Attachment 6

(DOT Spreadsheets for Tank V-3 used to calculate data for Option 3.)

Container ID # **INEEL Tank V-3 Solids (Total w/AVG)**

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: N/A

Description: 652 gallons of Solids

Form#

PKE#

Note: assume solid phase volume of 652 gallons with density of 1.02 g/cc

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
5550.00	2517.48	0.00	0.00	2517.48	#N/A	2.468

Dose survey from Sxxxxx on xx/xx/00 shows < mrem/hr OC.

Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.

Note: Gross weight of contents = (652 gal.)x(1.02 g/cc)x(3785.412 cc/gal.)x(2.2046E-03 lb/g) = 5,550.0 lbs.

EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-3)A2	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Solids Frac	Activity/gram (pCi/g)
Sr-90	5.44E+01	5.61E+01	2.01E+12	8.00E+05	3.70E-03	5.44E+02	1.00E-01	2.01E+04	2.01E+01	0.00E+00	0.00E+00	8.00E-02	2.16E+07
Cs-137	1.91E+01	3.95E+00	7.08E+11	2.81E+05	3.70E-02	1.91E+01	5.00E-01	1.42E+03	1.42E+00	0.00E+00	0.00E+00	5.62E-03	7.60E+06
Ni-63	2.40E+00	8.26E-03	8.89E+10	3.53E+04	3.70E+00	2.40E-02	3.00E+01	2.96E+00	2.96E-03	0.00E+00	0.00E+00	1.18E-05	9.54E+05
Co-60	4.72E-01	1.22E-01	1.74E+10	6.93E+03	3.70E-01	4.72E-02	4.00E-01	4.36E+01	4.36E-02	0.00E+00	0.00E+00	1.73E-04	1.87E+05
Pu-241	1.72E-01	1.77E+00	6.35E+09	2.52E+03	3.70E-02	1.72E-01	1.00E-02	6.35E+02	6.35E-01	1.72E-03	0.00E+00	2.52E-03	6.82E+04
Eu-154	7.91E-02	1.63E-02	2.93E+09	1.16E+03	3.70E-01	7.91E-03	5.00E-01	5.85E+00	5.85E-03	0.00E+00	0.00E+00	2.33E-05	3.14E+04
Eu-152	4.61E-02	5.28E-03	1.70E+09	6.77E+02	3.70E-01	4.61E-03	9.00E-01	1.89E+00	1.89E-03	0.00E+00	0.00E+00	7.52E-06	1.83E+04
Ru-103	4.10E-02	4.70E-03	1.52E+09	6.03E+02	3.70E-01	4.10E-03	9.00E-01	1.69E+00	1.69E-03	0.00E+00	0.00E+00	6.70E-06	1.63E+04
Ce-144	3.40E-02	1.75E-02	1.26E+09	4.99E+02	3.70E-02	3.40E-02	2.00E-01	6.28E+00	6.28E-03	0.00E+00	0.00E+00	2.50E-05	1.35E+04
Pu-238	3.36E-02	1.73E+01	1.24E+09	4.94E+02	3.70E-04	3.36E+00	2.00E-04	6.21E+03	6.21E+00	1.98E-03	1.33E+01	2.47E-02	1.33E+04
Ru-106	3.35E-02	1.73E-02	1.24E+09	4.92E+02	3.70E-02	3.35E-02	2.00E-01	6.20E+00	6.20E-03	0.00E+00	0.00E+00	2.46E-05	1.33E+04
Am-241	1.80E-02	9.29E+00	6.67E+08	2.65E+02	3.70E-04	1.80E+00	2.00E-04	3.33E+03	3.33E+00	0.00E+00	7.16E+00	1.32E-02	7.16E+03
Pu-239	1.74E-02	8.95E+00	6.42E+08	2.55E+02	3.70E-04	1.74E+00	2.00E-04	3.21E+03	3.21E+00	2.80E-01	6.89E+00	1.28E-02	6.89E+03
Sb-125	1.35E-02	1.55E-03	4.99E+08	1.98E+02	3.70E-01	1.35E-03	9.00E-01	5.55E-01	5.55E-04	0.00E+00	0.00E+00	2.20E-06	5.36E+03
Eu-155	1.08E-02	5.58E-04	4.01E+08	1.59E+02	3.70E-01	1.08E-03	2.00E+00	2.00E-01	2.00E-04	0.00E+00	0.00E+00	7.96E-07	4.30E+03
Zr-95	9.27E-03	1.06E-03	3.43E+08	1.36E+02	3.70E-01	9.27E-04	9.00E-01	3.81E-01	3.81E-04	0.00E+00	0.00E+00	1.51E-06	3.68E+03
Nb-95	8.04E-03	8.29E-04	2.97E+08	1.18E+02	3.70E-01	8.04E-04	1.00E+00	2.97E-01	2.97E-04	0.00E+00	0.00E+00	1.18E-06	3.19E+03
Ra-226	7.34E-03	3.78E-02	2.71E+08	1.08E+02	3.70E-03	7.34E-02	2.00E-02	1.36E+01	1.36E-02	0.00E+00	0.00E+00	5.39E-05	2.91E+03
U-233	5.62E-03	5.79E-01	2.08E+08	8.26E+01	3.70E-03	5.62E-02	1.00E-03	2.08E+02	2.08E-01	5.79E-01	0.00E+00	8.26E-04	2.23E+03
Cm-243	5.07E-03	1.74E+00	1.87E+08	7.44E+01	3.70E-04	5.07E-01	3.00E-04	6.25E+02	6.25E-01	0.00E+00	2.01E+00	2.48E-03	2.01E+03
Ag-110m	4.28E-03	1.10E-03	1.58E+08	6.29E+01	3.70E-01	4.28E-04	4.00E-01	3.96E-01	3.96E-04	0.00E+00	0.00E+00	1.57E-06	1.70E+03
Co-58	4.24E-03	4.37E-04	1.57E+08	6.23E+01	3.70E-01	4.24E-04	1.00E+00	1.57E-01	1.57E-04	0.00E+00	0.00E+00	6.23E-07	1.68E+03
Cs-134	3.82E-03	7.87E-04	1.41E+08	5.61E+01	3.70E-02	3.82E-03	5.00E-01	2.82E-01	2.82E-04	0.00E+00	0.00E+00	1.12E-06	1.52E+03
Zn-65	3.74E-03	1.93E-04	1.38E+08	5.50E+01	3.70E-01	3.74E-04	2.00E+00	6.92E-02	6.92E-05	0.00E+00	0.00E+00	2.75E-07	1.49E+03
Ag-108m	2.39E-03	4.11E-04	8.85E+07	3.51E+01	3.70E-01	2.39E-04	6.00E-01	1.47E-01	1.47E-04	0.00E+00	0.00E+00	5.86E-07	9.50E+02
Mn-54	1.51E-03	1.55E-04	5.58E+07	2.22E+01	3.70E-01	1.51E-04	1.00E+00	5.58E-02	5.58E-05	0.00E+00	0.00E+00	2.22E-07	5.99E+02
U-235	1.83E-04	0.00E+00	6.79E+06	2.70E+00	3.70E-03	1.83E-03	Unlimited	0.00E+00	0.00E+00	8.34E+01	0.00E+00	0.00E+00	7.29E+01
I-129	1.77E-04	0.00E+00	6.55E+06	2.60E+00	3.70E-05	1.77E-01	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.03E+01
U-238	1.71E-04	0.00E+00	6.35E+06	2.52E+00	3.70E-03	1.71E-03	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.81E+01
Th-234	1.71E-04	8.84E-05	6.35E+06	2.52E+00	3.70E+00	1.71E-06	2.00E-01	3.17E-02	3.17E-05	0.00E+00	0.00E+00	1.26E-07	6.81E+01
Cm-242	1.21E-04	1.25E-03	4.47E+06	1.78E+00	3.70E-02	1.21E-04	1.00E-02	4.47E-01	4.47E-04	0.00E+00	0.00E+00	1.78E-06	4.80E+01
Np-237	7.46E-05	3.84E-02	2.76E+06	1.10E+00	3.70E-04	7.46E-03	2.00E-04	1.38E+01	1.38E-02	0.00E+00	2.96E-02	5.48E-05	2.96E+01
Pa-233	7.46E-05	8.54E-06	2.76E+06	1.10E+00	3.70E+00	7.46E-07	9.00E-01	3.07E-03	3.07E-06	0.00E+00	0.00E+00	1.22E-08	2.96E+01
Total	7.70E+01	100.00%	2.85E+12	1.13E+06		5.72E+02		3.59E+04	3.59E+01	8.43E+01	2.94E+01	1.43E-01	3.06E+07

DOT regulated as Hazard Class 7 Radioactive Material

Contains a Reportable Quantity of a Hazardous Substance; use 'RQ(radionuclides)' as part of PSN

≥ Type A quantity; requires Type B Packaging

Does NOT meet LTD QTY Exception; Check if LSA

Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN

>15 grams Fissile Material - use Radioactive material, fissile material, n.o.s. as PSN

This is a Low-level waste

Performed by: [signature] Date: 9/25/01

Reviewed by: _____ Date: _____

9/25/01

Section III: Check radionuclides for listing on labels and shipping papers; Check reportable radionuclides per Disposal Facility

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Sr-90	5.44E+01	5.61E+01	5.61E+01
Pu-238	3.36E-02	1.73E+01	7.34E+01
Am-241	1.80E-02	9.29E+00	8.27E+01
Pu-239	1.74E-02	8.95E+00	9.17E+01
Cs-137	1.91E+01	3.95E+00	9.56E+01
Pu-241	1.72E-01	1.77E+00	9.74E+01
Cm-243	5.07E-03	1.74E+00	9.91E+01
U-233	5.62E-03	5.79E-01	9.97E+01
Co-60	4.72E-01	1.22E-01	9.98E+01
Np-237	7.46E-05	3.84E-02	9.99E+01
Ra-226	7.34E-03	3.78E-02	9.99E+01
Ce-144	3.40E-02	1.75E-02	9.99E+01
Ru-106	3.35E-02	1.73E-02	1.00E+02
Eu-154	7.91E-02	1.63E-02	1.00E+02
Ni-63	2.40E+00	8.26E-03	1.00E+02
Eu-152	4.61E-02	5.28E-03	1.00E+02
Ru-103	4.10E-02	4.70E-03	1.00E+02
Sb-125	1.35E-02	1.55E-03	1.00E+02
Cm-242	1.21E-04	1.25E-03	1.00E+02
Ag-110m	4.28E-03	1.10E-03	1.00E+02
Zr-95	9.27E-03	1.06E-03	1.00E+02
Nb-95	8.04E-03	8.29E-04	1.00E+02
Cs-134	3.82E-03	7.87E-04	1.00E+02
Eu-155	1.08E-02	5.58E-04	1.00E+02
Co-58	4.24E-03	4.37E-04	1.00E+02
Ag-108m	2.39E-03	4.11E-04	1.00E+02
Zn-65	3.74E-03	1.93E-04	1.00E+02
Mn-54	1.51E-03	1.55E-04	1.00E+02
Th-234	1.71E-04	8.84E-05	1.00E+02
Pa-233	7.46E-05	8.54E-06	1.00E+02
U-235	1.83E-04	0.00E+00	1.00E+02
I-129	1.77E-04	0.00E+00	1.00E+02
U-238	1.71E-04	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Source Material (kg)	SNM (g)	Activity Conc. (Ci/m^3)
Sr-90	5.44E+01	7.07E+01	Not applicable	Not applicable	2.21E+01
Cs-137	1.91E+01	2.48E+01	Not applicable	Not applicable	7.75E+00
Ni-63	2.40E+00	3.12E+00	Not applicable	Not applicable	9.73E-01
Co-60	4.72E-01	6.12E-01	Not applicable	Not applicable	1.91E-01
Pu-241	1.72E-01	2.23E-01	Not applicable	1.72E-03	6.95E-02
Eu-154	7.91E-02	1.03E-01	Not applicable	Not applicable	3.20E-02
Eu-152	4.61E-02	5.98E-02	Not applicable	Not applicable	1.87E-02
Ru-103	4.10E-02	5.33E-02	Not applicable	Not applicable	1.66E-02
Ce-144	3.40E-02	4.41E-02	Not applicable	Not applicable	1.38E-02
Pu-238	3.36E-02	4.36E-02	Not applicable	1.98E-03	1.36E-02
Ru-106	3.35E-02	4.35E-02	Not applicable	Not applicable	1.36E-02
Am-241	1.80E-02	2.34E-02	Not applicable	Not applicable	7.30E-03
Pu-239	1.74E-02	2.25E-02	Not applicable	2.80E-01	7.03E-03
Sb-125	1.35E-02	1.75E-02	Not applicable	Not applicable	5.47E-03
Eu-155	1.08E-02	1.41E-02	Not applicable	Not applicable	4.39E-03
Zr-95	9.27E-03	1.20E-02	Not applicable	Not applicable	3.76E-03
Nb-95	8.04E-03	1.04E-02	Not applicable	Not applicable	3.26E-03
Ra-226	7.34E-03	9.53E-03	Not applicable	Not applicable	2.97E-03
U-233	5.62E-03	7.30E-03	Not applicable	5.79E-01	2.28E-03
Cm-243	5.07E-03	6.58E-03	Not applicable	Not applicable	2.05E-03
Ag-110m	4.28E-03	5.56E-03	Not applicable	Not applicable	1.73E-03
Co-58	4.24E-03	5.50E-03	Not applicable	Not applicable	1.72E-03
Cs-134	3.82E-03	4.96E-03	Not applicable	Not applicable	1.55E-03
Zn-65	3.74E-03	4.86E-03	Not applicable	Not applicable	1.52E-03
Ag-108m	2.39E-03	3.11E-03	Not applicable	Not applicable	9.69E-04
Mn-54	1.51E-03	1.96E-03	Not applicable	Not applicable	6.11E-04
U-235	1.83E-04	2.38E-04	Not applicable	8.34E+01	7.43E-05
I-129	1.77E-04	2.30E-04	Not applicable	Not applicable	7.17E-05
U-238	1.71E-04	2.23E-04	Not applicable	Not applicable	6.95E-05
Th-234	1.71E-04	2.23E-04	Not applicable	Not applicable	6.95E-05
Cm-242	1.21E-04	1.57E-04	Not applicable	Not applicable	4.89E-05
Np-237	7.46E-05	9.69E-05	Not applicable	Not applicable	3.02E-05
Pa-233	7.46E-05	9.69E-05	Not applicable	Not applicable	3.02E-05

If #DIV/0! occurs in the Fraction of Waste Profile Column or the Does Nuclide Meet Waste Profile? Column of Section III, the nuclide is not included on the current profile and needs to be added.

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, and Ni-63 are major nuclides driving waste classification determination for Tank V-1, V-2, and V-3 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-3 All Sludge AVG
Sr-90	0.04	150	2.21E+01
Cs-137	1	44	7.75E+00
Ni-63	3.5	70	9.73E-01

Class A Sum of Fractions: 559.41

Class B Sum of Fractions: 0.34

ClassB

73 of 105

Container ID # **INEEL Tank V-3 Solids (50.2 gal per drum using AVG)**

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: 55 Gallon Metal OH

Description: 50.2 gallons of Solids

Form#

PKE#

Note: assume solid phase volume of 50.2 gallons with density of 1.02 g/cc (91.3% of capacity)

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
477.30	216.50	50.00	22.68	193.82	0.261	0.190

Dose survey from Sxxxxx on xx/xx/00 shows < _____ mrem/hr OC.

Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.

Note: Gross weight of contents = (50.2 gal.)x(1.02 g/cc)x(3785.412 cc/gal.)x(2.2046E-03 lb/g) = 427.3 lbs.

EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-3)A2	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Solids Frac	Activity/gram (pCi/g)
Sr-90	4.19E+00	5.61E+01	1.55E+11	7.99E+05	3.70E-03	4.19E+01	1.00E-01	1.55E+03	1.55E+00	0.00E+00	0.00E+00	7.99E-02	2.16E+07
Cs-137	1.47E+00	3.95E+00	5.44E+10	2.81E+05	3.70E-02	1.47E+00	5.00E-01	1.09E+02	1.09E-01	0.00E+00	0.00E+00	5.62E-03	7.59E+06
Ni-63	1.85E-01	8.26E-03	6.83E+09	3.53E+04	3.70E+00	1.85E-03	3.00E+01	2.28E-01	2.28E-04	0.00E+00	0.00E+00	1.18E-05	9.53E+05
Co-60	3.63E-02	1.22E-01	1.34E+09	6.92E+03	3.70E-01	3.63E-03	4.00E-01	3.35E+00	3.35E-03	0.00E+00	0.00E+00	1.73E-04	1.87E+05
Pu-241	1.32E-02	1.77E+00	4.88E+08	2.52E+03	3.70E-02	1.32E-02	1.00E-02	4.88E+01	4.88E-02	1.32E-04	0.00E+00	2.52E-03	6.81E+04
Eu-154	6.08E-03	1.63E-02	2.25E+08	1.16E+03	3.70E-01	6.08E-04	5.00E-01	4.50E-01	4.50E-04	0.00E+00	0.00E+00	2.32E-05	3.14E+04
Eu-152	3.54E-03	5.28E-03	1.31E+08	6.76E+02	3.70E-01	3.54E-04	9.00E-01	1.46E-01	1.46E-04	0.00E+00	0.00E+00	7.51E-06	1.83E+04
Ru-103	3.16E-03	4.70E-03	1.17E+08	6.02E+02	3.70E-01	3.16E-04	9.00E-01	1.30E-01	1.30E-04	0.00E+00	0.00E+00	6.69E-06	1.63E+04
Ce-144	2.61E-03	1.75E-02	9.66E+07	4.99E+02	3.70E-02	2.61E-03	2.00E-01	4.83E-01	4.83E-04	0.00E+00	0.00E+00	2.49E-05	1.35E+04
Pu-238	2.58E-03	1.73E+01	9.56E+07	4.93E+02	3.70E-04	2.58E-01	2.00E-04	4.78E+02	4.78E-01	1.52E-04	1.33E+01	2.46E-02	1.33E+04
Ru-106	2.58E-03	1.73E-02	9.53E+07	4.92E+02	3.70E-02	2.58E-03	2.00E-01	4.77E-01	4.77E-04	0.00E+00	0.00E+00	2.46E-05	1.33E+04
Am-241	1.39E-03	9.29E+00	5.13E+07	2.65E+02	3.70E-04	1.39E-01	2.00E-04	2.56E+02	2.56E-01	0.00E+00	7.15E+00	1.32E-02	7.15E+03
Pu-239	1.33E-03	8.95E+00	4.94E+07	2.55E+02	3.70E-04	1.33E-01	2.00E-04	2.47E+02	2.47E-01	2.15E-02	6.88E+00	1.27E-02	6.88E+03
Sb-125	1.04E-03	1.55E-03	3.84E+07	1.98E+02	3.70E-01	1.04E-04	9.00E-01	4.27E-02	4.27E-05	0.00E+00	0.00E+00	2.20E-06	5.36E+03
Eu-155	8.33E-04	5.58E-04	3.08E+07	1.59E+02	3.70E-01	8.33E-05	2.00E+00	1.54E-02	1.54E-05	0.00E+00	0.00E+00	7.95E-07	4.30E+03
Zr-95	7.13E-04	1.06E-03	2.64E+07	1.36E+02	3.70E-01	7.13E-05	9.00E-01	2.93E-02	2.93E-05	0.00E+00	0.00E+00	1.51E-06	3.68E+03
Nb-95	6.18E-04	8.29E-04	2.29E+07	1.18E+02	3.70E-01	6.18E-05	1.00E+00	2.29E-02	2.29E-05	0.00E+00	0.00E+00	1.18E-06	3.19E+03
Ra-226	5.64E-04	3.78E-02	2.09E+07	1.08E+02	3.70E-03	5.64E-03	2.00E-02	1.04E+00	1.04E-03	0.00E+00	0.00E+00	5.39E-05	2.91E+03
U-233	4.32E-04	5.79E-01	1.60E+07	8.25E+01	3.70E-03	4.32E-03	1.00E-03	1.60E+01	1.60E-02	4.45E-02	0.00E+00	8.25E-04	2.23E+03
Cm-243	3.90E-04	1.74E+00	1.44E+07	7.44E+01	3.70E-04	3.90E-02	3.00E-04	4.80E+01	4.80E-02	0.00E+00	2.01E+00	2.48E-03	2.01E+03
Ag-110m	3.29E-04	1.10E-03	1.22E+07	6.28E+01	3.70E-01	3.29E-05	4.00E-01	3.04E-02	3.04E-05	0.00E+00	0.00E+00	1.57E-06	1.70E+03
Co-58	3.26E-04	4.37E-04	1.21E+07	6.22E+01	3.70E-01	3.26E-05	1.00E+00	1.21E-02	1.21E-05	0.00E+00	0.00E+00	6.22E-07	1.68E+03
Cs-134	2.93E-04	7.87E-04	1.09E+07	5.60E+01	3.70E-02	2.93E-04	5.00E-01	2.17E-02	2.17E-05	0.00E+00	0.00E+00	1.12E-06	1.51E+03
Zn-65	2.88E-04	1.93E-04	1.06E+07	5.49E+01	3.70E-01	2.88E-05	2.00E+00	5.32E-03	5.32E-06	0.00E+00	0.00E+00	2.75E-07	1.48E+03
Ag-108m	1.84E-04	4.11E-04	6.80E+06	3.51E+01	3.70E-01	1.84E-05	6.00E-01	1.13E-02	1.13E-05	0.00E+00	0.00E+00	5.85E-07	9.49E+02
Mn-54	1.16E-04	1.55E-04	4.29E+06	2.21E+01	3.70E-01	1.16E-05	1.00E+00	4.29E-03	4.29E-06	0.00E+00	0.00E+00	2.21E-07	5.98E+02
U-235	1.41E-05	0.00E+00	5.22E+05	2.69E+00	3.70E-03	1.41E-04	Unlimited	0.00E+00	0.00E+00	6.41E+00	0.00E+00	0.00E+00	7.28E+01
I-129	1.36E-05	0.00E+00	5.04E+05	2.60E+00	3.70E-05	1.36E-02	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.02E+01
U-238	1.32E-05	0.00E+00	4.88E+05	2.52E+00	3.70E-03	1.32E-04	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.80E+01
Th-234	1.32E-05	8.84E-05	4.88E+05	2.52E+00	3.70E+00	1.32E-07	2.00E-01	2.44E-03	2.44E-06	0.00E+00	0.00E+00	1.26E-07	6.80E+01
Cm-242	9.29E-06	1.25E-03	3.44E+05	1.77E+00	3.70E-02	9.29E-06	1.00E-02	3.44E-02	3.44E-05	0.00E+00	0.00E+00	1.77E-06	4.79E+01
Np-237	5.73E-06	3.84E-02	2.12E+05	1.09E+00	3.70E-04	5.73E-04	2.00E-04	1.06E+00	1.06E-03	0.00E+00	2.96E-02	5.47E-05	2.96E+01
Pa-233	5.73E-06	8.54E-06	2.12E+05	1.09E+00	3.70E+00	5.73E-08	9.00E-01	2.36E-04	2.36E-07	0.00E+00	0.00E+00	1.22E-08	2.96E+01
Total	5.92E+00	100.00%	2.19E+11	1.13E+06		4.39E+01		2.76E+03	2.76E+00	6.48E+00	2.94E+01	1.42E-01	3.05E+07

