

January 20, 1998

FOR: The Commissioners

FROM: L. Joseph Callan /s/  
Executive Director for Operations

SUBJECT: PETITION FOR ENVIROCARE OF UTAH TO POSSESS SPECIAL NUCLEAR MATERIAL IN EXCESS OF CURRENT REGULATORY LIMITS

**PURPOSE:**

To inform the Commission of the staff's assessment of the Envirocare of Utah, Inc. (Envirocare) petition for rulemaking, which would exempt low-specific activity (LSA) waste containing special nuclear material (SNM) from the SNM possession limits specified in [10 CFR Part 150](#). This paper also responds to the Commission's December 12, 1997, Staff Requirement Memorandum, SECY 97-240, "Proposed Rulemaking Activity Plan," item 8.

**BACKGROUND:**

Envirocare disposes of low-level waste (LLW) and mixed low-level radioactive waste pursuant to a license from Utah for disposal of source and byproduct materials, and SNM in quantities less than sufficient to form a critical mass. SNM in quantities not sufficient to form a critical mass is defined by Nuclear Regulatory Commission regulations as quantities not exceeding 350 grams of uranium-235 (U-235), not exceeding 200 grams of U-233, and not exceeding 200 grams of plutonium. This quantity limit has been applied to above-ground possession. It has not been applied to waste that has been disposed of or has been placed into an active disposal unit. Thus, Envirocare cannot possess greater than 350 grams of U-235 above ground under its Utah license, no matter how low the concentration. It must apply for and obtain an NRC license to possess larger quantities. In October of 1992, Envirocare submitted a two-page petition for rulemaking to redefine "critical mass," in [10 CFR Part 150.11](#), to exclude LSA waste containing SNM.

Further background is provided in [Attachment 1](#). The background briefly describes the Envirocare facility; the basis of SNM regulation; the petition, including public comments and staff actions to date; and the recent interactions with Envirocare and the State of Utah, regarding Envirocare's exceeding the SNM possession limits in its State license and its submission of a [10 CFR 70](#) license application.

**DISCUSSION:**

In evaluating the petition, staff has come to the view that a categorical exemption for LSA waste containing SNM, without imposing any criticality safety restrictions, would not provide adequate assurance of criticality safety. The staff's reasons for this conclusion are discussed below. Staff also identified additional issues, that while not directly related to the petition request, warrant further consideration. These issues are also discussed below.

The Envirocare petition would apply to SNM-bearing wastes that require treatment before disposal (mixed waste) and wastes that do not require treatment (LLW). Staff explored the practicality of establishing a concentration limit for both treated and non-treated wastes. Because of the concern that SNM could be concentrated during mixed-waste processing, criticality safety could not be assured solely with a concentration-based limit. Process controls, such as a batch mass limit, would be required to ensure criticality safety. Because these controls could be treatment-specific, staff reached a preliminary conclusion that establishing a concentration limit for mixed waste is not a generic issue suitable for rulemaking. Therefore, the petition should not be granted with respect to mixed waste. Rather, the safety of mixed waste requiring treatment should be addressed through site-specific licensing.

As discussed in [Attachment 1](#), staff examined the safe concentration for untreated soil-like wastes containing 100 percent enriched uranium, 10 percent enriched uranium, and plutonium. These analyses assumed a homogeneous distribution of SNM, spherical geometry, and optimal moderation. The analyses did not explore the effects of heterogeneity, waste forms other than soil, effects of arrays, and the effects of mixtures of SNM. Staff identified three parameters (homogeneity, enrichment, and super moderators) that would need to be controlled to establish a concentration-based limit without control of the total mass of SNM.

Criticality benchmark studies for fuel fabrication activities have shown that certain configurations of heterogeneous distributions of SNM are inherently more reactive than homogenous configurations. Although these studies have not been performed for SNM in waste, it is reasonable to assume that heterogeneity of SNM in waste would have a similar effect on the reactivity. Considering that much of the waste Envirocare receives is decommissioning waste, and that the waste is removed from its container during disposal, it cannot be assumed that the SNM will be or remain homogeneously distributed. Therefore, assuming a homogeneous distribution of SNM in the waste is not considered to be realistic nor necessarily conservative. Significant additional study would be required to evaluate the effects of heterogeneity. The effects of variations in enrichment could be bounded by assuming 100 percent enrichment. Alternatively, analyses to calculate a concentration limit could be performed for a number of enrichments. The effects of super moderators, such as beryllium or graphite, have also not been examined. The presence of super moderators can significantly increase the criticality hazard. In response to safety concerns raised by Babcock and Wilcox, NRC regulations on shipments of certain fissile material were recently revised to limit beryllium and other special moderating materials in the shipments (62 FR 5907). Staff is initiating research to assist in evaluating the role of unusual moderators in the LLW disposal system to determine their effect on the potential to develop a critical mass. In view of these unaddressed safety issues, the staff has an insufficient technical basis to establish a generic concentration limit for untreated LLW.

