft. level Offices		☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # _____ ☐ WP # <u>314 - 35</u>		Model #	Serial #	CAL DUE
		DATE: <u>04/ 23 /12</u> TIME: <u>1000</u>		LB-5100	32487	09/30/12
Survey: As-Left for the 133ft. level offices.						
Note: (A) LAS taken on tile floors, rooms 101C, 110, Hallway, Restrooms, & Kitchen, all <100ccpm/frisk. (B) Direct frisk taken on 10% of the accessible floor surface areas [tile and /or carpet], all were < 100ccpm except where fixed contamination noted. (C) Smears taken, see page 2 of 3 and 3 of 3 [batch key #4329] for results and below schematic for location. (D) Dose rates taken are in μrem/hr. and are underlined.						
(E) Model 239-1F floor walker used to survey 100% of accessible areas in hallways and 10% of accessible areas in all other rooms. The background ranged from 800 to 1200cpm except where fixed contamination spots were identified and quantified with a Lud-3.						
LEGEND ☐ - SMEAR SURVEY LOCATION <input type="triangle"/> - AIR SAMPLE LOCATION ☐ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCATION XXXY ZZZ XXX = contact reading Y = radiation type ZZZ = reading @ 30cm						
AIRBORNE ACTIVITY SURVEY						
Sample #		Duration	Flow Rate	Field Analysis		% DAC
				cpm	μ Ci/cc	
N/A						
DOSE RATE (HIGHEST) Micro rem/hr.						
CONTACT READING				N/A		
GENERAL AREA READING				8		
MASSLINN SURVEY RESULTS (in dpm)						
1. < 1K		5. < 1K				
2. ↓		6. ↓				
3. ↓		7. ↓				
4. ↓		8. ↓				
SMEAR SURVEY RESULTS (dpm/100cm ²) (α , β - γ) ³ H						
1. See	8. Attached	15. Results				
2. Batch	9. Number	16. 4329				
3.	10.	17.				
4.	11.	18.				
5.	12.	19.				
6.	13.	20.				
7. ↓	14. ↓	21. ↓				
Surveyed By <u>Detterman</u> Date: <u>04/ 23 /12</u> Reviewed By: <u>[Signature]</u> Date: <u>4/23/12</u>						
FS-SOP-1000 Attachment 9.2						
Page <u>1</u> of <u>3</u>						

Activity Report

2/29/12
8:06:52PM

701 133ft. OFFICES

Batch Name:	31,279	Acquisition Date:	2/29/12
Batch ID:	1 Minute Smear Analysis - 201202291852	Acquisition Time:	1.0
Group:	E	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,380.0
Selected Geometry:	1/8" Stainless Steel	(volts)	

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20120229185212-E1	0.00	-0.56	0.64	14.79	25.13	25.49	32.73
20120229185513-E2	0.00	-0.56	0.64	14.79	9.60	18.11	32.73
20120229185633-E3	0.00	3.12	7.40	14.79	30.17	27.51	32.73
20120229185753-E4	0.00	-0.55	0.64	14.79	4.42	14.85	32.73
20120229185903-E5	0.00	-0.56	0.64	14.79	9.60	18.11	32.73
20120229190023-E6	0.00	-0.56	0.64	14.79	19.95	23.29	32.73
20120229190143-E7	0.00	-0.56	0.64	14.79	14.78	20.86	32.73
20120229190253-E8	0.00	-0.56	0.64	14.79	25.13	25.49	32.73
20120229190413-E9	0.00	-0.56	0.64	14.79	14.78	20.86	32.73
20120229190523-E10	0.00	-0.56	0.64	14.79	14.78	20.86	32.73
20120229190643-E11	0.00	3.12	7.40	14.79	24.99	25.49	32.73
20120229190803-E12	0.00	-0.55	0.64	14.79	4.42	14.85	32.73
20120229190913-E13	0.00	-0.56	0.64	14.79	9.60	18.11	32.73
20120229191033-E14	0.00	-0.56	0.64	14.79	14.78	20.86	32.73
20120229191154-E15	0.00	-0.56	0.64	14.79	9.60	18.11	32.73
20120229191304-E16	0.00	-0.56	0.64	14.79	30.31	27.51	32.73
20120229191424-E17	0.00	3.13	7.40	14.79	4.28	14.86	32.73
20120229191544-E18	0.00	-0.56	0.64	14.79	19.95	23.29	32.73
20120229191654-E19	0.00	-0.55	0.64	14.79	4.42	14.85	32.73
20120229191814-E20	0.00	-0.56	0.64	14.79	14.78	20.86	32.73
20120229191934-E21	0.00	-0.56	0.64	14.79	9.60	18.11	32.73
20120229192044-E22	0.00	-0.56	0.64	14.79	14.78	20.86	32.73
20120229192204-E23	0.00	-0.55	0.64	14.79	4.42	14.85	32.73
20120229192324-E24	0.00	-0.55	0.64	14.79	-0.76	10.65	32.73
20120229192434-E25	0.00	-0.56	0.64	14.79	25.13	25.49	32.73
20120229192554-E26	0.00	-0.56	0.64	14.79	14.78	20.86	32.73
20120229192714-E27	0.00	-0.55	0.64	14.79	4.42	14.85	32.73
20120229192824-E28	0.00	3.13	7.40	14.79	9.46	18.11	32.73
20120229192944-E29	0.00	-0.56	0.64	14.79	9.60	18.11	32.73
20120229193054-E30	0.00	-0.55	0.64	14.79	4.42	14.85	32.73
20120229193215-E31	0.00	-0.55	0.64	14.79	4.42	14.85	32.73
20120229193335-E32	0.00	-0.56	0.64	14.79	9.60	18.11	32.73
20120229193445-E33	0.00	3.13	7.40	14.79	9.46	18.11	32.73
20120229193605-E34	0.00	-0.56	0.64	14.79	9.60	18.11	32.73
20120229193725-E35	0.00	-0.55	0.64	14.79	-5.93	2.48	32.73

Activity Report

2/29/12
8:06:52PM

Efficiency Factors

Alpha
Efficiency:
(%)

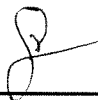
0.27 ± 0.00

Beta Efficiency:
(%)

0.19 ± 0.00

Sample ID	Quantity	Alpha (DPM)	2σ	Alpha MDA (DPM)	Beta Activity (DPM)	2σ	Beta MDA (DPM)
20120229193835-E36	0.00	-0.55	0.64	14.79	-5.93	2.48	32.73
20120229193955-E37	0.00	-0.55	0.64	14.79	4.42	14.85	32.73
20120229194115-E38	0.00	-0.56	0.64	14.79	14.78	20.86	32.73
20120229194225-E39	0.00	3.13	7.40	14.79	14.63	20.86	32.73
20120229194345-E40	0.00	-0.55	0.64	14.79	-0.76	10.65	32.73
20120229194505-E41	0.00	-0.56	0.64	14.79	9.60	18.11	32.73
20120229194615-E42	0.00	-0.57	0.64	14.79	40.66	31.17	32.73
20120229194735-E43	0.00	-0.56	0.64	14.79	9.60	18.11	32.73
20120229194855-E44	0.00	-0.56	0.64	14.79	14.78	20.86	32.73
20120229195005-E45	0.00	-0.55	0.64	14.79	-0.76	10.65	32.73
20120229195126-E46	0.00	-0.55	0.64	14.79	-0.76	10.65	32.73
20120229195236-E47	0.00	-0.55	0.64	14.79	4.42	14.85	32.73
20120229195356-E48	0.00	3.13	7.40	14.79	4.28	14.86	32.73
20120229195516-E49	0.00	-0.55	0.64	14.79	-0.76	10.65	32.73
20120229195626-E50	0.00	-0.55	0.64	14.79	-5.93	2.48	32.73
20120229195746-E51	0.00	-0.55	0.64	14.79	4.42	14.85	32.73
20120229195906-E52	0.00	-0.55	0.64	14.79	4.42	14.85	32.73
20120229200016-E53	0.00	-0.55	0.64	14.79	4.42	14.85	32.73
20120229200136-E54	0.00	3.13	7.40	14.79	4.28	14.86	32.73
20120229200256-E55	0.00	-0.55	0.64	14.79	-0.76	10.65	32.73
20120229200406-E56	0.00	-0.56	0.64	14.79	19.95	23.29	32.73
20120229200526-E57	0.00	-0.56	0.64	14.79	14.78	20.86	32.73

Reviewed by:



Page 3 of 3

RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENTS																							
LOCATION & EQUIPT. Bldg 701 133ft. level Offices		☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # _____ ☐ WP # 314 - 35		Model #																							
		DATE: 04/23/12 TIME: 1000		Serial #																							
Survey: As-Left for the 133ft. level offices. Note: (A) LAS taken on tile floors, rooms 101C, 110, Hallway, Restrooms, & Kitchen, all <100ccpm/frisk. (B) Direct frisk taken on 10% of the accessible floor surface areas tile and /or carpet , all were < 100ccpm except where fixed contamination noted. (C) Smears taken, see page 2 of 3 and 3 of 3 batch key #4329 for results and below schematic for location. (D) Dose rates taken are in μ rem/hr. and are underlined.				CAL DUE																							
				LB-5100																							
				LUD-3																							
				BICRON																							
				LUD-12																							
				LEGEND ○ - SMEAR SURVEY LOCATION △ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCATION XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ																							
				AIRBORNE ACTIVITY SURVEY																							
				<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="2">Field Analysis</th> <th rowspan="2">% DAC</th> </tr> <tr> <th>cpm</th> <th>μCi/cc</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	μ Ci/cc	N/A												
Sample #	Duration	Flow Rate	Field Analysis		% DAC																						
			cpm	μ Ci/cc																							
N/A																											
				DOSE RATE (HIGHEST) Micro rem/hr.																							
				CONTACT READING																							
				GENERAL AREA READING																							
				MASSLINN SURVEY RESULTS (in dpm)																							
				<table border="1" style="width:100%; border-collapse: collapse;"> <tbody> <tr> <td>1. < 1K</td> <td>5. < 1K</td> </tr> <tr> <td>2.</td> <td>6.</td> </tr> <tr> <td>3.</td> <td>7.</td> </tr> <tr> <td>4.</td> <td>8.</td> </tr> </tbody> </table>			1. < 1K	5. < 1K	2.	6.	3.	7.	4.	8.													
1. < 1K	5. < 1K																										
2.	6.																										
3.	7.																										
4.	8.																										
				SMEAR SURVEY RESULTS (dpm/100cm ²) (α, β-γ) ³ H																							
				<table border="1" style="width:100%; border-collapse: collapse;"> <tbody> <tr> <td>1. See</td> <td>8. Attached</td> <td>15. Results</td> </tr> <tr> <td>2. Batch</td> <td>9. Number</td> <td>16. 4329</td> </tr> <tr> <td>3.</td> <td>10.</td> <td>17.</td> </tr> <tr> <td>4.</td> <td>11.</td> <td>18.</td> </tr> <tr> <td>5.</td> <td>12.</td> <td>19.</td> </tr> <tr> <td>6.</td> <td>13.</td> <td>20.</td> </tr> <tr> <td>7.</td> <td>14.</td> <td>21.</td> </tr> </tbody> </table>			1. See	8. Attached	15. Results	2. Batch	9. Number	16. 4329	3.	10.	17.	4.	11.	18.	5.	12.	19.	6.	13.	20.	7.	14.	21.
1. See	8. Attached	15. Results																									
2. Batch	9. Number	16. 4329																									
3.	10.	17.																									
4.	11.	18.																									
5.	12.	19.																									
6.	13.	20.																									
7.	14.	21.																									
(E) Model 239-1F floor walker used for information and the background ranged from 800 to 1200cpm except where fixed contamination spots were identified and quantified with a Lud-3.																											
Surveyed By Detterman <i>[Signature]</i> Date: 04/23/12		Reviewed By: <i>[Signature]</i> Date: 4-24-12																									
FS-SOP-1000 Attachment 9.2																											

Sample Report

Batch ID: 1min. Smear - 201204231102
Group: D
Device: HFBR
Batch Key: 4,329
Selected Geometry: 1/8" Stainless Steel

Count Date: 4/23/2012
Count Minutes: 1.0
Count Mode: Simultaneous
Operating Volts: 1350

Efficiency (%)				Spillover (%)			
Alpha:	27.51	±	0.10	Alpha to Beta:	5.94	±	0.00
Beta:	19.49	±	0.10	Beta to Alpha:	0.08	±	0.00

<u>Sample ID</u>	<u>Sample Type</u>	<u>Alpha</u> <u>(dpm)</u>	<u>Unc</u>	<u>Alpha MDA</u> <u>(dpm)</u>	<u>Beta</u> <u>(dpm)</u>	<u>Unc</u>	<u>Beta MDA</u> <u>(dpm)</u>	<u>(dpm)</u>
20120423110228-D1	Unknown	-0.01	0.00	9.84	10.26	7.26	13.89	
20120423110359-D2	Unknown	-0.01	0.01	9.84	15.40	8.89	13.89	
20120423110519-D3	Unknown	-0.02	0.01	9.84	30.79	12.57	13.89	
20120423110629-D4	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120423110749-D5	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120423110909-D6	Unknown	-0.02	0.01	9.84	30.79	12.57	13.89	
20120423111019-D7	Unknown	-0.01	0.00	9.84	10.26	7.26	13.89	
20120423111139-D8	Unknown	-0.01	0.01	9.84	15.40	8.89	13.89	
20120423111249-D9	Unknown	-0.01	0.00	9.84	10.26	7.26	13.89	
20120423111409-D10	Unknown	-0.01	0.01	9.84	15.40	8.89	13.89	
20120423111519-D11	Unknown	3.63	3.64	9.84	15.09	8.89	13.89	
20120423111639-D12	Unknown	-0.01	0.01	9.84	25.66	11.48	13.89	
20120423111759-D13	Unknown	-0.01	0.00	9.84	10.26	7.26	13.89	
20120423111909-D14	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120423112029-D15	Unknown	-0.02	0.01	9.84	30.79	12.57	13.89	
20120423112139-D16	Unknown	-0.01	0.01	9.84	15.40	8.89	13.89	
20120423112259-D17	Unknown	-0.02	0.01	9.84	41.05	14.52	13.89	
20120423112409-D18	Unknown	-0.03	0.01	9.84	46.19	15.40	13.89	
20120423112529-D19	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120423112639-D20	Unknown	3.62	3.64	9.84	25.35	11.48	13.89	
20120423112759-D21	Unknown	-0.01	0.01	9.84	15.40	8.89	13.89	
20120423112919-D22	Unknown	-0.01	0.01	9.84	15.40	8.89	13.89	
20120423113029-D23	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120423113149-D24	Unknown	-0.01	0.01	9.84	15.40	8.89	13.89	
20120423113259-D25	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120423113419-D26	Unknown	-0.02	0.01	9.84	35.92	13.58	13.89	
20120423113529-D27	Unknown	0.00	0.00	9.84	5.13	5.13	13.89	
20120423113649-D28	Unknown	-0.01	0.01	9.84	15.40	8.89	13.89	
20120423113809-D29	Unknown	0.00	0.00	9.84	5.13	5.13	13.89	
20120423113919-D30	Unknown	-0.01	0.00	9.84	10.26	7.26	13.89	
20120423114039-D31	Unknown	0.00	0.00	9.84	5.13	5.13	13.89	
20120423114149-D32	Unknown	0.00	0.00	9.84	5.13	5.13	13.89	
20120423114309-D33	Unknown	0.00	0.00	9.84	5.13	5.13	13.89	
20120423114419-D34	Unknown	-0.01	0.00	9.84	10.26	7.26	13.89	
20120423114539-D35	Unknown	0.00	0.00	9.84	0.00	0.00	13.89	
20120423114649-D36	Unknown	0.00	0.00	9.84	5.13	5.13	13.89	

Sample Report

Efficiency (%)

Alpha: 27.51 ± 0.10
Beta: 19.49 ± 0.10

Spillover (%)

Alpha to Beta: 5.94 ± 0.00
Beta to Alpha: 0.08 ± 0.00

Sample ID	Sample Type	Alpha (dpm)	Unc	Alpha MDA (dpm)	Beta (dpm)	Unc	Beta MDA (dpm)	(dpm)
20120423114809-D37	Unknown	0.00	0.00	9.84	5.13	5.13	13.89	
20120423114929-D38	Unknown	0.00	0.00	9.84	5.13	5.13	13.89	
20120423115039-D39	Unknown	-0.02	0.01	9.84	30.79	12.57	13.89	
20120423115159-D40	Unknown	3.64	3.64	9.84	-0.31	0.31	13.89	
20120423115309-D41	Unknown	-0.01	0.00	9.84	10.26	7.26	13.89	
20120423115429-D42	Unknown	3.62	3.64	9.84	20.22	10.27	13.89	
20120423115539-D43	Unknown	-0.01	0.01	9.84	15.40	8.89	13.89	
20120423115659-D44	Unknown	-0.03	0.01	9.84	46.19	15.40	13.89	
20120423115819-D45	Unknown	3.63	3.64	9.84	9.96	7.26	13.89	
20120423115929-D46	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120423120049-D47	Unknown	-0.01	0.01	9.84	15.40	8.89	13.89	
20120423120159-D48	Unknown	0.00	0.00	9.84	5.13	5.13	13.89	
20120423120319-D49	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120423120429-D50	Unknown	-0.01	0.00	9.84	10.26	7.26	13.89	
20120423120549-D51	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120423120659-D52	Unknown	-0.03	0.01	9.84	46.19	15.40	13.89	
20120423120819-D53	Unknown	-0.01	0.00	9.84	10.26	7.26	13.89	
20120423120939-D54	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120423121049-D55	Unknown	-0.01	0.01	9.84	20.53	10.26	13.89	
20120423121209-D56	Unknown	-0.01	0.01	9.84	15.40	8.89	13.89	

