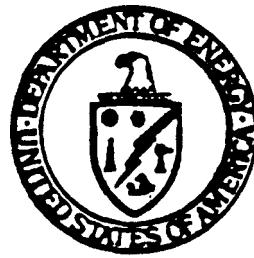


An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste

RESPONSES TO COMMENTS

DECEMBER 1985



MASTER

U.S. Department of Energy

**Assistant Secretary for Defense Programs
Deputy Assistant Secretary for Nuclear Materials
Director of Defense Waste & Byproducts**

AC01-83J/46017

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COMMENTS AND RESPONSES

FOR

DOE/DP/48017--T1

REPORT DOE/DP-0020

DE86 010377

ON

AN EVALUATION OF COMMERCIAL REPOSITORY CAPACITY

FOR THE

DISPOSAL OF DEFENSE HIGH-LEVEL WASTE

DECEMBER 1985

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INTRODUCTION

The Nuclear Waste Policy Act of 1982 (Public Law 97-425) requires that the President evaluate the use of disposal capacity at one or more repositories to be developed for permanent disposal of civilian spent nuclear fuel and high-level radioactive waste for the disposal of defense high-level radioactive waste. The Department of Energy prepared a report titled "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste," DOE/DP-0020, to provide input for the President's evaluation. The report constituted the Department's input and recommendation to be considered by the President in making his evaluation.

Although not required by the Act, the Department made the July 1984 draft of the report available to the general public for review and comment in order to increase public awareness, and develop a public record on the issue of disposal of defense high-level waste. Over 400 copies of the draft report were distributed. Thirty comment letters containing over 400 comments were received from representatives of States, localities, and Indian tribes, Federal agencies, organizations representing utilities, public interest groups, individual utilities, and private citizens.

All letters were reviewed and considered. Where appropriate, changes were made in the final report reflecting the comments received.

In reviewing the comment letters it was apparent that there may have been some misunderstandings about the nature and purpose of the report. In particular, some commenters thought that a separate decision was required on whether to codispose defense and commercial nuclear waste. Section 8 of the Act, however, assumes codisposal. This would be reconsidered only if "the President finds, after conducting the evaluation..., that the development of a repository for the disposal of high-level radioactive waste resulting from atomic energy defense activities only is required."

Other commenters thought that the report was the evaluation required by the law, but as stated above, that was not the intent.

Companion issues raised by commenters concerned the amount of defense waste that required disposal and whether the law required all high-level waste to be disposed of in a geologic repository. The volume of defense high-level waste that was assumed to be available for disposal in the repository was based on the reference plan of the Department of Energy as described in the Defense Waste Management Plan of July, 1983 (DOE/DP-0015). We recognize that there is a significant volume of radioactive waste in 149 single shell tanks at Hanford Reservation that is not included in the defense waste proposed for repository disposal. However, the current DOE reference plan is to stabilize in place waste stored in those tanks if, after the requisite environmental documentation, it is determined that the short-term risks and costs of retrieval and transportation are greater than the environmental benefits of

disposal in a geologic repository. Should it be determined that the benefits of geologic disposal prevail, then the waste in those single shell tanks will be processed and disposed of in a geologic repository. The requirement to dispose of such waste in a repository is not expected to alter the qualitative findings of the study. The Department is conducting a National Environmental Policy Act analysis which bears on the question of whether all defense high-level waste must be disposed of in a geologic repository. This analysis examines alternatives for disposal of the radioactive waste in the 149 single shell tanks at the Hanford Reservation. Whatever alternative is selected, the Department is committed to being in full compliance with all applicable laws.

Another issue of concern was with regard to whether defense high-level waste would delay receipt of commercial waste at the repository and take away space from commercial waste in the repository. The Department's planning activities have been based on the principle that defense high-level waste would be disposed of in the civilian repositories. Our intent is that defense waste will be received at the repository on a separate schedule, mutually agreed to by the Assistant Secretary for Defense Programs and the Office of Civilian Radioactive Waste Management, such that the rate of receipt of commercial waste, once established, will not be adversely impacted. The Department is obliged to accept for disposal all civilian high-level radioactive waste and spent nuclear fuel, and

intends to provide sufficient disposal capacity for all waste that it is responsible for.

The subject of the allocation of disposal costs to defense waste was also raised. The report does not deal with that subject because the Nuclear Waste Policy Act suggests that cost allocation be dealt with subsequent to the evaluation. It is the intent of the Department that the allocation of costs for disposal of nuclear waste be fair to all parties concerned. The details of the mechanism of cost allocation have not been worked out yet. Once the allocation mechanism has been arrived at, it will be made public.

Although some revisions to the technical content of the report were made in response to the comments received, no evidence was presented which would lead to the conclusion that a defense only repository was required. In fact, we were led to the conclusion that codisposal would be even more cost effective than the draft report indicated.

All comments and responses are included in this document. Each letter is assigned a number, and each comment within the letter is assigned a number corresponding to the letter number and the number of the comment within the letter. Responses are provided for each identified comment. Each comment letter is reproduced in its entirety and arranged so that a page of the comment letter and the responses to the comments on that page face each other.

An index is provided that contains an alphabetical list of the commentors and the page numbers on which their comments and responses appear.

The information presented in the responses to the comments represents information available and the status of the program as of June 1985, the date the evaluation report was published. Actions have occurred since that time but are not believed to change the basic conclusions in the evaluation report.



**Minnesota
Environmental Quality Board**
100 Capitol Square Building
550 Cedar Street
St. Paul, Minnesota 55101
Phone _____

September 18, 1984

Mr. David B. LeClaire, Director
Office of Defense Waste and Byproducts
Management
U.S. Department of Energy, DP-12
Washington, DC 20545

Dear Mr. LeClaire:

The State of Minnesota has reviewed "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste", dated July, 1984. The review resulted in a number of comments, which are attached.

We request that we be kept informed of the progress of defense waste disposal considerations and be provided continued opportunities to receive subsequent documents related to this issue.

Sincerely,

Tom Kalitowski

Tom Kalitowski, Chairman
Governor's Task Force on High-Level
Radioactive Waste

cc: First and Second Repository States

STATE OF MINNESOTA

Comments on the draft report "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High Level Waste"

1) Page E-2

Comment:

1-1 The report should state whether it is the intent of DOE to modify only the first commercial repository for comingling, or to modify all subsequent repositories for acceptance of defense wastes.

2) Page E-4

Comment:

1-2 The development and evaluation (D & E) costs for a repository for defense only waste are expected to be \$435 million, based on the WIPP experience. The D & E costs are expected to be \$4.5 billion for a commercial repository. The defense waste costs for WIPP, however, were for a salt repository and TRU waste, not high-level waste in a hard rock repository. In addition, the April 1984 Draft Mission Plan (p. 10-4) indicates that first repository D & E costs are between 3 and 3.2 billion, not 4.5 billion. For these reasons, the defense and commercial repository D & E costs do not appear accurate or directly comparable and an explanation of how these costs were estimated should be provided along with any needed revisions.

3) Page E-5

Comment:

1-3 It is our understanding that Section 8 (b)(3) of the Nuclear Waste Policy Act would not exempt a defense-only repository from the site approval and construction authorization responsibilities of the NRC. This should not be listed as a procedural rule that does not apply to a defense-only repository.

4) Page 1-2

Comment:

1-4 The first full paragraph on this page states that "Close liaison between the defense and commercial waste disposal programs is being maintained to assure technical and schedule compatibility." How is this done? Perhaps an organizational chart depicting this interaction, similar to figure 1-1, would be appropriate. In the past, it was our understanding that these two programs operated very independently.

5) Page 1-4

Comment:

1-5 Neither EPA's definition of high-level radioactive waste in 40 CFR 191 nor the wording which follows its reference in DOE/DP-0020 includes spent nuclear fuel. Is this an oversight, or is there some reason that spent nuclear fuel that has not been reprocessed is not considered defense high-level waste?

MINNESOTA ENVIRONMENTAL QUALITY BOARD

RESPONSE TO COMMENTS

1-1 The study considered disposal of defense waste in a single commercial repository only for the purpose of simplifying analysis. It is not to be assumed that defense waste could not be disposed of in several commercial repositories. The use of more than one commercial repository for defense waste would not alter the findings of the analysis.

1-2 The Draft report assumed that the defense repository program could purchase the D & E carried out by the commercial repository program for a site characterized but not finally selected for use for a commercial repository. However, upon reconsideration of this issue, it was determined that this may not be a feasible option. The D & E costs for a defense-only repository are not known at the present time. Therefore, as a simplifying assumption, they are considered to be comparable to the D & E costs associated with the commercial repository in the final report. When D & E costs are considered, the cost advantage of disposing of defense waste in a commercial repository is enhanced.

The three billion dollars that you refer to as an estimated D & E cost for the first commercial repository is the cost for the major D & E activities (p. 10-5 of the Draft Mission Plan). The addition of a share of the administration and technical support, socioeconomic impact mitigation, test and evaluation facility, and monitored retrievable storage costs (p. 10-7 of the Mission Plan) would increase the D&E costs for the first repository to about four billion dollars.

1-3 The regulation section for the defense-only repository in Table E-1 was modified.

1-4 The defense and commercial waste disposal programs are both the responsibility of the Department of Energy. The defense waste program is managed by the Assistant Secretary for Defense Programs. The commercial waste disposal program is managed through the DOE Office of Civilian Radioactive Waste Management. There is an understanding between the two DOE offices which specifically addresses their close liaison, particularly in the area of Research and Development activities. Each office also actively participates in the reviews of the documents of the other office to assure compatibility and consistency in regard to plans and schedules related to waste disposal, and to avoid duplication of efforts.

1-5 Consistent with the Nuclear Waste Policy Act of 1982, spent fuel is defined separately from high-level waste. At present, defense programs reprocess all their spent nuclear fuel and currently has no plans to dispose of spent nuclear fuel that has not been reprocessed.

6) Page 1-9, Table 1-1

Comment:

The independent operation of the commercial and defense programs seems most apparent when separately generated plans for commercial and defense disposal in a comingling repository are compared. The Draft Mission Plan (pp. 2-2 and 3-A-38) states that DOE intends to accept 400 MTHM of commercial waste annually during the three year (1998-2000) operation of the Phase I facility. Table 1-1 of the DOE/DP-0020 Draft, however, indicates that 1,860 defense packages - about 930 MTHM - would be accepted during those years if a comingling repository was available by 1998. The defense waste acceptance would be at a rate of 620 packages annually, or about 310 MTHM per year. This is inconsistent with the statement on page 3-A-36 of the Mission Plan, which claims that, "the Phase I facilities will be able to emplace and dispose of 400 MTU/year of radioactive waste, which includes unconsolidated commercial spent fuel and, if needed, small quantities of defense high-level waste" (emphasis added).

1-6 Furthermore, the Draft Mission Plan (p. 2-3) states that receipt of defense waste could be handled by "eventually dedicating the receiving facility of the first phase of the initial repository for receipt of defense waste." Given the 400 MTHM capacity of the first phase facility, how could it receive the defense wastes shown in Table 1-1 of DOE/DP-0020 after the year 2000 when the wastes will total about 500 MTHM annually?

We believe that there should be a more thorough discussion of the integration of commercial and defense waste streams, based on current repository design and schedule assumptions, as well as a discussion of defense waste contingencies if the repository is unable to meet the 1998 acceptance date or unable to accommodate the anticipated defense waste shipments set forth in Table 1-1.

7) Page 1-9, Table 1-1

Comment:

1-7 The anticipated shipments of defense waste from Hanford are shown to stop at the year 2007. Why does Hanford stop producing waste? Is it assumed that beginning in 2008 all waste produced at Hanford will be transported to Idaho for processing? If so, has this additional transportation been factored into the transportation analyses performed in Chapter 2.3.4?

8) Page 1-10, Table 1-2

Comment:

1-8 Why hasn't the "limiting temperature" of the waste form after Package Design Life been determined? Are spent fuel rods assumed to be emplaced without cannisters?

1-6 The details of defense waste acceptance at a commercial repository will be the subject of future negotiations between the Assistant Secretary for Defense Programs and the Office of Civilian Radioactive Waste Management pending the results of the evaluation by the President on the issue of disposal of defense waste. Defense wastes will be received at a commercial repository on a mutually agreed to schedule, such that the rate of receipt of commercial waste, once established, will not be adversely impacted. The assumptions used in the report were for analysis purposes only. As indicated in the report, provisions are being made at the DOE waste generating sites to provide interim on-site storage pending disposal in a geologic repository. Costs associated with interim storage of defense waste are small compared with the costs of building a separate defense repository.

1-7 The new and readily retrievable high-level waste at Hanford is currently planned to be worked off in the time interval indicated. There are no plans to transport high-level waste from Hanford to Idaho for subsequent processing. If it is subsequently determined that other high-level waste at Hanford must be disposed of in a geologic repository then there will be an increase in the amount of waste originating from Hanford and a consequent extension of the schedule of shipments from Hanford. However, this should not affect the finding of the study that there is no compelling requirement for a defense-only repository.

1-8 Spent fuel rods will be emplaced in canisters, as shown in Figures 2-6, 2-7, and 2-8 in the final report.

Temperature limits are now specified for each component of the waste package including the waste form. Ongoing and planned waste package performance tests will provide a basis for confirming or modifying these limits as appropriate.

9) Page 1-11
Comment:
1-9 How will current repository designs, which were based on a 70,000 MTHM capacity, be affected by the additional 10,000 MTHM emplaced in the "Augmented Repository" scheme? How long will these modifications take and what will they cost?

10) Page 2-7
Comment:
1-10 Information about tuff was used as a surrogate for the high end of repository hard rock costs. Using tuff as a high cost estimate is not conservative. Basalt is much harder than tuff; therefore drilling and mining costs should be higher. Likewise the current plans for tuff would site the repository in the unsaturated zone. This also could sway the costs toward the low side when it is recalled the other hard rock repositories would probably be located in the saturated zone. Table 10-6 in the Draft Mission Plan (p. 10-14) shows that basalt construction and operation costs are greater than the equivalent tuff costs.

11) Page 2-7
Comment:
1-11 DOE assumes a higher repository cost for hard rock as opposed to salt for several reasons, one of which is lower thermal conductivity. This is because lower conductivity requires more excavation of rock to produce a lower density emplacement scheme. How would cost estimates be affected if heat dissipation fins had been used on canister design in the reference calculations? (Hockman, J.N. and O'Neal, W.C., 1984)

12) Page 2-10
Comment:
1-12 How will an augmented repository for defense, with its larger underground area, affect sites currently under consideration for the first repository program and the screening criteria for the second repository program?

13) Page 2-16
Comment:
1-13 The analyses performed for Chapter 2.3.2 are not cited. Who performed these analyses for DOE? Is a report available to backup conclusions reached in this Chapter?

14) Page 2-19
Comment:
1-14 Retardation values (R) are stated to be conservative; however, they are either consistent with, or more conservative than, recent work done by Sandia Laboratory for the NRC (Chu, M.S. and

1-9 The augmentation of a 70,000 MTHM commercial repository to accommodate defense waste in the repository was done to simplify analysis. The physical size of a repository will be controlled by the heat dissipation and other technical properties of the site chosen for the repository and may accommodate more or less than 70,000 MTHM of nuclear waste. The 70,000 MTHM is simply a temporary statutory limit on the first repository and is removed when a second repository becomes available.

1-10 Cost information on a repository sited in a basalt formation was not available at the time that the analyses of the report were being done. Therefore "information about tuff was used as a surrogate for the high end of repository cost estimates." This was not meant to imply that cost estimates in tuff represent the extreme. While it might be true that if the combined repository were sited in a basalt formation and a defense waste only repository were sited in tuff, the cost advantage of the combined repository would be lessened, it would not follow that a defense-only repository would be required.

1-11 The details of canister design are not relevant to the conclusions of the report. The best available canister design will be used independent of whether a combined repository or a defense waste only repository is used. Canister design could narrow the cost differential between hard rock and salt sites but will not alter the relative cost advantage of a combined repository over the defense-only repository.

1-12 The underground area needed to accommodate waste is but one of many factors considered in evaluating the suitability of a site for a repository. It is certainly not the deciding factor. A site with a capacity for fewer than 70,000 MTHM would not be precluded from selection. It may also be possible to increase the capacity of a particular site by mining out two or more levels in the underground rock formation. See also response to comment 1-9 above.

1-13 A citation to the reference of Kocher et al., 1983 has been added to Sections 2.3.2 and 3.3.2 to indicate the primary source for the information presented. The report is available to support the conclusions reached.

1-14 As the final report indicates, the analysis has been found to provide very conservative results as compared with more recent studies using more realistic assumptions for sites currently under investigation. Work will continue during site-specific studies to ensure that appropriate retardation factors are used in planning and licensing activities.

1-14
cont'd

Axness, C.L., 1984). None of the values used by any authors cited as references have been verified under field conditions for porous or fractured media. Most values are taken from a range of values from laboratory analyses using crushed samples and may not be at all representative of behavior under field conditions.

15) Page 2-26

Comment:

1-15

Leach rates are based on temperatures at 300 and 1,000 years. This would appear to be a conservative assumption. However, in this analysis Murphy's law should not be overlooked. What happens in a worst case situation where a given percentage of the canisters are leached before 300 years?

16) Page 2-28

Comment:

1-16

What is the difference in the excavated volume between salt and hard rock in order to get the temperatures at 300 and 1,000 years down to the levels listed? Wouldn't it be a better comparison if the volumes were adjusted such that at 300 and 1,000 years the temperatures would be on an equal basis with salt? Given the lower thermal conductivities is this even possible - or would early time heat loadings be too great?

17) Page 2-29

Comment:

1-17

The old EPA assurance requirements will be adopted in the new 10CFR60 including the provision to carry release calculations out to 100,000 years using release rates of 10 EXP-6 and 10 EXP-4. This analysis was not done in this report and should be done in the next draft to assure compliance with the EPA standard.

18) Page 2-31

Comment:

1-18

The example used to show the lower composite effects per MTHM of comingled defense and commercial waste is an insult to the reader's intelligence. One is led to believe that because defense waste is co-mingled with commercial waste the net result is fewer health effects. The fact remains that an augmented repository would have more curies than a commercial only facility. The idea that more waste is better will not be accepted by even the most naive citizen, no matter what statistics the Department uses to show otherwise. This section should be removed.

19) Page 2-31

Comment:

1-19

The values used to calculate short term health effects were normalized to one MTHM. This will tend to underestimate the

1-15 As part of the repository development program, analyses are being performed to determine the impacts of abnormal scenarios such as you suggest. Results to date indicate that the regulatory performance objectives are met for the abnormal scenarios examined. This report is a comparative analysis of two disposal options for disposal of defense waste. The health and safety analysis is designed to compare the relative performance of the disposal scenarios. It is not meant to show compliance with the standards, which can only be done on a site-by-site basis.

1-16 There is no apparent technical reason for a hard rock repository to be maintained at the same temperature as a salt repository. Therefore, a comparison between a salt repository and a hard rock repository designed for the same temperature is not germane to the purposes of this study. The relevant comparison is between a combined repository and a defense-only repository which would not be affected by the comparison you suggest.

1-17 The proposed EPA standards are still in draft form and subject to continuing review and change. A final standard is not expected prior to issuance of this report in final form. There is nothing in the EPA draft revision referred to which would cause the analysis performed for this report to show that the standards could be exceeded. Further, the analysis was only designed to show the relative performance of the disposal scenarios. An analysis to assure compliance with the EPA standard can only be performed for a specific site.

1-18 There was no intention to mislead the reader into believing that the addition of defense waste to a commercial repository results in fewer total health effects. The EPA is currently considering a revision to its proposed rule which would require that different wastes meet their standard separately so that dilution cannot be used to achieve compliance. The final report does not include the paragraph referring to the reduced release of radionuclides per MTHM in the combined repository as compared to the commercial repository without defense waste.

1-19 As indicated in the footnote on page 2-33 of the final report, information for a more detailed analysis of short term health effects does not exist at present.

The estimates are based on information developed for a commercial repository. We believe that the estimates of short term health effects for the combined repository may be slightly overestimated and the estimates of short term health effects for the defense-only repository may be underestimated. Using a more realistic assumption for the defense-only repository would indicate greater health effects and thus further reinforce the conclusion to dispose of the defense waste in a commercial repository. Refer to Section 3.3 of the revised report for an explanation of how the analysis was done.

1-19 effects of the commercial waste and overestimate the effects of cont'd the defense wastes. Therefore, the values listed in Table 2-9 may not be representative.

20) Page 2-36
Comment:
1-20 Effects from potential accidents are mentioned and a frequency of occurrence is given. However, there is no discussion of these potential accidents or their impacts.

21) Page 3-12
Comment:
1-21 Why are total air pollutants higher during operation than during construction of the repository?

22) Page 3-12
Comment:
1-22 The most severe accident is caused by dropping a canister down the shaft. Again, the frequency of the event is given, but not the resulting health effects.

23) Page 4-6
Comment:
1-23 The transportation comparison should discuss at greater length and detail the implications a combined repository would have in concentrating transportation impacts versus two separate facilities and estimates of the number of deliveries that might be associated with each alternative.

24) Page 4-9
Comment:
1-24 How will a decision to proceed with comingling of defense and commercial wastes affect plans for federal interim storage and MRS facilities? Is there any possibility that these facilities also would have to be altered to accommodate interim or temporary storage of defense wastes for the same reasons that comingling is recommended (i.e., costs)?

25) Page 4-9
Comment:
1-25 The first of the two national security issues is troublesome. The issue is set forth as follows: "There must be no interruption or shutdown of a defense production or utilization facility because of regulatory or technical difficulties related to the repository."

- 1-20 The potential accidents are assumed to be similar for both disposal options under study and therefore further impact analysis would not show a difference among the disposal options.
- 1-21 Total air pollutants are higher during operation than during construction because construction extends for only five years whereas operation continues for 25 years.
- 1-22 The health effect from dropping a canister is worker fatalities. The number of fatalities is highly dependent on the circumstances of the accidents. Since the frequency of occurrence of dropping a canister is so small, there are not likely to be any fatalities from that cause. The effect would be comparable for both options under study.
- 1-23 As stated in Section 2.3.4 on transportation, the radiological and nonradiological impacts are extremely small for transportation of defense high-level waste to a commercial repository, but would be in addition to the impacts of commercial waste shipments. Such combined impacts would be detailed in future repository site selection studies.
- 1-24 Present plans call for defense waste to be stored on an interim basis at the generating sites until a repository becomes available. Defense waste is not eligible for Federal Interim Storage as defined in the Nuclear Waste Policy Act.
- 1-25 Technical adequacy and public health and safety will not be compromised for any reason. The consideration given to these and to other topics will be the same whether the repository is designed for commercial waste only or for commercial and defense waste. Interim storage for defense waste will insure that defense activities are not delayed by waste disposal considerations.

1-25
cont'd

Despite the possibility of providing for some interim defense storage, it is our concern that this stipulation could be used as an excuse to put pressure on the NRC during the licensing of a repository. We are aware of the pressure exerted during the Guidelines concurrence process and fear that technical adequacy and public health and safety may be emphasized less than schedule goals and defense needs if wastes are comingled. This situation must be avoided; we can not live with an unsafe repository, even if it means that some defense activities must be temporarily delayed. A final comingling decision must be accompanied by a commitment to thorough technical review and analysis and a recognition that a commercial repository is subject to a more extensive and uncertain regulatory process, one that should not be subverted due to expediency.

26) Page 4-9
Comment:

1-26 How would receipt of defense wastes affect repository management and control? For example, might the current work and forthcoming report of the AMFM Panel be affected, in any way, by a combined repository?

27) Page 4-9
Comment

1-27 Some attempt should be made to define alternative methods of cost allocation and the implications for the separate funding sources, i.e. the commercial nuclear waste fund and defense waste funding. Although cost comparisons may indicate greater overall efficiency with a combined facility, various cost allocation formulas could result in different conclusions, based on the respective interests and considerations associated with the separate funding sources.

It appears that the most equitable allocation would be based on volume, with the entire D & E, construction, and operating costs of the combined facility used as the basis for allocation. It would certainly not be desirable to have utility ratepayers subsidizing the cost of defense waste disposal.

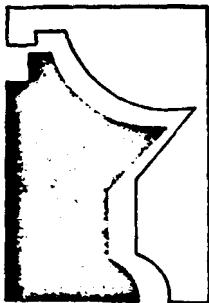
References cited:

Chu, M.S. and Axness, C.L. (1984). "A Comparison Study of Different Source Models for High Level Waste" in Waste Management '84 - Waste Isolation in the U.S., Technical Programs and Public Education Vol I, ed. Post, R.G., Arizona Board of Regents, USA pp. 411-418.

Hockman, J.N. and O'Neal, W.C. (1984). "Thermal Modeling of Nuclear Waste Package Designs for Disposal in Tuff" in Waste Management '84 - Waste Isolation in the U.S., Technical Programs and Public Education Vol I, ed. Post, R.G., Arizona Board of Regents, USA pp. 441-448.

1-26 The Nuclear Waste Policy Act provides that management and control of a commercial repository will be the responsibility of the Office of Civilian Radioactive Waste Management whether or not defense wastes are accepted. The Advisory Panel on Alternative Means of Financing and Managing Radioactive Waste Facilities (AMFM) was cognizant of the fact that defense high-level waste could be accepted by the repository. However, they did not consider that it would influence the results of their study.

1-27 This study was limited to comparing the total costs to the nation of separate vs. combined repositories. The allocation of costs for disposing of defense waste in a commercial repository will be negotiated at a later date. The issues raised will be considered in the negotiations, along with many others.



**Minnesota
Environmental Quality Board**
100 Capitol Square Building
550 Cedar Street
St. Paul, Minnesota 55101
Phone _____

September 26, 1984

Mr. David B. LeClaire, Director
Office of Defense Waste and Byproducts
Management
U.S. Department of Energy, DP-12
Washington, D.C. 20545

Dear Mr. LeClaire:

Please add the following comment to those submitted by the State of Minnesota on September 18, 1984, following our review of your report entitled "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste":

la-1 The discussion of schedules and transportation does not mention the new production reactor which is planned. Three sites are under consideration for this new reactor: Hanford, Savannah River and Idaho. When this new reactor goes on-line, changes in schedule must be made to accommodate its wastes. How does the addition of this plant: 1) effect the 10,000 MTHM total volume, and 2) schedules for receipt at the repository?

Sincerely,

Tom Kalitowski

Tom Kalitowski, Chairman
Governor's Task Force on High Level
Radioactive Waste

TK/pb

MINNESOTA ENVIRONMENTAL QUALITY BOARD

RESPONSE TO COMMENTS

1a-1 The new production reactor is being planned, however it is not known at this time if Congress will authorize funds for construction. This and other uncertainties could affect volumes of defense waste in the future. It was necessary for purposes of this report to make reasonable assumptions based on current facilities producing waste.

Plans to accommodate the waste from the proposed new production reactor will be addressed in the public documentation associated with the reactor program.

Atomic Industrial Forum, Inc.
7101 Wisconsin Avenue
Bethesda, MD 20814-4805
Telephone: (301) 654-9260
TWX 7108249602 ATOMIC FOR DC

September 24, 1984

Mr. David B. LeClaire, Director
Office of Defense Waste and Byproducts Management
U.S. Department of Energy, DP-12
Washington, D.C. 20545

Dear Mr. LeClaire:

The Atomic Industrial Forum's (AIF) Industry Oversight Committee on Waste Management welcomes the opportunity to present comments on the Department of Energy's (DOE) DOE/DP-0020, "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste."

We have three major comments:

- o The inclusion of defense wastes in a commercial repository must in no way delay the scheduled availability of the repository in 1998. The inclusion of defense wastes carries the potential of raising new technical, licensing and public acceptance issues, which could impact the development schedule of a civilian repository. DOE should give additional consideration to the likelihood of increased litigation, with resulting schedule delays, from combining defense and commercial wastes. Further, DOE should not only anticipate the potential for delay, but also build in the flexibility to return to a commercial-waste-only option if significant obstacles develop.
- o The inclusion of defense wastes in a commercial repository should in no way reduce the acceptance rates for commercial spent fuel in 1998 and beyond. The issue of DOE's capability to accept meaningful quantities of spent fuel beginning in 1998 was raised in the Oversight Committee's July 9, 1984, letter commenting on the draft "Mission Plan for the Civilian Radioactive Waste Management Program." The inclusion of defense wastes raises additional questions regarding anticipated acceptance rates for civilian waste. DOE should assure those companies which have contracted for its waste services that the inclusion of defense wastes in a commercial repository will in no way adversely impact the acceptance rate for commercial spent fuel.

2-1

2-2

ATOMIC INDUSTRIAL FORUM, INC.

RESPONSE TO COMMENTS

- 2-1 Section 8 of the Nuclear Waste Policy Act establishes that defense waste will be disposed of in the commercial repository unless the President finds that a defense-only repository is required. Since implementation of the Act, planning activities have been based on the principle that defense waste could be disposed of in the commercial repository. DOE will make every effort to meet its obligation to accept civilian waste by 1998.
- 2-2 Defense waste will be received at a commercial repository on a separate schedule mutually agreed to by the Assistant Secretary for Defense Programs and the Office of Civilian Radioactive Waste Management, such that the rate of receipt of commercial spent fuel, once established, will not be adversely impacted.

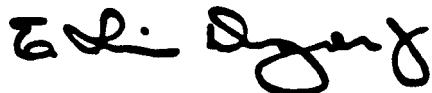
AF

2-3

- o A decision to co-dispose defense and commercial high-level waste should be premised on the understanding that each party pays its equivalent share of all costs. These costs should be based on total, not incremental, expenses, including relevant developmental expenses incurred prior to the decision to co-mingle. Further, if and when such a decision is reached, steps should immediately be taken to begin collecting for defense wastes. Further, the bases for determining the fair share for the defense waste should be re-examined. For example, it is likely that defense waste will represent a higher percentage of waste arisings than that assumed in DOE/DP-0020.

We appreciate the opportunity to provide comments. Please advise us if further clarification is needed.

Sincerely,



E. Linn Draper, Chairman
Industry Oversight Committee on
Waste Management

ELD:slw

2-3 The report does not suggest any formula for cost sharing between defense and commercial waste in a combined repository. The Nuclear Waste Policy Act states in broad terms the components of repository costs that must be included in any cost allocation formula. These are the "costs of developing, constructing, and operating this repository or repositories." Such formula will be developed subsequent to the President's evaluation of disposal of defense waste in commercial repositories.



NUCLEAR WASTE PROJECT OFFICE

OFFICE OF THE GOVERNOR

Capitol Complex

Carson City, Nevada 89710

(702) 885-3744

September 20, 1984

Mr. David B. Le Claire, Director
Office of Defense Waste & Byproducts
Management
U. S. Department of Energy, DP-12
Washington, D.C. 20545

Dear Mr. Le Claire:

Enclosed please find the comments by the State of Nevada on your draft report, "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High Level Waste", dated July, 1984.

The State of Nevada hereby requests, pursuant to Sec. 117 (a)(2) of the Nuclear Waste Policy Act, copies of the complete set of references contained in Sec. 5.0 of the study and reserves the right to provide additional comment once those references are reviewed and examined.

In general, we found the report to be lacking in sufficient detail regarding the impact that the presidential decision to commingle defense high-level waste with commercial high-level waste would have upon the siting construction, operation, and closure of a commercial waste repository. The entire study and its conclusions are based upon several unsupported assumptions, some of which, I believe, are of questionable validity. For example, the proposed decision to place all defense waste in the first repository is based upon two assumptions - that a commercial repository will be available to receive defense waste beginning in 1998, and that the second repository, assuming one will be proposed to Congress, will be in operation before the first repository reaches its 70,000 metric ton limit provided for in Sec. 114 (d)(2) of the Nuclear Waste Policy Act.

The study does not provide for alternatives should these assumptions prove to be invalid. There is no discussion of the effect on the defense waste program if, for example, the first repository program experiences even more significant delays than it is currently, resulting in the first repository not being available until much later than 1998. Furthermore, the study contains no discussion of the effect on the defense waste program in the event that a second repository experiences such significant delays that the first repository reaches its 70,000

3-1

3-2

NEVADA NUCLEAR WASTE PROJECT OFFICE

RESPONSE TO COMMENTS

3-1 The assumptions used to perform the study are believed to fairly reflect the essential characteristics of likely future repositories and operation to the extent that the specific purpose of the study could be accomplished. The qualitative findings of the study are not sensitive to the assumptions made.

The basic premise of the study is that Congress made the decision, in the Nuclear Waste Policy Act, that defense waste would be disposed of in the commercial repository unless the President finds that a defense-only repository is required. Congress also specified January 31, 1998 as the latest date on which the Secretary of DOE is to begin disposing of high-level radioactive waste or spent fuel (NWPA Section 302(a)(5)(B)).

DOE will make every effort to complete the repository and begin operation by 1998. Any delay in opening of the repository can be accommodated by providing additional storage capacity for defense waste at the generating sites, as indicated in the report. The findings of the analysis would not be altered by any delay in the opening of the first repository.

Current plans, as reported in the Mission Plan, call for opening of a second repository well before the 70,000 MTHM limit of the first repository would be reached.

No decision was made to place all defense waste in the first repository. The single repository was assumed in the study to simplify analysis.

3-2 Statements are included in the report to the effect that storage facilities will be built for defense waste at the generating site to store such waste until a repository is available to receive the waste. Significant delay in the second repository is likely to have more impact on the commercial waste program than on the defense waste program.

metric ton limit long before a second repository is in operation.

3-3 The study also assumes that only two options are available: first, to put all defense waste in a single defense-only repository; or, second, to dispose of all defense waste in the first repository. The second option is, of course, the proposed choice. This means that the host state for the first repository would receive at least 80,000 metric tons of waste, and perhaps more, while the host state for a second repository would receive significantly less. The study should, at a minimum, discuss at least two other options. First, the option of splitting defense wastes between the first and second repository is clearly viable and may, in fact, be more cost effective. Secondly, the study should also consider and discuss placing all of the defense waste in the second repository. If, for example, the first repository is located in the West, either at Hanford or the NTS, and the second in the East or Mid-West, then either splitting the waste or placing all of it in a second Mid-Western or Eastern repository could significantly reduce overall costs.

3-4 The study implies, but does not clearly say, that a commercial repository in which defense waste is commingled will be ten percent larger in area than a repository for commercial waste only. See, for example, pages E-3 and paragraph 4 on page 1-11. The assumption is made that 20,000 packages of defense high-level waste are considered equivalent to approximately 10,000 metric tons. The study states, "defense high level waste is expected to require approximately ten percent of the underground area. An additional disposal area for the defense waste will be constructed at the commercial repository site." Does this mean that the first repository, if also hosting all of the nation's defense waste, will be 10% larger than a commercial only facility?

3-5 The study does not include an examination of the initial nine potentially acceptable sites regarding the ability of those sites to physically accomodate the proposed increased repository size required by the inclusion of defense wastes. Would the lack of additional space at any of the potentially acceptable sites to accomodate the inclusion of defense waste disqualify any of the sites for further consideration for a combined repository?

3-6 Finally, the study contains no discussion whatever of the impact of a larger repository on the first host state. It should discuss, in detail, how much longer the construction of the repository is expected to take if defense wastes are commingled, and what the additional impacts of that construction will be on the state and affected local communities. It should also discuss how much longer an operational period can be expected for such a repository and what the consequent impacts of that operational period are expected to be.

3-3 It was not intended that the reader should conclude that all defense waste would only go into the first repository. Also, the capacity of the first repository could be more or less than 70,000 MTHM, depending on a variety of factors related to the site characteristics, rather than the quantity of waste available for disposal. Once a second repository is opened, some defense waste may be disposed of in that repository. Since at this time no one knows where the first or second repository will be located, it is not possible to judge which repository will receive defense waste or how it may be split up. Additional costs of storage at the generating sites may outweigh any future savings on transportation costs as a result of delaying disposal.

3-4 If a commercial repository were limited in capacity to 70,000 MTHM of commercial waste, then the addition of 10,000 MTHM of defense waste would increase the area of that repository by about 10 percent. However, the ultimate capacity of a repository will be determined by geology. Therefore, following the opening of a second repository, the first repository may accept more than 70,000 MTHM of waste, and some of the defense waste may also go to the second repository. Thus the actual fraction of repository area occupied by defense waste cannot be known at this time.

3-5 The capacity of a potentially acceptable site to accommodate the volume of waste available for disposal is one of several factors considered in selecting the site for a repository. A site would not be automatically excluded from consideration solely because it could not accommodate more than 70,000 MTHM.

3-6 No change in operational period is expected to occur because of the acceptance of defense waste at a commercial repository. The initial construction period of the repository will not be impacted.

Mr. David B. Le Claire
September 19, 1984

Page Three

Attached are specific comments for your consideration in addition to aforementioned general concerns. Again, these comments should be considered preliminary until the State of Nevada receives and has the opportunity to examine the entire list of references contained in Section 5.0 of this study.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Robert R. Loux
Director

RRL:sk
Encl.
cc: Mr. Ben Rusche

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DEFENSE WASTE PLAN

SPECIFIC COMMENTS

STATE OF NEVADA

3-7 Pg. E-4 The study states that, "The D & E costs for the commercial repository will not change if defense waste is disposed of in the repository." Given that defense waste is calculated to require 10% of the space of this first repository, the development and evaluation costs certainly have to change.

3-8 In the same paragraph the statement is made that "...a portion of those costs would be allocated to the defense waste and a final allocation mechanism has not been agreed upon." At what point will a final allocation mechanism be agreed upon? The State of Nevada believes that this final allocation mechanism should be contained in the final of this study.

3-9 Pg. E-5 In Table E-1 on page E-5, statements are made which are not accurate. Under "Regulation" of a defense-only repository, the study indicates that certain procedural rules do not apply, including site characterization, site approval and construction authorization. That assumption is not accurate. While the Act itself does not mention site characterization with respect to a defense-only repository, such a repository must be licensed by the NRC and 10 CFR 60 itself requires site characterization. We do not believe that the NRC will consider a license application for a defense-only repository without complete characterization of a proposed site. Construction authorization is the first step in the licensing process, a necessary prerequisite to an operating license. Given the experience of WIPP, both the NRC and DOE would need to establish some site selection guidelines in the context of a defense-only repository in order to satisfy their NEPA responsibilities. Further, the table indicates that disposal of defense waste will not require a review of classified defense information. Since the disposal of defense waste will require review and licensing by the NRC, it may be uncertain whether a review of classified information will be required.

3-10 Pg. 1-2 On page 1-2 it is indicated that, in the case of defense waste, OCRWM "will assume responsibility for permanent disposal of the waste at the repository site". It would seem that OCRWM should play some role, if not have the responsibility, earlier than "at the repository site". That office, the state and other interested parties have a critical interest in the waste form, waste package, etc.- if that waste is to be emplaced in a repository for which OCRWM has responsibility. The study should discuss in greater detail the role of OCRWM throughout the life of the defense waste management program.

3-11 Pg. 1-8 The study makes the assumption that the commercial repository will be able to accept defense waste at the rate specified in Table 1-1. On what is that assumption based? Additionally, there is no discussion of how that acceptance

3-12 ... (cont'd next page)

- 3-7 As noted in the final report, any additional development and evaluation (D & E) costs associated with disposal of defense waste in a commercial repository is expected to be small compared with the total D & E costs.
- 3-8 While it is recognized that the allocation of costs between commercial users and the federal government is of great importance to those affected, the cost allocation is not a relevant issue for this report, but rather the overall cost of the program to the nation. The NWPA does not require that the allocation of costs be made as part of the evaluation but rather subsequent to it.
- 3-9 The regulation section of the defense-only repository in Table E-1 was modified.
- 3-10 There is no need foreseen for inquiry by NRC into classified information for purposes of licensing of either a commercial or defense-only repository.
- 3-11 The defense and commercial waste disposal programs are both the responsibility of the Department of Energy. The defense waste program is managed by the Assistant Secretary for Defense Programs. The commercial waste disposal program is managed through the DOE Office of Civilian Radioactive Waste Management. There is an understanding between the two DOE offices which specifically addresses their close liaison particularly in the area of research and development activities. Each office also actively participates in the reviews of the documents of the other office to assure compatibility and consistency in regard to plans and schedules related to waste disposal, and to avoid duplication of efforts.
- 3-12 Table 1-1 has been removed from the final report. The table represented expected availability of defense waste for disposal in a repository; it was based on information presented in the Defense Waste Management Plan concerning the rate at which immobilized defense waste will be produced.

3-13
cont'd schedule will impact repository operations and the commercial waste acceptance schedule. There also needs to be a discussion of the impact on the commercial repository design, handling and packaging logistics and emplacement schedule and operations. The addition of defense waste in a commercial facility must have cost and time factors connected with the alteration of design that should be addressed in this study.

3-14
The anticipated shipment rates in Table 1-1, coupled with the transportation costs in Table 2-13 on page 2-54, are very confusing. That table indicates shipment of 500 casks from the Savannah River Plant over a 24-year period, only 120 casks per year from Hanford over a 10-year period, and 500 casks from INEL over a 14-year period. Those figures, obviously, drive the cost estimates found in Table 2-13 where it appears that transporting defense waste either by truck or rail to Hanford and the NTS are the two most expensive alternatives, and to a site in the Gulf interior region by far the least expensive option.

3-16 Those cost estimates conflict with information contained in the 1979 General Accounting Office report, "The Nations Nuclear Waste - Proposals for Organization and Siting". That report states that in 1979 6.3 million cubic feet of high-level waste and 5.3 million cubic feet of transuranic waste were located at Hanford, as compared to 3 million and 1.2 million respectively at INEL. The study should address this apparent inconsistency and provide a much more complete discussion of both the shipment rate and the costs of transportation relative to the current volumes of high-level defense waste located at the various sites.

3-17 For example, the transportation costs obviously assume shipment to a single assumed repository, apparently in salt. It cannot possibly cost \$284 million in 1984 dollars to ship high-level defense waste located at Hanford to a Hanford repository. Those anticipated transportation costs should, at a minimum, be broken down further, comparing transporation costs from the three DOE defense facilities to an assumed repository in each of the five geologic areas now under consideration as well as to a potential second repository located somewhere in the East or Midwest. That comparison should further consider the potential for splitting defense waste between a first and second repository.

3-18 Table 1-1 shows that shipments of defense waste from Hanford stop in the year 2000 and Idaho begins shipments at that time. The study should provide for greater explanation and detail.

3-19 Pg. 1-11 In paragraph 3 the baseline assumption is made that the 70,000 metric ton commercial inventory will be split evenly between spent fuel and commercial high-level waste. Does this assume future reprocessing of spent fuel? If so, that should be disclosed and fully discussed. Paragraph 4 should contain a more complete discussion of the size of the "additional disposal area" necessary to receive defense waste.

3-13 The cost of alterations to the repository design and operation if defense waste is disposed of in a commercial repository is reflected in the cost of the combined repositories shown in the report. The acceptance of defense waste by the commercial repository will be on a separate schedule that will not interfere with the acceptance of commercial waste.

3-14 The final report recognizes that additional development and evaluation costs may be incurred to accommodate defense waste in the commercial repository. The term "augmented repository" is used in this report to distinguish between the reference commercial waste only repository and a commercial repository containing defense waste. By law, the commercial repository must receive defense high-level waste unless the decision is made by the President, pursuant to the Nuclear Waste Policy Act, to develop a defense-only repository.

3-15 Table 2-13 is a summary table based upon transportation of defense high-level waste from the sites in the quantities shown in Table 1-1. Further clarification is provided in the responses to questions 3-16, 3-17, 3-28, and 3-29.

3-16 The basis of the shipment rates of Table 1-1 is "The Defense Waste Management Plan," DOE/DP-0015.