In summary, the staff's view at present is that the petition cannot be granted with respect to SNM wastes requiring treatment. In addition, the staff believes there is not, at present, a sufficient technical basis to support the petition with respect to untreated waste. Staff plans to notify the petitioner by

letter ([Attachment 2](#)) and offer it the opportunity to provide additional technical bases to support the petition.

In evaluating the petition, staff identified several additional potential criticality safety issues that warrant further consideration. The SNM mass limits in 10 CFR Part 150 have been applied to above-ground possession. The limits do not apply to waste that has been disposed of or placed into an active disposal unit. Emplacement criticality safety is addressed in 10 CFR 61.16(b)2, which requires licensees to describe proposed procedures for avoiding accidental criticality for both storage and emplacement. However, this portion of 10 CFR Part 61 is not a compatibility requirement for Agreement States. Under the existing compatibility policy, this requirement is reserved to NRC based on the view that Agreement States would not need to consider criticality safety.

Currently, SNM-bearing LLW is disposed of at three facilities (Envirocare's Clive, Utah, facility; U.S. Ecology's Hanford, Washington, facility; and Chem-Nuclear's Barnwell, South Carolina, facility). Until recently, the Hanford and Barnwell facilities were licensed by NRC under Part 70, to possess and dispose of quantities of SNM exceeding the 10 CFR Part 150 mass limits. In 1997, these facilities requested that the SNM possession limits be reduced to the 10 CFR 150.11 limits and that the NRC licenses be transferred to the respective Agreement States. These actions have been taken for both licensees. The State of Washington incorporated NRC criticality controls for emplaced waste in license conditions in its Hanford license; however, the Barnwell license does not address criticality safety beyond the 10 CFR Part 150 mass limits. Recommended criticality safety criteria for LLW disposal facilities are contained in "Criticality Safety Criteria for License Review of Low-Level Waste Facilities" (NUREG/CR-6284). Because 10 CFR 61.16(b)2 is not a matter of Agreement State compatibility, there is no regulatory requirement for Agreement State licensees to evaluate emplacement criticality safety. To address this issue, staff plans to develop guidance on emplacement criticality safety, which could be used by Agreement States for existing and proposed LLW disposal facilities. In conjunction with guidance development, staff also plans to reexamine the compatibility category assigned to 10 CFR 61.16 and discuss these concerns with affected Agreement States, as appropriate. Staff will consult with the Commission prior to initiating such discussions. If the compatibility category of section 61.16 is changed, this approach could represent a major policy shift where some aspects of criticality safety would be the responsibility of Agreement States. The staff recognizes that such a change could impact the progress of LLW disposal facility development in California, Nebraska, Texas, and other States. Additional evaluation of this issue by the Offices of State Programs, Nuclear Material Safety and Safeguards, and the General Counsel (OGC) is required. Staff will keep the Commission informed of this evaluation.

Staff also identified that the concentration limit for U-235, specified in the Envirocare license issued by the State of Utah, may not provide adequate assurance of emplacement criticality safety for large quantities of highly enriched uranium. This issue is not deemed an immediate safety concern because an analysis performed by Oak Ridge National Laboratory (NUREG/CR-6505) did not show emplacement criticality to be a concern based on a review of waste disposal records from 1988 to 1993. However, the volumes, enrichment, and mass of enriched uranium in the waste have changed significantly since completion of the analysis in 1995. After developing guidance on emplacement criticality safety, staff will evaluate the U-235 concentration limit in the context of the guidance before discussing this issue with the State of Utah.

Staff also has initiated longer-term efforts involving potential post-disposal criticality safety. As discussed in [Attachment 1](#), staff conducted two studies that explored the hydrochemical conditions by which SNM could be mobilized in the future, and be concentrated to form a critical mass. The study performed for the Envirocare site concluded that the likelihood of criticality at the historic disposal masses and enrichments is remote, but that the likelihood of future criticality is greater if the material is disposed of at license limits, without control of enrichment. The studies did not address the interaction of mixtures of SNM nor determine quantitatively the probability of occurrence. Reconcentration of SNM is not considered an immediate health and safety issue because the geochemical processes take thousands of years to redistribute the uranium. Staff is initiating research to define a methodology for quantifying the risk and identifying concentration thresholds for various risk levels, to recommend criteria to conduct evaluations on a site-specific basis, and to assess the need for related changes to applicable regulations.