DOT regulated as Hazard Class 7 Radioactive Material

Contains a Reportable Quantity of a Hazardous Substance; use 'RQ(radionuclides)' as part of PSN

≥ Type A quantity; requires Type B Packaging

Does NOT meet LTD QTY Exception; Check if LSA

Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN

Meets criteria for Fissile Excepted Package per 49 CFR 173.453

This is a Low-level waste

Performed by: Gordon Stanin Date: 9/25/01

Reviewed by: _____ Date: _____

74 of 105

Section III: Check radionuclides for listing on labels and shipping papers; Check reportable radionuclides per Disposal Facility

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Sr-90	4.19E+00	5.61E+01	5.61E+01
Pu-238	2.58E-03	1.73E+01	7.34E+01
Am-241	1.39E-03	9.29E+00	8.27E+01
Pu-239	1.33E-03	8.95E+00	9.17E+01
Cs-137	1.47E+00	3.95E+00	9.56E+01
Pu-241	1.32E-02	1.77E+00	9.74E+01
Cm-243	3.90E-04	1.74E+00	9.91E+01
U-233	4.32E-04	5.79E-01	9.97E+01
Co-60	3.63E-02	1.22E-01	9.98E+01
Np-237	5.73E-06	3.84E-02	9.99E+01
Ra-226	5.64E-04	3.78E-02	9.99E+01
Ce-144	2.61E-03	1.75E-02	9.99E+01
Ru-106	2.58E-03	1.73E-02	1.00E+02
Eu-154	6.08E-03	1.63E-02	1.00E+02
Ni-63	1.85E-01	8.26E-03	1.00E+02
Eu-152	3.54E-03	5.28E-03	1.00E+02
Ru-103	3.16E-03	4.70E-03	1.00E+02
Sb-125	1.04E-03	1.55E-03	1.00E+02
Cm-242	9.29E-06	1.25E-03	1.00E+02
Ag-110m	3.29E-04	1.10E-03	1.00E+02
Zr-95	7.13E-04	1.06E-03	1.00E+02
Nb-95	6.18E-04	8.29E-04	1.00E+02
Cs-134	2.93E-04	7.87E-04	1.00E+02
Eu-155	8.33E-04	5.58E-04	1.00E+02
Co-58	3.26E-04	4.37E-04	1.00E+02
Ag-108m	1.84E-04	4.11E-04	1.00E+02
Zn-65	2.88E-04	1.93E-04	1.00E+02
Mn-54	1.16E-04	1.55E-04	1.00E+02
Th-234	1.32E-05	8.84E-05	1.00E+02
Pa-233	5.73E-06	8.54E-06	1.00E+02
U-235	1.41E-05	0.00E+00	1.00E+02
I-129	1.36E-05	0.00E+00	1.00E+02
U-238	1.32E-05	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Source Material (kg)	SNM (g)	Activity Conc. (Ci/m^3)
Sr-90	4.19E+00	7.07E+01	Not applicable	Not applicable	2.20E+01
Cs-137	1.47E+00	2.48E+01	Not applicable	Not applicable	7.74E+00
Ni-63	1.85E-01	3.12E+00	Not applicable	Not applicable	9.72E-01
Co-60	3.63E-02	6.12E-01	Not applicable	Not applicable	1.91E-01
Pu-241	1.32E-02	2.23E-01	Not applicable	1.32E-04	6.95E-02
Eu-154	6.08E-03	1.03E-01	Not applicable	Not applicable	3.20E-02
Eu-152	3.54E-03	5.98E-02	Not applicable	Not applicable	1.86E-02
Ru-103	3.16E-03	5.33E-02	Not applicable	Not applicable	1.66E-02
Ce-144	2.61E-03	4.41E-02	Not applicable	Not applicable	1.37E-02
Pu-238	2.58E-03	4.36E-02	Not applicable	1.52E-04	1.36E-02
Ru-106	2.58E-03	4.35E-02	Not applicable	Not applicable	1.36E-02
Am-241	1.39E-03	2.34E-02	Not applicable	Not applicable	7.30E-03
Pu-239	1.33E-03	2.25E-02	Not applicable	2.15E-02	7.02E-03
Sb-125	1.04E-03	1.75E-02	Not applicable	Not applicable	5.46E-03
Eu-155	8.33E-04	1.41E-02	Not applicable	Not applicable	4.38E-03
Zr-95	7.13E-04	1.20E-02	Not applicable	Not applicable	3.75E-03
Nb-95	6.18E-04	1.04E-02	Not applicable	Not applicable	3.25E-03
Ra-226	5.64E-04	9.53E-03	Not applicable	Not applicable	2.97E-03
U-233	4.32E-04	7.30E-03	Not applicable	4.45E-02	2.27E-03
Cm-243	3.90E-04	6.58E-03	Not applicable	Not applicable	2.05E-03
Ag-110m	3.29E-04	5.56E-03	Not applicable	Not applicable	1.73E-03
Co-58	3.26E-04	5.50E-03	Not applicable	Not applicable	1.71E-03
Cs-134	2.93E-04	4.96E-03	Not applicable	Not applicable	1.54E-03
Zn-65	2.88E-04	4.86E-03	Not applicable	Not applicable	1.51E-03
Ag-108m	1.84E-04	3.11E-03	Not applicable	Not applicable	9.68E-04
Mn-54	1.16E-04	1.96E-03	Not applicable	Not applicable	6.10E-04
U-235	1.41E-05	2.38E-04	Not applicable	6.41E+00	7.43E-05
I-129	1.36E-05	2.30E-04	Not applicable	Not applicable	7.16E-05
U-238	1.32E-05	2.23E-04	Not applicable	Not applicable	6.94E-05
Th-234	1.32E-05	2.23E-04	Not applicable	Not applicable	6.94E-05
Cm-242	9.29E-06	1.57E-04	Not applicable	Not applicable	4.89E-05
Np-237	5.73E-06	9.69E-05	Not applicable	Not applicable	3.02E-05
Pa-233	5.73E-06	9.69E-05	Not applicable	Not applicable	3.02E-05

If #DIV/0! occurs in the Fraction of Waste Profile Column or the Does Nuclide Meet Waste Profile? Column of Section III, the nuclide is not included on the current profile and needs to be added.

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, and Ni-63 are major nuclides driving waste classification determination for Tank V-1, V-2, and V-3 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-3 Sludge(50.2 gal/drum w/AVG)
Cs-137	1	44	7.74E+00
Sr-90	0.04	150	2.20E+01
Ni-63	3.5	70	9.72E-01
Class A Sum of Fractions:			558.79
Class B Sum of Fractions:			0.34
			ClassB

75 of 105

Container ID # **INEEL Tank V-3 Solids (Total w/MAX)**

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: N/A

Description: 652 gallons of Solids

Form#

PKE#

Note: assume solid phase volume of 652 gallons with density of 1.02 g/cc

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
5550.00	2517.48	0.00	0.00	2517.48	#N/A	2.468

Dose survey from Sxxxxx on xx/xx/00 shows < _____ mrem/hr OC.

Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.

EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Note: Gross weight of contents = (652 gal.)x(1.02 g/cc)x(3785.412 cc/gal.)x(2.2046E-03 lb/g) = 5,550.0 lbs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-3)A2	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Solids Frac	Activity/gram (pCi/g)
Sr-90	1.12E+02	6.58E+01	4.14E+12	1.65E+06	3.70E-03	1.12E+03	1.00E-01	4.14E+04	4.14E+01	0.00E+00	0.00E+00	1.65E-01	4.45E+07
Cs-137	2.28E+01	2.68E+00	8.43E+11	3.35E+05	3.70E-02	2.28E+01	5.00E-01	1.69E+03	1.69E+00	0.00E+00	0.00E+00	6.70E-03	9.05E+06
Ni-63	4.46E+00	8.72E-03	1.65E+11	6.55E+04	3.70E+00	4.46E-02	3.00E+01	5.50E+00	5.50E-03	0.00E+00	0.00E+00	2.18E-05	1.77E+06
Co-60	8.08E-01	1.19E-01	2.99E+10	1.19E+04	3.70E-01	8.08E-02	4.00E-01	7.47E+01	7.47E-02	0.00E+00	0.00E+00	2.97E-04	3.21E+05
Pu-241	2.76E-01	1.62E+00	1.02E+10	4.05E+03	3.70E-02	2.76E-01	1.00E-02	1.02E+03	1.02E+00	2.76E-03	0.00E+00	4.05E-03	1.09E+05
Eu-154	9.54E-02	1.12E-02	3.53E+09	1.40E+03	3.70E-01	9.54E-03	5.00E-01	7.06E+00	7.06E-03	0.00E+00	0.00E+00	2.80E-05	3.79E+04
Eu-152	7.38E-02	4.81E-03	2.73E+09	1.08E+03	3.70E-01	7.38E-03	9.00E-01	3.03E+00	3.03E-03	0.00E+00	0.00E+00	1.20E-05	2.93E+04
Ce-144	6.44E-02	1.89E-02	2.38E+09	9.47E+02	3.70E-02	6.44E-02	2.00E-01	1.19E+01	1.19E-02	0.00E+00	0.00E+00	4.74E-05	2.56E+04
Ru-103	6.37E-02	4.16E-03	2.36E+09	9.36E+02	3.70E-01	6.37E-03	9.00E-01	2.62E+00	2.62E-03	0.00E+00	0.00E+00	1.04E-05	2.53E+04
Ru-106	4.51E-02	1.32E-02	1.67E+09	6.62E+02	3.70E-02	4.51E-02	2.00E-01	8.34E+00	8.34E-03	0.00E+00	0.00E+00	3.31E-05	1.79E+04
Pu-238	3.85E-02	1.13E+01	1.43E+09	5.66E+02	3.70E-04	3.85E+00	2.00E-04	7.13E+03	7.13E+00	2.27E-03	1.53E+01	2.83E-02	1.53E+04
Am-241	2.90E-02	8.50E+00	1.07E+09	4.25E+02	3.70E-04	2.90E+00	2.00E-04	5.36E+03	5.36E+00	0.00E+00	1.15E+01	2.13E-02	1.15E+04
Pu-239	2.52E-02	7.39E+00	9.31E+08	3.70E+02	3.70E-04	2.52E+00	2.00E-04	4.66E+03	4.66E+00	4.06E-01	1.00E+01	1.85E-02	1.00E+04
Nb-95	2.39E-02	1.40E-03	8.83E+08	3.51E+02	3.70E-01	2.39E-03	1.00E+00	8.83E-01	8.83E-04	0.00E+00	0.00E+00	3.51E-06	9.48E+03
Sb-125	2.09E-02	1.36E-03	7.73E+08	3.07E+02	3.70E-01	2.09E-03	9.00E-01	8.59E-01	8.59E-04	0.00E+00	0.00E+00	3.41E-06	8.30E+03
Ra-226	2.08E-02	6.11E-02	7.69E+08	3.06E+02	3.70E-03	2.08E-01	2.00E-02	3.85E+01	3.85E-02	0.00E+00	0.00E+00	1.53E-04	8.26E+03
Zr-95	1.72E-02	1.13E-03	6.38E+08	2.53E+02	3.70E-01	1.72E-03	9.00E-01	7.09E-01	7.09E-04	0.00E+00	0.00E+00	2.82E-06	6.85E+03
Eu-155	1.36E-02	4.01E-04	5.05E+08	2.01E+02	3.70E-01	1.36E-03	2.00E+00	2.52E-01	2.52E-04	0.00E+00	0.00E+00	1.00E-06	5.42E+03
U-233	1.02E-02	6.00E-01	3.78E+08	1.50E+02	3.70E-03	1.02E-01	1.00E-03	3.78E+02	3.78E-01	1.05E+00	0.00E+00	1.50E-03	4.06E+03
Cm-243	9.29E-03	1.82E+00	3.44E+08	1.37E+02	3.70E-04	9.29E-01	3.00E-04	1.15E+03	1.15E+00	0.00E+00	3.69E+00	4.55E-03	3.69E+03
Cs-134	6.65E-03	7.81E-04	2.46E+08	9.77E+01	3.70E-02	6.65E-03	5.00E-01	4.92E-01	4.92E-04	0.00E+00	0.00E+00	1.95E-06	2.64E+03
Ag-110m	6.57E-03	9.65E-04	2.43E+08	9.66E+01	3.70E-01	6.57E-04	4.00E-01	6.08E-01	6.08E-04	0.00E+00	0.00E+00	2.41E-06	2.61E+03
Co-58	5.92E-03	3.47E-04	2.19E+08	8.69E+01	3.70E-01	5.92E-04	1.00E+00	2.19E-01	2.19E-04	0.00E+00	0.00E+00	8.69E-07	2.35E+03
Zn-65	4.51E-03	1.32E-04	1.67E+08	6.62E+01	3.70E-01	4.51E-04	2.00E+00	8.34E-02	8.34E-05	0.00E+00	0.00E+00	3.31E-07	1.79E+03
Ag-108m	3.42E-03	3.35E-04	1.27E+08	5.03E+01	3.70E-01	3.42E-04	6.00E-01	2.11E-01	2.11E-04	0.00E+00	0.00E+00	8.39E-07	1.36E+03
Mn-54	2.05E-03	1.20E-04	7.59E+07	3.02E+01	3.70E-01	2.05E-04	1.00E+00	7.59E-02	7.59E-05	0.00E+00	0.00E+00	3.02E-07	8.15E+02
U-235	3.22E-04	0.00E+00	1.19E+07	4.74E+00	3.70E-03	3.22E-03	Unlimited	0.00E+00	0.00E+00	1.46E+02	0.00E+00	0.00E+00	1.28E+02
I-129	2.72E-04	0.00E+00	1.01E+07	4.00E+00	3.70E-05	2.72E-01	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E+02
U-238	2.14E-04	0.00E+00	7.92E+06	3.14E+00	3.70E-03	2.14E-03	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.50E+01
Th-234	2.14E-04	6.28E-05	7.92E+06	3.14E+00	3.70E+00	2.14E-06	2.00E-01	3.96E-02	3.96E-05	0.00E+00	0.00E+00	1.57E-07	8.50E+01
Cm-242	2.10E-04	1.24E-03	7.79E+06	3.09E+00	3.70E-02	2.10E-04	1.00E-02	7.79E-01	7.79E-04	0.00E+00	0.00E+00	3.09E-06	8.36E+01
Np-237	1.45E-04	4.25E-02	5.36E+06	2.13E+00	3.70E-04	1.45E-02	2.00E-04	2.68E+01	2.68E-02	0.00E+00	5.75E-02	1.06E-04	5.75E+01
Pa-233	1.45E-04	9.45E-06	5.36E+06	2.13E+00	3.70E+00	1.45E-06	9.00E-01	5.95E-03	5.95E-06	0.00E+00	0.00E+00	2.36E-08	5.75E+01
Total	1.41E+02	100.00%	5.21E+12	2.07E+06		1.15E+03		6.30E+04	6.30E+01	1.48E+02	4.05E+01	2.50E-01	5.60E+07

DOT regulated as Hazard Class 7 Radioactive Material

Contains a Reportable Quantity of a Hazardous Substance; use 'RQ(radionuclides)' as part of PSN

≥ Type A quantity; requires Type B Packaging

Does NOT meet LTD QTY Exception; Check if LSA

Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN

>15 grams Fissile Material - use Radioactive material, fissile material, n.o.s. as PSN

This is a Low-level waste

Performed by: Gordon Harris Date: 9/25/01

Reviewed by: _____ Date: _____

76 of 105

Section III: Check radionuclides for listing on labels and shipping papers; Check reportable radionuclides per Disposal Facility

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Sr-90	1.12E+02	6.58E+01	6.58E+01
Pu-238	3.85E-02	1.13E+01	7.71E+01
Am-241	2.90E-02	8.50E+00	8.56E+01
Pu-239	2.52E-02	7.39E+00	9.30E+01
Cs-137	2.28E+01	2.68E+00	9.57E+01
Cm-243	9.29E-03	1.82E+00	9.75E+01
Pu-241	2.76E-01	1.62E+00	9.91E+01
U-233	1.02E-02	6.00E-01	9.97E+01
Co-60	8.08E-01	1.19E-01	9.98E+01
Ra-226	2.08E-02	6.11E-02	9.99E+01
Np-237	1.45E-04	4.25E-02	9.99E+01
Ce-144	6.44E-02	1.89E-02	9.99E+01
Ru-106	4.51E-02	1.32E-02	1.00E+02
Eu-154	9.54E-02	1.12E-02	1.00E+02
Ni-63	4.46E+00	8.72E-03	1.00E+02
Eu-152	7.38E-02	4.81E-03	1.00E+02
Ru-103	6.37E-02	4.16E-03	1.00E+02
Nb-95	2.39E-02	1.40E-03	1.00E+02
Sb-125	2.09E-02	1.36E-03	1.00E+02
Cm-242	2.10E-04	1.24E-03	1.00E+02
Zr-95	1.72E-02	1.13E-03	1.00E+02
Ag-110m	6.57E-03	9.65E-04	1.00E+02
Cs-134	6.65E-03	7.81E-04	1.00E+02
Eu-155	1.36E-02	4.01E-04	1.00E+02
Co-58	5.92E-03	3.47E-04	1.00E+02
Ag-108m	3.42E-03	3.35E-04	1.00E+02
Zn-65	4.51E-03	1.32E-04	1.00E+02
Mn-54	2.05E-03	1.20E-04	1.00E+02
Th-234	2.14E-04	6.28E-05	1.00E+02
Pa-233	1.45E-04	9.45E-06	1.00E+02
U-235	3.22E-04	0.00E+00	1.00E+02
I-129	2.72E-04	0.00E+00	1.00E+02
U-238	2.14E-04	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Source Material (kg)	SNM (g)	Activity Conc. (Ci/m^3)
Sr-90	1.12E+02	7.95E+01	Not applicable	Not applicable	4.54E+01
Cs-137	2.28E+01	1.62E+01	Not applicable	Not applicable	9.23E+00
Ni-63	4.46E+00	3.16E+00	Not applicable	Not applicable	1.81E+00
Co-60	8.08E-01	5.73E-01	Not applicable	Not applicable	3.27E-01
Pu-241	2.76E-01	1.96E-01	Not applicable	2.76E-03	1.12E-01
Eu-154	9.54E-02	6.77E-02	Not applicable	Not applicable	3.87E-02
Eu-152	7.38E-02	5.23E-02	Not applicable	Not applicable	2.99E-02
Ce-144	6.44E-02	4.57E-02	Not applicable	Not applicable	2.61E-02
Ru-103	6.37E-02	4.52E-02	Not applicable	Not applicable	2.58E-02
Ru-106	4.51E-02	3.20E-02	Not applicable	Not applicable	1.83E-02
Pu-238	3.85E-02	2.73E-02	Not applicable	2.27E-03	1.56E-02
Am-241	2.90E-02	2.05E-02	Not applicable	Not applicable	1.17E-02
Pu-239	2.52E-02	1.79E-02	Not applicable	4.06E-01	1.02E-02
Nb-95	2.39E-02	1.69E-02	Not applicable	Not applicable	9.67E-03
Sb-125	2.09E-02	1.48E-02	Not applicable	Not applicable	8.47E-03
Ra-226	2.08E-02	1.48E-02	Not applicable	Not applicable	8.43E-03
Zr-95	1.72E-02	1.22E-02	Not applicable	Not applicable	6.99E-03
Eu-155	1.36E-02	9.68E-03	Not applicable	Not applicable	5.53E-03
U-233	1.02E-02	7.25E-03	Not applicable	1.05E+00	4.14E-03
Cm-243	9.29E-03	6.59E-03	Not applicable	Not applicable	3.76E-03
Cs-134	6.65E-03	4.72E-03	Not applicable	Not applicable	2.69E-03
Ag-110m	6.57E-03	4.66E-03	Not applicable	Not applicable	2.66E-03
Co-58	5.92E-03	4.20E-03	Not applicable	Not applicable	2.40E-03
Zn-65	4.51E-03	3.20E-03	Not applicable	Not applicable	1.83E-03
Ag-108m	3.42E-03	2.43E-03	Not applicable	Not applicable	1.39E-03
Mn-54	2.05E-03	1.46E-03	Not applicable	Not applicable	8.31E-04
U-235	3.22E-04	2.29E-04	Not applicable	1.46E+02	1.31E-04
I-129	2.72E-04	1.93E-04	Not applicable	Not applicable	1.10E-04
U-238	2.14E-04	1.52E-04	Not applicable	Not applicable	8.67E-05
Th-234	2.14E-04	1.52E-04	Not applicable	Not applicable	8.67E-05
Cm-242	2.10E-04	1.49E-04	Not applicable	Not applicable	8.53E-05
Np-237	1.45E-04	1.03E-04	Not applicable	Not applicable	5.87E-05
Pa-233	1.45E-04	1.03E-04	Not applicable	Not applicable	5.87E-05

If #DIV/0! occurs in the Fraction of Waste Profile Column or the Does Nuclide Meet Waste Profile? Column of Section III, the nuclide is not included on the current profile and needs to be added.

