

TWC
1-7-09
RDB
Gibber (1)

Hanford Advisory Board Tank Waste Committee Meeting January 7, 2009

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Figure 1 Early LAW Model Partition Block Diagram

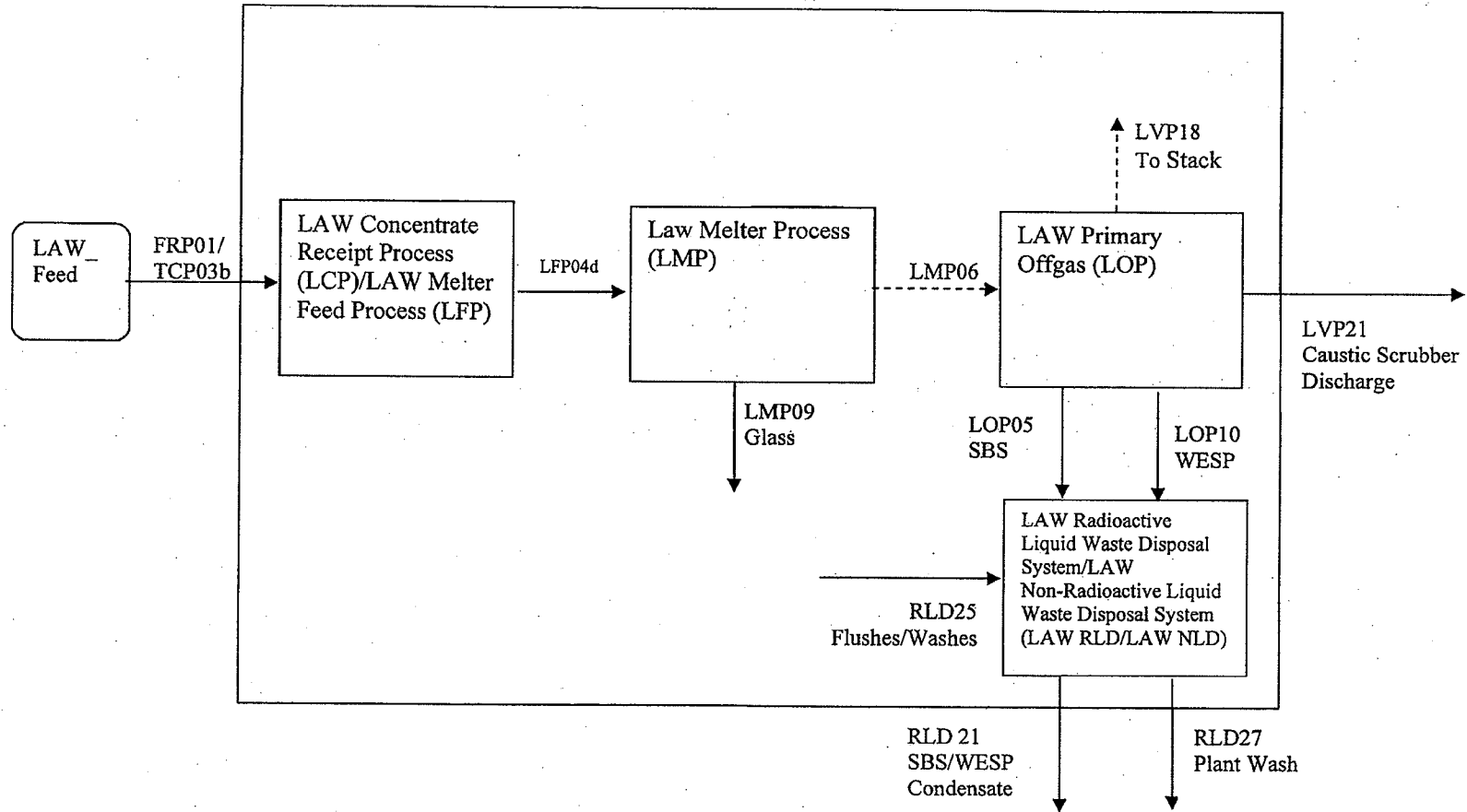


Figure 6 Average Secondary Waste

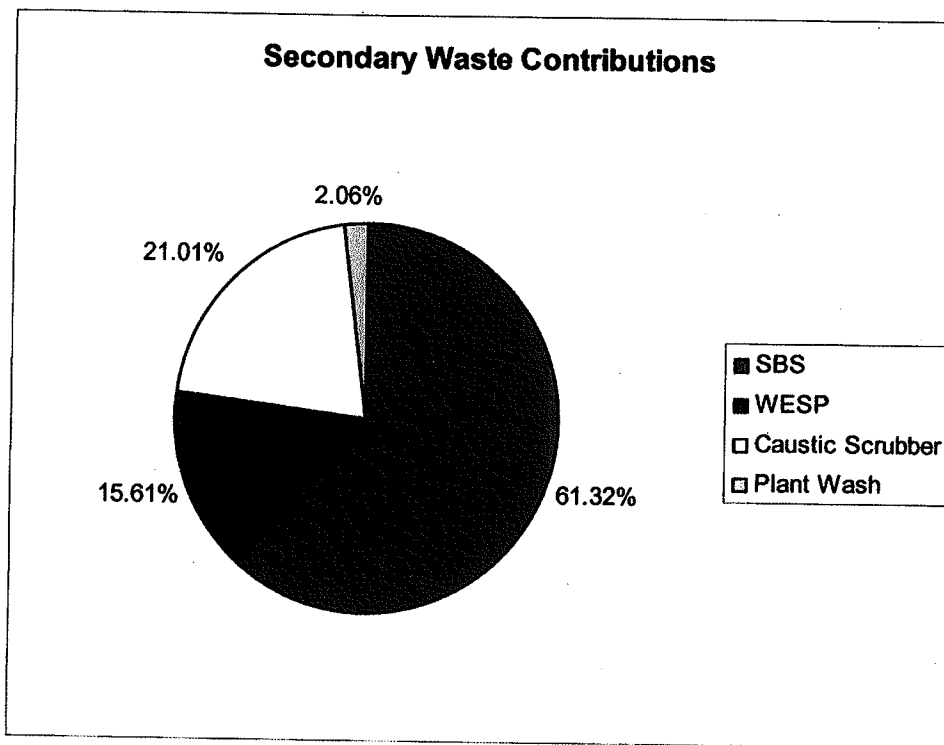


Table 6 - Summary of Secondary Waste Flow and Solids from RLD21 and LVP21

	1. AP-104	2. AP-102	3. AP-101	4. AP-103	5. AP-105	6. AP-108	7. AP-107	8. AN-104
Combined Volumetric Flow LVP21 & RLD21 (gpm)	6.53	6.89	5.22	6.60	6.63	6.83	5.01	6.53
Volumetric Flow LVP21 (gpm)	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34
Volumetric Flow Sec. RLD21 (gpm)	5.19	5.55	3.88	5.26	5.28	5.49	3.67	5.19
Sus. Solids Secondary Waste (kg/hr)	8.75E-01	8.69E-01	7.40E-01	9.09E-01	9.44E-01	8.27E-01	7.70E-01	8.75E-01
Dis. Solids Secondary Waste (kg/hr)	1.59E+01	2.01E+01	1.54E+01	1.94E+01	2.14E+01	1.87E+01	1.29E+01	1.59E+01
Total Mass Secondary Waste (kg/hr)	1.47E+03	1.56E+03	1.18E+03	1.49E+03	1.50E+03	1.54E+03	1.13E+03	1.47E+03
wt% Sus. Solids in Sec. Waste	0.06%	0.06%	0.06%	0.06%	0.06%	0.05%	0.07%	0.06%
wt% Dis. Solids in Sec. Waste	1.08%	1.29%	1.30%	1.30%	1.43%	1.21%	1.14%	1.08%