#### RESOURCES:

The Fiscal Year 1998 budget does not include resources for developing the guidance concerning emplacement criticality safety. The resource estimate is under development. The staff anticipates completing this proposal as part of a broader proposal to consider reprogramming resources to support review of Envirocare's license application under 10 CFR Part 70 in February 1998.

#### COORDINATION:

This paper has been coordinated with OGC. OGC has no legal objection to this paper. The Office of the Chief Financial Officer has reviewed this Commission Paper for resource implications and has no objections.

#### CONCLUSIONS:

The staff plans to take the following actions regarding the Envirocare petition and related matters:

1. Send a letter ([Attachment 2](#)) to Envirocare requesting additional information to support the petition.
2. Identify the resources needed to develop guidance on emplacement criticality safety, which could be used by Agreement States for existing and proposed LLW disposal facilities.

Review the compatibility category assigned to 10 CFR 61.16(b)2). The staff will consult with the Commission concerning the results of this reexamination before initiating discussions with affected Agreement States.

3. Continue research in post-disposal criticality of LLW.

CONTACT:	Tim Harris, NMSS/DWM (301) 415-6613
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Attachments: 1. Envirocare Background  
2. Draft letter to Envirocare

ATTACHMENT 1

## ENVIROCARE BACKGROUND

- WASTE DISPOSAL OPERATIONS
- REGULATION OF SPECIAL NUCLEAR MATERIAL
- PETITION FOR RULEMAKING
  - Contents of Petition
  - Initial Resolution Approach
- RECENT ENFORCEMENT ACTIONS

This background includes discussions of waste disposal operations at the Envirocare of Utah, Inc. (Envirocare) Clive, Utah facility, regulation of special nuclear material, Envirocare's petition for rulemaking, and recent enforcement actions.

### WASTE DISPOSAL OPERATIONS

Envirocare operates a low-level waste disposal facility in Clive, Utah. This facility is licensed by the State of Utah, an Agreement State, under a 10 CFR Part 61 equivalent license. In 1988, Envirocare began accepting naturally occurring radioactive material (NORM) waste. In 1992, Envirocare began accepting mostly decommissioning waste (contaminated building debris and soil). Over the past several years, the types of waste which Envirocare receives has changed. In 1996, Envirocare was authorized to accept dry active wastes, and ion exchange resins. These wastes are no longer generated almost exclusively from decommissioning sites but include wastes from reactor and fuel cycle facilities. Some of the Special Nuclear Material (SNM) waste from fuel fabrication and enrichment facilities is highly enriched. Moreover, the quantity of SNM that Envirocare has received has increased over time from approximately 16.6 kg in 1994 to 58.9 kg in 1995 and 57.5 kg in 1996. Envirocare is also licensed by Utah to dispose of mixed radioactive and hazardous wastes. In 1996, SNM in mixed waste accounted for an additional 121.9 kg. This is contrasted with Barnwell and Hanford facilities which disposed of 2.1 kg and 1.5 kg of SNM, respectively, in 1996. In addition, Envirocare has a U.S. Nuclear Regulatory Commission license to dispose of waste containing 11.e.2 by product material.

Envirocare receives wastes by rail and truck. Envirocare's method of disposal is to remove the waste from its container or dump bulk waste into lifts and compact the material. Subsequent lifts of material are placed above completed lifts. The Envirocare license permits an average U-235 concentration limit 770 pCi/g of soil at the time of disposal. By procedure, Envirocare can receive waste with concentrations up to ten times the average concentration limit. In these cases the waste is blended with soil until the average concentration limit is met in the lift of the disposal embankment. For soil-like wastes, Envirocare verifies adherence to the average concentration limit by sampling and testing at a specified frequency. In addition to disposing of certain types of LLW, Envirocare also treats and disposes of mixed wastes. For mixed waste requiring treatment to meet hazardous waste disposal requirements, Envirocare conducts bench scale treatability tests. These tests are somewhat a trial and error process and may take several weeks to complete. Following a satisfactory treatability study, the results are submitted to Utah for seven days prior to treating the waste. NRC staff understands that most of Envirocare's problems with SNM possession limits are in the mixed waste area and are a result of the time involved in the treatment and waste acceptance processes. Because the SNM-bearing mixed waste undergoing treatment approaches the total SNM inventory limit, the time required for treating the mixed waste effectively limits the rate at which any SNM-bearing waste can be received.