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, and Ni-63 are major nuclides driving waste classification determination for Tank V-1, V-2, and V-3 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-3 All SludgeMAX
Sr-90	0.04	150	4.54E+01
Cs-137	1	44	9.23E+00
Ni-63	3.5	70	1.81E+00
Class A Sum of Fractions:			1144.53
Class B Sum of Fractions:			0.54
			ClassB

77 of 105

Container ID # **INEEL Tank V-3 Solids (50.2 gal per drum using MAX)**

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: 55 Gallon Metal OH

Description: 50.2 gallons of Solids

Form#

PKE#

Note: assume solid phase volume of 50.2 gallons with density of 1.02 g/cc (91.3% of capacity)

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
477.30	216.50	50.00	22.68	193.82	0.261	0.190

Dose survey from Sxxxxx on xx/xx/00 shows < _____ mrem/hr OC.

Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.

Note: Gross weight of contents = (50.2 gal.)x(1.02 g/cc)x(3785.412 cc/gal.)x(2.2046E-03 lb/g) = 427.3 lbs.

EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-3)A2	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Solids Frac	Activity/gram (pCi/g)
Sr-90	8.63E+00	6.58E+01	3.19E+11	1.65E+06	3.70E-03	8.63E+01	1.00E-01	3.19E+03	3.19E+00	0.00E+00	0.00E+00	1.65E-01	4.45E+07
Cs-137	1.75E+00	2.67E+00	6.48E+10	3.34E+05	3.70E-02	1.75E+00	5.00E-01	1.30E+02	1.30E-01	0.00E+00	0.00E+00	6.69E-03	9.04E+06
Ni-63	3.43E-01	8.71E-03	1.27E+10	6.54E+04	3.70E+00	3.43E-03	3.00E+01	4.23E-01	4.23E-04	0.00E+00	0.00E+00	2.18E-05	1.77E+06
Co-60	6.22E-02	1.19E-01	2.30E+09	1.19E+04	3.70E-01	6.22E-03	4.00E-01	5.75E+00	5.75E-03	0.00E+00	0.00E+00	2.97E-04	3.21E+05
Pu-241	2.12E-02	1.62E+00	7.84E+08	4.05E+03	3.70E-02	2.12E-02	1.00E-02	7.84E+01	7.84E-02	2.12E-04	0.00E+00	4.05E-03	1.09E+05
Eu-154	7.35E-03	1.12E-02	2.72E+08	1.40E+03	3.70E-01	7.35E-04	5.00E-01	5.44E-01	5.44E-04	0.00E+00	0.00E+00	2.81E-05	3.79E+04
Eu-152	5.68E-03	4.81E-03	2.10E+08	1.08E+03	3.70E-01	5.68E-04	9.00E-01	2.34E-01	2.34E-04	0.00E+00	0.00E+00	1.20E-05	2.93E+04
Ce-144	4.96E-03	1.89E-02	1.83E+08	9.46E+02	3.70E-02	4.96E-03	2.00E-01	9.17E-01	9.17E-04	0.00E+00	0.00E+00	4.73E-05	2.56E+04
Ru-103	4.90E-03	4.15E-03	1.81E+08	9.35E+02	3.70E-01	4.90E-04	9.00E-01	2.01E-01	2.01E-04	0.00E+00	0.00E+00	1.04E-05	2.53E+04
Ru-106	3.47E-03	1.32E-02	1.28E+08	6.62E+02	3.70E-02	3.47E-03	2.00E-01	6.41E-01	6.41E-04	0.00E+00	0.00E+00	3.31E-05	1.79E+04
Pu-238	2.97E-03	1.13E+01	1.10E+08	5.67E+02	3.70E-04	2.97E-01	2.00E-04	5.49E+02	5.49E-01	1.75E-04	1.53E+01	2.83E-02	1.53E+04
Am-241	2.23E-03	8.49E+00	8.24E+07	4.25E+02	3.70E-04	2.23E-01	2.00E-04	4.12E+02	4.12E-01	0.00E+00	1.15E+01	2.12E-02	1.15E+04
Pu-239	1.94E-03	7.38E+00	7.16E+07	3.70E+02	3.70E-04	1.94E-01	2.00E-04	3.58E+02	3.58E-01	3.12E-02	9.99E+00	1.85E-02	9.99E+03
Nb-95	1.84E-03	1.40E-03	6.79E+07	3.50E+02	3.70E-01	1.84E-04	1.00E+00	6.79E-02	6.79E-05	0.00E+00	0.00E+00	3.50E-06	9.47E+03
Sb-125	1.61E-03	1.36E-03	5.95E+07	3.07E+02	3.70E-01	1.61E-04	9.00E-01	6.61E-02	6.61E-05	0.00E+00	0.00E+00	3.41E-06	8.29E+03
Ra-226	1.60E-03	6.10E-02	5.92E+07	3.05E+02	3.70E-03	1.60E-02	2.00E-02	2.96E+00	2.96E-03	0.00E+00	0.00E+00	1.53E-04	8.25E+03
Zr-95	1.33E-03	1.12E-03	4.91E+07	2.53E+02	3.70E-01	1.33E-04	9.00E-01	5.45E-02	5.45E-05	0.00E+00	0.00E+00	2.81E-06	6.84E+03
Eu-155	1.05E-03	4.00E-04	3.88E+07	2.00E+02	3.70E-01	1.05E-04	2.00E+00	1.94E-02	1.94E-05	0.00E+00	0.00E+00	1.00E-06	5.41E+03
U-233	7.87E-04	6.00E-01	2.91E+07	1.50E+02	3.70E-03	7.87E-03	1.00E-03	2.91E+01	2.91E-02	8.11E-02	0.00E+00	1.50E-03	4.06E+03
Cm-243	7.15E-04	1.82E+00	2.65E+07	1.36E+02	3.70E-04	7.15E-02	3.00E-04	8.82E+01	8.82E-02	0.00E+00	3.69E+00	4.55E-03	3.69E+03
Cs-134	5.12E-04	7.81E-04	1.89E+07	9.77E+01	3.70E-02	5.12E-04	5.00E-01	3.79E-02	3.79E-05	0.00E+00	0.00E+00	1.95E-06	2.64E+03
Ag-110m	5.06E-04	9.65E-04	1.87E+07	9.66E+01	3.70E-01	5.06E-05	4.00E-01	4.68E-02	4.68E-05	0.00E+00	0.00E+00	2.41E-06	2.61E+03
Co-58	4.55E-04	3.47E-04	1.68E+07	8.68E+01	3.70E-01	4.55E-05	1.00E+00	1.68E-02	1.68E-05	0.00E+00	0.00E+00	8.68E-07	2.35E+03
Zn-65	3.47E-04	1.32E-04	1.28E+07	6.62E+01	3.70E-01	3.47E-05	2.00E+00	6.41E-03	6.41E-06	0.00E+00	0.00E+00	3.31E-07	1.79E+03
Ag-108m	2.64E-04	3.36E-04	9.77E+06	5.04E+01	3.70E-01	2.64E-05	6.00E-01	1.63E-02	1.63E-05	0.00E+00	0.00E+00	8.40E-07	1.36E+03
Mn-54	1.58E-04	1.20E-04	5.84E+06	3.01E+01	3.70E-01	1.58E-05	1.00E+00	5.84E-03	5.84E-06	0.00E+00	0.00E+00	3.01E-07	8.14E+02
U-235	2.48E-05	0.00E+00	9.17E+05	4.73E+00	3.70E-03	2.48E-04	Unlimited	0.00E+00	0.00E+00	1.13E+01	0.00E+00	0.00E+00	1.28E+02
I-129	2.09E-05	0.00E+00	7.74E+05	3.99E+00	3.70E-05	2.09E-02	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E+02
U-238	1.65E-05	0.00E+00	6.09E+05	3.14E+00	3.70E-03	1.65E-04	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.49E+01
Th-234	1.65E-05	6.27E-05	6.09E+05	3.14E+00	3.70E+00	1.65E-07	2.00E-01	3.04E-03	3.04E-06	0.00E+00	0.00E+00	1.57E-07	8.49E+01
Cm-242	1.62E-05	1.23E-03	5.99E+05	3.09E+00	3.70E-02	1.62E-05	1.00E-02	5.99E-02	5.99E-05	0.00E+00	0.00E+00	3.09E-06	8.35E+01
Np-237	1.11E-05	4.24E-02	4.12E+05	2.12E+00	3.70E-04	1.11E-03	2.00E-04	2.06E+00	2.06E-03	0.00E+00	5.74E-02	1.06E-04	5.74E+01
Pa-233	1.11E-05	9.43E-06	4.12E+05	2.12E+00	3.70E+00	1.11E-07	9.00E-01	4.58E-04	4.58E-07	0.00E+00	0.00E+00	2.36E-08	5.74E+01
Total	1.09E+01	100.00%	4.02E+11	2.07E+06		8.89E+01		4.85E+03	4.85E+00	1.14E+01	4.05E+01	2.50E-01	5.60E+07

DOT regulated as Hazard Class 7 Radioactive Material

Contains a Reportable Quantity of a Hazardous Substance; use 'RQ(radionuclides)' as part of PSN

≥ Type A quantity; requires Type B Packaging

Does NOT meet LTD QTY Exception; Check if LSA

Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN

Meets criteria for Fissile Excepted Package per 49 CFR 173.453

This is a Low-level waste

Performed by: Gordon Harris Date: 9/25/01

Reviewed by: _____ Date: _____

78 of 105

Section III: Check radionuclides for listing on labels and shipping papers; Check reportable radionuclides per Disposal Facility

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Sr-90	8.61E+00	6.58E+01	6.58E+01
Pu-238	2.96E-03	1.13E+01	7.71E+01
Am-241	2.23E-03	8.50E+00	8.56E+01
Pu-239	1.94E-03	7.39E+00	9.30E+01
Cs-137	1.75E+00	2.68E+00	9.57E+01
Cm-243	7.14E-04	1.82E+00	9.75E+01
Pu-241	2.12E-02	1.62E+00	9.91E+01
U-233	7.86E-04	6.00E-01	9.97E+01
Co-60	6.21E-02	1.19E-01	9.98E+01
Ra-226	1.60E-03	6.11E-02	9.99E+01
Np-237	1.11E-05	4.25E-02	9.99E+01
Ce-144	4.96E-03	1.89E-02	9.99E+01
Ru-106	3.47E-03	1.32E-02	1.00E+02
Eu-154	7.34E-03	1.12E-02	1.00E+02
Ni-63	3.43E-01	8.72E-03	1.00E+02
Eu-152	5.67E-03	4.81E-03	1.00E+02
Ru-103	4.90E-03	4.16E-03	1.00E+02
Nb-95	1.84E-03	1.40E-03	1.00E+02
Sb-125	1.61E-03	1.36E-03	1.00E+02
Cm-242	1.62E-05	1.24E-03	1.00E+02
Zr-95	1.33E-03	1.13E-03	1.00E+02
Ag-110m	5.05E-04	9.65E-04	1.00E+02
Cs-134	5.11E-04	7.81E-04	1.00E+02
Eu-155	1.05E-03	4.01E-04	1.00E+02
Co-58	4.55E-04	3.47E-04	1.00E+02
Ag-108m	2.63E-04	3.35E-04	1.00E+02
Zn-65	3.47E-04	1.32E-04	1.00E+02
Mn-54	1.58E-04	1.20E-04	1.00E+02
Th-234	1.65E-05	6.28E-05	1.00E+02
Pa-233	1.11E-05	9.45E-06	1.00E+02
U-235	2.48E-05	0.00E+00	1.00E+02
I-129	2.09E-05	0.00E+00	1.00E+02
U-238	1.65E-05	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Source Material (kg)	SNM (g)	Activity Conc. (Ci/m^3)
Sr-90	8.63E+00	7.95E+01	Not applicable	Not applicable	4.54E+01
Cs-137	1.75E+00	1.61E+01	Not applicable	Not applicable	9.22E+00
Ni-63	3.43E-01	3.16E+00	Not applicable	Not applicable	1.80E+00
Co-60	6.22E-02	5.73E-01	Not applicable	Not applicable	3.27E-01
Pu-241	2.12E-02	1.95E-01	Not applicable	2.12E-04	1.12E-01
Eu-154	7.35E-03	6.77E-02	Not applicable	Not applicable	3.87E-02
Eu-152	5.68E-03	5.23E-02	Not applicable	Not applicable	2.99E-02
Ce-144	4.96E-03	4.57E-02	Not applicable	Not applicable	2.61E-02
Ru-103	4.90E-03	4.51E-02	Not applicable	Not applicable	2.58E-02
Ru-106	3.47E-03	3.19E-02	Not applicable	Not applicable	1.82E-02
Pu-238	2.97E-03	2.74E-02	Not applicable	1.75E-04	1.56E-02
Am-241	2.23E-03	2.05E-02	Not applicable	Not applicable	1.17E-02
Pu-239	1.94E-03	1.78E-02	Not applicable	3.12E-02	1.02E-02
Nb-95	1.84E-03	1.69E-02	Not applicable	Not applicable	9.66E-03
Sb-125	1.61E-03	1.48E-02	Not applicable	Not applicable	8.46E-03
Ra-226	1.60E-03	1.47E-02	Not applicable	Not applicable	8.42E-03
Zr-95	1.33E-03	1.22E-02	Not applicable	Not applicable	6.98E-03
Eu-155	1.05E-03	9.67E-03	Not applicable	Not applicable	5.52E-03
U-233	7.87E-04	7.25E-03	Not applicable	8.11E-02	4.14E-03
Cm-243	7.15E-04	6.59E-03	Not applicable	Not applicable	3.76E-03
Cs-134	5.12E-04	4.72E-03	Not applicable	Not applicable	2.69E-03
Ag-110m	5.06E-04	4.66E-03	Not applicable	Not applicable	2.66E-03
Co-58	4.55E-04	4.19E-03	Not applicable	Not applicable	2.39E-03
Zn-65	3.47E-04	3.19E-03	Not applicable	Not applicable	1.82E-03
Ag-108m	2.64E-04	2.43E-03	Not applicable	Not applicable	1.39E-03
Mn-54	1.58E-04	1.45E-03	Not applicable	Not applicable	8.30E-04
U-235	2.48E-05	2.28E-04	Not applicable	1.13E+01	1.30E-04
I-129	2.09E-05	1.93E-04	Not applicable	Not applicable	1.10E-04
U-238	1.65E-05	1.52E-04	Not applicable	Not applicable	8.66E-05
Th-234	1.65E-05	1.52E-04	Not applicable	Not applicable	8.66E-05
Cm-242	1.62E-05	1.49E-04	Not applicable	Not applicable	8.52E-05
Np-237	1.11E-05	1.03E-04	Not applicable	Not applicable	5.86E-05
Pa-233	1.11E-05	1.03E-04	Not applicable	Not applicable	5.86E-05

If #DIV/0! occurs in the Fraction of Waste Profile Column or the Does Nuclide Meet Waste Profile? Column of Section III, the nuclide is not included on the current profile and needs to be added.

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, and Ni-63 are major nuclides driving waste classification determination for Tank V-1, V-2, and V-3 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-3 Sludge(50.2 gal/drum w/MAX)
Cs-137	1	44	9.22E+00
Sr-90	0.04	150	4.54E+01
Ni-63	3.5	70	1.80E+00
Class A Sum of Fractions:			1145.26
Class B Sum of Fractions:			0.54
			ClassB

79 #105

Container ID # **INEEL Tank V-3 Liquids (Total)**

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: N/A Form#

Description: 5818 gallons of liquids PKE#

NTS Waste Stream # #N/A

SNL Waste Stream# #N/A

Note: assume liquid phase volume of 5818 gallons with density of 1.00 g/ml

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
48553.00	22023.64	0.00	0.00	22023.64	#N/A	22.024

Note: Gross weight of contents = (5818 gal.)x(1.0 g/ml)x(3785.412 ml/gal.)x(2.2046E-03 lb/g) = 48,553.0 lb

Dose survey from Sxxxxx on xx/xx/00 shows < _____ mrem/hr OC.

Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.

EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-4)A2)	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Liquids Fraction	Activity/gram (pCi/g)
Sr-90	2.71E-01	8.43E+01	1.00E+10	4.55E+02	3.70E-03	2.71E+00	1.00E-01	1.00E+03	1.00E-01	0.00E+00	0.00E+00	4.55E-04	1.23E+04
H-3	1.34E-01	1.04E-01	4.96E+09	2.25E+02	3.70E+00	1.34E-03	4.00E+01	1.24E+00	1.24E-04	0.00E+00	0.00E+00	5.63E-07	6.09E+03
Cs-137	9.32E-02	5.80E+00	3.45E+09	1.57E+02	3.70E-02	9.32E-02	5.00E-01	6.89E+01	6.89E-03	0.00E+00	0.00E+00	3.13E-05	4.23E+03
Ni-63	4.51E-03	4.69E-03	1.67E+08	7.58E+00	3.70E+00	4.51E-05	3.00E+01	5.57E-02	5.57E-06	0.00E+00	0.00E+00	2.53E-08	2.05E+02
Co-60	3.26E-04	2.54E-02	1.21E+07	5.48E-01	3.70E-01	3.26E-05	4.00E-01	3.02E-01	3.02E-05	0.00E+00	0.00E+00	1.37E-07	1.48E+01
Ru-103	3.00E-04	1.04E-02	1.11E+07	5.03E-01	3.70E-01	3.00E-05	9.00E-01	1.23E-01	1.23E-05	0.00E+00	0.00E+00	5.59E-08	1.36E+01
U-233	2.93E-04	9.12E+00	1.08E+07	4.92E-01	3.70E-03	2.93E-03	1.00E-03	1.08E+02	1.08E-02	3.02E-02	0.00E+00	4.92E-05	1.33E+01
Ru-106	2.31E-04	3.60E-02	8.56E+06	3.88E-01	3.70E-02	2.31E-04	2.00E-01	4.28E-01	4.28E-05	0.00E+00	0.00E+00	1.94E-07	1.05E+01
Ce-144	2.00E-04	3.12E-02	7.42E+06	3.37E-01	3.70E-02	2.00E-04	2.00E-01	3.71E-01	3.71E-05	0.00E+00	0.00E+00	1.68E-07	9.10E+00
Eu-152	1.02E-04	3.53E-03	3.77E+06	1.71E-01	3.70E-01	1.02E-05	9.00E-01	4.19E-02	4.19E-06	0.00E+00	0.00E+00	1.90E-08	4.63E+00
Sb-125	1.01E-04	3.50E-03	3.75E+06	1.70E-01	3.70E-01	1.01E-05	9.00E-01	4.16E-02	4.16E-06	0.00E+00	0.00E+00	1.89E-08	4.60E+00
Zr-95	8.81E-05	3.05E-03	3.26E+06	1.48E-01	3.70E-01	8.81E-06	9.00E-01	3.62E-02	3.62E-06	0.00E+00	0.00E+00	1.64E-08	4.00E+00
Eu-155	6.65E-05	1.04E-03	2.46E+06	1.12E-01	3.70E-01	6.65E-06	2.00E+00	1.23E-02	1.23E-06	0.00E+00	0.00E+00	5.59E-09	3.02E+00
Nb-95	4.89E-05	1.52E-03	1.81E+06	8.21E-02	3.70E-01	4.89E-06	1.00E+00	1.81E-02	1.81E-06	0.00E+00	0.00E+00	8.21E-09	2.22E+00
Co-58	4.54E-05	1.41E-03	1.68E+06	7.62E-02	3.70E-01	4.54E-06	1.00E+00	1.68E-02	1.68E-06	0.00E+00	0.00E+00	7.62E-09	2.06E+00
Zn-65	3.61E-05	5.62E-04	1.34E+06	6.07E-02	3.70E-01	3.61E-06	2.00E+00	6.68E-03	6.68E-07	0.00E+00	0.00E+00	3.03E-09	1.64E+00
Eu-154	3.37E-05	2.10E-03	1.25E+06	5.66E-02	3.70E-01	3.37E-06	5.00E-01	2.49E-02	2.49E-06	0.00E+00	0.00E+00	1.13E-08	1.53E+00
Ag-110m	3.19E-05	2.49E-03	1.18E+06	5.36E-02	3.70E-01	3.19E-06	4.00E-01	2.95E-02	2.95E-06	0.00E+00	0.00E+00	1.34E-08	1.45E+00
Ra-226	2.69E-05	4.18E-02	9.94E+05	4.51E-02	3.70E-03	2.69E-04	2.00E-02	4.97E-01	4.97E-05	0.00E+00	0.00E+00	2.26E-07	1.22E+00
Ag-108m	1.96E-05	1.02E-03	7.25E+05	3.29E-02	3.70E-01	1.96E-06	6.00E-01	1.21E-02	1.21E-06	0.00E+00	0.00E+00	5.49E-09	8.90E-01
Mn-54	1.65E-05	5.13E-04	6.10E+05	2.77E-02	3.70E-01	1.65E-06	1.00E+00	6.10E-03	6.10E-07	0.00E+00	0.00E+00	2.77E-09	7.48E-01
Cs-134	1.60E-05	9.96E-04	5.92E+05	2.69E-02	3.70E-02	1.60E-05	5.00E-01	1.18E-02	1.18E-06	0.00E+00	0.00E+00	5.37E-09	7.26E-01
U-235	8.83E-06	0.00E+00	3.27E+05	1.48E-02	3.70E-03	8.83E-05	Unlimited	0.00E+00	0.00E+00	4.01E+00	0.00E+00	0.00E+00	4.01E-01
Pu-241	6.67E-06	2.08E-02	2.47E+05	1.12E-02	3.70E-02	6.67E-06	1.00E-02	2.47E-01	2.47E-05	6.67E-08	0.00E+00	1.12E-07	3.03E-01
I-129	4.80E-06	0.00E+00	1.78E+05	8.07E-03	3.70E-05	4.80E-03	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.18E-01
U-238	2.97E-06	0.00E+00	1.10E+05	4.99E-03	3.70E-03	2.97E-05	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.35E-01
Th-234	2.97E-06	4.63E-04	1.10E+05	4.99E-03	3.70E+00	2.97E-08	2.00E-01	5.50E-03	5.50E-07	0.00E+00	0.00E+00	2.50E-09	1.35E-01
Pu-238	8.44E-07	1.31E-01	3.12E+04	1.42E-03	3.70E-04	8.44E-05	2.00E-04	1.56E+00	1.56E-04	4.96E-08	3.83E-05	7.09E-07	3.83E-02
Np-237	8.02E-07	1.25E-01	2.97E+04	1.35E-03	3.70E-04	8.02E-05	2.00E-04	1.48E+00	1.48E-04	0.00E+00	3.64E-05	6.73E-07	3.64E-02
Pa-233	8.02E-07	2.77E-05	2.97E+04	1.35E-03	3.70E+00	8.02E-09	9.00E-01	3.30E-04	3.30E-08	0.00E+00	0.00E+00	1.50E-10	3.64E-02
Am-241	7.00E-07	1.09E-01	2.59E+04	1.18E-03	3.70E-04	7.00E-05	2.00E-04	1.30E+00	1.30E-04	0.00E+00	3.18E-05	5.88E-07	3.18E-02
Pu-239	4.34E-07	6.75E-02	1.61E+04	7.29E-04	3.70E-04	4.34E-05	2.00E-04	8.03E-01	8.03E-05	7.00E-06	1.97E-05	3.64E-07	1.97E-02
Cm-243	1.38E-07	1.44E-02	5.12E+03	2.32E-04	3.70E-04	1.38E-05	3.00E-04	1.71E-01	1.71E-05	0.00E+00	6.28E-06	7.75E-08	6.28E-03
Cm-242	1.36E-07	4.24E-04	5.04E+03	2.29E-04	3.70E-02	1.36E-07	1.00E-02	5.04E-03	5.04E-07	0.00E+00	0.00E+00	2.29E-09	6.18E-03
Total	5.05E-01	100.00%	1.87E+10	8.48E+02		2.81E+00		1.19E+03	1.19E-01	4.04E+00	1.32E-04	5.40E-04	2.29E+04