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT																
LOCATION & EQUIPT. Bldg 701		☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # _____ ☐ WP # _____		MODEL #																
		DATE: 4/30/12 TIME: 08:00		SERIAL #																
SOUTHWEST STAIRWELL				CAL DUE																
Smears taken on the stairs and walls, results are on the attached sheet. All dose rates are 5-10 micro R/Hr.				S5-XLB																
				BICRON																
				N/A																
				N/A																
				LEGEND																
				☐ - SMEAR SURVEY LOCATION <input type="triangle"/> - AIR SAMPLE LOCATION ☐ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOC- C - CONTAMINATION * - CONTACT XXXY XXX = contact reading Y = radiation type ZZZ = reading @ 30cm ZZZ																
				AIRBORNE ACTIVITY SURVEY																
				<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="2">Field Analysis</th> <th rowspan="2">% DAC</th> </tr> <tr> <th>cpm</th> <th>µCi/cc</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A					
				Sample #	Duration	Flow Rate				Field Analysis			% DAC							
cpm	µCi/cc																			
N/A																				
DOSE RATE (HIGHEST) Micro-R/HR																				
CONTACT READING			N/A																	
GENERAL AREA READING			5-10																	
MASSLINN SURVEY RESULTS (in dpm)																				
1. N/A			5. N/A																	
2. ↓			6. ↓																	
3. ↓			7. ↓																	
4. ↓			8. ↓																	
SMEAR SURVEY RESULTS (dpm/100cm ²) (α) (β-γ) ³ H																				
1. See		8. Attached		15. Results																
2. Batch		9. Number		16. 31651																
3.		10.		17.																
4.		11.		18.																
5.		12.		19.																
6.		13.		20.																
7.		14.		21.																
Surveiled By <u>William Calash</u> Date: <u>4/30/12</u> Reviewed By: <u>[Signature]</u> Date: <u>4/30/12</u>																				
FS-SOP-1000 Attachment 9.2 Page <u>1</u> of <u>2</u>																				

Activity Report

4/30/12
8:41:10AM

WEST STAIR WAY

Batch Name:	31,651	Acquisition Date:	4/30/12
Batch ID:	1 Minute Smear Analysis - 201204300820	Acquisition Time:	1.0
Group:	E	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,350.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20120430082026-E15	0.00	3.50	7.40	12.78	21.25	25.76	38.35
20120430082156-E16	0.00	3.51	7.40	12.78	5.60	18.35	38.35
20120430082316-E17	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120430082436-E18	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120430082546-E19	0.00	7.19	10.46	12.78	41.97	33.15	38.35
20120430082707-E20	0.00	3.48	7.40	12.78	89.06	45.60	38.35
20120430082827-E21	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120430082937-E22	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120430083057-E23	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120430083207-E24	0.00	-0.19	0.37	12.78	26.61	27.79	38.35
20120430083327-E25	0.00	-0.19	0.37	12.78	26.61	27.79	38.35
20120430083447-E26	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120430083557-E27	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120430083717-E28	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120430083837-E29	0.00	-0.19	0.37	12.78	5.74	18.35	38.35
20120430083947-E30	0.00	-0.18	0.37	12.78	0.53	15.10	38.35

Reviewed by:



RADIOLOGICAL SURVEY FORM FS-SOP-1000		REASON FOR SURVEY		INSTRUMENT											
LOCATION & EQUIPT. Bldg 701		☐ ROUTINE _____ ☐ SPECIAL _____ ☐ RWP # _____ ☐ WP # _____		MODEL #	SERIAL #	CAL DUE									
		DATE: 4/30/12 TIME: 08:00		S5-XLB	67705	4/20/13									
SOUTHEAST STAIRWELL Smears taken on the stairs and walls, results are on the attached sheet. All dose rates are 5-10 micro R/Hr.				BICRON	A885S	8/11/12									
				N/A	N/A	N/A									
				N/A	N/A	N/A									
				LEGEND ○ - SMEAR SURVEY LOCATION △ - AIR SAMPLE LOCATION □ - MASSLINN SURVEY LOCATION # - DIRECT FRISK LOCATION C - CONTAMINATION * - CONTACT XXXY / ZZZ XXX = contact reading Y = radiation type ZZZ = reading @ 30cm											
				AIRBORNE ACTIVITY SURVEY											
				<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Sample #</th> <th rowspan="2">Duration</th> <th rowspan="2">Flow Rate</th> <th colspan="2">Field Analysis</th> <th rowspan="2">% DAC</th> </tr> <tr> <th>cpm</th> <th>µCi/cc</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Sample #	Duration	Flow Rate	Field Analysis		% DAC	cpm	µCi/cc	N/A	
Sample #	Duration	Flow Rate	Field Analysis		% DAC										
			cpm	µCi/cc											
N/A															
DOSE RATE (HIGHEST) Micro-R/HR				CONTACT READING: N/A											
				GENERAL AREA READING: 5-10											
MASSLINN SURVEY RESULTS (in dpm)				1. N/A 5. N/A 2. 6. 3. 7. 4. 8.											
				SMEAR SURVEY RESULTS (dpm/100cm²) (α, β-γ, ³H)											
Surveiled By <u>William Calash</u> Date: <u>4/30/12</u> Reviewed By: <u>[Signature]</u> Date: <u>4/30/12</u>				1. See 8. Attached 15. Results 2. Batch 9. Number 16. 31652 3. 10. 17. 4. 11. 18. 5. 12. 19. 6. 13. 20. 7. 14. 21.											

Surveiled By William Calash

Date: 4/30/12

Reviewed By: [Signature]

Date: 4/30/12

FS-SOP-1000

Attachment 9.2

Page 1 of 2

Activity Report

4/30/12
8:59:04AM

EAST STAIR WAY

Batch Name:	31,652	Acquisition Date:	4/30/12
Batch ID:	1 Minute Smear Analysis - 201204300820	Acquisition Time:	1.0
Group:	F	(minutes)	
Device:	S5 XLB	Operating Voltage:	1,350.0
		(volts)	

Selected Geometry: 1/8" Stainless Steel

Efficiency Factors

Alpha Efficiency:	0.27	±	0.00	Beta Efficiency:	0.19	±	0.00
(%)				(%)			

Sample ID	Quantity	Alpha	2σ	Alpha MDA	Beta Activity	2σ	Beta MDA
		(DPM)		(DPM)	(DPM)		(DPM)
20120430082049-F3	0.00	3.50	7.40	12.78	26.47	27.79	38.35
20120430084231-F2	0.00	-0.20	0.37	12.78	42.26	33.15	38.35
20120430084341-F1	0.00	3.50	7.40	12.78	31.68	29.68	38.35
20120430084501-F4	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120430084611-F5	0.00	3.49	7.40	12.78	47.33	34.75	38.35
20120430084731-F6	0.00	-0.19	0.37	12.78	21.39	25.76	38.35
20120430084851-F7	0.00	-0.19	0.37	12.78	21.39	25.76	38.35
20120430085001-F8	0.00	-0.19	0.37	12.78	26.61	27.79	38.35
20120430085121-F9	0.00	-0.18	0.37	12.78	0.53	15.10	38.35
20120430085241-F10	0.00	-0.19	0.37	12.78	16.18	23.55	38.35
20120430085351-F11	0.00	-0.20	0.37	12.78	37.04	31.46	38.35
20120430085511-F12	0.00	-0.19	0.37	12.78	10.96	21.11	38.35
20120430085631-F13	0.00	-0.18	0.37	12.78	-4.69	10.92	38.35
20120430085742-F14	0.00	7.18	10.46	12.78	62.83	39.17	38.35

Reviewed by:



Appendix C

ORISE Independent Verification Report

June 4, 2012

Ms. Terri Kneitel
U.S. Department of Energy
Brookhaven Site Office
53 Bell Avenue, Bldg. 464
Upton, NY 11973

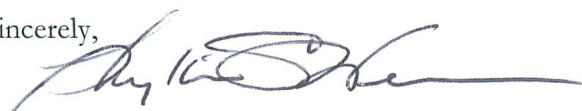
**SUBJECT: DOE CONTRACT NO. DE-AC05-06OR23100
PROJECT-SPECIFIC TYPE A VERIFICATION LETTER REPORT FOR
THE BROOKHAVEN GRAPHITE RESEARCH REACTOR,
BROOKHAVEN NATIONAL LABORATORY,
UPTON, NEW YORK
DCN: 5098-LT-01-0**

Dear Ms. Kneitel,

Oak Ridge Associated Universities, under the Oak Ridge Institute for Science and Education (ORISE) contract with the U.S. Department of Energy, is pleased to provide the attached letter report concerning the Type A verification activities conducted at the Brookhaven Graphite Research Reactor at the Brookhaven National Laboratory in Upton, New York.

Please contact me at (865) 576-5321 or Erika Bailey at (865) 576-6659 if you have any questions or need additional information.

Sincerely,



Phyllis C. Weaver
Health Physicist Project Manager
Oak Ridge Institute for Science and Education

PCW:fr

Enclosure

cc: E. Bailey, ORAU
T. Vitkus, ORAU
File/5098

Distribution approval and concurrence:	Initials
Technical Review	EW
Quality Review	EB
Group Manager Review	TV

**PROJECT-SPECIFIC TYPE A VERIFICATION LETTER REPORT FOR THE
BROOKHAVEN GRAPHITE RESEARCH REACTOR,
BROOKHAVEN NATIONAL LABORATORY,
UPTON, NEW YORK**

Oak Ridge Associated Universities (ORAU) has completed the review of project documentation and data for the Brookhaven Graphite Research Reactor (BGRR) “as-left” survey at the Brookhaven National Laboratory (BNL) in Upton, New York. ORAU and the U.S. Department of Energy (DOE)-Brookhaven Site Office (BSO) determined that a Type A verification of the “as-left” survey effort would be appropriate, considering that post-decommissioning radiological conditions guidelines were not established for unrestricted release (BNL 2012a). Brookhaven Science Associates (BSA) operates BNL under contract with DOE and has provided oversight and monitoring of the BGRR “as-left” radiological conditions. It is the responsibility of BSA to ensure that ultimately any removal actions by the contractor are such that human health and the environment are protected and that baseline conditions are established.

ORAU has been designated as the independent verification (IV) contractor for DOE facilities and for this task at the BGRR. ORAU performed this work under the Oak Ridge Institute for Science and Education (ORISE) contract with DOE. “DOE and the Office of Environmental Management (EM) have long used IV to ensure that radiological releases of property meet the applicable authorized limits” (DOE 2008). IV is also specifically required in accordance with the DOE Order 458.1 Change 1, for Radiation Protection of the Public and the Environment.

ORAU has reviewed the *As-Left Survey Procedure for the BGRR*, 14 data packages for the interior areas in Building 701, the remaining outside areas static data results, and the Engineered Cap Survey scan and sample results. Included in the data packages for the interior surfaces of Building 701 was a brief description of the survey area, a map of dose rate measurement locations, and results of smears collected for removable activity levels. Reported final data were compared to Attachment 3, “Radionuclides of Concern and Additional Radionuclides for Evaluation: BGRR—Remaining Outside Areas Radionuclides of Concern” and Attachment 5, “Post Decommissioning Radiological Conditions,” provided in the *As-Left Survey Procedure for the BGRR* (BNL 2012a). ORAU has determined that the data package summaries provided sufficient information to support a Type A evaluation. The following is a summarized assessment of the data and analytical results provided in the data packages for the “as-left” condition in each of the three separate areas.

WALKOVER SURVEY —REMAINING OUTSIDE AREAS

The “as-left” outdoor area surveys were performed per the removal actions required in the 2004 *Action Memorandum for the Brookhaven Graphite Research Reactor Canal and Deep Pockets of Soil Contamination Removal Action* (BNL 2004). All impacted soils that were easily accessible without compromising any nearby remaining or operating structures have been removed. Following removal actions and backfill of the area, the “as-left” survey design was based on a modified Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) approach. Soil used for backfill in the remaining outside areas had to meet the guidance in the *Overburden Soil Sampling Plan and “As-Left” Radiological Assessment* prior to being used for that purpose (BNL 2005).

The remaining outside area is considered a Class 2 sample design because of its proximity to the Engineered Cap around Building 701. Sixteen soil sample locations were determined to satisfy the MARSSIM statistical survey design for the Sign test (BNL 2012b). If any soil areas were identified during scans that were greater than the scan action level, they were noted and removed.

One duplicate, one background, and two composite soil samples were also obtained (BNL 2012c and d). Analytical results of the soil samples were compared to the cleanup values for the primary radionuclides of concern (ROCs): Cs-137, Sr-90, and Ra-226 (23 pCi/g, 15 pCi/g, and 5 pCi/g, respectively) (BNL 2012a). Gamma spectroscopy results provided were reviewed for Cs-137 and Ra-226 concentrations (BNL 2012a and e). Concentrations were well below the cleanup values.

Only the two composite samples (each with 8 of the 16 locations forming the two composite samples) were submitted for analytical determination of hard-to-detect (HTD) beta emitters and for alpha emitters in soil, the composite samples were identified as 32061-001 and 32061-002. When composite sampling strategies are used to demonstrate that removal actions were successful in meeting site cleanup action levels, there are additional requirements that must be considered. However, these other considerations were not specifically discussed in the data packages. The sampling methodology must ensure equality in aliquot size and that the matrix can be properly homogenized. Furthermore, there is the necessity to establish a modified investigation level (MIL) to account for the extent that the contaminant could be diluted. The default MIL is typically the cleanup action level divided by the number of increments that formed the composite.

Sr-90 is one of the primary contaminants and a HTD having a cleanup goal of 15 pCi/g; the MIL therefore would be $15/8 = 1.8$ pCi/g. After evaluating two conditional criteria, ORAU was able to determine that the Sr-90 in these composites would satisfy the cleanup action levels. First, because Cs-137 has been used as a surrogate for Sr-90 and the resulting Cs-137 concentrations were near or at background, then Sr-90 concentrations should also be near background concentration based on the surrogate ratio. Sr-90 results were well below the above calculated MIL at 0.138 pCi/g for sample 32061-001 and sample 32061-002 was -0.115 pCi/g (BNL 2012e).

H-3 concentrations were -16.3 pCi/g for composite 32061-001 and 60.5 pCi/g for composite 32061-002. A RESRAD evaluation to assess if the annual dose exceeds 4 millirem per year via groundwater pathways was not required based on these low level results. C-14 concentrations were reported at 0.236 and 0.543 pCi/g for 32061-001 and 32061-002, respectively. There was not a cleanup goal identified for C-14. Results for Pu-238 and Pu-239/240 by alpha spectroscopy were well below the estimated cleanup value of Pu-238 (57 pCi/g) and Pu-239/240 (35 pCi/g), at concentrations of -0.0182 pCi/g and 0.0472 pCi/g, and -0.0388 pCi/g and 0.0227 pCi/g, for sample 32061-001 and sample 32061-002, respectively. The composite results of the 16 samples provide information concerning the average plutonium concentrations for the area represented by the composite sample. However, as stated previously, information on the individual increment making up the composite is lost. For the case above, the MILs would be $57/8 = 7.1$ pCi/g and $35/8 = 4.4$ pCi/g for Pu-238 and Pu-239/240, respectively. Concentrations for Pu-238 and Pu-239/240 were well below these MILs.

BLDG 701 AS-LEFT SURVEY

Fourteen “as-left” data packages were reviewed to determine if sufficient information was collected to satisfy that the survey of the area was appropriately documented. The work procedure reviewed did not specify a required number of samples or how sample locations were determined. Each package included dose rate survey measurement and locations and smear results. The review noted that there were two packages (“South Below Ground Duct” and “Fuel Canal and Deep Pit”) in which the data exceeded the post-decommissioning radiological conditions general area contamination levels (BNL 2012f). The “South Below Ground Duct” removable contamination exceeded 76,000 dpm/100 cm² and the “Fuel Canal and Deep Pit (at the 79 ft deep pit level)” was in excess of 26,000 dpm/ 100 cm². The expected results guidelines for general area contamination

levels for loose beta-gamma contamination should be at $<7,000$ dpm/100 cm² and $<2,500$ dpm/100 cm², respectively (BNL 2012a). Additionally, the review noted that sample batch “31389” listed on the “Fuel Canal and Deep Pit” data package was not included.

The data packages did not indicate that either the “South Below Ground Duct” or “Fuel Canal and Deep Pit” had been posted as a contamination area as a result of the level of removable activity measured. The South Duct package did identify that the “Cut House,” in which both the North and South Ducts enter, was posted as a radiological and contamination area.

