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*TL authenticity dating of art objects since 1977*

Mr. Steven Courtemanche  
Nuclear Materials Safety Branch 1  
475 Allendale Road  
King of Prussia PA 19406

July 19, 2008

Dear Mr. Courtemanche;

Following up on your phone call inspection of last Monday, I hope to provide the information you need to close out the process. I was away during the middle of the week, so was unable to respond sooner.

**Physical inventory:**

Normally when the sources I possess are in use, I confirm their presence at least every week. Due to my ill health at the beginning of this year, they were put into storage in mid-February, and taken out just on July 15 for leak testing to be able to confirm their presence. I can confirm that the Sr-90 and Am-241 sealed sources are all in order, as well as the Sr-90 wipe test standard on that date.

**Leak testing:**

The last leak testing in 2007 was on December 27. No activity for either sealed source was detected in the wipe. I made another wipe on July 15, 2008 upon taking the sources out of storage, with the same result. See method below.

**Method:**

An alpha counter Daybreak Nuclear model 583 was used with a ZnS scintillator disk, set up for 85% counting efficiency of Th in thick source form. Under this calibration in the thin source case, (and 2 $\pi$  geometry) 0.005 uCi (185 Bq) will be counted as about 95 counts/sec, or 5700 counts/min. A null result for an alpha wipe I consider to be under 1 count/min.

Beta wipes are done similarly, using an NE102 plastic scintillator foil mounted on an acrylic disk. The counter HV is raised till betas from the check source are reliably counted. My check source is 0.00756 uCi as of 1977 or 0.0037 uCi today. Counter gain is typically set for about 1000-2000 counts/min detection of this source. Background counts are primarily due to electrical noise and generally are about 20-40 per minute. The wipe is then counted, and net counts have always been 0 +/- 20 counts, a result I consider to be a null measurement.

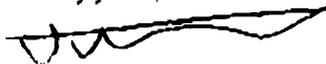
**Personnel dosimetry:**

LiF chip TL dosimeters (two in a plastic capsule) are stored on the lab bench about 50 cm from the beta irradiator, hence are an overestimate of personnel exposure. I typically spend 5-15 hours per week in that lab room, and only part of that as close to the irradiator as the dosimeters.

2007 was typical with 140 mR total exposure for the year, but 2003 was considerably higher at 550 mR. This was when I had moved locations and had for four months placed the dosimeters atop an electronics enclosure with a clear view of the irradiator not shielded by the lead bricks placed around it and only 40 cm away.

I hope that this information suffices for your purposes.

Sincerely yours,



Victor J. Bortolot, Ph.D.  
President and RSO