### REGULATION OF SPECIAL NUCLEAR MATERIAL

As defined in the Atomic Energy Act, Section 274(b)4, the Commission is authorized to enter into agreements with States with respect to regulatory authority over SNM in quantities not sufficient to form a critical mass. This authorization is codified in 10 CFR Part 150, "Exemptions and Continued Regulatory Authority in Agreement States and in Offshore Waters Under Section 274." Specifically, 10 CFR 150.10 exempts persons in Agreement States, who receive, possess, or use SNM, from obtaining an NRC license for quantities of SNM not sufficient to form a critical mass. NRC requirements in Part 150.11 defines a critical mass quantity as 350 grams of U-235, 200 grams of U-233, or 200 grams of plutonium. The unity rule also applies for combinations of SNM. This definition applies to SNM above-ground, prior to disposal. In accordance with 10 CFR 61.16(a), SNM that has been disposed is not counted towards a site's possession limit. Licensee possession of quantities of SNM in excess of the Part 150 limits is regulated by the NRC. Envirocare's low-level waste (LLW) disposal license, issued by the State of Utah, limits SNM to quantities specified in 10 CFR Part 150.11.

### PETITION FOR RULEMAKING

#### CONTENTS OF PETITION

Envirocare filed a two-page petition for rulemaking with the NRC on October 21, 1992 (Attachment A). The petition requested a rulemaking to establish

a categorical exemption from the SNM mass limits in Part 150 for persons generating or disposing of low-specific activity (LSA) waste contaminated with SNM. Envirocare has been receiving large volumes of decommissioning waste that contain quantities of low-concentration SNM that approached the 350-gram limit for uranium-235 (U-235), the principal SNM radionuclide of concern to Envirocare. The facility's U-235 possession limit specified in its Agreement State license is 350 grams. This limit restricts the rate at which Envirocare can receive SNM shipments. As justification for the petition, Envirocare stated that for waste material containing diffuse SNM, no accidental or purposeful acts could cause a criticality incident. The petition was noticed in the Federal Register on February 22, 1993 (58 FR 9552).

Two comments on the petition were received. One, in general, supported the petition. The other commented that the intent of the petition was to attempt to avoid being regulated by NRC, and to shift the tasks of criticality analysis and safety evaluation from the prospective licensee to the regulating body.

In furtherance of its petition request, Envirocare has submitted two letters (dated July 15 and August 11, 1997) (Attachments B and C) requesting expedited rulemaking and/or an exemption from Part 70 licensing requirements.

#### INITIAL RESOLUTION APPROACH

In evaluating the petition, staff initially proposed to pursue a rulemaking which would be based on a safe U-235 concentration in soil such that a licensee could be authorized to possess an unlimited quantity rather than granting a blanket exemption for all LSA contaminated with diffuse SNM as requested by Envirocare. Staff also planned to examine the possible reconcentration of SNM in the waste soil after disposal. In addition to revising 10 CFR 150.11, this proposed rulemaking would have revised 10 CFR 70.24(a) to exempt such waste from criticality accident requirements.

After further examination of the resources associated with the proposed rulemaking, staff analyzed the costs and benefits of several alternatives. Following this analysis, the option of issuance of an order under Section 274f of the Atomic Energy Act was presented to the Commission in a memorandum dated November 13, 1995. The order would have exempted Utah and Envirocare from the SNM mass limits in Part 150 and would have specified a safe soil concentration limit for Envirocare.

The staff briefed the Chairman on this alternative on February 6, 1996. The Chairman, in a memorandum dated February 7, 1996, stated that she had no objections to the staff's proposal and directed the staff to complete its analysis of determining the safe SNM concentration limit for diffuse waste before proceeding. This included the potential for reconcentration of SNM after disposal.

**The staff calculated safe soil concentration limits for U-235 enriched to 100 percent and 10 percent and for plutonium.** These initial calculations assumed an optimally moderated and reflected sphere with a homogeneous distribution of SNM. A factor of safety of five was used to estimate a "safe" soil concentration. The results of staff calculations and the State of Utah license concentration limit are as follows. The impact of these calculations is discussed in the Commission paper.