DOT regulated as Hazard Class 7 Radioactive Material

Contains a Reportable Quantity of a Hazardous Substance; use 'RQ(radionuclides)' as part of PSN

< Type A quantity/package per 49 CFR 173.431(a); check if excepted quantity -> excepted packaging

Does NOT meet LTD QTY Exception; Check if LSA

Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN

Meets criteria for Fissile Excepted Package per 49 CFR 173.453

This is a Low-level waste

Performed by: Gordon Harris Date: 9/25/01

Reviewed by: _____ Date: _____

80 of 105

Section III: Check radionuclides for listing on labels and shipping papers

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Sr-90	2.71E-01	8.43E+01	8.43E+01
U-233	2.93E-04	9.12E+00	9.35E+01
Cs-137	9.32E-02	5.80E+00	9.93E+01
Pu-238	8.44E-07	1.31E-01	9.94E+01
Np-237	8.02E-07	1.25E-01	9.95E+01
Am-241	7.00E-07	1.09E-01	9.96E+01
H-3	1.34E-01	1.04E-01	9.97E+01
Pu-239	4.34E-07	6.75E-02	9.98E+01
Ra-226	2.69E-05	4.18E-02	9.98E+01
Ru-106	2.31E-04	3.60E-02	9.99E+01
Ce-144	2.00E-04	3.12E-02	9.99E+01
Co-60	3.26E-04	2.54E-02	9.99E+01
Pu-241	6.67E-06	2.08E-02	9.99E+01
Cm-243	1.38E-07	1.44E-02	1.00E+02
Ru-103	3.00E-04	1.04E-02	1.00E+02
Ni-63	4.51E-03	4.69E-03	1.00E+02
Eu-152	1.02E-04	3.53E-03	1.00E+02
Sb-125	1.01E-04	3.50E-03	1.00E+02
Zr-95	8.81E-05	3.05E-03	1.00E+02
Ag-110m	3.19E-05	2.49E-03	1.00E+02
Eu-154	3.37E-05	2.10E-03	1.00E+02
Nb-95	4.89E-05	1.52E-03	1.00E+02
Co-58	4.54E-05	1.41E-03	1.00E+02
Eu-155	6.65E-05	1.04E-03	1.00E+02
Ag-108m	1.96E-05	1.02E-03	1.00E+02
Cs-134	1.60E-05	9.96E-04	1.00E+02
Zn-65	3.61E-05	5.62E-04	1.00E+02
Mn-54	1.65E-05	5.13E-04	1.00E+02
Th-234	2.97E-06	4.63E-04	1.00E+02
Cm-242	1.36E-07	4.24E-04	1.00E+02
Pa-233	8.02E-07	2.77E-05	1.00E+02
U-235	8.83E-06	0.00E+00	1.00E+02
I-129	4.80E-06	0.00E+00	1.00E+02
U-238	2.97E-06	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Source Material (kg)	SNM (g)	Activity Conc. (Ci/m^3)
Sr-90	2.71E-01	5.37E+01	Not applicable	Not applicable	1.23E-02
H-3	1.34E-01	2.66E+01	Not applicable	Not applicable	6.09E-03
Cs-137	9.32E-02	1.85E+01	Not applicable	Not applicable	4.23E-03
Ni-63	4.51E-03	8.95E-01	Not applicable	Not applicable	2.05E-04
Co-60	3.26E-04	6.46E-02	Not applicable	Not applicable	1.48E-05
Ru-103	3.00E-04	5.93E-02	Not applicable	Not applicable	1.36E-05
U-233	2.93E-04	5.80E-02	Not applicable	3.02E-02	1.33E-05
Ru-106	2.31E-04	4.58E-02	Not applicable	Not applicable	1.05E-05
Ce-144	2.00E-04	3.97E-02	Not applicable	Not applicable	9.10E-06
Eu-152	1.02E-04	2.02E-02	Not applicable	Not applicable	4.63E-06
Sb-125	1.01E-04	2.01E-02	Not applicable	Not applicable	4.60E-06
Zr-95	8.81E-05	1.75E-02	Not applicable	Not applicable	4.00E-06
Eu-155	6.65E-05	1.32E-02	Not applicable	Not applicable	3.02E-06
Nb-95	4.89E-05	9.69E-03	Not applicable	Not applicable	2.22E-06
Co-58	4.54E-05	8.99E-03	Not applicable	Not applicable	2.06E-06
Zn-65	3.61E-05	7.16E-03	Not applicable	Not applicable	1.64E-06
Eu-154	3.37E-05	6.68E-03	Not applicable	Not applicable	1.53E-06
Ag-110m	3.19E-05	6.33E-03	Not applicable	Not applicable	1.45E-06
Ra-226	2.69E-05	5.32E-03	Not applicable	Not applicable	1.22E-06
Ag-108m	1.96E-05	3.88E-03	Not applicable	Not applicable	8.90E-07
Mn-54	1.65E-05	3.26E-03	Not applicable	Not applicable	7.48E-07
Cs-134	1.60E-05	3.17E-03	Not applicable	Not applicable	7.26E-07
U-235	8.83E-06	1.75E-03	Not applicable	4.01E+00	4.01E-07
Pu-241	6.67E-06	1.32E-03	Not applicable	6.67E-08	3.03E-07
I-129	4.80E-06	9.51E-04	Not applicable	Not applicable	2.18E-07
U-238	2.97E-06	5.89E-04	Not applicable	Not applicable	1.35E-07
Th-234	2.97E-06	5.89E-04	Not applicable	Not applicable	1.35E-07
Pu-238	8.44E-07	1.67E-04	Not applicable	4.96E-08	3.83E-08
Np-237	8.02E-07	1.59E-04	Not applicable	Not applicable	3.64E-08
Pa-233	8.02E-07	1.59E-04	Not applicable	Not applicable	3.64E-08
Am-241	7.00E-07	1.39E-04	Not applicable	Not applicable	3.18E-08
Pu-239	4.34E-07	8.60E-05	Not applicable	7.00E-06	1.97E-08
Cm-243	1.38E-07	2.74E-05	Not applicable	Not applicable	6.28E-09
Cm-242	1.36E-07	2.70E-05	Not applicable	Not applicable	6.18E-09

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, and Ni-63 are major nuclides driving waste classification determination for Tank V-1, V-2, and V-3 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-3 All Liquid
H-3	40	*	6.09E-03
Cs-137	1	44	4.23E-03
Sr-90	0.04	150	1.23E-02
Ni-63	3.5	70	2.05E-04
Co-60	700	*	1.48E-05
Class A Sum of Fractions:			0.31
Class B Sum of Fractions:			0.00
			ClassA*

*Note: No limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Classs B unless the concentrations of other nuclides in Table 2 determine the waste to be Class C independent of these nuclides.

81 of 105

Container ID # **INEEL Tank V-3 Liquids (725 gal/HIC)**

Note: HIC Liner capacity is 804.9 gallons; assume 90% full to meet liner max load limit of 7500 lbs.

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: HIC Liner PL8-120 MT Form#

Description: 725 gallons of liquids PKE#

NTS Waste Stream # #N/A

SNL Waste Stream# #N/A

Note: assume liquid phase volume of 725 gallons with density of 1.00 g/ml

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
6650.40	3016.62	600.00	272.16	2744.46	3.427	2.744

Dose survey from Sxxxxx on xx/xx/00 shows < _____ mrem/hr OC.

Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.

Note: Gross weight of contents = (725 gal.)x(1.0 g/ml)x(3785.412 ml/gal.)x(2.2046E-03 lb/g) = 6,050.4 lb

EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-4)A2)	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Liquids Fraction	Activity/gram (pCi/g)
Sr-90	3.38E-02	8.43E+01	1.25E+09	4.55E+02	3.70E-03	3.38E-01	1.00E-01	1.25E+02	1.25E-02	0.00E+00	0.00E+00	4.55E-04	1.23E+04
H-3	1.67E-02	1.04E-01	6.18E+08	2.25E+02	3.70E+00	1.67E-04	4.00E+01	1.55E-01	1.55E-05	0.00E+00	0.00E+00	5.63E-07	6.09E+03
Cs-137	1.16E-02	5.80E+00	4.29E+08	1.56E+02	3.70E-02	1.16E-02	5.00E-01	8.59E+00	8.59E-04	0.00E+00	0.00E+00	3.13E-05	4.23E+03
Ni-63	5.63E-04	4.69E-03	2.08E+07	7.58E+00	3.70E+00	5.63E-06	3.00E+01	6.94E-03	6.94E-07	0.00E+00	0.00E+00	2.53E-08	2.05E+02
Co-60	4.06E-05	2.54E-02	1.50E+06	5.48E-01	3.70E-01	4.06E-06	4.00E-01	3.76E-02	3.76E-06	0.00E+00	0.00E+00	1.37E-07	1.48E+01
Ru-103	3.73E-05	1.04E-02	1.38E+06	5.03E-01	3.70E-01	3.73E-06	9.00E-01	1.53E-02	1.53E-06	0.00E+00	0.00E+00	5.59E-08	1.36E+01
U-233	3.65E-05	9.12E+00	1.35E+06	4.92E-01	3.70E-03	3.65E-04	1.00E-03	1.35E+01	1.35E-03	3.76E-03	0.00E+00	4.92E-05	1.33E+01
Ru-106	2.88E-05	3.60E-02	1.07E+06	3.88E-01	3.70E-02	2.88E-05	2.00E-01	5.33E-02	5.33E-06	0.00E+00	0.00E+00	1.94E-07	1.05E+01
Ce-144	2.50E-05	3.12E-02	9.24E+05	3.37E-01	3.70E-02	2.50E-05	2.00E-01	4.62E-02	4.62E-06	0.00E+00	0.00E+00	1.68E-07	9.10E+00
Eu-152	1.27E-05	3.53E-03	4.70E+05	1.71E-01	3.70E-01	1.27E-06	9.00E-01	5.22E-03	5.22E-07	0.00E+00	0.00E+00	1.90E-08	4.63E+00
Sb-125	1.26E-05	3.50E-03	4.67E+05	1.70E-01	3.70E-01	1.26E-06	9.00E-01	5.19E-03	5.19E-07	0.00E+00	0.00E+00	1.89E-08	4.60E+00
Zr-95	1.10E-05	3.05E-03	4.06E+05	1.48E-01	3.70E-01	1.10E-06	9.00E-01	4.51E-03	4.51E-07	0.00E+00	0.00E+00	1.64E-08	4.00E+00
Eu-155	8.29E-06	1.04E-03	3.07E+05	1.12E-01	3.70E-01	8.29E-07	2.00E+00	1.53E-03	1.53E-07	0.00E+00	0.00E+00	5.59E-09	3.02E+00
Nb-95	6.09E-06	1.52E-03	2.25E+05	8.21E-02	3.70E-01	6.09E-07	1.00E+00	2.25E-03	2.25E-07	0.00E+00	0.00E+00	8.21E-09	2.22E+00
Co-58	5.65E-06	1.41E-03	2.09E+05	7.62E-02	3.70E-01	5.65E-07	1.00E+00	2.09E-03	2.09E-07	0.00E+00	0.00E+00	7.62E-09	2.06E+00
Zn-65	4.50E-06	5.62E-04	1.67E+05	6.07E-02	3.70E-01	4.50E-07	2.00E+00	8.33E-04	8.33E-08	0.00E+00	0.00E+00	3.03E-09	1.64E+00
Eu-154	4.20E-06	2.10E-03	1.55E+05	5.66E-02	3.70E-01	4.20E-07	5.00E-01	3.11E-03	3.11E-07	0.00E+00	0.00E+00	1.13E-08	1.53E+00
Ag-110m	3.98E-06	2.49E-03	1.47E+05	5.36E-02	3.70E-01	3.98E-07	4.00E-01	3.68E-03	3.68E-07	0.00E+00	0.00E+00	1.34E-08	1.45E+00
Ra-226	3.35E-06	4.18E-02	1.24E+05	4.51E-02	3.70E-03	3.35E-05	2.00E-02	6.19E-02	6.19E-06	0.00E+00	0.00E+00	2.26E-07	1.22E+00
Ag-108m	2.44E-06	1.02E-03	9.04E+04	3.29E-02	3.70E-01	2.44E-07	6.00E-01	1.51E-03	1.51E-07	0.00E+00	0.00E+00	5.49E-09	8.90E-01
Mn-54	2.05E-06	5.13E-04	7.59E+04	2.77E-02	3.70E-01	2.05E-07	1.00E+00	7.59E-04	7.59E-08	0.00E+00	0.00E+00	2.77E-09	7.48E-01
Cs-134	1.99E-06	9.96E-04	7.37E+04	2.69E-02	3.70E-02	1.99E-06	5.00E-01	1.47E-03	1.47E-07	0.00E+00	0.00E+00	5.37E-09	7.26E-01
U-235	1.10E-06	0.00E+00	4.07E+04	1.48E-02	3.70E-03	1.10E-05	Unlimited	0.00E+00	0.00E+00	5.00E-01	0.00E+00	0.00E+00	4.01E-01
Pu-241	8.31E-07	2.08E-02	3.07E+04	1.12E-02	3.70E-02	8.31E-07	1.00E-02	3.07E-02	3.07E-06	8.31E-09	0.00E+00	1.12E-07	3.03E-01
I-129	5.98E-07	0.00E+00	2.21E+04	8.07E-03	3.70E-05	5.98E-04	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.18E-01
U-238	3.70E-07	0.00E+00	1.37E+04	4.99E-03	3.70E-03	3.70E-06	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.35E-01
Th-234	3.70E-07	4.63E-04	1.37E+04	4.99E-03	3.70E+00	3.70E-09	2.00E-01	6.85E-04	6.85E-08	0.00E+00	0.00E+00	2.50E-09	1.35E-01
Pu-238	1.05E-07	1.31E-01	3.89E+03	1.42E-03	3.70E-04	1.05E-05	2.00E-04	1.94E-01	1.94E-05	6.18E-09	3.83E-05	7.08E-07	3.83E-02
Np-237	9.99E-08	1.25E-01	3.70E+03	1.35E-03	3.70E-04	9.99E-06	2.00E-04	1.85E-01	1.85E-05	0.00E+00	3.64E-05	6.73E-07	3.64E-02
Pa-233	9.99E-08	2.77E-05	3.70E+03	1.35E-03	3.70E+00	9.99E-10	9.00E-01	4.11E-05	4.11E-09	0.00E+00	0.00E+00	1.50E-10	3.64E-02
Am-241	8.73E-08	1.09E-01	3.23E+03	1.18E-03	3.70E-04	8.73E-06	2.00E-04	1.61E-01	1.61E-05	0.00E+00	3.18E-05	5.88E-07	3.18E-02
Pu-239	5.41E-08	6.75E-02	2.00E+03	7.29E-04	3.70E-04	5.41E-06	2.00E-04	1.00E-01	1.00E-05	8.72E-07	1.97E-05	3.64E-07	1.97E-02
Cm-243	1.72E-08	1.44E-02	6.38E+02	2.32E-04	3.70E-04	1.72E-06	3.00E-04	2.13E-02	2.13E-06	0.00E+00	6.28E-06	7.74E-08	6.28E-03
Cm-242	1.70E-08	4.24E-04	6.27E+02	2.29E-04	3.70E-02	1.70E-08	1.00E-02	6.27E-04	6.27E-08	0.00E+00	0.00E+00	2.29E-09	6.18E-03
Total	6.29E-02	100.00%	2.33E+09	8.48E+02		3.50E-01		1.48E+02	1.48E-02	5.04E-01	1.32E-04	5.40E-04	2.29E+04

DOT regulated as Hazard Class 7 Radioactive Material

NOT an RQ amount of a Hazardous Substance

< Type A quantity/package per 49 CFR 173.431(a); check if excepted quantity -> excepted packaging

Does NOT meet LTD QTY Exception; Check if LSA

Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN

Meets criteria for Fissile Excepted Package per 49 CFR 173.453

This is a Low-level waste

Performed by: Gordon Harris Date: 9/25/01

Reviewed by: _____ Date: _____

8 of 105

Section III: Check radionuclides for listing on labels and shipping papers

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Sr-90	3.38E-02	8.43E+01	8.43E+01
U-233	3.65E-05	9.12E+00	9.35E+01
Cs-137	1.16E-02	5.80E+00	9.93E+01
Pu-238	1.05E-07	1.31E-01	9.94E+01
Np-237	9.99E-08	1.25E-01	9.95E+01
Am-241	8.73E-08	1.09E-01	9.96E+01
H-3	1.67E-02	1.04E-01	9.97E+01
Pu-239	5.41E-08	6.75E-02	9.98E+01
Ra-226	3.35E-06	4.18E-02	9.98E+01
Ru-106	2.88E-05	3.60E-02	9.99E+01
Ce-144	2.50E-05	3.12E-02	9.99E+01
Co-60	4.06E-05	2.54E-02	9.99E+01
Pu-241	8.31E-07	2.08E-02	9.99E+01
Cm-243	1.72E-08	1.44E-02	1.00E+02
Ru-103	3.73E-05	1.04E-02	1.00E+02
Ni-63	5.63E-04	4.69E-03	1.00E+02
Eu-152	1.27E-05	3.53E-03	1.00E+02
Sb-125	1.26E-05	3.50E-03	1.00E+02
Zr-95	1.10E-05	3.05E-03	1.00E+02
Ag-110m	3.98E-06	2.49E-03	1.00E+02
Eu-154	4.20E-06	2.10E-03	1.00E+02
Nb-95	6.09E-06	1.52E-03	1.00E+02
Co-58	5.65E-06	1.41E-03	1.00E+02
Eu-155	8.29E-06	1.04E-03	1.00E+02
Ag-108m	2.44E-06	1.02E-03	1.00E+02
Cs-134	1.99E-06	9.96E-04	1.00E+02
Zn-65	4.50E-06	5.62E-04	1.00E+02
Mn-54	2.05E-06	5.13E-04	1.00E+02
Th-234	3.70E-07	4.63E-04	1.00E+02
Cm-242	1.70E-08	4.24E-04	1.00E+02
Pa-233	9.99E-08	2.77E-05	1.00E+02
U-235	1.10E-06	0.00E+00	1.00E+02
I-129	5.98E-07	0.00E+00	1.00E+02
U-238	3.70E-07	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Source Material (kg)	SNM (g)	Activity Conc. (Ci/m^3)
Sr-90	3.38E-02	5.37E+01	Not applicable	Not applicable	1.23E-02
H-3	1.67E-02	2.66E+01	Not applicable	Not applicable	6.09E-03
Cs-137	1.16E-02	1.85E+01	Not applicable	Not applicable	4.23E-03
Ni-63	5.63E-04	8.95E-01	Not applicable	Not applicable	2.05E-04
Co-60	4.06E-05	6.46E-02	Not applicable	Not applicable	1.48E-05
Ru-103	3.73E-05	5.93E-02	Not applicable	Not applicable	1.36E-05
U-233	3.65E-05	5.80E-02	Not applicable	3.76E-03	1.33E-05
Ru-106	2.88E-05	4.58E-02	Not applicable	Not applicable	1.05E-05
Ce-144	2.50E-05	3.97E-02	Not applicable	Not applicable	9.10E-06
Eu-152	1.27E-05	2.02E-02	Not applicable	Not applicable	4.63E-06
Sb-125	1.26E-05	2.01E-02	Not applicable	Not applicable	4.60E-06
Zr-95	1.10E-05	1.75E-02	Not applicable	Not applicable	4.00E-06
Eu-155	8.29E-06	1.32E-02	Not applicable	Not applicable	3.02E-06
Nb-95	6.09E-06	9.69E-03	Not applicable	Not applicable	2.22E-06
Co-58	5.65E-06	8.99E-03	Not applicable	Not applicable	2.06E-06
Zn-65	4.50E-06	7.16E-03	Not applicable	Not applicable	1.64E-06
Eu-154	4.20E-06	6.68E-03	Not applicable	Not applicable	1.53E-06
Ag-110m	3.98E-06	6.33E-03	Not applicable	Not applicable	1.45E-06
Ra-226	3.35E-06	5.32E-03	Not applicable	Not applicable	1.22E-06
Ag-108m	2.44E-06	3.88E-03	Not applicable	Not applicable	8.90E-07
Mn-54	2.05E-06	3.26E-03	Not applicable	Not applicable	7.48E-07
Cs-134	1.99E-06	3.17E-03	Not applicable	Not applicable	7.26E-07
U-235	1.10E-06	1.75E-03	Not applicable	5.00E-01	4.01E-07
Pu-241	8.31E-07	1.32E-03	Not applicable	8.31E-09	3.03E-07
I-129	5.98E-07	9.51E-04	Not applicable	Not applicable	2.18E-07
U-238	3.70E-07	5.89E-04	Not applicable	Not applicable	1.35E-07
Th-234	3.70E-07	5.89E-04	Not applicable	Not applicable	1.35E-07
Pu-238	1.05E-07	1.67E-04	Not applicable	6.18E-09	3.83E-08
Np-237	9.99E-08	1.59E-04	Not applicable	Not applicable	3.64E-08
Pa-233	9.99E-08	1.59E-04	Not applicable	Not applicable	3.64E-08
Am-241	8.73E-08	1.39E-04	Not applicable	Not applicable	3.18E-08
Pu-239	5.41E-08	8.60E-05	Not applicable	8.72E-07	1.97E-08
Cm-243	1.72E-08	2.74E-05	Not applicable	Not applicable	6.28E-09
Cm-242	1.70E-08	2.70E-05	Not applicable	Not applicable	6.18E-09

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, and Ni-63 are major nuclides driving waste classification determination for Tank V-1, V-2, and V-3 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-3 Liquid (725 gal/HIC)
H-3	40	*	6.09E-03
Cs-137	1	44	4.23E-03
Sr-90	0.04	150	1.23E-02
Ni-63	3.5	70	2.05E-04
Co-60	700	*	1.48E-05
Class A Sum of Fractions:			0.31
Class B Sum of Fractions:			0.00
			ClassA*

*Note: No limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Classs B unless the concentrations of other nuclides in Table 2 determine the waste to be Class C independent of these nuclides.