ENGINEERED CAP VERIFICATION SURVEY

Shielded and unshielded measurements of the final Engineered Cap around Building 701 were provided for review (BNL 2012g). The review noted that numerous measurement locations were observed to be above the screening values for both shielded and unshielded detectors. High ambient activity measurements between Buildings 701 and 801 have been previously documented as being attributed to source materials located in Building 801. Additionally, soil samples collected during the “Outside Area Survey,” which was conducted in close proximity to the Building 801, were determined to be well below the ROC concentrations cleanup values (BNL 2012a).

Therefore, ORAU is of the opinion that the contractor has provided adequate evidence that the appropriate level of effort and documentation of the “as-left” conditions within the BGRR have been sufficient to meet the site established goal, with two exceptions associated with the Building 701 “as-left” conditions: the “South Below Ground Duct” and the “Fuel Canal and Deep Pit (at the 79 ft deep pit level).” Both areas should be posted and controlled as contamination areas.

Individual soil sample results were within the cleanup values for Cs-137 and Ra-226. Only the two composited samples were analyzed for Sr-90 and transuranics. Concentrations were below the cleanup values.

REFERENCES

- BNL 2004. *Action Memorandum Brookhaven Graphite Research Reactor Canal and Deep Pockets of Soil Contamination Removal Action*. Brookhaven National Laboratory. Upton, New York. December.
- BNL 2005. *Overburden Soil Sampling Plan and "As-Left" Radiological Assessment*. Brookhaven National Laboratory. Upton, New York. January.
- BNL 2008. *Final Remedial Design/ Remedial Action Work Plan For the Biological Shield Removal*. Brookhaven National Laboratory. Upton, New York. March.
- BNL 2012a. *As-Left Survey Procedure for the BGRR*. WP-314-35 Revision 2. Brookhaven National Laboratory. Upton, New York. April.
- BNL 2012b. E-mail from T. Kneitel (DOE-BSO) to P. Weaver (ORISE). "FW: MARSSIM Question". Brookhaven National Laboratory. May 30.
- BNL 2012c. E-mail from T. Kneitel (DOE-BSO) to P. Weaver (ORISE). "RE: BGRR As-Left Survey Information for ORISE - SU-3 samples results." Brookhaven National Laboratory. May 1.
- BNL 2012d. E-mail from T. Kneitel (DOE-BSO) to P Weaver (ORISE). "FW: SU 3 sample locations." Brookhaven National Laboratory. May 18.
- BNL 2012e. E-mail from T. Kneitel (DOE-BSO) to P. Weaver (ORISE). "FW: Data for COC 32061. GEL laboratories Case Narrative for Brookhaven National Laboratory SDG: 32061, Work Order: 303059." Brookhaven National Laboratory. May 24.
- BNL 2012f. Email from T. Kneitel (DOE-BSO) to P. Weaver (ORISE). "FW: BGRR As-Left Survey Information for ORISE - Interior of Bldg 701." Brookhaven National Laboratory. April 30.
- BNL 2012g. E-mail from T. Kneitel (DOE-BSO) to P Weaver (ORISE). "FW: Remaining FSS Data." Brookhaven National Laboratory. May 17.
- DOE 2007. Memorandum from Charles Anderson. "Clarification of Independent Verification and Radiological Release Requirements." U.S. Department of Energy. Washington, D.C. June.
- DOE 2008. Memorandum from James M. Owendoff. "Office of Environmental Management Headquarters Plan for the Approval and Independent Verification of Authorized Limits." U.S. Department of Energy. Washington, D.C. June 11.
- DOE 2011. DOE Order 458.1, Chg 1, Radiation Protection of the Public and the Environment. Washington, D.C. March 8.

Appendix D

RESRAD Summary Report

Dose Conversion Factor (and Related) Parameter Summary ...	2
Site-Specific Parameter Summary	4
Summary of Pathway Selections	8
Contaminated Zone and Total Dose Summary	9
Total Dose Components	
Time = 0.000E+00	10
Time = 1.000E+00	11
Time = 5.000E+00	12
Time = 1.000E+01	13
Time = 5.000E+01	14
Time = 1.000E+02	15
Time = 5.000E+02	16
Time = 1.000E+03	17
Dose/Source Ratios Summed Over All Pathways	18
Single Radionuclide Soil Guidelines	18
Dose Per Nuclide Summed Over All Pathways	19
Soil Concentration Per Nuclide	19

Summary : BGRR Outside Areas-Residential- Bkg-Subtract-May-2012

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BGRR-OA-RES-BKG-SUBTRACT-MAY-2012-1.RAD

Dose Conversion Factor (and Related) Parameter Summary

Dose Library: FGR 12 & FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA				
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	At-218 (Source: FGR 12)	5.847E-03	5.847E-03	DCF1(1)
A-1	Ba-137m (Source: FGR 12)	3.606E+00	3.606E+00	DCF1(2)
A-1	Bi-210 (Source: FGR 12)	3.606E-03	3.606E-03	DCF1(3)
A-1	Bi-214 (Source: FGR 12)	9.808E+00	9.808E+00	DCF1(4)
A-1	Cs-137 (Source: FGR 12)	7.510E-04	7.510E-04	DCF1(5)
A-1	Pa-234 (Source: FGR 12)	1.155E+01	1.155E+01	DCF1(6)
A-1	Pa-234m (Source: FGR 12)	8.967E-02	8.967E-02	DCF1(7)
A-1	Pb-210 (Source: FGR 12)	2.447E-03	2.447E-03	DCF1(8)
A-1	Pb-214 (Source: FGR 12)	1.341E+00	1.341E+00	DCF1(9)
A-1	Po-210 (Source: FGR 12)	5.231E-05	5.231E-05	DCF1(10)
A-1	Po-214 (Source: FGR 12)	5.138E-04	5.138E-04	DCF1(11)
A-1	Po-218 (Source: FGR 12)	5.642E-05	5.642E-05	DCF1(12)
A-1	Ra-226 (Source: FGR 12)	3.176E-02	3.176E-02	DCF1(13)
A-1	Rn-222 (Source: FGR 12)	2.354E-03	2.354E-03	DCF1(14)
A-1	Th-230 (Source: FGR 12)	1.209E-03	1.209E-03	DCF1(15)
A-1	Th-234 (Source: FGR 12)	2.410E-02	2.410E-02	DCF1(16)
A-1	Tl-210 (Source: no data)	0.000E+00	-2.000E+00	DCF1(17)
A-1	U-234 (Source: FGR 12)	4.017E-04	4.017E-04	DCF1(18)
A-1	U-238 (Source: FGR 12)	1.031E-04	1.031E-04	DCF1(19)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(1)
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2(2)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2(3)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(4)
B-1	U-234	1.320E-01	1.320E-01	DCF2(5)
B-1	U-238	1.180E-01	1.180E-01	DCF2(6)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(7)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(1)
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3(2)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3(3)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(4)
D-1	U-234	2.830E-04	2.830E-04	DCF3(5)
D-1	U-238	2.550E-04	2.550E-04	DCF3(6)
D-1	U-238+D	2.687E-04	2.550E-04	DCF3(7)
D-34	Food transfer factors:			
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(1,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(1,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(1,3)
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(2,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(2,3)
D-34				

Dose Library: FGR 12 & FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(4,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(4,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(5,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(5,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(5,3)
D-34				
D-34	U-238 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(1,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(2,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(2,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(3,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(3,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(4,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(4,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(5,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(5,2)
D-5				
D-5	U-238 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-238 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)

*Base Case means Default.Lib w/o Associate Nuclide contributions.

Summary : BGRR Outside Areas-Residential- Bkg-Subtract-May-2012

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BGRR-OA-RES-BKG-SUBTRACT-MAY-2012-1.RAD

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA					
R011	Area of contaminated zone (m**2)	3.200E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	5.000E+00	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	2.500E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	5.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	5.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	5.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
3 3 3 3 3					
R012	Initial principal radionuclide (pCi/g): Cs-137	2.500E-01	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): U-238	4.600E-01	0.000E+00	---	S1(6)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(6)
3 3 3 3 3					
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.660E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	3.300E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.400E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	5.000E+03	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	4.900E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	6.230E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	4.600E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.230E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.600E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
3 3 3 3 3					
R014	Density of saturated zone (g/cm**3)	1.660E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	3.300E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.400E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	2.000E+04	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	4.800E-03	2.000E-02	---	HGWT
R014	Saturated zone b parameter	4.900E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.800E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	0.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.660E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	3.300E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.400E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	4.900E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	5.000E+03	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.889E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	1.700E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	1.700E+01	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	1.700E+01	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.721E-03	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.082E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.154E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.349E-06	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name

R016	Distribution coefficients for daughter U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.614E-03	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)

R017	Inhalation rate (m**3/yr)	7.300E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	8.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.000E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)

R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)

R018	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.400E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	4.380E+01	3.650E+01	---	SOIL

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA					
R018	Drinking water intake (L/yr)	7.000E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	-1	-1	0.500E+00	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
3 3 3 3 3 3					
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	1.000E-05	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DR00T
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
3 3 3 3 3 3					
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
3 3 3 3 3 3					
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CS0IL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
3 3 3 3 3 3					

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH20CV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH20FL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	active
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	active
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	active

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
AAAAAAAAAAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAAAAAAAAAA	
Area:	32000.00 square meters	Cs-137	2.500E-01
Thickness:	5.00 meters	U-238	4.600E-01
Cover Depth:	0.00 meters		

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 1.500E+01 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
t (years): 0.000E+00 1.000E+00 5.000E+00 1.000E+01 5.000E+01 1.000E+02 5.000E+02 1.000E+03
TDOSE(t): 6.451E-01 6.411E-01 6.275E-01 6.157E-01 6.584E-01 4.749E-01 6.237E-02 5.720E-03
M(t): 4.301E-02 4.274E-02 4.183E-02 4.105E-02 4.389E-02 3.166E-02 4.158E-03 3.813E-04
Maximum TDOSE(t): 6.741E-01 mrem/yr at t = 55.1 ± 0.1 years

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.515E+01 years
Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Nuclide														
AAAAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA
Cs-137	1.436E-01	0.2129	5.191E-08	0.0000	0.000E+00	0.0000	1.183E-02	0.0176	0.000E+00	0.0000	0.000E+00	0.0000	1.117E-04	0.0002
U-238	3.341E-02	0.0496	9.992E-04	0.0015	0.000E+00	0.0000	2.068E-02	0.0307	0.000E+00	0.0000	0.000E+00	0.0000	3.123E-03	0.0046
iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii
Total	1.770E-01	0.2625	9.992E-04	0.0015	0.000E+00	0.0000	3.252E-02	0.0482	0.000E+00	0.0000	0.000E+00	0.0000	3.235E-03	0.0048

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.515E+01 years
Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Nuclide														
AAAAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA
Cs-137	2.614E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.921E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.555E-01	0.2307
U-238	4.291E-01	0.6366	0.000E+00	0.0000	0.000E+00	0.0000	3.126E-02	0.0464	0.000E+00	0.0000	0.000E+00	0.0000	5.186E-01	0.7693
iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii
Total	4.291E-01	0.6366	0.000E+00	0.0000	0.000E+00	0.0000	3.126E-02	0.0464	0.000E+00	0.0000	0.000E+00	0.0000	6.741E-01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA
Cs-137	5.216E-01	0.8084	1.886E-07	0.0000	0.000E+00	0.0000	4.300E-02	0.0666	0.000E+00	0.0000	0.000E+00	0.0000	4.059E-04	0.0006
U-238	4.335E-02	0.0672	1.296E-03	0.0020	0.000E+00	0.0000	2.683E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	4.051E-03	0.0063
iiiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii
Total	5.649E-01	0.8756	1.296E-03	0.0020	0.000E+00	0.0000	6.982E-02	0.1082	0.000E+00	0.0000	0.000E+00	0.0000	4.457E-03	0.0069

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA
Cs-137	8.345E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.543E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.650E-01	0.8757
U-238	4.368E-03	0.0068	0.000E+00	0.0000	0.000E+00	0.0000	3.026E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	8.019E-02	0.1243
iiiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii
Total	4.369E-03	0.0068	0.000E+00	0.0000	0.000E+00	0.0000	3.026E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	6.451E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : BGRR Outside Areas-Residential- Bkg-Subtract-May-2012

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BGRR-0A-RES-BKG-SUBTRACT-MAY-2012-1.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA
Cs-137	5.095E-01	0.7947	1.842E-07	0.0000	0.000E+00	0.0000	4.200E-02	0.0655	0.000E+00	0.0000	0.000E+00	0.0000	3.965E-04	0.0006
U-238	4.315E-02	0.0673	1.290E-03	0.0020	0.000E+00	0.0000	2.670E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	4.032E-03	0.0063
iiiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii
Total	5.526E-01	0.8620	1.290E-03	0.0020	0.000E+00	0.0000	6.870E-02	0.1072	0.000E+00	0.0000	0.000E+00	0.0000	4.428E-03	0.0069

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA
Cs-137	2.467E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.746E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.519E-01	0.8608
U-238	1.311E-02	0.0205	0.000E+00	0.0000	0.000E+00	0.0000	9.372E-04	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	8.922E-02	0.1392
iiiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii
Total	1.312E-02	0.0205	0.000E+00	0.0000	0.000E+00	0.0000	9.374E-04	0.0015	0.000E+00	0.0000	0.000E+00	0.0000	6.411E-01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA
Cs-137	4.640E-01	0.7394	1.678E-07	0.0000	0.000E+00	0.0000	3.825E-02	0.0610	0.000E+00	0.0000	0.000E+00	0.0000	3.611E-04	0.0006
U-238	4.234E-02	0.0675	1.266E-03	0.0020	0.000E+00	0.0000	2.620E-02	0.0418	0.000E+00	0.0000	0.000E+00	0.0000	3.956E-03	0.0063
iiiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii
Total	5.063E-01	0.8069	1.266E-03	0.0020	0.000E+00	0.0000	6.445E-02	0.1027	0.000E+00	0.0000	0.000E+00	0.0000	4.317E-03	0.0069

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA
Cs-137	8.272E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.023E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.026E-01	0.8009
U-238	4.770E-02	0.0760	0.000E+00	0.0000	0.000E+00	0.0000	3.457E-03	0.0055	0.000E+00	0.0000	0.000E+00	0.0000	1.249E-01	0.1991
iiiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii
Total	4.771E-02	0.0760	0.000E+00	0.0000	0.000E+00	0.0000	3.458E-03	0.0055	0.000E+00	0.0000	0.000E+00	0.0000	6.275E-01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	4.128E-01	0.6704	1.493E-07	0.0000	0.000E+00	0.0000	3.403E-02	0.0553	0.000E+00	0.0000	0.000E+00	0.0000	3.212E-04	0.0005
U-238	4.135E-02	0.0672	1.236E-03	0.0020	0.000E+00	0.0000	2.559E-02	0.0416	0.000E+00	0.0000	0.000E+00	0.0000	3.864E-03	0.0063
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	4.541E-01	0.7375	1.236E-03	0.0020	0.000E+00	0.0000	5.962E-02	0.0968	0.000E+00	0.0000	0.000E+00	0.0000	4.185E-03	0.0068

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	1.407E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.030E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.471E-01	0.7262
U-238	9.001E-02	0.1462	0.000E+00	0.0000	0.000E+00	0.0000	6.541E-03	0.0106	0.000E+00	0.0000	0.000E+00	0.0000	1.686E-01	0.2738
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	9.003E-02	0.1462	0.000E+00	0.0000	0.000E+00	0.0000	6.542E-03	0.0106	0.000E+00	0.0000	0.000E+00	0.0000	6.157E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : BGRR Outside Areas-Residential- Bkg-Subtract-May-2012

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BGRR-0A-RES-BKG-SUBTRACT-MAY-2012-1.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 5.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA
Cs-137	1.619E-01	0.2460	5.855E-08	0.0000	0.000E+00	0.0000	1.335E-02	0.0203	0.000E+00	0.0000	0.000E+00	0.0000	1.260E-04	0.0002
U-238	3.424E-02	0.0520	1.024E-03	0.0016	0.000E+00	0.0000	2.119E-02	0.0322	0.000E+00	0.0000	0.000E+00	0.0000	3.200E-03	0.0049
iiiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii
Total	1.962E-01	0.2980	1.024E-03	0.0016	0.000E+00	0.0000	3.454E-02	0.0525	0.000E+00	0.0000	0.000E+00	0.0000	3.326E-03	0.0051

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 5.000E+01 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA
Cs-137	2.674E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.965E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.754E-01	0.2665
U-238	3.945E-01	0.5993	0.000E+00	0.0000	0.000E+00	0.0000	2.873E-02	0.0436	0.000E+00	0.0000	0.000E+00	0.0000	4.829E-01	0.7335
iiiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii
Total	3.946E-01	0.5993	0.000E+00	0.0000	0.000E+00	0.0000	2.873E-02	0.0436	0.000E+00	0.0000	0.000E+00	0.0000	6.584E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : BGRR Outside Areas-Residential- Bkg-Subtract-May-2012

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BGRR-0A-RES-BKG-SUBTRACT-MAY-2012-1.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA
Cs-137	5.027E-02	0.1059	1.818E-08	0.0000	0.000E+00	0.0000	4.144E-03	0.0087	0.000E+00	0.0000	0.000E+00	0.0000	3.912E-05	0.0001
U-238	2.704E-02	0.0569	8.087E-04	0.0017	0.000E+00	0.0000	1.674E-02	0.0352	0.000E+00	0.0000	0.000E+00	0.0000	2.527E-03	0.0053
iiiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii
Total	7.731E-02	0.1628	8.087E-04	0.0017	0.000E+00	0.0000	2.088E-02	0.0440	0.000E+00	0.0000	0.000E+00	0.0000	2.567E-03	0.0054

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA
Cs-137	1.666E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.225E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.447E-02	0.1147
U-238	3.480E-01	0.7327	0.000E+00	0.0000	0.000E+00	0.0000	2.535E-02	0.0534	0.000E+00	0.0000	0.000E+00	0.0000	4.204E-01	0.8853
iiiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii
Total	3.480E-01	0.7327	0.000E+00	0.0000	0.000E+00	0.0000	2.536E-02	0.0534	0.000E+00	0.0000	0.000E+00	0.0000	4.749E-01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	4.339E-06	0.0001	1.569E-12	0.0000	0.000E+00	0.0000	3.577E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.377E-09	0.0000
U-238	4.092E-03	0.0656	1.228E-04	0.0020	0.000E+00	0.0000	2.541E-03	0.0407	0.000E+00	0.0000	0.000E+00	0.0000	3.837E-04	0.0062
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	4.096E-03	0.0657	1.228E-04	0.0020	0.000E+00	0.0000	2.542E-03	0.0408	0.000E+00	0.0000	0.000E+00	0.0000	3.837E-04	0.0062

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	7.660E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.635E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.708E-06	0.0001
U-238	5.148E-02	0.8253	0.000E+00	0.0000	0.000E+00	0.0000	3.751E-03	0.0601	0.000E+00	0.0000	0.000E+00	0.0000	6.237E-02	0.9999
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	5.148E-02	0.8253	0.000E+00	0.0000	0.000E+00	0.0000	3.751E-03	0.0601	0.000E+00	0.0000	0.000E+00	0.0000	6.237E-02	1.0000

*Sum of all water independent and dependent pathways.

