NUREG-0945
Vol. 2

Final Environmental Impact Statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste"

Appendices A-B

U.S. Nuclear Regulatory Commission

Office of Nuclear Material Safety and Safeguards

November 1982

Reprinted January 1986

NOTICE

Availability of Reference Materials Cited in NRC Publications

Most documents cited in NRC publications will be available from one of the following sources:

1. The NRC Public Document Room, 1717 H Street, N.W.
   Washington, DC 20555
2. The Superintendent of Documents, U.S. Government Printing Office, Post Office Box 37082, Washington, DC 20013-7082
3. The National Technical Information Service, Springfield, VA 22161

Although the listing that follows represents the majority of documents cited in NRC publications, it is not intended to be exhaustive.

Referenced documents available for inspection and copying for a fee from the NRC Public Document Room include NRC correspondence and internal NRC memoranda; NRC Office of Inspection and Enforcement bulletins, circulars, information notices, inspection and investigation notices; Licensee Event Reports; vendor reports and correspondence; Commission papers; and applicant and licensee documents and correspondence.

The following documents in the NUREG series are available for purchase from the GPO Sales Program: formal NRC staff and contractor reports, NRC-sponsored conference proceedings, and NRC booklets and brochures. Also available are Regulatory Guides, NRC regulations in the *Code of Federal Regulations,* and *Nuclear Regulatory Commission Issuances.*

Documents available from the National Technical Information Service include NUREG series reports and technical reports prepared by other federal agencies and reports prepared by the Atomic Energy Commission, forerunner agency to the Nuclear Regulatory Commission.

Documents available from public and special technical libraries include all open literature items, such as books, journal and periodical articles, and transactions. *Federal Register* notices, federal and state legislation, and congressional reports can usually be obtained from these libraries.

Documents such as theses, dissertations, foreign reports and translations, and non-NRC conference proceedings are available for purchase from the organization sponsoring the publication cited.

Single copies of NRC draft reports are available free, to the extent of supply, upon written request to the Division of Technical Information and Document Control, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

Copies of industry codes and standards used in a substantive manner in the NRC regulatory process are maintained at the NRC Library, 7920 Norfolk Avenue, Bethesda, Maryland, and are available there for reference use by the public. Codes and standards are usually copyrighted and may be purchased from the originating organization or, if they are American National Standards, from the American National Standards Institute, 1430 Broadway, New York, NY 10018.

NUREG-0945
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Appendices A-B

U.S. Nuclear Regulatory Commission

Office of Nuclear Material Safety and Safeguards

November 1982

ABSTRACT

The three-volume final environmental impact statement (FEIS) is prepared to guide and support publication of a final regulation, 10 CFR Part 61, for the land disposal of low-level radioactive waste. The FEIS is prepared in response to public comments received on the draft environmental impact statement (DEIS) on the proposed Part 61 regulation. The DEIS was published in September 1981 as NUREG-0782. Public comments received on the proposed Part 61 regulation separate from the DEIS are also considered in the FEIS. The FEIS is not a rewritten version of the DEIS, which contains an exhaustive and detailed analysis of alternatives, but rather references the DEIS and presents the final decision bases and conclusions (costs and impacts) which are reflected in the Part 61 requirements. Four cases are specifically considered in the FEIS representing the following: past disposal practice, existing disposal practice, Part 61 requirements, and an upper bound example.

The Summary and Main Report are contained in Volume 1. Volume 2 consists of Appendices A - Staff Analysis of Public Comments on the DEIS for 10 CFR Part 61, and Appendices B - Staff Analysis of Public Comments on Proposed 10 CFR Part 61 Rulemaking. Volume 3 contains Appendices C-F, entitled as follows: Appendix C - Revisions to Impact Analysis Methodology, Appendix D - Computer Codes Used for FEIS Calculations, Appendix E - Errata for the DEIS for 10 CFR Part 61 and last, Appendix F - Final Rule and Supplementary Information.

FOREWARD

In September 1981, NRC published the Draft Environmental Impact Statement on 10 CFR Part 61: "Licensing Requirements for Land Disposal of Radioactive Waste" (NUREG-0782). This draft environmental impact statement (EIS) contains an exhaustive and detailed analysis of a wide range of alternatives. Based upon NRC analysis of public comments on both the draft EIS and upon the proposed Part 61 regulation itself (Federal Register Notice 46 FR 38081, July 24, 1981), no new alternatives or principles were identified which required analysis. No major changes were required for several requirements of the Part 61 regulation, including the overall performance objectives which should be achieved in the land disposal of low-level radioactive waste, administrative and procedural requirements for licensing a land disposal facility, and the requirements for financial assurance. Many clarifying and explanatory changes were, however, required with respect to specific rule provisions.

Given this conclusion and public comments suggesting that the number of alternatives considered in the EIS be reduced to a smaller, more understandable number, NRC has chosen not to republish the extensive analysis of alternatives as presented in the draft EIS. Rather, NRC has refined the EIS impact analysis methodology based upon public comments and has grouped the alternatives analyzed onto four major alternatives which present the basis for decisions made regarding the Part 61 requirements.

This final EIS is therefore not a revision of the draft EIS but a stand-alone statement which uses the draft EIS as a resource and reference document. Refinements made to the draft EIS assumptions and impact analysis methodology are noted and used in the final EIS. NRC hopes that in this way, the final EIS will be of a more managable size and the alternatives analyzed and conclusions reached presented in more of a concise, understandable manner.

List of Preparers

The overall responsibility for the preparation of this draft environmental impact statement was assigned to the Low-Level Waste Licensing Branch, Division of Waste Management, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission. The statement was prepared with technical assistance from the firm of Dames and Moore, White Plains, New York.

Nuclear Regulatory Commission Staff

Preparers

R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Kitty S. Dragonette
Paul H. Lohaus
George C. Pangburn
G. W. Roles

Contributors

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James A. Shaffner
David L. Siefken
Derek Widmayer

Special Contributors

Willste CRESS Central Dictation Unit
- Carole Finan
- Jeannette Kiminas
- Pauline Rock
- Charline Simon
- Irene Suissa

Cathy S. Bromberg, Secretary, Low-Level Waste Licensing Branch
Robert Fonner, Attorney, Office of the Executive Legal Director

Dames and Moore Staff

Others contributing significantly to this environmental impact statement included personnel of the firm of Dames and Moore, Inc. (D&M) of White Plains, New York. The D&M contribution was directed by Dr. Oktay I. Oztunali.

OPTIONR & GRWATRR Codes

Oktay I. Oztunali
C. Joseph Pitt

Input on I-129 & C-14

Oktay I. Oztunali
Leslie Skoski
Kim D. Petschek

APPENDIX A

STAFF ANALYSIS OF PUBLIC COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR 10 CFR PART 61

APPENDIX A

STAFF ANALYSIS OF PUBLIC COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR 10 CFR PART 61

The draft Environmental Impact Statement (DEIS) for 10 CFR 61 was issued in September 1981 as NUREG-0782. The public comment period for the DEIS ended on January 14, 1982, and during this period 50 commenters provided written comments to NRC. Of the 50 comments received by the Commission, 8 contained no reference to the DEIS but were limited instead to comments on 10 CFR 61.

In this appendix the staff has assembled and organized the comments received and the staff's responses to them. The comment letters and staff responses have been placed in order of receipt by reference to the docket number assigned to each letter. Each letter was reviewed by the staff to identify items which required a response for clarification, additional information, etc. Each such item was bracketed in the margin of the letter and assigned a number. Therefore, response items are identified by their item number within the letter and the docketed comment number of the letter: e.g., Item 6, Comment 25.

Response items were assigned to appropriate staff members for preparation and were then organized for each specific comment letter. In the pages that follow, each docketed comment letter is reproduced in its entirety and adjoining each letter are the staff's responses to specific items within the letter. (The 8 letters mentioned earlier which do not comment upon the DEIS have not been reproduced in this appendix. However, they were considered by the staff in the rulemaking and are available for public review at the NRC Public Document Room (PDR), 1717 H Street NW., Washington, D.C. and are included in the analysis of rule comments in Appendix B.)

APPENDIX A
LIST OF COMMENTERS ON THE DEIS

Docketed Comment Number	Commenter
1	State of New Jersey
2	State of Georgia
3	Department of Housing and Urban Development
4	State of Hawaii
5	State of Missouri
6	State of South Dakota
7	State of New Jersey
8	Georgia Institute of Technology
9	Stock Equipment Company
10	State of Rhode Island
11	Argonne National Laboratory
12	Massachusetts Natural Heritage Program
13	State of Delaware
14	State of North Dakota
15	US Department of Health & Human Services
16	Arizona State Clearinghouse
17	State of Iowa
18	Minnesota Department of Economic Development
19	State of Oregon
20	Dow Chemical, U.S.A.
21	Northeast Utilities
22	Township of Lower Alloways Creek
23	General Electric
24	Amy Hubbard
25	Los Alamos National Laboratory
26	State of California
27	Duke Power Company
28	Arkansas Power and Light

Docketed Comment Number	Commenter
29	Stone and Webster
30	Health Physics Society
31	Betty Johnson
32	Atomic Industrial Forum
33	U.S. Ecology
34	State of Washington
35	American Institute of Chemical Engineers
36	Conference of Radiation Control Program Directors
37	(Not assigned)
38	New England Nuclear
39	New York State Department of Environmental Conservation
40	Commonwealth of Virginia
41	U.S. Department of the Interior
42	Utility Nuclear Waste Management Group
43	Tennessee Valley Authority
44	Chem-Nuclear Systems, Inc.
45	Atomic Energy of Canada, Ltd.
46	State of New Mexico
47	Texas Energy and Natural Resources Advisory Council
48	Texas Department of Water Resources
49	Virgnia Electric and Power Company
50	Argonne National Laboratory
51	U.S. Environmental Protection Agency

DOCKETED
USNRC

STATE OF NEW JERSEY '81 NOV -9 P2:53

JOSEPH A. LE FANTE
COMMISSIONER

DEPARTMENT OF COMMUNITY AFFAIRS
DIVISION OF PLANNING
OFFICE OF SECRETARY
363 WEST STATE STREET
CN 804
TRENTON, N.J. 08625

November 2, 1981

Mr. Samuel J. Chilk, Sec. of the Commission
Low-Level Waste Licensing Branch
Div. of Waste Mgmt., Office of Nuclear Material
Safety and Safeguards, Nuclear Regulatory Commission
Washington, D.C. 20555

SET NUMBER
PROPOSED RULE PR-61
(46 FR 517)

RE: State Application Identifier Number NJ8111021968 Draft Environmental Impact Statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste"

Dear Mr. Chilk:

The New Jersey State Clearinghouse has received and is processing your Project Notification as required by the provisions of the U.S. Office of Management and Budget Circular A-95 Revised and Chapter 85, New Jersey Laws of 1944. This project has been assigned the State Application Identifier Number NJ8111021968.

Effective with the date of this letter, the Clearinghouse has assigned a 30 day review period, which is consistent with our internal procedures and Federal regulations relevant to your program. The appropriate review agencies have been requested to comment on your application, and the Clearinghouse will perform its own review. If comments are received and any conflicts or issues arise, the Clearinghouse will notify you. It may be necessary to request additional information and/or schedule a conference in order to resolve any issues prior to clearance. Otherwise, you are cleared at the end of the review period to forward your final application to the Federal funding agency, accompanied by a copy of this letter. As an applicant, it is your responsibility to include any comments with your final application submission to the Federal agency.

If you encounter any problems or have any questions, at any time during the review process, please refer to the enclosed brochure for information, contact people, and telephone numbers.

Very truly yours,

Richard A. Gigman
State Review Coordinator

Attachment

NOTE: *It is extremely important that you put your State Application Identifier Number on all forms and correspondence (especially SUMMARY FORM 424), prior to final submission to the Federal funding agency.*

DS10
S/1

Add: Dale Smith

Acknowledged by card. 11/16/81 emp

NEW JERSEY IS AN EQUAL OPPORTUNITY EMPLOYER

NEW JERSEY DEPARTMENT OF COMMUNITY AFFAIRS

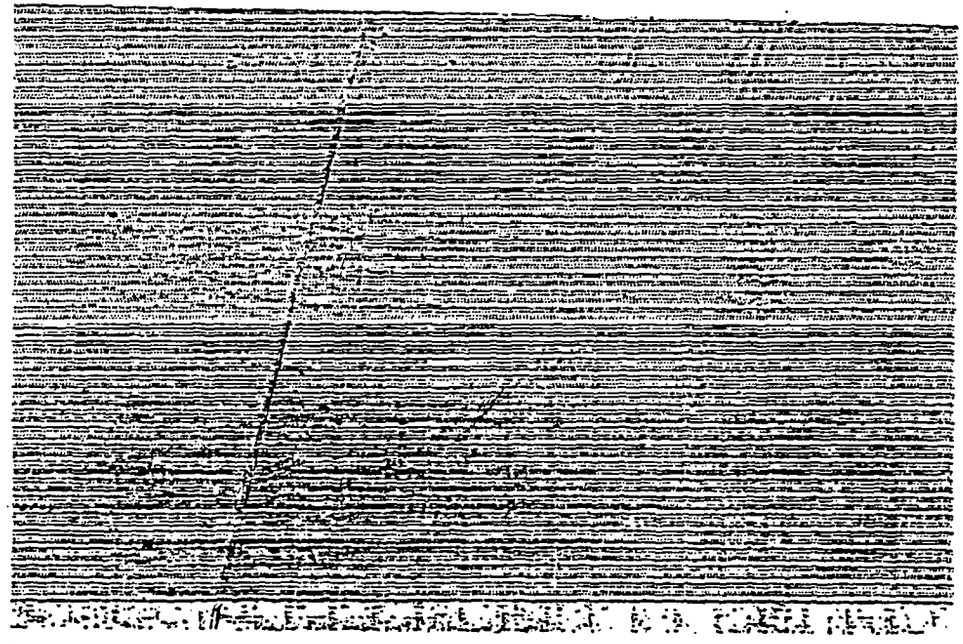
MEMORANDUM

TO Applicant

FROM New Jersey State Clearinghouse DATE October, 1981

SUBJECT Regional Review

As a result of budgetary constraints, the Delaware Valley Regional Planning Commission (DVRPC) has been forced to reduce its review activities as mandated by Federal A-95 Project Notification and Review System requirements. In order to insure that the regional perspective continues to be represented, the New Jersey State Clearinghouse has assumed the responsibility of circulating applications to the county planning board having jurisdiction. A copy of this application has been sent to the appropriate county planning board for its review.



Docketed Comment Number: 1

Commenter: State of New Jersey, Department of Community Affairs, Division of Planning

Responses(s): This comment was docketed and reviewed by the staff. No items were found in the comment which require a response.

Office of Planning and Budget

Executive Department

Clark T. Stevens
Director

GEORGIA STATE CLEARINGHOUSE MEMORANDUM

TO: Dale Smith, Chief
Low Level Waste Licensing Branch
Divison of Waste Management
Office of Nuclear Material
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

FROM: ~~Charles H. Badger,~~ Administrator
Georgia State Clearinghouse
Office of Planning and Budget

DATE: November 6, 1981

SUBJECT: RESULTS OF STATE LEVEL REVIEW

Applicant: Nuclear Regulatory Commission

Project: Draft EIS on 10 CFR 61 "Licensing Requirements for Land Disposal of Radioactive Waste"

State Application Identifier: GA 81-10-14-004/NUREG - 0782

The State of Georgia is pleased to review this document and to see what administrative and procedural requirements are being proposed for licensing a facility for the land disposal of radioactive waste. However, the state is opposed to any disposal program that could impact its resources such as bedrock storage. This document as presented addresses two phases of land disposal: 1) Short-term operational and 2) Long-term operational also known as after operations phase. In either phase, the concern is the protection of the environment, and the health and safety of the public. The proposed regulations, eg. financial technical, and safety considerations. Some parts of this rulemaking would serve to strengthen EPD rules and regulations involving disposal of radioactive waste. The State urges NRC and other federal agencies to continue and take a lead role in trying to resolve the waste dilemnas confronting our state and society. The State will continue to work with other agencies towards improving waste management. (1)

The following State agenices have been offered the opportunity to review and comment on this project: DNR/EPD
OPB/Physical and Ec. Dev.

CHB/lr
cc: Jim Benson, EPD

270 Washington St., S.W. • Atlanta, Georgia 30334 4-NCC

Docketed Comment Number: 2

Commenter: State of Georgia, Office of Planning and Budget, Executive Department

Response(s): Item 1 - The State notes its opposition "... to any disposal program that could impact its resources..." The proposed 10 CFR Part 61 and its supportive Environmental Impact Statement (NUREG-0782) do not constitute a disposal program, but rather a comprehensive set of regulations to be applied to the land disposal of radioactive waste. NRC will not be acting as a proponent or supporter of any specific waste disposal site or sites, but will review and take licensing action on any disposal facility application brought to it by commercial entities, individual states or regional compacts of states. Moreover, the siting requirements in § 61.50 of 10 CFR Part 61 require avoidance of areas having known natrual resources which, if exploited, would result in failure of the site to meet the performance objectives.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
REGIONAL/AREA OFFICE
EXECUTIVE TOWER - 1405 CURTIS STREET
DENVER, COLORADO 80202

REGION VIII

November 10; 1981 NOV 27 A10:31

IN REPLY REFER TO:
8SOQ-590d

emp

OFFICE OF THE SECRETARY
DOCKETING & SERVICE
BRANCH

(3)

-61
(46 FR 51776)

Low Level Waste Licensing Branch
Office of Nuclear Material
Safety and Safeguards
Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Thank you for the opportunity to review and comment on the Draft Environmental Impact Statement (EIS) on 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

Your draft has been reviewed with specific consideration for the areas of responsibility assigned to the Department of Housing and Urban Development (HUD). This review considered the proposal's compatibility with local and regional comprehensive planning and impacts on urbanized areas. Since this Draft EIS did not attempt to address site-specific locations for disposal, we would request that impacts be considered on an individual site basis prior to any actual site selection. (1)

If you have any questions regarding these comments, please contact Mr. Carroll F. Goodwin, Area Environmental Officer, at FTS 327-3102.

Sincerely,

Raymond D. McKinney
Director
Program Planning and Evaluation

12/1/81 emp

AREA OFFICE
DENVER, COLORADO

Docketed Comment Number: 3

Commenter: Department of Housing and Urban Development, Region VIII Office

Response(s): Item 1 - Impacts will be considered on a site-specific basis. Site selection will, however, be conducted by a potential applicant prior to submittal of an application to NRC. In the NRC environmental review of the application, the staff will evaluate impacts of the proposed site relative to alternative sites considered by the applicant.

GEORGE R. ARIYOSHI
Governor

HIDETO KONO
Director

FRANK SKRIVANEK
Deputy Director

DEPARTMENT OF PLANNING
AND ECONOMIC DEVELOPMENT

Kamamalu Building 250 South King St. Honolulu, Hawaii • Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

'81 DEC -2 A8:08

Ref. No. 3903

65

November 18, 1981

DOCKET NUMBER
PROPOSED RULE PR-2 et al
(46 FR 38081)

4

U.S. Nuclear Regulatory Commission
Office of Nuclear Material Safety
Washington, D.C. 20555

DOCKET NUMBER
PROPOSED RULE PR-61
(46 FR 51776)

Gentlemen:

Subject: Draft Environmental Impact Statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Wastes"

Thank you for the opportunity to review the subject draft EIS. Inasmuch as the proposed regulations provide ample opportunity for the expression of State concerns prior to the licensing of a disposal site, we feel that any Coastal Zone Management (CZM) program concerns can be addressed at that time. Moreover, should a disposal site be proposed within the CZM areas of the State, the federal consistency provisions of the National CZM Act require that the licensing be subject to State review for consistency with Hawaii's federally approved CZM program. (1)

Sincerely,

Hideto Kono

Acknowledged by card 12/3/81

Docketed Comment Number: 4

Commenter: State of Hawaii, Department of Planning and Economic Development

Response(s): Item 1 - The commentor's observation regarding the Coastal Zone Management Act of 1972 (PL92-583, as amended by PL94-370) is correct. Section 307 (c)(3) of the act states that "... any applicant for a required Federal license or permit to conduct an activity affecting land or water uses in the coastal zone of that state shall provide to the licensing or permitting agency a certification that the proposed activity complies with the state's approved program and that such activity will be conducted in a manner consistent with the program." Requirements contained in Part 61 (specifically §61.50) would generally preclude siting of a low-level waste disposal facility in the coastal zone. §61.50 specifically prohibits waste disposal in a "... coastal high-hazard area or wetland." NRC will, however, work closely with the states in the licensing process of a new low-level waste disposal facility to assure that the requirements of this act and other applicable legislation are complied with.

K. Dragonette

(5)

State of Missouri
OFFICE OF ADMINISTRATION
P.O. Box 809
Jefferson City 65102

Christopher S. Bond
Governor

Alden Shields, Director
Division of Budget and Planning

November 23, 1981

Director
Low-Level Waste Licensing Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards
Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Sir:

Subject: 81110011 - Draft Environmental Impact Statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste"

The State Clearinghouse, in cooperation with state agencies interested or possibly affected, has completed the A-95 review on the above project application.

None of the state agencies involved in the review had comments or recommendations to offer at this time. This concludes the State Clearinghouse's review.

A copy of this letter is to be attached to the application as evidence of compliance with the A-95 requirements.

Sincerely,

Lois Pohl

Lois Pohl
Chief, Grants Coordination

LP:fgm

Docketed Comment Number: 5

Commenter: State of Missouri, Office of Administration

Response(s): This comment was docketed and reviewed by the staff. No items were found in the comment which require a response.

STATE PLANNING BUREAU
State Capitol
Pierre, South Dakota 57501
605/773-3661

SOUTH DAKOTA Office of Executive Management

46 FR 51776

(69)

DOCKET NUMBER
PROPOSED RULE PR-12, 19, 20, 21, 30, 40, 51, 61, 70, 73, 170 (46 FR 38081)

'81 DEC -9 P2:35

emp

SECRETARY
DOCKETING & SERVICE BRANCH

(6)

December 2, 1981

Low-Level Waste Licensing Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards
Nuclear Regulatory Commission
Washington, DC 20555

DOCKET NUMBER
PROPOSED RULE PR-61 (46 FR 51776)

RE: SAI# SD811020-E15, Volumes 1-4
DRAFT EIS on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste"

Dear Sirs:

Thank you for the opportunity to review and comment on your draft environmental impact statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste."

Attached are some notations made by the South Dakota Department of Water and Natural Resources during the course of their review. You may want to take their comments into consideration when you prepare your final report.

Overall, South Dakota agencies felt your impact statement deserved recommendation for approval.

Sincerely,

Tony C. Merry
Commissioner
STATE PLANNING BUREAU

Acknowledged by ltr 12/15/81 emp

COMMENTS: 10 CFR 61 PROPOSED RULES

The South Dakota Department of Water and Natural Resource's Radiation Program has reviewed the summary volume of DEIS 10 CFR 61, and we recommend approval. The following are comments relative to minor discrepancies.

1. Volume 1, page 5, section 2.1, paragraph 3.

   The word "generated" should be replaced by "produced" because it may create confusion regarding fuel cycle power "generation", and the "generation" of LLW. Therefore, the last sentence should read: Institutional LLW production will account for about 19% of the non-fuel sources. (1)

2. Volume 1, page 9, paragraph 3, line 12.

   "The most important . . .". The use of "geometric means" should be justified in lieu of arithmetic means. (2)

3. Volume 1, page 19, Table S.5.

   The column heading "Costs & Impacts" should define units in column (i.e. dollars, etc.) (3)

4. Volume 1, page 27, paragraph 2, line 8.

   The use of the term "daughters" should be replaced by "progeny" likewise throughout the proposal. (4)

The following comments pertain to Volume 1, Attachment A, Proposed Rule 10 CFR 61: Licensing Requirements for Land Disposal of Radioactive Waste.

1. Volume 1, Attachment A, page 38082, column 1, paragraph 3, line 6.
   The word "numbr" should read "number".

2. Column 2, paragraph 1, line 11.
   "nonradio-active" should read "nonradioactive".

3. Volume 1, Attachment A, page 38084, Column 1, paragraph 1, item(5)
   "Stability - " The statement appears too generalized and vague. It should read: Stability - Stability of the disposal site over the long term (100 years) is mandatory to prevent loss of site integrity; The potential for migration and transport of wastes to offsite areas should be virtually eliminated. (As an example).

4. Volume 1, Attachment A, page 38084, Column 2, line 24.
   The word "if" should read "it".

5. Volume 1, Attachment A, page 38085, Column 1.
   The classification scheme presented covers present waste streams but contains no provisions for future waste stream developments. If a "miscellaneous" class "C" which is characterized by activity can be included it should provide a time-buffer for future amendment needs.

Docketed Comment Number: 6

Commenter: State of South Dakota, Office of Executive Management, State Planning Bureau

Response(s): Items 1: The word "generated" is widely used and generally accepted in reference to radioactive waste. Use of the word "produced" would carry with it the connotation of an end result or product, which is not appropriate to waste.

Item 2: On page D-35 of Appendix D, Low-Level Waste Sources and Processing Options, the use of geometric means in lieu of arithmetic means is discussed. The rationale is that geometric means allow representative estimates to be made from sets of data that contain a few concentrations that are several orders of magnitude greater than the majority in the set and that would dominate the average if arithmetic means were used.

Item 3: The commenter's observation is accurate and tables in the FEIS will be revised to clarify costs and impacts.

Item 4: The term "daughter" has been used routinely to describe a nuclide formed by the radioactive decay of another nuclide. The staff sees no advantage to replacing the term "daughters" with the term "progeny" in this EIS.

STATE OF NEW JERSEY
DEPARTMENT OF COMMUNITY AFFAIRS
DIVISION OF PLANNING

JOSEPH A. LE PANTE
COMMISSIONER

329 WEST STATE STREET
CN 806
TRENTON, N.J. 08625

81 DEC 14 P12:29

December 3, 1981

(7)

Mr. Samuel J. Chilk
Secretary of the Commission
Low-Level Waste Licensing Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards
Nuclear Regulatory Commission
Washington, D.C. 20555

DOCKET NUMBER
PROPOSED RULE PR-61
(46 FR 51776)

RE: NJ8111021968

Draft Environmental Impact Statement on
10 CFR Part 61 "Licensing Requirements
for Land Disposal of Radioactive Waste"

Dear Mr. Chilk:

This Letter of Clearance is to certify that your application, with the State Identifier Number NJ8111021968, has met the Project Notification and Review System requirements of the U.S. Office of Management and Budget's Circular A-95 Revised and Chapter 85 of the New Jersey Laws of 1944.

The New Jersey State Clearinghouse has circulated the application to the appropriate state agencies and has received comments from one (1) agency relative to its final review. Based upon these comments, which appear below, the Clearinghouse recommends that the application be:

__X__ Approved

_____ Approved with conditions

_____ Disapproved

The New Jersey Department of Energy has made the following comment:

"The EIS is a positive step toward the land disposal of radioactive wastes being generated by the nuclear powered generating stations.

Current activities of the State departments involved with the national waste disposal, as noted on the attached memo, are being directed at mutual agreements between adjacent states for multi-state disposal rather than national repositories. I believe that Pennsylvania has taken the lead in this effort".

As an applicant, it is your responsibility to include a copy of this Letter of Clearance when you submit your formal application to the Federal funding agency. Also, if you should change your formal application by submitting a request that differs substantially from this one, then you will have to resubmit your final application to this office for review.

If you have any questions, please call Vincent Amico of my staff at 609-292-2963.

Very truly yours,

Richard A. Ginman
State Review Coordinator

RAG:cp
Attachment

Acknowledged by card 12/15/81 emp

DS10
S1/1
Add: R. Smith
Dale Smith

NEW JERSEY IS AN EQUAL OPPORTUNITY EMPLOYER

STATE OF NEW JERSEY DEPARTMENT OF ENERGY

INTER-COMMUNICATION **DATE:** November 24, 1981

TO: Dr. Bharat C. Patel, Administrator
Office of Resource Application

FROM: Anthony Rizzolo

PHONE: 2403

SUBJECT: Comments On NRC Draft, Environmental Impact Statement: 10 CRF Part 61 "Licensing Requirements For Land Disposal Of Radioactive Waste", NUREG-0782, Vols 1 thru 4.

ORA #103-81

The U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards submitted this EIS. The EIS was submitted by NRC as part of its responsibility under the National Environmental Policy Act of 1969 and to demonstrate the decision process applied in the development of Part 61.

After a cursory review of the materials contained in NUREG-0782, Vols 1 thru 4, nothing obvious could be found requiring comments either positive or negative. The ultimate responsibility in the State for waste disposal siting and control will rest with N.J. Department of Environmental Protection. The documents reviewed were NRC's evaluation of the environmental impact of land disposal of radioactive waste.

State Departments involved in this area are the Department of Environmental Protection, National Governors Association and the National Council of State Legislators. New Jersey Department of Energy is not actively involved.

BCP/par

cc: Edward Linky

Note: Copies of NUREG 0782 available.

Docketed Comment Number: 7

Commenter: State of New Jersey, Department of Energy

Response(s): This comment was docketed and reviewed by the staff. No items were found in the comment which require a response.

Docketed Comment Number: 8

Commenter: Georgia Institute of Technology

Response(s): This comment was inadvertently docketed for both the rule and the EIS, although the comment addressed only the rule. The commenter's concerns were reviewed and responded to in the development of the final rule.

Docketed Comment Number: 9

Commenter: Stock Equipment Company

Response(s): This comment was inadvertently docketed for both the rule and the EIS, although the comment addressed only the rule. The commenter's concerns were reviewed and responded to in the development of the final rule.

46 FR 51776

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Administration
STATEWIDE PLANNING PROGRAM
265 Melrose Street
Providence, Rhode Island 02907

DOCKETED
81 DEC 23 P1:39
SECRETARY
U.S. SERVICE
BRANCH

December 15, 1981

Mr. R. Dale Smith, Chief
Low-level Waste Licensing Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

DOCKET NUMBER
PROPOSED RULE PR-61 (10)
(46 FR 51776)

Dear Mr. Smith:

This office, in the capacity of clearinghouse designate under OMB Circular Number A-95, Part II, has reviewed the Draft Environmental Impact Statement for the Licensing Requirements for Land Disposal of Radioactive Waste.

The Technical Committee of the Statewide Planning Program was presented the staff findings as a result of the review at its meeting of December 4, 1981. The Technical Committee recommends the following:

"The section of the Draft EIS pertaining to reuse of closed disposal sites is very brief and sketchy. Recreational uses, such as a golf course, might involve excavation to construct or reconstruct the course. The concept of reuse of these sites should be studied in more detail so that effective legal protections will be required." (1)

Comments from the R.I. Historical Preservation Commission and the R.I. Coastal Resources Management Council are attached.

We thank you for the opportunity to review this draft EIS.

Yours very truly,

Rene' J. Fontaine
A-95 Clearinghouse Coordinator

RJF/KFR/sjc

Reference File: EIS-81-12

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
INTER-OFFICE MEMO

TO : Mr. Daniel W. Varin, Chief
DEPT : Statewide Planning Program
FROM : Mr. John A. Lyons, Chairman
DEPT : Coastal Resources Management Council

DATE: 23 November 1981

SUBJECT: Draft Environmental Impact Statement "Licensing Requirments for Land Disposal of Radioactive Waste" File No. EIS-81-12.

No comment on the DEIS. Any proposed disposal project in Rhode Island will require CRMC review and approval.

JAL/drc

RECEIVED
STATEWIDE
PLANNING PROGRAM
NOV 24 1981
AM 7 8 9 10 11 12 1 2 3 4 5 6 PM

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

HISTORICAL PRESERVATION COMMISSION
Old State House
150 Benefit Street
Providence, R.I. 02903
(401) 277-2678

December 3, 1981

RE: EIS-81-12

Mr. Daniel W. Varin, Chief
Rhode Island Statewide Planning Program
265 Melrose Street
Providence, RI 02907

Dear Mr. Varin:

This office has reviewed the above-referenced DEIS for licensing land disposal of radioactive waste.

The DEIS is deficient in that it does not even mention impacts to cultural properties (or materials, for that matter). The DEIS should be revised to assess impacts to cultural properties, since the proposed activity may affect such resources. ②

Sincerely,

Eric Gerfelder
Deputy State Historic
Preservation Officer

RECEIVED
R.I. STATEWIDE
PLANNING PROGRAM
DEC 4 1981
AM 7|8|9|10|11|12|1|2|3|4|5|6 PM

Docketed Comment Number: 10

Commenter: State of Rhode Island, Department of Administration, Statewide Planning Program

Response(s): Item 1 - The staff received several comments on the draft rule with respect to control of site access and productive land use during the active institutional control period. The staff considered the issue of reuse of waste disposal facility land and determined that the government landowner administering the active institutional control program should have flexibility in controlling site access. This flexibility may include allowance of productive uses of the land provided the integrity and long-term performance of the site are not affected (emphasis added). Any productive use of the land during the institutional control period will require prior review and approval by NRC through the licensing process and would specifically consider the potential effects on site integrity and long-term performance.

Item 2 - The staff recognizes that construction and operation of land disposal sites for radioactive waste disposal may result in impacts to cultural resources. In preparing the draft EIS, the staff felt that these impacts were site-specific in nature and could not be adequately assessed in the absence of a specific site proposal. In the review and licensing process of a proposed disposal facility, NRC will operate under the requirements of Federal laws and regulations for the protection of cultural resources. Among other things, these requirements include coordination with the State Historic Preservation Office, conduct of a pre-construction cultural resources survey and the identification of mitigating measures to protect any known or encountered resources.

US Department of Energy
ARGONNE NATIONAL LABORATORY
9700 South Cass Avenue, Argonne, Illinois 60439
Telephone 312/972-6677

'81 DEC 23 P3:05

December 14, 1981

DOCKET NUMBER PROPOSED RULE PR-2, 19, 20, 21, 30, 40, 51, 61, 70, 73, 170 (46 FR 38081) (68)

SECRETARY DOCKETING & SERVICE BRANCH

DOCKET NUMBER PROPOSED RULE PR-61 (46 FR 51776) (11)

Mr. R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Division of Waste Management
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Smith:

Subject: Comments by Argonne National Laboratory on NRC Proposed Licensing Requirements for Land Disposal of Radioactive Waste (10 CFR 61), and Supporting Environmental Impact Statement (NUREG-0782)

Argonne National Laboratory has reviewed the Proposed Licensing Requirements for Land Disposal of Radioactive Waste (10 CFR 61) and the supporting Environmental Impact Statement (NUREG-0782). Our comments are attached.

We believe that the proposed 10 CFR 61 rule will provide a workable regulatory framework for licensing and operating new low-level radioactive disposal sites. The site requirements and criteria, operating and closure practices, and standards are conservative but in our opinion are generally practicable.

Very truly yours,

J. Howard Kittel

J. Howard Kittel, Manager
Office of Waste Management Programs

JHK:sfn
Enclosure

Acknowledged by card. 5/23/81. mdv

Comments on Proposed Licensing Requirements for Land Disposal of Radioactive Waste, 10 CFR Part 61, and on Supporting Draft Environmental Impact Statement, NUREG-0782

Argonne National Laboratory

December 10, 1981

I. 10 CFR 61

A. General Comment

Our general impression of the proposed rule 10 CFR 61 is that it is a good document. It should provide a workable regulatory framework for the successful licensing - and operation - of new low-level waste disposal sites. We do not find any serious flaws. It proposes reasonable site requirements and criteria, operating and closure practices, and standards. It implicitly and explicitly states, by virtue of its performance standards, that zero release or zero migration is not expected.

B. Definitions (61.2)*

The addition of definitions and discussions of several terms which have been omitted from Section 61.2 (Definitions) might eliminate some ambiguities in interpreting the regulations. The suggested additions and the reasons for adding them are outlined below.

1. "Long-Term" In Supplementary Information, Section V.B, "long-term" is defined as the time after operations cease (presumably the post-closure period). It is not clear that this is the intended definition to be used in the many references to "long-term" in the regulations. If so, further subdivision of the time following cessation of operations may be appropriate because the impacts and problems for different intervals of time beyond closure are quite different. For example, the problems during the period that one can rely on "passive" institutional controls (deeds, records, etc., that allow the owner and potential user to be aware of past use) are different from the problems beyond that period, and also from the problems in the period of active institutional control. A claim [Section 61.7(b)(3)] that is reasonable for a period of the order of 1000 years is that future occupation and use of the site is unlikely; it is less reasonable for a period of the order of 10^4 years or longer. It has not been established that the allowed concentrations of very long-lived radioisotopes are low enough to permit unrestricted use of the site (which must be considered probable after all records are lost), and there is nothing in the regulations that limits the period of concern for public health and safety.

* Numbers in ( ) refer to Section Nos. in 10 CFR 61.

2. "Disposal" The word "disposal is commonly interpreted to mean "permanent disposition of". If this is the intended definition, it should be so stated and noted that near-surface disposal is not necessarily a permanent means of disposition. Over a time period of the order of 10^5 years or longer, one cannot exclude the possibility (or even the likelihood) that the waste will be dispersed into the environment. The definition of "disposal" raises a legacy problem, and the implications of this for the hazards of waste with the limiting uranium and TRU concentrations need to be addressed, or at lease acknowledged, in the regulations.

3. "Stability" It is not clear whether the word "stability" is meant to be volume stability, so that the waste will not degrade, slump or collapse after burial, or also shape and physical stability, so that an intruder would clearly distinguish it from soil. If the former definition is allowed, then FUSRAP and similar waste is stable; if the latter definition is intended, it is not. If volume, shape, physical stability are required, some time limits may be needed; it might be difficult to ensure shape and physical stability for 10^4 years or longer unless rather expensive means, such as those proposed for high-level wastes, were used.

C. Protection of General Population from Releases of Radioactivity (61.41)

1. The performance objectives are given in terms of radiation dose. Since chemically-toxic, in addition to radiotoxic, substances may also be present in the waste, we believe that a general statement, at least, be included to the effect that releases of chemically-toxic substances shall not exceed any local or Federal standards that exist.

2. Two sets of radiation standards have been specified - one in terms of annual dose to any member of the public (25 mrem whole body and any organ except thyroid) and one in terms of drinking water concentration. The latter standard is based on 4 mrem/year for man-made radionuclides. Although it is recognized that the former is for individuals and the latter is for populations, it appears there are two different sets of standards. It is conceivable that releases to the general environment may cause exposures to as many individuals as contamination of the nearest public drinking water supply.

3. Regarding the statement "...at the nearest public drinking water supply...," this supply may not be the one most likely to be affected by the disposal site. The intent of this performance objective is certainly meant to apply to any water supply contaminated by waste migration, and this should be so stated.

4. It is possible that the last sentence in this paragraph might be misinterpreted by some to mean that the national drinking water standards are being applied to groundwater in general and not only to public drinking water supplies. We suggest that this sentence be reworded in somewhat this manner: "The waste disposal site shall not cause the National Primary Drinking Water Standards to be exceeded in any public drinking water supply." Additional clarification is needed to make the first and second sentences more compatible in terms of allowable dose, since in the first sentence drinking water could

yield a dose of 25 mrem to the whole body and still be in compliance, while in the second sentence it would not.

5. The evaluation of an annual dose to the individual requires a model which allows one to calculate dose from an environmental radioactivity concentration or source term. This model can, of course, not be given in the proposed rule, but it is presumed that guidance in this area will be provided later in Regulatory Guides. The rule could give some indication as to how this performance objective is to be met.

6. There is typographical error in the spelling of "radioactive" in the second sentence of the paragraph.

7. This Section is a general statement on standards, although not specifically directed at these. Standards are fixed absolute numbers, regardless of the uncertainties in the data on which they are based. Measurements and calculations made to assess performance against these standards are subject to uncertainties and to analytical and statistical errors. Thus, if the standard is 5 pCi/l, is a measurement of 5.1 + 0.2 pCi/l in violation? Probably yes, but is a measurement of 4.9 $\pm$ 0.2 pCi/l in violation? Probably no, but the two measurements do not significantly differ. It would be reasonable and useful if the standards could address this problem in some way. We do not have a clear answer at this time, but it is a technical rather than a legal question, and this may make it difficult to resolve. Possibilities are (1) specify a dose standard, e.g., 25 mrem/year, and the probability of delivering that dose, (2) specify a concentration, e.g., 5 pCi/l, and the standard deviation tolerated in a measurement meant to meet this standard and the method by which it was calculated.

D. Protection of Individuals from Inadvertent Intrusion (61.42)

1. It is our belief that the inadvertent intruder scenario is given too much weight and leads to some unreasonably low concentrations in Table 1, for example, in the case of ^{94}Nb (0.002 uCi/g). This may not cause any impact on waste disposal, since ^{94}Nb is not an abundant radionuclide, but this does establish a precedent that could be unnecessarily troublesome.

2. The inadvertent intruder scenario is tenuous at best - it requires predicting some far distant future event for which the uncertainty is large - and should not be the limiting or driving force in determining the hazards.

E. Disposal Site Suitability Requirements for Land Disposal (61.50)

1. We believe that the intent of this requirement is that the water table shall not cyclically rise into and fall beneath the buried waste. Burial beneath the water table could be satisfactory, if diffusion is the controlling rate (as stated in this paragraph), if the travel time is very slow, if the performance objectives can still be met, and if the water table never drops below the buried waste.

F. Environmental Monitoring (61.53)

1. It is not clearly stated in this section that the radiological and/or nonradiological (chemical and biological) characteristics of the environment should be determined to establish baseline concentrations.

2. Should there not be a reporting requirement to demonstrate compliance with applicable standards and discuss results? This is implicitly covered in 61.80 (h) (1).

G. Waste Classifications (61.55)

1. The proposed 10 CFR 61 specifically mentions two waste categories although they are outside its intended scope. These categories are: (1) wastes with radioisotope concentrations that exceed the limits in column (3) of Table I [Part 61.55d)]; and (2) wastes that might be exempted from the regulations (Supplementary Information, last paragraph of Section V.C). On the other hand, no mention is made in the current proposed regulations of the category referred to as "low-activity bulk solid waste" although it was included in the preliminary draft of 10 CFR 61 (issued November 5, 1979). Waste from the Formerly Utilized Sites Remedial Action Program (FUSRAP) would, presumably, fall into this category. FUSRAP waste is within the scope of 10 CFR 61, but it is unclear whether this was intended or incidental. It is of considerable interest why the low-activity bulk solid waste category was eliminated and whether it may be re-introduced at some future time.

2. FUSRAP waste meets the requirements of all of the 10 CFR 61 waste classifications (except possibly with regard to dimensional stability -- see below); it is mainly soil contaminated with very long-lived radioisotopes (mostly uranium and thorium ores and processing residues) at average concentrations that are smaller than the uranium and TRU limits in Table I by a factor of 100 or more. Waste-specific requirements for Class A, B, and C wastes may not be appropriate for such wastes.

3. In raising this question regarding the fate of the low-activity bulk solid waste category, we are aware of the recent published Branch Technical Position on Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations (46 FR 52061). The question concerns the waste identified in category 5 of the position paper, i.e., waste for which long-term disposal at a site other than a licensed disposal site will not normally be a viable option.

H. Labeling (61.57), and Tests at Land Disposal Facilities (61.81)

1. It is not clear where the primary responsiblity lies for verifying the character of a waste shipment. Is it the responsibility of the generator (Section 61.57), or the site operator, or the Commission (Section 61.81)? What means will be adopted to provide quality assurance?

II. NUREG - 0782

A. Federal and State Responsibilities (1.2.3)*

1. The proposed differences (if any) between the responsibilities of agreement states and those of nonagreement states with respect to the proposed rules are not clearly identified. For example, in the case of nonagreement state-owned disposal facility, is the state considered acceptable to provide surveillance during the site operational, closure, and institutional control phases? ①

2. If the site is owned by a state, the proposed rules should permit transfer to federal ownership during site operation or after closure. Such action could become desirable, although unforeseen at the time the license was issued. ②

B. Other Issues Regarding Classifications (2.4.3)

1. The EIS alludes to potential nonradiological hazards in LLW, but notes that NRC does not plan to address the total hazard of LLW. Nevertheless, it is desirable that the EIS or 10 CFR 61 note that the licensing applicant must take into account possible effects from biological or chemical hazards in the LLW and from any adjacent or colocated hazardous waste disposal site. ③

2. A "de-minimus" classification should be provided for LLW that is near or below background levels. The need for such a classification was noted in the 1980 regional workshops held to review the preliminary draft regulation (see App. C, Section 6.1.3). Support for a "de-minimus" or comparable classification has also been expressed by informed study groups including the Low-Level Waste Strategy Task Force (Ref. 1), the Conservation Foundation Dialogue Group on Low-Level Radioactive Waste Management (Ref.2), and the State Planning Council on Radioactive Waste Management (Ref.3). ④

C. Reference Disposal Facility Costs (3.6.5)

1. The direct operation cost for environmental monitoring (about $26,700 per year) shown in Table 3.6 is believed to be inadequate. We estimate that the cost of only the radiochemical analyses listed in Appendix E, page E-55 is about $40,000 per year. In addition, the cost for sample collection, sample preparation, quality assurance, and other factors might increase this cost by a factor of two. ⑤

D. Alternatives to the Base Case (5.2.4)

1. The EIS mentions use of high-integrity containers, but defines "high-integrity" only in subjective terms. LLW shippers and site operators will need a tightening of the definition of "high-integrity", if the use of such containers is specified as meeting NRC technical criteria for disposal. Will NRC provide a quantitative definition of "high-integrity container", or will this be left to others, such as state authorities or the private sector? ⑥

* Numbers in ( ) refer to Sections in NUREG-0782, Vol. 2, unless stated otherwise.

E. Classification of New Requirements (5.5.2)

1. Subsidence has proved to be a problem at LLW disposal sites, particularly in humid areas. The proposed approach of requiring structural stability for high-activity waste therefore has merit. Of greater importance, from a site operational standpoint, is the decontainerized disposal of low-activity waste, briefly discussed on page 5-113. This option should be available to waste generators and site operators for low-activity waste such as building rubble, machinery and other metal objects, biological waste, and compressible trash. Airborne activity release from dusting during emptying of containers can be minimized by use of dust control procedures. (7)

F. Potential Public Impacts from Small Spills During Normal Operation (6.2.1)

1. "Th-238" in Tables 6-3 is a typographical error. (8)

G. Background Irradiation (Appendix E, 3.2.7)

The pre-operational tritium concentraion of 350 pCi/l is about three times greater than it is in our (northern Illinois) area. The gross alpha and beta concentrations are reasonable. (9)

H. References

1. "Managing Low-Level Wastes: A Proposed Approach," EG&G Idaho, LLWMP-1 (August 1980)

2. "Toward a National Policy for Managing Low-Level Radioactive Waste," The Conservation Foundation (June 1981).

3. "Low-Level Radioactive Waste Management: An Economic Assessment," State Planning Council on Radioactive Waste Management (July 1981).

Docketed Comment Number: 11

Commenter: Argonne National Laboratory

Response(s): Item 1 - The responsibilities of Agreement and non-Agreement States would be different with respect to licensing of a near-surface disposal facility. In the case of a facility located in an Agreement State, the state would be responsible for licensing and regulatory control of the site. In the case of a non-Agreement State, the U.S. NRC would have licensing and regulatory jurisdiction. With respect to surveillance, monitoring, institutional and other land ownership responsibilities, however, both Agreement and non-Agreement States would have the same responsibilities as landowners and NRC believes both can administer acceptable programs. (The only difference would occur during the institutional control period where, in the case of an Agreement State, the Agreement State regulatory agency would license the state custodial agency. In a non-Agreement State, however, NRC would be responsible for such licensing.) NRC thus considers states (both Agreement and non-Agreement States) as well as the Federal government acceptable for providing land ownership, surveillance and monitoring during the institutional control period.

Item 2 - Part 61 does not preclude a state from transferring ownership of a site to the Federal government. Present laws, however, contain no specific provisions for such transfers (e.g., how they would take place and what Federal agency would assume ownership responsibility). As such, no specific provisions were included in Part 61 addressing such transfers. Each would need to be worked out on a case-by-case basis.

Item 3 - Several commenters on the proposed Part 61 regulations suggested that NRC adopt a total hazard approach to waste classification. That is, both the radiological hazard and nonradiological hazard would be considered and related in some manner so as to arrive at a combined hazard index. This combined hazard index would then be used to set different disposal requirements for different types and forms of waste. This approach, at the moment, presents a number of practical problems--the principal problem being

that to NRC's knowledge there is no accepted consistent way to numerically compare radiological and nonradiological hazards. This was the conclusion, for example, of a study which NRC commissioned to directly investigate the two types of hazard and try to compare the two numerically. (Reference 1) There are currently over 600 known radioisotopes which may emit three types of ionizing radiation: alpha, beta, and gamma. The effects of contact with radioactive material (e.g., through ingestion, inhalation or direct contact resulting in whole-body irradiation) can be quantified in terms of dose equivalents (e.g., so many millirems) which can be in turn related to an estimate of risk (e.g., a certain probability of an additional health effect). Thus, a "hazard index" (dose equivalent) which can be used to numerically compare radiological hazards exists and is generally accepted. A comparable hazard index, however, has not been generically developed for nonradiological hazards. There are hundreds of thousands of different chemicals in existence, and the level of knowledge of the effects of these chemicals on the human body is much less understood than the effects of radioactive material. Tests to determine whether a particular chemical may be a potential carcinogen are often accomplished by administering massive quantities of the chemical to laboratory animals. Here, it is difficult to relate the quantity of chemical uptake to a probability of a health effect.

Thus, NRC did not adopt a "total hazard" approach to waste classification for purely practical reasons. Nonetheless, NRC has not totally ignored potential nonradiological hazards associated with low-level waste. For example, proposed paragraph 61.51 (a)(7) states that only wastes containing radioactive materials shall be disposed of at the disposal site. This requirement is meant to preclude comingling of radioactive waste and nonradioactive hazardous waste. Siting a hazardous waste disposal site adjacent to a low-level waste disposal site could be allowed, however, as long as there was no interaction between the two facilities. [See §61.50(a)(11).]

Paragraph 61.56 (a)(8) requires that wastes containing biological, pathogenic, or infectious material must be treated to reduce the potential hazard. In addition, disposal facility licenses contain conditions which state that the chemical hazard in waste should not exceed the radiological hazard. Paragraph 61.56 (a)(2) prohibits waste being received at the site in cardboard or fiberboard boxes. This was intended in part to help ensure worker safety from possible harm from biological or infectious material. Finally, as part of reviewing a license for siting and operating a low-level waste disposal facility, NRC staff will review the applicant's nonradiological safety program.

Furthermore, the Commission believes that the technical provisions of Part 61 generally meet or exceed those expected in the Environmental Protection Agency's rules for the disposal of hazardous wastes. Although it is not the Commission's intent to allow disposal of hazardous wastes in a radioactive waste disposal facility, as is noted in the regulation, the Commission recognizes that such wastes may be present in low-level radioactive wastes. It is the Commission's view that disposal of these combined wastes in accordance with the requirements of Part 61 will adequately protect the public health and safety. Such hazardous wastes are expected to be such a small percentage of the total volume that dilution by other wastes would greatly minimize any risks. The Commission intends to work closely with the Environmental Protection Agency to assure continued compatibility. Further, EPA in its response to a resolution of the Conference of Radiation Control Program Directors indicated their willingness to work with other Federal agencies to deal with this problem.

Beyond this, the shipment manifest discussed in the proposed new paragraph 20.311 requires that the principal chemicals contained in the waste be identified. This is to allow identification of the presence of toxic or hazardous chemicals in specific waste streams. This will improve NRC's data base on the nonradiological hazard of LLW and allow consideration of any additional disposal requirements that may be required on a case-by-case basis.

Item 4 - NRC agrees that providing levels and other requirements for disposal of waste by less restrictive means (setting levels of "de minimis" waste disposal) is a very important issue. Setting such "de minimis" levels would accomplish at least three objectives:

1. It would reduce costs of disposal to licensees, particularly small entities.

2. It would help to conserve valuable disposal space in disposal facilities for waste which truly needs to be disposed according to the Part 61 requirements.

3. It would improve overall disposal site stability and thus help to reduce impacts from ground water migration and other long-term environmental releases as well as reduce long-term care costs.

Rather than delay the final EIS and promulgation of the final Part 61 rule, NRC staff have not included de minimis levels for radioactive wastes in the final EIS and rule. However, NRC intends to accelerate its schedule for development of de minimis levels. NRC believes that the fastest way to arrive at meaningful results in this matter is to first examine disposal of some specific waste streams by less restrictive means. From this experience, it is possible that generic levels may be developed which apply to all waste. In this regard, NRC is prepared to accept applications for licensees for declaring certain waste streams to be of no regulatory concern.

Item 5 - The commenter was contacted regarding the basis for the comment and provided estimates of the costs of various radiochemical analyses. Based upon this and other data, the environmental monitoring costs for the reference disposal facility (operational and post-operational) were recomputed. The costs for the alternative improved monitoring system discussed in Appendix F of the DEIS were also recomputed.

These new cost estimates have been set forth in Appendix C of this volume. These revised estimates do not change the overall conclusions reached in the DEIS but are included in the FEIS for the sake of accuracy and completeness.

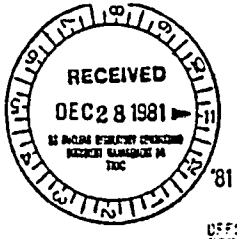
Item 6 - NRC has already provided specific guidance on the criteria for containers which include, where possible, quantitative data. The criteria have been set out in the draft Low-Level Waste Licensing Branch Technical Position on Waste Forms. Flexibility is being maintained to allow for a range of container designs and uses to meet individual waste generator needs.

Item 7 - NRC has attempted to maintain flexibility in meeting the performance objectives of Part 61. The option of decontainerized disposal or use of sanitary landfilling techniques for low activity compressible wastes was examined by NRC and is not precluded from use under final Part 61. NRC staff recognizes that this method of disposal may be one way of achieving greater site stability for low activity compressible wastes. Of concern during licensing would be the applicant's proposed methods to maintain operational exposures and potential airborne releases to low levels.

Item 8 - The listing in question should be for Th-228. See Errata section of this volume.

Item 9 - The comment refers to estimated background levels of tritium in surface water and ground water in the environs of the reference disposal facility. These estimates were included in Appendix B of the DEIS for illustration and completeness and are not meant to be representative of the Northern Illinois area. Background levels of tritium and other radionuclides in the environment vary from one region or area of the country to the next.

Massachusetts Natural Heritage Program



'81 DEC 28 A9:14

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

December 8, 1981

Mr. R. Dale Smith
Division of Waste Management
Office of Nuclear Material Safety and Safeguards
Nuclear Regulatory Commission
Washington, DC 20555

DOCKET NUMBER
PROPOSED RULE PR-61 (12)
(46 FR 51776)

Re: DEIS on 10 CFR Part 61

Dear Mr. Smith:

The Massachusetts Natural Heritage Program has reviewed the above referenced document and would like to compliment your agency on its careful and thorough documentation of a complex and controversial issue. As our particular concerns regard the maintenance and protection of rare species populations and other ecologically important natural features, our review focussed on the considerations given these natural environmental resources during the licensing process.

While the licensing process must comply with the National Environmental Policy Act and, thereby, with appurtenant federal laws and regulations dealing with rare species and significant habitats, we were pleased to acknowledge the DEIS's reference to state laws and regulations governing rare species. We would like to point out, though, that the vast majority of recognized rare species and, particularly, ecologically important habitat areas are not covered by either state or federal regulations and are not, therefore, subject to automatic consideration. So as to avoid impacting these unregulated natural features, we suggest that provision for this consideration be incorporated into the licensing procedure, particularly as it pertains to site selection. Incorporation of this concern into the site selection process could contribute to locating disposal facilities in the most environmentally sound manner, thereby avoiding later conflicts. (1)

As you may know, nearly 30 states have Natural Heritage Programs similar to ours which map and maintain extensive records on the location and status of rare plant and animal populations and other ecologically significant features. We, and the other Natural Heritage Programs, look forward to participating in the site selection and assessment for low-level radioactive waste disposal facilities.

We appreciate this opportunity to be of service. Please feel free to contact us for additional clarification or with any questions you may have.

Sincerely,

D510
S/O
Add: R. Dale Smith
20555

John E. Feingold
Program Coordinator

cc: Curtis Danforth, A-95 Clearinghouse

Department of Environmental Management 100 Cambridge Street, Boston, Mass. 02202 (617) 727-3188

Docketed Comment Number: 12

Commenter: Massachusetts Natural Heritage Program

Response(s): Item 1 - Potential applicants are encouraged by NRC to meet with the staff early in the planning process to discuss site selection criteria and procedures. These discussions will include recommendations by the staff for the applicant to consult as fully as possible with local and state agencies and resource centers having information on site-specific features such as rare species and important habitat areas which may or may not be protected by state or federal regulations. NRC will also work closely with state, county, municipal, and other agencies in the licensing process.

'82 JAN -4 A11:49

STATE OF DELAWARE
EXECUTIVE DEPARTMENT
OFFICE OF THE BUDGET
DOVER, DELAWARE 19901

TELEPHONE: (302) 736-4205

December 8, 1981

DOCKETED USNRC PR-61 (13)
PROPOSED RULE (46 FR 51776)

Low-Level Waste Licensing Branch
Division of Waste Management
Office of Nuclear Material Safety & Safeguards
Nuclear Regulatory Commission
Washington, DC 20555

Dear Sir:

RE: Draft Environmental Impact Statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste" (Volumes I, II, III & IV)

The Office of the Budget, in its function as the State Clearinghouse, has reviewed the above listed Draft EIS and has no negative comments to offer at this time.

Sincerely,

Henry James Decker
State Budget Director

HJD:FB:jm

Acknowledged by card. 1/4/82 mdu

Docketed Comment Number: 13

Commenter: State of Delaware, Executive Department, Office of the Budget

Response(s): This comment was docketed and reviewed by the staff. No items were found in the comment which require a response.

K. Dragonette

The State of North Dakota

Dale E. Moug
FEDERAL AID COORDINATOR

FEDERAL AID COORDINATOR OFFICE
State Capitol
Bismarck, North Dakota 58505

Allen I. Olson
GOVERNOR

DOCKET NUMBER PR-61 (14)
PROPOSED RULE (46 FR 51776)

December 2, 1981

"LETTER OF CLEARANCE" IN CONFORMANCE WITH OMB CIRCULAR NO. A-95

To: US Nuclear Regulatory Commission

STATE APPLICATION IDENTIFIER: ND8111020684

'82 JAN -4 A11:49

Division of Technical Information and
Document Control
US Nuclear Regulatory Commission
Washington, DC 20555

Dear Sir:

Subject: Draft Environmental Impact Statement for the Licensing Requirements for Land Disposal of Radioactive Waste.

This Draft EIS was received in this office on November 2, 1981.

Thank you for submitting your draft environmental impact statement for review and comment through the North Dakota State Intergovernmental Clearinghouse.

Your draft was referred to the appropriate agencies, and no comments were received to this date.

Please send copies of the final environmental impact statement and any supplemental impact statements to the North Dakota agencies that have commented on the draft and to this office. The opportunity to review your draft is appreciated, and if this office as Clearinghouse can be of further assistance with this project, please let me know.

Sincerely yours,

Lonnie A. Banks

Mrs. Leonard E. Banks
Coordinator
State Intergovernmental Clearinghouse

BAB/gd

Acknowledged by card. 1/4/82 mdv.

State Intergovernmental Clearinghouse 224-2095 | State & Local Planning 224-2818 | Energy Management & Conservation 224-2250 | Economic Opportunity 224-2467

Docketed Comment Number: 14

Commenter: State of North Dakota, Federal Aid Coordinator Office

Response(s): This comment was docketed and reviewed by the staff. No items were found in the comment which require a response.

46 FR 57176

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
Rockville MD 20857

'82 JAN -4 A11:49

DEC 24 1981

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

DOCKET NUMBER
PROPOSED RULE PR-61 (15)
(46 FR 51776)

Mr. R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Office of Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Smith:

The Bureau of Radiological Health staff have reviewed the Draft Environmental Impact Statement (DEIS) on 10 CFR 61, Licensing Requirements for Land Disposal of Radioactive Waste, NUREG-0782, dated September 1981. In reviewing this DEIS, we have limited our comments to the public health and safety impacts associated with the proposed regulations and have the following comments to offer:

1. In commenting on NUREG-0782, it is recognized that it is not a generic DEIS on disposal of low-level radioactive waste, but is a decision document which will provide a basis for decisions on the performance objectives and technical and financial criteria set forth in the proposed 10 CFR 61. Basic performance objectives are to (1) protect the inadvertent intruder, (2) assure long-term stability, (3) protect public health and safety over the long-term, and (4) assure safety during the short-term operational phase.

Radiation protection standards are considered a part of setting the performance objectives. An annual exposure limit of 25 mrem whole body, 75 mrem thyroid, and 25 mrem to any other organ of maximally exposed individuals at the site boundary (40 CFR 190), and an annual population limit of 4 mrem at the nearest public drinking water supply (40 CFR 141) are considered to be appropriate performance objectives for land disposal of low-level radioactive waste.

Because of the wide range of potential hazards, a waste classification system needs to be developed based on the methods or requirements that should be applied for disposal. These requirements can be defined by (1) waste characteristics, (2) containment and isolation capabilities of the method of disposal, and (3) social commitment controls. The implementation of this objective would require developing a set of potential exposure events at model waste disposal facilities and determining limiting concentrations of radionuclides in the waste such that any postulated event would not result in population exposure greater than the present radiation protection guidelines. These requirements would likely assure safe disposal of the radioactive waste and would, to the maximum extent possible, provide for long-term protection of the public health and safety.

Acknowledged by card. 1/4/82 mdv

2. The envronmental pathways identified in Volume 2, Chapter 5, and analyzed in Appendix G, Section 2, appear to cover the major emission pathways (Figures G.1 and G.2) through which radionuclides contained in the low-level wastes may be transported through the environment and impact on the population. The dose computational methodology and computer codes used to calculate individual and population exposure have resulted in reasonable estimates of doses resulting from assumed regional facility operations. The summary of the short-term and long-term environmental impacts for the base case and regional case studies shown in Volume 1, Tables 5.5, 5.6, 5.7, and 5.9 are within current radiation protection standards.

The release/transport/pathway and waste classification scenarios involve complex interacting parameters and diverse mechanisms through which radionuclides may be released and transported through the environment. Thus, it should be recognized that the dose calculations are based on many assumed parameters and environmental characteristics. On this basis, the DEIS should contain a section in Volume 2 on the uncertainties in the data base by expanding Section 3.3, Development of Data Bases for the Analysis. It is particularly important to address this issue since the doses are estimated for 100 and 500 years following closure of the disposal site. In Volume 1, page 20, it is stated that the exposures are calculated in a conservative manner indicating that the doses are on the high side. Because of the uncertainties discussed above and the time frame involved, it would be more appropriate to round off the doses and show the most likely range of population and individual doses. Such an approach would make the dose data more credible and would lead to an improved public understanding of the public health and environmental impact of land disposal of radioactive waste. (1)

3. Potential public impact from operational accidents is discussed in Volume 2, Section 6.2.2. Potential releases of radioactive material to the environment could occur from rupturing of a waste container or from a fire on-site that might consume waste packages with a subsequent release of a portion of the radioactivity in the waste. It is likely that the consequences of the accident would be confined to the site, and measures to mitigate the accident would be the responsibility of the onsite radiation safety personnel. Appendix E, Section 5.2.5.4 addresses abnormal or emergency situations and cites existing Federal regulations on notification of Federal authorities. In our view, this section, perhaps, should be expanded to include emergency planning requirements and the need for coordination with State and local authorities. (2)

The analyses of an accidental fire and of a ruptured dropped container are based on accident scenarios and methodology described in Appendix G. This analysis resulted in (1) stream-by-stream (mode) impacts to the whole body and bone from a fire accident (Table 6.3), and (2) stream-by-stream impacts to the whole body and lungs from a dropped container accident (Table 6.4). The calculated doses appear to be reasonable for the accident situation described. It is noted that any action at the facility to reduce potential long-term impacts from ground water intrusion or inadvertent human intrusion would have an additional benefit of reducing the short-term impact (i.e., individual exposure) from potential accidents.

Page 3 - Mr. R. Dale Smith

4. An environmental monitoring program that will be carried out at the referenced disposal facility is described in Appendix E, Section 5.2.6; and Appendix F, Section 2.3.1, and is summarized in Table E.10. This program appears to provide adequate sampling frequency and analysis for specific radionuclides in critical exposure pathways. It is considered sufficiently inclusive to measure potential emissions from short-term operational releases. Over the long-term, the ground water monitoring system is likely to detect ground water migration at the onsite and offsite sampling wells. The water sampling program should be extended to the nearest public drinking water supply to assure that the dose equivalent to the total body or any internal organ is not greater than 4 mrem/yr. (40 CFR 141.16). The facility operator should be on the alert to detect the potential rapid movement of radioactive material through fractured or jointed geological formations and showing up in the test wells. (3)

In our view the monitoring program must be capable of supplying information on the performance of the site, and the data must be interpreted in such a timely manner that actions to mitigate any unusual release can be initiated. (4)

5. Volume 2, Chapter 10, identified, evaluated and quantified the effects of the proposed regulation 10 CFR 61 on management of low-level radioactive waste disposal sites. Section 10.3.3 contains the long-term and short-term radiological impacts based on the regional analysis. There is, however, no discussion in this DEIS of the risk associated with operation of a low-level waste disposal facility. In our view, this section should be expanded to quantify the risks in relation to a referenced regional facility. (5)

Thank you for the opportunity to review and comment on this Draft Environmental Impact Statement.

Sincerely yours,

John C. Villforth
Director
Bureau of Radiological Health

Docketed Comment Number: 15

Commenter: U.S. Department of Health and Human Services, Public Health Service, Food and Drug Administration

Response(s): Item 1 - NRC agrees that uncertainties in the data bases should be included in the analyses. Due to the lack of specific data in some cases and the wide range in specific data points for many waste streams, however, NRC found that uncertainties could not be quantified and when quantified led to extremely large ranges in some cases. As such, and given the uncertain nature of accurately predicting many of the exposure pathways, NRC chose to point out the uncertainties in the data bases and pathways in the text and to emphasize that the doses reported were conservative. NRC also pointed out that potential exposures from disposal of waste at an actual site would not exceed these doses and would be much lower than those reported.

Item 2 - Potential public impacts from operational accidents were addressed in a conservative manner in the draft EIS, principally to investigate the effects that NRC's requirements addressing intrusion, environmental monitoring, and disposal facility stability would have on operational safety. It was concluded in the DEIS that such requirements generally helped to improve operational safety. NRC did not perform a detailed analysis, however, of all aspects of site operational safety. Such an analysis would have most use as part of an individual licensing action for a specific site.

In any case, NRC staff believes that the best approach would be to maintain a high degree of flexibility in possible approaches to achieving and improving operational safety. Additional safety requirements to those in the Part 61 rule would be imposed for different sites, disposal methods, or waste forms on a case by case basis. Reviewing and updating a licensee's operational safety program would also receive detailed consideration during periodic license renewal activities.

As the commenter has stated, measures to mitigate an accident would be primarily carried out by onsite radiation safety personnel. Sites licensed for radioactive waste disposal must have procedures in place for handling unusual or

potentially hazardous occurrences. These procedures are supplemented by training and drills. Site procedures to handle abnormal or emergency situations would be reviewed as part of licensing the disposal site as well as during license renewals. These procedures would include personnel training and drills, use of emergency equipment, and coordination with state and local authorities (police, hospitals, fire, etc.). This latter point is addressed in Section 5.2.5 in Appendix E, but may be clarified by adding the following to the end of the second complete paragraph on Page E-54: "This planning includes dialog and coordination with State and local authorities and emergency groups such as police, fire, and hospitals." This change has been incorporated into the Errata section of this volume.

Item 3: Water sampling will be part of an overall environmental monitoring program for a new LLW disposal facility which will included as a part of each application. The number and location of water monitoring locations is a critically site-specific consideration. NRC will review each applicant's monitoring program to assure that it will adequately assess site performance. The program may or may not include the nearest public drinking water supply.

With respect to the comment on rapid movement of radioactive material through fractured or jointed geological formations, the criteria for determining site suitability in §61.50 of 10 CFR Part 61 are intended to ensure that a disposal site is located in geologic media having predictable transport characteristics. The inability to monitor and predict site performance is one of the reasons for avoiding such formations. Although the site operator should be alert to any unusual monitoring results, the staff believes that any future licensed facilities would not be located in fractured or jointed geological formations.

Item 4 - NRC's review of the applicant's proposed environmental monitoring program will be based upon the ability of the program to supply information on site performance and the applicant's procedures to collect, interpret and take appropriate action on monitoring results.

Item 5 - In the draft EIS, NRC expressed radiological impacts associated with operation of a near-surface disposal facility in terms of exposures to individuals and populations. NRC did not convert or express these exposures in terms of risk because of the difficulty of accurately assessing risks of exposures to future populations and the small number of individuals involved who could receive a potential exposure. The staff reconsidered its decision on this issue, but has not changed its position. Expressing exposure in terms of risk would involve new work and time which is not warranted given the urgent need for Part 61 and the limited additional information which would be provided. In the DEIS, NRC compared calculated doses on a common basis to existing standards which are expressed in terms of dose equivalent. NRC has, however, attempted to express the overall impacts of Part 61 in the FEIS in a clearer manner such that comparison of alternatives and unmitigated impacts are easier to discern understand.

In addition, in response to this comment and to place in perspective the potential risk associated with the doses calculated in this FEIS. NRC has included a section in the summary which provides dose response relationships as set forth in International Commission on Radiation Protection Publication 26. The reader can use these relationships to estimate the level of risk associated with doses calculated for various alternatives.

major
DOCKET NUMBER PR-61 (16)
PROPOSED RULE PR (46FR 51776)

SIGNOFF

OMB Approval No. 29-R0218

FEDERAL ASSISTANCE

1. Type of Action (Mark appropriate box) ☐ Preapplication ☐ Application ☐ Notification Of Intent (Opt.) ☐ Report Of Federal Action	2. Applicant's application a. Number b. Date 19 Year Month Day	3. State application identifier a. Number AZ 81-80-0065 b. Date Assigned 1981 10 28
Leave Blank DEC 11 1981		

Section I - Applicant / Recipient Data

4. Legal Applicant/Recipient
a. Applicant Name : U.S. Nuclear Regulatory Comm.
b. Organization Unit : Off. of Nuclear Material Safety & Safeguards
c. Street/P.O. Box :
d. City : Washington e. County :
f. State : D.C. g. Zip Code : 20555
h. Contact Person (Name & telephone no.) : R. Dale Smith (301) 427-4433

5. Federal Employer Identification No.
DOCKETING & SERVICE BRANCH

6. Program (From Federal Catalog) a. Number 77-999 b. Title Unknown
Nuclear Regulatory Comm.

7. Title and description of applicant's project Draft Environmental Impact Statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste" - NUREG-0782
This EIS analyzes requirements for the land disposal of radioactive waste and specifically, near surface disposal.
The proposed action will provide licensing procedures, performance objectives, & tech. requirements for issuance of licenses for the land (over)

8. Type of applicant/recipient
A-State G-Special Purpose District
B-Interstate H-Community Action Agency
C-Substate District I-Higher Educational Institution
D-County J-Indian Tribe
E-City K-Other
F-School District
(Specify): Fed. Agency Enter appropriate letter K

9. Type of assistance
A-Basic Grant D-Insurance
B-Supplemental Grant E-Other
C-Loan Enter appropriate letter(s) E

10. Area of project impact (Names of cities, counties, states, etc.) Statewide, Arizona

11. Estimated number of persons benefiting

12. Type of application
A-New C-Revision E-Augmentation
B-Renewal D-Continuation
Enter appropriate letter A

13. Proposed Funding

a. Federal	$ .00
b. Applicant	.00
c. State	.00
d. Local	.00
e. Other	.00
f. Total	$ .00

14. Congressional Districts Of: a. Applicant b. Project 01, 02, 03, 04

15. Type of change For 12c or 12e
A-Increase Dollars F-Other Specify:
B-Decrease Dollars
C-Increase Duration
D-Decrease Duration
E-Cancellation
Enter appropriate letter(s)

16. Project Start Date Year month day 19
17. Project Duration Months
18. Estimated date to be submitted to federal agency Year month date 19
19. Existing federal identification number
20. Federal agency to receive request (Name, city, state, zip code)
21. Remarks added ☐ Yes ☐ No

Section II - Certification

22. The Applicant Certifies That
a. To the best of my knowledge and belief, data in this preapplication/application are true and correct, the document has been duly authorized by the governing body of the applicant and the applicant will comply with the attached assurances if the assistance is approved.
b. If required by OMB Circular A-95 this application was submitted, pursuant to instructions therein, to appropriate clearinghouses and all responses are attached:

	No response	Response attached
(1) Arizona State Clearinghouse	☐	☒
(2) Region I,III,V,VI Clearinghouses	☐	☒
(3) (Region II,IV will be forwarded)	☐	☐

23. Certifying representative a. Typed name and title b. Signature c. Date signed Year month day 19

Section III - Federal Agency Action

24. Agency name
25. Application received Year month day 19
26. Organizational Unit
27. Administrative office
28. Federal application identification
29. Address
30. Federal grant identification
31. Action taken ☐ a. Awarded ☐ b. Rejected ☐ c. Returned for amendment ☐ d. Deferred ☐ e. Withdrawn

32. Funding

a. Federal	$ .00
b. Applicant	.00
c. State	.00
d. Local	.00
e. Other	.00
f. Total	$ .00

33. Action date 19 Year month day
34. Starting date 19 Year month day
35. Contact for additional information (Name and telephone number)
36. Ending date 19 Year month day
37. Remarks added ☐ Yes ☐ No
38. Federal agency A-95 action
a. In taking above action, any comments received from clearinghouses were considered. If agency response is due under provisions of Part 1, OMB Circular A-95, it has been or is being made.
b. Federal Agency A-95 Official (Name and telephone number)

424-101

Standard Form 424 Page 1 (10-75)
Prescribed by GSA, Federal Management Circular 74-7

<u>Docketed Comment Number:</u> 16

<u>Commenter:</u> Arizona State Clearing House

<u>Response(s):</u> This comment was docketed and reviewed by the staff. No items were found in the comment which require a response.

DOCKET NUMBER PROPOSED RULE PR-61 (17)
(46 FR 51776)

PR 61
46 FR 51776

STATE OF IOWA

Office for Planning and Programming

523 East 12th Street, Des Moines, Iowa 50319 Telephone 515/281-3711

ROBERT D. RAY
Governor
EDWARD J. STANEK, PhD
Director

STATE CLEARINGHOUSE

PROJECT NOTIFICATION AND REVIEW SIGNOFF

Date Assigned: November 20, 1981 STATE APPLICATION IDENTIFIER: IA821130-347

Review Completed: December 31, 1981

APPLICANT PROJECT TITLE:
Draft EIS, Requirements for Land Disposal of Radioactive Waste NUREG-0782

APPLICANT AGENCY: U.S. Nuclear Regulatory Commission
Address Office of Nuclear Material Safety and Safeguards
Washington, D. C. 20555

FEDERAL PROGRAM TITLE, AGENCY AND CATALOG NUMBER: U.S. Nuclear Regulatory Commission

AMOUNT OF FUNDS REQUESTED: NA

PROJECT DESCRIPTION:
Draft Environmental Impact Statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste"
NUREG-0782 Volumes 1 - 4.

The State Clearinghouse makes the following disposition concerning this application:

[X] No Comment Necessary. The application must be submitted as received by the Clearinghouse with this form attached as evidence that the required review has been performed.

[ ] Comments are Attached. The application must be submitted with this form plus the attached comments as evidence that the required review has been performed.

STATE CLEARINGHOUSE COMMENTS:

'82 JAN -7 P3:02

CH-14 Acknowledged by card..1/7/82.mdv....

A. Thomas Wallace
Federal Funds Coordinator

Docketed Comment Number: 17

Commenter: State of Iowa, Office for Planning and Programming

Response(s): This comment was docketed and reviewed by the staff. No items were found in the comment which require a response.

Minnesota Department of Economic Development

'82 JAN -7 P3:23

December 18, 1981

USCAS NUMBER
PROPOSED RULE PR-61 (18)
(46 FR 51776)

U. S. Nuclear Regulatory Commission
Washington D. C.
20555

RE: Draft Enviromental Impact Statement on 10 CFR Part 61
Licensing Requirements for Land Disposal of Radio Active Waste
SCH #8110402

Nuseg-0782

Dear Sir:

This is to certify that the Minnesota State Clearinghouse has, in accordance with the procedures established by Office of Management and Budget (OMB) Circular A-95, reviewed the above project. State agencies which may be interested in or affected have been informed of the proposed project by this office.

This letter is to inform you that no state agency had any negative comment regarding your proposed project, and that you are therefore authorized to proceed with the application process. Your funding agency may want to know either the State Clearinghouse number or to see a copy of this letter in order to verify that you have complied with the requirements of OMB Circular A-95.

Sincerely,

Richard Woodbury, Administrator
State Clearinghouse
612/296-2289

RW:pas

Acknowledged by card. 1.7.82. mdw.

480 Cedar Street, St. Paul, Minnesota 55101 612/296-2753

Docketed Comment Number: 18

Commenter: Minnesota Department of Economic Development

Response(s): This comment was docketed and reviewed by the staff. No items were found in the comment which require a response.

Executive Department
155 COTTAGE STREET N.E., SALEM, OREGON 97310

VICTOR ATIYEH
GOVERNOR

RECEIVED 915-55

1981 DEC 29 PM 3 12

U.S. NUCLEAR REG. COMMISSION NMSS MAIL SECTION

December 1981

DOCKET NUMBER PR-61 (19)
PROPOSED RULE (46 FR 51776)

DOCKETED

'82 JAN -7 P3:23

OFFICE OF SECRETARY

U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

RE: Licensing Requirements for
Land Disposal of Radio Active
Wastes
OR811104-002-4

Thank you for submitting your draft Environmental Impact Statement for State of Oregon review and comment.

Your draft was referred to the appropriate state agencies for review. The consensus among reviewing agencies was that the draft adequately described the environmental impact of your proposal.

We will expect to receive copies of the final statement as required by Council of Environmental Quality Guidelines.

Sincerely,

INTERGOVERNMENTAL RELATIONS DIVISION

Kay Wilcox
A-95 Coordinator

KW:cb

Acknowledged by card 1/7/82 mdv

Docketed Comment Number: 19

Commenter: State of Oregon, Executive Department

Response(s): This comment was docketed and reviewed by the staff. No items were found in the comment which require a response.

DOW CHEMICAL U.S.A.

January 12, 1982

'82 JAN 15 P4:10

emp

LARKIN LABORATORY
1691 N. SWEDE RD.
MIDLAND, MICHIGAN 48640

(20)

DOCKET NUMBER
PROPOSED RULE PR-61
(46 FR 51776)

DOCKET NUMBER
PROPOSED RULE PR-2 etal (83)
(46 FR 38081)

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

Attention: Docketing and Service Branch

Subject: DOW COMMENTS, PROPOSED RULEMAKING 10 CFR 61

The subject proposed rulemaking was published in the Federal Register on July 24, 1981, with the comment period to expire on October 22, 1981. NUREG-0782, a draft environmental impact statement, was referenced to provide guidance and support to 10 CFR 61, however, NUREG-0782 had not been published. Dow comments on proposed rulemaking 10 CFR 61 are dated September 18, 1981, and were submitted to the Commission with a cover letter dated October 12, 1981. The cover letter states that additional comments will be submitted as necessary and as opportunities arise.

The Commission has extended the comment period for 10 CFR 61 to January 14, 1982. Dow received NUREG-0782 on October 19, 1981, and a draft Branch Technical Position (BTP) on Waste Form dated October 30, 1981. Additional Dow comments are as follows:

NUREG-0782

On pages 4, 5, 6, and 7 of the comments dated September 18, 1981, Dow stated concern that NUREG-0782 may be placing too much emphasis on pathway analysis and overlooking the concepts of ALARA and best available technology and ignoring the needs and objectives of assuring protection of the workers, the general population, and the environment during the operation of the disposal facility. (1)

Review of NUREG-0782 has confirmed that the concern is valid and justified.

BTP on Waste Form

Dow comments dated November 25, 1981, were submitted to Mr. Robert E. Browning, Deputy Director Division of Waste Management. Copies of the BTP and Dow comments are attached. Please consider them as part of the Dow comments on 10 CFR 61.

AN OPERATING UNIT OF THE DOW CHEMICAL COMPANY

Acknowledged by card 1/21/82 emp

Dow appreciates the opportunity to comment on 10 CFR 61. The Commission now has sufficient technical information and experience to justify establishment and enforcement of regulatory standards and technical criteria for the proper disposal of radioactive wastes. Dow encourages the Commission to take immediate actions on 10 CFR 61.

Sincerely,

J. B. Owen

J. B. Owen
Group Leader
Nuclear & Solidification Services
517-636-3388

fo

Attachment

Docketed Comment Number: 20

Commenter: Dow Chemical, U.S.A.

Response(s): Item 1 - With respect to the application of ALARA to a near-surface disposal (NSD) facility, NRC intends that ALARA apply to the performance objectives addressing releases of radioactivity to the environment and safety during operation. Changes have been made to 10 CFR 61 to reflect this intent. With respect to individual technical requirements based on ALARA, NRC made no change to the rule. Part 61 sets out minimum requirements that should be met in all cases. The choice of an individual licensee in meeting any given requirement(s) would be done on an individual basis considering all aspects of ALARA (e.g., occupational exposures during operations, effluent releases, cost, etc.). (NRC also addressed the issue of application of ALARA to an NSD facility and development of requirements based on ALARA in response to specific comments filed on proposed 10 CFR 61. The reader is referred to Appendix B.)

NRC has considered in its EIS the use of "best available technology" for the design, operation, closure and form of waste disposed of at a near-surface disposal facility. NRC does not believe, in its efforts to analyze the potential long-term costs and impacts of disposal that it has ignored the needs and objectives of assuring protection of the workers, the general population and the environment during the operations of the disposal facility. As discussed in Chapter 6 of the DEIS, the improvements reflected in Part 61 serve to reduce any potential operational impacts. NRC believes that flexibility is needed in methods to achieve and improve operational safety and that possible further improvements in operational safety may best be addressed on a case-by-case basis.

NORTHEAST UTILITIES

General Offices • Selden Street, Berlin, Connecticut

P.O. BOX 270
HARTFORD, CONNECTICUT 06101
(203) 666-6911

(95)

PR-2 etal
(46 FR 30081)

January 14, 1982

B10330

(21)

PR-61
(46 FR 51776)

Mr. Samuel J. Chilk
Secretary of the Commission
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Attention: Docketing and Service Branch

Reference: Proposed Changes to 10 CFR Parts 2, 11, 20, 21, 30, 40, 51, 61, 70, 73 and 170, Federal Register pages 38, 081-38,105, dated July 24, 1981.

