HPS # 5-24465

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COPY

PERMIT FOR VOLUMETRIC RELEASE OF SOIL, WATER, AND LIQUID

1. Signature of Preparer [signature] Date 3-11-03
   Printed Name of Preparer Darlene Smith

2. Waste drum or box identification number, as applicable: Carboy # 2
   Description (materials, liquid, water) and location including building and room number.
   State the material and chemical composition of (solid, liquid) being released.
   Attach chemical analysis of material*. *(Attach additional sheets.)*
   Approx 300 gallons of RAL waste water

3. Radiologically regulated waste? [signature] / [signature] [X] Yes [ ] No
   Completed by: Print / Sign

4. Are radioactive material concentrations greater than MDA*? [X] Yes [ ] No

5. Are radioactive material concentrations below release criteria*? [X] Yes [ ] No

6. Dilution or mixing that will occur* (*Attach calculations. An example would be dilution by normal sanitary sewer flows.*)
   N/A

7. Plan for release (*Release point and release conditions.*)
   Release through JN-1 Evap System
   N/A

RTS Manager J. F. [signature] Date 3-18-03
Environmental Operations Manager [signature] Date 3/21/03
Field Operations (Waste) Manager [signature] for PJW Date 3/24/03
Conditions of Approval (or state "None")
None

Permit Expiration Date 4-24-03

Release Completed [✓] by: Name M Bulter Date 4-1-03 Time 1500

Reviewed by [signature] 4-1-03

* *Indicates attachment required.*

☒ Continuation sheet (pg.2 of 3) and instructions (pg. 3 of 3) not used and not attached.

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HPS # J-24465

VOLUMETRIC RELEASE LOG
(Section A)

Date	HPS #	Item Description	Technician (print/sign)	Evaluator (Signature or NA)	Release Approval RFO Manager or Designee Signature
3/11/03	J 24465	APPROX 300 GALLONS OF RAL WATER	D Smith	C.D. CHAPMAN MAR 18 2003	

REVIEWED BY MAR 18 2003

HPS # J-24465

VOLUMETRIC RELEASE LOG
(Section B)

Item	Location Item is to be Used or Stored	Individual Receiving Item (Address)	Total Volume	Total Ci Content	Radionuclide Concentrations
APPROX 300 gallons RAL WASTE WATER	JN-1 EVAP SYSTEM	N/A	300 gallons	1.3E-5	CO-60 1.183E-5 uci/ml
↓	↓	↓	↓	2.10E-7	CS-137 4.492E-7 uci/ml
				1.80E-7	NP-239 1.590E-7 uci/ml
				1.05E-8	PU-238 9.222E-9 uci/ml
				4.19E-8	PU-239 3.689E-8 uci/ml
				LMDA	AM-241 LMDA
				6.80E-8	SR-90 5.99E-8 uci/ml
↓	↓	↓	↓	6.80E-8	Y-90 5.99E-8 uci/ml

REVIEWED BY [signature] MAR 18 2003

HPS # J-24465

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RADIOANALYTICAL LABORATORY ANALYTICAL REQUEST

*Project #	*Submitted By/Date:	*Needed By:	*Return To/Mail Stop:
G5012-2137 W.J.	E.H. SANDS 3-11-03	ASAP	JWL D.CHAPMAN

Type of Sample	Soil	Sediment	Water	Filter	Smear	Other (Specify)	*Number of Samples:
	☐	☐	☒	☐	☐	☐	1

*Sample Origin & Description: JW2 HOLDING TANK / 1st PUMPING.

*Collection Date(s)/Time(s): 3-11-03 1030

Special Request/Submitter Code/WI/HPS: 300 gal J-24465

For Lab Use Only: Sample(s) Accepted: ☒ Yes ☐ No

*Type of Analysis:

- ☐ Gross Alpha Beta
- ☒ Gamma Spectrometry
- ☒ Plutonium Isotope
- ☐ Americium Isotope
- ☐ Uranium Isotope
- ☐ Thorium Isotope
- ☒ Strontium 90

Other (Specify Below)

*Sample Disposition:

- ☐ Return to Submitter
- ☒ Dispose (The Lab will not be responsible for disposal of chemicals)
- ☐ Archive**

#PRIORITY (Manager's Approval)

FOR LAB USE ONLY

Received By: Eugene H. Sands 3-12-03 1230

R/RL #: 03-0090

File Name: RL03-0090

System: 1

Disk: 2003

Comments: All QC PASSED

Completion Date: 3-13-03

CHAIN-OF-CUSTODY RECORD

The sample(s) named below have been evaluated to procedure TR-OP-004 for transportation in commerce over public roads. Check applicable box below

- ☐ The materials are regulated by DOT. Contact Site Shipping Officer.
- ☐ The materials are exempted from regulation. Sign below and transport materials in accordance with procedure TR-OP-001.
- ☐ N/A – materials not going on public roadway.