83 of 105

Attachment 7

(DOT Spreadsheets for Tank V-9 used to calculate data for Option 3.)

Container ID # **INEEL Tank V-9 Solids (Total w/AVG)**

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: N/A

Description: 250 gallons of Solids

Form#

PKE#

Note: assume solid phase volume of 250 gallons with density of 1.02 g/cc

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
2128.10	965.31	0.00	0.00	965.31	#N/A	0.946

Note: Gross weight of contents = (250 gal.)x(1.02 g/cc)x(3785.412 cc/gal.)x(2.2046E-03 lb/g) = 2,128.1 lbs.

Dose survey from Sxxxxx on xx/xx/00 shows < [ ] mrem/hr OC.

Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.

EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-3)A2)	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Solids Frac	Activity/gram (pCi/g)
Sr-90	6.18E+00	2.48E+01	2.29E+11	2.37E+05	3.70E-03	6.18E+01	1.00E-01	2.29E+03	2.29E+00	0.00E+00	0.00E+00	2.37E-02	6.40E+06
Cs-137	5.40E+00	4.33E+00	2.00E+11	2.07E+05	3.70E-02	5.40E+00	5.00E-01	3.99E+02	3.99E-01	0.00E+00	0.00E+00	4.14E-03	5.59E+06
Co-60	9.10E-01	9.14E-01	3.37E+10	3.49E+04	3.70E-01	9.10E-02	4.00E-01	8.42E+01	8.42E-02	0.00E+00	0.00E+00	8.72E-04	9.43E+05
Pu-241	4.59E-02	1.84E+00	1.70E+09	1.76E+03	3.70E-02	4.59E-02	1.00E-02	1.70E+02	1.70E-01	4.59E-04	0.00E+00	1.76E-03	4.76E+04
Eu-154	2.14E-02	1.72E-02	7.93E+08	8.21E+02	3.70E-01	2.14E-03	5.00E-01	1.59E+00	1.59E-03	0.00E+00	0.00E+00	1.64E-05	2.22E+04
Pu-238	1.94E-02	3.89E+01	7.16E+08	7.42E+02	3.70E-04	1.94E+00	2.00E-04	3.58E+03	3.58E+00	1.14E-03	2.00E+01	3.71E-02	2.00E+04
U-234	9.74E-03	3.91E+00	3.60E+08	3.73E+02	3.70E-03	9.74E-02	1.00E-03	3.60E+02	3.60E-01	0.00E+00	0.00E+00	3.73E-03	1.01E+04
Pu-239	7.03E-03	1.41E+01	2.60E+08	2.69E+02	3.70E-04	7.03E-01	2.00E-04	1.30E+03	1.30E+00	1.13E-01	7.28E+00	1.35E-02	7.28E+03
Am-241	4.83E-03	9.69E+00	1.79E+08	1.85E+02	3.70E-04	4.83E-01	2.00E-04	8.93E+02	8.93E-01	0.00E+00	5.00E+00	9.25E-03	5.00E+03
U-233	2.11E-03	8.46E-01	7.79E+07	8.07E+01	3.70E-03	2.11E-02	1.00E-03	7.79E+01	7.79E-02	2.17E-01	0.00E+00	8.07E-04	2.18E+03
Cm-244	5.58E-04	5.61E-01	2.07E+07	2.14E+01	3.70E-04	5.58E-02	4.00E-04	5.17E+01	5.17E-02	0.00E+00	0.00E+00	5.35E-04	5.78E+02
U-235	3.40E-04	0.00E+00	1.26E+07	1.30E+01	3.70E-03	3.40E-03	Unlimited	0.00E+00	0.00E+00	1.55E+02	0.00E+00	0.00E+00	3.52E+02
U-236	9.03E-05	3.62E-02	3.34E+06	3.46E+00	3.70E-03	9.03E-04	1.00E-03	3.34E+00	3.34E-03	0.00E+00	0.00E+00	3.46E-05	9.35E+01
U-238	7.76E-05	0.00E+00	2.87E+06	2.97E+00	3.70E-03	7.76E-04	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.03E+01
Th-234	7.76E-05	1.56E-04	2.87E+06	2.97E+00	3.70E+00	7.76E-07	2.00E-01	1.43E-02	1.43E-05	0.00E+00	0.00E+00	1.49E-07	8.03E+01
Np-237	2.92E-05	5.86E-02	1.08E+06	1.12E+00	3.70E-04	2.92E-03	2.00E-04	5.40E+00	5.40E-03	0.00E+00	3.02E-02	5.60E-05	3.02E+01
Pa-233	2.92E-05	1.30E-05	1.08E+06	1.12E+00	3.70E+00	2.92E-07	9.00E-01	1.20E-03	1.20E-06	0.00E+00	0.00E+00	1.24E-08	3.02E+01
Total	1.26E+01	100.00%	4.66E+11	4.83E+05		7.07E+01		9.21E+03	9.21E+00	1.55E+02	3.24E+01	9.55E-02	1.31E+07

DOT regulated as Hazard Class 7 Radioactive Material

Contains a Reportable Quantity of a Hazardous Substance; use 'RQ(radionuclides)' as part of PSN

≥ Type A quantity; requires Type B Packaging

Does NOT meet LTD QTY Exception; Check if LSA

Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN

>15 grams Fissile Material - use Radioactive material, fissile material, n.o.s. as PSN

This is a Low-level waste

Performed by: [signature] Date: 9/25/01

Reviewed by: _____ Date: _____

85 of 105

Section III: Check radionuclides for listing on labels and shipping papers; Check reportable radionuclides per Disposal Facility

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Pu-238	1.94E-02	3.89E+01	3.89E+01
Sr-90	6.18E+00	2.48E+01	6.37E+01
Pu-239	7.03E-03	1.41E+01	7.78E+01
Am-241	4.83E-03	9.69E+00	8.75E+01
Cs-137	5.40E+00	4.33E+00	9.18E+01
U-234	9.74E-03	3.91E+00	9.57E+01
Pu-241	4.59E-02	1.84E+00	9.76E+01
Co-60	9.10E-01	9.14E-01	9.85E+01
U-233	2.11E-03	8.46E-01	9.93E+01
Cm-244	5.58E-04	5.61E-01	9.99E+01
Np-237	2.92E-05	5.86E-02	9.99E+01
U-236	9.03E-05	3.62E-02	1.00E+02
Eu-154	2.14E-02	1.72E-02	1.00E+02
Th-234	7.76E-05	1.56E-04	1.00E+02
Pa-233	2.92E-05	1.30E-05	1.00E+02
U-235	3.40E-04	0.00E+00	1.00E+02
U-238	7.76E-05	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Source Material (kg)	SNM (g)	Activity Conc. (Ci/m^3)
Sr-90	6.18E+00	4.91E+01	Not applicable	Not applicable	6.54E+00
Cs-137	5.40E+00	4.28E+01	Not applicable	Not applicable	5.70E+00
Co-60	9.10E-01	7.22E+00	Not applicable	Not applicable	9.62E-01
Pu-241	4.59E-02	3.65E-01	Not applicable	4.59E-04	4.86E-02
Eu-154	2.14E-02	1.70E-01	Not applicable	Not applicable	2.27E-02
Pu-238	1.94E-02	1.54E-01	Not applicable	1.14E-03	2.05E-02
U-234	9.74E-03	7.73E-02	Not applicable	Not applicable	1.03E-02
Pu-239	7.03E-03	5.58E-02	Not applicable	1.13E-01	7.43E-03
Am-241	4.83E-03	3.83E-02	Not applicable	Not applicable	5.10E-03
U-233	2.11E-03	1.67E-02	Not applicable	2.17E-01	2.23E-03
Cm-244	5.58E-04	4.43E-03	Not applicable	Not applicable	5.90E-04
U-235	3.40E-04	2.70E-03	Not applicable	1.55E+02	3.60E-04
U-236	9.03E-05	7.16E-04	Not applicable	Not applicable	9.54E-05
U-238	7.76E-05	6.16E-04	Not applicable	Not applicable	8.20E-05
Th-234	7.76E-05	6.16E-04	Not applicable	Not applicable	8.20E-05
Np-237	2.92E-05	2.32E-04	Not applicable	Not applicable	3.09E-05
Pa-233	2.92E-05	2.32E-04	Not applicable	Not applicable	3.09E-05

If #DIV/0! occurs in the Fraction of Waste Profile Column or the Does Nuclide Meet Waste Profile? Column of Section III, the nuclide is not included on the current profile and needs to be added.

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, Co-60, and H-3 are major nuclides driving waste classification determination for Tank V-9 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-9 All Sludge w/AVG
Sr-90	0.04	150	6.54E+00
Cs-137	1	44	5.70E+00
Co-60	700	*	9.62E-01
H-3	40	*	0.00E+00

*Note: No limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Classs B unless the concentrations of other nuclides in Table 2 determine the waste to be Class C independent of these nuclides.

Class A Sum of Fractions:	169.09
Class B Sum of Fractions:	0.17
	Class B*

86 of 105

Container ID # **INEEL Tank V-9 Solids (22.73 gal per drum using AVG)**

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: 55 Gallon Metal OH

Description: 22.73 gallons of Solids

Form#

PKE#

Note: assume solid phase volume of 22.73 gallons with density of 1.02 g/cc (41.3% of capacity)

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
243.50	110.45	50.00	22.68	87.77	0.261	0.086

Dose survey from Sxxxxx on xx/xx/00 shows < _____ mrem/hr OC.

Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.

Note: Gross weight of contents = (22.73 gal.)x(1.02 g/cc)x(3785.412 cc/gal.)x(2.2046E-03 lb/g) = 193.5 lbs.

EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-3)A2)	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Solids Frac	Activity/gram (pCi/g)
Sr-90	5.62E-01	2.48E+01	2.08E+10	2.37E+05	3.70E-03	5.62E+00	1.00E-01	2.08E+02	2.08E-01	0.00E+00	0.00E+00	2.37E-02	6.40E+06
Cs-137	4.91E-01	4.34E+00	1.82E+10	2.07E+05	3.70E-02	4.91E-01	5.00E-01	3.63E+01	3.63E-02	0.00E+00	0.00E+00	4.14E-03	5.59E+06
Co-60	8.28E-02	9.14E-01	3.06E+09	3.49E+04	3.70E-01	8.28E-03	4.00E-01	7.66E+00	7.66E-03	0.00E+00	0.00E+00	8.73E-04	9.43E+05
Pu-241	4.18E-03	1.84E+00	1.55E+08	1.76E+03	3.70E-02	4.18E-03	1.00E-02	1.55E+01	1.55E-02	4.18E-05	0.00E+00	1.76E-03	4.76E+04
Eu-154	1.95E-03	1.72E-02	7.21E+07	8.21E+02	3.70E-01	1.95E-04	5.00E-01	1.44E-01	1.44E-04	0.00E+00	0.00E+00	1.64E-05	2.22E+04
Pu-238	1.76E-03	3.89E+01	6.51E+07	7.42E+02	3.70E-04	1.76E-01	2.00E-04	3.25E+02	3.25E-01	1.03E-04	2.00E+01	3.71E-02	2.00E+04
U-234	8.85E-04	3.91E+00	3.28E+07	3.73E+02	3.70E-03	8.85E-03	1.00E-03	3.28E+01	3.28E-02	0.00E+00	0.00E+00	3.73E-03	1.01E+04
Pu-239	6.39E-04	1.41E+01	2.36E+07	2.69E+02	3.70E-04	6.39E-02	2.00E-04	1.18E+02	1.18E-01	1.03E-02	7.28E+00	1.35E-02	7.28E+03
Am-241	4.39E-04	9.69E+00	1.62E+07	1.85E+02	3.70E-04	4.39E-02	2.00E-04	8.12E+01	8.12E-02	0.00E+00	5.00E+00	9.25E-03	5.00E+03
U-233	1.91E-04	8.46E-01	7.08E+06	8.07E+01	3.70E-03	1.91E-03	1.00E-03	7.08E+00	7.08E-03	1.97E-02	0.00E+00	8.07E-04	2.18E+03
Cm-244	5.08E-05	5.61E-01	1.88E+06	2.14E+01	3.70E-04	5.08E-03	4.00E-04	4.70E+00	4.70E-03	0.00E+00	0.00E+00	5.35E-04	5.78E+02
U-235	3.09E-05	0.00E+00	1.14E+06	1.30E+01	3.70E-03	3.09E-04	Unlimited	0.00E+00	0.00E+00	1.41E+01	0.00E+00	0.00E+00	3.52E+02
U-236	8.20E-06	3.62E-02	3.04E+05	3.46E+00	3.70E-03	8.20E-05	1.00E-03	3.04E-01	3.04E-04	0.00E+00	0.00E+00	3.46E-05	9.35E+01
U-238	7.05E-06	0.00E+00	2.61E+05	2.97E+00	3.70E-03	7.05E-05	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.03E+01
Th-234	7.05E-06	1.56E-04	2.61E+05	2.97E+00	3.70E+00	7.05E-08	2.00E-01	1.30E-03	1.30E-06	0.00E+00	0.00E+00	1.49E-07	8.03E+01
Np-237	2.65E-06	5.86E-02	9.82E+04	1.12E+00	3.70E-04	2.65E-04	2.00E-04	4.91E-01	4.91E-04	0.00E+00	3.02E-02	5.59E-05	3.02E+01
Pa-233	2.65E-06	1.30E-05	9.82E+04	1.12E+00	3.70E+00	2.65E-08	9.00E-01	1.09E-04	1.09E-07	0.00E+00	0.00E+00	1.24E-08	3.02E+01
Total	1.15E+00	100.00%	4.24E+10	4.83E+05		6.42E+00		8.38E+02	8.38E-01	1.41E+01	3.23E+01	9.54E-02	1.31E+07

DOT regulated as Hazard Class 7 Radioactive Material

Contains a Reportable Quantity of a Hazardous Substance; use 'RQ(radionuclides)' as part of PSN

< Type A quantity/package per 49 CFR 173.431(a); check if excepted quantity -> excepted packaging

Does NOT meet LTD QTY Exception; Check if LSA

Performed by: Gordon Harris Date: 9/25/01

Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN

Meets criteria for Fissile Excepted Package per 49 CFR 173.453

This is a Low-level waste

Reviewed by: _____ Date: _____

87 of 105

Section III: Check radionuclides for listing on labels and shipping papers; Check reportable radionuclides per Disposal Facility

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Pu-238	1.76E-03	3.89E+01	3.89E+01
Sr-90	5.62E-01	2.48E+01	6.37E+01
Pu-239	6.39E-04	1.41E+01	7.78E+01
Am-241	4.39E-04	9.69E+00	8.75E+01
Cs-137	4.90E-01	4.33E+00	9.18E+01
U-234	8.85E-04	3.91E+00	9.57E+01
Pu-241	4.18E-03	1.84E+00	9.76E+01
Co-60	8.27E-02	9.14E-01	9.85E+01
U-233	1.91E-04	8.46E-01	9.93E+01
Cm-244	5.08E-05	5.61E-01	9.99E+01
Np-237	2.65E-06	5.86E-02	9.99E+01
U-236	8.20E-06	3.62E-02	1.00E+02
Eu-154	1.95E-03	1.72E-02	1.00E+02
Th-234	7.05E-06	1.56E-04	1.00E+02
Pa-233	2.65E-06	1.30E-05	1.00E+02
U-235	3.09E-05	0.00E+00	1.00E+02
U-238	7.05E-06	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Source Material (kg)	SNM (g)	Activity Conc. (Ci/m^3)
Sr-90	5.62E-01	4.90E+01	Not applicable	Not applicable	6.53E+00
Cs-137	4.91E-01	4.28E+01	Not applicable	Not applicable	5.71E+00
Co-60	8.28E-02	7.23E+00	Not applicable	Not applicable	9.63E-01
Pu-241	4.18E-03	3.64E-01	Not applicable	4.18E-05	4.86E-02
Eu-154	1.95E-03	1.70E-01	Not applicable	Not applicable	2.27E-02
Pu-238	1.76E-03	1.54E-01	Not applicable	1.03E-04	2.05E-02
U-234	8.85E-04	7.73E-02	Not applicable	Not applicable	1.03E-02
Pu-239	6.39E-04	5.57E-02	Not applicable	1.03E-02	7.43E-03
Am-241	4.39E-04	3.83E-02	Not applicable	Not applicable	5.10E-03
U-233	1.91E-04	1.67E-02	Not applicable	1.97E-02	2.23E-03
Cm-244	5.08E-05	4.43E-03	Not applicable	Not applicable	5.90E-04
U-235	3.09E-05	2.70E-03	Not applicable	1.41E+01	3.60E-04
U-236	8.20E-06	7.16E-04	Not applicable	Not applicable	9.54E-05
U-238	7.05E-06	6.15E-04	Not applicable	Not applicable	8.20E-05
Th-234	7.05E-06	6.15E-04	Not applicable	Not applicable	8.20E-05
Np-237	2.65E-06	2.32E-04	Not applicable	Not applicable	3.09E-05
Pa-233	2.65E-06	2.32E-04	Not applicable	Not applicable	3.09E-05

If #DIV/0! occurs in the Fraction of Waste Profile Column or the Does Nuclide Meet Waste Profile? Column of Section III, the nuclide is not included on the current profile and needs to be added.

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, Co-60, and H-3 are major nuclides driving waste classification determination for Tank V-9 wastes

	Table 2 limit (Ci/m^3)		
Radionuclide	Column 1	Column 2	V-9 Sludge (22.7 gal/drum w/AVG)
Sr-90	0.04	150	6.53E+00
Cs-137	1	44	5.71E+00
Co-60	700	*	9.63E-01
H-3	40	*	0.00E+00
Class A Sum of Fractions:			169.08
Class B Sum of Fractions:			0.17
			Class B*

*Note: No limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Classs B unless the concentrations of other nuclides in Table 2 determine the waste to be Class C independent of these nuclides.

Container ID # **INEEL Tank V-9 Solids (Total w/MAX)**

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: N/A

Description: 250 gallons of Solids

Form#

PKE#

Note: assume solid phase volume of 250 gallons with density of 1.02 g/cc

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
2128.10	965.31	0.00	0.00	965.31	#N/A	0.946

Note: Gross weight of contents = (250 gal.)x(1.02 g/cc)x(3785.412 cc/gal.)x(2.2046E-03 lb/g) = 2,128.1 lbs.

Dose survey from Sxxxxx on xx/xx/00 shows < [ ] mrem/hr OC.

Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.

EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-3)A2)	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Solids Frac	Activity/gram (pCi/g)
Sr-90	6.82E+00	2.22E+01	2.53E+11	2.62E+05	3.70E-03	6.82E+01	1.00E-01	2.53E+03	2.53E+00	0.00E+00	0.00E+00	2.62E-02	7.07E+06
Cs-137	6.15E+00	4.00E+00	2.28E+11	2.36E+05	3.70E-02	6.15E+00	5.00E-01	4.55E+02	4.55E-01	0.00E+00	0.00E+00	4.71E-03	6.37E+06
Co-60	1.12E+00	9.10E-01	4.14E+10	4.29E+04	3.70E-01	1.12E-01	4.00E-01	1.04E+02	1.04E-01	0.00E+00	0.00E+00	1.07E-03	1.16E+06
Pu-241	5.24E-02	1.70E+00	1.94E+09	2.01E+03	3.70E-02	5.24E-02	1.00E-02	1.94E+02	1.94E-01	5.24E-04	0.00E+00	2.01E-03	5.43E+04
Pu-238	2.76E-02	4.49E+01	1.02E+09	1.06E+03	3.70E-04	2.76E+00	2.00E-04	5.11E+03	5.11E+00	1.62E-03	2.86E+01	5.29E-02	2.86E+04
Eu-154	2.14E-02	1.39E-02	7.93E+08	8.21E+02	3.70E-01	2.14E-03	5.00E-01	1.59E+00	1.59E-03	0.00E+00	0.00E+00	1.64E-05	2.22E+04
U-234	1.26E-02	4.11E+00	4.68E+08	4.85E+02	3.70E-03	1.26E-01	1.00E-03	4.68E+02	4.68E-01	0.00E+00	0.00E+00	4.85E-03	1.31E+04
Pu-239	7.12E-03	1.16E+01	2.64E+08	2.73E+02	3.70E-04	7.12E-01	2.00E-04	1.32E+03	1.32E+00	1.15E-01	7.38E+00	1.37E-02	7.38E+03
Am-241	5.50E-03	8.94E+00	2.04E+08	2.11E+02	3.70E-04	5.50E-01	2.00E-04	1.02E+03	1.02E+00	0.00E+00	5.70E+00	1.05E-02	5.70E+03
U-233	3.30E-03	1.07E+00	1.22E+08	1.27E+02	3.70E-03	3.30E-02	1.00E-03	1.22E+02	1.22E-01	3.40E-01	0.00E+00	1.27E-03	3.42E+03
Cm-244	6.80E-04	5.52E-01	2.51E+07	2.60E+01	3.70E-04	6.80E-02	4.00E-04	6.29E+01	6.29E-02	0.00E+00	0.00E+00	6.51E-04	7.04E+02
U-235	4.34E-04	0.00E+00	1.61E+07	1.66E+01	3.70E-03	4.34E-03	Unlimited	0.00E+00	0.00E+00	1.97E+02	0.00E+00	0.00E+00	4.50E+02
U-236	1.23E-04	3.98E-02	4.54E+06	4.70E+00	3.70E-03	1.23E-03	1.00E-03	4.54E+00	4.54E-03	0.00E+00	0.00E+00	4.70E-05	1.27E+02
U-238	7.96E-05	0.00E+00	2.95E+06	3.05E+00	3.70E-03	7.96E-04	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.25E+01
Th-234	7.96E-05	1.29E-04	2.95E+06	3.05E+00	3.70E+00	7.96E-07	2.00E-01	1.47E-02	1.47E-05	0.00E+00	0.00E+00	1.53E-07	8.25E+01
Np-237	3.21E-05	5.22E-02	1.19E+06	1.23E+00	3.70E-04	3.21E-03	2.00E-04	5.95E+00	5.95E-03	0.00E+00	3.33E-02	6.16E-05	3.33E+01
Pa-233	3.21E-05	1.16E-05	1.19E+06	1.23E+00	3.70E+00	3.21E-07	9.00E-01	1.32E-03	1.32E-06	0.00E+00	0.00E+00	1.37E-08	3.33E+01
Total	1.42E+01	100.00%	5.26E+11	5.45E+05		7.88E+01		1.14E+04	1.14E+01	1.98E+02	4.17E+01	1.18E-01	1.47E+07

DOT regulated as Hazard Class 7 Radioactive Material

Contains a Reportable Quantity of a Hazardous Substance; use 'RQ(radionuclides)' as part of PSN

≥ Type A quantity; requires Type B Packaging

Does NOT meet LTD QTY Exception; Check if LSA

Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN

>15 grams Fissile Material - use Radioactive material, fissile material, n.o.s. as PSN

This is a Low-level waste

Performed by: Gordon Harris Date: 9/25/01

Reviewed by: _____ Date: _____

89 of 105

Section III: Check radionuclides for listing on labels and shipping papers; Check reportable radionuclides per Disposal Facility

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Pu-238	2.76E-02	4.49E+01	4.49E+01
Sr-90	6.82E+00	2.22E+01	6.70E+01
Pu-239	7.12E-03	1.16E+01	7.86E+01
Am-241	5.50E-03	8.94E+00	8.76E+01
U-234	1.26E-02	4.11E+00	9.17E+01
Cs-137	6.15E+00	4.00E+00	9.57E+01
Pu-241	5.24E-02	1.70E+00	9.74E+01
U-233	3.30E-03	1.07E+00	9.84E+01
Co-60	1.12E+00	9.10E-01	9.93E+01
Cm-244	6.80E-04	5.52E-01	9.99E+01
Np-237	3.21E-05	5.22E-02	9.99E+01
U-236	1.23E-04	3.98E-02	1.00E+02
Eu-154	2.14E-02	1.39E-02	1.00E+02
Th-234	7.96E-05	1.29E-04	1.00E+02
Pa-233	3.21E-05	1.16E-05	1.00E+02
U-235	4.34E-04	0.00E+00	1.00E+02
U-238	7.96E-05	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Source Material (kg)	SNM (g)	Activity Conc. (Ci/m^3)
Sr-90	6.82E+00	4.80E+01	Not applicable	Not applicable	7.21E+00
Cs-137	6.15E+00	4.32E+01	Not applicable	Not applicable	6.50E+00
Co-60	1.12E+00	7.87E+00	Not applicable	Not applicable	1.18E+00
Pu-241	5.24E-02	3.68E-01	Not applicable	5.24E-04	5.54E-02
Pu-238	2.76E-02	1.94E-01	Not applicable	1.62E-03	2.92E-02
Eu-154	2.14E-02	1.51E-01	Not applicable	Not applicable	2.27E-02
U-234	1.26E-02	8.89E-02	Not applicable	Not applicable	1.34E-02
Pu-239	7.12E-03	5.01E-02	Not applicable	1.15E-01	7.53E-03
Am-241	5.50E-03	3.87E-02	Not applicable	Not applicable	5.82E-03
U-233	3.30E-03	2.32E-02	Not applicable	3.40E-01	3.49E-03
Cm-244	6.80E-04	4.78E-03	Not applicable	Not applicable	7.18E-04
U-235	4.34E-04	3.05E-03	Not applicable	1.97E+02	4.59E-04
U-236	1.23E-04	8.62E-04	Not applicable	Not applicable	1.30E-04
U-238	7.96E-05	5.60E-04	Not applicable	Not applicable	8.42E-05
Th-234	7.96E-05	5.60E-04	Not applicable	Not applicable	8.42E-05
Np-237	3.21E-05	2.26E-04	Not applicable	Not applicable	3.40E-05
Pa-233	3.21E-05	2.26E-04	Not applicable	Not applicable	3.40E-05

If #DIV/0! occurs in the Fraction of Waste Profile Column or the Does Nuclide Meet Waste Profile? Column of Section III, the nuclide is not included on the current profile and needs to be added.

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, Co-60, and H-3 are major nuclides driving waste classification determination for Tank V-9 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-9 All Sludge w/MAX
Sr-90	0.04	150	7.21E+00
Cs-137	1	44	6.50E+00
Co-60	700	*	1.18E+00
H-3	40	*	0.00E+00

*Note: No limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Classs B unless the concentrations of other nuclides in Table 2 determine the waste to be Class C independent of these nuclides.

Class A Sum of Fractions:	186.85
Class B Sum of Fractions:	0.20
	Class B*

90 of 105

Container ID # **INEEL Tank V-9 Solids (17.85 gal per drum using MAX)**

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: 55 Gallon Metal OH

Description: 17.85 gallons of Solids

Form#

PKE#

Note: assume solid phase volume of 17.85 gallons with density of 1.02 g/cc (32.47% of capacity)

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
201.90	91.58	50.00	22.68	68.90	0.261	0.068

Dose survey from Sxxxxx on xx/xx/00 shows < _____ mrem/hr OC.

Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.

Note: Gross weight of contents = (17.85 gal.)x(1.02 g/cc)x(3785.412 cc/gal.)x(2.2046E-03 lb/g) = 151.9 lbs.

EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-3)A2)	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Solids Frac	Activity/gram (pCi/g)
Sr-90	4.87E-01	2.22E+01	1.80E+10	2.62E+05	3.70E-03	4.87E+00	1.00E-01	1.80E+02	1.80E-01	0.00E+00	0.00E+00	2.62E-02	7.07E+06
Cs-137	4.39E-01	4.00E+00	1.62E+10	2.36E+05	3.70E-02	4.39E-01	5.00E-01	3.25E+01	3.25E-02	0.00E+00	0.00E+00	4.72E-03	6.37E+06
Co-60	7.99E-02	9.10E-01	2.96E+09	4.29E+04	3.70E-01	7.99E-03	4.00E-01	7.40E+00	7.40E-03	0.00E+00	0.00E+00	1.07E-03	1.16E+06
Pu-241	3.74E-03	1.70E+00	1.38E+08	2.01E+03	3.70E-02	3.74E-03	1.00E-02	1.38E+01	1.38E-02	3.74E-05	0.00E+00	2.01E-03	5.43E+04
Pu-238	1.97E-03	4.49E+01	7.29E+07	1.06E+03	3.70E-04	1.97E-01	2.00E-04	3.65E+02	3.65E-01	1.16E-04	2.86E+01	5.29E-02	2.86E+04
Eu-154	1.53E-03	1.39E-02	5.66E+07	8.22E+02	3.70E-01	1.53E-04	5.00E-01	1.13E-01	1.13E-04	0.00E+00	0.00E+00	1.64E-05	2.22E+04
U-234	9.03E-04	4.11E+00	3.34E+07	4.85E+02	3.70E-03	9.03E-03	1.00E-03	3.34E+01	3.34E-02	0.00E+00	0.00E+00	4.85E-03	1.31E+04
Pu-239	5.09E-04	1.16E+01	1.88E+07	2.73E+02	3.70E-04	5.09E-02	2.00E-04	9.41E+01	9.41E-02	8.20E-03	7.38E+00	1.37E-02	7.38E+03
Am-241	3.93E-04	8.94E+00	1.45E+07	2.11E+02	3.70E-04	3.93E-02	2.00E-04	7.27E+01	7.27E-02	0.00E+00	5.70E+00	1.05E-02	5.70E+03
U-233	2.36E-04	1.07E+00	8.72E+06	1.27E+02	3.70E-03	2.36E-03	1.00E-03	8.72E+00	8.72E-03	2.43E-02	0.00E+00	1.27E-03	3.42E+03
Cm-244	4.85E-05	5.52E-01	1.80E+06	2.61E+01	3.70E-04	4.85E-03	4.00E-04	4.49E+00	4.49E-03	0.00E+00	0.00E+00	6.51E-04	7.04E+02
U-235	3.10E-05	0.00E+00	1.15E+06	1.67E+01	3.70E-03	3.10E-04	Unlimited	0.00E+00	0.00E+00	1.41E+01	0.00E+00	0.00E+00	4.50E+02
U-236	8.75E-06	3.98E-02	3.24E+05	4.70E+00	3.70E-03	8.75E-05	1.00E-03	3.24E-01	3.24E-04	0.00E+00	0.00E+00	4.70E-05	1.27E+02
U-238	5.69E-06	0.00E+00	2.10E+05	3.05E+00	3.70E-03	5.69E-05	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.25E+01
Th-234	5.69E-06	1.29E-04	2.10E+05	3.05E+00	3.70E+00	5.69E-08	2.00E-01	1.05E-03	1.05E-06	0.00E+00	0.00E+00	1.53E-07	8.25E+01
Np-237	2.30E-06	5.22E-02	8.49E+04	1.23E+00	3.70E-04	2.30E-04	2.00E-04	4.25E-01	4.25E-04	0.00E+00	3.33E-02	6.16E-05	3.33E+01
Pa-233	2.30E-06	1.16E-05	8.49E+04	1.23E+00	3.70E+00	2.30E-08	9.00E-01	9.44E-05	9.44E-08	0.00E+00	0.00E+00	1.37E-08	3.33E+01
Total	1.02E+00	100.00%	3.76E+10	5.45E+05		5.63E+00		8.13E+02	8.13E-01	1.41E+01	4.17E+01	1.18E-01	1.47E+07

DOT regulated as Hazard Class 7 Radioactive Material

Contains a Reportable Quantity of a Hazardous Substance; use 'RQ(radionuclides)' as part of PSN

< Type A quantity/package per 49 CFR 173.431(a); check if excepted quantity -> excepted packaging

Does NOT meet LTD QTY Exception; Check if LSA

Performed by: [signature] Date: 9/25/01

Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN

Meets criteria for Fissile Excepted Package per 49 CFR 173.453

This is a Low-level waste

Reviewed by: _____ Date: _____

91 7105

Section III: Check radionuclides for listing on labels and shipping papers; Check reportable radionuclides per Disposal Facility

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Pu-238	1.97E-03	4.49E+01	4.49E+01
Sr-90	4.87E-01	2.22E+01	6.70E+01
Pu-239	5.09E-04	1.16E+01	7.86E+01
Am-241	3.93E-04	8.94E+00	8.76E+01
U-234	9.03E-04	4.11E+00	9.17E+01
Cs-137	4.39E-01	4.00E+00	9.57E+01
Pu-241	3.74E-03	1.70E+00	9.74E+01
U-233	2.36E-04	1.07E+00	9.84E+01
Co-60	7.99E-02	9.10E-01	9.93E+01
Cm-244	4.85E-05	5.52E-01	9.99E+01
Np-237	2.30E-06	5.22E-02	9.99E+01
U-236	8.75E-06	3.98E-02	1.00E+02
Eu-154	1.53E-03	1.39E-02	1.00E+02
Th-234	5.69E-06	1.29E-04	1.00E+02
Pa-233	2.30E-06	1.16E-05	1.00E+02
U-235	3.10E-05	0.00E+00	1.00E+02
U-238	5.69E-06	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Source Material (kg)	SNM (g)	Activity Conc. (Ci/m^3)
Sr-90	4.87E-01	4.80E+01	Not applicable	Not applicable	7.17E+00
Cs-137	4.39E-01	4.32E+01	Not applicable	Not applicable	6.46E+00
Co-60	7.99E-02	7.87E+00	Not applicable	Not applicable	1.18E+00
Pu-241	3.74E-03	3.68E-01	Not applicable	3.74E-05	5.50E-02
Pu-238	1.97E-03	1.94E-01	Not applicable	1.16E-04	2.90E-02
Eu-154	1.53E-03	1.51E-01	Not applicable	Not applicable	2.25E-02
U-234	9.03E-04	8.89E-02	Not applicable	Not applicable	1.33E-02
Pu-239	5.09E-04	5.01E-02	Not applicable	8.20E-03	7.48E-03
Am-241	3.93E-04	3.87E-02	Not applicable	Not applicable	5.78E-03
U-233	2.36E-04	2.32E-02	Not applicable	2.43E-02	3.47E-03
Cm-244	4.85E-05	4.78E-03	Not applicable	Not applicable	7.14E-04
U-235	3.10E-05	3.05E-03	Not applicable	1.41E+01	4.56E-04
U-236	8.75E-06	8.62E-04	Not applicable	Not applicable	1.29E-04
U-238	5.69E-06	5.60E-04	Not applicable	Not applicable	8.36E-05
Th-234	5.69E-06	5.60E-04	Not applicable	Not applicable	8.36E-05
Np-237	2.30E-06	2.26E-04	Not applicable	Not applicable	3.38E-05
Pa-233	2.30E-06	2.26E-04	Not applicable	Not applicable	3.38E-05

If #DIV/0! occurs in the Fraction of Waste Profile Column or the Does Nuclide Meet Waste Profile? Column of Section III, the nuclide is not included on the current profile and needs to be added.

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, Co-60, and H-3 are major nuclides driving waste classification determination for Tank V-9 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-9 Sludge (17.9 gal/drum w/AVG)
Sr-90	0.04	150	7.17E+00
Cs-137	1	44	6.46E+00
Co-60	700	*	1.18E+00
H-3	40	*	0.00E+00

*Note: No limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Classs B unless the concentrations of other nuclides in Table 2 determine the waste to be Class C independent of these nuclides.

Class A Sum of Fractions: 185.60

Class B Sum of Fractions: 0.19

Class B*

92 A 105

Container ID # **INEEL Tank V-9 Liquids (Total)**

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: N/A Form#

Description: 70 gallons of liquids PKE#

NTS Waste Stream # #N/A

SNL Waste Stream# #N/A

Note: assume liquid phase volume of 70 gallons with density of 1.00 g/ml

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
584.20	264.99	0.00	0.00	264.99	#N/A	0.265

Note: Gross weight of contents = (70 gal.)x(1.0 g/ml)x(3785.412 ml/gal.)x(2.2046E-03 lb/g) = 584.2 lb

Dose survey from Sxxxxx on xx/xx/00 shows < _____ mrem/hr OC.

Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.

EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-4)A2)	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Liquids Fraction	Activity/gram (pCi/g)
H-3	9.35E-02	2.17E-01	3.46E+09	1.31E+04	3.70E+00	9.35E-04	4.00E+01	8.65E-01	8.65E-05	0.00E+00	0.00E+00	3.27E-05	3.53E+05
Sr-90	6.62E-02	6.15E+01	2.45E+09	9.25E+03	3.70E-03	6.62E-01	1.00E-01	2.45E+02	2.45E-02	0.00E+00	0.00E+00	9.25E-03	2.50E+05
Cs-137	1.11E-04	2.07E-02	4.12E+06	1.55E+01	3.70E-02	1.11E-04	5.00E-01	8.24E-02	8.24E-06	0.00E+00	0.00E+00	3.11E-06	4.20E+02
Pu-241	1.01E-04	9.41E-01	3.75E+06	1.42E+01	3.70E-02	1.01E-04	1.00E-02	3.75E+00	3.75E-04	1.01E-06	0.00E+00	1.42E-04	3.83E+02
U-234	5.59E-05	5.19E+00	2.07E+06	7.81E+00	3.70E-03	5.59E-04	1.00E-03	2.07E+01	2.07E-03	0.00E+00	0.00E+00	7.81E-04	2.11E+02
Pu-238	4.50E-05	2.09E+01	1.67E+06	6.29E+00	3.70E-04	4.50E-03	2.00E-04	8.33E+01	8.33E-03	2.65E-06	1.70E-01	3.14E-03	1.70E+02
Pu-239	1.20E-05	5.57E+00	4.44E+05	1.68E+00	3.70E-04	1.20E-03	2.00E-04	2.22E+01	2.22E-03	1.94E-04	4.53E-02	8.38E-04	4.53E+01
Am-241	1.07E-05	4.94E+00	3.94E+05	1.49E+00	3.70E-04	1.07E-03	2.00E-04	1.97E+01	1.97E-03	0.00E+00	4.02E-02	7.44E-04	4.02E+01
U-233	3.29E-06	3.05E-01	1.22E+05	4.59E-01	3.70E-03	3.29E-05	1.00E-03	1.22E+00	1.22E-04	3.39E-04	0.00E+00	4.59E-05	1.24E+01
U-235	1.83E-06	0.00E+00	6.76E+04	2.55E-01	3.70E-03	1.83E-05	Unlimited	0.00E+00	0.00E+00	8.31E-01	0.00E+00	0.00E+00	6.90E+00
Cm-244	1.38E-06	3.20E-01	5.11E+04	1.93E-01	3.70E-04	1.38E-04	4.00E-04	1.28E+00	1.28E-04	0.00E+00	0.00E+00	4.82E-05	5.21E+00
U-236	8.64E-07	8.02E-02	3.20E+04	1.21E-01	3.70E-03	8.64E-06	1.00E-03	3.20E-01	3.20E-05	0.00E+00	0.00E+00	1.21E-05	3.26E+00
Co-60	3.13E-07	7.26E-05	1.16E+04	4.37E-02	3.70E-01	3.13E-08	4.00E-01	2.89E-04	2.89E-08	0.00E+00	0.00E+00	1.09E-08	1.18E+00
U-238	2.58E-07	0.00E+00	9.53E+03	3.60E-02	3.70E-03	2.58E-06	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.72E-01
Th-234	2.58E-07	1.20E-04	9.53E+03	3.60E-02	3.70E+00	2.58E-09	2.00E-01	4.76E-04	4.76E-08	0.00E+00	0.00E+00	1.80E-08	9.72E-01
Eu-152	1.50E-07	1.55E-05	5.55E+03	2.09E-02	3.70E-01	1.50E-08	9.00E-01	6.17E-05	6.17E-09	0.00E+00	0.00E+00	2.33E-09	5.66E-01
Eu-154	7.21E-08	1.34E-05	2.67E+03	1.01E-02	3.70E-01	7.21E-09	5.00E-01	5.33E-05	5.33E-09	0.00E+00	0.00E+00	2.01E-09	2.72E-01
Np-237	5.30E-08	2.46E-02	1.96E+03	7.40E-03	3.70E-04	5.30E-06	2.00E-04	9.80E-02	9.80E-06	0.00E+00	2.00E-04	3.70E-06	2.00E-01
Pa-233	5.30E-08	5.47E-06	1.96E+03	7.40E-03	3.70E+00	5.30E-10	9.00E-01	2.18E-05	2.18E-09	0.00E+00	0.00E+00	8.22E-10	2.00E-01
Total	1.60E-01	100.00%	5.92E+09	2.24E+04		6.71E-01		3.99E+02	3.99E-02	8.32E-01	2.56E-01	1.50E-02	6.04E+05

DOT regulated as Hazard Class 7 Radioactive Material

NOT an RQ amount of a Hazardous Substance

< Type A quantity/package per 49 CFR 173.431(a); check if excepted quantity -> excepted packaging

Does NOT meet LTD QTY Exception; Check if LSA

Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN

Meets criteria for Fissile Excepted Package per 49 CFR 173.453

This is a Low-level waste

Performed by: Gordon Harris Date: 9/25/01

Reviewed by: _____ Date: _____

93 of 105

Section III: Check radionuclides for listing on labels and shipping papers

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Sr-90	6.62E-02	6.15E+01	6.15E+01
Pu-238	4.50E-05	2.09E+01	8.24E+01
Pu-239	1.20E-05	5.57E+00	8.80E+01
U-234	5.59E-05	5.19E+00	9.31E+01
Am-241	1.07E-05	4.94E+00	9.81E+01
Pu-241	1.01E-04	9.41E-01	9.90E+01
Cm-244	1.38E-06	3.20E-01	9.94E+01
U-233	3.29E-06	3.05E-01	9.97E+01
H-3	9.35E-02	2.17E-01	9.99E+01
U-236	8.64E-07	8.02E-02	1.00E+02
Np-237	5.30E-08	2.46E-02	1.00E+02
Cs-137	1.11E-04	2.07E-02	1.00E+02
Th-234	2.58E-07	1.20E-04	1.00E+02
Co-60	3.13E-07	7.26E-05	1.00E+02
Eu-152	1.50E-07	1.55E-05	1.00E+02
Eu-154	7.21E-08	1.34E-05	1.00E+02
Pa-233	5.30E-08	5.47E-06	1.00E+02
U-235	1.83E-06	0.00E+00	1.00E+02
U-238	2.58E-07	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Source Material (kg)	SNM (g)	Activity Conc. (Ci/m^3)
H-3	9.35E-02	5.84E+01	Not applicable	Not applicable	3.53E-01
Sr-90	6.62E-02	4.14E+01	Not applicable	Not applicable	2.50E-01
Cs-137	1.11E-04	6.95E-02	Not applicable	Not applicable	4.20E-04
Pu-241	1.01E-04	6.33E-02	Not applicable	1.01E-06	3.83E-04
U-234	5.59E-05	3.49E-02	Not applicable	Not applicable	2.11E-04
Pu-238	4.50E-05	2.81E-02	Not applicable	2.65E-06	1.70E-04
Pu-239	1.20E-05	7.50E-03	Not applicable	1.94E-04	4.53E-05
Am-241	1.07E-05	6.65E-03	Not applicable	Not applicable	4.02E-05
U-233	3.29E-06	2.05E-03	Not applicable	3.39E-04	1.24E-05
U-235	1.83E-06	1.14E-03	Not applicable	8.31E-01	6.90E-06
Cm-244	1.38E-06	8.62E-04	Not applicable	Not applicable	5.21E-06
U-236	8.64E-07	5.39E-04	Not applicable	Not applicable	3.26E-06
Co-60	3.13E-07	1.95E-04	Not applicable	Not applicable	1.18E-06
U-238	2.58E-07	1.61E-04	Not applicable	Not applicable	9.72E-07
Th-234	2.58E-07	1.61E-04	Not applicable	Not applicable	9.72E-07
Eu-152	1.50E-07	9.37E-05	Not applicable	Not applicable	5.66E-07
Eu-154	7.21E-08	4.50E-05	Not applicable	Not applicable	2.72E-07
Np-237	5.30E-08	3.31E-05	Not applicable	Not applicable	2.00E-07
Pa-233	5.30E-08	3.31E-05	Not applicable	Not applicable	2.00E-07

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, and Ni-63 are major nuclides driving waste classification determination for Tank V-1, V-2, and V-3 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-9 All Liquid
H-3	40	*	3.53E-01
Cs-137	1	44	4.20E-04
Sr-90	0.04	150	2.50E-01
Ni-63	3.5	70	0.00E+00
Co-60	700	*	1.18E-06
Class A Sum of Fractions:			6.26
Class B Sum of Fractions:			0.00
			ClassB*

*Note: No limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Classs B unless the concentrations of other nuclides in Table 2 determine the waste to be Class C independent of these nuclides.