Dear Sir:

NRC Proposed Rule on Licensing Requirements for Land Disposal of Radioactive Waste

Northeast Utilities Service Company, on behalf of Northeast Nuclear Energy Company and Connecticut Yankee Atomic Power Company commends the Commission on its work to date regarding land disposal of radioactive wastes. While the Notice of Proposed Rulemaking represents a significant improvement over earlier drafts, the present version still requires additional modifications to ensure that disposal of low-level waste is accomplished in a fair and equitable manner.

Northeast Utilities' subsidiary companies, responsible for the operation of three nuclear power plants and the part owner of five others that are either operating or under construction, has a vital interest in providing for the safe and efficient disposal of nuclear waste. As such, we believe that all rules must have a sound basis and that arbitrary, capricious rules have no place in federal regulations. With these thoughts in mind, we offer our comments on the proposed rule and the accompanying "Draft Environmental Impact Statement" (NUREG-0782) for the Commission's consideration in development of the final rule for land disposal of radioactive wastes.

DS10
1/1
ADD:
R. D. Smith
Jos Donoghue
P. Goldberg
D. Nussbaumer

SPECIFIC COMMENTS

1. Waste Stability Requirement

Paragraph 61.7(b)(2):

As it is not possible to reduce water access to zero the phrase "eliminated or" (line 6) should be deleted. Furthermore, "stability of the waste and the disposal site" needs to be clarified as to whether stability of the disposal site refers to its operational phase or the stabilization for site closure, the latter of which, according to paragraph 61.7(c)(2), would not be required until disposal operations are about to cease.

Rec'd by NRC 1/22/82 cmp

"...institutional control is relied on for periods up to 100 years to control access to the closed site. This permits the disposal of Class A segregated and Class B stable waste without special provisions for intrusion protection, since these classes of waste contain types and quantities of radioisotopes that will decay during the 100-year period to levels that do not pose a danger to public health and safety..." (emphasis added)

This paragraph appears to support the numerical values of maximum permissible concentrations listed in Table 1. However, paragraph 61.56(b) states:

"...The requirements in this section are intended to provide stability of the waste for at least 150 years. Stability is intended to assure that the waste does not degrade and promote slumping, collapse, or other failure of the disposal unit and thereby lead to water infiltration. Stability is also a factor in limiting exposure to an inadvertent intruder, since it provides a recognizable and nondispersible waste..."

There is no justification for providing "stability" for 150 years when the waste does not pose a danger to public health after 100 years. Therefore, we recommend that the waste stability requirement of paragraph 61.56(b) be changed from 150 to 100 years to be consistent with paragraph 61.7(b)(4).

Paragraph 61.7(b)(5)

This paragraph needs to clarify whether the High Integrity Container (HIC) alone will meet the stability requirments for Class C wastes. (i.e. 500 year stability requirement)

Paragraph 61.44

Burial trenches that contain only Class A waste, which according to paragraph 61.55(a) are not required to be stable, should be excluded from long-term stability requirements of paragraph 61.44.

Paragraph 61.50(a)(5)

The terms "coastal high-hazard area" and "wetland" should be defined.

Paragraph 61.52(a)(3)

The term "cover" should be clarified as to whether it includes an impervious cap.

2. License Renewal

Paragraph 61.7(c)(2) states:

> "...Periodically, the authority to conduct the above surface operations and receive waste will be subject to a license renewal, at which time the operating history will be reviewed and a decision made to permit or deny continued operation..."

We understand the above requirement to mean that the disposal facility operating license must be renewed periodically, at five year intervals. This is not appropriate since the operation of the disposal facility is viewed by NRC and industry as a long-term activity. Therefore, the license should be for the operational lifetime of the facility as is the current licensing practice for operating plants. This would require a long-term commitment from the facility operator while at the same time prevent a possible periodic disruption of service.

Furthermore, periodic license renewals are unnecessary as NRC has authority to perform inspections under Paragraph 61.82 and to take appropriate action in instances of violation under Paragraph 61.24 and 61.83 of this rule, including revoking or suspending any license. (Additional comments on public hearings associated with license renewals are provided under item 5.)

3. Transuranic Limit

Paragraph V.B. states:

> "...The Commission is applying a 500 mrem/yr maximum individual exposure limit for this unusual case. (intrusion) This limit is based on ICRP recommendations for dose limits to individuals and is a level that is recognized as providing adequate protection. Since only one, or at most a few, persons would be involved, it is not necessary to consider a population dose. This limit is then used to determine the allowable concentrations of nuclides in each class of waste. (See Paragraph 61.42) ..."

As stated above, Paragraph 61.42 provides a 500 mrem/yr accidental instrusion dose limit for the isotopes listed in Table 1, including transuranics. Yet this stated criteria (500 mrem/yr) was apparently ignored in the development of the maximum allowable concentration for alpha-emitting transuranic isotopes for Class C waste. Rather, Paragraph V.C. states:

> "...For most of the alpha emitting transuranic nuclides, the maximum allowable concentrations were calculated to be in the range of 10 nanocuries per gram currently imposed by disposal facilities. These calculations were conservatively based, in the that did not allow credit for dilution by other wastes. If this factor were changed, the values would increase somewhat. A decision was made not to recalculate in order to come up with higher values. This decision is based on two factors. First, in the spirit of the ALARA (as Low as Reasonably Achievable) concept, the lower value of 10 nCi/g has been demonstrated as an achievable concentration to control the disposal of transuranic nuclides. This value has been imposed by the Department of Energy for some eleven years and by most of the commerical disposal site operators for nearly that long. The last commercial site imposed the 10 nCi/g restriction in 1981; Thus, there is no need to increase the limit from the standpoint of achievability..."

One of the major problems the NRC needs to address is the development of consistency throughout its regulations. There is no technical justification for arbitrarily lowering the limits on the maximum allowable concentration of Class C transuranic waste to 10 nCi/gm from that value necessary to limit intruder dose to 500 mrem/yr. Establishment of a limit simply because it is believed to be achievable does not consititute a valid or rational basis in the absence of a cost/benefit analysis.

An EPRI study described in NP-1494, "Activity Levels of Transuranic Nuclides in Low-Level Solid Waste from U. S. Power Reactors" presents the results of isotopic analysis of various waste forms from 25 nuclear plants. Although for transuranic isotopes, the median values were within the 10 nCi/g proposed limit, there were dozens of analyses of Pu-239, Am-241, Cm-242 and Cm-244 which contained concentrations in the 10-100 nCi/g range. These results clearly show that the 10 nCi/g limit on transuranic elements is not readily achievable in all cases and could cause needless hardship and expense. The reference to ALARA, therefore, as justification for establishment of this arbitrary limit is a blatant misuse of this concept. The "Reasonably Achievable" concept within ALARA is just as important as the concept of "As low as..."

We also call your attention to the fact that the House Science Committee, during a recent mark-up session on HR 5016, voted to expand the definition of transuranic waste from 10 to 100 nCi/g.

Paragraph 61.55 - Table 1

At present the burial sites in South Carolina and Nevada will not accept any waste that has transuranics above 10 nCi/g. However, alpha-emitting transuranics that are found in nuclear power plant radioactive waste are not the isotopes of major concern. Therefore, we recommend that Columns 1 and 2 of Table 1 permit burial of alpha-emitting transuranic isotopes of up to 100 nCi/g when the isotopes have been identified and rationed to specific gamma emitting isotopes. We also recommend that class A and B waste limits should also be established for Pu-241.

Furthermore, as the intruder pathway (i.e. long-term potential for hazard) is the basis for the TRU limit, Cm-242, which has a 163 day half-life should be exempted from whatever limit is ultimately established for TRU wastes.

Paragraph 61.55(d)

The paragraph indicates that radioactive wastes with concentrations that exceed the values shown in column 3 are not generally acceptable for near-surface disposal and shall not be disposed of without specific Commission approval pursuant to subsection 61.58. This requirement would clearly create problems for spent resin shipments from our nuclear facilities. As such, we recommend that the final rule specify the criteria the Commission intends to use in authorizing disposal of wastes which exceed the limits for class C wastes specified in column 3 of Table 1.

5. De Minimus Concentrations

Paragraph V.C. states:

> "...The Commission recognizes the need for a "de minimis" classification of wastes, wastes that would be exempt from Part 61 and would be considered of no regulatory concern. The Commission believes, however, as the Federal Radiation Policy Council has recommended, that such exemptions should be determined on a specific waste basis. In this regard, a recent rulemaking (46 FR 16230) established such an exemption in a new § 20.306 for certain levels of tritium and carbon-14 contained in liquid scintillation and animal carcass waste. Other wastes may also readily lend themselves to treatment in this manner. The Commission will be working over the next 2 years to define these wastes and provide for additional exemptions as appropriate. Thus, Part 61 will not establish a generic "de minimis" category for waste..."

Northeast Utilities supports the "de minimus" concept and encourages the prompt establishment of the necessary criteria. It appears to us that broader use of the "de minimus" classification would result in conservation of scarce disposal site area while maintaining protection for the health and safety of the public. The AIF's National Environmental Studies Project has issued a report entitled "De Minimus Concentrations of Radionuclides in Solid Wastes" which should be reviewed by the Commission.

5. Public Hearings

Paragraph V.C. states:

> "...The life of a typical facility can be broken into 5 phases: preoperational, operational, closure, postclosure observation, and institutional control...at intervals specified in the license, (the normal term for materials licenses is currently 5 years) the licensee would be required to submit a license renewal application (§ 61.27). At this time, the disposal site closure plan and funding requirements would be updated and financial arrangements for assurance of adequate funding reviewed. A public hearing would be offered..."

Northeast Utilities has reviewed the five phases that make up the life cycle of the disposal facility. Within these five phases there are provisions for multiple public hearings.

1. The first public hearing is provided for subsequent to docketing the license application.

2. During operation, public hearings are provided for at each of the 5 year license renewals. For a typical facility with a 25 year life, public hearings would be held at 5, 10, 15 and 20 years after initial operation.

3. A public hearing is provided for at the time of site closure, i.e., the 25th year.

4. The final hearing is provided for at the time of license transfer, i.e., about 5 years after closure or the 30th year.

Thus, for a disposal facility with a 25 year operating life, the regulations provide for a total of seven public hearings.

Although Northeast Utilities supports the concept of public participation, and believes that all pertinent issues should be addressed prior to commencement of construction, we have also observed the obstructionist tactics some parties have utilized at public hearings and the disastrous influence these have had on cost and schedule of a project.

The provisions for a multitude of public hearings with their pernicious effect on orderly and predictable construction, operation, closure and transfer of license processes makes us deeply concerned that no private entity will be willing to subject themselves to this degree of regulatory uncertainty.

Northeast Utilities believes that the conditions for facility construction, operation, closure and license transfer must be specified and agreed upon at the outset by the licensee. A public hearing will be held at that time, if requested, for public input to the process. Subsequent to license issuance, the NRC should monitor and inspect the activities at the facility to ensure they are in conformance with the license. Unforeseen events can be accommodated by amending the facility license. Further participation by the public is not necessary to ensure the facility is being operated properly. The prospect of repeated public hearings every five years to consider continued operation of the facility is totally unnecessary and must be eliminated from the final rule. A more appropriate and effective oversight would be provided by assigning a full time NRC inspector to a disposal site.

Additional Comments on 10CFR61

Title of Proposed Rule:

It is essential for the public to begin to distinguish between high level nuclear wastes which will require disposal in geologic repositories and low-level waste which, under 10 CFR 61, will be permitted to be disposed of in shallow land burial sites. Furthermore, the act P.L.96-573, which gives authority to states to establish regional compacts and for which 10 CFR 61 will be a major guideline is, is titled the "Low Level Radioactive Waste Policy Act" (emphases added). Therefore, we believe that it is entirely appropriate to change the title of the proposed rule to "Licensing Requirements for Land Disposal of Low-Level Radioactive Wastes."

Paragraph 61.59(g):

The 100 year institutional control period should be extended for as long as the governing body exists. This would extend the surveillance period and protect against site intrusion until the governing body determines the site could be reopened to the public.

Paragraph 61.62(g):

"Pay as you go" surety requirements for closure should be permitted, as opposed to surety bonding for an entire site.

General Comment on Draft Environmental Impact Statement (NUREG-0782)

The Commission should indicate how the adequacy of quality-scaling factors (used to estimate nuclides not readily identifiable) will be determined. (1)

General Comments on 10 CFR 20 Proposed Changes

Notice should be provided as to when the Regulatory Guide on classification of radioactive waste will be available. In the interim, guidance should be provided regarding classification of wastes as required by 20.311(c).

Paragraph 20.311(d)(3) and (f)(5):

The degree of implementation and criteria for the quality assurance programs, required under these paragraphs should be indicated. We would also recommend that the term, "quality assurance" be changed to "quality control" so as not to be confused with the quality assurance requirements of 10 CFR 50, Appendix B.

Should you have any questions regarding our comments, please feel free to contact us.

Very truly yours,

NORTHEAST UTILITIES SERVICE COMPANY

W. G. Counsil

W. G. Counsil
Senior Vice President

By: J. P. Cagnetta
Vice President Nuclear and
Environmental Engineering

Docketed Comment Number: 21

Commenter: Northeast Utilities

Response(s): Item 1 - In Chapter 7 of Volume 2 (Main Report) of the draft EIS, NRC presented an example of the possible use of scaling factors to estimate the presence of trace radionuclides based upon measurements of radionuclides which are easier to measure. The example used the isotopes Co-60 and Cs-137 as indicator isotopes. The isotope Ce-144 has also been used by licensees to estimate the presence of transuranic isotopes. The scaling factors were developed based on reported concentrations obtained from a number of studies involving measurements of radionuclide concentrations in reactor wastes. One of the intents of the example was to inform the public that NRC staff recognized the difficulties that would result from a requirement to strictly measure every radionuclide listed in Table 1 in every waste package. NRC staff recognized that compliance with the waste classification requirement would be of concern and used the example as a means of helping to focus input on the subject. Specific factors that might be applied at a particular facility would be determined based on measurements of radionuclide concentrations in waste generated at that facility. The accuracy of such factors would be confirmed through periodic specific measurements.

In the final Part 61 rule, NRC intends to help clarify its intent regarding waste classification by allowing indirect methods to determine radionuclide concentrations and waste classes. Further, the NRC Low Level Waste Licensing Branch of the Division of Waste Management has prepared a draft branch technical position (BTP) on waste classification and has made it available for public review. This BTP outlines acceptable methods by which a licensee may comply with waste classification, including the use of scaling factors, and will eventually be used as a basis for a regulatory guide on waste classification.

Docketed Comment Number: 22

Commenter: Township of Lower Alloways Creek

Response(s): This comment was inadvertently docketed for both the rule and the EIS, although the comment addressed only the rule. The commentor's concerns were reviewed and responded to in the development of the final rule.

Docketed Comment Number: 23

Commenter: General Electric, Nuclear Energy Products Division

Response(s): This comment was inadvertently docketed for both the rule and the EIS, although the comment addressed only the rule. The commentor's concerns were reviewed and responded to in the development of the final rule.

January 4, 1982

(90)

DOCKET NUMBER PROPOSED RULE PR-2 et al (46FR 38081)

DOCKET NUMBER PROPOSED RULE PR-61 (24) (46 FR 51776)

Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
ATTN: Docketing and Service Branch

Dear Sir/Ms.:

I would like to comment on the proposed rule, "Licensing Requirements for Land Disposal of Radioactive Waste" (46 FR 38081), and on the Draft Environmental Impact Statement, NUREG-0782, supporting that proposed rule.

In light of the troubled history of land disposal of radioactive waste, this proposed rule is an admirable attempt to regulate such facilities. The provisions which would subject these facilities to the NRC hearing process, thereby encouraging public debate, are especially commendable. However, I feel that insufficient consideration has been given to the long-term consequences of shallow land burial of radioactive wastes.

A realistic extrapolation of past and present societal trends would reveal some flaws in the analysis presented in NUREG-0782. Radioactive wastes remain dangerous for centuries; their safe disposal is dependent upon a stable social structure for at least 500 years. History (and current events) clearly shows that such stability cannot be predicted, much less insured. It is questionable whether the United States, as we now know it, will exist 500 years from now. The stability of the financial world is even more uncertain. The financial assurances proposed in NUREG-0782 are not depression-proof. Should this Nation be intact in the future, its economy most surely would not have remained static. The effects of war have not been considered; even a conventional war fought near a waste disposal site would release large quantities of radioactivity to the environment. (1)

The DEIS analysis is particularly deficient in its assessment of future land use. Present trends in population growth, soil erosion, and water resources indicate that in the future land and water will be extremely precious commodities. There is already a water shortage in many parts of the country. As the population increases and more and more farmland is lost to erosion and urban growth, arable land will be in short supply. It may be that the "intruder scenarios" proposed in the DEIS will not be inadvertant, as is now assumed; the need for land and food may be so severe that the use of waste burial sites for agriculture may be permitted. This is especially likely since the site characteristics (topography, soil permeability, meteorology) most favorable for waste disposal are also the best for farming or residential purposes. The water crisis may be so serious that the use of contaminated wells will be allowed. (2)

DS10 1/0 Add: R.D. Smith D. Wasserman P. Goldberg Joe Darwsykar

An example of an analysis in the DEIS that is deficient even in the context of today's society is that of exposure calculations for the intruder-agriculture scenario, appendix G, Section (3)

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3.4.2. The intruder is assumed to be an individual who lives in a house on the waste burial site and consumes food grown in a garden on the site. The intruder is assumed to work at a regular job during the day and spend only about half his time at home. This scenario does not consider a more plausible family-intruder, in which the following factors would alter the risk analysis: (1) some members of the family may not work or may work in the home, thus spending much more time at the site; (2) some family members may be children or pregnant women, who are more sensitive to radiation. This analysis is inadequate for present-day society; its applicability to the future is even more uncertain. (3) (con't)

The DEIS also neglects the vulnerability of shallow land burial to acts of terrorism or sabotage. (4)

I fear that the proposed rule, if adopted, would encourage the proliferation of waste disposal sites. This is undesirable for the reasons detailed above. Instead, the problem of radioactive waste disposal should be addressed from another perspective, that of waste reduction. Rather than continuing to produce wastes when there is no satisfactory method to dispose of them, a moratorium on waste production from those waste sources for which there exist alternative means of obtaining the same benefits is appropriate. The use of nuclear fission to generate electricity is an obvious candidate. Viable alternatives exist for the production of electricity: solar, wind, coal, magnetohydrodynamics, etc. The costs, of which waste generation is one, far outweigh the benefits of nuclear power plants. An immediate shutdown of all operating plants will decrease the volume of waste to be disposed of by about 65% (according to figures on p. D-65 of NUREG-0782). This would permit the use of existing waste facilities while alternatives can be developed for institutional and industrial uses of radioactive materials. This alternative, which was not considered in the DEIS, is clearly the most reasonable solution to the problem of radioactive waste disposal. (5)

Sincerely,

Amy S. Hubbard
Box 5636
Cleveland, Ohio 44101

Docketed Comment Number: 24

Commenter: Amy Hubbard

Response(s): Item 1 - The safe disposal of radioactive waste at a near-surface disposal facility is not solely dependent on a stable social structure for at least 500 years as noted in the comment. The approach NRC has followed in defining requirements for safe disposal of LLW is to establish controls on each of the principal components of a "disposal system"--the waste form and package, site characteristics, facility design and engineering and institutional controls. Complete reliance is not placed on any one component (e.g., institutional controls), but each acts with the others to collectively ensure safe disposal over the long term. Thus, Part 61 does not assume total and complete reliance on institutional controls to prevent disturbance of the waste. Rather, Part 61 assumes reliance on active institutional controls for a limited time frame (100 years) after which the waste form, site characteristics, and facility design and operations continue to provide the necessary control.

If the social structure were to change radically or if a major war were to be fought, as noted in the comment, the impacts from such changes would probably be far more significant than the radioactivity which might be released from a disposal facility.

Item 2 - The approach NRC has followed in Part 61 is to ensure that if someone unknowingly intrudes into a disposal facility after the end of active institutional controls, that individual or individuals would not receive an unacceptable dose. Based on NRC's analysis, exposures to such individuals, assuming reasonable activities would result in doses only a few hundred millirem at 100 years and a few millirem at 500 years.

Part 61 would allow productive uses of the site provided such uses would not affect site integrity or lead to disturbance of the disposed waste. If at some future time it is decided to use the site for productive purposes (such as farming as noted in the comment) the potential impacts of doing so would have to be weighed and balanced against the benefits.

Item 3 - For purposes of analysis NRC considered 3 intrusion events. These were selected based on evaluation of the broadest range of events possible, those potential events considered by other investigators and the likelihood of occurrence. The 3 events can be characterized as intruder-construction (exposure to workers constructing a house at the site), intruder-agriculture (exposure to individuals living in the house constructed and consuming food grown onsite), and intruder-discovery (exposure to an individual who digs into the waste, realizes that something is wrong and ceases his excavation activities). NRC assumed that only a few individuals would be exposed through such activities based on the number of people normally required to construct and live in a house. NRC could have used much more conservative events and assumptions regarding the types of individuals involved and time spent at home. Given the unlikely nature of the assumed event, and the conservative nature of many assumptions in the analysis, NRC did not make such assumptions. NRC has generally tried to consider a more realistic set of likely individual actions rather than a less realistic worst-case approach.

Item 4 - NRC did not consider the effects of terrorism or sabotage. Besides the unlikely nature of such events, their consequences would generally be limited and involve only onsite effects.

Item 5 - The proposed rule is not intended to encourage proliferation of waste disposal sites. Rather the purpose of the rule is to establish comprehensive national standards and technical criteria for siting, licensing, operation, closure and institutional care to ensure the safe disposal of LLW.

We concur that waste reduction is a laudable goal. The staff has encouraged waste generators to use available technology and administrative procedures to reduce the volume of shipments. The disposal site operators and state governments have also encouraged volume reduction.

With respect to the suggestion for immediate shutdown of all operating nuclear power plants as a means of waste reduction, this action would result in immediate and severe impacts to society as a whole without corresponding

clearly-defined benefits. At the same time this would not eliminate the generation of waste from the shutdown plants or from nonfuel-cycle sources. Moreover, in the absence of compelling public health, safety and/or environmental reasons, NRC is not empowered to take such an action.

Secretary of the Commission

ATTN: Docketing and Service Branch

U.S. Nuclear Regulatory Commission

Washington, D. C. 20555

'82 JAN 15 P3:02

DOCKET NUMBER PROPOSED RULE PR-61 (46 FR 51776)

(25)

Dear Sir:

Enclosed are comments on the NRC draft EIS on regulations for shallow-land burial of radioactive waste (10 CFR 61). Questions on these comments should be directed to either Dr. John C. Rodgers or Dr. Betty A. Perkins, Group LS-6, Environmental Science Group, Los Alamos National Laboratory, FTS 843-3167.

Sincerely,

Robert Y. Lowrey

Director, Waste Management and

Rodgers/Perkins

Los Alamos National Laboratory

Group LS-6-72-10, Mail Stop 455

Los Alamos, New Mexico 87545

Acknowledged by card. 1/22/82 SMB

GENERAL COMMENTS ON THE DRAFT EIS FOR 10CFR61 (NUREG-0782)

Environmental scientists at the Los Alamos National Laboratory have made a preliminary review of the draft EIS for the proposed NRC regulations 10CFR61.

The following comments, grouped as general and technical, are offered as brief summary statements.

General Issues

1) This EIS is to be commended for trying to bring a voluminous amount of data into one set of documents that can be used as a beginning for open discussion on the issue of disposal of radioactive wastes. Moreover the presentation of the concept of intruder scenarios is important in determining possible pathways for mobilization of radionuclides. The documents also suggest the necessity for de minimus, shallow land burial, and deeper confinement classification types of wastes, which is important.

2) The proposed regulations purport to provide a generic waste classification system which is an "umbrella" (Main Report 7.1) under which the disposal of all types of non-high level wastes can be regulated. This umbrella approach, in the manner in which the regulations are formulated, is flawed because in some cases the linking of the waste classification system with the specific disposal requirements for near surface land disposal NSD (Main Report 7.1) has the result of imposing technological fixes (such as waste form, and layering) on classes of wastes which might have otherwise been candidates for disposal by some form of greater confinement disposal (GSD) system. These technological "fixes" are questionable because their long-term containment properties are poorly understood and largely untested under the expected geophysical conditions of shallow land burial and possible future land use. (1)

3) The regulations, in classifying wastes as concentration as a function of volume, appear to encourage dilution as a means of allowing NSD for some types of wastes. The draft EIS should discuss whether this type of "technical fix" is desirable or whether greater confinement facilities should be the preferred mode of disposal. (2)

4) The regulations in classifying waste as a function of radionuclide content place an extremely large burden on the accurate measurement of these radionuclides. In many cases the use of scaling factors will not be satisfactory because of the variation of radionuclide distribution as a function of time, operating parameters, specific events during operation, and initial conditions. These accurate measurement requirements (many of which are technically difficult to make) in turn place a large burden on the waste generator, disposal site operator, and finally on the governmental manager (who must accept that the wastes have been accurately classified). (3)

5) There are many uncertainties in the data base used to develop the proposed classification system. The draft EIS itself contains numerous references to the highly uncertain and often extremely variable nature of much of the data used in determining the concentration, inventory, and hazard potentials of low-level wastes (Note in particular the discussion of uncertainties in source characterization in section 3 of Appendix D, of intrusion pathway characterization in the Main Report Ch. 4, and especially the problems of defining the uncertainties in the proposed methods and parameters used to assign hazard reduction credits for supposedly stable, nondispersible, low-leaching waste forms in the Main Report, section 4.3.4). The propagation of these uncertainties through the system to the formulation of waste classification itself is nowhere explicitly evaluated, and incorporated in these regulations. The order of magnitude increase of waste classification limits for Cs-137 over calculated concentration limits (Main Report, Section 7.2.3) is particularly questionable, in light of these uncertainties. (4)

6) Although ALARA considerations are mentioned in the EIS (Main Report, sections 7.2.5, 7.2.6, and elsewhere) it is always with the qualifiers "in the interests of" or "in the spirit of" ALARA on the part of NRC, rather than where it is perhaps most needed as part of performance objectives for waste generators and site operators (as was the case in earlier versions of these regulations). Thus, the requirement to meet or exceed (in the sense of ALARA) the performance objectives of these regulations has been improperly lifted from the requirements of this Part. (5)

7) An oversight noted is that NRC has not stated its support for regulation of the hazardous, non-radioactive components in low-level wastes, or how these regulations might be integrated with the requirements of this Part. (6)

8) Neither the documentation of the data bases for waste stream characterization (references 5 and 46, App. D), nor documentation of the data and methodology for the pathway analyses (references 1, 6, and 12, App. G) have been available for review due to a failure by NRC to have them published and available with the release of the EIS. This severely limits a thorough assessment of the suitability of the EIS on the proposed action. (7)

9) While the draft EIS covers burial sites that may be licensed in the future, the draft does not discuss the impact of the regulations on sites that are presently in use or have been used. Some type of Appendix is needed to indicate how the proposed regulations may affect these existing sites. (8)

Technical Issues

1) As mentioned in the general comments, there are uncertainties and technical difficulties in determining radionuclide content, yet the regulations are very specific about permitted concentrations in the three waste categories. The responsibility for correctly segregating and properly certifying that wastes meet the requirements of this Part rests solely on waste generators. The NRC recognizes that waste generators face severe operational difficulties and economic penalities meeting the requirements by direct measurement, and are prepared to compromise in terms of 'scaling factors' (Main Report, section 7.5). The stated (Main Report, Ch. 7 and App. G) examples of how this might work are fraught with many technical difficulties, including two in particular: 1.) Because the data on radionuclide concentration in most waste streams are highly variable (App. G), or completely unknown and must be guessed at (Main Report, Ch. 7), resort has been made to dubious techniques such as forming products of geometric averages of basic data with geometric averages of ratios of known to unknown concentrations to obtain what are claimed to be 'reasonable' scaled estimates of unknown radionuclide concentrations. These very data bases lead one to wonder if requisite correlations between known and unknown radionuclides can be established with sufficient reliability to make the scaling factor approach acceptable, as attractive as it may be from an operational viewpoint; 2.) in application, (e.g., Main Report Table 7.6), the scaling factor concept seems to be applied as though there were no other radionuclides present in a given waste stream except the pair of measured and target nuclides, and that the sum of fractions rule (Main Report, section 7.4.2) for mixtures does not apply. For these and other reasons the concept presents a disturbing prospect for quality assurance and enforcement. Ultimately it may force disposal site operators to prepare their own verification system in self-defense, as has been seen in some recent temporary site closures in Nevada and Washington. From a larger perspective this issue can be seen to be the result of having drawn a box around the problem of low-level waste disposal and then attempting to force the solution to fit the box. The box is the linking of waste classification and the requirements of waste form and disposal by shallow land burial. (9)

The solution then only seems to require some means for the generator to practically and economically segregate, identify specific radionuclide content, and modify waste form or package so as to meet the requirements of disposal in the near surface environment. But of course another solution is to reformulate the problem in terms of the constructive role greater confinement disposal technologies can play alongside NSD, and thereby redefine the requirements for disposal, taking into account the many advantages GCD offers with respect to contaminant migration and human reuse of a site, and thus, considerably modify and ease the burdens of measurement and waste form modification for the generators. Such a solution would greatly enhance the prospects for quality assurance (QA) and enforcement as well. (9 cont'd)

2) The NRC should directly address the QA and enforcement issues of these proposed regulations in the EIS, and not leave them to a proposed Regulatory Guide (Main Report section 7.5). The NRC has itself identified elsewhere many problems with QA programs in other aspects of the nuclear industry, including unqualified workers and QA inspectors, falsified records, lack of authority, lack of communication, inadequate corrective action systems, lack of supervision, and poor to non-existent procedures. The proposed scheme to implement waste classification minimally sketched out in the EIS (Main Report Ch. 7) could too easily suffer these sorts of QA deficiencies and should be carefuly reconsidered. Preferably such reconsideration would be done in a context that would make it possible to compare the overall QA and enforcement potential of the preferred alternative (linking waste classification and NSD requirements, plus adding scaling factors to make the system practicable), with that of a system that decouples waste classification and disposal requirements to an extent that permits GCD technology to play a constructive role. Then the possible institutional, economic, and QA penalties of the proposed action of the EIS can be more directly evaluated. (10)

3) The presumption that any NSD facility will be a man-made artifact whose hazard potential (particularly due to various forms of inadvertent human reuse) might well outlive institutional control measures is a common feature of many governmental and private industry studies of shallow land burial regulation (Main Report, section 4.2). NRC has commendably followed this lead. However, NRC has significantly limited the intruder scenario. This limitation should not be justified on the grounds that intrusion is "only hypothetical" (Main Report, section 4.2). Artificial restrictions in the basic intruder scenarios, which have been used to set waste classification limits include: 1.) the intruder who builds a house cannot live in it (Main Report, 4.2.2.1); 2.) the intruder who lives in a house cannot drink water drawn from a well onsite or nearby (Main Report, 4.2.2.2); 3.) the agricultural intruder cannot grow deep rooted plants that would contact the wastes through remaining trench covers (App. G, 3.4.2); 4.) the agricultural intruder cannot dig stockponds, septic tanks, drain fields or utility trenches (App. G, 3.4.2); 5.) the agricultural intruder cannot work or normally stay at home (e.g., be a farmer, housewife, or child) (App. G, 3.4.2); 6.) and the agricultural intruder cannot occupy the basement he is assumed to construct and thereby be exposed to gaseous releases into that space (e.g., tritiated vapors, C-14 labeled gases, etc.) (App. G, 3.4.2). The treatment of intruder contact with artifacts or relatively stable waste forms is unsatisfactory and unconvincing (Main Report, 4.3.4). The only justification given in this EIS for a lack of attention to the consequences of burial of stable waste forms containing high surface contamination or large concentrations of long-lived radionuclides is simply that "it is not credible" that extensive human reuse of a NSD site or of extended contact or recovery of persistent waste forms buried in it would occur (Main Report, 4.3.4.3). The EIS should discuss the alternative of limiting NSD disposal to those wastes that by nature of decay and dilution in trench materials will not present a hazard to any inadvertent human reuse following loss of institutional controls, and disposing of higher activity, and/or longer lived non-high level waste in GSD systems. (11)

4) NRC has gone only part way toward bringing their radiological dose assessment methodologies up to date by switching from those used in Regulatory Guide 1.109 to the Task Group Lung Model. To the extent that ingestion doses continue to be based on this Guide (App. G, (12)

2.4.2), they may be based on outdated data and assumptions. For example, current revisions in uranium ingestion dosimetery for environmental sources have resulted in EPA limiting uranium concentration in public drinking water to 10 pCi/l (Adopted in these proposed Part 61 regulations in section 61. 41). These are not reflected in the pathway dose conversion factors. These factors also need to be taken into account in considering the disposal of natural and depleted uranium (which is in the proposed regulations up to the natural specific activity concentration, Main Report 7.2.2). (12) (cont)

5) In attempts to reproduce the NRC intruder scenario computation of concentration limits, it was found that in the agricultural scenarios plant uptake was based on the leaching of waste to the interstitial water and that only the fractions of radionuclides transferred from waste to water was assumed accessible to roots (Appendix G, 3.4.2). The calculational procedures used in the NRC calculation do not have a clear basis in the literature and moreover considerably underestimate plant uptake. The NRC calculations should be changed to reflect these considerations. (13)

6) If the pathway assumptions and models given in the draft EIS for the arid site are used, the calculated arid site concentration limits for Pu are more restrictive than the generic site by an order of magnitude (data from App. J, Table J.5, methodology from App. G, Ch.3). There is no technical basis for the NRC conclusion (Main Report, 7.2.4) that this consequence is adequately offset by consideration of differences in intruder behavior at arid sites. The NRC should set generic concentration limits based on the most limiting site conditions. (14)

7) The proposed flexibility reserved for deciding the final form of waste classification limits is objectionable if it is to be based on the kinds of arguments advanced in the case of Cs-137 (Main Report. 7.2.5). The quality of the source characterization data used in this EIS provides no real assurance that an additional dilution factor of 10 to 20 is warranted, particularly in light of the anticipated averaging and scaling practices to be used by waste generators. (15)

8) A more complete discussion of waste processing than is presented in Appendix G - section 5 is needed. Emissions as a function of processing temperature, off-gas treatment systems, type of process equipment used, and operating conditions should be discussed. (16)

9) A proposed regulation in 10CFR61 requires separation of units so that there is "no interaction between them." The draft EIS should discuss whether this is possible in terms of hydrocarbon (such as methane) migration, ponding of water from subsidence and subsequent movement into adjacent regions, etc. (17)

10) The draft fails to address all types of wastes which may need disposal before 2000. It would appear likely for example that at least some pilot plant reprocessing waste might need disposal. Since UF_6 facility wastes presently contain Ra and Th and since these will be present as daughters of uranium as the uranium ages these radionuclides should be considered in the regulations as soon as possible. In addition wastes from the thorium high temperature gas cooled reactor fuel cycle also need to be considered. (18)

01774

Docketed Comment Number: 25

Commenter: Los Alamos National Laboratory

Response(s): Item 1 - Prior to responding to this comment, it is useful to briefly review both the 10 CFR Part 61 rulemaking action and the DOE greater confinement disposal (GCD) study program. The Part 61 rulemaking is intended to cover land disposal of radioactive wastes (generally referred to as low-level radioactive waste) which are not covered by other regulations. That is, the scope of the Part 61 regulation excludes disposal of uranium mill tailings, disposal of high-level and transuranic waste in geologic repositories, and disposal by the many other possible methods defined in 10 CFR Part 20 (e.g., disposal by transfer to another person, disposal by release to air or water, disposal of H-3 and C-14 by less restrictive means). The current Part 61 regulations provide overall requirements for land disposal as well as a number of specific requirements for disposal of waste reasonably near the earth's surface. Concentration limits for near-surface disposal for a number of radionuclides were set forth in the proposed 10 CFR 61. Space is left at appropriate points in Part 61 to provide for additional specific requirements which may be developed in the future for disposal by other methods than near-surface disposal.

NRC expects that only relatively small quantities of wastes currently being sent to operating near-surface disposal facilities will be generally unacceptable for near-surface disposal under the Part 61 concentration limits. However there may be larger quantitites of such wastes generated in the future from such activities as decommissioning nuclear power plants or plutonium recycle. NRC intends to examine in the immediate future the impacts of disposal of such waste streams by disposal methods which may offer greater confinement capability than near-surface disposal. These methods may include, for example, deeper disposal, use of engineered structures, or mined cavity disposal. NRC expects that this analysis would be performed in a similar manner as the current analysis.

DOE defines greater confinement disposal as "the disposal of LLW in such a manner as to provide greater confinement of radiation, reduced potential for migration/dispersion of radionuclides, and greater protection from inadvertent human and biological intrusions in order to protect the health and safety of the public." (Reference 2) Greater confinement disposal (GCD) is intended for a few higher activity waste streams which are being generated or may be generated in the future from commercial or defense operations. DOE has defined this disposal method very broadly to include disposal at greater depths, use of engineered barriers, waste containment, and waste solidification. In Reference 2, DOE also stated their intention to demonstrate the concept by constructing and operating demonstration GCD facilities--one in an arid western environment and another in a humid eastern environment. Preliminary designs and concepts for these demonstration facilities would indicate that while the design facilities would involve only minor modifications to existing practices or experience, facilities separate from existing DOE near-surface disposal facilities are envisioned.

NRC staff found a lack of clarity in the commentor's statements that the rule is flawed because the waste classification system is linked to specific disposal requirements. NRC's regulations are based upon the principle that progressively restrictive disposal requirements should be imposed on progressively more hazardous waste. Thus, in the draft Part 61 regulations, Class B waste is required to be stabilized either as part of disposal facility design or through a stable waste form or package. Class C waste must meet the stability requirement as well as a requirement for an intruder barrier (layering). The stability requirement accomplishes a number of safety objectives, including protection of groundwater, enhancement of overall site stability, reduction of long-term care costs, improved operational safety, and reduction of potential inadvertent intruder impacts. The intruder requirement improves operational safety as well as reduces potential inadvertent intruder impacts. The above criteria also reduce impacts due to potential intrusion by burrowing animals and deep rooted plants as well as reduce potential impacts (already negligible) from release of tritiated methane. The commenter states that there are classes of waste (possibly Class B and Class C Waste) which should be disposed by "some form of greater confinement disposal system." The commentor further questions "technical fixes" such as waste form and layering. However, NRC notes the "technical fixes" that the commenter questions accomplish similar objectives as those set out by DOE for "greater confinement disposal." For example, waste containment and solidification are defined by DOE as one method of achieving greater confinement. Deeper burial (e.g., layering) is another method suggested by DOE of achieving greater confinement. In addition, the commentor has provided no rationale for his supposition that a "greater confinement disposal system" will be any better tested or understood than the "technical fixes" in Part 61. Thus, the concept of "greater confinement" of some wastes, as suggested by the commentor, is already an intrinsic part of the Part 61 regulation.

Item 2 - Neither NRC nor Part 61 encourage dilution. In addition, NRC staff does not believe that requiring disposal of waste in some non-specific type of "greater confinement disposal facility" presents a reasonable alternative to the potential for dilution of waste to meet a particular waste class. That is, one is not an alternative to the other. It is even possible that a "greater confinement disposal facility" would increase the potential for waste dilution. Assuming that NRC required large quantities of waste to be disposed into such a facility, then waste dilution to avoid potentially more expensive requirements could be used.

With respect to the second part of the comment, in establishing generic requirements for low-level waste disposal, NRC recognizes that there is a wide variation in low-level waste characteristics, including waste form, waste volumes, radionuclide quantity or concentration, and chemical content. Some requirements must be established on the basis of a radionuclide concentration. For example, concentration limits can be used to establish de minimis requirements for certain waste streams, or to establish different requirements for wastes suitable for near-surface disposal facilities. Assuming that disposal by some non-specific "greater confinement disposal facility" was required for some or all (except de minimis) waste, then concentration limits would ultimately be about the only practical means to identify such waste.

Item 3 - NRC staff recognizes the difficulty of making detailed measurements of radionuclide concentrations in waste. To assist waste generators in complying with the waste classification system, NRC has prepared a technical position which outlines acceptable methods by which a licensee may demonstrate compliance with the classification system including the use of scaling factors. NRC staff continue to believe that a compliance program may be implemented by licensees in a reasonable manner. The use of scaling factors is discussed further in the response to Item 9 below.

Item 4 - As the commenter states, there are uncertainties in the radioactive waste data base. This data base was used to assess various alternative performance objectives and technical criteria for the draft Part 61 regulations. Despite these uncertainties, however, NRC staff believe that the data base is the most complete data base yet devised for low-level waste. Regulation of radioactive waste disposal is an ongoing process; it did not start with nor will it end with the present Part 61 effort. Additional information, as it becomes available, will be incorporated into NRC's program. For example, updated information on distributions of activity in LWR process wastes has been included in the calculations for the final EIS.

NRC staff also believe that the uncertainties do not preclude making an intelligent decision on Part 61 requirements. All decisions are made under the restrictions of available information. NRC staff believe that the data base and assumptions are conservative, although an effort has been generally made to avoid over conservatism. NRC staff does not believe that the uncertainties warrant adoption of much more restrictive requirements as are apparently advocated by the commentor.

In response to one of the specific parts of this comment, in the impacts analyses methodology, NRC made certain assumptions regarding the relative ability of certain waste forms to resist airborne dispersion by an inadvertent intruder and uptake by plant roots. This was done to explore the relationship of waste form with potential inadvertent intruder impacts. (Previous work had suggested that a poor waste form would tend to reduce intruder exposures. Through their analysis, however, NRC staff determined that this was exactly the opposite.) In most of the calculations in the EIS and in establishing the waste classification limits, however, no credit was taken for improved waste forms to resist airborne dispersion or plant uptake. This was a conservatism that was included in consideration of uncertainties of the long-term performance of waste forms.

Regarding the final waste classification limits for Cs-137, it must be remembered that the limits in Table 1 were formulated based upon a number of considerations. One of the considerations was protection of the potential inadvertent intruder. This consideration was the main consideration, for example, in determining limiting allowable concentrations for near-surface disposal. However, other equally valid considerations are costs to licensees (especially small entities), groundwater migration, site stability, long-term social commitment, and operational safety. The need to reduce the potential for groundwater migration, reduce long-term social commitment, and improve site stability were especially important to developing limits for Class A waste disposal. (These points were perhaps not set out as clearly in the draft EIS as would be desired. An effort to clarify NRC's intentions has been made in the final EIS.)

The Cs-137 limits as calculated from intrusion considerations were judged in the draft EIS to involve a large cost impact to licensees. Cs-137 limits used in the final rule are similar to existing license conditions at operating disposal facilities. Cs-137 is only moderatively long-lived ($\tilde{\sim}$ 30 years half-life) and the increase made essentially no impact on long-term intruder impacts.

Item 5 - The rule has been amended to include specific reference to ALARA in the performance objectives for protection of populations (§61.41) and safety during operations (§61.43).

Item 6 - NRC agrees with the need to address the potential non-radiological as well as radiological hazard of LLW. For most LLW (probably greater than 90%) the predominant or controlling hazard potential is radiological. For those presenting an associated non-radiological hazard, NRC believes the requirements in Part 61 provide a high degree of safety in disposal. In addition, existing conditions in effect at the three operating sites prohibit

the disposal of waste having a higher non-radiological than radiological hazard. NRC plans to address this issue further in coordination with EPA. In the interim, the existing state license conditions should help minimize the potential for disposal of chemically hazardous wastes at the LLW sites and the Part 61 requirements coupled with coordination with EPA should assure an adequate level of safety in the disposal of radioactive wastes also containing associated chemically toxic material.

Item 7 - The data bases for waste stream characterization and documentation of the data and methodology for pathway analyses were presented in NUREG/CR-1759 published in November 1981. (Reference 3.) Los Alamos National Laboratory was included in the general mailing of this multi-volume report.

Item 8 - Part 61 requirements are not intended to specifically apply to existing closed sites. The performance objectives regarding long-term stability and releases to the environment as well as technical requirements on conditions for closure, post-closure care and institutional control can, however, serve as guidance in the final closure and post-closure care for such sites. The implementation of the requirements at any specific site would need to be considered on a case-by-case basis considering site-specific conditions.

The application of Part 61 requirements to existing operating sites must also be handled generally on a case-by-case basis. NRC believes uniformity must be achieved in the application of the waste form and classification; design and operation; and manifest reporting and recording keeping requirements in the future operation of the existing sites. NRC plans to work closely with the Agreement State regulatory authorities to achieve uniformity in application of these and other requirements.

Item 9 - The use of scaling factors to estimate concentrations of trace radionuclides in waste streams is believed to be a reasonable approach based on existing information. This approach is also believed to be conservative. In work in many previous documents, often only the principal radionuclides in low-level wastes were characterized. By including trace radionuclides, a more conservative estimate of impacts has been obtained. NRC also believes that the use of inferential measurement techniques, including the use of scaling factors to estimate concentrations of hard to measure isotopes, can be a practical and reasonably implementable approach to showing compliance with the waste classification requirements. A particular set of scaling factors, however, would be best developed for a specific facility's conditions. Such inferential measurement techniques have in fact been developed at Los Alamos National Laboratory and are in use for measurement of transuranic levels in waste.

The discussion in Chapter 7 of Volume 2 of the DEIS regarding the use of scaling factors was included to communicate NRC's recognition of the need to implement a workable approach to compliance with the waste classification requirement. Another intent was to provide a stepping off point for public comments on the subject. It is possible that NRC was not sufficiently clear on this matter. In any case, based upon input on the draft rule, DEIS, and from other sources, NRC staff believe that a compliance program may in fact be implemented by licensees in a reasonable manner.

Finally, NRC staff does not believe that the commentor's "greater confinement disposal" system necessarily holds any inherent advantages in terms of easing the burden to licensees or enhancing the prospect for quality assurance and enforcement. NRC staff also found some lack of consistency with statements relating to the constructive role of "greater confinement disposal" alongside of near-surface disposal, or the many advantages that greater confinement disposal has regarding contaminant migration and human reuse of a site. In the first place, regardless of what advantages an undefined "greater confinement disposal" system offers, it does not follow that the burden of "measurement and waste form modification" would be eased for waste generators. There would still have to be an upper and lower limit for "greater confinement disposal" to be complied with, and waste form would in any case be of concern from operational safety considerations. Neither has it been shown that quality assurance or enforcement would be enhanced.

In any case, the concepts of greater confinement disposal which are included in DOE's own broad definition of the term are already incorporated into the

Part 61 rule. The rule incorporates improved stability of some wastes, deeper disposal of some wastes, and sets a concentration limit for near-surface disposal.

Item 10 - Enforcement of the requirements proposed in 10 CFR 61 will be carried out in a similar manner as applied to all NRC-licensed activities--through the NRC inspection and enforcement program. The rule proposes no new requirements in this regard.

Quality assurance of waste classification is, as the DEIS carefully points out, a subject which can result in a number of operational difficulties. The rule requires the waste generator to implement a QA program to assure compliance with §§61.55 and 61.56 and to include in this program provisions for management audits. The adequacy of each proposed licensee's QA program will be determined on a case-by-case basis. NRC staff does not understand the concluding part of this comment about decoupling waste classification and disposal requirements to an extent that permits greater confinement disposal technology to play a constructive role.

Item 11 - The very approach suggested in the last sentence of this comment is the approach NRC has followed in developing regulations for near-surface disposal of LLW. NRC intends that wastes determined to be unacceptable for near-surface disposal should be disposed of with greater controls such that the performance objectives would be realized.

A basic dilemma faced in determining the concentrations of waste acceptable and not acceptable for near-surface disposal are the pathways which should be assumed for analysis. The intrusion pathways which could be considered range from very trivial events (e.g., walking across the site) to events which could cause relatively significant exposures (e.g., an archaeologist working in the waste for extended periods of time reclaiming artifacts). Each pathway may also have a different probability of occurrence. Rather than assess probabilities of occurrence, NRC conservatively assumed that a limited number of intrusion scenarios would occur based upon considerations of typical human activities. However, given the fact that such intrusion may never occur, NRC assumed that reasonably conservative actions on the part of the intruders occur. Thus, NRC did not assume the worst, most conservative case and most of the actions discussed in Items 1-6 were not considered. NRC did consider the use of water by an intruder drawn from an onsite well. (See for example, Volume II, Section 5.2, page 5-4; and Section 5.2.2, page 5-13 of the DEIS).

Item 12 - Actually, there are a number of factors which go into the pathway dose conversion factors for calculating dose equivalents from ingestion of radionuclides. Starting with a given concentration of a radionuclide in a biota access location, there are a number of transfer factors which relate the transfer of the radionuclide through intermediary stages to man (for example, transfer of radionuclides from soil to plants to cattle to man), where a dose may be calculated. In the analysis, the dose conversion factors were taken from Regulatory Guide 1.109 and NUREG-0172. (References 4 and 5.) This is consistent with NRC's policy in licensing of uranium mills and other fuel cycle facilities. However, the transfer factors for the various radionuclides were determined based upon review of a number of other sources. (References 6-11.) This is discussed in Volume 3 of Reference 3. Thus, the pathway dose conversion factors for ingestion are considerably updated from Regulatory Guide 1.109.

Item 13 - On the contrary, it is the practice of assuming that radioactive waste exists in a form immediately available for plant uptake, as assumed in other documents, that does not have a clear basis in the literature. All of the analyses that have been performed to date by various parties have used transfer data from references such as Regulatory Guide 1.109, which was originally written to calculate impacts to the public from releases of trace quantities of radionuclides from nuclear power plants. The radionuclides would be so released either as fine particulates (submicron range) into air or as dissolved in water. The radionuclides can arrive at a point where they may be ultimately ingested by humans through settling out of the air, for example, or water may be used to irrigate a garden. Radionuclides may be then transferred into plant roots and this process may be quantified through use of numerical transfer factors. Values for the transfer factors are generally determined through experiments in which radioactive tracers are added to soil in a form immediately and readily available to plant roots.

On the other hand, at a former low-waste disposal site, radionuclides within disposed waste are contacting or contained within a number of different forms such as spent resins, trash, activated metals, etc. When emplaced within a disposal trench, radionuclides are not in a form which can be immediately taken up by plant roots. That is, there must be a transfer factor which relates the presence of radionuclides within waste to their presence in a form readily accessible to plant roots. Certainly radionuclides bound up within a block of cement or contained within activated metal cannot be immediately accessed by plant roots. NRC staff believes that to not consider the existence of this transfer factor is to overestimate plant uptake.

This is consistent with NRC's overall approach regarding consideration of impacts to a potential inadvertent intruder. The potential for inadvertent intrusion should be considered, but the potential for severe economic impacts should also be considered. NRC staff believe that inadvertent intrusion to the extent considered in the EIS is very unlikely. Merely to assume that it occurs is conservative. Therefore, NRC staff believe that a reasonable approach is required for setting forth typical scenarios for intruder exposure. It accomplishes no good to multiply one conservatism after another merely for the sake of being conservative.

Formulation of numerical values for a transfer factor between waste and a form available for plant uptake is somewhat uncertain (as is the entire intruder scenario). As a first approximation of this transfer factor, NRC staff have used leaching data from disposal sites at Maxey Flats, Kentucky and West Valley, New York. The physical conditions under which the data were collected involved a condition in which waste was continuously saturated for a number of years.

Item 14 - In the draft EIS, different potential disposal site environments were considered. It was observed that the environmental conditions at a particular site affected the potential for dispersion of radionuclides as dust. This was accounted for numerically by development of a transfer factor, T_{so}, which relates the concentration of a radionuclide in soil to the concentration of that radionuclide in air inhaled by an intruder. Of the four hypothetical sites considered in the draft EIS, three were located in humid environments while one site, the one with the highest value of T_{so}, was located in an arid environment.

In response, NRC disagrees with the commentor's suggestion that generic concentration limits derived from consideration of potential inadvertent intrusion should be based upon the most conservative site conditions. As stated in the response to Item 13 above, NRC staff believe that a reasonable estimate of intruder exposures is preferable to the most conservative. NRC expects that over three-quarters of the waste generated in the country will be generated in humid environments. Assuming that regional disposal of radioactive waste is implemented, this means that over three-quarters of waste will also be disposed in humid environments.

In addition, NRC staff believe that there is no technical basis for not considering differences in waste form and intruder behavior at arid sites. In formulating a reasonable set of intruder scenarios, NRC staff believe that likely human activities must be considered, which is different from considering the most conservative possible set of human activities. Merely multiplying conservatisms by conservatisms leads to unrealistic results which may lead to severe economic impacts. Regarding arid sites, one would expect that degradation of waste into a readily dispersible form would proceed at a much lower rate at an arid site than at a humid site. This would tend to reduce potential inadvertent intruder impacts in two ways: First, the waste would be in a less dispersible form, and second, the fact that more of the waste is in a form recognizable as something other than soil would tend to reduce the likelihood that an intruder would spend significant time in contact with the waste.

In any case, there are operational techniques which may be used to further reduce the potential for intruder exposures. In NRC's analysis, an intruder barrier equivalent to 5 meters of soil or low activity waste was assumed to be effective for only 500 years. After 500 years, some credit was taken for the potential for dilution of waste disposed below 5 meters. This is a conservatism for Class C waste. This is even more conservative for disposal sites located in an arid environment, since the depth of disposal is generally much greater than for a humid site. Thus, waste containing higher concentrations

of transuranic radionuclides may be placed at greater depths, further reducing potential intruder exposures due to transuranics. This would be relatively easy to accomplish at a western site because of the greater disposal depths possible.

Item 15 - NRC staff disagrees. The analysis shows that the dilution factor is warranted. In any case, Cs-137 is not a particularly long-lived radionuclide, and the additional dilution factor makes no difference in long-term impacts.

Item 16 - Section 4 of Appendix D to the DEIS provides a more complete discussion of processing impacts considered in the DEIS and the data presented in Section 5 of Appendix G. In addition, Volume 2 of the Data Base for Radioactive Waste Management (Reference 3) contains additional information.

For purposes of analysis, NRC assumed that only incineration resulted in additional potential population exposure as a result of processing. Other processes, such as evaporation, compaction, solidification and packaging were assumed to result in no potentially significant additional population exposures to those already considered and analyzed as a part of each facility's license. Since there was no potentially significant incremental change from existing practice, NRC did not specifically analyze it.

Item 17 - The staff considers the separation to be physically possible, and the staff anticipates that in some cases Class A wastes may even be disposed of at sites separate from those for Class B and C wastes.

Item 18 - NRC recognizes that several waste streams and specific radionuclides, not addressed as a part of this first effort, need to be addressed to the extent possible. NRC has attempted in this FEIS to address radionuclides and daughter radionuclides present or expected to be present in waste streams to be generated over the next 20 years. In addition NRC plans to further analyze specific waste streams (e.g., certain reprocessing and decommissioning streams) as a part of subsequent work to that already performed. Such work may result in amendments to Part 61 for disposal of such wastes.

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R. Dale Smith, Chief
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Dear Mr. Smith:

We are pleased to transmit the comments of the State of California on the Nuclear Regulatory Commission's proposed rulemaking on land disposal of low-level radioactive waste (10 CFR Part 61) and the related draft environmental impact statement (EIS). Because these two documents are closely related, this letter transmits comments on both. However, to facilitate differentiation of the issues, each will be discussed separately.

PROPOSED RULEMAKING ON LAND DISPOSAL OF LOW-LEVEL RADIOACTIVE WASTE (10 CFR Part 61)

The comments of various State agencies on the proposed rulemaking are included below. I would like to raise the following additional points.

1) Part 61.52(a)(6) states that the "waste must be placed and covered in a manner that limits the gamma radiation at the surface of the cover to levels that are within a few percent above the natural background levels of the site" (emphasis added). This terminology is unnecessarily vague. We recommend that the term "a few percent" be replaced with a specific number.

2) Part 61.55. With regard to waste classification, we share the view that segregating waste into different classes can be beneficial from the standpoints of protecting public health and maximizing disposal economies. However, the language of the rulemaking does not appear to definitively rule out the possibility of a "low-level" disposal site for transuranic-contaminated waste. Part 61.55(d) states that waste with a concentration exceeding the values shown in the accompanying table is not acceptable for near-surface disposal

"without specific Commission approval pursuant to Part 61.58 of this Part". Part 61.58 is one very brief paragraph which appears to permit the Commission to authorize "other provisions for the classification and characteristics of waste on a specific basis" measured against criteria and an evaluation process which are not specified in any way. It is therefore unclear to us under what conditions the Commission would exercise its authority under Part 61.58 and whether or not waivers could be granted for waste that exceeds the concentrations in Column 3 of Table 1. Our view is that transuranic-contaminated waste should under no circumstances be considered low-level waste and should not be included in low-level waste disposal sites. Rather, this material should be disposed of at the specifically-designated sites operated by the federal government to receive and dispose of transuranic-contaminated waste.

3) Part 61.54, similarly, in one brief paragraph appears to permit the Commission to authorize provisions other than those set forth in detail in Parts 61.51 through 61.53 of the proposed rulemaking without any discussion of the considerations that would go into such a decision. One can only wonder why the specific elements of this rulemaking are included if the Commission is empowered at the same time to unilaterally change the requisite requirements for segregation and disposal of waste on the basis of what appears to be an arbitrary finding. This part should be clarified or deleted.

4) Part 61.62 -- Funding for disposal site closure and stabilization. The financial arrangements, while on the right track, do not appear to us to be sufficiently comprehensive. It is unclear whether the annual review by the Commission of the financial arrangements would include the requirement that the size of the post-closure funding be increased on an annual basis to account for inflation and unforeseen problems and costs. The financial surety arrangements mentioned in subparagraph (g) (surety bonds, cash deposits, certificate of deposits, etc.) are not instruments which increase in value over time to compensate for the effects of inflation. We suspect that a device such as a sinking fund would be a preferable vehicle, but this receives no mention. Additionally, there is no mention whatsoever of the funds that would be required or the source of such funds if problems should occur at the site which would require considerably greater post-closure expense than that budgeted on an assumption of normal operation. Surely the experience of the State of Kentucky with Maxey Flats testifies to the importance of making contingency funds available in the event that serious problems occur. This issue should be addressed and the rulemaking changed accordingly.

5) Subpart F -- Participation by state governments and Indian tribes. We are disturbed by the tenor of Subpart F. As drafted, it appears to set up an adversary relationship

between the states and the federal government. Rather there should be full cooperation between state government and federal agencies in all phases of low-level waste management. This rulemaking as drafted does not lay the groundwork for that cooperation. For example, the state proposal for participation required under Part 61.72(b) and (c) calls for a submission by the state of various specific items of information at a time so early in the process that all the state's concerns may not yet be apparent because of lack of information. While we understand the Commission's desire to avoid an unnecessarily protracted participation by a hostile state, nonetheless the legitimate interests of state governments should be accommodated in a more thorough and flexible manner. The regulations as drafted do not accomplish this. Note also in Part 61.71 the statement that "upon request of a state or federal government body, the director may make available Commission staff to discuss with representatives of the state..." (emphasis added). As a first step in the right direction, surely the word "may" should be replaced with "shall." This section should be completely revised to facilitate collegiality between the federal government and the states.

6) Part 61.82 -- Commission inspections of land disposal facilities. We thoroughly endorse the notion that the Commission should be afforded an opportunity at all reasonable times to inspect radioactive wastes and the premises, equipment, etc. An explicit provision should be added that host states enjoy a similar right.

7) Part 2, Subpart 2.764 (a)(b)(e). The intent and consequences of these parts are unclear. They appear to authorize an initial decision by the Commission that would preclude effective appeal by either a concerned party or state. Immediate effectiveness, as it has been implemented by the Commission in reactor licensing, has had the effect of denying states effective participation, discouraging cooperative efforts between state and federal governments, and rendering state's appeals ineffectual, since a facility would commence operation before appeals had run their course. The implications of these sections should be clarified.

Below you will find additional detailed comments of various State agencies on the proposed rulemaking.

THE RESOURCES AGENCY

With regard to site suitability described in Section 61.50(a)(5), the criteria should be changed to require a lower risk of flooding. Currently, the section would allow waste disposal in a floodplain that is likely to be flooded less than once every 100 years. The current ratings of flood risks are crude at best. For example, in California we have had floods rated as a 100-year flood and as a 300-year flood, both within the last 25 years. This experience has led many people to suggest that our estimates of flooding potential are much too low.

Based on the California experience, we would suggest that the 100-year floodplain discussed in the regulation should be increased to at least a 300-year floodplain and, preferably, to a 500-year floodplain. Where the purpose of the disposal site is to keep the wastes isolated for a period of at least 500 years, surface flooding of that site should be avoided within our best estimates of what would be likely to happen within that 500-year period. The experience at Maxey Flats, Kentucky, should convince people that flooding of the disposal site should be avoided.

Third, the performance objective in Section 61.2 concerning protection of individuals from inadvertent intrusion should be strengthened. Some kind of permanent sign or warning device should be in place at the perimeter of the site. The warning sign or symbol should be designed to last 500 years and to remain effective as a communicator, even if the language spoken in the area changes within that period. An example could be a combination of the skull and crossbones and the symbol for nuclear radiation.

Fourth, although the regulations describe minimum requirements for waste characteristics to be accepted at a disposal site, the regulations do not appear to require some kind of checking of the condition of the materials at the site. A site could experience the problems found in the past when sealed steel drums were delivered for disposal and no one knew what the drums contained. If there is no program for checking the contents of the drum, either at the site of origin or at the disposal site, the requirements for waste characteristics may well be ignored by many of the waste generators.

OFFICE OF EMERGENCY SERVICES

Following closure, the draft assumes the State becomes the site owner (pp. 3-36 of NUREG-0782, V-2.). However, paragraph 61.59 of Part 61 states either the state or the federal government shall become the site owner. Governmental ownership is certainly desirable; however, the apparent conflict should be clarified. ①

Paragraphs 61.1 and 61.3 indicate that licenses will be issued by the NRC. In paragraph 61.70 through 61.73, provision is made for a state or tribal government to participate in the licensing process, yet it is quite clear the NRC retains sole authority to issue the license. This suggests that a local jurisdiction has neither a voice in determining whether or not a site is established in their locale nor the conditions under which it is established and operated. The NRC should take steps to facilitate participation by affected local governments, including consideration of funding such participation.

If the State government has little or no real control during the functional life of the site, there is some question whether it would wish to assume responsibility for the site when it was closed. This would be especially questionable if the new site owner (i.e., the State) was expected to fund the cost for maintenance and monitoring.

Although several methods are mentioned for providing funds to the institutional authority, the rule makes no provision for it. In fact, the Commission admits it has no authority to "...require land disposal facility licensees to provide financial responsibility for activities occurring after the original licensee's responsibilities have ceased and the license has been transferred to another party." We would suggest the Commission ask Congress for authority to require financial assurances for licensees for the active institutional control period.

For additional comments please see Part 7.2 below of the comments on the environmental impact statement.

DEPARTMENT OF CONSERVATION

The California Department of Conservation (CDC) has reviewed the subject document for its geotechnical and procedural aspects. We. . .feel Section 61.72 is very important, providing for State participation in the review of any license application that affects the State. These procedures are very important to assure a real opportunity for the states, and thereby any affected local government, to have an effective input in the low-level waste (LLW) disposal process and specific site decisions which inevitably will impact all "host" states.

However, we believe that there is a significant defect in Subpart D, Subsection 61.50, Disposal site suitability requirements for land disposal. These requirements will not provide adequate protection to usable groundwater or to the environment from radionuclides that could be transported from the site by groundwater.

None of the stipulations in the disposal site criteria refer specifically to preventing migration of radionuclides into usable groundwater. Item (7) in Subsection 61.50 states, "The disposal site must provide sufficient depth to the water table that groundwater intrusion, perennial or otherwise, into the waste, will not occur. The Commission will consider exceptions to this requirement if it can be conclusively shown that disposal site characteristics will result in diffusion being the predominant means of radionuclide movement and the rate of movement will result in the performance objectives of Subpart C of this part being met."

Our concern is that the above-quoted stipulation is concerned only with groundwater intrusion into the facility and, furthermore, would allow diffusion of radionuclides in groundwater as an acceptable concept in the disposal of waste.

What is lacking in these criteria is the fail-safe approach to planning and design. The uncertainties inherent in geologic, design, and operational factors for any LLW site cast serious doubt on the assumption that the wastes can be guaranteed to be isolated for the prescribed time. If radionuclides should prematurely escape from their confinement at the site, it would be difficult and expensive, if not impossible, to prevent their contaminating the groundwater. Therefore, CDC recommends that Item (7) in Subpart D, Section 61.50 be rewritten as follows:

Department of Conservation (continued)

The disposal site must not be located 1/ within basins containing usable groundwater or their recharge areas, or 2/ within geologic formations which will permit the diffusion of radionuclides to the environment, or their transport by groundwater to a degree exceeding the performance objectives of Subpart C.

We recognize that the adoption of this recommendation will have the effect of decreasing the number and size of the search areas which would be eligible for consideration as potential LLW sites. Nevertheless, we believe that the seriousness of the risk of any radioactive contamination of groundwater warrants this degree of effort to assure that even if radionuclides were to escape, they could not contaminate any usable aquifer.

The regulations also fail to specify in Subpart G, Subsection 61.81 the nature and extent of Records, Reports, Tests and Inspections which will be required to ensure compliance with Subpart D - Technical Requirements for Land Disposal Facilities. Greater specificity is necessary regarding geologic, hydrologic, and other types of surveys and/or research to determine that potential sites comply fully with the regulations.

DRAFT ENVIRONMENTAL IMPACT STATEMENT
ON 10 CFR PART 61 "LICENSING REQUIREMENTS
FOR LAND DISPOSAL OF RADIOACTIVE WASTE"

The Draft Environmental Impact Statement is an important accompanying document, without which the proposal rule-making would be difficult to assess. Comments from several state agencies are included below. First, however, I would like to make a few additional points.

1) Part 2.3 -- Alternative Disposal Methods. The EIS discusses briefly ocean disposal of low-level wastes. Although this disposal alternative is not addressed in detail within the EIS, we want to express our opposition to the use of the oceans for disposal of low-level wastes. (2)

2) Part 4.6.1 -- Institutional Control Requirements. We support the concept of permitting disposal of low-level wastes only on land owned by the federal government or by the states, since the need for control of near-surface disposal facilities will last, in some cases, for several hundred years.

3) Part 5.5.1.2(2) -- Site Characteristics. With regard to the location of future sites, we believe the criteria should be changed to require a lower risk of flooding. We reiterate our comment (see comments above from The Resources Agency) that the 100-year floodplain may not be conservative enough. We suggest that a 300-year floodplain or, preferably, a 500-year floodplain be required to avoid surface flooding of a site. (3)

4) Part 5.5.1.3(2) -- Design and Operations. We share the view that prior to any license application, the applicant shall gather information concerning "the ecology, meteorology, climate, hydrology, geology, and seismicity of the site." However, we disagree with the requirement that "for those characteristics that are subject to seasonal variation, data shall cover at least one full year." We believe this should be strengthened. Any locale's susceptibility to changing environmental factors requires that an attempt be made to gather historical data so as to try to accurately reflect how a proposed site has changed over time. We suggest that this section be amended to require collection of historical data going back a reasonable period of time, to the degree such collection is feasible. (4)

5) Part 7.2 -- Waste Classification Based Upon Consideration of a Potential Inadvertent Intruder. The discussion of financial requirements during the operation of the (5)

postclosure period touches on most of the relevant issues. However, there is a lack of depth to the analysis, and adequate solutions are not suggested for problems that have been identified. For example, per our comments above, it is clear that a sinking fund or some similar financial assurance mechanism would be the most preferable alternative for ensuring that necessary funds will be available for the lifetime of the site (i.e., including postclosure lifetime). Steps should be taken by the Commission to seek the authority to explicitly require that a sinking fund be established. Instead, the document endorses less satisfactory alternatives while at the same time the Commission recognizes the shortcomings of this approach. Additionally, the EIS, like the draft rulemaking, fails to account for the possibility of serious problems occurring at the site. It does not make contingencies for such problems or for the costs which a state would no doubt incur if such problems occurred. This is a major failing of the document and should be rectified. Costs and cost estimates should reflect the possibility of a serious failure of the site -- a failure of greater consequence than those that have already occurred at existing sites.

(5) (cont)

6) Part 7.2.6 -- Transuranic Isotopes. We support the retention of the 10 nanocurie per gram limit for surface disposal of low-level waste. We believe that wastes that exceed this limit should not be considered low-level waste and should not be buried at commercial low-level waste disposal sites.

(6)

7) Part 8.4 -- State, Tribal, and Public Participation. We would like to reiterate our point made earlier in Part 61.71 of the proposed rulemaking that there should be full cooperation between the state and federal governments in all phases of low-level waste management. This cooperation will strengthen the working relationship between the states and the federal government and thereby facilitate the safe establishment of necessary new disposal sites.

(7)

Below you will find additional detailed comments of several state agencies on the draft Environmental Impact Statement.

STATE WATER RESOURCES CONTROL BOARD

General Comments:

1. In California, disposal to land of all but very low level radioactive wastes is prohibited by state law (California Administrative Code, Title 17, Section 30288, attached).

   The entire document fails to emphasize the need to prevent significant movement of pollutants from the disposal site to underlying ground water. The placement of an impervious cap over the waste will not preclude gravity drainage of liquid pollutants through a pervious trench bottom. Further, if the trench walls contain pervious beds (even lenses or "stringers"), water from precipitation or other nearby sources can move laterally into the trench, leach out pollutants, and then percolate vertically to underlying ground water. These ground water pollution threats can be essentially precluded by requiring disposal trenches to have impervious bottoms and sides. An engineered impervious barrier such as a clay liner could be required for each disposal trench. Better yet, the trench site should be in an area having a substantial thickness of clay. (See Class I Disposal Site Criteria, California Administrative Code, Title 23, Section 2510.)

(8)

Specific Comments:

1. Summary, page 11: The abbreviations, "PWR" and "BWR" should be interpreted (re Report Page 3-10, bottom).

(9)

2. Report, Pages 10-6 and 13 et seq. - The southwest "hypothetical regional site" is described as serving the western half of the country. The "High Plains" location, however, is far from the significant concentration of nuclear generating facilities on the west coast. It would be more appropriate for the western hypothetical site to be located near the west coast facilities.

(10)

3. Proposed Rule 10 CFR Part 61:

   A. Section 61:40 sets standards to avoid excessive exposure to humans. Excessive exposure to animal life should be avoided also.

   B. Section 61:50 should include criteria requiring impervious material (natural or "engineered") beneath and along the sides of all disposal trenches.

Attachment

SUBCHAPTER 15. WASTE DISPOSAL TO LAND

Article 1. General Provisions

2500. Definition of Terms. (a) "Disposal site" means any place used for the disposal of solid or liquid wastes. It does not include any part of a sewage treatment plant or point of discharge of sewage effluent or land drainage from pipes or ditches into waters of the state.

(b) "Disposal area" is that portion of the site which has received or is receiving wastes.

(c) "Leachate" is drainage from the waste or fluid resulting from the percolation of liquid through a waste substance.

(d) "Usable" ground or surface water includes potentially usable water.

(e) "Hydraulic continuity" is a condition existing when fluid occupying an interstice of a saturated material is able to move under a head differential to adjoining interstices or surface channels containing fluid.

(f) "Capillary fringe" is the partly saturated zone immediately above the water table in which water is held by capillary forces.

(g) "Toxic" means lethal, injurious, or damaging to man or other living organisms including plants, domestic animals, fish and wildlife.

(h) "Active life" is the period of time required to achieve stabilization of decomposing waste in a site such that leachate or the rate of generation of gases is no longer a threat to water quality.

NOTE: Authority cited: Sections 1058, 13140, 14010, Water Code.

History: 1. New Subchapter 15 (§§ 2500, 2510-2513, 2520-2522, 2530-2536, 2540, 2541, 2550) filed 3-10-72; effective thirtieth day thereafter (Register 72, No. 11).

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Article 2. Classification of Waste Disposal Sites

2510. Class I Disposal Sites. Class I disposal sites are those at which complete protection is provided for all time for the quality of ground and surface waters from all wastes deposited therein and against hazard to public health and wildlife resources. The following criteria must be met to qualify a site as Class I:

(a) Geological conditions are naturally capable of preventing vertical hydraulic continuity between liquids and gases emanating from the waste in the site and usable surface or groundwaters.

(b) Geological conditions are naturally capable of preventing lateral hydraulic continuity between liquids and gases emanating from wastes in the site and usable surface or groundwaters, or the disposal area has been modified to achieve such capability.

(c) Underlying geological formations which contain rock fractures or fissures of questionable permeability must be permanently sealed to provide a competent barrier to the movement of liquids or gases from the disposal site to usable waters.

(d) Inundation of disposal areas shall not occur until the site is closed in accordance with requirements of the regional board.

(e) Disposal areas shall not be subject to washout.

(f) Leachate and subsurface flow into the disposal area shall be contained within the site unless other disposition is made in accordance with requirements of the regional board.

(g) Sites shall not be located over zones of active faulting or where other forms of geological change would impair the competence of natural features or artificial barriers which prevent continuity with usable waters.

(h) Sites made suitable for use by man-made physical barriers shall not be located where improper operation or maintenance of such structures could permit the waste, leachate, or gases to contact usable ground or surface water.

(i) Sites which comply with a, b, c, e, f, g, and h but would be subject to inundation by a tide or a flood of greater than 100-year frequency may be considered by the regional board as a limited Class I disposal site.

History: 1. Amendment of subsections (a), (b) and (c) filed 12-29-72; effective thirtieth day thereafter (Register 72, No. 53).

50

51

A-60

(b) Excreta from individuals undergoing medical diagnosis or therapy with radioactive material shall be exempt from any limitations contained in this section, provided that the user provides for appropriate radiological monitoring whenever any waste line in the user's installation which may carry such excreta is opened.

30285. Disposal by Burial in Soil. (a) No user shall dispose of radioactive material by burial in soil unless:

(1) the total quantity of radioactive material buried at any one location and time does not exceed, at the time of burial, 1,000 times the amounts specified in Section 30356, Appendix B; and

(2) burial is at a minimum depth of four feet; and

(3) successive burials are separated by distances of at least six feet and not more than 12 burials are made in any year.

(b) The department will not approve any application for license to receive radioactive material from other persons for disposal on land not owned by the Federal or State Government.

30289. Treatment or Disposal by Incineration. No user shall treat or dispose of radioactive material by incineration except as specifically approved by the department pursuant to Section 30045.

NOTE: Authority cited: Sections 102, 208, 25811, Health and Safety Code.

History: 1. New section filed 7-22-71; effective thirtieth day thereafter (Register 71, No. 30).

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Article 6. Records, Reports and Notifications

30291. Records. (a) Each user shall maintain accurate and complete written records, as follows:

(1) The results of each required calibration, survey and test.

(2) Each receipt, transfer, and disposal of a source of radiation.

(3) Radiation exposures of all individuals for whom personnel monitoring is required under Section 30276. Exposure records shall be kept on department Form RH-2365 or in a manner which includes all the applicable information required on said form. Each entry shall be for a period of time not exceeding one calendar quarter.

(4) Results of medical examinations and bio-assays pursuant to Section 30277.

(b) Each required record of dose received by individuals and of medical examination and bioassay shall be preserved indefinitely or until the Department authorizes their disposal. Each other required record shall be preserved for a period of three years following the date of the occurrence that is the subject of such record.

Sent by Bill Friedman, Dept. Health ~~5-0931~~ 3-2767

30356. Appendix B.

APPENDIX B

Radionuclide	Microcuries	Radionuclide	Microcuries	Radionuclide	Microcuries
Americium-241	.01	Iodine-134	10	Silver-105	10
Antimony-122	100	Iodine-135	10	Silver-110m	1
Antimony-124	10	Iridium-192	10	Silver-111	100
Antimony-125	10	Iridium-194	100	Sodium-22	1
Arsenic-73	100	Iron-55	100	Sodium-24	10
Arsenic-74	10	Iron-59	10	Strontium-85	10
Arsenic-76	10	Krypton-85	100	Strontium-89	1
Arsenic-77	100	Krypton-87	10	Strontium-90	0.1
Barium-131	10	Lanthanum-140	10	Strontium-91	10
Barium-133	10	Lead-210	0.1	Strontium-92	10
Barium-140	10	Lutetium-177	100	Sulfur-35	100
Beryllium-7	100	Manganese-52	10	Tantalum-182	10
Bismuth-210	1	Manganese-54	10	Technetium-96	10
Bromine-82	10	Manganese-56	10	Technetium-97m	100
Cadmium-109	10	Mercury-197m	100	Technetium-97	100
Cadmium-115m	10	Mercury-197	100	Technetium-99m	100
Cadmium-115	100	Mercury-203	10	Technetium-99	10
Calcium-45	10	Molybdenum-99	100	Tellurium-125m	10
Calcium-47	10	Neodymium-147	100	Tellurium-127m	10
Carbon-14	100	Neodymium-149	100	Tellurium-127	100
Cerium-141	100	Nickel-59	100	Tellurium-129m	10
Cerium-143	100	Nickel-63	10	Tellurium-129	100
Cerium-144	1	Nickel-65	100	Tellurium-131m	10
Cesium-131	1,000	Niobium-93m	10	Tellurium-132	10
Cesium-134m	100	Niobium-95	10	Terbium-160	10
Cesium-134	1	Niobium-97	10	Thallium-200	100
Cesium-135	10	Osmium-185	10	Thallium-201	100
Cesium-136	10	Osmium-191m	100	Thallium-202	100
Cesium-137	10	Osmium-191	100	Thallium-204	10
Chlorine-36	10	Osmium-193	100	Thorium (natural)	100
Chlorine-38	10	Palladium-103	100	Thulium-170	10
Chromium-51	1,000	Palladium-109	100	Thulium-171	10
Cobalt-58m	10	Phosphorus-32	10	Tin-113	10
Cobalt-58	10	Platinum-191	100	Tin-125	10
Cobalt-60	1	Platinum-193m	100	Tungsten-181	10
Copper-64	100	Platinum-193	100	Tungsten-185	10
Dysprosium-165	10	Platinum-197m	100	Tungsten-187	100
Dysprosium-166	100	Platinum-197	100	Uranium (natural or depleted)	100
Erbium-169	100	Plutonium-239	.01	Uranium-233	.01
Erbium-171	100	Polonium-210	0.1	Uranium-234—Uranium-235	.01
Europium-152 9.2 h	100	Potassium-42	10	Vanadium-48	10
Europium-152 13 yr	1	Praseodymium-142	100	Xenon-131m	1,000
Europium-154	1	Praseodymium-143	100	Xenon-133	100
Europium-155	10	Promethium-147	10	Xenon-135	100
Fluorine-18	1,000	Promethium-149	10	Ytterbium-175	100
Gadolinium-153	10	Radium-226	.01	Yttrium-90	10
Gadolinium-159	100	Rhenium-186	100	Yttrium-91	10
Gallium-72	10	Rhenium-188	100	Yttrium-92	100
Germanium-71	100	Rhodium-103m	100	Yttrium-93	100
Gold-198	100	Rhodium-105	100	Zinc-65	10
Gold-199	100	Rubidium-86	10	Zinc-69m	100
Hafnium-181	10	Rubidium-87	10	Zinc-69	1,000
Holmium-166	100	Ruthenium-97	100	Zirconium-93	10
Hydrogen-3	1,000	Ruthenium-103	10	Zirconium-95	10
Indium-113m	100	Ruthenium-105	10	Zirconium-97	10
Indium-114m	10	Ruthenium-106	1	Any alpha emitting radionuclide not listed above or mixtures of alpha emitters of unknown composition	.01
Indium-115m	100	Samarium-151	10		
Indium-115	10	Samarium-153	100		
Iodine-125	1	Scandium-46	10		
Iodine-126	1	Scandium-47	100	Any radionuclide other than alpha emitting radionuclides, not listed above or mixtures of beta emitters of unknown composition	0.1
Iodine-129	0.1	Scandium-48	10		
Iodine-131	1	Selenium-75	10		
Iodine-132	10	Silicon-31	100		
Iodine-133	1				

NOTE: For purposes of Sections 30275, 30279, 30287 and 30289 where there is involved a combination of radionuclides [illegible]

EXAMPLE: [illegible]

RESOURCES AGENCY, DEPARTMENT OF CONSERVATION

The California Department of Conservation, based on review by the Division of Mines and Geology, has considered the Draft Environmental Impact Statement with respect to geotechnical aspects and procedural requirements.

In the DEIS, NRC discusses the use of high-integrity disposal package containers with extended containment life (approximately 300 years) for use in the disposal of high-concentrations wastes, as a waste processing option (DEIS, Ch. 5.2.4.8, App. D.4.3). This section also discusses potential use of similar containers for lower concentration wastes, but usage of this type of containerized disposal is not required by the proposed regulations. Also, for less concentrated wastes, the proposed regulations appear to require that the disposal package containers maintain their integrity only during the operational phase of the disposal site trenches (DEIS, App. D.4.3). However, we feel that because the less concentrated wastes could still release radionuclides similar to, or even the same as, those contained in the waste packages for high-concentration wastes, container integrity is essential to preventing the release of radionuclides into groundwater (prior to adequate confined decay time) to insure that the resultant activity level is low enough to not pose a danger to public health and safety. (11)

As discussed in the DEIS, the proposed regulations in 10 CFR Part 61 assume that in the event of early release of radionuclides from disposal containers, or from decontainerized disposal, the site design, including the geologic setting, should be capable of preventing radionuclide migration out of the disposal trenches and into the surrounding groundwater and environment. However, the proposed regulations provide no fail-safe assurance that this will be the case. (12)

Even if the wastes were to be segregated according to the active life of the different radionuclides and disposed of in containers which could maintain their integrity for the necessary containment time of each of the different classes of radionuclides, there does not appear to be adequate provisions in the proposed regulations for enforcement of this degree of detailed inspection during waste processing. We feel that the potential for migration of radionuclides from the disposal site and subsequent contamination of groundwater in the vicinity of the disposal sites could, coupled with adequate site planning and design, be minimized by containerized disposal of wastes in containers capable of maintaining their integrity for a minimum confinement period of 100 years [10 CFR Part 61, Subpart A, 61.7 (4)]. However, due to the lack of provisions in the regulations to require containerized disposal of all wastes, (13)

Department of Conservation (continued)

along with uncertainty in the capability for adequate enforcement of the regulations relative to proper packaging and disposal, we recommend that item 7 in Subpart D, Section 61.50 of [the proposed rulemaking for] 10 CFR Part 61 be rewritten as recommended above. (13 (cont))

DEPARTMENT OF HEALTH SERVICES

We continue to be troubled by the cost issues and their presentation in this EIS draft.