Summary : BGRR Outside Areas-Residential- Bkg-Subtract-May-2012

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BGRR-0A-RES-BKG-SUBTRACT-MAY-2012-1.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA
Cs-137	3.610E-11	0.0000	1.305E-17	0.0000	0.000E+00	0.0000	2.976E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.809E-14	0.0000
U-238	3.873E-04	0.0677	1.181E-05	0.0021	0.000E+00	0.0000	2.455E-04	0.0429	0.000E+00	0.0000	0.000E+00	0.0000	3.689E-05	0.0064
iiiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii
Total	3.873E-04	0.0677	1.181E-05	0.0021	0.000E+00	0.0000	2.455E-04	0.0429	0.000E+00	0.0000	0.000E+00	0.0000	3.689E-05	0.0064

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA
Cs-137	1.386E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.020E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.925E-11	0.0000
U-238	4.696E-03	0.8210	0.000E+00	0.0000	0.000E+00	0.0000	3.422E-04	0.0598	0.000E+00	0.0000	0.000E+00	0.0000	5.720E-03	1.0000
iiiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii
Total	4.696E-03	0.8210	0.000E+00	0.0000	0.000E+00	0.0000	3.422E-04	0.0598	0.000E+00	0.0000	0.000E+00	0.0000	5.720E-03	1.0000

*Sum of all water independent and dependent pathways.

Summary : BGRR Outside Areas-Residential- Bkg-Subtract-May-2012

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\BGRR-OA-RES-BKG-SUBTRACT-MAY-2012-1.RAD

Dose/Source Ratios Summed Over All Pathways
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	5.000E+00	1.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03
AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA
Cs-137+D	Cs-137+D	1.000E+00	2.260E+00	2.208E+00	2.010E+00	1.788E+00	7.017E-01	2.179E-01	1.883E-05	1.570E-10
U-238	U-238	5.400E-05	4.116E-06	5.144E-06	9.211E-06	1.419E-05	4.999E-05	4.383E-05	6.484E-06	5.892E-07
U-238+D	U-238+D	9.999E-01	1.743E-01	1.939E-01	2.716E-01	3.665E-01	1.050E+00	9.138E-01	1.354E-01	1.233E-02
U-238+D	U-234	9.999E-01	1.097E-07	3.467E-07	1.555E-06	3.642E-06	4.152E-05	1.052E-04	1.733E-04	9.116E-05
U-238+D	Th-230	9.999E-01	4.463E-13	2.602E-12	2.971E-11	1.052E-10	2.192E-09	7.831E-09	9.303E-08	1.753E-07
U-238+D	Ra-226+D	9.999E-01	2.070E-10	6.266E-10	1.910E-09	4.587E-09	1.913E-08	4.039E-08	1.182E-06	4.263E-06
U-238+D	Pb-210+D	9.999E-01	7.985E-10	2.417E-09	7.357E-09	1.760E-08	6.444E-08	9.031E-08	9.182E-07	3.683E-06
U-238+D	äDSR(j)		1.743E-01	1.939E-01	2.716E-01	3.665E-01	1.050E+00	9.139E-01	1.356E-01	1.243E-02
iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii

The DSR includes contributions from associated (half-life ó 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 1.500E+01 mrem/yr

Nuclide (i)	t=	0.000E+00	1.000E+00	5.000E+00	1.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	6.638E+00	6.795E+00	7.461E+00	8.387E+00	2.138E+01	6.884E+01	7.965E+05	9.554E+10	
U-238	8.604E+01	7.734E+01	5.524E+01	4.093E+01	1.429E+01	1.641E+01	1.106E+02	1.206E+03	
iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)
and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
at tmin = time of minimum single radionuclide soil guideline
and at tmax = time of maximum total dose = 55.1 ñ 0.1 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i, tmin)	G(i, tmin) (pCi/g)	DSR(i, tmax)	G(i, tmax) (pCi/g)
AAAAAA	AAAAAA	AAAAAAAAAAAAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	2.500E-01	0.000E+00	2.260E+00	6.638E+00	6.221E-01	2.411E+01
U-238	4.600E-01	55.5 ñ 0.1	1.129E+00	1.329E+01	1.127E+00	1.331E+01
iiiiiiii	iiiiiiii	iiiiiiiiiiiiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii

Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr								
			t=	0.000E+00	1.000E+00	5.000E+00	1.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03
AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA
Cs-137	Cs-137	1.000E+00	5.650E-01	5.519E-01	5.026E-01	4.471E-01	1.754E-01	5.447E-02	4.708E-06	3.925E-11	
U-238	U-238	5.400E-05	1.893E-06	2.366E-06	4.237E-06	6.526E-06	2.300E-05	2.016E-05	2.983E-06	2.710E-07	
U-238	U-238	9.999E-01	8.019E-02	8.922E-02	1.249E-01	1.686E-01	4.829E-01	4.204E-01	6.228E-02	5.674E-03	
U-238	äDOSE(j)		8.019E-02	8.922E-02	1.249E-01	1.686E-01	4.829E-01	4.204E-01	6.229E-02	5.674E-03	
U-234	U-238	9.999E-01	5.048E-08	1.595E-07	7.153E-07	1.675E-06	1.910E-05	4.838E-05	7.973E-05	4.193E-05	
Th-230	U-238	9.999E-01	2.053E-13	1.197E-12	1.367E-11	4.840E-11	1.008E-09	3.602E-09	4.279E-08	8.064E-08	
Ra-226	U-238	9.999E-01	9.521E-11	2.883E-10	8.788E-10	2.110E-09	8.800E-09	1.858E-08	5.435E-07	1.961E-06	
Pb-210	U-238	9.999E-01	3.673E-10	1.112E-09	3.384E-09	8.098E-09	2.964E-08	4.154E-08	4.224E-07	1.694E-06	
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii

THF(i) is the thread fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g								
			t=	0.000E+00	1.000E+00	5.000E+00	1.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03
AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA
Cs-137	Cs-137	1.000E+00	2.500E-01	2.442E-01	2.224E-01	1.979E-01	7.762E-02	2.410E-02	2.080E-06	1.730E-11	
U-238	U-238	5.400E-05	2.484E-05	2.472E-05	2.426E-05	2.369E-05	1.962E-05	1.549E-05	2.345E-06	2.213E-07	
U-238	U-238	9.999E-01	4.600E-01	4.578E-01	4.492E-01	4.388E-01	3.633E-01	2.869E-01	4.342E-02	4.098E-03	
U-238	äS(j):		4.600E-01	4.578E-01	4.493E-01	4.388E-01	3.633E-01	2.869E-01	4.342E-02	4.098E-03	
U-234	U-238	9.999E-01	0.000E+00	1.300E-06	6.418E-06	1.263E-05	5.570E-05	9.537E-05	1.475E-04	7.966E-05	
Th-230	U-238	9.999E-01	0.000E+00	5.857E-12	1.452E-10	5.747E-10	1.322E-08	4.772E-08	5.701E-07	1.075E-06	
Ra-226	U-238	9.999E-01	0.000E+00	8.459E-16	1.049E-13	8.309E-13	9.601E-11	6.971E-10	4.208E-08	1.509E-07	
Pb-210	U-238	9.999E-01	0.000E+00	6.534E-18	3.957E-15	6.089E-14	2.842E-11	3.292E-10	3.581E-08	1.401E-07	
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii

THF(i) is the thread fraction of the parent nuclide.

RESCALC.EXE execution time = 25.58 seconds

Table of Contents

ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

Part I: Mixture Sums and Single Radionuclide Guidelines

[illegible]

Dose Conversion Factor (and Related) Parameter Summary ...	2
Site-Specific Parameter Summary	4
Summary of Pathway Selections	8
Contaminated Zone and Total Dose Summary	9
Total Dose Components	
Time = 0.000E+00	10
Time = 1.000E+00	11
Time = 5.000E+00	12
Time = 1.000E+01	13
Time = 5.000E+01	14
Time = 1.000E+02	15
Time = 5.000E+02	16
Time = 1.000E+03	17
Dose/Source Ratios Summed Over All Pathways	18
Single Radionuclide Soil Guidelines	18
Dose Per Nuclide Summed Over All Pathways	19
Soil Concentration Per Nuclide	19

Dose Conversion Factor (and Related) Parameter Summary

Dose Library: FGR 12 & FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1 DCF's for external ground radiation, (mrem/yr)/(pCi/g)				
A-1	At-218 (Source: FGR 12)	5.847E-03	5.847E-03	DCF1(1)
A-1	Ba-137m (Source: FGR 12)	3.606E+00	3.606E+00	DCF1(2)
A-1	Bi-210 (Source: FGR 12)	3.606E-03	3.606E-03	DCF1(3)
A-1	Bi-214 (Source: FGR 12)	9.808E+00	9.808E+00	DCF1(4)
A-1	Cs-137 (Source: FGR 12)	7.510E-04	7.510E-04	DCF1(5)
A-1	Pa-234 (Source: FGR 12)	1.155E+01	1.155E+01	DCF1(6)
A-1	Pa-234m (Source: FGR 12)	8.967E-02	8.967E-02	DCF1(7)
A-1	Pb-210 (Source: FGR 12)	2.447E-03	2.447E-03	DCF1(8)
A-1	Pb-214 (Source: FGR 12)	1.341E+00	1.341E+00	DCF1(9)
A-1	Po-210 (Source: FGR 12)	5.231E-05	5.231E-05	DCF1(10)
A-1	Po-214 (Source: FGR 12)	5.138E-04	5.138E-04	DCF1(11)
A-1	Po-218 (Source: FGR 12)	5.642E-05	5.642E-05	DCF1(12)
A-1	Ra-226 (Source: FGR 12)	3.176E-02	3.176E-02	DCF1(13)
A-1	Rn-222 (Source: FGR 12)	2.354E-03	2.354E-03	DCF1(14)
A-1	Th-230 (Source: FGR 12)	1.209E-03	1.209E-03	DCF1(15)
A-1	Th-234 (Source: FGR 12)	2.410E-02	2.410E-02	DCF1(16)
A-1	Tl-210 (Source: no data)	0.000E+00	-2.000E+00	DCF1(17)
A-1	U-234 (Source: FGR 12)	4.017E-04	4.017E-04	DCF1(18)
A-1	U-238 (Source: FGR 12)	1.031E-04	1.031E-04	DCF1(19)
B-1 Dose conversion factors for inhalation, mrem/pCi:				
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(1)
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2(2)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2(3)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(4)
B-1	U-234	1.320E-01	1.320E-01	DCF2(5)
B-1	U-238	1.180E-01	1.180E-01	DCF2(6)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(7)
D-1 Dose conversion factors for ingestion, mrem/pCi:				
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(1)
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3(2)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3(3)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(4)
D-1	U-234	2.830E-04	2.830E-04	DCF3(5)
D-1	U-238	2.550E-04	2.550E-04	DCF3(6)
D-1	U-238+D	2.687E-04	2.550E-04	DCF3(7)
D-34 Food transfer factors:				
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(1,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(1,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(1,3)
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(2,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(2,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: FGR 12 & FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(4,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(4,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(5,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(5,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(5,3)
D-34				
D-34	U-238 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(1,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(2,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(2,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(3,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(3,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(4,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(4,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(5,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(5,2)
D-5				
D-5	U-238 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-238 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.
*Base Case means Default.Lib w/o Associate Nuclide contributions.

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	3.200E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	5.000E+00	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	2.500E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	5.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	5.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	5.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Cs-137	2.500E-01	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): U-238	4.600E-01	0.000E+00	---	S1(6)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(6)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.660E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	3.300E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.400E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	5.000E+03	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	4.900E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	6.230E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	4.600E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.230E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.600E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.660E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	3.300E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.400E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	2.000E+04	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	4.800E-03	2.000E-02	---	HGWT
R014	Saturated zone b parameter	4.900E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.800E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	0.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.660E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	3.300E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.400E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	4.900E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	5.000E+03	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCC(1)
R016	Unsat. zone 1 (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.889E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	1.700E+01	5.000E+01	---	DCNUCC(6)
R016	Unsat. zone 1 (cm**3/g)	1.700E+01	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	1.700E+01	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.721E-03	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(2)
R016	Unsat. zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.082E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	5.000E+01	7.000E+01	---	DCNUCC(3)
R016	Unsat. zone 1 (cm**3/g)	5.000E+01	7.000E+01	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	5.000E+01	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.614E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(4)
R016	Unsat. zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.349E-06	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA					
R016	Distribution coefficients for daughter U-234				
R016	Contaminated zone (cm**3/g)	1.700E+01	5.000E+01	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	1.700E+01	5.000E+01	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	1.700E+01	5.000E+01	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.721E-03	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R017	Inhalation rate (m**3/yr)	7.300E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.500E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	8.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	1.700E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	6.000E-02	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL

Site-Specific Parameter Summary (continued)

	User	Used by RESRAD	Parameter
Menu	Input	Default (If different from user input)	Name
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA			
R018	Drinking water intake (L/yr)	3.500E+02	DWI
R018	Contamination fraction of drinking water	1.000E+00	FDW
R018	Contamination fraction of household water	not used	FHHW
R018	Contamination fraction of livestock water	not used	FLW
R018	Contamination fraction of irrigation water	not used	FIRW
R018	Contamination fraction of aquatic food	not used	FR9
R018	Contamination fraction of plant food	not used	FPLANT
R018	Contamination fraction of meat	not used	FMEAT
R018	Contamination fraction of milk	not used	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	LFI6
R019	Livestock water intake for meat (L/day)	not used	LWI5
R019	Livestock water intake for milk (L/day)	not used	LWI6
R019	Livestock soil intake (kg/day)	not used	LSI
R019	Mass loading for foliar deposition (g/m**3)	not used	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	DM
R019	Depth of roots (m)	not used	DROOT
R019	Drinking water fraction from ground water	1.000E+00	FGWDW
R019	Household water fraction from ground water	not used	FGWHH
R019	Livestock water fraction from ground water	not used	FGWLW
R019	Irrigation fraction from ground water	not used	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	TE(1)
R19B	Growing Season for Leafy (years)	not used	TE(2)
R19B	Growing Season for Fodder (years)	not used	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	TIV(1)
R19B	Translocation Factor for Leafy	not used	TIV(2)
R19B	Translocation Factor for Fodder	not used	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	C12CZ
C14	Fraction of vegetation carbon from soil	not used	CSOIL
C14	Fraction of vegetation carbon from air	not used	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	REVSN
C14	Fraction of grain in beef cattle feed	not used	AVFG4
C14	Fraction of grain in milk cow feed	not used	AVFG5

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH20CV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH20FL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	active
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	active

Contaminated Zone Dimensions	Initial Soil Concentrations, pCi/g	
AAAAAAAAAAAAAAAAAAAAAAAAA	AAAAAAAAAAAAAAAAAAAAAAAAA	
Area: 32000.00 square meters	Cs-137	2.500E-01
Thickness: 5.00 meters	U-238	4.600E-01
Cover Depth: 0.00 meters		