3-17 The transportation costs as presented in Table 2-13 are for transportation from the three locations shown in Table 1-1 (Savannah River, Hanford, and Idaho) to the destinations listed in Table 2-13 (Hanford Reservation, Nevada Test Site, Paradox Basin, Permian Basin, and Gulf Interior Region).
These sites are not all in salt formations, at least one is basalt and one is tuff. No cost (\$0) is attributed to rail or truck for the movement of waste from Hanford to a Hanford repository. The consideration of a second repository is not relevant to the decision to build a defense-only repository and was not included as a consideration in either the referenced report or in this report.

3-18 The phased shipment schedules are detailed in the Defense Waste Management Plan (DOE/DP-0015) and do include the ending of shipments from Hanford in 2007 and the beginning of shipments from INEL the following year.

3-19 By law a repository must be capable of accepting both commercial high-level waste and spent fuel. The even split between the two waste types was a reasonable assumption given the information available at the time this study was initiated. Although current economic conditions do not favor reprocessing, it is assumed that future conditions could make it part of the waste management options.

3-20 The repository area required for defense waste in a commercial repository depends on the amount of commercial and defense waste placed in the repository. Both of these are unknown at the present time. In the reference repository design used in the report, the defense waste would occupy approximately 10 percent of the total repository area.

3-21 Pg. 2-19 The study assumes a commercial repository will be available to accept waste in 1998. However, the DOE draft Mission Plan dated April, 1984 identifies a start date for full operation at the first commercial repository in 2001. This discrepancy should be resolved.

3-22 Pg. 2-18 The study indicates that a simple transport model (GARD=2) was used to perform the health and safety impact analysis. Why was this model selected over others? What is the reference for the model and the health and safety analysis?

3-23 Pg. 2-25 The statement that overpacks are expected to withstand corrosion for much longer than 1000 years in most environments requires further discussion and examples of the types of environments considered.

3-24 Pg. 2-31 The study indicates that the results of a long-term effort modeling suggest that comingling of defense and commercial waste has the effect of reducing slightly the overall releases to the accessible environment. We take exception to that statement; any reduction would be minimal but impossible at this point to identify. The comingling release effects are lost in the uncertainty of the assumption used in the model calculations.

3-25 Pg. 2-52 The study assumes no routing restrictions for either truck or rail transport. Such restrictions will undoubtedly exist, and should be discussed. Furthermore, the study does not discuss actual potential transportation routes from the three DOE facilities from which defense waste will be shipped even to an assumed repository location. Such potential routes should be disclosed and their impacts discussed, again by comparison to a repository site in the five regions identified as continuing potentially acceptable sites plus a second repository in the East or Midwest.

3-26 Pg. 2-53 On page 2-53 it is indicated that transport by rail is more costly due mainly to slower rail speeds and "more constraints on routing". How can this be reconciled with the assumption one page earlier that no routing restrictions for either truck or rail were assumed?

3-27 Pg. 2-54 Table 2-13 is a summary of costs of transporting defense waste to a commercial repository. We have two criticisms of this table. First, costs assume uniform travel time for waste shipments as noted on p. 2-53. This cannot be a reasonable assumption - the travel time from Savannah River to a proposed site in the West must be different from the travel time from Savannah River to a proposed repository in the Gulf Interior region. Secondly, the costs for transporting waste to Hanford must be incorrect. According to Table 1-1 on p. 1-9, 1200 packages of defense high-level waste from the Hanford Reservation will require disposal. Why are the rail costs the same as Nevada and truck costs higher when they would be disposed of at the same reservation where they are currently stored? These discrepancies

3-21 As indicated in the report, a delay in the start-up date of the repository might result in increased costs for interim storage of defense waste, however the conclusion of the report would not be altered. The anticipated start-up date of the repository remains 1998 for the present, barring unforeseen schedule changes.

3-22 A reference citation has been added to the text.

3-23 The report assumes that overpacks can be designed to perform in accordance with regulatory requirements once the repository environment is identified.

3-24 The report states that the releases from the repository per metric ton of heavy metal are lower in the combined repository than for a repository containing commercial waste only. This is because the release per unit of defense waste as defined in the study is much lower than for a unit of commercial waste. However, the total release to the environment from both defense and commercial waste is not expected to be different if defense waste is disposed of in separate repositories or codisposed with commercial waste in the same repository.

3-25 Possible routing restrictions and specific transportation routes were not necessary for this evaluation report. Such information will be detailed in the siting reports and other required documentation that will be prepared for the specific repositories.

3-26 The routing constraints referred to for rail are that the rail network is more limited than the highway network and that railroads try to maximize the use of their own rail lines prior to transfer to another rail line. No routing restrictions imposed by government regulation were assumed.

3-27 The costs presented in Table 2-13 do not assume uniform travel time but rather uniform travel rates: 35 mph by truck and three mph by rail for short hauls and 12 mph by rail across country.

3-28 The transportation costs to a Hanford repository include shipping costs for two legs: Savannah River to Hanford and Idaho to Hanford. The transportation costs to a Nevada repository include shipping costs for three legs: Savannah River to Nevada, Hanford to Nevada, and Idaho to Nevada. It is coincidental that the rail costs for the two legs is nearly equal to that for the three legs. The study referred to in the response to comment 3-17 did consider the particular routing that would be required for rail transport for each leg.

cast doubt on the validity of this transport cost analysis.

3-29 Pg. 3-18 The study suggests that a defense waste-only repository is less complicated technically; therefore, the licensing process is less complex and fewer questions will be raised about the confidence level in the data base. We believe the arguments presented are unfounded. We do not feel the licensing process would be less complex than a comingled repository, and the confidence level in the data base would be greater. In fact, the states, public and the NRC may have less confidence in the data base because of the perceived "secret" nature of defense activities.

3-29 Your comments are well taken and may in fact be the case. However we have no basis to confirm or deny either your opinion or our own. We indicated our own uncertainty by stating that "fewer questions may also be raised about the level of confidence which can be placed on the technical analysis supporting licensing decisions," rather than using a more affirmative "will".



Department of
Comprehensive Planning
RICHARD B. HOLMES
DIRECTOR
SEP 21 1984

NUCLEAR WASTE PROJECT OFFICE

CLARK COUNTY BRIDGER BUILDING
225 BRIDGER AVENUE, SEVENTH FLOOR
LAS VEGAS, NEVADA 89155
(702) 366-4181

JAMES L LEY
ASSISTANT DIRECTOR

September 20, 1984

Mr. David B. LeClaire, Director
U.S. Department of Energy
Office of Defense Waste and By Products Management
U.S. Department of Energy, DP-12
Washington, D.C. 20545

COMMENT ON DOE/DP-0020 (DRAFT) "AN EVALUATION OF COMMERCIAL
REPOSITORY CAPACITY FOR THE DISPOSAL OF DEFENSE HIGH-LEVEL WASTE"

The following are Clark County Department of Comprehensive Planning's comments to the Department of Energy's draft document "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste."

4-1

While the emphasis of the document is to evaluate the influence of defense-related waste on repository capacity given two alternative scenarios, there are associated issues that should be mentioned. Transportation of spent fuel of defense or commercial origin, for example, is of significant concern to local citizens and elected officials. With the realization that many of these questions have yet to be resolved (mode of transport, for example) the potential cumulative impact of transporting defense and commercial waste to a site such as Yucca Mountain are not discussed in the document. Other concerns are related to who will be transporting the waste (military, private carrier?), what role local governments will have in the selection of routes for transport, questions of liability for the accidental spills of material and associated emergency management questions. These should be treated more comprehensively.

4-2

The document also takes a rather negative view of the public and elected officials' evaluation of the nuclear waste repository program. While the suppositions provided are correct, much of the public's perceptions about a project with as much potential controversy as this result from a lack of awareness. Discussion, therefore, should be provided in the study describing how the Department of Energy intends on addressing the public's concerns about these issues.

4-1

COMMISSIONERS

Thalia M. Dondaro, Chairman • Manuel J. Cortez, Vice-Chairman
Donald M. Clark, Karen Hayes, Paul W. May, R.J. "Dick" Ronzone, Bruce L. Woodbury
Joseph C. Denny, County Manager • Donald L. "Pat" Shalmy, Assistant County Manager

CLARK COUNTY DEPARTMENT OF COMPREHENSIVE PLANNING

RESPONSE TO COMMENTS

- 4-1 The cumulative impact of transporting defense and commercial waste to a specific site is site-specific and will be detailed in future siting studies. Defense, and other Departmental wastes, are currently being transported by the commercial carrier industry. It is the intention to continue using commercial carriers for defense wastes to a repository. Liability coverage for these waste shipments is provided under the Price-Anderson Act. The role of local governments with respect to transportation of nuclear waste will be based on established laws and regulations.
- 4-2 The Department of Energy is making every effort to increase public awareness of the repository program. In making the report, that you have commented on, available to the public, we have gone beyond the requirements of the law in order to increase public awareness, and develop a public record on the issue of defense high-level waste disposal.

It is beyond the scope of the report to come up with specific plans for addressing public concerns. Public concerns will be addressed in greater detail in various sections of the "Mission Plan for the Civilian Radioactive Waste Management Program." As stated in Chapter 11 of the draft Mission Plan "In selecting a repository site, the Department is required to ascertain that significant adverse impacts, if any, can be offset by reasonable mitigation and compensation," and this includes addressing socioeconomic parameters as identified in the draft Plan.

DAVID B. LeCLAIRE

-2-

SEPTEMBER 20, 1984

4-2
cont'd

As was the case with the draft mission plan local concerns seem to take a back seat to technological on-site matters. While no one doubts the importance of having a repository that will safely contain radioactive waste for thousands of years, the issues related to a public that will have to take the brunt of the activities associated with the construction and transportation of the repository should not be ignored. This is the main failing of the document.

Sincerely,

DEPARTMENT OF COMPREHENSIVE PLANNING

Richard B. Holmes

Richard B. Holmes

Director

RBH:ii

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R E C E I V E D

SEP 21 1984

Nuclear Waste Project Office

September 20, 1984

Nuclear Waste Project Office
Office of the Governor
Capitol Complex
Carson City, Nevada 89710

ATTENTION: Mr. Robert R. Loux, Director

SUBJECT: Comments to Department of Energy Report Entitled, "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High Level Waste

Dear Mr. Loux:

In accordance with the contractual agreement between the Nuclear Waste Project Office and Lincoln County, the County hereby submits comments to the subject report on behalf of itself and the City of Caliente. The comments have been prepared by Resource Concepts, Inc., technical consultant to Lincoln County and the City of Caliente concerning the proposed nuclear waste repository at the Nevada Test Site.

The concerns of Lincoln County and the City of Caliente are generally related to transportation and health safety factors. In general, the County and City are concerned that DOE has not adequately considered the compounding effects of shipping defense nuclear waste to a proposed commercial repository. The County and the City are particularly concerned that issues concerning routing and mode of transportation, institutional and legal restraints; carrier safety and liability have not been addressed in the report. The entities believe that a comprehensive analysis of the feasibility of commingling defense with commercial nuclear waste must consider these transportation issues. The following comments are presented in a format which provides the specific page number and section within the subject report to which the comments are offered.

COMMENTS

Page 2-48 through Page 2-50, Section 2.3.4, first paragraph.

5-2 The first paragraph of this section of the report suggests that while the Department of Transportation and the Nuclear

RESOURCE CONCEPTS INC.

RESPONSE TO COMMENTS

- 5-1 The issues raised do not bear directly on the question of whether a defense-only repository is required. They are more of a site specific nature and will be addressed in future siting studies.
- 5-2 The scope of the Department of Transportation's regulatory authority covers all transportation issues for hazardous materials shipments, including those for both commercial and defense radioactive waste.

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ATTENTION: Mr. Robert R. Loux, Director
Page 2

5-2
cont'd

Regulatory Commission have regulatory authority over transportation of commercial radioactive waste, only the Department of Energy has authority over the design and certification of defense high level waste packaging systems. This section of the report does not indicate who has regulatory authority for the transportation of defense radioactive waste for issues other than design and certification of packaging systems.

Page 2-50, third paragraph.

5-3

The report indicates that the analysis assumes that a total of 20,000 cannisters will be transported from three DOE sites. While this assumption is made, no indication of the reasonableness of the assumption is offered. It would seem possible, given current defense facilities and waste generation levels, to suggest the reasonableness of the 20,000 cannister assumption. The City and the County are particularly interested in the quantities of defense nuclear waste potentially moving to a Nevada Test Site repository as this may increase rail traffic through the County.

Page 2-52, second paragraph.

5-4

This section of the report indicates that the total transportation cost for defense high level waste includes the capital and maintenance cost for the casks and carrier transportation charges. The report does not consider capital costs associated with the track improvements, which may be necessary to ensure that rail transportation can occur within reasonable levels of risk. While the report does reference carrier transportation charges, it is not clear whether these capital improvements are considered to be recaptured by the carriers through transportation charges.

Page 2-53.

5-5

This section of the report documents the assumptions and procedures used in estimating rail transportation costs associated with the disposal of defense nuclear waste. While it would appear that assumptions concerning the number of shipments is necessary to have derived the costs presented in Table 2-13, data on frequency of shipments is not presented in the report. This information is particularly important to Lincoln County and the City of Caliente in that rail traffic

- 5-3 The number of packages of defense waste assumed for this analysis is based on information presented in the Defense Waste Management Plan and includes waste expected to be available through the year 2021. The number of defense waste packages that will go into any single repository may vary depending on such factors as the availability of a second repository, the repository locations, and their capacity. The mode of transport or mix of transport modes has not been established at this time.
- 5-4 Costs associated with track improvements are assumed to be recaptured by the carriers in their shipping charges.
- 5-5 If rail is used to transport defense high-level waste, the average number of shipments will range from three to four rail cars per week. The actual number of shipments in a given week may vary depending on the rate of receipt at the repository. Also, if more than one repository is available to receive defense wastes, the number of defense waste shipments to a particular site will be less.

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5-5
cont'd

and the frequency of shipments could represent a significant impact to the area. Discussion in the report should be expanded to include information on the number of shipments assumed to be occurring in the analysis. Page 2-60 suggests that if defense waste is commingled with commercial waste

5-6

more waste shipments to the repository site may cause increased traffic congestion and increase the potential for accidents to occur thereby increasing the health and safety risk to the public. It would appear that DOE recognizes the possible impact associated with increased shipments. However, in this report they have elected not to show the assumptions associated with an increased number of shipments.

Page 2-60, second paragraph.

5-7

This portion of the report recognizes the impact of the nuclear waste storage investigations, be they for commercial or defense wastes, on public perceptions concerning health and safety risks to local populace. Lincoln County and the City of Caliente are concerned that these perceptions may impair the success of economic development activities currently underway in the County and the City. Proposals to ship defense nuclear waste to a proposed repository at the Nevada Test Site would only exacerbate this situation. This report does not appear to recognize the effect of negative perceptions on economic development activities occurring in areas potentially being impacted by studies of possible repository sites.

It is hoped that these comments will be of value to DOE in preparing their final evaluation of commercial repository capacity for the disposal of defense high level waste.

Lincoln County and the City of Caliente would hope that DOE would more thoroughly consider the added impacts on transportation associated with shipments of defense high level wastes to a repository potentially located in Southern Nevada.

Respectfully submitted,

Mike Baughman
Senior Planner

MB:db

- 5-6 Impacts associated with increased shipments to a repository site are site dependent and will be dealt with in documents associated with future siting studies.
- 5-7 The specific socioeconomic impacts of a specific repository site are site-specific and will be addressed in future siting studies.

It is not apparent that the addition of defense waste to a commercial repository would significantly change public perceptions about the repository.

RESOURCE CONCEPTS INC

ENGINEERING • ECONOMICS
RESOURCE PLANNING

348 N. MINNESOTA ST. • CARSON CITY, NEVADA 89701 • (702) 883-1800

RECEIVED

SEP 21 1984

NUCLEAR WASTE PROJECT OFFICE

September 20, 1984

Nuclear Waste Project Office
Office of the Governor
Capitol Complex
Carson City, Nevada 89710

ATTENTION: Mr. Robert R. Loux, Director

SUBJECT: Comments to Department of Energy Report Entitled, "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High Level Waste."

Dear Mr. Loux:

In accordance with the contractual agreement between the Nuclear Waste Project Office and Lincoln County, the County hereby submits comments to the subject report on behalf of itself and the City of Caliente. The comments have been prepared by Resource Concepts, Inc., technical consultant to Lincoln County and the City of Caliente concerning the proposed nuclear waste repository at the Nevada Test Site.

The concerns of Lincoln County and the City of Caliente are generally related to transportation and health safety factors. In general, the County and City are concerned that DOE has not adequately considered the compounding effects of shipping defense nuclear waste to a proposed commercial repository. The County and the City are particularly concerned that issues concerning routing and mode of transportation, institutional and legal restraints, carrier safety and liability have not been addressed in the report. The entities believe that a comprehensive analysis of the feasibility of commingling defense with commercial nuclear waste must consider these transportation issues. The following comments are presented in a format which provides the specific page number and section within the subject report in which the comments are offered.

COMMENTS

Page 2-48 through Page 2-50, Section 2, 3rd first paragraph.

The first paragraph of this section of the report suggests that while the Department of Transportation and the Nuclear

5-1

5-2

September 20, 1984

Nuclear Waste Project Office

ATTENTION: Mr. Robert R. Loux, Director

Page 2

Regulatory Commission have regulatory authority over transportation of commercial radioactive waste, only the Department of Energy has authority over the design and certification of defense high level waste packaging systems. This section of the report does not indicate who has regulatory authority for the transportation of defense radioactive waste for issues other than design and certification of packaging systems.

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cont'

5-3

5-4

5-5

September 20, 1984
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Page 3

and the frequency of shipments could represent a significant impact to the area. Discussion in the report should be expanded to include information on the number of shipments assumed to be occurring in the analysis. Page 2-60 suggests that if defense waste is commingled with commercial waste, more waste shipments to the repository site may cause increased traffic congestion and increase the potential for accidents to occur thereby increasing the health and safety risk to the public. It would appear that DOE recognizes the possible impact associated with increased shipments. However, in this report they have elected not to show the assumptions associated with an increased number of shipments.

Page 2-60, second paragraph.

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It is hoped that these comments will be of value to DOE in preparing their final evaluation of commercial repository alternatives for the disposal of defense high level waste.

Lincoln County and the City of Caliente would urge that DOE would more thoroughly consider the added impacts of transportation associated with shipments of defense high level wastes to a site potentially located in Southern Nevada.

Respectfully submitted,

Mike Baughman
Senior Planner

MB:db

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MIDDLE SOUTH SERVICES, INC./BOX 61000/NEW ORLEANS, LA. 70161/(504) 529-5262

FELIX M. KILLAR, JR.
MANAGER, NUCLEAR FUEL SUPPLY

September 19, 1984

Mr. David B. LeClaire, Director
Office of Defense Waste and
Byproducts Management
U.S. Department of Energy, DP-12,
Washington, D.C. 20545

Dear Mr. LeClaire:

Re: An Evaluation of Commercial Repository
Capacity for the Disposal of Defense
High-Level Waste, U.S. Department of Energy.

6-1

6-2

This letter provides the comments of Middle South Services, Inc. on the referenced report. We have several concerns over the commingling of defense waste and commercial waste in the same repository. These concerns are potential adverse effects on the costs of the commercial waste disposal program, the potential for defense waste taking away space or receiving capability at the repository from commercial waste, and the possible negative political consequences to the commercial nuclear industry caused by public misperceptions about its role relative to the defense program.

For these reasons, we oppose commingling of defense and commercial wastes unless it can be demonstrated that:

- A cost savings for the commercial program will result.
- Acceptance of commercial waste will not be delayed.
- Political and public relations problems will not result.

Please call if you have any questions.

Sincerely,



FMK/FBR/nb

File: 041-01
096-02
096-07

cc: Mr. J. F. Fager
Mr. L. L. Kittley
Dr. T. W. Schnatz
NED/QA Managers
Nuclear Fuel Subcommittee

6-1

MIDDLE SOUTH SERVICES, INC.

RESPONSE TO COMMENTS

- 6-1 The allocation of costs for disposal of defense waste in the commercial repository will be made following the President's evaluation. The allocation will cover the full cost of disposing of defense waste and, thereby, prevent adverse effects on the costs of the commercial waste disposal program.
- 6-2 If defense wastes are to be disposed of in the commercial repositories, those wastes will be received on a separate schedule mutually agreed to by the Assistant Secretary for Defense Programs and the Office of Civilian Radioactive Waste Management, such that the rate of receipt of commercial wastes once established will not be adversely affected. Since it will be known well in advance of repository design and construction if defense waste will be accepted at the repository, the repository system can be designed to provide sufficient receiving capacity and space to accommodate all the available commercial and defense wastes proposed for repository disposal.

It is not at all evident that there will be public misperceptions and/or negative political consequences to the commercial nuclear industry if defense waste is disposed of in the same repository as commercial waste.

EDISON ELECTRIC INSTITUTE

The association of electric companies

1111 19th Street, N.W.
Washington, D.C. 20036
Tel: (202) 828-7400

September 24, 1984

Mr. David B. Leclaire
Director, Office of Defense Waste and
Byproducts Management
U.S. Department of Energy, DP-12
Washington, D.C. 20545

Re: An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste (DOE/DP-0200 (Draft))

Dear Mr. Leclaire:

These comments are submitted on behalf of the Edison Electric Institute (EEI) and Utility Nuclear Waste Management Group (UNWMG) in response to Mr. Rusche's letter dated August 10, 1984. We have reviewed the above-referenced document. Our general comments are contained in this letter, and specific comments are presented in the Enclosure.

7-1 At the outset, EEI/UNWMG wish to emphasize their support for the efficient, cost-effective disposal of both spent nuclear fuel and commercial and defense high-level radioactive waste. Further, it is clear that there is no fundamental reason why commercial spent fuel and defense high-level waste cannot be disposed of together. We are concerned, however, that the report does not contain sufficient information to enable an informed electric utility choice between the alternatives of combined or separate disposal. We recognize the potential cost efficiency of combined disposal in the commercial repository. However, the dollar values for that repository used throughout the report to validate the recommendation are badly out of date. Perhaps more importantly, the report does not sufficiently consider the possible negative impacts combined disposal could have on the completion schedule for the first commercial repository, the rate of acceptance of civilian spent fuel, and the resultant costs. Further, the matter of cost allocation between electric utilities and the government is not adequately addressed.

7-2

7-3

First is the matter of public acceptance of defense high-level waste disposal in a commercial spent fuel repository. The report, to its credit, contains a discussion of this issue. It notes, for example, that opponents can be expected to favor the lowest risk option of any available set of alternatives -- even though all options comply with applicable regulatory standards -- and that the issue of defense waste disposal in a commercial repository

EDISON ELECTRIC INSTITUTE

RESPONSE TO COMMENTS

7-1 The cost data presented in the report were based on early repository designs. The references for this data are:

Lazur, E.C. "Cost Estimates for Disposal of Defense High-Level Waste (DHLW) in a Defense-Only Repository."

Varadarajan, R. V. and Dippold, D. G. "Cost Estimates for Disposal of DHLW in a Commercial Repository: An Update."

The references are included in the reference section of the report and are cited in the appropriate text section of the final report.

A comparison with a recent design detailed in the Draft Mission Plan for Civilian Radioactive Waste Management indicates that current costs would be higher. However this would not alter the qualitative result of this study.

7-2 Since implementation of the Nuclear Waste Policy Act, DOE planning activities have been based on the principle that defense waste could be disposed of in the civilian repository. Thus the acceptance of defense waste has been factored into the completion schedule for the repository. DOE is not aware of any reason for acceptance of defense waste to contribute the delays in the repository program. DOE is committed to meeting its obligations to accept civilian waste by 1998.

Defense waste will be received at a civilian repository on a separate schedule, mutually agreed to by the Assistant Secretary for Defense Programs and the Office of Civilian Radioactive Waste Management, such that the rate of receipt of commercial waste, once established, will not be adversely impacted.

7-3 While it is recognized that the allocation of costs between commercial users and the federal government is of great importance to those affected, the cost allocation is not a relevant issue for this report, but rather the overall cost to the nation of the program. The Nuclear Waste Policy Act does not require that the allocation of costs be made as part of the evaluation, but rather subsequent to it.

could easily become a focus for activities delaying the licensing process based on purported concerns over multiple waste sources, forms, and a general perception of greater complexity. It also notes that states, Indian tribes and local officials would probably not be pleased by the addition of defense waste to a commercial repository in their locality based, among other things, on concerns over increased repository waste volumes and a larger number of shipments.

Nowhere, however, does the report analyze the impact of such complications on the projected schedule for completion and operation of the commercial spent fuel repository, or cost. We believe that, contrary to the conclusion stated in the report that "the differences in acceptability between the options appear to be minor compared to gaining public acceptance for any high-level waste repository," the relative impacts could be major. Accordingly, the report must discuss the potential result of increased public opposition stemming from the combined disposal of defense high-level waste and commercial spent fuel in a single repository in both terms of time and money. The potential effects on schedule and cost are too substantial to be omitted and must be analyzed, even if only in terms of contingencies. Any significant potential for schedule delay identified as a result of combined disposal must be considered a major detriment to the program which could well outweigh expected cost advantages.

7-5 Second, from the information presented in the report, it appears that the volume of defense waste anticipated to arrive at a repository is substantial and, indeed may well be comparable to that of commercial spent fuel during the early years of repository operation. Spent fuel acceptance rates, however, are of vital importance to utilities, and the report should make it clear that defense shipments will be managed on a not-to-interfere basis.

7-6 Further, the report should discuss any additional project requirements and costs associated with the handling of defense waste so as not to adversely impact the acceptance of commercial spent fuel; perhaps, e.g., for providing an enlarged repository access shaft. An option that should be considered is the dedicated use in early years of operation (1998 to 2010) of the first repository to the storage of spent fuel -- so as to ensure adequate waste acceptance rates. Similarly, early use of the second repository might be dedicated to the storage of defense high-level waste. This approach might facilitate licensing and siting as well.

7-7 Third, the report indicates that DOE will complete, at a later date, a formula for allocating costs between electric utilities and the government. Such information is, of course, of great importance to an informed utility judgement as to whether or

7-4 The impact on the schedule and cost of siting the first repository if there is public opposition to the combined disposal of defense high-level waste and commercial waste is recognized in the report. The extent of such opposition and the degree to which it affects the schedule and cost is one of many subjective judgments which must be considered in determining whether a defense-only repository is required.

7-5 The schedule for receipt of waste at the repository has not been determined yet. Waste acceptance schedules will be published in the final Mission Plan for the Civilian Radioactive Waste Management Program.

It is the Department of Energy policy that if defense wastes are to be disposed of in the commercial repositories, those wastes will be received on a separate schedule, mutually agreed to by the Assistant Secretary for Defense Programs and the Office of Civilian Radioactive Waste Management, such that the rate of receipt of commercial waste, once established, will not be adversely impacted.

7-6 The additional project requirements and associated costs for handling and disposing of defense high-level waste in a commercial repository are reflected in the costs of the combined repository shown in the report.

The Office of Civilian Radioactive Waste Management will be considering a number of approaches to accommodating both commercial and defense waste in the repository system, so as not to adversely impact the schedule for receipt of commercial waste. Your suggested approach will certainly be considered as one possible option.

7-7 The allocation of costs for disposal of defense waste in the commercial repository will be made following the President's evaluation. The allocation will cover the cost of disposing of defense waste as prescribed in the Nuclear Waste Policy Act.

Mr. David B. Leclaire
September 24, 1984
Page Three

7-7
cont'd

not combined disposal is preferable to separate facilities. A proposed allocation formula should cover all costs, including those for development and evaluation (D&E) activities, and any incurred directly by utilities as a consequence of delays in the acceptance of spent fuel or waste. Further, it must be the result of close consultation and coordination between both DOE and the utility industry. Also, the time of payment for disposal of

7-8

defense wastes is of primary concern to the utilities and of vital importance to the funding for the program. Electricity ratepayers are providing significant funds through the electric utilities to the Nuclear Waste Fund now, at least fourteen years before the actual disposal service will be provided. Early and equitable payments should be made to the Nuclear Waste Fund for the disposal of defense wastes.

We appreciate this opportunity to comment on the draft report. We would be pleased to discuss with you at your convenience any of the issues raised in these comments in greater detail.

Sincerely yours,

Loring E. Mills
Loring E. Mills
Vice President, Nuclear
Activities

LEM:jhd
Enclosure

7-8 Since the funds for payment of the costs resulting from permanent disposal of high-level radioactive waste from atomic energy defense activities require an appropriation of the Congress of the United States, the timing and amounts of these payments will be subject to Congressional acts.

EEI/UNWMG DETAILED COMMENTS ON AN EVALUATION OF COMMERCIAL REPOSITORY CAPACITY FOR THE DISPOSAL OF DEFENSE HIGH-LEVEL WASTE (DOE/DP-0200 (DRAFT))

p. E-4

7-9

The statement that the development and evaluation (D&E) costs of \$4.5 billion will not change if defense wastes are disposed of in a commercial repository should be adequately supported.

pp. 1-7 to 1-10

7-10

Defense waste shipments are discussed on these pages. From the information presented, it appears that the volume of defense waste expected is substantial and, indeed, may well be comparable to that of commercial spent fuel during the early years of repository operation. The report should make it clear that defense shipments will be managed so as not to interfere with the spent fuel acceptance rates promulgated elsewhere, such as in the final Mission Plan. Utilities believe specific criteria should provide that spent fuel will be accepted by DOE and shipped to federal facilities so that no additional spent fuel storage capacity would need to be provided at nuclear power plants after 1998. Further, any additional project requirements and costs associated with the handling of defense waste on a not-to-interfere basis (perhaps, e.g., for enlarging the repository access shaft) should be identified.

p. 1-11

7-12

With respect to the baseline assumptions presented on this page, the basis for assuming that half of the commercial waste in a 70,000 MTHM repository will be spent fuel, and half reprocessing waste, should be explained. In addition, the basis for establishing 20,000 defense waste packages as equivalent to 10,000 MTHM should be explained. Finally, assumption number 4 should be modified to make it clear that the total of both defense and commercial waste in the first repository is not to exceed 70,000 MTHM before the second repository is placed in operation.

pp. 2-5 to 2-10

7-14

An enhanced evaluation of cost efficiency is very desirable, requiring greater knowledge of the overall system as well as that of the specific facilities involved. The DOE draft Mission Plan acknowledged the need for systems integration studies which are needed so that each facility is coordinated with all others.

7-9 We agree that additional D & E costs may be incurred to accommodate defense waste in the commercial repository. However, the additional costs are expected to be small in comparison with the total. The report has been revised to reflect this.

7-10 A schedule for receipt of waste at the repository has not been determined yet. It is the policy of DOE that defense waste will be received at a commercial repository on a separate schedule, mutually agreed to by the Assistant Secretary for Defense Programs and the Office of Civilian Radioactive Waste Management, such that the rate of receipt of commercial waste, once established, will not be adversely impacted.

7-11 The additional project requirements and extra costs associated with handling defense waste are reflected in the costs of the combined repository shown in the report.

7-12 The even split between the two waste types was a reasonable assumption given the information available at the time this study was initiated. This assumption was also made in an early draft of the Mission Plan for the Civilian Radioactive Waste Management Program.

Since the EPA has proposed Curie release limits per MTHM charged to a light water reactor, Curie releases and repository loadings in MTHM equivalents were calculated for defense high-level waste on a Curie basis.

7-13 The text of assumption #4 (page 1-11) has been modified to satisfy the concern raised by your comment.

7-14 The level of detail implied by your comment was beyond the scope of the costing models used. Methods to improve cost efficiency will be determined during detailed design of the facility or facilities. The relative cost of the two options determined by the costed models, although general and non-specific, are the basis for this evaluation.

pp. 2-5 to 2-10
(continued)

7-14
cont'd

For instance, how do the MRS, separation of surface and underground facilities, and universal cask feature in the combined facility?

pp. 2-10 to 2-16

7-15

The cost information presented on these pages does not compare with that presented elsewhere; e.g., in the draft Mission Plan. This information should be consistent. Further, the report does not propose a cost allocation formula. Such information is, of course, important to an informed electric utility judgement as to whether or not the combined disposal of civilian and defense waste in a single repository is preferable to separate facilities.

7-16

The cost allocation between commercial spent fuel and defense high-level wastes should recognize all costs, not just incremental costs, associated with the program under the OCRWM; and an equitable basis for the allocation should be determined in an open forum as a result of close consultation between DOE and the utility industry. The basic differences in the wastes, with defense wastes being of lower activity but larger volume, must be considered in determining the basis for cost sharing. The timing and rate of payment of federal funds into the Nuclear Waste Fund should be similar to those provided under the contracts with utilities. Payments should begin immediately after a determination is made that defense wastes are to be emplaced in the repositories with commercial spent fuel.

p. 3-3

7-17

The basis for the statement in the paragraph ending at the top of the page that a defense-only repository "would not handle transuranic waste" should be provided.

p. 4-9

7-18

The first sentence on this page contains the statement that:

"In general, the differences in acceptability between the options appear to be minor compared to gaining public acceptance for any high-level waste repository."

This conclusion, however, does not generally follow from the discussion which precedes it and should be deleted.

7-15 We recognize that the cost data may be inconsistent with recent cost data. This is because of the rapid evolution of the civilian repository program. The cost data is based on early repository designs which have since been changed. A comparison with the repository design detailed in the Draft Mission Plan for the Civilian Radioactive Waste Management Program indicates current costs would be higher, however the qualitative result of the study would not change.

While it is recognized that the allocation of costs between commercial users and the federal government is of great importance to those affected, the cost allocation is not a relevant issue for this report, but rather the overall cost of the program to the nation. The Nuclear Waste Policy Act does not require that the allocation of costs be made as part of the evaluation but rather subsequent to it.

7-16 The allocation of costs for disposal of defense waste in the commercial repository will be made following the President's evaluation. The allocation will include costs of developing, constructing, and operating the repository or repositories as prescribed in the Nuclear Waste Policy Act.

No decisions have been made regarding the details of the cost allocation. A wide variety of cost allocation mechanisms are being considered.

Since the funds for payment of the costs resulting from permanent disposal of high-level radioactive waste from atomic energy defense activities require an appropriation of the Congress of the United States, the timing and amounts of these payments will be subject to Congressional acts.

7-17 The statement regarding TRU waste disposal (page 3-3) was clarified. Defense TRU waste is currently scheduled to be disposed of in the Waste Isolation Pilot Plant authorized under PL96-164.

7-18 The public acceptability analysis did not indicate that the public is more likely to accept one of the disposal options for defense high-level waste over the other. The primary concerns of the public are whether the repository itself, regardless of the types of waste it contains, will adversely affect public health and safety.



State of South Carolina

Office of the Governor

RICHARD W. RILEY
GOVERNOR

POST OFFICE BOX 11450
COLUMBIA 29211

September 21, 1984

Mr. David B. Le Claire, Director
Office of Defense Waste and Byproducts Management
U. S. Department of Energy DP-12
Washington, D. C. 20545

Dear Mr. Le Claire:

SUBJECT: An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste (DOE/DP-0020 Draft)

South Carolina appreciates the opportunity to comment, and concurs with the basic conclusions contained in the draft Report. In particular we endorse the recommendation for disposal of defense wastes in repositories to be developed by the Office of Civilian Nuclear Waste Management under the NWPA of 1982. In revising this draft as a Final Report to the President, we believe there are a number of areas which could be clarified. The following are specific comments on these areas of the Report.

8-1 1. The "final allocation mechanism" mentioned on page E-4 and referred to elsewhere should be established now. Although the cost of a defense-only repository might have been \$435 million some years ago, the lack of progress with defense wastes until recently has raised the awareness of the public regarding nuclear waste disposal. As a result, it is expected that the costs of waste disposals will be higher than previously estimated. The defense program should be expected to pay a proportionate share of the costs incurred for waste disposal. Furthermore, the methodology behind any conclusion regarding the cost of a defense-only repository should be specified. Generalizations, such as those on page E-3 and elsewhere regarding low curie content of defense wastes, and the anticipated minuscule percentage of nuclear waste volume in the year 2000 (assuming that the civilian industry quadruples) do not contribute to the planning and evaluation process.

8-2 8-3 Because the defense wastes will effectively displace a proportion of civilian wastes, that proportion (1/7th, or 1/8th or 1/3rd...) of commercial wastes displaced should be reimbursed to the Waste Fund by the defense budget to take the burden from the rate payers who would otherwise be financing the deposit of spent fuel in the first and second repositories. The role of the second repository in the storage of defense wastes is not specified in this report, and should be clarified in the final draft.

SOUTH CAROLINA, OFFICE OF THE GOVERNOR

RESPONSE TO COMMENTS

8-1 The 435 million dollars you refer to was the original estimate of development and evaluation (D & E) costs for a defense-only repository. The construction, operating, and decommissioning costs of a defense-only repository were estimated to range between 2.2 and 3.0 billion dollars. The estimate of the D & E costs for the defense-only repository has been revised in the final report. It is likely to be of the same order of magnitude as for the commercial repository, but lower because not all elements of D & E associated with the commercial repository are associated with the defense-only repository.

8-2 The methodology for developing the costs for both the defense-only repository and the Augmented Repository are contained in the following references:

Lazur, E.C. "Cost Estimates for Disposal of Defense High-Level Waste (DHLW) in a Defense-Only Repository."

Varadarajan, R. V. and Dippold, D. G. "Cost Estimates for Disposal of DHLW in a Commercial Repository: An Update."

The information on the Curie content and volume of defense waste was provided to give some perspective on the relative magnitude of waste involved. The values do influence the amount of space needed for defense waste in any repository and, to some extent, could influence the decision on whether a defense-only repository is required. For instance, if the amount of defense waste that needed disposal within the time frame of the study was of the same order of magnitude as civilian waste, a separate repository for defense waste might have been shown to be cost effective.

The Nuclear Waste Policy Act of 1982 provides guidance on the cost elements that must be included in any allocation formula developed for the share of disposal costs to be paid for by defense waste.

The allocation of the costs for disposal of defense waste in the commercial repository will cover the full costs of disposing of the defense waste.

8-3 There is no reason to preclude the possibility that some of the defense waste would be disposed of in the second repository. A statement to that effect has been added to the report.

September 21, 1984
Mr. David B. Le Claire
Page 2

8-4 2. The matter of "augmenting" the first repository with 10,000 MTHM of defense wastes is complicated. The concept should be dealt with more specifically. We question, for example:

- How would acceptance schedules be addressed? (Will defense wastes be a proportion of Phase I? Will there be fractional mixing of defense and commercial wastes for acceptance?) How will defense wastes be divided between the first and second repositories?
- Will the mining of defense-only drifts delay mining of commercial drifts?
- Will handling and emplacement facilities be upgraded up to handle the added waste?

8-5 3. References to relevant laws should be included in sections 1, 2, and 3. Nothing in Section 8(b) of the Nuclear Waste Policy Act exempts a defense-only repository from the provisions of NEPA, RCRA, or other federal environmental protection laws.

8-6 4. The report should discuss compatibility of commercial and defense waste packages. For example, would there be savings in transporting, handling and disposal if cannisters of the same size were used? Would defense use of a cannister that could be stored on site eliminate the potential need for additional temporary facilities if repository operations are delayed? What is the justification for independently designing and testing a small number of defense waste casks?

8-7 5. Changing definitions are a recurring problem. In this document the definitions of high-level wastes, TRU wastes, remote- and contact-handled wastes must be specified. It would be most convenient if the definitions agreed with other agencies' definitions. The defense definition of high-level wastes on page 1-4 appears to have omitted research reactor spent fuel rods and unprocessed military materials.

8-8 6. The arguments on pages 2-30 and 2-31 regarding the benefit of adding defense wastes to a commercial repository in order to reduce "composite effects per MTHM" are irrelevant particularly in light of the "augmented repository" concept. The question is whether the increased effects are significant.

8-9 7. It is possible that the repository for defense wastes (whether a defense-only repository or a codisposal facility) will not be available in the year 2000.

8-4 Waste acceptance schedules will be published in the Mission Plan for the Civilian Radioactive Waste Management Program and subsequent revisions, if any. If defense wastes are to be disposed of in the commercial repositories, those wastes will be received on a separate schedule mutually agreed to by the Assistant Secretary for Defense Programs and the Office of Civilian Radioactive Waste Management, such that the rate of receipt of commercial wastes once established will not be adversely impacted.

No plans have been made at this time with regard to allocating defense waste among the two repositories.

Details with regard to mining, handling, and emplacement facilities at the repository are not fully developed. The capacity to handle the defense waste without adversely affecting the receipt and emplacement of civilian waste will be factored into repository planning and design.

8-5 Your statement is correct. The report does not assume that a defense-only repository is exempt from the federal environmental protection laws.

8-6 This report is limited to a comparison of two options for disposal of defense high-level waste with respect to the factors specified in the Nuclear Waste Policy Act. A discussion of the items you suggest is immaterial to this comparison; however, the issues you identified will be the subject of future studies as part of the program planning activities.

8-7 This report is concerned with disposal of defense high-level waste. The definition given on page 1-4 is for defense high-level waste and the final report was corrected to reflect this. At the present time, there are no plans to dispose of research reactor spent fuel rods and unrepurposed military materials as such.

8-8 The reference to composite effects per MTHM of disposal of defense high-level waste and commercial waste in the same repository has been deleted from the report.

8-9 DOE will make every effort to meet its obligation to accept civilian waste by 1998.

As stated in the report, generators of defense high-level waste will provide on-site interim storage facilities for their waste to preclude the need to shut down their production facilities in the event that a repository is not able to accept their wastes in a timely manner.

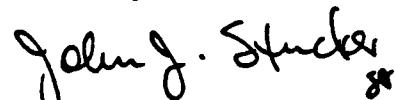
September 21, 1984
Mr. David B. Le Claire
Page 3

8-9
cont'd

8-10

Therefore, defense program planners should have a contingency plan storing defense wastes at defense facilities after that time. The national security specifications on page E-9 and elsewhere are proper goals, but it is not reasonable to base this country's national security upon the operation of any nuclear waste repository in the year 2000.

Sincerely,



John J. Stucker
Special Assistant

JJS/SR/shc

8-10 The nation's national security is not based on "the operation of any nuclear waste repository in the year 2000." There are contingency plans in place but they are not the subject of this report.

PICKARD, LOWE AND GARRICK, INC.

1200 18TH STREET, N. W., SUITE 612
WASHINGTON, D. C. 20036

JAMES K. PICKARD
WILLIAM W. LOWE
B. JOHN GARRICK
HAROLD F. PERLA

THOMAS R. ROBBINS
KEITH WOODARD
THOMAS E. POTTER
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ROBERT S. HUNTER

ASSOCIATES
STAN KAPLAN
GEORGE APOSTOLAKIS
RICHARD V. CALABRESE
VIJAY K. DHIR
CAROLYN D. HEISING

WASHINGTON, D. C.
TELEPHONE 202 296-8633

NEWPORT BEACH, CALIFORNIA
TELEPHONE 714 650-8000
TELEX 3718953

September 20, 1984

Mr. David B. LeClaire, Director
Office of Defense Waste and Byproducts
Management
U. S. Department of Energy, DP-12
Washington, D. C. 20545

Subject: Comments on "An Evaluation of Commercial
Repository Capacity for Disposal of Defense
High Level Waste," (DOE/DP-0020 Draft)

Dear Mr. LeClaire:

We have reviewed the referenced document and have prepared comments
which we have discussed with several of our utility clients. We are
attaching a copy of these comments to this letter for your
consideration.

Very truly yours,


James K. Pickard

Attach
JKP:b

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**COMMENTS ON THE DOE/DP 0020 (DRAFT) REPORT,
AN EVALUATION OF COMMERCIAL REPOSITORY CAPACITY FOR THE DISPOSAL OF
DEFENSE HIGH-LEVEL WASTE**

9-1

1. The analyses reported by DOE cover the obvious topics required by the NWPA. These topics, however, are covered in a general and cursory manner and are often based on very general and only partially supported assumptions and technical data.

