

September 24, 2012

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Dear Mr. Bramnik,

This letter constitutes Eastern Michigan University's response to the four open items you identified on your recent (18 September 2012) inspection of Eastern Michigan University's radiation safety program. Each of the four points and the relevant response is listed below:

- 1) Provision of an expanded sealed source inventory to include sealed sources currently or originally contained inside of equipment such as liquid scintillation counters, and labeling each sealed source as an exempt or non-exempt quantity (10 CFR 18, limits specified in 10 CFR 30.71 Schedule B).

I have attached an updated sealed source inventory spreadsheet which includes sealed sources currently or originally contained inside of equipment such as liquid scintillation counters, and (as far as possible) indicates whether each sealed source is an exempt quantity.

Please note that the instrument source inventory includes one missing source, which was originally held in a Searle Delta 300 liquid scintillation counter. There is some discrepancy as to whether this instrument (including source) was placed into storage at EMU or has been removed from campus (source would have remained at EMU). In any case, I have been unable to locate this instrument/source, or any waste disposal records for this source. I have not been able to locate the technical specifications on EMU's Searle Delta 300, nor have I been able to obtain factory specifications from the manufacturer. My understanding of the company history is that Searle was purchased by Amersham, which was later purchased by GE. I have requested technical information from the GE Life Science technical service center via telephone, but have not yet received any response. However, this brand and model of instrument has been reported to use a Ba-133 source (see equipment inventory in US Army Center for Health Promotion and Preventative Medicine. 1997. *Historical Data Review Walter Reed Army Institute of Research*; I can supply this document as a PDF file if you would like). A typical amount of Ba-133 used in an individual liquid

scintillation counter would be  $< 20 \mu\text{Ci}$ , so I am confident that this loss is sufficiently small (less than 10 times the value of  $100 \mu\text{Ci}$  listed for Ba-133 in 10 CFR 20 Appendix C, i.e., less than  $1000 \mu\text{Ci}$  of Ba-133) to not require reporting to the NRC, as per 10 CFR 20.2201. Inclusion of sources within instruments in the formal source inventory should prevent future losses of this type.

- 2) Provision of additional information on removal of sealed sources from instruments, including dates of removal, isotope and activity of removed sources, and NRC license of the firm that did the on-site removals.

In July 2012, removal of three sealed sources from instruments was performed by David Westfall of Technical Alternatives, a laboratory equipment servicing firm (4220 Varsity Dr., Ann Arbor MI 48108, phone 888 200-7341). These sources were:  $40 \mu\text{Ci}$  of Cs-137, removed from a Beckman Beta-Mate II;  $18.8 \mu\text{Ci}$  of Ba-133 removed from a Packard 2500 TR liquid scintillation counter; and  $10 \mu\text{Ci}$  of Ra-226 removed from a LKB Wallac Rackbeta 1219 liquid scintillation counter. I spoke with Mr. Westfall on 19 September 2012 via telephone. He indicated that Technical Alternatives does not have an NRC license, and that he has been advised by the NRC that his business does not require licensing for such activities. He requested that I pass on his contact information to you, should you wish to communicate directly with him. All three of these sources are stored at EMU. If the source from the Searle Delta 300 was removed, it would have been removed by a (now retired) Technical Alternatives employee, Mr. George Ladd. Additionally, in August 2008, a defective  $30 \mu\text{Ci}$  Cs-137 source was removed from a Beckman LS6500 liquid scintillation counter and replaced with a new  $30 \mu\text{Ci}$  Cs-137 by a service technician, as part of a repair process. The defective  $30 \mu\text{Ci}$  Cs-137 source is currently stored at EMU.

- 3) Provision of additional information regarding Dr. Judd's 2011 request to use radioactive material off-site at Douglas Lake.

I have attached Dr. Judd's original request as a pdf file. Dr. Judd indicated that Dr. Regan (EMU RSO in 2011) did not approve her original request. However, Dr. Regan, in conjunction with Mark Driscoll (University of Michigan RSO) and Dennis Palmieri (UM Health Physicist), did approve a series of transfers between EMU and UM. EMU transferred small amounts of material ( $< 0.4 \mu\text{Ci}$  C-14 per transfer, 3 total transfers) to UM. Dr. Judd and her UM collaborators then used this material for laboratory experiments at the UM Biological Station (located on the shore of Douglas Lake). The material was then transferred back to EMU, where Dr. Judd completed her sample processing and sample analysis in EMU facilities approved for radioisotope use. I have attached a PDF file containing the transfer approvals and relevant email communications from all involved parties. I will append these records to Dr. Judd's original request, to prevent any future confusion regarding approval of off-site use of material.

- 4) Provision of wipe test records for Dr. Judd's recorded uses in 2011, including reconciliation of wipe test dates with recorded dates of use.

Dr. Judd had stored these records in her office, instead of the radiation laboratory record book. She has now added these records to the appropriate section of the radiation laboratory record book. No EMU laboratory wipe test was conducted for the last "use" date, because Dr. Judd and her colleagues did not conduct the experiment originally planned for this date, and thus Dr. Judd had no samples to process in the EMU laboratory (see email from Dr. Judd on page 15 of the attached pdf file). I have discussed with Dr. Judd the need to deposit records in appropriate locations, so as to prevent future confusion. The apparent discrepancy between the dates of use and the wipe tests reflects the time interval between the transfer to UM (recorded as the use date) and the completion of Dr. Judd's sample processing at EMU/subsequent post-experiment wipe test of the EMU laboratory.

I hope that this response has provided you with the information necessary to complete your inspection report. Please feel free to contact me if any further information would be helpful.

Sincerely,



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