Table 7 - Radiological Comparison to LERF/ETF Requirements

LERF/ETF Radiological Acceptance Criteria										
Radionuclide	¹ LERF/ETF Criteria (Ci/l)	² LERF/ETF Criteria (Ci/l)	1. AP-104	2. AP-102	3. AP-101	4. AP-103	5. AP-105	6. AP-108	7. AP-107	8. AN-104
3H	2.4E-04	2.4E-04	3.03E-06	7.17E-06	2.50E-05	2.00E-05	4.48E-06	7.50E-06	2.08E-05	3.03E-06
14C	1.6E-06	1.6E-06	7.21E-10	7.35E-10	1.02E-09	1.69E-09	6.15E-10	6.12E-10	6.90E-10	7.21E-10
60Co	2.4E-06	2.4E-06	3.43E-10	1.59E-08	1.78E-08	4.07E-08	3.07E-08	1.45E-08	2.40E-08	3.43E-10
79Se	1.5E-07	1.5E-07	8.79E-08	2.01E-07	6.40E-08	1.50E-07	2.58E-07	1.25E-07	6.36E-08	8.79E-08
90Sr	4.2E-05	4.2E-05	4.05E-06	1.64E-06	2.76E-06	9.14E-06	7.64E-06	3.67E-06	4.59E-06	4.05E-06
*94Nb	2.6E-07	2.6E-07	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
99Tc	1.8E-05	1.8E-05	5.46E-05	4.75E-05	3.44E-05	6.43E-05	6.51E-05	3.82E-05	3.67E-05	5.46E-05
106Ru	6.5E-07	6.5E-07	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
129I	1.8E-06	1.8E-06	3.10E-08	8.39E-08	3.33E-08	8.85E-08	7.20E-08	5.54E-08	2.51E-08	3.10E-08
134Cs	4.1E-07	4.1E-07	5.29E-11	7.94E-12	9.20E-10	5.55E-11	1.65E-10	1.76E-10	8.67E-10	5.29E-11
137Cs	1.0E-05	9.9E-06	9.85E-06	1.08E-05	5.82E-06	1.18E-05	1.28E-05	1.02E-05	3.77E-06	9.85E-06
*144Ce	2.0E-05	8.3E-07	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
154Eu	9.8E-06	9.8E-06	1.81E-14	1.32E-07	6.83E-08	6.00E-08	1.98E-07	5.44E-08	9.34E-08	1.81E-14
155Eu	6.3E-05	6.3E-05	6.96E-15	7.46E-08	1.16E-07	7.90E-08	1.75E-07	5.87E-08	1.60E-07	6.96E-15
233U	2.1E-10	2.1E-10	2.83E-11	1.14E-10	5.74E-11	6.21E-11	2.36E-11	5.58E-11	3.92E-11	2.83E-11
234U	2.1E-10	2.1E-10	2.01E-11	2.12E-11	3.92E-11	4.47E-11	7.89E-12	3.88E-11	3.17E-11	2.01E-11
235U	2.1E-10	2.1E-10	7.93E-13	8.40E-13	1.46E-12	1.91E-12	3.20E-13	1.52E-12	1.29E-12	7.93E-13
237Np	2.1E-09	2.1E-09	3.98E-11	2.01E-09	6.88E-10	2.14E-10	2.17E-09	1.84E-10	5.21E-10	3.98E-11
238Pu	2.8E-09	2.8E-09	2.18E-11	3.42E-11	4.24E-10	8.21E-10	6.24E-11	8.94E-11	1.04E-09	2.18E-11
239Pu	1.8E-08	1.7E-08	3.01E-10	1.31E-09	5.86E-09	5.97E-09	1.22E-09	1.44E-09	1.13E-08	3.01E-10
240Pu	1.8E-08	1.7E-08	7.85E-11	2.22E-10	1.37E-09	1.01E-09	2.44E-10	2.74E-10	3.01E-09	7.85E-11
241Am	1.4E-09	1.4E-09	9.58E-09	1.43E-08	3.73E-09	5.65E-09	1.77E-08	1.21E-08	3.61E-09	9.58E-09
241Pu	2.6E-08	2.6E-08	1.37E-09	1.58E-09	2.94E-08	7.28E-09	3.64E-09	3.46E-09	7.37E-09	1.37E-09
243Cm	2.5E-08	2.5E-08	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
244Cm	2.5E-08	2.5E-08	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

Yellow highlight are limits that are different between the two sources. Pink Highlights are values that exceed one or both limits. #N/A means the data was not available.

1 Source: HNF-3172 Table D-1, REV. 3

2 Source: HNF-3172 Table D-1, REV. 2 & WMH-9758688 Table E-1 (these two sources are the same)

*Data not included in feed data from SVF 1484, Rev.0; Interim Pretreatment System DST Feed Calculation, Worksheet "Ordered IPS DST Feed"