9-2

2. The NWPA mandates schedules for completion of various activities associated with the deployment of a civilian waste repository. It does not mandate schedules for the defense waste activities. At the present time, it is very doubtful that many of the mandated schedules in the civilian program will be met. Certainly none will be met without very strenuous efforts on the part of DOE and NRC. The addition of any additional considerations or issues especially in the siting and licensing of the civilian facilities will increase the risk of further delay. As a minimum, whether the facilities for defense and civilian waste are combined or not, the civilian program should be given priority at all government levels. These considerations suggest that DOE's evaluation should analyze the relative burdens on all involved government agencies for combining or not combining defense and civilian waste as well as the effects of phasing the efforts in time to provide maximum assurance that the civilian program is completed on the mandated schedule.

9-3

3. The evaluation with respect to health and safety, transport, national security, and regulation, although general is reasonably straight-forward. The following comments, however, are pertinent:
 - a. Transportation considerations are likely to be very important if not crucial factors in siting and licensing and more in-depth study is required regarding the number and types of shipments, nature of the carriers, licensing and public acceptance.
 - b. The cost efficiency (e.g., cost saving of the combined facility) requires greater detailed evaluation (see item 4 below).
 - c. Public acceptance is a major consideration (also see below).

9-4

4. The cost efficiency evaluation is based on the assumption that Defense High Level Waste (DHLW) will decrease from 15% of the Commercial High Level Waste (CHLW) existing today to 3% in the year 2020.
 - a. Because of the large number of power reactor cancellations and delays, there is strong likelihood the defense waste will be a greater percentage of the total, especially in the later years.

PICKARD, LOWE AND GARRICK, INC.

RESPONSE TO COMMENTS

9-1 The report presents a condensation of more detailed information contained in the references listed. Citations to the references used are contained in the body of the final report.

9-2 It is the policy of the U.S. government to dispose of both defense high-level waste and commercial high-level waste and spent fuel in a safe and expeditious manner. DOE will make every effort to meet its obligation to accept civilian waste by 1998. It is likely that if separate repositories were required for defense and commercial wastes, the burden on involved government agencies would be greater than if only one repository were required for defense and commercial wastes, because of the need to act on two license applications at the same time.

9-3 The importance of transportation factors, such as nature of the carriers, accidents, and the number and type of shipments, is recognized in regard to siting and licensing of repositories. Such factors will be detailed in the analyses included in the various documentation leading to the selection of the site of the first repository. However, such details are not required for this evaluation report.

9-4 The relative amounts of each type of waste available for repository disposal was based on current knowledge. If the relative amount of each type of waste changes in the future, reevaluations of the proportionate share of the cost allocated to each type of waste will be made if necessary.

The cost efficiency analysis used in the report was based on early repository designs and the baseline assumptions discussed. It is recognized that the repository program is dynamic and that changes in the quantity and character of waste as well as other factors are likely to occur in the future. A comparison with the current repository concept detailed in the Draft Mission Plan for the Civilian Radioactive Waste Management Program indicates that costs are higher at present. However, the qualitative results of the study would not change as a result.

Since the EPA has proposed Curie release limits for MTHM charged to a light water reactor, Curie releases and repository loadings in MTHM equivalents were calculated for defense high-level waste on a Curie basis.

The even split between the two waste types was a reasonable assumption given the information available at the time the study was initiated. This assumption was also made in an early draft of the Missions Plan for the Civilian Radioactive Waste Management Program.

9-4
cont'd

9-5

9-6

- b. The basis for determining the equivalency of the defense waste to the civilian waste should be reexamined as necessary to make realistic cost comparisons of the various activities in evaluating the combined and separate facilities. DOE's assumption that one-half of the CHLW will be processed waste and one-half spent nuclear fuel should be supported.
- c. An enhanced evaluation of cost efficiency is very desirable, requiring greater knowledge of the overall system as well as of that of the specific facilities involved. The DOE Mission Plan acknowledged the need for systems integration studies which are needed so that each facility is coordinated with all others. For instance, how do the MRS, separation of surface and underground facilities, and universal cask feature in the combined facility?
- d. The annual acceptance rate may be of far greater significance than the total quantity generated in determining the cost efficiency. For example:
 - (1) The DHLW is stated to involve 20,000 packages. The acceptance rate is stated to increase from 620 packages per year in 1998 to 1,000 packages per year in the year 2008 and beyond. The total volume of these packages is about 550m³ in 1998, increasing to about 900m³ in the year 2008. The annual acceptance rate for the civilian waste must be about 3,000 MTHM to accommodate the projected generation and the disposal of the accumulated inventories. This civilian waste acceptance rate will involve about 900 packages and a total volume of about 600m³ per year beginning in 1998 or shortly thereafter.
 - (2) The surface processing and handling facilities for a combined system may therefore have to be doubled if it is to handle both the civilian and defense waste simultaneously. This could involve considerably larger cost increases for the combined facility than shown in the evaluation.
 - (3) Also in order to handle 7 to 8 shipments or packages per day, rather than 3 or 4, the repository shaft may have to be considerably enlarged or duplicated, involving a cost increase of as much as \$500 million.
- e. As a minimum these considerations suggest that additional evaluations are required to determine the cost efficiency of the combined facility.

5. Public acceptance considerations are especially important and should be explored in greater detail by paying particular attention to the likelihood of there being a greater burden on the federal agencies and consequently, greater likelihood of delays caused by the combined facility as compared with a phased approach for separate facilities.

9-7

9-5 The level of detail implied by the comment was beyond the scope of the costing models used. Methods to improve cost efficiency will be determined during detailed design of the facility or facilities. The relative cost of the two options determined by the cited models, although general and non-specific, are the basis for this evaluation.

9-6 The cost models for the various options for an Augmented Repository show higher costs than for a commercial-only repository for the reasons you cite.

9-7 Since implementation of the Nuclear Waste Policy Act of 1982, planning activities for the civilian repository program have been based on the principle that defense waste could be disposed of in the commercial repository.

The impact on the schedule and cost of siting the first repository if there is public opposition to the combined disposal of defense high-level waste and commercial waste is recognized in the report. The extent of such opposition and the degree to which it affects the schedule and cost is one of many subjective judgments which must be considered in determining whether a defense-only repository is required.

9-7
cont'd

Also consideration should be given to the greater likelihood of more extensive litigation with more litigants and the consequences of delay by combining facilities. What, for instance, will be the reaction of the Public, State, Local and Tribes to the addition of Defense Wastes after having undertaken Consultation and Cooperation agreements on the understanding that only Civilian wastes were involved.

9-8

As regards the combined operation, further consideration should be given to the political concerns which led to the requirement for two repositories so that the burden would be shared by at least two regions of the country. These considerations should evaluate the extra burden caused by the additional transportation as well as the greater loading of the repository. Also, a program for adding the DHLW to the first repository should be compared with that of sharing with a second repository or adding it only to the second repository or developing a third repository.

9-9

6. Contrary to DOE's conclusions, these additional considerations could lead to the conclusion that the cost efficiency may not materialize except for underground facilities which could be more than offset by cost increases caused by more costly surface facilities, further delays and increased expenses of providing for interim storage.

7. Specific comments:

9-11

a. Efforts should be made as soon as possible to determine the method of allocating costs with the combined facility.

9-12

b. The assumption (page E-4) that the DOE costs of \$4.5 billion ('84 \$) will be the same for all options should be supported.

9-13

c. The evaluation assumes that all wastes will be ten years old. This is contrary to the DOE contracts.

9-14

d. The evaluation also assumes that a defense only repository would experience the same siting and licensing steps as required by the civilian repository. This is contrary to the NWPA and may not be justified.

9-15

e. It is not clear why the defense-only repository would not handle transuranic waste (page 3-3).

9-16

f. There seems to be very limited consideration of accidents at either the repository or during transport (pages 2-36 and 2-57). There is a significant likelihood that mitigation of accidents and their consequences will be controlling considerations in siting and licensing.

9-17

g. It is not clear why the defense-only repository would not require an overpack (p. 4-5) if one option in the combined repository includes an overpack.

9-8 The premise of the Nuclear Waste Policy Act is that defense high-level waste would be disposed of in the commercial repositories unless the President finds that a defense-only repository is required. It was not intended to preclude the use of the second repository for some or all of the defense waste. If appropriate, defense waste could be disposed of in both repositories currently planned for civilian waste.

9-9 The additional analysis suggested is not warranted as the qualitative results of the report would not be changed.

9-10 There is no reason to believe that it would be easier or faster to develop a defense-only repository than a commercial repository. A defense-only repository would be subject to the same NRC regulations and public scrutiny as a commercial repository, under existing provisions. It is not expected that interim storage costs for defense waste will be significantly different for either disposal option. Further, the costs of interim storage are small in comparison with the savings achieved by the combined repository. It is expected that any enhancement of surface facilities at the civilian repository to accommodate defense waste will be less costly than a duplicate set of surface facilities needed at a defense-only repository.

9-11 While it is recognized that the allocation of costs between commercial users and the federal government is of great importance to those affected, the cost allocation is not a relevant issue for this report, but rather the overall cost to the nation of the program. The Nuclear Waste Policy Act does not require that the allocation of costs be made as part of the evaluation but rather subsequent to it.

9-12 The final report recognizes that additional development and evaluation (D & E) costs may be incurred to accommodate defense waste in the commercial repository.

9-13 Although such details as age of the waste could affect specific design features of a repository, they would not affect the results of the comparison of disposal options for defense waste.

9-14 The assumption cited in your comment is based on the requirements of Nuclear Regulatory Commission Regulation 10 CFR 60 which is applicable to the defense-only repository per the Nuclear Waste Policy Act.

9-15 The statement regarding TRU waste disposal (page 3-3) was modified. Defense TRU waste will be disposed of in the Waste Isolation Pilot Plant authorized by PL 96-164.

9-16 The detailed analysis of factors that might be controlling considerations will be part of future site specific studies. Such detailed analyses are not germane to the present report since it is a repository options comparison and not a siting or licensing study.

9-17 It was not assumed that a defense-only repository would not require an overpack. The text statement referred to in your comment refers to a possible benefit of disposing of defense waste in a defense-only repository. The need for an overpack on defense waste in a defense-only repository would have to be determined by the NRC during the licensing process on the basis of the specific repository environment. Similarly, the need for an overpack on defense waste in a commercial repository would have to be determined on repository specific considerations.



Mr. David B. Le Claire, Director
Office of Defense Waste
U.S. Department of Energy, DP-12
Washington, D.C. 20545

September 18, 1984

Dear Mr. Le Claire:

We have had the opportunity of reviewing the report, An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste prepared for your office. It is understood that this study will be part of the record on which the Secretary of the Department of Energy (DOE) will make a recommendation to the President prior to January 1985 on the commingling of defense and civilian radioactive wastes in repositories constructed under the Nuclear Waste Policy Act of 1982 (NWPA).

We welcome the opportunity of commenting on this evaluation and the efficacy of the dual use of repositories built under the NWPA.

It is important to evaluate the question of commingling of defense and commercial wastes in context with the primary purpose of the NWPA, i.e. "to establish a schedule for the siting, construction and operation of repositories that will provide a reasonable assurance that the public and the environment will be adequately protected from the hazards posed by high-level radioactive waste and such spent fuel as may be disposed of in a repository", Section 111 (b). If there is a possibility that this goal may be jeopardized or delayed by inclusion of defense waste with civilian spent fuel, we would not be in favor of commingling wastes from the two sources.

The evaluation performed by the Mitre Corporation falls far short in evaluating the impact of repository delays. We think it is imperative to demonstrate to the American public that spent nuclear fuel can be safely disposed in a repository. It is also necessary to remove spent fuel from reactor pools as soon as possible to avoid additional costly storage expansions or the possibility of reactor shutdowns because they lack adequate storage capability. We would not be in favor of dual use of repositories if it would result in a delay or a reduction in spent fuel receipt rate in 1998. The draft report does not come up with a definitive resolution of either of these areas and therefore should be strengthened to provide a basis for the Secretary's recommendation.

10-1

FLORIDA POWER AND LIGHT COMPANY

RESPONSE TO COMMENTS

10-1 Since implementation of the Nuclear Waste Policy Act DOE planning activities have been based on the principle that defense high-level waste would be disposed of in the civilian repositories. DOE will make every effort to meet its obligation to accept civilian waste by 1998. Defense waste will be received at a civilian repository on a separate schedule, mutually agreed to by the Assistant Secretary for Defense Programs and the Office of Civilian Radioactive Waste Management, such that the rate of receipt of commercial waste, once established, will not be adversely impacted.

10-2

The draft evaluation found an advantage for commingling in only one area, namely the potential for lower repository capital and operating cost. The important consideration here is what is the difference in total cost to utility ratepayers and the Department of Defense for disposal of these wastes and how will these costs be equitably shared. The analysis does not evaluate

10-3

the potential increased costs to utility ratepayers resulting from reduced civilian spent fuel repository acceptance rates or the possible delay of repository operation resulting from commingling. The total costs of dual facility use and the potential increased costs resulting from potential delays in the program must be addressed in the evaluation before a meaningful conclusion can be reached. Until this is done there is no basis for the statement on page E-10 of the evaluation that there is a "clear cost advantage" to combining both waste categories.

10-4

The NWPA and the implementing Spent Fuel Disposal Contracts have established a fee basis for civilian high level wastes which at best can be characterized as a "use charge" somewhat independent of radioactivity or uranium weight. The Defense Waste must bear a full share of both the fixed and variable costs of the entire disposal program. The draft evaluation must be extended to address the basis for assigning the disposal cost to each category of customer before we can adequately evaluate the merits of commingling.

10-5

One of the major considerations in nuclear waste disposal is that of public acceptability. The draft evaluation points out that there is no record of the public on this issue and therefore proceeds to speculate on public perception. The DOE should establish a public record on the acceptability of dual use of repositories before a recommendation is made to the President.

Enclosure 1 presents additional specific comments to the draft evaluation.

Florida Power & Light looks forward to working with the DOE in developing a recommendation on the dual use of repositories mandated under the NWPA. We welcome the opportunity to comment on this document and are available for discussions at any time.

Very truly yours,


H.C. Cook
Group Vice President

Enclosure
cc: D. Hodel

- 10-2 While it is recognized that the allocation of costs between commercial users and the federal government is of great importance to those affected, the cost allocation is not a relevant issue for this report, but rather the overall cost to the nation of the program. The Nuclear Waste Policy Act does not require that the allocation of costs be made as part of the evaluation but rather subsequent to it.
- 10-3 It is DOE policy that the receipt of defense waste at the civilian repository will not adversely impact the receipt of commercial waste at the repository, therefore there should be no increased costs to the utility rate payers on account of defense waste. DOE will also make every effort to avoid delay in opening the repository and is not aware of any reason for acceptance of defense waste at the repository to contribute to any delay.
- 10-4 The Nuclear Waste Policy Act provides guidance for the equitable allocation of the costs of the repository to defense waste. Such allocaton is a subject of negotiation between the Office of Civilian Radioactive Waste Management and the Assistant Secretary for Defense Programs.
- 10-5 The text of the document has been revised in recognition of the fact that the issue has been discussed in the U.S. Congress and elsewhere. In addition, the comments received on the draft report, and assembled in this comment response document, create a public record on the issue of disposal of defense waste in a civilian repository.

ENCLOSURE 1

DETAILED COMMENTS ON
THE USE OF COMMERCIAL REPOSITORY CAPACITY
FOR THE DISPOSAL OF DEFENSE HIGH LEVEL WASTE

<u>PAGE</u>	
	E-3 Lines 1,2 The equivalency between defense and commercial high level waste has not been established on a consistent basis. In fact there is not be a single equivalency applicable for all comparisons of defense and commercial waste properties.
10-6	On the basis of radioactivity, the report equates two defense waste packages to one MTHM. However the report then uses this same equivalence to determine the approximate fraction of underground area required for defense waste. This latter equivalency must be determined by comparing detailed repository designs for both types of wastes in a specific media.
10-7	In the base line assumptions (page 1-11) a different equivalence should be used when assessing the limiting loading imposed on the repository by the NWPA. Section 114(d)(2) defines this limit as "70,000 metric tons of heavy metal or a quantity of solidified high-level radioactive waste resulting from the reprocessing of such a quantity of spent fuel". Since some of the defense waste results from the reprocessing of spent fuel another equivalence should be derived.
10-8	E-4 Paragraph 3, line 4 The final allocation method and the contracting mechanism are important aspects of the question of the advantages of commingling. The allocation of costs must be specified. Will a formal contract between two components of the DOE be used? What will be the relative priority for receipt of waste? The NWPA uses the principal of oldest fuel first, what impact will defense waste have on spent fuel removal from reactors?
10-9	1-11 Assumption 3 The assumption that the first commercial repository will contain 50% spent fuel and 50% commercial high-level waste is not realistic. Based on the principal of oldest fuel first, the first repository limit will be exceeded with spent fuel before a repository could be licensed in today's environment.

10-6 Since the EPA has proposed Curie release limits per MTHM charged to a light water reactor, Curie releases and repository loadings in MTHM equivalents were calculated for defense high-level waste on a Curie basis.

10-7 The fraction of underground area required for defense waste is, as you state, an approximation, based on the assumption used in the report. The actual fractional area of the repository occupied by defense waste will vary depending on the mix of commercial spent fuel and defense waste in the repository, and the repository characteristics.

10-8 For a number of reasons, including the fact that defense spent fuel, from which the defense high-level waste is derived, experienced a lower burn-up than the same amount of commercial spent fuel, it may not be appropriate to categorize defense high-level waste on the basis of the quantity of spent fuel from which it was derived.

10-9 The Nuclear Waste Policy Act requires that the allocation of costs of disposal to defense waste be made subsequent to the President's evaluation. It is the intent of the Department of Energy that the allocation of costs for disposal of nuclear waste be fair to all parties concerned. Therefore, the allocation should not influence the findings of the study. The exact mechanism of the allocation has not been worked out as yet, however it is intended that any agreement will address all concerns including the rate and schedule for receipt of wastes. The allocation formula will be negotiated between the Office of Civilian Radioactive Waste Management and the Assistant Secretary for Defense Programs, based on the guidance provided by the Nuclear Waste Policy Act of 1982. Once the allocation mechanism has been arrived at, it will be made public.

Defense wastes will be received at the civilian repository on a mutually agreed to schedule, such that the rate of receipt of commercial waste, once established, will not be adversely impacted.

10-10 The even split between the two waste types was a reasonable assumption, given the information available at the time this study was initiated. This assumption was also made in an early draft of the Mission plan for the Civilian Radioactive Waste Management Program.

2-10 The delay of the first repository by 2 years will generate a requirement for storage of 1,000 additional waste canisters at Savannah River with an additional cost of \$35 million dollars for storage. What about the additional cost that utilities will bear as a result of the two year delay?

10-11

10-12 Is it the intent that the defense waste from Savannah would be given priority over commercial spent fuel? If so, the initial receiving rate of 400 MTU/year for the first three years of repository operation would only allow a net of about 100 MTU/year for the entire civilian nuclear industry.

2-11 Table 2-1
The major conclusion of this evaluation rests on the relative costs of separate and dual use repositories however the report does not provide sufficient detail on the methods used for these determinations to allow critique. How were the costs for the reference repository without defense waste determined? How was the cost determined for the augmented repository containing both types of waste? How were the defense only repository costs determined. What is the uncertainty on each of these estimates? Are the uncertainties equivalent for each case?

10-13

10-14 Since the major conclusion results from the cost estimates these should be detailed in the final version of the evaluation report.

3-7 Table 3-2
The heading for this table should refer to 1984 dollars rather than 1948 dollars.

10-11 This study was only concerned with a comparison of disposal options for defense high-level waste.

10-12 If defense wastes are to be disposed of in the commercial repositories, those wastes will be received on a separate schedule mutually agreed to by Defense Programs and the Office of Civilian Radioactive Waste Management, such that the rate of receipt of commercial wastes once established will not be adversely impacted. There is no intent to give priority to defense high-level waste for disposal in a commercial repository.

10-13 For details on the cost calculation methodologies, please refer to the reports by Lazur, and Varadarajan and Dippold which are listed in the reference section of the report.

10-14 The text has been corrected.

IOWA STATE COMMERCE COMMISSION

Commissioners:
Andrew Varley
Christine A. Hansen
Paul Franzenburg

Executive Secretary:
Robert G. Holtez

September 17, 1984

Mr. David B. Le Claire, Director
Office of Defense Waste and Byproducts Management
U.S. Department of Energy, DP-12
Washington, D.C. 20545

Dear Mr. Le Claire:

SUBJECT: Comments on DOE/DP-0020 (DRAFT)

We appreciate the opportunity to comment on this important topic.

11-1 One possible problem with the draft evaluation is that it appears to target only the first commercial SNF (spent nuclear fuel) repository.

Another recent DOE publication, DOE/RW-0005, "Mission Plan for the Civilian Radioactive Waste Management Program," dated April, 1984, in Table II-1: Waste Acceptance Schedule, on page 2-3, indicates the second 70,000 MTHM repository commencing to accept SNF in 2003.

11-2 The prompt licensing by NRC of the first SNF repository will probably be of considerable economic significance to electric utilities and to electricity ratepayers and should not be delayed or jeopardized by any unique characteristics of the separate high-level waste licensing by NRC. Keeping the first repository on schedule should be the highest priority.

11-3 It is suggested that the licensing by NRC for disposal of defense high-level waste be targeted for the second SNF repository only to minimize delay regarding the first repository. This would still allow our nation to take advantage of the savings associated with codisposal, as estimated on your page 4-2, to be in the 17% to 21% range, or approximately \$1.6 billion.

Please continue to keep us informed regarding progress toward permanent disposal of SNF.

Sincerely,


Andrew Varley
Chairman

AV:gb

11-1

IOWA STATE COMMERCE COMMISSION

RESPONSE TO COMMENTS

- 11-1 There was no intended implication that defense waste would only be disposed of in the first repository. The use of more than one commercial repository to dispose of defense high-level waste is permitted by the Nuclear Waste Policy Act.
- 11-2 The Nuclear Regulatory Commission licenses the repository, not the waste. It is not apparent that consideration of disposal of defense waste in the commercial repository would delay the repository schedule. Since implementation of the Nuclear Waste Policy Act, planning activities have been based on the principle that defense waste could be disposed of in the commercial repository.
- 11-3 Factors that may delay the opening of the first repository may also delay the opening of a second repository. Delays in disposing of defense waste will result in additional costs for interim storage of the wastes.

September 11, 1984

Mr. David B. Le Claire, Director
Office of Defense Waste and Byproducts Management
U. S. Department of Energy, DP-12,
Washington, D. C. 20545

Dear Sir:

We submit the following comments on your draft DOE report entitled "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste" dated July 1984 and received August 31, 1984.

12-1 1. Will the report be submitted to an independent peer review panel for review and comment and, if so, will those comments be made available for public review?

12-2 2. Will public hearings be held on the report?

12-3 3. The report states (p. E-2) that it is in response to Section 8 of the NWPA which directs the President to conduct an evaluation of the use of a commercial waste repository for the "disposal" of high-level defense wastes. Has the President requested the DOE's recommendation and will he conduct his own evaluation?

12-4 4. What volumes of salt or other rock forms would have to be mined to accomodate 20,000 defense waste packages?

12-5 5. How would such material be safely disposed of? What would be the cost and economic impact of mining salt and selling it into an already depressed commercial market which sells about 9.9 million tons annually at about \$13 a ton F.O.B. the mine? Since it costs over \$25/ton to market salt, or transport it to a disposal site, will this not add significant costs?

12-6 6. What total underground area is assumed (E-3) in estimating that defense waste will occupy only 10% thereof?

12-7 7. Does the evaluation of health and safety impacts take into consideration the release of fission gases from breached spent-fuel assembly and concomitant effects it may have within the repository as well as in the accessible environment?

12-8 8. If a colocation decision is reached by the President, all wastes will be subject to C & C agreement procedures and requirements. This regulation factor does not seem to have been evaluated in Section 2.3.3. How will peer review procedures effect the disposal of defense wastes?

DONALD F. X. FINN

RESPONSE TO COMMENTS

- 12-1 The report will not be submitted to an independent peer review panel for review and comment.
- 12-2 Public hearings will not be held on this report.
- 12-3 DOE was asked to conduct a study. This report was one input to the President's evaluation. Other inputs may have been used. We are not aware of how the President's evaluation was made.
- 12-4 Approximately 1.7 million cubic meters of salt or 1.1 million cubic meters of tuff would have to be mined to accommodate 20,000 defense waste packages.
- 12-5 Methods for disposing of salt in excess of needs for backfilling have been investigated in the past. DOE is committed to its proper control or suitable disposal. The cost of transporting, storing and disposing of mined rock (or salt) has been included in the cost model for these facilities.
- 12-6 The fraction of the area occupied by defense waste in a repository will depend on the repository design, media, and waste quantities. An underground area of approximately 1,200 acres was assumed.
- 12-7 The health and safety analysis is based on a scenario involving groundwater intrusion into the repository and subsequent leaching and transport of nuclides to the accessible environment. Spent fuel assemblies are expected to be disassembled and consolidated in a waste packaging facility. Fission gases released during waste packaging are separately controlled.
- 12-8 A colocation decision has already been made by Congress. The President must decide whether a defense-only repository is required. The C&C agreement is required for any repository and included waste forms.
- 12-9 Peer review procedures will be the same whether defense waste is disposed of in a commercial repository or a defense-only repository.

12-10 9. What assumptions are made as to the composition and nature of commercial high-level wastes (35,000 MTHM) referred to at page 1.11?

12-11 10. What volume and what composition/of transuranic wastes are assumed (2-5)? and types

12-12 11. It should be noted that the adequacy of required financial assistance is a matter very much in question. See, e.g., DOE Mission Plan, April 1984. How will defense wastes cost allocations be handled in accepting responsibility for its share of that assistance?

12-13 12. The DOE Mission Plan contemplates an enlargement of the repository at a future date. Your present evaluation cuts off as of the year 2021 (p. 1-8). Why is that?

12-14 13. Is it correct to assume that the total volume of defense waste through 2021 will be .61 x 3.0 meters x 20,000 packages (1-10,11)?

12-15 14. How many packages will be buried per acre and x depth of underground space?

12-16 15. Recent ONWI studies indicate higher thermal loads in salt dome repositories than stated at page 2-49.

12-17 16. Is it correct to assume that a decision has been made which excludes the use of barges to transport defense wastes (2-52)?

12-18 17. Your evaluation states that citizens may be confused by reason of the fact that a colocated repository involves two types of wastes. Should this be three (2-5,2-48) or four (2-19)?

12-19 18. Why has no attempt been made to determine "public acceptability" in the prime candidate States?

12-20 19. Why is no reference made to public comments on colocation made in response to the Mission Plan, the Siting Guidelines and in the open literature? We find it preposterous, to say the least, for you to state that there is no other record of actual public opinions on colocation other than "discussions" in the U. S. Congress and that "one may only speculate on potential public reactions". Such speculation does not satisfy the required Presidential evaluation of Section 8, NWPA.

12-21 20. No evaluation is made of colocating wastes below-the-water-table vs. above-the-water-table as is recommended by the National Research Council which prefers the latter.

12-22 21. The unavailability of referenced supporting documents from your Office precludes other comments. It would seem to have made just plain common sense to have them made available during the comment period which is most restrictive.

12-10 The assumed characteristics of commercial high-level waste are shown in Table 1-2 of the draft document (Table 1-1 in the final document). The composition of the waste is shown in Table 2-5 (omitted from the final report).

12-11 The assumption was made in Varadarajan and Dippold (1984) that the following volumes and types of transuranic waste would be disposed of in the reference commercial repository:

- 34,518 canisters of remote-handled transuranic waste, of which 32,083 are associated with commercial high-level waste and 2,435 are assumed to be generated on-site from spent fuel disassembly and packaging operations at the repository.
- 345,036 55-gallon drums of contact-handled transuranic waste.

No defense transuranic wastes were assumed.

12-12 The matter of cost allocation will be dealt with separately following the President's evaluation of the disposal options for defense high-level waste. It will be negotiated between the Assistant Secretary for Defense Programs and the Office of Civilian Radioactive Waste Management following the guidelines of the Nuclear Waste Policy Act.

12-13 The Nuclear Waste Policy Act of 1982 requires only that an estimate of the repository capacity required to accommodate the disposal of all high-level radioactive waste and spent nuclear fuel expected to be generated through December 31, 2020 be provided.

12-14 Yes.

12-15 Approximately 166 packages of defense waste will be buried per acre. These packages will occupy about 430,000 cubic meters of volume per acre.

12-16 As stated in the report, the thermal history in a repository will vary depending on a variety of factors, including spacing of waste in the repository, repository media, the age of the waste, and the types of waste. The thermal history curves presented were for illustrative purposes only.

12-17 Barges are not being considered for transport of defense waste.

12-18 The two types of waste referred to were civilian waste and defense waste.

12-19 The body of comments received in response to the draft report is considered a useful guide to likely opposition and support.

12-20 The section on public acceptability has been revised to acknowledge the existence of a public record on the issue of colocation of defense waste with civilian waste in a repository.

12-21 The location of waste packages with respect to the water table at the repository site is not considered germane to the issue of whether a defense-only repository is required.

12-22 Requests for referenced documents were honored, although all references were not immediately available.

12-23 22. Query...what Section 8 evaluation factors do you deem to constitute a significant disadvantage? (E-10).

12-23 23. Please quantify the higher volume of mined salt referred to at page 2-15.

12-25 24. Please quantify the volume of overpack referred to also.

12-26 25. Page 2-19. Is it not true that spent fuel assembly cannisters could corrode in less than 300 years and release fission gases, especially in salt domes?

12-27 26. What is the basis for your assumption that some radionuclides "are likely to be removed" from commercial wastes during "reprocessing"? The Mission Plan seems to assume there will be no such reprocessing. (2-22)

12-28 27. You refer to dry conditions in the repository (2-24). Is it not true that salt domes contain brine and brine-gas inclusions which migrate along grain boundaries and other paths and are driven or attracted by thermal gradients? Does this not constitute a wet repository condition?

12-29 28. Please identify the principal "sources of uncertainty" (2-30) which effect predictions of repository performance.

12-30 29. You suggest that codisposal reduces effects per ton. Does it not increase total effects by increasing total amounts disposed of? (2-31)

12-31 30. You refer to "occasional decontamination of waste canisters" (2-34). Will not all commercial waste canisters have to have accumulated crud removed and will not repackaging of those assemblies result in the need for continual decontamination?

12-32 31. What "spacing" design do you have in mind to accommodate thermal loads (2-48)?

12-32 32. Do you know of any predicted higher "current or future values" (2-48) which differ from the thermal histories set forth in Figure 2-5?

12-33 33. Transportation costs set forth in Table 213 do not seem to make sense unless most of defense wastes will come from Georgia. What percentages of total wastes are expected to be shipped from each of the three sites referred to at page 2-50?

12-34 34. What is your definition of a pro-nuclear group (2-59)? Does this include nuclear vendors, engineer-architects, and groups such as the socalled "U. S. Committee for Energy Awareness", the Edison Electric Institute, the Utility Waste Management Group, the Atomic Forum, EPRI, and the Electric Utility Companies Nuclear Transportation Group and Mississippians for Energy Action?

12-23 None of the factors considered were deemed to constitute a significant disadvantage.

12-24 Approximately 525,000 cubic meters more of salt than of hard rock were assumed to be mined for the same 20,000 packages of defense waste (total of seven million cubic meters).

12-25 Each overpack adds a volume of about 0.8 cubic meters to the volume of a canister of defense high-level waste.

12-26 Spent fuel packages will be designed consistent with the requirements of NRC rules and regulations.

12-27 The reprocessing operation is used to recover, from the spent fuel, uranium and plutonium, which can be reused to make fresh fuel for a power reactor. At present, there are no plans to reprocess spent fuel from commercial power reactors; however, such reprocessing may occur in the future.

12-28 The statement in the report refers to site-specific factors that could assist in complying with the containment criterion of the NRC regulations. If, as you imply, a specific site does not provide a dry environment, other measures would be taken to assure the integrity of the waste container during the required containment period.

12-29 The uncertainty referred to in the report is in relation to the precision with which measurements of various parameters used in analysis can be made.

12-30 The total amount of waste to be disposed of is the same whether it is disposed of in a single repository or in separate repositories. The discussion of effects per ton was deleted from the final version of the document.

12-31 Normal practice is to conduct operations in such a manner as to minimize surface contamination of waste containers. A need for "continual decontamination" is not contemplated. Canisters will be continuously monitored as received and will be decontaminated if necessary.

12-32 Repository design and thermal history are site-specific factors that will be identified when a site is selected for characterization. It is expected that the thermal loading of defense high-level waste as compared to spent fuel will allow emplacement holes for defense high-level waste to be more closely spaced than those for spent fuel. The information presented in the report was for illustrative purposes only. As stated in the report, thermal considerations do not present an obstacle to achieving the acceptable performance of a repository containing both civilian and defense waste. Therefore, the repository thermal environment is not a critical factor in the comparison of the disposal options considered for defense waste.

12-33 59 percent from Savannah River Plant.
6 percent from Hanford Reservation.
35 percent from Idaho National Engineering Laboratory.

12-34 A pro-nuclear group is defined as one for which there is a reasonable expectation that the group would be in favor of a technically sound, environmentally acceptable, and cost effective nuclear activity. The question as to whether a specific group is pro-nuclear should be addressed to that group. DOE cannot respond concerning the proclivity of a particular group.

Please inform me of:

12-35 1. The full availability of referenced supporting studies and documents.

12-36 2. The availability of public comments to your evaluation.

12-37 3. The availability of any revised or final evaluation made by your office and of any independent peer review thereof.

12-38 4. Any Presidential evaluation undertaken pursuant to Section 8 NWPA.

Sincerely yours,

Donald F. X. Finn

Donald F. X. Finn
P. O. Box 1623
Natchez, Mississippi 39120

442-1601

12-35 Requests for referenced documents were honored, although all references were not immediately available.

12-36 All public comments to the study are included in this
12-37 document. The final study has been sent to all those who
12-38 commented on the draft. Independent peer reviews were not
conducted. The Presidential evaluation undertaken pursuant to
Section 8 of the Act was completed in April 1985.



Electric Power
Research Institute

September 24, 1984

Mr. David B. LeClaire, Director
Office of Defense Waste and Byproducts Management
U.S. Department of Energy, DP-12
Washington, D.C. 20545

Subject: "An Evaluation of Commercial Repository Capacity
for the Disposal of Defense High-Level Waste",
DOE/DP-0020 (Draft), July 1984

Dear Mr. LeClaire:

This letter responds to the suggestion of Mr. Ben C. Rusche, Director, Office of Civilian Radioactive Waste Management, for utility industry comments on the Office of Defense Programs report, "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste", DOE/DP-0020 (Draft), July 1984.

EPRI is conducting an active technical program in cooperation with the Department of Energy and several lead utilities to assure that a range of licensable spent fuel storage options are available to meet utility needs for on-site spent fuel storage. EPRI, on behalf of member utilities, is also conducting research on certain aspects of nuclear waste disposal to provide technical assessment and perspective on technical and regulatory issues that may significantly influence the R&D requirements, licensing, cost, or schedule of the federal program.

In principle, we support the overall conclusion of the report, that there is a clear cost advantage to be gained by disposing of defense waste in a combined commercial and defense repository. However, we have questions about many of the cost data, the procedural steps to combine the program, and other assumptions presented in the report. The report does not adequately consider the potential impact on the completion schedule of the repository or the combined rate of receipt of civilian and defense waste. Our detailed comments, Attachment 1, discusses these questions and concerns.

Mr. David B. LeClaire

-2-

September 24, 1984

We urge that early steps be taken to publish for comment more details of the programmatic basis under which defense and commercial wastes might be disposed in a single repository, and the degree to which costs would be shared and management activities combined.

Early review and planning will help assure that a decision to combine defense and commercial wastes will not upset the planning base in the Mission Plan, or result in unanticipated delays in near-term milestones.

We hope these comments are helpful. If you have questions regarding these comments, please do not hesitate to call.

Very truly yours,



J. D. Taylor
Vice President

JJT:RFW:js

Attachment

cc: Ben C. Rusche, DOE

Attachment 1

Detailed Comments on

**"An Evaluation of Commercial Repository Capacity
for the Disposal of Defense High-Level Waste"**

DOE/DP-0020, July 1984

This attachment provides detailed comments regarding the subject report. In general, we support the conclusion that Defense and Commercial Waste be disposed in a combined repository. However, there are a number of questions regarding the bases and completeness of the data in the draft report. These and other comments are discussed in more detail below.

I. Comments Related to Costs

13-1 1) Some statements appear to support a particular approach to cost allocation, but cost allocation, timing of payments, and scheduling are not sufficiently addressed.

The draft report, page E-7, states "Discussions have begun to determine a method for allocating costs, however, a final allocation mechanism has not been agreed upon".

Despite this statement, there are a number of citations throughout the text that could be taken as establishing a technical basis for allocation of costs. We believe these data should be discussed in a section that deals with cost allocation, and the combined scheduling of commercial and defense wastes.

13-2 2) Page E-3, "If defense high-level waste is emplaced in a commercial repository, defense waste is expected to require approximately 10 percent of the underground area".

In this regard we believe DOE should further evaluate the cost impact of comingling low curie, low heat content packages with higher heat content packages. The factors effecting cost should be discussed. There are potential waste streams from reactors that might require similar disposal and a similar cost basis.

13-3 3) Page E-3, "By 2000, it is expected that radioactivity in defense high-level waste will 3% of the total".

While the statement is accurate in the context of the executive summary, it appears to minimize the significance of the defense waste.

ELECTRIC POWER RESEARCH INSTITUTE

RESPONSE TO COMMENTS

- 13-1 While it is recognized that the allocation of costs between commercial users and the federal government is of great importance to those affected, the cost allocation is not a relevant issue for this report, but rather the overall cost of the program to the nation. The NWPA does not require that the allocation of costs be made as part of the evaluation, but rather subsequent to it. Nothing in the report was intended to suggest a method for allocating costs to the defense waste.
- 13-2 The cost analysis was based on the ground rules and assumptions stated. This was considered sufficient for the purposes of this effort. The factors you suggest will most certainly be considered in developing detailed estimates for the final repository design, for fine tuning the costs of the repository and for establishing fees for both defense and civilian waste disposal.
- 13-3 The statement regarding defense high-level waste is correct and is not meant to minimize the significance of this waste but to indicate the proportional relationship between defense and commercial wastes.

13-4 4) Page E-4, "The development and evaluation (D&E) costs for the repositories are not included in the cost estimates. These costs are estimated to be \$4.5 billion for the commercial repository and \$435 million for the defense-only repository".

Note that the Mission Plan Tables 10-1 to 10-3 projects total D&E expenses at \$7.427 billion, not \$4.5 billion. The D&E costs for a defense-only repository are likely to be considerably greater than \$435 million. The appropriate bases for sharing the site characterization, licensing, design, and engineering costs should be more completely discussed.

13-5 5) Page 2-12, Table 2-1. The costs presented for the reference repository are substantially different than previously published costs for a reference repository in salt.

<u>\$ Millions</u> <u>Repository System</u>	<u>Table 10-4</u> <u>Mission Plan</u> <u>April 1984</u>	<u>Fee Study</u> <u>Table A-5</u> <u>DOE-S-0020</u>	<u>Table 2-1</u> <u>DP-0020</u>
Capital	1291	2750	721
Operating	2501	4258	2128
Decom.	<u>244</u>	<u>534</u>	<u>152</u>
TOTAL	4037	7542	3001

In general this cost basis for the defense waste and commercial waste should be presented on a basis that is consistent with the Mission Plan and the fee report which serves as a basis for utility payments of 1 mill/Kwhr.

II. Comments Related to Package Quantities.

13-6 In four locations in the report (Page E-2; Table 1-1 - Page 1-9; Table 1-2 - Page 1-10; Page 1-11), and in various additional places throughout the text, it is indicated that the defense waste inventory will amount to approximately 20,000 packages. The basis is described on page 1-12, "DHLW is assigned a value of 0.5 MTHM based on the curie equivalence of commercial high-level waste as shown in Table 1-2". (Note Table 1-2 shows 0.5 tons DHLW = 1.5×10^5 curies; hence 1 ton DHLW = 300,000 curies). It is further noted that any defense waste shipments after 2021 were not considered in the study.

We believe these quantities and the basis for equivalence require additional documentation and review.

13-4 The final report recognizes that additional development and evaluation (D & E) costs may be incurred to accommodate defense waste in the commercial repository. The D & E cost estimate used was for a single repository. The 7,427 million dollars you refer to is for two repositories. We have reevaluated the probable D & E costs for a defense-only repository and conclude that it would be of the same order of magnitude as for the commercial repository. This is reflected in the final report.

13-5 The cost calculations for the commercial repository were based on an earlier design than that used in the Draft Mission Plan for the Civilian Radioactive Waste Management Program of April 1984. A comparison with the Mission Plan repository indicates that costs are currently higher. However, the results of the study do not change.

13-6 The quantities of defense high-level waste anticipated through 2020 are documented in the current Defense Waste Management Plan. Confining analysis to the period prior to 2021 is consistent with the Nuclear Waste Policy Act. Since the EPA has proposed Curie release limits per MTHM charged to a light water reactor, Curie releases and repository loadings in MTHM equivalents were calculated for defense high-level waste on a Curie basis.

13-7

- 1) There is a possibility that a significant quantity of defense waste from INEL is omitted under this ground rule. Secondly, because of the apparent low waste loadings in the INEL waste ($.079 \times 10^5$ curies/cannister versus 1.77×10^5 Ci/cannister for Savannah River), Table 1-1 may significantly underestimate INEL package production over the lifetime of INEL wastes.

We believe the lifetime inventory of defense waste should be considered, rather than projecting a cutoff at an arbitrary date of 2021.

13-8

- 2) Note that if the spent fuel packaging factors in Table 1-2 were used, and the total projected spent fuel of 120,000 tons were reduced to 100,000 to account for higher burnup of future fuel, and all fuel was disposed as spent fuel, the CHLW inventory would only amount to about 35,000 packages. If packaging and handling is a predominant element of cost, then the costs for defense and commercial waste may be of the same order of magnitude.

III. Safety Assessment and Waste Equivalence

13-9

Earlier, we have commented that we reserve judgment whether 300,000 Ci (mixed age and half-life) of defense high level waste is equivalent to 1 ton of commercial high level waste. We note this equivalence has been suggested by EPA in background documents to 40CFR191. However, we do not believe the present version of the EPA standard 40CFR191, working draft 4 - 5/21/84 has a sufficient definition of equivalence between defense waste and 1 ton of reactor fuel to be a useful or practical basis for licensing.

We have separately urged EPA to rectify this omission and make other changes in the proposed standard. In the meantime, regulatory questions and potential delays may arise over the amount of combined commercial and defense waste that should be used as a basis for calculating the total repository curie release limit. One extreme would be to allow no upward adjustment for the defense waste. This would make the limits more severe for the commercial fuel.

Another extreme would be to take the tonnage of defense fuel actually irradiated. This would be excessive for defense waste. However, it should also be noted that there is no adjustment in the fee schedule or in the EPA criteria for low exposure (first core) or high exposure commercial fuel which in some way would be similar to production reactor fuel and submarine reactor fuel. A special adjustment is made for the fuel discharged prior to April 1982.