Evaluator's Signature _____ Date _____

Sample Submitted By: _____ Relinquished: _____

Received By: _____ Relinquished: _____

Received By: _____ Returned/Disposed/Archived: Eugene H. Sands 3-13-03

Collection Date/Time	Sample ID	For Lab Use Only R/RL#	Collection Date/Time	Sample ID	For Lab Use Only R/RL#	Collection Date/Time	Sample ID	For Lab Use Only R/RL#
3-11/1030	JW2 TANK	03-0090	5)			9)		
2)			6)			10)		
3)			7)			11)		
4)			8)			12)		

Requires Building Manager's or Health Physics Supervisor's approval for priority samples only. Contact Laboratory Manager prior to submitting.
* Mandatory entries for acceptance of samples.
** Requires Laboratory Manager's and Department/Building Manager's approval.

REVIEWED BY _____ MAR 14 2003

HPS # J-24463

Sample ID : RL03-0090 Acquisition date : 12-MAR-2003 13:42:33

Battelle Radioanalytical Laboratory Report

Configuration : DKA0:[GAMMA.SCUSR.ARCHIVE]SMP_RL030090_GAMMA1_15LQMARMG_4662.
Report Generated : 13-MAR-2003 06:23:21.79

Lab Number : RL03-0090
Description : JN2 HOLDING TANK 1ST TRANSFER

Deposition date :
Sample date : 11-MAR-2003 10:30:00 Acquisition date : 12-MAR-2003 13:42:33
Sample quantity : 1.72500E+03 ML Critical level : Yes
Sample type : WATER

Detector name : GAMMA1 Detector geometry: 1.5LQMAR M/G
Serial Number : Critical level : Yes
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:51.47 0.1%
Pk start channel : 100 Pk end channel : 4096
Sensitivity : 5.00000 Gaussian : 10.00000
Bkg Filename : DKA0:[GAMMA.SCUSR.ARCHIVE]BKG_BKG26FEB031_GAMMA1__4628.CNF;1
Nuclide library : DKA0:[GAMMA.SCUSR.LIB]BCLDP_LIQUID.NLB;
ASF Filename : SAMPLES uCi Procedure number RL-TP-030

Brief Report

Nuclide	Activity uCi/ML	2-Sigma Error
CO-60	1.183E-05	7.068E-07
CS-137	4.492E-07	5.181E-08
NP-239	1.590E-07	1.820E-08
Total Activity :	1.244E-05	

Analyzed by: Eugene H. Sands EHS 3-13-03

Reviewed by: Eugene H. Sands EHS 3-13-03

GRETCHEN FARNUNG GAF 3/13/03

REVIEWED BY

MAR 14 2003

HPS # J-34465

Combined Activity-MDA Report
Sample ID : RL03-0090

Acquisition date : 12-MAR-2003 13:42:33

---- Identified Nuclides ----

Nuclide	Activity (uCi/ML)	Act error	MDA (uCi/ML)	MDA error	Act/MDA
CO-60	1.183E-05	7.068E-07	7.290E-09	5.776E-10	1622.387
CS-137	4.492E-07	5.181E-08	1.306E-08	1.435E-09	34.406
NP-239	1.590E-07	1.820E-08	2.161E-08	1.931E-09	7.356