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 1.500E+01 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)
AAAAAAAAAAAAAAAAAAAAAAAAA

t (years):	0.000E+00	1.000E+00	5.000E+00	1.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03
TDOSE(t):	1.740E-01	1.747E-01	1.780E-01	1.834E-01	2.576E-01	1.982E-01	2.711E-02	2.467E-03
M(t):	1.160E-02	1.165E-02	1.187E-02	1.222E-02	1.717E-02	1.321E-02	1.808E-03	1.645E-04

Maximum TDOSE(t): 2.691E-01 mrem/yr at t = 55.3 ± 0.1 years

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.532E+01 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Nuclide														
AAAAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA
Cs-137	4.311E-02	0.1602	1.470E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.843E-05	0.0001
U-238	1.007E-02	0.0374	2.840E-04	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.974E-04	0.0030
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	5.318E-02	0.1976	2.840E-04	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.258E-04	0.0031

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.532E+01 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Nuclide														
AAAAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA
Cs-137	1.306E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.315E-02	0.1603
U-238	2.148E-01	0.7982	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.260E-01	0.8397
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	2.149E-01	0.7983	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.691E-01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	1.573E-01	0.9037	5.365E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.037E-04	0.0006
U-238	1.307E-02	0.0751	3.687E-04	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.035E-03	0.0059
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
Total	1.703E-01	0.9788	3.687E-04	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.139E-03	0.0065

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	4.172E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.574E-01	0.9043
U-238	2.184E-03	0.0125	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.666E-02	0.0957
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
Total	2.184E-03	0.0126	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.740E-01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	1.536E-01	0.8794	5.240E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.013E-04	0.0006
U-238	1.301E-02	0.0745	3.669E-04	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.030E-03	0.0059
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
Total	1.666E-01	0.9539	3.670E-04	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.132E-03	0.0065

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	1.233E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.537E-01	0.8800
U-238	6.557E-03	0.0375	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.096E-02	0.1200
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
Total	6.558E-03	0.0375	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.747E-01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	1.399E-01	0.7860	4.772E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.227E-05	0.0005
U-238	1.277E-02	0.0717	3.601E-04	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.011E-03	0.0057
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
Total	1.527E-01	0.8578	3.601E-04	0.0020	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.103E-03	0.0062

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	4.136E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.400E-01	0.7866
U-238	2.385E-02	0.1340	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.799E-02	0.2134
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
Total	2.385E-02	0.1340	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.780E-01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TD0SE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAAA	AAAAAAA	AAAAAA	AAAAAAA	AAAAAA	AAAAAAA	AAAAAA	AAAAAAA	AAAAAA	AAAAAAA	AAAAAA	AAAAAAA	AAAAAA	AAAAAAA	AAAAAA
Cs-137	1.245E-01	0.6788	4.246E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.208E-05	0.0004
U-238	1.247E-02	0.0680	3.517E-04	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.875E-04	0.0054
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	1.369E-01	0.7468	3.517E-04	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.070E-03	0.0058

Total Dose Contributions TD0SE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAAA	AAAAAAA	AAAAAA	AAAAAAA	AAAAAA	AAAAAAA	AAAAAA	AAAAAAA	AAAAAA	AAAAAAA	AAAAAA	AAAAAAA	AAAAAA	AAAAAAA	AAAAAA
Cs-137	7.034E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.246E-01	0.6792
U-238	4.501E-02	0.2455	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.882E-02	0.3208
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	4.502E-02	0.2455	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.834E-01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	4.883E-02	0.1895	1.665E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.220E-05	0.0001
U-238	1.032E-02	0.0401	2.912E-04	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.177E-04	0.0032
iiiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii
Total	5.915E-02	0.2296	2.912E-04	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.499E-04	0.0033

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	1.337E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.887E-02	0.1897
U-238	1.973E-01	0.7659	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.087E-01	0.8103
iiiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii	iiiiiiiiii	iiiiiii
Total	1.973E-01	0.7660	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.576E-01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	1.516E-02	0.0765	5.171E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.997E-06	0.0001
U-238	8.153E-03	0.0411	2.300E-04	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.459E-04	0.0033
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
Total	2.331E-02	0.1176	2.300E-04	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.559E-04	0.0033

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	8.330E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.518E-02	0.0766
U-238	1.740E-01	0.8779	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.830E-01	0.9234
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
Total	1.740E-01	0.8779	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.982E-01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TD0SE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	1.308E-06	0.0000	4.463E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.629E-10	0.0000
U-238	1.234E-03	0.0455	3.485E-05	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.786E-05	0.0036
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	1.235E-03	0.0456	3.485E-05	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.786E-05	0.0036

Total Dose Contributions TD0SE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	3.830E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.313E-06	0.0000
U-238	2.574E-02	0.9495	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.711E-02	1.0000
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	2.574E-02	0.9495	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.711E-02	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	1.089E-11	0.0000	3.713E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.179E-15	0.0000
U-238	1.166E-04	0.0473	3.296E-06	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.257E-06	0.0038
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	1.166E-04	0.0473	3.296E-06	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.257E-06	0.0038

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	6.930E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.096E-11	0.0000
U-238	2.338E-03	0.9477	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.467E-03	1.0000
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	2.338E-03	0.9477	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.467E-03	1.0000

*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)								
			0.000E+00	1.000E+00	5.000E+00	1.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03	
AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	
Cs-137+D	Cs-137+D	1.000E+00	6.295E-01	6.149E-01	5.600E-01	4.982E-01	1.955E-01	6.071E-02	5.252E-06	4.385E-11	
U-238	U-238	5.400E-05	4.030E-07	8.894E-07	2.813E-06	5.166E-06	2.210E-05	1.948E-05	2.879E-06	2.611E-07	
U-238+D	U-238+D	9.999E-01	3.622E-02	4.557E-02	8.258E-02	1.279E-01	4.537E-01	3.978E-01	5.885E-02	5.347E-03	
U-238+D	U-234	9.999E-01	1.420E-08	8.032E-08	9.045E-07	3.164E-06	6.504E-05	1.141E-04	8.389E-05	1.520E-05	
U-238+D	Th-230	9.999E-01	6.229E-14	3.093E-13	3.182E-12	1.045E-11	2.070E-10	7.133E-10	5.825E-09	8.059E-09	
U-238+D	Ra-226+D	9.999E-01	9.383E-11	2.841E-10	1.278E-09	2.020E-09	1.062E-08	4.328E-08	3.223E-07	6.373E-07	
U-238+D	Pb-210+D	9.999E-01	2.590E-10	7.843E-10	3.525E-09	5.565E-09	2.797E-08	1.096E-07	5.200E-07	8.303E-07	
U-238+D	äDSR(j)		3.622E-02	4.557E-02	8.258E-02	1.279E-01	4.537E-01	3.979E-01	5.893E-02	5.364E-03	
iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	

The DSR includes contributions from associated (half-life ó 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 1.500E+01 mrem/yr

Nuclide (i)	t=	0.000E+00	1.000E+00	5.000E+00	1.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03
AAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA
Cs-137	2.383E+01	2.439E+01	2.679E+01	3.011E+01	7.673E+01	2.471E+02	2.856E+06	3.421E+11	
U-238	4.142E+02	3.291E+02	1.816E+02	1.173E+02	3.306E+01	3.770E+01	2.545E+02	2.797E+03	
iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)
and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
at tmin = time of minimum single radionuclide soil guideline
and at tmax = time of maximum total dose = 55.3 ñ 0.1 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
AAAAAAAA	AAAAAAAA	AAAAAAAAAAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA	AAAAAAAA
Cs-137	2.500E-01	0.000E+00	6.295E-01	2.383E+01	1.726E-01	8.691E+01
U-238	4.600E-01	55.6 ñ 0.1	4.915E-01	3.052E+01	4.913E-01	3.053E+01
iiiiiiii	iiiiiiii	iiiiiiiiiiiiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii

Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr								
			t=	0.000E+00	1.000E+00	5.000E+00	1.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03
AAAAAAA	AAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	
Cs-137	Cs-137	1.000E+00	1.574E-01	1.537E-01	1.400E-01	1.246E-01	4.887E-02	1.518E-02	1.313E-06	1.096E-11	
U-238	U-238	5.400E-05	1.854E-07	4.091E-07	1.294E-06	2.376E-06	1.017E-05	8.960E-06	1.324E-06	1.201E-07	
U-238	U-238	9.999E-01	1.666E-02	2.096E-02	3.799E-02	5.881E-02	2.087E-01	1.830E-01	2.707E-02	2.460E-03	
U-238	äDOSE(j)		1.666E-02	2.096E-02	3.799E-02	5.882E-02	2.087E-01	1.830E-01	2.707E-02	2.460E-03	
U-234	U-238	9.999E-01	6.533E-09	3.695E-08	4.161E-07	1.456E-06	2.992E-05	5.246E-05	3.859E-05	6.991E-06	
Th-230	U-238	9.999E-01	2.866E-14	1.423E-13	1.464E-12	4.805E-12	9.520E-11	3.281E-10	2.679E-09	3.707E-09	
Ra-226	U-238	9.999E-01	4.316E-11	1.307E-10	5.877E-10	9.292E-10	4.886E-09	1.991E-08	1.483E-07	2.932E-07	
Pb-210	U-238	9.999E-01	1.192E-10	3.608E-10	1.622E-09	2.560E-09	1.287E-08	5.041E-08	2.392E-07	3.820E-07	
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	

THF(i) is the thread fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g								
			t=	0.000E+00	1.000E+00	5.000E+00	1.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03
AAAAAAA	AAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	
Cs-137	Cs-137	1.000E+00	2.500E-01	2.442E-01	2.224E-01	1.979E-01	7.762E-02	2.410E-02	2.080E-06	1.730E-11	
U-238	U-238	5.400E-05	2.484E-05	2.472E-05	2.426E-05	2.369E-05	1.962E-05	1.549E-05	2.345E-06	2.213E-07	
U-238	U-238	9.999E-01	4.600E-01	4.578E-01	4.492E-01	4.388E-01	3.633E-01	2.869E-01	4.342E-02	4.098E-03	
U-238	äS(j):		4.600E-01	4.578E-01	4.493E-01	4.388E-01	3.633E-01	2.869E-01	4.342E-02	4.098E-03	
U-234	U-238	9.999E-01	0.000E+00	1.298E-06	6.368E-06	1.244E-05	5.149E-05	8.132E-05	6.150E-05	1.160E-05	
Th-230	U-238	9.999E-01	0.000E+00	5.851E-12	1.444E-10	5.688E-10	1.255E-08	4.310E-08	3.587E-07	4.964E-07	
Ra-226	U-238	9.999E-01	0.000E+00	8.451E-16	1.044E-13	8.236E-13	9.185E-11	6.383E-10	2.784E-08	7.195E-08	
Pb-210	U-238	9.999E-01	0.000E+00	6.529E-18	3.943E-15	6.045E-14	2.739E-11	3.051E-10	2.419E-08	6.796E-08	
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	

THF(i) is the thread fraction of the parent nuclide.

RESCALC.EXE execution time = 23.73 seconds

ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

|||||

Dose Conversion Factor (and Related) Parameter Summary ...	2
Site-Specific Parameter Summary	4
Summary of Pathway Selections	8
Contaminated Zone and Total Dose Summary	9
Total Dose Components	
Time = 0.000E+00	10
Time = 1.000E+00	11
Time = 5.000E+00	12
Time = 1.000E+01	13
Time = 5.000E+01	14
Time = 1.000E+02	15
Time = 5.000E+02	16
Time = 1.000E+03	17
Dose/Source Ratios Summed Over All Pathways	18
Single Radionuclide Soil Guidelines	18
Dose Per Nuclide Summed Over All Pathways	19
Soil Concentration Per Nuclide	19

Dose Conversion Factor (and Related) Parameter Summary

Dose Library: FGR 12 & FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA				
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	At-218 (Source: FGR 12)	5.847E-03	5.847E-03	DCF1(1)
A-1	Ba-137m (Source: FGR 12)	3.606E+00	3.606E+00	DCF1(2)
A-1	Bi-210 (Source: FGR 12)	3.606E-03	3.606E-03	DCF1(3)
A-1	Bi-214 (Source: FGR 12)	9.808E+00	9.808E+00	DCF1(4)
A-1	Cs-137 (Source: FGR 12)	7.510E-04	7.510E-04	DCF1(5)
A-1	Pa-234 (Source: FGR 12)	1.155E+01	1.155E+01	DCF1(6)
A-1	Pa-234m (Source: FGR 12)	8.967E-02	8.967E-02	DCF1(7)
A-1	Pb-210 (Source: FGR 12)	2.447E-03	2.447E-03	DCF1(8)
A-1	Pb-214 (Source: FGR 12)	1.341E+00	1.341E+00	DCF1(9)
A-1	Po-210 (Source: FGR 12)	5.231E-05	5.231E-05	DCF1(10)
A-1	Po-214 (Source: FGR 12)	5.138E-04	5.138E-04	DCF1(11)
A-1	Po-218 (Source: FGR 12)	5.642E-05	5.642E-05	DCF1(12)
A-1	Ra-226 (Source: FGR 12)	3.176E-02	3.176E-02	DCF1(13)
A-1	Rn-222 (Source: FGR 12)	2.354E-03	2.354E-03	DCF1(14)
A-1	Th-230 (Source: FGR 12)	1.209E-03	1.209E-03	DCF1(15)
A-1	Th-234 (Source: FGR 12)	2.410E-02	2.410E-02	DCF1(16)
A-1	Tl-210 (Source: no data)	0.000E+00	-2.000E+00	DCF1(17)
A-1	U-234 (Source: FGR 12)	4.017E-04	4.017E-04	DCF1(18)
A-1	U-238 (Source: FGR 12)	1.031E-04	1.031E-04	DCF1(19)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(1)
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2(2)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2(3)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(4)
B-1	U-234	1.320E-01	1.320E-01	DCF2(5)
B-1	U-238	1.180E-01	1.180E-01	DCF2(6)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(7)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(1)
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3(2)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3(3)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(4)
D-1	U-234	2.830E-04	2.830E-04	DCF3(5)
D-1	U-238	2.550E-04	2.550E-04	DCF3(6)
D-1	U-238+D	2.687E-04	2.550E-04	DCF3(7)
D-34	Food transfer factors:			
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(1,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(1,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(1,3)
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(2,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(2,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: FGR 12 & FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,3)
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(4,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(4,3)
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(5,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(5,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(5,3)
D-34	U-238 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(1,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(2,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(2,2)
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(3,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(3,2)
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(4,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(4,2)
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(5,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(5,2)
D-5	U-238 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-238 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.
*Base Case means Default.Lib w/o Associate Nuclide contributions.