	<b>U-235; enrichment 100 percent</b>	<b>U-235; enrichment 10 percent</b>	<b>Plutonium</b>
Staff Calculated	400 pCi/g	8,600 pCi/g	5 Ci/g
State of Utah License Limit	770 pCi/g	770 pCi/g	1 - 3.5 nCi/g

It is significant to point out that Envirocare's procedures currently allow for SNM concentrations in waste received for disposal to substantially exceed the safe soil concentrations derived by the NRC staff. Although exceeding these limits are theoretically possible, Envirocare's possession limit of 350 g U-235 and procedures for ensuring average concentrations in the waste provide sufficient assurance that Envirocare's emplacement of waste will not pose immediate criticality safety hazards. Over the longer term however, NRC staff will address this issue in developing guidance and addressing emplacement criticality concerns.

In addition, the staff completed an SNM reconcentration study of the Envirocare site (performed under NRC contract by Oak Ridge National Laboratory) in June 1997 (Attachment D). This study examined the hydrochemical conditions by which the SNM could be mobilized in the future and be concentrated to form a critical mass and geometry. While this study indicates that the likelihood of criticality at the historic disposal masses and enrichments is remote, the likelihood of future criticality is greater if the material is disposed at the limits specified in the Envirocare license, without control of enrichment. This study was limited to criticality of U-235 and did not consider U-233, plutonium, or interaction of all fissile material (SNM).

A similar study of the Chem-Nuclear Systems, Inc., Barnwell, South Carolina facility was also conducted. This study is being finalized and is expected to be published in early 1998. The two studies indicate that the hydrochemical conditions which mobilize and concentrate the uranium are significantly different among sites.

#### RECENT ENFORCEMENT ACTIONS

On May 15, 1997, the State of Utah conducted an inspection of the Envirocare facility that found Envirocare in possession of significantly greater quantities of SNM than were permitted by its State license and Part 150. NRC conducted its own inspection and issued a Confirmatory Order on June 25, 1997, which required Envirocare to stop receiving SNM waste until its SNM inventory was reduced below the Part 150 limits. Envirocare was also required to submit a compliance plan for continued compliance with Part 150. Envirocare reported that it had achieved compliance on July 18, 1997, and the staff approved Envirocare's compliance plan for future operations on August 1, 1997. The compliance plan limits Envirocare to the possession limits

within the restricted area to the Part 150 limits with the exception of trucks that proceed directly to the disposal cell for immediate disposal.

As a result of this violation, the staff has had several meetings with Envirocare in the past months to discuss the SNM possession issue. On December 5, 1997, Envirocare submitted an application to NRC, for a license under Part 70 to receive, possess, store, process, and transfer larger quantities of SNM-bearing waste. Staff is currently conducting an acceptance review of the application and plans to complete the acceptance review in February. Because this is an unbudgeted activity, the technical review of the application in FY98 will be subject to reprogramming of resources, which will be reviewed by the Program Review Committee.

Attachments:           A. Envirocare petition request (10/21/92)  
                              B. Envirocare 7/15/97, ltr  
                              C. Envirocare 8/11/97, ltr  
                              D. "The Potential for Criticality Following Disposal ..." (NUREG/CR-6505)

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ATTACHMENT 2

Charles A. Judd, President  
Envirocare of Utah, Inc.  
46 West Broadway, Suite 240  
Salt Lake City, UT 84101

SUBJECT:               EVALUATION OF RULEMAKING PETITION AND EXEMPTION REQUESTS

Dear Mr. Judd:

This letter relates to your petition request, dated October 21, 1992, which requested a rulemaking to include a categorical exemption from the special nuclear material (SNM) mass limits in 10 CFR 150 for persons generating or disposing of low specific activity (LSA) waste containing SNM not capable of forming a critical reaction. This letter also addresses your letters dated July 15, and August 11, 1997, to Chairman Jackson which requested that the rulemaking be expedited and that an exemption from the 10 CFR 70 licensing requirements be granted.

The petition requests a categorical exemption from the SNM mass limits in 10 CFR Part 150 for LSA waste containing SNM. In evaluating the petition, staff has come to the view that a categorical exemption for LSA waste containing SNM without imposing any criticality safety controls would not reasonably preclude accidental criticality. However, staff considered that the intent of the petition could be granted if a concentration limit could be developed that considered all factors affecting criticality. Because the SNM possession limits in Part 150 apply to all SNM at a facility and because licensees such as Envirocare of Utah, Inc. (Envirocare) may receive SNM-bearing wastes which require treatment prior to disposal (mixed waste) and wastes that do not require treatment [low-level waste (LLW)], staff explored the practicality of establishing a concentration limit for treated wastes and non-treated wastes.