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (uCi/ML)	K.L. Ided	Act error	MDA (uCi/ML)	MDA error	Act/MDA
BE-7	2.946E-08		5.326E-08	8.580E-08	7.717E-09	0.343
K-40	-7.968E-11		3.775E-08	5.730E-08	4.995E-09	-0.001
MN-54	-5.655E-09		9.257E-09	1.509E-08	1.274E-09	-0.375
CO-57	3.026E-09		3.969E-09	6.353E-09	5.326E-10	0.476
CO-58	1.091E-09		8.967E-09	1.473E-08	1.978E-09	0.074
ZN-65	2.567E-08		2.197E-08	3.597E-08	7.743E-09	0.714
NB-94	7.194E-09		1.015E-08	1.661E-08	1.279E-09	0.433
AG108M	2.462E-09		8.135E-09	1.349E-08	1.387E-09	0.183
SB-125	2.295E-09		1.693E-08	2.741E-08	2.546E-09	0.084
I-131	4.089E-11		6.448E-09	1.053E-08	1.095E-09	0.004
BA-133	-1.754E-09		7.397E-09	1.207E-08	1.235E-09	-0.145
CS-134	-7.648E-09		6.349E-09	1.047E-08	1.068E-09	-0.730
EU-152	1.061E-08		1.258E-08	1.911E-08	2.182E-09	0.555
EU-154	-9.697E-10		8.383E-09	1.338E-08	1.236E-09	-0.072
EU-155	-4.207E-09		1.103E-08	1.754E-08	1.725E-09	-0.240
TL-208	-6.222E-09		7.178E-09	1.170E-08	1.169E-09	-0.532
BI-212	-3.554E-08		1.136E-07	1.858E-07	2.077E-08	-0.191
PB-212	-2.340E-10		1.036E-08	1.695E-08	1.847E-09	-0.014
BI-214	4.427E-09		1.439E-08	2.336E-08	2.447E-09	0.189
PB-214	-3.421E-09		1.310E-08	2.098E-08	2.249E-09	-0.163
RA-226	3.170E-08		1.053E-07	1.723E-07	1.449E-08	0.184
AC-228	-6.146E-08		4.275E-08	6.784E-08	6.049E-09	-0.906
TH-234	-6.627E-08		9.821E-08	1.500E-07	6.176E-08	-0.442
U-235	3.466E-10		3.320E-08	5.165E-08	4.563E-09	0.007
U-239	1.150E-07		8.418E-08	1.364E-07	2.395E-08	0.843
AM-241	3.902E-09		1.200E-08	1.972E-08	2.024E-09	0.198

REVIEWED BY

MAR 14 2003

HPS # J-24465

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RADIOANALYTICAL LABORATORY ANALYTICAL REQUEST

*Project #	*Submitted By/Date:	*Needed By:	*Return To/Mail Stop:
G5012-2137 W.J.	E. H. SANDS 3-11-03	—	JWL D. CHAPMAN

Type of Sample	Soil	Sediment	Water	Filter	Smear	Other (Specify)	*Number of Samples:
	☐	☐	☒	☐	☐	☐	1

*Sample Origin & Description: JW2 HOLDING TANK / 1st PUMPING.

*Collection Date(s)/Time(s): 3-11-03 1030

Special Request/Submitter Code/WI/HPS:

For Lab Use Only: Sample(s) Accepted: ☒ Yes ☐ No

*Type of Analysis:

- ☐ Gross Alpha Beta
- ☒ Gamma Spectrometry
- ☒ Plutonium Isotope
- ☐ Americium Isotope
- ☐ Uranium Isotope
- ☐ Thorium Isotope
- ☒ Strontium 90

Other (Specify Below)

*Sample Disposition:

- ☐ Return to Submitter
- ☒ Dispose (The Lab will not be responsible for disposal of chemicals)
- ☐ Archive**

#PRIORITY (Manager's Approval)

FOR LAB USE ONLY

Received By: Eugene H. Sands 3-12-03 1230

R/RL #: 03-0090

File Name: 14mar03 ; 03-0090 _ Pu236

System: ALPHA

Disk: 2003

Comments: All QC PASSED

Completion Date: 3/17/03

CHAIN-OF-CUSTODY RECORD

The sample(s) named below have been evaluated to procedure TR-OP-001 for transportation in commerce over public roads. Check applicable box below.

- ☐ The materials are regulated by DOT. Contact Site Shipping Officer.
- ☐ The materials are exempted from regulation. Sign below and transport materials in accordance with procedure TR-OP-001.
- ☐ N/A – materials not going on public roadway.

Evaluator's Signature _____ Date _____

Sample Submitted By: _____ Relinquished: _____

Received By: _____ Relinquished: _____

Received By: _____ Returned/Disposed/Archived: GRETCHEN FARNUNG GAF 3/17/03

Collection Date/Time	Sample ID	For Lab Use Only R/RL#	Collection Date/Time	Sample ID	For Lab Use Only R/RL#	Collection Date/Time	Sample ID	For Lab Use Only R/RL#
1) 3-11/1030	JW2 TANK	03-0090	5)			9)		
2)			6)			10)		
3)			7)			11)		
4)			8)			12)		

Requires Building Manager's or Health Physics Supervisor's approval for priority samples only. Contact Laboratory Manager prior to submitting.
* Mandatory entries for acceptance of samples.
** Requires Laboratory Manager's and Department/Building Manager's approval.