First, we are discouraged to find NRC using their own regions for the waste data bases. The states have been working for more than a year now with regions and waste volume projections based on U.S. Department of Energy (USDOE) studies. Comparison, then, with the USDOE data becomes difficult or impossible. However, because we know something of USDOE's efforts, their strengths and weaknesses, there is a need for careful comparison of data and conclusions on such an important matter as this. The final EIS should facilitate those comparisons. (14)

Secondly, costs are based on the 20-year period from 1980 to 2000. We think it important that costs be shown by year from 1986 (when exclusionary authority may be conferred by Congress) through 2000. For some regions (as defined by current state actions, or the USDOE), initial costs may verge on prohibitive. A review of USDOE data indicates that by 1986 only three regions would generate the volume of waste on which the EIS was based. One, Region 5 (USDOE), would not have the waste volume by the year 2000 (see Table I). (15)

Given the history of some existing disposal sites, one key concern should be the assurance of adequate financial resources on the part of the applicant to construct and operate a disposal facility and to provide adequate financial provisions for site closure and long-term care. (16)

The EIS, although it cites no specific cost figures, appears to underestimate the short- and long-term costs of operating and maintaining a low-level waste disposal site, and fails to recognize the problems small companies (as identified in the EIS) have in meeting financial requirements in operating a waste disposal site. It seems likely that few small companies can raise the necessary capital for plant development, set aside trust funds, cash deposits, purchase surety bonds against short-term financial needs and further set aside additional money for 100-year care costs within the life span of the disposal site. The most careful attention should therefore be paid to the financial resources of any applicant who seeks to develop and/or operate a new site. (17)

The "unanticipated contingencies" not addressed by the EIS (i.e., problems occurring at a site) should, we believe, be explicitly addressed either by the NRC or the Congress. To the extent that all national sites meet or exceed a (18)

Department of Health Services (continued)

common design and performance standard, the Congress might accept such a responsibility. That uniformity might, however, require some special handling as was done for uranium mill tailings. (18 cont'd)

To summarize, the EIS should contain a section specifically developed for informing the Congress on the impact of its impending action as authorized in PL 96-537. That section would chart waste disposal needs and costs by regions as they actually exist or are planned by the states. The conclusion of such a piece might well be that the implementation date of 1986 is too early in terms of waste volume, and unaffordable. Additionally, given the amount of time necessary to bring new sites into operation (4-7 years), the 1986 date in PL 96-537 may be premature, if safe management and disposal of these materials is to be assured. (19)

TABLE I

Fraction of Representative Site Waste Volume by Region*

	1986	2000
Region 1	120%	230%
Region 2	46%	97%
Region 3	140%	290%
Region 4	87%	180%
Region 5	19%	40%
Region 6	52%	84%

*Reference: Low-Level Radioactive Waste Management Report, prepared by the U. S. Department of Energy, March 13, 1981.

Thank you for affording us the opportunity to comment of these documents. This is a most timely issue, and one which we are sure will benefit from the careful attention and input provided by all interested parties.

Sincerely,

Phillip A. Greenberg
Assistant to the Governor
for Energy and Environment

Docketed Comment Number: 26

Commenter: State of California, Governor's Office

Response(s): Item 1 - There is no conflict between §61.59 of the rule which states that either the state or the federal government shall become the site owner and the assumption on page 3-36, Volume 2 of the draft EIS that the state would be the site owner. The rule identifies the two parties who may become the site owner and the draft EIS merely assumes for the purposes of analysis one of those two parties.

Item 2 - Ocean disposal of low-level waste was discontinued in 1970. Responsibility for licensing this disposal method, should it be resumed, rests with the U.S. Environmental Protection Agency as a result of the Marine Protection Research, and Sanctuaries Act of 1972. The state's opposition to this disposal method is noted.

Item 3-- The staff considers the 300- or 500-year floodplain to be too restrictive since the major impact of flooding is inundation of disposed units which have not been covered or stabilized. Part 61 requires that each disposal unit be closed and stabilized as it is filled and covered. Thus, each disposal unit will be open a comparatively short time. In addition, Part 61 requires that disposal unit covers direct surface water and infiltrating water away from the waste and that the site be designed to eliminate the contact of percolating or standing water with the wastes after disposal. Therefore, given the short time frame that disposal units will be open, the staff considers the 100-year floodplain (Executive Order 11988, Floodplain Management Guidelines) to be adequate protection against inundation. Other site flooding will be handled by the site drainage system.

Item 4 - The staff considered this requirement and determined that the one year period is adequate for data collection. However, in branch technical positions and regulatory guides under development, the staff will advise applicants to collect existing information from government agencies and other resource centers to allow a determination to be made as to the representativeness of the year's field data.

Item 5 - The staff is aware that explicitly requiring a licensee to establish a sinking fund for long-term care would be the most effective method of ensuring that sufficient funds be available for long-term care. However, at this time, NRC lacks the statutory authority to require that a long-term care fund be established. The Commission has presented testimony requesting this authority. Until such authority is granted, the Commission cannot require licensees to establish a long-term care fund.

The amount of financial assurances that a licensee is required to provide for closure and post-closure care will be determined by the Commission during the licensing period. The Commission will ensure that such funds are adequate and will consider the position of the state and any other parties involved as to the amount and type of the licensee's financial responsibility for closure and post-closure care.

With respect to financial responsibility for long-term care, the amount and type of coverage would be established between the licensee and the site owner in a lease or other type of binding arrangement. The Commission would review this document at the time of licensing and periodically thereafter to ensure adequate financial responsibility for costs during the long-term care period.

Item 6 - A considerable number of comments were received on the limit on near-surface disposal proposed in the draft rule for transuranic radionuclides. These comments were received from persons addressing the draft Part 61 rule as well as those addressing the rationale set out in the draft EIS. Due to this interest, NRC has reevaluated this limit and has determined that the 10 nCi/gm limit may safely be raised to 100 nCi/gm for wastes in which transuranic nuclides may exist in only trace amounts. For example, measurement of transuranic content in wastes from nuclear power plants have indicated that the TRU content is typically well below 10 nCi/gm and only occasionally in the 10-100 nCi/gm range. These latter occurrences have furthermore been associated with past incidents of failed fuel. Fuel performance has since generally improved. For wastes in which the transuranics may be the principal radionuclide within the waste (e.g., from decommissioning former MOX fabrication facilities), additional criteria would be imposed. The disposal limit would be placed at 100 nCi/gm, but such waste would be required

to be treated at least as Class C waste. That is, disposal with an intruder barrier such as a 5-meter thick cover would be required.

Item 7 - NRC staff agrees the states will have a major role in the development of new sites. Under the Low-Level Radioactive Waste Policy Act of 1980 (P.L. 96-573), the states are responsible for providing for the availability of adequate disposal capacity. The Act provides for the establishment of regional compacts to meet this responsibility. Proposals for new sites should come from Policy Act activities and the siting arena which the Act establishes. Thus the state will be involved from the beginning and NRC plans to work closely with the states in the licensing process.

The state will also likely be the landowner and provide institutional control after site closure. The lease and other arrangements made to fulfill the institutional requirements of proposed Part 61 will afford another means of early state involvement. These arrangements also afford a means of continuing state involvement during operation and closure of sites.

Item 8 - The use of impervious clay liners will trap any infiltrating water in disposal trenches leading to soaking of wastes in standing water and the need to periodically pump and treat the trench waters thus created. NRC does not believe that leachate collection systems and water treatment are acceptable means of disposal and lead to the need for long-term active maintenance water treatment are acceptable means of disposal and lead to the need for long-term active maintenance. The need for such maintenance is contrary to the performance objectives of Part 61.

Item 9 - "PWR" is an abbreviation for pressurized water reactors and "BWR" is an abbreviation for boiling water reactors.

Item 10 - The location of the hypothetical southwest regional site was chosen to be roughly central relative to existing and future nuclear generating capacity in NRC Regions IV and V.

Item 11 - A preferred alternative identified in the draft EIS was that all waste should be placed into a stable form or container to eliminate the need (and cost) for long term active maintenance. It was not selected, however, because stability was not warranted for all wastes on the basis of public health and safety protection and because of the high cost to small waste generators of having to place low activity wastes into a stable form. NRC selected the alternative of only requiring higher activity wastes to be placed into a stable form. The concentration limits calculated for the low activity wastes were determined on the basis of their disposal in an unstable form and their not resulting in the Part 61 performace objectives being exceeded.

Item 12 - The state is correct in its assumption that the proposed regulations do not provide fail-safe assurances. The rule's basis is that waste form, site characteristics, site design and site operation and closure constitute an interactive system which will provide a reasonable assurance that the performance objectives of Subpart C will be realized.

Items 13 - See response to Item 11 above.

Item 14 - The work done in projecting waste data as a basis for the rule was begun well in advance of passage of the Low-Level Radioactive Waste Policy Act of 1980 and subsequent waste volume projections by DOE. Moreover, NRC's regional waste projections were made in support of the development of a regulatory program for land disposal of radioactive waste and for this reason the staff considers the use of these projections appropriate.

Item 15 - The staff believes that a year-by-year breakdown of costs will add little to the overall evaluation of benefits and costs associated with the proposed 10 CFR Part 61. The purpose of the rule is to assure long-term public health and safety and environmental protection, and conclusions about the efficacy of the rule made on the basis of costs incurred in a single calendar year are not considered by the staff to be appropriate.

With respect to the commentor's observations on waste volume projections, the regional breakdown may or may not give rise to questions about the need for additional disposal capacity. However, the staff feels that waste volume will continue to increase nationally, and the proposed rule is considered necessary to deal with this increase in a manner consistent with NRC's statutory responsibilities.

Item 16 - The staff has reviewed the financial history of the existing disposal facilities, and shares these concerns for the need to require licensees to provide adequate financial resources for closure, post-closure, and long-term care. The proposed rules require licensees to provide financial assurances for closure, post-closure, and long-term care of the low-level waste disposal facility.

Item 17 - The Commission staff agrees with the importance of having a licensee possess sufficient financial resources, and they will therefore examine the financial resources of the license applicant at the time of the license application review.

Item 18 - The proposed rule provides that responsibility for the costs of closure and post-closure care at a low-level waste disposal site will be determined during the license application review. The NRC will ensure that such funds are adequate and will consider the position of the state and any other parties involved as to the type and amount of financial responsibility the licensee should provide for during closure and post-closure care. Financial responsibility for all events during the long-term care period will be covered in the lease or other type of binding agreement between the licensee and the site owner.

The staff also thinks that Congress, in passing the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) has already enacted a program to provide for financial responsibility for the cleanup of unanticipated contingencies at a low-level waste disposal site, such as a release of radioactive materials.

Item 19 - As stated in the introduction, the scope and purpose of this EIS was to examine and provide a decision basis for the requirements in Part 61 to ensure safe disposal of LLW. It is not a generic EIS and it is not intended to provide a planning basis for the identification and selection of new sites. Such work is being performed by DOE, and NRC has not and does not plan to prepare its own independent assessment. NRC and DOE have cooperated closely in this area and plan to continue to do so in the future.

DUKE POWER COMPANY

POWER BUILDING
422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

January 13, 1982

(46 FR 51776)

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

Dear Mr. Secretary:

Subject: Licensing Requirements for Land Disposal of Radioactive Wastes;
Proposed 10CFR61 Supplemental Duke Power Company Comments
File: GS-811.02

Duke Power Co. is pleased to supplement its previous comments, dated October 23, 1981, on this subject and on the Draft Environmental Impact Statement NUREG-0782, in accordance with the additional opportunity presented to the public to do so.

First, we want to inform you that we generally subscribe to the comments submitted to you on this subject from the AIF and the EEI/UNWMG.

Our most important comment on the DEIS is that in no way neither technically, nor quantitatively, does it support the values listed in Table 1 of the proposed regulation (i.e., the values in the Table are not derived in the EIS). This, of course, calls the conservatism of the Table into serious question as well as some of the conclusions reached which are reflected in the proposed regulation. (1)

Although originally written for somewhat different purposes, we also want to include as our comments the information presented on the two enclosures to this letter. One item in the enclosures describes a mechanism by which the NRC can establish a generic "de minimus" category for low level contaminated trash.

Thank you for the opportunity to submit additional comments. We expect that they will receive full and careful consideration by the Commission.

Very truly yours,

William O. Parker, Jr.

DS10
S
1/1

WOP/LL/scd
Enclosures

ADD:
R. D. Smith

Acknowledged by card 1/22/82 emp

Docketed Comment Number: 27

Commenter: Duke Power Company

Response(s): Item 1 - Contrary to the assertion of the commentor, the values listed in Table 1 of the proposed Part 61 rule are derived in the DEIS--specifically in Chapter 7 of the Main Report (Vol. 2). Further examination of the values in Table 1 has been performed in the Final EIS.

Docketed Comment Number: 28

Commenter: Arkansas Power and Light

Response(s): This comment was inadvertently docketed for both the rule and the EIS, although the comment addressed only the rule. The commenter's concerns were reviewed and responded to in the development of the final rule.

Docketed Comment Number: 29

Commenter: Stone and Webster

Response(s): This comment was inadvertently docketed for both the rule and the EIS, although the comment addressed only the rule. The commenter's concerns were reviewed and responded to in the development of the final rule.

Docketed Comment Number: 30

Commenter: Health Physics Society

Response(s): This comment was inadvertently docketed for both the rule and the EIS, although the comment addressed only the rule. The commenter's concerns were reviewed and responded to in the development of the final rule.

(31)

PR-61
(46 FR 51776)

Betty Johnson
1907 Stratford Lane
Rockford, IL 61107

COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT ON CFR PART 61

"Licensing Requirements for Land Disposal of Radioactive Waste" NUREG -0782, vol. 1-4

Because it may help prevent repeating serious mistakes made in the past at low level waste land disposal sites, it is highly desirable to have specific requirements for land disposal of radioactive wastes-specifically for LLW in shallow burial sites-as proposed in 10 CFR Part 61. Mistakes made at Maxey Flats, Ky., Sheffield, Il., West Valley, N.Y., Hanford, Wa., and other burial sites have seriously affected the health and safety of the public and it is important that they not be repeated.

Therefore I recommend that the most careful and strict requirements for compaction, stabilization, reduction of waste volume, and segregation of waste be used as outlined in these proposed regulations. In spite of these strict regulations it seems likely that groundwater, air, soil and human and animal life will be contaminated over the long term. This is likely because institutional arrangements cannot be made to last for the hundreds and thousands of years that longlived, toxic radioactive wastes must be isolated. These proposed regulations set up cost/benefit analysis and exceptions to regulations and minimum amounts of transuranics and other long lived radionuclides that may be included in the waste stream, all of these may lead to pollution from these wastes. In this draft EIS groundwater contamination is considered to be the most dangerous. It is likely that this will occur because of the fact stated in this report that three fourths of the waste will be buried in a humid environment. Also many of the proposed solutions have not been and cannot be thoroughly tested for the length of time some elements in this radioactive waste will remain toxic. (1)

In February, 1981 when EPA issued its temporary landfill standards for permitting new landfill facilities, it was stated that "as EPA examines the problem of hazardous waste management generally, it is becoming increasingly convinced that the long-range potential for migration of wastes from even the good facilities argues for a long-

term strategy that involves phasing out land disposal."

It is imperative that we find a place to put radioactive waste. Therefore, I would like to suggest use of the alternative of above ground structural containment as suggested in NREG/CR-0308 UC 209-02, "Screening of Alternative Methods for the Disposal of Low Level Radioactive Wastes". If possible sites used for above ground structural containment should be those that are already radioactively contaminated and also contaminated land areas that are no longer being used and could contain waste, such as civilian reactors, Manhatton Project and AEC facilities, surplus or obsolete DOE nuclear sites, and shut down nuclear reactors of utilities, such as Dresden I. This would offer the following advantages: (2)

1) Savings in cost of decontaminating and transporting wastes from these sites.
2) Use of existing setups for security and monitoring.
3) Wastes put in storage could be made retrievable; burial mistakes are more difficult to remedy.
4) These above ground structures could help prevent accidental intrusion because they could be easily identified, labeled, etc.
5) Past acceptance of the sites for radioactive type activities by local populations could minimize opposition and make site selection less difficult.
6) Valuable natural resources would be saved from radioactive contamination. Agricultural land, water, air and mineral resources, such as salt, that will be needed as world population grows would be protected from radiation pollution.

There are several hundred sites of this type which might be suitable, unless there was poor siting of these facilities from a geological (i.e. groundwater and earthquake) or social (i.e. high population areas like Zion, IL. or Indian Point, N.Y.) standpoint. One or more of these sites could be used for small experimental land burial sites to try out proposals contained in CFR Part 61. Large sites of even operating commercial reactors or other facilities could also be used for limited land burial of LLW to minimize transportation and new site location. Then the

operating facilities on these sites are closed (i.e, reactors after 20 to 40 years of operation)they could be used as waste burial sites on either land or in structural containment.

Additional Comments *

3-30 Is a picnic ground in the planning map for this waste disposal site appropriate? This use could make intrusion more likely and the plantings could cause problems. (3)

4-6 Even unlikely "events" must be guarded against. Looking at 200 years of U.S. history and the record of nuclear facilities in a time span of less than 50 years shows loss of records, and many accidents and mistakes from unpredicted events. (4)

4-12. How can it be assumed that these radiation impacts will be very small? Radiation is cumulative and concentrated as it moves up the food chain, and new discoveries are still being made about its long-term effects. (5)

4-34-37. Waste disposal sites should never be put on land that is needed for food production now or in the future. As world population grows every available bit of agricultural land will be needed. (6)

5-16.I agree that it is very important to prevent closing of landfill sites prematurely without sufficeent funds to protect the site. Should insurance be mandatory? (7)

5-117. Urea formaldehyde is toxic and should not be used for stabilization. Why add to the potential for pollution with another toxic material? (8)

Federal Resgister Proposed Rules:

p. 38083--Says the inadvertant intruder can't be reasonably protected against and that it may be one or a few individuals. There could be many individuals, so this assumption is faulty. 55 mrem/yr maximum individual exposure limit is not acceptable for children who might be the intruders.

p. 38085--Smoke detectors contin transuranic Am-241 in concentrations greater than 10 nCi/g and they are being generated in significant volumes. they should be required to be disposed of in low level waste repositories.

* Notations of sctions and/or pages placed by these comments are not cross-indexed and should be applied to other references to these same problems in the draft EIS.

Institutional Control--There should be some sort of automatic signal for leakage required. As past experience has shown, operators of the waste disposal site can't be depended on to report accurately and monitor carefully.

Financial assurances--See comment on 5-16.

p. 38086. Shipping regulations proposed are good, but may not preclude accidents. Preoperational Phase of site selection--There is no adequate provision for meaningful public participation. There should be a representative citizen's committee and mandatory public hearings at every step of the site selection and licensing. Site selection should be governed by Federal and state rules for hazardous waste disposal. The state and local governments must concur with the disposal option.

p. 38088 How to minimize duplication with superfund requirements? Incorporate these requirements where possible and add those needed for long lived hazard of radioactivity.

p. 38091. I question whether or not institutional control can be relied on for periods up to 100 years, and disposing of A and B waste without protection; past experience with sites less thwn 100 years old find this did not work. Also 500 years calulation is not long enough for the most long lived waste.

p. 38092. 61.53--Environmental monitoring. There is a need to also monitor the health of the human population in the area. The monitoring system must have an automatic alarm for early warning monitoring. Could the wste be color dyed or given an odor?

I participated in the 1980 workshop held by the Midwestern Regional Office of the Council of State Governments for the central region and Midwest., and I am pleased by the careful efforts that have been made to get public input on proposed CFR 61 regulations.

Betty Johnson

Betty Johnson

Docketed Comment Number: 31

Commenter: Betty Johnson

Response(s): Item 1 - Based upon past experiences (both good and bad) and analyses of LLW disposal, NRC selected requirements leading to long-term site stability. These types of requirements have been found to work well at existing sites, (e.g., the Barnwell, South Carolina site). NRC recognizes, however, the difficulties in demonstrating and assuring that the requirements will continue to work well. With this in mind, NRC plans to assure that Part 61 requirements are properly implemented through a structured licensing program including periodic updates and inspection of operations. This will enable the operating history of each site to be properly reflected in the conditions of operation. Also, Part 61 provides for a period of observation and maintenance after active operations cease to ensure the site has reached a stable condition before releasing the site operator from his responsibilities.

Item 2 - The EIS and requirements developed for Part 61 do not deal with identification of specific near-surface disposal alternatives for actual disposal of LLW. Rather, they establish the safety limits and technical requirements which should be applied in disposal to ensure public health and safety over the long term. Each of the options mentioned in the comment can be evaluated against the requirements in Part 61 as well as against the types of social and political factors raised. Part 61 does not preclude their use but establishes the requirements on how they should be sited, designed, operated, closed and cared for over the long term.

Item 3 - The picnic area shown in Figure 3.3 of the DEIS, Conceptual Layout of Support Facilities, is not intended to be a public facility and therefore, would have no effect on the probability of disposal site intrusion. The picnic area is intended for the use of site workers during operations and no waste would be disposed of in the area indicated.

Item 4 - A basic problem in determining the requirements for disposal of waste was the choice of pathways and events which should be considered in the analyses. The commenter suggests no specific "unlikely event" which should be guarded against. As a part of the analyses, NRC considered both credible and potentially unlikely events (e.g., intrusion into a closed disposal facility). In addition, NRC analyzed potential accidents which might occur at a site during operations such as dropping a container of waste releasing a portion of its contents and a fire in a disposal trench. In the final EIS, NRC also analyzed one additional pathway, trench overflow and surface water transport. NRC staff believes the pathway and events considered in the analyses in the FEIS are adequate to assess the impacts of disposal of LLW.

Item 5 - The staff believes that the comment refers to a statement in the first complete paragraph on page 4-12, Volume 2 of the DEIS. This statement notes that for the purposes of the EIS, operational releases from other waste processing operations (e.g., compaction and solidification) would be very small and as such were not included in the analysis. Only potential additional impacts from waste incineration were included in the analysis.

Perhaps the statement in the DEIS was not sufficiently clear as to NRC's intent. For purposes of the Part 61 rule, NRC wished to analyze the costs and impacts of different waste form and packaging options. For example, incineration of combustible waste material combined with solidification of the resultant ashes has the advantage of placing the waste into a stable form, helping to promote disposal site stability and reduce potential groundwater impacts. On the other hand, waste incineration is not currently practiced by most waste generators, and involves an additional expense as well as an airborne release pathway.

For the EIS, it was recognized that waste processing activities such as waste compaction or solidification are currently being carried out by a number of licensees such as nuclear power facilities. As such, these activities are already being included as part of assessing the potential impacts of operation of a particular facility. In such assessments, the effects of radionuclide being incorporated into food chains are considered. Such assessments have indicated that the potential impacts of such "normal" waste processing operations are indeed small. Waste incineration, however, has not been extensively used by waste generators, and so estimates of potential airborne impacts were included in the draft EIS.

In any case, the purpose of the EIS was not to perform a detailed environment survey of all waste management operations, but to address costs and impacts only to the extent that they relate to development of the Part 61 rule on waste disposal. In this case, it was determined that waste incineration was a useful means of helping to ensure disposal site stability.

Item 6 - The siting requirements developed in Part 61 require consideration of projected population growth and future development to determine their effect on the ability of the disposal site to meet the performance objectives. Almost any type of land with proper treatment and sufficient water could potentially be used for agriculture. As such, given the commentor's assumption, all potential sites could be eliminated from consideration. Since the number of sites required for LLW is small and the hazard duration for the waste is short, they should not have an impact on the overall U.S. or world agricultural production. In addition, Part 61 would allow productive uses of the site provided such uses would not affect site integrity or lead to disturbance of the disposed waste. If at some future time it is decided to use the site for productive uses such as farming, the potential impacts of doing so would have to be weighed and balanced against the benefits.

Item 7 - The staff agrees with the importance of requiring the licensee to provide financial responsiblity for closure, post-closure, and long-term care of the disposal site, and the proposed rules require that the licensees obtain these types of financial assurances. However, at this time, the Commission does not require LLW disposal site operators to obtain third party liability insurance, although the operators of all the operating LLW disposal sites currently carry this type of coverage from the nuclear insurance pools as a normal business practice. The Commission staff is currently conducting a generic review of mandatory insurance for a variety of types of material licensees, and depending on the results, the Commission may require LLW operators to obtain this type of coverage.

Item 8 - Urea-formaldehyde (UF) has been used as a solidification agent for liquid radioactive wastes. In 1979 the State of Nevada prohibited the acceptance of urea-formaldehyde at the Beatty facility. In 1981 both the States of South Carolina and Washington also prohibited its acceptance. Urea-formaldehyde was prohibited at the three commercial disposal sites due to its inability to consistently produce a solidified product which would meet the disposal site free-standing liquid requirements.

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January 18, 1982

(100)
(46 FR 38081)
(32)
(46 FR 51776)

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

Attention: Docketing and Service Branch

Re: Notice on Proposed Rulemaking "Licensing Requirements for Land Disposal of Radioactive Waste" 10 CFR Part 61 (46 Federal Register 38081) and "Draft Environmental Impact Statement," NUREG-0782

Dear Sir:

The enclosed comments on the proposed rule and the draft EIS were prepared by two AIF subcommittees on low level radioactive waste.

The consensus of the subcommittees is that the proposed rule appears reasonable; however, some suggestions and some exceptions to the proposed rule and to the draft EIS were made and are reflected in the enclosures.

Sincerely,

John H. MacMillan
Chairman, AIF
Committee on the Nuclear
Fuel Cycle

JHM:gpg
Enclosures

Acknowledged by card. 1/22/82.

Comments on the Proposed NRC Rulemaking: "Licensing Requirements for Land Disposal of Radioactive Waste", 10 CFR Part 61, and on the "Draft Environmental Impact Statement", NUREG 0782
prepared by
The AIF Subcommittee on Low-Level Radioactive Waste and
the AIF Subcommittee on Solidification of Low Level Reactor Radwaste

Comments on "Supplementary Information":

p. 38084 Para V,C — The first paragraph in this section under "Disposal Site Design, Land Disposal Facility Operation and Disposal Site Closure Requirements" calls for operations and design which will result in the elimination of ongoing active maintenance after closure, requiring only minor custodial care. "Active maintenance" is not clearly defined here or even in the definition in Para. 61.2 "Definitions". In the definition, active maintenance is described as a "significant remedial" action. It is suggested that the postclosure maintenance requirement should be site specific and incorporated in the license conditions.

p. 38084 Para V,C — The first paragraph under "Waste Characteristics and Classification" points out the desirability of the physical integrity of the waste and the site lasting until radioisotopes decay "to levels where they are no longer of concern from the migration standpoint". What standards should be applied to satisfy this requirement?

p. 38085 Para V,C — In the section "Waste Characteristics and Classification", there is a discussion of a "de minimus" classification for wastes which would be exempt from 10 CFR Part 61. It is noted that the NRC in the next two years will work to define these wastes and "to provide for additional waste exceptions as appropriate." We support the need for a "de minimus" concept and encourage the expeditious establishment of suitable criteria for this concept. A "de minimus" classification would result in the conservation of valuable disposal site burial space while at the same time protecting the health and safety of the public. In this connection, the Commission is urged to permit case by case reviews of requests for specific applications of the "de minimus" concept during the period criteria are being developed. We will be pleased to be of assistance in the establishment of "de minimus" levels and would like to call attention to the

report by the Forum's National Environmental Studies Project entitled "De Minimus Concentration of Radionuclides in Solid Wastes", AIF/NESP-016. Also, the Utility Nuclear Waste Management Group sponsored a study, "Suggested Concentration Limits for Shallow Land Burial of Radionuclides", which should be of value.

p. 38086 Para F — In reference to the "Manifest Tracking System" we urge the Commission to ensure that any changes in manifest tracking systems are compatible with existing systems in order to minimize or eliminate possible duplication.

p. 38086 Para G — The five phases of the life-cycle for a typical land disposal facility discussed in the proposed rule are: preoperational, operational, closure, post-closure observation, and institutional control. Some discussion is needed to indicate that several of these phases may proceed simultaneously at the same site as part of the normal disposal site operation.

There should be a sixth phase in the life cycle for a land disposal facility identified in the regulation; namely - release for uncontrolled use. This phase, which occurs after the radioactive contents of the landfill have decayed, should be stressed. It is further important to stress the need to keep toxic or mutagenic chemical forms out of landfills intended for radioactive waste. Chemical wastes are present forever and the land used must be restricted forever. Radioactivity decays away in time and land use can be recovered.

p. 38087 Para G — The proposed rule requires a license renewal every five years. For a facility of this type, a five-year license renewal policy appears unreasonably short. Disposal sites should be provided with a full term license, subject to appropriate review. The fiscal basis for site operation and monitoring assumes a reasonable operating life. Licensing similar to that under 10 CFR 50 would appear to be more appropriate.

p. 38087 Para G — The proposed rule states that the Institutional Control Board has a responsibility to "keep people off the site". This approach may be unnecessarily restrictive. Limited use of the land may be desirable in the future. A more appropriate action might be to control access to the site. The control board should have the flexibility to institute suitable control options depending on the particular condition existing at the site.

Comments on Part 61:

p. 38089 Para 61.2 — See our comments on Para. V,C p. 38084 on "active maintenance".

p. 38090 Para 61.2 — In the definition of "Disposal" isolation of radioactive wastes from the biosphere should be clarified. A better definition would be: "Confinement of the wastes with no provision made for subsequent retrieval."

p. 38091 Para 61.7 (b)(1) — The primary safety objectives for a near-surface disposal facility should be redefined in a manner that will (a) keep the site personnel dose as low as reasonably achievable and (b) keep the environmental impact and population dose below specified limits. In the existing statement of objectives the word "prevention" should be replaced with "minimize". To minimize migration of radionucludes is to provide a means towards achieving the primary safety objectives. "Prevention of exposure to "inadvertent intruders" is a special case of (b) above, and should be regarded as a secondary objective.

p. 38091 Para 61.7 (b)(2) — In the first sentence the word "eliminated" should be modified or omitted. The requirement may not be possible.

p. 38092 Para 61.13 (b) — It is not apparent what is required for "demonstration" or how analysis will be accomplished. This section should be clarified. This comment applies to Paras. 61.23(f),(i) and (j).

p. 38094 Para 61.25 — The section on "changes" is too restrictive. The licensee should be allowed to make changes when deemed necessary, providing they do not decrease the level of protection to the public and provided they are brought to the attention of the Commission in a timely manner (i.e., Subpara.(d) provisions for changes similar to those in 10 CFR 70.32 (d)).

p. 38095 Para 61.29 — The closure period should be included in the closure plan rather than the regulation. The required period of observation should be a function of specific site characteristics.

p. 38095 Para 61.30 (5)	The requirement for transfer of the license to Federal or State custodial care should be part of the closure agreement and not the regulation. Transfer should be contingent upon licensee satisfaction of required conditions. Transfer "when the agency is prepared" leaves an open-ended commitment by the licensee which is not warranted.
p. 38096 Para 61.50 (a)(3)	Projections of population growth should be limited to useful demographics. Projection to 100 years or even 50 could be a useless exercise or worse, could rule out an acceptable site.
p. 38096 Para 61.51 (a)(4)	Replace "prevent" with "minimize".
p. 38096 Para 61.52 (a)(1)	Replace "no interaction" with "no significant interaction".
p. 38096 Para 61.51 (a)(6)	Replace "eliminate" with "minimize".
p. 38096 Para 61.52 (a)(4)	The word "orderly" should be deleted or explained.
p. 38096 Para (a) (7)	"Accurately located" depends on the state of the art. The word "accurately" should be defined or not included.
p. 38097 Para 61.55 (a)	Table 1 has a footnote eliminating wastes containing chelating agents in concentrations greater than 0.1% except as specifically approved by the Commission. This requirement eliminates most routine decontamination techniques to reduce occupational exposures and thus adversely affects ALARA programs. It is not clear why this restriction is being imposed. Guidance on acceptable packaging and disposal techniques for these agents is needed.

p. 38097 Para 61.55	Table 1 is a specific list of radioisotopes with their respective concentration limits for three classifications of wastes, Class A segregated waste, Class B stable waste, and Class C intruder waste. While some of the concentration limits shown are reasonable, demonstrating compliance for others would be difficult (for example Ni-59 and Ni-63) because of problems in sampling and long delay periods for off-site transport which consequently result in additional increases in personnel radiation exposures. Additionally, the measurement of TRU in the 10 nanocurie/gram range in the presence of other interfering radionuclides is very difficult. Detection of 10 nanocuries/gram can be accomplished readily if TRU isotopes are the only ones present. Further, the present policy of volume reduction increases the concentration of radionuclides in the waste and in some cases may cause the waste to exceed the Table 1 concentration limits. For these reasons, the concentration limits in Table 1 should be reevaluated to determine their ability to be achieved in a realistic situation and in a cost-effective manner.
p. 38097 Para 61.56 (a)(7)	Change to read ..."that does not significantly exceed atmosphere at 20 degrees C". If this requirement is not modified, waste generators may be required to package gases under reduced pressure or elevated temperatures. The basis for the 100 curies should be provided.
p. 38098 Para 61.56 (b)(1)	By specifying a 5% limitation on the physical waste form, the proposed rule may well be unintentionally mandating a high integrity container for Class B wastes. Experience has shown that drums and liners can normally be filled to about 80% of their volume. Demonstrating compliance with a 95% criteria could be difficult. Also, the 50 psi compressive load criteria may eliminate bitumen media as a waste stabilization process. The compressive load criteria may also be more appropriately related to individual disposal site overburden characteristics rather than specified as a generic criteria.

p. 38100 Para 61.82 (a)	Eliminate radioactive waste already disposed of and covered from NRC inspection requirement.
p. 38100 Para 2.103	It is not understood how this paragraph applies to 10 CFR 61.
p. 38102 Para 20.311 (d)(3) and (f)(5)	Regulatory requirements suggest rewording section to "conduct operations in a manner which assures compliance with Paras. 61.55 and 61.56 of this chapter." Existing wording implies that a separate quality assurance program will be used. Same comments as suggested for 20.311(d)(3).

Comments on Draft Environmental Impact Statement on 10 CFR Part 61 "Licensing Requirement for Land Disposal of Radioactive Waste" NUREG 0782

p. 2-2 and 2-3 Para 2.2	Generic performance objectives should be limited to occupational and environmental impact limitations and should be specified in the regulations. Prescriptive requirements that limit site inventory or quantities shipped to protect against excessive migration of radionuclides in ground water are site specific and should be incorporated in site licenses.	(1)
p. 2-8 Para 2.4	As noted, de minimus levels may be readily applied to other waste streams. We urge the NRC to develop these levels as well as levels for other radionuclides.	(2)
p. 4-49 Para 4.3.6	Consensus of opinion indicates that the institutional control period may reasonably range from 100 to 300 years. Since this parameter is somewhat arbitrary it should be the last parameter selected in the equation for determining prescriptive requirements.	(3)
p. 4-65 Para 4.5.4	The 500 rem/yr limit to an inadvertent intruder is too conservative when considering the low probability of acquiring such a dose commitment.	(4)
p. 7-3 Para 7.1.1	A "generic on-site-specific waste classification system" will be too conservative. Waste generators shall normally only need to consider one site to dispose waste. They shall normally only need to be conversant with the classification system specific to that site. Publishing generic classification systems shall not enable waste generators to ignore site specific limitations since these can be expected to be complex and many. A site specific waste classification shall allow optimum site utilization.	(5)
p. 7-13 Para 7.2	On this page and on several other occasions the ALARA concept is incorrectly used to justify excessive restrictions. Levels should be defined as ALARA when the costs to reduce radiological parameters to these levels are justified by the benefits accrued and where costs to reduce radiological parameters below these levels are not justified. It is not necessarily ALARA merely because it is lower. It is not necessarily ALARA when industry has learned to comply to an excessive restriction. It is not reasonable and therefore not ALARA to require industry to reduce environmental impacts 2-3 orders of magnitude below impacts from other conventional industries.	(6)

p. 7-16
Para 7.2

The 10 nCi/gm limit for disposing of TRU waste is not ALARA even though industry has complied with this regulation. The only alternative requiring indefinite storage of TRU waste exceeding 10 nCi/gm is not reasonable. (7)

p. 7-23
Para 7.5

Industry will have difficulty in economically arranging waste to ensure that it complies to the conditions of a particular category:

- This may lead to generators assigning conservative estimates to waste concentrations and consequential under utilization of a waste site.
- Inability of regulatory authorities to assay containers of waste renders control by assay unenforceable.
- The scaling factors recommended to simplify waste analysis are not applicable to industries generating a wide range of wastes. (8)

General Comments on the Above:

- The product of a large number of conservative estimates will be unreasonably conservative even if individual estimates are only marginally conservative. A better method for combining parameters is to use best estimates of each parameter and to propagate uncertainty errors to generate upper and lower confidence boundaries. A simplified version of this approach using a range of values for each parameter (e.g. as used in the BEIR III report), is preferable to compounding conservative estimates. (9)
- Since the inadvertent intruder is identified as the critically exposed group for most radionuclides more effort should be directed into determining the probability of intruder scenarios occurring. Waste concentration limits should then be relaxed if these interaction probabilities are factored into the impact calculations. (10)
- Credit should be given for improving critical waste forms to reduce plant uptake in the intruder-agriculture scenario. (11)

- There is no discussion of the potential impact of technologically enhanced natural radiation (TENR) due to calibration operations or changes in pH. Radon and potassium-40 levels in groundwater may be increased due to site operations. The EIS should show that such an impact would not be likely to violate EPA drinking water quality regulations and then TENR can be expiicitly excluded from 10 CFR 61. (12)
- Although there is provision for exceptions to the proposed limits on a case by case basis there should be some calculations to show the impact expected from radioactive gas. Also the wide range in toxicity of labeled compounds should also be addressed. (13)
- Provision should be made to allow waste generators to categorize waste by an inventory process. The quantities of waste generated in a year or present in an individual shipment could be determined with greater accuracy than by making separate determinations for individual containers. This comment is particularly relevant to very low level waste and to radionuclides that are restricted by the ground water migration scenario. (14)
- Scenarios assume that all waste is emplaced just before site closure. However, in practice waste will accumulate over a 20 to 60 year period and a considerable fraction shall have decayed before site closure. Hence a relaxation in concentration limits should be considered when applied to the short half-life radionuclides received during the initial period of burial activities. (15)
- Studies are quoted in the EIS which indicate that the average radioactivity concentrations in waste can be expected to be from 1 to 10% of the maximum concentration. Hence concentration limits should be relaxed by at least an order of magnitude and still provide adequate intruder protection. (16)
- We have been unable to find any justifications for the quantity limits for containers. Individual container limits appear excessively conservative. (17)
- For waste buried as received the DOT limit should apply since airborne release and nonoccupational exposure is the controlling factor. (18)
- For waste produced on-site the limit for individual containers should be 10 times the DOT limit since it is occupational exposure which provides the limiting scenario. (19)

Docketed Comment Number: 32

Commenter: Atomic Industrial Forum

Response(s): Item 1 - NRC staff agrees. This is the very approach adopted and used by NRC. Part 61 establishes overall performance objectives which define levels of protection for individuals and populations which should not be exceeded in the disposal of LLW. Part 61 also states that the inventory of specific nuclides disposed of at a particular site will be controlled on a site-specific basis.

Item 2 - NRC agrees that development of de minimis levels for radioactive waste is of importance and has programs underway in this area. (Also see the response on this issue under Item 4, Comment 11.)

Item 3 - NRC analyzed a range of institutional control periods from 50 to 300 years. Based on the analysis NRC found no compelling reason to select one particular institutional control period over another. Use of a longer institutional control period would theoretically allow higher concentrations of some radionuclides to be disposed of as Class A waste. The limit of 100 years proposed in Part 61 was selected because:

(1) It agreed well with previous estimates on the effective length of institutional controls made by EPA;

(2) It was consistent with the consensus arrived at from the regional workshops on Part 61; and

(3) Public comments on the preliminary draft of Part 61 was that 100 years was about the right time period.

Based on public comments received on the proposed Part 61 rule, NRC has not changed the 100 year institutional control period. NRC does not believe raising the institutional control period to 300 years is acceptable since it raises long-term care costs, it may place an undue burden on future generations, and it creates greater uncertainty in analyzing LLW disposal. (It is more difficult to postulate what may happen over such a long time period.) In addition, several commentors stated they believed 100 years was too long. Raising the institutional control period to 150-200 years would have the effect of raising the radionuclide concentrations for Class A wastes based on intruder protection considerations. Since the stability requirement for Class B waste is of more importance for other reasons besides intruder protection (i.e., migration, operational safety and long-term stability), NRC does not believe changing the 100 year time frame for active institutional control is warranted.

Item 4 - NRC has not adopted a higher dose limit for protection of an inadvertent intruder. Rather, given the hypothetical nature and low probability for such an event occurring (e.g., passive institutional controls should prevent it from occurring), NRC has performed a more realistic analysis in determining concentrations of specific radionuclides acceptable for near-surface disposal. Based on the analysis, concentration limits for certain radionuclides were raised. The impacts to an inadvertent intruder over the long term, however, were not found to change. They are still only a few millirem at 500 years.

Item 5 - NRC staff disagrees with the comment. Although waste generators normally send waste to one site, there have been numerous instances in the past in which waste shipments originally headed for one site have actually been disposed in another. Waste generators have also made use of 2 or more different waste disposal facilities within a year. This has occurred, for example, as a result of temporary closure of disposal facilities. A site-specific classification system would increase the potential for some wastes being acceptable at one site and not in another. Such a system would also be difficult to enforce and would tend to increase the number of shipment violations (e.g., wastes delivered to a site in forms or having radioactivity concentrations unacceptable at that site). This situation would be worsened if the number of disposal sites grows as a result of development of regional disposal compacts.

NRC staff believes that case-by-case consideration of exemptions to Table 1 should be allowed for specific waste forms and specific disposal site conditions. Provisions have been included in the Part 61 rule to allow this. However, NRC staff still believes that the most workable overall approach is a generic waste classification system rather than a site-specific one.

Item 6 - NRC staff does not believe it has necessarily incorrectly used ALARA. In response to the comment however, NRC has deleted reference to ALARA in the two instances specifically noted in the comment (Paragraph 7.2.6 of Chapter 7 and Paragraph 6.3 of the summary). This change has been incorporated into Appendix E, "Errata."

Item 7 - The reader is referred to the response to Item 6, Comment 26.

Item 8 - Compliance with waste classification is an important issue and NRC has taken a number of steps to clarify the matter. These include:

- o reducing the radionuclides listed in Table 1 to those which are really needed;
- o specifically allowing indirect measurement techniques;
- o allowing averaging of C-14, Tc-99, I-129 and other radionuclides over the volume of the waste;
- o In addition, NRC staff is developing a technical position on waste classification to set out further guidance on compliance with the waste classification system.

Item 9 - The staff believes the current approach is the most reasonable considering the level of available information and the generic nature of the analysis.

Item 10 - NRC has not performed a probabilistic analysis of inadvertent intrusion. Rather, NRC has conservatively assumed a few individuals will be exposed through inadvertent intrusion involving reasonable productive uses to which the land could be put in the future. As discussed in Item 4 above, NRC has performed more realistic analyses involving inadvertent intrusion which has increased concentrations for certain radionuclides.

(The reader is also referred to Item 3, Comment 24.)

Item 11 - The staff included provisions in proposed Part 61 for improved waste form to be considered on a case-by-case basis. At the present time there is insufficient data for most waste streams on the relationship of improved waste form to reduced plant uptake to allow a credit to be factored into the intruder-agriculture scenario for such improvements.

Item 12 - Technologically enhanced natural radiation (TENR) has been defined as those natural sources of radiation that would not normally occur without the presence of some technological activity not expressly designed to produce radiation. Examples would include the release of concentrations of natural radioactivity to the environment from the combustion of coal and natural gas to produce electricity and from the mining industry. NRC staff is unsure of the appropriateness of application of such a concept to the construction activities which might take place at a LLW near-surface disposal facility. The staff believes that impacts from TENR at a near-surface disposal facility would be similar to those resulting from any large construction project. In addition, they would be very site-specific with respect to the concentration of natural radioactivity that would be present in the specific site soils and ground water. As such, NRC has not addressed them in this FEIS.

Item 13 - NRC considered the full range of potential pathways of release of radioactivity to the environment. The pathways considered included groundwater migration, plant and animal intrusion, wind and surface water transport and gaseous releases. (See Appendix M of the DEIS for details.) Based on consideration of existing data and measurements, NRC concluded that gaseous

releases were not a significant pathway for release and thus no detailed analyses were performed in the EIS. NRC did not specifically analyze the range in chemical toxicity of labeled compounds due to a lack of information about the specific compunds used and more importantly, due to the lack of an accepted methodology of assessing biological effects of exposure to such compounds.

Item 14 - This comment relates to the basic issue of compliance with the waste classification requirements. NRC recognizes the difficulty in directly assaying for some radionuclides on a routine basis and will allow indirect measurement techniques. NRC has prepared a branch technical position which outlines methods and procedures acceptable to NRC staff for complying with the waste classification requirements.

Item 15 - The staff does not agree with the commentor on this point. Rationale for the staff's position is contained in the response to Item 10, Comment 38.

Item 16 - Several commenters have remarked about the concentration limits in Table 1. As noted earlier, the staff has conducted more pragmatic analyses and as a result the concentration limits in Table 1 have been revised.

Items 17-19 - The 100 Ci limit is based on the license conditions for the disposal of gaseous wastes now in effect at the Hanford and Barnwell disposal sites. These limits have not resulted in unsafe environmental conditions at the disposal sites nor have they resulted in overly restrictive situations for waste generators.

The 100 Ci limit is consistent with an accident evaluation assuming a dropped package producing occupational exposures to site workers. The DOT limits, however, are established based on accident doses to the public. For tritium and Kr-85 in uncompressed gaseous forms, the DOT limits are 1,000 Ci in a Type A package and 50,000 Ci in a Type B package (49 CFR 173.389(1) and 173.390(a)). For gaseous waste forms the occupational exposure case is the limiting condition.

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502 426-7160

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emp

USEcology

(101)
PR-2 et al
(46 FR 38081)

January 13, 1982

(33)
PR-61
(46 FR 51776)

R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Division of Waste Management
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Smith:

US Ecology has reviewed the proposed NRC rules for the land disposal of radioactive wastes (10 CFR 61) published in the Federal Register on July 24, 1981, and comment as follows:

1. Disposal Site Design, Land Disposal Facility Operation, and Disposal Site Closure Requirements. Page 38084, Col. 1.

   This section as well as others in the proposed regulation refer to "eliminating the need for active maintenance after site closure." It is impossible to ensure that the need for no active maintenance can be achieved, so we would suggest that the word "minimize" be used in place of "eliminate."

2. Waste Characteristics and Classification.

   a. Page 38084, Col. 2.
      This section states that the stability of the waste and the disposal site should last long enough for the radioisotopes to decay to levels where they are no longer of concern from a migration standpoint. Without any reference to appropriate standards it is the regulatory agency's interpretation which must be used as a standard. References to applicable standards should be given.

   b. Page 38084, Col. 3.
      The limit of 10 nanocurie per gram for TRU waste is excessively conservative and is counter productive. Limits of this nature may dissuade waste generators from practicing volume reduction.

1/22/82 emp

   c. Page 38085, Col. 2.
      Decreased burial efficiencies will be experienced in burial facilities if the Commission fails in the establishment of a lower limit Class A segregated waste concentration. It is suggested that de minimus quantities be established to properly categorize those wastes that are suitable for alternate disposal methods. (e.g. sanitary landfills).

3. Financial Assurances. Page 38085, Col. 3.

   The Commission indicates that certain types of surety mechanisms are acceptable. It is recommended that representatives of the commercial insurance industry be given definitive criteria against which to base any bonds in order to ascertain whether or not underwriters will accept the risk and default provisions set forth in these regulations.

4. Manifest System. Page 38086, Col. 2 and Pages 38102, 38103, Section 20.311.

   The manifest tracking system provides for three (3) copies of the manifest. It has been the experience of this company that a greater number of copies is needed. A total of 5 identical manifests would provide a copy for the generator, carrier, an advanced copy to the intended recipient, one copy with the shipment and one copy as a receipt for the waste.

5. Regulatory Flexibility Act. Page 38088, Col. 1.

   The lack of a de minimus quantity as well as any lower limits on the Class A segregated waste concentrations conflicts with the Department of Transportation Regulations governing the transport of radioactive material. 49CFR section 173.389 defines radioactive material as "any material or combination of materials which spontaneously emit ionizing radiation. Material in which the estimated specific activity is not greater than 0.002 microcurries per gram of material, and in which the radioactivity is essentially uniformly distributed is not classed as Radioactive material."

6. 61.2 Definitions

   Page 38090, Col. 1.
   "Disposal" is defined as isolation of radioactive wastes from the biosphere. This is not possible as the "biosphere" can be interpreted as meaning part of the world in which life can exist. Many microorganisms will exist in and around all the waste. It is suggested that disposal be defined as isolation from the biospheres inhabited by man or his food chain.

7. 61.5 Interpretations

Page 38090, Col. 3:
By placing the responsibility for all regulatory interpretations upon the General Counsel and preventing other Commission personnel from making interpretations, the Commission could significantly disrupt operations by slowing the regulatory process. To avoid this, the regulations should establish a period, for example 10 days, within which the General Counsel must respond to requests for interpretation.

8. 61.7 (c) (2). Page 38091, Co.

Since closure plans are to be submitted with the initial license application and periodically updated until final closure occurs, the licensee should not have to apply for a license amendment to close the site. The closure plan will have been periodically reviewed by the licensing agency throughout the disposal site operational phase, therefore, closure of the disposal site in accordance with the final updated and approved closure plan should be sufficient.

9. 61.13. Page 38092

The definition of what is required for "demonstration" or how analysis will be accomplished should be provided. The comments apply to 61.2 (f) (i) (j).

10. 61.24 Conditions of Licenses.

61.24 (f). Page 38094, Col. 2.
This section refers to possession of radioactive materials and should be clarified to indicate that buried waste is no longer in the possession of the licensee.

11. 61.25 Changes.

61.25 (a). Page 38094, Col. 3.
This section on changes is too restrictive. The licensee should be allowed to make changes when deemed necessary providing they do not decrease the level of protection to the public and provided they are brought to the attention of the Commission prior to implementation.

12. 61.29 Post-Closure Observation and Maintenance: Page 38095, Col. 1.

If the Commission or licensing agency closely monitors the closure per 61.28 and is familiar with the site, the minimum period of five years for post-closure observation and maintenance could be shortened commensurate with the condition of the disposal facility as closed. Provisions should be made for a period of less than five years if conditions warrant upon request of the licensee.

13. 61.30 Transfer of License.

61.30 (a) (5). Page 38095, Col. 2.
This section will allow the long-term custodial care agency even though prior commitments have been made to delay in accepting its responsibility. The use of the phrase "when the agency is prepared" in effect negates all prior commitments of long-term custodial care agency.

14. 61.50 Disposal Site Suitability Requirements.

61.50 (a) (2). Page 38096, Col. 1.
Modeling of any site can only be approximate. Some statement as to what criteria should be used to define "capable of being modeled" is required.

61.50 (a) (3). Page 38096, Col. 1.
A time frame for projecting population growth and future development is needed. Is this time frame the 100 year custodial care period or the 500 year engineered barrier life span?

61.50 (a) (5). Page 38096, Col. 1.
Clarification is warranted as to the requirement for well-drained and free of areas of flooding and frequent ponding. Is this a selection criteria based on "as is" conditions or "as can be engineered."

61.50 (a) (11). Page 38096, Col. 1.
If the environmental monitoring program is masked then it is not going to be a proper indication of the stability of the site, therefore, the use of the phrase "significantly masked" is not appropriate.

15. 61.51 Disposal Site Design for Land Disposal.

61.51 (a) (4). Page 38096, Col. 2.
No cover will totally prevent all water infiltration. This section should require that covers be designed to minimize water infiltration.

61.51 (a) (5). Page 38096, Col. 2.
In a humid area some minor erosion will occur. This is one of the criteria which must be taken into account when selecting and closing a disposal site. It is not possible in a humid area to ensure that erosion will not result or that active maintenance will not be necessary in the future.

16. 61.52 Land Disposal Facility Operation and Disposal Site Closure

61.52 (a) (4) Page 38096, Col. 2.
The word "orderly" should be deleted or defined. Orderly placement is often inconsistent with the principles of ALARA.

61.52 (a) (7) Page 38096, Col. 3.
The requirement to accurately locate each disposal unit is reasonable if an allowed tolerance is indicated.

17. Table I Page 38097.

Having no lower limit activity concentrations for Class A segregated waste conflicts with the definition of radioactive material used in 49CFR.

18. 61.56 Waste Characteristics

61.56 (a) (7) Page 38097, Col. 1.
49CFR allows limited quantities of radioactive gases to be packaged in greater quantities than 100 curies. This is inconsistent with the requirements of these proposed regulations.

61.56 (b) Page 39098, Col. 1.
By specifying a 5% limitation on the physical waste form, the proposed rule may well be unintentionally mandating a high integrity container for Class B wastes. Experience has shown that drums and liners can normally be filled to about 80% of their volume. Demonstrating compliance with a 95% criteria is unrealistic as a practicle matter. Also, the 50 psi compressive load criteria may eliminate bitume media as a waste stabilization process. The compressive load criteria would be more appropriately related to individual disposal site overburden characteristics rather than specified as a generic criteria.

Draft EIS Comments

In general, the Environmental Impact Statement (EIS) states current practices and also cites alternate methods. It is unclear whether the Commission accepts either case or prefers the alternates. It is important for the Commission not to specify a method as any proposed site for disposal will be unique. (1)

1. Page S-106

Vibratory compactors are recommended by the EIS. Such compactors are good for granular soils but are less effective for cohesive soils. The Commission should specify a degree of compaction or required permeability rather than a method of compaction. (2)

2. Page 3-35, Section 3.6.3.6 Security

Full time security personnel have not been used at the present commercial burial facilities. The full time security provisions such as fences, signs and periodic law enforcement visits have provided effective security and have not resulted in any security violations that would warrant the employment of full-time security personnel. The use of radio communication to contact emergency and law enforcement agencies is not warranted as the fastest and easiest method is the telephone. Many years of experience has shown that the use of telephone communication in emergency situations has proved reliable. (3)

3. Page E-13, Section 2.1.

It appears that the Commission is basing site selection on the ability of the locations to fit their computer model. Due to projected site complexity, it is not realistic to require a location to fit present computer models. (4)

4. Page Q-16 and 17, Section 4.1.1, Table Q-7.

The cost of building demolition ($300,000) seems high in view of the fact that the three buildings to be demolished cost only $423,850 to build (See Q-3) and about half of that would have been materials. (5)

5. Q-16, Section 4.1.2.

Vibratory compaction equipment will be effective only in granular fill. (6)

6. Page K-45, Section 5.1.

The last paragraph of this section factually states that this fund is inadequate to pay for long-term care of the site but does not properly state that monies were placed in the State's general fund and not earmarked for the use intended. (7)

7. Page K-50, Section 5.5.

The statement that the fund is inadequate is not based on current facts. The surcharge has increased by 10% in 1981 and the proper investment of the funds will take care of the effects of inflation. Further increases can and are being implemented which will provide substantial funding to the State. (8)

Sincerely,

J. J. Scoville
President

JJS:db

Docketed Comment Number: 33

Commenter: U.S. Ecology

Response(s): Item 1 - The purpose of the DEIS was to examine current and some past practices and alternatives which could be applied in the near-surface disposal of waste. Based on the examination preferred alternatives were selected which are reflected in Part 61 as performance objectives and technical and other requirements. The minimum technical requirements must be met in the siting, design, operation and closure of a near-surface disposal facility and allow flexibility in how they might be met at any particular site. The requirements generally reflect current practices with some additional improvements (e.g., requiring deeper burial of certain wastes exceeding specified concentrations).

Item 2 - Page 5-106 of the DEIS discusses "using commercially available compacting equipment such as vibratory compactors." This is only an example, which indeed, may be most applicable to granular soil. With respect to a degree of compaction or required permeability, these will be determined on a case-by-case basis due to differences in designs and site soils. Additional guidance will be provided in a technical position paper on site design and operations.

Item 3 - Full-time security personnel are in fact used at one of the present operating commercial disposal facilities. Use of full-time security personnel at future disposal facilities will be at the discretion of the site operator and the licensing authority. Similarly, radio communication capability with emergency and/or law enforcement agencies is present at one of the current operating commercial disposal facilities and will likewise be a discretionary feature at future sites.

Item 4 - The NRC is not basing site selection on the ability of a site to fit any computer model. However, modeling of a site is one basic tool in site evaluation. As indicated in a December, 1980 interagency workshop on modeling and low-level waste management, NRC believes that adequate modeling capability already exists for non-complex sites. (Reference 12.) For the complex sites, either existing or new models must be available to adequately represent the site conditions and potential migration from the site. In the case of new models, the applicant should expect that NRC will review the model as well as its use to predict site performance.

Item 5 - The consideration of cost of building demolition was estimated for the draft EIS based upon the cost for building demolition estimated by Chem-Nuclear Systems, Inc. as part of their preliminary site closure and stabilization plan for the Barnwell disposal site. (Reference 13.) In this closure and stabilization plan, an estimate of $525,000 was made for decontamination and demolition of most of the onsite buildings (some would be left standing for use by the site owner following license termination), conservatively assuming that a private contractor was hired to perform these services. Recognizing that CNSI carries out a number of additional activities at the Barnwell facility besides waste disposal (e.g., truck, transporter and cask refurbishment, mobile solidification units, development of solidification agents), a building demolition cost of $300,000 was estimated for the reference disposal facility.

It should be recognized that actual closure costs such as building decontamination and demolition costs would be specific for a particular site and should be evaluated specifically for that site. Whether or not the assumed decontamination and demolition costs for the reference disposal facility are overconservative does not change the essential conclusions reached in the draft EIS regarding the need to consider and plan for facility closure prior to site licensing and the need to assure that funds will be available to carry out closure activities. In the interest of completeness, however, these costs have been reduced to $200,000 for the final EIS. This change does not alter the conclusions reached in the EIS but is reflected in the cost/benefit analyses and estimates of unmitigated impacts.

Item 6 - See staff response to Item 2 above.

Item 7 - The staff agrees with this comment and has included it in the Appendix E, Errata in this volume.

Item 8 - The staff has revised its statement for the FEIS and included it in the Errata Appendix of this volume.

JOHN SPELLMAN
Governor

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Mail Stop PV-11 • Olympia, Washington 98504 • (206) 459-6000

DONALD W. MOOS
Director

January 13, 1982

Mr. R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Division of Waste Management
Office of Nuclear Material Safety &
Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Smith:

Thank you for the opportunity to comment on the draft environmental impact statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste". As the state's coordinator for NEPA documents, we notified all state agencies of the availability of the EIS. The Department of Social and Health Services was the only agency to respond. A copy of their comments is attached.

If you have any questions, please call Ms. Nancy Kirner, Department of Social and Health Services, at (206) 753-3459 or Mr. Greg Sorlie, Department of Ecology, at (206) 459-6016.

Sincerely,

Dennis Lundblad, Supervisor
Comprehensive Management Division

DL:ic

Attachment

cc: Ms. Nancy Kirner
Mr. Greg Sorlie

JOHN SPELLMAN
Governor

STATE OF WASHINGTON
DEPARTMENT OF SOCIAL AND HEALTH SERVICES
Olympia, Washington 98504

ALAN J. CIBBS
Secretary

January 13, 1982

TO: Barbara Ritchie
Department of Ecology
PV-11

FROM: Nancy P. Kirner, Supervisor
Radioactive Materials Unit
Radiation Control Section

SUBJECT: COMMENTS ON PROPOSED 10 CFR 61 ENVIRONMENTAL IMPACT STATEMENT

The environmental impact statement for 10 CFR 61, "Licensing Requirements for Land Disposal of Radioactive Waste," appears to be well written and it adequately supports appropriate regulation of a radioactive waste disposal site having more than 10 inches of rain each year. The environmental impact statement and its proposed regulation, however, fail to accurately address realistic concerns and place realistic conditions on the operation of a radioactive waste disposal site at an arid location. Among the major problems of an arid site are slumping and wind erosion. More emphasis should be placed on mitigating these two impacts, absent infiltration of ground and surface water. (1)

While it is conceded that the stability of the waste form enhances safety, the strong reliance placed upon scenarios involving groundwater infiltration appears inappropriate for an arid site such as the low-level waste disposal site located near Richland, Washington. Without the liklihood of groundwater or surface water transport of radionuclides, segregation of class A and class B wastes seems to be unnecessary when weighed against the burden of operating separate disposal units. For the arid site, a case can even be made to allow co-mingling of waste classes in an attempt to lower the average concentration of the most hazardous wastes. The same logic can likewise be used for class C wastes at an arid site, provided class C wastes are placed at deeper depths and solidified in a relatively leach-free matrix or otherwise segregated for their hazardous lifetime. The proposed regulation and its supporting environmental impact statement do not appear, however, to make a convincing enough argument for the establishment of a third disposal unit to handle only class C (2)

wastes at an arid site. Washington does not believe that the segregation of waste by classification should become a matter of compatibility.

Since the draft environmental impact statement on 10 CFR 61 was written, the state of Washington has increased its perpetual care and maintenance funding. Descriptions of Washington's funding mechanisms should be revised on pages 9-6 and K-50 to reflect these recent changes as follows:

a. The Perpetual Care and Maintenance (PC&M) Fund contribution by U S Ecology, currently at $0.275 per cubic foot, will increase to $1.75 per cubic foot. This renegotiated contribution will provide a total fund of approximately $6 million by July 1, 1985. The total accumulation will be determined by the actual volume of waste disposed.

b. In addition, US Ecology will contribute $0.25 per cubic foot of waste disposed to a newly established Contingency Closure Fund. A contribution at this rate will yield a fund of $800,000 by July 1985, assuring that the state of Washington will be able to adequately close the radioactive waste disposal operations conducted at the site if and when needed.

c. On Jaunary 15, 1982, the company will post a surety bond in the amount of $500,000 for a period of one year to protect the state if the company should leave the site without meeting closure conditions as stated in the license.

Thank you for the opportunity to incorporate our concerns.

NPK/db

(2) cont.

(3)

Docketed Comment Number: 34

Commenter: State of Washington, Department of Social and Health Services

Response(s): Item 1 - NRC believes the requirements established in Part 61 for achieving long-term stability will be effective at both humid and arid sites and the requirement for segregation of compressible from stable wastes should reduce slumping of trench covers for trenches containing stable wastes. The control of surface erosion at both a humid and arid site will need to be considered on a site-specific basis through establishment of a proper surface water drainage system at a humid site and establishment of a cover that is not easily eroded by surface winds at an arid site.

Item 2 - As discussed above, NRC believes the segregation of compressible and stable wastes will help reduce trench cover slumping and associated increased potential for wind erosion of the cover due to cover instability and slumping. As such, NRC does not believe the rule should be changed. NRC believes, however, that site-specific considerations can and should be addressed through the licensing process.

Item 3 - The staff agrees with the points raised in this comment and has included them in the Appendix E, Errata in this volume.

NUCLEAR ENGINEERING DIVISION
AMERICAN INSTITUTE OF CHEMICAL ENGINEERS

'82 JAN 19 P7:15

January 11, 1982

(102)

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

-2 etal
(46 FR 38081)

Attention: Docketing and Service Branch

(35)
-61
(46 FR 51776)

Dear Sir:

The Nuclear Engineering Division (NED) of the American Institute of Chemical Engineers appreciates this opportunity to comment on the proposed regulation related to land disposal of radioactive waste (10 CFR Part 61) published at 46 FR 38081 on July 24, 1981.

The American Institute of Chemical Engineers is a professional organization representing over 50,000 chemical engineers, many of whom are members of the Nuclear Engineering Division. A number of these persons have had decades of experience in most (if not all) of the technologies related to land disposal of radioactive waste.

NED heartily concurs with the urgent need for regulations codifying requirements for land disposal of radioactive waste. However, we believe that Subpart D of the proposed regulations is so basically flawed that it should be deleted and the proposed regulation rewritten and republished for comment.

Generally, the regulation should present not "technical requirements" but "performance objectives." If technical requirements persist in the regulation:

- Overconservatism now embodied in the proposed technical requirements should be considerably reduced.
- Cost/benefit considerations should be based on the entire fuel cycle as now defined by the Administration and recognized by the Commissioners of the NRC.
- The definition of transuranic waste should be made realistic recognizing the entire fuel cycle with a rational application of the ALARA principle.
- Full recognition of the beneficial consequences of "layered"

disposal should be reflected.

PERFORMANCE OBJECTIVES

The primary flaw in the proposed regulation consists of the abortive attempt by the NRC to formulate generic limits for disposal. This will deprive a potential disposal facility operator of the opportunity to either:

- Take advantage of natural or engineered features of his operation to permit him to accept materials of above-normal radionuclide content and dispose of them with quite adequate protection of the public in both the short and long term, or
- Limit his receipts to less contaminated material to permit him to avoid some of the more costly proposed NRC requirements, still with adequate safety, to be able to offer a service less costly to his customers (and, therefore, the public).

An unacceptable reason given by the NRC not to adopt a performance objective appears in Section 2.2.1 of NUREG-0782 (hereinafter, the NUREG), where it is stated, "In addition, it may not be totally clear to an applicant or interested person how to design and operate a disposal facility to meet the general objectives." We submit that anyone so naive or lacking in thorough understanding of all technical aspects of waste disposal should not be involved in a responsible technical position related to a land disposal operation. The role of the regulating agency should be that of regulation, not the establishment of design bases. (1)

We have felt repeatedly in past years that NRC regulations resembled more and more a "cook book" approach. As with other nuclear operations, waste disposal cannot be left to unqualified persons to be carried out simply by rote. It must be done under the supervision of highly qualified management.

Accordingly, there should be no reason why the NRC should not adopt only performance objectives for waste disposal rather than the limits and criteria proposed. To the contrary, it appears that the former would offer worthwhile benefits. Granted, Subpart D does allow departure from its requirements if it can be shown that there will be compliance with Subpart C; however, the very existence of the requirements of Subpart D will inevitably present a major obstacle to an applicant endeavoring to benefit from an especially good site or operational provisions.

UNDUE CONSERVATISM

We feel that there is gross overconservatism in the NUREG. The proposed (2)

requirements are, to a great extent, not cost-effective and extend far beyond ALARA requirements. There are many examples of this, including:

- Both NUREG-0456 and NUREG/CR-1005 are frequently referenced in the NUREG. Indeed the conclusions of all three documents bear many similarities. However, in the two referenced documents no credit was taken for the waste package nor for waste stabilization or solidification. The proposed regulation carries with it requirements for all of these. That all documents are similar at the bottom line but so very different in basic premises shows the extreme conservatism in the NUREG.

- It is well known that the mixing of ^{129}I with stable (^{127}I) iodine results in directly proportionate reduction in iodine related dose to the thyroid and other organs. This is recognized in the NUREG (for example, on pages 4-16 and 5-73) but then ignored in consideration of ^{129}I limits.

- As addressed below, the only scenarios for transport of radionuclides from a disposal trench when the waste is emplaced at moderate depths (say 10 meters) below grade are the water pathways. Sections 61.51(a)(4) and (6) require that the disposal site design be such as to prevent water infiltration and to eliminate the contact of water with waste. If the proposed regulation is adopted, it seems fair to presume that a prospective disposal site operator would be required by the NRC to give reasonable proof that it is probable that these requirements can be and will be met. If so, then there exists no credible water pathway, making limits proposed quite irrational.

SOURCES OF WASTE

The NUREG pointedly ignores significant sources of waste. It references what is now known to be an interim federal policy against recovery of valuable, irreplaceable energy resources by reprocessing spent fuel. This is no longer the policy, as was recognized by the Commissioners in their Second Prehearing Memorandum and Order dated November 6, 1981 in the waste disposal confidence rulemaking (PR-50.51). In that document, the Commissioners stated, "On October 8, 1981, the President issued a statement outlining a policy favoring commercial reprocessing." It is well known that the operation of a reprocessing plant generates sizeable quantities of "low level" waste. One must include in such quantities the waste also discharged from the operation of the plutonium and "high level" waste solidification facilities.

Further, it is the policy of the current Administration that the nation should

proceed with a breeder program. This will require the processing of plutonium for fuel, generating more waste not addressed in the NUREG.

Indeed, the NRC in its proposed 10CFR Part 60 recognizes the possibility of reprocessing in the definition of "high level radioactive waste." (60.2)

The nature and quantity of reprocessing, high level waste solidification, and plutonium processing wastes mandates that they be included in consideration of land disposal regulation.

TRANSURANIC (TRU) WASTES

The definition of the waste form called "transuranic" must be redone for at least several reasons:

- The quantity of wastes from those portions of the entire fuel cycle ingored in the NUREG, much of which would likely be in the 10 to 100 nCi/cm^3 range, must be taken into account in assessing the cost-benefit balance on the ALARA principle. One of the more significant components of these wastes is, for instance, leached fuel cladding hulls. It is likely that the transuranium content of hulls will be below 100 nCi/cm^3. To unnecessarily identify them as being excluded from land burial could result in large and wasteful expenditures of money. Other components of these wastes likely will fall in the same range.

- It appears that, in tying the 10 nCi limit to lung dose, the inhalation pathway has been used. With layered disposal (see below) this pathway for transuranics should not be applicable. The water pathway would lead to, first, only an ingestion pathway, and second, only to the requirement for an inventory limit rather than a concentration limit.

- The "fact" that the 10 nCi limit is readily complied with now loses its meaning when all real (even if not now generated) wastes are taken into account and the principle of ALARA is sincerely applied.

VALIDITY OF PROPOSED LIMITS

As noted above, the NUREG frequently references NUREG-0456 and NUREG-CR/1005. Both of these documents (with deep involvement of

NRC personnel) concluded:

- Intruder-construction and intruder-agricultore scenarios would require concentration limits to be imposed on waste to be disposed of by land burial.
- The potential for other intruders and the potential (likely or not) man-rem consequences to a few individuals lead to the conclusion that such a scenario is unimportant in the future.
- Water migration scenarios would require not concentration limits but total site inventory limits to be imposed. (6)
- None of these scenarios is expected to take place while there is institutional control (taken in the NUREG to be 100 years). Cont'd
- The "layered" mode of disposal, as described in the NUREG, obviates the need to address any intruder scenario for the higher activity wastes.
- There is no need for special packaging or stabilization of wastes to make the above conclusions valid (the referenced NUREGs assumed no such requirement).

Therefore, the limits proposed in the draft 10CFR 61.55 must be re-computed. There should be a clear recognition that waste buried at the bottom (say 10 meters deep) of an operation is only subject to site-specific inventory limits (a performance objective). Further, credit should be given for compliance with the requirements of 61.51 "disposal site design for land disposal."

Also, the consideration of subsidence should be redone We can see no valid reason why, during the period of institutional control with monitoring by the NRC, any subsidence could not and would not be promptly corrected. In line with this, we believe that even without the proposed requirements to prevent or minimize subsidence, all significant subsidence could be expected to take place well before the expiration of the 100 year period (after site closure) of institutional control. Accordingly, the costly requirements proposed in Part 61 are unnecessary both during the priod of institutional control and after. (6a)

Finally, througout the NUREG, numbers on concentrations, doses, etc., are expressed to as many as three or four significant figures. Such a presentation is very misleading in that it implies that our knowledge is that precise (which it is not) or that such accuracy is needed (which it is not). (7)

We do note with approval that the discussion on 46 FR 38083 indicates that

de minimis waste classifications will be established. Hence, potentially lower cost disposal options may develop for materials at lower concentration levels. We encourage establishment of such de minimis limits outside the scope of Part 61. This approach should allow consideration of both the form and type of waste.

In conclusion, 10CFR Part 61 should be rewritten based on simple performance objectives. Any competent applicant has available all the necessary tools (hydrological, geological, climatological, etc., data, codes, etc.) to support appropriate site-specific limits for his proposed operation. We urge that he be given the latitude to take advantage of site-specific benefits or to search for an improved site which would give him an opportunity to offer a better service at a reduced cost.

We request the opportunity to answer any negative response by the NRC to any aspect of this discussion.

Sincerely,

R. I. Newman

R.I. Newman
Chairman, Nuclear Waste Task Force
Past Chairman, Nuclear Engineering Division

Docketed Comment Number: 35

Commenter: American Institute of Chemical Engineers, Nuclear Engineering Division

Response(s): Item 1 - The reason cited by the commenter for NRC not adopting purely performance objective requirements is only one of several. Others included the additional time required to develop only performance objective requirements, the additional time that would be required in licensing specific facilities due to the large number of factors that would need to be considered to determine compliance, and the fact that, while workable, it would not allow for establishment of more detailed prescriptive requirements in those areas where specific guidance is known to be needed. Based on the comments received on the rule the majority of commenters supported the combined approach of setting overall objectives to define an acceptable level of performance and minimum technical requirements on the siting, design, operation and closure of a LLW disposal facility.

Item 2 - NRC staff believes that the commentor has not provided an adequate basis for his assertions regarding either the level of conservatism in the draft EIS or the cost-effectiveness of the requirements in the draft Part 61 rule. The commenter has given three examples to back up his assertions. NRC's responses to each of these examples are as follows:

(1) Besides the draft EIS, the commenter references two other NRC publications, NUREG-0456 and NUREG/CR-1005. (References 14 and 15.)

While there are some similarities between the earlier work and the draft EIS, the draft EIS applies more recent dose assessment methodology and an improved handling of groundwater impacts. A number of important conclusions are also quite different--for example, the importance of waste form in limiting the consequences of potential contact of waste by an inadvertent intruder is not considered in the earlier work. This results in some large differences in the limiting concentrations calculated for near-surface disposal. In this regard, NRC staff believes that by not considering waste form, it is the earlier work which leads to overconservative conclusions rather than the draft EIS. NRC staff believes that adoption of the limits proposed in NUREG/CR-1005 would have had a greater impact on most waste generators.

(2) The potential for reduction of thyroid dose due to dilution of radioactive iodine (^{129}I) with stable iodine (^{127}I) was briefly considered in the draft EIS. Work performed by Leddicotte, et. al., was cited, for example. (Reference 16.) At the time, NRC staff believed that while information gaps and time limitations precluded taking credit for dilution by stable iodine in the draft EIS, it was a matter that obviously needed to be further examined. This potential for dilution by stable iodine has in fact been examined in more detail in the final EIS.

As it turns out, whether or not dilution by stable iodine is considered makes essentially no difference in determining whether a waste generator meets waste classification limits obtained from consideration of exposures to an intruder. Iodine-129 typically exists in only trace quantities in low-level waste well below (typically one or more orders of magnitude) the maximum concentration limits. However, dilution with stable iodine may make a large difference in long-term groundwater impacts and consequently any site-specific inventory limits.

(3) In the draft EIS, the effectiveness of layering waste in order to reduce potential intruder exposures was considered insofar as this technique could be implemented in all regions of the country. It is not clear what type of waste the commentor is referring to in his statements regarding disposal at a depth of 10 meters. Since this would be unreasonable for all wastes, NRC staff believes that the commentor is referring to Class C waste. NRC has not required in the draft rule that Class C waste be placed a minimum of 10 meters below grade as such a requirement is not necessary and might also preclude disposal of Class C waste in many humid disposal sites. Rather, NRC has required 5 meters of depth which provides an adequate level of protection against intrusion for the limited period of time required. It is also not clear that the only credible pathways (as the commentor asserts) for waste disposal at a depth greater than 10 meters are water pathways. It is true that

pathways such as erosion or human intrusion from housing construction are probably extremely unlikely. However, this does not preclude other activities such as a well being drilled onsite which passes through waste, bringing contaminated material to the surface. Disposal of waste at greater depths will be considered by NRC in subsequent work.

Finally, it appears that NRC staff was not sufficiently clear regarding their intent with paragraphs 61.51(a)(4) and (6) in the draft Part 61 rule. The intent was that requirements in Section 61.51 such as preventing water infiltration or eliminating contact of water with waste be considered as objectives to be strived for rather than absolute criteria. This intent is being clarified in the final Part 61 rule.

Item 3 - The requirements and classification system developed for Part 61 can be applied to any waste whether currently generated or to be generated in the future. The requirements define safe disposal and establish minimum controls which should be applied to ensure safe disposal of waste regardless of type or point of generation. Some wastes are not considered generally acceptable for near-surface disposal and will need to be analyzed further. A preliminary analysis indicated that certain reprocessing wastes may fall into this category. (See response to Item 4 below.) NRC plans to address disposal of such wastes through subsequent work which may result in amendments to Part 61 setting out requirements for the disposal of such wastes.

Item 4 - Due to the volume of comments received regarding TRU waste disposal, the limits for transuranic waste have been reexamined in the final EIS. However, some of the commentor's rationale for his assertions may be briefly examined. First, NRC staff continue to believe that the option of reprocessing of spent reactor fuel and recycle of the recovered plutonium is not likely to be a significant source of waste for at least several years. Secondly, NRC staff compared the limits in 10 CFR 61 with some estimated concentrations in a number of waste streams which could be projected to result from plutonium recycle activities. These estimated concentrations were obtained from work on the subject performed by DOE. (Reference 18.) This analysis projects that cladding hulls, for example, would contain transuranics at levels greatly exceeding 100 nCi/gm--e.g., nearly 700 nCi/gm. Thirdly, the commenter incorrectly assumes that all waste possibly containing TRU isotopes would be layered. It is possible that much of this assumption comes from a lack of clarity in Table 1 of Section 61.55. In any case, NRC staff believe that the concept of layered disposal as defined in the Part 61 rule does not automatically exclude potential inhalation exposures.

Item 5 - As discussed in response to other comments by this commenter, NRC staff does not believe that the commenter's conclusions fall from the premises stated.

Item 6 - NRC does not believe the consideration of subsidence should be redone. The requirements for reducing subsidence are intended to reduce the need for active and costly maintenance during the active institutional control period. By placing greater emphasis on stability as a part of operations, long-term maintenance costs are reduced. In addition, if consideration of subsidence was neglected, the very same requirements for long-term stability would be needed to help ensure safety during operations, reduce potential for migration and reduce potential exposures to an inadvertent intruder.

Item 7 - NRC staff apologize for any difficulties regarding the presentation of the results in the draft EIS. Most of the calculations were performed with the assistance of a digital computer. Since the computer was inherently able to handle a large number of significant figures, it was convenient to retain several significant figures throughout intermediate calculations and in final printouts of results. (This was believed to be more useful than the practice of rounding at intermediate steps which could have been the case if hand calculations were involved.) Retaining three or four significant figures in the computer output facilitated debugging the computer programs and checking the reasonableness of results. In the draft EIS, tabulated results were considered "intermediate results" and were generally reproduced as printed by the computer. These tabulated results were used to provide a backdrop for discussions and help reach conclusions. Rounding up to a more reasonable number of significant figures was accomplished as part of the discussions and conclusions reached and as part of setting forth particular numerical requirements (e.g., Table 1) in the draft Part 61 rule.

CONFERENCE OF RADIATION CONTROL PROGRAM DIRECTORS, INC.
P. O. Box 148
Concord, New Hampshire 03301

'82 JAN 20 P1:12

(103)

DOCKET NUMBER
PROPOSED RULE PR-2 et al
(46 FR 38081)

January 15, 1982

(36)

DOCKET NUMBER
PROPOSED RULE PR-61
(46 FR 51776)

Mr. R. Dale Smith, Chief
Low-Level Waste Licensing Branch
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Dale:

The following comments relate to the Proposed Rule for a new Part 61, and other related amendments, as published in Volume 46, No. 142 of the Federal Register, dated July 24, 1981.

The Nuclear Regulatory Commission is to be commended on this proposed regulation. This new proposed rule provides a vast improvement in guidance and requirements for the control of land disposal of radioactive waste. The existing regulation on the disposal of radioactive waste contained in Part 20 provides only a limited guidance that has resulted in problems at both NRC and state licensed burial sites.

The Conference has taken the position since the late sixties that more federal guidance and criteria is needed in the area of shallow land disposal of radioactive waste. The Conference has passed various resolutions addressing this concern. Such guidance is imperative for uniform management of the country's radioactive waste.

Many of the improvements in the proposed Part 61 are responsive to some of the recommendations made by the Conference. Proposed Part 61 also establishes, in the NRC regulatory system, many "state of the art" improvements that have been developed by the states in the operation and regulation of low-level radioactive and hazardous waste burial sites.

The Conference concurs and supports the following proposals contained in the new Proposed Part 61:

1. An improved waste classification system that divides the present all-inclusive "low-level" waste into several categories based on hazard evaluation.

2. Confirmation of the definition of transuranic wastes as recommended by the Conference several years ago.

3. Technical requirements for burial that become more stringent based on the increasing hazard of the radionuclide concentration in the waste.

4. Technical requirements on stability of waste packaging.

5. Technical requirements on burial site operations that minimize voids in trenches with emplaced waste.

6. Technical and financial requirements associated with the site closure phase and the post-closure observation and maintenance phase.

7. Defining a period of time for institutional control, and relating the classification and disposal of waste to this time frame.

8. For design purposes of new proposed sites, and until specific recommendations are forthcoming from the Environmental Protection Agency, the Conference supports the objective in Proposed Part 61 that any movement of radioactivity should not result in calculated doses in excess of 25 mrem/year to an individual at the site boundary, and support the application of the EPA drinking water standard to the nearest public drinking water supply. We also recommend the application of these dose limits as guidelines for existing sites. Of course, the application of ALARA should be applied to a near surface burial site, as with other licensees.

We strongly support the proposed amended requirements to Part 20 for the certification and use of shipping manifests to track waste shipments.

We offer the following specific comments on the proposals.

(1) 61.2 Definitions:

a. Should include a definition for "minor custodial care."

b. "Disposal" - As stated, the temporary storage of waste could meet the definition. Disposal into land generally connotes long term or permanent removal of the waste from the biosphere. Possibly the words "long term" should be added before the word "isolation."

c. "Waste" - The definition should include levels of concentrations of radioactive materials specific to a particular waste stream below which regulatory control is no longer required. This position was previously

transmitted to the Commission in the form of Resolution III which was adopted at the thirteenth annual Conference meeting.

Although the definition for waste may not be the area in which the following concerns should be addressed, we strongly urge the Commission to consider the total hazard, both radiological and chemical, in the classification of acceptable waste for a radioactive burial site. Although this concern is somewhat addressed under 61.56, criteria or guidelines are needed which specifically consider the appropriateness and/or procedures of combining waste which is highly toxic, chemically, but low in radioactivity, with chemically nontoxic radioactive material.

Consideration should be given to a definition of "toxic chemical/radioactive waste" which may require different handling and burial requirements. This concern was expressed to the Commission in the form of Resolution II adopted by the Conference.

(2) 61.7 Concepts:

Under section (c)(4), "The Licensing Process," the concept of license transfer to a state or federal agency after finding of satisfactory disposal site closure is discussed. Under this concept, if transferred to a state, the NRC would be licensing a state government until institutional care is not required. This concept for a low-level waste site may need further discussion and refinement before implementation. For example, what criteria will be used to judge the adequacy of the state government licensee? If "state government" violates the conditions of the license, what enforcement actions would be taken? Additionally, why would the license be terminated if transferred to the Department of Energy, but not terminated if transferred to a state? Experience and history has shown that states have been as effective as the federal government in assuming responsibility for long-term care of existing sites. Therefore, consideration should be given to license termination after transfer to a state government.

(3) 61.12 Specific Technical Information:

Section (d) would require a description of the design basis natural events or phenomena. Requirements should be

placed on the applicant to consider the maximum creditable accident anticipated, and a description of actions that would be taken should such an event occur.

(4) 61.50 Site Characteristics:

Consideration should be given to a nonsuitability requirement for burial into areas high in natural radioactivity.

(5) 61.80 Records:

Consideration should be given to the requirement for the maintenance of a duplicate set of vital records at an alternate location in case of destruction by fire or other loss of primary records.