- 13-7 The waste loading of an INEL cannister has not been established. It has been assumed for this study that it will approximate the waste loadings at Savannah River.
- 13-8 The analysis is consistent with planning at the time the study was initiated. Factors such as those you cite will be continually monitored to determine their impact on program costs.
- 13-9 The rationale for the MTHM equivalence of defense waste is given in response to comment 13.6 above. The formula for cost allocation is to be negotiated and may be developed on a basis different from that for commercial waste.

13-9
cont'd

In principle, these matters are correctable by reasonable and timely action by the regulatory authorities. Until reasonable resolution, these issues constitute a potential cause for delay of schedules and licensing approvals.

IV. Shared R&D Data

13-10

We believe it is possible that the sharing of the R&D data from a salt repository that is now being obtained under the defense program at WIPP could conceivably reduce the R&D and capital costs of a first waste repository for CHLW and DHLW below those shown in Table 2-1.

The potential for significant cost reduction from programmatic sharing should be evaluated as an additional alternative. The incentive to combine programs may be much greater than stated in the draft report, page E-4 and Table E-1, of \$1.5 billion. It may be important to establish realistic incentives to have an accurate basis for assessment as the complexity of program combination begins to appear.

V. Transportation Costs

13-11

The transportation cost projection in Table 2-13 is based on a set of assumptions that lead to the conclusion that rail shipment is considerably more expensive than truck shipment for defense waste. There is concern that some opponents of rail shipment of waste could use this data to argue that tariffs and provisions for rail shipment should not be established because truck shipment is the lower cost and more competitive approach.

We would suggest an additional table be prepared with more optimistic, but still reasonable assumptions which will show rail shipment is potentially less costly. We believe little purpose is served by the present report indirectly taking sides in the truck versus rail debate.

13-10 The defense and commercial waste disposal programs are both the responsibility of the Department of Energy. The defense waste program is managed by the Assistant Secretary for Defense Programs. The commercial waste disposal program is managed by the DOE Office of Civilian Radioactive Waste Management. There is an understanding between the two DOE offices which specifically addresses their close liaison, particularly in the area of research and development activities. Sharing of information has potential for significant cost reduction and in all probability will be considered in the cost allocation negotiations to determine the fee for disposal of defense waste in a commercial repository.

13-11 It was not the intention of the report to take sides in a truck vs. rail debate. Using assumptions based on information available to them, Joy, et al. estimated the costs for truck and rail transportation of defense waste to five potential sites for a repository. It is not inconceivable that competition for the business may force costs downward, but this cannot be predicted with any reasonable certainty and would not affect the overall conclusions of the report. In addition, factors other than cost may influence the decision to use one mode of transport over the other or to use both transport modes if appropriate.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

OCT 15 1984

Mr. David B. Leclaire, Director
Office of Defense Waste and
Byproducts Management
U.S. Department of Energy
Washington, DC 20585

Dear Mr. Leclaire:

I am pleased to provide comments on your recent draft report to the President entitled An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste, prepared in response to Section 8 of the Nuclear Waste Policy Act.

14-1 Our review focused on the sections of the report addressing health and safety and regulations. Observations in other areas which were noted during our review are also provided for your consideration. Overall we believe the final report would benefit if additional referencing of data supporting conclusions presented in the report would be included and the draft working papers that are referenced would be finalized.

We appreciate the opportunity to review the draft report. If we can be of further assistance, please call me or Dr. Bell at 427-4069.

Sincerely,

RE Browning
Robert E. Browning, Director
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

U.S. NUCLEAR REGULATORY COMMISSION

RESPONSE TO COMMENTS

14-1 The final report includes citations to the primary reference material used. That material is available in draft form only in many cases.

COMMENTS ON DOE DRAFT REPORT:
"AN EVALUATION OF COMMERCIAL
REPOSITORY CAPACITY FOR THE DISPOSAL
OF DEFENSE HIGH-LEVEL WASTE"

The comments which follow are grouped into six sections corresponding to the introductory section of the report and the sections on Cost Efficiency, Health and Safety, Regulations, Transportation, and Public Acceptability. Among these, we consider the following items most important from NRC's standpoint in revising the draft:

<u>Introductory Sections</u>	Comment 4
<u>Cost Efficiency</u>	Comment 2
<u>Health and Safety</u>	Comments 3, 9, and 11
<u>Regulations</u>	All comments
<u>Transportation</u>	Comments 1, 2, 3, and 6

Other comments describe recommended changes to the report or identify additional concerns which relate more to implementation of the repository program than to the report itself.

Introductory Sections

1. Page E-5, Table E-1

14-2 The statement that procedural rules, such as those relating to site characterization, do not apply to a defense-only repository is misleading because site characterization is required by 10 CFR Part 60. It would be better to state instead: "Procedures established by NWPA that do not apply are:"

2. Page 1-3, Figure 1-1

14-3 The dashed line (representing a memorandum of understanding) between the EPA and NRC boxes should be deleted. The agency responsibilities stated in NWPA Sec. 121 can be carried out without any MOU.

3. Page 1-4, last paragraph

14-4 The definition of high-level waste in Section 2(12) of the Nuclear Waste Policy Act should be used.

- 14-2 The regulation section for the defense-only repository in Table E-1 was modified in accordance with your suggestion.
- 14-3 Figure 1-1 (page 1-3) has been revised to delete reference to an MOU between DOE and NRC.
- 14-4 The text has been changed to specify defense high-level waste.

4. Page 1-8, first paragraph, and Page 1-9, Table 1-1

14-5 The draft defense waste report and the draft Mission Plan are not consistent. The draft Mission Plan states that beginning in 1998, the Phase 1 facilities at the first repository will be able to accept for disposal 400 MTU/year (which, according to Table 1-2 in the draft defense waste report, represents 120 to 150 spent fuel packages per year), including small quantities of defense high-level waste, if needed. Phase 2 facilities would bring the repository capacity to 900 MTU/year in 2001, 1800 MTU/year in 2002, and finally 3000 MTU/year in 2003.

In contrast, the draft defense waste report anticipates shipping 620 packages (310 MTU) per year of defense high-level waste to the repository beginning in 1998. This inconsistency should be resolved. Furthermore, a footnote to Table 1-1 states that the shipment schedule is taken from the June, 1983 Defense Waste Management Plan. However, the Defense Waste Management Plan does not contain such information.

The rates of acceptance shown in Table 1-1 would substantially reduce the amount of commercial waste that could be accepted at the repository in the first five years of operation. Depending on the plan ultimately chosen for receiving commercial waste during this time period, this could cause the need for commercial power plant operators to expand their onsite storage capacity and obtain licenses for such expansion. DOE should consider alternatives which would minimize the need for expansion of onsite storage capacity.

5. Page 1-11, third assumption

14-6 It is assumed that the commercial waste disposed of in a commercial repository will be half spent fuel and half reprocessing waste. The basis for this assumption and its effect on the evaluation are not clear.

6. Page 2-2, line 8 and second footnote

14-7 The citation for 10 CFR Part 60 should also include 46 FR 13971, Feb. 25, 1981 (licensing procedures). The authority reference in the second footnote should also include the Atomic Energy Act.

Cost Efficiency - NRC has not made an analysis of the cost sections of the report. However, in looking over these sections, we have made the following observations:

14-5 The inconsistencies in waste acceptance schedules between the draft report and the Mission Plan arose primarily from the passage of time entailed in producing and reviewing the report, while repository concepts continue to develop. Table 1-1 has been removed from the final report. The table represented expected availability of defense waste for disposal in a repository; it was based on information presented in the Defense Waste Management Plan concerning the rate at which immobilized defense waste will be produced. It is the policy of DOE that defense waste will be received at a civilian repository on a separate schedule, mutually agreed to by the Assistant Secretary for Defense Programs and the Office of Civilian Radioactive Waste Management, such that the rate of receipt of commercial waste, once established, will not be adversely compacted.

14-6 By law a repository must be capable of accepting both commercial high-level waste and spent fuel. The even split between the two waste types was a reasonable assumption, given the information available at the time the study was initiated. Although current economic conditions do not favor reprocessing, it is assumed that future conditions could make it part of the waste management options. While total costs for a different repository design would differ from those in the report, the results of the study would not change.

14-7 The text was modified regarding the authority for the NRC regulations.

1. Page 2-7, paragraph on geologic media

14-8 The report states that information about tuff was used as a surrogate for the high end of repository cost estimates. However, as stated in the draft Mission Plan (Vol. II., p. 10-14), basalt is the highest cost hard rock medium.

2. Page 2-10, third paragraph; Page 3-4, first paragraph

14-9 The cost estimates are asserted without derivation or documentation. It is suggested that these sections be revised so as to substantiate the cost estimates.

3. Page 2-12, Table 2-1

14-10 The costs shown for shafts in the augmented repository are incorrect. It appears that these figures should be switched with those in the previous line.

4. Pages 2-12 and 2-13, Tables 2-1 and 2-2; Page 3-6, Table 3-1

14-11 The basis for some of the major cost estimates for salt and hard rock repositories should be reexamined. The capital costs for shafts in hard rock (for all options) would likely be higher than the costs for shafts in salt, based on experience in the mining industry. Although the tendency for salt to creep requires either the lining of shafts or initial excavation of larger shafts, as noted on p. 2-15, this would only affect the cost of the portion of the shaft going through salt, a portion extending over a depth of only a few hundred feet. The overburden at a hard rock site would generally be harder and therefore costlier to excavate than the overburden at a salt site.

14-8 Cost information on a repository sited in a basalt formation was not available at the time that the analyses of the report were being done. Therefore "information about tuff was used as a surrogate for the high end of repository cost estimates." This was not meant to imply that cost estimates in tuff represent the extreme. While it might be true that if the combined repository were sited in a basalt formation and a defense waste only repository were sited in tuff, the cost advantage of the combined repository would be lessened, it would not follow that a defense-only repository would be required.

14-9 References to identify the sources of the cost reports were added to the final report.

14-10 The table has been corrected by transposing the incorrectly placed cost numbers.

14-11 The cost data presented in the report were the most recent available. Tuff was used as a surrogate for hard rock in this study.

What you say about hard rock may be true for hard rock media other than tuff, however, information relative to repository costs in such other hard rock media was unavailable to us at the time this study was initiated.

5. Pages 2-12 and 2-13, Tables 2-1, and 2-2; Pages 3-6 and 3-7, Tables 3-1 and 3-2

14-12 Using the numbers provided in these tables, our calculations show that the cost of overpacks for defense high-level waste packages is estimated to be higher in a defense waste only repository than in a commercial repository:

	<u>Total Cost of Overpack</u>	<u>Equivalent Cost Per Canister</u>
Defense only, salt repository	\$810M	\$40,500
Defense only, hard rock repository	\$493M	\$24,650
Augmented commercial salt repository	\$713M	\$35,650
Augmented commercial hard rock repository	\$428M	\$21,400

The reason for the higher estimated cost is not clear. If the costs are based on particular designs, those designs should be described so that the estimates may be evaluated.

6. Pages 3-4 and 3-8, last paragraph in Section 3.3.1

14-13 It is assumed that a defense-only repository would be located at a site which has been characterized by DOE but not selected for a commercial repository. Development and Evaluation (D&E) information for these sites would be purchased from OCRWM, and the estimated cost for additional required D&E is \$435 million. This suggests that this cost would be incurred for a defense-only repository but not for disposal of defense waste in a commercial repository. However, it is then stated (p.3-8) that this sum is not included in the cost estimates because it is assumed to be the same for all disposal options. It seems this additional D&E cost should be included in the estimated cost of a defense-only repository.

Health and Safety1. Pages 2-16 to 2-31, Section 2.3.2.1 (Long-term health effects)

14-14 While the analysis performed for transport of waste from the repository should be sufficient for the purpose of this report, we note that this type of analysis would not be sufficient for assessment of actual repository performance due to variability and uncertainties. For example, releases were calculated for a repository model which considered only single-valued retardation coefficients. In addition, the leach rates given are not well-documented and the groundwater travel times were

14-12 It is not obvious where you got your numbers in Table 2-1, the cost of the overpack for defense waste in the commercial repository is 713 and 428 million dollars in salt and hard rock respectively. The overpack costs for defense waste in a defense-only repository, as shown in Table 3-1 are 714 and 438 million dollars in salt and hard rock respectively. The slight differences are the result of rounding errors in the calculations.

14-13 The final report recognizes that additional D & E costs may be incurred to accommodate defense waste in the commercial repository. The draft report assumed that the defense repository program could purchase the D & E carried out by the commercial repository program for a site characterized but not finally selected for use for a commercial repository. However, upon reconsideration of this issue, it was determined that this may not be a feasible option. The D & E costs for a defense-only repository are not known at the present time. Therefore, as a simplifying assumption, they are considered to be comparable to the D & E costs associated with the commercial repository in the final report. When D & E costs are considered, the cost advantage of disposing of defense waste in a commercial repository is enhanced.

14-14 It is agreed that the analysis performed for this study would be inappropriate for site-specific examinations. The text has been revised and cites the findings of recent (unpublished) studies by the DOE Office of Civilian Radioactive Waste Management which use more realistic information from potential repository sites. These studies confirm the conservatism of the models used in our report.

14-14
cont'd

arbitrarily chosen. Although the values chosen were somewhere in the middle of accepted ranges, the DOE approach does not recognize the known variability and uncertainties in the data. Approaches such as the analyses by NRC and Sandia, referenced below, which were performed for the 10 CFR Part 60 Rationale provide a more complete picture since multiple runs over wide ranges of the parameters are considered. See:

USNRC, "Rationale for the Performance Objectives in 10 CFR Part 60," August 30, 1982, including appendices A and B.

Pepping, R.E., M.D. Siegel, and M.S. Chu, NUREG/CR 3235, Vols 1-4, Sandia National Laboratories, Albuquerque NM, 1983. Although this Sandia analysis is referenced in the report, it is not clear how the analysis was used.

2. Page 2-17, Table 2-4; Page 2-29, Table 2-8; Page 3-10, Table 3-3

14-15 Table 2-4 presents release limits in the proposed 40 CFR Part 191 (47 FR 58195, Dec. 29, 1982). The EPA Science Advisory Board recently recommended that these limits be changed in the final standard (letter from Herman E. Collier, Jr. to William D. Ruckelshaus, February 17, 1984; availability of report noticed at 49 FR 19604, May 8, 1984). In determining the ratios in Tables 2-8 and 3-3, it should be recognized that the values in the proposed standard are likely to change.

3. Page 2-24, fifth line; Page 2-44, bottom paragraph

14-16 The requirement of 10 CFR §60.113(a)(2) is not accurately paraphrased in these locations. The actual requirement states that "...pre-waste-emplacement groundwater travel time along the fastest path of likely radionuclide travel from the disturbed zone to the accessible environment shall be at least 1,000 years or such other travel time as may be approved or specified by the Commission" (emphasis added). The descriptions of this requirement in the report should be modified accordingly.

4. Page 2-26, first complete paragraph, second line

14-17 There is no 1982 DOE publication listed in the reference section.

5. Page 2-26, first complete paragraph, seventh line

14-18 The reference to Table 2-9 should be Table 2-7.

14-15 The final report includes recognition of pending changes to the Proposed 40CFR191.

14-16 The text on 10 CFR 60 requirements on groundwater travel time has been corrected.

14-17 The text was corrected to cite primary source information.

14-18 The text has been corrected to refer to Table 2-7.

6. Page 2-27, second complete paragraph

14-19 Since EPA's high-level waste standard has not yet been issued in final form, the FR citation for the proposed rule should be provided (or a working draft of the final standard should be referenced) rather than the CFR citation given.

7. Page 2-27, second complete paragraph

14-20 Support should be provided for the statement, "Non-zero releases occur only for C-14, Tc-99, and I-129."

8. Page 2-29, Table 2-8

14-21 The reference to Table 2-6 in footnote b should be to Table 2-4.

9. Page 2-31, Section 2.3.2.2, second paragraph; Page 2-33, Table 2-9; Page 2-34, top of page

14-22 The discussion of short-term radiological impact focuses on exposure to radon and its daughter products which are released from exposed rock. However, it should also address protection of the labor force from external radiation emitted from waste canisters during the operation phase.

10. Page 2-36, last paragraph in Section 2.3.2

14-23 It is estimated that the probability of accidentally dropping a waste canister down the repository mine shaft is 10^{-5} per year. The basis for or source of this estimate should be provided in the report.

11. Page 2-48, first complete paragraph; Pages 4-3 to 4-4, second paragraph in section 4.2

14-24 The report states (pp.4-3 to 4-4) that the calculated releases of radionuclides to the accessible environment are less than the limits in the proposed EPA standard for the options considered. Therefore, it is stated, health and safety is not a basis for the selection of one of the two disposal options. Based on our current information and understanding of the mechanisms for radionuclide release, we believe that either disposal option, combined or separate repositories for defense and commercial waste, could be acceptable from a health and safety point of view if appropriate measures are taken to mitigate the risk of radionuclide release. However, it is likely that the cost of such

14-19 The text has been revised to give a Federal Register reference for the draft EPA standard.

14-20 Citations to direct the reader to the source document for details not found in the report have been added to the text.

14-21 The text of the footnote has been changed to refer to Table 2-4.

14-22 Exposure of the work force to radiation from the waste containers during repository operation is addressed on pages 2-35 to 2-37 of the final report.

14-23 The estimated frequency for an accidental drop of a canister has been referenced.

14-24 The report provides a range for expected costs of the commercial repository containing defense waste by considering disposal in two different geologic media, and also by considering disposal of defense waste with and without an overpack. Consideration of the two overpack options reflects the effect on cost of measures which may be taken to mitigate the risk of radionuclide release. Even if an overpack were required for defense waste in the commercial repository but not in the defense-only repository, there would be a considerable cost savings by disposing of the defense waste in the commercial repository.

14-24
cont'd

measures would differ between the disposal options. We suggest that cost estimates in the report reflect such differences.

For example, the report states in the health and safety section (p.2-48) that defense waste could be subjected to a higher temperature environment in a combined repository, but that acceptable containment performance can still be assured provided the waste package and repository are designed appropriately. This is due to the fact that commercial waste disposed of as either spent fuel or immobilized high-level waste from reprocessing will have a greater heat output than a comparable quantity of high-level defense waste. If defense waste were disposed of in a defense-only repository, the waste package or repository designs could be modified if the temperature of the repository was lower. On the other hand, if defense waste is emplaced in a commercial repository and is subject to a higher temperature, environment, the packages would need to be as durable as those in which the commercial wastes are contained in order to withstand the higher temperatures which the report says could occur. Under such circumstances, the cost of defense waste disposal would be increased vis a vis the option of the defense-only repository.

If such measures are necessary, their cost is not addressed in the report. If the cost estimates are based on studies which do consider these factors, it is suggested that the basis for the estimates be provided in the report.

12. Page 3-9, sixth line

14-25

It is stated that the potential leach rate of the defense waste due to water leaching in the 50 to 60°C temperature range would be approximately 10⁶ parts per year. The source of this estimate should be provided. NRC has previously indicated that the majority of data on borosilicate glass available to date have not been obtained under the water, temperature, and radiation conditions likely to be encountered in an actual repository environment (see letter from John B. Martin to Thomas B. Hindman, Jr., November 4, 1982, and attached comments on the Environmental Assessment of the Waste Form Selection for SRP High-Level Waste, to be provided under separate cover). Furthermore, although Savannah River waste glass has been tested, these leach rates may not apply for other high-level waste at INEL and Hanford.

14-25 The leach rate at 50°-60° was provided by Kocher et al., 1984. Kocher et al. cite the following primary sources:

Westinghouse Electric Corporation, 1983. Engineered Waste Package Conceptual Design: Defense High-Level Waste (Form 1), Commercial High-Level Waste (Form 2).

Westinghouse Electric Corporation, 1983. Conceptual Waste Package Designs for Disposal of Nuclear Waste in Tuff. ONWL-439, Pittsburgh, PA 15236.

National Research Council, Waste Isolation Systems Panel, 1983. A Study of the Isolation System for Geologic Disposal of Radioactive Wastes. National Academy Press, Washington, D.C.

The leach rate data used is necessarily from laboratory measurements until data can be obtained from an actual repository setting. Actual data will be obtained as part of the repository research and development effort. We recognize that such data may differ from that obtained in laboratory studies. However, the differences are not expected to be great enough to influence the results of this study.

Until waste forms for high-level waste from Hanford Reservation and Idaho National Engineering Laboratory are developed and tested, it is necessary to use the data for Savannah River Plant waste as a first estimate.

13. Page 3-10, Table 3-3

14-26 It would be useful if ratios were provided in Table 3-3 for all four scenarios examined in Table 2-8 (scenarios 7 through 10), rather than just one set of figures for minimal overpack and salt or hard rock.

14. Page 4-3, footnote

14-27 The controlling definition of "accessible environment" would be that which appears in 10 CFR Part 60. The footnote should be modified accordingly.

Regulations

1. Page 2-36, bottom of page; Page 2-40, third bullet; Page 2-41, first bullet; Page 3-17, second bullet

14-28 In these locations, reference is made to an application for authorization to construct a repository. This does not accurately describe the NRC licensing procedures. Our comments to DOE on the draft Mission Plan (letter to Ben C. Rusche, July 31, 1984, Enclosure 2, p.11) are repeated here for clarification:

"It is stated that the repository design will be finalized during the Commission's review of the "construction authorization application" and that the "application for the license to receive and process radioactive waste...will be submitted to the Nuclear Regulatory Commission while construction is proceeding." These statements indicate that DOE may not completely understand the nature of the Commission's licensing process. As we pointed out in our comments on the preliminary draft of the Mission Plan on the use of the term "construction authorization application," the process established by 10 CFR Part 60 involves an application for a license to receive or possess source, special nuclear, or byproduct material at a geologic repository operations area. 10 CFR §60.3(a). As an initial step in its review of the license application, the Commission may issue a construction authorization for the repository if the requisite standards are met. 10 CFR §60.31. Under 10 CFR §60.32(d), DOE is required to update its original license application as specified in 10 CFR §60.24 before the Commission will issue a license to receive radioactive waste at the repository. Although we have no objection to the use of the term "construction authorization application" as a convenient way to describe this portion of the repository siting process (particularly in view of the fact that this term appears in several sections of the NWPA), the use of this terminology should be

14-26 Kocher et al. provide results for all scenarios; the worst case was presented. Table 3-3 has been removed and the reader referred to the basic documentation for detailed information.

14-27 The section to which the footnote refers has been rewritten and the footnote is no longer required.

14-28 Appropriate changes have been made throughout the report text in order to reflect the Commission's licensing process accurately.

14-28 within a context that clearly and accurately describes the
cont'd Commission's licensing process."

2. Page 2-36, bottom of page

14-29 The Commission has noted its intention to undertake additional rulemaking to deal with any changes in licensing procedures that may be necessary in light of NWPA (see 48 FR 28195, June 21, 1983). Accordingly, it is recommended that the reference to Table 2-11 be qualified as follows:

"The procedure leading to the construction authorization, as stated in that Act and existing regulations, is summarized in Table 2-11. (Note that NRC regulations may be revised as necessary in light of NWPA. 48 FR 28195, June 21, 1983.)"

3. Page 2-37, bottom of complete paragraph; Pages 2-44 to 2-46, Table 2-12

14-30 Other sections in 10 CFR Part 60 are also relevant to comparing the two disposal options in assuring compliance with EPA's forthcoming standard. Table 2-12 should also reference:

- Section 60.111 (pre-closure performance objectives, including retrievability);
- Section 60.112 (post-closure performance objectives); and
- Section 60.113(c) (unanticipated processes and events).

4. Page 2-38, Table 2-11, sixth bullet; Page 2-40, Table 2-11, third bullet

14-31 It should be noted that 10 CFR Part 60 also has requirements governing the submittal of site characterization plans (10 CFR §60.11(a)). Furthermore, Part 60 has requirements governing the submittal of a license application (10 CFR §60.21-23).

5. Page 2-41, Table 2-11, first bullet

14-32 It is stated that NRC must issue a final decision on the application within 3 years of submittal. It should be clarified that NRC is required to reach a decision on whether or not to authorize construction within 3 years of submittal of the license application, and is not required to reach a final decision by then on the license to possess (see Comment #1, above). Furthermore, an additional bullet should be provided regarding the update of the license application required under 10 CFR §60.24 and the

14-29 Your suggested wording has been incorporated into the document on the appropriate page.

14-30 We do not believe that the sections of 10CFR60 that you refer to could be applied differently to a defense-only repository than to a commercial repository, therefore they were not singled out for special discussion.

14-31 Reference to additional sections of 10CFR60 would provide more detail than was considered necessary for purposes of the study.

14-32 The correction you suggest has been incorporated in the final report.

14-32
cont'd

granting by NRC of a license to receive nuclear material at the repository, as specified in 10 CFR §60.41.

6. Page 2-44, Table 2-12

14-33

The requirements of 10 CFR §60. 113(a)(1) are not properly stated. The requirement that containment be substantially complete during the period when radiation and thermal conditions in the engineered barrier system are dominated by fission product decay is a requirement on the engineered barrier system (Section 60.113(a)(1)(i)(A)). Table 2-12 indicates that this is a requirement on the waste package. Also, containment of high-level waste within the waste package must be substantially complete for a period of 300 to 1000 years, to be determined by the Commission (Section. 60.113(a)(1)(ii)(A)). Table 2-12 is confusing on this.

Furthermore, in the first line of the second paragraph, the word "subsequent" should be deleted as it does not appear in the equivalent portion of the regulation.

Finally, in the third line of the third paragraph, the word "emplacement" is incorrect. Under Part 60, the inventory of radionuclides for this requirement is to be calculated 1,000 years after permanent closure, not after emplacement. Also, the citation of the regulation should be §60.113(a)(1)(ii)(B).

7. Page 2-45, Table 2-12

14-34

The paraphrasing of the first paragraph of §60.113(b) is not quite accurate. Since the paragraph being paraphrased is short, an exact quote would be preferable.

8. Page 2-47, first complete paragraph

14-35

The reference to Section §60.102(e)(1) is not accurate. We suggest substituting the following for the second sentence in this paragraph:

- Substantially complete containment of nuclides is required "during the first several hundred years following permanent closure of a geologic repository, when radiation and thermal levels are high and the uncertainties in assessing repository performance are large" (60.102(e)(1)).

14-33 Table 2-12 (now 2-10) has been corrected.

14-34 Your suggestion has been accepted.

14-35 Your suggestion has been accepted.

9. Pages 3-15 to 3-17, Table 3-6

14-36 All references to Part 51 should be replaced with references to NEPA and NWPA as appropriate. Part 51 does not include specific requirements for geologic repositories.

10. Page 4-6, end of section 4.3

14-37 This section should reflect the fact that the procedural roadmap for a commercial repository is absent in the case of a defense-only repository. This might be presented in the form of a new penultimate paragraph in Section 4.3:

"Another consideration is that the procedures for commercial repositories are mandated comprehensively by provisions of law, whereas defense-only repositories would be more subject to procedures which, in the absence of statutory guidance, could be the subject of controversy and delay."

For example, a factor that could adversely affect the schedule and therefore the cost of a defense-only repository is the absence of the NEPA process dictated by NWPA. Under NWPA, the scope of the alternatives that must be considered in the DOE EIS is largely defined. In addition, NRC is to adopt DOE's EIS to the extent practicable. An EIS for a defense-only repository may be required to have a broader scope and NRC would have broader review responsibilities, possibly including the preparation of a separate EIS. NRC has in the past taken the position that if it had to prepare a separate EIS, a three year schedule for construction authorization could not be met.

Transportation1. Pages 2-48 and 2-50, first paragraph in Section 2.3.4

14-38 The paragraph should be clarified to state the extent to which defense waste shipments will be subject to NRC and DOT regulations. The paragraph should also clearly state DOE's intent regarding the certification of packages to be used for these shipments. As written, the draft report raises these issues, but does not answer them.

2. Page 2-52, second complete paragraph

14-39 The report states that a computerized routing model (HIGHWAY) was used to calculate truck distances for defense waste shipments, and that "routes

14-36 Please see 10CFR51.51(a)(11), 10CFR51.40(d) and 10CFR51.41, which refer to geologic repositories.

14-37 We believe that the differences among procedures mandated for the two options are clearly stated and refer to the many uncertainties in drawing conclusions between options on the basis of regulation.

14-38 This suggestion has been accepted, and the text changed accordingly.

14-39 A footnote has been added on page 2-55 of the final document in response to your comment.

14-39
cont'd that might be used for general commerce were used." It should be noted that the routes selected for the calculations would have to conform with DOT's final rule on highway routing of large quantity radioactive material shipments (DOT Docket HM-164).

3. Page 2-56, Table 2-14; Page 2-58, Table 2-15

14-40 We are unable to confirm the validity of the reported non-radiological or radiological impacts of transportation. The reported impacts are asserted without derivation or documentation. The report should be revised so as to substantiate these health impact estimates.

4. Page 2-57, first complete paragraph

14-41 The first sentence in the paragraph should be revised to include the number of miles traveled and accident location as additional factors in assessing the probability and impacts of an accident. Also, normal transport activities result in low-level radiation exposure, a fact that Table 2-15 recognizes, but the accompanying text does not.

5. Page 3-14, Section 3.3.4

14-42 We agree with the second sentence in the paragraph that the costs and impacts in transporting defense waste to a commercial repository would also apply to a defense-only repository located in the same five prospective regions. We can envision scenarios, however, in which the total transportation impacts differ, depending on whether commercial and defense repositories are located in the same region. For example, assume that the closest available repository site to defense waste generators is selected for a commercial repository. If a decision is then made to ship defense waste to a defense-only repository, then the defense shipment distance (and therefore transportation impacts) will be greater than if it had been decided to ship both kinds of wastes to the commercial repository. We cannot judge how significant such transportation considerations are since we would expect them to be outweighed by geological site suitability characteristics in the commercial and defense repository option decision. We do believe these considerations could be given a more thorough treatment in the report. This comment also applies to Section 4.4.

6. General comment, Sections 2.3.4 and 3.3.4

14-43 In addition to the discussions of the costs and health and safety impacts of transporting defense high-level waste to a commercial or defense-only

14-40 The reference for the information is cited in the text of the final report.

14-41 The "number of miles traveled" and "accident location" were added to the list of factors affecting accident impacts.

14-42 Although various repository development options can have varying ranges of transportation impacts, including transportation cost variations, depending on the specific locational relationship between a waste site and a specific repository, such transportation cost differences are minor compared to the differential cost of the disposal options for defense waste and would not be sufficient to overcome the cost advantage of a combined repository.

14-43 The elements used in the analysis of a particular topic such as transportation were selected on the basis of illustrating the difference between the disposal options of defense waste in a commercial or a defense-only repository. The transportation safeguard requirements are independent of the disposal option in this comparison study.

14-43 repository, the safeguards requirements applicable during transportation
cont'd should be addressed.

14-43
cont'd

7. General comment, Sections 2.3.4 and 3.3.4

14-44 The report would benefit from a description of the insurance that
covers shipments of defense waste, and how this coverage may differ
from that for commercial waste shipments.

14-44

Public Acceptability

1. Page 3-19, second complete paragraph

14-45 It is stated that a defense-only repository would be perceived by local
officials as having a lesser impact than a commercial repository because
of its smaller size and lower total radioactivity content. We suggest
that the word "would" in this sentence be changed to "might."
Furthermore, it should be noted that if separate repositories were
developed for defense and commercial wastes, a larger populace might be
affected than if the wastes were commingled.

14-45

14-44 The subject of insurance is not relevant to the purpose of the study.

14-45 The text has been modified as suggested.

PERRY COUNTY CITIZENS AGAINST NUCLEAR DISPOSAL, INC.
POST OFFICE DRAWER G
RICHTON, MISSISSIPPI 39476
September 24, 1984

Mr. David B. LeClaire, Director
of Office of Defense Waste and
Byproducts Management
U. S. Department of Energy OP-1Z
Washington, DC 20545

Dear Sir:

We would like to submit the following comments on DOE/DP-0020 (Draft), AN EVALUATION OF COMMERCIAL REPOSITORY CAPACITY FOR THE DISPOSAL OF DEFENSE HIGH-LEVEL WASTE, Dated July 1984.

15-1 1: This draft is very poorly put together. In fact we think there should be a denial page therein, as in the other ONWI drafts.

15-2 2: There are approximately 63 assumptions and expectations in this draft. We would not like for the people in the state of Mississippi to be put into a dangerous position based on assumptions. As you know, the world at one time was assumed to be flat.

15-3 3. The contradiction of cost on the two hard rocks and salt - due to creep effect of salt - was not this known before. All other ONWI drafts state hard rock more costly.

15-4 4. The creep effect of salt brings up another problem - the larger amount of mined salt and its effect on the environment. Colocation would increase the required repository area and the amount of salt mined.

15-5 5: Cost efficiency seems to be the only reason for colocation. We do hope that consideration will be given the state, its people and the environment.

15-6 6: Transportation is not adequately addressed. With the added shipments from Defense Waste and the fact that the repository site would become "the end of the transportation funnel" and vulnerability to possible transport-system bottlenecks, would the people near the site be exposed to greater releases of radiation?

15-7 7: Will private carriers be used to transport defense waste or will military modes be used?

PERRY COUNTY CITIZENS AGAINST NUCLEAR DISPOSAL, INC.

RESPONSE TO COMMENTS

- 15-1 We do not agree that the draft was "very poorly put together." The purpose of wide distribution of the draft document was to obtain comments useful in improving it, and we believe that the final document has benefited from this process.
- 15-2 Your count of assumptions and expectations may be correct. Since the study is a comparative analysis and not site specific, we do not believe it affects the residents of any particular state more than others.
- 15-3 In general hard rock is more costly to mine than salt. However, the creep effect of salt tends to reduce its cost advantage.
- 15-4 The ultimate size of a repository in any medium will not be influenced as much by the decision whether to co-locate defense wastes and commercial wastes, as by physical and other design features of each site.
- 15-5 All factors were considered in the conclusion that there is no basis for finding that a defense only repository is required. Consideration of people and the environment in any state was included in the health and safety, public acceptability, and regulation factors.
- 15-6 An increased rate of shipments may be experienced at a combined repository. Local transportation impacts resulting from such increased impacts will be identified and addressed in future site-specific studies. Should a significant local impact be identified, appropriate mitigating measures would be part of the site specific study.
- 15-7 Waste transportation would be by commercial carriers and would not require military transport.

15-8 8: May we assume that a decision has been made which excludes the use of barges to transport defense wastes (2-52) ?

15-9 9: What additional Volumes of salt or other rock forms would have to be mined to accomodate 20,000 defense waste packages?

15-10 10: What total underground area is assumed (E-3) in estimating that defense waste will only occupy 10% there of?

15-11 11: Please quantify the higher volume of mined salt referred to at page 2-15.

15-12 12: You refer to any conditions in the repository (2-24). Is it not true that salt domes contain brine and brine-gas inclusions which migrate along grain boundaries and other small unidentified paths and are driven or attracted by thermal gradients? This to us constitutes a wet repository condition.

15-13 13: The DOE "Mission Plan" for the management of nuclear wastes (April 1984) states that spent fuel assemblies are to be shipped to the repository taken apart and consolidated this will release radon gases and its daughters. ONWI-534 (July 1984) states that "there are no firm data upon which to estimate the composition or quantity of gas" that would be so released. No colocation decision should be made without such data.

15-14 14: The report states (p. E-2) that it is in response to section 8 of the NWPA which directs the President to conduct an evaluation of the use of a commercial waste repository for "disposal of high-level defense wastes. Has President Regan requested DOE's recommendation and is there any possibility he will have his own independent evaluation made?

15-15 15: What volume and what composition and types of transuranic wastes are assumed? (2-5)

15-16 16: Your evaluation states that citizens may be confused by reason of the fact that a colocated repository involves two types of wastes. Should this be three (2-5,2-48) or four (2-19)?

15-17 17: Why has no attempt been made to determine "public acceptability" in the prime nine candidate states?

15-18 18: What is the basis for your assumption that some radionuclides" are likely to be removed" from commercial wastes during "reprocessing"? The Mission Plan seems to assume there will be no such reprocessing. (2-22).

15-19 19: What is your definition of a pro-nuclear group (2-59)? Does this include such groups as "U.S. Committee for Energy Awareness," the Edison Electric Institute, Utility Waste Management Group and Mississippians for Energy Action?

15-8 Barges are not being considered for transport of defense waste.

15-9 Defense waste would displace 1.7 million cubic meters of salt or 1.1 million cubic meters of tuff.

15-10 The fraction of the area occupied by defense waste in a repository will depend on the repository design, media, and the amount of defense waste and commercial waste in the repository. The repository design assumed in the report had an area of about 1,100 acres.

15-11 Approximately 7 million cubic meters (about 525,000 cubic meters of salt more than of hard rock).

15-12 The statement in the report refers to site-specific factors that could assist in complying with the containment criterion of the NRC regulations. If, as you imply, a specific site does not provide a dry environment, other measures would be taken to assure the integrity of the waste container during the required containment period.

15-13 This comment refers to a factor surrounding commercial spent fuel handling, and is in no way relevant to the subject or purposes of this report.

15-14 DOE was asked to conduct a study. This report was one input to the President's evaluation. Other inputs may have been utilized. We are not aware of how the President's evaluation was made.

15-15 The assumption was made in Varadarajan and Dippold (1984) that the following volumes and types of transuranic waste would be disposed of in the reference commercial repository:

- 34,518 canisters of remote-handled transuranic waste, of which 32,083 are associated with commercial high-level waste and 2,435 are assumed to be generated on-site from spent fuel disassembly and packaging operations at the repository
- 345,036 55-gallon drums of contact-handled transuranic waste.

No defense transuranic wastes were assumed.

15-16 The reference (section 2.3.5) is to defense and commercial waste.

15-17 The body of comments received in response to the draft report is considered a useful guide to likely opposition and support.

15-18 The reprocessing operation is used to recover, from the spent fuel, uranium and plutonium which can be reused to make fresh fuel for a power reactor. At present, there are no plans to reprocess spent fuel from commercial power reactors, however, such reprocessing may occur in the future.

15-19 A pro-nuclear group is defined as one for which there is a reasonable expectation that the group would be in favor of a technically sound, environmentally acceptable, and cost effective nuclear activity. The question as to whether a specific group is pro-nuclear should be addressed to that group. DOE cannot respond concerning the proclivity of a particular group.

15-20 20: You allude to the fact that you examined citizen groups and the General Public (2-59) we head the largest known citizens group (some nine hundred members) in Perry County, Mississippi, one of the nine purposed sites, and we know of no survey or poll which has been taken in regard to co-location of commercial and defense wastes. If there has been examinations at the state level we would like this information.

15-21 21: Please inform us of (1) any public comments to your evaluation taken from Mississippi. (2) the availability of any revised or final evaluation made by your office and of any independent peer reviews. (3) any Presidential evaluation under-taken pursuant to Section 8, NWPA.

15-22 22: We firmly, oppose the fact that the only issue that you feel is significant is the cost factor. More attention should be placed on (1) Health and Safety factors. (2) The possible insufficient technical information (4-7) to make sound regulatory and licensing decisions and (3) public acceptability. In our opinion the NWPS states that the public acceptance must be considered in the establishment of a nuclear waste repository.

15-23 23: We object to the fact that no public hearings have been scheduled on comingling of defense and commercial waste.

15-24 24: The differences of/or in standards are very important to the people in this area. We do not know what standards will be enforced in colocation or who will be the enforcer.

15-25 25: We feel that population should take priority over "cost efficiency". Population over lying the dome is not addressed-in fact, part of the town of Richton over lies the Richton dome.

15-26 26: In 1974 the reorganization of the Atomic Energy changed to the Department of Energy and the Nuclear Regulatory Commission. Since some manpower from A.E.C. went to each of these, N.R.C-D.O.E. and E.P.A., will not there be bias decisions made by each of these mentioned?

15-27 27: Would security be more strict with the commingling of Defense and Commercial waste?

15-27 28: Would military personnel be used for security at a colocation for defense and commercial waste?

15-27 29: If defense and commercial waste are colocated would the radius of the control area be extended?

15-27 30: Would there be more strict controls placed on the inter and/or outer control areas for a colocation of Defense and Commercial waste than would be for commercial waste only?

15-20 The issue of colocation has been discussed in Congress and has also been addressed by commentors on the Mission Plan.

15-21 All public comments to the study are included in this document. The final study has been sent to all those who commented on the draft. Independent peer reviews were not conducted. The Presidential evaluation undertaken pursuant to Section 8 of the Act was completed in April 1985.

15-22 The other factors you mention were examined in the study but none were shown to provide a basis for suggesting that a defense-only repository is required.

15-23 There was no requirement in the Nuclear Waste Policy Act of 1982 to conduct public hearings or obtain public comments on the draft study. The Nuclear Waste Policy Act has established national policy in regard to permanent isolation of radioactive waste, and has mandated elaborate procedures to ensure that the opinions and interests of citizens, states, Indian tribes, and other interested parties are heard throughout the repository siting process.

15-24 Under applicable law and regulations, the same standards are applicable regardless of whether the repository contains defense waste or commercial waste, or both.

15-25 This site specific comment is not relevant to the comparative study undertaken here.

15-26 This comment is not relevant to the comparative study undertaken here.

We wish to clarify an apparent misunderstanding about the purpose of the report. It was the judgment of Congress as provided in the Nuclear Waste Policy Act of 1982 that defense high-level waste be disposed of in the commercial repositories to be developed under the Act. The Act requires the President to evaluate this and permits reconsideration only if "the President finds, after conducting the evaluation. . . , that the development of a repository for the disposal of high-level radioactive waste resulting from atomic energy defense activities only is required."

15-27 When the processed and immobilized defense high level waste leaves the Defense plants where the waste originated, it will be completely unclassified. Inclusion of these wastes in a geologic repository, whether defense-only or defense and commercial, will require no security measures beyond those that would be required at a commercial waste repository. Military personnel will not be involved in either disposal option and the "radius of control" will not be extended.

Page #4

Mr. David B. LeClaire, Director
September 24, 1984

We appreciate having the opportunity to comment on this Draft.

Respectfully submitted

The Perry County Citizens Against
Nuclear Disposal, Inc.

Dorothy G. Cole
Dorothy G. Cole, President

DGC/deh

cc: Mr. Ron Forysthe
Mississippi Energy & Transp.

Mr. Hodel, Secretary of Energy
Mr. Ben Rusche Dir. of the Office of CRWM
Senator John C. Stennis
Senator Thad Cochran
Rep. Trent Lott

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JOHN SPELLMAN
Governor

WARREN A. BISHOP
Chair

STATE OF WASHINGTON

NUCLEAR WASTE BOARD

Mail Stop PV-11 • Olympia, Washington 98504 • (206) 459-6670

September 24, 1984

David B. Leclaire, Director
Office of Defense Waste &
Byproduct Management
U.S. Department of Energy
Washington, D. C. 20585

Dear Mr. Leclaire:

Enclosed are the comments of the Washington State Nuclear Waste Board on the draft defense commingling study (An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste) prepared by USDOE in compliance with Section 8 of the Nuclear Waste Policy Act.

We wish to emphasize that these comments are directed to the adequacy of the draft report as a basis for the commingling recommendation and do not address the recommendation per se. Until the additional information requested in our comments is made available in revisions to this draft document, the Board is not in a position to comment on the commingling decision.

16-1 As our comments discuss in detail, we find the draft to be inadequate in its discussion of the volume of defense waste to be emplaced in a commingled repository and in its consideration of the effect on the siting of the civilian repository of the proposed recommendations to commingle defense and civilian waste. The Environmental Impact Statement (EIS) now in preparation on defense waste management alternatives at Hanford should provide important information on the volume of defense waste at Hanford to be placed in a commingled repository and on the planned management of the remaining defense wastes at Hanford. Unfortunately, this EIS is not scheduled for release prior to the submission of the revised commingling report to the President. Without this information, the state cannot conduct meaningful review of the draft commingling study. We, therefore, request the final report on commingling provide this specific information. The considerable volume of defense waste stored at the Hanford Reservation in close proximity to the candidate site for a civilian repository explains our concerns on these matters.