94 q105

Container ID # **INEEL Tank V-9 Liquids (35 gal per drum)**

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: 55 Gallon Metal OH

Description: 35 gallons of liquids

Form#

PKE#

Note: assume liquid phase volume of 35 gallons with density of 1.0 g/ml (63.64% of capacity)

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
342.10	155.18	50.00	22.68	132.50	0.261	0.133

Note: Gross weight of contents = (35 gal.)x(1.0 g/ml)x(3785.412 ml/gal.)x(2.2046E-03 lb/g) = 292.1 lb

Dose survey from Sxxxxx on xx/xx/00 shows < [ ] mrem/hr OC.

Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.

EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-4)A2	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Liquids Fraction	Activity/gram (pCi/g)
H-3	4.68E-02	2.17E-01	1.73E+09	1.31E+04	3.70E+00	4.68E-04	4.00E+01	4.33E-01	4.33E-05	0.00E+00	0.00E+00	3.27E-05	3.53E+05
Sr-90	3.31E-02	6.15E+01	1.23E+09	9.25E+03	3.70E-03	3.31E-01	1.00E-01	1.23E+02	1.23E-02	0.00E+00	0.00E+00	9.25E-03	2.50E+05
Cs-137	5.56E-05	2.07E-02	2.06E+06	1.55E+01	3.70E-02	5.56E-05	5.00E-01	4.12E-02	4.12E-06	0.00E+00	0.00E+00	3.11E-06	4.20E+02
Pu-241	5.07E-05	9.41E-01	1.88E+06	1.42E+01	3.70E-02	5.07E-05	1.00E-02	1.88E+00	1.88E-04	5.07E-07	0.00E+00	1.42E-04	3.83E+02
U-234	2.80E-05	5.19E+00	1.03E+06	7.81E+00	3.70E-03	2.80E-04	1.00E-03	1.03E+01	1.03E-03	0.00E+00	0.00E+00	7.81E-04	2.11E+02
Pu-238	2.25E-05	2.09E+01	8.33E+05	6.29E+00	3.70E-04	2.25E-03	2.00E-04	4.17E+01	4.17E-03	1.32E-06	1.70E-01	3.14E-03	1.70E+02
Pu-239	6.00E-06	5.57E+00	2.22E+05	1.68E+00	3.70E-04	6.00E-04	2.00E-04	1.11E+01	1.11E-03	9.68E-05	4.53E-02	8.38E-04	4.53E+01
Am-241	5.33E-06	4.94E+00	1.97E+05	1.49E+00	3.70E-04	5.33E-04	2.00E-04	9.85E+00	9.85E-04	0.00E+00	4.02E-02	7.44E-04	4.02E+01
U-233	1.64E-06	3.05E-01	6.08E+04	4.59E-01	3.70E-03	1.64E-05	1.00E-03	6.08E-01	6.08E-05	1.69E-04	0.00E+00	4.59E-05	1.24E+01
U-235	9.14E-07	0.00E+00	3.38E+04	2.55E-01	3.70E-03	9.14E-06	Unlimited	0.00E+00	0.00E+00	4.16E-01	0.00E+00	0.00E+00	6.90E+00
Cm-244	6.90E-07	3.20E-01	2.55E+04	1.93E-01	3.70E-04	6.90E-05	4.00E-04	6.38E-01	6.38E-05	0.00E+00	0.00E+00	4.82E-05	5.21E+00
U-236	4.32E-07	8.02E-02	1.60E+04	1.21E-01	3.70E-03	4.32E-06	1.00E-03	1.60E-01	1.60E-05	0.00E+00	0.00E+00	1.21E-05	3.26E+00
Co-60	1.56E-07	7.26E-05	5.78E+03	4.37E-02	3.70E-01	1.56E-08	4.00E-01	1.45E-04	1.45E-08	0.00E+00	0.00E+00	1.09E-08	1.18E+00
U-238	1.29E-07	0.00E+00	4.76E+03	3.60E-02	3.70E-03	1.29E-06	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.72E-01
Th-234	1.29E-07	1.20E-04	4.76E+03	3.60E-02	3.70E+00	1.29E-09	2.00E-01	2.38E-04	2.38E-08	0.00E+00	0.00E+00	1.80E-08	9.72E-01
Eu-152	7.50E-08	1.55E-05	2.77E+03	2.09E-02	3.70E-01	7.50E-09	9.00E-01	3.08E-05	3.08E-09	0.00E+00	0.00E+00	2.33E-09	5.66E-01
Eu-154	3.60E-08	1.34E-05	1.33E+03	1.01E-02	3.70E-01	3.60E-09	5.00E-01	2.67E-05	2.67E-09	0.00E+00	0.00E+00	2.01E-09	2.72E-01
Np-237	2.65E-08	2.46E-02	9.80E+02	7.40E-03	3.70E-04	2.65E-06	2.00E-04	4.90E-02	4.90E-06	0.00E+00	2.00E-04	3.70E-06	2.00E-01
Pa-233	2.65E-08	5.47E-06	9.80E+02	7.40E-03	3.70E+00	2.65E-10	9.00E-01	1.09E-05	1.09E-09	0.00E+00	0.00E+00	8.22E-10	2.00E-01
Total	8.01E-02	100.00%	2.96E+09	2.24E+04		3.36E-01		1.99E+02	1.99E-02	4.16E-01	2.56E-01	1.50E-02	6.04E+05

DOT regulated as Hazard Class 7 Radioactive Material

NOT an RQ amount of a Hazardous Substance

< Type A quantity/package per 49 CFR 173.431(a); check if excepted quantity -> excepted packaging

Does NOT meet LTD QTY Exception; Check if LSA

Performed by: [signature] Date: 9/25/01

Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN

Meets criteria for Fissile Excepted Package per 49 CFR 173.453

This is a Low-level waste

Reviewed by: _____ Date: _____

95 A 105

Section III: Check radionuclides for listing on labels and shipping papers; Check reportable radionuclides per Disposal Facility

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Sr-90	3.31E-02	6.15E+01	6.15E+01
Pu-238	2.25E-05	2.09E+01	8.24E+01
Pu-239	6.00E-06	5.57E+00	8.80E+01
U-234	2.80E-05	5.19E+00	9.31E+01
Am-241	5.33E-06	4.94E+00	9.81E+01
Pu-241	5.07E-05	9.41E-01	9.90E+01
Cm-244	6.90E-07	3.20E-01	9.94E+01
U-233	1.64E-06	3.05E-01	9.97E+01
H-3	4.68E-02	2.17E-01	9.99E+01
U-236	4.32E-07	8.02E-02	1.00E+02
Np-237	2.65E-08	2.46E-02	1.00E+02
Cs-137	5.56E-05	2.07E-02	1.00E+02
Th-234	1.29E-07	1.20E-04	1.00E+02
Co-60	1.56E-07	7.26E-05	1.00E+02
Eu-152	7.50E-08	1.55E-05	1.00E+02
Eu-154	3.60E-08	1.34E-05	1.00E+02
Pa-233	2.65E-08	5.47E-06	1.00E+02
U-235	9.14E-07	0.00E+00	1.00E+02
U-238	1.29E-07	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Source Material (kg)	SNM (g)	Activity Conc. (Ci/m^3)
H-3	4.68E-02	5.84E+01	Not applicable	Not applicable	3.53E-01
Sr-90	3.31E-02	4.14E+01	Not applicable	Not applicable	2.50E-01
Cs-137	5.56E-05	6.95E-02	Not applicable	Not applicable	4.20E-04
Pu-241	5.07E-05	6.33E-02	Not applicable	5.07E-07	3.83E-04
U-234	2.80E-05	3.49E-02	Not applicable	Not applicable	2.11E-04
Pu-238	2.25E-05	2.81E-02	Not applicable	1.32E-06	1.70E-04
Pu-239	6.00E-06	7.50E-03	Not applicable	9.68E-05	4.53E-05
Am-241	5.33E-06	6.65E-03	Not applicable	Not applicable	4.02E-05
U-233	1.64E-06	2.05E-03	Not applicable	1.69E-04	1.24E-05
U-235	9.14E-07	1.14E-03	Not applicable	4.16E-01	6.90E-06
Cm-244	6.90E-07	8.62E-04	Not applicable	Not applicable	5.21E-06
U-236	4.32E-07	5.39E-04	Not applicable	Not applicable	3.26E-06
Co-60	1.56E-07	1.95E-04	Not applicable	Not applicable	1.18E-06
U-238	1.29E-07	1.61E-04	Not applicable	Not applicable	9.72E-07
Th-234	1.29E-07	1.61E-04	Not applicable	Not applicable	9.72E-07
Eu-152	7.50E-08	9.37E-05	Not applicable	Not applicable	5.66E-07
Eu-154	3.60E-08	4.50E-05	Not applicable	Not applicable	2.72E-07
Np-237	2.65E-08	3.31E-05	Not applicable	Not applicable	2.00E-07
Pa-233	2.65E-08	3.31E-05	Not applicable	Not applicable	2.00E-07

If #DIV/0! occurs in the Fraction of Waste Profile Column or the Does Nuclide Meet Waste Profile? Column of Section III, the nuclide is not included on the current profile and needs to be added.

Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that Sr-90, Cs-137, Co-60, and H-3 are major nuclides driving waste classification determination for Tank V-9 wastes

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	V-9 Liqid (35 gal/drum)
Sr-90	0.04	150	2.50E-01
Cs-137	1	44	4.20E-04
Co-60	700	*	1.18E-06
H-3	40	*	3.53E-01

Class A Sum of Fractions: 6.26

Class B Sum of Fractions: 0.00

Class B*

*Note: No limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Classs B unless the concentrations of other nuclides in Table 2 determine the waste to be Class C independent of these nuclides.

96 of 105

Attachment 8

New Calc for all V-Tank Liquids

Container ID # **INEEL ALL V-Tank Liquids**

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: N/A

Description: 8128 total gallons of all V-Tank liquids

Note: assume liquid phase volume of 8,128 gallons with density of 1.00 g/ml

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
67830.76	30768.03	0.00	0.00	30768.03	#N/A	30.766

Note: Gross weight of contents = (8128 gal.)x(1.0 g/ml)x(3785.412 ml/gal.)x(2.2046E-03 lb/g) = 67830.76 lbs

Dose survey from Sxxxxx on xx/xx/01 shows < mrem/hr OC.

Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.

EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-4)A2)	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Liquids Fraction	Activity/gram (pCi/g)
H-3	7.77E-01	3.88E-01	2.88E+10	9.34E+02	3.70E+00	7.77E-03	4.00E+01	7.19E+00	7.19E-04	0.00E+00	0.00E+00	2.34E-06	2.53E+04
Sr-90	3.66E-01	7.32E+01	1.35E+10	4.40E+02	3.70E-03	3.66E+00	1.00E-01	1.35E+03	1.35E-01	0.00E+00	0.00E+00	4.40E-04	1.19E+04
Cs-137	1.61E-01	6.44E+00	5.96E+09	1.94E+02	3.70E-02	1.61E-01	5.00E-01	1.19E+02	1.19E-02	0.00E+00	0.00E+00	3.87E-05	5.23E+03
Ni-63	7.61E-03	5.07E-03	2.82E+08	9.15E+00	3.70E+00	7.61E-05	3.00E+01	9.38E-02	9.38E-06	0.00E+00	0.00E+00	3.05E-08	2.47E+02
U-233	5.37E-04	1.07E+01	1.99E+07	6.45E-01	3.70E-03	5.37E-03	1.00E-03	1.99E+02	1.99E-02	5.53E-02	0.00E+00	6.45E-05	1.74E+01
Ru-103	5.03E-04	1.12E-02	1.86E+07	6.05E-01	3.70E-01	5.03E-05	9.00E-01	2.07E-01	2.07E-05	0.00E+00	0.00E+00	6.72E-08	1.63E+01
Ru-106	4.61E-04	4.61E-02	1.71E+07	5.54E-01	3.70E-02	4.61E-04	2.00E-01	8.53E-01	8.53E-05	0.00E+00	0.00E+00	2.77E-07	1.50E+01
Co-60	4.48E-04	2.24E-02	1.66E+07	5.38E-01	3.70E-01	4.48E-05	4.00E-01	4.14E-01	4.14E-05	0.00E+00	0.00E+00	1.35E-07	1.45E+01
Ce-144	3.88E-04	3.87E-02	1.43E+07	4.66E-01	3.70E-02	3.88E-04	2.00E-01	7.17E-01	7.17E-05	0.00E+00	0.00E+00	2.33E-07	1.26E+01
Sb-125	1.93E-04	4.29E-03	7.15E+06	2.32E-01	3.70E-01	1.93E-05	9.00E-01	7.95E-02	7.95E-06	0.00E+00	0.00E+00	2.58E-08	6.28E+00
Eu-152	1.43E-04	3.17E-03	5.29E+06	1.72E-01	3.70E-01	1.43E-05	9.00E-01	5.88E-02	5.88E-06	0.00E+00	0.00E+00	1.91E-08	4.64E+00
Eu-155	1.36E-04	1.36E-03	5.03E+06	1.63E-01	3.70E-01	1.36E-05	2.00E+00	2.51E-02	2.51E-06	0.00E+00	0.00E+00	8.17E-09	4.41E+00
Zr-95	1.20E-04	2.67E-03	4.44E+06	1.44E-01	3.70E-01	1.20E-05	9.00E-01	4.94E-02	4.94E-06	0.00E+00	0.00E+00	1.60E-08	3.90E+00
Pu-241	1.19E-04	2.37E-01	4.39E+06	1.43E-01	3.70E-02	1.19E-04	1.00E-02	4.39E+00	4.39E-04	1.19E-06	0.00E+00	1.43E-06	3.86E+00
Nb-95	6.75E-05	1.35E-03	2.50E+06	8.11E-02	3.70E-01	6.75E-06	1.00E+00	2.50E-02	2.50E-06	0.00E+00	0.00E+00	8.11E-09	2.19E+00
Ag-110m	6.65E-05	3.32E-03	2.46E+06	8.00E-02	3.70E-01	6.65E-06	4.00E-01	6.15E-02	6.15E-06	0.00E+00	0.00E+00	2.00E-08	2.16E+00
Co-58	6.14E-05	1.23E-03	2.27E+06	7.38E-02	3.70E-01	6.14E-06	1.00E+00	2.27E-02	2.27E-06	0.00E+00	0.00E+00	7.38E-09	2.00E+00
U-234	5.59E-05	1.12E+00	2.07E+06	6.72E-02	3.70E-03	5.59E-04	1.00E-03	2.07E+01	2.07E-03	0.00E+00	0.00E+00	6.72E-06	1.82E+00
Zn-65	5.07E-05	5.06E-04	1.87E+06	6.09E-02	3.70E-01	5.07E-06	2.00E+00	9.37E-03	9.37E-07	0.00E+00	0.00E+00	3.05E-09	1.65E+00
Ra-226	4.91E-05	4.91E-02	1.82E+06	5.91E-02	3.70E-03	4.91E-04	2.00E-02	9.09E-01	9.09E-05	0.00E+00	0.00E+00	2.95E-07	1.60E+00
Pu-238	4.88E-05	4.88E+00	1.81E+06	5.87E-02	3.70E-04	4.88E-03	2.00E-04	9.03E+01	9.03E-03	2.87E-06	1.59E-03	2.93E-05	1.59E+00
Eu-154	4.85E-05	1.94E-03	1.79E+06	5.83E-02	3.70E-01	4.85E-06	5.00E-01	3.59E-02	3.59E-06	0.00E+00	0.00E+00	1.17E-08	1.58E+00
Ag-108m	3.91E-05	1.30E-03	1.45E+06	4.71E-02	3.70E-01	3.91E-06	6.00E-01	2.41E-02	2.41E-06	0.00E+00	0.00E+00	7.85E-09	1.27E+00
Mn-54	2.27E-05	4.54E-04	8.41E+05	2.73E-02	3.70E-01	2.27E-06	1.00E+00	8.41E-03	8.41E-07	0.00E+00	0.00E+00	2.73E-09	7.38E-01
Cs-134	2.23E-05	8.93E-04	8.26E+05	2.69E-02	3.70E-02	2.23E-05	5.00E-01	1.65E-02	1.65E-06	0.00E+00	0.00E+00	5.37E-09	7.26E-01
U-235	1.97E-05	0.00E+00	7.28E+05	2.37E-02	3.70E-03	1.97E-04	Unlimited	0.00E+00	0.00E+00	8.94E+00	0.00E+00	0.00E+00	6.39E-01
Pu-239	1.41E-05	1.40E+00	5.20E+05	1.69E-02	3.70E-04	1.41E-03	2.00E-04	2.60E+01	2.60E-03	2.27E-04	4.57E-04	8.45E-06	4.57E-01
Am-241	1.25E-05	1.25E+00	4.61E+05	1.50E-02	3.70E-04	1.25E-03	2.00E-04	2.31E+01	2.31E-03	0.00E+00	4.05E-04	7.49E-06	4.05E-01
I-129	6.60E-06	0.00E+00	2.44E+05	7.94E-03	3.70E-05	6.60E-03	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.15E-01
Th-234	6.19E-06	6.18E-04	2.29E+05	7.44E-03	3.70E+00	6.19E-08	2.00E-01	1.14E-02	1.14E-06	0.00E+00	0.00E+00	3.72E-09	2.01E-01
U-238	6.19E-06	0.00E+00	2.29E+05	7.44E-03	3.70E-03	6.19E-05	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.01E-01
Cm-244	1.87E-06	9.33E-02	6.91E+04	2.25E-03	3.70E-04	1.87E-04	4.00E-04	1.73E+00	1.73E-04	0.00E+00	0.00E+00	5.62E-07	6.07E-02
Np-237	1.08E-06	1.08E-01	4.01E+04	1.30E-03	3.70E-04	1.08E-04	2.00E-04	2.01E+00	2.01E-04	0.00E+00	3.53E-05	6.52E-07	3.53E-02
Pa-233	1.08E-06	2.41E-05	4.01E+04	1.30E-03	3.70E+00	1.08E-08	9.00E-01	4.46E-04	4.46E-08	0.00E+00	0.00E+00	1.45E-10	3.53E-02
U-236	8.64E-07	1.73E-02	3.20E+04	1.04E-03	3.70E-03	8.64E-06	1.00E-03	3.20E-01	3.20E-05	0.00E+00	0.00E+00	1.04E-07	2.81E-02
Cm-242	1.94E-07	3.88E-04	7.19E+03	2.34E-04	3.70E-02	1.94E-07	1.00E-02	7.19E-03	7.19E-07	0.00E+00	0.00E+00	2.34E-09	6.31E-03
Total	1.32E+00	100.00%	4.87E+10	1.58E+03		3.85E+00		1.85E+03	1.85E-01	9.00E+00	2.48E-03	6.02E-04	4.28E+04

DOT regulated as Hazard Class 7 Radioactive Material
Contains a Reportable Quantity of a Hazardous Substance; use 'RQ(radionuclides)' as part of PSN
< Type A quantity/package per 49 CFR 173.431(a); check if excepted quantity -> excepted packaging
Does NOT meet LTD QTY Exception; Check if LSA
Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN
Meets criteria for Fissile Excepted Package per 49 CFR 173.453
This is a Low-level waste