We would also like to comment on the Summary Draft E.I.S., NUREG-0782, Volume 1. We believe the Draft E.I.S. adequately supports the need for the Proposed Part 61, and identifies impacts. Our specific comments are as follows:

1. Page 15, Impact Measures:

Another pathway which should be considered is trench overflow and/or pumping of water from trenches. ①

2. Page 16, Table S.4:

Impact measures should include trench overflow or pumping of trenches, and the release of tritiated methane. ②

3. Page 30, 5.1.2., 4th paragraph:

The "bathtub" problem not only "leads to costly long-term trench pumping," but may also release radioactivity in the process. ③

4. Page 55, Impacts on the Public:

An additional beneficial impact with the implementation of the requirements of the Proposed Part 61 is the reduction of potentially large, long-term financial cost for taxpayers in states in which sites are located. ④

- GENERAL COMMENTS -

There is an urgent need for written criteria and/or guidelines as to what constitutes acceptability in meeting the performance

standards of the new Proposal. We recommend immediate consideration be given to the following:

1. Standards for acceptable solidifying agents for liquid low-level waste.
2. Acceptable testing procedures to determine if solidified liquids meet the above standard.
3. Comprehensive licensing guidelines for waste reduction methods such as incineration and compacting units.
4. Guidelines for types of acceptable or optimum geological formations for the land disposal of low-level radioactive waste.
5. Standards or criteria for the optimum design of a site, considering dry vs. humid climates.
6. Guidelines as to acceptable or optimum burial practices.
7. Guidelines relating to the minimum acceptable health physics program for a near surface burial facility.
8. Guidelines relating to the minimum acceptable nonradiological occupational protection program for a near surface burial facility.
9. Guidelines relating to the specific areas that must be considered for emergency planning for a near surface burial facility.
10. Guidelines on environmental contamination trend analysis, and recommended protective actions based on potential increasing environmental levels of specific radionuclides.
11. Standards or criteria which specifies what constitutes stabilization and a decommissioned site.
12. Guidelines which identify the minimum acceptable activities to be performed by a government agency after closure.
13. Guidelines on methods of determining financial needs for long-term care.
14. Guidelines as to the minimum acceptable environmental monitoring programs for a near surface disposal facility.
15. Guidelines on the application of ALARA for near surface facilities.
16. Guidelines on ground water modeling for near surface facilities.

Again, I would like to commend the Commission for the excellent work contained in the new Proposed Part 61. Such regulations have been needed for many years. We appreciate the opportunity to comment on this very vital need to our country.

Yours very truly,

John R. Stanton

John R. Stanton, Chairman
Conference of Radiation Control
Program Directors, Inc.

JRS/CMH/pch

cc: Board
Federal Liaisons
Executive Secretary
G. Wayne Kerr

Docketed Comment Number: 36

Commenter: Conference of Radiation Control Program Directors, Inc.

Response(s): Item 1 - In the draft EIS, a scenario was considered in which a disposal facility experiences a severe water accumulation problem in disposal trenches. Potential costs of managing this accumulation problem were calculated, which included pumping leachate from trenches, processing the leachate through an evaporator, and solidifying and disposing of the concentrated evaporator bottoms. In the draft EIS, however, potential radiological impacts from overflow of leachate from disposal trenches or from operation of the evaporator were not estimated. However, the potential occurrence of such scenarios was part of the basis for NRC's position in the draft Part 61 rule regarding the need for disposal site stability.

It should be recognized that actual impacts due to trench overflow would not be expected to occur to any great extent. Rather, the cognizant officials in charge of radiological health (either on a State or Federal level) would take steps (e.g., leachate pumping and treatment, recapping disposal trenches) to minimize or eliminate such impacts. However, the calculated impacts represent levels of potential human exposures which could occur if such steps to eliminate water accumulation were not taken. Experience has shown that these steps can be very expensive. Of course, operation of an evaporator to reduce the volume of the accumulated leachate would indeed involve release of radioactive material to the environment.

An estimate of potential radiological impacts from trench overflow and evaporation has been performed in the Final EIS. These calculated impacts add support to NRC's position regarding the need for disposal site stability.

Item 2 - As stated in Item 1 above, an estimate of potential impacts from trench overflow and operation of a leachate evaporator have been included in the final EIS. These potential impacts provide further support to NRC's position regarding the need for disposal site stability. From data available to NRC at the time the draft EIS was written, however, it appeared that potential impacts from tritiated methane released through disposal trench covers are at negligible levels. NRC staff is not aware of any new data which would contradict this belief.

Item 3 - As stated in Item 1 above, an estimate of potential impacts from trench overflow and operation of a leachate evaporator have been included in the final EIS.

Item 4 - The staff concurs with the commenter's opinion and will include this suggestion in the final EIS.

Docketed Comment Number: 37 (Not assigned)

Commenter: N.A.

Response(s): N.A.

New England Nuclear

'82 JAN 27 P2:56

January 21, 1982

R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Division of Waste Management
Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Smith:

I enclose this letter to alert you to the fact that New England Nuclear chaired the NELRAD 10 CFR 61 Subcommittee and was actively involved in the development of the detailed comments. As such New England Nuclear endorses the report and recommends due consideration be given to it.

Sincerely,

NEW ENGLAND NUCLEAR

J. C. Brantley
V.P. Administration, NENC

JCB/da

DOCKET NUMBER
PROPOSED RULE PR-2, et al (110)
(46 FR 38081)

DOCKET NUMBER
PROPOSED RULE PR-61 (38)
(46 FR 51776)

Acknowledged by card 1/27/82 LN

549 Albany Street, Boston, Massachusetts 02118 Telephone 617-482-9595 Telex 94-0996

NELRAD

'82 JAN 27 P2:56

January 21, 1982

R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Division of Waste Management
Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Smith:

I enclose comments on 10 CFR Part 61 and the accompanying Draft Environmental Impact Statement. These comments are written from the generator's perspective, compiled from safety officer input from several waste generating firms in New England.

These collective comments are a product of NELRAD activity. NELRAD is a consortium of New England firms and institutions who use radioactive materials and have a common need for a nearby low-level radioactive waste disposal facility. Our group was formally organized in 1981 to support the efforts of the six New England states in complying with the Low-Level Radioactive Waste Policy Act.

We are pleased to be a part of the process that allows review of proposed regulations. In general, we approve the intent of 10 CFR Part 61 and encourage expeditious progress.

Sincerely,

Janis D. Stelluto
Executive Director,
NELRAD

JDS/da

Enc.

P. O. BOX 1267 CONCORD, MA 01742-1267 Tel. (617) 371-0358

TO: NELRAD Committee

FROM: NELRAD 10 CFR 61 Subcommittee

SUBJECT: Comments on Proposed Rulemaking on Land Disposal of Low-Level Radioactive Waste.

DATE: 1/20/82

The enclosed report presents detailed comments on 10 CFR 61, the Draft Environmental Impact Statement (NUREG-0782) and the accompanying summary of the proposed rule. The detailed comments are preceded by a summary of the main points.

Members of the subcommittee which prepared this report are:

F.N. Brenneman (to Dec. 1981)	Northeast Utilities P.O. Box 270 Hartford, CT 06101
M. Galanik	77 Main St. Room 20B, 238, MIT Cambridge, MA 02139
D. Gomer	Nuclear Metals, Inc. 2229 Main St. Concord, MA 01742
L.R. Smith (Chairperson)	New England Nuclear Corp, DuPont 549 Albany St. Boston, MA 02118
J. Stelluto	NELRAD 549 Albany St. Boston, MA 02118
E. Tarnuzzer	Yankee Atomic Electric Company 1671 Worcester Rd. Framingham, MA 01702

Thanks are due to K. Bennert, J.D. Bernardy, J.C. Brantley and C.B. Killian for their helpful comments and to K. Thomas for processing this report.

L.R. Smith

L.R. Smith

SUMMARY OF COMMENTS ON THE PROPOSED RULEMAKING ON LAND DISPOSAL OF LOW-LEVEL RADIOACTIVE WASTE: PREPARED BY THE NELRAD 10 CFR 61 SUBCOMMITTEE.

10 CFR 16 Scope.

We believe that the development of performance standards in 10 CFR 61 is the best approach to establishing licensing requirements for land-disposal of low-level radioactive waste. We agree that only essential generic prescriptive requirements should be included in the regulations and all site specific requirements should be incorporated in individual facility licenses.

Site Licenses and Inspection.

The scope and sequence of activities in establishing safe operations and ensuring proper closure of a facility appear realistic. We recommend that safeguards be strengthened by:

a. granting disposal facilities a full term license with appropriate review instead of subjecting a license to the public hearing process every five years.

b. assigning a full-time NRC inspector to each LLW site during the operational phase.

c. encouraging active monitoring and review of site records by state authorities.

Probability of Inadvertent Intrusion.

The method used to establish generic prescriptive requirements to protect inadvertent intruders is appropriate for estimating the lower boundaries of concentration limits. However, these limits are unnecessarily conservative because the probability of intruders encountering radioactivity has not been factored into the calculations.

We believe that better estimates of maximum permissable concentrations can be made if the following considerations are included in the calculations:

a. The probability of inadvertent intruders encountering critical waste forms.

b. The concentration of radioactivity in waste sent to a site exhibits a log-normal distribution with an average concentration at least an order of magnitude lower than the maximum permissable concentration.

(1)

If these probability factors are included in the calculations, maximum permissable radioactivity concentrations are expected to be at least an order of magnitude higher than those presented in 10 CFR 61 and will still provide sufficient protection to the inadvertent intruder.

Site Selection and Utilization.

The site could be better utilized if credit was given for the decay of short lived radionuclides during the operational period.

It is clear that local resources and demographic developments are important considerations when selecting a suitable site. However, demographic predictions can be unreliable therefore we recommend that the NRC consider zoning requirements to restrict activities that may adversely affect the site hydrology and environment.

The potential impact of changes in natural radioactivity in ground water due to site excavations was not conspicuously covered in the DEIS. We recommend that these effects be considered. (2)

Clarification of the Intent of 10 CFR 61.

We have indicated several instances where the intent of the regulations is not clear. The following improvements are recommended:

a. replace absolute statements by achievable practical ones.

b. use units and terminology recommended by scientific standard setting organizations (eg. ICRU and ICRP).

c. clarify performance objectives by specifying internal and external dose equivalent limits to individual organs as suggested by the ICRP

Waste Concentration.

Waste generators are concerned that the difficulty in accurately assaying radioactivity in individual containers will cause overly conservative values to be assigned to shipments resulting in poor utilization of the site. We recommend that the NRC consider relaxing concentration limits on individual containers and accept inventory methods designating average concentrations in waste shipments. Using inventory averaging methods would also enhance the generator's ability to determine if waste concentrations were below "de minimis" levels. The establishment of "de minimis" levels for radionuclides and waste forms should be encouraged for better site utilization.

The 100 Ci per container limit appears excessively conservative. We recommend that DOT limits be adopted since the most restrictive potential impact scenario appears to be individual exposure from accidential breach of containment during transportation to the site.

Use of ALARA Concept.

In several instances the ALARA concept is improperly used to justify excessive restriction. We recommend that optimum levels be defined at which an operation could be described to be ALARA. Imposing further restrictions yielding small benefits at great cost is not ALARA. For example, the proposed 10 nCi/g limit for TRU contaminated waste is not ALARA simply because industry has complied with this regulation. The EPA has suggested that 100 nCi/g is an appropriately conservative limit. We recommend that the EPA's suggestion be adopted unless a better limit is derived.

Manifest Tracking.

We recommend that a reasonable procedure be developed to integrate enforcement agencies into the control or supervision of the manifest tracking systems.

Conclusion.

In general, we recommend that 10 CFR 61 should not duplicate existing regulations but should reference them and be compatible with them.

Our final conclusions is that 10 CFR 61 will provide a reasonable and necessary regulatory frame-work for low-level radioactive waste disposal. We submit these comments in the hope that they shall improve both safety and cost effectiveness.

SPECIFIC COMMENTS ON THE PROPOSED RULEMAKING ON LAND DISPOSAL OF LOW-LEVEL RADIOACTIVE WASTE: PREPARED BY THE NELRAD 10 CFR 61 SUBCOMMITTEE

1. Page 38084, Col. 2.

This section specifies that waste stability should be sufficient to ensure that the residual radioactivity is "no longer of concern from the migration standpoint" We recommend that the quoted phrase be replaced by appropriate dose limits.

2. Page 38084, Col. 3.

a. The 10 nCi/g limit for transuranic waste is too conservative. The EPA suggests that 100 nCi/g is a conservative limit. Overly conservative limits may dissuade waste generators from practicing volume reduction of waste potentially contaminated with TRU.

b. Although industry has been able to comply with the 10 nCi/g limit for TRU waste we do not agree that this limit is ALARA. On page 7-13 of the DEIS and in several other instances the ALARA concept is misapplied to justify excessive restrictions. Operations should only be said to be ALARA when the cost to reduce impacts from these operations is justified by the benefits accrued and when further costs to reduce impacts are not justified. Compliance with an excessive restriction or achieving a lower level of impact are not necessarily ALARA. Reduction of environmental impacts 2-3 orders of magnitude below comparable impacts from other conventional industries is not reasonable and therefore not ALARA. (3)

3. Page 38085, Col. 2.

The establishment of de minimis levels for other waste streams and radionuclides should be encouraged since this should lead to improved utilization of disposal sites.

4. Page 38087, Col. 2.

Disposal sites should be provided full term license with appropriate review. The financial planning necessary for long term site monitoring assumes a reasonable operating life. Hence the license should not be subject to the public hearing process every five years with the possibility that renewal may not occur.

5. Page 38087, Col. 2.

"Keep people off the site" should be replaced by "control access to the site" to allow maintenance, surveillance and other appropriate activities.

6. In the following sections the words "assurance" and "assure" should be replaced by "ensurance" and "ensure" respectively. This is to indicate that positive action should be taken to achieve an objective rather than merely persuading that an objective can be achieved.

Page 38089, Col. 3, line 5, 61.2.
Page 38090, Col. 1, line 51, 61.2.
Page 38091, Col. 1, line 14, 61.7 (b), (3).
Page 38093, Col. 3, 61.23 (b), (c), (d).
Page 38094, Col. 1, 61.23 (e), (g).
Page 38095, Col. 1, 61.28 (b).
Page 38095, Col. 2, 61.30 (a), (2), (5).
Page 38095, Col. 3, 61.50 (a), (1).
Page 38096, Col. 2, 61.51 (a), (2).
Page 38097, Col. 2, 61.55 (b), (c), (1).
Page 38097, Col. 3, 61.56 (b).

7. Page 38090, Col. 2, line 16.
Page 38091, Col. 1, line 3, 61.7 (a), (1)

Instead of "15-20" meters a single value should be used. "15-20" may be confused as meaning burial below 15 meters and above 20 meters from the ground surface.

8. Page 38090, 61.7 (a), (1).

a. We agree that both performance objectives and prescriptive requirements are necessary. Performance objectives should be limited to occupational and environmental impact concentrations and should be specified in the regulations.

b. Generic prescriptive requirements are appropriate to limit LLW concentrations and to protect inadvertent intruders. These and prescriptive requirements which provide financial surety should also be incorporated in the regulations. In the cases where prescriptive requirements are adopted from other existing or proposed regulations these should be referenced or incorporated in 10 CFR 61.

c. Other prescriptive requirements which limit site inventory or which protect against excessive migration of radionuclides are site specific and should be incorporated in site licenses. 10 CFR 61 should specify that site licenses will incorporate these site specific prescriptive requirements.

9. Page 38091, Col. 1, 61.7 (b), (1).

a. We recommend that the primary objectives for disposal of LLW are: To isolate LLW from the biosphere in a manner that maintains:

i. personnel dose equivalent commitments ALARA;
ii. environmental impact and personnel dose equivalent commitments below specified limits.

b. "Prevention of migration of radionuclides" is an important strategy for achieving those primary safety objectives. "Prevention of exposure to inadvertent intruders" is a special case of (a) (ii) and should be called a secondary objective.

10. Page 38091, Col. 1, 61.7 (b), (2).

a. Omit "eliminated or" since it is not possible to reduce water access to zero.

b. This paragraph should be written more clearly. In particular it should be clear when "stability" refers to trench structure or the waste itself.

11. The generic term "radionuclide" should replace "isotope" and "radioistope" in the following sections:

Page 38091, Col. 2, line 1, 61.7 (b), (2).
Page 38097, Table 1
Page 38097, Col. 2, 61.55 (a), (1).

12. Page 38091, Col. 2, 61.7 (b), (3).

Replace "would" by "could" since intruder risk has a statistical basis.

13. Page 38091, Col. 2, 61.7 (b), (4).

a. The first sentence is ambiguous. It may be rewritten thus: "Institutional control of access to the site is required for at least 100 years after closure of the burial site:

b. Page 4-49 of the DEIS indicates that consensus of opinion expects that the institutional control period may reasonably range from 100 to 300 years. Since this parameter is somewhat arbitrary it should be the last parameter selected in the equation for determining prescriptive requirements. (4)

14. Page 38091, Col. 3, 61.7 (c), (1).

"Established administrative procedures" should be cross referenced to enable recognition of specific procedures.

15. Page 38093 Col. 1, 61.13 (b).

"Demonstration" should be replaced by "reasonable indication" since it is not possible to demonstrate the achievement of performance objectives until long after a site has been closed.

16. Page 38094, Col. 1, 61.23 (e).

Replace "should" by "to".

17. Page 38095, Col. 2, 61.40.

Eliminate "reasonable assurance exists that".

18. Page 38095, 61.41 and 61.42.

a. Specify whether "annual" and "year" refer to a calender or a sliding year.

b. i. "Dose" should be defined to mean "dose equivalent".
ii. It is not stated whether "dose" refers to internal, external or a summation of these commitments.
iii. We advise that the ratio of dose equivalent limits to various organs should follow ICRP recommendations.

19. Page 38095, 61.42.

a. Since the inadvertent intruder is identified as the critically exposed individual for most radionuclides, more effort should be directed into determining the probability of intruder scenarios occuring. Waste concentration limits could then be relaxed if these interaction probabilities are factored into the impact calculations.

b. We agree with the proposed dose limit provided that waste concentration limits are calculated to ensure, with reasonable probability, that the inadvertent intruder does not receive more than 500 mrem/yr.

c. Dose equivalent limits following ICRP guidelines should also be specified for the inadvertent intruders' thyroid, skin, bone and other organs.

20. Page 38095, 61.50 (a), (1).

The second sentence should be clarified. The "long-term performance objectives of Subpart C" should be specified or cross referenced individually.

21. Page 38096, 61.50 (a), (3), (4), (11).

If industrial or other activities which may adversely disturb the ground water should not be located near the site, consider the need to establish zoning restrictions to exclude these activities.

22. Page 38096, 61.50 (a), (5).

"Coastal high-hazard area or wet land" should be defined or a definition else-where in the regulations referenced.

23. Page 38096, 61.50 (a), (6).

Clarify whether "upstream drainage area" refers to onsite or other locations.

24. Page 38096, 61.50 (a), (7).

It is not appropriate to specify that ground water intrusion cannot contact waste. This section should be rewritten to specify the maximum permissable probability for ground water intrusion as is similarly accomplished when defining 100 year flood plains etc.

25. Page 38096, 61.51 (a), (4).

Replace "prevent" by "minimize".

26. Page 38096, 61.51 (a), (6).

Replace "eliminate" by "minimize".

27. Page 38096, 61.52 (a), (1).

This sentence requires clarification. "no interaction" should be defined since migration of released radionuclides could be considered a form of interaction.

28. Page 38096, 61.52 (a), (3).

It is not clear whether 5 meters refers to the distance from the top or bottom surface of the cover. Does cover include an impervious cap?

29. Page 38096, 61.52 (a), (4).

Remove "orderly". If it is intended that the waste should be emplaced in a specified manner the intent should be described more explicitly.

30. Page 38096, 61.52 (a), (6).

a. Replace "radiation ... levels" by "exposure rates" or "dose rates". Include exposure to X-rays and bremstrahlung. Consider contributions from neutrons.

b. "A few percent above... background" is too vague. Specify a limit and require adherance to the ALARA principle.

31. Page 38096, 61.52 (a), (8).

If concentration limits are relaxed, more emphasis should be placed on isolating critical radionuclides from ground water and preventing access to potentially contaminated ground water. The latter might be accomplished by extending the buffer zone in the direction of ground water migration.

32. Page 38096, 61.53 (a).

We recommend that the potential impact of technologically enhanced natural radiation due to excavation operations or changes in pH should be considered in the DEIS. Radon and ^{40}K levels in ground water may be increased due to site operations. The DEIS should show that such an impact would not be likely to violate EPA drinking water quality regulations. Then T.E.N.R. can be explicitly excluded from 10 CFR 61. (6)

33. Page 38097, 61.53 (d).

Place this section before (b) to indicate that it refers to all phases under the licensee's control.

34. Page 38097, Table 1.

a. Use scientifically accepted notation or provide a definition of the convention employed (eg. tritium is properly indicated by the symbol ^{3}H).

b. Table 1 is unclear and could be improved by:

i. lining up decimal points in a column.
ii. using larger type
iii. indicating units by subheading instead of by note.

c. Table 1 should reference a list of de minimis levels for particular waste streams and other disposal methods for waste exceeding table 1 categories.

d. The limit on concentration for diluting agents should be specified as 0.1% of the container volume.

e. For a 55 gallon drum the concentration limits specified in $\mu Ci/cm^3$ should be multiplied by 200,000 ml to determine the maximum permissable total activity expressed in μCi.

f. The use of scaling prefixes for units should be minimized. In particular multiple prefixes should be eliminated and in fractions a single prefix should be placed in the numerator. (eg. instead of $\mu Ci/ml$ write Ci/m^3; instead of ρ Ci/ml write mCi/m^3

g. As suggested on page 5-76 of the DEIS, site utilization maybe improved if site licenses specified the option to dilute ^{129}I by inoculating potentially contaminated waste with ^{127}I sufficient to reduce potential thyroid uptake and exposure by 2 to 3 orders of magnitude. (6)

35. Page 38097, 61.55

a. In the DEIS the product of a large number of conservative estimates will be unreasonably conservative even if individual estimates are only mildly conservative. A better method for combining parameters is to use the best estimates of each parameter and propagate uncertainty errors to generate upper and lower confidence boundaries. A simplified version of this approach using a range of values for each parameter (eg. as used in the BEIR III report) is preferable to compounding conservative estimates. Credit should be given for improving critical waste forms to reduce plant uptake in the intruder-agriculture scenario. Studies are quoted in the DEIS which indicate that the average radioactivity concentration in waste can be expected to be from 1% to 10% of the maximum concentration. Hence concentration limits should be relaxed by at least one order of magnitude and will still provide adequate intruder protection. (7)

b. If concentration limits are to be included in the regulations we encourage the development of concentration limits for other radionuclides and compounds. However a "generic nonsite-specific waste classification system" will be too conservative. Waste generators should normally only need to consider one site to dispose waste. They should normally only need to be conversant with the classification system specific to that site. A site specific waste classification system should allow optimum site utilization.

c. Industry will have difficulty in economically assaying waste to ensure that it complies to the conditions of a particular category.

i. This may lead to generators assigning conservative estimates to waste concentrations and consequential under utilization of a waste site.
ii. The inability of regulatory authorities to assay containers of waste renders control by assay unenforcable.
iii. The scaling factors recommended to simplify waste analysis are not applicable to industries making a wide range of custom products.

36. Page 38097, 61.56, (a).

Clarify whose health and safety is being referred to.

37. Page 38097, 61.56 (a), (1), (7).

Individual container limits appear excessively conservative and should be justified in the DEIS.

i. For waste disposed as received the DOT limits should apply since airborne release and non-occupational exposure is the controlling factor.
ii. For waste processed on site the limits for individual containers should be 10 times the DOT limit since it is occupational exposure which provides the limiting scenario. (8)

38. Page 38097, 61.56 (a), (5).

Add "normally" to read "waste must not contain or be normally capable of generating..." This is to ensure that plastics with high ignition points but which are capable of emiting toxic burn products are not unnecessively excluded from the waste.

39. Page 38097, 61.56 (a), (7).

a. Add "significantly" to read: "... at a pressure that does not significantly exceed one atmosphere at 20°C." If this sentence is not modified, waste generators may be constrained to packaging gases under reduced pressure or elevated temperatures.

b. It is not clear whether the 100 Ci limit applies only to gases. This should be clarified. 100 Ci limit per package is too restrictive for certain radioactive gases. eg. $^{14}CO_2$ and ^{3}H.

c. Although there is provision for exceptions to the proposed limits on a case by case basis, calculations should be included to show the impact expected from radioactive gas. Also the wide range in toxicity of labeled compounds should be addressed in the DEIS. (9)

40. Page 38098, 61.56 (b), (1).

The intent of "within 5%" should be clarified.

41. Page 38098, 61.56 (b), (2).

"Non corrosive liquid" should be defined as it is in the DEIS, ie., "pH between 4 and 10 and incapable of significant galvanize and chemical reaction".

42. Page 38098, 61.58

a. Provision should be made to allow waste generators to categorize waste by an inventory process. The quantities of waste generated in a year or present in an individual shipment could be determined with greater accuracy than by making separate determinations for individual containers. This comment is particularly relevant to very low contamination levels and radionuclides which are restricted by the ground water migration scenario.

b. Scenarios assume that all waste is placed just before the site was closed. However in practice waste will accululate over a 20 to 60 year period and a considerable fraction shall have decayed before site closure. Hence a relaxation in concentration limits can be applied to short lived radionuclides received during the initial period of burial activities. (10)

43. Page 38100, 61.82.

a. We recommend that a full-time NRC inspector or agreement state agency inspector be assigned to a LLW site during the operational phase.

b. The State authorities should be encouraged to monitor the disposal site and review site records.

44. Page 38102, 20.311

From the language in the proposed rule, it is not clear how enforcement agencies would be involved. One possible procedure would require the site operator to return a receipted copy of the manifest system to the generator vice merely notifying him of receipt. If the generator were then required to maintain a file of all shipment manifests and backrouted receipts, the enforcement agency could check for compliance at each generator's place of business. Such a system closes the loop on the process and allows one to readily check for compliance during a regular facility inspection. It has the further advantage of not burdening the enforcement agency with volumes of manifests. Additionally, generators could reserve making payment to shippers until the backroute is received. This would provide a strong economic incentive to comply with the manifest tracking system.

In any event, some reasonable procedure should be developed to integrate enforcement agencies into the control or supervision of the manifest tracking system.

Docketed Comment Number: 38

Commenter: New England Nuclear

Response(s): Item 1 - The staff has reviewed the basis for the concentration limits and has modified certain aspects of the analysis. These changes are reflected in Chapter 5.0 of the FEIS.

Item 2 - This comment is essentially the same as Item 5 of this letter. The staff response is contained under Item 5 below.

Item 3 - The staff does not believe it has necessarily used ALARA incorrectly. In response to the comment, however, NRC has deleted references to ALARA in the instances cited. This change has been incorporated into Appendix E, Errata.

Item 4 - NRC analyzed a range of institutional control periods from 50 to 300 years. Based on the analysis, NRC found no compelling reason to select one particular institutional control period over another. Use of a longer institutional control period would theoretically allow higher concentrations of some radionuclides to be disposed of as Class A waste. The limit of 100 years proposed in Part 61 was selected because:

(1) It agreed well with previous estimates on the the effective length of institutional controls made by EPA;

(2) It was consistent with the consensus arrived at from the regional workshops on Part 61;

(3) Public comments on the preliminary draft of Part 61 were that 100 years was about the right time period.

Based on public comments received on the proposed Part 61 rule, NRC has not changed the 100 year institutional control period. NRC does not believe raising the institutional control period to 300 years is acceptable since it raises long-term care costs, it may place an undue burden on future generations,

and it creates greater uncertainty in analyzing LLW disposal. (It is more difficult to postulate what may happen over such a long time period.) In addition, several commenters stated they believed 100 years was too long. Raising the institutional control period to 150-200 years would have the effect of raising the radionuclide concentrations for Class A wastes based on intruder protection considerations. Since the stability requirement for Class B waste is of more importance for other reasons besides intruder protection (i.e., migration, operational safety and long-term stability), NRC does not believe changing the 100 year time frame for active institutional control is warranted.

Item 5 - Technologically enhanced natural radiation (TENR) has been defined as those natural sources of radiation that would not normally occur without the presence of some technological activity not expressly designed to produce radiation. Examples might include the release of concentrations of natural radioactivity to the environment from the combustion of coal and natural gas in the generation of electric power or from the mining industry. The staff is not sure of the appropriateness of application of such a concept to the construction activities which might take place at a near-surface LLW disposal facility. The staff believes that impacts from TENR at a near-surface disposal facility would be similar to those resulting from any large construction project. In addition, such impacts would be very site-specific with respect to the concentration of natural radioactivity that would be present in the specific site soils and ground water. As such, NRC has not addressed them in this FEIS.

Item 6 - The potential for reduction of thyroid dose due to dilution of radioactive iodine(^{129}I) with stable iodine (^{127}I) was briefly considered in the draft EIS. Work performed by Leddicotte, et. al., was cited, for example. (Reference 16.) At the time, NRC staff believed that while information gaps and time limitations precluded taking credit for dilution by stable iodine in the draft EIS, it was a matter that obviously needed to be further examined. This potential for dilution by stable iodine has in fact been examined in more detail in the final EIS.

As it turns out, whether or not dilution by stable iodine is considered makes essentially no difference fn determining whether a waste generator meets waste classification limits obtained from consideration of exposures to an intruder. Iodine-129 typically exists in only trace quantities in low-level waste well below (typically one or more orders of magnitude) the maximum concentration limits. However, dilution with stable iodine may make a large difference in long-term groundwater impacts and consequently any site-specific inventory lists.

Item 7 - The staff believes the current approach is the most reasonable considering the level of information and the generic nature of the analysis. The staff included provisions in proposed Part 61 for improved waste form to be considered on a case-by-case basis. At the present time there is insufficient data (for most waste streams) on the relationship of improved waste forms to reduced plant uptake to allow a credit to be factored into the intruder-agriculture scenario for such improvements.

Several commenters have remarked about the concentration limits in Table 1. As noted earlier, the staff has conducted more realistic analyses and as a result, the concentration limits in Table 1 have been revised.

Item 8 - The 100 Ci limit is based on the license conditions for the disposal of gaseous wastes now in effect at the Hanford and Barnwell disposal sites. These limits have not resulted in unsafe environmental conditions at the disposal sites nor have they resulted in overly restrictive situations for waste generators. The 100 Ci limit is consistent with an accident evaluation assuming a dropped package producing occupational exposures to site workers. The DOT limits, however, are established based on accident doses to the public. For tritium and Kr-85 in uncompressed gaseous forms, the DOT limits are 1,000 Ci in a Type A package and 50,000 Ci in a Type B package (173.389(1) and 173.390(a)). For gaseous waste forms the occupational exposure case is the limiting condition.

Item 9 - NRC considered the full range of potential pathways of release of radioactivity to the environment. The pathways considered included

groundwater migration, plant and animal intrusion, wind and surface water transport and gaseous releases. (The reader is referred to Appendix H of the DEIS for details.) Based on a consideration of existing data and measurements, NRC concluded that gaseous releases were not a significant release pathway and thus no detailed analyses were performed in the DEIS. NRC did not specifically analyze the range in chemical toxicity of labeled compounds due to a lack of information about the specific compounds used and more importantly, due to the lack of an accepted methodology of assessing biological effects of exposure to such compounds.

Item 10 - The assumption that the waste is placed just before the site is closed is a conservative assumption for purposes of setting waste classification limits. NRC staff believes, however, that the practical effect of relaxing concentration limits for short-lived isotopes (based upon considering accumulation over a 20-40 year period) would be minimal. Such a consideration would have a practical effect only upon the limits for Class A waste containing the isotopes Co-60 and tritium. However, there are other concerns such as site stability, long-term environmental releases, and exposure during handling which argue against raising the Class A limits for these and other isotopes.

PR-61
46 PR 51776 2

File #2860.3.3

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

'82 JAN 27 P1:56

Robert F. Flacke
Commissioner

January 19, 1982

Mr. R. Dale Smith
Chief, Low Level Waste Licensing Branch
Division Waste Management
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

(39)
DOCKET NUMBER
PROPOSED RULE PR-61
(46FR51226)

Dear Mr. Smith:

Attached are comments of the State of New York on U.S. Nuclear Regulatory Commission's September 1981 Draft Environmental Impact Statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste" (NUREG-0782).

In general, we find that this draft EIS was well prepared and required the expenditure of significant effort. The forthcoming Final Environmental Impact Statement should serve as a useful reference document on land disposal of low level radioactive waste if the New York State comments are adequately considered.

Thank you for providing New York State the opportunity to comment on your document.

Sincerely yours,

Paul J. Merges

Paul J. Merges
Assistant Director,
Division of Regulatory Affairs

cc: J. Corr
N.Y. State Agencies

att.

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AOD:
R.D. Smith

Acknowledged by card. 1/27/82 LN

Comments of the State of New York on the U.S. NRC Sept., 1981 Draft Environmental Impact Statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste (NUREG 0782)

1. General Comment

The DEIS adequately supports the need for 10 CFR 61 and identifies impacts. However, there is a tendency in the DEIS to compare proposed requirements with practices in use in the late sixties or early seventies. Many of the requirements in Part 61 have been implemented by individual states with regulatory control of low level radioactive waste burial sites. There is some scattered acknowledgement of these actions in the text (see page 35) but the broad recognition of this fact should be emphasized in the DEIS. (1)

The DEIS should also acknowledge that several states, such as New York, have had continuing development of requirements for hazardous waste disposal sites. Many of the requirements in Part 61 are required in State regulation of hazardous waste. For example, the manifest system to be established by Part 20 is also required for hazardous wastes by both EPA and New York State. Vol. 1, p. 53 only refers to EPA's requirements.

2. General Comment

The advantages of below grade stability for polyethylene drums should be weighed against the hazards encountered in transit and storage. (2)

3. General Comment

Important radionuclides-radium-226, thorium and other naturally occurring radioactive elements are not listed. Their disposal should be covered. (3)

4. General Comment

It could be argued that the disposal of large quantities (tons) of source material is not in our best national interest and such material should be stored for later retrieval. The DEIS should address this point. (4)

5. General Comment

Both the proposed rule and the draft EIS should adequately address the possibility of food chain contamination via wildlife. (5)

6. General Comment

The EIS should describe the potential health and environmental effects of the various rem doses. It is otherwise impossible to compare advantages or disadvantages of the alternatives. (6)

7. General Comment

One important parameter, which should be covered is the heat build up in Class C intruder waste. (7)

8. Vol. 1, Page 15 Impact Measures

The last paragraph refers to a long term radiological exposure through potential leaching and transport of the wastes through the groundwater. Another pathway that should be noted is trench overflow and/or pumping of water from the trenches. The pumping of water is referred to on page 30. (8)

9. Vol. 1, Page 16, Table S-4

This table should include the overflow or pumping to surface waters and release of tritiated methane. (9)

10. Vol. 1, page 20, (second and last paragraphs)

The phrase (State or Federal Government) should be added in parenthesis after the phrase "site owner." (10)

11. Vol. 1, Page 23, Controlling the Disposal of Specific Waste Streams

The first paragraph notes most of the longer-term hazard is caused by transuranics isotopes and then states "If these waste streams are eliminated... long term impacts...are only a few mrem/yr. (3 to 5) after 500 years."

The DEIS should acknowledge that the transuranics are banned at this time by action of the states.

However, due to its industrial importance, options for disposal of transuranic nuclides above 10 nCi/g should be addressed. (11)

12. Vol. 1, Page 30, Section 5.12

The fourth paragraph notes that the "bathtub" problem can lead to costly long term pumping. It should also note that this pumping leads to releases to the environment. (12)

13. Vol. 1, Page 53, Section 7.3

Reference is made to the EPA manifest tracking system for hazardous waste. The DEIS should consider the impact and benefits of a common manifest system for radioactive wastes and hazardous wastes. (13)

14. Vol. 1, Page 55, Impacts on the States

Some of the identified actions have been accomplished by New York to some degree by DEC's Part 380 modification that incorporates the requirements of Part 360 for hazardous wastes into Part 380 by reference. (14)

15. Vol. 1, Page 55, Impacts on the Public

An additional beneficial impact is the reduction of potential financial risks for taxpayers in states that own burial sites. (15)

16. Vol. 1 Page 56, Impacts on the Public

The adverse impact of allocation of federal and state resources should be offset by establishing fees to cover these costs. (16)

17. Vol. 2, Section 103.1 Hypothetical Regional Sites

It would be valuable to include, under Geology, the seismic characteristics of the four regions discussed. This is particularly important when considering the location of the disposal sites and the engineering of the sites. (17)

Docketed Comment Number: 39

Commenter: New York State Department of Environmental Conservation

Response(s): Item 1 - The staff recognizes that significant improvements in regulatory requirements have been made by the states since the first commercial radioactive waste disposal site was licensed in 1962. Moreover, the staff feels that these improvements were sufficiently noticed in the DEIS. The staff closely interacted with the states to utilize as fully as possible their operating experience and regulatory insights.

With respect to the commentor's second point regarding the role of states in toxic or hazardous waste management, the staff is aware that several states have indeed played prominent roles in this area. This experience may or may not, however, be applicable to the management of radioactive wastes.

Item 2 - High density, high molecular weight polyethylene (HDPE) containers are commonly used in the chemical industry for the shipment and storage of hazardous or corrosive materials. Because of the chemical resistance of HDPE, this material would also provide protection from degradation in a burial environment which is not an aggressive corrosion environment for HDPE. HDPE has been shown to also resist microbial attack. Radiation testing has shown that the mechanical properties of polyethylene do not exhibit significant changes up to radiation exposures of 10^8 rads. The lifetime accumulated dose for all but a few high activity wastes is below 10^8 rads. These properties of HDPE could increase delay time and trench stability to allow for additional radionuclide decay.

One manufacturer of HDPE containers has qualified a 55-gallon size HDPE drum to meet the DOT Specification 7A requirements. The DOT Specification 7A requirements qualifies a container as a Type A package for the shipment of radioactive materials. The standard Specification 17C and 17H 55-gallon carbon steel drums are also capable of meeting Specification 7A. Therefore, for transportation purposes the HDPE containers can be considered to be equivalent to standard carbon steel drums.

For waste storage HDPE drums provide good corrosion protection which could minimize leakage and waste spills. However, because of the viscoelastic properties of polymers, adequate creep strength must be designed into the container to prevent material deformation and possible rupture under the proposed loads during the storage period. Chemical industry storage experience indicates that properly designed containers can be provided at competitive costs for storing materials for extended periods. Storage of radioactive materials in HDPE containers would require specific consideration of the proposed storage period, stacking arrangements, container weight, and the specific container design to minimize any adverse effects from material creep.

Item 3 - In the initial effort to develop the draft Part 61 rule and draft EIS, NRC staff concentrated on the principal moderate and long-lived radionuclides and principal types and forms of radioactive waste. Guidance for disposal of other radionuclides and waste forms such as radium-226 and other naturally occurring elements will be addressed subsequently.

Item 4 - NRC agrees that for the reason stated and also to reduce the volume of waste required for disposal, consideration should be given to storage of large quantities of source material for possible later use. However, the purpose and scope of the EIS for Part 61 is that it serve as a decision document for the performance objectives and technical and other requirements of Part 61. It is not a generic EIS and is not intended to judge the utility or political considerations involved in deciding whether a particular material should or should not be considered a waste. As such, Part 61 establishes the requirements to ensure safety in disposal of material that could be considered waste. In addition, based on a review of the various waste streams in Appendix D of the DEIS containing source material, those indicating large quantities of source material contain depleted uranium not natural uranium.

Item 5 - Wildlife could conceivably be contaminated by radioactive materials at a low-level waste disposal facility in several ways: ingestion of contaminated water, consumption of contaminated plants, burrowing into buried waste and/or direct exposure to exposed waste. The performance

objectives and technical requirements of proposed 10 CFR Part 61 would minimize the probability as well as the severity of such an occurrence. Assuming the objectives and requirements of the rule are met, the staff believes that wildlife contamination on a significant scale is unlikely to occur and that this event does not pose a threat to public health and safety.

Item 6 - In the DEIS, NRC did not convert or express exposures in terms of risks because of the difficulty of accurately assessing risks to future populations from exposures incurred at future times and the small number of individuals involved who could receive a potential exposure. In the DEIS, NRC compared calculated doses on a common basis to exising standards which are expressed in terms of dose equivalent. NRC has, however, attempted to express the overall impacts of Part 61 in the EIS in a clearer manner such that comparison of alternatives and unmitigated impacts are easier to discern and understand. In addition, in response to this comment and to place in perspective the potential risk associated with doses calculated in this FEIS, NRC has included a section in the summary which provides dose response relationships as set forth in International Commission on Radiation Protection Publication 26. The reader can use these relationships to estimate the level of risk associated with doses calculated for various alternatives.

Item 7 - As part of the work performed for the final Part 61 rule, an analysis was performed on the practicality of some of the limits proposed in Table 1. This analysis included both surface radiation levels and potential heat buildup.

Item 8 - NRC staff does not believe that trench overflow treatment and release of pumped leachate represent a long-term radiological exposure hazard. Trench overflow is a short-term potential hazard which would be avoided by leachate pumping and treatment. The leachate pumping and treatment operations, however, would involve short-term releases to the environment. Pumping and treatment operations would also be quite expensive. This does not mean, however, that NRC believes that such potential short-term releases are not important. The impacts from trench overflow and leachate treatment have been calculated for the final EIS and support NRC's position regarding the need for disposal site stability.

Item 9 - Potential impacts from trench overflow or releases due to leachate pumping and treatment have been included in the calculations for the final EIS. From data available to NRC at the time the draft EIS was written, however, it appeared that potential impacts from tritiated methane released through disposal trench covers are at negligible levels. NRC staff is not aware of any new data which would contradict this belief. Thus, potential impacts from tritiated methane were not calculated for the final EIS.

Item 10 - This change has been made, and the reader is referred to Appendix E, Errata in this volume.

Item 11 - The staff acknowledges that burial of transuranics above 10 nCi/gm is, in fact, banned at this time. In preparing limits for disposal for the final 10 CFR Part 61, the routine disposal of transuranics between 10 and 100 nCi/gm has been allowed as Class C waste.

Item 12 - Potential releases to the environment from leachate pumping and treatment have been considered in the final EIS.

Item 13 - The proposed new §20.311 of 10 CFR Part 20 would establish a manifest tracking system for radioactive waste shipments. The provisions of §20.311 are general in that required information is listed and general requirements to forward and use manifests are included. The requirements were developed to provide information needed for disposal and to be compatible with existing DOT requirements for radioactive shipments.

The staff reviewed the U.S. Environmental Protection Agency (EPA) regulations for hazardous waste manifests. The same general approach for tracking was used. The staff also looked into the Uniform Hazardous Waste Manifest proposed by a joint EPA and DOT rule change published March 4, 1982 (47 FR 9336). The proposed rulemaking would require the use of a specific manifest form for all hazardous waste shipments. The form was proposed to provide relief to shippers from the individual state requirements on manifest contents. Individual states developed their own form which meet Federal requirements but also required additional state information. Thus shippers crossing states were faced with potentially differing requirements on forms in each State. The proposed form is a

one page document carefully tailored to provide required and needed information on hazardous wastes. The form may be used as an NRC manifest or DOT shipping paper for radioactive wastes by using additional lines to provide information on radioactive materials. A few minor procedural and terminology changes were made to the final Part 61 rule to conform to the proposed EPA/DOT manifest.

The manifest requirements in §20.311 of the NRC rule change are compatible with DOT supplementary requirements for radioactive material. Neither DOT or NRC prescribe specific forms for information on radioactive waste shipments.

Item 14 - The staff recognizes these actions. However, modification of existing Agreement State programs to assure compatibility with 10 CFR Part 61 is an action separate from that mentioned by the commenter.

Item 15 - The staff concurs wih the commenter's opinion and will include this beneficial impact in the final EIS.

Item 16 - Allocation of federal resources will be offset by licensing and inspection fees as set forth in 10 CFR 170. With respect to the allocation of state resources, each Agreement State that would be the location of a new facility will be able to establish its own system of fees or other compensation on a case-by-case basis to allow regulatory costs to be compensated. These arrangements are within the state's discretion and are not addressed by 10 CFR 61 or the EIS.

Item 17 - The seismic characteristics for each of the four regions is included in the detailed descriptions of the sites contained in Appendix J of the DEIS. (See, for example, the last paragraph of Section 1.4.1 of Appendix J, "Geology" for the Southwestern Site.) It was not included in the summary descriptions contained in Chapter 10 of the DEIS.

COMMONWEALTH of VIRGINIA

Council on the Environment

J B JACKSON JR
ADMINISTRATOR

903 NINTH STREET OFFICE BUILDING
RICHMOND 23219
804-786-4500

'82 FEB -4 P1:28

January 12, 1982

(40)

DOCKET NUMBER
PROPOSED RULE PR-61
(46 FR 51176)

Mr. R. Dale Smith
Chief, Low-Level Waste Licensing Branch
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Smith:

The Commonwealth of Virginia is in the process of reviewing the Draft Environmental Impact Statement on New Licensing Requirements for Land Disposal of Radioactive Waste (10 CFR Part 61). The Council on the Environment is responsible for coordinating the State's review of federal environmental impact statements and responding to appropriate federal officials on behalf of the Commonwealth. The following agencies have responded to our review request at this time:

Department of Agriculture and Consumer Services
Department of Conservation and Economic Development
Department of Health
Office of Emergency and Energy Services
Virginia Research Center for Archaeology.

In addition, we expect comments from at least two other state agencies in a few days.

The Draft EIS gives rise to only limited concerns on the part of the responding agencies above. There is presently no site for disposal of low-level radioactive waste in Virginia. If any sites are planned for use, the Virginia Research Center for Archaeology should be contacted before site disturbances begin.

It is possible that farm operations might one day intrude into a radioactive waste site; effective site controls could foreclose this possibility.

The document's discussion of geologic requirements for waste disposal is adequate.

We expect to furnish additional comments within two weeks. Thank you for the opportunity to review this document.

Sincerely,

J.B. Jackson, Jr.

Enclosures

cc: The Honorable Maurice B. Rowe, Secretary of Commerce and Resources
Mr. Earl A. Finch, Department of Agriculture and Consumer Services
Mr. Randolph Turner, Virginia Research Center for Archaeology
Mr. Bruce B. Meador, Department of Conservation and Economic Development

JBJ/CHE/all

REVIEW INSTRUCTIONS:

A) Please review the document carefully. If the proposal has been reviewed earlier (e.g., if the current document is a FINAL EIS), please consider previous comments.

B) Prepare your agency's comments in a form which would be acceptable for responding directly to a project sponsoring agency.

C) Use the space below for your comments. If additional space is needed, please attach extra sheets.

Return your comments to:

Charles H. Ellis III
Environmental Impact Statement Coordinator
Council on the Environment
903 Ninth Street Office Building
Richmond, Virginia 23219

3027 →

CHARLES H. ELLIS III
ENVIRONMENTAL IMPACT STATEMENT COORDINATOR

COMMENTS

NRC

NONE, THE DRAFT ADEQUATELY ADDRESSES ALL OF THE geologic REQUIREMENTS FOR LAND DISPOSAL OF SUCH WASTE

(SIGNED) Bruce Meador (DATE) 4 JAN 81

(TITLE) Ex Asst

(AGENCY) DCED

cc Gene Rader, NRC

8. REVIEW INSTRUCTIONS:

A) Please review the document carefully. If the proposal has been reviewed earlier (e.g., if the current document is a FINAL EIS), please consider previous comments.

B) Prepare your agency's comments in a form which would be acceptable for responding directly to a project sponsoring agency.

C) Use the space below for your comments. If additional space is needed, please attach extra sheets.

Return your comments to:

Charles H. Ellis III
Environmental Impact Statement Coordinator
Council on the Environment
903 Ninth Street Office Building
Richmond, Virginia 23219

CHARLES H. ELLIS III
ENVIRONMENTAL IMPACT STATEMENT COORDINATOR

COMMENTS

We have made a review of the Draft Environmental Impact Statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste."

Currently no site for this Class of waste exist in Virginia.

The Draft EIS for licensed sites in the U.S. for the disposal of radioactive low level waste (LLW) does not present any problems for agriculture as far as we can determine. The exception to this would be a very low probability of inadvertent intrusion of agricultural operations, including farm livestock into a closed (terminated) disposal facility through the first 100 years and into a 500 year span. However, since these sites are relatively small, dedicated sites, it would seem that the period of institutional control would be "open ended" to extend throughout a "safe" time frame that would be determined by site monitoring. (1)

(SIGNED) Earl A. Finch (DATE) January 6, 1982

(TITLE) Earl A. Finch
Resource/Environmental Economist

(AGENCY) Dept. of Agriculture and Consumer Services

JAN 1982
Council on the Environment

COUNCIL ON THE ENVIRONMENT
Commonwealth of Virginia

TO: File

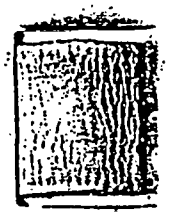
FROM: C. Ellis

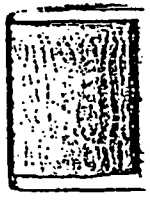
SUBJECT: NRC Draft EIS on Licensing Requirements for Land Disposal of Radioactive Waste

Virginia Research Center for Archaeology comments, per Randy Turner on January 5, 1982, are as follows:

"If any land disposal sites are planned for Virginia, the Virginia Research Center for Archaeology, as the archaeological agency representing the Virginia State Historic Preservation Officer, should be contacted pursuant to federal legislation on archaeological resources." (2)

CHE/all





Docketed Comment Number: 40

Commenter: Commonwealth of Virginia, Council on the Environment

Response(s): Item 1 - The commenter is correct that disposal of LLW under Part 61 should not present any problems for agriculture. The commenter is also correct that there is a low probability of inadvertent intrusion into the site for agricultural purposes. NRC staff believe that active institutional control of the site following site closure should preclude such intrusion from occurring during the 100-year institutional control period. After that time passive institutional controls such as continued government land ownership and land records should reduce the potential for such inadvertent intrusions.

Item 2 - In the NEPA-mandated environmental review and licensing process of a proposed near-surface disposal facility, NRC will operate under the requirements of Federal laws and regulations for the protection of cultural resources. Among other things, these requirements include coordination with the State Historic Preservation Office, conduct of a pre-construction cultural resources survey and the identification of mitigating measures to protect any known or encountered resources.

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240 '82 FEB -2 P3:18

ER 81/2260

JAN 28 1982

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

DOCKET NUMBER PROPOSED RULE PR-61 (46 FR 51776) (41)

DOCKET NUMBER PROPOSED RULE PR-2 et al (46 FR 38081) (114)

Dear Sir:

We have reviewed the proposed licensing requirements for Land Disposal of Radioactive Waste (10 CFR 61).

General Comments

In general, we are in agreement with the overall technical philosophy and strategy employed in the rule. It appears to be a major step forward in improving low-level radioactive waste management. We concur that many acceptable sites should be possible in most areas throughout the country and we agree, in general, with the flexibility and conservatism of the combined prescriptive and performance objective approach. Finally, we agree that waste classification is a cornerstone for a good waste management rule and that the classification scheme proposed is sensible and practical in terms of radionuclide content.

Our principal concern with the waste classification system is that it fails to address nonradioactive toxicity of the waste. We believe that any waste classification scheme should be based on total hazard. It would seem inappropriate for a particular waste to be declared as Class A radiologically when it might contain toxic metals or organic compounds with potential harmful effects several orders of magnitude greater than those of the radionuclides. Perhaps the rule should either prohibit components with greater potential toxicity than the radionuclides or provide for additional classification options based on other-than-radiological toxicity. This position would be consistent with recommendations of the Conservation Foundation Dialogue Group on Low-Level Radioactive Waste and the Department of Energy's Task Force on Radioactive Waste Management.

We believe that waste volume reduction is an important element in reducing overall magnitude and complexity of the problem. We therefore suggest giving it greater emphasis and perhaps offering additional incentives. We also believe that Federal/Defense generated low-level radioactive waste should come under the same earth-science guidelines and criteria.

Participation of Bureau of Indian Affairs (BIA) and the Indian Tribes

The Secretary's trust responsibilities apply to waste disposal sites that are to be located on Indian reservations. The Bureau of Indian Affairs (BIA) provides the support services necessary to carry out the Secretary's trust responsibilities. Therefore, BIA area directors or their authorized representatives should be invited to participate in the review of applications for the location of low-level radioactive waste disposal sites on Indian reservations. In addition,

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Acknowledged by card 2/4/82 emp

Secretary of the Commission 2

regulatory policy should also be coordinated with BIA's Office of Trust Responsibilities with respect to locating, licensing, operating and maintaining commercially operated disposal sites on Indian lands. Because of variations and changes in Indian land ownership, BIA's involvement will be essential.

Specific comments on the proposed rule and the environmental impact statement are attached separately.

We hope these comments will help you in the preparation of a final statement.

Sincerely,

Bruce Blanchard, Director
Environmental Project Review

Enclosures

The following more specific comments are addressed to the rule itself but would also apply to corresponding sections of the Summary and the environmental statement.

Section 61.2, Definitions

Buffer Zone. The buffer zone definition should include depth as well as lateral boundaries, and should be described as a three-dimensional zone. The performance standards might then apply to releases beyond the boundary of the buffer zone. Unrestricted use of land and resources beyond the buffer zone (laterally or at depth) would then be allowable during and after site operations.

61.50 Disposal Site Suitability Requirements for Land Disposal

(a)(2) We suggest being more specific in the "modeling" requirements. Do you mean physical scale model? numerical ground water/solute transport model? conceptual model? (There are many kinds of possible models.)

(a)(7) We endorse this option but suggest using "molecular diffusion" in place of "diffusing" and/or defining maximum hydraulic conductivity allowable such as 10^{-6} cm/sec.

61.51 Disposal Site Design for Land Disposal

(a)(4) It is impossible to totally "prevent" infiltration; suggest using "minimize" in place of "prevent."

(a)(6) This requirement appears inconsistent with 61.50(a)(7). The option of disposing in the saturated zone should be mentioned again.

61.52 Land Disposal Facility Operation and Disposal Site Closure

(a)(8) We believe the location of the buffer zone should be determined on the basis of site performance. The zone ideally would be enclosed within a three-dimensional surface surrounding and underlying the burial site. Our concept of the buffer zone is a zone that provides a controlled/restricted-access volume of earth material around and under the site, beyond which unrestricted use of land and resources, surface or subsurface, could be allowed during and after site operation. The 100 foot lateral extent listed in the rule appears somewhat arbitrary.

61.53 Environmental Monitoring

(a) We believe that "geochemistry" should be listed with the other subjects (ecology, meteorology, climate, hydrology, etc.). Although geochemistry is often an implied aspect of hydrology, we believe it deserves specific mention because it plays such an important part in radionuclide mobility in ground water.

61.55 Waste Classification

General: We believe waste should be classified according to total toxicity as described above under "General Comments."

(d) It is not clear what the disposition will be of wastes which exceed Class C concentrations. What type of disposal is envisioned by the Commission for those wastes?

61.56 Waste Characteristics

General: The non-radiological toxicity of the waste needs to be considered here, we believe. It is apparently ignored.

General Comments

Evidence of the life expectancy and other advantages of polyethylene drums over steel or others should be presented. Will they simply delay the compaction/degradation problem? The same question also applies to wooden boxes—are they significantly better than cardboard? (1)

During extended dry periods, desiccation cracks tend to form in trench caps due to shrinkage of fine grained minerals. These cracks can extend several feet vertically and can provide avenues for rapid water infiltration. How can this problem be avoided? (2)

We question the long-term viability of using plastic sheeting as an infiltration barrier in the trench cap. How can its integrity be assured? What is the evidence that this technique works consistently? (3)

Also, the extent of hazard presented by low level radioactive wastes is not clearly indicated in the DEIS. While low level radioactive wastes are indicated for some of the more dangerous isotopes, a general definition of hazard or risk should be presented in the introduction to understand impact analyses. (4)

Cultural Resources Protection

Section 2.3 of Appendix E of the DEIS discussing a reference disposal facility makes only passing reference to historic areas. Section 3 should make specific reference to historic and archeological resources. (5)

Minor Comments

Volume I

Page 3, 1.5 Scoping for the EIS, line 2 - "501.7" should be "1501.7." (6)

Page 55, The role of the U.S. Geological Survey should be defined. (7)

Volume II

Page xi, top line - "Chapter 10" should read "Chapter 9." (8)

Page 3-23, 3.5.2, line 16 - Identify the levels of "little high energy gamma emitting radionuclides." (9)

Line 19 - Identify the level of "large quantities of high energy gamma emitting radionuclides." (10)

Page 3-31, paragraph 2 - Would trench liners be required? (11)

Page 4-8, 4.3.2, line 11 - "of" should read "at." (12)

Page 4-69, Requirement, 2 - Delete "economically." (13)

Page 5-69, table - Units should be presented. (14)

Page 6-11, last paragraph, line 5 - Change ".033" to ".33." (15)

Page 7-8, paragraph 4, line 5 - "C-137" should read "Cs-137." (16)

Page 7-22, Mixtures of Radioisotopes, next-to-last line - Insert closing parenthesis. (17)

Docketed Comment Number: 41

Commenter: U.S. Department of the Interior, Office of the Secretary

Response(s): Item 1 - High density, high molecular weight polyethylene (HDPE) containers are commonly used in the chemical industry for the shipment and storage of hazardous or corrosive materials. Because of the chemical resistance of HDPE, this material would also provide protection from degradation in a burial environment which is not an aggressive corrosion environment for HDPE. HDPE has been shown to also resist microbial attack. Radiation testing has shown that the mechanical properties of polyethylene do not exhibit significant changes up to radiation exposures of 10^8 rads. The lifetime accumulated dose for all but a few high activity wastes is below 10^8 rads. These properties of HDPE could increase delay time and trench stability to allow for additional radionuclide decay.

One manufacturer of HDPE containers has qualified a 55-gallon size HDPE drum to meet the DOT Specification 7A requirements. The DOT Specification 7A requirements qualifies a container as a Type A package for the shipment of radioactive materials. The standard Specification 17C and 17H 55-gallon carbon steel drums are also capable of meeting Specification 7A. Therefore, for transportation purposes the HDPE containers can be considered to be equivalent to standard carbon steel drums.

For waste storage, HDPE drums provide good corrosion protection which could minimize leakage and waste spills. However, because of the viscoelastic properties of polymers, adequate creep strength must be designed into the container to prevent material deformation and possible rupture under the proposed loads during the storage period. Chemical industry storage experience indicates that properly designed containers can be provided at competitive costs for storing materials for extended periods. Storage of radioactive materials in HPDE containers would require specific consideration of the proposed storage period, stacking arrangements, container weight, and the specific container design to minimize any adverse effects from material creep. Wooden boxes provide much more protection to workers during the waste handling operation at the disposal site than do cardboard boxes. In some cases, contaminated syringes have penetrated cardboard boxes during transit causing injury to workers. While wood boxes are not expected to provide substantially greater protection against subsidence than do cardboard boxes, they do provide greater safety during handling.

Item 2 - There are techniques available, particularly layered systems which will prevent or significantly restrict development of dessication cracks in trench covers. These are currently being studied under an NRC contract with the the Illinois State Geological Survey.

Item 3 - The proposed Part 61 does not require the use of moisture or infiltration barriers. Such barriers were considered as an alternative but were rejected because of the staff's concern for their long-term viability. They may be approved, however, for use on a case-by-case basis. If they were to be used for Class A wastes with relatively short radiological hazard, plastic membranes may have sufficient proven design life. Other methods such as filter fabric may be viable for longer periods in a layered cover due to the advantages of such a cover, i.e., nearly constant temperature, moisture content, soil water chemistry, protection against burrowing animals or root penetration and protection against radiation from above or below.

Item 4 - See staff response to Item 5, Comment 15.

Item 5 - The staff recognizes that construction and operation of land disposal sites for radioactive waste disposal may result in impacts to cultural resources. In preparing the draft EIS, the staff felt that these impacts were site-specific in nature and could not be adequately assessed in the absence of a specific site proposal. In the NEPA-mandated environmental review and licensing process of a proposed disposal facility, NRC will operate under the requirements of Federal laws and regulations for the protection of cultural resources. Among other things, these requirements include coordination with the State Historic Preservation Office, conduct of a pre-construction cultural resources survey and the identification of mitigating measures to protect any known or encountered resources.

Item 6 - This change has been made. See Appendix E, Errata in this volume.

Item 7 - The role of the U.S. Geological Survey has been included in the FEIS.

Item 8 - This change has been made. See Appendix E, Errata in this volume.

Item 9 - Identification of these levels is provided in Chapter 4.0, Transportation Impacts, Volume 3 of NUREG/CR-1759, Data Base for Radioactive Waste Management. (Reference 3.)

Item 10 - Identification of these levels is provided in Chapter 4.0, Transportation Impacts, Volume 3 of NUREG/CR-1759, Data Base for Radioactive Waste Management. (Reference 3.)

Item 11 - The commenter's reference is to a description of a reference disposal facility. Trench liners would not be required and are not a requirement of Part 61.

Item 12 - The reader is referred to Appendix E, Errata in this volume.

Item 13 - The staff has considered this comment and determined that it would be appropriate to delete the word "economically" both here and in the proposed 10 CFR Part 61.

Items 14-17 - The reader is referred to Appendix E, Errata in this volume.

PR 61
(46 FR 51776)

DOCKETED

UNWMG

Utility Nuclear Waste Management Group

1111 19th Street, N.W. • Washington, D.C. 20036 • (202) 828-7669

82 FEB -5 A9:24

February 4, 1982--

(42)

U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

DOCKET NUMBER
PROPOSED RULE PR-61
(46 FR 51776)

Attn: Chief, Low-Level Waste Licensing Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards

Re: Draft Environmental Impact Statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste," NUREG-0782 (46 Fed. Reg. 51,776)

Dear Sir:

The enclosed comments are submitted on behalf of the Utility Nuclear Waste Management Group (UNWMG) is connection with the above-referenced matter.

On January 14, 1982, the UNWMG submitted its comments on the NRC's proposed licensing requirements for land disposal of radioactive waste, 10 C.F.R. Part 61 (46 Fed. Reg. 38,081). In preparing those comments, the proposed rule was used as a point of departure. That is, the regulations in the proposed Part 61 were basically taken as a given. From that perspective, the comments focused on offering suggestions aimed at making the rule, as proposed, more workable.

Review of the Draft Environmental Impact Statement (DEIS) on Part 61, however, has raised some fundamental questions concerning the basic desirability of certain aspects of the proposed rule. This is addressed in the enclosed comments under the heading: "Cost/Benefit Analysis."

In essence, the UNWMG is concerned that a failure to analyze and compare the costs and benefits of various alternatives in a systematic and rigorous fashion has resulted in a proposed rule which, if adopted, would greatly increase the cost of disposal with few -- if any -- benefits. Such an outcome would be wasteful and, thus, inconsistent with one of the basic concerns underlying NEPA; i.e., the efficient management and utilization of available resources.

(1)

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ADD: R.D. Smith

Another matter of almost equal importance is discussed in the enclosed comments under the heading of "Educational and Public Information Aspects." One of the main functions of an environmental impact statement is to provide the public with an informed insight into the nature, scope and magnitude of relevant issues. The DEIS, however, falls so far short of this goal as to render it inadequate as an environmental full-disclosure statement.

Such a deficiency is not merely cosmetic, nor is it of only legal and academic importance. It can have real, undesirable effects. By failing to present the matter of low-level waste disposal in full and appropriate context, the DEIS is counterproductive to the NRC supported goal of opening new regional burial sites. If knowledgeable, widespread community acceptance of burial sites is to be achieved, the NRC must make the effort necessary to properly inform the public of how reasonable an undertaking the establishment of such a site really is. The environmental impact statement on Part 61 provides an excellent opportunity to do so and should be fully utilized to help dispel basic misapprehensions concerning the perceived dangers of low-level waste disposal.

(1)

In concluding, the UNWMG acknowledges that the enclosed comments tend to be rather critical. In addition, we recognize that they are somewhat belated. It is hoped, however, that these comments will be received and utilized by the NRC in the constructive spirit in which they are offered.

Sincerely,

R. E. L. Stanford
Program Manager

RELS:lk
Enclosure

Enclosure

Comments of the UNWMG on
the "Draft Environmental Impact
Statement on 10 CFR Part 61
'Licensing Requirements for Land
Disposal of Radioactive Waste'"
(NUREG-0782)

The UNWMG has reviewed the Draft Environmental Impact Statement (DEIS) on Part 61 and, as a result, developed comments in the following areas:

- o Basic Presentation
- o Educational and Public Information Aspects
- o Cost/Benefit Analysis

Each of these matters is discussed below in ascending order of importance.

Basic Presentation

As organized and written, the DEIS is almost incomprehensible. The multiplicity of cases, alternatives, and activity spectra, which are neither carefully defined nor used consistently, has led to a very disjointed treatment.

We would recommend that a much smaller number of cases -- spanning the expected range of activity levels -- be selected for presentation. The presentation should then be developed to lead to summary tables patterned after those suggested in Attachment A. The UNWMG further suggests that the more simplified discussion of a smaller number of cases and spectra

(2)

include data on specific isotopic contributions to doses, since actions appropriate to control one isotope may not be at all appropriate for another.

(2) Cont

Educational and Public Information Aspects

One of the more important functions of an environmental impact statement is to provide the public with a reasoned insight into the nature, scope and magnitude of relevant issues. The DEIS, however, falls so far short of this goal as to render it inadequate as an environmental full-disclosure statement.

First, the entire document reads as though a serious public health and radiological protection problem were being addressed whereas, in truth, the shallow land burial of low-level nuclear waste is essentially a non-problem in these respects. Using the population dose estimates presented in the DEIS, we have calculated the annually expected statistical deaths from current shallow land burial practices and, in Attachment B, compared this risk to other causes of death. As can be noted, the risk from shallow land burial is four orders of magnitude less than that associated with activities as prosaic as the use of skate boards.

(3)

Of course, we fully recognize the institutional issues that, unfortunately, surround and confuse the matter of low-level waste disposal. However, an EIS should, at least,

strive to put the area under consideration into a proper and understandable scientific and technical perspective. Unfortunately, the existing document not only fails to do this but, as indicated earlier, exacerbates existing misunderstandings and misconceptions regarding shallow land disposal.

It is important to recognize that this deficiency is of more than just legal and academic importance. It can have real and undesirable effects. By failing to present the matter of low-level waste disposal in its full and appropriate context, the DEIS is counterproductive to the NRC supported goal of opening new regional burial sites. If knowledgeable, widespread community acceptance of burial sites is to be achieved, the NRC must properly inform the public of how reasonable an undertaking the development of such a site really is; not just with numbers, but on a conceptual, comparative basis as well. The EIS on Part 61 presents an excellent opportunity to do so, and should be fully utilized to help dispel basic misconceptions concerning the dangers of low-level waste disposal.

(3) (cont)

Another misconception, enhanced by and threaded throughout the DEIS, concerns the oft assumed dominance of the water pathway. (See, e.g., Vol. I, p. 17; Vol. II, p. 5-1.) Only a very careful reading reveals the fact that, with the exception of four isotopes, all isotopes are limited by

intrusional pathways and the possible doses are restricted to a very few individuals. This distinction is very important to public understanding, for the perception of widespread water contamination is quite a different matter than that of a few individual intruders being exposed. Once again, a disservice is done to the public by the portrayal of a less than accurate -- or, at least, easily misunderstood -- picture.

The basic lack of perspective embodied in the DEIS is, perhaps, best illustrated by the following sentence taken from page one of the Summary volume:

> Space disposal, although feasible, is not developed to the point of routine technical and economic application.

(3) (cont)

(Emphasis added.) Such a statement adds materially to public misconceptions. Even the suggestion that space is considered a possible alternative conveys the impression that we are dealing with a problem of truly cosmic proportions. Space disposal of low-level waste will never be "feasible," within the dictionary definition of that word. Space disposal, if mentioned at all, should be dismissed with a single sentence acknowledging its inapplicability to the subject at hand.

Cost/Benefit Analysis

An EIS should specify, in a clear, concise and meaningful way, the costs and benefits associated with the various alternative actions considered. In this respect, too, the

(4)

DEIS is plainly deficient.

We have -- as best we could given the difficulties arising from the presentational shortcomings of the DEIS, mentioned earlier -- performed a cost/benefit analysis of 14 of the alternatives to present practice (the "no-action case"). The results of this analysis are summarized in Attachment C, Tables 1216/1, 1216/2 and 1216/3.

As the tables show, not a single alternative considered in the DEIS meets the Appendix I cost/benefit test criteria ($1000/man-rem, escalated to about $1700/man-rem to account for inflation since 1975), and many of them are highly non-beneficial. This valuable and important information is nowhere presented in the DEIS, and can be extracted only with considerable effort.

In addition, it should be noted that the analytical results presented in the tables do not take into account the effect on occupational exposure of the various alternatives. Total occupational exposure, over the operational lifetime of the burial site analyzed in the DEIS, routinely runs ten times the non-occupational exposure calculated over 2000 years. Since most of the alternatives involve increased waste handling, with concomitant increases in occupational exposure, it is likely that, when this factor is taken into account, many of the alternatives will increase total exposure rather than decrease it. To assure that these impacts are all clearly

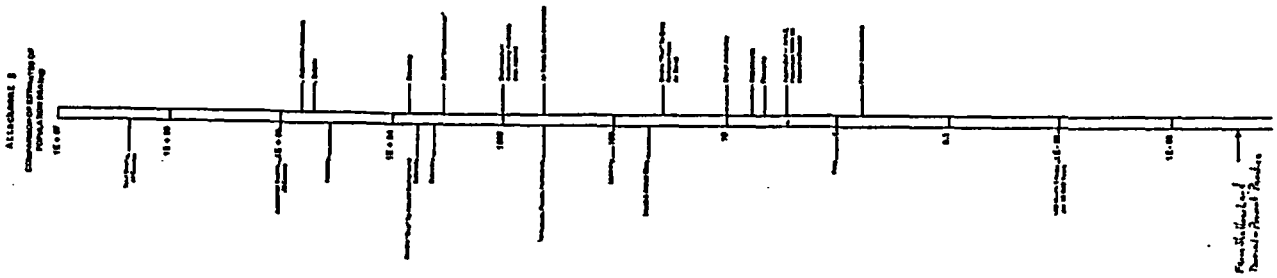
(4) (cont)

identified and evaluated, the UNWMG believes that the final EIS must contain a clear, concise and meaningful cost/benefit analysis, plus a detailed evaluation of alternatives based on the results of that analysis.

(4) (cont)

In concluding; we wish to emphasize that -- while the foregoing comments are wholly critical -- they are offered in a genuine effort to be constructive. Providing for the safe, cost-effective disposal of low-level waste in an environmentally sound manner is a matter of national importance. As such, it is a matter concerning which the public deserves to be fully informed, in as clear and complete a manner as possible. While we are hopeful that the final EIS will adequately address the relevant issues, the current draft, as discussed above, can only be viewed as being far from adequate.

The UNWMG, of course, remains willing to assist in the constructive revision of the DEIS and would be pleased to provide any further assistance which the Commission deems desirable and appropriate.



Attachment A

S U M M A R Y T A B L E

Maximum Individual Dose				Cost Beneficiality			
Alternative	mrem/year	Pathway	Dominant Isotopes	Δ Dose* man-rem	Δ Cost* $	Referred to Case	Cost Benefit Ratio $/man-rem

S U M M A R Y T A B L E

Alternative	Required By	Part 61 Reference

* From previous alternative case.

Table 1216/1

Cost Beneficiality of Alternatives Ordered on Dose

Alter.	Description	2000 year Pop Dose man-rem	Δ Pop Doses from Ref	Δ Pop Doses fr New Base	Cost 10^8	Δ Costs from Ref	Δ Costs fr New Base	Cost/Benefit Ratio $/man-rem from Ref	Cost/Benefit Ratio $/man-rem fr New Base
Ref	Present Practice	2.50E+03	--	--	4.28				
1	Some Segregation to Bottom	1.30E+03	1.20E+03	--	4.31	3.00E+06	--	2.5E+03	--
7A	Improved Waste Form	1.14E+03	1.36E+03	1.60E+02	7.91	3.63E+08	3.60E+08	2.7E+05	2.3E+06
4D	Stacked Disposal	1.10E+03	1.40E+03	4.00E+01	4.55	2.70E+07	2.40E+07[a]	1.9E+04	1.2E+05
4E	Hotwaste Facility	1.08E+03	1.42E+03	2.00E+01	4.58	3.00E+07	3.00E+06	2.1E+04	1.5E+05
4C	Improved Covers	9.34E+02	1.57E+03	1.46E+02	4.43	1.50E+07	1.20E+07[a]	9.6E+03	3.3E+04
4A	Segregation	9.20E+02	1.58E+03	1.40E+01	4.34	6.00E+06	3.00E+06	3.8E+03	7.9E+03
4B	Compaction	9.10E+02	1.59E+03	1.00E+01	4.34	6.00E+06	3.00E+06[b]	3.8E+03	7.7E+03
6	Decontainerized Disposal	9.00E+02	1.60E+03	1.00E+01	4.79	5.10E+07	4.50E+07[b]	3.2E+04	4.5E+06
7B	Segregation	8.62E+02	1.64E+03	3.80E+01	7.80	3.52E+08	3.01E+08	2.2E+05	7.9E+06
7C	Compaction	8.61E+02	1.64E+03	1.00E 00	7.70	3.42E+08	2.91E+08[c]	2.1E+05	7.5E+06
7D	Improved Covers	8.60E+02	1.64E+03	1.00E 00	7.74	3.64E+08	4.00E+06	2.1E+05	4.0E+06
5	Cement-walled Trench	5.20E+02	1.98E+03	3.40E+02	6.38	2.10E+08	1.59E+08[c]	1.1E+05	4.2E+05
8	Ocean Disposal	0[d]	2.50E+03	5.20E+02	8.591	4.31E+08	2.71E+08	1.7E+05	4.3E+05
9	Space	0[d]	2.50E+03	5.20E+02[e]	1900	1900E+08	1900E+08	7.6E+07	3.7E+08

a Referred to Case 1.

b Referred to Case 4B.

c Referred to Case 6.

d Given credit for zero—not strictly true.

e Referred to Case 5.

Table 1216/3

Differential Cost Beneficiality of Alternates Ordered on Cost Beneficiality to Reference

Alter.	Description	Pop Dose man-rem	Δ Pop Dose from Prev Case	Cost 10^6	Δ Costs from Prev Case	Cost/Benefit Ratio	
Ref	Present Practice	2.50E+03	—	4.28	—	—	
1	Some Segregation to Bottom	1.30E+03	1.20E+03	4.31	3.00E+06	2.5E+01	
4B	Compaction	9.10E+02	3.90E+02	4.34	3.00E+06	7.7E+03	
4C	Improved Covers	9.34E+02	increase	4.43	9.00E+06	∞	
4D	Stacked Disposal	2.11E+01	increase	4.55	2.12E+07	∞	Referred to 4B
4E	Hot Waste Facility	1.00E+03	increase	4.58	3.00E+06	∞	Referred to 4B
6	Decontainerized Disposal	9.00E+02	1.00E+01	4.79	2.10E+07	2.1E+06	
5	Cement-walled Trench	5.20E+02	3.80E+02	6.38	1.59E+09	4.2E+05	
7D	Improved Covers	8.60E+02	increase	7.74	1.36E+08	∞	
7B	Segregation	8.62E+02	increase	7.80	1.47E+08	∞	Referred to 5
7A	Improved Waste Form	1.16E+03	increase	7.91	1.53E+08	∞	Referred to 5
8	Ocean Disposal*	0	5.2E+02	8.59	2.22E+08	4.2E+05	
9	Space*	0	5.20E+02	1900	1900E+08	3.7E+08	

* Ocean and space given credit for zero dose--not strictly true. Both referred to 5.

Table 1216/2

Cost Beneficiality of Alternatives
Ordered on Cost Benefit to Reference Case

Alter.	Description	Cost Benefit to Base, $/man-rem	
Ref	Present Practice	—	
1	Some Segregation to Bottom	2.5E+03	
4A	Segregation	3.8E+03	
4B	Compaction	3.8E+03	4B preferred--slightly lower dose at same cost
4C	Improved Covers	9.6E+03	
4D	Stacked Disposal	1.9E+04	
4E	Hot Waste Facility	2.1E+04	
6	Decontainerized Disposal	3.2E+04	
5	Cement-walled Trench	1.1E+05	
7C	Compaction	2.1E+05	
7D	Improved Covers	2.1E+05	7D preferred--slightly lower dose at same cost
7B	Segregation	2.2E+05	
7A	Improved Waste Form	2.7E+05	

Docketed Comment Number: 42

Commenter: Utility Nuclear Waste Management Group

Response(s) Item 1 - Contrary to the commenter's allegations, the staff believes that low-level radioactive waste, if not managed and disposed of properly, may indeed jeopardize public health and safety and the environment in addition to posing long-term economic burdens. In developing the proposed rule and the DEIS, the staff explicitly sought to explore a broad range of alternatives to assure that both the Commission's mandate under the Atomic Energy Act and the requirements of the National Environmental Policy Act were met. The staff feels that it achieved these goals in both cases and notes that this commenter was alone among nearly 50 others in suggesting that the DEIS was inadequate as an environmental full-disclosure statement. The staff would like to add that the comments of several state and federal agencies with extensive experience in the preparation of environmental impact statements did not indicate that the DEIS was inadequate in strategy or content.

Item 2 - NRC staff does not believe the DEIS, as written, is "almost incomprehensible." The number of alternatives considered and analyzed in the DEIS is large. NRC staff purposely selected a broad range of alternatives for analysis to ensure completeness in consideration of possible approaches and variations in disposal technologies which could be applied. NRC staff agrees, however, that the number of alternatives can be reduced in number and has presented fewer alternatives in the FEIS. NRC staff also agrees that the use of summary tables will help in their clear presentation and has included additional summary tables in the FEIS.

With respect to including data on specific isotopic contributions to dose, NRC recognizes that actions taken to control one isotope may not be appropriate for another. The majority of wastes, however, contain a mixture of isotopes and not just a single isotope.

Item 3 - The EIS for Part 61 is not a generic EIS for LLW disposal. Rather it is a decision document for the technical requirements that should be applied in the disposal of LLW. As such, many issues generally related to LLW disposal, such as promotion of new disposal sites, may not have been addressed at all or may not have been addressed in detail.

NRC staff agrees the EIS should provide the public with a reasoned insight into the nature, scope and magnitude of relevant issues. In this regard, the staff does not believe the EIS falls so far short of this goal as to render it inadequate as an environmental full-disclosure statement. Further, NRC staff does not believe that LLW disposal can be dismissed as a "non-problem." The commenter's attempts to consider it as such and to relegate LLW disposal to a place among the most innocuous of society's activities are inappropriate.

The EIS should present information and analyses about LLW disposal in an understandable scientific and technical perspective. NRC has tried to improve the public information aspects and method of presentation used in the EIS. The commenter claims that a "misconception" reflected in the EIS--"the oft-assumed dominance of the water pathway"--presents a disservice to the public by the "portrayal of a less than accurate--or, at least, easily misunderstood--picture." NRC staff does not believe it has portrayed a less than accurate or easily misunderstood picture and the commenter, by implying that only a few individual intruders might be exposed is not accurately portraying the full range of exposure pathways accurately. As stated in Section 3.8.2 of the DEIS, the various ways that a person can be exposed to radioactive waste may be divided into three principal categories:

(1) Activities involving the processing and handling of the waste prior to disposal. This would include activities involved in the handling, processing, and packaging of the waste at its point of generation; transport of the waste from the point of generation to disposal; and activities at the disposal facility involving emplacement of the waste at the disposal facility (processing of waste at facilities other than the generating licensee's facility would also be included).

(2) Man contacting the waste after disposal (i.e., intrusion into the disposal facility leading to exposure to disposed waste). This would include activities of man that would lead to his intruding into the disposal facility either purposefully (such as an archeologist in the future

intentionally digging into the sites attempting to reclaim artifacts from the disposed waste) or inadvertently (such as an unknowing individual who might attempt to use the land for reasonable productive purposes in the future--e.g., farming or housing).

(3) The waste entering one of several natural environmental pathways back to man. This would include the potential leaching and transport of the waste through the ground water; intrusion and dispersion by plants and animals; long-term erosion of the site with eventual uncovering of the waste and surface water and air transport; and release of gaseous decomposition products from the waste containing radioactive species (e.g., tritiated methane gas).

The first mode involves primarily short-term considerations and the second and third, long-term considerations.

Later in Chapter 5 of the DEIS, NRC again reviews the various pathways of release to the environment and notes that of these, the most significant pathway is ground-water migration. Gaseous releases do not have a large impact and can be reduced by assuring stable site conditions. Impacts from plant and animal intrusion are site-specific and can be reduced through engineering designs applied to reduce ground-water migration and potential intruder exposures. Erosion is a slow, long-term process which can be controlled through proper siting and good operational techniques.

NRC staff continues to believe that the ground-water migration pathway is probably of most significance in relation to other environmental release pathways and has the potential of exposing the largest number of individuals. In addition, contamination of groundwater has been documented in more than one instance from the disposal of hazardous and solid wastes. As such, it is a real potential pathway of exposure which should be considered, not a hypothetical pathway which might occur in the future, such as inadvertent intrusion.

Item 4 - Summary tables illustrating the results of the numerical "cost-benefit" analysis have been included in the final EIS.

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

February 4, 1982

'82 FEB -9 P4:00

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

DOCKET NUMBER PROPOSED RULE PR-2 et al (46 FR 38081) (116)

DOCKET NUMBER PROPOSED RULE PR-61 (46 FR 51776) (43)

Attention: Docketing and Service Branch

Dear Sir:

The Tennessee Valley Authority (TVA) is pleased to provide comments on the proposed amendments to 10 CFR Parts 2, 19, 20, 21, 30, 40, 50, 51, 61, 70, 73, and 170 concerning licensing requirements for land disposal of radioactive waste as noticed in the July 24, 1981 Federal Register notice (46 FR 38081-38105) and comments on NUREG-0782.

We appreciate the opportunity to comment and our specific comments are enclosed.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Regulation and Safety

Enclosure
cc (Enclosure):
Executive Secretary
Advisory Committee on Reactor Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Mr. Tom Tipton
AIF, Inc.
7101 Wisconsin Avenue
Washington, DC 20555

DS10

Add: R.D. Smith, D. Nussbaumer, Joe Dinogue, P. Goldberg

Acknowledged by card 2/16/82 emp

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2 46FR38081 PDR

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ENCLOSURE

1. Page 38096, last paragraph in column 1--This paragraph would require a licensee (disposal facility operator) to provide financial responsibility for a disposal site even after it has been turned over to a Government agency for long-term institutional care and monitoring. Since the institutional care period could last as long as 100 years, a licensee's money could be tied up for 100 years. We believe it would be preferable to have the licensee turn over the site and any required money at the time that the license is transferred to the Government.