WASHINGTON NUCLEAR WASTE BOARD

RESPONSE TO COMMENTS

16-1 We wish to clarify an apparent misunderstanding about the purpose of the report. It was the judgment of Congress as provided in the Nuclear Waste Policy Act of 1982 that defense high-level waste be disposed of in the commercial repositories to be developed under the Act. The Act requires the President to evaluate this and permits reconsideration only if "the President finds, after conducting the evaluation. . . , that the development of a repository for the disposal of high-level radioactive waste resulting from atomic energy defense activities only is required." The report is one analytical input to that evaluation.

The volume of defense waste to be emplaced in the repository that was used in the report was based on the current reference plans of the Department of Energy (DOE) as described in the Defense Waste Management Plan. If external factors cause changes in these plans, additional defense waste may require disposal in a geologic repository. A requirement to dispose of such additional waste is not expected to alter the qualitative findings of this study.

Mr. David B. Leclaire
September 24, 1984
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16-1a

In view of the inadequacies in the draft document and our decision not to comment on the recommendation per se at this time, we hereby request the opportunity to prepare comments on the final report and the assurance that our comments will accompany the report that is submitted to the President.

Sincerely,


Warren A. Bishop, Chair
Nuclear Waste Board

WAB/JP:hlt

Enclosure

cc: Ben Rusche

16-1a The draft report was distributed to interested states and other organizations for comment. Comments were received and incorporated into the final report. All comments and responses are included in this document. These actions were not required by the Nuclear Waste Policy Act of 1982, but were taken by DOE to provide public participation. The report has been approved by the Secretary and forwarded to the President. Upon release of the final report, copies will be sent to all who received a copy of the draft for comment.

**COMMENTS ON USDOE
DEFENSE WASTE COMMINGLING STUDY
(DOE/DP-0020)**

**SUBMITTED BY
NUCLEAR WASTE BOARD OF WASHINGTON**

SEPTEMBER 24, 1984

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16-2

1. MAGNITUDES OF DEFENSE AND COMMERCIAL WASTE

The Commingling Study implies that the defense wastes represent a very minor addition to a commercial repository with the statement that "15% of the radioactivity in spent fuel and high-level waste in this country originated from atomic energy defense activities...[and] by 2000...the radioactivity in defense high-level waste will be 3% of the total" (pp E-3 and 1-5). This statement may create a misleading impression, considering the waste volumes involved. The Defense Waste Management Plan states that those same wastes represent 98% of the total volume of high-level waste and spent fuel today and 92% of that projected for 2000.

Once vitrified and packaged, the defense waste will also represent a relatively large proportion of the waste considered in the comparative evaluation in the Commingling Study. The 10,000 MTHM defense waste would require approximately 20,000 packages, in contrast to about 27,000 packages to contain 70,000 MTHM commercial waste. (Based on data in Table 1-2, p.1-10). Thus, defense waste would account for about 43% of the waste shipped to a commingled repository. These numbers give a somewhat different impression of the magnitude of defense waste to be handled and lead to a different perception of potential transportation impacts.

16-3

An expanded discussion of Hanford wastes to be considered for placement in a geologic repository should include clarification of planned use or disposition of cesuim and strontium salts which have been separated from the stored wastes. The study merely notes that this material "will be stored in water basins pending use" (p. 1-7).

- 16-2 There was no intent to mislead. Several methods are available to compare quantities of high-level wastes for different purposes: radioactivity, volume, MTHM, and number of packages. The estimates presented in this report are accurate, and most useful for repository planning purposes. Comparisons of the relative volumes of unprocessed wastes would not be useful.
- 16-3 The numbers you cite are correct and were used in analysis of the combined repository.
- 16-4 The use or disposition of cesium and strontium salts at Hanford is still under evaluation. This report is limited to a discussion of disposal options for defense high-level waste that is currently scheduled for disposal in a repository.

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September 24, 1984

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2. PROJECTED QUANTITIES OF DEFENSE WASTE

A. Proportions of Waste From Each Defense High-Level Site

16-5

The analysis of the commingled and defense-only repository options is based upon the projected shipments of defense high-level waste shown in Table 1-1 of the report. The projected quantities of defense waste to be shipped do not appear to correspond well with the current and projected inventories of high-level waste at each of the three defense sites. Table 1-1 indicates that less than 6% of the waste shipments will originate at Hanford. However, the two reference documents for this table (DOE/DP-0015, "The Defense Waste Management Plan", and DOE/NE0017/2, "Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics") state that 58.7% of the volume and 36% of the radioactivity in defense high-level waste is contained in the inventory at Hanford. This implies that USDOE plans to leave a substantial amount (95%) of the Hanford wastes in place. Such an unstated intent may create a bias toward the commingling option by understating the potential impact of defense wastes on a commercial waste repository.

B. Definition of Readily Retrievable Waste

16-6

Table 1-1 indicates that the "Hanford shipments are based on vitrification of high-level waste [from]...N-reactor spent fuel and readily retrievable stored high-level waste". The definition of "readily retrievable" appears to be the primary explanation for the discrepancies noted above. The amount and nature of waste not "readily retrievable" or not retrievable at all should be specified, and the impacts on the commingling and defense-only options of also disposing of these wastes should be examined, perhaps as a "worst case" analysis. The need to handle this very large additional volume of defense waste at a

16-5 The current DOE reference plan is to stabilize in-place waste stored in 149 single shell tanks at Hanford Reservation if, after the requisite environmental documentation, it is determined that the short-term risks and costs of retrieval and transportation are greater than the environmental benefits of disposal in a geologic repository. For that reason, that waste was not considered in this study. Should it be determined that the benefits of geologic disposal prevail, then the waste in those single shell tanks will be processed and disposed of in a geologic repository. The requirement to dispose of such waste in a repository is not expected to alter the qualitative findings of this study.

16-6 The Hanford Environmental Impact Statement is not publicly available at this time and it would be premature to use it as a reference. The information presented in the Defense Waste Management Plan on the number of packages of high-level waste that would be generated by Hanford for disposal in a repository is the best available at present. The reference plan of the Environmental Impact Statement is expected to be consistent with the Defense Waste Management Plan. The report is limited to a discussion of disposal options for defense high-level waste that is currently scheduled for disposal in a repository.

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16-6 cont'd repository cannot be overlooked. An Environmental Impact Statement on alternative defense waste strategies is currently being conducted by USDOE to determine whether "the short-term risks and costs of retrieval and transportation outweigh the environmental benefits of disposal in a geologic mined repository".

16-7 (Defense Waste Management Plan, pp. 12, 18.) Data defining the retrievable waste volumes and characteristics at Hanford developed for this Environmental Impact Statement must be contained in the revised commingling report since it provides the basis for determining the wastes from Hanford that require geologic disposal. That data may, in turn, change the cost analysis that USDOE states is the primary factor in the commingling recommendation.

16-8 The Commingling Study should contain a full disclosure of USDOE policy and intent with respect to the Hanford wastes and an explicit identification of the volume and radioactivity of defense wastes at each storage location.

16-9 The statement of projected defense high-level waste should clearly indicate whether strontium and cesium will be removed from the waste to be generated from Purex reprocessing of N-reactor fuels. If not, the impact on radioactivity and heat

16-10 content of Hanford wastes should be identified. In addition, it is not clear whether the projected waste shipments include any wastes to be generated from reprocessing of fuel from the New Production Reactor. The study should also explain the termination of shipments from Hanford in 2007.

3. CONSIDERATION OF TRANSURANIC WASTES

A. Commercial Transuranic Wastes

16-11 The design for the commingled repository (p. 2-3) includes commercial transuranic (TRU) wastes, although these are not

16-7 The Nuclear Waste Policy Act requires the President to decide whether a defense-only repository is required. It is not clear that if the cost of using a defense-only repository were less than the cost of using a commercial repository that a defense-only repository would then be required. Other factors specified in the Act must be considered. In any event, the incremental cost of adding additional Hanford waste to a commercial repository would be the same as the incremental cost of adding it to a defense-only repository so that there, in effect, would be no change to the cost advantage shown by using the commercial repository.

16-8 It is not the purpose of this document to establish policy with respect to Hanford wastes. The policy has already been stated in the Defense Waste Management Plan. Details on the volumes and radioactivity of defense wastes at each storage location is contained in a DOE report titled "Spent Fuel and Radioactive Waste Inventories and Projections" an updated version of which is published in September each year. These reports can be purchased from the National Technical Information Service, Springfield, Virginia.

16-9 A decision on removal of strontium and cesium from waste to be generated from PUREX has not been made yet.

16-10 The new production reactor is being planned, however it is not known at this time if Congress will authorize funds for construction. This and other uncertainties could affect volumes of defense waste in the future. It was necessary for purposes of this report to make reasonable assumptions based on current facilities producing waste. Plans to accommodate the waste from the proposed new production reactor will be addressed in the public documentation associated with the reactor program.

It was expected that Hanford would complete processing of waste generated during the current PUREX campaign by 2007.

16-11 The quantity of commercial TRU waste that will be handled depends on the extent of reprocessing of civilian spent fuel. Its volume does not affect the comparison of disposal options for defense high-level waste. The referenced report by Varadarajan and Dippold 1984 assumed 32,083 canisters of remote handled civilian transuranic waste would be received with the civilian high-level waste and that 2,435 canisters of remote handled transuranic waste would be generated on site from spent fuel disassembly and packaging operations. In addition, the repository would receive 345,036 55-gallon drums of contact-handled civilian transuranic waste for disposal.

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16-11 cont'd included in the waste volume assumptions (p. 1-11). An estimate of the quantity of TRU to be handled under different scenarios and an analysis of the implications of including this in a commingled repository should be provided.

B. Defense Transuranic Wastes

16-12 The Defense Waste Management Plan indicates that defense transuranic wastes will be either stabilized on-site or processed and sent to the Waste Isolation Pilot Project (WIPP) (pp. 26-27). The Commingling Study should make clear this assumption. Moreover, the Plan indicates such wastes will be accepted at WIPP on a retrievable basis and the decision of whether to convert WIPP to a permanent repository will occur after five years of operation (DWMP, p. 31; p. 32). The Commingling Study should discuss the implications for commingling if a decision against permanent disposal of transuranic defense wastes in the WIPP is made.

4. IMPACT OF TOTAL NUCLEAR WASTE PROJECTION ON AUGMENTED REPOSITORY DESIGN

There are several potential difficulties created with the "augmented repository" concept (p. 1-11) and the final version of the study document should contain a detailed treatment of them, proposals for resolution, and evaluation of the unmitigable impacts.

An augmented repository will contain an additional 10,000 MTHM, and up to 75% more waste packages compared to a commercial-only repository. This is because defense high-level waste is much bulkier per unit of equivalent heavy metal content, by an average factor of about five to one (Table 1-2). Following is a page by page listing of the statements that need correction or amplification as a result of this condition.

16-12 The text has been revised (paragraph 3.2, page 3-3) to clarify this. The report is based on current DOE policy which is to dispose of defense transuranic waste in the Waste Isolation Plot Plant.

E-3 "If defense high-level waste is emplaced in a commercial repository, defense high-level waste is expected to require approximately 10 percent of the underground area".

This would be true if the amount of mining required is proportional to the number of MTHM of waste disposed. As is explained subsequently (p. 2-32), this is a valid assumption for a repository containing only one type of waste. Since there is a very significant difference in the volume of the defense and commercial waste per MTHM, this assumption and the above quotation based on it are not valid and should be revised. If the volume of the waste determines repository space required for defense waste, then an increase in repository volume of up to 70% would be required for the commingling option. If, however, heat content of defense waste determines required repository space, the lower heat content of such waste could result in a smaller increase in repository volume.

16-13

Thermal considerations would permit closer packing, if it is contemplated that defense high-level waste containers will be subject to the same rock temperature regime as commercial waste (p. 2-48) at the crest of the thermal pulse, but in our view structural requirements for safety in mined openings could limit the amount of concentration allowable. At the Hanford site there may in fact be limited allowable concentration because of the very high, highly anisotropic forces known to be present at repository depth.

E-4 "The D&E costs for the commercial repository will not change if defense waste is disposed of in the repository".

16-14

This statement is incorrect. Even if the USDOE allocated costs for defense wastes cover all of the development and evaluation costs of the defense wastes, there will be a very substantial increase in development and evaluation costs of the civilian

16-13 On the basis of other studies, it was assumed that defense waste packages would be placed as close together as would be allowed by structural limitations in the repository. As can be seen in Figure 2-1, pages 2-6 of the final report, the area occupied by defense waste in the reference commercial repository is approximately 10%. The actual area occupied by defense waste in a commercial repository will depend on the ultimate capacity of the repository and the use made of the second repository by defense waste.

16-14 The document has been revised to reflect the fact that development and evaluation costs will change for the reasons you cite.

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portion, stemming from the volumetric increase as well as materials handling underground, ventilation and other house-keeping requirements.

The volumetric increase creates a real design problem in fractured and/or jointed hard rock, since the block defining the disturbed area must be larger, making it that much more difficult to find and confirm that there are no disqualifying structures or other avenues of radionuclide escape.

16-14
cont'd

Calculation of costs for a commingled repository reflect simple extrapolation of costs for a commercial repository to account for increased excavation volumes for defense wastes. Underground engineering requires consideration of the uncertainty of the availability of qualified basalt or tuff flows for a repository; in salt, the uncertainty issue is not as great. At Hanford, for example, just one exploratory hole over a year ago caused BWIP to change the target horizon in the basalt sequence because the thickness of the Umtanum flow was less at that spot than anticipated. At the tuff site, consideration is being given to having a multi-level repository because of the space limits of the site which are controlled by faults and flow thicknesses.

16-15

Adding defense waste to commercial waste could reduce the margin for error at a selected site and make a site that is good enough for a 70,000 MTHM repository unsatisfactory for an 80,000 MTHM repository. Thus, adding defense waste to commercial waste could delay and add technical difficulties to an already complex problem.

5. COST COMPARISONS OF OPTIONS

16-16

In view of the importance of cost considerations in the decision to recommend commingling of defense and commercial wastes, the Commingling Study should discuss in greater detail the basis for the projected costs (pp. 2-7 to 2-15; Table 2-2). No references

16-15 The inability of a site to contain 70,000 or 80,000 MTHM would not necessarily exclude the site from consideration as a potential repository site. The NWPA currently provides for two repositories, although Congress has to authorize construction of the second, and there is nothing in the law which would prohibit one repository from containing say 50,000 MTHM and a second repository from containing 100,000 MTHM. And, as you indicate, it may be possible to have multi-level repositories.

16-16 The references for the cost data are:

Lazur, E.C. "Cost Estimates for Disposal of Defense High-Level Waste (DHLW) in a Defense-only Repository."

Varadarajan, R. V. and Dippold, D. G. "Cost Estimates for Disposal of DHLW in a Commercial Repository: An Update."

The references are included in the reference section of the report and are cited in the appropriate text section of the final report. BWIP cost projections are not the basis of the cost estimates.

The issue you raise regarding increasing the capacity of a specific repository site is site-specific and could not be addressed by this study. The question that the study is directed to is not whether defense waste should be placed in a particular commercial repository but rather whether a defense-only repository is required.

COMMENTS ON USDOE DEFENSE WASTE COMMINGLING STUDY
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16-16
cont'd are given, nor is the confidence to be assigned to such estimates indicated. If these projections are based on preliminary projections for the BWIP site, the Study should reflect analysis currently being conducted for the draft Environmental Assessment on the effect of increasing the conceptual design capacity of the BWIP site from 47,400 MTHM to 72,000 MTHM. The commingling decision should reflect data from this study on the cost, impacts, and feasibility of a larger repository. The decision should also reflect data on the cost, impacts, and feasibility of increasing repository capacity from 70,000 MTHM to 80,000 MTHM, as discussed above.

16-17 Calculation of the costs attributable to commingling should reflect the disproportionate development and evaluation costs resulting from the increased capacity required by such a repository, as noted above. Moreover, it should include both the cost of buying development and evaluation data developed under the commercial program and the cost of performing a detailed process of site selection and characterization as required under 10 CFR 60.116 and 10 CFR 51.40 if the two remaining sites from the commercial program are not suitable. Failure to do so would impact adversely on utility and consumer power costs.

6. USE OF FIRST REPOSITORY

A. Limiting Sites Under Consideration

16-18 The Commingling Study does not provide a rationale for limiting the analysis of impacts from a commingled repository to those sites under consideration for the first repository (pp.2-50 ff and 3-14). The Nuclear Waste Policy Act does not require this. Neither the study nor the Defense Waste Management Plan provides any indication of a need for placement of defense wastes in a geologic repository immediately upon completion of such a

16-17 The discussion of development and evaluation costs of the repositories has been revised in the final report and addresses your concern.

16-18 The analysis you refer to is the analysis of impacts from transportation of defense waste. The analysis provides a sufficient indication of the range and magnitude of costs and risks that could be expected from transportation of defense waste to a repository. An analysis of the costs and risks of transportation of defense waste to other potential repository sites would not be expected to provide any additional information that would justify the effort.

It was not intended that the reader should conclude that all defense waste would only go into the first repository. The assumption was made to simplify analysis and illustrate the effect of disposing of defense waste in a commercial repository. Once a second repository location is selected, an evaluation could be made of the desirability of using that repository for some or all of the defense high-level waste generated after that repository becomes operational.

There was no reason to believe that the geologic media in which a repository was located would be a factor in evaluating whether a defense-only repository is required. The objective in performing the analysis in two geologic media was to provide an indication of the range and magnitude of the costs and risks of the disposal options for defense high-level waste. A similar analysis for other geologic media would not be expected to provide any additional information that would justify the effort.

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16-18 repository. Similarly, no rationale is given for assuming that
cont'd all defense waste must go to one repository. Consideration of a
crystalline rock site for at least part of the defense waste
(e.g., that from the Savannah River Plant) could offer significant
advantages in terms of transportation cost and risk.
Evaluation of all geologic media under examination in the high-
level waste program would remove any appearance of bias toward
sites in the Commingling Study.

B. Implications of 70,000 MTHM Limit

16-19 The implications for a commingled repository of limiting waste
receipts to 70,000 MTHM until a second repository opens is
unclear (pp. E-2, and 1-11). Would the repository accept only
commercial high-level waste up to 70,000 MTHM and then receive
defense waste after the second repository opens? Would defense
wastes have priority at the repository, limiting commercial
waste receipts to 60,000 MTHM until the second repository starts
operations? The shipment schedule shown in Table 1-1 does not
indicate how this issue is to be addressed.

16-20 To date, the commercial waste repository schedules have not
dealt with the commingled repository (see State of Washington
response to the draft Mission Plan, August 6, 1984). However,
receipt of defense wastes at a commercial repository could
potentially impact on other aspects of the commercial program
such as the need for, and timing of, a Monitored Retrievable
Storage facility, or the need to accelerate schedules for the
second repository. The Commingling Study implies (Table A-1)
that defense waste will be shipped to the repository as it is
processed and packaged, without considering the potential impacts
on the commercial waste program. This carries potential
cost implications for a commingled repository that are not
addressed in the evaluation of the commingling and defense-only
options.

16-19 Under the Nuclear Waste Policy Act of 1982, the combined quantity of commercial waste and defense high-level waste in the first repository cannot exceed 70,000 MTHM equivalent until after a second repository is placed in operation and the requisite NRC authorization to expand the capacity of the repository is obtained.

Table 1-1 has been removed from the final report. The table represented expected availability of defense waste for disposal in a repository; it was based on information presented in the Defense Waste Management Plan concerning the rate at which immobilized defense waste will be produced. The actual schedule for receipt of waste at the repository has not been determined yet. Waste acceptance schedules will be published in the final mission plan. If defense wastes are to be disposed of in the commercial repositories, those wastes will be received on a separate schedule, mutually agreed to by the Assistant Secretary for Defense Programs and the Office of Civilian Radioactive Waste Management, such that the rate of receipt of commercial wastes, once established, will not be adversely impacted.

16-20 Consistent with the Nuclear Waste Policy Act, two repositories are currently being planned. The second repository is planned to be in operation well before the first repository contains 70,000 MTHM waste equivalent.

The purpose of Monitored Retrievable Storage is to provide a back-up facility or insurance that will permit the government to accept and store spent fuel or waste if the repository is significantly delayed or other alternatives are not available.

There are many potential causes of delay in making the repository available. To single out the co-disposal of defense waste as a cause for delay and to try to estimate its impact would be difficult at best. As stated above, DOE policy is to not permit acceptance of defense waste to adversely impact the established rate of acceptance of commercial waste.

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7. REPOSITORY START-UP DATE IN 1998

16-21 The states have consistently argued that USDOE is being unrealistic in maintaining that there will be an operational repository in 1998. Even the Mission Plan speaks now of at best a token operation by that date, and it is certain that utilities hard pressed for waste storage space would claim priority over defense high-level waste for the first few years of token operation. Therefore, it is a virtual certainty that \$35 million or more will be spent on storage of waste at Savannah River Plant (p. 2-10). This cost should be factored into this Commingling Study and its recommendations. The impacts on Hanford and INEL should also be presented and a realistic scenario developed for the first movement of defense high-level waste to a commingled repository, as under these conditions there could be a stronger case for a defense-only facility developed on a more streamlined procedural path.

8. DEFENSE WASTE TRANSPORTATION

A. Transportation Risks

16-22 The Commingling Study concludes that "The total risks associated with shipping defense high-level waste to a defense-only or commercial repository are estimated to be significantly smaller than predicted for the United States from other transportation activities" (p. E-8). This is an unfortunate and misleading statement. It really only says (p. 2-55) that nonradiological risks, e.g., accidents, are proportional to the waste traffic as a fraction of all traffic. Regarding radiological accidents, the conclusion (p. 2-57) is that "Because transportation casks are designed to survive extremely severe accidents without serious consequences, the probability that release of material will occur due to an accident is very small, as shown in Table 2-15".

16-21 The anticipated start-up date of the repository remains 1998 for the present barring unforeseen schedule changes. Although a delay in the start-up date for the repository might result in increased costs for interim storage of defense wastes, such costs are deemed to be small in comparison with the savings that can be achieved with a commingled repository. Further, there is no reason to believe that it would be easier or faster to develop a defense-only repository than a commercial repository. A defense-only repository will be subject to the same NRC regulations and public scrutiny as a commercial repository.

16-22 Minimization of total road mileage is only one of many factors that must be considered in selecting a site for a repository. A defense-only repository site, a commercial repository site, or a combined repository site could be selected to minimize total road mileage. There is no assurance that the low mileage site would be suitable for a repository for other reasons. The cost savings that might accrue by selecting the low cost site with respect to transportation is small compared to the cost savings by disposing of defense waste in the commercial repository. Similarly, the differential risk is small. Therefore the transportation considerations are not a basis for the selection of one of the two disposal options.

Table 2-15 does not allow for one breach of containment accident except as a vanishingly small probability.

The summary conclusion (p. E-9) is that costs and risks are independent of commingling and that "therefore the transportation considerations are not a basis for the selection of one of the two disposal options". This conclusion is incorrect. Waste transportation is a significant factor in selecting the disposal option.

16-22
cont'd

A defense-only repository could be sited to minimize total road or rail mileage, while other considerations determine the site of a larger, commingled facility. Both cost and risks are partly determined by mileage in a comparison between two sites. Risks of a radiological release accident are related to not only container design but total exposure--miles, hours, and the actions of other users of the right-of-way. Even container design is predicated on standards such as the 30-foot drop test which may not be realistic, particularly for the western states and their climatic conditions.

16-23

All of these factors must be considered, with at least the amount of site-specificity that is being employed at Battelle in its studies of civilian waste transport to potential sites. However, the Battelle data are not directly transferable because of the increased total exposure per unit HM shipped, different containers and different chemistry of the contaminants in commercial high-level waste. Because some 20,000 containers of defense waste are involved, transportation impacts are a non-trivial consideration in the commingling decision.

B. Transportation Costs

The conclusion that transport costs to Hanford are high relative to other sites despite the fact that a high percentage of

16-23 The present study is a generic evaluation of disposal options and not a site-specific analysis. Site-specific factors will be detailed in future analytical reports, including site selection studies.

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16-24 defense wastes are already at Hanford, requires elaboration (p. 2-54). That conclusion assumes only a small portion of Hanford wastes are to go to geologic disposal, an assumption that requires documentation.

C. State Role in Regulation of Defense Waste Transportation

16-25 The draft study refers to the regulatory authority for transportation of the commercial radioactive wastes of the DOE and the NRC (p. 2-48), but states that DOE has authority for design and certification of packaging of defense wastes. It fails, however, to discuss authority for route selection or responsibility for accident response. Moreover, it fails to acknowledge any role of state and local government in regulating transportation.

9. HYDROGEOLOGIC ASSUMPTIONS

A. Groundwater

16-26 We are pleased to see in the record the statement that "The groundwater flux in repository host formations is expected to be quite low; however, it is not appropriate to use a velocity typical of the host rock to represent the entire flow path to the accessible environment because associated geologic units may support much larger flows" (p. 2-22). At Hanford there have been severe disagreements between the state, USGS and NRC, on the one hand, and USDOE/Rockwell, on the other, over this point. Clearly, at Hanford the volumetric increase necessary for a commingled repository could increase the chances of encountering such a "geologic unit", specifically faults or shears. Thus, in at least this case, there is a real, if perhaps small, impact of DHLW commingling on the groundwater question which is of great concern to the state.

16-24 The amount of defense waste assumed to be available for disposal in a geological repository is based on current DOE policy and planning as expressed in the Defense Waste Management Plan. Present plans call for new and readily retrievable high-level waste at Hanford to be immobilized and disposed of in a geologic repository. Other waste will be stabilized in place if, after the requisite environmental documentation, it is determined that the short-term risks and costs of retrieval and transportation outweigh the environmental benefits of disposal in a geologic mined repository. Should it be determined that the benefits of geologic disposal prevail, there will be a substantial increase in the amount of high-level waste originally from Hanford to be processed and disposed of in a geologic repository. However, this should not affect the finding of the study that there is no compelling requirement for a defense-only repository.

16-25 The introductory paragraphs to the transportation analysis section of the report have been revised. All transportation issues for hazardous materials shipments, including those for both commercial and defense radioactive waste, are within the scope of the Department of Transportation regulatory authority. State and local transportation concerns would not affect this generic comparison of disposal options for defense waste since they would be the same regardless of whether the waste goes to a defense-only repository or to a commercial repository.

16-26 The capacity of a repository will be based on geological limitations and not on the volume of waste that requires disposal.

B. Geochemical and Groundwater Transport Assumptions

16-27 While the assumptions used to evaluate the long-term effects of a commingled repository appear to be relatively conservative, these are sufficient only for comparing disposal options. They should not be used to make site-specific evaluations.

10. WASTE IMMOBILIZATION TECHNOLOGY

16-28 The Commingling Study inadequately defines the technology of waste immobilization. Table 1-2 does indicate the waste form for both defense and civilian wastes is borosilicate glass. While no program to confirm the suitability of this approach to immobilization is noted, the draft indicates NRC will review all DOE plans to immobilize defense wastes (p. 2-63). This is of particular interest in view of the cautions expressed by NRC in the review of the draft Mission Plan regarding the performance of borosilicate glass. The final Evaluation should discuss the consequences for high-level defense waste management of potential problems with the planned immobilization technology.

16-27 Your statement is true and agrees with what is stated in the report.

16-28 A discussion of the technology of waste immobilization is not germane to the purpose of this comparative analysis. The NRC regulations are designed to provide multibarrier protection to control releases of radionuclides to the accessible environment. A combination of natural and engineered barriers will be implemented to complement the performance characteristics of each barrier and to provide the measure of protection required.

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OTHER RELATED COMMENTS ON THE DRAFT COMMINGLING STUDY

16-29 1. The final study should include appendices containing the basic data, calculations, and models used to develop the findings so that the reader can check the validity of the conclusions. For example, it would be helpful to better describe the models used to calculate radiologic releases from the repository or evaluate transportation impacts. It would also be helpful if reference citations included the page(s), since many of the references are rather voluminous.

16-30 2. Although the study compares the combined cost impacts for a commingled repository with those for defense-only plus commercial-only repositories, other impact analyses address only the contribution from defense wastes. This assumes that the impacts of defense and commercial waste are strictly additive. However, some impacts (e.g., land required, transportation risk) may be a more complicated function of total waste quantity.

16-31 3. The study should also compare the options in terms of land use and socioeconomic impacts. Land-use impacts could potentially be higher for the defense-only option because of the amount of land disrupted for both defense and commercial repositories. On the other hand, the commingled repository could have greater socioeconomic impacts on a small community with limited ability to absorb the increased work force.

16-32 4. (Table E-1) The conclusion that a commingled repository may be more publicly acceptable than 2 separate repositories is not supported by the discussions in Sections 2.3.5 and 3.3.5. A reluctance to shoulder the burdens for both the

16-29 Citations to the primary references were added to the text of the final report. These primary references contain the information you require. They are available.

16-30 The focus of the evaluation report is the differences between disposal of defense high-level waste in a defense-only geologic repository or in a commercial geologic repository. The report is not an exhaustive examination of impacts. The analyses focus on the differences in the defense waste disposal options with respect to the factors specified in the Nuclear Waste Policy Act.

16-31 As your comment indicates, socioeconomic impacts tend to be site-specific and would have to be dealt with during the process of repository site selection. This comparative analysis addresses those factors considered to be most significant in differentiating between the defense-only and commingled repository options. The amount of land disrupted for a repository would be a function of its ultimate capacity for waste regardless if it is defense or commercial waste.

16-32 The comparative analysis does not intend to suggest a combined repository at a given location would be more acceptable than a defense-only or commercial-only repository at a given location. There are a number of factors which could influence public acceptability in either direction.

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commercial and defense programs may cause the opposite effect in many locations.

16-33 5. (p.1-11) What is the basis of the assumption that 50% of the commercial waste will be high-level waste and spent fuel? The West Valley high-level waste is a very small quantity and there are no other current plans for reprocessing that would produce other high-level waste.

16-34 6. (Sections 2.3.3 and 3.3.3) This study should address the issue of whether NRC will also license defense waste processing facilities, an issue with DOE since 1979.

16-35 7. (pp. 2-2, 2-30, and Table 2-7) What is the justification for assuming a lower release rate (factor of 10) for defense wastes than for commercial wastes? The reference that is cited on p. 2-26 does not appear in the list of references so we are unable to review this assumption. Why are the release rates shown in Table 3-3 (p. 3-10) for a defense-only repository lower than those from defense wastes in a commingled repository (Table 2-8)?

16-36 8. (pp. 2-52, 2-53, 2-58) How many rail casks are assumed on each train? The calculations of the number of casks needed for truck transport appear to assume 24 hours/day of travel. However, many states limit overweight shipments to 8 hours/day or daylight hours. Thus, a larger number of casks and higher transportation costs for truck shipments than shown will be required. What is the rationale for the conclusion that rail accident health effects for Hanford are lower than those for trucks?

16-37 9. (p. 2-61) A key issue that is not addressed is the potential impact on the options if the public perceives a close association between the repository proposals and nuclear weapons production. For example, if the public

16-33 By law, a repository must be capable of accepting both commercial high-level waste and spent fuel. The even split between the two waste types was a reasonable assumption given the information available at the time this study was initiated. Although current economic conditions do not favor reprocessing, it is assumed that future conditions could make it part of the waste management options.

16-34 The present report only addresses disposal at a repository. As pointed out on page 2-67 of the revised report, Section 202(4) of the Energy Reorganization Act of 1974 does not authorize any NRC involvement in nuclear defense activities.

16-35 The reference cited was in error. The correct reference is: Kocher, D. C., J. P. Wetherspoon, and Ellen P. Smith, 1983. "Evaluation of Health and Safety Impacts of Defense High Level Waste in Geologic Repositories," ORNL/NFW 83/43 Draft Working Paper, Oak Ridge National Laboratory, Oak Ridge, Tenn. Release rates for defense waste in a defense waste only repository are lower than in a commercial repository because of the lower temperature environment in the defense-only repository.

16-36 No assumption about the number of rail casks on each train was required. For details on the calculations, please refer to the report by Joy, D.S., L.B. Shappert, and J.W. Boyle, 1983. "The Impact of Transporting Defense High-Level Waste to a Geologic Repository." Draft Working Paper No. NFW-83/40, Oak Ridge National Laboratory, Oak Ridge, TN. This reference is cited in the final report. The calculation of rail accidents is based on the shipment of waste from Savannah River Plant, and Idaho National Engineering Laboratory to a repository site at Hanford. The calculations showed that rail accident health effects for shipment of wastes from these two locations to Hanford are lower than those for truck shipments from these same locations to Hanford.

16-37 The impact on the schedule and cost of siting the first repository, if there is public opposition to the combined disposal of defense high-level waste and commercial waste, is recognized in the report. The extent of such opposition and the degree to which it affects the schedule and cost is a subjective judgment which must be made by the President in determining whether a defense-only repository is required. As stated in the report, provision is being made to store defense waste on-site, if the repository opening is delayed, to prevent interruption or shutdown of production operations.

COMMENTS ON USDOE DEFENSE WASTE COMMINGLING STUDY

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16-37
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develops an attitude that weapons production can be halted if a repository for defense wastes is prevented, inclusion of those wastes in a commercial repository proposal could lead to major delays or even total inability to site a commingled repository.

16-37
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STATE OF
WISCONSIN

RADIOACTIVE WASTE REVIEW BOARD

September 28, 1984

921 Tenney Building
110 E. Main Street
Madison, WI 53702
(608) 266-0597
(608) 267-7615

Mr. David B. LeClaire, Director
Office of Defense Waste and Byproducts
Management
U. S. Department of Energy, DP-12
Washington, DC 20545

Dear Mr. LeClaire:

Enclosed are the comments of the Wisconsin Radioactive Waste Review Board's Technical Advisory Council on An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste, DOE/DP-0020 (Draft).

17-1 After careful review, it is our conclusion that the report does not provide a confident basis for concluding that a combined civilian and defense repository is the best disposal option for defense high-level radioactive waste.

Thank you for the opportunity to submit comments on this report.

Sincerely,

A handwritten signature in black ink that appears to read "DuWayne Gebken (RJG)".

DuWayne Gebken, Chairperson
Technical Advisory Council

DG:RH:krb/0462u

cc: Governor Anthony S. Earl
Wisconsin Congressional Delegation
Roger Gale, DOE/OCRWM

WISCONSIN RADIOACTIVE WASTE REVIEW BOARD

RESPONSE TO COMMENTS

17-1 As provided in Section 8 of the Nuclear Waste Policy Act (E-1), the President is required to evaluate whether examination of any of the factors leads to the conclusion that defense wastes are required to be disposed of separately. This report, as input to that evaluation, seeks to identify any compelling reason for such a conclusion. None was found, and none has been identified through the very extensive external review process. The NWPA does not charge the President with determining which option might be "best;" the Act specifies that defense wastes will be disposed of in commercial repositories, unless a disqualifying reason is identified.

Wisconsin Radioactive Waste Review Board
Technical Advisory Council

September 28, 1984

Review Comments
on

An Evaluation of Commercial Repository Capacity for the Disposal
of Defense High-Level Waste, DOE/DP-0020 (DRAFT), July, 1984

GENERAL COMMENTS

This document, also referred to as the Section 8 Report, recommends that defense HLW be disposed of in a combined civilian and defense repository. The report considered six criteria in comparing the defense-only and co-disposal options: cost efficiency, health and safety, regulation, transportation costs and risks, public acceptability, and national security. The analyses of the specific criteria are frequently superficial, and often questionable or contradictory. The report does not provide a confident basis for concluding that co-disposal is the best disposal option for defense HLW. Each of the six criteria considered in the report are discussed in the following paragraphs.

Comment 1, Cost Efficiency. The discussion of economic benefits, which concludes that co-disposal would save between \$1.6 and \$3.3 billion dollars (1984 dollars) is seriously flawed. First, there is no clear identification of the additional costs which may be incurred as a result of handling defense waste in addition to commercial waste. The defense waste canisters will be different in size and in weight. The report should delineate the way in which the physical differences in waste canisters will affect repository operations. If DOE believes that the difference in waste canisters will not lead to additional costs, then documentation for that conclusion must be provided. Second, the scope of the comparative economic analysis is too narrow. In addition to considering the defense-only and co-disposal options, the report should have also considered: (a) converting the Waste Isolation Pilot Plant (WIPP) in New Mexico for use as a permanent repository for defense high level waste; (b) long-term surface or near-surface monitored retrievable storage at one or more of the existing federal defense waste facilities; and (c) the impact of regional distribution (particularly one repository in the east and one repository in the west) on defense disposal costs.

Comment 2, Health and Safety. The report concludes that there will be no significant difference in the health and safety effects of the co-disposal or defense only options. Indeed, the report argues that inclusion of the defense wastes, with their lower thermal output and radioactivity, will actually lower the anticipated release rate per metric ton of heavy metal (MTHM) emplaced. However, while inclusion of defense waste may lower the average release rate per unit, the fact remains that more waste would be emplaced in the repository with a co-disposal than with a defense-only option, and this will increase the absolute quantity of waste in place, and thus increase the potential risk to an exposed individual or individuals.

17-2 The total cost of a commercial repository containing defense waste was higher than the cost of the commercial repository without defense waste. The higher cost was due in part to the factors you mentioned.

The alternative options for disposal of defense high-level waste that you suggested were not options that we were requested to examine. The Nuclear Waste Policy Act deals with geologic repository disposal of high-level waste and spent fuel. Long-term surface or near surface monitored retrievable storage is not a disposal option, but an interim storage measure. Disposal of defense high-level waste in the Waste Isolation Pilot Plant would require an Act of Congress as it is not permitted by the law authorizing the Waste Isolation Pilot Plant.

Once the second commercial repository site is selected, an evaluation will be made of the use of such repository for some or all of the defense waste available for disposal after that repository begins operation.

17-3 The observation that inclusion of defense wastes in a repository results in lower calculated unit releases is valid. However, since proposed revisions to the draft EPA regulations on releases of radioactivity to the environment from disposal of high-level waste effectively negates possible benefits from dilution in complying with the regulation, the argument you refer to has been deleted from the report.

17-4

Comment 3, Regulation. The report concludes that there would be little difference in the licensing process for the defense-only and co-disposal options. Concerning co-disposal, there is insufficient analysis of potential regulatory problems which may occur as a result of the NRC's and the EPA's perception of the potential technical questions arising from co-disposal. The technical feasibility of co-disposal is never adequately addressed in the report, and there is no basis for concluding that such issues would not slow regulatory approval. Moreover, the siting process proposed here, use of a "leftover" site after the civilian repository is selected from among three or more characterized sites, is not clearly defined in the National Waste Policy Act (NWPA), as is the process for picking a civilian waste repository. This lack of statutory direction for defense waste repository siting would almost certainly lengthen the regulatory process. Moreover, the defense-only repository might be easier to license from a national security standpoint. Given the past experience with the WIPP, it seems fair to assume that the Armed Services Committees in Congress would be more comfortable seeing the defense wastes go to a defense only repository, if only because of the potential for intervenor participation in the licensing process.

17-5

Comment 4, Transportation Risk and Cost. The report concludes that there are no significant differences between transportation risks and costs for the defense-only and co-disposal options. First, all of the risk assumptions are based upon the questionable assumption that because "trasportation casks are designed to survive extremely severe accidents without serious consequences, the probability that release of material will occur due to an accident is very small." (Page 2-57). Moreover, the analysis identifies only two shipment modes, truck and rail mixed-freight. A comparable risk and cost analysis for shipment by dedicated trains should be performed and included in the final version of the report. In particular, the risk calculation should be redone assuming that all large-quantity, cross country shipments (for example, shipment of defense HLW from Savannah River to a western site, or shipments of defense HLW from Hanford and Idaho National Engineering Laboratory to a southeastern site) was made by dedicated trains.

17-6

The cost comparisons between modes are questionable because of the different assumptions used in evaluating truck and rail transportation. In particular, the analysis prepared for this report assumes optimal or least cost routing for truck shipments, but does not assume optimal or least cost routing for rail shipments.

17-7

The report also fails to accurately address the local transportation impacts of co-disposal. The addition of defense HLW to a civilian repository will clearly increase the number of deliveries to the site. Depending upon the transportation modes chosen, co-disposal will result in an additional 125 to 620 annual deliveries, up to and including the year 2007. After 2007, the number of additional deliveries per year would increase to between 200 (all shipments by rail) and 1,000 (if all shipments were by truck) per year. While impacts on the national and regional transportation systems of such additional deliveries may or may not be significant, there is no question that the addition of two or three deliveries per day to the repository site (assuming all shipments by truck) will have a significant local impact.

17-9

Additionally, the report does not address the issue of shipping regulations. Presently, DOE's shipments of defense HLW are not subject to the same regulations as are shipments of civilian HLW and spent fuel. The current

17-4 The report does not conclude that there "would be little difference in the licensing process" for the two options. It sets forth the procedures for both, as well as is currently known, and points out several of the uncertainties mentioned in your comment. The report concludes that these uncertainties obscure the comparison of regulatory obstacles to the degree that a selection of the disposal option could not be based on regulation differences. Certainly, no regulatory evidence has been identified that would require a defense-only repository.

The technical feasibility of co-disposal is not dwelt upon in this report because it has not been seriously called into question, and is not one of the decision factors specified by Congress in Section 8 of the Nuclear Waste Policy Act. The reference designs employed in the supporting study on costs were prepared for costing purposes. However, preparation of these designs did not uncover any technical feasibility problems.

The assumption in the draft report that the use of a "leftover" site for the defense-only repository would be possible has been reconsidered. The final report has been revised to reflect the fact that three sites would have to be characterized before one is selected for a defense-only repository. This would make the development and evaluation costs for the defense-only repository comparable to those of the commercial repository. As a result, the cost advantage of disposing of defense waste in a commercial repository is substantially enhanced.

17-5 The assumption that transportation casks will survive severe accidents is sound. This survivability is ensured through a Federal certification process which requires a variety of stringent impact, puncture, and fire and water immersion tests to confirm engineering adequacy.

17-6 In the context of this comparative study, there is no justification for a proliferation of transportation scenarios and analyses to produce a wider range of cost estimates. No factor has been identified that would require a dedicated defense waste repository, even with substantial shifts in estimates of transportation costs. Use of dedicated trains for defense waste is not currently under consideration. However, even if they were used, the costs would be the same for either disposal option.

17-7 The assumptions in this report are reasonable and consistent with current practice. Least-distance routing, consistent with DOT guidelines, is a reasonable approximation of least-cost routing for trucks. Train transportation costs are not clearly predictable on the basis of distance alone, so typical average freight rates actually experienced today were used in the analysis.

17-8 An increased rate of shipments may be experienced in the locale of a joint defense/commercial repository during some or all of the period the repository is receiving waste. It is not, however, correct to state that the "addition of two or three deliveries per day . . . will have a significant local impact," since the risk associated with each shipment is so small. Local (that is, site-specific) transportation impacts, including accident risks, will be detailed in future siting studies. Should a significant local impact be identified in these studies, appropriate mitigating measures will be considered in the siting study.

17-9 Transportation issues for hazardous materials shipments, including those for both commercial and defense radioactive waste, are within the scope of the Department of Transportation's regulatory authority. It is true that DOE has the authority to certify its own packaging for the shipment of DOE radioactive materials. The DOE has voluntarily accepted the NRC packaging standards as the basis for their certification program to assure equivalent protection of the public health and safety. Section 2.3.4 of the report has been revised to include additional information on transportation regulations.

