AbstractID: 13321 Title: Medical Radionuclide Impurities in Wastewater

Purpose: NCRP report No.160 states medical exposure constituted nearly half of the total radiation exposure of the US population from all sources in 2006. This increase in exposure is due partly to the rise in nuclear medicine procedures. With this observed growth in medical radionuclide usage there is an increase in the radionuclides being released into wastewater after the procedures. Often medical radionuclides are not exactly 100% radionuclide pure due to the process in which the nuclide is produced, but must meet certain standards of purity. The longer lived radionuclide impurities associated with these medical radionuclides are of particular interest. The longer lived impurities will have a higher chance of reaching the environment. **Materials and Methods:** A HPGe detector was used to acquire a spectrum of previously used Tc-99m medical syringes as well as a spectrum from a sample of digested sewer sludge. These spectrums were analyzed to identify if and what impurities were present. **Results:** Identified in the Tc-99m syringe spectrum were small amounts of impurities presumably associated with the manufacturing process. Impurities of potentially medical origin were also observed in the digested sewer sludge. **Conclusion:** Although research is ongoing it is conceivable that long lived impurities from nuclear medicine procedures could make it into municipal wastewater and possibly the environment.

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