DDO-027, Rev. 15

10/01 (DT)

REVIEWED BY _____ MAR 18 2003

BATTELLE
RADIOANALYTICAL LABORATORY **HPS # J- 24465**

ALPHA SPECTROMETRY REPORT
17-MAR-2003 14:25:16

****
Spectral File: ND_AMS_ARCHIVE_S:S_14MAR03$03-0090_PU236.CNF
****

BATCH ID:	14MAR03	SAMPLE ID:	03-0090
SAMPLE DATE:	14-MAR-2003 00:00	ALIQUOT:	1.000E+01 ml
SAMPLE TITLE:	JN2 HOLDING TANK 1ST	DETECTOR NUMBER:	008
ACQ DATE:	14-MAR-2003 15:17	AVERAGE EFFICIENCY:	18.03%
ELAPSED LIVE TIME:	60000.	RECOVERY:	84.05%
TRACER ID:	PU236-FEB02	TRACER FWHM (kev):	50.15
LAMBDA VALUE:	200.	ROI TYPE:	MANUAL
TRACER DPM AT SAMPLE DATE:	3.360	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	WATER	LLD CONSTANT:	2.71
ENERGY CAL DATE:	27-FEB-2003 19:50	EFF CAL DATE:	27-FEB-2003 19:50
BKG FILENAME:	B_008_26FEB03	BKG ELAPSED TIME:	60000.

****

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY uCi/ ml	TPU/ERROR 2-SIGMA	MDC uCi/ ml
*PU236	5755.0	509.00	2.00	100.0	1.514E-07	2.149E-08	2.760E-09
PU-238	5487.1	31.00	3.00	99.9	9.222E-09	3.873E-09	3.202E-09
PU-239	5147.7	124.00	0.00	99.9	3.689E-08	8.623E-09	8.062E-10

****

Pu236 = Tracer, Added Activity

GRETCHEN FARNUNG
GAF
Analyst

3/17/03
Date

Thomas Beddick TB
Reviewer

3-17-03
Date

Procedure number RL-CP-012

REVIEWED BY

MAR 18 2003

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HPS # J-24465

Sample Preparation Record Sheet

Preparation Date 3/13/03 by GAF

Analysis Pu R/RL# 03-0089 thru 0092

Sample Identification	Tare Weight	Tare Plus Sample Weight	Sample Weight/ Volume	Comments
RL03-0089				10mL sample
0090				
0090 Dup				
0090 MS				
0091				
0092				
Blank				
BS				
				Added 200 µL Pu236 FEB02 tracer to all
				Added 200 µL Pu239 MAY01 to MS
				Added 50 µL Pu239 MAY01 to BS
				TRUResin Lot TRSR2F

Pg. 3 of 3

DDO-021, Rev. 4 REVIEWED BY [signature] MAR 18 2003 9/00(dt)

HPS # J-24465

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RADIOANALYTICAL LABORATORY ANALYTICAL REQUEST

*Project #	*Submitted By/Date:	*Needed By:	*Return To/Mail Stop:
G5012-2137 W.J.	E. H. SANDS 3-11-03	—	JW1 D. CHAPMAN

*Type of Sample	Soil	Sediment	Water	Filter	Smear	Other (Specify)	*Number of Samples:
	☐	☐	☒	☐	☐	☐	1

*Sample Origin & Description: JW2 HOLDING TANK / 1st PUMPING.

*Collection Date(s)/Time(s): 3-11-03 1030

Special Request/Submitter Code/WI/HPS:

For Lab Use Only — Samples Accepted: ☒ Yes ☐ No

*Type of Analysis:
- ☐ Gross Alpha Beta
- ☒ Gamma Spectrometry
- ☒ Plutonium Isotope
- ☐ ~~Americium Isotope~~
- ☐ Uranium Isotope
- ☐ Thorium Isotope
- ☒ Strontium 90

Other (Specify Below): N/A

*Sample Disposition:
- ☐ Return to Submitter
- ☒ Dispose (The Lab will not be responsible for disposal of chemicals)
- ☐ Archive**

#PRIORITY (Manager's Approval): N/A

FOR LAB USE ONLY

Received By: Eugene H. Sands 3-12-03 1230

R/RL #: 03-0090

File Name: 03-0090.DAT

System: 2

Disk: 236

Comments: All QC PASSED

Completion Date: 3/18/03

CHAIN-OF-CUSTODY RECORD

The sample(s) named below have been evaluated to procedure TR-OP-001 for transportation in commerce over public roads. Check applicable box below.
- ☐ The materials are regulated by DOT. Contact Site Shipping Officer.
- ☐ The materials are exempted from regulation. Sign below and transport materials in accordance with procedure TR-OP-001.
- ☐ N/A – materials not going on public roadway.