2. 10 CFR 61.41, first sentence--We believe the term "general environment" should be defined and suggest the definition should be similar to the same term in 40 CFR Part 190.

3. 10 CFR 61.51(a)(4)--We suggest changing "prevent" to "minimize" and, in 10 CFR 61.51(a)(6), changing "eliminate" to "minimize."

4. 10 CFR 61.51(a)(7)--We believe this item should be deleted since many activities usually take place at a disposal facility other than disposal of radioactive waste. Some facilities are used for transportation equipment storage, empty container storage, and a center for radwaste services to nuclear plants. This regulation could have a significant impact on present disposal sites and conflicts with 10 CFR 61.11(c)(4).

5. 10 CFR 61.52(a)(4)-(10)--It appears that these regulations apply to Class A, B, and C waste. However, 10 CFR 61.52(a)(2) says that these regulations apply to Class B waste. We believe this should be clarified.

6. 10 CFR 61.52(a)(8)--We believe the designation of a minimum distance of 100 feet for the buffer zone does not appear to be necessary. We support the need for a buffer zone but the distance criteria should be determined by site specific and other factors of the disposal facility to meet the performance objectives of Subpart C of this part.

7. 10 CFR 61.55, Table 1--The limits for some of the isotopes in this table are the same for all three classes of waste. We suggest the regulations should contain statements that any waste containing these isotopes in concentrations exceeding these limits cannot be disposed of at a near-surface disposal facility.

8. 10 CFR 61.55(b)(2) and 61.56(b)-- The stability requirement of at least 150 years for Class B stable waste appears inconsistent with the institutional control period of up to 100 years (see paragraph 61.59(b), page 38097). As discussed in paragraph 61.7(b)(4), page 38091, Class B stable waste contains the ". . .types and quantities of radioisotopes that will decay during the 100-year period to levels that do not pose a danger to public health and safety." Therefore, for waste in this classification, there does not seem to be a need for stability requirements beyond 100 years.

Also, it is not obvious why the stability requirement for Class C intruder waste is given as at least 150 years. This waste classification specifies a maximum concentration of radionuclides so that at the end of 500 years, the remaining radioactivity is at a level that does not pose a danger to public health and safety (see paragraph 61.7(b)(5), page 38091). Therefore, for this waste in this classification, the stability requirements should be for 500 years.

9. 10 CFR 20.311(d)(5)—It appears this regulation requires that a copy of the shipping manifest be sent to the intended recipient (possibly by mail) at the time of shipment. If shipments are sent by truck it is very likely that the truck will get to the disposal facility before the advance copy of the manifest. Therefore, this method would not provide a way of providing prior notification of the intended shipment.

   We believe the substance of the information required by this regulation is already required by the Department of Transportation (DOT). We suggest the procedure be revised to require only the submittal of copies of the material sent to DOT. This requirement should be placed in 10 Part CFR 61 or 10 CFR Part 71 and not 10 CFR Part 20.

10. NUREG-0782, Volume 3, Table E.2, Page E-21—We believe the concentration should be in $\mu g/m^3$ instead of mg/m^3. Also the annual average secondary standard of 60 $\mu g/m^3$ for sulfur dioxide was revoked in 1973. The current annual average primary sulfur dioxide standard is 80 $\mu g/m^3$. Also, this table includes only four of the seven pollutants for which standards have been developed. We suggest inclusion of the remaining three—carbon monoxide, ozone, and lead.

(1)

Docketed Comment Number: 43

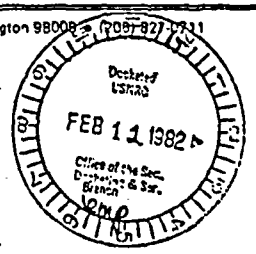
Commenter: Tennessee Valley Authority

Response(s): Item 1 - The staff noted this correction. The reader is referred to Appendix E, Errata in this volume.

PR-61
(41 FR 51776)
PDR

CHEM–NUCLEAR SYSTEMS INC.
P.O. Box 1865 • Bellevue, Washington 98009 • (206) 822-1711

February 9, 1982



44

PR-61
(46 FR 51776)

Mr. R. Dale Smith, Chief
Low Level Waste Licensing Branch
Office of Nuclear Material Safety & Safeguards
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Re: Draft Environmental Impact Statement on 10CFR61, "Licensing Requirements for Land Disposal of Radioactive Waste", NUREG-0872

Dear Mr. Smith:

Our memo to you on January 12, 1982 indicated that we would not be submitting comments on the Draft Environmental Impact Statement (DEIS) on 10CFR Part 61. Subsequent conversations with your staff have indicated that you still have an interest in hearing from us. We have, therefore, put together the following comments in an effort to assist you in writing the final EIS.

- The DEIS is very well done and provides an excellent comprehensive basis for evaluating the requirements of Part 61. From Chem-Nuclear's point of view, there may be somewhat excessive emphasis on past problems in managing low-level waste at the closed sites with a correspondingly conservative set of resulting requirements. We recognize the need to use very conservative scenarios in such an analysis, but hope that it is also understood that careful management and operating practices will avoid the kinds of problems experienced in the past. (1)

- The Draft Statement does, in its methodology, account for the natural decay which occurs for all radioisotopes contained within radioactive waste. Since the final EIS will be a public document, we feel that the introduction (Chapter 1) should contain a rather elementary review of what radioactive decay is and how it affects waste packaging, transport and disposal. (2)

- Section 1.2.2 mentions sea disposal in a discussion of historical and potential alternates for disposal. While we realize that it was done in the past, we feel that future use of ocean disposal poses serious problems of monitoring and control. Any reconsideration of its use should compare it with land disposal in terms of retrievability, environmental monitoring and public perception. (3)

- In Section 1.2.4 you may want to mention the situations where long-term care and maintenance funds were placed in state general funds rather than dedicated, interest-bearing trusts. It is important that future funds be managed separately to insure their availability after site closure. (4)

- In Section 2.4.3.1 we feel that the EIS should directly address pyrophoric and potentially explosive materials which are either contaminated with radioisotopes or are themselves radioactive (e.g., uranium and zirconium chips). (5)

- We feel strongly that DOE and other Government disposal facilities should also be subject to the same requirements for near surface disposal as NRC licenses, since their activities also affect the environment. (6)

- Section 3.4.2.2 should note that a large number of scintillation vials are made of plastic and do not lend themselves to compaction. (7)

- In Section 3.4.3.2 it appears that a straight-line relationship is drawn between waste volume and electrical generation capacity. This does not account for the increase in volume which occurs as reactors get older. (8)

- All assumptions in the EIS regarding the use of urea formaldehyde for solidification should note that this material is no longer an acceptable solidification medium. (9)

- In Section 3.5.1 and elsewhere in the draft, reference is made to the transfer of title for waste from the generator to an intermediary or broker. While current practice is for the generator to pass responsibility for the waste to the broker or operator, legal precedent for actually taking title to the waste is unclear. (10)

- Exposure data for transportation which are discussed in Section 4.3.2 and shown in Table 4.3 indicate higher occupational exposures for such workers than for handling during disposal. Our experience indicates that exposure to transportation workers is only a small fraction of that received by workers involved in disposal operations. (11)

- In Section 4.3.4.1 and elsewhere in the draft, the assumption is made that records may not be available in 100 years. Our society has preserved records, knowingly or not, for over 300 years. The 100 year limit seems overly conservative. (12)

- In Section 5.5.2.3 the use of hypalon membranes is suggested to improve trench caps. Our experience with such membranes showed that when earth fill was placed on such a covered, mounded surface, it would move away from the peak or centerline of the mound, leaving a bare membrane surface. The maintenance costs are high. (13)

- In Section 6.2.1 the implication is made that the potential for airborne releases will be reduced if the number of perimeter air samples is increased. It will in fact only increase the probability of detecting such releases. (14)

- In Section 7.4, Table 7.3 specifies "a stable waste form will maintain its physical dimensions within 5% and its form, under . . . .compressive load of 50 psi . . . .changes." We feel that 50 psi may be overly restrictive in some cases and that the actual pressure should be selected on the basis of the geology and operating parameters for a specific site. (15)

  The statement is also made that "waste which exceeds this concentration (Table 7.2) . . . . is not generally acceptable. . . .this part." The term "generally acceptable" is not clear. Perhaps some words could be added to reflect the possibility that a particularly suitable proposed site may be able to accept those wastes, even though most facilities probably would not. (16)

- Even though Table E.4 in Appendix E reflects 1980 annual salaries, for certain of the staff members they seem to be low by about 20% even without considering inflation. (17)

- In Section 5.2.3 of Appendix E no credit is given for a combination of random and selective placement of wastes in the trench at the reference site. This combination is used at existing facilities resulting in a trench volume use efficiency of from 35 to 50%. (18)

  Pertaining to the same section, vehicle survey results before and after decontamination are documented, although not usually on the RSR. (19)

- In Section 5.2.5.1 of Appendix E the subject of contamination in wounds is discussed. Standard health physics practice requires that potentially contaminated wounds be surveyed for beta and gamma contamination and then receive a separate alpha survey if alpha emitting isotopes are suspected. (20)

- Section 6.3.1 of Appendix E discusses the decontamination and dismantling of site buildings. If a site is operated in compliance with Parts 20 and 61 of 10CFR and the facility license conditions, and if it utilizes accepted health physics practices, the efforts and materials required for decontamination should be minimal. In addition, site buildings could be used for custodial purposes or leased for business purposes. These uses would reduce the projected costs. (21)

- In Section 2.3.3.3 of Appendix F decontainerized disposal is discussed as an option. Such disposal at existing facilities has been limited to bulk wastes with very low activity. The disposal of large volumes of such wastes may be more appropriately conducted at a facility other than shallow land burial if their activity levels are low enough. (22)

- The NRC estimates 1-2 years for site screening and 1-2 years for their review of the license application package. It is critical to the availability of low-level waste disposal capacity in this country that the review period be expedited as much as possible. Considering the 1986 date for excluding out-of-region waste from regional facilities (Low-Level Waste Policy Act, 1980) the 4-5 year site development process faces extreme scheduling problems. We urge the Commission to consider ways in which the review process could be expedited and licenses issued as quickly as possible. As an example, the proposed procedure for tendering a notice of intent to apply for a license should specify a commitment to respond (e.g., 60 days after submittal) to avoid unnecessary delays. (23)

- Although the discussion of funding for institutional control (Appendix Q) does present a low cost scenario, it is still probably considerably higher than would be the case if improved operating and closure procedures were employed during the life of the site. The discussion does mention that the costs for the low cost scenario may be conservatively high. We would recommend increased emphasis on this qualifying statement. (24)

- Staff operating costs in Appendix Q are based on 70 employees. We understand that the reference facility represents a site that can meet minimum regulatory requirements, but feel that an estimate of 100 people would more accurately represent operating needs for a site receiving 1.7 million cubic feet of waste per year. Environmental monitoring costs also appear to be low. Site monitoring, the offsite environmental program, and personnel monitoring would total about $300,000 per year if sent out for third party contractual analysis. (25)

- Appendix Q readily admits than an investment in a disposal site is a risky proposition for an investor. In order to compensate the investor for this high risk, a high return on the financial investment is required. This return should not be based on a "cost plus" philosophy as in the NRC study. Instead, it should be based on the time value of money (TVM). The TVM concept implies that a dollar invested in the first year of a 20-year period is not equal in value to a dollar or profit returned in year 20. The investor must demand substantially more than a dollar in return because of the economic, business, and financial risks that are incurred each year. (26)

  The disposal price for receiving wastes at a new facility must be set at a rate which compensates the investor for the risks involved. This price should be such that the net present value of the cash flow equals zero at the risk-adjusted rate of return.

- Section 3.4.3.2 discusses the projected growth in non-fuel cycle waste based on existing data. The increasing costs of disposal and transportation to distant sites have provided the incentives to find ways to generate less waste, to reduce the volumes that are generated, and to make maximum use of NRC's new rule on scintillation fluids and animal carcasses. It is not clear whether this trend has been factored into the waste projections. (27)

- In Section 3.6.5 the reference facility costs include 200 acres of land which is calculated to be adequate for the site lifetime. This assumes that essentially all of the site can be used for disposal, a situation which we expect is rare in much of the country. Chem-Nuclear would suggest the purchase of 400-500 acres of land to provide for unusable areas (e.g., due to topography) to allow wider buffer zones, and to give flexibility in the event the waste projections are underestimated. This section also assumes $1200/acre, a price which is probably low for many sections of the country. (28)

- Section 4.3.5.2 examines the alternative of thicker disposal cell covers by adding 3 meters of over burden. Consideration should be given to the effect of this on the water table. Experience at Oak Ridge National Laboratory found that raising the surface elevation caused the water table to also rise to follow the topography. This practice could cause the groundwater pathway to become a greater concern. (29)

- In Section 5.2.4.8 what is the difference between the assumptions for Case 10A and Case 10B? They appear to have the same waste spectra and designs. (30)

We believe that these comments will assist you in the preparation of the final EIS. Please contact me if you have questions, or would like additional clarification.

Sincerely,

CHEM-NUCLEAR SYSTEMS, INC.

Leslie K. Poppe
Corporate Health Physicist

LKP:slj

Docketed Comment Number: 44

Commenter: Chem-Nuclear Systems, Inc.

Response(s): Item 1 - The staff believes that the emphasis placed on past problems at closed waste disposal sites in the DEIS is both appropriate and necessary to establish a historical framework of the need for the proposed action and to identify the types of problems which have occurred and could occur again without proper safeguards. The staff does not believe the emphasis to be undue, nor does the staff believe it has resulted in overly conservative requirements. The performance objectives and technical requirements were developed through independent analyses which considered both benefits and costs in arriving at a reasonable regulation.

Item 2 - The staff has assumed a basic level of knowledge with respect to the structure of matter, radioactive decay and other related subjects on the reader's behalf in preparing this document. In Chapter 2.0 of the FEIS the lay reader is referred to appropriate works which provide a discussion of these subjects adequate for the purposes of understanding the FEIS.

Item 3 - Section 1.2.2 discusses ocean disposal in its historical context, but does not evaluate its acceptability as an alternative disposal method. In Section 2.3, ocean disposal is briefly discussed as an alternative to land disposal and it is noted that jurisdiction over ocean disposal rests not with NRC, but rather with the U.S. Environmental Protection Agency. The benefits and liabilities of this disposal method are, therefore, not appropriate subjects for further discussion in this FEIS.

Item 4 - The staff agrees with the commenter's observation and has incorporated this suggestion in the FEIS.

Item 5 - These aspects were generally addressed in the DEIS regarding handling and worker safety. NRC staff believes that wastes containing such materials should be excluded from disposal facilities due to concern for general handling safety.

Item 6 - Presently, DOE disposal facilities for the disposal of LLW are exempt from NRC and Agreement State regulatory jurisdiction. NRC recognizes the comment and notes that legislation would be required.

Item 7 - The staff recognizes the difficulty which the commenter is alluding to. This comment, however, does not affect the analysis of the EIS.

Item 8 - As the commenter states, a linear relationship has been assumed between the electrical generation capacity of nuclear power plants and the volume of waste generated by the plants. However, NRC staff does not believe that this assumption leads to nonconservative results. For one thing, data which was principally used to estimate volumes of waste generated by nuclear power facilities was based upon a survey of a number of different power plants of varying ages (Reference 18). Thus, the effects of the tendency for older plants to generate larger volumes of waste was already considered to a certain extent.

More importantly, perhaps, the electrical generating capacity projected in the draft EIS to the year 2000 was estimated in a very conservative manner. In NRC's estimates of the projected capacity by the year 2000, two scenarios were considered: a "low" scenario and a "high" scenario (Reference 3). The "low" scenario assures that construction continues on power reactors which are already under construction but that any additional construction of power reactors essentially ceases until at least the late 1980's. The "high" scenario assumes that all facilities either planned or deferred indefinitely as of December 31, 1979 are constructed. These two scenarios resulted in a projected capacity by the year 2000 of 146,000 Mw(e) and 169,000 Mw(e), respectively. The high scenario was assumed for the draft EIS, although it was recognized at the time that it was very likely an overestimate of actual capacity by the year 2000.

This viewpoint has been confirmed by a number of more recent events. Since the development of the high scenario, a number of nuclear power plants which were either planned or under construction have been cancelled, deferred, or delayed. A partial list includes, for example:

- North Anna-4 (901 Mw(e) PWR): cancelled
- Allens Creek (1150 Mw(e) BWR): delayed
- WNP-4 (1218 Mw(e) PWR): cancelled
- WNP-5 (1242 Mw(e) PWR): cancelled
- Hartsville-B1 (1233 Mw(e) BWR): construction deferred
- Hartsville-B2 (1233 Mw(e) BWR): construction deferred
- Yellow Creek-2 (1285 Mw(e) PWR): construction deferred
- Bailley (644 Mw(e) BWR): cancelled
- Callaway-2 (1120 Mw(e) PWR): cancelled
- Sharon Harris-3 (900 Mw(e) PWR): cancelled
- Sharon Harris-4 (900 Mw(e) PWR): cancelled
- Hope Creek-2 (1067 Mw(e) BWR): cancelled
- Pilgrim-2 (1150 Mw(e) PWR): originally listed as "deferred," now cancelled.

In addition, the schedules for completing many of the other power plants under construction has slipped.

Thus, NRC expects that the use of the high scenario will give a very conservative estimate of the electrical generating capacity, and thus give a very conservative estimate of the volume of waste likely to be generated by nuclear power stations.

Item 9 - Urea-formaldehyde (UF) has been used as a solidification agent for liquid radioactive wastes. In 1979 the State of Nevada prohibited the acceptance of urea-formaldehyde at the Beatty facility. In 1981 both the States of South Carolina and Washington also prohibited its acceptance. Urea-formaldehyde was prohibited at the three commercial disposals due to its inability to consistently produce a solidified product which would meet the disposal site free-standing liquid requirements.

A statement regarding the prohibition of UF has been added to the FEIS to address this item.

Item 10 - The transfer of title is a legal issue that is independent of responsibilities assigned in the proposed rule. The staff was not trying to set legal precedent. Other forums exist for addressing title

such as contracts or leases between disposal facility operators and the landowner.

Item 11 - As stated by the commenter, exposures to transportation workers are typically a small fraction of those received by workers involved in disposal operations. One of the main reasons for this is that transportation workers generally do not perform unloading and disposal activities at disposal sites. However, the transportation impacts calculated for the draft EIS include the following components: loading operations at the waste generator's facility, transport to the disposal site, and time spent at the disposal site during unloading. Of these three, loading operations at the waste generator's facility contribute the largest exposures.

Item 12 - NRC did not intend to imply that records would only last for 100 years. NRC has assumed that active institutional controls can only be relied on for 100 years. They may last much longer. NRC has also assumed that other passive institutional controls such as government land ownership, records and deed restrictions would last for a much longer period of time than 100 years. NRC believes this is adequately addressed in Section 4.3.6 of the DEIS.

Item 13 - The question raised with respect to movement away from the mounded crest is dependent largely on the degree of slope and soil erosion. The observation is valid but would have to be considered on a site-specific basis. Part 61 does not require the use of moisture or infiltration barriers. Such barriers were considered as an alternative but were rejected because of concern for their long-term viability.

Item 14 - The commenter's observation is accurate and has been reflected in Appendix E, Errata, of this volume.

Item 15 - The requirement that a stable waste form maintain its physical dimensions within five percent under a 50 psi compressive load was intended to ensure that degradation of waste containers and waste forms would not lead to severe trench subsidence. The five percent value was selected as a conservative deformation level which would be expected to produce only minor subsidence effects. These minor subsidence effects could be easily resolved by an inexpensive post-closure maintenance program at the burial site.

The NRC staff believes that trench subsidence needs to be carefully controlled in order to minimize water infiltration and major remedial care operations. In order to achieve this objective in a pragmatic way, the NRC staff has chosen to delete from the rule the prescriptive requirement for a five percent dimensional limit. The requirement that wastes remain structurally stable, however, remains in place. In order to provide guidance to waste generators on acceptable waste forms the NRC staff is preparing a Branch Technical Position (BTP) which defines acceptable test methods and criteria oriented to ensuring structural stability. The 50 psi limit for solidified waste forms will remain in the BTP as a value that would assure compliance but not a requirement.

In addition to the BTP, 10 CFR 61 Section 61.52(a)(4) and 61.52(a)(5) requires that wastes be emplaced to maintain package integrity and that void spaces be filled to reduce subsidence. The filling of void spaces will minimize the creep effects in asphalt or polymeric solidified products since lateral stability will be provided by the fill material. If there are no voids, there will be no space for viscoeleastic wastes to flow into.

Item 16 - In the final EIS, NRC has emphasized the concept set out in §61.58 that wastes exceeding the Class C limits may be acceptable given special treatment or disposal at greater depths or with special facility designs.

Item 17 - Based upon input from the commenter, the staff members for which unusually low salaries were originally estimated were identified. Appropriately higher salaries were assigned to these staff members as listed below:

Occupation	Salary originally assumed	Modified salary
QA technician	$14,000	$25,000
Radiation safety technician	$15,000	$25,000
Security personnel	$12,000	$18,000
Waste shipment scheduler	$16,000	$20,000
QA and safety supervisor	$26,000	$30,000
Site manager	$40,000	$45,000

These revised salaries were used in the calculations performed for the final EIS. Use of the modified salaries has not altered the overall conclusions reached in the draft EIS but have been included in the interest of completeness and accuracy.

Item 18 - As the commenter states, at existing disposal facilities a combination of stacked and random disposal is generally used. Typically, waste packages having rectangular dimensions are stacked in place (e.g., wooden boxes, steel bins) to conserve trench space, while low activity drummed waste is generally disposed in a random manner to reduce radiation exposures to site personnel. Higher activity waste in drums and large cylindrical waste containers such as resin liners are generally stacked or at least emplaced carefully to reduce the potential hazard to site personnel. This results in a trench use efficiency which varies depending upon the particular mix of waste received during the filling of a particular trench. A good rule of thumb with this waste emplacement technique is a volume use efficiency of about 50%.

NRC did not consider relatively small variations in trench use efficiency in the draft EIS. This was believed to be in keeping with the scope of the EIS which is to help determine overall requirements for waste disposal in the Part 61 regulation. For the purposes of the EIS, then, two general alternatives for waste emplacement were considered. One, termed "random" disposal, assumed the existing practice by which some waste is stacked and some is disposed randomly. A volume use efficiency of 50% was assumed for this alternative, consistent with current experience. The second alternative, termed "stacked" disposal, assumed neat stacking of all waste containers. A volume use efficiency of 75% was assumed for this alternative, coupled with a higher level of personnel exposures at the site.

The commenter's point regarding a factual description of waste disposal operations at a typical facility may be addressed in Appendix E by deleting the first two sentences in the first paragraph of Section 5.2.3 (p. E-47) and replacing these two sentences with a new paragraph consisting of the following:

> Waste is emplaced in the trench, and backfilled with dirt removed during trench excavation. Typically, waste packages are emplaced with the aid of construction equipment such as cranes and forklifts, using a combination of stacked and random disposal. Waste packages such as wooden boxes or steel bins having rectangular dimensions are generally stacked in place while low activity drummed waste is generally emplaced in a more random manner. Special care is taken during emplacement of higher activity waste such as high activity ion exchange liners to ensure operational safety. This combination of random and stacked disposal is termed "random disposal" in this EIS (to distinguish it from a placement alternative of fully stacked disposal: see Appendix F) and results in a trench volume efficiency of about 50%.

Item 19 - Disposal sites may have different recording practices. Some record the vehicle survey results on the shipment manifest (e.g., the radioactive shipment record, or RSR) and some record the survey results on a separate form. This point may be generalized in Appendix E of the DEIS by modifying the last sentence in Section 5.2.3 (p. E-98) so that it reads as follows: The results of the survey are recorded.

Item 20 - This point may be clarified in Appendix E of the DEIS by modifying the next to last sentence in the next to last paragraph (p. E-50) of Section 5.2.5.1. as follows: "If through a site accident, a worker may receive an open wound and the wound is suspected of having become contaminated, a radiation survey is also performed. The survey is performed for beta and gamma contamination, and also for alpha contamination if alpha emitting isotopes are suspected."

Item 21 - The consideration of cost of building demolition was estimated for the draft EIS based upon the cost for building demolition estimated by Chem-Nuclear Systems, Inc. as part of their preliminary site closure and stabilization plan for the Barnwell disposal site (Reference 13). In this closure and stabilization plan, an estimate of $525,000 was made for decontamination and demolition of most of the onsite buildings (some would be left standing for use by the site owner following license termination), conservatively assuming that a private contractor was hired to perform these services. Recognizing that CNSI carries out a number of additional activities at the Barnwell facility besides waste disposal (e.g., truck, transporter and cask refurbishment, mobile solidification units, development of solidification agents), a building demolition cost of $300,000 was estimated for the reference disposal facility.

It should be recognized that actual closure costs such as building decontamination and demolition costs would be specific for a particular site and should be evaluated specifically for that site. Whether or not the assumed decontamination and demolition costs for the reference disposal facility are overconservative does not change the essential conclusions reached in the draft EIS regarding the need to consider and plan for facility closure prior to site licensing and the need to assure that funds will be available to carry out closure activities. In the interest of completeness, however, these costs have been reduced to $200,000 for the final EIS. This change does not alter the conclusions reached in the EIS but is reflected in the cost/benefit analyses and estimates of unmitigated impacts.

Item 22 - NRC staff agrees with this comment and believes the disposal of such wastes can be individually evaluated for disposal on site at the point of generation or at a central facility such as a sanitary landfill.

Item 23 - The staff is in fact considering methods of expediting the review process and certain changes to the licensing procedures of the rule have been made to achieve this end. While no new LLW disposal facility has been recently licensed, NRC staff believe that if an applicant takes action in the pre-application phase to involve the local community, the public and the state (and/or compact), prepares a detailed and complete application, and promptly responds to additional information needs, it may be possible to license such a facility in a time frame of about 15 months.

Item 24 - In Appendix Q and for purposes of the EIS analysis, NRC staff assumed three cost scenarios corresponding to three levels of long-term care: a low cost level, a moderate cost level, and a high cost level. These levels were used to help assess the potential long term costs of various waste management alternatives. As the commentor states, NRC staff believes that the estimated costs corresponding to the low level of long-term care may be conservatively high. Perhaps one of the reasons for this is that most of the experience with waste disposal has been with high levels of long-term costs resulting from site stability and subsidence problems. Less experience has been gained with potential long-term costs associated with stable site conditions.

Item 25 - The reference site staffing (70 employees) was not intended in all cases to represent a disposal facility which can meet minimum regulatory requirements. One of the purposes of the draft EIS was to examine the long-term consequences of unstable waste and disposal unit conditions as well as analyze the effects of many of the improvements that have been implemented at disposal sites over the past several years. As the commenter has stated earlier in this comments, the analysis in Chapter 5 of the DEIS examines some past practices and the reference case in Chapter 5 corresponds more to operating practices of several years ago then to currently operating practices. As discussed above, this was deliberate.

In any case, the assumed personnel level of 70 employees at the reference disposal facility is meant to represent the minimum staff needed to comply with the existing safety requirements of 10 CFR Part 20. The minimum personnel level projected to meet the disposal facility stability and long-term environmental impact requirements proposed in 10 CFR Part 61, however, would be larger. NRC's analysis considers the additional personnel requirements associated with typical site operations which would be required to improve site stability and reduce groundwater releases. Many of these typical site operations are being carried out today.

Another point is that the commenter's site operations include several activities which are not directly related to waste disposal. They include, for example, delivery vehicle refurbishment and routing, mobile solidification operations, and development of new solidification agents. NRC staff is not sure if this has been fully recognized by the commenter.

In any case, the basis for the comment was requested by NRC staff and was provided by the commentor. Based upon discussions with the commenter, the base number of site employees has been raised to 80. The job functions, salaries, and impact on total operating costs are addressed in Appendix D of this volume.

Environmental monitoring costs have been reevaluated and a revised level included in the analysis.

Item 26 - The cost analysis has been modified to consider the time value of money concept. This has been done for the sake of completeness and accuracy. The overall conclusions reached for the Part 61 rule, however, have not been altered.

Item 27 - In the analysis, NRC first considered a "base case" projection of wastes generated from both fuel cycle and non-fuel cycle sources. In this base case, termed "waste spectrum 1," waste volumes generated by fuel cycle sources were linked to electrical generating capacity, while waste volumes generated by non-fuel cycle sources were generally based upon a linear projection from a number of existing data sources. Subsequent waste spectra considered the effects on waste volumes, radionuclide concentrations, waste stability, etc. from various waste processing alternatives. These alternatives included use of different waste solidification media, use of improved liquid waste evaporation techniques, compaction of compressible waste, incineration of compressible waste and ion exchange media, and use of high integrity containers. Thus, the effects of volume reduction were considered in the analysis.

NRC also briefly examined the possible effects of the recent modifications to 10 CFR Part 20 to allow disposal by less restrictive means of less than .05 μCi/gm of tritium and carbon-14 contained in liquid scintillation fluids and animal carcasses. The modification was determined to not alter NRC's conclusions regarding the draft Part 61 rule.

It is true that increased disposal costs have encouraged many waste generators to reduce waste volumes through waste minimization techniques as well as volume reduction techniques such as compaction. One way to account for this would be to assume a curved rather than a linear waste volume generation rate. That is, as time passes, the rate of volume increase would lessen. NRC did not take this approach, however, as the increased complexity did not seem to be warranted by any potential improvements in the analytical results. Unlike fuel cycle wastes, non-fuel cycle wastes are not linked to electrical generating capacity. Compared to fuel cycle sources, non-fuel cycle sources are much more numerous and the levels of use of volume minimization and reduction techniques much more difficult to assess. In addition, much of the waste is generated by small entities such as hospitals, universities, research facilities, and radioisotope manufacturers. Uses of radioisotopes may change, new manufacturing facilities may be built, etc.

For purposes of determining requirements for waste disposal in the Part 61 rule, then, it was believed to be sufficient to assume a linear growth relationship for fuel cycle waste. This approach is believed to be reasonable considering the level of data and at the same time conservative with respect to impacts from waste disposal.

Item 28 - Although the reference facility costs did include purchase of 200 acres of land, only about 140 acres was actually assumed to be used for the disposal. Thus, some consideration was given in the draft EIS to the possibility of unstable areas and to flexibility. Also, the precise amount of land purchased and the price paid for the acreage are not significant as far as the final conclusions reached.

For completeness, however, the assumed acreage purchased for the reference facility has been raised to 400 acres and at an assumed price of $1400/acre. As the commenter states, the larger acreage provides for wider buffer zones than assumed for the reference facility and gives some additional flexibility in operations.

Item 29 - The comment is well-taken. Areas where significant thicknesses of fill will be placed will be evaluated on a site-specific basis for water table rises. Native cohesionless soils will not typically experience the response observed at Oak Ridge. In addition, a capillary barrier can be installed under the thick fill to prevent a rise in the water table.

Item 30 - The commenter's observation is accurate. The text in Section 5.2.4.8 contained a typographical error which indicated that Waste Spectrum 2 should be assumed for Case 10A: The text should have stated that Case 10A assumed Waste Spectrum 1. This has been noted in Appendix E, Errata, in this volume.

Docketed Comment Number: 45

Commenter: Atomic Energy of Canada, Limited.

Response(s): This comment was inadvertently docketed for both the rule and the EIS, although the comment addressed only the rule. The commenter's concerns were reviewed and responded to in the development of the final rule.

PR-61
46 FR 51776

STATE OF NEW MEXICO
DEPARTMENT OF FINANCE AND ADMINISTRATION
STATE PLANNING DIVISION
505 DON GASPAR AVENUE
SANTA FE, NEW MEXICO 87503
(505) 827-2073
(505) 827-3191
(505) 827-2108

BRUCE KING
GOVERNOR
KATHLEEN R. MARR
SECRETARY

ANITA HISENBERG
DIRECTOR
JOE GUILLEN
DEPUTY DIRECTOR

'82 FEB 19 P2:51

December 22, 1981

(46)

DOCKET NUMBER
PROPOSED RULE PR-61
(46 FR 51776)

U.S. Nuclear Regulatory Commission
Division of Technical Information and
Document Control
Washington, D.C. 20555

Dear Sirs:

This is to inform you that neither our office nor the Environmental Improvement Division have any comments on the draft environmental impact statement on 10 CFR, Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste."

Sincerely,

Betsy Reed
Betsy Reed
Planning Bureau

BR:jeh

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R. Dale Smith
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PLANNING DIVISION
(STATE CLEARINGHOUSE)
REVIEW CERTIFICATION FORM

MIS 6

STATE PLANNING DIVISION
DEPT. OF FINANCE & ADMINISTRATION
505 DON GASPAR
SANTA FE, NEW MEXICO 87503
(505) 827-2073

TO: Nuclear Regulatory Commission

DATE: January 20, 1982

SUBJECT: ☐ PRELIMINARY REVIEW ☐ FINAL REVIEW Draft ☐ STATE/AREA PLAN ☒ ENVIRONMENTAL IMPACT STATEMENT

PROJECT TITLE: DEIS Licensing Requirements for Land Disposal of Radioactive Waste

APPLICANT: Nuclear Regulatory Commission

SAI NUMBER: NM 82 11 17-015 FEDERAL CATALOG NUMBER: 77.000

FEDERAL AGENCY: Nuclear Regulatory Commission

PROPOSED FUNDING (PER 424 FORM)

	AMOUNT
FEDERAL	$
APPLICANT	
STATE	
LOCAL	
OTHER	
TOTAL	

FOR FINAL APPLICATION ONLY:

REVIEW RESULTS:

X The application is supported.
___ The application is not in conflict with State, Areawide or Local plans.
___ Comments are attached for submission with this application.

LEAD AGENCY REVIEW COORDINATOR — AGENCY: State Planning Division

TO THE APPLICANT:

You may now submit your application package, this form and all review comments to the Federal or State Agency(s) from whom action is being requested.

Please notify the Planning Division (Clearinghouse) of any changes in this project. Refer to the SAI number on ALL correspondence pertaining to this project.

STATE CLEARINGHOUSE — DATE 1/20/82

STATE PLANNING DIVISION DIRECTOR — DATE 1/20/82

Approved July, 1979
Secretary, DFA

White: to Applicant.
Green: for Federal Agency.
Canary: SPD Copy.
Pink: Lead Agency.
Goldenrod: Federal Funds Tracking.

PLANNING DIVISION
(STATE CLEARINGHOUSE)
MIS-4
Review and Comment

DATE: 11-23-81

TO: Martin Castillo
Environmental Improvement Division

FROM: Betsy Reed, Planning Bureau

RE: NM 82 11 17-015 (SAI NUMBER) Draft Environmental Impact Statement - Licensing Requirements (PROJECT TITLE) for Land Disposal of Radioactive Waste

Planning Division
LEAD AGENCY

Please review and comment on the above application and return to the sender by 12-31-81

1. Does this plan duplicate any programs which have similar goals and objectives to the proposed application?
   _____Yes (If yes, please identify these programs.)
   _____No

2. Does the proposed application conform with a comprehensive plan developed for the area in which it is located?
   _____Not applicable
   _____Yes
   _____No (If no, please explain in what way it is not compatible.)

3. Does the proposed application conflict with any applicable statute, order, rule, or regulation (federal, state or local?
   _____Yes (If yes, please cite the conflicting statute, order, rule or regulation.)
   _____No

4. Describe any suggestions or means of improving or strengthening the proposed application.

__X__ No ~~[illegible]~~ comment on, this project.
_____Proposal is supported.
_____Proposal is supported with recommendations.
_____Proposal is not supported.
_____Further information needed, review suspended and applicant notified of request.
_____Comments attached.

On the basis of my review, I have indicated my response and/or recommendations above.

[signature]
Signature of Reviewer

ENVIRONMENTAL REVIEW COORDINATOR
Title

DECEMBER 4, 1981
Date

ENVIRONMENTAL IMPROVEMENT DIVISION
Agency

Approved July, 1979
Secretary, DFA

1 - white - to applicant
1 - yellow - SPD
2 - pink
1 - lead agency
1 - review division

OMB Approval No. 29-R0218

FEDERAL ASSISTANCE

2. Applicant's application — a. Number: — b. Date: 19 Year Month Day
3. State application identifier — a. Number: NM 82 11 17-015 — b. Date Assigned: 19 81 11 17

1. Type Of Action (Mark appropriate box): ☐ Preapplication ☒ Application ☐ Notification Of Intent (Opt.) ☐ Report Of Federal Action
Leave Blank

Section I - Applicant / Recipient Data

4. Legal Applicant/Recipient
a. Applicant Name: US Nuclear Regulatory Commission
b. Organization Unit:
c. Street/P.O. Box:
d. City: Washington
e. County:
f. State: D. C.
g. Zip Code: 20555
h. Contact Person (Name & telephone no.):

5. Federal Employer Identification No.

6. Program (From Federal Catalog) — a. Number: 77ddd — b. Title: Nuclear Regulatory Commission

7. Title and description of applicant's project
DEIS Licensing Requirements for Land Disposal of Radioactive Waste

Action being considered in this EIS is the issuance of a new regulation, part 61, to the Us-NRC rules Title 10 code of CFR. Part 61 will provide licensing procedures, performance objectives of "low-level" radioactive waste.

8. Type of applicant/recipient (Specify): Federal — Enter appropriate letter: A
A-State B-County C-City D-Special Purpose District E-Commercial Agency F-Higher Education G-Individual H-Profit Org. I-Indian Tribe J-Other

9. Type of assistance: A-Basic Grant B-Supplemental Grant C-Loan D-Insurance E-Other — Enter appropriate letter(s): A

10. Area of project impact (Names of cities, counties, states, etc.): Statewide
11. Estimated number of persons benefiting:
12. Type of application: A-New B-Renewal C-Revision D-Continuation E-Augmentation — Enter appropriate letter: A
13. Proposed Funding
a. Federal $ .00
b. Applicant .00
c. State .00
d. Local .00
e. Other .00
f. Total $ .00
14. Congressional Districts Of:
a. Applicant: 01 - 02
b. Project: 01 - 02
15. Project Start Date: 19 82 01 01
16. Estimated date to be submitted to federal agency: 19 81 12 17
17. Project Duration: 12 Months
18. Estimated date: Year month date
19. Existing federal identification number
20. Federal agency to receive request (Name, city, state, zip code): Nuclear Regulatory Commission
21. Remarks added: ☐ Yes ☐ No

Section II - Certification

22. The Applicant Certifies That
a. To the best of my knowledge and belief, data in the preapplication/application are true and correct, the document has been duly authorized by the governing body of the applicant and the applicant will comply with the attached assurances if the assistance is approved.
b. If required by OMB Circular A-95 the application was submitted, pursuant to instructions therein, to appropriate clearinghouses and all responses are attached:

	No response	Response attached
(1)	☐	☐
(2)	☐	☐
(3)	☐	☐

23. Certifying representative — a. Typed name and title — b. Signature — c. Date signed: Year month day 19

Section III - Federal Agency Action

24. Agency name
25. Application received: Year month day 19
26. Organizational Unit
27. Administrative office
28. Federal application identification
29. Address
30. Federal grant identification
31. Action taken: ☐ a. Awarded ☐ b. Rejected ☐ c. Returned for amendment ☐ d. Deferred ☐ e. Withdrawn
32. Funding
a. Federal $ .00
b. Applicant .00
c. State .00
d. Local .00
e. Other .00
f. Total $ .00
33. Action date: Year month day 19
34. Starting date: Year month day 19
35. Contact for additional information (Name and telephone number)
36. Ending date: Year month day 19
37. Remarks added: ☐ Yes ☐ No
38. Federal agency A-95 action
a. In taking above action, any comments received from clearinghouses were considered. If agency response is due under provisions of Part 1, OMB Circular A-95, it has been or is being made.
b. Federal Agency A-95 Official (Name and telephone number)

424-101

Standard Form 424 Page 1 (10-75)
Prescribed by GSA, Federal Management Circular 74-7

(ALSO PLEASE COMPLETE REVERSE SIDE)

Docketed Comment Number: 46

Commenter: State of New Mexico, Department of Finance and Administration, State Planning Division

Response(s): This comment was docketed and reviewed by the staff. No items were found in the comment which require a response.

PR-61
46 FR 51776

TEXAS ENERGY AND NATURAL RESOURCES ADVISORY COUNCIL
200 EAST 18TH STREET, AUSTIN, TEXAS 78701

February 12, 1982

(47)

DOCKET NUMBER
PROPOSED RULE PR-61
(46 FR 5177

Mr. Dale Smith
Division of Waste Management
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Smith:

The Texas Energy and Natural Resources staff has reviewed the Draft Environmental Impact Statement for the "Licensing Requirements for Land Disposal of Radioactive Waste" and has no comment to make. This agency, however, appreciates the opportunity to review and comment on this report. It is obvious that a great deal of time and effort were necessary to produce it.

If I can assist you in any other way, please feel free to call.

Sincerely,

Edward Selig
Executive Assistant

Enclosure

ES:iml

Docketed Comment Number: 47

Commenter: Texas Energy and Natural Resources Advisory Council

Response(s): This comment was docketed and reviewed by the staff. No items were found in the comment which require a response.

PR-61
46 FR 51776

TEXAS DEPARTMENT OF WATER RESOURCES
1700 N. Congress Avenue
Austin, Texas

TEXAS WATER DEVELOPMENT BOARD
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February 23, 1982

(48)

DOCKET NUMBER
PROPOSED RULE PR-61
(46 FR 51776)

Mr. R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Smith:

Re: U.S. Nuclear Regulatory Commission (NRC)...Draft Environmental Impact Statement (DEIS) on Proposed 10 CFR Part 61, Relative to Federal Licensing Requirements for the Land Disposal by Shallow Land Burial and Alternative Disposal Methods of Low-Level Radioactive Waste. (NUREG-0782, Volumes 1-4), September 1981.

Pursuant to instructions received by this Department on January 18, 1982, from the Governor's Budget and Planning Office, we have reviewed the referenced document from the standpoint of our statutory statewide responsibilities relative to water resources planning, development, conservation, and management, under the Texas Water Code and the Texas Administrative Code. We hereby submit directly our review comments, as requested. Therefore, we have directed our staff review to the following portions of the proposed regulations, 10 CFR Part 61 (46 FR July 24, 1981, pp. 38081-38105), insofar as they relate to water resource matters:

Supplementary Information Section V.C. (Summary of Rule--Minimum Technical Requirements):

Disposal Site Suitability Requirements.
Disposal Site Design.
Land Disposal Facility Operation.
Disposal Site Closure Requirements.

Subpart D (Technical Requirements for Disposal Facilities):

Section 61.13 (Technical Analyses).
Section 61.50 (Disposal Site Suitability Requirements for Land Disposal).
Section 61.51 (Disposal Site Design for Land Disposal).
Section 61.52 (Land Disposal Facility Operation and Disposal Site Closure).

We offer the follcwing staff review comments:

1. The above-listed portions of the proposed regulations provide adequate criteria, guidelines, and policies for achieving a comprehensive evaluation of the potential impacts of proposed low-level radioactive waste disposal facilities on local water sources, to ensure the selection of sites that will afford the effective exclusion, isolation, and containment of the waste from aqueous pathways to the biosphere.

2. We feel that insofar as water quality protection considerations are concerned, the proposed regulations will, together with present and anticipated new implementing State regulations to be promulgated by the Texas Department of Health, and/or by the Texas Low-Level Radiation Waste Disposal Authority (creation authorized in S.B. 1177 of the 67th Legislature of the State of Texas, effective June 1, 1981), will provide the required consistent Federal and State criteria, guidance, and standards for the timely, comprehensive consideration of State water resource protection. We understand that the above-mentioned two State agencies have the primary responsibility for implementing the proposed 10 CFR Part 61, for the State of Texas, as an "Agreement State" under the provisions of 10 CFR Part 150. Also, we understand that this Department will be required to participate in the governmental interagency review of disposal facility site selection determinations, and facility project plans and specifications, to the extent of certifying the potential water quality impacts thereof. We offer the following suggested additions to the technical water-related guidelines in the regulations:

   a. Guidance on the interim or temporary emergency storage of the wastes, as distinct from the permanent disposal of waste, in the event of a temporary, unavoidable denial of the permanent disposal facility due to equipment malfunctions or other unforeseen events.

b. Policy guidance on determinations which must be made regarding the best allocation of activities which can be sanctioned in the vicinity of any selected temporary storage or final waste disposal facility site, from the standpoint of public health, safety, and welfare.

c. Guidance regarding the identification and plotted map locations of springs, sinkholes, swamps, mines, pits, quarries, deep waste-injection wells, water wells, test borings, excavations, monitoring wells, pipelines, and other underground facilities.

3. We feel that the referenced DEIS adequately fulfills the administrative, analytical, and coordinative requirements of Section 102(2)(C) of the National Environmental Policy Act of 1969, and the implementing regulations, 40 CFR Parts 1500-1508.

We appreciated the opportunity to review and comment on the referenced document and the related proposed 10 CFR Part 61. Please advise if we can be of further assistance.

Sincerely yours,

Harvey Davis
Executive Director

Docketed Comment Number: 48

Commenter: Texas Department of Water Resources

Response(s): This comment was docketed and reviewed by the staff. No items were found in the comment which require a response.

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

R. H. LEASBURG
VICE PRESIDENT
NUCLEAR OPERATIONS

March 9, 1982

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

(49)

Serial No. 138
NO/ERS,Jr.:acm

NET NUMBER
PROPOSED RULE PR-61
(46 FR 51776)

Dear Sir:

We have reviewed the comments provided to you by the Atomic Industrial Forum, Inc. and by the Utility Nuclear Waste Management Group. These comments were for proposed rulemaking (46FR51776) dealing with 10CFR61 and NUREG-0782. We are in agreement with those comments.

Very truly yours,

R. H. Leasburg

Acknowledged by card. 3/16/82 amp

Docketed Comment Number: 49

Commenter: Virginia Electric and Power Company

Response(s): This comment was docketed and reviewed by the staff. The submittals which the commenter references--those of the Atomic Industrial Forum and the Utility Nuclear Waste Management Group--have been responded to by the staff. No additional items were found in this comment which require a response.

U.S. Department of Energy
ARGONNE NATIONAL LABORATORY
9700 South Cass Avenue, Argonne, Illinois 60439

Telephone 312/972-6677

March 4, 1982

46 FR 38081 (WM-4) and 46 FR 51776 (121)

DOCKET NUMBER PROPOSED RULE PR-2 et al (46 FR 38081) (50)

DOCKET NUMBER PROPOSED RULE PR-61 (46 FR 51776)

Mr. G. W. Roles
U. S. Nuclear Regulatory Commission
Mail Stop SS-197
Washington, D. C. 20555

Dear Mr. Roles:

Subject: Comments by Argonne National Laboratory on Environmental Monitoring Costs in Draft EIS on 10 CFR Part 61

Reference: Ltr. J. H. Kittel to R. Dale Smith, "Comments by Argonne National Laboratory on NRC Proposed Licensing Requirements for Land Disposal of Radioactive Waste (10 CFR 61), and supporting Environmental Impact Statement (NUREG 0782)" December 14, 1981.

In response to your recent telephone inquiry, attached are the environmental monitoring cost estimates developed by Argonne National Laboratory for a reference LLW disposal site. These estimates formed the basis for our comments in the reference letter that the direct operation cost for environmental monitoring shown in Table 3.6 of NUREG 0782 is believed to be inadequate.

Please let me know if further information is needed.

Very truly yours,

J. Howard Kittel, Manager
Office of Waste Management Programs

JHK:pf

cc: S. A. Mann, DOE-CH

DRAFT EIS ON 10 CFR PART 61

COMMENTS ON ENVIRONMENTAL MONITORING COSTS

The environmental monitoring costs given for the Reference Site in Table 3.6 (page 3-39) are $543,000 over 20 years, or $26,700 per year. The environmental monitoring program for the Reference Facility is discussed in Appendix E, Section 5.2.6 (pages E-55 and E-58). A preliminary estimate of the costs can be obtained from the sampling and analysis schedule in Table E-10 (page E-57) and is given in the following table. For this cost estimate, we have assumed that 1) the particulate air sample to be analyzed daily for gross beta-gamma activity is counted on-site as part of routine operations, 2) the other samples are sent to an outside commercial firm for analysis, and 3) the cost per analysis are average charges by firms performing this work, expressed in 1981 dollars.

Annual Environmental Monitoring Costs

Sample	No. of Locations	Frequency of Analysis	No. of Analysis	Cost per Analysis	Total Cost
External Gamma-TLD	50	Quarterly*	200*	$25	$ 5,000
Atmosphere - Particulate	1	Weekly	52	80 (γ-spec)	4,160
Atmosphere - Charcoal	1	Weekly	52	20 (^{131}I)	1,040
Soil and Vegetation	10	Quarterly	40	20 (β-γ) 20 (α) 40 (tritium)	800 800 1,600
Off-Site Wells	5	Semi-annually	10	80 (γ-spec) 20 (α) 40 (tritium)	800 200 400
Site Boundary Wells	10	Semi-annually	20	80 (γ-spec) 20 (α) 40 (tritium)	1,600 400 800
Disposal Area Wells	15	Quarterly	60	80 (γ-spec) 20 (α) 40 (tritium)	4,800 1,200 2,400
Trench Sumps	58	Monthly	70**	80 (γ-spec) 20 (α) 40 (tritium)	5,600 1,400 2,800
					$35,800

*Paragraph 5.2.6.4 (page E-58) states 12 locations are to be analyzed monthly, for a total of 296 analyses. The number in this table was taken from Table E-10

**Assuming water was present 10% of the time.

2

In addition to the purely analytical costs, expenses of sample collection, sample preparation, quality control, maintenance of sampling equipment, record keeping, supplies, and other expenses may increase the analytical costs by a factor of up to two. If the analyses were performed in-house by personnel who also perform other work, such as the sample collection and preparation, some cost saving would result. We believe a more realistic estimate is $60,000 per year for the total program.

Docketed Comment Number: 50

Commenter: Argonne National Laboratory

Response(s): The environmental monitoring costs submitted by ANL were requested by NRC to establish a more accurate basis for cost projections in the FEIS. The ANL estimates were considered along with other estimates in developing the revised monitoring costs contained in the FEIS.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

(122)

MAR 18 1982 '82 MAR 19 P12:16

PR-2 et al
(46 FR 38081)

OFFICE OF
THE ADMINISTRATOR

(51)
DOCKET NUMBER PR-61
PROPOSED RULE (46 FR 51776)

Mr. Samuel Chilk
Secretary of the Commission
Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Chilk:

In accordance with Section 309 of the Clean Air Act, as amended, the U.S. Environmental Protection Agency (EPA) has reviewed the Nuclear Regulatory Commission's (NRC) proposed Licensing Requirements for Land Disposal of Radioactive Waste (46 FR 38081) and the accompanying Environmental Impact Statement (NUREG-0782).

EPA believes it is appropriate for NRC to use both performance objectives and prescriptive requirements in its proposed regulations. These proposed regulations and the supporting analyses are an important step in solving the nation's low-level radioactive waste (LLW) problems. The information presented by NRC will be of considerable assistance to EPA in its low-level radioactive waste standards program.

EPA is concerned that the handling of low-level waste licensing in Agreement States may become inconsistent, so EPA recommends that NRC help the Agreement States adopt consistent state regulations and procedures.

NRC solicited comments on possible duplicative requirements for effluent releases and broker activities under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). This "Superfund" law exempts from notification "any release of source, special nuclear, or byproduct material ... in compliance with a legally enforceable license, permit, regulation, or order issued pursuant to the Atomic Energy Act of 1954" (CERCLA Section 101(10)(K)). Radioactive releases from nuclear waste disposal facilities which are not in compliance with an NRC license, permit, regulation, or order fall within the reporting requirements of CERCLA. Furthermore, as part of the notification regulations under CERCLA, EPA is planning to develop a notification scheme for releases of radioactive materials not licensed under the Atomic Energy Act of 1954 or the Uranium Mill Tailings Radiation Control Act of 1978. EPA wishes to minimize duplicative reporting requirements for releases reported to other agencies. EPA intends to work with NRC to minimize duplicative reporting requirements to the extent possible.

EPA has regulatory responsibility for the disposal of hazardous wastes under the Resource Conservation and Recovery Act, as amended (RCRA). RCRA, Section 1004(27), specifically exempts "source, special nuclear, or byproduct material as defined in the Atomic Energy Act of 1954, as amended." Additionally, Section 1006(a) of RCRA states that "Nothing in this Act shall be construed to apply to ... any activity or substance which is subject to the ... Atomic Energy Act of 1954 (42 U.S.C. 2011 and following) except to the extent that such application (or regulation) is not inconsistent with the requirements of such Acts." RCRA does not address the issue of hazardous chemicals mixed with radioactive materials. We believe the most positive way for NRC and EPA to establish jurisdication over these wastes is in a memorandum of understanding. Such a memorandum would enable both agencies to avoid excessive costs and duplicative licensing of wastes. Furthermore, close coordination of EPA's RCRA and NRC's nuclear waste requirements is necessary in areas such as manifest tracking systems, groundwater protection, technical requirements, and financial assurances, since some NRC licensed wastes may be disposed of in EPA permitted facilities. A memorandum of understanding could serve as a vehicle for accomplishing this.

Hazardous and toxic chemicals are frequently present in these nuclear wastes. EPA is particularly concerned that these hazardous and toxic non-radioactive chemicals and their health impact are not considered in this proposed rule and EIS. We consider the rule and EIS deficient in this regard. Accordingly, EPA has rated this draft EIS ER-2 (environmental reservations and additional information requested). (1)

EPA has divided its enclosed comments into major and minor comments on both the proposed regulations (10 CFR 61) and the supporting draft Environmental Impact Statement (EIS). Should you have any questions on our comments, please call Dr. W. Alexander Williams (755-0790) of my staff.

Sincerely yours,

Paul C. Cahill

Paul C. Cahill
Director
Office of Federal Activities

Acknowledged by card: 3/25/82 emp

COMMENTS

'82 MAR 19 P2:16

Detailed Comments
of the
U.S. Environmental Protection Agency (EPA)
on the
U.S. Nuclear Regulatory Commission's
proposed licensing
Requirements for Land Disposal
of
Radioactive Waste (10 CFR 61)
and draft
Environmental Impact Statement
(NUREG-0782)

Major Comments on 10 CFR 61

1. The 500 millirem per year performance objective for an inadvertant intruder limit is not appropriate as a "regulatory limit." It is not a regulatory limit which will be monitored against for compliance. Nor is it a triggering level for an action such as an accident-related Protective Action Guide. The 500 millirem per year as applied in Part 61, is the design basis for the waste classification system. We believe that if "As Low As Reasonably Achievable" (ALARA) principles were applied, the exposure to the inadvertant intruder would be lower than 500 millirem per year. This is evident from NRC's own analyses in the regional case studies, which use realistic assumptions and the proposed prescriptive requirements.

2. Setting an individual exposure limit at the site boundary is appropriate. The 25 millirem per year is in the correct range of values if, as the NRC indicates, that range includes 1 to 25 millirem per year. We are assured by the NRC analyses and their own statements in the DEIS that they should be able to establish a regulatory limit compatible with any future EPA standard established using ALARA principles.

3. It is not appropriate to adopt the contaminant level of 4 millirem per year from the National Interim Primary Drinking Water Regulations as a performance objective for contamination of public drinking water supplies from LLW disposal. The National Interim Primary Drinking Water Regulations were established in the context of levels of contamination, which if exceeded, would require mitigating action by the water supply authority. It is also not appropriate to allow one group of radioactive materials users to contaminate a water supply to a limit which would preclude other releases from nuclear power plants, hospitals, and other users. It does not appear from the NRC analysis that the LLW disposal requirements are so sensitive to this limit that a lower value would be difficult to meet. It should also be noted that the 10 picocurie per liter value for uranium and therium is not part of the National Interim Primary Drinking Water Regulations. EPA would not object to the use of the National Interim Primary Drinking Water Regulations for protection of groundwater. In forthcoming RCRA land disposal regulations we expect to use the drinking water regulations as one aspect of groundwater protection.

4. The NRC's intentions in applying 10 CFR 20 to the operational phase of LLW disposal is unclear. This arises out of the lack of specificity in Section 61.43 in view of the requirement of Section 61.41. This ambiguity is enhanced in the DEIS: see Vol. 1, Section 5.1.3 (page 35); Section 5.2 (bottom of page 38); Vol. 2, Section 6.3 and Section 6.4 (page 6-13); and Section 6.6 (page 6-18). (2)

It is our understanding, after talking to NRC staff, that the offsite exposures during operation of the disposal site (approximately 20 years) should be held to the same limits as the long-term offsite exposures. To make this clear, it should be stated that Section 61.43 (use of 10 CFR 20 limits) applies to occupational exposures only. Section 61.41 should be broadened to include direct radiation exposure.

5. Section 61.59.b makes it clear that active institutional controls may not be relied on for more than 100 years following transfer of control of the disposal site to the owner. This is appropriate for risk assessment and as a basis for design criteria. However, the regulations should contain a positive requirement that active institutional controls should be established for this period, since this is the design basis of the facility. It is also clear from the DEIS (Vol. II, page 4-69) that institutional maintenance of records of the nature of the hazard is desirable over a longer period of time. This should also be made a positive requirement of the license transfer to the site owner, although it is realized that it cannot be depended upon.

6. Class A segregated wastes will be put in separate trenches from the stable Class B wastes and will have potentially permeable trench covers. The active maintenance of such trenches can be expected to be extensive for many years. NRC should indicate how they plan to develop long-term stablility of the Class A trenches. Although Class A wastes may not present a serious radiological public health hazard, they may, in the eastern United States, under certain hydrogeological conditions, cause site instability problems, pose a "public nuisance", and, more important, the non-radioactive chemical portion of Class A wastes may cause significant ground and surface water pollution just as sanitary landfills may.

7. We urge the NRC to give a high priority to fulfilling its pledge to conduct performance, safety, and cost/benefit analyses for other readily available disposal methods such as hydrofracture, deep well injection and disposal in a mined cavity. These alternatives could show lower intruder impacts. Promulgation of 10 CFR 61 should not be delayed to permit consideration of these alternatives, however.

8. Because it is based solely on the intruder scenario, Table 1 presents some practical incongruities. For example, tritium and some of the short halflife isotopes would have heat rates that clearly would be impractical (i.e., self boiling of tritiated water and, decompostion of the solidifying medium). Also, it does not appear that some of these high specific activities exist in any actual waste stream.

9. Part 61 shows no consideration of hazards from other chemicals and toxic substances that may be associated with the waste. This is a particularly significant omission because some of these materials may have essentially infinite lives compared to many of the radioactive constituents. As a minimum, Part 61 regulations should indicate that these materials must be handled in a manner compatible with RCRA requirements.

10. The NRC proposes to develop a manifest tracking system which is "somewhat similar" to the EPA's hazardous waste manifest system. NRC and EPA should seriously consider coordination and possible integration of the two systems. At the least, the two systems should be compatible because of the possible future need to transfer wastes from NRC regulatory authority to EPA authority, or vice versa (i.e., slightly radioactive LLW whose primary hazard is from non-radioactive substances) and for future interaction between NRC and EPA on the ocean disposal of LLW.

Minor Comments on 10 CFR 61

1. (Sect. 61.52.a:6): It states that, "Waste must be placed and covered in a manner that limits the gamma radiation at the surface of the cover to levels that are a few percent above the background levels of the site." This would be difficult to enforce in its present form due to the ambiguity of "a few percent" and the variability of background levels.

2. (Sect. 61.55, Table 1): The table should have a title and appropriate labels for the columns.

3. Methane, carbon dioxide, and other waste decomposition gases generated within a shallow disposal trench can build up sufficient pressures to directly affect the stablility of any engineered trench covers, particularly if the trench covers are impervious and not properly vented. Gases can also be generated from the decomposition of wastes in arid disposal sites, even in the absence of significant precipitation.

Gases from sanitary landfills have travelled underground for hundreds of feet. Gases from Class A trenches, therefore, have the possibility of affecting the stability of the Class B trenches if proper precautions are not taken. Gas generation is a long continuing process which commonly extends for 50 years or more, requiring active repair and maintenance work on the trenches. Part 61 does not indicate any consideration of this phenomena.

4. We recommend that the following additional or similar requirement be added to Subpart D, "a disposal medium with a permeability sufficiently low to cause the accumulation of water in the trench should not be used, especially for Class B wastes, unless compensating measures are taken to prevent or reduce the leaching of radioactive materials from the waste such as (1) installing an impermeable trench cover to keep water out of the trench or (2) preparing wastes in a low-leachable form."

5. Part 61 or its explanatory preamble should contain a clear statement that, "The intent of site selection is to insure that off-site migration or releases of radioactivity from waste disposed in a facility shall not exceed specified health and safety limits. Although it is reasonable to expect success of a properly sited facility in providing the necessary confinement, this cannot absolutely be guaranteed in advance of actual use."

Major Comments on DEIS for 10 CFR 61

1. The need for cooperation between EPA and NRC in the development of a final 10 CFR 61 is indicated by the intention of NRC to include "Specific concentration limits for the disposal of important naturally occuring and accelerator produced nuclides" in a planned regulatory guide on the classification of waste. (See page 42 of DEIS Vol. 1 and page 7-22 of Vol. 2). Natural radionuclides, particularly radium, are expected to be included in EPA regulations under the Resource Conservation and Recovery Act. Positive steps should be taken to ensure compatibility under these two jurisdictions. (3)

2. In the preamble of the regulation (p. 38091, column 2) and in the DEIS, it is indicated that engineered barriers such as concrete covers are assumed to have an effective life of 500 years. Outside of comments received at public hearings, there is no indication of any basis for such an assumed lifetime. NRC should discuss data which confirm the lifetime of engineered barriers and criteria for approving barrier designs. (4)

3. Monitoring at LLW disposal facilities will be an important activity and will require a regulatory guide from NRC. This should be added to NRC's commitment to prepare regulatory guides in the future. (Vol. 2, Section 2.2 p. 2-4). This guide should establish "action levels" for elevated levels of radioactive materials in the environment to indicate when increased monitoring and corrective actions should begin. (5)

4. The NRC calls for Class B wastes to be stable for 150 years. We believe that criteria should be given that will reasonably assure a 150 year waste stability. (6)

5. Actual experience at existing sites has shown that under certain hydrogeological conditions, such as outlined in Base Case 3, the direct overflow of contaminated water to land surface has been a very important, if not the dominant, pathway. The "direct to land surface overflow" pathway also has a very short travel path and does not give the benefits of delay for decay afforded by the longer travel paths and slower travel times of the ground-water pathway. The short- and long-term impacts of the "overflow to land surface" pathway should be evaluated and compared with the ground-water pathway for Base Case 3 and for all similar test cases.

6. (Vol. 4; Append. M, Sect. 3): The DEIS should make estimates of maximum individual and population health risks, projected over time, for each of the pathways evaluated. As a part of this evaluation, the integrated activity moving through each pathway and its resultant population dose should be presented.

7. (Vol. 2, Sect. 3.8, p. 3-48, and Append. G, p. G-98)): The doses for transportation are based on a 1972 USAEC report on the transportation of LLW from nuclear power plants. We believe that the quantities of wastes and level of radioactivity in them are considerably higher in actual experience per shipment than was predicted in the 1972 estimates. Therefore, estimated dose levels should be adjusted accordingly. Also, Table 5.5 and the discussion on p. 5-15 should be adjusted accordingly.

8. The DEIS considers the time value of money in the estimation of the postoperational (closure and institutional control) costs but does not consider the time value for the design and operational costs. The operational costs which occur in the years 1 through 20 should also be discounted. Otherwise, combining the operational and postoperational costs to represent the total disposal costs for each alternative may result in an incorrect cost ranking of alternatives.

9. The cost estimates for institutional control need to be reexamined. After the several manipulations involving constant dollars, inflation and a nominal interest rate are made. It is unclear on what basis the final institutional control costs are stated.

10. The DEIS is deficient throughout in its failure to account for and assess the potential environmental impact and health risk from the non-radioactive chemical, hazardous, and toxic materials in the LLW. The contamination of ground and surface waters and risk to inadvertant intruders could be significant from non-radioactive materials.

Minor Comments on DEIS for 10 CFR 61

1. The short-term impacts of LLW disposal have been underestimated. In the Summary, in Chapters 3 and 4 of Volume 2, and in Appendices D and G, the radionuclides considered are only those with long half-lives

or those occurring in "significant" quantities in LLW. For short-term impacts, such as radiation doses delivered during the operational phase of a waste disposal facility (including occupational, population and accident doses), the source term should include the presence of shorter-lived, gamma-emitting radionuclides.

2. The ground-water pathway is not significant for many arid zone sites. In arid regions, attention should be given to the upward translocation of radionuclides by plants and animals and by the upward "wicking" effects of the strong evaporation potential on capillary water in the soil. Transport, and possibly erosion, by wind should also be considered.

3. The EIS does not give any specific distances for separating the Class A and Class B trenches. This distance could be significant in assuring overall site stability.

4. It is difficult to follow the projections of waste volumes as given in Tables D.25-D.26, which are based on Tables D.9 and D.11-14. For example D.9 gives untreated waste volumes by "region" while Tables D.25-26 list wastes by "spectrum".

5. Carbon-14 from Light Water Reactors (LWR) would more appropriately be scaled to Co-60. In the LWR, C-14 is produced both in the fuel and coolant. Except in cases of gross fuel failure, C-14 in the fuel stays there. Consequently, C-14 that ends up in LLW originates from activation in the reactor coolant. Therefore, it would seem more approporiate to scale C-14 to an activation product such as Co-60.

6. (Vol. 2, p. 6-7, last sentence): An explanation or reference should be given for the assumed release fraction 0.1 of the radioactivity within the waste packages involved in a fire.

7. (Vol. 2, Chap. 6, Sect. 6.2): Accident probability numbers would be helpful in placing the accidents and potential consequences in perspective. Data is available to at least make reasonable probability estimates.

9. (Append. E, Sect. 2.2): Consideration No. 1 should be expanded to include "and other discontinuities in the geologic media which increase the permeability significantly." For example, sand lenses or layers and desiccation cracks, as well as other unexpected features may be encountered, in addition to those listed.

9. (Append. E., Sect. 3.2.2): Texture and mineral composition are critical parameters for radionuclide retention by a geologic medium. It would be helpful to plot the composition of the Schwinn Formation on a United States Department of Agriculture (USDA) Textural Classification Chart in addition to the descriptive terminology of sandy loam and loamy sand. The advantage of using the USDA chart is

that it shows the percent clay, silt and sand fractions of the medium which are textural parameters correlative with permeability and the sorption potential of a disposal medium.

10. (Appendix J): Insufficient data are presented to make reasonable predictions about the sorption capabilities of the geologic media. For example, only the percentage of the silt-size fraction was given when the clay-size fraction of the medium is more important in assessing its capabilities to retain radionuclides. The Eh and pH are not presented either.

11. (Appendix J, Sect. 1.1.1): In the first sentence, change "underlain" to "overlain."

12. (Append. J, Sect. 1.1.3): The factors that contribute to increased permeability should be briefly described in this section. For example, in glacial tills, this includes sand lenses and desiccation cracks.

13. (Append. J., Sect. 1.1.9, 1.2.9 and 1.3.9): In a detailed site evaluation, the following additional information is needed: texture of the medium described in percentage of sand, silt, and clay-size fractions; mineral composition and organics described quantatively for each size fraction and a weighted average for total sample; cation exchange capacity correlated to clay mineral and organics content; Eh and pH of medium; chemistry of the groundwater; and naturally occurring radionuclides in the medium.

14. Executive Order 12291 requires government agencies to use a 10 percent real discount rate in developing their regulatory impact analyses. The DEIS uses an "implied" real discount rate of approximately 1 percent in the cost analyses. We believe the use of 1 percent in the DEIS should be reconciled with the requirements of the executive order. In doing so, the DEIS should present a sensitivity analysis of alternative discount rates, possibly using 1, 5 and 10 percent.

15. (Appendix Q): The methodology for calculation of capital, operational, closure and institutional costs appears reasonable. What appears to be lacking is a consistent treatment of the date attached to each cost. For example, captial costs are presented in 1980 dollars, operational costs are provided as sums of money appropriate to the 20 year operating life of the site but no particular date is attached to this amount, and closure costs are presented as 1980 costs inflated to the end of site closure. In order to evaluate disposal costs appropriately, a consistent time treatment of money is needed.

16. The last term in the long equation for postoperational costs on p. Q-44 should be corrected.

17. In the discussion of financial arrangements, the license applicant is to prepare an estimate of the amount of money required for closure and long-term care. We urge the use of a very careful review process on these cost estimates because past experience has shown that the licensee, with one exception where the regulator took an active part, has traditionally underestimated closure and long-term costs. (29)

18. (Appendix G, pp. G-12/13): The dilution factor Q was taken to be equal to its pumping rate in the intruder well pathway. This dilution factor should be taken as the total groundwater flow within the plume of contamination rather than the well pumping rate. (30)

19. The methodology used to develop trench infiltration should be presented somewhere in the text or appendices. The reference cited in Appendix G on p. 68, paragraph 2, is insufficient. There is no indication that the "externally produced" value is ever allowed to vary within the analysis. (31)

20. A clearer explanation of the basis for the indices used in calculating the interaction factors in Appendix G is needed. (32)

21. (Append. G, p. G-68): The rate of infiltration was calculated by multiplying by the number of days for which the precipitation exceeds 0.01 in/day. This method is very simple but, in our opinion, does not meet the state of the art for estimating infiltration rates. Our technical staff is available to discuss other possible methods for calculating infiltration. (33)

22. (Vol. 2, p. 5-22): The dose rates through the population well and surface water pathways for Case 1A (Table 5-6) is calculated to be approximately 10 times lower than for Case 1 (Table 5-3) simply due to replacing the backfill material on moderately permeable soil used in Case 1 with more permeable soil. This fact does not agree with current knowledge of the leaching process. This phenomena was explained by the waste-water contact time being longer in Case 1 than in Case 1A and a resultant higher rate of leaching. In reality, the pellicular water in the waste, which contains dissolved radionuclides, will be maintained in between the interstices of the waste all of the time. Therefore, any added percolation of gravity water will be mixed with the pellicular water during the course of percolation and will be independent of the true velocity of the water movement. Therefore, the rate of radionculide release should change very little because of changes in the permeablility of the backfill material. (34)

23. (Vol. 1, p. 19, Table S.5): The values listed under Body & Bone need to be explained in a footnote as "the number of years at which this impact level exists." (35)

24. At several points in the DEIS (e.g. Vol. 1, p. 23), the comment is made that "the potential hazard quickly drops to about 1000 millirem per year to bone at about 500 years following facility closure." The term "quickly" does not seem compatible with a 500 year time period. (36)

25. (Vol. 1, p. 20): The statement, "Maximum annual thyroid doses are in the range of 850 mrem at the intruder and population wells, 270 mrem at the population well, and 12 mrem at the surface water body" is ambiguous. This leaves in doubt what the dose is at the population well. (37)

26. (Vol. 1, p. 26, Table S.7 & Vol. 2, p. 4-41, Table 4.19): Several of these costs (those with double asterisk) are not comparable with the others because they are based only on the 10% volume of waste employing that technique. To make the costs comparable, costs for the other 90% of the wastes should be figured and a weighted average presented. (38)

27. (Appendix N): EPA's authority under the Marine Protection, Research, and Sanctuaries Act of 1972 for ocean disposal of radioactive waste should be listed. (39)

28. (Appendix N): EPA's proposed guidance for Occupational Exposures should be discussed. (Federal Register, Vol. 46, No. 15, Friday, January 23, 1981, page 7836). (40)

29. (Appendix N, p. N-5): EPA's schedule for its Low-Level Waste Standard is currently under review and may be revised. We will notify NRC of any such revision. (41)

30. (Appendix N, p. N-19): National Primary Drinking Water Regulations is incorrect, it should be Interim National Primary Drinking Water Regulations. (42)

31. (Appendix G): Tables G-3 through G-10 are poorly titled and measurement units are not well identified. (43)

Docketed Comment Number: 51

Commenter: U.S. Environmental Protection Agency

Response(s): Item 1 - As noted in the response to Item 3, Comment 11, the staff considered toxic and hazardous chemicals to the extent practicable in developing the requirements of 10 CFR 61. However, the primary focus of the rule is the safe land disposal of radioactive wastes.

The staff recognizes that toxic and hazardous chemicals may be present in radioactive wastes and has incorporated provisions in the rule which reflect this fact. (These provisions are cited in Item 3, Comment 11 and are not repeated here.) We believe that the rule in its current form provides an adequate level of protection with respect to those substances which may be associated with LLW and should not cause EPA to have any further reservations about the rule or its supportive EIS in this regard. The Commission intends to continue working closely with EPA on this matter.

Item 2 - The staff has modified the language of §61.41 and 61.43 to clarify the purpose of applying 10 CFR 20 to the operational phase of LLW disposal and to remove any ambiguity between these two sections of the rule. It is the Commission's intent that the provisions of Part 20 will apply to all aspects of radiation protection during operation except for releases of radioactivity from the site which will be governed by the more stringent requirements of § 61.41. The specific sections mentioned in EPA's comments have been changed to reflect this.

Item 3 - NRC does not intend to specify concentration limits for naturally occurring and accelerator-produced nuclides in Part 61. As EPA notes, NRC does not have statutory authority over such materials. In response to comments, however, and to provide for safe disposal of certain long-lived naturally occurring and accelerator-produced materials by the Agreement State (which do regulate such materials), NRC plans, as a minimum, to develop guidelines for disposal of Ra-226. This information will be made available to EPA to help ensure compatibility.

Item 4 - Based on the analyses carried out in the DEIS, exposures to a potential inadvertent intruder from almost all waste streams are in the range of a few millirem after a few hundred years. NRC thus selected 500 years as a general upper bound upon which reliance on any particular intruder barrier would be allowed. As such, 500 years serves as a design objective. NRC staff has no specific engineering data on the expected maximum lifetimes of various intruder barriers which might be used but believes that depth of cover and concrete engineered structures should be capable of providing protection for that length of time. Specific guidance which should be considered by an applicant relating to intruder barriers will be set out in a technical position paper prepared by the staff on facility design and operation.

Item 5 - NRC's future regulatory guides will include a guide on environmental monitoring of LLW disposal facilities. With respect to the establishment of "action levels" for elevated concentrations of radioactive material in the environment, the staff feels that this is a site-specific subject and will require applicants to specify such levels as a part of the license application. These levels will be reviewed and acted upon by the staff for each proposed LLW disposal facility.

Item 6 - NRC agrees and recognizes the need for additional guidance regarding waste form stability. In this respect, NRC is preparing a technical position on waste form which will provide guidance, criteria and acceptable tests to demonstrate waste stability.

Item 7 - An estimate of the potential impacts from leachate overflow to the land surface from disposal cells has been included in the FEIS.

Item 8 - In the draft EIS, NRC expressed radiological impacts associated with operation of a near-surface disposal facility in terms of responses to individuals and populations. NRC did not covert or express these exposures in terism of risk because of the difficulty of accurately assessing risks of exposures to future populations and the small numbers of individuals who could receive a potential exposure. The staff reconsidered its decision on this issue, but has not changed its position. Expressing exposures in terms of risk would

involve new work and time which is not warranted given the urgent need for Part 61 and the limited additional information which would be provided. In the EIS, NRC compared calculated doses on a common basis to existing standards which are expressed in terms of dose equivalent. NRC has, however, attempted to express the overall impacts of Part 61 in the FEIS in a clearer manner such that comparison of alternatives and unmitigated impacts are easier to discern and understand.

In addition, in response to this comment and to place in perspective the potential risk associated with the doses calculated in this FEIS, NRC has included a section in the summary which provides dose response relationships as set forth in International Commission on Radiation Protection Publication 26. The reader can use these to estimate the level of risk associated with doses calculated for the various alternatives.

Item 9 - NRC staff believes that the assumptions used in approximating transportation exposures are adequate for the purposes of the EIS. The EIS is not a generic environmental impact assessment of low-level waste transportation and disposal. Rather, it is a decision document with which to consider alternatives for establishment of performance objectives and technical criteria in the Part 61 rule. As part of considering alternatives, a number of costs, radiological impacts, and other impact measures associated with various disposal technology cases were calculated. Transportation impacts were not the principal impact measures used to arrive at decisions but were included for completeness. Issues related to transportation safety are beyond the scope of the EIS.

The document referenced by the commenter (Reference 19) was used to estimate an average exposure per shipment mile. This was multiplied by the number of shipments (which is a function of waste volume and activity) and by the average distance to the reference disposal facility. This was used to obtain exposure estimates which could be compared from one disposal technology alternative to the next. Thus, the absolute values of the transportation exposures calculated are not as important as the comparison between alternatives. This is believed to be in keeping with the scope of the Part 61 rule and EIS. NRC staff members are aware of more sophisticated calculational methodologies to calculate exposures due to waste transportation (References 20 and 21), but believe that such methodologies are more appropriate for rulemaking actions on transportation safety than for rulemaking actions on low level waste disposal. In any case, no matter what the levels of radioactivity in different forms of waste, the established DOT radiation limits at vehicle surfaces would still apply. Wastes having higher surface radiation levels require more shielding.

In addition, a more recent environmental statement (Reference 20) was examined. This statement, which calculated transportation impacts in a much more sophisticated manner than Reference 19, estimated a total dose (except doses from stopovers, which as in the Part 61 EIS are considered separately) to the public of 520 person-rems from shipment of radioactive material in 1975. Out of a total of 2.19 million packages shipped, only about 7% contained radioactive waste. Assuming 40 waste packages per shipment and an average shipment distance of 400 miles, one can estimate an average exposure of .0008 person-millirem/shipment mile, which is a factor of about 10 less than that assumed for the DEIS. Thus, NRC staff believe that the calculated transportation exposures have been handled in an acceptable manner.

Item 10 - For the FEIS, disposal costs have been recalculated using a time value of money approach on capital and operational costs.

Item 11 - In the DEIS, three levels of site maintenance during the institutional control period (and corresponding costs) were examined: high, medium and low. The institutional control costs were presented as the amount of money that would have to be collected as a surcharge on received waste over the operating life of the site to pay for a given level of maintenance. Money collected from the surcharge is assumed to be placed into an interest-bearing sinking fund. The average interest rate and inflation rate assumed over the operating life of the site and institutional control period were 10% and 9%, respectively.

Based upon revised estimates of monitoring, personnel and other costs as discussed in Appendix C of this volume, revised institutional control costs have been calculated for the FEIS.

Item 12 - The staff has responded to this comment previously. The reader is referred to Item 1 above and Item 3, Comment 11.

Item 13 - NRC staff recognizes that the short-term impacts may have been underestimated since only a few short half-lived nuclides were considered. NRC staff does not believe this is significant, however, since short term actions taken to protect against exposure to the longer half-lived nuclides considered in the analyses should also be adequate to protect against exposure to the shorter half-lived nuclides that would also be present in the waste.

Item 14 - As stated in the Branch Technical Position on Site Suitability, Selection and Characterization (Reference 22), the staff considers the contact of soil moisture with the waste containers and waste to be the major mechanism for potential release of radionuclides. With respect to arid sites, the staff considers the movement of soil moisture and vapor upward by evaporation potential or by plant uptake to be the most significant pathway for migration of radionuclides into the general environment.

Item 15 - The staff agrees that the distance between Class A and Class B trenches could be significant in assuring overall site stability. However, the staff feels that site-specific characteristics must govern the determination of an appropriate distance between these types of waste trenches. For this reason, the EIS does not contain a specific figure for separation.

Item 16 - The projections of waste volumes are not based on Tables D.11-14. It is possible, however, that NRC was insufficiently clear in Appendix D of the DEIS regarding waste volume projections.

Table D-9 presents volumes projected to the year 2000 of 36 waste streams in each of the 4 regions considered in the EIS. The volumes are shown "untreated," which means as-generated volumes prior to further treatment or packaging for shipment. For example, volumes for PWR and BWR concentrated liquids are given as-generated prior to solidification. The volumes which will be shipped, however, are a function of the waste spectrum considered. A "waste spectrum" is a term used to indicate the total volume and properties of the 36 waste streams after they have been processed by a set of selected waste treatment options. Each spectrum corresponds to a general level of waste performance in terms of waste stability, resistance to wind mobilization, resistance to leaching, and physical, chemical, and radiological properties. The spectra differ significantly in waste volumes, radioactive concentrations, and performance.

To obtain the volumes shipped in a given region, one would multiply the volume of each waste stream by factors which correspond to any changes in volume of the stream associated with processing according to a given spectra. These factors, termed volume increase factors (VIF) and volume reduction factors (VIR), are given for each of the four spectra in Table D.21. For example, the volume of PWR concentrated liquids projected to be generated in region 1 according to the level of processing associated with waste spectrum 2 is as follows:

$$\text{Volume} = 4.87\ E{+}4 * VIF/VIR$$

$$= 4.87\ E{+}4 * 1.82/6.0 = 1.48\ E{+}4 m^3$$

Table D.25 presents the volumes by waste spectra (that is, as multiplied and divided by the appropriate VIF and VIR, respectively) summed over all four regions. That is, this table presents the projected total to the year 2000 of the country's waste as a function of waste spectra.

Table D.26 then presents the above volumes normalized to one million m^3 of waste for waste spectrum 1. The volumes in Table D.26 represent a "reference" waste distribution and were used for the generic calculations performed in Chapters 4-6 of Volume 2 of the DEIS. The regional calculations performed in Chapter 10 of Volume 2 of the DEIS were performed using the volumes presented in Table D.9 as modified by the appropriate VIF and VIR presented in Table D.21.

Item 17 - NRC staff believe that C-14 can be scaled to either an activation product or to a fission product is somewhat arbitrary. Like any other fission product, C-14 can escape fuel rods and enter the reactor coolant through imperfections in the fuel rods. Such imperfections can range from tiny pinholes to gross fuel failure. Thus, NRC staff believe that the current scaling is sufficient for the FEIS. Ongoing studies by NRC in which samples of reactor process wastes are being analyzed for a number of trace radionuclides

(including C-14, I-129, and Tc-99) should help provide a more accurate estimate of C-14 levels. Additional consideration will be given at that time to the use of scaling factors and to selection of appropriate scaling isotopes.

Item 18 - The basis for the assumed release fractions is presented in Appendix G of the DEIS and Reference 23.

Item 19 - EPA staff were contacted regarding the intent of this comment, particularly as regards their comment on the availability of data. Their intent was that NRC staff should review several years of accident reports at nuclear power stations and other licensees and, based upon any available information on accidents involving waste management activities, to arrive at accident probabilities which could be applied to low-level waste disposal facilities.

It is possible that an assessment of accident probabilities, assuming that such information is available, could have some use as supplemental information. However, NRC staff question whether such data can be applied in a straightforward manner to low-level waste disposal facilities. NRC staff does not believe, however, that it would be appropriate or desirable to delay preparation of the final EIS and rule until such data could be assembled and manipulated. NRC staff believe that even assuming that accident probabilities could be acquired, the overall conclusions of Chapter 6 of the DEIS are not likely to change. These conclusions were basically that actions taken to reduce potential inadvertent intruder exposures, reduce long-term environmental releases, and improve long-term site stability and reduce institutional control costs would also tend to improve safety during site operations.