Site-Specific Parameter Summary

		User	Used by RESRAD	Parameter
Menu	Parameter	Input	Default (If different from user input)	Name
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA				
R011	Area of contaminated zone (m**2)	3.200E+04	1.000E+04	--- AREA
R011	Thickness of contaminated zone (m)	5.000E+00	2.000E+00	--- THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	--- SUBMFRACT
R011	Length parallel to aquifer flow (m)	2.500E+02	1.000E+02	--- LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	--- BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	--- TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	--- T(2)
R011	Times for calculations (yr)	5.000E+00	3.000E+00	--- T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	--- T(4)
R011	Times for calculations (yr)	5.000E+01	3.000E+01	--- T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	--- T(6)
R011	Times for calculations (yr)	5.000E+02	3.000E+02	--- T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	--- T(8)
R011	Times for calculations (yr)	not used	0.000E+00	--- T(9)
R011	Times for calculations (yr)	not used	0.000E+00	--- T(10)
R012	Initial principal radionuclide (pCi/g): Cs-137	2.500E-01	0.000E+00	--- S1(1)
R012	Initial principal radionuclide (pCi/g): Ra-226	4.000E-01	0.000E+00	--- S1(3)
R012	Initial principal radionuclide (pCi/g): U-238	4.600E-01	0.000E+00	--- S1(6)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	--- W1(1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	--- W1(3)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	--- W1(6)
R013	Cover depth (m)	0.000E+00	0.000E+00	--- COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	--- DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	--- VCV
R013	Density of contaminated zone (g/cm**3)	1.660E+00	1.500E+00	--- DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	--- VCZ
R013	Contaminated zone total porosity	3.300E-01	4.000E-01	--- TPCZ
R013	Contaminated zone field capacity	2.400E-01	2.000E-01	--- FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	5.000E+03	1.000E+01	--- HCCZ
R013	Contaminated zone b parameter	4.900E+00	5.300E+00	--- BCZ
R013	Average annual wind speed (m/sec)	6.230E+00	2.000E+00	--- WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	--- HUMID
R013	Evapotranspiration coefficient	4.600E-01	5.000E-01	--- EVAPTR
R013	Precipitation (m/yr)	1.230E+00	1.000E+00	--- PRECIP
R013	Irrigation (m/yr)	2.600E-01	2.000E-01	--- RI
R013	Irrigation mode	overhead	overhead	--- IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	--- RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	--- WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	--- EPS
R014	Density of saturated zone (g/cm**3)	1.660E+00	1.500E+00	--- DENSAQ
R014	Saturated zone total porosity	3.300E-01	4.000E-01	--- TPSZ
R014	Saturated zone effective porosity	2.400E-01	2.000E-01	--- EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	--- FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	2.000E+04	1.000E+02	--- HCSZ
R014	Saturated zone hydraulic gradient	4.800E-03	2.000E-02	--- HGWT
R014	Saturated zone b parameter	4.900E+00	5.300E+00	--- BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	--- VWT

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Well pump intake depth (m below water table)	1.800E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	0.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.660E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	3.300E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.400E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	4.900E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	5.000E+03	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCC(1)
R016	Unsat. zone 1 (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.889E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	5.000E+01	7.000E+01	---	DCNUCC(3)
R016	Unsat. zone 1 (cm**3/g)	5.000E+01	7.000E+01	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	5.000E+01	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.614E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	1.700E+01	5.000E+01	---	DCNUCC(6)
R016	Unsat. zone 1 (cm**3/g)	1.700E+01	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	1.700E+01	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.721E-03	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(2)
R016	Unsat. zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.082E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(4)
R016	Unsat. zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.349E-06	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.614E-03	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R017	Inhalation rate (m**3/yr)	7.300E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	8.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.000E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.400E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	4.380E+01	3.650E+01	---	SOIL

Site-Specific Parameter Summary (continued)

	User	Used by RESRAD	Parameter
Menu	Input	Default (If different from user input)	Name
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA			
R018	Drinking water intake (L/yr)	7.000E+02	DWI
R018	Contamination fraction of drinking water	1.000E+00	FDW
R018	Contamination fraction of household water	not used	FHHW
R018	Contamination fraction of livestock water	not used	FLW
R018	Contamination fraction of irrigation water	1.000E+00	FIRW
R018	Contamination fraction of aquatic food	not used	FR9
R018	Contamination fraction of plant food	-1	FPLANT
R018	Contamination fraction of meat	not used	FMEAT
R018	Contamination fraction of milk	not used	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	LFI6
R019	Livestock water intake for meat (L/day)	not used	LWI5
R019	Livestock water intake for milk (L/day)	not used	LWI6
R019	Livestock soil intake (kg/day)	not used	LSI
R019	Mass loading for foliar deposition (g/m**3)	1.000E-05	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	DM
R019	Depth of roots (m)	9.000E-01	DR00T
R019	Drinking water fraction from ground water	1.000E+00	FGWDW
R019	Household water fraction from ground water	not used	FGWHH
R019	Livestock water fraction from ground water	not used	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	TE(2)
R19B	Growing Season for Fodder (years)	not used	TE(3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	TIV(2)
R19B	Translocation Factor for Fodder	not used	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	C12CZ
C14	Fraction of vegetation carbon from soil	not used	CSOIL
C14	Fraction of vegetation carbon from air	not used	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	REVSN
C14	Fraction of grain in beef cattle feed	not used	AVFG4
C14	Fraction of grain in milk cow feed	not used	AVFG5

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH20CV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH20FL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	active
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	active
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	active

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
AAAAAAAAAAAAAAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAAAAAAAAAAAAAA	
Area:	32000.00 square meters	Cs-137	2.500E-01
Thickness:	5.00 meters	Ra-226	4.000E-01
Cover Depth:	0.00 meters	U-238	4.600E-01

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 1.500E+01 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

t (years):	0.000E+00	1.000E+00	5.000E+00	1.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03
TDOSE(t):	5.323E+00	5.395E+00	5.658E+00	5.951E+00	7.347E+00	7.664E+00	3.959E+00	1.373E+00
M(t):	3.549E-01	3.596E-01	3.772E-01	3.968E-01	4.898E-01	5.110E-01	2.639E-01	9.156E-02

Maximum TDOSE(t): 7.684E+00 mrem/yr at t = 129.4 ± 0.3 years

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.294E+02 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Nuclide														
AAAAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA
Cs-137	2.526E-02	0.0033	9.136E-09	0.0000	0.000E+00	0.0000	2.083E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	1.966E-05	0.0000
Ra-226	2.129E+00	0.2771	2.366E-04	0.0000	0.000E+00	0.0000	3.395E+00	0.4419	0.000E+00	0.0000	0.000E+00	0.0000	8.805E-02	0.0115
U-238	2.353E-02	0.0031	7.039E-04	0.0001	0.000E+00	0.0000	1.457E-02	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	2.200E-03	0.0003
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	2.178E+00	0.2834	9.405E-04	0.0001	0.000E+00	0.0000	3.412E+00	0.4440	0.000E+00	0.0000	0.000E+00	0.0000	9.027E-02	0.0117

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.294E+02 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Nuclide														
AAAAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA
Cs-137	1.088E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.999E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.738E-02	0.0036
Ra-226	1.564E+00	0.2035	0.000E+00	0.0000	0.000E+00	0.0000	1.145E-01	0.0149	0.000E+00	0.0000	0.000E+00	0.0000	7.291E+00	0.9489
U-238	3.024E-01	0.0394	0.000E+00	0.0000	0.000E+00	0.0000	2.204E-02	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	3.654E-01	0.0476
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	1.866E+00	0.2429	0.000E+00	0.0000	0.000E+00	0.0000	1.365E-01	0.0178	0.000E+00	0.0000	0.000E+00	0.0000	7.684E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	5.216E-01	0.0980	1.886E-07	0.0000	0.000E+00	0.0000	4.300E-02	0.0081	0.000E+00	0.0000	0.000E+00	0.0000	4.059E-04	0.0001
Ra-226	2.774E+00	0.5211	8.558E-05	0.0000	0.000E+00	0.0000	1.883E+00	0.3538	0.000E+00	0.0000	0.000E+00	0.0000	1.881E-02	0.0035
U-238	4.335E-02	0.0081	1.296E-03	0.0002	0.000E+00	0.0000	2.683E-02	0.0050	0.000E+00	0.0000	0.000E+00	0.0000	4.051E-03	0.0008
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	3.338E+00	0.6272	1.382E-03	0.0003	0.000E+00	0.0000	1.953E+00	0.3669	0.000E+00	0.0000	0.000E+00	0.0000	2.326E-02	0.0044

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	8.345E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.543E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.650E-01	0.1061
Ra-226	2.139E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	1.495E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.678E+00	0.8788
U-238	4.368E-03	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	3.026E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	8.019E-02	0.0151
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	6.508E-03	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	4.521E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	5.323E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TD0SE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	5.095E-01	0.0944	1.842E-07	0.0000	0.000E+00	0.0000	4.200E-02	0.0078	0.000E+00	0.0000	0.000E+00	0.0000	3.965E-04	0.0001
Ra-226	2.768E+00	0.5131	9.208E-05	0.0000	0.000E+00	0.0000	1.957E+00	0.3627	0.000E+00	0.0000	0.000E+00	0.0000	2.165E-02	0.0040
U-238	4.315E-02	0.0080	1.290E-03	0.0002	0.000E+00	0.0000	2.670E-02	0.0049	0.000E+00	0.0000	0.000E+00	0.0000	4.032E-03	0.0007
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	3.321E+00	0.6155	1.382E-03	0.0003	0.000E+00	0.0000	2.025E+00	0.3754	0.000E+00	0.0000	0.000E+00	0.0000	2.607E-02	0.0048

Total Dose Contributions TD0SE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	2.467E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.746E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.519E-01	0.1023
Ra-226	6.762E-03	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	4.883E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	4.753E+00	0.8812
U-238	1.311E-02	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	9.372E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	8.922E-02	0.0165
iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii	iiiiiii
Total	1.988E-02	0.0037	0.000E+00	0.0000	0.000E+00	0.0000	1.426E-03	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	5.395E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	4.640E-01	0.0820	1.678E-07	0.0000	0.000E+00	0.0000	3.825E-02	0.0068	0.000E+00	0.0000	0.000E+00	0.0000	3.611E-04	0.0001
Ra-226	2.746E+00	0.4852	1.159E-04	0.0000	0.000E+00	0.0000	2.221E+00	0.3925	0.000E+00	0.0000	0.000E+00	0.0000	3.206E-02	0.0057
U-238	4.234E-02	0.0075	1.266E-03	0.0002	0.000E+00	0.0000	2.620E-02	0.0046	0.000E+00	0.0000	0.000E+00	0.0000	3.956E-03	0.0007
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
Total	3.252E+00	0.5747	1.382E-03	0.0002	0.000E+00	0.0000	2.286E+00	0.4039	0.000E+00	0.0000	0.000E+00	0.0000	3.638E-02	0.0064

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	8.272E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.023E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.026E-01	0.0888
Ra-226	2.977E-02	0.0053	0.000E+00	0.0000	0.000E+00	0.0000	2.179E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	5.031E+00	0.8891
U-238	4.770E-02	0.0084	0.000E+00	0.0000	0.000E+00	0.0000	3.457E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	1.249E-01	0.0221
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
Total	7.748E-02	0.0137	0.000E+00	0.0000	0.000E+00	0.0000	5.637E-03	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	5.658E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	4.128E-01	0.0694	1.493E-07	0.0000	0.000E+00	0.0000	3.403E-02	0.0057	0.000E+00	0.0000	0.000E+00	0.0000	3.212E-04	0.0001
Ra-226	2.718E+00	0.4567	1.414E-04	0.0000	0.000E+00	0.0000	2.502E+00	0.4205	0.000E+00	0.0000	0.000E+00	0.0000	4.320E-02	0.0073
U-238	4.135E-02	0.0069	1.236E-03	0.0002	0.000E+00	0.0000	2.559E-02	0.0043	0.000E+00	0.0000	0.000E+00	0.0000	3.864E-03	0.0006
iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii
Total	3.172E+00	0.5330	1.378E-03	0.0002	0.000E+00	0.0000	2.562E+00	0.4305	0.000E+00	0.0000	0.000E+00	0.0000	4.739E-02	0.0080

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	1.407E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.030E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.471E-01	0.0751
Ra-226	6.729E-02	0.0113	0.000E+00	0.0000	0.000E+00	0.0000	4.931E-03	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	5.336E+00	0.8965
U-238	9.001E-02	0.0151	0.000E+00	0.0000	0.000E+00	0.0000	6.541E-03	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	1.686E-01	0.0283
iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii
Total	1.573E-01	0.0264	0.000E+00	0.0000	0.000E+00	0.0000	1.147E-02	0.0019	0.000E+00	0.0000	0.000E+00	0.0000	5.951E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	1.619E-01	0.0220	5.855E-08	0.0000	0.000E+00	0.0000	1.335E-02	0.0018	0.000E+00	0.0000	0.000E+00	0.0000	1.260E-04	0.0000
Ra-226	2.505E+00	0.3409	2.365E-04	0.0000	0.000E+00	0.0000	3.517E+00	0.4787	0.000E+00	0.0000	0.000E+00	0.0000	8.556E-02	0.0116
U-238	3.424E-02	0.0047	1.024E-03	0.0001	0.000E+00	0.0000	2.119E-02	0.0029	0.000E+00	0.0000	0.000E+00	0.0000	3.200E-03	0.0004
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	2.701E+00	0.3676	1.260E-03	0.0002	0.000E+00	0.0000	3.552E+00	0.4834	0.000E+00	0.0000	0.000E+00	0.0000	8.888E-02	0.0121

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	2.674E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.965E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.754E-01	0.0239
Ra-226	5.409E-01	0.0736	0.000E+00	0.0000	0.000E+00	0.0000	3.961E-02	0.0054	0.000E+00	0.0000	0.000E+00	0.0000	6.688E+00	0.9104
U-238	3.945E-01	0.0537	0.000E+00	0.0000	0.000E+00	0.0000	2.873E-02	0.0039	0.000E+00	0.0000	0.000E+00	0.0000	4.829E-01	0.0657
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	9.355E-01	0.1273	0.000E+00	0.0000	0.000E+00	0.0000	6.835E-02	0.0093	0.000E+00	0.0000	0.000E+00	0.0000	7.347E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TD0SE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	5.027E-02	0.0066	1.818E-08	0.0000	0.000E+00	0.0000	4.144E-03	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	3.912E-05	0.0000
Ra-226	2.261E+00	0.2950	2.458E-04	0.0000	0.000E+00	0.0000	3.544E+00	0.4624	0.000E+00	0.0000	0.000E+00	0.0000	9.115E-02	0.0119
U-238	2.704E-02	0.0035	8.087E-04	0.0001	0.000E+00	0.0000	1.674E-02	0.0022	0.000E+00	0.0000	0.000E+00	0.0000	2.527E-03	0.0003
iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii
Total	2.339E+00	0.3051	1.054E-03	0.0001	0.000E+00	0.0000	3.565E+00	0.4651	0.000E+00	0.0000	0.000E+00	0.0000	9.372E-02	0.0122

Total Dose Contributions TD0SE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	1.666E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.225E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.447E-02	0.0071
Ra-226	1.205E+00	0.1572	0.000E+00	0.0000	0.000E+00	0.0000	8.821E-02	0.0115	0.000E+00	0.0000	0.000E+00	0.0000	7.189E+00	0.9380
U-238	3.480E-01	0.0454	0.000E+00	0.0000	0.000E+00	0.0000	2.535E-02	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	4.204E-01	0.0549
iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii
Total	1.553E+00	0.2026	0.000E+00	0.0000	0.000E+00	0.0000	1.136E-01	0.0148	0.000E+00	0.0000	0.000E+00	0.0000	7.664E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TD0SE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	4.339E-06	0.0000	1.569E-12	0.0000	0.000E+00	0.0000	3.577E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.377E-09	0.0000
Ra-226	9.971E-01	0.2519	1.125E-04	0.0000	0.000E+00	0.0000	1.610E+00	0.4066	0.000E+00	0.0000	0.000E+00	0.0000	4.197E-02	0.0106
U-238	4.092E-03	0.0010	1.228E-04	0.0000	0.000E+00	0.0000	2.541E-03	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	3.837E-04	0.0001
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	1.001E+00	0.2529	2.353E-04	0.0001	0.000E+00	0.0000	1.612E+00	0.4073	0.000E+00	0.0000	0.000E+00	0.0000	4.236E-02	0.0107

Total Dose Contributions TD0SE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	7.660E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.635E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.708E-06	0.0000
Ra-226	1.162E+00	0.2936	0.000E+00	0.0000	0.000E+00	0.0000	8.507E-02	0.0215	0.000E+00	0.0000	0.000E+00	0.0000	3.896E+00	0.9842
U-238	5.148E-02	0.0130	0.000E+00	0.0000	0.000E+00	0.0000	3.751E-03	0.0009	0.000E+00	0.0000	0.000E+00	0.0000	6.237E-02	0.0158
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	1.214E+00	0.3066	0.000E+00	0.0000	0.000E+00	0.0000	8.882E-02	0.0224	0.000E+00	0.0000	0.000E+00	0.0000	3.959E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA
Cs-137	3.610E-11	0.0000	1.305E-17	0.0000	0.000E+00	0.0000	2.976E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.809E-14	0.0000
Ra-226	3.582E-01	0.2609	4.042E-05	0.0000	0.000E+00	0.0000	5.783E-01	0.4211	0.000E+00	0.0000	0.000E+00	0.0000	1.508E-02	0.0110
U-238	3.872E-04	0.0003	1.181E-05	0.0000	0.000E+00	0.0000	2.454E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	3.688E-05	0.0000
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	3.586E-01	0.2611	5.223E-05	0.0000	0.000E+00	0.0000	5.786E-01	0.4213	0.000E+00	0.0000	0.000E+00	0.0000	1.512E-02	0.0110

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA	AAAAAAAAAA	AAAAAA
Cs-137	1.386E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.020E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.925E-11	0.0000
Ra-226	3.876E-01	0.2822	0.000E+00	0.0000	0.000E+00	0.0000	2.837E-02	0.0207	0.000E+00	0.0000	0.000E+00	0.0000	1.368E+00	0.9958
U-238	4.696E-03	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	3.422E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	5.719E-03	0.0042
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	3.923E-01	0.2856	0.000E+00	0.0000	0.000E+00	0.0000	2.871E-02	0.0209	0.000E+00	0.0000	0.000E+00	0.0000	1.373E+00	1.0000

*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	5.000E+00	1.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03
AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA	AAAAAAAAA
Cs-137+D	Cs-137+D	1.000E+00	2.260E+00	2.208E+00	2.010E+00	1.788E+00	7.017E-01	2.179E-01	1.883E-05	1.570E-10
Ra-226+D	Ra-226+D	1.000E+00	1.158E+01	1.156E+01	1.151E+01	1.145E+01	1.097E+01	1.041E+01	4.940E+00	1.766E+00
Ra-226+D	Pb-210+D	1.000E+00	1.191E-01	3.210E-01	1.065E+00	1.889E+00	5.751E+00	7.562E+00	4.801E+00	1.653E+00
Ra-226+D	äDSR(j)		1.169E+01	1.188E+01	1.258E+01	1.334E+01	1.672E+01	1.797E+01	9.740E+00	3.419E+00
U-238	U-238	5.400E-05	4.116E-06	5.144E-06	9.211E-06	1.419E-05	4.999E-05	4.383E-05	6.484E-06	5.892E-07
U-238+D	U-238+D	9.999E-01	1.743E-01	1.939E-01	2.716E-01	3.665E-01	1.050E+00	9.138E-01	1.354E-01	1.233E-02
U-238+D	U-234	9.999E-01	1.097E-07	3.467E-07	1.555E-06	3.642E-06	4.152E-05	1.052E-04	1.733E-04	9.116E-05
U-238+D	Th-230	9.999E-01	4.463E-13	2.602E-12	2.971E-11	1.052E-10	2.192E-09	7.831E-09	9.303E-08	1.753E-07
U-238+D	Ra-226+D	9.999E-01	2.891E-10	8.752E-10	2.667E-09	6.397E-09	2.573E-08	4.929E-08	1.169E-06	3.986E-06
U-238+D	Pb-210+D	9.999E-01	7.976E-10	2.415E-09	7.349E-09	1.758E-08	6.438E-08	9.033E-08	8.929E-07	3.306E-06
U-238+D	äDSR(j)		1.743E-01	1.939E-01	2.716E-01	3.665E-01	1.050E+00	9.139E-01	1.356E-01	1.243E-02