17-9
cont'd

regulations allow DOE to establish its own performance standards for defense waste shipping casks, and allow DOE to make its own certification that the standards have been met. Moreover, the existing DOT and NRC regulations which govern civilian shipments (and which require, among other things, advance routing approval and prenotification of state officials) apparently do not apply to shipments of defense waste. The report should specify whether or not defense shipments to a civilian repository would be subject to the same regulations as civilian shipments.

17-10

Comment 5, Public Acceptability. The report cavalierly concludes that, from the public perspective, acceptability of the defense-only or co-disposal options is equally uncertain. Absolutely no evidence is provided to support the notion that the public is likely to accept co-disposal. In Wisconsin at least, the limited evidence available (results of the statewide referendum on a nuclear weapons freeze and repository siting in Wisconsin, the 1980 public opinion survey of potential repository host communities, and a 1984 survey of state fair attendees) suggest that in Wisconsin, at least, the public is likely to oppose co-disposal. Given the already unfriendly public attitude toward DOE's civilian waste disposal program, the decision to co-mingle defense and civilian waste could significantly delay the site selection process for the second repository. This could, in turn, severely affect the waste acceptance schedule for the first repository, given the 70,000 metric ton limit on first repository emplacements until after a construction authorization is granted for the second repository.

At the very least, DOE should do some public opinion polling to test the effect of co-disposal on public acceptability.

17-11

Comment 6, National Security. The report concludes that national security considerations do not favor either the defense only or co-disposal options, and that NRC licensing activities will not interfere with defense nuclear material production regardless of which option is followed. The underlying assumption is that national security considerations, particularly those regarding disclosure of classified information, are compatible with the degree of public information disclosure that will be required for NRC licensing, and furthermore, that there will be sufficient interim storage at federal weapons production facilities to prevent any disruption of defense weapons production in the event of a delay or disruption in repository operations. We agree with DOE that at the present time there are no national security considerations which would justify withholding technical information on the quantity and characteristics of military waste. We are concerned, however, about the possibility that over the next two decades, changes in defense production schedules and processes may occur, and these changes may result in new concerns about the national security implications of potential disclosure of classified information.

17-12

Comment 7, Feasibility of Co-disposal. The report never clearly addresses the technical issues related to co-disposal of defense and civilian waste. The report does not actually demonstrate that co-disposal is technically feasible. Throughout the report, the compatibility of the two different waste forms is merely assumed, which overlooks at least three potential problem areas. First, as the report points out in Table 1-2, the waste package characteristics for defense high level waste, civilian high level waste, and consolidated civilian spent fuel are quite different. The physical

17-10 Public concern has been addressed in greater detail in Section A.5.d of Chapter 3 and in Chapter 11 of the draft "Mission Plan for the Civilian Radioactive Waste Management Program." The impact on the schedule and cost of siting the first repository, if there is public opposition to combined disposal of defense high-level waste and commercial waste, is recognized in the report. The extent of such future opposition and the degree to which it could affect the schedule and cost is a subjective judgment which must be made in determining whether a defense-only repository is required. The body of comments received in response to this draft, is considered a useful guide to likely opposition and support.

17-11 No changes in defense production schedules or processes that could affect the unclassified status of defense high-level wastes (at the facility gate) are foreseen; in fact, it is not clear what changes could have such an effect. This report, of necessity, deals with current best understanding.

17-12 The technical feasibility of co-disposal is not dwelt upon in this report because it has not been seriously called into question, and is not one of the decision factors specified by Congress in Section 8 of the Nuclear Waste Policy Act. The reference designs employed by Varadarajan and Dippold (1984) in the supporting study on costs were prepared for costing purposes. However, preparation of these designs did not uncover any technical feasibility problems.

17-13 differences in size and weight will certainly increase the complexity of waste handling operations at the repository, particularly if the daily schedule of operations is such that both waste types are received, packaged and emplaced on a day-to-day basis. This could significantly increase the likelihood of an accident, such as a dropped cask. Second, the different thermal output of the defense and civilian waste forms must be considered. DOE must assume the burden of proving not only that emplacement of defense HLW canisters in a repository dominated by much hotter civilian HLW and canistered spent fuel is technically acceptable, but will be perceived as such by the NRC and EPA during licensing proceedings. Finally, there is considerable uncertainty about the performance of the defense borosilicate glass waste forms, especially if DOE is considering emplacement without an overpack. NRC has already expressed concern about the way in which DOE addressed these issues in the Mission Plan for the civilian waste program. According to the NRC, "The statements concerning the very low potential for leaching and the structured resistance of (borosilicate) glass imply that an overpack is unnecessary for the borosilicate waste form. NRC believes these statements should be qualified by recognition that (1) leaching of radionuclides, not glass, is the issue, (2) such leaching appears unacceptably high without an overpack, and (3) under compressive load, the glass will fracture." [Palladino to Rusche, July 31, 1984, Enclosure #1, p. 38]

17-14 In addition to the technical issues already addressed, there are a number of questions about the logistical feasibility of co-disposal. The State of Wisconsin addressed this issue in great detail in comments on the DOE's Mission Plan. In particular, the Mission Plan does not adequately address the impact of co-disposal on the waste acceptance schedule presented in Volume 1. Moreover, there is no discussion of whether or not defense waste would be excluded from the statutory 70,000 metric ton limit for first repository emplacement.

17-15 Comment 8, Number of Repositories. The report does not discuss the potential impact of co-disposal on the need for more than one repository for civilian high level waste. The report states that defense waste is expected to account for about 10 percent of the total waste emplaced in an augmented repository. Without further information, it is impossible to determine whether the amount of defense waste emplaced would require construction of a second repository for civilian waste, which might not otherwise be necessary, given declining projections of the amount of civilian spent fuel expected to accumulate during the first three decades of the next century.

17-16 Comment 9, Documentation. The report is very poorly documented. No footnotes link the conclusions in the report with the references listed on pages 5-1 to 5-3. Indeed, without access to these references, it is impossible to evaluate the conclusions which are drawn. Many of the references cited are working draft papers, final versions of which may or may not support the conclusions drawn. In particular, we are concerned about the following references: Hindman, 1983; Joy, Shappert, and Boyle, 1983; Kocher, Smith, and Witherspoon, 1983; Lazur, 1983; Lord and Goldfarb, 1983; and Nealey, Schilling, Dively, and Radford, 1983. In addition, we note that the transportation analysis is based upon the Oak Ridge model for highway transportation, which the State of Wisconsin has requested repeatedly--and unsuccessfully--over the past year, and upon a yet to be published model for railroad routing. The lack of

17-13 As stated in the draft Mission Plan for the Civilian Radioactive Waste Management Program, designs for the commercial repository "...will incorporate the capability of disposing of defense waste. The capability will be maintained unless the President finds that a defense-only repository is required."

The temperature in the repository was considered in the long-term health and safety analysis of the co-disposal option on pages 2-16 through 2-31 of the July draft report. The analysis demonstrated that the EPA standard would be met even under the most conservative assumption, that of defense waste would be disposed of without an overpack.

The repository and waste package will be designed so that the repository can be licensed and the waste disposed of properly. If necessary, the repository design and placement of defense waste in the repository can be arranged to minimize the exposure of the defense waste to undesirable temperature levels.

17-14 This comment appears to be directed to the draft Mission Plan, which is currently undergoing revision. The evaluation report recognizes in several places (Sections 1.3 and 2.2, for example) that the statutory limit of 70,000 metric tons of heavy metal may not be exceeded until a second geologic repository is in operation. This limitation applies to all wastes considered. Waste acceptance schedules for a commingled repository are not yet agreed to. Future editions of the Mission Plan will present the negotiated waste acceptance schedules.

17-15 Current DOE projections of commercial waste that will require disposal in a repository are well above the 70,000 MTHM trigger point for a second repository.

17-16 An effort has been made to clarify the relationship between statements in this report and the supporting studies, prepared as background. Citations to the references were added at appropriate points of the text in the final document.

17-16 documentation, and the reliance upon draft working papers and unpublished studies, is completely unacceptable for a report of this significance, particularly given the national security considerations.
cont'd

SPECIFIC COMMENTS

17-17 Comment 10, Page 1-2, Role of Office of Civilian Radioactive Waste Management (OCRWM) in a defense only repository. The report states that "If the decision is made to put defense waste in a commercial repository, the Office of Civilian Radioactive Waste Management will assume responsibility for permanent disposal of waste at the repository site." In the event that a defense only repository is required, which DOE office would operate such a repository?

17-18 Comment 11, Pages 1-4 to 1-5, Definition of Defense HLW. The definition of high level defense waste cited here would permit the shipment of liquid defense waste to a civilian repository. What effect would the receipt of liquid high level waste have upon civilian repository operations?

17-19 Comment 12, Page 1-8, Impact of Defense Receipts on Waste Acceptance Schedule. The report states that "it was assumed that the commercial repository was able to receive defense waste at the anticipated rate of production and shipment. However, the planned or actual rate of receipt has not been determined at this time." If the planned or actual rate of receipt has not been determined, how is it possible to conclude that the acceptance of defense waste will not adversely affect the acceptance schedule for civilian spent fuel? How is it possible to determine whether the additional complexity of handling defense waste in addition to civilian waste will not adversely affect the acceptance schedule beyond the mere increased volume of waste received?

17-20 Comment 13, Page 1-11, Impact of Defense Receipts on Statutory Limitation. The report states that about 20,000 defense waste packages, approximately equivalent to 10,000 MTHM of commercial high level waste, will be emplaced in the repository. Will this quantity of defense waste be included in the 70,000 MTHM limit specified in Section 114 (d) (2) of the NWPA?

17-21 Comment 14, Page 2-10, Estimated Cost of Additional On-site Storage. The report states that a two year delay would require expenditure of an additional \$35 million at the Savannah River Plant for the storage of an additional 1,000 canisters of immobilized defense high level waste. What is the maximum capacity of waste which could be accommodated by constructing additional storage at SRP? What is the basis for the cost estimate?

17-22 Comment 15, Page 2-31, Impact of Co-disposal on Health Effects. The discussion of long-term health effects concludes with the statement that "co-disposal of defense and commercial waste has the effect of reducing slightly the composite effects per MTHM of waste compared with those found in a commercial only repository." This slight reduction in the release rate per unit of waste disposed must be evaluated against the fact that there is an absolute increase in the number of units of waste disposed, and that therefore the cumulative radioactivity and thermal output of the emplaced waste are increased.

17-17 In the event a defense-only repository were developed, its operations would be the responsibility of the Assistant Secretary for Defense Programs.

17-18 Defense high-level waste will not be shipped in liquid form to a geologic repository. The Office of Civilian Radioactive Waste Management has no expectation of receiving defense high-level waste in liquid form.

17-19 Acceptance schedules for commercial waste are being revised. A schedule for defense waste will be added. The planning assumptions presented in Table 1-1 of the draft evaluation report were not essential to the analysis, and have been removed. Advanced design and planning could compensate for larger total acceptance rates at a geologic repository. Defense wastes would be received at the commercial repository on a separate, mutually agreed to schedule, such that the rate of receipt of commercial waste will not be adversely impacted.

17-20 The 70,000 MTHM limit specified in section 114(d)(2) of the NWPA applies to all waste considered; civilian and defense.

17-21 Sufficient capacity will be provided to store defense waste on-site until a repository is ready to receive the waste. The estimated cost of such storage was stated in the Defense Waste Management Plan published in June 1983.

17-22 The sentence you refer to has been deleted from the final report. Although it is correct, the proposed revisions to the draft EPA regulations on releases of radioactivity to the environment from disposal of high-level waste do not permit the effect of dilution to be considered in determining compliance.

17-23 Comment 16, Page 2-36, Potential Impact of Co-disposal on Repository Workers. The discussion of short-term health effects does not address the potential impact of increased complexity in waste handling operations, and the resultant potential increase in probability of an accident, such as a dropped canister. Moreover, the potential consequences of an accident such as a dropped canister must consider differences in the structural integrity of the waste form. This is particularly the case if borosilicate Defense HLW waste canisters are disposed of without an additional overpack.

17-24 Comment 17, Page 2-48, Potential Impact of Temperature Differentials Between Defense and Civilian Waste. What documentation is available to support the assertion at page 2-48 that "this temperature differential should not present a technical problem for defense waste and can be adjusted by repository design (spacing of emplacement holes) if desired?"

17-25 Comment 18, Page 2-52, Transportation Assumptions. Why were no routing restrictions assumed in the truck transportation modeling? Were the routes that were evaluated selected in accordance with existing regulations, such as HM-164?

17-26 Comment 19, Page 2-52, Transportation Assumptions. Why were all rail shipments assumed to travel as general freight between origination and destination, allowing originating railroads to maximize distance travelled on their rights-of-way, even though such assumptions result in asymmetrical routing?

17-27 Comment 20, Page 2-53, Transportation Cost Comparisons. The report concludes that transportation "by rail is more costly, varying between 1.6 and 2.0 times the cost of truck transport to the same location." To what extent is the difference in cost accounted for simply by the additional mileage resulting from the assumption of asymmetrical rail routing? Has any sensitivity analysis been performed to determine the extent to which the cost differential is a result of the use of optimal routes for truck shipments but not for rail shipments?

17-28 Comment 21, Pages 2-55 to 2-57, Calculated Transportation Risks. The report addresses increased accident risk as a result of co-disposal and the resulting larger number of shipments only from a national perspective. What impact would the additional hundreds of shipments to the repository have on the calculated risk of a transportation accident in the vicinity of the repository itself?

17-29 Comment 22, Pages 2-57 to 2-62, Lack of Documentation on Public Acceptability. The report states that "one may only speculate on the potential reaction of the public" when comparing the co-disposal and defense only options. There are no footnotes in this section which would allow a reader to link these conclusions to the reports listed in the section entitled References, on pages 5-1 to 5-3. In particular, what evidence was presented by Nealey, et al., in their draft working paper entitled "Public Acceptability of Co-location of Defense and Commercial High-Level Radioactive Waste"?

17-30 Comment 23, Page 2-46, Classified Information. The report states that only a "small percentage" of defense waste in storage tanks is classified, but notes "There will probably be classified waste in the future." How much certainty is there that classified waste in the future can be handled in such a way as

17-23 The report does not address the potential impact on short-term health and safety of the increased complexity of co-disposal operations because any increased risk due to the complexity can be mitigated by appropriate design and operating procedures.

The health and safety analysis assumed that, regardless of the waste form, a dropped canister would rupture. The probability of such an accident is extremely small. All waste forms and handling procedures will be designed to meet accepted safety standards.

17-24 The statement you refer to is our best engineering judgment based on related test data and accepted engineering practice.

17-25 The routing model used normal commercial routes and was designed mainly to provide estimated mileages and estimated transit times between origins and destinations. It was not necessary for purposes of this study to include routing restrictions or select routes in accordance with DOT rule HM-164. It is recognized, and a footnote to this effect was added to the final report, that in actual practice routes would have to conform to DOT's final rules HM-164.

17-26 The assumptions used for rail shipments were based on current industry practice.

17-27 It was not the intention of the report to take sides in a truck vs. rail debate. Using assumptions based on information available to them, Joy, et al. estimated the costs for truck and rail transportation of defense waste to five potential sites for a repository. It is not inconceivable that competition for the business may force costs downward, but this cannot be predicted with any reasonable certainty and would not affect the conclusion of the report that transportation cost considerations do not result in a requirement for a defense-only repository. In addition, factors other than cost may influence the decision to use one mode of transport over the other or to use both transport modes if appropriate.

17-28 The impact of additional waste shipments to a single repository site is site-specific and will be addressed by local impact assessments during the repository siting process. If necessary, measures will be taken to mitigate such impacts.

17-29 The section on public acceptability is based on the Draft Working Paper of Nealey, S.M., A.H. Schilling, D.D. Dively, and L.R. Radford, 1983. "Public Acceptability of Colocation of Defense and Commercial High Level Radioactive Waste," Battelle Human Affairs Research Center. The report is cited in the Public Acceptability Section of the final evaluation report. Their analysis is based on an extrapolation of their knowledge of public responses on related matters. This was necessary because prior to publication of this report there was not much record of public opinion on the options for disposal of defense high-level waste.

17-30 Once the waste in tanks is mixed with existing waste it becomes unclassified. The unclassified mixture is processed for disposal. The text in Section 2.3.6 of the final report has been modified to clarify this point.

17-30 cont'd to allow its disposal in a commercial repository, without comprising either national security needs, or the need to protect public health and safety and the environment?

17-31 Comment 24, Page 3-2 to 3-3, Operation of a Defense-only Repository. Under what circumstances could a defense-only repository receive liquid defense high level wastes?

17-32 Comment 25, Page 3-4, Site Selection Process for a Defense Only Repository. The report states that "For purposes of this study the assumptions are made that a defense only repository would be located at one of the three sites recommended for characterization by the Secretary of the Department of Energy but not selected by the President and recommended to Congress for the civilian repository." What is the legal basis for such an assumption? What are the implications of this assumption regarding the question of whether all three sites recommended for characterization must be qualified for repository development?

17-33 Comment 26, Page 3-7, Table 3-2. The table includes a typographical error. 1948 dollars should presumably be 1984 dollars.

17-34 Comment 27, Pages 3-8 to 3-9, Long-term Health Effects of Defense-only Option. To what extent would the requirement of an overpack reduce the expected release rate from the defense waste form?

17-35 Comment 28, Page 3-12, Probability of Accident in a Defense-only Repository. The calculated frequency of an accident such as the dropping of a canister down the repository mine shaft is stated as 10^{-5} per year, the same frequency calculated for the co-disposal option. What was the basis of this calculation? How was the issue of increased complexity due to the handling of additional types of waste forms, addressed in the risk analysis for the co-disposal scenario?

17-36 Comment 29, Page 3-18, Concern about Multiple Waste Forms. The report states "A valid concern is that a combined repository has multiple waste forms, i.e., defense high level waste, commercial high level waste and spent fuel, whereas a defense only repository has just one waste form, defense high level waste. It is possible that the defense only option will be perceived [emphasis added] as presenting the least technical challenge, especially if the differences in defense and commercial high level waste are clearly highlighted." Why doesn't the report address this issue directly? Is increased complexity merely a problem of perception, or is it a valid technical concern?

BH:krb/0319n

17-31 Current plans are to receive and dispose of immobilized high-level waste in a repository. There are no plans to dispose of high-level waste in a liquid form.

17-32 Please refer to the response to your Comment No. 17-4.

17-33 The table has been corrected.

17-34 The analysis of long-term health and safety impacts assumed that the waste packages failed completely and simultaneously after a period of time. The time of failure depended upon whether or not the waste canister had an overpack. The canister without an overpack was assumed to provide complete containment for 300 years and the canister with an overpack was assumed to provide complete containment for 1000 years. Following failure of the containment, the leach rate was assumed to be the same for both cases.

17-35 The frequency of an accidental dropping of a canister down the repository mine shaft was taken from U.S. Department of Energy, 1980. "Final Environmental Impact Statement on Management of Commercially Generated Radioactive Waste," DOE/EIS-0046F. Any increased risk due to the complexity of the co-disposal option can be mitigated by appropriate design and operating procedures, and thus was not addressed in the analysis.

17-36 It is agreed that a combined repository is technically more complex than a repository containing only a single waste. However, once it is known that different types of waste must be handled, it is possible to design into the system the capability of handling the mix of wastes and to employ operating policies and procedures that will eliminate any undue risks.



STATE OF MAINE
HOUSE OF REPRESENTATIVES
AUGUSTA, MAINE 04333

September 19, 1984

Mr. David B. LeClaire, Director
Office of Defense Waste and Byproducts Management
U.S. Department of Energy, DP-12
Washington, DC 20545

Dear Mr. LeClaire:

Thank you for the opportunity to review your draft report, "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High Level Waste".

18-1

The basic conclusion, that disposal of defense waste in a commercial repository instead of a separate facility would save money seems to be well supported, although my office is not equipped to comment on the accuracy of the projected \$1.5 billion savings.

Also, your assessment seems realistic that a defense-only repository may have to follow the same procedures as a commercial facility, even where that is not required by statute. In our experience, procedural short cuts tend to increase public opposition.

Finally, I would add to the report that transportation, equity and public acceptance considerations suggest it would be preferable to dispose of defense high level waste in the region where it is generated. My understanding is that these are outside the northeast, so that Maine would not be a good location for a high level defense waste site.

Thank you for your consideration.

Sincerely yours,

A handwritten signature in black ink, appearing to read "John L. Martin".
John L. Martin
Speaker of the House

elk-629

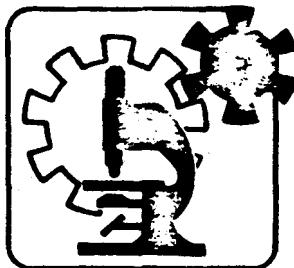
MAINE HOUSE OF REPRESENTATIVES

RESPONSE TO COMMENTS

18-1 Thank you for your comments.

Senator Al Williams,
Chair
Senator Barney Goltz
Senator Sam Guess
Senator Irving Newhouse

Representative Richard Barnes,
Vice-Chair
Representative Jean Brough
Representative Donn Charnley
Representative Dean Sutherland



joint legislative committee on science and technology

September 24, 1984

David B. Leclaire, Director
Office of Defense Waste &
Byproduct Management
U.S. Department of Energy
Washington, D.C. 20585

Dear Mr. Leclaire:

I wish to supplement the official comments of the Washington State Nuclear Waste Board on the draft defense waste commingling study.*

After the Board's comments were approved, our Science and Technology Committee staff brought another apparent inconsistency to my attention. I believe it may affect the credibility of cost estimates contained in the study.

19-1 There is an apparent discrepancy between the Draft Mission Plan and the Defense Waste Evaluation on the question of "overpacking"--placing a second shield or container over waste canisters before placing them in the repository. The Mission Plan, Vol. 2, p. 2-35, says carbon-steel overpacks will be used for the solidified commercial high level wastes (a small quantity) and defense waste if the latter is accepted at the commercial repository. No overpacking is assumed for spent fuel. The Defense Waste paper (pp. 2-7 to 2-9) looks at carbon-steel and no-overpacking options for defense wastes, but assumes an overpack for all commercial wastes, including spent fuel.

19-2 Using the Mission Plan assumptions would change Tables 2-1 and 2-2 of the Defense Waste paper in several ways. First, the middle column is not consistent with the Mission Plan assumption that defense wastes would be overpacked. Second, the costs for commercial capacity are presumably over-stated since overpacking is assumed for spent fuel. Thus one would expect the "bottom line" difference between the first and third column to grow.

WASHINGTON JOINT LEGISLATIVE COMMITTEE
ON SCIENCE AND TECHNOLOGY

RESPONSE TO COMMENTS

- 19-1 The assumption of an overpack for all commercial waste was based on the thinking at the time the study was initiated. Any changes with respect to the overpack requirements for commercial waste will affect the total costs of a commercial repository but will not affect the conclusion of the report that it is more cost effective to dispose of defense waste in the commercial repository than in a defense-only repository.
- 19-2 The report is based on a series of topical studies that were commissioned shortly after P.L. 97-425 became law. To complete the study prior to the President's evaluation, it was necessary to establish and fix repository concepts, geologic media, waste quantities, and other baseline assumptions that would fairly reflect the essential features of likely future repositories and operation, to the extent that the specific purpose of the evaluation could be accomplished.

Because of the rapid evolution of the repository program, some inconsistencies have arisen between assumptions of the study and the latest data and thinking within the repository program concerning such factors as repository design, waste forms, waste packaging concepts, regulatory requirements, and costing factors. For example, the cost calculations for the commercial repository are based upon an earlier repository design than that detailed in the Civilian Radioactive Waste Management Mission Plan (DRAFT), which was submitted for public review and comment in April 1984. A comparison with the mission plan repository indicates an increased cost, but it would not change the result of the study.

With regard to the no overpack assumption for defense waste, that scenario was used to provide a lower bound to the cost estimates. Neither a decision on the need for an overpack nor overpack design and cost has been determined yet. It was felt that a likely range for the cost of disposal of defense waste using two extremes for the overpack scenarios would provide a useful basis for comparison of the costs of the disposal options.

Hopefully this discrepancy will be resolved in the final report. As Mr. Warren Bishop's letter, dated September 24, 1984, and the Washington State Nuclear Waste Board's comments indicate, we do not feel we have an adequate basis to decide whether to support a commingling recommendation. Inconsistencies such as the one noted here add to our feeling that adequate analysis has not been presented.

Sincerely,



Senator Al Williams, Chair

AW:dc9-14

cc: Mr. Warren Bishop

* An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste.

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United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VA. 22092

OFFICE OF THE DIRECTOR

In Reply Refer To:
WGS-Mail Stop 106

September 21, 1984

Mr. Ben C. Rusche
Director, Office of Civilian
Radioactive Waste Management
U.S. Department of Energy
Washington, D.C. 20585

Dear Mr. Rusche:

We concur with the Department of Energy (DOE) that there is no logical reason to segregate Defense high-level radioactive wastes from civilian high-level radioactive wastes for purposes of disposal. In fact, such segregation would require the construction and licensing of a third repository by the Nuclear Regulatory Commission (NRC), a time-consuming and difficult process to accomplish and, as DOE clearly indicates, costly.

20-1 On page 2-15 it is stated that the overpack cost for waste emplaced in salt was assumed to be higher than in hard rock. However, on page 2-25 it is stated that the same overpack was assumed for all waste packages. If so, why should the costs vary?

20-2 We do not believe the correct emphasis is placed on the discussions of public acceptance of a colocation decision. The approach DOE has utilized in discussing the issue in Section 2.3.3 is entirely negative. The fact that colocation would reduce the near-term need for repositories from three to two and consequently reduce the overall impacts on the public-at-large is not discussed at all. Defense wastes are to be reduced to a glass form whether they are to be stored with civilian wastes or not, thus the argument of different waste forms is negated even though the composition of the vitrified Defense wastes will not be identical to that of the civilian wastes. If canister designs are also identical, costs will also be reduced, especially in handling facilities, since one design will serve all users.

20-3

20-4 Figure 2-6 would imply that the Gulf Interior Region is isolated to the State of Mississippi. This is not the case.

102003

U.S. DOI, GEOLOGICAL SURVEY

RESPONSE TO COMMENTS

- 20-1 The same material was assumed to be used as overpack (steel & TiCode-12) for all wastes, but different designs are required for the two repository media considered (rock and salt). The overpack in salt has a thicker steel shell to accommodate the expected high lithostatic load in a salt repository.
- 20-2 The approach on public acceptability was to present likely or possible public perceptions.
- 20-3 The cost estimates for the combined facility reflect any expected savings due to sharing of facilities.
- 20-4 The purpose of the figure was to show the approximate center of a region for purposes of estimating transportation costs.

SS
Table 2-13 shows the cost of transporting Defense waste to Hanford is high and to the Gulf Interior Region is low. We do not understand why this should be the case as a considerable amount of the Defense waste is at or near Hanford, and it would seem that moving this waste considerable distances would rise transportation costs to areas such as the Gulf Interior Region.

In summary, we concur with DOE's conclusion that the most cost effective approach will be to comingle the civilian and Defense wastes in a common repository but believe a much more positive approach should be taken in discussing the anticipated public reaction to the proposed decision.

Sincerely yours,

JR Rollo
for James F. Devine
Assistant Director for
Engineering Geology

20-5 The costs of transportation are based on transporting 12,000 waste packages from Savannah River Plant, 1,200 waste packages from Hanford Reservation, and 7,000 waste packages from Idaho to each of the five repository site destinations considered in the study, i.e., Gulf Interior Region, Permian Basin, Paradox Basin, Nevada Test Site, and Hanford Reservation.

North Carolina 
Department of Administration
116 West Jones Street Raleigh 27611

James B. Hunt, Jr., Governor
Jane Smith Patterson, Secretary

Margaret C. Riddle
Coordinator
Office of Policy and Planning
(919) 733-4131

October 5, 1984

David B. LeClaire
US Dept. of Energy
Office of Defense Waste & Byproducts
Washington, D.C. 20545

Dear Mr. DeClaire:

RE: SCH File #85-E-0000-0195; Draft EIS on Evaluation
of Commercial Repository Capacity for the Disposal
of Defense High-Level Waste

The State Clearinghouse has received and reviewed the above
referenced project. As a result of this review, the State
Clearinghouse has received the attached comments from the
North Carolina Department of Natural Resources and Community
Development.

Thank you for the opportunity to review the above referenced
document.

Sincerely,

Chrys Baggett

Chrys Baggett (Mrs.)
Clearinghouse Director

CB/jcp

Attachment

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North Carolina Department of Natural Resources & Community Development

James B. Hunt, Jr., Governor

James A. Summers, Secretary

NATURAL RESOURCES
PLANNING AND ASSESSMENT
Telephone 919 733-6376
Anne Taylor
Deputy Assistant Secretary
Telephone 919 733-4984

October 1, 1984

MEMORANDUM

TO: Chrys Baggett, Director
State Clearinghouse

FROM: Anne Taylor

SUBJECT: An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste (85-0195)

OCT 2 1984

21-1 The Department of Natural Resources and Community Development has reviewed "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste" and offers the following comments. We have been working with the Crystalline Repository Program for nearly two years and have a good general background on the issues related to the Defense Waste Program. From this understanding, we must express concern about the incompleteness of the evaluation and those issues omitted from discussion.

21-2 The "close liaison between the defense and commercial waste disposal programs" (page 1-2) is questionable and is not supported by the evaluation. Organizational charts and a discussion of interaction would help readers understand the depth of coordination.

21-3 There appear to be significant inconsistencies between the Draft Mission Plan (pages 2-2 and 3-A-38) and this evaluation (page 1-9) on the subject of acceptance rates and types of waste for storage in the first repository. These must be better coordinated if either program is to retain credibility in the ongoing siting processes and if the involved states are to have meaningful participation.

21-4 The report should specifically establish (page E-2) whether DOE intends to modify only the first repository for the comingling of commercial and defense waste. If all repositories are to be modified for comingling, then this needs to be known before any involved state is asked to take a position on the issue.

21-5 The larger underground area required by comingling (page 2-10) appears to be a significant consideration that should be integrated into the first repository program and second repository program screening methodology and criteria. To what extent can a subsequent decision on comingling defense waste be expected to delay first and second repository schedules if the larger area is not considered in early decision processes for repository siting?

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES
AND COMMUNITY DEVELOPMENT

RESPONSE TO COMMENTS

21-1 The defense and commercial waste disposal programs are both the responsibility of the Department of Energy. The defense waste program is managed by the Assistant Secretary for Defense Programs. The commercial waste disposal program is managed by the DOE Office of Civilian Radioactive Waste Management. There is an understanding between the two DOE offices which specifically addresses their close liaison, particularly in the area of Research and Development activities. Each office also actively participates in the reviews of the documents of the other office to assure compatibility and consistency in regard to plans and schedules related to waste disposal, and to avoid duplication of efforts.

21-2 The details of defense waste acceptance at a commercial repository will be the subject of future negotiations between the Assistant Secretary for Defense Programs and the Office of Civilian Radioactive Waste Management, pending the results of the evaluation by the President on the issue of disposal of defense waste. Acceptance schedules for commercial waste are being revised and will appear in the final Mission Plan along with a schedule for defense waste acceptance.

21-3 A decision on use of more than one commercial repository for defense waste has not been made, however, it is permitted under the Nuclear Waste Policy Act.

21-4 The capacity of a potentially acceptable site to accommodate the volume of waste available for disposal is one of several factors considered in selecting the site for a repository. A site would not be automatically excluded from consideration because it could not accommodate 70,000 or 80,000 MTHM.

21-5 The repository program has operated on the assumption that defense waste would be disposed of in the commercial repository. The law as written only requests the President to evaluate the use of commercial repository capacity for the disposal of defense high-level waste. Since the passage of the Nuclear Waste Policy Act, the Office of Civilian Radioactive Waste Management has been operating on the assumption that defense waste will be disposed of in the commercial repository pending the outcome of the President's evaluation. Consequently, there would be no delay in the repository schedules if a defense-only repository is not required.

21-6

Likewise, comingling (page 4-9) could alter plans and/or schedules for Federal Interim Storage and Monitored Retrievable Storage. This should be discussed in detail, including the circumstances leading to such changes, extent of change, cost, and related impacts.

21-7

In any program as controversial as high-level nuclear waste repositories, where scientific understanding is developing concurrently with program planning, the worst case scenario must be used to establish a basis for discussion and decision making. Several issues should be included:

- o defense waste contingencies should DOE be unable to meet the 1998 waste shipments (page 1-9, Table 1-1);
- o what happens if a significant number of canisters are leached prior to the 300 years anticipated (page 2-26);
- o what would result from carrying release calculations (page 2-29) out to 100,000 years as suggested by the EPA assurance requirements, and
- o what are the environmental and health effects associated with accidents (page 2-36 and 3-12) or accidents worse than anticipated?

21-8

The discussion of transportation (page 4-6) should be expanded. Estimates of deliveries and the impacts of transportation to separate sites and a comingled site should be compared and contrasted.

21-9

Finally, a major concern is implied (page 4-9) in the National Security Issues. North Carolina's position has been that a repository should not be located in this state unless it is shown that there is no better place in the nation. If DOE emphasizes defense needs and schedule goals over technical adequacy and public health and safety, then federal credibility and state participation will once again be jeopardized. This situation must be avoided.

AT:ap:863

21-6 Current plans call for Defense waste to be stored at the sites where it is generated until it is shipped to a repository. The acceptance of defense waste into the waste management system would not alter the DOE's commitment to accept significant quantities of spent fuel from the utilities beginning in 1998.

21-7 Defense waste contingency planning was discussed in the report. The other issues you raise are independent of a decision on whether a defense-only repository is required.

21-8 Transportation impacts are site-specific and will be addressed as part of site selection activities. When necessary, action can be taken to mitigate the effects of increased transportation activities in a local area.

21-9 There is no basis for considering that defense needs and schedule goals would be emphasized over technical adequacy or public health and safety. The consideration given to these topics and all other topics in any analysis will depend on the requirements of the analysis and would not be preempted by national security issues.



SCOTT M. MATHESON
GOVERNOR

STATE OF UTAH
OFFICE OF THE GOVERNOR
SALT LAKE CITY

84114

October 23, 1984

David B. LeClaire, Director
Office of Defense Waste and
Byproducts Management
U. S. Department of Energy, DP-12
1000 Independence Avenue
Washington, D.C. 20545

Dear Mr. LeClaire:

The state of Utah, hereby requests that DOE respond to the following questions and requests for information within the statutorily required 30 days (Sec.117(a): NWPA):

The state of Utah has reviewed the recently released document An Evaluation of Commercial Repository Capacity for the Disposal of Defense High Level Waste, DOE/DP-0020 (Draft). Our initial review produced the attached questions and comments. However, without access to the supporting reference documents the state cannot adequately review or concur with the conclusions of the report. The state therefore requests two copies of the documents referenced in that report. We will give additional consideration to the report and its conclusions after receiving all reference documents.

1. Will the DOE/DP-0200 document be the only DOE document that (with its reference documents) evaluates the use of a commercial waste repository for the disposal of defense waste? What other documents or studies, related to this decision, are planned or in progress? Will a final DOE/DP-0200 report be issued prior to release of the draft EAs? What procedures does DOE intend to follow in making the final decision on whether or not to commingle nuclear wastes? The state requests public notice (in major newspapers in states under consideration for repositories, and in the Federal Register) of a 60 day period during which the public can comment on the decision and its supporting rationales.

STATE OF UTAH
RESPONSE TO COMMENTS

22-1 The Nuclear Waste Policy Act requires the President to evaluate the use of disposal capacity at one or more of the commercial repositories to be developed under the Act for disposal of defense high-level waste. DOE/DP-200 provides input to the President for that evaluation. No other documents or studies related to this are planned or in progress by DOE. The Nuclear Waste Policy Act does not require public comment on the evaluation. We have gone beyond the requirements of the law by releasing the draft document for public review and comment prior to submitting the document to the President. There are no plans to provide future revisions for additional public comment. The Draft EAs are being released on a schedule that is independent of this document.

David B. LeClaire, Director

October 23, 1984

Page -2-

22-2

2. DOE/DP-0200 introduces the concept of an "augmented repository." The report states that "a commercial repository may ultimately accept more than 70,000 MTU of commercial waste..."; and that, "the quantity of defense waste emplaced in the repository will be in addition to the 70,000 MTHM of commercial waste" (p.1-11). What is the estimated upper limit on the size of an augmented repository? What is the basis for that estimate? Can all potentially acceptable sites currently under consideration for repositories physically accommodate an augmented repository of 80,000 MTU? Of 140,000 MTU?

22-3

3. The report offers no justification for adopting the 10,000 MTHM bounding condition on the amount of defense waste to be emplaced in the augmented repository. How many tons of high level defense exist and how many tons will be disposed of in the first, augmented repository? Will the augmented commercial-defense repository (repositories) eventually be used for disposal of all defense high level waste? If not all, for what percentage of high level defense waste? The report states that a defense waste only repository will be "smaller in size" (p.3-3). Please define smaller in terms of MTU.

22-4

4. There are numerous, fundamental inconsistencies between the draft Mission Plan and the DOE/DP-0200 document. How, and when, will these inconsistencies be resolved? For example, the Mission Plan states that the first repository will accept only a small percentage of defense waste in its first three years of operation; yet the acceptance schedule in DOE/DP-0200 indicates that over 75% of the waste accepted in those years will be defense waste. What process will be, or is being used, to trade-off defense industry requirements against commercial waste disposal requirements?

22-5

5. What repository concept will be used in the Environmental Assessments-- the commercial waste only repository of 70,000 MTU or the augmented repository? If the augmented repository will be analyzed in the EAs, what size (MTU) of an augmented repository is assumed? What is the basis of this assumption? And how will the conclusions of the draft DOE report favoring an augmented repository affect site nomination and recommendation decisions? Will the potential impacts from defense wastes on the suitability of a site for characterization and a repository be addressed in the EAs to the extent possible without site characterization activities? If not, why not? At what point in the site screening and selection process will those impacts be addressed? Will the Environmental Assessments consider the impacts of enlarged surface facilities, e.g. hot cells and lag storage areas, associated with the augmented repository? Will those impact evaluations estimate worst case scenarios?

22-2 The capacity of a specific repository site is limited by the geology of that site. The waste type can also be a factor limiting capacity since some waste types may require more area per unit of waste than others, e.g., a unit quantity of commercial spent fuel requires more area than the same unit quantity of defense high-level waste. The capacity of a site may be increased by designing a multiple level repository. In any event, the Nuclear Waste Policy Act requires that a second repository be in operation before the first repository can be licensed to accept more than 70,000 MTHM. The ultimate capacities of all potentially acceptable sites are unknown at this time.

22-3 The Nuclear Waste Policy Act only requires an estimate of repository capacity requirements for waste generated through December 31, 2020. [Section 301(a)(9)(A)] The 10,000 MTHM equivalent of defense waste is the best estimate of the quantity of defense waste that would be available for disposal in a geologic repository during that time period.

We recognize that there is a significant volume of defense high-level waste in 149 single shell tanks at Hanford Reservation that is not accounted for in these figures. However, the current DOE reference plan is to stabilize in-place waste stored in those tanks if, after the requisite environmental documentation, it is determined that the short-term risks and costs of retrieval and transportation are greater than the environmental benefits of disposal in a geologic repository. For that reason, that waste was not considered in this study. Should it be determined that the benefits of geologic disposal prevail, then the waste in those single shell tanks will be processed and disposed of in a geologic repository. The requirement to dispose of such waste in a repository is not expected to alter the qualitative findings of this study.

The amount of defense waste that will go in the first repository is contingent upon the availability of a second repository, and the relative advantages of using the second repository for some defense waste.

The design capacity of the defense-only repository for purposes of the study is 10,000 MTHM, as compared to 80,000 MTHM or more for the augmented commercial repository used in the study.

22-4 The actual rate of receipt of defense waste has not been determined at this time. Table 1-1 has been eliminated from the report to reduce confusion. If civilian repositories receive defense waste, these wastes will be received on a separate, mutually agreed to, schedule such that the rate of receipt of commercial waste will not be adversely impacted. Acceptance schedules for commercial waste are being revised and will appear in the final Mission Plan along with a schedule for acceptance of defense waste.

22-5 Section 8 of the NWPA-1982 presumes defense waste will be disposed of in a commercial repository. Planning for the commercial repositories has included defense waste. Aspects concerning the content of the Environmental Assessments of specific sites are beyond the scope of the study supporting the evaluation required by Section 8.

October 23, 1984

Page -3-

22-6

6. The report states that an augmented repository cost allocation mechanism has not been agreed upon. What parties have been involved in negotiating the cost allocation mechanism? What parties must agree on the cost allocation decision? The state requests full information on the current state of cost allocation discussions and negotiations. How will increased mitigation, public participation, impact assistance, research and development, and construction costs associated with an augmented repository be determined?

22-7

7. What size of "lag storage area" is being considered for the repository site? What is the purpose of this area? How will this area be used to buffer waste acceptance schedules? What is the longest potential time waste will be held in repository site lag storage? What other DOE facilities will be used for "interim storage of immobilized defense high-level waste..." (p.E-9)? Does the DOE believe that MRS facilities may be used for defense waste storage? On what authority? When will DOE determine whether or not MRS facilities may be used for defense waste storage?

22-8

8. In this report, DOE raises the possibility that a defense waste repository could be located "at one of the three sites recommended for characterization by the Secretary of the Department of Energy but not selected by the President and recommended to Congress for the civilian repository. (p.3-4)" How many sites does DOE believe it must determine are suitable for a repository at the completion of site characterization? If the augmented repository is not a viable option what initial steps will DOE take to develop a process for siting a defense-only repository?

22-9

9. DOE states that disruption of defense production and utilization facilities could occur if the opening of the repository is delayed, if the repository accepted defense high-level waste at less than the expected rate, or if the repository was closed for regulatory or technical reasons (p.4-9). Such disruptions appear likely. The report should discuss these potential disruptions, offer alternative waste storage and acceptance plans, and discuss how these contingencies might affect repository siting, construction, licensing and operations. Could national security reasons force an augmented repository to be, or remain, open(ed) even if it violated regulatory and technical standards? On what basis? Might DOE use national security demands as a basis for avoiding procedural delays or for pursuing procedural shortcuts?

22-10

10. Sources for the estimates of health and safety impacts are not offered. And, in fact, specific citations supporting any of the DOE's conclusions cannot be found in the text. The state thus has no basis upon which to judge the adequacy of the draft document's analysis and conclusions. The state requests that it be provided

22-6 The Nuclear Waste Policy Act is specific with respect to the costs that would have to be allocated to defense waste disposed of in the civilian repository. Cost allocation is not the subject of this document. It will be addressed by the Department of Energy following the President's decision on whether or not a defense-only repository is required. Cost allocation will be negotiated by the Assistant Secretary for Defense Programs and the Office of Civilian Radioactive Waste Management.

22-7 Details of the facilities being considered for the repository site are still in the formative stages. It is clear that some storage capacity will be required to, as you say, "buffer" waste acceptance. As stated in the document, each defense high-level waste generating site plans to have on-site interim storage capacity to hold immobilized waste until the waste can be shipped to the repository. A determination of the need to store defense waste at an MRS is premature at this time. The question of MRSs is not relevant to the evaluation of the use of disposal capacity at civilian repositories for defense high-level waste.

22-8 The Draft report assumed that a defense-only repository could use one of the sites characterized but not finally selected for use for a commercial repository. However, upon reconsideration of this issue, it was determined that this may not be a feasible option. No plans have been developed at this time regarding a process for siting a defense-only repository.

22-9 The report states that each site generating defense high-level waste is required to have on-site interim storage capacity for immobilized high-level waste to permit continued operation of production or immobilization facilities in the event of shutdowns or delays in the operation of the geologic repository.

