



**SAFETY AND ECOLOGY CORPORATION  
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To: Rafael Rodriguez From: John E. Dixon  
Company: Safety and Ecology Corp Date: 12/9/2002  
Department: Operations Time: 11:00  
Fax: 1-301-415-5398 # of Pages: 4 (including cover sheet)

Mr. Rodriguez,

Page one is the reference information you asked for (old report).  
Page two is the TCAAP activity calculation for the waste in question. (Please use this sheet)  
Page three is the OLD activity calculation- PLEASE DISREGARD THIS. The information you require is on page two of this fax.

Hope this helps.

Best regards,

John E. Dixon

J/D

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Ref # 1 -  
Table of Radioactive Decay Data from Ref #3.

Ref #2 -  
TID-7004 and Fig 2.1 (energy absorption coefficients) from the:  
Reactor Shielding Design Manual, written by Theodore Rockwell III, Naval Reactors  
Branch, Division of Reactor Development USAEC, March 1956.

Ref # 3 -  
CRC Handbook of Radiation Measurement, Section H volume 1, Physical Science and  
Engineering Data. CRC Press Inc. West Palm Beach Fl. 1978.

**TCAAP WASTE STREAM UNIMPORTANT QUANTITY CALCULATION**

Assume 1 Ci source

	Activity % Abundance	Cl Iso Activ	Cl/g SpA	Iso Weight g	% Wt Abundance	
U234	0.305	0.305	6.24E-03	4.89E+01	2.41E-05	0.002408
U235	0.014	0.014	2.18E-06	6.47E+03	3.18E-03	0.318218
U238	0.681	0.681	3.36E-07	2.03E+08	9.97E-01	99.67838
Total Wt (g)				2.03E+05	1.00E+00	

Assume 1 g Source

	% Wt. Abundance	Wt. (g)	SpA	Activity Contribution	Percent Activity Contribution
U234	2.41E-05	2.41E-05	6.24E-03	1.50E-07	3.05E-01
U235	3.18E-03	3.18E-03	2.18E-06	6.89E-09	1.40E-02
U238	9.97E-01	9.97E-01	3.36E-07	3.35E-07	6.81E-01
		1.00E+00	1.00E+00	4.92E-07 Ci/g	1.00E+00

SPECIFIC ACTIVITY USING THE TCAAP RATIO ----->

491,869 pCi/g

245.93 pCi/g - .05% limit

191.101

3.822E-07 Ci/g

2618417.5 g/Cl

5763.0341 lbs/Cl

136 lbs/ft<sup>3</sup> - Est waste stream density

648895 lbs - Est waste stream weight  
0.06% DU limit

294598330 g - Est waste stream weight

324.4475 lbs - Max DU in waste stream  
7.25E-02 Ci - Max DU in waste stream  
7.25E+10 pCi - Max DU in waste stream  
245.9346772 pCi/g - Ave DU in waste stream

activity

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### Specific Activity Calculation



Formula  $3.575E+05$  divided by  $(A)^*(T1/2)^*(\%)$  in units of Ci per gram

	T1/2 (yr)	Atomic Wgt	Activity-based % Abundance	Iso-specific SpA
U234	2.45E+05	234	0.108	6.24E-03
U235	7.03E+08	235	0.0165	2.16E-06
U238	4.47E+09	238	0.875	3.36E-07

Assume 1 Ci source

	Activity % Abundance	Ci Iso Activity	Ci/g SpA	Iso Weight g	% Wt Abundance	
U234	0.108	0.15	6.24E-03	2.41E+01	9.69E-06	0.000969
U235	0.0165	0.019	2.16E-06	8.78E+03	3.54E-03	0.353792
U238	0.875	0.831	3.36E-07	2.47E+06	8.96E-01	99.64524
Total Wt (g)				2.48E+06	1.00E+00	

Assume 1 g Source

	% Wt. Abundance	Wt. (g)	SpA	Activity Contribution	
U234	9.69E-06	9.69E-06	6.24E-03	6.04E-08	1.50E-01
U235	3.54E-03	3.54E-03	2.16E-06	7.66E-09	1.80E-02
U238	9.96E-01	9.96E-01	3.36E-07	3.35E-07	8.31E-01
		1.00E+00	1.00E+00	4.03E-07 Ci/g	

SPECIFIC ACTIVITY USING THE LCAAP ISOTOPIC RATIO → 402,946 pCi/g

Discard  
this !!

W