Item 20 - The consideration referred to by the commenter is one of general applicability, but only one of many which the staff has recommended for siting of new disposal facilities. The technical requirements for site suitability in Part 61 have been elaborated upon in a Branch Technical Position on Site Suitability, Selection and Characterization (Reference 22). The staff's guidance within this paper includes the following:

> "...the hydrogeologic unit used for disposal should not have continuous permeable or impermeable anomalies such as faults or fracture zones, sand lenses, weathered horizons, or Karstic features that provide preferential pathways for or barriers to ground-water flow."

Item 21 - The descriptive information provided in Appendix E of the DEIS is for a reference near-surface disposal facility located on a hypothetical site. This information is intended to provide a general picture of various site environmental conditions in sufficient detail to approximate base case costs and impacts at the reference facility. The description of site soils from the Schwinn formation is considered to be sufficiently detailed for a lay person to comprehend site conditions, and the staff feels that addition of the USDA chart would add little in the way of new information to Appendix E of the DEIS.

Item 22 - For each of the hypothetical sites described in Appendix J of the DEIS, average cation exchange capacity at the subsurface media have been provided as one estimate of the sorption capabilities of the geologic medium. Assuming that these were measured volumes, the cation exchange capability values are more useful than percentage of silt or clay in estimating sorption capabilities. Further, the reported values for silt content represent the entire fraction passing the 200 sieve (i.e., silt and clay sizes).

Item 23 - This change has been made and is included in Appendix E, Errata, in this volume.

Item 24 - As noted earlier in a comment on Appendix E of the DEIS, the descriptions in Appendix J of the DEIS are not intended to be all-inclusive. Consequently, although the commenter has identified some information that is not included in Section 1.1.3 of Appendix J, the staff does not feel that this level of detail is necessary or appropriate to the appendix material.

Item 25 - As noted above, the descriptions in Appendix J of the DEIS are not intended to be all-inclusive. The Branch Technical Position on Site Suitability, Selection and Characterization (Reference 22) discusses the informational needs projected by the staff for preparing a detailed site evaluation. These needs may be more sharply focused when a specific site proposal is submitted. However, no EIS text changes are considered by the staff to be necessary with respect to this comment.

Item 26 - The commenter is not quite correct in his comment. In order to assess the long term costs for institutional control, NRC assumed that funds would be collected as a surcharge on waste received at a disposal facility and placed into an interest-bearing sinking fund. In the calculations, a 10% interest rate was assumed. (States are often restricted by law regarding the types of securities which may be invested in; securities offering very high interest rates may not be allowed.) Using this interest rate, and an assumed average inflation rate of 9%, a real interest rate of about 1% is obtained. This real interest rate is not the same thing as the discount rate.

Regarding Executive Order No. 12291 (Reference 24), it is not clear that the proposed Part 61 constitutes a major rule as defined in the order and, therefore, it is not clear that Part 61 falls under the scope of the order. In addition, the Commission is currently considering steps to be followed to generally implement the order. Until a decision is reached, the Commission has adopted an interim procedure of following criteria developed from Executive Order No. 12044 (Reference 25). As part of the analysis conducted for the FEIS, however, the staff has reviewed Executive Order No. 12291, as well as the draft Office of Management and Budget (OMB) Interim Regulatory Impact Analysis Guidance on implementing Executive Order No. 12291 (Reference 26).

The OMB guidance states that an annual discount rate of 10% should be used. The guidance also states that where it appears desirable, other discount rates also may be used to test the sensitivity of the results.

The NRC staff believe that a 10 percent discount rate is unrealistically low when applied to siting and operating a low-level waste disposal facility. Support for this belief is provided by comments on the draft EIS from the operator of an existing disposal facility. (See commenter 44.) This commenter's position is that operation of a disposal facility is a high risk venture and that the discount rate should reflect this risk. Subsequent input from this commenter indicates their position that a 10% discount rate is unrealistically low. A considerably higher rate would be used by the commenter for siting and operating an actual low-level waste disposal facility (Reference 27).

A comparison between disposal costs associated with a number of different discount rates is, however, included in Appendix C to the final EIS.

Item 27 - See the response to item 10 above.

Item 28 - As the commenter has noted, the equation on page Q-44, Appendix Q of the DEIS contains two typographical errors. The last term in the equation should be the same as the equation for LTC on p. Q-42. That is:

$$\frac{iTT_o PV_{80}(1+j)^m}{V_w[(1+i)^{TT_o}-1](1+i)^{TT_c}}$$

Item 29 - The staff agrees. The Commission will review carefully all aspects of a license application for waste disposal under 10 CFR 61, including the estimates of closure and long-term care funds.

Item 30 - There is no discussion of a dilution factor or a pumping rate on the indicated pages. For the intruder well, the dilution volume is a function of site specific conditions and is given as the total volume of water percolating through the disposal units under natural conditions. The well pumping rate (7700 m^3/yr) was taken as a lower bound as it is about the minimum required for a well to be considered useful. This approach gives reasonable yet conservative results.

Item 31 - The discussion on p. 68 of Appendix G of the DEIS and in the reference cited is believed to be sufficient. The variation of the percolation rate in the analyses is summarized on the p. 69 of the appendix.

Item 32 - Additional information is presented in Reference 23.

Item 33 - NRC staff believe that more sophisticated methods of calculating infiltration rates are more appropriate for an analysis of a specific site where actual site data may be acquired and used. Given the generic, non site-specific nature of the EIS analysis, the approach taken by NRC is believed

to be sufficient for the purpose of rulemaking. A complex model cannot compensate for a lack of site specific data and is furthermore of less practicality when considering a large number of alternatives.

Item 34 - The Case 1A reduction in concentration of approximately 10 times that calculated for Case 1 results from the use of a clean, permeable sand backfill. This sand backfill reduces concentrations by three mechanisms First, the trench cap is more stable due to less consolidation and settlement in the filled trenches. Second, the greater porosity of the sand backfill as compared with the surrounding site soil will result in some reduction of water entering the backfill due to the wick effect. And third, the greater posority will result in less pellicular water (i.e., less film in contact with and leaching the wastes) than a finer textured backfill as used in Case 1. This then leads to less pellicular water being flushed off by infiltrating water.

Item 35 - The requested footnote is already contained in Table S.5, Appendix S of the DEIS.

Item 36 - The commenter's point is well taken and it is noted in Appendix E, Errata, in this volume.

Item 37 - The sentence contains a typographical error. It should read, "Maximum thyroid doses are in the range of 850 mrem at the intruder and boundary wells..." This change has been made in Appendix E, Errata, in this volume.

Item 38 - This comment has been noted by the staff.

Item 39 - The U.S. Environmental Protection Agency (EPA) has authority under the Marine Protection Research and Sanctuaries Act of 1972 (P.L. 92-532) for regulation and permitting of ocean disposal activities. EPA is developing a regulatory program and permitting system for resumption of ocean disposal of radioactive wastes. NRC did not include a specific reference to this authority in Appendix N of the DEIS since the scope of the EIS was limited to land disposal. The staff has made no change to the FEIS as a result of this comment.

Item 40 - Appendix N of the DEIS reviews a number of proposed and promulgated regulations and guidance applicable to LLW disposal. Since EPA's Proposed Guidance for Occupational Exposures was of more general applicability. NRC staff did not specifically indicate it in Appendix N.

Item 41 - NRC will maintain close coordination with EPA on the development of these standards.

Item 42 - This comment has been noted and included in Appendix E, Errata, in this volume.

Item 43 - This comment has been noted by the staff.

References:

1. General Research Corporation, "Study of Chemical Toxicity of Low-Level Wastes," NUREG/CR-1793, November 1980.

2. Oak Ridge National Laboratory, "Proceedings of the Third Annual Information Meeting, DOE Low-Level Waste Management Program, November 4-6, 1981, New Orleans, LA," ORNL/NFW-81/34, December 1981.

3. Wild, R., "Data Base for Radioactive Waste Management, 3 volumes, NUREG/CR-1759, Dames and Moore, Inc. for U.S. NRC, November 1981.

4. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.109, "Calculation of Annual Doses to Man From Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1, October 1977.

5. Hoenes, G. R., J. K. Soldat, "Age-Specific Radiation Dose Commitment Factors for a One-Year Chronic Intake," NUREG-0172, Battelle Pacific Northwest Labratories for U.S. NRC, November 1977.

6. Healy, J. W., and J. C. Rodgers, "Limits for the Department of Energy Transuranic Wastes," Los Alamos Scientific Laboratory, LA-UR-79-100, January 1979.

7. U.S. Nuclear Regulatory Commission, Office of Standards Development. Draft Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I." March 1976.

8. U.S. Nuclear Regulatory Commission, Office of Standards Development, "Calculational Models for Estimating Radiation Doses to Man from Airborne Radioactive Materials Resulting from Uranium Milling Operations," Task RH 802-4, For Comment, May 1979.

9. Moore, R. E., et. al. "AIRDOS-EPA: A Computerized Methodology for Estimating Environmental Concentrations and Dose to Man from Airborne Releases of Radionuclides," EPA 520/1-79-009, December 1979.

10. Greenhouse, N. A., and E. T. Lessard, "A Dosimetric Analysis of Pathways to Man From the Environmental Release of Low Level Radioactive Wastes," Prepared for Dames and Moore by Occupational and Environmental Health Analysts, Inc., 1980.

11. Ng, Y. C., et. al., "Transfer Coefficients for the Prediction of the Dose to Man via the Forage-Cow-Milk Pathway from Radionuclides Released to the Biosphere." University of California, Lawrence Livermore Laboratory Report No. UCRL-51939.

12. Oak Ridge National Laboratory, "Modeling and Low-Level Waste Management: An Interagency Workshop," Oak Ridge National Laboratory, June 1981.

13. Chem-Nuclear Systems, Inc., "Preliminary Site Stabilization and Closure Plan for the Barnwell Low-Level Radioactive Waste Disposal Facility," Chem-Nuclear Systems, Inc., May 1980.

14. Adam, J., V. Rogers, "A Classification System for Radioactive Waste Disposal--What Waste Goes Where?," NUREG-0456, Ford, Bacon and Davis, Utah for USNRC, June 1978.

15. Rogers, V., "A Radioactive Waste Disposal Classification System," NUREG/CR-1005, Ford, Bacon and Davis, Utah for USNRC, September 1979.

16. Leddicotte, G. W., et. al., "Suggested Quantity and Concentration Limits to be Applied to Key Isotopes in Shallow Land Burial," Management of Low-Level Radioactive Waste, Volume 2, Pergamon Press, New York, 1979.

17. U.S. Department of Energy, "Technology for Commercial Radioactive Waste Management," DOE/ET-0028, May 1979.

18. Phillips, J., et. al., "A Waste Inventory Report for Reactor and Fuel-Fabrication Facility Wastes," ONWI-20, NUS corporation for US DOE, March 1979.

19. U.S. Atomic Energy Commission, Environmental Survey of Transportation of Radioactive Materials To and From Nuclear Power Plants, WASH-1238, December 1972.

20. U.S. Nuclear Regulatory Commission, Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes, NUREG-0170, December 1977.

21. Finely, N. C., et al., Transportation of Radionuclides in Urban Environs: Draft Environmental Assessment, NUREG/CR-0743, July 1980.

22. Siefken, D., et al., Site Suitability, Selection, & Characterization, Branch Technical Position--Low-Level Waste Licensing Branch, NUREG-0902, April 1982.

23. Oztunali, O. I., et al., Data Base for Radioactive Waste Management: Vol. 3, Impact Analyses Methodology Report, NUREG/CR-1759, November 1981.

24. Executive Order 12291, Federal Register, Vol. 46, No. 33, February 19, 1981.

25. Executive Order 12044, Federal Register, Vol. 43, No. 53, March 24, 1978.

26. Office of Management and Budget, Draft Interim Regulatory Impact Analysis Guidance for Implementing Executive Order 12291, June 5, 1981.

27. May 7, 1982 telephone conversation between Leslie Poppe, Corporate Health Physicist, Chem-Nuclear Systems, Inc., and G. W. Roles, U.S. NRC.

APPENDIX B

STAFF ANALYSIS OF PUBLIC COMMENTS ON PROPOSED 10 CFR PART 61 RULEMAKING

PUBLIC COMMENTS ON PROPOSED
10 CFR PART 61

On July 24, 1981 proposed 10 CFR Part 61 was published in the Federal Register (46 FR 38081). Proposed Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," contains requirements for disposal of low-level wastes. The original comment period expired October 22, 1981 but was extended to January 14, 1982 (46 FR 51776) to coincide with the comment period for the supporting draft environmental impact statement (NUREG-0782). The following commenters responded and copies of the original comment letters are included in this appendix following the staff's analysis of the issues raised therein:

Statistical Analysis of Commenters on
Part 61

Type of Commenter/Commenters/Docket Number

1. States
   - New Mexico (4) & (45)
   - Nevada (14)
   - PA (16)
   - Ohio EPA (38)
   - Arizona (47)
   - KY Legislative Research Comm (55)
   - Hawaii (65)
   - SD (69)
   - SC (79)
   - California (93)
   - Power Authority of NY (92)
   - Attorney General of NY (99)
   - Conf of Radiation Control Program Directors (103)
   - NC (109)
   - Colorado (111)
   - Washington (112)
   - Texas (117)

2. Utilities
   - Florida Power & Light (31)
   - Wisc Electric (32) & (98)
   - Alabama Power (33)
   - Commonwealth Edison (35)
   - Duke Power (48)
   - Ontario Hydro (51)
   - Arkansas Power & Light (52) & (94)
   - Utility NWMG (81)
   - Middle South Services (84)
   - NE Utilities (85)
   - Florida Power (91)
   - Carolina Power & Light (106)
   - Tennesse Valley Authority (116)

3. Industry
   - Homestake Mining (1)
   - Proctor & Gamble (6)
   - Bethlehem Steel (7)
   - Exxon (15)
   - Dow (17) & (83)
   - Kerr-McGee (22) & (115)
   - Packard (25)
   - Union Carbide (39)
   - Pathfinder Mines (40)
   - Breeder Reactor Corp. (56)
   - R/A Services Inc. (57)
   - Union Oil of California (66)
   - Stock Equipment (67)
   - Werner & Pfleiderer (82), (124)
   - Nuclear Monitoring System (86)
   - General Electric (89)
   - Atomic Industrial Forum (100)
   - NEN (110)
   - General Research Corporation (123)

4. Individuals
   - Reynek (2)
   - Lewis (3)
   - Quigg (13)
   - White (21)
   - Mathews (23)
   - Klotz (42)
   - Jaffer (46)
   - Scarpa (50)
   - Lowroski (62)
   - Jensen (64)
   - Gorenflo (71)
   - Anders (73)
   - Hadala & Banks (76)
   - Yuan (77)
   - Hubbard (90)

5. Federal Agencies/Labs
   - EPA (11), (122)
   - NOAA Boulder (12)
   - NASA (26)
   - DOE (28), (119)
   - Los Alamos (43)
   - Dept. of Army (63)
   - Argonne (68), (120), (121)
   - EG & G Committee (104)
   - U.S. Department of the Interior (114)

6. Medical
   - Advanced Medical & Research Center (5)
   - American College of Nuclear Physicians (53)
   - U of Texas Medical Branch (75)
   - U of Texas Cancer Center (105)

7. University
   - U of California (8)
   - Northern Ill (27)
   - U of NC (30)
   - Howard (49)
   - GA Tech (70)
   - U of Ariz (78)

8. Brokers/Disposal firms
   - Nuclear Dignostic Labs (29) & (108)
   - Chem-Nuclear (41)
   - US Ecology (101)

9. Legal groups
   - Environmental Law Project (9)
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10. Surety
   - Surety Assn of America (20)
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11. Engineering firms
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12. Public interest groups
   - Concerned Scientists (36)
   - Sierra Club (37)
   - Birmingham Audubon (80)
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13. Professional organizations
    American Nuclear Society (87)
    Health Physics Society (96)
    American Institute of Chemical Engineers (102)
    American Society of Mechanical Engineers (107) & (113)

14. Others
    ACRS (10)
    Dept of the Environment, London (19)
    Yakima Indians (74)
    Township of Lower Alloways Creek (88), (125)
    Atomic Energy of Canada Limited (118)

INDEX OF ISSUES

The analysis of the individual issues raised by the commenters is structured, to the extent practical, according to the part of the rule being addressed by the commenter. The issue numbers are assigned based on the part of the rule being addressed, e.g., issues addressing Subpart A, General Provisions, are numbered A-1, A-2, etc. The issue numbers are indicated on the annotated set of comments following the discussion of issues.

ISSUE A-1

Issue: Scope and applicability of rule

Commenters: Homestake Mining Company (1)
Marvin I. Lewis (3)
New Mexico Secretary for Health and Environment (4)
Advisory Committee on Reactor Safeguards (10)
Nevada Department of Human Resources (14)
Dow Chemical (17)
Union of Concerned Scientists (36)
Pathfinder Mines Corporation (40)
Bechtel National, Inc. (44)
Alfonso Scarpa (50)
Union Oil (66)
South Carolina Department of Health and Environmental Control (79)
Birmingham Audubon Society (80)
American Nuclear Society (87)
Carolina Power & Light Company (106)
American Society of Mechanical Engineers (107), (113)
Department of Energy (119)

Rule Citation: §61.1 Purpose and scope
§61.2 Definitions

Summary of comments: Commenters suggested changes to the scope of the rule to both include and exclude topics and materials. Suggestions for additions to the scope included exempted source material and criminal penalties of up to 25 years for violations. Suggestions for deletion from the scope included mill tailings, fuel cycle wastes, and fissile materials. In addition, one commenter expressed the view that the rule should apply only to near-surface disposal until specific requirements for other methods are formulated. One suggested that above ground engineered disposal be included in the scope.

Several commenters addressed the applicability of the rule to existing sites. One commenter was concerned that the abandoned sites being cleaned up by the Department of Energy (DOE) and existing commercial low-level waste sites were not included. One emphasized the difficulty in developing case-by-case guidance for decommissioning the commercial sites where operations have been terminated. One commenter cited the financial burden on operators of existing sites if the five year postclosure observation and maintenance requirement is imposed. One commenter agreed that existing sites should have little or no difficulty in complying with operational and waste characteristics requirements. One commenter was concerned about migration from the West Valley site. One commenter expressed the view that existing sites should be exempted or granted an interim status in the rule to avoid instant noncompliance. South Carolina noted the need to apply Part 61 requirements on a case specific basis at the Barnwell site.

Commenters also addressed the applicability of the rule to Agreement States and individual licensees. Three commenters recommended that the regulation recognize and clarify that Part 61 does not apply to persons licensed by Agreement States. Three requested changes to §61.1(a) to allow individual licensees to operate a burial site under a Part 61 license and one felt that such individual burials should be governed by requirements as stringent.

Analysis of Comments: The two suggested additions to the scope of the rule were not needed to address the commenters' concerns. The Union Oil Company concern about source material was directed toward § 61.10 language and the need for a de minimis provision. The Company objected to the use of "containing" because the contained activity could be so very small in view of the concentration limits which define source material in 10 CFR Part 40. In Part 40 source material generally means containing more than .05 weight percent of uranium or thorium or a combination of the two. The Company noted that wastes containing traces of material made up of just over .05 percent uranium or thorium would be far less active than most natural ores. Part 61 is intended to permit the disposal of all source material, including low concentrations or exempted amounts. The staff agrees that this is an option needed by licensees. The proposed language in Part 61 would not negate any exemption or relief provided generating licensees in other parts of the Commission's rules or in a license. Part 61 applies only to wastes transferred to a land disposal facility. Thus no change was adopted for exempted source material.

The suggestion to include criminal penalties is addressed by the authority citations following the table of contents. The Commission imposes civil penalties but refers cases involving potential criminal acts to the Department of Justice for action. The authority citation provides the legal basis for Justice cases, and each of the sections listed in the second paragraph may involve criminal penalties if violated. Specifying specific criminal penalties is beyond Commission authority.

Only clarifying changes were needed to address most of the concerns of the commenters suggesting deletions from the scope of the rule. The disposal of uranium mill tailings and related source material by a licensee operating under a Part 40 license is currently regulated under the terms of 10 CFR Parts 20 and 40. No change in this situation was intended. Language to emphasize the exemption of all but small quantities of mill tailings was added to the final rule. Waste disposal by individual licensees is currently licensed under the terms of Part 20 and Parts 30, 40, and/or 70 and no change was intended. Fuel cycle waste transferred for disposal at a land disposal facility would have to meet the requirements in Part 61 as required by the new §20.311 of 10 CFR Part 20. Fuel cycle waste disposed of by other methods would not be affected and no change to the rule is needed.

The Birmingham Audubon's concerns over criticality from fissile materials are understandable but from a practical point of view, criticality limitations for special nuclear materials have never been a serious problem at the sites. The criticality potential is evaluated but has little, if any, impact on waste limits or emplacement. The materials in question are primarily enriched uranium and plutonium. The rule establishes limits in the classification scheme on transuranics, hence plutonium, that preclude any criticality concerns. Enriched uranium is not a factor in the classification scheme in § 61.55 because of its

relatively low radiological hazard. Thus the staff sees no reason to further restrict special nuclear materials.

The commenter who expressed the view that the rule should apply only to near-surface disposal is correct that Part 61 applies to other than near-surface disposal. The performance objectives and the procedural (licenses), institutional, financial, state and tribal participation, and records, reports test, and inspections subparts apply equally to all land disposal of low level wastes. The technical requirements are specified only for near-surface disposal, but sections are reserved for other than near-surface methods. Above ground engineered disposal falls in this other category and the staff continues to believe that engineered disposal above ground is sufficiently unique that the specific technical requirement should not be mandatory. The staff considered whether the regulation should cover only near-surface disposal when the rule was proposed. Based on staff judgement and staff experience providing technical assistance to Kansas on a mined cavity application, the staff believed that applications for other disposal methods were credible and that the regulation could be framed to provide the needed flexibility. The comments offered no specific problems with the scope as proposed. Staff still believes the flexibility wise. Alternative disposal methods are further discussed under Issue A-8.

Applicability of the rule to existing sites is a complex issue. The application of the requirements in the rule to existing sites was intended to be a case-by-case determination. The regulation was modified to clarify the applicability to existing sites and address concerns for instant noncompliance.

Lewis expressed concern that the abandoned sites being cleaned up by DOE are not covered by Part 61. Commission authority to regulate Department of Energy waste management activities is limited to the activities covered by 10 CFR Part 60, "Disposal of High-Level Radioactive Wastes in Geologic Repositories". Therefore, Part 61 cannot be modified in scope to cover DOE cleanup activities.

The staff recognizes that problems exist at existing sites. The experiences at these sites provided part of the basis for the proposed rule in a lessons learned sense. The siting, design, operational, financial, and licensing procedures are intended to collectively prevent past problems at future sites.

Part of the confusion concerning the applicability of the rule to Agreement States resulted from language in the Supplementary Information portion of the Notice of Proposed Rulemaking for Part 61. Section V.H. of the Supplementary Information states: "Although nearly all disposal at existing facilities is carried out under State licenses, it would be the Commission's intent that in the future all disposal would be expected to comply with the provisions of Part 61." Section 61.1(b) as proposed referred to Part 150 in outlining exceptions. The intent was not to imply that the rule itself applied to persons licensed by Agreement States. The commenters are correct in noting that Agreement States must promulgate regulations if the requirements are to apply to Agreement State licensees. Agreement States must have programs compatible with the Commission, and the assumption concerning future disposal was based on the expectation that the manifest and disposal requirements would be implemented by the States. Section 61.1(b) was modified to clarify the applicability in Agreement States.

The requests to extend the scope of Part 61 to include disposal by individual licensees was apparently based on the belief that severe limits on burial quantities are imposed on individual licensees by 10 CFR Part 20. The deleted §20.304 did limit the quantities that could be buried without prior Commission approval. Disposal of large quantities was authorized pursuant §20.302. All individual licensee burials are currently licensed pursuant to §20.302. Section 20.302 does not impose specific limits on the types or quantities of waste which may be authorized for disposal. Limits are established on a case-by-case basis. The Part 61 and accompanying rule changes leaves the quantity flexibility in §20.302. Thus the basis for the request appears to have been a misunderstanding.

Licensee burials of their own wastes are approved on a case-by-case base as noted in the preceeding paragraph. The performance objectives and other requirements in Part 61 will certainly be considered in the evaluation of such proposals. However due to the wide variety of possible proposals, mandatory compliance was not proposed. In general, the hazard and quantities of wastes will be significantly less so that siting and design features needed for multiple user sites may not be required. The flexibility to make these judgements without granting exemptions to a regulation was retained.

Rule Changes:

1. Amend 61.1(b) to read:

   (b) Except as provided in Part 150 of this chapter, which deals with an assumption of certain regulatory authority by Agreement States, and §61.6 "Exemptions," the regulations in this part apply to all persons in the United States. The regulations in this part do not apply to (1) disposal of high-level waste as provided for in Part 60 of this chapter; (2) disposal of uranium or thorium tailings or wastes (byproduct material as defined in § 40.4(a-1)) as provided for in Part 40 of this chapter; or (3) disposal of licensed material as provided for in Part 20.

2. Amend 61.2:

   "Waste", for purposes of this part, means those low-level radioactive wastes containing source, special nuclear, or byproduct material that are acceptable for disposal in a land disposal facility. For the purposes of this definition, low-level waste has the same meaning as in the Low-Level Waste Policy Act, that is radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or byproduct material as defined in section 11 e.(2) of the Atomic Energy Act (uranium or thorium tailings and waste).

3. Add to §61.1(a):

   Applicability of the requirements of this regulation to Commission licenses in effect on the effective date of this part will be determined on a case-by-case basis and implemented through the terms and conditions of the license or orders issued by the Commission.

ISSUE A-2

Issue: Agreement State compatibility

Commenter: Pennsylvania Department of Environmental Resources (16)
State of North Carolina (109)
U.S. Environmental Protection Agency (122)

Rule Citation: General

Summary of Comments: The Pennsylvania Department of Environmental Resources (Department) expressed the view that the NRC formally specify which portions of Part 61 must be adopted by Agreement States for compability. The State of North Carolina urged maximum flexibility for Agreement States in adopting Part 61 requirements. EPA urged consistency.

Analysis of Comments: The Department expressed concern that states contemplating changing Agreement State status be able to assess the impact of adopting all or part of the rule and that the rule must be compatible with state and compact activities under the LLW Policy Act. The Department was silent on how the NRC should articulate its compability policy.

The State of North Carolina agreed that "most, if not all, of the technical requirements...should be imposed by such [Agreement] states." However the State felt that the administrative and procedural aspects would pose an unnecessary burden on the states. The EPA urged that Agreement States adopt consistent state regulations and procedures to assure consistent handling of low-level wastes.

On January 23, 1981 the NRC published modified criteria concerning Agreement States to provide for States to enter into agreements for low level waste only (46 FR 7540). These criteria are silent on the issue of compatibility with Part 61. (Part 61 was not published as a proposed rule until July 24, 1981.) Draft guidance has been provided to all states on these limited agreements. The Commission lacks the authority to impose Part 61 as minimum national standards and to require identical regulations.

The NRC staff would expect that the technical requirements of Part 61 would form the basis for state regulations. Procedural flexibility is a recognized need for States. However, the conerns reflected in the procedures established in Part 61 should be addressed in the state regulatory program.

The Commission has held meetings with Agreement State authorities to plan for the orderly implementation of the new requirements in Agreement States. Since the provisions in § 20.311 of 10 CFR Part 20 could affect all waste generators, both in Agreement States and states regulated by the Commission, the effective date of this section should be delayed to permit the necessary changes in Agreement State regulations and license conditions of the Agreement State-regulated disposal facilities. Waste form, waste classification, and manifest requirements would be affected.

Since all other provisions of the proposed rules would pertain only to applicants or licensees for new Commission-licensed disposal facilities, there are no reasons to delay the effective date of these requirements. The Commission

is working with the Agreement States to develop model regulations to be adopted by the Agreement States in accordance with their agreements to maintain compatible State regulations.

Proposed Rule Change: None.

ISSUE A-3

Issue: Commencement of Construction

Commenters: Harry Lawroski (62)
Union Oil Company (66)
Birmingham Audubon Society (80)
Utility Nuclear Waste Management Group (81)
Middle South Services (84)

Rule Citation: § 61.3(b), § 70.23(a)(7)

Summary of Comments: Most of the commenters recommended providing more flexibility to commence construction of the disposal site at the applicant's risk. One commenter strongly supported delaying construction.

Analysis of Comments: The language quoted by Lawroski on commencement of construction was taken from 70.23(a)(7) of Part 70. (A proposed change to delete "commercial waste disposal of land burial "from this paragraph was included in the notice as an editorial change since licenses for disposal of wastes from others will be issued pursuant to Part 61 when Part 61 becomes effective not Parts 30, 40, and 70.) The language states that early commencement "shall be grounds for denial." The applicable language in proposed Part 61 is in § 61.3, License required, which states:

> (b) Each person shall file an application with the Commission and obtain a license as provided in this part before commencing construction of a land disposal facility. Failure to comply with this requirement may be grounds for denial of a license.

The Part 61 language "may be grounds" does not make denial mandatory. Further, the Commission may grant exemptions to any requirement in Part 61 under § 61.6, Exemptions. Thus flexibility exists without modifying the proposed lauguage.

Union Oil argued that if an applicant has all other required permits except an NRC license, he should be able to construct the facility at his own risk. This flexibility would allow development of the site at the same time associated facilities not requiring approval are developed.

Birmingham Audubon Society strongly supported the requirement for a license before commencing construction.

The Utility Nuclear Waste Management Group expressed concern over the severity of denial and recommended deleting the second sentence in § 61.3(b). As noted above denial is not mandatory.

Middle South Services also recommended more flexibility to construct and deletion of the second sentence of 61.3(b) on denial.

The Commission is concerned that the actual spending of funds for construction or apparent spending or other financial committments not influence the licensing decision and NEPA evaluations. Also, construction of disposal units or modification of the intended buffer zone prior to final review and licensing decision is of particular concern. Further, neither existing site operators nor persons claiming to be potential applicants commented on the provision. Thus the suggested change to rule was not adopted.

Rule Change: None.

ISSUE A-4

Issue: Commission Authority

Commenters: Pennsylvania Department of Environmental Resources (16)
Joel Jaffer (46)
U.S. Environmental Protection Agency (122)

Rule Citation: General and 61.7(c)(4)

Summary of Comments: One commenter suggested that NRC should request authority from Congress to regulate commercial low level waste sites if transferred to DOE. One stated "I don't think the Commission has any authority to license the disposal of radioactive wastes which remain toxic for lengths of time, and for proposed purposes and scope, beyond the NRC's authority." The EPA suggested close coordination between agencies for mixtures of wastes containing both hazardous and radioactive materials.

Analysis of Comments: The Pennsylvania Department of Environmental Resources correctly observes that NRC does not have the authority to regulate disposal sites if the Department of Energy (DOE) is to provide institutional control and that such lack accounts for the license termination after closure where DOE is custodial agency as discussed in § 61.7(c)(4). The commenter suggests that authority to license DOE during institutional control be requested from Congress in order to ensure adequate protection of public health and safety.

While the suggestion has merit, as a practical matter the Commission is not aware of plans for DOE custodial care of existing sites or new sites that might be licensed pursuant to Part 61. The question is an academic one now and can be addressed at some future time should such transfer become more likely.

Mr. Jaffer challenged the Commission's authority to license long-lived materials. The Commission clearly does have the authority to license use and disposal of byproduct, source, and special nuclear materials. These materials include long lived radionuclides. The NRC and its predecessor AEC have always licensed disposal as a necessary adjunct to use of materials. The Commission has and does license commercial or other disposal sites involving disposal of wastes from other persons. Proposed Part 61 only codifies and elaborates on how the Commission will continue this activity.

The U.S Environmental Protection Agency noted that the EPA has regulatory responsibility for the disposal of hazardous wastes under the Resource Conservation and Recovery Act (RCRA), that RCRA exempts materials regulated by NRC, and that RCRA does not address hazardous chemicals mixed with radioactive materials.

EPA suggested a memorandum of understanding as a vehicle for coordinating the two agencies' programs. NRC agrees that close coordination is needed and intends to pursue the matter with EPA.

ISSUE A-5

Issue: Pre-emption of State laws

Commenter: Environmental Law Project (9)

Rule Citation: none

Summary of Comment: The commenter recommended that authority for some form of final approval of a license by a local or preferably state government be included in the regulation.

Analysis of Comment: The commenter is concerned that Commission authority is pre-emptive over State laws and that the Commission might issue a license in spite of state wishes and in spite of state plans to meet its responsibilities under the Low-Level Radioactive Waste Policy Act.

Under the Policy Act, it is quite clear that the Commission is to license sites in non-Agreement States. Under the Commission's licensing authority, no final decision is vested in local governments and there is no provision for State veto. Issuing the license is a decision the Commission must make. This responsibility does not mean that State concerns will not be considered. States have several avenues for expressing concerns and can exercise a de facto veto by not accepting the role of landlord and long term custodian.

Rule Change: none

ISSUE A-6

Issue: Official interpretations

Commenters: Union Oil Company of California (66)
U.S. Ecology (101)

Rule Citation: § 61.5

Summary of Comments: The commenters were concerned about the restrictions on interpreting the regulation articulated in § 61.5.

Analysis of Comments: U.S. Ecology and Union Oil expressed concern that the requirement in § 61.5 that only written interpretations by the General Counsel are binding could unnecessarily delay the regulatory process. U.S. Ecology suggested a 10 day time limit for obtaining General Counsel responses.

The language in § 61.5 is a statement of legal fact whether restated in Part 61 or not. The need for official interpretation is rare and staff routinely explains or clarifies the intent of rules through regulatory guides, technical positions, correspondence etc. Section 61.5 does not restrict these activities.

Because of the rarety of such interpretations, it is impossible to predict the nature or subject of them or the time that may be required to develop an official written response. Thus, the time limit suggested was not adopted.

Rule Change: none

ISSUE A-7

Issue: Exemptions to the rule

Commenters: Birmingham Audubon Society (80)
State of California (93)
U.S. Department of Energy (119)

Rule Citation: §§ 61.6, 61.7(b)(5), 61.54, 61.55

Summary of Comments: The Birmingham Audubon Society expressed opposition to case-by-case exceptions on waste concentrations that exceed Table 1 values and felt that general exemptions under § 61.6 should involve extensive noticing and hearings. The State of California was opposed to the flexibility to approve alternative requirements on design and operations in § 61.54 and DOE offered explicit support.

Analysis of Comments: The Audubon Society was concerned that wastes remaining dangerous longer than 500 years should not be allowed in near-surface facilities. The staff shares the Society's concerns but believes that special, and usually more stringent, requirements on waste form and disposal methods can mitigate the potential danger. This issue is discussed more fully in the waste classification issues. The intent for more restrictive requirements versus generally acceptable was clarified in the final rule but the flexibility to consider wastes on a case-by-case basis was retained.

The Society recommended that the Governor and State legislative be notified if any exemptions are granted under § 61.6 and that public hearings be held in the nearest large city. Staff agrees that exemptions should be carefully considered and will do so but does not believe that procedural changes are needed to assure that officials and the public are informed. If the exemption is requested in the initial application, the required distribution assures notification. If a major health and safety issue is involved after the license is issued, § 61.25 assures notification.

The State of California expressed the view that approval of alternative design and operations pursuant to § 61.54 was arbitrary. Since the section includes a requirement that the alternate proposals meet the performance objectives, the same degree of safety is assured and staff does not agree that flexibility to provide unique or innovative solutions is arbitrary.

Rule Changes: none

ISSUE A-8

Issue: Other than near-surface disposal methods

Commenters: Advisory Committee on Reactor Safeguards (ACRS) (10)
Department of the Environment, London (19)
Northern Illinois University (27)
Zelia M. Jensen (64)
Nuclear Monitoring Systems & Management Corporation (86)
U.S. Department of the Interior (114)
Kerr McGee (115)
U.S. Department of Energy (119)
U.S. Environmental Protection Agency (122)

Rule Citation: General

Summary of Comments: The ACRS, Department of the Environment, Kerr-McGee, DOE, and EPA supported the development of criteria and flexibility for disposal methods other than near-surface for more hazardous wastes. Northern Illinois University and Zelia Jensen were opposed to near-surface disposl methods and favored alternate methods for all wastes. Nuclear Monitoring suggested use of the Corporation's specific retrievable storage system for more hazardous waste. The U.S. DOI questioned what would be done with wastes exceeding Class C limits.

Analysis of Comments: The ACRS offered general support for the "establishment of criteria for deeper land burial and disposal in mined cavities." The staff agrees and notes that while the performance objectives, institutional, financial, and procedural requirements apply to any form of land disposal, the specific technical requirements developed so far cover only near-suface disposal and that staff plans that future additions to Part 61 will specify technical criteria for other types of land disposal, such as the use of deep mined cavities, if necessary.

The Department of the Environment supported the flexibility of the systems approach to allow the combination of factors in disposal to determine the disposal methods based on the nature of the wastes. The Department also supported the concept of a range of disposal methods including existing cavities and intermediate depth disposal. Kerr-McGee also supported the development of requirements for other the near-surface disposal, particularly for the disposal of transuranic wastes from decommissioning facilities. Such disposal would be more economic than in a Part 60 high level waste geologic repository.

The DOE supported the concept of alternatives for more hazardous wastes but expressed concern that separate facilities may not be necessary. The DOE noted that other factors in the method of disposal, such as waste form, may provide the greater confinement needed. The staff agrees and did not intend to limit additional assurances to depth of burial only. Such requirements are similar to the considerations for protecting near-surface Class C wastes from intruders. The proposed rule provided depth or other means such as engineered barriers for Class C wastes. The case-by-case considerations provided for when concentrations exceed § 61.55 limits for Class C wastes would also involve a range of factors in providing additional protection, not just depth. Separate facilities were certainly not intended but no change to the rule is needed to allow other than near surface disposal at a near-surface facility.

The EPA urged analysis for other disposal methods such as hydrofracture, deep well injection, and mined cavities but stated that Part 61 should not be delayed for these analyses. Staff agrees with this EPA view.

The Northern Illinois University and Jensen were opposed to near-surface disposal for radioactive wastes. The University referenced experience at existing sites and uncertainties in understanding the mechanisms for migration as the basis for dismissing near-surface dispbsal in favor of disposal in "deep mined cavities in areas of low precipitation." Jensen felt geologic repository disposal of all wastes would solve the problem of waste disposal and not leave it to "future generations to resolve." The staff disagrees with these two commenters and believes that wastes can be safely disposed of in near-surface facilities with reasonable assurance of protection of the public health and safety and with minimum burden on future generations.

The Nuclear Monitoring Systems and Managemet Corporation has developed a specific technology " which is capable of Storing, Monitoring, and Recovering [SMR] both high-level and low level radioactive wastes." A copy of a document prepared for the State of Texas was submitted for the Commission's information. The commenter supports a systems solution for near-surface land burial and use of their specific SMR technology for wastes not suitable for near-surface burial. Staff did not evaluate the specific SMR technology and has no comment on the merits of the proposal.

The Department of Interior questioned what alternatives exist for waste exceeding Class C limits. Such wastes can (1) be considered on a case-by-case basis for disposal at the near-surface facility with additional measures for protection, (2) stored by the licensee until alternate disposal methods are developed, or (3) stored by another licensee or DOE until alternate methods are available.

Rule Changes: none

ISSUE B-1

Issue: Contents of applications; meaning of "demonstrate" compliance

Commenters: Union Oil Company of California (66)
Birmingham Audubon Society (80)
Utility Nuclear Waste Management Group (81)
American Nuclear Society (87)
Health Physics Society (96)
State of New York, Department of Law (99)
Atomic Industrial Forum (100)
U.S. Ecology (101)
Conference of Radiation Control Program Directors (103)
The American Society of Mechanical Engineers (107) & (113)
Department of Energy (119)

Rule Citations: §§ 61.11, 61.12, 61.13, 61.23

Summary of Comments: Three commenters suggested adding more prescriptive requirements. Two commenters suggested clarification or definition of terms. Five commenters addressed the intent and meaning of the requirement to "demonstrate" compliance with objectives and requirements. One suggested addressing accidents in design plans and one questioned whether the experience requirement would lead to monopolies by present companies.

Analysis of Comments: The Union Oil Company of California raised three points about § 61.12. One was the need to define "vicinity" in paragraph (a) to limit the bounds of surveys for data since adjacent properties may not always be accessible. The need for data on adjacent properties will be very site specific and depend on features such as the complexity of the subsurface and ground water flow paths. The characterization of sites will be addressed in regulatory guides and other guidance. The general reference is needed to make it clear that data needs may not be limited just to the disposal areas. A second point questioned the need for information on auxilliary buildings not an integral part of the actual disposal process as proposed paragraph (f) would require by a literal interpretation of "land disposal facility." The intent was not to require detailed architectural drawings of support facilities or auxilliary buildings. Staff agrees that the emphasis and key is the relavance to disposal operations. General descriptions and layouts for auxilliary features would be sufficient. Clarifying the reference to methods of construction to focus on disposal units should help (See rule change 1). The third point suggested limiting the requirements in (h) to "known" natural resources to avoid the implication that extensive exploration is required. Staff agrees and the suggestion was adopted.

The Birmingham Audubon Society suggested that additional specificity be provided for 61.11(b)(2) (specific personnel qualifications), 61.12(b) (minimum standards for design features), 61.12(1) (minimum corrective measures for migration), and 61.13(b) (minimum standards for adequate intruder barriers). The commenter's suggestion would make the rule very prescriptive in nature.

Technical requirements for design features for near surface disposal are addressed in Subpart D, § 61.51 so further modification of 61.12(b) is not needed to address the Society's comment. Personnel qualifications needed will vary depending on the types and quantities of wastes and on the design and operation of the facility. Expertise is provided by employees and consultants. Staff prefers to address this question in regulatory guides where options and flexibility prevail. Minimum corrective measures warrented will not only be site specific, they may be different for each incident. A general requirement in § 61.53(d) on environmental monitoring keys actions to assuring that performance objectives will be met. Case-by-case flexibility must be preserved. Applicants can propose a variety of intruder barriers. Generic standards for reducing intruder risks or for discouraging intruders involve factors that are too subjective and staff prefers to provide general guidance in supporting guides.

The Utility Waste Management Group comments focused on the use of the terms "demonstrate" and "demonstration." The commenter refers to use of the terms in § 61.13(b) and 61.23(f), (i) and (j). The commenter suggested clarifying what is meant by demonstration by specifying that analysis resulting in reasonable assurance is intended. Adoption of language similiar to proposed § 60.101(a)(2) on findings was suggested. Section 60.101(a)(2) states:

> (2) While these performance objectives and criteria are generally stated in unqualified terms, it is not expected that complete assurance that they will be met can be presented. A reasonable assurance, on the basis of the record before the Commission, that the objectives and criteria will be met is the general standard that is required. For § 60.111, and other portions of this subpart that impose objectives and criteria for repository performance over long times into the future, there will inevitably be greater uncertainties. Proof of the future performance of engineered systems and geologic media over time periods of a thousand or many thousands of years is not to be had in the ordinary sense of the word. For such long-term objectives and criteria, what is required is reasonable assurance, making allowance for the time period and hazards involved, that the outcome will be in conformance with those objectives and criteria.

The commenter's point is somewhat related to "absoluteness" (see Issue GEN-1) and to what "demonstrate" means. Staff agrees that absolute guarentees are not possible and were not intended by the use of demonstrate.

In § 61.23 "Standards for issuance of a license," the "reasonable assurance" criterion is included in findings for the four performance objectives ((b)-(e)). The commenter correctly notes that the same language should be reflected for all findings. The commenter's suggestion to add the "reasonable assurance" standard to § 61.13 was adopted. The Atomic Industrial Forum and the American Society of Mechanical Engineers expressed similiar views.

The Health Physics Society strongly supported the requirements for specifying a radiation protection program and environmental program. The Society also stressed that the environmental program and occupational exposures should be consistent with ALARA. (See changes to Subpart C made because of other comments on ALARA.)

The Conference of Radiation Control Program Directors suggested revision of § 61.12(d) concerning design basis natural events or phenomena to add consideration of the maximum credible accident anticipated and planned response to such accidents. The response from a radiation safety point of view is covered by § 61.12(k). Section 61.12(d) requires identification of the natural phenomena or events used as a design basis, which includes the maximum credible event concept.

The American Society of Mechanical Engineers also addressed two additional points. One is the need to clarify 61.11(c)(4) to indicate the time periods to address when describing plans for use of the facility for purposes other than disposal of radioactive wastes. The intent was to focus primarily during operations to identify activities that might impact disposal. However, any plans that might impact disposal, monitoring, etc. should be addressed. Plans prior to operations would be addressed in the environmental report and considered as part of the overall impacts of the proposed action. Plans following operations would be addressed in the closure plan and in the application for license transfer to the custodial agency. No change to the rule was made since potentially all time periods are relevant and none could be excluded. The second point suggested adding prescriptive requirements for the quality assurance program requirement in 61.12(j). As discussed earlier and in other issues, the rule focuses on the performance objectives and general requirements and includes only limited prescriptive details. The flexibility thus provided has received broad support. Guidance will be provided in regulatory guides and no rule change was adopted.

The Department of Energy expressed concern that the requirement for being qualified by training and experience could lead to monopolies by present companies and suggested replacing "and" with "or." Such was not the intent. For example, experience handling comparable quantities of radioactive materials, experience constructing similiar facilities, experience disposing of hazardous wastes could all be used to demonstrate that the applicant is qualified. The change was not adopted. The State of New York felt that past experience was not emphasized enough.

Rule Changes:

1. Change 61.12(f) to add after include: ", but not be limited to," and after construction: "of disposal units"

2. Amend § 61.23(f)-(j) to read as follows:

   (f) The applicant's demonstration provides reasonable assurance that the applicable technical requirements of Subpart D of this part will be met.

   (g) The applicant's proposal for institutional control provides reasonable assurance that such care will be provided for the length of time found necessary to ensure the findings in paragraphs (b)-(e) of this section and that the institutional control meets the requirements of §61.59.

   (h) The information on financial assurances meets the requirements of Subpart E of this part.

(i) The applicant's physical security information provides reasonable assurance that the requirements of Part 73 of this chapter will be met, insofar as they are applicable to special nuclear material to be possessed before disposal under the license.

(j) The applicant's criticality accident information provides reasonable assurance that the requirements of §70.24 of Part 70 of this chapter will be met, insofar as they are applicable under the license.

3. Change 61.13(b) to add a reference to "reasonable assurance."

4. Amend 61.12(h) to add "known."

ISSUE B-2

Issue: Groundwater as Major Pathway

Commenters: Department of the Environment, London (19)
Utility Nuclear Waste Management Group (81)

Category:

Rule Citiation: Secton 61.13 Technical Analysis, paragraph (a)

Summary of Comments: The Department of the Environment commented that paragraph 61.13(a) states that ground water is probably the most significant pathway for radioactive transport back to man and requires particular study. They state that although transport is very significant, recent sensitivity analyses suggest that other pathways such as human intrusion, erosion and vegetation uptake may be more significant. The UNWMG recommended deleting the reference to the groundwater pathway as unnecessary.

Analysis of Comments: NRC recognizes that other pathways of exposure, particularly intrusion events by man into the disposal facility, will result in significantly higher exposures to the individuals involved than the ground water pathway. Such events may also bring disposed wastes to the surface where they may be transported off-site by surface water or incorporated into crops grown at the site. Intrusion into a disposal facility is relatively non site specific and NRC has incorporated specific requirements in Part 61 which, if met by a licensee, should assure that an inadvertent intruder would not receive an unreasonable exposure (i.e., greater than 500 mrem to the whole body) assuming reasonable uses of the land. The requirements principally involve the waste classification requirements which include requirements to bury waste presenting high potential hazard to an inadvertent intruder at deeper depths or with additional intruder barriers. The type of pathways analyzed in developing the requirements included construction of house at the site, living in the house constructed and consuming food grown at the site.

The release of radioactivity to the environment through air, soil, ground water, surface water, plant uptake and burrowing animal pathways is relatively site specific and depends primarily on the natural characteristics of the site and its environs. Of these, NRC considers ground water transport to be of greatest potential significance in comparison to the potential releases to the environment which may occur through the other pathways. In addition, requirements in

Part 61 and controls instituted at specific sites directed at controlling migration will also reduce the potential for releases through the other pathways (e.g., thicker, denser trench caps). As noted above, intrusion into the site including the cultivation and consumption of food crops at the site will generally yield higher exposures and has also been addressed in Part 61.

The Utility Nuclear Waste Management Group noted that the reference to the ground water pathway was gratutious and recommended deletion. The staff agrees and has removed the reference.

Rule Change: Delete from 61.13(a): "For near-surface disposal, the ground water pathway will generally be the most significant in terms of releases of radioactivity."

ISSUE B-3

Issue: Time limits on licensing process

Commenters: Ohio EPA (38)
Union Carbide (39)
University of Texas Medical Branch (75)
Health Physics Society (96)
Atomic Industrial Forum (100)

Rule Citation: Section G of Supplementary Information and Subpart B

Summary of Comments: Most of the commenters recommended specifying periods of time in the rule for parts of the licensing process. One commenter suggested a specific licensing step for unrestricted use following institutional control.

Analysis of Comments: The Ohio EPA noted that the only time period listed for Commission action is a reference in the Supplementary Information to the statement that completeness review of tendered applications generally will be made within 30 days. No other time periods are listed in the notice and none in the rule. Union Carbide expressed concern about meeting the January 1986 deadline in the LLW Policy Act and the need for specifying definite times to assure that compacts can meet the deadline. (The January 1986 date is the time compacts can begin excluding non-compact wastes.) The University Texas Medical Branch recommended a time limit to approve or deny the application based on financial considerations and noted that "Applicants who have options on land or own land that could be used for other purposes may incur substantial financial losses due to unreasonable delays." The Medical Branch also suggested that applicants be compensated for delays. The Health Physics Society recommended limits on hearings.

The Commission is sympathetic to the problem of uncertain time frames in the licensing process, the potential for delays, and the need for expedicious action. However, the review and licensing process involves a number of uncertain or potentially uncertain time periods such as the quality of the application, extent of supplemental tests or data that may be required of applicants, State or tribal participation schedules, Commission use of contractors to aid

a specific timeframe that might curtail other rights does not seem justified. The Commission is building in-house expertise and computer capabilities to minimize the use of contractors to minimize delays and uncertainties in this area and will expedite its review to the extent possible. Schedules will be developed for all parties on a case-by-case basis for each application. Issues related to compensation must be addressed through the courts or other means and are inappropriate for a rule such as Part 61

The Atomic Industrial Forum suggested a sixth phase for the life cycle of a disposal facility - release for unrestricted or uncontrolled use after institutional control. The commenter noted that such release would result from radioactive decay to safe levels if sufficient controls on the non-radiological properties are imposed. The rule as proposed does provide for a discrete period of institutional control and license termination at the end of the control period. The proposed rule is silent on what the landowner may do with the land at this point. Reliance on passive controls such as land records and intruder barriers continues after the end of the active institutional control period and, for purposes of analysis, are assumed to cease functioning after 500 years for near-surface disposal. The landowner could allow reuse of the surface after license termination and even limited use of the surface during institutional control. The commenter suggested that some of the phases - preoperational, operational, closure, post closure observation, and institutional control - may take place simultaneously. Closure activities will occur during operations and no other overlaps should occur so no clarification seem warrented.

Rule Change: None.

ISSUE B-4

Issue: License conditions and safety related changes

Commenters: Bechtel (44)
Duke Power (48)
Utility Nuclear Waste Management Group (81)
Middle South Services (84)
American Nuclear Society (87)
General Electric (89)
Stone and Webster Engineering Corporation (95)
Atomic Industrial Forum (100)
U.S. Ecology (101)
The American Society of Mechanical Engineers (107)

Rule Citations: §§ 61.24(g) and (h) and 61.25(a)

Summary of Comments: Three commenters suggested deleting § 61.24(h) which allows the Commission to add additional requirements into license conditions. Nine commenters (all but Stone and Webster) suggested modification of 61.25(a) to allow nonsafety changes. Stone and Webster suggested alternate language for § 61.24(g) to provide for license certifications instead of Commission inspection prior to beginning disposal.

Analysis of Comments: The commenters (Bechtel, American Nuclear Society, and American Society of Mechanical Engineers) who recommended deletion of 61.24(h) were concerned that the applicant's, or licensee's rights under § 2.105 to

petition for a hearing on additional requirements or conditions was being bypassed. No such bypass was intended and the provision in 61.24(h) in no way restricts the rights under § 2.105. No change is necessary.

Stone and Webster Engineering Corporation expressed the view that the Commission should prepare a value/impact analysis in support of any changes to the license made pursuant to 61.24(h). The staff agrees that the impacts of its actions must be evaluated but does not believe that a prescriptive requirement to specify how that evaluation will be documented is appropriate. The nature of the change could range from correcting drafting or typographical errors to major changes requiring an EIS or supplement to the EIS.

The nine commenters who expressed the view that § 61.25 was too restrictive were concerned that minor changes that would not affect the public health and safety are necessary during routine operation of the disposal facility. They were also concerned about changes in administrative or support facilities being restricted. Several recommended the following addition to § 61.25(a) that would allow changes without prior notification:

> (4) changes that do not impact public health and safety can be made immediately with subsequent notification of the Commission in a timely manner.

U.S. Ecology, a current site operator, indicated that notification of the Commission prior to implementation was acceptable.

The commenters' concerns can be addressed through the wording in the specific license conditions in the license issued for each land disposal facility. The issue really boils down to whether the Commission should be aware of all minor changes not requiring Commission approval 60 days before implementing (as proposed), at the time of implementation, or after implementing, or whether a further hierarchy of conditions or other clarification is warrented. The commenters are correct that the proposed language requires all changes to the facility and procedures to be classified as one of the three categories. The three categories were established based on the relative importance to public health and safety. Many day to day changes may involve matters of no concern from a health and safety prespective as the commenters noted. Descriptive information on the facility or procedures may have been submitted in the application for illustrative purposes. An editorial change to require the important features to be addressed by conditions falling in the categories but not all will accomplish the same objective as adding a fourth category as suggested by the commenters.

Stone and Webster suggested an elaborate process of certification, notification, and notices on an alternative to § 61.24(g) which states

> "No radioactive waste may be disposed of until the Commission has inspected the land disposal facility and has found it to be in conformance with the description, design, and construction described in the application for a license.

The wording of the alternative suggests concern about Commission delays. If budget constraints or other unforeseen problems arise to prevent timely Commission inspection, other arrangements such as State reports or an exemption to

the provision can be made. The staff views this final inspection to be very important and the provisions in § 61.24(g) are intended to be administratively simple: i.e., no notices or other procedural steps are required. A letter or inspection report will meet the condition. Thus, the suggestion was not adopted.

Rule Changes:

Amend second sentence of 61.25(a) to read:

> "The license will include conditions restricting certain subsequent changes to the facility and the procedures authorized which are important to public health and safety."

ISSUE B-5

Issue: License renewals

Commenters:
Pennsylvania Department of Environmental Resources (16)
Union Carbide Corporation (39)
Duke Power Company (48)
Oswald U Anders (73)
Utility Nuclear Waste Management Group (81)
Middle South Services Inc. (84)
Northeast Utilities (85)
General Electric (89)
Stone and Webster Engineering Corporation (95)
Don't Waste Washington Legal Defense Foundation (97)
Atomic Industrial Forum (100)
Carolina Power and Light Company (106)
The American Society of Mechanical Engineers (107)
North Carolina Radiation Protection Commission (109)
New England Nuclear (110)
Department of Energy (119)

Rule Citations: Summary Section V.G.
§ 61.27 Application for renewal or closure; 61.25(b); 61.7(c)(2)

Sumary of Comments: All of the commenters except Stone and Webster, Don't Waste Washington, and DOE were concerned about the burden, particularly if hearings are involved, of the implied 5 year renewal requirement and recommended life of the facility licenses. Stone and Webster addressed renewal intervals linked to actual receipt of waste and DOE suggested specifying the renewal interval. Don't Waste Washington supported the clear statement of responsibility for buried wastes in § 61.27.

Analysis of Comments: Under section V.G. "Life Cycle of a Typical Land Disposal Facility" of the Supplementary Information portion of the regulation, the operational phase is discussed. The discussion indicated that at intervals specified in the licensee, the license would be renewed following § 61.27. A parenthetical reference to 5 years as the normal term for materials licensees was made and a practice of offering the opportunity for public hearings was mentioned. The offering of hearings would be required for renewals under the provisions of proposed 61.25(b). The renewal interval is not specified in the regulation

but is implied by the parenthetical reference. Section 61.27 outlines procedures for submitting and acting on applications for renewal but does not require renewals or specify intervals. Section 61.7 "Concepts" under (c)(2) also discusses periodic renewals.

The commenters believed that the regulation provides adequate evaluation and control of the licensee and any potential changes without the burden of frequent hearings which might be involved if a 5 year interval is adopted in the license.

The Commission included the renewal provision in the rule to provide an opportunity to review the operating history and determine whether wastes should continue to be received and disposed of at the site. The renewal provides incentive to update the license to reflect developing technology and to fully factor operating experience and new site information and site performance into periodic reassessments. The renewal provides a greater degree of assurance that the licensee and the Commission will perform the reassessment.

The commenters' belief that adequate controls exist independent of the renewal process was based in part on the tight control of changes and opportunities for notices and of opportunities for requesting hearings in § 61.25(a). (Note that 9 commenters believed that proposed § 61.25(a) does not provide reasonable flexibility. See issue B-4 for a discussion of changes made to provide additional flexibility.) Further monitoring of site activities is provided through inspections and reports filed by licensees. Comprehensive annual reports are proposed in § 61.80(h). Annual financial reports are to be submitted under § 61.80(g). An annual financial re-evaluation of closure funding by the Commission is required by § 61.62(c).

A relevant legal point is that licensees or interested parties can request hearings on any Commission licensing action under existing rules. In proposed requirements such as those in § 61.25 the Commission is advertising the opportunity to request hearings and providing opportunity to request hearings before taking action. Any licensing action taken as a result of Commission review of reports or inspections would be subject to requests for hearings.

The staff reconsidered the issue of how to assure periodic reassessments and reduce the potential hearing burden on licensees. Three alternatives to the proposed renewal provisions were considered. One was to add a section to § 61.24 "Conditions of licenses" to require submittal of periodic reassessments or to require a condition in the specific license issued to the applicant for submittal of such periodic reassessments. All references to renewal would be deleted and reliance placed on the new requirement in § 61.24. The second was to expand the scope of reporting requirements in § 61.80 to cover additional areas of concern. All references to renewal would also be deleted. A third was to delete the requirement to automatically notice renewals in § 61.25(b).

The second altenative to rely on reports provides the greatest assurance of reduced opportunity for hearings. No opportunity for a hearing exists unless the Commission issues orders or otherwise amends the license based on evaluation of the reported information. Updates or reassessments required by conditions of licenses could appear to be equivalent to submittal of an application. In such case, the opportunity for hearings could exist. Thus relying on conditions of licenses reduces the assurance of reassessment while not

completely assuring no hearings. The third alternative would keep renewals to assure reassessment but publicize the opportunity for hearings only when significant changes to license conditions were made, e.g., when renewal involved changes in any conditions covered by 61.25(a)(1). The need for periodic reassessment has been dramatically proved by experience with existing sites and other materials licensees and the Commission believes it must be assured by renewal.

Stone and Webster recommended that the renewal interval begin when actual receipt of waste begins rather than when the license is issued since the applicant does not begin construction until the license is issued. This change was not adopted since the rule does not specify the renewal period (5 years was given as an example only) and such factors can be factored into the expiration date establishing the renewal period. Additionally, construction should only involve a few months.

The Department of Energy suggested that § 61.27(d) or some prior section indicate the amount of time for which a license is issued. Section 61.27 refers to "any" expiration date on the license. As proposed, Part 61 would not have mandated an expiration date but 5 year renewals were referenced as typical in V.G. of the Supplementary Information, as noted earlier. A new paragraph was added to § 61.24 "Conditions of licenses" to establish the requirement for an expiration date in the license. Flexibility to set the date on a case-by-case basis was retained to allow periods longer or shorter than 5 years.

Don't Waste Washington endorsed the language in § 61.27 stating the licensee's continuing responsibility for site closure, postclosure observation, and transfer to the site owner whether the authority to continue to receive waste is renewed or not. Staff agrees and no changes were made to change the language other than grammatical.

Rule Changes:

1. Add to § 61.24 a new (j):

   The authority to continue disposal of wastes shall expire at the date stated in the license except as provided in § 61.27(a) of this Part."

2. Delete "license renewal" in § 61.25(b).

ISSUE B-6

Issue: Closure procedure a burden

Commenters: Ontario Hydro (51)
Oswald U. Anders (73)
U.S. Ecology (101)

Rule Citation: §§ 61.25 and 61.27 and 61.7(c)(2)

Summary of Comments: Two commenters suggested not subjecting the licensee to opportunity for hearings at closure and one suggested deleting the requirement for a license amendment to allow closure.

Analysis of Comments: Ontario Hydro expressed the view that hearings before issuing the license should be sufficient and that a negative result from hearings on closure would impose an unfair financial burden on the licensee. Anders expressed a general veiw that the procedures proposed in Part 61 are over-regulation and will lead to perpetual litigation. Closure was singled out as the final blow - the lack of the right to "walk away in frustration." U.S. Ecology noted that closure plans will be reviewed in the initial application and periodically updated and expressed the view that no license amendment should be required.

In response to these comments and the comments concerning the regulatory burden of the renewal provision (Issue B-5), changes to license conditions (Issue B-4), the burden of multiple hearings (Issue B-9), and concerns of States and local citizens and governments (e.g., Issue F-2), the staff re-examined the procedures proposed to assure up-to-date information and periodic reassessment.

For most licensees, closure will be a continuing activity all during operations and final plans will not usually involve major activities. Broad input and a last chance for the most affected persons to agree on the plans for long term care seems prudent and in the best interest for providing assurances to the custodian so that the custodian is willing to make the required upfront committment. The requirement for a closure amendment and noticing closure was retained.

Rule Changes: None.

ISSUE B-7

Issue: Length of Post Closure Observation and Maintenance Period

Commenters:
Chem-Nuclear Systems, Inc. (41)
Bechtel National Inc. (44)
American Nuclear Society (87)
Atomic Industrial Forum (100)
U.S. Ecology (101)
The American Society of Mechanical Engineers (107)
U.S. Department of Energy (119)

Rule Citation: § 61.7(c)(3) "Concepts" and 61.29 "Post Closure Observation and Maintenance"

Summary of Comments: None of the commenters took exception with the need for a period of post closure observation and maintenance by the licensee. The Atomic Industrial Forum and the American Society of Mechanical Engineers suggested that since the period may need to be extended or possibly shortened based on site specific conditions, it should be included in the site closure plan rather than the rule. U.S. Ecology commented similarly about the need to consider site specific conditions at closure which could warrant a shorter period. They suggested that provision be made for a period of less than 5 years if conditions warrant upon request of the licensee. The Department of Energy questioned the basis for applying the 5 year period in all cases since a shorter or longer time period might be required depending on site specific conditions.

The American Nuclear Society, The American Society of Mechanical Engineers and Bechtel national, Inc. commented that the requirement, as written in requiring a minimum of 5 years was open ended and did not provide sufficient guidance to establish adequate funding for the time required. They suggested that a specific time frame should be set such that the licensee could plan for the time required. Chem-Nuclear Systems commented similarly noting that a clear position on the time frame is necessary for an operator to set aside funds to cover those activities.

Analysis of Comments: The comments do not take exception with the need to observe and maintain the site after site closure to help ensure it is in a stable condition prior to transfer of control to the site owner. They do take exception, however, with the fact that specifying a minimum of 5 years results in an open ended requirement which can affect a licensees planning activities and also the fact that site conditions may warrant a shorter or longer period of observation and maintenance. NRC did not intent to establish an open ended requirement and believed that by specifying a minimum of 5 years, a specific limited time frame would be established which could be extended, if needed, based on site specific conditions. NRC staff agrees that the length of time required will be a function of site specific conditions at closure and the post operating history of the site.

Rule Change: Based on the staff's analysis of comments, § 61.29 has been modified to read as follows:

> § 61.29 Post-closure observation and maintenance.
>
> Following completion of closure authorized in § 61.28, the licensee shall observe, monitor, and carry out necessary maintenance and repairs at the disposal site until the site closure is complete and the license is transferred by the Commission in accordance with § 61.30. Responsibility for the disposal site must be maintained by the licensee for 5 years. A shorter or longer time period for post closure observation and maintenance may be established and approved by the Commisson as a part of the site closure plan based on site specific conditions.

ISSUE B-8

Issue: License transfer

Commenters:
Environmental Law Project (9)
PA Department of Environmental Resources (16)
Chem-Nuclear Systems, Inc. (41)
Arizona State Clearinghouse (47)
State of California (93)
Atomic Industrial Forum (100)
U.S. Ecology (101)
Conference of Radiation Control Program Directors (103)
U.S. Department of Energy (119)
General Research (123)

Rule Citations: § 61.23 (g), 61.30, and related citations 61.24(a), 61.26.

Summary of Comments: One commenter was concerned that adequate safeguards are specified in the event of transfer of the license from one operator to another. Two commenters were concerned about requirements for specific plans and assurances related to transfer of the license to the custodial agency and three were concerned about delays in accepting transfer by the custodial agency. The Conference raised several questions concerning the concept of license transfer to a state or federal agency after closure. They questioned what criteria would be used to judge the agency, what enforcement actions might be taken, and why a state might be licensed for custodial care but not DOE. The Conference suggested considering termination after closure. Pennsylvania questioned whether the rule would allow the operator to remain the licensee for long term care if so desired by the site owner. California expressed concern about a state assuming responsibility without adequate funds. (See Issue E-1). The DOE suggested that custodial license conditions be added to the rule in § 61.31.

Analysis of Comments: The commenter concerned about license transfer to another operator was primarily concerned about transferees being subject to all requirements that the initial licensee was. The commenter wanted more explicit assurance. The proposed rule requires a license amendment for transfer of the license in § 61.24(a), "Conditions of licenses." A general requirements for issuing amendments is in § 61.26(b) which says that the Commission will apply the criteria set forth in § 61.23. Section 61.23 specifies the standards for issuing the initial license. Thus the proposed rule does require equivalent assurances.

Chem-Nuclear Systems, Inc. who questioned whether a specific plan for institutional care is required and how an applicant can assure compliance with such a plan raised good points. Section 61.59(a) outlines certain minimum specific activities which the custodian must perform. The amount of detail required concerning activities during institutional control will be dictated by two factors. One is the degree of reliance on the activities to assure protection of the public health and safety in the technical analyses. The second is financial planning. Section 61.63 requires Commission approval of the arrangements and adequacy of financial assurances for institutional control. Costs must be estimated for institutional care to determine adequacy. Thus some preliminary plans would be required. Finalization of such plans would be part of the application for amendment to transfer to the site owner pursuant to § 61.30. The staff does not agree with DOE that license conditions for the custodial agency should be added. The conditions will be site specific, and flexibility is needed. Detailed conditions were not added.

The applicant cannot assure the actions of the site owner. The applicant should demonstrate that close coordination has occurred with the Federal or State government who owns or will assume ownership of the disposal site. The certification required in § 61.14 is intended to be "informed" consent and agreement. The applicant can only be expected to provide the basis for informed certification and financial planning and evidence of the arrangement. Just as the Commission determines that the applicant's proposals provide reasonable assurances, the applicant is demonstrating the custodial committment provides reasonable assurance that institutional care will occur.

The commenters were concerned about delays in transfer under § 61.30 because the custodial agency might impose more stringent requirements or use "when the agency is prepared" to effect delays. Such delays could deplete financial reserves set aside. The commenters (U.S. Ecology and Chem-Nuclear Systems,

Inc. the two companies currently operating sites and the Atomic Industrial Forum) correctly identify a weakness in the proposed licensing procedures. The dilemma the Commission faces is how to assure that the custodial agency has the commitment, staff, funds, authority, etc. to carryout the institutional care before releasing the site operator without imposing an unfair burden on the site operator as the commenters suggest. In the draft EIS, alternative licensing options were discussed in Chapter 8, including a co-licensee arrangement up front. The co-licensee experience with the West Valley, New York reprocessing facility did not solve this dilemma. None of the commenters offered a solution other than making transfer a "part of the closure agreement and not the regulation." Contingency planning for delays in transfer will have to be a risk associated with doing business unless case-by-case solutions are found. The proposed rule provided maximum flexibility to address the issue on a case-by-case basis and no changes were made.

Two factors important to the transfer to the landowner are the limits on NRC authority and the importance of early and continuing involvement by the landowner. The turnover to the landowner is a contractural arrangement between the operator and owner that NRC cannot mandate. The NRC can object to transfer only. As pointed out in the analysis of comments on § 61.59, since the landowner (usually the State) ultimately is responsible, it behooves the landowner to be involved during the lifetime of site operations. Continuing awareness and involvement should minimixe any last minute problems in transfer.

The Arizona commenter recommended that license transfer occur after operations to receive wastes cease. The commenter is concerned that the lack of economic incentive to carryout closure and postclosure activities could prompt the operational licensee to use legal means to escape responsibility. The commenter suggested that provisions for the landowner to assume responsibility and marked funds and then carryout closure, post closure observation and institutional care should be added as a requirement in the rule to eliminate reliance on the operator.

The rule as proposed has sufficient flexibility to allow a number of options including licensing options. The license can be transferred any time not precluded in the rule. The landowner and custodian can be joint licensees and share or shift responsibilities at any point in the process. The State may be the operator. The Arizona or Pennsylvania scheme--operator as long term care licensee--may happen under the proposed rule but is not mandated. The Pennsylvania proposal has some drawbacks, but if the custodial period is short because of waste restrictions or method of disposal (e.g., sealed mine), it might be preferable. The Commission prefers to keep the flexibility for operator/custodian roles in view of the LLW Policy Act activities and negotiations.

With respect to the questions raised by the Conference, criteria to be used to judge the State readiness for license transfer will be focused on having staff, authority, and funding in place. Any state can be a licensee - the key is readiness to implement the custodial program. Possible enforcement actions include any the Commission is authorized to take against licensees. The state would qualify as a "person" under Commission rule and would be a licensee in the same status as other licensees. The only reason for licensing a state and not DOE is lack of authority (see Issue A-4). The Commission lacks the authority to license DOE to provide institutional control.

The General Research Corporation expressed concern over the lack of more prescriptive procedures for closure and postclosure activities. The commenter was concerned that end points of these phases are not well defined and unanticipated problems may arise to interfere with orderly transfer for institutional control. The commenter raises some interesting points to factor in specific site planning but staff believes the level of detail and attempts to postulate all possible problem scenarios and include coverage to be too prescriptive and speculative for a rule.

Rule Changes: none

ISSUE B-9

Issue: Hearings

Commenters: Environmental Law Project (9)
Oswald U. Anders Ph.D. (73)
Northeast Utilities (85)
Health Physics Society (96)

Rule Citation: § 2.105, V.G. of the Supplementary Information, § 61.25

Summary of Comments: One commenter believed the rule should require that public informational hearings be held near the proposed site. Two commenters believed that the multiple opportunities for hearings are a burden and will virtually eliminate the private sector. One expressed a general concern about the burden of hearings and questioned how the scope might be limited.

Analysis of Comments: The Environmental Law Project is concerned that public hearings be mandatory. The suggested hearings would be in addition to the adversary hearings which can be requested under existing regulations. The Project also believed that residents of the area should be given two months notice for the hearings and a local public document room should be established.

The Commission considered the alternative of mandatory hearings of the "adversary type" as prescribed under existing regulations rather than such hearings being optional. Establishing a new type of hearing and prescribing the conduct of a new type of informational hearing was not considered. Nothing in the proposed rulemaking would prohibit holding such hearings. The applicant, the State, the local government, or the Commission could hold informational hearings.

In view of State activities under the Low-Level Radioactive Waste Policy Act, a Commission requirement for local hearings could be duplicative and cause additional delays. Developing the rules for such hearings would be difficult and would require supplementary proposed regulations. The proposed regulations require notification of local officials. Local officials and citizens can comment on and provide input for the environmental impact statements for the site. Thus the suggestion was not adopted.

The Commission also considered mandatory local public document rooms. Local document rooms have been established for existing Commission disposal site licensees so a requirement would codify current practice. In the DEIS, case-by-case flexibility was indicated as preferable in case the state has made other arrangements or lack of interst or willingness for a local group to accept

responsibility for maintaining the docket files. The Project offered no specific arguments that would negate these views expressed in the DEIS. No change was proposed.

The Northeast Utilities expressed concern that the multitude of public hearings and the associated uncertainties and burden would result in no private entity being willing to develop a site. Northeast Utilities reviewed the five-phases that make up the life cycle of a site and counted seven opportunities for hearings assuming five year renewals and 25 years of operation. (The seven identified would be a minimum number, depending on how many changes require notice and opportunity under § 61.25.) The commenter's concerns are addressed under issues B-5 (renewals) and B-6 (closure) for these parts of the cycle. No issue was taken with opportunity for initial hearings. The remaining opportunity discussed by the commenter is at transfer to the custodian.

Oswald U. Anders expressed similiar concerns about the private sector viability under the proposed regulatory scheme, including multiple opportunities for hearings.

As discussed for renewals (Issue B-5) and closure (Issue B-6), the licensee or their interested party can request hearings on any Commission action. The Commission has a choice in whether to advertise the opportunity and delay action for a specified period to allow requests as in 61.25(a)(1). In response to the concerns raised by commenters, the required number of notices in § 61.25(b) has been reduced by deleting renewals.

Limiting the timing and scope of hearings would involve changing the existing process defined by 10 CFR Part 2. No changes to Part 2 are appropriate for one category of licensee.

Rule Changes: See Issues B-5 and B-6.

ISSUE B-10

Issues: Post-Operational Monitoring

Commenters: Environmental Law Project (9)
University of North Carolina (30)
Commonwealth of Pennsylvania, Department of Environmental Resources (16)
Duke Power Company (48)

Rule Citation: § 61.29 and 61.59

Summary of Comments: Five comments were received on this particular issue by the commenters:

(a) "...the five-year active monitoring phase required by the proposed rule § 61.29 is far too short..." (9)

(b) "At least ten years of some form of active monitoring seems to be required, and perhaps more..." (9)

(c) "Some specific provision for additional monitoring if determined necessary by geologic or other conditions would be helpful." (9)

(d) "It should also be made clear that active controls, especially environmental surveillance, could continue beyond the 100 year time period if the custodial agency so desires." (16)

(e) The environmental monitoring program should only continue during the five-year post closure period if environmental monitoring is intended to be a period of sampling of wells and other environmental samples for radioactivity. If environmental monitoring is deemed to be required for the period of 100 years, it should be severely limited to occasional samples of the ground water pathway." (48)

Analysis of Comments: Environmental monitoring at proposed near surface disposal facilities under 10 CFR Part 61 is intended to be comprehensive and extend beyond the post-closure observation and maintenance period. § 61.53(a) requires a preoperational monitoring program and § 61.53(b) extends this program throughout the facility construction and operational period. § 61.29 requires that the site licensee maintain complete responsibility for the site for a post-closure observation and maintenance period of 5 years and, as part of this responsibility, the licensee must monitor the site. NRC has some discretion over the length of this post-closure period and may extend it as conditions warrant. With respect to Comments (a), (b) and (c), NRC is not bound to a 5-year monitoring program, but depending upon site characteristics, facility inventory or other factors, will determine the length of required post-operational monitoring on a facility-specific basis. (See change made, Issue B-7.)

The staff disagrees with comment (e). The nature of the monitoring program and extent of sampling will also be depend on site characteristics and will be determined on a site specific basis.

With respect to Comment (d), the staff feels that the language of § 61.59(b) is clear: The Commission will determine the length of the period of active controls. As mentioned above, the length of this period will be determined based on facility-specific characteristics. Although the custodial agency may continue active controls beyond the period required by the Commission, the Commission has in establishing the performance objectives and technical requirements of 10 CFR Part 61, operated on the basis of not assuming reliance on active controls for more than 100 years following transfer of control of the disposal site.

Rule Change: See Issue B-7.

ISSUE B-11

Issue: License each disposal unit

Commenter: Arizona State Clearinghouse (47)

Rule Citation: Subpart B

Summary of Comment: Arizona suggested that a licensing approach oriented to individual disposal units be considered.

Analysis of Comment: Under Arizona's proposed scheme, only limited numbers of disposal units would be authorized for use. Use of additional units would not be authorized until filled units were adequately closed and stabilized. Such an approach would guarentee that closure was completed during the operating life of the site. However, it would involve additional burdens for the licensee and the Commission since specific license amendments would be required. These amendments would be an administrative burden and would subject the licensee to additional requests for hearings since hearings can be requested concerning any Commission licensing action. The proposed rule already provides for tight control of licensee activities and periodic reassessments. The licensee car be required through the license to complete closure as units are filled.

From a technical point of view, the site closure activities will be very site specific. Some features of closure can be accomplished as you go, others will involve larger areas of the site or the entire site or longer timeframes. The applicant will have to identify closure activities and schedules in order to adequately develop funding. These plans will be part of the activities covered by the license and license conditions.

The Commission agrees with the thrust of the commenter's point that closure should be completed to the extent practical during operations to minimize the work that must be done after operations cease and economic incentives are gone. The Commission prefers to keep site specific flexibility and minimize administrative burdens in implementing this approach. Thus the suggestion was not adopted.

Rule Change: None.

ISSUE B-12

Issue: Signing application under oath

Commenters: Ontario Hydro (51)
General Electric (89)
The American Society of Mechanical Engineers (107)

Rule Citations: § 61.20(a), 61.24(b)

Summary of Comments: The commenters questioned the need to sign the license application and statements under oath.

Analysis of Comments: Knowingly submitting false information to a federal agency is a crime. Signing under oath focuses attention on the responsibility for the submitted information and provides added weight if the information misrepresents facts or circumstances should the Commission be forced to take action. Considering the long term importance of information associated with waste dispoal, such focus and assurance seem reasonable.

Rule Change: None.

ISSUE B-13

Issue: Number of copies of application and EIS

Commenter: Union Oil Company of California (66)

Rule Citation: § 61.20

Comment: "The applicant should be required to provide only enough copies of the application and EIS to satisfy the distribution requirement."

Analysis of Comment: Section 61.20 requires the applicant to file 3 copies of the application and environmental report and retain 85 copies for distribution as directed. The distribution and basis for directing the applicant to distribute copies is in proposed § 2.101(b). The numbers of officials and interested parties will be different for each applicant. The 85 copies were judged to the adequate to cover expected distribution needs. The number was specified up front so that the applicant would know that multiple copies will be required and can seek bulk rates for printing or copying. The current provisions of 10 CFR 51.40(c) require the applicant for disposal facilities to retain 85 copies of the environmental report for distribution. This number was retained. Submission of 3 copies instead of 15 as required in § 51.40(c) was adopted because of Paperwork Reduction Act limits. The Commission has no better number and the 85 copies requirement was kept.

Rule Change: None.

ISSUE C-1

Issue: Systems Analysis/Objectives vs. Prescriptive Requirements

Commenters:
Department of the Environment, London (19)
Commonwealth Edison (35)
Los Alamos National Laboratory (43)
Ontario Hydro (51)
Georgia Yuan (77)
General Electric Company (89)
Don't Waste Washington Legal Defense Foundation (97)
American Institute of Chemical Engineers (102)
Conference of Radiation Control Program Directors (103)
Carolina Power and Light Company (106)
New England Nuclear Corporation (110)
United States Department of the Interior (114)
U.S. Department of Energy (119)
U.S. Environmental Protection Agency (122)

Rule Citation: Subpart C

Summary of Comments: Almost all commenters supported the approach of addressing disposal from an overall systems standpoint; establishing overall performance objectives (radiological protection standards) and minimum technical requirements; and leaving considerable flexibility in how an applicant or licensee would design and operate a site. For example, the U.S. Department of the Interior stated they agreed, in general, with the flexibility and conservatism of the combined prescriptive and performance objective approach.

The New England Nuclear Corporation, The General Electric Company and Carolina Power and Light all offered a similar comment that the development of performance standards in 10 CFR 61 is the best approach to establishing licensing requirements for land-disposal of low-level radioactive waste. They agreed that only essential generic prescriptive requirements should be included in the regulations and all site specific requirements should be incorporated in individual facility licenses. New England Nuclear further commented they agreed that both performance objectives and prescriptive requirements are necessary. Performance objectives should be limited to occupational and environmental impact concentrations and should be specified in the regulations. They also stated that generic prescriptive requirements are appropriate to limit LLW concentrations and to protect inadvertent intruders. These and prescriptive requirements which provide financial surety should also be incorporated in the regulations. In the cases where prescriptive requirements are adopted from other existing or proposed regulations these should be referenced or incorporated in 10 CFR 61. Other prescriptive requirements which limit site inventory or which protect against excessive migration of radionuclides are site specific prescriptive requirements. Detailed prescriptive requirements should not be in the regulation.

The U.S. Department of Energy commented, however, that the proposed regulation is restrictive by setting both overall performance objectives and technical requirements, which could significantly increase the costs and occupational health impacts without any significant benefits in increased safety. DOE recommended that primary emphasis should be on the overall performance objectives, and the Commission should provide applicants with flexibility to propose specific subsystem performance criteria based on a systems approach which considers site characteristics, design, and operating practices.

The Don't Waste Washington Legal Defense Foundation questioned the justification for relying primarily on performance objectives in a area where concern for public health and safety is so great. They further questioned why additional technical requirements could not be used in the rule. The American Institute of Chemical Engineers commented that the rule should present only performance objectives and no technical requirements. They argued that the establishment of technical requirements would constrain a licensee, result in overconservatism, and prevent an operator from taking advantage of natural or engineered features of a site which could allow disposal of higher concentrations without affecting public health and safety protection.

Yuan commented that while the goal of flexibility has merit, the proposed rule does not provide enough specific guidance. She particularly felt that the site suitability requirements would be difficult to apply because they are too general and depend on meeting the performance objectives.

Analysis of Comments: The approach the NRC has followed is to set overall performance objectives to define an acceptable level of safety leaving an applicant or licensee flexibility in choosing design features and operating practices to achieve the objectives. The NRC also established some minimum prescriptive requirements that were judged necessary in all cases in light of past operating experience with waste disposal and based on specific controls needed for disposal of waste according to the classification system established by Part 61. Based on the comments, this approach appears acceptable and NRC plans to continue its use. The U.S. DOE provided no specific details with respect to their claim that Part 61 could significantly increase costs and occupational health impacts without any significant benefits in increased safety. NRC has examined the Part 61 requirements as modified based on comments filed on the draft rule and further staff analysis, and believes that they do provide a significant benefit in increased safety over the long-term and a reduction in long-term care costs for a small increase in costs to some waste generators to improve waste forms and a small increase in disposal costs. With respect to the comments from the American Institute of Chemical Engineers that the technical requirements will constrain a licensee and not allow full consideration of site characteristics and design features, the NRC believes that the flexibility provided in the technical requirements will not unduly constrain a licensee. They will, however, help ensure a uniform level in safety in disposal and that problems which have occurred in the past will not occur to the same extent in the future.