Evaluator's Signature: N/A Date:

Sample Submitted By: N/A

Received By: N/A

Received By: N/A

Relinquished: N/A

Relinquished: N/A

Returned/Disposed/Archived: GRETCHEN FARNUNG GF 3/18/03

Collection Date/Time	Sample ID	For Lab Use Only R/RL#	Collection Date/Time	Sample ID	For Lab Use Only R/RL#	Collection Date/Time	Sample ID	For Lab Use Only R/RL#
1) 3-11/1030	JW2 TANK	03-0090	5)			9)		
2)	N		6)			10)		
3)	A		7)			11)		
4)			8)			12)		

Requires Building Manager's or Health Physics Supervisor's approval for priority samples only. Contact Laboratory Manager prior to submitting.
* Mandatory entries for acceptance of samples.
** Requires Laboratory Manager's and Department/Building Manager's approval.

DDO-027, Rev. 15

10/01 (DT)

REVIEWED BY [signature] MAR 18 2003

HPS # J-24465

THU MAR 13, 2003 RL03-0090 & 0091

GROUP C SR90 COUNT OF JN2 RAL HOLDING TANK 1ST AND 2ND PUMPING 3/11-3/12/03.

SAMPLE SN	CODE	TIME (MIN.)	ALPHA COUNTS	BETA COUNTS	ALPHA CPM	BETA CPM	TOD CLOCK HR:MN:SEC	
1	SR90	100.00	22	152	0.22	1.52	17:43:42	0090
2	SR90	100.00	7	117	0.07	1.17	19:24:04	Dup
3	SR90	100.00	15	3830	0.15	38.30	21:04:26	M/S
4	SR90	100.00	5	122	0.05	1.22	22:44:47	0091
5	SR90	100.00	8	104	0.08	1.04	00:25:08	BLK
6	SR90	100.00	13	2059	0.13	20.59	02:05:30	BLK SPIKE

*A>

REVIEWED BY: GRETCHEN FARNUNG GAF

3/18/03

REVIEWED BY

MAR 18 2003

Strontium-90 Analysis of JN2 Holding Tank Water 1st Pumping

Method: RL-TP-035

Dates of Collection: 3/11/03

HPS # J-24465

Sample Size (ml) : 10.00
Separation Date: 3/13/03
Separation Time: 14:10

First Count:

Sample ID (RL #)	Sample Code	Date/Time Counted	Weight SrNO3 (mg)	Theoretical Weight (mg)	Chemical Yield (%)	Sys. #	Count Time (mins)	Gross Beta Counts	Bkgrd CPM	Counter Efficiency (%)	Sr-90 (µCi/mL)	Error +/- 2s	MDA
03-0090	1st Pumping	3/13/03 17:43	7.6	12.3	61.8	2	100	152	1.18	39.91	5.99E-08	5.79E-08	9.74E-08
03-0090 Dup	1st Pumping	3/13/03 19:24	8.0	12.3	65.0	2	100	117	1.18	39.91	-1.64E-09	5.04E-08	9.25E-08
03-0090 MS	1st Pumping	3/13/03 21:04	7.6	12.3	61.8	2	100	3830	1.18	39.91	6.33E-06	2.14E-07	9.74E-08
Blank	NA	3/14/03 0:25	7.8	12.3	63.4	2	100	104	1.18	39.91	-2.26E-08	4.80E-08	9.49E-08
BS	NA	3/14/03 2:05	8.1	12.3	65.9	2	100	2059	1.18	39.91	2.97E-06	1.43E-07	9.14E-08

NOTE: 03-0090MS and BS contains activity added by the RAL.

