## HLWYM HEmails

**From:** [redacted]
**Sent:** Wednesday, May 31, 2006 3:14 PM
**To:** Patrick Laplante
**Cc:** opovetko@cnwra.swri.org; [redacted]; james.winterle@swri.org; Ronald Janetzke
**Subject:** FOLLOW-UP - Re: Question about Pa and Ac DCFs
**Attachments:** gw_cb_ad.dat

Pat,

As a follow-up to the email below -

Oleg and I are working on the validation test for invent (SVTR#3). We are evaluating U235->Pa231->Ac227.

In my initial scoping runs, I have assumed properties for Pa and Ac are the same as U. Dave Pickett told this would be a good way to start this evaluation.

The results show both Pa231 and Ac227 are the major dose contributors. I looked at DCFs for Pa231 and Ac227 in the "gw_cb_ad.dat" file (this file is attached) and found the GW ingestion DCFs for Pa231 and Ac227 are the largest DCFs.

I was wondering if this makes sense to you.

I'd appreciate your insights.

Thanks,

Rob
(I'm at x6840 here in San Antonio.)

-----Original Message-----
From: Rwrice
To: plaplante@cnwra.swri.edu
Cc: Rwrice
Sent: Mon, 22 May 2006 19:18:25 -0400
Subject: Question about Pa and Ac DCFs

Pat,

I have a quick question about DCFs for Pa-231 and Ac-227.

I am working with Oleg on the TPA 5.1 Validation and he wants to look at the U235->Pa231->Ac227 chain for the GW.

To get the TPA code to cooperate and give some results for screening purposes, I was wondering if you could give me some idea (in the ball park sort of things) of the relative magnitudes of the ratio of Pa-231 to Ac-227 DCFs. (We will, more than likely, need to scale the results in this screening, so this ratio would be useful.)

Thanks for the help,

Rob

**Hearing Identifier:** HLW_YuccaMountain_Hold_EX
**Email Number:** 461

**Mail Envelope Properties** (8C852FD8AA5E4FE-DC-B66)

**Subject:** FOLLOW-UP - Re: Question about Pa and Ac DCFs
**Sent Date:** 5/31/2006 3:14:15 PM
**Received Date:** 5/31/2006 3:19:19 PM
**From:** [redacted]

**Created By:** [redacted]

**Recipients:**
"opovetko@cnwra.swri.org" <opovetko@cnwra.swri.org>
Tracking Status: None
[redacted]
Tracking Status: None
"james.winterle@swri.org" <james.winterle@swri.org>
Tracking Status: None
"Ronald Janetzke" <rjanetzke@cnwra.swri.edu>
Tracking Status: None
"Patrick Laplante" <plaplante@cnwra.swri.edu>
Tracking Status: None

**Post Office:** mblk-d39.sysops.aol.com

| **Files** | **Size** | **Date & Time** |
|---|---|---|
| MESSAGE | 1441 | 5/31/2006 3:19:19 PM |
| gw_cb_ad.dat | 3678 | |

**Options**
**Priority:** Standard
**Return Notification:** No
**Reply Requested:** No
**Sensitivity:** Normal
**Expiration Date:**
**Recipients Received:**

These DCFs are for a reasonably maximally exposed individual rural resident located 18 km from Yucca Mountain in a non-pluvial biosphere and are for doses due solely to direct exposure, inhalation, ingestion of animal products, ingestion of crops, ingestion of drinking water, and ingestion of milk. Units are (rem/yr)/(Ci/m3). DCFs include daughter contributions, are based on unit groundwater concentrations, and represent total effective dose equivalent. DCFs are age-specific, based on choice made in tpa.inp.