The law requires any repository for disposal of high-level waste and spent nuclear fuel to comply with the rules and regulations of the Nuclear Regulatory Commission. It is not expected that any national security considerations will be involved.

22-10 Although not specifically cited in the Health and Safety section, the reference, Kocher, D. C., E. D. Smith, and J.P. Witherspoon, 1983, was listed in the reference section and provided the support for the Health and Safety discussion. The section on Health and Safety has been rewritten and a reference citation has been added. Reference documents have been provided as requested. A final report reflecting public comments will be sent to all who received the draft for comment when the final is released by the White House.

David B. LeClaire, Director

October 23, 1984

Page -4-

22-10
cont'd

with a draft report that cites the evidence for DOE's conclusions, that DOE provide the state with the documents constituting that evidence, and that DOE agree, in writing, to accept and consider all comments for 60 days after such a report has been provided.

22-11 Finally, the decision (not) to commingle defense and commercial nuclear waste is a significant federal decision which merits significant public notice and comment. Public interest groups in the state of Utah have not received adequate notice of this document's release. The state would like a copy of all press releases, public notices, and letters used to announce the issuance of this document and solicitation of public comment. We feel that all agencies and groups with an interest in defense waste issues should have received announcement of this document's release.

The state expects you will give careful consideration to these requests and provide a written response within 30 days.

Sincerely,

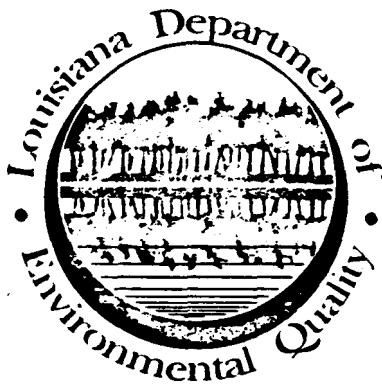


Judith Hinchman
High Level Nuclear Waste Program Manager

JH:gj:rmm

cc: Ben Rusche
Senator Jake Garn
Senator Orrin Hatch
Representative James Hansen
Representative Howard Nielson
Representative Dan Marriott

22-11 More than 400 copies of the draft document were distributed to interested groups, individuals, States, and Federal agencies. Section 8 of the NWPA presumes defense high-level waste will be disposed of in a commercial repository. The office of Civilian Radioactive Waste Management, created to implement the Act, has been planning on that basis.



PATRICIA L. NORTON
SECRETARY

OFFICE OF AIR QUALITY AND NUCLEAR ENERGY

October 30, 1984

L. HALL BOHLINGER
ASSISTANT SECRETARY

Mr. David B. LeClaire, Director
Office of Defense Waste and Byproducts
Management
U.S. Department of Energy, DP-12
Washington, DC 20545

Dear Mr. LeClaire:

The State of Louisiana has reviewed "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste", dated July, 1984. The review resulted in several comments, which are attached.

Thank you for this opportunity to comment on this document, and we request that we continue to be provided with forthcoming documents related to this issue.

Sincerely,

L. Hall Bohlinger
L. HALL BOHLINGER
Assistant Secretary

LHB:pfv

cc: J. J. Friloux
C. G. Groat
J. Gervers

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**COMMENTS ON THE DRAFT REPORT:
"AN EVALUATION OF THE COMMERCIAL REPOSITORY CAPACITY
FOR THE DISPOSAL OF DEFENSE HIGH LEVEL WASTE"**

Page E-2

23-1 It is unclear whether co-mingling is being considered for only the first repository or also for subsequent repositories.

Page E-4

23-2 The estimated cost for a commercial repository is stated in this document to be \$4.5 billion dollars. This contradicts the estimate given in the April, 1984, Mission Plan by about \$1.5 billion dollars. Since the only factor that results in a significant advantage for disposing of defense wastes in a combined commercial and defense repository is a \$1.5 billion dollar advantage, this contradiction appears suspicious. A thorough breakdown of the costs should be presented explaining this discrepancy.

Page E-4

23-3 In reference to the estimated cost of an augmented commercial repository, do the figures presented in this document reflect the cost of storing more waste than planned in the 70,000 MTHM capacity commercial repository as stated in (4) (P. 1-11)? It appears that this additional excavation would necessarily be extensive and correspondingly expensive.

Page E-9 and 4-7

23-4 Under the heading of transportation, this document states that "--associated risks do not depend on whether the site is a defense-only or a commercial repository." While the composite risk may be the same in both cases, the fact is that an increase in the number of shipments to any one location would seem to multiply the risks near that specific site by the percentage increase of the shipments. There would seem to be different risks when considered site-specifically since all wastes would converge on that one site in the event of a co-mingled repository.

Page 1-2

23-5 An organizational chart or description of the statement "Close liaison between the defense and commercial waste disposal programs is being maintained—" should be provided.

Page 1-9

23-6 Anticipated shipments as listed in Table 1-1 estimate defense wastes averaging 620 packages per year for years 1998-2007. This would represent 310 MTHM per year during that period. This directly contradicts the statement in the April, 1984 Draft Mission Plan which states "It is estimated that the Phase 1 facilities will be able to emplace and dispose of 400 MTU/year of radioactive waste which includes unconsolidated commercial spent fuel and, if needed, small quantities of defense high level waste." According to the plan set forth in DOE/DP-0020, the repository in the first 10 years of operation would essentially be a defense

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

RESPONSE TO COMMENTS

- 23-1 It was assumed all defense waste was disposed of in a single repository to simplify the analysis. It was not meant to preclude the possibility of using more than one of the commercial repositories for defense waste. The Nuclear Waste Policy Act specifically permits this. A statement to this effect has been added to the text.
- 23-2 The 4.5 billion dollars you are referring to are the development and evaluation costs associated with the repository. The 1.5 billion dollar cost advantage of a combined repository is attained without including the costs associated with development and evaluation. In the revised report consideration of development and evaluation costs are shown to enhance the cost advantage of a combined repository.
- 23-3 The "augmented" repository contains 70,000 MTHM of commercial waste and 10,000 MTHM of defense waste. The incremental cost of adding the 10,000 MTHM of defense waste to the repository ranged between 700 million and 1.5 billion dollars for the reasons you state as well as others.
- 23-4 The analysis of site-specific risks is not appropriate to the study. Such analysis will be conducted during the process of selecting a repository site.
- 23-5 The defense and commercial waste disposal programs are both the responsibility of the Department of Energy. The defense waste program is managed by the Assistant Secretary for Defense Programs. The commercial waste disposal program is managed by the DOE Office of Civilian Radioactive Waste Management. There is an understanding between the two DOE offices which specifically addresses their close liaison, particularly in the area of Research and Development activities. Each office also actively participates in the reviews of the documents of the other office to assure compatibility and consistency in regard to plans and schedules related to waste disposal, and to avoid duplication of efforts.
- 23-6 The anticipated schedule of shipments of defense waste used in the report was based on estimates of high-level waste production at DOE defense sites presented in the Defense Waste Management Plan. It was used for estimating the quantity of defense waste that would need disposal through the year 2020 and also to estimate transportation costs to a disposal site. As stated in the report, an actual schedule of shipments has not been determined. Any differences between the actual schedule and that used for cost estimating purposes is not likely to significantly affect the total cost of disposal over the repository lifetime.

If the defense waste is disposed of in the commercial repository, the defense waste will be received at the repository on a separate, mutually agreed to schedule, such that the rate of receipt of commercial wastes will not be adversely impacted.

Acceptance schedules for commercial waste are being revised and will appear in the final Mission Plan along with a schedule for defense waste acceptance.

waste repository augmented with commercial wastes.

Page 2-7

23-7 Information about tuff was used as a surrogate for the high end of repository cost estimates. Figures based on basalt would probably more accurately represent the high end estimate since tuff is a more porous rock than basalt, therefore easier and less expensive to work with than basalt.

Page 2-8 and 2-9

23-8 In view of the fact that the total inventory of long-lived radionuclides as set forth in Table 2-5 is three times higher in commercial HLW as in defense HLW, clarification is needed as to why the width of the wall in the Ticode-12 overpack is illustrated as being nearly four times thicker in the defense waste canister as in the commercial waste canister.

Page 2-12 and 3-6

23-9 Clarification is needed for Table 2-1 as to why it will cost an estimated \$1.323 billion dollars for underground workings/rock handling to store approximately 30,000 canisters in a reference repository without defense wastes. Table 3-1 on Page 3-6 estimates that the cost for underground workings/rock handling to store 20,000 canisters of defense waste is only \$168 million dollars in a defense only repository. This suggests that these costs will run \$33,330/canister of commercial wastes and only \$8400/canister for defense wastes. Why does it cost more than four times as much in underground workings/rock handling to store commercial waste as it does for defense wastes?

Page 2-27

23-10 In order to accurately document the statement that non-zero releases occur only for C-14, Tc-99, and I-129, which indicates that there are no calculated releases for all other radionuclides, a table of predicted release for all other radionuclides, a table of predicted releases and release limits should be included. Also, references as to how these non-releases were calculated should be listed.

Page 2-29

23-11 Release limits are contained in Table 2-4, and not in Table 2-6 as referred to in Table 2-8 on Page 2-29.

Page 2-29

23-12 Table 2-8 on this page lists calculated releases for CHLW, PWR, and BWR for salt and hard rock respectively. However, only one figure is listed in each case. Is the same value applicable to both or is this an error?

Page 2-31

23-13 The fact that the composite effects per MTHM is lower with a co-mingled repository is not relevant. The relevant fact is that there will be a higher total inventory in the case of co-mingled wastes, and therefore a higher total possible impact.

23-7 Information about basalt was not sufficiently developed at the time this study was initiated to use in the analysis.

23-8 The overpack is a composite consisting of a thick-walled carbon steel cylinder covered by a thin TiCode outer shell. The TiCode outer shell is the same thickness on both the commercial waste overpack and the defense waste overpack. Its thickness, 2.5 mm, is the minimum thickness needed to handle and work with the material. The thickness of the carbon steel cylinder is different in the two cases primarily for reasons of structural strength requirements rather than radioactivity or heat levels.

23-9 The 168 million dollars for the cost of underground workings and rock handling in a defense-only repository is for capital (construction) and compares with a capital cost of 245 million dollars for the commercial salt repository. The operating costs associated with underground workings and rock handling in the defense-only repository is included in the 1.2 billion dollar defense-only repository operating costs. They are not separately shown because different cost estimating methodologies were required. The operating cost for underground workings in the defense-only repository will be different than for the commercial repository because of the different number of waste packages and the closer spacing of the defense waste as compared with the commercial waste.

23-10 Since the predicted releases for radionuclides other than C-14, TC-99, and I-129 are zero, it is not clear what usefulness would be served by including them in a table. The health and safety section of the report has been revised based on recent data indicating there will be no releases of any radionuclides during the first 10,000 years following decommissioning of the repository. Citations to the reference in which the data presented in the draft report can be found were added to the final report.

23-11 A correction has been made to Table 2-8.

23-12 Yes, the same value is applicable to both salt and hard rock because the assumptions used in the estimating methodology were the same for both. The only factor that would affect the release rates in the methodology used is the retardation factor. This factor was the same in both media for the three radionuclides that were predicted to be released. The table referred to has been eliminated from the final document.

23-13 The reference to composite effects per unit of waste has been deleted and the health and safety section has been substantially revised. Recent studies indicate there will be no releases from a repository during the first 10,000 years following decommissioning.

Page 3-7

23-14

Table 3-2 on this page cites costs based on 1948 dollars. Is this a typographical error? If not, these figures should be converted to 1984 dollars for simplicity.

Page 4-2

23-15

Table 4-1 on this page lists the comparison of costs for separate repositories and in augmented commercial repository. According to these figures, it could be possible to build separate repositories for \$7.8 billion dollars. This table also states that it could cost as much as \$9.5 billion dollars to build a co-mingled repository. This seems to indicate that there is no clear cost advantage to disposing of defense wastes in a combined commercial and defense repository as stated on Page 4-12. What Table 4-1 appears to indicate is that the advantage depends heavily on the geologic medium and whether overpack is used on defense waste. In other words, it may be less expensive to store defense and commercial waste in separate salt repositories than to store them together in hard rock repository. These various scenarios need to be detailed individually to properly assess the alleged cost advantage cited in DOE/DP-0020 for disposing of defense wastes in a combined commercial and defense repository.

23-14 A correction was made to the table. The costs in the table are in 1984 dollars.

23-15 The maximum cost calculated for a combined repository of 7.9 billion dollars is slightly more than the lowest cost of 7.8 billion dollars for separate repositories. It is not appropriate to compare those two numbers. This is because the 7.9 billion dollars is for a repository in hard rock and the 7.8 billion dollars is for two repositories in salt. If the commercial repository was in hard rock and the defense-only repository was in salt, the lowest cost for separate repositories would be 8.7 billion dollars, which is still higher than the highest cost for a combined repository in hard rock of 7.9 billion dollars. This latter cost includes an overpack for defense waste whereas the lowest cost for the two separate repositories does not include an overpack for defense waste. It is possible however, that defense waste would require an overpack in a commercial repository but not in a defense-only repository. In addition, when the substantial development and evaluation costs are added to the cost of a defense-only repository, the cost advantage of the combined repository is even more pronounced, as discussed in the final report.

DEPARTMENT OF ENERGY & TRANSPORTATION

Watkins Building, 510 George Street

Jackson, Mississippi 39202

601 / 961-4733

October 25, 1984

Mr. David B. LeClaire, Director
Office of Defense Waste and Byproducts
Management
U. S. Department of Energy, DP-12
Washington, D.C. 20545

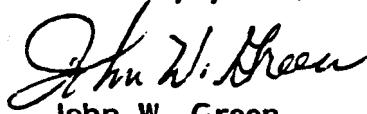
Dear Mr. LeClaire:

The State of Mississippi has reviewed the draft of "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste", dated July 1984. This review has resulted in the attached comments.

Also, please find attached two additional comments for your consideration. One is from Ms. Susan Purdy, the Secretary of the Nuclear Waste Policy Advisory Council to the Mississippi Department of Energy and Transportation. The other is from a Perry County citizen, Mrs. Bonnie J. Cole.

We appreciate the opportunity of reviewing this document and request we be kept informed and be allowed to comment on any other drafts as the final document is developed.

Sincerely yours,



John W. Green
Director, Nuclear Waste Division

JWG:pf
Attachments

cc: Mr. Benard Rusche
Mr. Wilbur G. Ball

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STATE OF MISSISSIPPI COMMENTS ON THE DRAFT REPORT "AN
EVALUATION OF COMMERCIAL REPOSITORY CAPACITY FOR
THE DISPOSAL OF DEFENSE HIGH-LEVEL WASTE"

The State of Mississippi has reviewed the U. S. Department of Energy's "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste." This review has resulted in the following comments.

GENERAL COMMENTS:

24-1

The report was generated as a result of the requirements of Section 8 of the Nuclear Waste Policy Act. This section requires the President to evaluate the use of repositories developed under Subtitle A of the Act for the disposal of high-level waste generated as a result of atomic energy defense activities. The Act places a limit on the loading capacity of the first repository; i.e., that capacity cannot exceed 70,000 metric tons of heavy metal (MTHM) prior to the operation of the second repository. The report assumes the operation of the second repository before the 70,000 MTHM limit is reached. Of that 70,000 MTHM, 20,000 packages (10,000 MTHM) of defense waste are assumed in the inventory. Those assumptions are at best, bold especially in light of the fact that the Nuclear Waste Policy Act allows for a maximum loading capacity in the first repository of only 70,000 MTHM until the second repository is operational. The Act also authorizes the construction of only one repository. Congressional action is required for construction and operation of a second repository. The report does not address the possibility that Congress, given the obvious public sentiment on the issue, may not authorize a second repository. The impacts of such a Congressional action, which are directly related to the issue of public acceptability, are avoided in the report, especially with respect to predicted impacts on the commercial fuel cycle should a second repository not be authorized. Additionally, no contingency alternative for disposition of defense-related HLW disposal is addressed should the second repository not be authorized.

24-2

The report states, on page E-10, that "the only factor that results in a significant advantage for either option is cost efficiency". "Cost" is a socioeconomic factor which is not addressed with any degree of adequacy. To be sure, the "cost" referred to in the report deals exclusively with construction and operation of the facility and with transportation costs to the facility. While it may be accurate that in the case of a comingled repository, the costs of the defense waste part of the facility are linearly related to the commercial waste repository costs, that is likely not the case for a defense-waste only repository given all the socioeconomic factors for the various sites. That issue with associated data should be developed and presented in the report much in the same fashion as would be expected in the environmental impact statement.

With respect to the comments in the previous paragraph, related to costs, Section 2.3.1. discusses such cost efficiency beginning on page 2-5. Socioeconomic studies are mentioned on page 2-15. It is one of seven

DEPARTMENT OF ENERGY AND TRANSPORTATION

JACKSON, MISSISSIPPI

COMMENTS

24-1 It is true that the combined inventory of defense and commercial wastes cannot exceed 70,000 MTHM in the first repository until a second repository becomes available. Since the Nuclear Waste Policy Act includes procedures for selecting a second repository, it is reasonable to assume that two repositories will be constructed. If a second repository is not authorized and built, the utilities will be faced with a disposal problem, regardless of whether or not defense waste is placed in the commercial repository, since the utilities are expected to have 140,000 MTHM equivalent of waste available for disposal by the year 2020.

The purpose of this document is to compare two disposal options for defense high-level waste with respect to the factors specified in the Nuclear Waste Policy Act. It is not a planning document for defense high-level waste. Therefore it is not appropriate to address alternative disposition of this waste if a second repository is not built.

24-2 The socioeconomic costs are part of development and evaluation (D&E) activities. As indicated in the final report, these costs are likely to be nearly the same for a defense-only repository as for a commercial repository. Incremental D&E costs for a commercial repository due to the inclusion of defense waste in the repository will be small by comparison. Thus, the inclusion of D&E costs in the comparison will increase the cost advantage of the combined repository option.

24-2
cont'd

elements for which cost estimates are 4.5 billion 1984 dollars. There is no indication of what proportion of the total cost is associated with each of the seven factors. That cost is assumed to be the same for all disposal options. No data, documentation or specific citations are included to support or otherwise provide a basis for the assumption. That should be included.

24-3

With regard to the assumptions used, and that appears to be the basis of the report since there are over sixty cited "assumptions", the Department is strongly urged to provide a basis and supporting data for the assumptions. More simply, the assumptions should be legitimatized. We feel that the issue is one which must receive specific attention by the Department of Energy as they revise the document. So many assumptions tend to make this document one of the weakest we have reviewed.

SPECIFIC COMMENTS:

24-4

(1) It is stated on page 1-2 "Close liaison between the defense and commercial waste disposal programs is being maintained to assure technical and schedule compatibility." This, frankly, is difficult to believe. If there were such close liaison, why wasn't the comingling option even discussed in the current draft of the Environmental Assessments? Since the available dosage and amount of host rock to be excavated should be affected, then the option should have been included in the E.A.'s. There either wasn't close liaison or there is a reason why the option was not included.

24-5

(2) It may be premature to identify the final waste form, at least until more definitive information is known about the geochemical characteristics of the potential repositories. However, on page 1-5 it is noted that the SRP waste form will be borosilicate glass. Final waste forms from Hanford and INEL are not noted. From a conservative standpoint, it is suggested that the ultimate determination of the waste form, cannister design and composition, and the overpack/backfill design and composition should be delayed until such time as definitive information on the geochemical characteristics of the potential host media have been determined. For purposes of the conceptual repository design, it is ill advised to make these preliminary design decisions until after the prospective sites have undergone detailed site characterization.

24-6

(3) There are several possibly errant assumptions utilized in the transport model used to perform health and safety impact analyses. While the results of execution of the model are to be used to identify only gross (significant) differences between options, the model should be refined to reflect contingencies such as short-term cannister failure. On page 2-19 the statement is made that "no releases of radioactivity from the waste package were assumed to occur for a time period of 300 to 1000 years." From a conservative standpoint, the Department should exercise the model utilizing exactly the opposite assumption - while closure rates and accompanying geomechanical forces on the waste package may be of no significance in hard-rock repository, such would not be the case in the salt repository. While the Section 8 report does not require the President to analyze the use of the potential salt repository versus a hard-rock repository, that analysis should be performed using a more specific assumption similar to the one on page 2-18, but inserting a failed cannister

24-3 The report is based on a series of topical studies that were commissioned shortly after P.L. 97-425 became law. To complete the input prior to the President's evaluation, it was necessary to establish and fix repository concepts, geologic media, waste quantities, and other baseline assumptions that would fairly reflect the essential features of likely future repositories and operation, to the extent that the specific purpose of this evaluation could be accomplished.

Because of the rapid evolution of the repository program, some inconsistencies have arisen between assumptions of this study and the latest data and thinking within the repository program concerning such factors as repository design, waste forms, waste packaging concepts, regulatory requirements and costing factors. For example, the cost calculations for the commercial repository are based upon an earlier repository design than that detailed in the Civilian Radioactive Waste Management Mission Plan (DRAFT), which was submitted for public review and comment in April 1984. A comparison with the mission plan repository indicates an increased cost, but it would not change the result of this study.

24-4 The defense and commercial waste disposal programs are both the responsibility of the Department of Energy. The defense waste program is managed by the Assistant Secretary for Defense Programs. The commercial waste disposal program is managed by the DOE Office of Civilian Radioactive Waste Management. There is an understanding between the two DOE offices which specifically addresses their close liaison, particularly in the area of Research and Development activities. Each office also actively participates in the reviews of the documents of the other office to assure compatibility and consistency in regard to plans and schedules related to waste disposal, and to avoid duplication of efforts.

Since the passage of the Nuclear Waste Policy Act, the Office of Civilian Radioactive Waste Management has been operating on the assumption that defense waste will be disposed of in the commercial repository pending the outcome of the President's evaluation.

Since the repository capacity is initially limited to 70,000 MTHM it is premature to consider a larger capacity at this time in the EAs.

24-5 The assumptions made were for purposes of the analyses required in the report. No final decisions with respect to the repository design have been made. Such decisions are not expected to affect the qualitative results of the analyses presented in the report. The selection of borosilicate glass as the waste form for Savannah River Plant high-level waste was made in 1982.

24-6 This report is a comparative analysis of two disposal options for disposal of defense waste. The health and safety analysis is designed to compare the relative performance of the disposal scenarios. It is not meant to show compliance with the standards, which can only be done on a site-by-site basis.

SPECIFIC COMMENTS
PAGE THREE

24-6
cont'd

rate of a much shorter duration than the 300 years. This same comment is applicable to the overpack analysis presented on pages 2-24 and 2-25.

24-7

(4) The comments of the utilities are interesting given that the loading capacity of the repository with respect to commercially-generated wastes (including spent fuel and high-level waste) will be reduced by more than 14 percent should the repository be utilized for defense waste disposal with the commercial wastes. The report does not specifically state that the combined inventory of defense and commercial wastes cannot exceed 70,000 MTHM in the first repository. The Nuclear Waste Policy Act presumes the codisposal option, but does not presume the operation of a second repository. The economic impacts of a significantly delayed second repository and/or no second repository should be included in the report.

24-8

(5) Many utilities are now analyzing the effects on plant operation of going to extended fuel burnup. The report does not seem to address that issue, and perhaps it should not; however, the increased radionuclide inventory in spent fuel subjected to extended burnup should be addressed by the Department of Energy at some point in time, and the results of such a study applied to the codisposal option as per Section 8 of the NWPA.

24-9

(6) Health and Safety impact analyses are presented in Section 2.3.2. of the report. Of particular interest is Table 2-9 in which the short-term and safety impacts are presented. Two facts presented are worthy of comment. One, the table presents the radiological and non-radiological health and safety impacts for a salt and hard-rock repository. There is a difference by 5 orders of magnitude in the workers' dose commitments for the salt and hard rock repository. While there may be no distinction that is obvious with regard to a codisposal option, the difference may be significant in terms of the site selection. DOE is considering tuff and basalt as the "hard rock" options, and that should be spelled out specifically in the text. If granite is included as a "hard rock", the report is incorrect since granite is not presently among the media being considered for the first repository. It is difficult to believe that the radon contribution to dose in tuff and basalt would be as high as the table presents.

(7) The MDET Manager of Rail Activities presented comments on Section 2.3.4. These comments are:

24-10

(a) On page 2-50 the issue of shipping cask availability is presented. DOE has committed to the use of NRC certified casks for commercial wastes "if they are available." Are such casks compatible with defense waste forms? Will DOE transport its own defense wastes or will commercial carriers be employed?

24-10(1)

(b) Also on page 2-50 the costs of transportation, specifically rail transportation, does not consider track condition as a factor. Such consideration needs to be included in the report. On page 2-52, again transportation costs of rail transport do not include track rehabilitation costs.

24-10(2)

(c) On page 2-52 the statement is made, "No routing restrictions were imposed." That statement does not consider FRA track safety conditions as

24-7 A footnote has been added on page E-3 of the final report to make it clear that the 70,000 MTHM limit in the Act applies to the combined quantity of commercial and defense waste. Since the Nuclear Waste Policy Act includes procedures for a second repository, and there is more than enough commercial waste to trigger a second repository, it is not unreasonable to assume for purposes of this study that a second repository will be built.

24-8 This report is for the purpose of comparing disposal options for defense high-level waste. As you indicate, this report is not the appropriate place to address issues such as extended burn-up of commercial nuclear fuel.

24-9 As the report indicates, the dose commitment received by a worker may vary depending on the repository site and media selected. It was not intended to imply that the numbers presented are absolute for the media represented in the report.

24-10 A cask is currently being designed and developed for defense high-level waste. DOE intends to continue using commercial carriers for the transport of defense waste.

24-10(1) It is assumed that costs associated with maintenance and rehabilitation of railroad tracks will be recovered in the shipping charges. The same charges will apply whether the defense waste goes to a commercial repository or to a defense-only repository, therefore, consideration of these extra costs, if necessary, would not affect the conclusions of the study.

24-10(2) There is no reason why special use trains should be used. In any event, if they are required, the cost would be the same whether the defense waste went to a commercial repository or to a defense-only repository.

It is correct that the transportation routing model does not impose routing restrictions. Such restrictions are not predictable since monitoring of track conditions and subsequent correction of safety defects influence the timing of the restrictions imposed. Consideration of potential routing restrictions were not considered necessary for purposes of this analysis.

SPECIFIC COMMENTS
PAGE FOUR

24-10(2)
cont'd

a potential impediment. The assumption that rail shipments would be handled as "general freight" is a poor assumption. More conservatively, the assumption should be that unit trains, or special use trains, would be used.

24-10(3)

(d) On page 2-53 the statement is made that "the originating railroad tries to maximize the distance traveled on its own right-of-way. That may not be the case with regard to this consignment especially in view of the liability question.

24-10(4)

(e) On page 2-53 the loaded weight of a rail cask may exceed weight limitations on some trackage segments. The turnaround time of five days for rail casks is overly optimistic.

24-10(5)

(f) On page 2-57 the statement is presented, "Only very severe accidents would result in any exposure at all." What is a very severe accident?

24-11

(8) While the question of public acceptability has only been established by the Congressional record, the record surrounding the development of the Los Medanos site as the WIPP project should be included in the data base. That was not done.

24-12

(9) There is an assumption presented on page 3-4 with which we must take issue. "...the assumptions are made that a defense only repository would be located at one of the three sites recommended...but not selected...for the civilian repository." While the conclusion of the report does not include a defense waste - only repository, the Department's contractor must not presume that any site will be qualified. What if three sites are not successfully characterized?

24-13

(10) There is a technical point worthy of some discussion regarding Table 4-1, page 4-2. The capacity of the combined repository is given at 80,000 MTHM. Footnote (b) is correct in stating that Section 114(d)(2) of the NWPA limits the capacity - regardless of the waste form-to 70,000 MTHM, not 80,000 MTHM. The capacity limitation is removed altogether when the second repository is licensed and becomes operational. The figure of 80,000 MTHM is misleading at best and not in accord with the NWPA. The table should be corrected accordingly. It assumes a second repository.

24-14

(11) Our last comment is directed at the reference section of the report starting on page 5-1. There are but a few of the references presently available to the State upon which to present more detailed commentary on the report. More importantly, perhaps, is the fact that the references cited in Section 5.0 are not cited in the preceding four sections. Those footnoted references would improve the overall quality of the report. The lack of access to the references weakens this state's comments.

24-10(3) The factors that influence routing by the railroad are the same whether the waste goes to a defense-only repository or a commercial repository; therefore, the analysis would not benefit from considering alternative routings.

24-10(4) Turn-around time only refers to the time for loading of the casks at the waste generating site and unloading the cask at the repository site. The travel time between the generating site and the repository depends on the locations of the origin and destination and was considered separately for each origin and destination in the analysis.

24-10(5) A very severe accident is one which would result in the release of radioactive material.

24-11 The public acceptability section has been reworded to indicate that there are other records of public discussion relating to disposal of defense waste.

24-12 The report was modified to reflect the fact that for a defense-only repository, at least three sites may have to be characterized, one of which would be selected as the actual repository site.

24-13 It is true that the combined inventory of defense and commercial wastes cannot exceed 70,000 MTHM in the first repository until a second repository becomes available. It is not unreasonable to assume that a second repository will be built as scheduled in the Act and therefore that additional waste could thereafter be placed in the first repository.

24-14 Your comment is well taken. The references have been cited in the text of the final report. The references were made available to those who requested them.

RECEIVED

BONNIE JR CURTISS COLE
RICHTON AND ABERDEEN, MISSISSIPPI
P.O. Box 566 Richton
39476

OCT 1 '84

NWP

Ron Forsythe
Dept. of Energy
Wardrobe Ltd
510 George St
Jackson, MS
39202-2096

Dear Ron,

In reference to the D.O.E./D.P. 0020 (Draft) the collocation of defense and commercial waste, there are a few comments I would like to make:

25-1

1) This draft is based on assumptions. There in - is 43 assumptions several expectations. This does not appear to be a responsible approach; we know it is not a technical one. This causes great fear in the minds of the people in this area.

25-2

2) Contradictions on cost of hard rocks versus salt - the only factors are the creep effect plus back fill. In all ONWI's Hard rock Repositories were assets to be more costly.

25-3

3) The creep effect plus collocation, brings with it other problems. Larger area needed, larger amounts of mixed salt, and the effects of the salt on the environment

25-4

4) The only reason for this draft is cost efficiency.

25-5

5) The transportation of Nuclear waste is not adequately addressed; with increased transportation to one site, this could cause a bottle neck effect which would increase the chance of accidents and radon releases.

BONNIE J. CURTISS COLE
Richton and Aberdun, Mississippi

RESPONSE TO COMMENTS

- 25-1 The purpose of the report was to provide a comparison of options for disposal of defense high-level waste. It does not require the detailed technical analysis that will be used in making decisions for reporting site selection.
- 25-2 The characteristics of the media are but one factor that influences repository costs. There are other factors which are site-specific such as availability of roads, utilities, rail lines, and other services as well as the site topography.
- 25-3 The total amount of material mined would be greater when separate repositories are constructed than when defense waste is disposed of in the commercial repository.
- 25-4 The Nuclear Waste Policy Act requires defense waste to be disposed of in a commercial repository unless the President finds that a defense-only repository is required. Cost efficiency is one of the factors to be considered in the evaluation.
- 25-5 Local transportation effects are site-specific and will be addressed during the process of site selection. Appropriate remedial actions may be taken to avoid traffic bottlenecks.

The Department of Energy has investigated several methods for disposing of salt in excess of needs for backfilling the repository. DOE is committed to the proper control or disposal of the salt. Specific methods that may be used to control or dispose of the salt are discussed in the environmental assessments of the salt sites under consideration for a repository. If a salt site is selected for a repository, the Environmental Impact Statement will provide further details on plans for control and disposal of the excess mined salt.

25-6
 b) Population is not addressed: we feel that regulation should take priority over security and cost efficiency.

25-7
 i. Is the collection of defense and commercial waste will this not lessen time standards? who will regulate? Most defense wastes are classified will this cause problems? who handles security?

25-8
 ii) Examinations, page 2-54 DOE/DP 0020 Draft Public institutions and groups that have been when has been an examination taken place? by whom was it taken? If the people in the state of MS had been examined it would be well known, there is no acceptability for the siting of any nuclear repository in this state.

25-9
 9) Major concern. Not sufficient technical information to make sound decisions on the storage of nuclear waste in salt be it any type.

25-10
 iii) Major Problems in Radiation Zone - are still population
 Bore holes
 Dissolution
 aquifers
 insufficiency studies

Other sites have been disqualified for these reasons:

Engineering, Inc.
 P.O. Box 564
 Richton, MS
 39060

Constituents

J.C. Stennis
from last-
The 1 specimen

- 25-6 Population is a relevant consideration to the comparison of disposal options for defense waste, and is an inherent consideration of the health and safety factor and the regulation factor.
- 25-7 Defense waste that will be disposed of in the repository will be unclassified. It will be subject to the same regulations as the commercial waste.
- 25-8 The issue of concern is whether there is a difference in public acceptability for the two disposal options for defense waste, not the public acceptability of a particular nuclear waste repository.
- 25-9 The question of the acceptability of a particular media for a repository is not relevant to this report.
- 25-10 The issues involved in the selection of a specific site for a repository are outside the scope of this study.

DEPARTMENT OF ENERGY & TRANSPORTATION

MEMORANDUM

TO:

John Green

DATE: October 2, 1984

FROM:

Susan Purdy *Susan Purdy*

SUBJECT: Comments on Comingling Study

The document is unique in its quality compared to previous documents received from the Department of Energy. What a pleasant change it is to have the unknown acknowledged in the mathematic model as well as the hypothesis clearly stated.

26-1

I feel that before the recommendation could be accepted an indepth analysis needs to be done on how it would affect the interpretation of the Nuclear Waste Policy Act of 1982, particularly with regard to access to information and public participation; how it would affect the Mission Plan, and, if the comingling recommendation were accepted, how it would affect the state and federal relationship, particularly with regard to access to information, and how it would affect the legal relationship. And I would like the question asked about the difference in cost figures in the comingling document and DOE's figures in salt--we would like clarification on the basis of those differences. DOE has salt being the least expensive and the comingling document has salt being more expensive.

26-2

It should be noted that the document is a scientifically sound one for its limited scope but the scope should be expended before a decision of that magnitude is made.

SP:mpf

DEPARTMENT OF ENERGY AND TRANSPORTATION
Jackson, Mississippi

RESPONSE TO COMMENTS

- 26-1 The Nuclear Waste Policy Act requires the same degree of cooperation and consultation with States and Indian Tribes for a defense-only repository as for a commercial repository.
- 26-2 The cost of a repository is influenced by a number of factors. The higher cost of the defense-only salt repository was due to the fact that the lower cost overpack in hard rock more than compensated for higher costs associated with construction of the hard rock repository. The commercial hard rock repository was more costly than the commercial salt repository in the report.

The Nuclear Waste Policy Act presumes that defense waste will be disposed of in the commercial repository unless the President determines that a defense-only repository is required. Thus, the access to information and public participation requirements of the Act are not affected if the President lets stand the Congressional decision to place defense waste in the commercial repository.

Natural Resources Defense Council, Inc.

1350 NEW YORK AVENUE, N.W.
SUITE 300
WASHINGTON, D.C. 20005
202 783-7800

New York Office
122 EAST 42ND STREET
NEW YORK, N.Y. 10168
212 949-0049

October 31, 1984

Western Office
25 KEARNY STREET
SAN FRANCISCO, CALIF. 94108
415 421-6561

Mr. David B. LeClaire
Director
Office of Defense Waste
and Byproducts Management
U.S. Department of Energy, DP-12
Washington, D.C. 20545

Dear Mr. LeClaire:

The Natural Resources Defense Council (NRDC) submits these comments on the Department of Energy (DOE) report, "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste" (DOE/DP-0020) (DRAFT) (July 1984) (hereafter cited as the "Draft Report").^{1/}

I. The Draft Report Fails to Account or Plan For Over Half the Defense High-Level Waste Which, By Law, Must Be Disposed of in a Permanent Geologic Repository

27-1 The most glaring error in the Draft Report is the Department's failure to account or plan for nearly half the

^{1/} On August 28, 1984, NRDC requested an extension of the comment period on this report until October 31, 1984, or until sixty days after NRDC receives copies of the Working Papers upon which the Draft Report is based, whichever is later. DOE extended the comment period for NRDC to October 31, 1984, but has still not released all the Working Papers, even though NRDC filed a request under the Freedom of Information Act for those papers on August 14, 1984, over two months ago. NRDC therefore reserves the right to submit additional comments on the Draft Report after we receive copies of the Working Papers.

New England Office: 850 BOSTON POST ROAD • SUDBURY, MA. 01776 • 617 237-0472
Public Lands Institute: 1720 RACE STREET • DENVER, CO. 80206 • 303 377-9740

NATURAL RESOURCES DEFENSE COUNCIL, INC.

RESPONSE TO COMMENTS

27-1 The current DOE reference plan is to stabilize in-place waste stored in 149 single shell tanks at Hanford Reservation if, after the requisite environmental documentation, it is determined that the short-term risks and costs of retrieval and transportation are greater than the environmental benefits of disposal in a geologic repository. For that reason, that waste was not considered in this study. Should it be determined that the benefits of geologic disposal prevail, then the waste in those single shell tanks will be processed and disposed of in a geologic repository. The requirement to dispose of such waste in a repository is not expected to alter the qualitative findings of this study.

27-1
cont'd

defense high level waste (HLW) which, by law, must be disposed of in a permanent geologic repository. DOE's examination of both the colocation and defense-only repository options is apparently premised on the assumption that a great percentage of the defense HLW in this country need not be sent to a geologic repository at all. In particular, as shown below, the Department apparently assumes that up to 45 percent of the nation's existing defense HLW will be stabilized in place at the Hanford Reservation. In

27-2

the Draft Report, DOE also fails to account or plan for disposal of thousands of cubic meters of defense HLW that the agency will generate in the next few decades at the Hanford Reservation and the Savannah River Plant.

27-3

This major miscalculation is apparently based on an erroneous reading of the Nuclear Waste Policy Act, a statute which, as shown below, requires DOE to dispose of all HLW in underground geologic repositories. The Department must correct this error and all the evaluations upon which it is based. In particular, the Department must determine whether this faulty assumption has skewed the Draft Report's analysis of the factors listed in Section 8(b)(1) of the Nuclear Waste Policy Act; namely, the relative cost efficiency, health and safety effects, regulation, transportation impacts, public acceptability and national security of the two repository options.^{2/}

2/

It may well be that correcting for this error will produce no change in the Draft Report's conclusion that a colocated repository is preferred, largely on cost grounds, over a defense-only repository. In our view, the Department's

footnote cont'd

- 27-2 The 20,000 canisters of defense waste (10,000 MTHM) addressed in this document include all the high-level defense waste that will be generated in the next few decades at the Hanford Reservation and the Savannah River Plant.
- 27-3 The Department is conducting a National Environmental Policy Act analysis which examines alternatives for disposal of radioactive waste in 149 single shell tanks at Hanford Reservation. This analysis bears on the question of whether all defense high-level waste must be disposed of in a geologic repository. Whatever alternative is selected, the Department is committed to being in full compliance with all applicable laws.

The erroneous assumptions noted here are not confined only to the Draft Report. Indeed, the projections regarding the volume of defense waste to be disposed of in a geologic repository are based on prior DOE documents, notably the Department of Energy Defense Waste Management Plan (DOE/DP-0015) (June 1983). The Department's Draft Mission Plan (DOE/RW-0005 DRAFT) (April 1984) contains similar errors, which NRDC noted in our July 1984 comments to DOE. These erroneous projections and assumptions regarding defense wastes have created systematic flaws in much of the Department's planning regarding nuclear waste management, and must be corrected. We urge you to review not only the Draft Report, but such other planning documents as the Defense Waste Management Plan, the Mission Plan, and the upcoming Hanford Defense Waste Environmental Impact Statement, to correct for these flaws.

A. The Draft Report Fails to Plan for Disposal of Over 140,000 Cubic Meters of Hanford Defense High-Level Wastes.

A close examination of the Draft Report reveals a fact which 27-4 DOE fails to state explicitly: that it plans to stabilize in place, rather than dispose of, over 140,000 cubic meters of

conclusions with regard to the Section 8(b)(1) factors would probably not change greatly, since the increased costs, and the impacts upon transportation, health and safety, and national security would occur with respect to either repository option. It is nevertheless incumbent upon the Department to perform the Section 8(b)(1) analysis taking into account the entire volume of existing and projected defense HLW.

27-4 In response to your comment and others on the same subject, the final document was revised to address the waste you refer to. The document was not intended to be a planning document for defense high-level waste management. The Defense Waste Management Plan which you refer to is. The plan states that the DOE reference plan is to stabilize in-place waste stored in 149 single shell tanks at Hanford Reservation if, after the requisite environmental documentation, it is determined that the short-term risks and costs of retrieval and transportation are greater than the environmental benefits of disposal in a geologic repository. For that reason, that waste was not considered in this study. Should it be determined that the benefits of geologic disposal prevail, then the waste in those single shell tanks will be processed and disposed of in a geologic repository. The requirement to dispose of such waste in a repository is not expected to alter the qualitative findings of this study. It is not appropriate to address comments to the Plan or to the Hanford Briefing Document which you refer to here.

the existing defense HLW in the United States. This plan is simply unacceptable.

27-4 cont'd The Draft Report's evaluations of both the colocation and defense-only repository options appear to be premised on the assumption that no more than "20,000 defense waste packages, approximately equivalent to 10,000 MTHM of commercial high-level waste, are to be emplaced in the repository." Draft Report, p. 1-11 (emphasis added). This 20,000 canister^{3/} assumption is echoed throughout the report, see, e.g., pp. E-2 to E-3, and provides the baseline assumption from which all cost calculations and other assessments of the Section 8(b)(1) factors are made. The basis for this assumption appears to be Table 1-1, Anticipated Shipment of Defense Waste Packages To A Geologic Repository (Draft Report p. 1-9), which is in turn derived from the June 1983 Defense Waste Management Plan. Id.

The assumption that no more than 20,000 canisters will be emplaced in a repository, when read in combination with other statements in the Defense Waste Management Plan, makes it clear that the Department is not planning to dispose of all of the country's high-level defense waste in an underground repository. For instance, the Department has stated that:

New and readily retrievable high-level waste [at DOE's Hanford Reservation] will be immobilized for disposal in a geologic

^{3/} The Draft Report appears to use the terms "package" and "canister" interchangeably. If the Department intends these terms to have different meanings, it should be more specific.

repository. Other high-level waste [at Hanford] will be stabilized in place if, after the requisite environmental documentation, it is determined that the short-term risks and costs of retrieval and transportation outweigh the environmental benefits of disposal in a geologic mined repository.

Defense Waste Management Plan, p. 18 (emphasis added). Table 1-1 of the Draft Report similarly indicates that anticipated 27-4 cont'd shipments of immobilized waste from Hanford are based on "vitrification of high-leval waste generated by reprocessing the inventory of N-reactor spent fuel and readily retrievable stored high-level waste." Table 1-1, p. 1-9 (emphasis added).

Although DOE has never provided a definition of "readily retrievable" high level waste,^{4/} it is, in fact, quite clear that the Department does not consider any of the waste currently stored in the 149 single-shell tanks at Hanford to be "readily retrievable." A recent DOE Hanford briefing document, prepared for the Environmental Protection Agency, indicates that the waste in the single-shell tanks is not considered "readily retrievable," since these tanks do not possess the sluicing capabilities of the 20 double-shell tanks at Hanford. See DOE-RL, Hanford Defense Waste Disposal Program, EPA Staff Site Visit (Dec. 1983) ("DOE Hanford Briefing Document"), p. 2-18. The DOE Hanford Briefing Document explicitly affirms that the Department now considers its "reference disposal plan" for the Hanford waste to be the in-place stabilization of all 149 single-

^{4/} DOE should provide such a definition in the final version of the Report.

