

August 27, 2009

Mr. Thomas E. Magette, P.E.  
Senior Vice President  
Nuclear Regulatory Strategy  
EnergySolutions, Inc.  
423 West 300 South, Suite 200  
Salt Lake City, Utah 84101

SUBJECT: BLENDING OF LOW-LEVEL RADIOACTIVE WASTE

Dear Mr. Magette:

I am writing in response to your letter of May 12, 2009, in which you provided your views on a number of low-level radioactive waste (LLRW) topics for consideration by the Commission. We appreciate your comments on these issues, and, like others we received in connection with the April 17, 2009 Commission meeting on the LLRW program, we will consider them as we implement our LLRW program. I would, however, like to discuss the issue of blending, that is, the mixing of LLRW of different concentrations into a homogenous mixture, since your letter and other stakeholders have encouraged us to clarify our position on this issue.

The practice of blending is not prohibited nor is it explicitly addressed by the U.S. Nuclear Regulatory Commission (NRC) regulations. NRC specifically acknowledges in its guidance that blending of homogeneous wastes is appropriate under certain conditions. Your letter notes that the NRC's regulations (10 CFR, Part 20, Appendix G, Section III.A) allow waste generators to defer classifying waste until the time that waste is ready for disposal and do not require generators to classify waste before it is shipped from a generator to a processor. In practice, generators often classify waste before it is shipped for disposal, even though waste classification need not occur until the waste is ready for disposal. The 10 CFR 61.55 waste classification tables are predicated solely on protection of an inadvertent intruder into waste at a disposal facility at some future time after the disposal facility is closed. The classification of the waste in accordance with 10 CFR 61.55 is not directly related to the safety of the waste at intermediate points in its management.

While NRC regulations do not prohibit blending, NRC staff has at times discouraged blending in its guidance. NRC's 1995 "Final Branch Technical Position on Concentration Averaging and Encapsulation" (BTP) includes in an appendix staff responses to public comments received on the draft BTP. The appendix states that wastes should not be intentionally mixed solely to lower the waste classification. In another guidance document, "Consolidated Decommissioning Guidance" (NUREG-1757, Volume 1, Revision 2), NRC staff states that mixing of soils to meet the waste acceptance criteria of an offsite disposal facility "should not result in lowering the classification of the waste . . . ." Blending does not increase waste volumes and, as defined by NRC staff, involves materials that are disposed of, not released to the general environment. In comparison, dilution, i.e. the mixing of clean and contaminated materials, has also been discouraged by the staff. Dilution increases waste volumes and may facilitate the release, however small, of contaminated materials to the general environment, where members of the public could be exposed to the hazard. The staff has not always clearly differentiated between

dilution and blending in its guidance, even though the impacts may be significantly different, as noted above.

NRC guidance is generally consistent with the position of other regulatory organizations that blending and dilution are not prohibited, but are discouraged in certain circumstances and acknowledged as appropriate in others.<sup>1</sup> For example, the BTP notes that blending of homogeneous media such as resins and filter media resulting in worker dose reductions or operational efficiencies is not included in its recommendations that limit the amount of blending. Similarly, the decommissioning guidance allows for blending to reduce the classification of the waste from licensable material that must be disposed of in a licensed disposal facility to exempt material suitable for disposal in landfills. This decommissioning guidance also recognizes that mixing of clean and contaminated soils may be appropriate under certain very limited circumstances to meet the dose standard in 10 CFR Part 20, Subpart E. Agreement States are not required to use NRC guidance, but often adopt it for use in their regulatory programs.

I would like to address two final issues. First, if a licensee submits a license amendment request that involves blending of wastes, the acceptability of that request would have to be determined by NRC or the appropriate Agreement State regulator. NRC's guidance on this topic is one way for a licensee to demonstrate compliance with the regulations. Conditions may need to be included in the license to ensure protection of public health and safety during processing and after disposal. A licensee may need to submit an amendment request that involves blending when, for example, the location for such processing is changed or there are modifications to previously approved procedures. NRC licensees could ship waste for processing, including blending, if it is being sent to a licensed facility authorized to perform these activities. Second, NRC intends to revise the BTP. This effort was one of the priority tasks identified in the staff's 2007 LLRW Strategic Assessment.<sup>2</sup> While the positions described in this letter are applicable now, revisions could be forthcoming which would further elaborate on some of the issues discussed in this letter. In fact, the staff believes that such clarification would be both worthwhile and appropriate given the current waste management conditions.

I trust this response clarifies our position. If you have any questions, please call me at (301) 415-7437.

Sincerely,

**/RA/**

Larry W. Camper, Director  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

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<sup>1</sup> SECY-04-0035, "Results of License Termination Rule Analysis of the Use of Intentional Mixing of Contaminated Soil," summarizes these organizations and their positions.

<sup>2</sup> SECY-07-0180, "Strategic Assessment of Low-Level Waste Regulatory Program"

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