Staff's present view is that a generic concentration limit could not be established for treated wastes (mixed wastes). Whereas a concentration limit could be verified and controlled before and after processing, SNM concentration control during processing appears questionable. Considering that accidental criticalities occur very quickly and without warning, and that SNM concentration could change during processing, criticality safety does not appear to be assured solely with a concentration-based limit. Process controls, such as a batch mass limit, would seem to be required to ensure criticality safety. Because these controls could be treatment specific, establishing a concentration limit for mixed waste does not appear to be a generic issue suitable for rulemaking. In addition, new treatment processes could be developed over time that would need to be evaluated to determine if there are any associated criticality safety concerns. Therefore, in view of the foregoing, staff is inclined to believe that criticality safety for treated waste (mixed waste) in excess of the Part 150 limits would be better addressed through site-specific licensing. The SNM mass limits in Part 150 are considered protective for mixed waste treatment to prevent inadvertent criticality regardless of concentration. Thus, unless Envirocare has technical data or arguments that would cause the staff to reconsider the above, staff is not inclined to support granting the petition for mixed waste.

Staff also examined the practicality of establishing a concentration-based limit for non-treated wastes (LLW). Staff performed a series of initial criticality calculations for SNM in soil-like waste. As noted in your August 15, 1997, letter, the results of these calculations were presented in NUREG/CR-6505 Vol. 1, "The Potential for Criticality Following Disposal of Uranium at Low-Level Waste Facilities." These analyses assumed a homogeneous distribution of SNM, spherical geometry, and optimal moderation. However, after further evaluation, staff's present view is that these assumptions are not adequately bounding to serve as a generic basis for rulemaking.

Staff found that several factors in addition to concentration need to be considered. These factors include enrichment, homogeneity, and the effects of super moderators. The effects of variations in enrichment could be bounded by assuming 100 percent enrichment. However, this approach may be overly restrictive. Alternately, analyses to calculate a concentration limit could be performed for a number of enrichments. Assuming a homogeneous distribution of SNM in the waste is not considered to be realistic or conservative. Considering that much of the waste Envirocare receives is decommissioning waste and that the waste is uncontainerized during disposal, the basis would accordingly seem questionable for an assumption that the SNM will be or remain homogeneously distributed. The effects of super moderators, such as beryllium or graphite, have also not been examined. The presence of super moderators can dramatically increase the criticality hazard.

In your July 15, 1997, letter, you provided additional safety considerations to your 1992 petition. Specifically, you state that concentration and geometry should by themselves eliminate criticality concerns. However, a technical justification or basis for this statement was not provided. You also reference recent revisions to Part 71 and propose to use the limit of 5 grams of SNM per liter of waste. You state that this limit will provide an adequate margin of

safety and propose to limit beryllium, graphite, and deuterium to less than 0.1 percent of the SNM mass. The SNM concentration you propose is for transportation and considers several other factors such as: (1) a quality assurance program satisfying the provisions of Subpart H of Part 71; (2) packages contain no more than Type A quantities of radioactive material and no more than 400g total of SNM; (3) total shipment quantities of SNM are less than 2500 g; and (4) packages are handled in accordance with DOT regulations (49 CFR Part 173) to prevent loading, transport, or storage of these packages with other fissile material. Therefore, the concentration limit of 5 grams of SNM per liter of waste would not alone be suitable for a generic concentration limit without regard to other factors.

The staff's present view is that the petition and supplemental letters do not provide a technical basis to support the conclusion that a safe concentration-based limit can be set which would assure very low specific activity wastes contaminated with SNM exceeding the quantities specified in 10 CFR 150.11 are not capable of forming a critical reaction. Staff recognizes however that Envirocare may be able to provide additional information and technical basis to support its petition. In addition to the above parameters, the staff would be very interested in any analyses Envirocare can provide to consider the effects of waste other than soil, array geometries, and mixtures of SNM. NRC will consider any additional information that Envirocare provides before deciding whether to proceed with rulemaking.

If you have any questions or comments, please contact John Hickey of my staff at (301) 415-7234.

Sincerely,  
Carl J. Paperiello, Director  
Office of Nuclear Material Safety and Safeguards

Docket No.: 040-8989  
License No.: SMC-1559

cc: William Sinclair, State of Utah