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shell tanks, rather than geologic disposal of the wastes they contain.

As of May 1983, DOE has stored at Hanford approximately 183,000 cubic meters of high-level defense wastes in various forms. Defense Waste Management Plan, p. 17. This represents 27-4 nearly 60% of the total volume of defense high-level waste in the country. Id., p. 12. Of this amount, over 140,000 cubic meters is stored in the 149 single-shell tanks, and alone represents cont'd some 45% of the nation's defense high-level nuclear waste by volume. Under its current plan, therefore, the Department does not intend to dispose of almost half of the defense high-level waste in the United States in a geologic repository.

This plan is simply unacceptable on health and safety, environmental,^{5/} and legal grounds. While the Department has asserted that retrieving the waste stored in the Hanford single-shell tanks will cost more and pose greater safety and health risks than would in-place stabilization, see, e.g., DOE Hanford Briefing Document, pp. 3-4 to 3-24, we have found no documentation to support these claims, either in the DOE Hanford Briefing Document or the Defense Waste Management Plan. Furthermore, DOE assertions that in-place stabilization of the Hanford tanks will "meet applicable standards and regulations"

^{5/} DOE has yet to carry out a full environmental investigation of this proposal. DOE Hanford Briefing Document, pp. 3-1 to 3-29.

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27-4
cont'd

for safety, health and the environment, id. at p. 3-9, remain just that -- assertions without substantiation.^{6/} The limited data provided in the EPA briefing materials, purporting to show that radiation from the leaking tanks has not spread very far, are unconvincing and have not been subjected to critical review. Nor are they adequate grounds to justify the supposed safety of in-place stabilization. Even if there were legal grounds for exempting the Hanford tanks from geologic disposal, the Department's data and arguments for in-place stabilization remain most unconvincing. And as shown below, DOE has no legal authority to exempt its waste from the NWPA's repository disposal requirements.

B. The Draft Report Fails to Plan For Disposal of a Large Portion of the Defense HLW that Will Be Generated in the Next Few Decades

27-5

In addition to ignoring much of the existing HLW at Hanford, the Draft Report also fails to plan for disposal of thousands of cubic meters of defense HLW that DOE will generate at Hanford and the Savannah River Plant over the next few decades. The Draft Report indicates that 120 canisters of defense HLW will be shipped from Hanford each year beginning in 1998. Table 1-1, p. 1-9. This figure is based on current projections that the B

^{6/} These assertions have a particularly hollow ring in light of DOE's attempts to lobby EPA and the Nuclear Regulatory Commission to weaken the standards and regulations that would apply to this waste.

27-5 The 3200 cubic meters of waste initially generated by the PUREX is processed in such a manner so as to concentrate the highly radioactive components in 114 cubic meters of sludge which is fed to the immobilization facility. The residual waste volume is low-level waste and treated accordingly.

27-5
cont'd

Plant Immobilization Pilot Plant at Hanford will reprocess 114 cubic meters of Purex sludge annually beginning in the late 1980's. Defense Waste Management Plan, p. 18-19. Yet, assuming these projections are correct, the B Plant will not be able to reprocess all of the 3200 cubic meters of waste generated annually by the Hanford Purex facility, which began operating again in 1983. Id., p. 19. Thus it appears from the Draft Report that not only will the backlog of wastes in the single-shell tanks at Hanford not be vitrified and shipped to a repository, but that the backlog of waste at Hanford will continue to grow larger. Another possible interpretation of these figures is that DOE has deliberately understated the amount of Hanford waste that will be generated in the next few decades, reprocessed by the B Plant, and sent to a repository.

27-6

The Draft Report's discussion of the Savannah River Plant (SRP) vitrification plans contains a similar inconsistency. The Draft Report states, at p. 1-5, that DOE will produce 500 canisters of immobilized waste a year at SRP beginning in 1989. However, according to Table 1-1, DOE does not anticipate beginning shipment of 500 canisters a year until 1998, nine years later. Thus, after 1998 the canisters produced each year will equal the number sent to a repository; however, no mention is made of the 4500 canisters which will be produced between 1989 and 1998, before DOE begins shipments to a repository. We conclude that DOE has either severely underestimated the total amount of waste that will be shipped from SRP, or made no plans to dispose of this waste in a repository.

27-6 Once the backlog of waste currently in storage tanks at Savannah River is worked off, the rate of production of canisters of immobilized waste will be reduced below the rate of shipment of canisters to the repository to allow the backlog of immobilized waste in storage at Savannah River to be worked off.

27-6
cont'd

In short, the Draft Report fails to account for a large amount of the existing and future defense waste in the country, underestimates the volume of wastes on the order of 50 percent and is extremely unclear about current Department plans regarding such wastes. To the extent these omissions are based on DOE plans to store or stabilize much of its HLW on site, they are completely unacceptable. The Department must not only clarify its assumptions and plans in the Draft Report, but must also correct the Report where necessary to plan for the disposal of all high-level defense wastes.

27-7

C. DOE Has No Legal Authority to Exempt Any of its High-Level Wastes From the Requirements of the Waste Policy Act

The Department of Energy has no legal authority to stabilize or store defense HLW on site indefinitely in lieu of final repository disposal. The Nuclear Waste Policy Act (NWPA) requires DOE to dispose of all high-level nuclear waste in a permanent geologic repository. It is apparent from the comprehensive language of the Act and its legislative history that no high level wastes, including the defense wastes at Hanford, are exempt from this requirement.

Before enacting the Nuclear Waste Policy Act, Congress considered at length a number of proposed solutions to the nuclear waste disposal problem. Congress clearly rejected all other disposal options in favor of deep geologic burial. "The decision to go with deep geologic disposal is based on a belief

27-7 The current DOE reference plan is to stabilize in-place waste stored in 149 single shell tanks at Hanford Reservation if, after the requisite environmental documentation, it is determined that the short-term risks and costs of retrieval and transportation are greater than the environmental benefits of disposal in a geologic repository. For that reason, that waste was not considered in this study. Should it be determined that the benefits of geologic disposal prevail, then the waste in those single shell tanks will be processed and disposed of in a geologic repository.

The Department is conducting a National Environmental Policy Act analysis which examines alternatives for disposal of the radioactive waste in the 149 single shell tanks at Hanford Reservation. This analysis bears on the question of whether all defense high-level waste must be disposed of in a geologic repository. Whatever alternative is selected, the Department is committed to being in full compliance with all applicable laws.

that, no matter how well crafted, no man-made barrier is likely to last the eons during which the radioactive waste must be contained." 128 Cong. Rec. H8796 (daily ed., Dec. 2, 1982) (statement of Rep. Ottinger).

Congress' choice of deep geologic disposal does not distinguish between defense and commercial waste, and certainly not between "readily retrievable" and "non-readily retrievable" waste. Neither the preamble to the Act, which speaks broadly of the "disposal of high level radioactive waste", nor the definition of such waste in Section 2(12) of the Act, makes such distinctions. The language of Section 8 further demonstrates Congress' intent to permanently dispose of all HLW, both defense and commercial, in a geologic repository. The only options open to the President and the Secretary under this section are either to find that a defense-only repository is necessary, or to collocate defense and commercial waste in a repository. Section 8(2), NWPA.

27-7
cont'd

Public concern about radioactive wastes was a key element in prompting Congress to enact the NWPA. This concern extended to defense wastes as well as civilian waste. In fact, in considering the issue, Congress pointed to the leaks from the Hanford single shell tanks as a reason for the successful state initiatives banning further construction of nuclear power plants until a solution to the nuclear waste problem had been found. H.R. Rep. No. 491, Part I, 97th Cong., 2nd Sess. (1982), at 27. See also H.R. Rep. No. 785, Part I, 97th Cong., 2nd Sess. (1982)

(1982) (discussions of defense waste as part of the overall radioactive waste problem).

The exceptions for defense waste in the NWPA do not reach as far as exempting defense waste from disposal in a geologic repository, but merely exempt any defense-only repository from certain NWPA siting requirements. Thus, by failing to include all high-level defense wastes in its current plans and in the Draft Report, the Department is creating a new exception for certain high-level wastes, in violation of the NWPA and contrary to Congressional intent.

This legal requirement that all HLW must be disposed of in a mined geologic repository applies to the Hanford wastes in 27-7
cont'd single-shell tanks, as it does to other defense wastes. The NWPA gives no authority to the Department or any other agency to exempt certain wastes from this requirement, even if the costs of retrieving those wastes are higher than for other wastes.^{7/} It is simply not the agency's role to substitute its own cost and safety assessments for those of Congress. Current plans to stabilize the Hanford wastes in place are therefore unacceptable and should not be the presumed or reference option for planning purposes in the Draft Report or other Department reports. The Department is required by law to dispose of all defense HLW and

^{7/} As stated above, we have found no evidence that retrieval of the Hanford wastes would cost more in terms of health and safety than in-place stabilization.

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must correct the Draft Report and other planning documents in this regard.

27-7
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II. The Draft Report Understates the Differences in Costs Between a Comingled and a Defense-Only Repository.

27-8

Despite DOE's failure to account for all its existing and projected HLW, the Draft Report's basic assessment that a defense-only repository would cost considerably more than a colocated repository appears to be generally accurate. Yet there is a major erroneous cost assumption in the report which, when corrected, would appear to raise the estimated relative cost of a defense-only facility over a comingled repository. This error is the Draft Report's failure to include development costs in its cost comparisons. The Draft Report estimates that development costs will be about \$4.5 billion,^{8/} which "is assumed to be the same for all the options." Draft Report Table 2-3, p. 2-14. Moreover, the Draft Report asserts that construction and operating costs, but not development costs, are the "primary elements that would be affected" by comingling the wastes. Id. p. 2-10.

^{8/} DOE should explain the basis for this cost estimate in the final report. It is very possible that, because technologies for immobilization, waste packaging, and waste transportation may differ between defense and commercial waste, the Department could incur significant additional development costs for defense waste. The Department should take this factor into account in its cost estimate, even though it may not affect the relative costs of the two disposal options.

27-8 The Draft report assumed that the defense repository program could purchase the D & E carried out by the commercial repository program for a site characterized but not finally selected for use for a commercial repository. However, upon reconsideration of this issue, it was determined that this may not be a feasible option. The D & E costs for a defense-only repository are not known at the present time. Therefore, as a simplifying assumption, they are considered to be comparable to the D & E costs associated with the commercial repository. When D & E costs are considered, the cost advantage of disposing of defense waste in a commercial repository is enhanced as you indicate. The final report has been revised to reflect this.

The major flaw in these estimates is that they are based on the assumption that a defense-only repository would be located at one of the three sites recommended for site characterization but not chosen for a civilian repository. Draft Report, p. 3-4. As shown below, this assumption is untenable on policy grounds. And without such an assumption, it is clear the Department would incur significant additional costs in selecting an entirely new site for a defense-only repository.

While the NWPA provides little guidance on how DOE should select a defense-only repository site, it does require DOE to notify and consult with affected states and Indian tribes regarding the site selection decision-making process. The Department should not assume that affected states and Indian tribes would concur in a decision to site a defense-only repository on one of the sites characterized for commercial repository development. Furthermore, a real possibility exists that site characterization will reveal some sites to be technically unsuitable for a repository under NRC licensing requirements. The possibility that affected states or tribes could discourage location of a defense-only repository in one of the unselected characterized sites (through the political process or otherwise), and that sites could be technically disqualified after characterization, renders the draft Report's assumption highly uncertain. This assumption should be rejected. Thus, the costs of a defense-only repository would rise even more in comparison to the colocation option if DOE had to select an

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27-8
cont'd entirely new site and undertake the requisite scientific investigation undertaken.

27-9

III. Several of the Baseline Assumptions in the Draft Report are Highly Questionable and Must Be Clarified or Revised

The Draft Report lists nine "baseline assumptions," pp. 1-11 and 12, which were used in comparing the two repository options. In general, we find that DOE has failed to carefully explain these assumptions, and to explore the sensitivity of the analysis to changes in these assumptions. Again, this problem is not confined to the Draft Report alone, but also permeates both the Defense Waste Management Plan and the Mission Plan. We urge you to carefully reconsider this approach, both to improve public accountability and acceptability of the program, and to insure against major obstacles which could otherwise develop if any of the Department's assumptions prove false.

27-10
A. The Draft Report Should Not Perpetuate Erroneous Assumptions From the Defense Waste Management Plan

Assumption 1 states that the evaluation in the Draft Report is consistent with the Defense Waste Management Plan. Yet, as noted above, the Defense Waste Management Plan makes numerous erroneous or questionable assumptions regarding defense waste disposal. These assumptions should not be perpetuated and given greater validity in the Draft Report. Consistency is not a desirable goal, in this case, where the plans at issue fail to

27-9 The assumptions made in the report reflected the data and thinking with respect to the repository program at the time the study was initiated. Because of the rapid evolution of the repository program, some of those assumptions do not reflect today's concepts. A comparison between current repository concepts and the concept used in the study indicates that the repository cost is higher today, but the results of the study do not change on account of this. It would require a drastic change in the baseline assumptions to effect a change in the cost relationship between disposal options.

27-10 The Defense Waste Management Plan is a policy and planning document for the Department of Energy. It establishes reference plans for disposal of defense high-level waste at each Department generating and storage site. Those plans are recognized as subject to revision based on completion of the National Environmental Policy Act process, authorization and appropriation of funds by Congress, agreements with states, as appropriate, and, in some cases, the results of ongoing research and development activities. The final report addresses the possibility that the reference plan may not be followed ultimately, and the consequences with respect to the Hanford reference plan are stated as in our response to your comment 27-7, above.

27-10 address the proper disposal of nearly half of the existing high
cont'd level waste in this country.

B. DOE's Assumption Regarding Commercial HLW is Highly Questionable

27-11 Assumption 3 posits that a 70,000 MTHM commercial repository would contain exactly half spent nuclear fuel and half commercial HLW. This is an incomprehensible assumption, given that there was only 2315 cubic meters of commercial HLW in existence as of 1982,^{9/} and that there are virtually no prospects for reprocessing of commercial high level waste in the foreseeable future.

C. DOE Must Justify Its Assumption Regarding An Augmented Repository

27-12 The assumption that up to 20,000 defense waste packages are to be emplaced in the repository has been discussed above. The Department, however, must also address the question of whether an "augmented repository" will be legally permissible if a second repository is not constructed, as the Draft Report assumes it will be, before the first repository reaches the 70,000 MTHM limit set out in the NWPA.

^{9/} See U.S. Dept. of Energy, Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics, pp. 54, 58 (DOE/NE-0017/2) (Spent Fuel Report) (Sept. 1983).

27-11 As stated in our response to your comment 27-9 above, the assumption made with regard to the mix of civilian waste was plausible at the time the study was initiated. Current concepts expect only a small amount of commercial high-level waste to be disposed of in the repository, i.e., from West Valley, New York. A comparison between current repository concepts as described in the Draft Mission Plan for the Civilian Radioactive Waste Program and that used in the study indicates that costs would increase but the result of the study would not change.

27-12 The concept of an augmented repository was developed for comparative purposes in this study. Since the Nuclear Waste Policy Act includes procedures and a schedule for selecting a second repository, it is reasonable to assume that at least two repositories will be constructed.

D. DOE's Assumption Regarding Applicable Standards Incorrectly Implies In-Place Stabilization

27-13

Assumption 8 states that disposal of defense HLW will "in all cases" meet the applicable EPA and NRC standards and regulations. This assumption is needless and redundant, since, as discussed above, all defense HLW must be emplaced in a repository licensed by the NRC and operated in accordance with NRC and EPA regulations. Implicit in this statement is another assumption, which must be rejected, that in-place stabilization of some HLW is permissible and will occur.

E. DOE Must Clarify Its Assumptions Regarding Volume and Characteristics of Future Defense HLW

27-14

Finally, the Department should add another assumption, to explain its projections regarding the volume and characteristics of future defense high-level wastes, to the extent such information is unclassified. DOE has provided no such explanation in either the Draft Report or in the September 1983 Spent Fuel Report. While DOE provided estimates of the volume of future defense HLW in the Defense Waste Management Plan, these estimates are insufficient to indicate how much growth in wastes -- and thus in needed disposal capacity -- should be expected.

IV. DOE Should Provide More Detail When Analyzing the Public Acceptability of the Two Disposal Options

27-15

The Draft Report should contain much more information and analysis regarding the public acceptability of the two repository

- 27-13 The assumptions in this report apply only to defense waste that will be disposed of in a geologic repository.
- 27-14 The 20,000 canisters of defense high-level waste (10,000 MTHM) addressed in this document include all the waste that is expected to be generated from the three Department of Energy sites in the next few decades.
- 27-15 Prior to release of this document there was little information on public opinions regarding the issue of options for disposal of defense high-level waste. This draft report on which you are commenting was sent to at least 400 individuals and organizations. The comments received from you and others is reflected in the final report to the extent possible. This document will contribute to the body of public opinion on this issue.

disposal options. While the Report notes that a large number of groups have differing opinions regarding the options, it makes no attempt to describe the role each group may play in the decisionmaking process. In particular, the Report should discuss 27-15 cont'd the possibility of opposition from various federal agencies. The Report should specify the opinions held by each concerned department and the probable impact of such opinion on the final decision. This section must be expanded since the Department makes no real attempt to analyze the potential public acceptability of each option.

V. The Final Report Should Explain the Basis For Several Assertions Regarding HLW Radioactivity.

Finally, the Report should explain the basis for several of its assertions regarding HLW radioactivity by answering the following questions:

1. What is the basis for the assertion, on p. E-3, that "by 27-16 2000, ... the radioactivity in defense high-level waste will be 3% of the total radioactivity in spent fuel and HLW in the country? What assumptions regarding nuclear power growth, commercial waste output, and defense waste output does this assertion rely on? How sensitive are the results to changes in these assumptions?

2. What assumptions underlie the calculation regarding the 27-17 heat output and radioactivity of defense wastes in the report, given that such wastes are a changing mix of newer and older wastes?

27-16 The expectation of radioactivity in defense waste by the year 2000 is based on information presented in referenced document U.S. Department Energy, 1983b. "Spent Fuel and Radioactive Waste Inventories, Projections and Characteristics." DOE/NE-0017/2.

27-17 The report notes that the actual characteristics of the waste may vary from that shown in the tables. The reference for the data is cited in the final report: Varadarajan, R.V. and D. C. Dippold, 1984. "Cost Estimates for Disposal of Defense High-Level Waste in a Commercial Repository: An Update." Battelle Project Management Division Report P/TM-1, Rev. 1.

27-18 3. Why claim that the assumption, p. 2-19, that "no releases of radioactivity from the waste package were assumed to occur for ... 300 to 1,000 years" is a conservative assumption? This, in fact, appears to be highly optimistic.

Thank you for the opportunity to comment on this Draft Report. If possible, we would appreciate a written response to any of the foregoing comments that are not addressed in the final report.

Sincerely,

Barbara A. Finamore
Barbara A. Finamore
Senior Project Attorney
Natural Resources Defense Council
1350 New York Avenue N.W., Suite 300
Washington, D.C. 20005
(202) 783-7800

27-18 The whole section was rewritten to clarify the assumptions and the analysis. In the most conservative analysis, all canisters are assumed to fail simultaneously at 300 years.

HARMON, WEISS & JORDAN

2001 S STREET, N.W.

SUITE 430

WASHINGTON, D.C. 20009

GAIL MCGREEVY HARMON
ELLYN R. WEISS
WILLIAM S. JORDAN, III
DIANE CURRAN
DEAN R. TOUSLEY

TELEPHONE
(202) 328-3500

December 5, 1984

Mr. David B. LeClaire, Director
Office of Defense Waste and
Byproducts Management
U.S. Department of Energy
1000 Independence Ave., S.W.
Washington, D.C. 20585

RE: Yakima Indian Nation Comments on Comingling Report

Dear Mr. LeClaire:

Enclosed are the Comments of the Yakima Indian Nation on your draft report, "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste." We apologize for the late submission, but hope you will still be able to consider these comments in preparation of the final document.

The major problem we have with the document--its dissembling concerning the intended disposition of Hanford DHLW--is one which a representative of the State of Washington and I asked you about when you spoke to program participants in Atlanta. It is also a subject which I believe you have heard about from other commenters. We trust this issue will be more forthrightly dealt with in the final report.

28-1

Sincerely yours,

Dean R. Tousley

Dean R. Tousley
ASSOCIATE ATTORNEY FOR
THE YAKIMA INDIAN NATION

Enclosure

cc: Russell Jim
James B. Hovis
Kathy Russell, NRC/WM
Roger Gale, DOE/OCRWM

YAKIMA INDIAN NATION

RESPONSE TO COMMENTS

28-1 A discussion of DOE policy regarding the disposition of waste in 149 single shell tanks at Hanford is beyond the scope of this document. DOE policy is documented in the Defense Waste Management Plan and will be the subject of public discussion following publication of the Draft Hanford EIS. The current DOE reference plan is to stabilize in-place waste stored in 149 single shell tanks at Hanford Reservation if, after the requisite environmental documentation, it is determined that the short-term risks and costs of retrieval and transportation are greater than the environmental benefits of disposal in a geologic repository. Should it be determined that the benefits of geologic disposal prevail, then the waste in those single shell tanks will be processed and disposed of in a geologic repository.

This document made assumptions based on this. Should there be additional waste from Hanford that requires repository disposal, it will be dealt with at that time. The final report addresses the possibility that additional defense high-level waste from Hanford will require disposal in a repository. The requirement to dispose of additional defense high-level waste from Hanford would not lead to a conclusion that a defense-only repository is required.

The National Environmental Policy Act analysis referred to above examines alternatives for disposal of the radioactive waste in the 149 single shell tanks at Hanford Reservation, and bears on the question of whether all defense high-level waste must be disposed of in a geological repository. Whatever alternative is selected, the Department is committed to being in full compliance with all applicable laws.

UNITED STATES OF AMERICA
DEPARTMENT OF ENERGY

An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste under the Nuclear Waste Policy Act of 1982) DOE/DP-0020 (DRAFT)

COMMENTS OF THE YAKIMA INDIAN NATION

Section 8(b)(1) of the Nuclear Waste Policy Act of 1982 requires the President to evaluate whether to dispose of high-level radioactive waste resulting from atomic energy defense activities using capacity at geologic repositories for commercial high-level radioactive waste and spent nuclear fuel. The U.S. Department of Energy has issued in draft form for comment "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste" [hereafter cited as "Draft Comingling Study"]. Following are the comments of the Confederated Tribes and Bands of the Yakima Indian Nation on that draft evaluation.

General Comments

The relevant statutory language requires the President to consider, in making this evaluation, "factors relating to cost efficiency, health and safety, regulation, transportation, public acceptability, and national security." NWPA Section 8(b)(1). Unless those considerations dictate that a separate repository for defense wastes only is required, the Secretary of Energy is required to make arrangements for disposal of defense high-level

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wastes in the repositories developed for commercial wastes under Subtitle A of the NWPA. NWPA Section 8(b)(2). The Nuclear Waste Policy Act thus permits two options for the disposal of defense high-level wastes ("DHLW"): they are to be disposed of either in repositories developed for commercial wastes, or in repositories developed for defense wastes only.

The Yakima Indian Nation ("YIN") strongly supports the conclusion that DHLW should be disposed of in repositories developed for the disposal of commercial nuclear waste and spent fuel. While DOE also purports to support this resolution, careful reading of the Study and referenced material reveals that DOE in fact proposes comingled repository disposal of only a fraction of the defense high-level waste. The great majority of the waste now at Hanford is apparently destined, under DOE's plans, to remain there forever rather than to be disposed of in a licensed geologic repository meeting the safety standards established under the authority of the Nuclear Waste Policy Act.

The Draft Comingling Study is fundamentally flawed in that it does not honestly deal with a major conflict between the NWPA's requirements for the disposal of DHLW and DOE's current "reference plans" with regard to that disposal. In flagrant derogation of the Nuclear Waste Policy Act, it is clear from DOE representations elsewhere that DOE's current "reference plan" is not to remove for disposal the DHLW now "temporarily" stored in 149 single-shelled underground tanks at the Hanford Reservation.

A report cited in the Draft Comingling Study, and materials submitted by DOE to the Environmental Protection Agency, state that the DHLW stored at Hanford as of 1982 constitutes 58.7

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percent of the total national inventory of DHLW by volume, and 34.2 percent of the national total by radioactivity content.

Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics, DOE/NE-0017/2, September 1983, Figures 2.1, 2.2.

By any measure, the DHLW now stored at Hanford constitutes a major portion of the nation's DHLW problem.

The Draft Comingling Study states only that PUREX waste and "readily retrievable" older waste at Hanford will be processed for disposal in a geologic repository. Draft Comingling Study at 1-7. In the term "readily retrievable" resides the Study's only hint that all of the nation's DHLW will not be disposed of in repositories. The Study does not define or explain the meaning of "readily retrievable", nor does it specify the intended disposition of waste which is not so deemed. The Study does not explain what portion of the Hanford DHLW DOE considers to be "readily retrievable".

The Study does state that only about 120 cannisters of waste annually over a 10-year period will be shipped to a repository from Hanford. This means that DOE expects to ship a total of only 1200 cannisters from Hanford to a repository. Since DOE projects that the total number of DHLW cannisters shipped from all DHLW sites to repositories will number about 20,000, it appears that, under DOE's plan, only about 6 percent of the DHLW shipped to repositories will come from Hanford.

We do not know the specifics of the processing and stabilization processes, so we cannot say how many cannisters would be required to ship all of the DHLW at Hanford to a repository. However, since about half of the nation's DHLW is

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currently at Hanford, but DOE projects that only 6 percent of the DHLW shipped to a repository will come from Hanford, it is quite clear that DOE is planning not to dispose of the overwhelming majority of Hanford DHLW in a repository, as required by the NWPA.

The implications of this totally unexplicated, unexplained, radical departure from Congressional intent with respect to disposal of the nation's DHLW are enormous. In the first place, the disingenuousness of the Study's treatment of this matter is disgraceful. DOE apparently does not intend to dispose of at least half of the volume and one-third of the radioactivity of the nation's DHLW in a repository. No place in the Draft Comingling Study is this fundamental fact spelled out. One must look to other documents to discover how much DHLW is actually at Hanford and what DOE's plans are to discern how little of that DHLW DOE apparently intends to dispose of in a repository as the NWPA requires.

Since the Study dissembles about the fact that roughly half of the nation's DHLW will not in fact be disposed of as required by law, it is not surprising that the justification for that fact is nowhere to be found. Nor is there one word about what DOE does intend to do with the bulk of the DHLW at Hanford.

This crucial information is not missing from the Draft Comingling Study because it does not exist, however. DOE's conceptual plans (purportedly still tentative) for the Hanford DHLW can be found in briefing materials which DOE has submitted to the Environmental Protection Agency in support of its plea to the latter agency to create an exemption from the standards of 40 CFR Part 191 for the disposition of the Hanford DHLW.

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After years of embarrassing leaks and arguing that the underground tanks at Hanford constituted only temporary storage, DOE has now decided that the costs and risks which would attend removal of the wastes from the old single-shell tanks for repository disposal would be too great. Consequently, DOE would now like to be able to "stabilize and isolate" most of the Hanford DHLW in place, in spite of the complete lack of legal authority to pursue that option.

Since DOE would not be able to satisfy the present proposed EPA standards with such a scheme, the agency is actively seeking an exemption from the proposed standards which would result in a requirement only that DOE demonstrate compliance with the health-effects aspect of the standards. Our preliminary research has revealed no legal authority for the EPA to issue a different set of standards for DHLW. Section 8(b)(3) of the NWPA requires any defense-only repository to comply with all requirements of the NRC for a repository. Section 121(b)(1)(C) requires the NRC criteria and requirements to be consistent with the EPA standards. Section 121(a) requires EPA to issue standards for the protection of the environment from radioactivity from "repositories." No distinction is made between commercial and defense repositories. In spite of the lack of legal authority to do so, and in spite of the scheme's inability to satisfy the generally applicable standards, DOE wants to come through the back door to make Hanford into a de facto DHLW repository which is exempt from the generally applicable safety standards for repositories set under the NWPA.

The Yakima Indian Nation does not here comment on the merits of the DOE contention that the benefits of removing the Hanford

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DHLW for disposal would not justify the costs and risks involved. DOE has made no efforts to explain their views to the YIN or its representatives in this matter, nor to present facts which support them. Moreover, the NWPA does not authorize exemption from safety standards on "cost-benefit" grounds. The Act allows such considerations to affect the decision on comingling versus separate defense facilities, but does not authorize waiver from substantive standards on cost-benefit grounds.

The Draft Comingling Study purports to evaluate the relative merits of disposing of DHLW by the two means contemplated by the NWPA: comingling in a commercial repository or disposal in a defense only repository. Nevertheless, DOE implicitly and blithely assumes in the Study that it will be permitted to dispose of nearly half of the nation's DHLW by a means not contemplated by the NWPA or any other authority. Although the implications of this assumption for the national waste program are quite fundamental, the Department fails even to make the assumption explicit, let alone discuss the significance of the very likely possibility that the assumption will turn out to be incorrect.

The NWPA requires DOE to dispose of all its DHLW in a geologic repository. This means that the required repository capacity for DHLW may in fact be 50 to 100 percent greater than is assumed in the Draft Comingling Study, based on the quantity of DHLW at Hanford relative to the national total. This matter also has very substantial implications for the schedule of DHLW deliveries to a repository. The lack of discussion of this subject in the Draft Comingling Study is a fatal flaw which the YIN insists must be remedied in the final study. The study should

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assume that all DHLW will be disposed of in a repository as required by the NWPA, and base all its primary capacity, schedule, and other projections on that assumption.

Specific Comments

Page E-4

28-2 The development and evaluation costs for a repository for defense waste only is projected to be \$435 million, based on the WIPP experience. The costs for WIPP, however, were for a salt repository and TRU waste, not HLW in a hard rock repository. Consequently, the defense repository D&E costs are probably not accurate for comparison.

Page 1-9, Table 1-1

28-3 The shipments of DHLW from Hanford are shown to stop in the year 2008, and, as discussed above, the quantities projected to be shipped from Hanford are not nearly enough to take care of all the DHLW at Hanford which needs to be disposed of. The Study should explain why the quantities shipped from Hanford are so low, and why shipments from Hanford end after only 10 years. Does DOE plan to discontinue nuclear waste generation at Hanford? Will waste generated at Hanford be transported to another site for processing?

Page 1-10, Table 1-2

28-4 Why has the limiting temperature of the spent fuel after Package Design Life not been determined?

Page 1-11

28-5 Among the baseline assumptions used in the evaluation was that a commercial repository will have an inventory of 35,000 MTHM of spent nuclear fuel and 35,000 MTHM of commercial high-level (reprocessed) waste. In light of the current lack of any prospect for commercial reprocessing, what is the basis for DOE's assumption that so much spent fuel will be reprocessed before disposal? What are the implications for the required size of repository capacity if, as seems likely, the overwhelming majority of waste is disposed of as spent fuel?

Page 1-11

28-6 How will current repository designs, which were based on a 70,000 MTHM capacity, be affected by the additional 10,000 MTHM emplaced in the "augmented repository" scheme? How would they be affected by the 15,000 - 20,000 MTHM of additional capacity that will be required to dispose of all the Hanford DHLW, as the NWPA requires? What will be the cost and schedule implications of these design modifications?

Page 1-12

28-2 The discussion of development and evaluation costs for a defense-only repository has been revised.

The Draft report assumed that the defense repository program could purchase the D & E carried out by the commercial repository program for a site characterized but not finally selected for use for a commercial repository. However, upon reconsideration of this issue, it was determined that this may not be a feasible option. The D & E costs for a defense-only repository are not known at the present time. Therefore, as a simplifying assumption, they are considered to be comparable to the D & E costs associated with the commercial repository. When D & E costs are considered, the cost advantage of disposing of defense waste in a commercial repository is enhanced as you indicate. The final report has been revised to reflect this.

28-3 The quantity of waste shipped from Hanford is based on the amount that will be generated from the current PUREX campaign. The current campaign to reprocess PUREX waste at Hanford is expected to end before the year 2007. At the time this report was prepared, Hanford only planned to operate the immobilization facility over a 10-year period, which would be sufficient to immobilize all the waste from the current PUREX campaign. If spent fuel continues to accumulate at Hanford beyond that date, a second reprocessing campaign would be initiated at some future date. There are no plans, at present, to ship defense high-level waste to another location for processing.

28-4 The limiting temperature of spent fuel was not available at the time of preparation of this report. The commercial repository program is currently using a peak spent fuel temperature limit of approximately 375°C. It is not critical to this particular study.

28-5 By law a repository must be capable of accepting both commercial high-level waste and spent fuel. The even split between the two waste types was a reasonable assumption, given the information available at the time the study was initiated. Although current economic conditions do not favor reprocessing, it is assumed that future conditions could make it part of the waste management options. While total costs for a different repository design would differ from those in the report, the results of the study would not change.

28-6 Since passage of the Nuclear Waste Policy Act, the Office of Civilian Radioactive Waste Management has been operating on the assumption that defense waste will be disposed of in the commercial repository pending the outcome of the President's evaluation.

This document made assumptions based on current planning. Should there be additional waste from Hanford that requires repository disposal, it will be dealt with at that time. The final report addresses the possibility that additional defense high-level waste from Hanford will require disposal in a repository. The requirement to dispose of additional defense waste from Hanford would not lead to a conclusion that a defense-only repository is required.

The Department is conducting a National Environmental Policy Act analysis which examines alternatives for disposal of the radioactive waste in the 149 single shell tanks at Hanford Reservation. This analysis bears on the question of whether all defense high-level waste must be disposed of in a geologic repository. Whatever alternative is selected, the Department is committed to being in full compliance with all applicable laws.

28-6
cont'd

The statement that disposal of DHLW will in all cases meet the requirements of applicable EPA and NRC standards is less than totally honest. DOE should acknowledge that it is actively seeking modifications of the EPA standards so that most of those presently proposed standards will not apply to a major portion of the nation's DHLW (that in old single-shell tanks at Hanford). DOE should also acknowledge its plan not to "dispose" of half of its DHLW in a repository.

Page 2-7

28-7

Information about tuff was used as a surrogate for the high end of repository hard rock costs. This is probably not conservative, as granite and basalt are much harder than tuff, raising drilling and mining costs for the former. In addition, if the tuff case assumes a relatively shallow repository in the unsaturated zone, as would be the case at NTS, that would also tend to be non-conservative relative to costs of a deep repository in the saturated zone in basalt or granite.

Page 2-16

28-8

Where are the analyses performed for section 2.3.2, Health and Safety Impacts, documented? There are no citations.

DOE states that "...all disposal options must satisfy the requirements of the 10 CFR 20 and 10 CFR 60 (NRC) and the proposed 40 CFR 191 (EPA) during both the operational and post-closure phases." DOE should acknowledge that it is seeking an exemption from most of the present proposed EPA standards for DHLW at Hanford.

Page 2-19

28-9

Retardation values (R) are said to be conservative. However, none of the values used by any authors cited as references have been verified under field conditions for porous or fractured media. Most values are taken from a range of values from laboratory analyses using crushed samples and may not be at all representative of behavior under field conditions.

Page 2-26

28-10

Leach rates are based on temperatures at 300 and 1000 years. This may be a conservative assumption, generally. However, DOE should also evaluate the significance of leaching from cannisters that fail before the end of the containment period, when temperatures are much higher. (We have heard representatives of the NRC Staff suggest that failure of as many as 5 % of the cannisters would still be consistent with the containment requirement.)

Page 2-28

28-11

What assumptions were used concerning volumes of rock excavated for salt and hard rock in order to get the temperatures down to the levels listed? Wouldn't the comparison of fractional release rates be more realistic if

- 28-7 The increase in cost would not, in and of itself, require that a defense-only repository be built.
- 28-8 Citations to the references have been added in the final report.
- 28-9 The conservatism of the health and safety analysis has been confirmed by recent studies, as discussed in the final report.
- 28-10 The calculation you suggest would not affect the comparative analysis of the disposal options for defense waste since the same scenario would have to be assumed for both disposal options.
- 28-11 The spacing of waste in the repository is limited by structural considerations involving either near field or far field thermal-mechanical phenomena. There is no technical reason to maintain the same temperature in a salt repository as in a hard rock repository.

28-11 the respective volumes were adjusted to yield equivalent
cont'd temperatures for salt and hard rock at the end of the
containment period?

Page 2-29

28-12 To avoid premature obsolescence of this Study, DOE should include discussion of the implications of likely changes to the proposed 40 CFR 191 and 10 CFR 60. For example, Table 2-8 should include projections of compliance or not with the proposed new groundwater protection provisions which require carrying release calculations out to 100,000 years using release rates of 10U and 10U.

Page 2-31

28-13 To avoid a possible misrepresentation with respect to the effects of a comingled repository, the last sentence of section 2.3.2.1 should be revised to state that although the effects per MTHM would be slightly reduced with the codisposal option, the total effects from the repository would be increased because the contribution from DHLW would be added to the full 70,000 MTHM commercial repository.

Page 2-36

28-14 The projection of less than two radiological health effects to workers during the operational phase of the repositories seems unrealistically low, especially if spent fuel will have to be repackaged at the repository. To our knowledge, there is not yet a universal cask suitable for both shipping and repository emplacement, so repackaging will probably be necessary. The Study is deficient in considering only one potential accident. An estimated frequency for dropping a cannister down a shaft is given, but the consequences are not.

Page 3-12

28-15 The Study should explain why total air pollutants are greater during operation than construction. Once again, the consequences of dropping a cannister down a shaft should be discussed.

- 28-12 The EPA regulations are still in draft form and subject to further revision. The calculations of releases out to 100,000 years are only for the purpose of comparing two actual sites and is not useful in a generic study as was performed here.
- 28-13 The sentence you refer to has been deleted from the report.
- 28-14 There was no assumption made to the effect that the shipping cask would be used for repository emplacement. A waste packaging facility was assumed at the repository to place an overpack around the waste canisters. The consequences of dropping a canister down a shaft are assumed to be fatality of workers in the vicinity of the dropped canister.
- 28-15 The operational period of the repository extends over 25 years while construction extends for only 5 years.

Conclusion

The Yakima Indian Nation agrees with the conclusion of the Draft Comingling Study that DHLW should be disposed of in repositories developed for commercial HLW and spent fuel. The analysis is severely flawed, however, by a less than honest treatment of DOE's plans with respect to the DHLW at Hanford, and to a lesser extent by the other issues discussed above. We sincerely hope that these defects will be remedied in the final version of the Study.

Respectfully submitted,

**Dean R. Tousley
HARMON, WEISS & JORDAN
2001 S Street, N.W.
Suite 430
Washington, D.C. 20009**

**ASSOCIATE ATTORNEY FOR
THE YAKIMA INDIAN NATION**

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 21 1984

Mr. David B. LeClaire
Director
Office of Defense Waste
and Byproducts Management
Department of Energy (DP-12)
Washington, D.C. 20545

Dear Mr. LeClaire:

We appreciate the opportunity to comment on "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste," DOE/DP-0020 (DRAFT), July 1984. This report was required by the Nuclear Waste Policy Act (NWPA) of 1982 in order to evaluate the need for a separate repository for defense high-level wastes.

Based on the evaluations presented in the report, as well as our own experience in developing environmental standards for disposal of these wastes, we fully support the report's primary recommendation--that defense high-level wastes are best disposed of in combined commercial and defense repositories rather than in a dedicated, defense-only repository. We know of no reason why disposing of defense wastes in a combined repository would compromise the long-term isolation afforded by the repository, and we believe that the NWPA repository site selection process should result in use of sites with particularly good natural characteristics. Thus, building a dedicated, defense-only repository would seem to be an entirely unwarranted additional expense.

We are pleased to see that long-term performance assessments of repository performance played a part in developing this report's recommendations. However, we would like to reinforce the report's own caution that these performance assessments should only be considered as scoping analyses. They are far too simplified to be useful for comparing repositories in different geologic media or at different sites. We expect that these simplified analyses substantially overestimate the radionuclide releases from undisturbed groundwater flow; however, the analyses apparently did not consider the effects of accidental events, such as inadvertent human intrusion, on long-term repository performance. Such simplifications and omissions should not affect the recommendations of this report, but performance assessments supporting more specific disposal plans should be much more detailed and comprehensive.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

RESPONSE TO COMMENTS

29-1 Thank you for your remarks and comments.

We agree that the simplified analysis used to assess long-term repository performance for the study tends to overestimate the radionuclide releases from the undisturbed groundwater flow. The final version of the report clarifies this point, stating that the purpose of the analysis was to compare the relative effect of the disposal options and not to demonstrate compliance with any standard. Demonstration of compliance with standards must be accomplished on a site-by-site basis. It is also noted in the report that recent unpublished studies by the Office of Civilian Radioactive Waste Management, using more realistic information from potential repository sites, have indicated that there would be no releases of radioactivity from a commercial repository in salt or hard rock during the first 10,000 years following decommissioning.

We are looking forward to the release of the document in its final form and encourage you to proceed with development of a combined repository. If you have questions or desire further discussions, please contact Mr. Daniel Egan at 557-8610.

Sincerely yours,



Sheldon Meyers, Acting Director
Office of Radiation Programs (ANR-458)

M. I. LEWIS
6504 BRADFORD TERR.
PHILA, PA. 19149

Dear Mr Leclaire

Thank you for the draft of DOE/DP 0020. Please send me the final edition.

I have several requests for improvements of the document.

30-1 1. It is very difficult to get absolute numbers. How many Curies and how much volume are you taking about each year or decade.?

What are the transportation routes and mileage? How do you get your mileage.?

30-2 In the year 2000, How many curies and volume have been buried , transported, mileage , costs, for that year and cumulatively? Give projections of number of repositories, mix of ~~commercial~~ commercial and military, isotopes, waste form, and number of jobs per site and in transportation?

30-3 There just does not seem to be a Table with the actual number of Curies, volume and costs per year and cumulatively for cost of repository , cost of transportation number of Curies by the ~~year~~ year and cumulatively. Your report is nice ~~in~~ writing but it doesn ot convey any good numbers or information.

Very truly yours,

M. I. Lewis
1/23/75.

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M. I. LEWIS
Citizen Action in the Northeast

RESPONSE TO COMMENTS

30-1 The reference defense waste package has a curie level of 150,000 curies (See Table 1-1, page 1-9 of the report). Using this value, the number of curies of defense waste to be disposed of annually would range between 100 and 150 million. The actual curie level in a defense waste package is likely to be lower than the reference value because much of the defense waste is old and its radioactivity has decayed.

30-2 The transportation routing models used for the study used normal commercial routes to provide estimated mileages and estimated transit times between origins and destinations. This was sufficient for purposes of this document. When a repository becomes operational, actual routes will be the responsibility of the carrier and will be subject to Federal and State restrictions including DOT rule HM-164.

Current plans call for opening a repository in 1998. Thus, by the year 2000 it will have operated for two years. Only one repository will be operating at that time. A schedule for receipt of waste at the repository has not been determined yet. Waste acceptance schedules will be published in the final Mission Plan for the Civilian Radioactive Waste Management Program. Therefore we cannot tell you the amount of waste that will have been buried by the year 2000 or the mix of commercial and defense waste. Commercial waste is expected to consist mostly of spent fuel. Some vitrified (glass) commercial waste from reprocessing of commercial spent fuel will be received from West Valley, New York. Defense waste will be in vitrified (glass) form.

About 870 to 1100 workers will be employed during the expected 25 year operating period of a repository.

30-3 It was not necessary for purposes of this study to provide information on an annual basis. We hope the information presented above provides you with some of the information you desire. As the repository program progresses, additional detailed information will be made available by the Office of Civilian Radioactive Waste Management.

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