

LSNReviews

From: John Bradbury
Sent: Friday, June 06, 2003 9:16 AM
To:
Subject: RE: TPA Recommendation

Tim and I are going to be discussing questions about the rule and stuff probably including your questions at 10 am in T7F5. Can you make it?

>>> Patrick LaPlante < > 06/05/03 06:46PM >>>
John,

You appear to be recommending consideration of an alternative exposure scenario. This is not merely a technical modeling issue but also involves (as any scenario would) in making speculative policy-related assumptions that may/or may not be consistent with Part 63. For example, where would you be placing the pumping well or wells and where are they located in relation to the land being irrigated? (I can envision a number of possibilities here) and what would be the bases for these assumptions?. Without the details of the scenario or the assumptions you are making, it is difficult to consider how it would be analyzed, evaluate whether it is consistent with the regulations, or whether it presents a significant contribution to risk.

Although I'm presently buried in work testing the TPA code, I would be interested in hearing more about this idea as it is developed further.

Thanks
Pat

-----Original Message-----

From: John Bradbury [mailto:]
Sent: Thursday, June 05, 2003 12:35 PM
To: James Firth
Cc: @cnwra.swri.edu; Larry Campbell
Subject: IPA Recommendation

I am very concerned that the TPA code may be ignoring a potentially important process that could affect risk. The recent study by the USGS entitled "Estimates of Deep Percolation beneath Native Vegetation, Irrigated Field, and the Amargosa-River Channel, Amargosa Desert, Nye County, Nevada" Open File Report 03-104 provides evidence that irrigation can mobilize anions in the unsaturated zone. The study examined chloride, nitrate, and sulfate pore water concentrations, along with water potential, and water content as a function of depth. Under fields using the pivot point irrigation, chloride and nitrate peaks observed in undisturbed soils had been apparently washed down to greater depths. The authors conclude that 8 to 16% of the irrigation water becomes deep percolation.

The current PA modeling efforts suggest that the anions, Tc, and I, are major contributors to dose. These anions should move like those in the study. However, the GENII code, used in TPA, does not consider deep percolation and potential recharge back to the pumped aquifer. Likewise, DOE's TSPA assumes radionuclides will not migrate below irrigated fields to the underlying groundwater aquifer.

Radionuclides in irrigation water not captured by plants or retained in the soil could travel through the unsaturated zone and fall into the capture zone of the well to be brought to the surface again repeatedly. Meanwhile, every year more radionuclides travelling from the repository to the accessible environment could potentially be added to the water pumped to the surface. The recycling of technetium and iodine could result in increased risk.

I speculated on this scenario several months ago. With the evidence provided in this Open File Report that these processes could occur, I suggest we need further studies. The wells studied by USGS were located to the south where the depth to water was approximately 35m. At the accessible environment boundary depth to water is 100m. There are lots of questions needing answers.

Properties Page

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To:

Subject: RE: TPA Recommendation

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