Analyzed By: Sean Brenner SB
Date: 3-18-03

Reviewed By: GRETCHEN FARNUNG
Date: 3/18/03 GAF

REVIEWED BY
MAR 18 2003

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HPS # J-84465

Sample Preparation Record Sheet

Preparation Date 3-13-03 By: Sean Brenner SB 3-13-03

Analysis SR90 R/RI # 03-0090 THRU 03-0092

Sample Identification	Tare Weight g	Tare Plus Sample Weight g	Sample Weight/Volume g	Comments
03-0090	10.7304	10.7380	0.0076	10mL of SAMPLE
03-0090 Dup	10.6719	10.6799	0.0080	
03-0090 M/S	10.7860	10.7936	0.0076	ADDED 0.1mL of SR90 SEP02
03-0091	10.6639	10.6718	0.0079	
03-0092	10.7120	10.7209	0.0089	
BLANK	10.7891	10.7969	0.0078	10mL D.I. H_2O
B.S.	10.7305	10.7386	0.0081	ADDED 0.05mL of SR90 SEP02
	Weighed 3/13/03	Weighed 3/14/03	WTS checked by	ADD 1mL of SR CARRIER TO ALL
	By: SBrenner	By: SBrenner	GAF 3/17/03	SAMPLES.
				USED SR CART. LOT SRSR 30
				SR90/Y90 Separation: 3/13/03 1410

Pg. 4 of 5

DDO-021, Rev. 4 REVIEWED BY [signature] MAR 18 2003 9/00(dt)

HPS # J-24465

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ALPHA/BETA COUNTER SAMPLE HOLDER GUIDE

Date: 3-13-03
System No.: 2
Disk No: 136
File Name: 03-0090.DAT + 03-0092.DAT

Operator: S. Gemmer

Background (cpm)
α: / βγ: 1.18
α: / βγ: /

RL No.: 03-0090 thru 03-0092

Efficiency (percent)
α: / βγ: 35.91

Tray No.	Grp	Identity	Remarks		Tray No.	Grp	Identity	Remarks	
1	C	0090			26				
2		Dup			27				
3		M/S			28				
4		0091			29				
5		BLK			30				
6		B.S			31				
7	D	0092			32				
8					33				
9					34				
10					35				
11					36				
12					37				
13					38				
14					39				
15					40				
16					41				
17					42				
18					43				
19					44				
20					45				
21					46				
22					47				
23					48				
24					49	Pg. 5 of 5			
25					50				

REVIEWED BY [signature] MAR 18 2003

HPS #J-24465: 300 Gallons of RAL Waste Water

Isotope	Activity *uCi/mL*	EF Applied	ADF Applied	HEPA Applied	10CFR20 Eff. Rel. Criteria	10 mrem Criteria Limits	1 mrem Criteria Limits	Resultant Concentration	Comparative Result Must Be < 1
Co-60	1.18E-05	9.68E-09	9.68E-15	4.84E-18	5.00E-11	1.00E-11	1.00E-12	4.84E-18	4.84E-06
Cs-137	4.49E-07	3.68E-10	3.68E-16	1.84E-19	2.00E-10	4.00E-11	4.00E-12	1.84E-19	4.59E-08
Np-239	1.59E-07	1.30E-10	1.30E-16	6.50E-20	3.00E-09	6.00E-10	6.00E-11	6.50E-20	1.08E-09
Sr-90	5.99E-08	4.90E-11	4.90E-17	2.45E-20	6.00E-12	1.20E-12	1.20E-13	2.45E-20	2.04E-07
Y-90	5.99E-08	4.90E-11	4.90E-17	2.45E-20	9.00E-10	1.80E-10	1.80E-11	2.45E-20	1.36E-09
Pu-238	9.22E-09	7.55E-12	7.55E-18	3.77E-21	2.00E-14	4.00E-15	4.00E-16	3.77E-21	9.43E-06
Pu-239	3.69E-08	3.02E-11	3.02E-17	1.51E-20	2.00E-14	4.00E-15	4.00E-16	1.51E-20	3.77E-05
Am-241	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E-14	4.00E-15	4.00E-16	0.00E+00	0.00E+00
TOTAL	**1.26E-05**							**TOTAL**	**5.23E-05**

REQUESTED RELEASE THROUGH JN-1 EVAPORATOR SYSTEM ***Carboy #2***

EF Applied = Mean Activity / Expansion Factor (1.22E03)

ADF Applied = EF Applied Resultant x Atmospheric Dispersion Factor (1.E-06)

HEPA Applied = Credit taken for 1 HEPA filters (99.95% efficiency) on water to be evaporated in JN-1 evaporator

Comparative Result = Resultant Concentration / 1 mrem criteria; sum of fractions must be < 1

Calculation By: John Tholen Date: 3/18/03

Reviewed By: J. F. [illegible] Date: 3/18/03

Reviewed by [illegible] 4-1-03