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 1.500E+01 mrem/yr

[illegible]

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)
and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
at tmin = time of minimum single radionuclide soil guideline
and at tmax = time of maximum total dose = 129.4 ± 0.3 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i, tmin)	G(i, tmin) (pCi/g)	DSR(i, tmax)	G(i, tmax) (pCi/g)
AAAAAAAA	AAAAAAAAAA	AAAAAAAAAAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA
Cs-137	2.500E-01	0.000E+00	2.260E+00	6.638E+00	1.095E-01	1.370E+02
Ra-226	4.000E-01	172.6 ± 0.3	1.839E+01	8.156E-01	1.823E+01	8.229E-01
U-238	4.600E-01	55.5 ± 0.1	1.129E+00	1.329E+01	7.944E-01	1.888E+01
iiiiiiii	iiiiiiiiii	iiiiiiiiiiiiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii

Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr								
			t=	0.000E+00	1.000E+00	5.000E+00	1.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03
AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA
Cs-137	Cs-137	1.000E+00	5.650E-01	5.519E-01	5.026E-01	4.471E-01	1.754E-01	5.447E-02	4.708E-06	3.925E-11	
Ra-226	Ra-226	1.000E+00	4.630E+00	4.625E+00	4.605E+00	4.580E+00	4.388E+00	4.164E+00	1.976E+00	7.065E-01	
Ra-226	U-238	9.999E-01	1.330E-10	4.026E-10	1.227E-09	2.943E-09	1.184E-08	2.267E-08	5.376E-07	1.834E-06	
Ra-226	äDOSE(j)		4.630E+00	4.625E+00	4.605E+00	4.580E+00	4.388E+00	4.164E+00	1.976E+00	7.065E-01	
Pb-210	Ra-226	1.000E+00	4.764E-02	1.284E-01	4.259E-01	7.555E-01	2.300E+00	3.025E+00	1.920E+00	6.612E-01	
Pb-210	U-238	9.999E-01	3.669E-10	1.111E-09	3.380E-09	8.089E-09	2.961E-08	4.155E-08	4.107E-07	1.521E-06	
Pb-210	äDOSE(j)		4.764E-02	1.284E-01	4.259E-01	7.555E-01	2.300E+00	3.025E+00	1.920E+00	6.612E-01	
U-238	U-238	5.400E-05	1.893E-06	2.366E-06	4.237E-06	6.526E-06	2.300E-05	2.016E-05	2.983E-06	2.710E-07	
U-238	U-238	9.999E-01	8.019E-02	8.922E-02	1.249E-01	1.686E-01	4.829E-01	4.204E-01	6.228E-02	5.674E-03	
U-238	äDOSE(j)		8.019E-02	8.922E-02	1.249E-01	1.686E-01	4.829E-01	4.204E-01	6.229E-02	5.674E-03	
U-234	U-238	9.999E-01	5.048E-08	1.595E-07	7.153E-07	1.675E-06	1.910E-05	4.838E-05	7.973E-05	4.193E-05	
Th-230	U-238	9.999E-01	2.053E-13	1.197E-12	1.367E-11	4.840E-11	1.008E-09	3.602E-09	4.279E-08	8.064E-08	
iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	
THF(i) is the thread fraction of the parent nuclide.											

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g								
			t=	0.000E+00	1.000E+00	5.000E+00	1.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03
AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA
Cs-137	Cs-137	1.000E+00	2.500E-01	2.442E-01	2.224E-01	1.979E-01	7.762E-02	2.410E-02	2.080E-06	1.730E-11	
Ra-226	Ra-226	1.000E+00	4.000E-01	3.992E-01	3.959E-01	3.919E-01	3.611E-01	3.259E-01	1.437E-01	5.164E-02	
Ra-226	U-238	9.999E-01	0.000E+00	8.458E-16	1.048E-13	8.300E-13	9.546E-11	6.891E-10	3.973E-08	1.350E-07	
Ra-226	äS(j):		4.000E-01	3.992E-01	3.959E-01	3.919E-01	3.611E-01	3.259E-01	1.437E-01	5.164E-02	
Pb-210	Ra-226	1.000E+00	0.000E+00	1.222E-02	5.716E-02	1.053E-01	2.915E-01	3.223E-01	1.497E-01	5.378E-02	
Pb-210	U-238	9.999E-01	0.000E+00	6.533E-18	3.955E-15	6.083E-14	2.829E-11	3.259E-10	3.391E-08	1.258E-07	
Pb-210	äS(j):		0.000E+00	1.222E-02	5.716E-02	1.053E-01	2.915E-01	3.223E-01	1.497E-01	5.378E-02	
U-238	U-238	5.400E-05	2.484E-05	2.472E-05	2.426E-05	2.369E-05	1.962E-05	1.549E-05	2.345E-06	2.213E-07	
U-238	U-238	9.999E-01	4.600E-01	4.578E-01	4.492E-01	4.388E-01	3.633E-01	2.869E-01	4.342E-02	4.098E-03	
U-238	äS(j):		4.600E-01	4.578E-01	4.493E-01	4.388E-01	3.633E-01	2.869E-01	4.342E-02	4.098E-03	
U-234	U-238	9.999E-01	0.000E+00	1.300E-06	6.418E-06	1.263E-05	5.570E-05	9.537E-05	1.475E-04	7.966E-05	
Th-230	U-238	9.999E-01	0.000E+00	5.857E-12	1.452E-10	5.747E-10	1.322E-08	4.772E-08	5.701E-07	1.075E-06	
iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	iiiiiiii	
THF(i) is the thread fraction of the parent nuclide.											

Table of Contents

ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ

Part I: Mixture Sums and Single Radionuclide Guidelines

iiiiiii

Dose Conversion Factor (and Related) Parameter Summary ...	2
Site-Specific Parameter Summary	4
Summary of Pathway Selections	8
Contaminated Zone and Total Dose Summary	9
Total Dose Components	
Time = 0.000E+00	10
Time = 1.000E+00	11
Time = 5.000E+00	12
Time = 1.000E+01	13
Time = 5.000E+01	14
Time = 1.000E+02	15
Time = 5.000E+02	16
Time = 1.000E+03	17
Dose/Source Ratios Summed Over All Pathways	18
Single Radionuclide Soil Guidelines	18
Dose Per Nuclide Summed Over All Pathways	19
Soil Concentration Per Nuclide	19

Dose Conversion Factor (and Related) Parameter Summary

Dose Library: FGR 12 & FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1 DCF's for external ground radiation, (mrem/yr)/(pCi/g)				
A-1	At-218 (Source: FGR 12)	5.847E-03	5.847E-03	DCF1(1)
A-1	Ba-137m (Source: FGR 12)	3.606E+00	3.606E+00	DCF1(2)
A-1	Bi-210 (Source: FGR 12)	3.606E-03	3.606E-03	DCF1(3)
A-1	Bi-214 (Source: FGR 12)	9.808E+00	9.808E+00	DCF1(4)
A-1	Cs-137 (Source: FGR 12)	7.510E-04	7.510E-04	DCF1(5)
A-1	Pa-234 (Source: FGR 12)	1.155E+01	1.155E+01	DCF1(6)
A-1	Pa-234m (Source: FGR 12)	8.967E-02	8.967E-02	DCF1(7)
A-1	Pb-210 (Source: FGR 12)	2.447E-03	2.447E-03	DCF1(8)
A-1	Pb-214 (Source: FGR 12)	1.341E+00	1.341E+00	DCF1(9)
A-1	Po-210 (Source: FGR 12)	5.231E-05	5.231E-05	DCF1(10)
A-1	Po-214 (Source: FGR 12)	5.138E-04	5.138E-04	DCF1(11)
A-1	Po-218 (Source: FGR 12)	5.642E-05	5.642E-05	DCF1(12)
A-1	Ra-226 (Source: FGR 12)	3.176E-02	3.176E-02	DCF1(13)
A-1	Rn-222 (Source: FGR 12)	2.354E-03	2.354E-03	DCF1(14)
A-1	Th-230 (Source: FGR 12)	1.209E-03	1.209E-03	DCF1(15)
A-1	Th-234 (Source: FGR 12)	2.410E-02	2.410E-02	DCF1(16)
A-1	Tl-210 (Source: no data)	0.000E+00	-2.000E+00	DCF1(17)
A-1	U-234 (Source: FGR 12)	4.017E-04	4.017E-04	DCF1(18)
A-1	U-238 (Source: FGR 12)	1.031E-04	1.031E-04	DCF1(19)
B-1 Dose conversion factors for inhalation, mrem/pCi:				
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(1)
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2(2)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2(3)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(4)
B-1	U-234	1.320E-01	1.320E-01	DCF2(5)
B-1	U-238	1.180E-01	1.180E-01	DCF2(6)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(7)
D-1 Dose conversion factors for ingestion, mrem/pCi:				
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(1)
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3(2)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3(3)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(4)
D-1	U-234	2.830E-04	2.830E-04	DCF3(5)
D-1	U-238	2.550E-04	2.550E-04	DCF3(6)
D-1	U-238+D	2.687E-04	2.550E-04	DCF3(7)
D-34 Food transfer factors:				
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(1,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(1,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(1,3)
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(2,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(2,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: FGR 12 & FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,3)
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(4,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(4,3)
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(5,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(5,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(5,3)
D-34	U-238 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(1,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(2,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(2,2)
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(3,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(3,2)
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(4,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(4,2)
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(5,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(5,2)
D-5	U-238 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-238 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.
*Base Case means Default.Lib w/o Associate Nuclide contributions.

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA					
R011	Area of contaminated zone (m**2)	3.200E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	5.000E+00	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRAC
R011	Length parallel to aquifer flow (m)	2.500E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	5.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	5.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	5.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
3 3 3					
R012	Initial principal radionuclide (pCi/g): Cs-137	2.500E-01	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Ra-226	4.000E-01	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): U-238	4.600E-01	0.000E+00	---	S1(6)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(6)
3 3 3					
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.660E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	3.300E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.400E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	5.000E+03	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	4.900E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	6.230E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	4.600E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.230E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.600E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
3 3 3					
R014	Density of saturated zone (g/cm**3)	1.660E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	3.300E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.400E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	2.000E+04	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	4.800E-03	2.000E-02	---	HGWT
R014	Saturated zone b parameter	4.900E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Well pump intake depth (m below water table)	1.800E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	0.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.660E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	3.300E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.400E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	4.900E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	5.000E+03	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCC(1)
R016	Unsat. zone 1 (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.889E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	5.000E+01	7.000E+01	---	DCNUCC(3)
R016	Unsat. zone 1 (cm**3/g)	5.000E+01	7.000E+01	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	5.000E+01	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.614E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	1.700E+01	5.000E+01	---	DCNUCC(6)
R016	Unsat. zone 1 (cm**3/g)	1.700E+01	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	1.700E+01	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.721E-03	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(2)
R016	Unsat. zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.082E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(4)
R016	Unsat. zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.349E-06	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name

R016	Distribution coefficients for daughter U-234				
R016	Contaminated zone (cm**3/g)	1.700E+01	5.000E+01	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	1.700E+01	5.000E+01	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	1.700E+01	5.000E+01	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.721E-03	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)

R017	Inhalation rate (m**3/yr)	7.300E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	2.500E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	8.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	1.700E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	6.000E-02	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)

R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)

R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL

Site-Specific Parameter Summary (continued)

	Menu	Parameter	User Input	Default	(If different from user input)	Used by RESRAD	Parameter Name			
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA										
R018	3	Drinking water intake (L/yr)	3	3.500E+02	3	5.100E+02	3	---	3	DWI
R018	3	Contamination fraction of drinking water	3	1.000E+00	3	1.000E+00	3	---	3	FDW
R018	3	Contamination fraction of household water	3	not used	3	1.000E+00	3	---	3	FHHW
R018	3	Contamination fraction of livestock water	3	not used	3	1.000E+00	3	---	3	FLW
R018	3	Contamination fraction of irrigation water	3	not used	3	1.000E+00	3	---	3	FIRW
R018	3	Contamination fraction of aquatic food	3	not used	3	5.000E-01	3	---	3	FR9
R018	3	Contamination fraction of plant food	3	not used	3	-1	3	---	3	FPLANT
R018	3	Contamination fraction of meat	3	not used	3	-1	3	---	3	FMEAT
R018	3	Contamination fraction of milk	3	not used	3	-1	3	---	3	FMILK
	3		3		3		3		3	
R019	3	Livestock fodder intake for meat (kg/day)	3	not used	3	6.800E+01	3	---	3	LFI5
R019	3	Livestock fodder intake for milk (kg/day)	3	not used	3	5.500E+01	3	---	3	LFI6
R019	3	Livestock water intake for meat (L/day)	3	not used	3	5.000E+01	3	---	3	LWI5
R019	3	Livestock water intake for milk (L/day)	3	not used	3	1.600E+02	3	---	3	LWI6
R019	3	Livestock soil intake (kg/day)	3	not used	3	5.000E-01	3	---	3	LSI
R019	3	Mass loading for foliar deposition (g/m**3)	3	not used	3	1.000E-04	3	---	3	MLFD
R019	3	Depth of soil mixing layer (m)	3	1.500E-01	3	1.500E-01	3	---	3	DM
R019	3	Depth of roots (m)	3	not used	3	9.000E-01	3	---	3	DR00T
R019	3	Drinking water fraction from ground water	3	1.000E+00	3	1.000E+00	3	---	3	FGWDW
R019	3	Household water fraction from ground water	3	not used	3	1.000E+00	3	---	3	FGWHH
R019	3	Livestock water fraction from ground water	3	not used	3	1.000E+00	3	---	3	FGWLW
R019	3	Irrigation fraction from ground water	3	not used	3	1.000E+00	3	---	3	FGWIR
	3		3		3		3		3	
R19B	3	Wet weight crop yield for Non-Leafy (kg/m**2)	3	not used	3	7.000E-01	3	---	3	YV(1)
R19B	3	Wet weight crop yield for Leafy (kg/m**2)	3	not used	3	1.500E+00	3	---	3	YV(2)
R19B	3	Wet weight crop yield for Fodder (kg/m**2)	3	not used	3	1.100E+00	3	---	3	YV(3)
R19B	3	Growing Season for Non-Leafy (years)	3	not used	3	1.700E-01	3	---	3	TE(1)
R19B	3	Growing Season for Leafy (years)	3	not used	3	2.500E-01	3	---	3	TE(2)
R19B	3	Growing Season for Fodder (years)	3	not used	3	8.000E-02	3	---	3	TE(3)
R19B	3	Translocation Factor for Non-Leafy	3	not used	3	1.000E-01	3	---	3	TIV(1)
R19B	3	Translocation Factor for Leafy	3	not used	3	1.000E+00	3	---	3	TIV(2)
R19B	3	Translocation Factor for Fodder	3	not used	3	1.000E+00	3	---	3	TIV(3)
R19B	3	Dry Foliar Interception Fraction for Non-Leafy	3	not used	3	2.500E-01	3	---	3	RDRY(1)
R19B	3	Dry Foliar Interception Fraction for Leafy	3	not used	3	2.500E-01	3	---	3	RDRY(2)
R19B	3	Dry Foliar Interception Fraction for Fodder	3	not used	3	2.500E-01	3	---	3	RDRY(3)
R19B	3	Wet Foliar Interception Fraction for Non-Leafy	3	not used	3	2.500E-01	3	---	3	RWET(1)
R19B	3	Wet Foliar Interception Fraction for Leafy	3	not used	3	2.500E-01	3	---	3	RWET(2)
R19B	3	Wet Foliar Interception Fraction for Fodder	3	not used	3	2.500E-01	3	---	3	RWET(3)
R19B	3	Weathering Removal Constant for Vegetation	3	not used	3	2.000E+01	3	---	3	WLAM
	3		3		3		3		3	
C14	3	C-12 concentration in water (g/cm**3)	3	not used	3	2.000E-05	3	---	3	C12WTR
C14	3	C-12 concentration in contaminated soil (g/g)	3	not used	3	3.000E-02	3	---	3	C12CZ
C14	3	Fraction of vegetation carbon from soil	3	not used	3	2.000E-02	3	---	3	CSOIL
C14	3	Fraction of vegetation carbon from air	3	not used	3	9.800E-01	3	---	3	CAIR
C14	3	C-14 evasion layer thickness in soil (m)	3	not used	3	3.000E-01	3	---	3	DMC
C14	3	C-14 evasion flux rate from soil (1/sec)	3	not used	3	7.000E-07	3	---	3	EVSN
C14	3	C-12 evasion flux rate from soil (1/sec)	3	not used	3	1.000E-10	3	---	3	REVSN
C14	3	Fraction of grain in beef cattle feed	3	not used	3	8.000E-01	3	---	3	AVFG4
C14	3	Fraction of grain in milk cow feed	3	not used	3	2.000E-01	3	---	3	AVFG5
	3		3		3		3		3	

