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May 18, 1994

Secretary of the Commission  
 U.S. Nuclear Regulatory Commission  
 Washington, DC 20555

**SUBJECT:** Advanced Notice of Proposed Rulemaking / Request for  
 Information: Disposal of Radioactive Materials by Release  
 into Sanitary Sewer Systems: FR/Vol.59, No. 38/Friday,  
 February 25, 1994/ 9146-9149.

Dear Mr. Secretary:

Thank you for this opportunity to comment on the above notice.

As a general comment, from the discussion and cases given in the FR Notice, the major reason for considering revising sewer disposal limits appears to be the mere detectability of certain radioisotopes and not to any real or even probable adverse health effects on either STP workers or the general public. This seems to be more and more the standard response of many regulatory agencies. One of the problems of responding in this way is that any realistic exposure or activity release standards automatically become suspect by the general public or special interest groups. From another angle, it becomes more and more difficult for biomedical licensees to assure compliance of medical research and clinical staff to even realistic and necessary radiation safety procedures when that staff observes the constant ratcheting down of radiation regulatory limits below levels that have any scientific meaning.

Concerning the specific subjects listed:

(1) Form of the Material for Disposal --- I am not aware of what effect, if any, sludge bioprocessors would have on reconcentrating radio-labeled buffers/organics commonly used in biomedical research, but I think the NRC should be very skeptical of making regulatory changes because of any theoretical effects. The nature of the vast majority of biomedically used materials disposed of in the sewer system is that upon sewer disposal they almost immediately break down into relatively simple compounds and are readily soluble or dispersible. The activity levels are likely to be very low in any event, even with multiple, localized biomedical institutional releases.

It would be currently be impossible for the University of Texas M.D. Anderson Cancer Center (UTMDACC) to otherwise dispose of our

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water soluble/dispersible radioactive waste/tissue.

There are currently no available commercial disposal options. We are not permitted to incinerate any radioactive material, nor is this likely to occur unless NRC allows current sewer release limits for incineration also. There is not sufficient space available at UTMDACC for storage for decay to background levels (not an option for H-3 or C-14 in any case).

(2) **Total Quantity of Material** --- In terms of actual biokinetics and health risks for the low levels of radio-labeled materials commonly used in medical research (e.g. H-3, C-14, P-32/33, S-35, Cr-51, I-125, etc.), the three current NRC total quantity limits on releases per year are probably too low. However, as a practical matter, these limits should be retained as they are simple to state, understand and document. In my opinion this is much preferable to individual quantity/concentration/form limits for each radionuclide.

The petitioner's request that all licensees provide at least 24 hours advance notice to the appropriate sewer treatment plant (STP) before releasing radioactive material to the sewer system is unnecessary and impractical, certainly in terms of biomedical institutions. UTMDACC releases some small amounts of radioactive material to the sewer system on a daily basis. These activities could probably only be detected, if at all, at the STP by expensive continuing on-line sampling and scintillation counting. I cannot see how this would serve any radiation safety purpose.

However, I would support the petitioner's request that the NRC exempt materials that enter the sewer system waste stream from the requirements regarding NRC approval for incineration under current NRC regulations, certainly with regard to those radioisotopes commonly used in biomedical research. Given the radioisotopes and activities involved, the pathways for human exposure from radioactive wastes seem no more or less significant whether the wastes are dispersed in water or air.

(3) **Type of Limits** --- I think that the most realistic model of exposure from radioactive material released to a sanitary sewer system would be to assume that an individual would always ingest water after the water had passed through the system's STP. Credit should be given to the licensee for any extra water volume this model would provide. From the cases cited there appears to be no significant concentrations of contamination in sewage sludge from radioactive material used in medical research or patients. This is consistent with what one would expect from such radioisotopes and would indicate no significant exposure to STP workers.

I recommend that the NRC not consider a dose limit approach to sewer disposal primarily because the current regulations are

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adequate, particularly concerning radioactive material used in medical research or patients. If a dose limit approach is considered, it should be based on a calculated dose of 500 mrem/year with all of the terms, methods of calculation and report requirements clearly and realistically defined, particularly for biomedical institutions.

(4) **Exemption of Patient Excreta** --- Patient excreta should continue to be exempt from sewer release limits. Again, detectability by no means equates with either actual or even probable significant personal exposure in terms of patient excreta in the sewer system. Although there has been a significant increase in the number of nuclear medicine diagnostic procedures over the years, the use of radioisotopes with much shorter half-lives have mostly replaced longer half-life radioisotopes previously used.

Any attempt to regulate the release of excreta from patients receiving nuclear medicine diagnosis would be totally impractical.

Holding for decay excreta from hospitalized patients receiving nuclear medicine therapy will definitely increase radiation exposures and contamination incidents involving nurses, nuclear medicine technicians and radiation safety personnel. This was our past experience at UTM DACC.

Sincerely,



M. E. Norton  
Radiation Safety Officer