Table 8 - Non-Rad Comparison to ETF Limits

	WMH-9758688		Source	***HNF-3172 Rev. 3 & 2	Estimated Concentrations of Secondary Liquid Waste							
	*Table F-1 (ppm)	**Highest Value (ppm)			ppm	1. AP-104 (ppm)	2. AP-102 (ppm)	3. AP-101 (ppm)	4. AP-103 (ppm)	5. AP-105 (ppm)	6. AP-108 (ppm)	7. AP-107 (ppm)
Al	NA	5	2		6.70E+00	6.33E+00	6.74E+00	6.55E+00	7.21E+00	6.03E+00	7.06E+00	6.79E+00
B	NA	0.2	2		1.41E+02	1.31E+02	1.41E+02	1.42E+02	1.30E+02	1.29E+02	1.49E+02	1.41E+02
Ca	330	330	4		2.64E+00	1.92E+00	5.26E+00	2.27E+00	2.52E+00	1.79E+00	7.01E+00	2.64E+00
Cl	59	250	3		9.60E+02	1.05E+03	4.15E+02	1.15E+03	1.05E+03	9.73E+02	3.51E+02	1.05E+02
Cr	NA	1	1		9.91E+00	3.92E+00	4.37E+00	4.28E+00	2.92E+00	4.40E+00	4.37E+00	1.31E+00
F	4	40	1		7.89E+01	8.69E+00	1.30E+02	1.68E+02	3.28E+01	6.68E+01	9.07E+01	7.19E+01
Cl+F				10000	7.38E+01	1.26E+01	1.34E+02	1.58E+02	3.54E+01	7.13E+01	1.01E+02	7.38E+01
Fe	9	9	4		7.97E+00	7.43E+00	8.09E+00	8.07E+00	8.53E+00	7.09E+00	8.53E+00	7.97E+00
Hg	NA	0.02	1		2.06E-34	6.14E-07	2.57E-03	6.04E-03	3.94E-04	1.09E-04	9.40E-03	2.28E-18
K	6.5	6.5	4		9.07E+01	9.43E+01	1.29E+02	1.19E+02	8.47E+01	1.05E+02	5.26E+01	8.07E+01
Mg	110	110	4		1.34E-01	1.25E-01	1.36E-01	1.35E-01	1.43E-01	1.19E-01	1.55E-01	1.34E-01
Mn	NA	0.024	2		3.72E-02	8.20E-02	1.46E-01	9.34E-02	9.93E-02	7.77E-02	1.77E-01	3.72E-02
Na	59	59	4		1.17E+03	1.21E+03	1.06E+03	1.26E+03	1.01E+03	1.14E+03	8.11E+02	1.17E+03
NH4	737	737	4	100,000	1.28E+03	1.62E+03	1.33E+03	1.28E+03	1.32E+03	1.59E+03	1.43E+03	1.28E+03
Ni	0.12	0.12	4		9.57E-02	9.61E-02	1.06E-01	1.46E-01	1.40E-01	1.06E-01	1.17E-01	9.57E-02
NO2	39	39	4	1000	1.31E+02	1.73E+02	1.72E+02	1.67E+02	1.72E+02	1.60E+02	1.34E+02	1.31E+02
NO3	1700	1700	4	1000	4.38E+03	8.74E+03	3.69E+03	5.93E+03	5.71E+03	8.31E+03	4.10E+03	4.38E+03
Pb	NA	0.15	1		2.20E-02	1.89E-01	5.19E-02	8.19E-02	6.26E-02	5.91E-02	3.32E-02	2.20E-02
PO4	1.3	1.3	4	1000	1.40E+01	1.58E+01	2.39E+01	1.02E+01	2.31E+01	3.69E+00	1.72E+01	1.40E+01
CO3	522.0	522			1.24E+02	1.46E+02	1.84E+02	1.22E+02	1.48E+02	1.42E+02	1.78E+02	1.24E+02
Si	24.3	24.3	4		3.29E+01	3.00E+01	3.23E+01	3.29E+01	3.78E+01	2.84E+01	3.31E+01	3.29E+01
SO4	84	84	4	1000	1.40E+02	2.34E-01	6.39E+02	8.09E+01	9.71E+01	3.68E-01	1.44E+03	1.40E+02
TOC	2	2	4		#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
TOC (wt%)				1%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Zn	0.33	100	1		8.88E+00	8.29E+00	8.93E+00	8.98E+00	9.48E+00	7.91E+00	9.39E+00	8.88E+00

Estimated Concentrations of Secondary Liquid Waste (cont'd)										
	WMH-9758688	HNF-3172 Rev. 3 & 2 (ppm)	1. AP-104 (ppm)	2. AP-102 (ppm)	3. AP-101 (ppm)	4. AP-103 (ppm)	5. AP-105 (ppm)	6. AP-108 (ppm)	7. AP-107 (ppm)	8. AN-104 (ppm)
Rate m3/yr	100,000	100,000	12989	13708	10387	13131	13183	13597	9972	12989
Rate lpm	190		24.7	26.1	19.8	25.0	25.1	25.9	19.0	24.7
pH	0.5-13	0.5-13	8.21	8.29	8.29	7.59	8.38	8.19	8.34	8.21
Yellow highlight are limits that are different between the two sources. Pink Highlights are values that exceed one or both limits.										
*Used the highest value from Table F-1.										
**Highest value from the tables C-1, D-1, D-2 or F-1.										
***Values from Table C-1, D-1, and D-2 (from WMH-9758688) are discharge limits after treatment at ETF.										
****NO2, NO3, SO4 & PO4 targeted as oxidizers.										
Sources: 1= Table C-1, 2=Table D-1, 3= Table D-2, and 4=Table F-1 (from WMH-9758688)										