start_data

| nuclide | dir exp | inh | ing ani | ing crop | ing dw | ing milk |
|---|---|---|---|---|---|---|
| U238 | 3.85E+03 | 1.21E+02 | 1.46E+03 | 5.94E+04 | 1.22E+05 | 2.50E+02 |
| Cm246 | 4.86E+02 | 3.30E+03 | 3.00E+01 | 2.67E+05 | 5.67E+05 | 5.67E+01 |
| Pu242 | 1.89E+03 | 3.74E+03 | 6.22E+01 | 3.05E+05 | 6.48E+05 | 3.46E+00 |
| Am242m | 1.16E+04 | 3.14E+03 | 2.07E+02 | 2.43E+05 | 5.13E+05 | 4.02E+00 |
| Pu238 | 5.08E+02 | 3.57E+03 | 5.96E+01 | 2.92E+05 | 6.21E+05 | 3.32E+00 |
| U234 | 2.44E+02 | 1.48E+02 | 1.57E+03 | 6.26E+04 | 1.32E+05 | 2.72E+02 |
| Th230 | 4.65E+02 | 7.65E+02 | 4.32E+01 | 2.67E+05 | 5.67E+05 | 1.40E+01 |
| Ra226 | 4.22E+03 | 2.78E+02 | 6.63E+03 | 3.73E+05 | 7.56E+05 | 5.08E+03 |
| Pb210 | 2.19E+03 | 3.28E+02 | 7.82E+04 | 1.09E+06 | 1.86E+06 | 2.47E+03 |
| Cm243 | 6.41E+04 | 2.02E+03 | 2.14E+01 | 1.90E+05 | 4.05E+05 | 4.05E+01 |
| Am243 | 1.34E+05 | 3.30E+03 | 2.18E+02 | 2.55E+05 | 5.40E+05 | 4.11E+00 |
| Pu239 | 2.23E+02 | 3.91E+03 | 6.57E+01 | 3.18E+05 | 6.75E+05 | 3.61E+00 |
| U235 | 5.44E+04 | 1.30E+02 | 1.52E+03 | 6.05E+04 | 1.27E+05 | 2.62E+02 |
| Pa231 | 2.46E+04 | 1.07E+04 | 2.17E+02 | 9.07E+05 | 1.92E+06 | 4.73E+01 |
| Ac227 | 1.39E+05 | 9.50E+04 | 9.10E+02 | 1.45E+06 | 2.97E+06 | 6.60E+02 |
| Cm245 | 5.39E+04 | 3.30E+03 | 3.00E+01 | 2.67E+05 | 5.67E+05 | 5.67E+01 |
| Pu241 | 1.17E+00 | 7.15E+01 | 1.24E+00 | 6.10E+03 | 1.30E+04 | 6.93E-02 |
| Am241 | 1.70E+04 | 3.30E+03 | 2.17E+02 | 2.54E+05 | 5.40E+05 | 4.07E+00 |
| Np237 | 1.17E+05 | 1.48E+03 | 2.82E+03 | 1.49E+05 | 2.97E+05 | 7.75E+00 |
| U233 | 2.34E+02 | 1.57E+02 | 1.64E+03 | 6.52E+04 | 1.38E+05 | 2.83E+02 |
| Th229 | 7.10E+04 | 6.21E+03 | 6.57E+02 | 7.10E+05 | 1.32E+06 | 7.79E+02 |
| Cm244 | 4.10E+02 | 1.55E+03 | 1.71E+01 | 1.52E+05 | 3.24E+05 | 3.24E+01 |
| Pu240 | 4.87E+02 | 3.91E+03 | 6.47E+01 | 3.18E+05 | 6.75E+05 | 3.61E+00 |
| U236 | 2.12E+02 | 1.39E+02 | 1.51E+03 | 6.00E+04 | 1.27E+05 | 2.61E+02 |
| U232 | 9.39E+04 | 1.94E+03 | 1.06E+04 | 4.27E+05 | 8.91E+05 | 1.86E+03 |
| Sm151 | 2.82E+00 | 2.80E-01 | 1.23E+01 | 1.26E+02 | 2.65E+02 | 2.65E-02 |
| Cs137 | 1.46E+02 | 8.66E-01 | 1.66E+04 | 1.84E+04 | 3.51E+04 | 1.44E+03 |
| Cs135 | 2.06E+01 | 1.55E-01 | 2.63E+03 | 2.95E+03 | 5.40E+03 | 2.29E+02 |
| I129 | 2.47E+03 | 1.24E+00 | 1.17E+05 | 1.40E+05 | 2.97E+05 | 1.47E+04 |
| Sn126 | 1.10E+06 | 1.92E+00 | 9.83E+03 | 6.54E+03 | 1.27E+04 | 6.67E+01 |
| Sn121m | 2.49E+03 | 3.20E-01 | 1.10E+03 | 7.29E+02 | 1.03E+03 | 7.41E+00 |
| Ag108m | 8.60E+05 | 5.61E-01 | 2.22E+02 | 2.94E+03 | 6.21E+03 | 1.53E+00 |
| Pd107 | 0.00E+00 | 2.45E-02 | 3.84E+00 | 5.91E+01 | 9.99E+01 | 5.34E+00 |
| Tc99 | 2.18E+00 | 1.48E-02 | 5.52E+01 | 2.66E+03 | 1.73E+03 | 4.03E+00 |
| Mo93 | 1.38E+03 | 2.44E-02 | 3.15E+02 | 6.39E+03 | 8.37E+03 | 1.02E+02 |
| Nb94 | 9.29E+05 | 8.00E-01 | 5.67E-02 | 2.28E+03 | 4.59E+03 | 1.01E-02 |
| Zr93 | 2.63E+02 | 8.15E-01 | 4.28E-02 | 1.41E+03 | 2.97E+03 | 9.49E-03 |
| Sr90 | 1.64E+03 | 1.42E+00 | 7.00E+03 | 5.75E+04 | 7.56E+04 | 1.59E+03 |
| Se79 | 1.18E+01 | 2.23E-01 | 1.83E+03 | 3.82E+03 | 7.83E+03 | 1.61E+02 |
| Ni63 | 0.00E+00 | 3.58E-02 | 1.98E+01 | 2.16E+02 | 4.05E+02 | 3.55E+01 |
| Ni59 | 0.00E+00 | 1.17E-02 | 8.33E+00 | 9.07E+01 | 1.70E+02 | 1.49E+01 |
| Cl36 | 1.88E+01 | 2.41E-02 | 1.89E+03 | 8.32E+03 | 2.51E+03 | 6.54E+02 |
| C14 | 0.00E+00 | 0.00E+00 | 4.25E+02 | 1.89E+03 | 1.57E+03 | 2.15E+01 |