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH20CV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH20FL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	active
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	active

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
AAAAAAAAAAAAAAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAAAAAAAAAAAAAA	
Area:	32000.00 square meters	Cs-137	2.500E-01
Thickness:	5.00 meters	Ra-226	4.000E-01
Cover Depth:	0.00 meters	U-238	4.600E-01

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 1.500E+01 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

t (years):	0.000E+00	1.000E+00	5.000E+00	1.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03
TDOSE(t):	1.016E+00	1.018E+00	1.029E+00	1.048E+00	1.305E+00	1.506E+00	9.197E-01	3.082E-01
M(t):	6.775E-02	6.789E-02	6.860E-02	6.984E-02	8.702E-02	1.004E-01	6.131E-02	2.054E-02

Maximum TDOSE(t): 1.768E+00 mrem/yr at t = 184.0 ± 0.4 years

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.840E+02 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Nuclide														
AAAAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA
Cs-137	2.123E-03	0.0012	7.243E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.400E-06	0.0000
Ra-226	5.741E-01	0.3247	6.093E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.041E-02	0.0115
U-238	5.483E-03	0.0031	1.547E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.345E-04	0.0002
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	5.817E-01	0.3290	2.157E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.085E-02	0.0118

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.840E+02 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA		AAAAAAAAAAAAAAAA	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Nuclide														
AAAAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA	AAAAAAAA	AAAAAA
Cs-137	2.173E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.127E-03	0.0012
Ra-226	1.049E+00	0.5932	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.644E+00	0.9295
U-238	1.165E-01	0.0659	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.226E-01	0.0693
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	1.165E+00	0.6591	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.768E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TD0SE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	1.573E-01	0.1547	5.365E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.037E-04	0.0001
Ra-226	8.363E-01	0.8229	2.434E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.807E-03	0.0047
U-238	1.307E-02	0.0129	3.687E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.035E-03	0.0010
iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii
Total	1.007E+00	0.9906	3.930E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.945E-03	0.0059

Total Dose Contributions TD0SE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	4.172E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.574E-01	0.1549
Ra-226	1.070E-03	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.422E-01	0.8288
U-238	2.184E-03	0.0021	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.666E-02	0.0164
iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii
Total	3.254E-03	0.0032	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.016E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	1.536E-01	0.1509	5.240E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.013E-04	0.0001
Ra-226	8.346E-01	0.8197	2.619E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.532E-03	0.0054
U-238	1.301E-02	0.0128	3.669E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.030E-03	0.0010
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	1.001E+00	0.9833	3.932E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.663E-03	0.0065

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	1.233E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.537E-01	0.1510
Ra-226	3.381E-03	0.0033	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.436E-01	0.8284
U-238	6.557E-03	0.0064	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.096E-02	0.0206
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	9.939E-03	0.0098	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.018E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	1.399E-01	0.1360	4.772E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.227E-05	0.0001
Ra-226	8.279E-01	0.8046	3.298E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.194E-03	0.0080
U-238	1.277E-02	0.0124	3.601E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.011E-03	0.0010
iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii
Total	9.806E-01	0.9529	3.931E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.298E-03	0.0090

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	4.136E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.400E-01	0.1361
Ra-226	1.489E-02	0.0145	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.510E-01	0.8270
U-238	2.385E-02	0.0232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.799E-02	0.0369
iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii
Total	3.874E-02	0.0376	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.029E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	1.245E-01	0.1188	4.246E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.208E-05	0.0001
Ra-226	8.195E-01	0.7823	4.021E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.104E-02	0.0105
U-238	1.247E-02	0.0119	3.517E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.875E-04	0.0009
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	9.564E-01	0.9130	3.919E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.211E-02	0.0116

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	7.034E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.246E-01	0.1189
Ra-226	3.364E-02	0.0321	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.642E-01	0.8250
U-238	4.501E-02	0.0430	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.882E-02	0.0561
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	7.866E-02	0.0751	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.048E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	4.883E-02	0.0374	1.665E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.220E-05	0.0000
Ra-226	7.553E-01	0.5786	6.727E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.186E-02	0.0168
U-238	1.032E-02	0.0079	2.912E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.177E-04	0.0006
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	8.144E-01	0.6240	3.585E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.271E-02	0.0174

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	1.337E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.887E-02	0.0374
Ra-226	2.704E-01	0.2072	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.048E+00	0.8026
U-238	1.973E-01	0.1512	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.087E-01	0.1599
iiiiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii	iiiiiiiiii	iiiiii
Total	4.678E-01	0.3584	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.305E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	1.516E-02	0.0101	5.171E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.997E-06	0.0000
Ra-226	6.819E-01	0.4528	6.992E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.329E-02	0.0155
U-238	8.153E-03	0.0054	2.300E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.459E-04	0.0004
iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii
Total	7.052E-01	0.4683	2.999E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.395E-02	0.0159

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	8.330E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.518E-02	0.0101
Ra-226	6.024E-01	0.4001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.308E+00	0.8684
U-238	1.740E-01	0.1156	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.830E-01	0.1215
iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii
Total	7.765E-01	0.5156	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.506E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	1.308E-06	0.0000	4.463E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.629E-10	0.0000
Ra-226	3.007E-01	0.3269	3.200E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.073E-02	0.0117
U-238	1.234E-03	0.0013	3.485E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.786E-05	0.0001
iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii
Total	3.019E-01	0.3283	6.685E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.082E-02	0.0118

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 5.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
Cs-137	3.830E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.313E-06	0.0000
Ra-226	5.811E-01	0.6319	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.926E-01	0.9705
U-238	2.574E-02	0.0280	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.711E-02	0.0295
iiiiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii	iiiiiiii	iiiiii
Total	6.069E-01	0.6599	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.197E-01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	1.089E-11	0.0000	3.713E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.179E-15	0.0000
Ra-226	1.080E-01	0.3506	1.150E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.854E-03	0.0125
U-238	1.166E-04	0.0004	3.296E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.257E-06	0.0000
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
Total	1.081E-01	0.3509	1.479E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.863E-03	0.0125

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA	AAAAAAAAA	AAAAAA
Cs-137	6.930E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.096E-11	0.0000
Ra-226	1.938E-01	0.6289	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.057E-01	0.9920
U-238	2.338E-03	0.0076	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.467E-03	0.0080
iiiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii	iiiiiii	iiiiii
Total	1.961E-01	0.6365	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.082E-01	1.0000

*Sum of all water independent and dependent pathways.

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i, tmin)	G(i, tmin) (pCi/g)	DSR(i, tmax)	G(i, tmax) (pCi/g)
AAAAAAAA	AAAAAAAAAA	AAAAAAAAAAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA
Cs-137	2.500E-01	0.000E+00	6.295E-01	2.383E+01	8.508E-03	1.763E+03
Ra-226	4.000E-01	184.3 ± 0.4	4.109E+00	3.650E+00	4.109E+00	3.651E+00
U-238	4.600E-01	55.6 ± 0.1	4.915E-01	3.052E+01	2.666E-01	5.627E+01
iiiiiiii	iiiiiiiiii	iiiiiiiiiiiiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii	iiiiiiiiii

Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr								
			t=	0.000E+00	1.000E+00	5.000E+00	1.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03
AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA
Cs-137	Cs-137	1.000E+00	1.574E-01	1.537E-01	1.400E-01	1.246E-01	4.887E-02	1.518E-02	1.313E-06	1.096E-11	
Ra-226	Ra-226	1.000E+00	8.418E-01	8.422E-01	8.435E-01	8.452E-01	8.569E-01	8.683E-01	4.479E-01	1.593E-01	
Ra-226	U-238	9.999E-01	4.316E-11	1.307E-10	5.877E-10	9.292E-10	4.886E-09	1.991E-08	1.483E-07	2.932E-07	
Ra-226	äDOSE(j)		8.418E-01	8.422E-01	8.435E-01	8.452E-01	8.569E-01	8.683E-01	4.479E-01	1.593E-01	
Pb-210	Ra-226	1.000E+00	4.261E-04	1.427E-03	7.496E-03	1.908E-02	1.907E-01	4.393E-01	4.447E-01	1.463E-01	
Pb-210	U-238	9.999E-01	1.192E-10	3.608E-10	1.622E-09	2.560E-09	1.287E-08	5.041E-08	2.392E-07	3.820E-07	
Pb-210	äDOSE(j)		4.261E-04	1.427E-03	7.496E-03	1.908E-02	1.907E-01	4.393E-01	4.447E-01	1.463E-01	
U-238	U-238	5.400E-05	1.854E-07	4.091E-07	1.294E-06	2.376E-06	1.017E-05	8.960E-06	1.324E-06	1.201E-07	
U-238	U-238	9.999E-01	1.666E-02	2.096E-02	3.799E-02	5.881E-02	2.087E-01	1.830E-01	2.707E-02	2.460E-03	
U-238	äDOSE(j)		1.666E-02	2.096E-02	3.799E-02	5.882E-02	2.087E-01	1.830E-01	2.707E-02	2.460E-03	
U-234	U-238	9.999E-01	6.533E-09	3.695E-08	4.161E-07	1.456E-06	2.992E-05	5.246E-05	3.859E-05	6.991E-06	

Th-230 U-238 9.999E-01 2.866E-14 1.423E-13 1.464E-12 4.805E-12 9.520E-11 3.281E-10 2.679E-09 3.707E-09
íííííííí íííííííí íííííííííí íííííííííí íííííííííí íííííííííí íííííííííí íííííííííí íííííííííí
THF(i) is the thread fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g								
			t=	0.000E+00	1.000E+00	5.000E+00	1.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03
AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA
Cs-137	Cs-137	1.000E+00	2.500E-01	2.442E-01	2.224E-01	1.979E-01	7.762E-02	2.410E-02	2.080E-06	1.730E-11	
Ra-226	Ra-226	1.000E+00	4.000E-01	3.992E-01	3.959E-01	3.919E-01	3.611E-01	3.259E-01	1.437E-01	5.164E-02	
Ra-226	U-238	9.999E-01	0.000E+00	8.451E-16	1.044E-13	8.236E-13	9.185E-11	6.383E-10	2.784E-08	7.195E-08	
Ra-226	äS(j):		4.000E-01	3.992E-01	3.959E-01	3.919E-01	3.611E-01	3.259E-01	1.437E-01	5.164E-02	
Pb-210	Ra-226	1.000E+00	0.000E+00	1.222E-02	5.716E-02	1.053E-01	2.915E-01	3.223E-01	1.497E-01	5.378E-02	
Pb-210	U-238	9.999E-01	0.000E+00	6.529E-18	3.943E-15	6.045E-14	2.739E-11	3.051E-10	2.419E-08	6.796E-08	
Pb-210	äS(j):		0.000E+00	1.222E-02	5.716E-02	1.053E-01	2.915E-01	3.223E-01	1.497E-01	5.378E-02	
U-238	U-238	5.400E-05	2.484E-05	2.472E-05	2.426E-05	2.369E-05	1.962E-05	1.549E-05	2.345E-06	2.213E-07	
U-238	U-238	9.999E-01	4.600E-01	4.578E-01	4.492E-01	4.388E-01	3.633E-01	2.869E-01	4.342E-02	4.098E-03	
U-238	äS(j):		4.600E-01	4.578E-01	4.493E-01	4.388E-01	3.633E-01	2.869E-01	4.342E-02	4.098E-03	
U-234	U-238	9.999E-01	0.000E+00	1.298E-06	6.368E-06	1.244E-05	5.149E-05	8.132E-05	6.150E-05	1.160E-05	

Th-230 U-238 9.999E-01 0.000E+00 5.851E-12 1.444E-10 5.688E-10 1.255E-08 4.310E-08 3.587E-07 4.964E-07
íííííííí íííííííííí íííííííííí íííííííííí íííííííííí íííííííííí íííííííííí íííííííííí íííííííííí
THF(i) is the thread fraction of the parent nuclide.

Appendix E

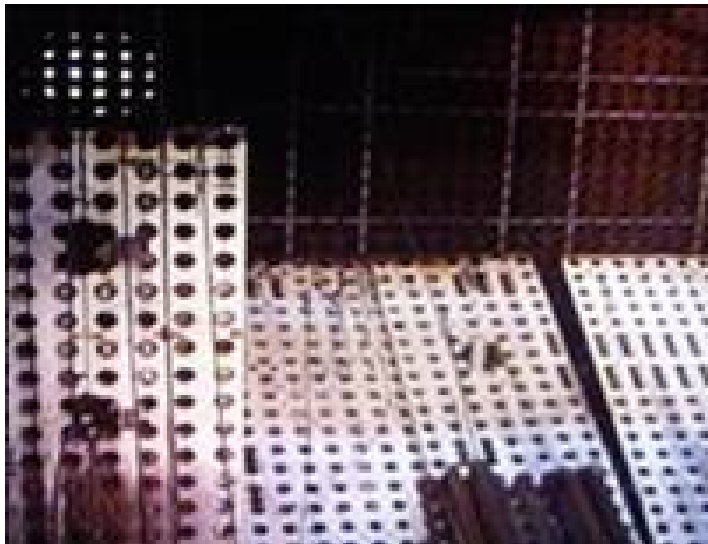
Project Photo Log



Cutting access hole in roof pan with Bug-O® drive and torch. Access hole will allow insertion of neutron shield cutting tool.



View looking down through scanner slot. Bug-O® drive can be seen in foreground. The oxy-propylene torch can be seen in the background.



3 sections of the neutron shield after cutting and laying on biological shield floor for lifting and loading into waste container. In the background the south biological shield thermal shield can be seen.



Remote camera view of the special IPM tool cutting the neutron shield backstay



One of the five intermodal containers which had shielding designed and installed by BSA engineers and technicians. These containers were modified specifically to transport the highly-activated neutron shields.



The Brokk remote manipulator fitted with a hydraulic breaker hammer being used to break the roof concrete. The Brokk manipulator was used extensively throughout the project when the larger Gradall and New Holland excavators were not effective.



A section of the roof steel being removed. The piece being lifted is one side of the steel frame for the roof opening.



View with roof removed at north wall



One of the tools designed and fabricated by the BSA team. This is an oxy-propylene torch on a 20+ foot long extension rod. At the top of this rod is the Bug-O® drive which controlled the horizontal movement of the torch.



Bug-O® track installed on a BSA-designed vertical rack with magnetic securing devices. This method was extensively used to cut the inner biological shield walls.



View of the Gradall excavator fitted with the hydraulic breaker hammer breaking west wall concrete.



View of the Brokk remote manipulator fitted with a clamshell bucket loading concrete from the east wall.



View of the north inner wall showing the 4-inch thick aluminum and steel thermal shield. This shield, which surrounded the walls of the outlet air plenums had to be removed to access the inner wall plates for cutting.



View of the south outlet air plenum from the below ground duct. The opening to the biological shield is the dark square area. This entire area was filled with cementitious grout up to elevation ~109' to support the final reinforced concrete floor over the biological shield footprint.



View of the inner biological shield looking south from the north wall opening. At this time, the majority of the wall concrete has been demolished; the concrete and the experimental port tubes can be seen on the floor.



A view of the self-tipping 8-ton hopper that was used to load the majority of the concrete rubble into the waste intermodal containers.



August 21, 2011 – First entry of personnel into the biological shield interior since original construction in the late 1940s.



A large section of the north outer wall plate being lifted.



View of the biological shield interior after removal of the majority of the interior concrete and steel wall plates. A small amount of wall concrete can be seen at the lower areas near the floor. The arm of the New Holland excavator can be seen on the left.



BSA technician using a hand-held torch to cut the contaminated section of the south outer biological shield wall.



South outer biological shield wall after removal of the upper section. Note the two horizontal and vertical retaining bars which prevented the cut steel plates from falling outward during removal.



South outer wall cutting from the inside by remote camera.



View of the south outer wall after removal of the contaminated center section. Removal of this section allowed the dismantlement of the CCE.



Removal of the CCE in progress viewed from the south at floor level. In this photo the majority of the north and west fabric walls have been removed.



View of the high bay from the south at elevation 140'. In this photo, all of the CCE fabric and side wall framing has been removed. The roof framing can be seen at the top of the photo.



Concrete delivery to place the final cap over the biological shield footprint.



Subcontractor placing final finished concrete cap over the biological shield footprint.



View of the biological shield footprint looking north after placement of the final cap.



View of the Building 701 high bay looking south where the reactor once stood. The charging elevator can be seen in the background.



New Holland excavator being brought out of Building 701 after completion of its use on the project.



New Holland excavator in "supersack" ready for transfer to another DOE project at Paducah, KY.