Rule Change: None

ISSUE C-2

Issue: Need for EPA Standards

Commenters: Catherine Quigg (13)
Conference of Radiation Control Program Directors (103)
North Carolina Radiation Protection Commission (109)
Kerr-McGee (115)
U.S. Environmental Protection Agency (122)

Rule Citation: Subpart C

Summary of Comments: Quigg questioned whether NRC is preempting EPA standards setting authority. North Carolina urged a high priority for EPA efforts. The Conference supported NRC objectives in the absence of EPA standards. Kerr-McGee expressed the view that the exposure and emission standards proposed for Part 61 are premature and beyond the agency's authority to the extent that they are not already embodied in 10 CFR Part 20. The EPA supported the performance objective and prescriptive requirements approach used and noted that the information presented will assist EPA in its standards program.

Analysis of Comments: Quigg's comment is addressed in the following analysis of Kerr-McGee's comment.

The Kerr-McGee comment is based upon the transfer to EPA, by Reorganization Plan No. 3 of 1970, of Atomic Energy Act authority to establish generally applicable environmental standards for the protection of the general environment from radioactive material. Such EPA standards can take the form of "limits on radiation exposures or levels, or concentrations or quantities of radioactive material, in the general environment outside the boundaries of locations under the control of persons possessing or using radioactive materials" (the quoted language is from Reorganization Plan No. 3). The commenter argues that this transfer of function leaves NRC no authority to issue exposure and emission standards. Until EPA acts NRC is alleged to be frozen into the standards of 10 CFR Part 20 promulgated prior to 1970.

The comment sweeps too broadly, overlooking the legislative history of Reorganization Plan No. 3, which clearly establishes that the role to be played by EPA consists of establishing base levels of radiation exposure or concentrations of materials regulated under the Atomic Energy Act when the materials have been dissipated to the general environment and are no longer under control at a specific site. (See Hearings, "Reorganization Plan Nos. 3 and 4 of 1970" Subcommittee on Executive Reorganization and Government Research, Committee on Government Operations, U.S. Senate, 1970, at pp. 136-142.)

A subsequent memorandum dated December 7, 1973, from Ray L. Ash, Director of the Office of Management and Budget further clarified the relationship between AEC (now NRC) and EPA as to standard setting authority. EPA was ordered, on behalf of the President, to discontinue preparation of any standards for facilities, and to restrict its role under Reorganization Plan No. 3 to setting standards for the total amount of radiation in the general environment from all facilities combined in the uranium fuel cycle.

When viewed against this more closely defined division of labor it is clear that the standards in proposed 10 CFR 61.41 fall within the ambit of NRC authority. The standards govern release of radioactive materials from within the boundaries of locations under the control of licensees. The Supplementary Information to the proposed rule also notes that the standards are anticipatory of EPA ambient standards. If and when EPA issues ambient standards the release rates in Part 61 will be adjusted, if necessary, to be consistent and in harmony with the EPA standards.

The Commission also rejects the notion that the standards of 10 CFR Part 20 are frozen in place until EPA takes final action on related ambient standards. There is no law of which the Commission is aware that stipulates that it must await the action of another agency before it can discharge its statutory duties to protect the health and safety of the public from the hazards of source, byproduct, and special nuclear material disposed of in commercial near-surface burial grounds.

Rule Changes: None

ISSUE C-3

Issue: Performance Objective for Environmental Protection

Commenters:
Marvin Lewis (3)
New Mexico Department for Health and Environment (4)
Catherine Quigg (13)
PA, Dept. of Environmental Resources (16)
Department of the Environment, London (19)
Joseph H White III (21)
Union of Concerned Scientists (36)
American College of Nuclear Physicians (53)
Union Oil Company of California (66)
Argonne National Laboratory (68)
Georgia Institute of Technology (70)
South Carolina Department of Health and Environmental Control (79)
Birmingham Audubon Society (80)
State of New York Department of Law (99)
Conference of Radiation Control Program Directors (103)
New England Nuclear (110)
Colorado Department of Health (111)
Kerr-McGee (115)
U.S. Department of Energy (119)
U.S. Environmental Protection Agency (122)

Rule Citation: § 61.41, Protection of the general population from releases of radioactivity.

Summary of Comments: There was no clear pattern or recurring issue in the comments. Marvin Lewis commented that there is no absolute amount of leakage which would be considered unsafe and the entire contents of a site could leak out slowly into the environment without violating the proposed rule. Joseph White, III asked what amount of off-site migration would be acceptable to NRC.

The State of New York advocated a "zero discharge" criterion for ground and surface waters or at least an ALARA criterion.

The EPA commented that the establishment of an individual exposure limit at the site boundary for enviornmental releases as proposed in § 61.41 was appropriate. They stated that the 25 mrem/yr limit is in the correct range of values (1-25 mrem/yr was analyzed by NRC) that should encompass any future EPA standard for LLW disposal facilities. Based on NRC's analysis, NRC does not anticipate any need to change the technical requirements of Part 61 to meet such an EPA standard. The Department of the Environment, London commented that the standards specified in the rule appeared to be reasonable. The approach of setting an individual dose limit for inadvertent intrusion and separate limits for ground water releases is consistent with the proposed U. K. approach to radiological protection standards for disposal options and with ICRP principles. The Conference of Radiation Control Program Directors supported the objective as proposed.

As discussed under Issue C-2, Kerr-McGee Corporation commented that the standards established in § 61.41 were premature and beyond the NRC authority to the extent that they are not already embodied in 10 CFR Part 20. Catherine Quigg asked why NRC didn't wait for the EPA to set its limits and, in effect, preempted the EPA's authority by "anticipating" the EPA standards. The Colorado Department of Health also expressed the view that this performance objective was not sufficiently justified and noted the legal challenge to the 25 mrem criterion.

Kerr-McGee also commented that the proposed limits in § 61.41 are too stringent and unsupported. They specifically noted that the apparent use of the EPA 40 CFR 190 standard for fuel cycle facilities to derive a standard for LLW disposal facilities is not correct since:

(1) EPA specifically excluded operations at waste disposal facilities from Part 190. NRC may not promulgate its own standard in the absence of action by EPA;

(2) The limits proposed are too low since they are a small fraction of the existing limits in Part 20 which have not resulted in any untoward results. They are also a small fraction of natural background exposure which leading authorities believe is not hazardous or harmful; and

(3) The limits deviate from that specified in EPA 40 CFR Part 190 since they do not exclude radon and its daughters excluded by 40 CFR Part 190. Without this exclusion they note that the rule may be unduly stringent when applied to the disposal of either uranium or thorium ore residue wastes at a LLW disposal facility.

The Pennsylvania Department of Environmental Resources pointed out that the same ALARA principles applied in the development of the 40 CFR Part 190 standards may also be applicable in the case of LLW disposal facilities since engineered barriers and other site design features could further reduce potential exposures in a cost effective manner.

The Department of the Environment, London commented that the dose limits for ground water releases are consistent with current U.S. practice and, when

combined with the requirement that EPA Drinking Water Standards should not be exceeded, should ensure the doses are as low as reasonably achievable. The New Mexico Department for Health and Environment recommended that the EPA drinking water standards should be applied to both existing and future potential public and private drinking water supplies. The Union of Concerned Scientists similarily commented that the EPA drinking water standards should be extended to all actual or potential water supplies outside the site boundary. The American College of Nuclear Physicians recommended that the EPA drinking water standards should be applied at the site boundary. They pointed out that the "nearest public drinking water supply" criterion might change after establishment of the site causing potential danger of retroactive design limitations. South Carolina noted that the rule should clarify whether the EPA drinking water limit or 25 mrem/yr apply at the site boundary. EPA commented that it was inappropriate to apply the EPA drinking water standard in § 61.41 as proposed by NRC and stated it should be deleted from § 61.41. Kerr-McGee recommended that the 10 pCi/l limit for uranium and thorium in drinking water should be deleted from § 61.41. Argonne suggested including standard deviation for the limit for uranium and thorium.

New England Nuclear Suggested clarifying changes concerning the use of "annual" and "dose." The DOE commented that the basis for the drinking water limits should be provided.

Analysis of Comments: With respect to the comments of Marvin Lewis and Joseph White III, the performance objective in § 61.41 defines an acceptable level of safety regarding releases to the environment from all environmental pathways of release from the site. It thus defines a safe level for releases from the site. Since migration is the principal environmental release pathway; the performance objective also defines an "acceptable" amount of migration that would be allowed at the site.

Kerr-McGee's comments that the performance objectives were premature and beyond NRC's authority were discussed and addressed under Issue C-2. The EPA, under its generally applicable standards setting authority, has responsibility to prepare a standard that will set limits on radioactivity in the general environment from disposal facilities. Presently, there exists no such EPA standard. In the absence of a standard, NRC examined a range of limits within that expected for the EPA standard and selected a proposed performance objective that establishes a release limit for the site boundary. The performance objective thus takes the place of EPA standards and will be replaced by the EPA standard when it is developed. Under its regulations development authority, NRC may establish such limits on releases as it deems necessary to ensure protection of the public health and safety. As such, NRC developed the performance objective under its general authority to establish such limits for radiation protection purposes. In a rule making action, NRC is not solely limited to existing standards in Part 20 and NRC does not intend to withdraw any portions of the proposed rule that may be related to the performance objective.

NRC did not adopt the 40 CFR Part 190 standard for application to LLW disposal facilities and as such is not subject to any limitations that are expressly implied by EPA in the application of that standard. Rather, NRC used the 40 CFR 190 standard to help establish a range of dose guidelines that should be analyzed in selecting a performance objective for Part 61. Based on the analyses, NRC selected 25 mrem (whole body and other organs except thyroid)

and 75 mrem (thyroid) as the preferred performance objective for environmental releases. The performance objective represents what is achieveable and ALARA at a LLW disposal facility and as such is a small fraction of other dose limits set out in 10 CFR Part 20. The actual performance at individual disposal facilities may be less than 25 mrem/yr based on site specific conditions. NRC does not believe it is too stringent or low and based on EPA's comments, believes it is close to any standard EPA may develop in the future. NRC, thus, has made no change to this part of the performance objective on environmental releases, but has, however, added the ALARA concept for emphasis

As suggested by Kerr-McGee, Part 61 does not apply to the bulk disposal of uranium and thorium mill tailings or wastes (byproduct material as defined in § 40.4(a-1)) which are covered by Part 40. Disposal of other uranium and thorium wastes and small amounts of tailings is permitted by Part 61. Also, NRC has not addressed as a part of this rulemaking the subject of the linear non-threshold model, radiation hormesis, or other detailed aspects dealing with radiation dose response relationships. They will be addressed in other forums.

With respect to comments on the application of EPA drinking water standards to the nearest public drinking water supply, NRC heavily weighted the EPA comment that its use in § 61.41 was not appropriate and believes that it should be deleted from the performance objective. NRC intends, as a part of the review of an application for a site, to consider and evaluate water usage near the site including application of appropriate standards.

With respect to comments on "annual" and "dose," NRC did not express the limit in terms of effective dose since NRC is presently evaluating, as a part of development of proposed amendments to Part 20, whether and how NRC will implement this approach. Until this work is completed NRC does not plan to use this approach in individual rulemaking actions and no change will be made to § 61.41 in this regard. Based on the final decisions made in amendments to Part 20, however, compatible changes may need to be made to the performance objectives in Part 61. NRC considers the performance objective dose limits expressed in units of rem, to mean dose equivalent. The term annual or year refers to any period of 12 consecutive months.

Rule Change: Based on the staff's analysis of comments, the performance objective for protection of the general population from releases of radioactivity has been revised to delete reference to the EPA drinking water standard and include ALARA. The revised performance objective reads as follows:

§ 61.41 Protection of the general population from releases of radioactivity

Concentrations of radioactive material which may be released to the general environment in ground water, surface water, air, soil, plants, or animals must not result in an annual dose exceeding an equivalent of 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public. Reasonable effort should be made to maintain releases of radioactivity in effluents to the general environment to as low as is reasonably achievable.

ISSUE C-4

Issue: Performance Objective for Intruder Protection

Commenters:
Marvin Lewis (3)
Catherine Quigg (13)
Department of the Environment, London (19)
Commonwealth Edison (35)
Union of Concerned Scientists (36)
Union Carbide Corporation (39)
Bechtel National Inc. (44)
Ontario Hydro (51)
Argonne National Laboratory (68)
Oswald U. Anders (73)
Birmingham Audubon Society (80)
American Nuclear Society (87)
Amy S. Hubbard (90)
New York State Department of Law (99)
Paul Ziemer for EG&G Idaho, Inc. (104)
Program Review Committee
Carolina Power and Light (106)
New England Nuclear (110)
The American Society of Mechanical Engineers (113)
Kerr McGee Corporation (115)
U.S. Department of Energy (119)
U.S. Environmental Protection Agency (122)

Rule Citation: § 61.42 - Protection of individuals from inadvertent intrusion

Summary of Comments: There was no clear pattern or recurring issue in the comments. The Union of Concerned Scientists stated that the nature of the intrusion events should be specified in the amendments. The American Society of Mechanical Engineers inquired about the time frame that should be applied to the inadvertent intrusion to evaluate the 500 mrem/yr. Marvin Lewis commented that 500 mrem seemed like a large exposure for making a small mistake and questioned how a 500 mrem exposure could be ensured without on-site security. The Birmingham Audubon Society commented that instead of using 500 millirem per year, it should be no more than 10 percent of background per year. Catherine Quigg inquired how the NRC arrived at the 500 mrem limit. She asked if NRC took into consideration the greater health risk to children, pregnant women or the fetus, or ill, elderly people from such a dose. She stated there is no basis for NRC projecting that only one, or at most, a few persons would be exposed and asked how NRC could predict how many people might be farming or digging in a certain plot of land over the next 200-300 years. Amy Hubbard commented similarly noting that present trends in population growth, soil erosion, and water resource needs will result not in inadvertent intrusion but actual permitted uses of the land and water at a site. She stated the analyses of intruder exposures were deficient since they did not consider a more plausible family intruder where some numbers of the family would spend more time at the site and some family members (children and pregnant women) would be more sensitive to radiation. She concluded that the analysis was inadequate for present day society and its applicability to the future is even more uncertain.

The Department of the Environment, London commented that the approach of setting an individual dose limit for inadvertent intrusion is consistent with the U.K. approach and with ICRP principles. They questioned, however, whether the limit was consistent with ICRP dose limits because the rule did not state whether the limit is in terms of effective dose. They stated this point should be clarified. The New England Nuclear Corporation also recommended that NRC clarify the performance objectives by specifying internal and external dose equivalent limits to individual organs as suggested by the ICRP and that dose be defined to mean "dose equivalent". They inquired as to whether "annual" and "year" refer to a calendar or a sliding year. Onario Hydro supported the 500 millirem dose limit as only a few people could conceivably receive that dose. The New England Nuclear Corporation commented they agreed with the proposed dose limit provided that waste concentration limits are calculated to ensure, with reasonable probability, that the inadvertent intruder does not receive more than 500 mrem/yr. They further noted that since the inadvertent intruder is identified as the critically exposed individual for most radionuclides, more effort should be directed into determining the probability of intruder scenarios occuring. Waste concentration limits could then be relaxed if these interaction probabilities are factored into the impact calculations. The New York State Department of Law stated they were impressed with the innovative approach to disposal regulation through protection of various populations at risk; general populations, intruders and employees. The American Nuclear Society and Bechtel National Inc. commented on the absoluteness of the performance objective and recommended using the word "should" in place of the word "must".

The Union Carbide Corporation commented that with continuing passive institutional controls such as deed restrictions, the dose limit of 500 mrem was too low. The Union Carbide Corporation recommended it be raised by a factor of 10 to the occupational exposure limit of 5000 mrem. Carolina Power and Light commented similarly noting that the 5000 mrem/year limit currently applied to radiation workers represents an acceptably low risk and should be the standard applied, that there is a low probability of intrusion and a limited number of individuals would be involved. The Department of Energy, the LLW Management Program Review Committee, Argonne National Laboratory, and Oswald U. Anders all commented that the inadvertent intruder scenario is given too much weight. Reasons stated included the fact that it leads to unreasonably low concentrations for radionuclides in Table 1, exercises inordinate control over potential disposal site options, and safety regulations for the general population should not be dictated by the hypothetical actions of a very small number of individuals. The LLW Management Program Review Committee noted that the intruder scenario is more analogous to an accidental exposure pathway than to a chronic exposure pathway. They sugggested that more emphasis should be placed on requirements to reduce the likelihood of intrusion such as use of durable monuments large enough to warn potential intruders. Oswald Anders also noted the inadvertent intruder could be sufficiently warned by a big enough monument with an inscription in deep relief on it about the disposal site. For the same reason, the U.S. Department of Energy recommended that the NCRP 25 rem accidental exposure limit be used as the intruder dose limit rather than 500 mrem. They also noted that the 500 mrem limit leads to unreasonably low concentrations and increases the costs of disposal. Oswald Anders commented that the inadvertent intruder's needs are readily taken care of by placing the required cap onto the burial trench. He stated no truly inadvertent intruder would burrow to more than 7 feet under the ground without considerable deliberation and knowing what he is doing. The Kerr-McGee Corporation also objected to

restrictions embodied in the intruder performance objective. They argued that the inadvertent intruder hypothesis is predicated on the assumption that the government will fail which is inconsistent and antithetical to our constitution. They also argue that this is doubly the case since the proposed regulations require licensees to provide funding for institutional controls of indefinite duration.

The EPA commented that the 500 mrem dose limit was not appropriate as a regulatory limit. A licensee would not be able to monitor or demonstrate compliance with a specific dose limit imposed in the objective today that applies to an event that might occur several hundred years from now. They recognized use of 500 mrem as a basis for determining the concentration limits in Table 1 of Part 61, noting that, given ALARA actual exposures to an inadvertent intruder would be lower then 500 mrem per year.

Commonwealth Edison commented that this performance objective lacked adequate provision for protection of the general public from potential releases to the environment. They noted that although terrorists are not "inadvertent" intruders, they believe there should be a plan to safeguard a site from terrorists in that disposal sites may be more susceptable to covert acts than nuclear power sites. Amy Hubbard also commented that acts of terrorism and sabotage were neglected.

Analysis of Comments: With respect to comments that NRC express the dose limit in terms of effective dose, NRC did not express the limit in terms of effective dose since NRC is presently evaluating, as a part of development of proposed amendments to Part 20, whether and how NRC will implement this approach. Until this work is completed NRC does not plan to use this approach in individual rulemaking actions and no change will be made to § 61.42 in this regard. Based on the final decisions made in amendments to Part 20, however, compatible changes may need to be made to the performance objectives in Part 61. NRC considers the performance objective dose limits expressed in units of rem, to mean dose equivalent. The term annual or year refers to any period of 12 consecutive months.

NRC staff agree with EPA's position that it is not appropriate to set out a specific limit in the performance objective although a limit should continue to be used as a basis for the waste classification concentration limits in § 61.55. A dose limit in the performance objective will be essentially impossible to monitor against and ensure compliance with for several reasons. Inadvertent intrusion into a LLW disposal facility is a hypothetical event which may never occur. NRC's objective is to ensure that if it should occur, the exposure to the individuals involved would not be unacceptable high. Since it is not possible to control today what may happen several hundred years in the future, NRC is controlling the concentration of waste disposed of today such that if someone should contact it through reasonable uses to which the site could be put in the future, the individuals involved would not receive a high exposure. NRC used 500 mrem as a basis for determining the concentration limits in waste which would result in actual potential exposures to an inadvertent intruder of a few 100 mrem at 100 years and a few mrem at 500 years. Thus the performance objective is to keep potential exposures to an inadvertent intruder to a dose limit that is not unreasonably high given the accidental and hypothetical nature of the event. Using 500 mrem as a limit to calculate concentration limits yields potential exposures of a few mrem after 500 years.

In addition, there is no practical way in which a licensee could monitor and assure compliance with an actual exposure limit and there is no way to absolutely predict the type of intrusion event which might occur, when it might occur, and how many people might be involved.

The majority of the commenters, including Argonne National Laboratory, the Union Carbide Corporation and the U. S. Department of Energy, Oswald Anders, the LLW Management Program Review Committee, and the Carolina Power and Light Company, in their comments about considering probability of occurrence, expressed concern about weighting too heavily inadvertent intrusion in determining disposal requirements for waste. Several expressed concern about the basis for the 500 mrem limit and some recommended that a higher dose limit (e.g., 5000 mrem or 25 rem) should be applied.

NRC's selection of the 500 mrem limit was based on (1) public opinion gained through the 4 regional workshops held on the preliminary draft of Part 61; (2) its acceptance by national and international standards organizations (e.g., ICRP) as an acceptable exposure limit for members of the public; and (3) the results of analyses presented in Chapter 4 of the draft EIS. In considering EPA's comment above that the intruder dose limit is not appropriate as a regulatory limit and considering ALARA (given the mix of waste disposed of at a site) actual potential exposures at 500 years would only be a few mrem; comments on the nature of intrusion events and ability to predict what with actually happen; and comments that NRC has weighted intruder considerations too heavily, NRC has changed its approach to addressing inadvertent intrusion. No change has been made in the intruder scenarios considered since they reflect, to the extent that we can predict today, reasonable , probable and productive uses of the disposal facility site. As such, probability of occurrence of specific events will not be quantitatively assessed. The NRC believes that the primary concern of those who feel that the intruder protection objective is too restrictive is the effect that this has on the concentrations of certain nuclides that are acceptable for disposal in a near surface facility and the need to meet waste form requirements such as stability for some wastes. With this in mind and in response to other comments, the NRC has reevaluated the calculations that establish the waste classification concentration limits to eliminate unnecessarily conservative assumptions with the result that the analysis is more realistic and the limits for several important nuclides have been raised. With this action, the NRC believes that most of the concerns of those who encouraged higher exposure limits or less emphasis on protection of intruders will have been met.

As previously discussed, the actual exposures to an intruder if such events should occur at 500 years would be a few millirem. NRC did not specially consider the greater health risk to children, pregnant women or the fetus, and others except to the extent that they may already be considered as a part of the 500 mrem exposure limit recommended by various national and international authorities such as the ICRP.

Several commented about the nature of the intrusion events, (Union of Concerned Scientists), how many people would be involved, how NRC predicted this (Catherine Quigg) and questioned the adequacy of site security to preclude inadvertent intrusion. (Marvin Lewis). Kerr-McGee objected to the restriction in the performance objective since it assumed failure of the government which is inconsistent with our constitution. For purposes of

analysis, NRC considered 3 intrusion events. These were selected based on evaluation of the broad range of events possible, those considered by other investigators, and the likelihood of occurrence. The 3 events can be characterized as intruder construction (exposure to workers constructing a house at the site), intruder agriculture (exposure to individuals living in the house constructed and consuming food grown onsite), and intruder discovery (exposure to an individual who digs into the waste, realizes something is wrong and ceases his excavation activities). NRC assumed that only a few individuals would be exposed though such activities based on the number of people normally required to construct and live in a house. With respect to site security and institutional control, during the operational and post closure observation and maintenance periods, the licensee would be responsible for maintaining site security and control of the site. This would include fencing, posting, security guards, and controlled entrance and exit from the site. During the following 100 year institutional control period the government land owner would be responsible for site security which would include maintaining the fence and warning signs, physical surveillance and control over access to the site. NRC does not assume that the government fails at the end of the 100-year institutional control period, but rather that the government ceases active control over access to the site. Thus, Kerr-McGee's assumption has no foundation in the rule. The rule does not presuppose collapse or failure of government, but rather places a restriction on the character of radioactive material disposable by near surface disposal that serves to relieve government of the burden of actively excluding persons from the site in perpetuity. The lifting of institutional control under the rule results from the fact that an inadvertent intruder will not be subjected to an unacceptable high dose of radiation (defined to be 500 mrem for purposes of analysis). Based upon the kinds of material expected to be buried and public opinion, the NRC staff determined that the maximum period of institutional control will be 100 years after closure. Kerr-McGee also states that funding is required for institutional controls of an indefinite duration. This is not so. Active institutional controls are not indefinite (100 years as noted above) if the concentration limits of § 61.55 are adhered to. Other passive controls such as government land ownership, records, deed restrictions and covenants which will have little to no cost would continue after active controls cease and would serve as an additional means for preserving and transmitting information about the site.

Finally, as noted above, NRC also did not directly consider the probability of various intrusion events occurring except to the extent of considering reasonable, probable productive uses to which the land could be put. Unusual activities such as an archaeologist reclaiming artifiacts at the site were not considered. NRC agrees with the comments on use of "permanent" markers at a site to inform of the material disposal of at the facility.

Rule Changes: Based on the staff's analysis of comments, the performance objective for protection of the inadvertent intruder has been revised to delete specific reference to 500 mrem. It reads as follows:

> Design, operation and closure of the land disposal facility must ensure protection of any individual inadvertently intruding into the disposal site and occupying the site or contacting the waste at any time after active institutional controls over the disposal site are removed.

In addition, words have been added to Part 61 to indicate that monuments are required to warn against intrusion.

ISSUE C-5

Issue: Protection of Individuals During Operations; ALARA for the Performance Objectives

Commenters: Dow Chemical Company (17), (83)
Department of the Environment, London (19)
New York State Department of Law (99)
Conference of Radiation Control Program Directors (103)
New England Nuclear (110)
U.S. Environmental Protection Agency (122)

Rule Citation: §61.43 Protection of Individuals During Operations; Subpart C

Summary of Comments: EPA commented that this section was not clear with respect to whether releases to the environmental during operations would be covered by Part 20, as implied here, or by the performance objective in §61.41 on protection of the general population from releases of radioactivity. EPA further commented that it was their view the performance objective on protection of the population should apply both during and after operations. The DOW Chemical Company commented that in an effort to reduce the uncertainties associated with pathway analysis, the NRC should make it very clear that the spirit of the ALARA concept applies to all standards and technical criteria. The Department of the Environment expressed the view that the approach used to develop Part 61 reflected ALARA principles throughout. New York and the Conference commented that ALARA should guide all site activities and all of Subpart C. New England Nuclear cautioned against using ALARA to impose excessive restrictions.

Analysis of Comments: NRC agrees with EPA's view on application of §§61.41 and 61.43. NRC intends that §61.43 would require that everything in 10 CFR Part 20 with respect to occupation safety, control of radiation in restricted areas, control of radiation in unrestricted areas, and maintaining radiation exposures and releases of radioactive materials to unrestricted areas as low as reasonably achievable would apply to the disposal facility. Releases of radioactivity to the environment during operations and over the long term after operations cease would be governed by §61.43. Although §61.43 conflicts with limits in Part 20, NRC believes the lower limits in §61.43, which are achievable, should apply in the spirit of ALARA.

Rule Changes:

1. Add to §61.41:

Every reasonable effort should be made to maintain releases of radioactivity in effluents to the general environment as low as is reasonably achievable.

2. Add to §61.43:

Except for releases of radioactivity in effluents from the land disposal facility, which shall be governed by §61.41 of this part every reasonable effort shall be made to maintain radiation exposures as low as is reasonably achievable.

ISSUE C-6

Issue: Stability of the Disposal Site After Closure

Commenters: Dow Chemical Company (17)
Joseph H. White, III (21)
Sierra Club (37)
Duke Power Company (48)
Northeast Utilities (85)
New York State Department of Law (99)

Rule Citation: §61.44

Summary of Comments: The New York State Department of Law commented that they particularly support the notion of site stability as a criterion for successful disposal. If the site is stable over long periods of time, the likelihood of excessive long-term maintenance costs is significantly lower. They also point out that, as history has shown, site owners (States in this case) have been and probably will be saddled with unrecoverable multi-million dollar bills each decade to maintain facility integrity. Joseph H. White, III inquired what would be done if stability is not met. Duke Power Company commented that stability, as defined, applied to the waste and disposal site. They recommended clarification to show that the more important aspect is really stability of the trench, not the waste. Dow Chemical Company commented that placing reliance on stability of the disposed waste will be possible only if stability is specified and enforced by the standards and technical criteria during the disposal operation. They pointed out that techniques which provide stable waste forms are available today but due to lack of regulatory standards and technical criteria they are not in general use. They noted that these techniques result in monoliths which place the radionuclides into forms which are less likely to be dispersed and less likely to be released to and transported by ground water. These monoliths are more likely to be recognized and therefore avoided or properly investigated and handled by intentional or inadvertent intruders. They also commented that these factors are within the concept of ALARA and reduce the need to rely on the many unknowns and uncertainties associated with pathway analysis.

The Sierra Club commented that the goal of long-term stability and avoidance of continued, active maintenance at the site is central to Part 61 and noted the goal was enthusiastically shared by environmentalists, industry and government. They expressed concern, however, that there is no basis in experience with burial sites located in regions of moderate to high rainfall that indicates this goal can be achieved by the means outlined in Part 61. They further commented that unless the recommended measures have been demonstrated to work at an already existing facility, then the measures are examples of wishful thinking and not concrete tactics whose implementation will result in the desire goal. To establish regulation on the basis of a hoped-for future dream and not on the basis of actual experience is a dangerous process that may lull the unwary into a false sense of security.

They commented that the goal of stability supposedly will be achieved through specific site design features. They cite for example, in § 61.51(a)(4) that "Covers must be designed to prevent water infiltration" but note that at none of the existing sites and after twenty years of experimentation has water

infiltration through covers been prevented. They note an apparent misunderstanding in Part 61 regarding the inevitable slumpage of trench contents. Without this understanding--that slumpage leads to cover indentations, cracks and collapse--then it is possible to make the mistake that cover "design" can solve the problem. Likewise, they note there is a fundamental misunderstanding that slumpage can be avoided by techniques of placing materials into the trench or by packaging of materials. They finally comment that unless the relationships are clearly seen between gradual deterioration of packaging, slumpage, trench cover collapse and water infiltration, no meaningful design criteria can be established.

Northeast Utilities suggested that Class A waste disposal areas be exempted from the stability objective because the wastes are not required to be stable.

Analysis of Comments: NRC has stated the stability performance objective as a goal. The site characteristics, facility design and operations, and waste characteristics should work together to assure protection of the public health and safety without the need for continued active care and maintenance. As discussed under Issue Number GEN-1, the absoluteness of the language needs modification. However, only minor custodial care (and minor maintenance) should be required over the long term. As Mr. White inquired, there may be cases where this goal will not be met in an absolute sense which may require some additional maintenance to achieve a stable site condition.

With respect to the comments by Duke Power, Dow and the Sierra Club, each seemed to reflect one part of the combination of site characteristics, design and operations (e.g., trench and covers) and waste form characteristics which would work collectively to ensure long-term site stability. That is, NRC does not expect reduced infiltration through trench covers that are constructed on waste forms and containers which are not structurally stable and which have not been placed into a trench and backfilled in a manner to help achieve a stable disposal environment. It is with this view in mind that NRC in Part 61 separated out the higher activity wastes requiring that they be placed into a structurally stable form or container. Waste must also be disposed such that disposal unit design, waste emplacement, backfilling and other operational techniques will lead to a stable site condition. Lower activity wastes that do not need to meet the structural stability waste form requirement are required to be disposed of in separate disposal units such that they do not contribute to the slumping and collapse of trench covers. (This is one of the primary reasons for trench cover collapse problems that have occurred at several existing sites.) In this way a stable foundation is created for a better designed trench cap which can retard infiltration and direct water away from disposal units. Disposal units containing lower activity compressible wastes may require some increased maintenance to achieve a stable site condition but the hazard presented by such wastes is low. Also for such cases, greater emphasis will be placed on appropriate design and operations to achieve a stable site condition given the compressible and degradable nature of the waste involved.

Rule Change: Based on the staff's analysis of comments, NRC changed the stability performance objective (§61.44) by deleting the words "disposed waste and the" and adding the words, "to the extent practicable" after eliminate. In this way stability of the disposal site itself and the absoluteness of the requirements is addressed.

ISSUE C-7

Issue: Need for Additional Performance Objectives

Commenters: Los Alamos National Laboratory (43)
State of California (93)
Health Physics Society (96)

Rule Citation: Subpart C

Summary of Comments: The Health Physics Society recognized the need to assure radiation protection for employees, possible intruders, and the general public during land disposal facility operations and beyond. They recommend that each of these groups be properly protected using limits in 10 CFR 20, as currently written or as proposed, rather than proposing a system of new and unique limits related to waste disposal. They noted the establishment of a unique system of dose limits for a separate area of the nuclear fuel cycle seemed unnecessary and may imply a special need for protection in the minds of the public; thereby exacerbating an already confused public perception of radioactive waste disposal issues. The Los Alamos National Laboratory commented that it would be desirable to add a performance objective to minimize intrusion by plants and animals which have the potential for transporting radionuclides to the food chain. The State of California noted that §61.40 sets standards to avoid excessive exposure to humans and that excessive exposure to animal life should be avoided also.

Analysis of Comments: The NRC staff agrees with the comments of the Health Physics Society that new radiation protection limits should not be developed if existing limits can be applied. This is the approach that NRC has followed. With respect to occupational safety, NRC has required that disposal facilities comply with the same limits in Part 20 which other licensees must comply with. With respect to releases to the general environment from disposal facilities, however, NRC does not have any existing standards in Part 20 or EPA standard to apply. Existing standards in Part 20 apply to effluents where a licensee can exercise direct control over the releases. They don't necessarily apply to the migration and release of material from a disposal facility from less readily controllable means. At the same time, protection of the inadvertent intruder is a new consideration applicable to disposal facilities, but not necessarily applicable to other types of facilities NRC licenses. Thus, NRC was faced with examination and determination of radiological limits involving somewhat different considerations than those already covered in Part 20. As discussed in the EIS, however, NRC did consider the range of existing standards in establishing performance objective for environmental and intruder protection. NRC recognizes the need to minimize intrusion by plants and animals and considered this as part of the draft EIS analysis. NRC established no specific requirements in this area because of the site specific nature of the type of animals and vegetation which should be considered. NRC plans to review, on a site specific basis, to ensure that burrowing animals and deep routed plants which could serve to transport radionuclides offsite are not a problem.

Rule Changes: None

ISSUE D-50-1

Issue: Complexity siting requirement

Commenters: Ontario Hydro (51)
Union Oil Company of California (66)
Georgia Institute of Technology (70)
Georgia Yuan (77)
South Carolina Department of Health and Environmental Control (79)
U.S. Ecology (101)
U.S. Department of Interior (114)
U.S. Department of Energy (119)

Rule Citation: 61.50(a)(2)

Summary of Comments: Six of the eight commenters questioned the vagueness of the requirement: i.e., what does it mean to be capable of being characterized, modeled, analyzed, and monitored? Two of the commenters (South Carolina Department of Health and Environmental Control and U.S. Department of Energy) suggested examples or rewordings to answer the preceding question. The U.S. Department of the Interior queried what types of models were included, i.e., physical scale, numerical, or conceptual; and, Union Oil Company of California asked questions such as: what role will modeling play, what site characteristics and events will be modeled, and are there NRC-approved models?

Analysis of Comments: The staff recognizes the vagueness of Section 61.50(a)(2) and has attempted to provide additional explanation in the draft technical position paper on site suitability and site characterization. The staff is revising that technical position paper and the examples and suggested rewordings offered by South Carolina Department of Health and Environmental Control and the U.S. Department of Energy will be incorporated into that revision. (See page 5 of NUREG-0902, "Site Suitability, Selection, and Characterization.")

The staff does not believe that a concise statement can be made in the regulation to remove the vagueness noted by the commenters. Rather, technical position papers on these subjects will provide direction. In addition the staff is developing an in-house modeling capability and will share that capability through pre-qualification of prospective computer codes.

Rule Change: No changes are recommended for Section 61.50(a)(2).

ISSUE D-50-2

Issue: Ground water requirements

Commenters: Department of the Environment, London (19)
Sierra Club, Radioactive Waste Campaign (37)
Ontario Hydro (51)
Union Oil Company (66)
Argonne National Laboratory (68)
Georgia Institute of Technology (70)

Paul F. Hadala and Don C. Banks (76)
South Carolina Department of Health and Enviornmental Control (79)
State of California (93)
Peter Skinner for Attorney General of New York (99)
New England Nuclear (110)
U.S. Department of Interior (114)
U.S. Department of Energy (119)

Rule Citation: 61.50(a)(4), 61.50(a)(7), 61.50(a)(8)

Summary of Comments: Four commenters (Ontario Hydro, Argonne National Laboratory, Department of Interior, and Department of Energy) concurred with the exception to Section 61.50(a)(7) to permit disposal below the water table where diffusion dominated the ground-water flow system. The Department of the Interior recommended using the term "molecular diffusion" and both they and Ontario Hydro specified a soil hydraulic conductivity of less than 10^{-6} cm/sec as appropriate. The State of California, on the other hand, took considerable exception to disposal below the water table and spoke in favor of total containment. They suggested a revision of Section 61.50(a)(7) as follows:

> The disposal site must not be located 1/within basins containing usable groundwater or their recharge area, or 2/within geologic formations which will permit the diffusion of radionuclides to the environment, or their transport by groundwater to a degree exceeding the performance objectives of Subpart C.

The Department of the Environment, London, commented that no requirement on ground water other than meeting Section 61.41 was needed. One commenter recommended a siting requirement on soils which will preclude or reduce leachate migration by attenuation. Two commenters (Georgia Institute of Technology and Peter Skinner for the Attorney General of New York) recommended separate mention of requirements for impervious and porous soils. Both cited the ability of porous soils to drain readily and thereby avoid prolonged contact of infiltrating water with the waste. The former commenter suggested the impervious soils could be treated to keep water out of the disposal units; the latter commenter suggested a leachate collection and treatment system for the impervious soils.

Three commenters requested that Section 61.50(a)(7) provide a minimum depth to the water table, and, the Department of Energy stressed the importance of avoiding the transection zone of the water table.

The South Carolina Department of Health and Environmental Control recommended that the natural resources considered under Section 61.50(a)(4) specifically include ground water and aquifers underlying the sites and suggested examples of ground water characterization data needs. Two concerned citizens (Commenters 76) suggested revision of Section 61.50(a)(8) to conform to the wording used in the staff's draft technical position on site suitability and site characterization. Union Oil Company suggested that §61.50(4) address areas of "known" natural resources.

New England Nuclear suggested addressing changes in natural background radioactivity due to construction and assigning a probability limit on ground water intrusion.

Analysis of Comments: The staff appreciates the approval for the exception to permit disposal below the water table where molecular diffusion dominates the ground-water system. The staff disagrees with the comment received from the State of California and would point out that a clay encapsulated disposal unit proposed by the State is somewhat comparable. The basic difference is that the type of site envisioned by the staff as satisfying the exception is an inactive flow system so the water which would contact the solid/solidified wastes would move on the order of less than one foot per year. Given the low hydraulic conductivity and affective porosity of the soils, very little water would actually contact the waste or flow from the disposal units. The travel time will result in sufficient reduction of concentration of the small amounts released; and fine-grained soils will typically provide significant attenuation for most radionuclides. The staff interprets the State of California comment to be largely based on experiences with disposal of liquid wastes in fine-grained soils above the water table. The staff considers that experience is not applicable to the disposal required under 10 CFR Part 61.

The comment from the Department of the Environment, London raises the very interesting question of why, if the performance objectives can be shown to be met, do there have to be any requirements related to water access or diffusion-dominated transport. The commenter states that it is only necessary to ensure the releases via ground water will not result in failure to meet the performance objectives. Given the latter statement, all that is really needed in the regulation are the performance objectives. However, the staff has identified in 61.50 and 61.51 certain characteristics which will if present (or in some cases if absent) enhance the ability to meet the performance objectives and, consistent with the ALARA concept, result in potential releases which are both within acceptable limits and as low as reasonably achievable through prudent site selection and site design. Since the staff considers the water (soil moisture) to be the prime catalyst for degradation of waste containers, leaching of wastes, subsidence, and transport, particular attention has been given to limiting the access of water into the disposal unit.

The staff does not consider a specific siting requirement on such characteristics which promote attenuation of radionuclides to be appropriate. Whereas the staff does agree that attenuation is advantageous for some radionuclides, others such as H-3, C-14, Tc-99 and I-129, are not significantly attenuated. Rather, the rule uses siting requirements which will keep water away from the wastes, result in low volumes released, and provide long travel time for decay.

Proposed sites with impervious or porous soils will be evaluated on a case basis. The staff agrees that site design features can effectively limit access of water to wastes; however, the staff takes exception to any design which relies upon a leachate collection and treatment system as violating Section 61.44. Sump systems may well be installed in the disposal units to collect precipitation entering while the trench is open. The sump systems can provide monitoring locations and, if necessary, leachate collection systems. However, the staff does not want the disposal facility designed so as to rely on the sump systems to make the facility meet the performance objectives and/or to prevent bathtubbing. Rather, the disposal facility should fully meet the performance objective on isolation (Section 61.41) without the sump systems.

The staff agrees with the Department of Energy comment on avoiding alternative wetting and drying within the disposal unit due to fluctuations of the water

table. However, the staff does not feel that a numerical value can be assigned to a minimum depth to the water table. That particular depth will vary according to soil type due to the height of the capillary fringe above the water table. The staff will review the minimum depth on a case basis, and, if the soil type changes across the site as at the Sheffield site, on a trench basis based on soil moisture and tensiometer measurements.

As indicated in the draft technical position paper on site suitability and site selection, the term natural resources does include ground water and aquifers underlying the site. The staff agrees that the wording in Section 61.50(a)(8) can be improved as suggested. The intent of the section is to require, through site requirements, a travel time for potential releases at least approximately equal to the time required for groundwater to travel to the site boundary. During the travel distance, decay, sorption, precipitation, and other processes could act to reduce concentrations to within acceptable limits. In addition, the travel distance to the site boundary provides space in the buffer zone for remedial actions, if needed, prior to releases to the surface environment.

Staff agrees with the ground water data needs identified by South Carolina and they are reflected in the BTP (NUREG-0902). The data needs are too prescriptive to include in the rule, however.

Staff agrees with Union Oil that the applicant should not have to perform extensive exploratory evaluations looking for natural resources and that "known" resources would be addressed.

New England Nuclear's suggestions regarding addressing changes in natural background due to construction and addressing ground water intrusion on a probabilistic basis as was done for flooding are interesting points. Changes in ground water background will be a very site specific issue and is judged to be of most importance in the environmental monitoring program. (See Issue D-53-1). Staff did not adopt this suggestion. (See responses to DEIS comments: Commenter 32, Item 12 and Commenter 38, Item 5.) Staff also did not adopt the probabilistic approach for intrusion in favor of retaining the flexibility of an objectives and reasonable assurance approach.

Rule Changes:

1. Section 61.50(a)(4) should be changed to delete "economically significant," and insert "known". Conforming changes should also be made to §61.12(h) (see Issue B-1).

2. Section 61.50(a)(7) should be changed as follows:

   The disposal site must provide sufficient depth to the water table that ground water intrusion, perennial or otherwise, into the waste will not occur. The Commission will consider an exception to this requirement to allow disposal below the water table if it can be conclusively shown that disposal site characteristics will result in molecular diffusion being the predominant means of radionuclide movement and the rate of movement will result in the performance objectives of Subpart C of this part being met. In no case will waste disposal be permitted in the zone of fluctuation of the water table.

3. Section 61.50(a)(8) should be changed to read as follows:

The hydrogeologic unit used for disposal shall not discharge ground water to the surface within the disposal site.

ISSUE D-50-3

Issue: Surface water drainage and flooding

Commenter: New Mexico Secretary for Health and Environment (4), (45)
Sierra Club, Radioactive Waste Campaign (37)
Duke Power Company (48)
Union Oil Company (66)
Georgia Yuan (77)
South Carolina Department of Health and Environmental Control (79)
Utility Nuclear Waste Management Group (81)
Northeast Utilities (85)
State of California (93)
U.S. Ecology (101)
New England Nuclear (110)
U.S. Department of Energy (119)

Rule Citation: Supplementary Information, V.C.(3) Surface Water
61.50(a)(5), 61.50(a)(6)

Summary of Comments: The commenters raised four questions on the siting requirements related to surface water drainage. These comments can be summarized as:

(1) definition of terms, specifically upstream drainage areas, costal high-hazard area, and wetland,

(2) the adequacy of the exclusion of waste disposal based on the 100-year floodplain rather than the 300 or 500-year floodplains,

(3) whether engineering drainage modifications can be made in order to meet the requirements, and

(4) the vagueness of the terms, such as generally free, minimized, and decrease.

Analysis of Comments: The second sentence in Section 61.50(a)(5) implements Executive Order 11988, Floodplain Management Guidelines. The terms "coastal high-hazard area" and "wetland"are defined in the Executive Order. The term "upstream drainage area" can be defined in conventional hydrologic terms as all the land surface which drains, either by channel flow or sheetwash, across the near-surface disposal facility. Since these definitions either exist already in federal regulations or are standard definitions, the staff does not see the need to re-define or reproduce the definitions in 10 CFR Part 61.

The comments on the adequacy of exclusion of waste disposal from the 100-year floodplain fell in two groups, namely those, such as the State of California, who felt the probability of occurrence was too high given the length of radiological hazard and others who misinterpreted the meaning of the 100-year floodplain and assumed it meant one flood of that magnitude was certain within a 100-year period.

With respect to the probability of occurrence, the 100-year floodplain is that land which would be inundated by a flood having a 1 in 100 chance of occurring in any particular year. The staff feels the major hazard due to flooding is associated with the period of site operations when disposal units are open. Given that Section 61.51(a)(6) required that the contact of water with wastes must be minimized during and after disposal and Section 61.52(a)(9) requires that disposal units be closed and stabilized as each unit is filled and covered, the disposal units will be open a comparatively short time. Once closed, the covers and site drainage system will provide protection against flooding. The staff considers the 300 or 500-year floodplains to be unnessarily restrictive; and, the staff questions whether an adequate data base or standard methods of determining the 300 or 500 year floodplains exist.

The question on engineering modifications raised by U.S. Ecology and Union Oil will be addressed more fully in technical position papers related to site suitability, selection and characterization and to site design and operations. The requirements on well-drained, free of areas of standing water, and minimal upstream drainage areas relate primarily to the site after construction. However, natural areas of poor drainage or frequent ponding can be indicative of seasonally high ground-water levels. In addition, any engineering drainage modifications must have a lifetime in excess of 150 years and must be consistent with Section 61.44.

With respect to the vagueness or non-prescriptive nature of the requirements, as questioned by Georgia Yuan, the staff recognizes that potential disposal facilities may represent a wide variety of site characteristics. Whereas the staff prefers, for example, sites which are well-drained and not subject to frequent ponding, the staff views the Barnwell site with its shallow bays perched on surficial clay deposits as a suitable site for low-level waste disposal. Basically then the staff anticipated that "non-prescriptive" siting requirements will be site screening tools which will be met in most cases and which, if not met fully, will require a site-specific evaluation. The staff finds this preferrable to treating the "prescriptive" siting requirements as exclusionary.

The State of New Mexico supported the wording of §61.50(a)(6) and suggested editorial changes to the Supplementary Information to be more consistent with §61.50(a)(6) to insert "The potential for flooding should be low". Staff believes this issue should be addressed by clarifying the real concerns raised by potential flooding as indicated in recommended rule change 1 below.

Rule Changes:

1. Wording in Section V.C.(3) Surface Water of the Supplementary Information should be revised as follows if it is used in the future:

   Areas which are poorly drained, subject to flooding, or downstream of significant upstream drainage areas should be avoided to reduce the potential for inundation or exhumation by erosion of the disposal units.

2. Insert a reference to Executive Order 11988 in §61.50(a)(5).

3. No changes are recommended for §61.50(a)(6).

ISSUE D-50-4

Issue: Colocation with hazardous waste disposal facilities or other nuclear facilities

Commenters: Ohio Environmental Protection Agency (38)
Bechtel National, Inc. (44)
South Carolina Department of Health and Environmental Control (79)
Utility Nuclear Waste Management Group (81)
American Nuclear Society (87)
U.S. Ecology (101)
American Society of Mechanical Engineers (107)
Colorado Department of Health (111)

Rule Citations: 61.51(a)(7)
61.50(a)(11)

Summary of Comments: Comments on this issue covered two separate rule citations, 61.50(a)(11) dealing with masking of the environmental monitoring program and 61.51(a)(7) dealing with using the disposal site for radioactive wastes only.

The South Carolina Department of Health and Environmental Control commented that the requirement on masking of the environmental monitoring program should not be interpreted so strictly as to prevent location adjacent to existing federal facilities. U.S. Ecology suggested an editorial revision.

Most of the other commenters agreed that the requirement on disposal of radioactive wastes only (Section 61.51(a)(7)) was too restrictive and that colocation, without co-mingling, could be advantageous.

The Utility Nuclear Waste Management Group noted that proposed Part 61 would not preclude location of a disposal facility at a reactor site and the ANS noted that location adjacent to another nuclear facility is not prohibited.

Analysis of Comments: The staff agrees with the comments from South Carolina, ANS, and the UNWMG; however, the staff cautions that the environmental monitoring program for a near-surface disposal facility must be able to identify and quantify releases. Should adjacent activities also result in releases, the environmental monitoring program must be able to differentiate the source and quantity of releases. U.S. Ecology objected to the use of "significantly masked" and expressed the view that the monitoring program is either masked or not masked. Only not masked should be acceptable. Staff chose to leave the flexibility for locations near other nuclear facilities but would repeat the caution on identifying and quantifying releases and interpreting results.

With respect to colocation, there appears to be a misinterpretation of the requirement. The requirement indicates that the disposal site, which is subject to NRC licensing, shall be used only for disposal of radioactive wastes. It does not preclude colocating facilities, such as at Sheffield. However, the hazardous waste site must be separate from the licensed radwaste site and potential interactions between the sites must be fully evaluated in terms of the site performance objectives. This issue is also discussed under issue D-52-4.

Rule Change: No wording changes are recommended for Sections 61.50(a)(11) or 61.51(a)(7). Note that 61.51(a)(7) should be relocated in the rule to §61.52 on operations.

ISSUE D-50-5

Issue: Tectonics

Commenter: University of California, Los Angeles (8)
Georgia Institute of Technology (70)
Georgia Yuan (77)
U.S. Department of Energy (119)

Rule Citation: 61.50(a)(9)

Summary of Comments: Three of the commenters raised the question of the relevance of seismic or volcanic hazards to low-level waste disposal given the orders of magnitude difference between time frames between those geologic phenomena and the hazard of the low-level wastes. The UCLA comment indicated that Section 61.50(a)(9) may completely eliminate all potential sites in California; yet, it is highly unlikely ground faulting would result in releases given the other siting and waste packaging requirements.

The Department of Energy and Georgia Institute of Technology suggested rewording the requirements as follows: "Active seismic faults or volcanic sites are unsuitable."

Analysis of Comments: The staff deliberated to great lengths the question of whether, given all the minimum technical requirements on site selection and waste packaging, surface faulting would result in significant releases of radionuclides. The staff has also considered indirect effects of faulting, such as creation of barriers or highly transmissive drains for ground water flow.

The staff also gave serious consideration to the UCLA comment that the proposed requirement could possbly eliminate all potential sites in California. That comment ignores the key words in the requirements which are "with such frequency and extent to significantly effect the ability of the disposal site to meet the performance objectives...preclude defensible modeling and prediction of long-term impacts."

Rather than adopt the wording suggested by the Department of Energy and Georgia Institute of Technology, the staff has provided a mechanism for site-specific evaluation of such factors as recurrence intervals, probabilities, liquefaction potential and ground accelerations to compare against a 500-year radiological hazard, dimensionally stable waste container requirements, solidified waste forms, and disposal above the water tables. The minimum technical requirement would not arbitrarily eliminate potential sites so much as (1) provide a site screening test which will be met in most cases and (2) mandate a thorough evaluation of site performance in areas of known tectonic hazards.

Rule Change: No changes are recommended for Section 61.50(a)(9).

ISSUE D-50-6

Issue: Demographic requirement

Commenters: Birmingham Audubon Society (80)
Atomic Industrial Forum (100)
U.S. Ecology (101)
New England Nuclear (110)

Rule Citation: 61.50(a)(3), 61.50(a)(11)

Summary of Comments: The Department of Energy and New England Nuclear have expressed reservations about the reliability of projections of population growth for 100 years or more. U.S. Ecology recommended specifying a timeframe for population projections to clarify whether 100 or 500 years is intended. In addition, New England Nuclear has indicated that zoning requirements should be mandated in order to restrict off-site activities which may affect the performance of the disposal facility.

The Birmingham Audubon Society indicates strong approval for the requirement as written.

Analysis of Comments: The comments on the reliability of long-term projections are very interesting, since a significant portion of the staff findings to support approval of a license application will be based in large part upon long-term projections equivalent to the duration of the radiological hazard. The staff recognizes each of these projections, whether demographic, hydrogeologic or other, has a degree of uncertainty. Part of the staff review of any projections focuses on this uncertainty and how it has been handled by the applicant.

In addition, the staff considers the previous experience with commercial low-level disposal sites to illustrate that suitable sites can be reasonably found in areas of low population density and minimal population growth potential.

With respect to requiring zoning restrictions on land adjacent to a near-surface disposal facility, the staff considers this to be unnecessary since site selection and an appropriately-sized buffer zone around the disposal site can provide sufficient separation from near-by activities. This should be especially true when one considers the type of site which meets the entire set of site suitability requirements. The site should have very limited water resources, either surface or subsurface, insignificant mineral resources, a low population density to draw a work force from, and then there should be no existing nearby facilities which could adversily impact the site or the environmental monitoring program.

With respect to specifying a timeframe for projections, the staff considers such a provision to be overly prescriptive for the rule. The projections should address the combination of factors discussed in the preceding paragraphs. Both 100- and 500-year intervals are a part of the disposal scheme but should be addressed in different levels of detail and approach in view of the uncertainties and changing institutional control and intruder protection measures related to each period.

Rule Change: No changes are recommended for Sections 61.50(a)(3) or 61.50(a)(11).

ISSUE D-50-7

Issue: Transportation siting requirement

Commenters: Pennsylvania Department of Environmental Resources (16)
Ohio Environmental Protection Agency (38)

Rule Citation: Proposed new requirement for 61.50(a)

Summary of Comments: The Pennsylvania Department of Environmental Resources and the Ohio Environmental Protection Agency have recommended an additional siting requirement on accessibility of near-surface disposal facilities to major transportation routes. The Pennslyvania DER expressed concerned that the largest contributor to population exposure is transportation from the waste generator to the disposal facility. In addition, the Pennsylvania DER recommended a separate section for minimum institutional requirements, such as transportation routes, public water supplies, and population density.

Analysis of Comments: Transportation requirements are addressed in D. O. T. regulations, and given that they are met, the issue of accessibility of major transportation routes becomes primarily an economic consideration to be considered in site selection and the evaluation of alternatives required under NEPA. The other two "institutional" requirements recommended by Pennsylvania are already present in Sections 61.50(a)(3) and 61.50(a)(4).

Rule Change: No changes are recommended.

ISSUE D-50-8

Issue: Properties of site soils

Commenters: South Carolina Department of Health and Environmental Control (79)
Conference of Radiation Control Program Directors (103)
U.S. Environmental Protection Agency (122)

Rule Citation: Proposed new requirement for 61.50(a)

Summary of Comments: Each commenter has proposed additional siting requirements related to characteristics of the soils. South Carolina Department of Health and Environmental Control has proposed requirements that the mechanical and physical properties of the soils be compatible with certain uses required primarily in Section 61.51(a), e.g., suitable for compaction. The Conference of Radiation Control Programs Directors have recommended exclusion in areas of high natural radioactivity. The Environmental Protection Agency recommended a requirement that the site soils be permeable enough that water infiltrating into a trench can drain through the trench bottom rather than accumulate.

Analysis of Comments: The staff feels each of these suggested requirements is unnecessary. The requirements in Section 61.51(a) which South Carolina addresses will be met, but not necessarily with on-site soils. Off-site soils may be

trucked in, as at Sheffield, or engineered features may be used. Requirements such as being capable of supporting the construction equipment or being amenable to the surface water drainage are implicit if stabilization is to be accomplished.

With respect to areas of high natural radioactivity, these areas would be excluded if they could be shown to violate Section 61.50(a)(11). Otherwise, the staff sees no valid reason for excluding these areas.

The staff agrees with the concept of the EPA comment and has included a recommendation in the technical position paper on site suitability, selection, and characterization (NUREG-0902, p. 8) that the bottom of the disposal unit should drain at least as readily as water can infiltrate into the disposal unit. However, the staff feels that this can be accomplished by site characteristics, design features, or most frequently a combination of both. Therefore, the staff has given the applicant flexibility while requiring in 61.51(a)(6) that the contact of percolating or standing water with wastes after disposal must be minimized to the extent practicable.

Rule Change: No changes are recommended.

ISSUE D-50-9

Issue: Time spans for siting and design requirements

Commenters: Advisory Committee on Reactor Safeguards (10)
Bechtel National, Inc. (44)
South Dakota State Planning Bureau (69)
Birmingham Audubon Society (80)
American Nuclear Society (87)

Rule Citations: Supplementary Information, V., C., (5) Stability; 61.12(d); 61.50; and 61.51

Summary of Comments: The Advisory Committee on Reactor Safeguards has raised the general question of how long do the various siting or design requirements have to be satisfied. This comment was repeated in various terms by Bechtel National, the American Nuclear Society, and the Atomic Industrial Forum. Bechtel National and the American Nuclear Society requested that the design basis natural events or phenomena be identified and that the length of hazard associated with these be stated.

The South Dakota State Planning Bureau offered the suggestion that the stability requirement be specified as 100 years; whereas the Birmingham Audubon Society commented that waste stability should be required for the 500-year duration of the radiological hazard.

Analysis of Comments: As indicated in Column 1 on page 38084 of the Federal Register notice, the siting, design, and waste package requirements relate to both stability of the disposal site and control of releases within acceptable limits. Over the time frame of the radiological hazard, reliance must be placed primarily on the site since the waste package and design features will decrease in effectiveness. Therefore, each of the siting requirements in Section 61.50(a) should be considered applicable over the indefinite future and should be evaluated for at least a 500-year time frame.

The time requirements on design and waste packages, however, should be applied to a shorter period. Given any necessary passive maintenance to maintain the design features in an effective manner, the staff would anticipate a gradual decrease in effectiveness of the design features and waste package such that they will continue to provide a significant though decreasing contribution to isolation for approximately 300 years. This should be particularly true because the design features will have been observed, repaired and modified, if necessary, to assure a stable disposal site prior to the end of the institutional control period.

Bechtel National and the American Nuclear Society request that the time frame for which design bases natural events or phenomena must be considered be stated. This comment raises much the same question as raised by the ACRS on time spans for siting requirements. The staff believes that the time frame for considering the design bases natural events or phenomena is equivalent to the minimum time of concern for siting requirements (500 years). The design life of the particular design feature would thus be evaluated over the period (300 years) when the feature is significantly contributing to isolation and a follow on period of contribution of less significance. Additional guidance will be provided in a BTP on site design.

Rule Changes: No changes are recommended.

ISSUE D-51-1

Issue: Site design

Commenters: Chem-Nuclear Systems, Inc. (41)
Bechtel National, Inc. (44)
Arizona State Clearinghouse (47)
Duke Power Co. (48)
American Nuclear Society (87)
Peter Skinner for Attorney General, State of New York (99)
Atomic Industrial Forum (100)
U.S. Ecology (101)
American Society of Mechanical Engineers (107)
Texas Department of Health (117)
U.S. Department of Energy (119)

Rule Citation: 61.51(a)(3), 61.51(a)(4), 61.51(a)(6), 61.62(a)

Summary of Comments: Five of the commenters objected to the absoluteness of the requirements in 61.51(a)(4) and 61.51(a)(6) and suggested replacing the words "prevent" and "eliminate" with "minimize." Several indicated the words "and improve" should be removed from 61.51(a)(3) or similar concerns about mandatory improvements. Several commenters questioned the use of "eliminate" when referring to erosion in §61.51(a)(5) and active maintenance in §61.62(a).

The Texas Department of Health requested preferential consideration be given to progressive slope design for burial; and Peter Skinner indicated concern that the rule does not provide specific guidance for engineered features which would deal with leachate generation and that site areas used for disposal of Class A waste will require more maintenance.

Analysis of Comments: Sections 61.51(a)(3), 61.51(a)(4), and 61.51(a)(6) are design objectives. Given these are design objectives, the actual achievement will be to minimize, rather than absolutely prevent or eliminate. The staff anticipated that at most sites, design features can be used to improve natural site characteristics, particularly with respect to surface water drainage and limiting infiltration into the disposal unit. Additional guidance will be provided in the technical position paper on site design and operations. Staff agrees that improvements may not be mandatory and inserted "where appropriate" in §61.51(a)(3).

The commenters on §§61.51(a)(5) and 61.62(a) are referred to the definition of "Active maintenance" in Section 61.2. It is the staff's intent that the need for active maintenance be eliminated and staff believes that this goal as reflected in the definition can be achieved.

With respect to progressive slope design for burial, the regulation does not specify the type of disposal unit. Alternative types of disposal units have been evaluated in NUREG's CR-0308 and CR-0680. Additional guidance will be provided in the technical position paper on site design and in an NRC-sponsored symposium in September, 1982 on the same subjects.

The staff will provide more specific guidance on avoiding leachate generation and addressing the inherent instability of Class A waste in the technical position paper on site design and operations. (See the discussion of stability under Issue D-52-2 also.) The site designer should give particular attention to the design of that portion of the site used for disposal of Class A wastes and use innovative designs to provide long-term stability.

Rule Changes:

1. In Sections 61.51(a)(4) and 61.51(a)(s6), change "prevent" and "eliminate" to "minimize." (See Issue GEN-1 also.)

2. In Section 61.51(a)(3), add "where appropriate" after "and improve."

ISSUE D-51-2

Issue: Design life of markers and monuments

Commenters: Union of Concerned Scientists (36)
State of New Mexico (45)
State of California (93)
U.S. Department of Energy (119)

Rule Citation: 61.52(a)(7), (9)

Summary of Comments: The Union of Concerned Scientists recommends that "warning signs" with a 500-year design life be employed as a deterrent to inadvertent intrusion. The U.S. Department of Energy also recommends requiring permanent monuments for the site.

The States of New Mexico and California request that there be a provision for a "permanent" identification monument with a design life of 500 years. They recommend this be high enough to be visible above the contour of the disposal site.

Analysis of Comments: There are few "signs" in the traditional sense that have design lives of anything approaching 500 years. The staff would consider granite monuments, near the survey marker control points required in 61.52(a)(7), which have the radioactivity symbol and descriptive data engraved on them as permanent markers. Staff also notes that the later the monuments are installed, the longer they should last during the passive control period. Thus installation after the licensed period of active institutional control may be appropriate and this flexibility was provided by the suggested change.

Rule Change: Addition to subsection 61.31(c)(2): "permanent monuments or markers warning against intrusion have been installed."

ISSUE D-51-3

Issue: Alternatives for Class A or Classes A & B Waste

Commenter: Ohio Environmental Protection Agency (38)

Rule Citation: §§61.50, 61.51, and 61.52

Summary of Comment: The commenter suggests that the NRC consider less stringent siting, design, and operational requirements for a facility designed to contain Class A or Classes A and B wastes than one containing Class C wastes. The commenter indicated that the present rules are designed to ensure containment of Class C wastes.

Analysis of Comment: The proposed rule assigned lesser operational requirements to the disposal of Class A wastes. However, the stability and design requirements for Class B and C wastes have the same basis, with additional intruder protection added for Class C wastes. The staff does not agree that the Class B requirements can be lowered to those for Class A wastes.

The commenter is correct that the siting requirements apply equally to all classes of waste and staff believes that this position continues to be reasonable in view of the minimum nature of the requirements. Section 61.54 provides flexibility to approve alternative design and operational requirements and would be the vehicle for considering proposals such as less restrictive measures for disposal of Class A waste only.

Rule Change: No changes are recommended.

ISSUE D-51-4

Issue: Intruder barrier engineering

Commenter: PA Department of Environmental Resources (16)
Joseph H. White III (21)
Ohio EPA (38)
Chem-Nuclear Systems, Inc. (41)
University of Arizona (78)
U.S. Department of Energy (119)

Rule Citation: Section 61.7(b)(5)

Summary of Comments: The University of Arizona and Department of Energy point out the usages of the term "engineered barrier" in 10 CFR Parts 60 and 61 are inconsistent. Ohio and Pennsylvania noted that "engineered barriers" may also be used to describe features that limit or control water movement. Chem-Nuclear Systems Inc. indicated their support for the use of "engineered barriers" as an alternative to deeper disposal for Class C waste. White questioned what types of barriers may be used.

Analysis of Comments: The usage in 10 CFR Part 61 for the term "engineered barrier" is inconsistent with 10 CFR Part 60. The usage in 10 CFR Part 61 should be changed to "intruder barrier."

Options other than depth involve use of natural or man-made barriers having an estimated protection lifetime of at least 500 years. Options might include multiple layers of soil, clay, gravel, and boulders or caissons capped with concrete. Additional guidance on such options will be addressed in the Branch Technical Position on design and operation being prepared.

Rule Change: Change "engineered barrier" to "intruder barrier" in 61.7(b)(5), in 61.52(a)(3).

ISSUE D-52-1

Issue: Segregation of wastes

Commenters: Joseph H. White III (21)
Alabama Power (33)
Union Carbide Corporation (39)
South Carolina Department
of Health and Environmental Control (79)
State of New York (99)
New England Nuclear (110)
Utility Nuclear Waste Management Group (81)
State of Washington (112)
U.S. Department of Energy (119)

Rule Citation: § 61.52(a)(1).

Summary of Comments: Alabama Power is concerned that the waste classification requirements should not prohibit mixed classes of waste being shipped on one transport vehicle. For example, if a container of Class B or Class C waste needs to be transported by a shipping cask the commenter felt that, any remaining space in the cask should be allowed to be filled by available waste containers, including Class A waste containers. Otherwise, transport costs would be needlessly raised. The commenter believes that waste containers should be segregated at the disposal site rather than segregated by the generator into different transport vehicles.

Union Carbide stated that Class A material would form a good shielding buffer from the more radioactive Class B material. By segregating the waste classes, burial trenches for Class B may be filled with dirt simply to provide shielding which could have been provided by the Class A material, resulting in better land use.

The State of New York, New England Nuclear, the Utility Nuclear Waste Management Group, and DOE questioned the meaning and intent of the term "interaction" in the requirement in § 61.52(a)(1). The Utility Nuclear Waste Management Group suggested defining sufficient separation as no interactions that can result in premature failure of the disposal facility. The State of Washington questioned the need to segregate by waste class at arid sites, indicating that comingling should be allowed. White questioned how wastes would be segregated.

The South Carolina Department of Health and Environmental Control recognized waste segregation as a viable option to further assure meeting the performance objectives over the long-term; however, waste segregation has several short-term drawbacks. These include increased operational exposures due to the absence of shielding provided by the Class A wastes, a need for at least two trenches open simultaneously and a resulting need for additional handling equipment, and higher radiation levels at the trench boundaries with a resultant significant increase in occupational exposure.

Analysis of Comments: The intent of the rule is not to prohibit waste from more than one class from being shipped on the same transport vehicle.

Consistant with transportation requirements, the staff has no objection to comingling different classes of waste in transport.

In response to Union Carbide's comment, the staff notes that the Class A wastes are segregated to provide better long-term stability of the disposal site because Class A waste, such as ordinary trash-type wastes, is less stable. If mixed with higher activity Class B wastes, the deterioration of Class A wastes could lead to failure of the cover system and permit water to penetrate the disposal unit, resulting in potential migration of the higher activity wastes. Therefore, the long-term potential for waste migration is considered a more important factor than the optimization of short-term operational parameters. This same reasoning is applicable to the comments raised by the South Carolina Department of Health and Environmental Control. The operational exposures can be directly monitored and controlled such that applicable standards are not exceeded. In addition, recent advances have been made in the technology to remotely place wastes with a variety of lifting devices, thereby providing some mitigation of potential occupational exposures.

In identifying the need to clarify the term "interaction," the commenters noted that it was vague and unenforceable. The intent of the provision was to protect Class B and C wastes from the less stable Class A wastes. Class A waste as proposed may contain absorbed liquids, dewatered resins, and biological materials, for example, that may release solvents, water, known chelates, or other mobile components. These mobile components may interact with other wastes in the disposal unit. If the other wastes are Class A and of lesser hazard, the consequences of the interaction are minimized. In addition, Class A wastes are less stable and more prone to degradation, will consolidate and provide a less stable support for disposal unit covers, leading to increased infiltration of precipitation and increased potential for surface water intrusion through voids in the covers. When the additional moisture from any of these sources leaches the waste, some of the solvents and organics are mobilized along with soluble radionuclides. The amounts and range of these mobilized materials will be very site specific and depend on factors such as soil types, hydraulic gradients, precipitation, and cover designs. The language in the rule was modified to reflect the desired protection of Class B and C wastes and to reference meeting the performance objectives instead of the absolute "no interaction." In addition, the rule was modified to permit disposal of stable Class A waste with Class B and C wastes.

The State of Washington regulates the arid disposal site located near Richland, Washington. The State noted that ground water or surface water are not significant factors at arid sites, and, segregation of Class A wastes seems to be unnecessary when weighed against the burden of operating separate disposal units. The State noted that co-mingling of Class A and B wastes would dilute the Class B wastes and have potential benefit. The State's observations may have merit for arid sites, but they are difficult to adopt in a rule that must address sites located in all parts of the country. However, the Commission anticipated the need to consider alternative disposal requirements and included § 61.54, "Alternative requirements for design and operations" to provide for consideration of such alternatives, without granting exceptions to the rule, provided the performance objectives of Subpart C are met. State requirements could certainly contain similar provisions for alternatives and remain compatible with the rule.

Rule Changes:

1. The concern raised by Alabama Power has been addressed by changing the wording of § 61.52(a)(1) to more clearly indicate the intent as follows:

   "...placing in disposal units which are sufficiently separated from disposal units for the other waste classes..."

2. The concern about the meaning of the term "interaction" has been addressed by relating the requirement to the performance objectives as follows:

   "...so that any interaction between Class A wastes and other wastes will not result in the failure to meet the performance objectives in Subpart C of this Part."

3. The concern about comingling waste classes has been partially addresses by adding the following statement to § 61.52(a)(1):

   "This segregation is not necessary for Class A wastes if they meet the stability requirements in § 61.56(b) of this Part."

ISSUE D-52-2

Issue: Factors in Stability of the Site

Commenters:
Advisory Committee on Reactor Safeguards (10)
Nevada, Department of Human Resources (14)
University of North Carolina (30)
Sierra Club (37)
Duke Power Company (48)
South Carolina Department of Health and Environmental Control (79)
Utility Nuclear Waste Management Group (81)
State of New York (99)
Atomic Industrial Forum (100)
U. S. Ecology (101)
Conference of Radiation Control Program Directors (103)
American Society of Mechanical Engineers (107)
State of North Carolina (109)
New England Nuclear (110)
State of Washington (112)
Department of Energy (119)
Environmental Protection Agency (122)

Rule Citation: § 61.52(a)(4) and (5)

Summary of Comments: The ACRS requested that Section 61.52 be reevaluated since subsidence is the result of many factors, including primarily the manner of placement of waste packages in the trenches. DOE questioned why have these requirements, which increase costs, if the overall performance objectives are met; and, the Utility Nuclear Waste Management Group felt the specific stability requirements were unnecessarily prescriptive as to the specific method to minimize subsidence.

Numerous commentors (Sierra Club, Duke Power Company, Utility Nuclear Waste Management Group, Atomic Industrial Forum, U.S. Ecology, American Society of Mechanical Engineers, and New England Nuclear) objected to placing wastes in an "orderly" manner. Several indicated their comment was based on increased costs and/or occupational exposures due to handling the waste packages to meet the requirement. Several asked for an explanation of a specific method; and, several indicated stacking may not benefit long-term package or trench integrity due to corrosion and/or decay.

The Conference of Radiation Control Program Directors indicated support for § 61.52(a)(5). Duke Power Company requested an editorial change; and, the University of North Carolina indicated filling void spaces with earth material will not be successful unless there is mechanical compaction of the backfill. The South Carolina Department of Health and Environmental Control requested that the staff specify what material, other than earth materials, are suitable for use as backfill. The State of Nevada Department of Human Resources indicated that subsidence may be delayed 50-100 years at arid sites; and, the State of Washington recommended that more emphasis should be placed on avoiding slumping and wind erosion at arid sites. EPA indicated that gases can build up sufficient pressures over a period greater than 50 years to affect the stability of trench covers, thus requiring active maintenance and repair of breaches.

The State of New York and EPA questioned the long-term stability of Class A disposal units and indicated that, even if the overall performance objective on releases was met, the Class A disposal units will pose a significant nuisance condition. The State of New York indicated that the appearance of Class A disposal units will lead to public and local government steps to close the sites and will undo the favorable treatment of Class B and C wastes. Further, the EPA raised the question of releases of both radiological and longer-term non-radiological contaminants, while the State of New York indicated that decay during the period of institutional control cannot be relied upon to reduce the hazard of Class A wastes if there is migration during that period. The State of New York and the Sierra Club recommend the same requirements for Class A wastes as for Class B and C wastes.

Analysis of Comments: The ACRS correctly points out that subsidence is the result of many factors, including primarily the manner of placment of the waste packages in the trenches. The staff addressed these lessons learned by proposing requirements on many of these factors, including placement of the waste package so as to maintain package integrity during placement, to minimize void spaces between packages, and to permit filling of the void spaces (§ 61.52(a)(5)). Although the Department of Energy suggested that meeting the overall performance objective of stability is sufficient, the staff has taken the approach throughout the regulation that the best way to assure the entire system (site characteristics, design, operations, waste classification, waste form, etc.) will meet the overall performance objectives is to place requirements on each of the components of the system. The staff has attempted to provide flexibility on how the specific requirements will be met; and, this is reflected in the rewording of § 61.52(a)(4).

In addidition, the staff will provide guidance on preferred methods of meeting the specific requirements in a branch technical position paper on design and operations. The BTP will stress that, while no one method can prevent

subsidence, the combined effect of the total system should be a dramatic reduction in the potential for catastrophic or significant failure of trench caps as observed at several closed low-level waste disposal sites. Also, Section 61.12(b) requires, in the application, specific information which relates to subsidence. Section 61.13(d) requires specific technical information related to long-term trench stability.

The staff agrees that there are alternatives, such as backfilling individual layers of waste packages after placement or grouting between the wastes, to orderly placement of the waste packages. Likewise, there are alternatives, such as the use of granular backfill between individual layers of waste packages, to mechanical compaction of the backfill. The staff will address means to avoid the longer term slumping or subsidence at arid sites in the BTP on design and operations. In addition, technical analyses pursuant to Section 61.12(b) and 61.13(d) should address Nevada's and Washington's concerns in the application phase. Experience has shown that short-term (5-10 year) subsidence in humid sites is more dramatic and requires a greater amounts of maintenance than subsidence at arid sites. Long-term subsidence at either type of site will likely be gradual and can be dealt with through minor maintenance activities by the custodian.

With respect to the generation of gases raised by EPA, several specific requirements such as on trench covers and waste characteristics should reduce the rate of gas generation such that it may diffuse through the soil or trench cap without pressure buildup. In addition, sumps constructed for drainage while trenches are open and used for monitoring and/or remedial pumping after trench filling may provide sufficient venting to the atmosphere, especially if granular backfill is used. The effects of trench gas, like the effects of gradual deterioration of waste packages, are addressed by the requirements for continued maintenance during the post-closure observation and institution control periods.

The concerns expressed by the State of New York and EPA about the long-term stability and appearance of Class A disposed units is well-taken. The staff would point out that the siting and design requirements (§ 61.50 and 61.51) are applicable to all waste classes. In addition, the rule has been revised so that all waste classes must be disposed of in accordance with § 61.52(a)(4) through (11). Further guidance on Class A disposal units will be provided in the BTP on design and operations and in an NRC-funded symposium on design and operations in September 1982. Innovative thinking and techniques are needed for disposal of segregated Class A wastes; and, the BTP and symposium should provide an appropriate forum.

Rule Change:

1. Revise § 61.52(a)(3) as follows:

   "All wastes shall be disposed of..."

2. Revise § 61.52(a)(4) to eliminate "orderly" placement and to stress the objectives rather than prescribe methods. The revised section should read:

   "Wastes must be emplaced in a manner that maintains the package integrity during placement, minimizes the void spaces between packages, and permits the void spaces to be filled.

ISSUE D-52-3

Issue: Basis for 100 foot buffer zone

Commenters: Joseph H. White III (21)
Law Engineering Testing Co. (34)
Paul F. Hadala and Don C. Banks (76)
Birmingham Audubon Society (80)
New England Nuclear (110)
U.S. Department of the Interior (114)
Tennessee Valley Authority (116)

Rule Citation: § 61.52(a)(8), 61.2

Summary of Comments: All commenters generally supported the concept and purposes of a buffer zone; however, there was disagreement on whether a specific distance should be required. White asserted that 100 feet is too small. Law Engineering and TVA questioned the basis for the 100 foot buffer zone and stated that the buffer zone should be based on site performance objectives. Hadala and Banks and the Audubon Society suggested that the minimum buffer zone size be increased to at least 300 feet. The Department of the Interior suggested a three-dimensional zone based on site performance; and, New England Nuclear suggested that the buffer zone extend farther in the direction of ground-water migration.

Analysis of Comments: The proposed prescriptive requirement of a minimum buffer zone of 100 feet in § 61.52(a)(8) was arbitrarily selected. The intent was to provide adequate space for monitoring or remedial action and adequate physical separation from off-site activities. The intent was to evaluate the needed size on a site-specific basis, emphasizing that 100 feet was an absolute minimum. Certainly the distance would vary both from site to site and directionally at a given site. Greater distances were anticipated in the direction of ground-water flow where contingency actions might be required or in directions needed for surface water management or erosion control measures. In addition, discussions with the Corps of Engineers indicated that 100 feet may not be sufficient for purposes of remedial action. Therefore, the prescriptive 100 feet was dropped and the purpose of the buffer zone was expressed. The buffer zone must be adequate to meet the performance objectives. In addition, the Department of Interior comment that the buffer zone include depth as well as lateral boundaries was adopted in the definition. Unrestricted use of land and resources beyond the three-dimensional buffer zone is possible during and after site operation, thereby, reducing the impacts of the disposal site.

White also questioned what mitigative measures may take place in the buffer zone as discussed in § 61.7(a)(2). The possible measures are site/situation specific and the staff felt that speculation in § 61.7(a)(2) concerning what specific measures may be employed was inappropriate.

Rule Changes:

1. Amend § 61.52(a)(8) to read: "A buffer zone of land must be maintained between any buried waste and the disposal site boundary and beneath the disposed waste. The buffer zone shall be of adequate dimension to carry out environmental monitoring activities specified in § 61.53(d) of this Part and take mitigative measures if needed."

2. Add to § 61.12(b) "and adequacy of the size of the buffer zone for monitoring and potential mitigative measures."

3. Revised definition of buffer zone in § 61.2 as follows:

> "...licensee and that lies under the disposal units and between the disposal units and the boundary of the site."

ISSUE D-52-4

Issue: Ancillary activities at the site

Commenters:
Duke Power Company (48)
South Carolina Department of Health and Environmental Control (79)
Birmingham Audubon Society (80)
Utility Nuclear Waste Management Group (81)
Middle South Services (84)
The American Society of Mechanical Engineers (113)
Tennessee Valley Authority (116)

Rule Citations: § 61.12, 61.13, 61.51(a)(7); 61.2

Summary of comments: South Carolina and ASME addressed the need for on site surge storage provisions and consideration of the radiological impacts of satellite activities, such as trucking terminals. The Audubon Society offered strong support of § 61.51(a)(7), and the UNWMG, Middle South Services, TVA, and others suggested clarification of this provision on exclusive use for disposal of radioactive wastes in order to clearly state that the provision addresses waste types and not ancillary activities.

Analysis of Comments: South Carolina suggested adding a provision to § 61.12(f) to require contingency plans for surge storage of wastes because natural phenomena and unplanned events might interrupt operations and delay disposal. The ASME made a similar comment for the definition of disposal facility in § 61.2. In such cases, storage would be required so that trucks could be off loaded and released. Existing site operators generally have provisions in their licenses for storage of up to 6 months, although prompt disposal is encouraged and is the usual practice. Paragraph 61.12(f) requires a description of "methods and area of waste storage" but makes no distinction between routine and contingency storage plans.

South Carolina also suggested adding evaluation of the radiological impacts of ancillary or satellite activities such as trucking terminals to the required analyses in § 61.13. The State noted that such ancillary activities could have significant radiological impacts. Ancillary activities, such as incinerators, trucking terminals, or supply services, which might be located at the disposal facility or in close proximity to the disposal site, would be licensed under 10 CFR Parts 30, 40, 70, et al., as appropriate. The performance objectives in Part 61 would not necessarily apply since Part 61 deals with disposal of wastes. The impacts of the ancillary activities, both radiological and nonradiological, would be addressed in the site specific EIS to the extent they are known or anticipated.

Paragraph 61.51(a)(7) states "The disposal site shall be used exclusively for the disposal of radioactive wastes." The wording resulted in confusion as to whether other waste types or other activities were prohibited. The confusion centers on the term "disposal site," which is defined in § 61.2 to mean "that portion of a land disposal facility which is used for disposal of waste." The disposal site consists of disposal units and a buffer zone; therefore, the requirements of § 61.51(a)(7) apply only to the disposal units and the buffer zone.

The intent was to prevent co-mingling of radioactive wastes with other types of wastes such as chemical or hazardous wastes. There was no intent to prohibit ancillary activities, such as incineration or other waste treatment, at the disposal facility provided they are not located within the perimeter of the buffer zone. In addition, there was no intent to prevent co-location of other facilities outside the buffer zone. Thus, a hazardous waste disposal site could be developed at the same location and use common administrative facilities as is currently done at the Beatty, Nevada site. The disposal sites for the two types of wastes must be separate and the wastes must be properly segregated. Concerns such as masking the environmental monitoring data so that site performance cannot be monitored must be addressed in such plans in accordance with § 61.50(a)(11). The provision to describe such ancillary activities in § 61.11(c)(4) was intended to flag these activities so their impacts could be assessed.

Rule Changes: Section 61.51(a)(7) was revised and moved to § 61.52(a)(11). Section 61.52(a)(11) restricts disposal to only radioactive wastes.

ISSUE D-52-5

Issue: Operational requirements on direct gamma levels and miscellaneous comments on operation and closure

Commenters:
Joseph White (21)
Union of Concerned Scientists (36)
Union Carbide Corp (39)
State of New Mexico (45)
S.C. Department of Health and Environmental Control (79)
Birmingham Audubon Society (80)
Northeast Utilities (85)
State of California (93)
Atomic Industrial Forum (100)
U.S. Ecology (101)
The American Society of Mechanical Engineers (107)
New England Nuclear (110)
Department of Energy (119)
U.S. Environmental Protection Agency (122)

Rule Citations: § 61.52(a)(2), (a)(3), (a)(6), (a)(7), (a)(9)

Summary of Comments:

Direct gamma levels: Proposed § 61.52(a)(6) required that disposal take place in a manner that limited gamma radiation at the surface to levels that are

within a few percent above background. White questions the meaning of a few percent above background Union of Concerned Scientists; States of New Mexico, South Carolina and California; New England Nuclear and DOE suggest gamma radiation levels should be some specific level above background. The Birmingham Audubon Society suggested 1%. The DOE suggested 10% or 1 mrem/hour. Union Carbide suggests limiting gamma radiation to limits established in 10 CFR Part 20. New England Nuclear suggested use of "exposure" or "dose rates" to include other types of radiation. EPA indicated a few percent was vague and didn't taken into account the variability of background radiation levels at any particular site.