Performed by: Gordon Harris Date: 9/25/01

Reviewed by: _____ Date: _____

98 4105

Section III: Check radionuclides for listing on labels and shipping papers

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Sr-90	3.66E-01	7.32E+01	7.32E+01
U-233	5.37E-04	1.07E+01	8.39E+01
Cs-137	1.61E-01	6.44E+00	9.03E+01
Pu-238	4.88E-05	4.88E+00	9.52E+01
Pu-239	1.41E-05	1.40E+00	9.66E+01
Am-241	1.25E-05	1.25E+00	9.78E+01
U-234	5.59E-05	1.12E+00	9.90E+01
H-3	7.77E-01	3.88E-01	9.93E+01
Pu-241	1.19E-04	2.37E-01	9.96E+01
Np-237	1.08E-06	1.08E-01	9.97E+01
Cm-244	1.87E-06	9.33E-02	9.98E+01
Ra-226	4.91E-05	4.91E-02	9.98E+01
Ru-106	4.61E-04	4.61E-02	9.99E+01
Ce-144	3.88E-04	3.87E-02	9.99E+01
Co-60	4.48E-04	2.24E-02	9.99E+01
U-236	8.64E-07	1.73E-02	1.00E+02
Ru-103	5.03E-04	1.12E-02	1.00E+02
Ni-63	7.61E-03	5.07E-03	1.00E+02
Sb-125	1.93E-04	4.29E-03	1.00E+02
Ag-110m	6.65E-05	3.32E-03	1.00E+02
Eu-152	1.43E-04	3.17E-03	1.00E+02
Zr-95	1.20E-04	2.67E-03	1.00E+02
Eu-154	4.85E-05	1.94E-03	1.00E+02
Eu-155	1.36E-04	1.36E-03	1.00E+02
Nb-95	6.75E-05	1.35E-03	1.00E+02
Ag-108m	3.91E-05	1.30E-03	1.00E+02
Co-58	6.14E-05	1.23E-03	1.00E+02
Cs-134	2.23E-05	8.93E-04	1.00E+02
Th-234	6.19E-06	6.18E-04	1.00E+02
Zn-65	5.07E-05	5.06E-04	1.00E+02
Mn-54	2.27E-05	4.54E-04	1.00E+02
Cm-242	1.94E-07	3.88E-04	1.00E+02
Pa-233	1.08E-06	2.41E-05	1.00E+02
U-235	1.97E-05	0.00E+00	1.00E+02
I-129	6.60E-06	0.00E+00	1.00E+02
U-238	6.19E-06	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Source Material (kg)	SNM (g)	Activity Conc. (Ci/m^3)
H-3	7.77E-01	5.91E+01	Not applicable	Not applicable	2.53E-02
Sr-90	3.66E-01	2.78E+01	Not applicable	Not applicable	1.19E-02
Cs-137	1.61E-01	1.22E+01	Not applicable	Not applicable	5.23E-03
Ni-63	7.61E-03	5.78E-01	Not applicable	Not applicable	2.47E-04
U-233	5.37E-04	4.08E-02	Not applicable	5.53E-02	1.74E-05
Ru-103	5.03E-04	3.82E-02	Not applicable	Not applicable	1.63E-05
Ru-106	4.61E-04	3.50E-02	Not applicable	Not applicable	1.50E-05
Co-60	4.48E-04	3.40E-02	Not applicable	Not applicable	1.45E-05
Ce-144	3.88E-04	2.95E-02	Not applicable	Not applicable	1.26E-05
Sb-125	1.93E-04	1.47E-02	Not applicable	Not applicable	6.28E-06
Eu-152	1.43E-04	1.09E-02	Not applicable	Not applicable	4.64E-06
Eu-155	1.36E-04	1.03E-02	Not applicable	Not applicable	4.41E-06
Zr-95	1.20E-04	9.13E-03	Not applicable	Not applicable	3.90E-06
Pu-241	1.19E-04	9.02E-03	Not applicable	1.19E-06	3.86E-06
Nb-95	6.75E-05	5.13E-03	Not applicable	Not applicable	2.19E-06
Ag-110m	6.65E-05	5.06E-03	Not applicable	Not applicable	2.16E-06
Co-58	6.14E-05	4.67E-03	Not applicable	Not applicable	2.00E-06
U-234	5.59E-05	4.25E-03	Not applicable	Not applicable	1.82E-06
Zn-65	5.07E-05	3.85E-03	Not applicable	Not applicable	1.65E-06
Ra-226	4.91E-05	3.73E-03	Not applicable	Not applicable	1.60E-06
Pu-238	4.88E-05	3.71E-03	Not applicable	2.87E-06	1.59E-06
Eu-154	4.85E-05	3.69E-03	Not applicable	Not applicable	1.58E-06
Ag-108m	3.91E-05	2.98E-03	Not applicable	Not applicable	1.27E-06
Mn-54	2.27E-05	1.73E-03	Not applicable	Not applicable	7.38E-07
Cs-134	2.23E-05	1.70E-03	Not applicable	Not applicable	7.26E-07
U-235	1.97E-05	1.50E-03	Not applicable	8.94E+00	6.39E-07
Pu-239	1.41E-05	1.07E-03	Not applicable	2.27E-04	4.57E-07
Am-241	1.25E-05	9.47E-04	Not applicable	Not applicable	4.05E-07
I-129	6.60E-06	5.02E-04	Not applicable	Not applicable	2.15E-07
Th-234	6.19E-06	4.70E-04	Not applicable	Not applicable	2.01E-07
U-238	6.19E-06	4.70E-04	Not applicable	Not applicable	2.01E-07
Cm-244	1.87E-06	1.42E-04	Not applicable	Not applicable	6.07E-08
Np-237	1.08E-06	8.25E-05	Not applicable	Not applicable	3.53E-08
Pa-233	1.08E-06	8.25E-05	Not applicable	Not applicable	3.53E-08
U-236	8.64E-07	6.57E-05	Not applicable	Not applicable	2.81E-08
Cm-242	1.94E-07	1.48E-05	Not applicable	Not applicable	6.31E-09

Section IV: Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that H-3, Cs-137, Sr-90, Ni-63, and Co-60 are major nuclides driving waste classification determination for all liquids from Tanks V-1, V-2, V-3, and V-9.

	Table 2 limit (Ci/m^3)		
Radionuclide	Column 1	Column 2	All Liquid
H-3	40	*	2.53E-02
Cs-137	1	44	5.23E-03
Sr-90	0.04	150	1.19E-02
Ni-63	3.5	70	2.47E-04
Co-60	700	*	1.45E-05
Class A Sum of Fractions:			0.30
Class B Sum of Fractions:			0.00
			ClassA*

*Note: No limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Classs B unless the concentrations of other nuclides in Table 2 determine the waste to be Class C independent of these nuclides.

99 12 105

Container ID # **INEEL ALL V-Tank Liquids in 812.8 gal portions (10 equal portions)**

Constants	Units
3.70E+10	Bq/Ci
453.6	g/lb
1.00E-12	TBq/Bq or Ci/pCi
1000.00	g/kg
1.00E+09	nCi/Ci

Section I. Waste Stream Information

Container Type: N/A

Description: 812.8 total gallons of all V-Tank liquids

Note: assume liquid phase volume of 812.8 gallons with density of 1.00 g/ml

Container Gross Wt (lb)	Container Gross Wt (kg)	Container Tare Wt (lb)	Container Tare Wt (kg)	Waste Net Wt (kg)	External Vol. (m3)	Est. Waste Vol. (m3)
6783.08	3076.80	0.00	0.00	3076.80	#N/A	3.077

Note: Gross weight of contents = (812.8 gal.)x(1.0 g/ml)x(3785.412 ml/gal.)x(2.2046E-03 lb/g) = 6783.08 lbs

Dose survey from Sxxxxx on xx/xx/01 shows < mrem/hr OC.

Radioactive liquid effluents from hot cells, labs, and decon facilities at TAN and IETF.

EPA regulated hazardous COCs: Barium, Cadmium, Chromium, Lead, Mercury, Silver, VOCs, SVOCs, and PCBs.

Section II. List the radionuclides and activities; perform DOT RAM, RQ, LTD QTY, and Type A Packaging checks

Nuclide	Activity (Ci)	% of Total A2 Fraction	Activity (Bq)	Activity/gram (Bq/gram)	RQ limits (TBq)	RQ Ratios (amount/limit)	A2 Value (TBq)	LTD QTY Det. (amount/(10-4)A2)	Type A Pkg? (amount/A2)	DOT Fissile Mass (g)	TRU Conc. (nCi/g)	LSA-II Liquids Fraction	Activity/gram (pCi/g)
H-3	7.77E-02	3.88E-01	2.88E+09	9.34E+02	3.70E+00	7.77E-04	4.00E+01	7.19E-01	7.19E-05	0.00E+00	0.00E+00	2.34E-06	2.53E+04
Sr-90	3.66E-02	7.32E+01	1.35E+09	4.40E+02	3.70E-03	3.66E-01	1.00E-01	1.35E+02	1.35E-02	0.00E+00	0.00E+00	4.40E-04	1.19E+04
Cs-137	1.61E-02	6.44E+00	5.96E+08	1.94E+02	3.70E-02	1.61E-02	5.00E-01	1.19E+01	1.19E-03	0.00E+00	0.00E+00	3.87E-05	5.23E+03
Ni-63	7.61E-04	5.07E-03	2.82E+07	9.15E+00	3.70E+00	7.61E-06	3.00E+01	9.38E-03	9.38E-07	0.00E+00	0.00E+00	3.05E-08	2.47E+02
U-233	5.37E-05	1.07E+01	1.99E+06	6.45E-01	3.70E-03	5.37E-04	1.00E-03	1.99E+01	1.99E-03	5.53E-03	0.00E+00	6.45E-05	1.74E+01
Ru-103	5.03E-05	1.12E-02	1.86E+06	6.05E-01	3.70E-01	5.03E-06	9.00E-01	2.07E-02	2.07E-06	0.00E+00	0.00E+00	6.72E-08	1.63E+01
Ru-106	4.61E-05	4.61E-02	1.71E+06	5.54E-01	3.70E-02	4.61E-05	2.00E-01	8.53E-02	8.53E-06	0.00E+00	0.00E+00	2.77E-07	1.50E+01
Co-60	4.48E-05	2.24E-02	1.66E+06	5.38E-01	3.70E-01	4.48E-06	4.00E-01	4.14E-02	4.14E-06	0.00E+00	0.00E+00	1.35E-07	1.45E+01
Ce-144	3.88E-05	3.87E-02	1.43E+06	4.66E-01	3.70E-02	3.88E-05	2.00E-01	7.17E-02	7.17E-06	0.00E+00	0.00E+00	2.33E-07	1.26E+01
Sb-125	1.93E-05	4.29E-03	7.15E+05	2.32E-01	3.70E-01	1.93E-06	9.00E-01	7.95E-03	7.95E-07	0.00E+00	0.00E+00	2.58E-08	6.28E+00
Eu-152	1.43E-05	3.17E-03	5.29E+05	1.72E-01	3.70E-01	1.43E-06	9.00E-01	5.88E-03	5.88E-07	0.00E+00	0.00E+00	1.91E-08	4.64E+00
Eu-155	1.36E-05	1.36E-03	5.03E+05	1.63E-01	3.70E-01	1.36E-06	2.00E+00	2.51E-03	2.51E-07	0.00E+00	0.00E+00	8.17E-09	4.41E+00
Zr-95	1.20E-05	2.67E-03	4.44E+05	1.44E-01	3.70E-01	1.20E-06	9.00E-01	4.94E-03	4.94E-07	0.00E+00	0.00E+00	1.60E-08	3.90E+00
Pu-241	1.19E-05	2.37E-01	4.39E+05	1.43E-01	3.70E-02	1.19E-05	1.00E-02	4.39E-01	4.39E-05	1.19E-07	0.00E+00	1.43E-06	3.86E+00
Nb-95	6.75E-06	1.35E-03	2.50E+05	8.11E-02	3.70E-01	6.75E-07	1.00E+00	2.50E-03	2.50E-07	0.00E+00	0.00E+00	8.11E-09	2.19E+00
Ag-110m	6.65E-06	3.32E-03	2.46E+05	8.00E-02	3.70E-01	6.65E-07	4.00E-01	6.15E-03	6.15E-07	0.00E+00	0.00E+00	2.00E-08	2.16E+00
Co-58	6.14E-06	1.23E-03	2.27E+05	7.38E-02	3.70E-01	6.14E-07	1.00E+00	2.27E-03	2.27E-07	0.00E+00	0.00E+00	7.38E-09	2.00E+00
U-234	5.59E-06	1.12E+00	2.07E+05	6.72E-02	3.70E-03	5.59E-05	1.00E-03	2.07E+00	2.07E-04	0.00E+00	0.00E+00	6.72E-06	1.82E+00
Zn-65	5.07E-06	5.06E-04	1.87E+05	6.09E-02	3.70E-01	5.07E-07	2.00E+00	9.37E-04	9.37E-08	0.00E+00	0.00E+00	3.05E-09	1.65E+00
Ra-226	4.91E-06	4.91E-02	1.82E+05	5.91E-02	3.70E-03	4.91E-05	2.00E-02	9.09E-02	9.09E-06	0.00E+00	0.00E+00	2.95E-07	1.60E+00
Pu-238	4.88E-06	4.88E+00	1.81E+05	5.87E-02	3.70E-04	4.88E-04	2.00E-04	9.03E+00	9.03E-04	2.87E-07	1.59E-03	2.93E-05	1.59E+00
Eu-154	4.85E-06	1.94E-03	1.79E+05	5.83E-02	3.70E-01	4.85E-07	5.00E-01	3.59E-03	3.59E-07	0.00E+00	0.00E+00	1.17E-08	1.58E+00
Ag-108m	3.91E-06	1.30E-03	1.45E+05	4.71E-02	3.70E-01	3.91E-07	6.00E-01	2.41E-03	2.41E-07	0.00E+00	0.00E+00	7.85E-09	1.27E+00
Mn-54	2.27E-06	4.54E-04	8.41E+04	2.73E-02	3.70E-01	2.27E-07	1.00E+00	8.41E-04	8.41E-08	0.00E+00	0.00E+00	2.73E-09	7.38E-01
Cs-134	2.23E-06	8.93E-04	8.26E+04	2.69E-02	3.70E-02	2.23E-06	5.00E-01	1.65E-03	1.65E-07	0.00E+00	0.00E+00	5.37E-09	7.26E-01
U-235	1.97E-06	0.00E+00	7.28E+04	2.37E-02	3.70E-03	1.97E-05	Unlimited	0.00E+00	0.00E+00	8.94E-01	0.00E+00	0.00E+00	6.39E-01
Pu-239	1.41E-06	1.40E+00	5.20E+04	1.69E-02	3.70E-04	1.41E-04	2.00E-04	2.60E+00	2.60E-04	2.27E-05	4.57E-04	8.45E-06	4.57E-01
Am-241	1.25E-06	1.25E+00	4.61E+04	1.50E-02	3.70E-04	1.25E-04	2.00E-04	2.31E+00	2.31E-04	0.00E+00	4.05E-04	7.49E-06	4.05E-01
I-129	6.60E-07	0.00E+00	2.44E+04	7.94E-03	3.70E-05	6.60E-04	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.15E-01
Th-234	6.19E-07	6.18E-04	2.29E+04	7.44E-03	3.70E+00	6.19E-09	2.00E-01	1.14E-03	1.14E-07	0.00E+00	0.00E+00	3.72E-09	2.01E-01
U-238	6.19E-07	0.00E+00	2.29E+04	7.44E-03	3.70E-03	6.19E-06	Unlimited	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.01E-01
Cm-244	1.87E-07	9.33E-02	6.91E+03	2.25E-03	3.70E-04	1.87E-05	4.00E-04	1.73E-01	1.73E-05	0.00E+00	0.00E+00	5.62E-07	6.07E-02
Np-237	1.08E-07	1.08E-01	4.01E+03	1.30E-03	3.70E-04	1.08E-05	2.00E-04	2.01E-01	2.01E-05	0.00E+00	3.53E-05	6.52E-07	3.53E-02
Pa-233	1.08E-07	2.41E-05	4.01E+03	1.30E-03	3.70E+00	1.08E-09	9.00E-01	4.46E-05	4.46E-09	0.00E+00	0.00E+00	1.45E-10	3.53E-02
U-236	8.64E-08	1.73E-02	3.20E+03	1.04E-03	3.70E-03	8.64E-07	1.00E-03	3.20E-02	3.20E-06	0.00E+00	0.00E+00	1.04E-07	2.81E-02
Cm-242	1.94E-08	3.88E-04	7.19E+02	2.34E-04	3.70E-02	1.94E-08	1.00E-02	7.19E-04	7.19E-08	0.00E+00	0.00E+00	2.34E-09	6.31E-03
Total	1.32E-01	100.00%	4.87E+09	1.58E+03		3.85E-01		1.85E+02	1.85E-02	9.00E-01	2.48E-03	6.02E-04	4.28E+04

DOT regulated as Hazard Class 7 Radioactive Material
NOT an RQ amount of a Hazardous Substance
< Type A quantity/package per 49 CFR 173.431(a); check if excepted quantity -> excepted packaging
Does NOT meet LTD QTY Exception; Check if LSA
Meets Low Specific Activity (LSA)-II material - Check <Type A quantity and use Radioactive material, LSA, n.o.s. as PSN
Meets criteria for Fissile Excepted Package per 49 CFR 173.453
This is a Low-level waste

Performed by: Gordon Harris Date: 9/25/01

Reviewed by: _____ Date: _____

100 of 105

Section III: Check radionuclides for listing on labels and shipping papers

Nuclide	Activity (Ci)	% of Total A2 Fraction	Cumulative A2 Fraction
Sr-90	3.66E-02	7.32E+01	7.32E+01
U-233	5.37E-05	1.07E+01	8.39E+01
Cs-137	1.61E-02	6.44E+00	9.03E+01
Pu-238	4.88E-06	4.88E+00	9.52E+01
Pu-239	1.41E-06	1.40E+00	9.66E+01
Am-241	1.25E-06	1.25E+00	9.78E+01
U-234	5.59E-06	1.12E+00	9.90E+01
H-3	7.77E-02	3.88E-01	9.93E+01
Pu-241	1.19E-05	2.37E-01	9.96E+01
Np-237	1.08E-07	1.08E-01	9.97E+01
Cm-244	1.87E-07	9.33E-02	9.98E+01
Ra-226	4.91E-06	4.91E-02	9.98E+01
Ru-106	4.61E-05	4.61E-02	9.99E+01
Ce-144	3.88E-05	3.87E-02	9.99E+01
Co-60	4.48E-05	2.24E-02	9.99E+01
U-236	8.64E-08	1.73E-02	1.00E+02
Ru-103	5.03E-05	1.12E-02	1.00E+02
Ni-63	7.61E-04	5.07E-03	1.00E+02
Sb-125	1.93E-05	4.29E-03	1.00E+02
Ag-110m	6.65E-06	3.32E-03	1.00E+02
Eu-152	1.43E-05	3.17E-03	1.00E+02
Zr-95	1.20E-05	2.67E-03	1.00E+02
Eu-154	4.85E-06	1.94E-03	1.00E+02
Eu-155	1.36E-05	1.36E-03	1.00E+02
Nb-95	6.75E-06	1.35E-03	1.00E+02
Ag-108m	3.91E-06	1.30E-03	1.00E+02
Co-58	6.14E-06	1.23E-03	1.00E+02
Cs-134	2.23E-06	8.93E-04	1.00E+02
Th-234	6.19E-07	6.18E-04	1.00E+02
Zn-65	5.07E-06	5.06E-04	1.00E+02
Mn-54	2.27E-06	4.54E-04	1.00E+02
Cm-242	1.94E-08	3.88E-04	1.00E+02
Pa-233	1.08E-07	2.41E-05	1.00E+02
U-235	1.97E-06	0.00E+00	1.00E+02
I-129	6.60E-07	0.00E+00	1.00E+02
U-238	6.19E-07	0.00E+00	1.00E+02

Nuclide	Activity (Ci)	% of Total Activity	Source Material (kg)	SNM (g)	Activity Conc. (Ci/m^3)
H-3	7.77E-02	5.91E+01	Not applicable	Not applicable	2.53E-02
Sr-90	3.66E-02	2.78E+01	Not applicable	Not applicable	1.19E-02
Cs-137	1.61E-02	1.22E+01	Not applicable	Not applicable	5.23E-03
Ni-63	7.61E-04	5.78E-01	Not applicable	Not applicable	2.47E-04
U-233	5.37E-05	4.08E-02	Not applicable	5.53E-03	1.74E-05
Ru-103	5.03E-05	3.82E-02	Not applicable	Not applicable	1.63E-05
Ru-106	4.61E-05	3.50E-02	Not applicable	Not applicable	1.50E-05
Co-60	4.48E-05	3.40E-02	Not applicable	Not applicable	1.45E-05
Ce-144	3.88E-05	2.95E-02	Not applicable	Not applicable	1.26E-05
Sb-125	1.93E-05	1.47E-02	Not applicable	Not applicable	6.28E-06
Eu-152	1.43E-05	1.09E-02	Not applicable	Not applicable	4.64E-06
Eu-155	1.36E-05	1.03E-02	Not applicable	Not applicable	4.41E-06
Zr-95	1.20E-05	9.13E-03	Not applicable	Not applicable	3.90E-06
Pu-241	1.19E-05	9.02E-03	Not applicable	1.19E-07	3.86E-06
Nb-95	6.75E-06	5.13E-03	Not applicable	Not applicable	2.19E-06
Ag-110m	6.65E-06	5.06E-03	Not applicable	Not applicable	2.16E-06
Co-58	6.14E-06	4.67E-03	Not applicable	Not applicable	2.00E-06
U-234	5.59E-06	4.25E-03	Not applicable	Not applicable	1.82E-06
Zn-65	5.07E-06	3.85E-03	Not applicable	Not applicable	1.65E-06
Ra-226	4.91E-06	3.73E-03	Not applicable	Not applicable	1.60E-06
Pu-238	4.88E-06	3.71E-03	Not applicable	2.87E-07	1.59E-06
Eu-154	4.85E-06	3.69E-03	Not applicable	Not applicable	1.58E-06
Ag-108m	3.91E-06	2.98E-03	Not applicable	Not applicable	1.27E-06
Mn-54	2.27E-06	1.73E-03	Not applicable	Not applicable	7.38E-07
Cs-134	2.23E-06	1.70E-03	Not applicable	Not applicable	7.26E-07
U-235	1.97E-06	1.50E-03	Not applicable	8.94E-01	6.39E-07
Pu-239	1.41E-06	1.07E-03	Not applicable	2.27E-05	4.57E-07
Am-241	1.25E-06	9.47E-04	Not applicable	Not applicable	4.05E-07
I-129	6.60E-07	5.02E-04	Not applicable	Not applicable	2.15E-07
Th-234	6.19E-07	4.70E-04	Not applicable	Not applicable	2.01E-07
U-238	6.19E-07	4.70E-04	Not applicable	Not applicable	2.01E-07
Cm-244	1.87E-07	1.42E-04	Not applicable	Not applicable	6.07E-08
Np-237	1.08E-07	8.25E-05	Not applicable	Not applicable	3.53E-08
Pa-233	1.08E-07	8.25E-05	Not applicable	Not applicable	3.53E-08
U-236	8.64E-08	6.57E-05	Not applicable	Not applicable	2.81E-08
Cm-242	1.94E-08	1.48E-05	Not applicable	Not applicable	6.31E-09

Section IV: Waste Classification Determination for near surface disposal per 10 CFR §61.55

Assume that H-3, Cs-137, Sr-90, Ni-63, and Co-60 are major nuclides driving waste classification determination for all liquids from Tanks V-1, V-2, V-3, and V-9.

Radionuclide	Table 2 limit (Ci/m^3) Column 1	Column 2	All Liquid
H-3	40	*	2.53E-02
Cs-137	1	44	5.23E-03
Sr-90	0.04	150	1.19E-02
Ni-63	3.5	70	2.47E-03
Co-60	700	*	1.45E-05
Class A Sum of Fractions:			0.30
Class B Sum of Fractions:			0.00
			ClassA*

*Note: No limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Classs B unless the concentrations of other nuclides in Table 2 determine the waste to be Class C independent of these nuclides.

101 of 105