Miscellaneous Comments: South Carolina suggested adding a requirement in § 61.52(a)(9) that erosion control measures be carried out. The American Society of Mechanical Engineers (ASME) recommended defining "adequate" in this paragraph.

Northeast Utilities and New England Nuclear (NEN) questioned whether the disposal unit cover referenced in § 61.52(a)(3) includes an impervious cap. NEN also questioned whether the 5 meters refers to the distance from the top or bottom of the cover.

U.S. Ecology stated that the requirement in § 61.52(a)(7) to accurately locate each disposal unit is reasonable if an allowed tolerance is indicated. The ASME and AIF recommended clarifying "accurately located" in this paragraph.

Analysis of direct gamma level comments: The staff agrees that the requirement should be reexamined. The staff considers the permissible levels of radiation in unrestricted areas, as specified in § 20.105 of 10 CFR Part 20, to be appropriate for application at the time of transfer of the disposal facility license to the site owner for the period of institutional control. Although access to the site is restricted during this period of institutional control, the persons working at the site should not be considered radiation workers; therefore, the higher occupational exposures for radiation workers are not appropriate. When ALARA considerations are applied to § 20.105, the levels will probably not be significantly above a few percent of background. The applicant or licensee is allowed greater flexibility and more specific guidance on an acceptable upper limit by the reference to §20.105.

Analysis of miscellaneous comments: Paragraph 61.52(a)(9) requires closure and stabilization measures to be carried out as disposal units are filled and covered. South Carolina suggested specific reference to erosion control measures which are an important part of closure and stabilization. The staff does not feel specific reference to erosion is needed; however, erosion control would be included in the site closure plan which must be submitted for approval as part of the application for approval and will be periodically reassessed during operations of the disposal facility. "Adequate" was replaced with a reference to the approved closure plan to clarify the requirement.

Paragraph 61.52(a)(2) addresses the intruder barrier and waste emplacement for Class C wastes. The Northeast Utilities recommended clarifying the term "cover" in § 61.52(a)(2) to indicate whether the cover includes an impervious cap. New England Nuclear raised the same point. The requirement in § 61.52(a)(3) was addressing the intruder barrier depth only, not materials or design. Design requirements for covers are provided in § 61.51(a)(4). New England Nuclear

also recommended clarifying the 5-meter distance. The 5-meter distance is intended to be from the accessible surface to the top of the wastes, i.e., the thickness of material between a potential intruder and the wastes. The rule was clarified to so indicate.

The suggestion to add a tolerance limit to paragraph 61.52(a)(7) was not adopted. All measures, surveys, etc. by nature have some range of error. In keeping with an objective approach, a more prescriptive requirement was not adopted. Guidance on surveying accuracy, including both elevation and location, will be provided in the technical position paper on design and operations.

Rule Changes:

1. § 61.52(a)(6) replace "gamma radiation" by "radiation dose rates" and replace the reference to a few percent of background with a requirement to comply with § 20.105.

2. Amend § 61.52(a)(9) to read: "Closure and stabilization measures as set forth in the approved closure plan must be carried out as each disposal unit (e.g., each trench) is filled and covered."

3. § 61.52(a)(2): insert "top" before "surface of the cover."

ISSUE D-52-6

Issue: Closure plan

Commenters: Environmental Law Project (9)
Birmingham Audubon Society (80)
The American Society of Mechanical Engineers (113)
General Research Corporation (123)

Rule Citations: Paragraph 61.12(g) requires a conceptual closure plan with the license application and § 61.28 requires a final revision of the closure plan. Related citation: § 61.52(a)(9).

Summary of Comments: The Environmental Law Project seems to be requesting a detailed closure plan with the license application which can be periodically amended and updated. The Audubon Society suggested a requirement for alteration of the site or disposed waste before closure if necessary to protect the public health and safety. The ASME suggested making the rule sufficiently prescriptive to eliminate the need for a closure plan and adding procedures to assure that the closure is addressed and settled up front when the license is issued. General Research Corporation expressed concern that Part 61 may not establish adequate requirements for the specific content of the closure plan and for revision during operations.

Analysis: An applicant is required to submit a closure plan with the license application. Parts of the plan will be conceptual rather than detailed. However, staff agrees that it would be appropriate to periodically "flesh out" the conceptual portions of the plan as more information about the site becomes available during site operations and to reflect changing technology. The annual review of the adequacy of the funding for closure required by § 61.62(c) will be keyed to any changes and updates in the activities to be funded after

operations cease and the status of measures completed as units are filled. An important concept and requirement related to concern about updating or revising the plan is the requirement to carry out closure and stabilization measures as each disposal unit is filled in paragraph (a)(9) of § 61.52. Closure is actually a two phased activity. Much of the work will be done as the units are filled and closed. This work can be defined and described in detail in the application. The activities which must be delayed or are best delayed until after operations cease and all units filled and covered will be more conceptual in nature and will need to be updated. However, the delayed activities must be sufficiently defined and described to estimate costs in order to meet the requirements of Subpart E. As a minimum, the plan and its basis will be updated at license renewal and as part of approving closure pursuant to § 61.28.

The provisions of § 61.28 are adequate, without any changes, to give the NRC authority to require any changes in the site or wastes at closure that are needed to protect the public health and safety. Thus, no change was adopted in response to the Audubon comment. The General Research Corporation raised several topics that might be addressed in the rule such as how can activities during long-term care be factored in and what happens if the closure plan is not approved. While the points are valid questions, they are potentially very site and circumstance specific. Additional guidance on the closure plan will be considered as guidance for the format and content of the application is developed. The Corporation notes that the rule does not state when the closure plan must be revised, although several opportunities are provided when the plan may be reviewed. The staff considers this flexibility appropriate.

Change in Rule: None

ISSUE D-53-1

Issue: Environmental monitoring

Commenters: Commonwealth of Pensylvania, Department of Environmental Resources (16)
Joseph H. White III (21)
Union of Concerned Scientists (36)
Bechtel National, Inc. (44)
Union Oil Company of California (66)
Argonne National Laboratory (68), (121)
American Nuclear Society (87)
Attorney General State of New York (99)
The American Society of Mechanical Engineers (107)
North Carolina Radiation Protection Commission (109)
New England Nuclear (110)
U.S. Department of the Interior (114)

Rule Citation: § 61.13 and 61.53

Summary of Comments: One commenter noted with respect to Subsection 61.13 that analyses of release pathways should be conducted so that they may be validated by data acquired from subsequent monitoring. Monitoring should be conducted with this end in view and validation should be required at set periods. (36)

The other comments received all relate to § 61.53. One commenter noted that the requirement in § 61.53(a) for monitoring data covering a simple twelve-month period for seasonally variable characteristics is insufficient. Seasonal variations having an impact on future environmental monitoring would better be related to established normals, maximums and minimums as provided by appropriate agencies (16). The State of North Carolina (109) expressed the view that the 12 months begin when the application is filed and continue during the review period.

Another commenter noted that § 61.53(a) should include among preoperational monitoring programs the areas of land use, local population density and predicted future movements of population. (21)

With respect to § 61.53(c) two commenters suggested that the last sentence of that section be rephrased to read: "The monitoring system must be capable of providing early warning of migration of radionuclides from the disposal units before they egress the site boundary (emphasis added)." (44) (87) Similar concerns were expressed by another commenter (107).

One commenter suggested that § 61.53(d) should be amended to include language specifying when performance specifications should be readied and to whom they should be submitted (16) and one (68) suggested an explicit reporting requirement in § 61.53.

The State of New York suggested that § 61.53 be rewritten to provide detailed prescriptive requirements, for groundwater monitoring, in particular (99). Two other commenters also addressed providing more details. Union Oil (66) objected to the term "information" in § 61.53(a) as unduly broad and recommended specifying the type of monitoring in § 61.53(b). Argonne (68) suggested clarifying that baseline data must cover both radiological and nonradiological characteristics. Argonne also provided cost data on environmental monitoring for the FEIS (121). Union Oil also questioned the need for monitoring during construction.

New England Nuclear (110) recommended that technological enhanced natural radiation be excluded from § 61.53(a).

The U.S. Department of the Interior (114) recommended adding "geochemistry" to § 61.53(a).

Analysis of Comments: In general, the comments received on this aspect of the rule have not required substantive change in the applicable sections of the rule. Analysis of individual comments follows in the order that the comments were listed above.

With respect to the comment on § 61.13, it is the staff's intent that analyses of release pathways will be conducted by the potential applicant with respect to specific verifiable locations: i.e., environmental monitoring stations. Results of monitoring will be made available to the Commission on an annual basis as per §61.80(h)(2)(ii), and verification of site performance will be made by NRC based upon the applicant's technical analyses, the results of the applicant's environmental monitoring and NRC release limits.

In establishing the period for pre-operational monitoring in § 61.53(a), NRC intentionally set a minimum time period of 12 months for seasonally variable data. If site conditions warrant additional monitoring to establish an accurate baseline of environmental data, NRC may require such monitoring on a site-specific basis. It is also NRC's intent that site monitoring results be related by the applicant to data acquired over a longer term by appropriate agencies to determine the representativeness of the site data. This intent will be elaborated upon in regulatory guides to be issued subsequent to this rulemaking.

The State of North Carolina (109) expressed concern about the additional time the 12 month preoperational monitoring program would require in view of the January 1986 exclusionary date in the Low-Level Waste Policy Act. The State suggested changing the rule to require that the applicant "shall have implemented such preoperational monitoring by the time a license application is submitted." Since NRC review would probably take about 15-18 months and construction cannot begin until the license is issued, the State believed adequate data could be developed while review takes place. Section 61.53(a) requires 12 month data only for those characteristics subject to seasonal variation. The NRC can grant exemptions to the rule that are consistent with health and safety under § 61.6. For example, if regional data on seasonal characteristics was exceptionally good and applicability to the site clearly established, the NRC would consider a request for an exemption to the 12 months data requirement. An applicaton with no preoperational data to confirm site characteristics would involve demonstrations that are very speculative in nature. Further,

the site characterization and preparation of an application will take at least a year. These activities and the monitoring take place in parallel. The data submitted would not have to be based on 12 months data from every monitoring point developed. The rule is sufficiently flexible to permit phased development of data based on interim findings. Thus from a practical view, the requirement should not be a burden or pacing item and the suggestion was not adopted.

The site suitability requirements of § 61.50(a)(3) necessitate gathering of population and land use data by the applicant. This data is generally available from existing sources (such as federal, state or local agencies; aerial photographs or other remote sensing; or topographic maps) and therefore, monitoring of these subject areas under § 61.53(a) is not necessary.

The rule in § 61.53(c) states that the monitoring system must be capable of providing early warning of migration of radionuclides from the disposal site. The disposal site as defined in § 61.2 contains both the disposal units and the buffer zone. The rule's intent is that monitoring should take place within the buffer zone so as to detect any migration before radionuclides would reach the site boundary. Hence, the commentor's point of clarification on this item is accurate and the language of the rule should be revised accordingly.

With respect to the comment on § 61.53(d) relative to when performance specifications should be readied and to whom they should be submitted, the rule sets forth in Subpart C the performance objectives to be met under the rule. The applicant (or licensee) must submit plans as part of the license application for taking corrective measures if migration of radionuclides indicate that the performance objectives of Subpart C would not be met. Action levels, evaluation of results, and special reports in addition to the annual report required by § 61.80(h) will be addressed on a site specific basis and specific license conditions. Thus no new reporting requirements were added to the rule.

The State of New York (99) suggested that § 61.53 be totally rewritten to provide specific prescriptive requirements for monitoring programs. The commenter suggested adding specific requirements for groundwater programs such as number of wells, depths, zones, and gradient orientation. A monitoring layer beneath the disposal units was also suggested. The commenter correctly notes that the NRC has experience with monitoring systems at existing sites. This experience suggests the highly site specific nature of monitoring programs. Similar considerations apply to Union Oil's (66) comments on more specificity. Argonne's (68) point about radiological/nonradiological is addressed to some extent by the list of topics or subjects in 61.53(a). The addition of geochemistry in response to commenter 114 further emphasizes nonradiological characteristics. One additional factor to consider is that environmental impacts and monitoring are a key issue under NEPA and will be addressed under the requirements of 10 CFR Part 51. The focus of Part 61 is the health and safety performance objectives based on radiological considerations. With respect to Union Oil's comment on the need for monitoring during construction, staff believes such monitoring is needed. As the list of subjects in § 61.53(a) indicates, the monitoring intended is more comprehensive than just monitoring pathways per se. Information on site characteristics important to understanding the site and predicting long term performance and events is intended. For example, excavation of a trench can yield important data on soil and ground water properties. Additional data on seasonal variations can be obtained.

The NRC does plan to address monitoring programs in regulatory guides and believes that this is the better forum for addressing the details.

New England Nuclear (110) recommended that technologically enhanced natural radiation due to excavation operations or change in pH be explicitly excluded from Part 61 in § 61.53(a). Specifically, Radon and K-40 levels in ground water may be increased due to site operations. As proposed, § 61.53 does not address this phenomonon. The commenter expects that the enhancement should not violate EPA drinking water quality regulations and may therefore be excluded. Such a specific prescriptive requirement is not in keeping with the approach of § 61.53. Details such as altered radon and K-40 levels prior to receipt of waste would be documented and evaluated as part of the site specific data. Any guidance on this issue would be included in a regulatory guide. No change to the rule was adopted based on the comment.

The U.S. Department of the Interior (114) recommended that the technical area "geochemistry" be added to the list of subjects listed in § 61.53(a). Staff agrees and the addition was adopted.

Rule Changes:

1. The last sentence in § 61.53(c) should be changed from:

   "The monitoring system must be capable of providing early warning of migration of radionuclides from the disposal site."

   to:

   "The monitoring system must be capable of providing early warning of releases of radionuclides from the disposal site before they leave the site boundary."

2. Add to 61.53(a) after "geology": "geochemistry"

ISSUE D-55-1

Issue: Waste classification - basis for numbers

Commenters:
D. M. Mathews, Ph.D (23)
Sargent and Lundy (24)
Wisconsin Electric (32)
Sierra Club (37)
Ohio EPA (38)
Bechtel (44)
Duke Power (48)
Argonne National Laboratory (68)
Georgia Institute of Technology (70)
The University of Texas Medical Branch (75)
American Nuclear society (87)
General Electric (89)
Health Physics Society (96)
Atomic Industrial Forum (100)
American Institute of Chemical Engineers (102)
Carolina Power & Light (106)
The American Society of Mechanical Engineers (107)
New England Nuclear (110)
Kerr-McGee (115)
Atomic Energy of Canada (118)
U.S. Department of Energy (119)

Rule Citation: Table 1 of Section 61.55.

Summary of Comments: This group of commenters in one way or another objected to the numbers set out in Table 1. Commenter 24 stated that the waste concentration scheme and associated concentration limits would have a substantial impact on the nuclear power industry's waste disposal costs, but gave no basis for the statement. Commenter 24 suggested replacing the values in Table 1 with those from FBDU's study NUREG/CR-1005, rather than the current "arbitrary" values. Commenter 44 thought that the logic for the concentrations was not apparent, and cited as an example the proposed limit (0.8 Ci/m^3) for C-14. As stated by the commenter, "it would appear, for example, that carbon-14 which contains less than 0.8 microcuries per cc may be disposed of as segregated waste but that any concentration greater than 0.8, even if it is only a tiny increase, immediately requires that the disposer seek special permission from the government for disposal. The abrupt demarcation needs explaining so that the logic of it can be understood."

Commenter 38 thought that depleted uranium should be classed as a heavy metal poison, not as a radiation hazard, and questioned why it should be controlled at all. Commenters 68 and 107 questioned the status of low-activity bulk solid wastes containing uranium and/or thorium and referenced the draft BTP published October 23, 1981 (46 FR 52061) on uranium and thorium wastes. Atomic Energy of Canada questioned the entries for uranium and the potential for excluding natural uranium oxides because of the different limits for uranium as a metal. The DOE raised similiar concerns about uranium fluoride compounds. Similarly,

commenter 38 thought that "iodine-129, as found (which means diluted with reactor-produced stable iodine) is of such low specific activity it is less of a radiation hazard than natural potassium or rubidium."

Commenter 23 did not see the line of reasoning associated with the numbers in Table 1, and made a comparison with NCRP total body burdens for I-129 and Sr-90. He requested a statement regarding how the numbers were chosen. Commenter 23 was also distressed that there was no consideration in the table regarding the chemical composition of the isotope under consideration. "It is my contention for example that iodine-129 in the form of lead iodide which has a very low solubility would be of less hazard than iodine in the form of potassium iodide which has a rather high solubility." Commenter 70 suggested that physical form be considered for H-3 and C-14 limits.

Commenters 75 and 96 and others felt that the numbers for the beta emitters not specifically listed were unduly restrictive. Commenter 37 felt that the half-lives of the listed nuclides had not been adequately considered. Commenter 106 and others felt that decay during operations had not been adequately considered. Commenter 89 felt that the system and supporting rationale is workable.

Analysis of Comments: The basic problem is that the commenters could not see the basis for the numbers in the table as published in the Federal Register Notice. However, the notice clearly states that the basis for the numbers is contained in NUREG-0782, the draft environmental statement for the rule. Many of the comments are general and did not identify specific values in Table 1 that were of concern.

The FBDU values in some cases are even more conservative than those in NUREG-0782. Other problems have been identified with the FBDU work. The FBDU numbers do not form a workable classification system in that they do not consider stability or waste form. The FBDU work contains some errors (for example, their treatment of direct gamma radiation is in error by at least a factor of two and possibly higher, and the lung model FBDU uses is in error for transuranics by about a factor of 10) that have been corrected in the NUREG-0782 work.

The comment on the demarcation between acceptable and nonacceptable quantities of C-14 reflects the very nature of all numerical limits in that on one side of the limit you are ok but on the other side you are not. It's possible that the commenter is confused by Table 1, with the same number for C-14 and other isotopes in all three columns. It would probably be better to set out two tables for Table 1.

The basis for limits for specific isotopes and which isotopes to include in the table(s) was re-examined in the FEIS and the commenters are referred to the EIS and the discussion of comments on the DEIS on this issue. Staff generally agrees that natural uranium should be deleted from the table. The proposed final version of the rule allows disposal of low specific activity residues (except for large quantities of mill tailings wastes) as Class A waste. Under DEIS calculations, iodine-129 is important since it can give high intruder exposures (and population impacts based upon intrusion) and dominates the ground water pathway. The possibility that the calculated impacts from iodine-129 are exaggerated by not considering dilution with stable iodine was included in preparing the FEIS.

As far as chemical forms of isotopes effecting the results is concerned, the commenter is probably correct. However, staff does not have the data necessary (and neither, undoubtedly, do most waste generators) to draw these distinctions in the classification scheme. Similarly for the physical form of H-3 and C-14.

Rule Changes:

(a) Modify Table 1 to make two tables.

(b) Change limits and/or delete some nuclides (e.g., possibly uranium, C-14).

ISSUE D-55-2

Issue: De minimis levels for waste

Commenters:
PA, Department of Environmental Resources (16)
Dow Chemical (17)
United Technologies - Packard (25)
University of North Carolina (30)
Alabama Power (33)
Sierra Club (37)
Ohio EPA (38)
Union Carbide (39)
Bechtel (44)
Duke Power Co. (48)
Ontario Hydro (51)
American College of Nuclear Physicians (53)
Kentucky Special Advisory Committee on Nuclear Issues (55)
Union Oil Company of California (66)
Stock Equipment Company (67)
Argonne National Laboratory (68)
Georgia Institute of Technology (70)
Utility Nuclear Waste Management Group (81)
Middle South Services, Inc. (84)
Northeast Utilities (85)
American Nuclear Society (87)
General Electric, Wilmington (89)
Arkansas Power and Light (94)
Health Physics Society (96)
Don't Waste Washington Legal Defense Foundation (97)
Wisconsin Electric Power Company (98)
Atomic Industrial Forum, Inc. (100)
U.S. Ecology (101)
American Institute of Chemical Engineers (102)
Conference of Radiation Control Program Directors (103)
Carolina Power and Light (106)
American Society of Mechanical Engineers (107)
North Carolina Radiation Protection Commission (109)
New England Nuclear (110)
U.S. Department of Energy (119)

Rule Citation: 10 CFR Parts 20 and 61.

Summary of Comments: Of the commenters who commented on the concept of setting levels for wastes below which there is no regulatory concern, i.e., de minimis wastes, all but apparently one (Commenter 97) supported the concept. In their response, commenter 97 stated that "we agree with the proposed regulation's statement that there should be no generic 'de minimus' category for waste." While the great majority of the remaining commenters supported the de minimis concept firmly, some commenters' support was more of an implied nature. For example, commenter 37 suggested that at places such as medical hospitals and research institutions, wastes having half lives under 190 days could be segregated, stored for decay, and sent to a "regular municipal landfill if there is certainty that full decay has occurred. This would significantly reduce low level dump site volume requirements (currently 25% of total low level waste volume is provided by medical wastes) and provide a more rational segregation." Holding wastes for decay is discussed further under Issue D-55-14.

Some of the commenters supporting the de minimis concept made direct reference to NRC's position that exempting particular waste streams from compliance with the Part 61 regulations was preferable to setting generic de minimis levels for all isotopes. Commenter 16, for example, thought that setting "exemptions on the basis of certain waste streams is of dubious value and is considered to be a poor excuse for failure to deal with the controversial topic." As another example, commenter 51 thought it unfortunate that the rules did not establish a generic de minimus category, as it would (in the commenter's opinion) have a greater economic advantage than case-by-case decisions. This commenter then remarked, however, that as there is not yet a concensus on a generic de minimus level, any level chosen would be premature. A number of other commenters suggested that a de minimis classification be added to the Part 61 regulation, perhaps as an additional column to Table 1.

Considering all the comments, the fundamental concern appeared to be not whether a generic or a case-by-case approach should be taken, but that action to develop de minimis standards should be taken as soon as possible. As stated by commenter 81, "the establishment of a 'de minimus' category of low-level waste (LLW) whether upon a generic or case-by-case basis, would be extremely useful and would result in considerable savings of time, money and valuable burial space at disposal sites without any corresponding increase in risk to the public health and safety." Several commenters (e.g., commenter 100) suggested that NRC "permit case-by-case reviews of requests for specific applications of the 'de minimus' concept during the period criteria are being developed." Some suggested specific values for specific waste streams or radioisotopes. For example, commenters 68 and 107 suggested that low specific activity wastes containing uranium or thorium should not have to meet the proposed waste form requirements for Class A, B, and C wastes.

A potential pitfall in development of de minimis levels was observed by commenter 25 and others, who noted a problem with the de minimis standard for H-3 and C-14 in relation to DOT transportation standards. We permit disposal of waste containing H-3 and C-14 in liquid scintillation fluids in concentrations less than .05 uCi/gm without reguard to its radioactive content. However, DOT defines radioactive material as material with a specific activity greater than 0.002 uCi/gm (49 CFR 173.389(e)). Thus the H-3 and C-14 shipments must be identified as radioactive and hazardous disposal sites and landfills are reluctant to accept radioactive shipments. This situation led the commenter

to note that "since the DOT regulations require a radioactive hazard label, the relaxed requirements of paragraph 20.306 are null and void for any wastes which must be transported from the generator's site."

Analysis of Comments: NRC agrees with the importance of setting timely standards for disposal of certain wastes by less restrictive means. NRC agrees with the commenters that establishment of such "de minimis" levels would reduce costs of disposal for many licensees and would also conserve space in disposal facilities which are otherwise designed for wastes having much higher activities, and also believes that such levels can be set and enforced so that the public health and safety is ensured. NRC staff also believes that establishment of de minimis levels is important in enhancing overall stability of a disposal facility, and therefore in reducing potential long-term site maintenance (and corresponding costs). As stated elsewhere, disposal facility stability would be best facilitated by requiring that all wastes be placed in a stable form. NRC staff, however, believe that this would be costly to many small entities and is difficult to require of waste streams which may contain only small amounts of radioactivity or are only suspected of being so. NRC has therefore compromised by requiring that high activity wastes (i.e., Class B and C wastes) be stabilized in a segregated manner from Class A wastes, for which no waste stability requirements are imposed. The result is improved overall site safety and stability relative to disposal of waste without consideration of classification. Some maintenance would still be required for Class A disposal units, but such disposal units would only contain low activity waste.

NRC plans to further examine cost-effective methods to improve the overall stability of Class A disposal units. Some methods might include improved packaging. It is apparent, however, that eliminating waste streams that do not have to be disposed by rigorous methods will have a significant effect in improving overall disposal site stability. Restricting disposal to wastes which truly need to be disposed under the Part 61 requirements would also improve the cost-effectiveness of future potential improvements in Class A waste stability.

Regarding the issue of setting de minimis levels on a generic or on a case-by-case basis, NRC staff still believe that the current policy of examining waste streams on a case-by-case basis will result in the quickest and best results. It is recognized that setting generic limits may be a desirable goal, and NRC plans to work toward this goal over the next few years. However, the question of setting generic limits involves resolving a number of issues and questions such as limits for public exposures, pathways by which the public may be exposed, and ensuring compliance with the de minimis requirements. NRC staff believe that the process of resolving such issues and questions on a generic basis would be expidited by first examining such issues with respect to a few specific waste streams. From these specific cases, generic requirements may be determined. Attempting to set generic limits and then applying these limits to specific waste streams, conversely, is believed to be less likely to produce workable results on a timely basis.

Rule Changes: Part 61 should not be deferred until additional waste streams or generic de minimis requirements are determined.

NRC staff plan, however, to accelerate work on setting standards for disposal of waste by less restrictive means. Such standards are expected to include

consideration of controlled on-site disposal by licensees as well as disposal into sanitary landfills and hazardous waste disposal facilities.

As a part of this, NRC staff intends to examine disposal of some specific waste streams, and will accept petitions for rulemaking or applications from licensees. In making such petitions or applications, licensees or petitioners should provide at least the following information:

- o a description of the process by which the waste is generated;
- o a description of the waste generated, including chemical characteristics;
- o the radionuclide content of the waste, including principal as well as trace contaminants;
- o a description of the potential change in the radionuclide content as a function of process variations;
- o a description of the process control and quality control programs by which the licensee would ensure compliance.

Waste streams in which the radionuclide content is well known and relatively nonvarient are generally preferred.

The preceding guidance should be included in the discussion of the final rule.

ISSUE D-55-3

Issue: TRU classification (10 nCi/gm limit)

Commenters:
Catherine Quigg (13)
Department of the Environment, London (19)
Florida Power & Light Company (31)
Wisconsin Electric Power Company (32)
Alabama Power (33)
Ohio EPA (38)
Union Carbide Corp./Medical Products Division (39)
Duke Power Company (48)
Utility Nuclear Waste Management Group (81)
Northeast Utilities (85)
American Nuclear Society (87)
Power Authority of the State of New York (92)
State of California (93)
Arkansas Power and Light (94)
Health Physics Society (96)
Wisconsin Electric (98)
Atomic Industrial Forum (100)
U.S. Ecology (101)
American Institute of Chemical Engineers (102)
Conference of Radiation Control Program Director (103)
Carolina Power and Light (106)
American Society of Mechanical Engineers (107)

North Carolina Radiation Protection Commission (109)
New England Nuclear (110)
Colorado Department of Health (111)
Kerr-McGee (115)
U.S. Department of Energy (119)
Argonne National Laboratory (120)

Rule Citation: Table 1 of Section 61.55.

Summary of comments: This subject created a lot of discussion, with a number of related points addressed. Of the commenters, 4 thought that the 10 uCi/gm limit should be either retained or lowered, while most of the remaining suggested that the limit be raised.

The commenters who suggested that the 10 nCi/gm limit be raised presented a number of points. Commenter 19 commented that the limit "could be too restrictive for Class C wastes," and also stated that it wasn't clear whether the limit applied to Class A and Class B wastes as well. This commenter (19) was also concerned that the rule didn't allow case-by-case consideration of higher levels for disposal for improved methods (the commenter notes that allowing case-by-case considerations is in the rule but erroneously says that it doesn't apply to TRU waste). That is, there is no allowance for disposal between shallow land disposal and a high level waste repository at intermediate depth. The commenter thought that such a tact would prove to be very expensive in the UK.

Several commenters stated that the technical justification for the 10 nCi/gm limit had not been demonstrated since it came from the old comparison with natural radium (31, 32, 33, 39, 106, 107, 115). Many said that the number was conservative or arbitrary. Other commenters observed that assay procedures for alpha-emitting transuranic isotopes were difficult, and one stated that it had not been determined that the detectable limit for alpha-emitting TRU radionuclides is down to less than 100 nCi/gm, thus making the 10 nCi/gm limit not measurable and therefore not enforceable (33). The difficulties of routinely measuring for TRU radionuclides at such low levels was also noted by other commenters (e.g., 96). Along these lines, several commenters objected to the logic that since 10 nCi/gm is achievable, it should be continued. Commenters (e.g., 110) stated that "operations should only be said to be ALARA when the cost to reduce impacts from these operations is justified by the benefits occured and when further costs to reduce impacts are not justified. Compliance with an excessive restriction or achieving a lower level of impact are not necessarily ALARA." Some of commenters (e.g., 38, 87, 107) stated that the limit led to great quantities of waste that is only suspected of containing TRU isotopes (mainly due to origin) to be needlessly stored. As stated by commenters 87 and 107, "much of the waste presently stored as transuranic waste is segregated from low-level waste on the basis of waste origin since the 10 nCi/gm limit is too low for accurate measurement and certification. However, segregation according to the 100 nCi/gm limit could be achieved, eliminating expensive retrievable storage and deep geologic disposal of 'suspect' transuranic waste."

As implied above, many if not most of the commenters suggested that the limit be safely raised to 100 nCi/gm. One (31) suggested that based on studies the

limit could be as much as 50 times higher. These commenters stated that raising the level to 100 nCi/gm was technically defensible and would furthermore provide some advantages. As discussed above, one advantage would be enforcability. That is, with current measurement techniques, it was very dififuclt if not impossible to certify that one was below 10 nCi/gm but much less difficult to certify that one was below 100 nCi/gm. In discussing this, commenter 106 observed that although 10 nCi/gm is achievable during normal power plant operations, there are documented reports (EPRI Project 613, August 1980) of levels associated with unusual fuel performance which were occasionally in the 10-100 nCi/gm range. The commenter felt that the very small amount of waste that falls in this range could be readily disposed of safely. The commenter also believed that "all waste from operating power reactors could safely be assumed to fall below the 100 nCi/gm level, thereby achieving compliance by definition and making it unnecessary to perform direct or indirect measurements which are technically very difficult."

Another advantage stated by the commenters was that a 100 nCi/gm limit would encourage volume reduction through incineration and other means while conversely, a 10 nCi/gm limit would discourage volume reduction. Commenters expressed the view that it may be necessary to dilute wastes in order to meet the concentration limits and that discouraging volume reduction would be contrary to NRC's policy on volume reduction as published in the Federal Register (46 FR 51100) on October 16, 1981.

The commenters cited a number of reports, documents, and ongoing activities as providing justification for their contension that the 10 nCi/gm limit be raised to at least 100 nCi/gm. Reports cited included those by Leddicotte, et. al. ("Suggested Concentration Limits for Shallow Land Burial of Radionuclides"), Adam and Rogers ("A Classification System for Radioactive Waste Disposal--What Waste Goes Where," NUREG-0956), and Rogers ("A Radioactive Waste Disposal Classification System," NUREG/CR-1005). One commenter (81) notes that the latter two documents have been criticized since they used an older ICRP-2 lung model rather than a more realistic ICRP-30 (Task Group) lung model. Commenter 81 then cited a recent publication by Dunning and Killangh ("A Comparison of Effective Dose Equivalents From Three Major Internal Dose Compilations," Radiation Protection Dosimetry, Vol. 1 No. 1, 1981) and contended that this publication demonstrated that "conclusions derived on the basis of the ICRP-2 lung model are valid for the transuranics." Staff does not agree with the commenters contention.

Other documents cited by commenters included:

- a proposed revision of DOE Manual Chapter 0511 (dated 7/30/81);
- a recent mark-up of House Bill HR 5016 by the House Science Committee;
- the proposed EPA regulation for high level waste disposal, 40 CFR 191.

Others thought the NRC analysis of the TRU limit in the draft environmental impact statement was excessively conservative. The most common comment in this regard was that NRC was too conservative in that it did not consider dilution by other (lower activity) wastes, and that if dilution was considered, the allowable concentration could be increased by an order of magnitude or more.

One commenter (110) stated that studies are quoted in the DEIS which "indicate that the average radioactivity concentration in waste can be expected to be from 1% to 10% of the maximum concentration." Another commenter (81) referenced a DOE document by Healy and Rodgers ("Limits for the Burial of the Department of Energy Transuranic Wastes," LA-UR-79-100, January, 1979) which indicated that a dilution factor of 20-60 could be expected for DOE trash wastes.

Two commenters believed that there were some errors in NRC's calculations. For example, commenter 102 thought that an inhalation pathway would not be applicable with layered disposal. This commenter also compares conclusions in the DEIS with supposed conclusions in the documents NUREG-0456 and NUREG/CR-1005. Commenter 115 believed that NRC's method for calculating airborne dispersion by an intruder was in error and suggested another technique based upon resuspension by wind. Similarly to commenter 102, commenter 105 also stated (erroneously) that since all transuranic waste would be Class C waste, such waste would always be disposed a minimum of 5 meters below the earth's surface and could therefore never be contacted by an intruder.

One commenter questioned whether the transuranic concentration limit is a cumulative limit for all transuranic isotopes (except Pu-241) or if it is based upon a concentration per transuranic isotope. Another commenter (31) urged the Commission to perform an in-depth evaluation of TRU isotopes in reactor plant radioactive waste streams prior to adopting the 10 nCi/gm concentration limit, and to evaluate the practicality of techniques for demonstrating compliance.

Commenters that supported the 10 nCi/gm limit or did not want it raised included commenters 13, 93, 103, and 111. Commenter 93 expressed general support for the 10 nCi/gm limit for near surface disposal of low-level waste, and stated that "wastes that exceed this limit should not be considered low-level waste and should not be buried at commercial low-level waste disposal sites." Commenter 103 expressed support for "confirmation of the definition of transuranic wastes as recommended by the conference serveral years ago." Commenter 111 stated that "transuranic wastes should be limited to 10 nCi/gm regardless of its decay mode due to the fact that the daughters may be hazardous."

Commenter 13 had a number of concerns, and included some enclosures to support her positions and concerns. (Note that commenter 120 clarified some of the points the commenter attributed to him.) The commenter stated that based upon experience at Maxey Flats, INEL, and ORNL, which indicated that plutonium migrated much more quickly than originally anticipated, one would expect to see the concentration of transuranics allowed for shallow land burial regulated downward.

The principal concerns, however, appeared to be that:

(1) much greater than 10 nCi/gm of TRU would be considered for land burial; and

(2) the limit for Pu-241 is too high since it decays to Am-241, which the commenter considers to be extremely toxic.

The first of the above two concerns is based upon two items. One is section 61.58, which allows "other provisions for the classification and characterization of the waste, disposal site, and method of disposal, if it

finds reasonable assurance of compliance with the performance objectives. . ." The second is the footnote in Table 1 which states that the concentration may be averaged over a waste package (multiply by 200,000 for a 55 gallon drum). The commenter noted that this allows up to 2 million nanocuries of TRU or 70 million nanocuries of Pu-241 per 55 gallon drum. These issues are addressed as part of Issues D-55-5 (Case-by-case approval of disposal of wastes in greater than Class C concentrations), D-55-7 (Averaging concentrations over packages), and in the FEIS.

Other specific comments/questions on TRU waste from commenter 13 were:

- Why didn't the NRC put "less than 10 nCi/gm in columns 1 and 2 on page 38085. Doesn't it apply?
- Why didn't the NRC say that TRU waste above 10 nCi/gm should be given retrievable surface storage until its new regulations for intermediate waste are available?

Commenter 85 suggested that 163 day half-life Cm-242 should be exempted from the limit. Commenters 87 and 107 suggested removable surface contamination limits.

The DOE commented that the TRU limit should be based on pathway analyses and that DOE is reassessing its use of the 10 nCi/g limit.

Analysis of comments: The commenters raised a variety of issues. Most of the comments were written without consideration of the draft EIS. In the draft EIS, staff made an effort to come up with numbers for individual transuranics, but this effort suffered from two basic limitations: (1) the analysis did not consider decay chain daughters and (2) the analysis did not go from individual isotopic concentrations and calculate an effective cumulative limit for all alpha-emitting isotopes. These limitations were factored into the final EIS. Staff agress that Cm-242 deserves special consideration and has addressed it in the same manner as Pu-241.

There has been some discussion by commenters and others regarding raising the TRU limit to the range of 100 nCi/gm. The best reason for doing this appears to be the ability to measure transuranics. It's easier and less expensive for them to show that they are under 100 nCi/gm than under 10 nCi/gm.

Work in the draft EIS did not consider dilution due to depth of disposal and by other waste streams; the calculated limit for many if not most alpha-emitting TRU isotopes was about 10 nCi/cm^3 (about 6 nCi/gm). Staff agrees that not considering that Class C waste (which has been disposed at a minimum depth of five meters) would still be difficult to contact even after 500 years was an unnecessarily conservative assumption. Other considerations include dilution by lower activity waste streams, improvements in health physics methodologies, and differing disposal site environmental characteristics. In order to provide more realistic estimates of the consequences that will result from disposal of TRU wastes, the analyses were reevaluated in the final EIS, with the result that the near-surface disposal limits for transuranics and other isotopes were raised by a factor of 10.

The following discussion addresses some of the specific questions raised by the commenters who supported a raised limit:

- Commenter 19 questioned whether the limit applied to Class A and B waste as well as Class C waste. The answer is yes.

- Commenter 19 was also concerned that there was no disposal method between shallow land burial and a repository. A partial answer is that developing requirements for disposal by such intermediate methods (and correspondingly higher isotope concentrations) is planned. Licensees will have to continue to store wastes not acceptable when evaluated on a case-by-case basis until a commercial or DOE facility is available. The commenters concerns are valid but not new or a result of Part 61.

- The justification for the 10 nCi/gm limit (commenters 31, 32, 33, 39) was addressed in the draft EIS.

- The comments (31, 33, 38) that assaying for alpha-emitting TRU isotopes is difficult, impossible to routinely directly measure down to 10 nCi/gm, and leads to a lot of suspect waste are good comments and support a higher limit.

- Commenter 39 questioned the logic that the 10 nCi/gm limit should be continued because it is achievable since there have been occasions when wastes could not meet this limit and were not acceptable at the commercial disposal sites. Unless there is no limit, there may be some waste streams which are over the limit and this point is not sufficient reason to change the limit.

- As proposed and as finalized, the limit is a cumulative limit for all TRU (except Pu-241 and Cm-242) isotopes rather than an individual isotopic limit. The cumulative limit is more conservative but also contributes to the need to raise the limit.

- Commenter 31 suggests that we should take a close look at TRU isotopes in reactor waste, as well as the practicality of determining compliance, prior to adopting the 10 nCi/gm limit. Because of the license conditions in effect at the disposal sites, licensees have had to comply with the limit for years. However staff is continuing to look at these issues and follow work being done by EPRI and others in this area. Raising the limit for Class C wastes should alleviate some of the commenter's concerns.

Commenter 13 expressed concerns about plutonium migration, disposal above 10 nCi/gm, the Pu-241 limit, applicability of the 10 nCi/gm limit to columns 1 and 2 in Table 1, and requiring storage of TRU wastes above the limits.

In response the comment regarding "migration" of TRU isotopes at Maxey Flats and ORNL (migration has not been reported at INEL), the experience at Maxey Flats and ORNL does not prove that TRU isotopes migrate faster than expected. Maxey Flats and ORNL are similar situations in that in both cases we have had bath-tubbing as well as disposal in fractured formations. The bathtubbing at ORNL has led to surface seeps. On one hand, we have had extended periods of contact between water and waste (plenty of time to form a semi-organic leachate leading to concern regarding chelating agents) and on the other hand we have

had instances of rapid flow through fractures. We also have had lots of surface contamination at these sites. However, consider the situation at other places such as the HLW tanks at Hanford and the Barnwell and Sheffield sites. Where there are no fractured formations and percolating water has flowed through the waste and soil rather than being allowed to bath-tub, plutonium and other TRU isotopes have shown a definite propensity to migrate little if at all (even with organic chemicals present).

Case-by-case determination of higher limits than 10 nCi/gm is addressed in Issue D-55-5. In approving any exceptions or alternatives to the technical requirements in Part 61, meeting the performance objectives rather than the numerical concentration limits will be the bottom line. Thus the response to the question about what criteria will be used to evaluate proposals to dispose of higher concentrations is, the performance objectives form the "criteria." With respect to the Pu-241/ Am-241 issue, the submitted information included no calculations or pathway analysis. Based on work associated with the EIS, staff continues to believe that it can be demonstrated through analysis that the 350 nCi/gm number for Pu-241 is conservative. The applicability of the 10 nCi/gm in TRU limits for Class A and B wastes needs to be clarified in a revised table. The proposed rule and table were somewhat confusing with respect to columns 1 and 2. There is no need to require that licensed TRU waste be stored. The requirements already exist under existing rules. If the waste cannot be transferred out of the licensee's possession, the licensee must safely store it.

Commenter 13 also questioned the numerical TRU concentration limit for "near-surface" that would be approved on a case basis. NRC is not in a position at this time to set such a limit, and there is furthermore no compelling reason to set one now. A concentration limit for intermediate depth disposal will be considered at a later time. NRC would want to caveat any future limits to allow for flexibility and future improvements. If NRC gets a license application in the meantime, a site specific limit can be included as part of addressing the license application. Similiar arguments apply to the question on numerical limits on the depth of disposal.

The ANS and ASME suggestion to add a 100 picocurie per square centimeter (pCi/cm^2) limit for transferable contamination of TRU nuclides was based on proposed revisions to the DOE Manual Chapter 0511. The surface contamination limit could reduce the potential exposure for an archeological or scavenger type intruder. Part 61 did not attempt to protect such intentional intruders who would be looking for identifiable waste such as lathes. Protection of the inadvertent intruder was considered and surface contamination is not important in the scenarios. However, such a limit is not unreasonable for DOE wastes as an ALARA approach in view of the more frequent disposal of contaminated equipment of interest and of the TRU contamination in DOE wastes that is primary and not incidental to other nuclides.

In response to commenters 102 and 115, NRC's intent regarding the 10 nCi/gm limit in the proposed rule was that the limit apply to all classes, not just Class C. Given the uncertainties regarding natural and human actions over long time periods, and the long half lives of many of the transuranic isotopes, NRC believes that it is unreasonable to assume that Class C waste could never be contacted by humans. Although the commenters assertions regarding the draft EIS analyses did not accurately describe what was actually done, the analyses

were reassessed for the final EIS to determine whether there existed excessive conservatism. In regard to the methodology used to calculate airborne dispersion, such dispersion is assumed to result from mechanical disturbance of the soil, not from wind resuspension as mistakenly asserted by commenter 115.

Rule Changes:

1. Raise the limit for TRU includes with half lives greater than five years to 100 nCi/g for Class C wastes.

2. Clarify the case-by-case approval provision.

3. Clarify the TRU limits for Class A and B.

4. Add a separate limit for Cm-242.

ISSUE D-55-4

Issue: Waste classification - Ra-226

Commenter: Commonwealth Edison (35)
Bechtel (44)
New Mexico Secretary for Health and Environment (45)
American Nuclear Society (87)
American Society of Mechanical Engineers (107)
North Carolina Radiation Protection Commission (109)

Rule Citation: Table 1 of 61.55.

Summary of Comments: Basically, the commenters want to know what to do with waste contaminated with or containing Ra-226, a radioisotope which is not currently listed in Table 1. Commenter 35 states that they possess several radium-226 sources used at their fossil fuel stations for flow rate determinations. Commenter 45 states that it is not clear whether Ra-226 will be permitted for disposal and in what concentrations. Commenters 44, 87, 107, and 109 all request a value or concentration limit for Ra-226 disposal.

Analysis of Comments: As the commenters have observed, there is no waste disposal concentration limit for Ra-226. It appears that there are two types of radium wastes to be considered: (1) small concentrated sources such as sealed sources or radium dials, and (2) wastes which contain small amounts of radium incidental to other radioisotopes such as mining or manufacturing residues. The former would in general not fall under the auspices of the Atomic Energy Act of 1954, and would also not appear to be generated in significant quantities. The EPA has a program for collection of discrete radium sources. Disposal of the latter type of waste is probably more common and may or may not involve material regulated under the Atomic Energy Act. NRC has not placed limits for such material in § 61.55 because such wastes are believed to generally not occur in sufficient quantities to warrant it. However, the staff sees no reason to exclude small amounts of uranium or thorium mill tailings wastes that might result from laboratory assay, research activites, environmental sample analyses, etc. Therefore, a provision for disposal of small quantities of tailings waste as Class A waste should be added. For purposes of this provision,

a small quantity could be defined as 10,000 kilograms containing not more than 5 millicuries of radium-226. This radium concentration is typical of uranium mill tailings (0.5 nanocuries per gram). The quantity of radium-226 is that contained in 150 pounds of natural uranium at equilibrium with its daughter products using a specific activity of 6.77×10^{-7} curies per gram from Appendix B of 10 CFR Part 20. 10 CFR Part 40, § 40.22 permits persons to possess and use under general license 150 pounds of source material per year. Permitting the disposal of such a quantity in a near-surface disposal facility is judged to be acceptable. For larger amounts, specific approval would be required.

Suggested Rule Change: Amend 61.1(b)(2) to read:

(2) Disposal of uranium or thorium tailings or wastes (byproduct material as defined in § 40.4(a-1)) as provided for in Part 40 of this chapter in quantities greater than 10,000 kilograms of uranium tailings or wastes containing less than five (5) millicuries of radium-226.

ISSUE D-55-5

Issue: Case-by-case approval of disposal of waste in greater than Class C concentrations

Commenter: Catherine Quigg (13)
Los Alamos National Laboratory (43)
Birmingham Audubon Society (80)
Northeast Utilities (85)
State of California (93)
North Carolina Radiation Protection Commission (109)

Rule Citation: Section 61.55, Table 1 of Section 61.55, and Section 61.58.

Summary of Comments: The commenters' concerns were related to a footnote in Table 1 and paragraph 61.55(d) which indicates that greater concentrations than Class C limits may be determined to be acceptable for near surface disposal under certain conditions. The footnote to Table 1, for example, states "Until establishment and adoption of other values or criteria, the values in this table (or greater concentrations as may be approved by the Commission in particular cases) shall be used in categorizing waste for near-surface disposal." Paragraph 61.55(d) states "Waste that has a radioisotope concentration that exceeds the values shown in Column 3, Table 1 of this section, is not generally acceptable for near-surface disposal and shall not be disposed of without specific Commission approval pursuant to § 61.58 of this part." Section 61.58 states that "The Commission may, upon request or on its own initiative, authorize other provisions for the classification and characteristics on a specific basis, if, after evaluation of the specific characteristics of the waste, disposal site, and method of disposal, it finds reasonable assurance of compliance with the performance objectives in Subpart C of this part."

In their responses, the commenters either asked for clarification of the requirements (43, 85, 109) or were opposed to any exceptions in near-surface disposal requirements (13, 80). Commenter 80, for example, stated that "there should be no exemptions in near-surface disposal prohibitions against the higher level wastes." Commenter 13 was concerned that the Part 61 requirements would allow large quantities of transuranic isotopes to be disposed by near-surface

disposal. This concern appeared to be motivated by Section 61.58 as well as by another footnote in Table 1 which states that radionuclide concentrations may be averaged over the volume of a package and for a 55-gallon drum the concentration limits may be multiplied by 200,000 to determine allowable total activity. Commenter 13 noted that this allows up to 2 million nanocuries of TRU or 70 million nanocuries of Pu-241 per 55 gallon drum. (Note that while the commenter correctly calculates the maximum activities that the concentration limit would allow in a drum, intentional dilution to meet this limit was not intended and concentrated sources are not a common waste form in non DOE wastes. (See issue D-55-7.) Commenter 13 also questioned who in NRC would make a case-by-case decision and what the criteria would be to judge whether a particular site was suitable, and questioned what the maximum limit on transuranic concentration NRC will allow for land disposal. Commenter 43 was concerned that the definition of waste that might be included in land disposal was too open ended, and that according to Section IV under Supplementary Information, "high-specific activity wastes, such as those produced presently during the cleanup operations at TMI-2, will qualify for land disposal as 'Class C Intruder Wastes.'" Commenter 93 throught that TRU-contaminated waste should in no circumstances be considered low level waste and each waste should be disposed of at specifically-designated sites operated by the federal government. Commenter 85 questioned what criteria would be used for approvals under § 61.58 and Commenter 109 was concerned about special treatment of certain licensees that might result from case-by-case approvals.

Analysis of Comments: The concentration limitations and other requirements in Subpart D are intended to help ensure that the performance objectives established in Subpart C are met. That is, the concentration limits and other requirements are not the end in themselves, but are a means of achieving the end. The Class C limits were developed using the performance objectives as criteria to ensure safe disposal of waste considering the degree of isolation provided by "normal" near-surface disposal. Obviously, to ensure that the performance objectives are met, disposal of higher concentration of isotopes than those listed in column 3 of Table 1 would have to be by disposal technologies having higher isolation capacity than "normal" near-surface disposal. Such improved disposal technologies could, depending upon the particular radioisotopes, involve better waste forms or packaging, or disposal by methods having additional barriers against intrusion.

While there are some minor changes which should be made to the rule to clarify NRC's intent, NRC still believes that the best overall approach to the rule is the existing framework in which requirements are established which apply to the majority of the waste, but some flexibility is allowed in meeting the performance objectives. The principal reasons for this position are as follows:

1. The approach allows for potential improvements in disposal technology, and also allows for consideration of licensees which may produce unique wastes.

2. The approach is in keeping with the philosophy of the Regulatory Flexibility Act of 1980 (Public Law 96-345) which emphasizes objectives and flexibility to reduce burdens on the public.

3. NRC will be looking next at setting regulatory requirements in the form of amendments to 10 CFR 61 for licensing disposal by methods offering greater isolation than near-surface disposal. These methods could include,

for example, intermediate depth disposal or use of mined cavities. NRC staff expect that the regulatory requirements developed will include setting limiting concentrations for isotopes of significant concern. In the meantime, it is possible that license applications will be received for disposal by such improved methods. NRC staff wish to retain the flexibility to be able to address these license applications in the existing framework of the rule. It is not desirable to arbitrarily prohibit NRC from considering such applications, especially since there is a current shortage in disposal capacity.

For similar reasons and in response to Commenter 13, NRC staff does not plan at this time to establish an absolute concentration limit for land disposal of transuranic or other radionuclides. In the near future, NRC intends to analyze and develop technical criteria for disposal by disposal methods offering greater isolation than near-surface disposal. As part of these efforts, NRC expects to develop concentration limits for disposal by these methods; these concentration limits are of course expected to be higher than limits established for near-surface disposal. In any case, NRC staff expect to incorporate flexibility into future requirements to allow for alternative ways to meet the performance objectives as well as potential improvements in technology.

Commenter 43 stated reservations regarding the definition of wastes acceptable for near-surface disposal. The commenter was particularly concerned that some high-specific activity wastes from the Three Mile Island (TMI) cleanup would quality as Class C wastes. While the commenter did not specifically state which TMI wastes he was concerned about, staff assume that he is referring to the EPICOR-II first stage liners. These wastes contain organic resins which are highly loaded with Cs-134, Cs-137 and Sr-90. The loadings on these resins would qualify these wastes as Class C. The commenter's concern, staff assumes, involves the radiolytic degradation of the organic resins.

The NRC is preparing a Branch Technical Position (BTP) on Waste Form which recommends a restriction against the generation of organic resins which would have total accumulated doses of greater than 10^8 Rads. At this dose level organic resins begin to undergo substantial degradation. The BTP guidance includes loading of organic resins in excess of 10^8 Rads when it has been demonstrated that the specific resins will not suffer substantial degradation. Staff views this type of detail to be overly precriptive and restrictive for the rule.

The EPICOR-II first stage resins will receive total accumulated doses in excess of 10^8 Rads. Due to their unique nature, the DOE has agreed to accept these wastes for research and development and disposal purposes. See Issue D-56-15 also.

Suggested Rule Change:

1. Change the language in the footnote in Table 1 reading "...or greater concentrations as may be approved by the Commission in particular cases..." to read "...or greater concentrations as may be approved by the Commission in accordance with § 61.58..."

ISSUE D-55-6

Issue: Compliance with waste classification requirements

Commenter:
United Technologies - Packard (25)
Florida Power & Light (31)
Bechtel (44)
Duke Power Co. (48)
Arkansas Power and Light (52)
Department of the Army (63)
Utility Nuclear Waste Management Group (81)
Middle South Services (84)
American Nuclear Society (87)
Florida Power Corporation (91)
Power Authority of the State of New York (92)
Arkansas Power and Light (94)
Health Physics Society (96)
Wisconsin Electric Power Company (98)
Atomic Industrial Forum (100)
Carolina Power and Light (106)
The American Society of Mechanical Engineers (107), (113)
North Carolina Radiation Protection Commission (109)
New England Nuclear (110)
U.S. Department of Energy (119)

Rule Citation: Section 61.55 and Table 1.

Summary of Comments: These commenters' concern was how one determines compliance with the waste classification requirement. That is, how does one measure and report all the radionuclides contained in all the miscellaneous waste streams, and how accurate must one be? Most commenters were concerned that the regulations would require them to routinely measure for every isotope in Table 1 within each package of waste. As stated by commenter 25 in regard to trash wastes, "this mixture is not amenable to analysis, therefore any statement of activity can only be a rough estimate, and the combining of radios of mixed radionuclides will certainly increase the uncertainty." Commenter 31 was concerned with the practicality of demonstrating compliance for non-gamma emitting isotopes. Commenter 31 felt that any requirement to perform complete assays on each waste shipment would (1) result in significant increases in personnel radiation exposures (from collection of more and larger samples and from increases in sample handling times), (2) result in transportation difficulties (transport casks tied up longer while awaiting completion of assays prior to shipment), and (3) increase need for temporary on-site storage. Similar sentiments were expressed by other commenters, including commenters 84, 91, 94, and 98.

Some commenters mentioned specific isotopes which they felt would be very difficult to routinely measure and demonstrate compliance with (e.g., Commenters 92 and 100). These isotopes included Ni-59, Ni-63, Nb-94, Tc-99, I-129, and Cs-135.

Commenters 44, 87, and 107 and others felt that classification of external dose measurements should be allowed, particularly for wastes such as trash. Commenter 48 suggested that rather than sampling every container to determine compliance, the waste could be generally classified by source. Only under unusual or abnormal conditions would more detailed calculations have to be made. That is, "PWR ion exchange resins might be said to be Class B-Stable waste under normal conditions of reactor operation where there is less than X% failed fuel in the reactor and where the total activity in the waste container is less than Y curies." Commenters 106 and 119 (and others) suggested that the rule specifically state that indirect measurement techniques would be allowed. Commenter 81 strongly supported "the concept of using key isotopes which can be externally measured and without opening the waste package." Some suggested that the concentrations be averaged over a shipment. Commenter 106 suggested that the concept of error limits be included for measurements.

Commenter 52 felt that it would be impractical to "positively determine a given activity level as being characteristic of a given isotope," and therefore the proposed waste classification methodology is also impractical. Others stated that the limits in the table would tend to discourage volume reduction and were therefore too low. One commenter suggested classification limits be developed for every site (110). This commenter was also concerned that the classification system "may lead to generators assigning conservative estimates to waste concentrations and consequential under utilization of waste site." In addition, the commenter was concerned that the "recommended scaling factors" in the DEIS "are not applicable to industries making a wide range of custom products."

Commenters 44 and 87 (and others) questioned whether the classification scheme could be combined with the transportation system requirements in 10 CFR Part 71.

Commenter 63 indicated no compliance difficulties for the Army.

Analysis of Comments: This issue, along with transuranics and de minimis, is one of the largest issues related to the proposed rule. Staff agrees that additional guidance is needed for licensees. The draft waste classification regulatory guide should be made available for comment as soon as practical and discussed in both the preamble to the final rule and the final EIS. Staff agrees that routine assay of all packages is not necessary or desirable. Alternative methods can be used to show compliance. For example, staff has identified four basic programs which may be used either individually or in combination by licensees. They are: materials accountability; classification by source; gross radioactivity measurements; and direct measurement of individual radionuclides including scaling some radionuclides based upon measurement of others. These methods are discussed in the draft Branch Technical Position on Waste Classification and in the FEIS. Staff also recognizes that the confidence with which licensees assure proper classification will increase as programs are established and verified and more experience is gained with the licensee's specific wastes.

The answer to the question of can the clasification requirements in Part 61 be combined with the transportation requirements in Part 71 is no. The requirements are based on different concerns and different time periods. Part 71 requirements are to get the materials safely to the site. Part 61 classification addresses what happens over the long term in the facility. For example,

nuclides that are short-lived may produce high gamma radiation levels which are of concern in shipping and handling but of little concern over the long term and long-lived soft beta emitters such as C-14 that do not pose a handling hazard are of special concern over the long term.

All measurements or calculations of radioactive content involve error limits. Staff judged that this point is sufficiently understood but will consider the issue in the regulatory guide on classification.

Rule Change: Add a provision to the rule that indirect methods may be used to determine compliance with classification. Also the number of isotopes in the rule should be reduced to the minimum needed. For example, Cs-135 could be eliminated. Compliance with classification should be discussed in the preamble to the final rule.

ISSUE D-55-7

Issue: Averaging concentrations over packages

Commenter: Bethlehem Steel Corporation (7)
Catherine Quigg (13)
New England Nuclear (110)
U.S. Department of Energy (119)

Rule Citation: Table 1

Summary of Comments: One commenter requested confirmation of the averaging provision for sealed sources. One commenter was concerned about concentrated TRU waste or "hot spots" allowed by averaging and one noted the need to specifically allow averaging TRU over the weight of the package. One suggested averaging concentrations of certain nuclides over shipments or the site rather than packages.

Analysis of Comments: Bethlehem Steel Corporation applyed the averaging provision for sealed Co-60 and Cs-137 sources correctly and averaged the activity over the volume of the package. However, the waste must also meet the physical form and characteristics requirement of the waste class determined by the averaging.

Quigg, who was concerned about averaging the concentration over the volume of the container, is correct that areas of concentrated activity are permitted. The commenter was specifically concerned about concentrations of transuranic (TRU) nuclides. From a practical point of view, most shipments with trace TRU will generally be fairly homogeneously distributed and incidental to the total activity. Averaging over the packages is physically representative of the waste itself in this case. Only occasional shipments from any generator should involve heterogenous distribution. Possibilities include some decontamination and decommissioning waste from cleanup of mixed oxide fuel research facilities and waste from destructive metallurgical analysis of an occasional fuel rod.

TRU wastes are just not produced in significant amounts where averaging would permit disposal under the proposed or final classification scheme. Further, when the exposure scenarios are examined, the waste must degrade to become accessible in the important scenarios. Mixing with the package contents and

surrounding fill and soil should occur as the intruder disturbs the disposal site. Hot spots are not important in migration pathways such as groundwater transport. Relying on such mixing for the occasional package seems reasonable and relief for the shipper is justified. If frequent shipments with heterogenous distribution were expected, more restrictive averaging requirements might have been proposed. Future changes in waste streams (e.g., if reprocessing is resumed) can be reflected in changes to the rule. Certainly if reprocessing is resumed the Commission will examine the wastes being generated.

Commenter 119 and others noted that the rule should clearly allow averaging TRU over the weight of the package. Staff agrees.

New England Nuclear's suggestion to "accept inventory methods designating average concentrations in waste shipments" was part of the commenter's arguments offered in support of providing relief for assaying individual containers for very low concentrations and hard to measure nuclides which must be restricted because of ground water scenarios (i.e., H-3, C-14, Tc-99, and I-129). Changes to the final rule to delete some nuclides (e.g., Cs-135) and to clarify that indirect methods of determining activities partially address the commenter's concerns. The commenter also emphasized that without some relief, licensees would conservatively over-report the four nuclides H-3, C-14, Tc-99, and I-129 or report that the waste meets the limits so that the values used to keep total site inventories would not represent activity actually present. This conservative over-reporting could exhaust site inventory limits and lead to inefficient use of the site. Staff agrees and plans to address this issue in the BTP on waste classification. Keeping the concept of averaging over the waste volume or mass is important for the rule but details are more readily addressed in guidance documents.

Rule Change: Provide flexibility in the averaging language of the rule.

ISSUE D-55-8

Issue: Ensuring waste generator compliance with Part 61 requirements and impacts on volume reduction

Commenters:
Nevada Department of Human Resources (14)
Dow Chemical (17)
Sierra Club (37)
Union Carbide (39)
Stock Equipment Company (67)
South Carolina Department of Health and Environmental Control (79)
Power Authority of the State of New York (92)
State of California (93)
Health Physics Society (96)
Wisconsin Electric Power Company (98)
State of New York, Department of Law (99)
Atomic Industrial Forum (100)
Carolina Power and Light (106)
North Carolina Radiation Protection Commission (109)
The American Society of Mechanical Engineers (113)
U.S. Department of the Interior (114)
U.S. Department of Energy (119)

Rule Citation: None specific.

Summary of Comments: Commenters 14, 17, 67, 79, 93, and 96 remarked on the issue of ensuring compliance with the Part 61 rules once promulgated. One

commenter (14), speaking from the viewpoint of a state regulator, noted that the record and history of packaging of radioactive waste by generators has not indicated a durable capability to package waste in conformance with DOT regulations. Given this assertion, and the commenter's opinion that the types and quantities of isotopes in waste packages are at best educated guesses, the commenter doubted that waste generators will be able to properly classify or even properly label the waste according to the proposed regulation. Another commenter (17) spoke from the position of a radwaste solidification media and equipment supplier. The commenter stated that neither the Commission nor the existing disposal facilities have inspection and enforcement programs to assure that the requirements are being met. In the commenter's opinion, standards and technical criteria without inspection and enforcement are useless and unnecessary.

Commenter 67 (another radwaste solidification media and equipment supplier) stated that "the key to any program is inspection and enforcement," and suggested that "after the standards are established, enforcement be immediately established to ensure compliance." Like commenter 17, commenter 67 thought that criteria should be based upon ALARA and use the best available technology.

Commenters 79, 93, and 96 made somewhat more specific suggestions. Commenter 93 suggested that the rules require programs for checking the contents of waste drums, either at the site of origin or at the disposal site. Commenter 79 suggested that Section 61.12 of the draft rule ("Specific technical information") include provisions "for the inspection of waste forms to insure that license requirements are being met. These provisions should require periodic inspection of waste packages, administrative procedures, or waste inspection and preparation procedures submitted by the waste generators utilizing the burial facility." Commenter 96 suggested that waste generators warrenty that packages being shipped will meet the long-term 150-year criteria. Disposal facility licensees would also warrenty that "to the best of his knowledge and efforts, the packages as buried will meet the same criteria." Commenter 96 also stated that "the form of the quality assurance programs by both the generator or processor to meet these criteria may need to be spelled out in more detail."

A number of commenters, including 37, 39, 98, 100, 106, 109, 113, and 119 argued that the waste classification scheme tends to discourage volume reduction. The point was made for TRU nuclides (Issue D-55-3) and all nuclides that since volume reduction increases concentrations, treated wastes may fall in a more restrictive and thus more costly class or become generally unacceptable for near-surface disposal. The commenters noted that the Commission encourages volume reduction and referenced the policy statement on this issue published October 16, 1981 (46 FR 51100). Most of these commenters supported volume reduction by implication. The state of New York, DOI, and ASME explicitly supported volume reduction.

Analysis of Comment: Issue D-55-6 is concerned with how waste generators will demonstrate compliance with waste classification. This issue, however, is the other side of this issue--how can regulators, through inspection and enforcement programs, ensure that the requirements in the rule are being met?

The issue of inspection and enforcement to assure compliance with regulations neither started with nor will end with 10 CFR 61. Inspection and enforcement is obviously not something that can be ensured through rulemaking alone. One

of the problems has been that in the past, there was often not much attention given to waste disposal. NRC has recognized the need for more uniformity in compliance with waste transportation regulations by, for example, incoporating DOT transportation regulations into NRC's own regulations. Thus, compliance with transportation regulations may be inspected against by NRC.

Similarly, prior to the development of the Part 61 rule, waste generator compliance with license conditions at disposal facilities has been generally enforced through provisions in 10 CFR Parts 30, 40, and 70 (e.g., § 30.41 Transfer of byproduct material) that provide that no person may transfer licensed material to another person unless that person is properly licensed to receive it. Setting out specific requirements in 10 CFR 61, however, will greatly enhance NRC's ability to inspect against violations of site license conditions. In addition, a quality control program is required of generating licensees in the new § 20.311 of 10 CFR 20 to help ensure compliance by waste generators and other licensees with the Part 61 requirements. This quality control program can also be inspected against. (See Issue M-2.) Adoption of uniform requirement for quality control programs and waste form and classification by Agreement States will greatly bolster the effectiveness of a national system of inspection and enforcement.

In regard to suggestions by commenters 79, 93 and 96, the suggestions would involve adding more prescriptive requirements to the rule on the quality control program the site operator must have. The proposed rule has a general requirement for a quality control program that must include waste receipt, handling, and emplacement. The commenters raise valid issues that should be factored into additional guidance documents being developed. Two important related points are (1) the emphasis the proposed rule places on the generator's responsibility for compliance and (2) the associated inspectable documentation and certifications required. Ensuring compliance will be a collective effort by NRC and Agreement State inspectors, once compatible State regulations are in place. The site operator's program will no longer be the first line of defense. Staff agrees with Commenter 79 that disposal site package inspection, administrative procedures, and generator programs are parts of a compliance program but prefers to leave flexibility in the mix and dependence on these and other parts of the program.

With respect to the impact of complying with Part 61 on volume reduction, staff does not feel that waste classification necessarily discourages volume reduction. While a higher classification of waste might result in more stringent requirements on waste form and disposal methods, there are economic considerations that need to be considered by the waste generator. The cost of processing, shipping, and disposal of a small volume of higher classification waste needs to be compared with the transportation and disposal of a larger volume of a lower classification waste. There is no reason to believe that the balance will always be against volume reduction. For wastes with concentrations that would place them not generally acceptable for near-surface disposal if they were volume reduced, the provisions for specific Commission approval of the disposal of such wastes provides a potential alternative for licensees considering volume reduction.

Rule Change: None.

ISSUE D-55-9

Issue: Waste classification by total hazard

Commenter: American College of Nuclear Physicians (53)
Argonne National Laboratory (68)
General Electric, Wilmington (89)
Conference of Radiation Control Program Directors (103)
U.S. Department of the Interior (114)
U.S. Environmental Protection Agency (122)
Township of Lower Alloways Creek (125)

Rule Citation: § 61.55

Summary of Comments: These commenters were concerned with materials which may be present in low level radioactive waste which may be chemically toxic or hazardous. Some, but not all commenters, suggested that NRC's waste classification system incorporate a "total hazard "approach which would consider both the radiological and chemical hazard of a substance.

For example, commenter 53 thought that the rule should make "provision for handling of waste" which is both radioactive and requires special handling for other reasons." Commenter 103 also throught that consideration should be given to a definition of "toxic chemical/radioactive waste" which may require different handling and burial requirements," and recommended classification by total hazard.

Commenter 114 throught that any classification scheme should be based on total hazard. As stated by commenter 114, "it would seem inappropriate for a particular waste to be declared as Class A radiologically when it might contain toxic metals or organic compounds with potential harmful effects several orders of magnitude greater than those of the radionuclides. Perhaps the rule should either prohibit compounds with greater potential toxicity than the radionuclides or provide for additional classification options based on other-than-radiological toxicity." Commenter 68 suggested that "a general statement, at least, be included to the effect that releases of chemically-toxic substances shall not exceed any local or Federal standards that exist."

On the other hand, commenter 89 supported the concept of not developing a waste classification system based on total hazard. As stated by this commenter:

> While concerns related to both the chemical and radiological components of a waste must be evaluated to determine the proper disposal method, the establishment of a total hazard classification system would be a redundant effort. The U.S. Environmental Protection Agency already addresses chemically-related concerns through the comprehensive regulations associated with the implementation of the Resource Conservation and Recovery Act (RCRA).
>
> The proposed regulations properly address necessary radiation protection considerations and provide adequate guidelines for judging proper treatment or exclusion of nuclear of waste components. This avoids the need to develop a very complex classification system that somehow interrelates radiological and nonradiological concerns on a detailed basis.

The U.S. EPA stated:

> Hazardous and toxic chemicals are frequently present in these nuclear wastes. EPA is particularly concerned that these hazardous and toxic non-radioactive chemicals and their health impact are not considered in this proposed rule and EIS.

and

> As a minimum, Part 61 regulations should indicate that these materials must be handled in a manner compatible with RCRA requirements.

Valore, et al. (125) endorced the EPA concerns.

Analysis of Comments: The Commission has stated publically on several occasions that if it were technically feasible to classify waste by total hazard, then it would make eminently good sense to do so. However, unlike the technical methods for radiation, there is no reliable consistent system to relate a "dose" and potential health effects to exposure to chemicals. Therefore, there is no reliable consistent way to relate exposure to chemicals to exposure to radiation. See DEIS response to Argonne National Laboratory, Comment number 11, Item 3 for details. Thus a "total hazard" approach was not adopted.

The nonradiological hazards of the waste are not ignored. The operating disposal sites have general words on site licenses regarding chemical hazards not out weighing radioactive hazards. The prohibition against cardboard and fiberboard boxes was in part due to protection of workers from non-radiological hazards. Paragraph 61.56(a)(8) requires that wastes containing biological, pathogenic, or infectious material must be treated to reduce the potential hazard. The information requirements for shipping manifests in § 20.311(b) include specifying the chemical forms to the extent practicable. This requirement will provide a means of generating a more definitive data base on the chemical form of wastes being shipped for disposal. Finally, we have not observed any situation where migration of chemicals away from a nuclear disposal site has been a problem.

The DOE plans to support research into the development of a classification system for hazardous waste that might be compatible with Part 61. In the meantime, the staff will study the chemical toxicity of low-level waste, with special emphasis on identifying any licensees who generate hazardous wastes subject to requirements of the Environmental Protection Agency and re-examine what could be done, perhaps through processing, to minimize the hazard.

Furthermore, the Commission believes that the technical provisions of Part 61 generally meet or exceed those expected in the Environmental Protection Agency's rules for the disposal of hazardous wastes. Although it is not the Commission's intent to allow disposal of hazardous wastes in a radioactive waste disposal facility, as is noted in the regulation, the Commission recognizes that such wastes may be present in low-level radioactive wastes. It is the Commission's view that disposal of these combined wastes in accordance with the requirements of Part 61 will adequately protect the public health and safety. Such hazardous wastes are expected to be such a small percentage of the total volume that dilution by other wastes would greatly minimize any risks. The Commission

intends to work closely with the Environmental Protection Agency to assure continued compatibility. Further, EPA in its response to a resolution of the Conference of Radiation Control Program Directors indicated their willingness to work with other Federal agencies to address this problem.

Rule Change: None.

ISSUE D-55-10

Issue: Radionuclide inventory vs. concentration limits

Commenters: Union of Concerned Scientists (36)
Bechtel (44)
Duke Power Co. (48)
American Nuclear Society (87)
The American Society of Mechanical Engineers (107), (113)
New England Nuclear (110)
U.S. Department of Energy (119)

Rule Citation: Table 1 of Section 61.55; 61.7(b)(2)

Summary of Comments: The basis for the comments by these commenters are the statements in Table 1 that NRC intends to set maximum site inventories for H-3, C-14, Tc-99, and I-129 and in § 61.7(b)(2) that maximum disposal site inventories will be established. Several of the commenters requested the basis or criteria for setting the inventory limits. Commenters 44 and 87 thought that the criteria should take into account site conditions and locations (and also thought that "the criteria should reflect the fact that if a site is properly selected, a single large site may be more desirable than a series of smaller sites."). Commenter 110 throught that "prescriptive requirements which limit site inventory or which protect against excessive migration of radionuclides are site specific and should be incorporated in site licenses." This commenter also thought that "10 CFR 61 should specify that site licenses will incorporate these site specific prescriptive requirements." Commenter 107 suggested adding criteria and questioned the basis for site inventory limits. Commenter 48 questioned the need for inventory limits, stating that the 500 year intruder barrier should provide the protection required (apparently the commenter did not take into account the ground water aspects). Commenter 36, on the other hand, thought that a maximum site inventory should be determined for every isotope. The reason was again potential intrusion. As proposed by commenter 36, "adoption of a maximum site inventory for all isotopes would provide some protection in the event of inadvertent intrusion of a severity greater than that specified or in the event of other circumstances which might lead to unanticipated releases of radioactivity." DOE (commenter 115) suggested clarifying which nuclides are intended in § 61.7(b)(2).

Analysis of Comments: It appears that at least part of the comments on this issue are caused by confusion over why NRC is differentiating between waste concentrations and inventories. Concentration limits for radionuclides have been established based upon a number of considerations, including protection of a potential inadvertent intruder, operational safety, ground water migration, and long-term site stability. The desire to have the ability to set maximum site inventories for some isotopes is to have additional control over radionuclides that are of concern from a ground water point of view. Iodine-129,

Tc-99, and C-14 are both mobile and long-lived. Tritium is of concern due to its extreme mobility and its presence in waste in large quantities. There is no reason to set maximum inventories for all radionuclides because they are of less concern for ground water migration. Controlling the migration of the mobile radionuclides will ensure control of the migration of the less mobile radionuclides. The basis for the establishment of inventory limits for some radionuclides would be to help ensure that the performance objectives for ground water migration are not exceeded. As suggested by commenters 44 and 110, any inventory limits would be site-specific in nature and would be established as part of licensing a particular site.

Conversely, NRC staff believe that there is no need to establish a site inventory limit for every isotope to protect against potential inadvertent intrusion. To begin with, inadvertent intruder exposures are mainly controlled by the concentration of a particular isotope, and to a lessor degree by the site inventory. NRC has also determined that to control such potential exposure to exceptable levels, concentrations limits for every isotope need not be specified. It is sufficient to control the disposal of a few key isotopes. Staff believes that only those isotopes which are of significant long-term toxicity and/or are reasonably expected to be in waste in large quantities should be listed in § 61.55.

Rule Changes:

1. Clarify the footnote to Table 1.

2. Clarify § 61.7(b)(2) to reference that the purpose of the limits is to limit potential exposure.

ISSUE D-55-11

Issue: Cost and regulatory burden of classification requirements

Commenters: Nevada Department of Human Resources (14)
Sargent and Lundy (24)
Union Carbide (39)
Arkansas Power and Light Company (52)
American Nuclear Society (87)
Florida Power (91)
American Society of Mechanical Engineers (107)

Rule Citation: Technical Requirements and Table 1.

Summary of Comments: The comments pertains to various site operation and waste packaging requirements, in addition to waste classification requirements, which the commenters believe would raise the cost of waste disposal. Some of the scenarios that Commenter 14 discussed which he believes would result from the rule and/or raise costs include:

- potential active maintenance costs would be assessed for Class A waste;
- the site operator would consider all other (besides Class A) waste as Class C waste and bury it in a separate trench under 17 feet of earth;

- o the site operator would have to accept the radioactive waste as classified by the generator because he cannot open the packages for inspection;

- o additional bookkeeping would be required, as well as new methods of disposal;

- o the regulatory agency governing the site would either require waste packages not labeled with a waste classification to be opened by the site operator at his expense, or have the waste returned by the operator at his expense;

- o the requirement that Class B waste be stabilized will require considerable (expensive) quality control on the part of the generator. For resins solidified in cement, dependence may have to be placed on the container for prevention of deformation, an additional expense.

Commenter 14 also believes that the waste classification and other requirements will increase regulatory burden and expenses. Two reasons are given for the commenter's concern:

(1) The regulatory agency (in the commenter's opinion) will need to monitor charges collected by the site operator for active maintenance because "if the money was not all used during the five years after site closure, it should be turned over to the institution that will have custody of the site for long-term care and maintenance"; and

(2) The regulatory agencies governing the generators would have to increase inspections of the actual waste packaging operations to determine that the packaged waste meets the requirements for different classifications. The commenter doubts that regulatory agencies can do more inspection in this area than they are doing now because of budget limitations.

Commenter 24 and others made very general statements that the classification scheme would increase costs of nuclear power and disposal costs in general.

Analysis of Comments: The issue of the cost of implementation of waste classification is strongly related to other issues such as Issue D-55-3 (10 nCi/gm TRU limit) Issue D-55-6 (compliance with waste classification), and Issue D-55-9 (basis for waste classification numbers). Although Commenters 24, 87, and 107 did not provided any clear basis for their claims, from the context of their responses it appears that much of the concern was related to the issue of determining compliance with the waste classification limits. These commenters also suggested that the "arbitrary" numbers in Table 1 be replaced with those from NUREG/CR-1005.

The comment that potential additional active maintenance costs would be assessed for Class A waste is an interesting one. Such an occurrence is possible, and appears to be reasonable from a technical point of view. Class A waste contains waste for which structual stability cannot be assured, and such waste have been demonstrated to principally contribute to subsidence of disposal trenches and subsequent maintenance.

The comment by Commenter 14 that the site operator would treat all Class B and Class C waste as Class C waste is not intended by the rule and NRC staff believe that this situation is unlikely to occur.

Regarding the comment that the site operator would have to accept waste as classified by the waste generator, this is no different than current practice today. Waste generators are already required by site operators to record on Radioactive Shipping Records (RSR's) information such as radionuclide content, presence of special nuclear material or source material, DOT transport class, chemical content, and so forth. Disposal facility operators accept this information as given. Limited opening of packages has occurred particularly at the South Carolina site but such practices are not routine and require special procedures and facilities. The rule does not require opening but does not prohibit it either. Spot checks can be a part of the operator's quality control program. Regarding the comment on regulatory agencies either opening unclassified waste or returning it to the waste generator, again there are already procedures at all waste sites to deal with waste shipments having improperly filled out RSR's. This is no different than the situation today.

Additional bookkeeping will indeed have to be carried out by waste generators and disposal facility operators, as will additional quality control. Increased attention and costs now mean reduced attention and costs later.

The comment that additional costs will result from quality control programs and use of high integrity containers is true. However, such costs are not expected to be large.

In analyzing the comment on state regulatory burden, NRC staff reviewed comments received on the draft rule and EIS from other state agencies (e.g., Commenters 4, 16, 38, 45, 47, 55, 65, 69, 79, 92, 93, 99, 109, 111, 112), particularly those from other states currently having operational disposal sites within their boundaries (79, 112), to determine if others had similar concerns. No such concerns were observed.

It is probably true that the waste classification and other requirements in 10 CFR 61 will increase NRC and State regulatory expense, if for no other reason than the new regulations exist. Any new requirements mean additional criteria to be complied with which means additional personnel hours to assure that the criteria are complied with. The additional costs are justifiable, however. There is a demand for the regulation. To a great extent, the waste form, waste classification, and other requirements in the Part 61 regulation are intended to reduce regulatory and other institutional costs at later dates. The rule trades somewhat higher short-term costs (i.e., costs while the disposal facility is operating) for reducing the uncertain, potentially very high, continuous long-term costs. Consider, for example, how much money and time NRC, Kentucky, and other government agencies have spent with respect to the Maxey Flats site.

NRC would expect that state regulatory agencies would monitor long-term care costs as a normal part of land owner responsibility related to waste classification. The incremental burden is judged small. This is being accomplished today. Costs of a reasonable inspection program should be included in the financial planning by the operator and State.

Inspection of waste generators for compliance with waste classification is more the responsibility of the Commission or the Agreement State regulating the generator. Existing regulatory responsibilities include inspection of the packaging and shipment of radioactive waste. The incremental burden of reviewing a licensee's program for classifying these wastes should be small.

Rule Change: None

ISSUE D-55-12

Issue: Waste classification - definitions clarifications, and miscellaneous other comments

Commenters: Nevada Department of Human Resources (14)
United Technologies - Packard (25)
Ohio EPA (38)
Bechtel (44)
State of New Mexico (45)
Oswald U. Anders (73)
Atomic Industrial Forum (100)
U.S. Ecology (101)
American Society of Mechanical Engineers (107)
New England Nuclear (110)

Rule Citation: 61.7(b), 61.55, and Table 1.

Summary of Comment: This group of commenters requested clarifications or definitions on some part of waste classification. Some of the points raised are listed below:

- Commenter 14. In paragraph 61.7(b), clarify what is meant by Class A waste decaying to acceptable levels during the period when the site is occupied. What are acceptable levels? (There could be no appreciable decay of uranium during the period the site is occupanied.) Does this mean that "receipt of Class A waste at the site would have to be stopped at some point in time before the site is closed, if it is to decay to acceptable levels prior to site closure?"

- Commenter 25. Clarify that NRC is not mandating segregation of radioactive waste by radionuclide.

- Commenter 38. Believes that there is opportunity for confusion since Table 1 on page 38097 classifies waste by isotope whereas the classification on page 38085 is by point of origin.

- Commenters 44, 107. The term "significant gamma radiation" should be defined.

- Commenter 45.

  (a) Footnote 3 to Table 1 doesn't refer to any waste class but only to Class C waste.

(b) Suggests that 61.55(d) be changed to read "Waste that has a radioisotope concentration that exceeds the numerical values shown in Column 3, Table 1. . ."

- Commenters 73, 100, 107 and 110. The commenters note that the preamble to the draft rule states that the stability of the disposal site should last long enough for the radioisotopes to decay to levels where they are no longer of concern from a migration standpoint. The commenters believe that standards should be given.

- Commenter 73. Raised the issue of the number of factors that should be included in the classification scheme and suggested that a much more complex computerized system be used.

Analysis of Comments:

- Commenter 14. The line in question is "Even though the Class A segregated waste is unstable, it decays to acceptable levels during the period when the site is occupied and active maintenance can control water infiltration." This line is conceded to be poorly worded. Class A waste doesn't "decay to acceptable levels during the period when the site is occupied." Class A waste is such that even under the conditions of extreme waste degradation, potential intruder impacts at the end of the institutional control period will meet the intruder performance objective. In addition, the concentrations in the waste are low so that the likely radionuclide inventories in the Class A waste will also be low. Hence the ground water performance objective will be met even given the occurrence of increased water infiltration (relative to Class B and Class C waste) into the waste. It does not mean that "receipt of Class A waste at the site would have to be stopped at some point in time before the site is closed. . ."

- Commenter 25. NRC is indeed not mandating segregation of radioactive waste by radionuclide.

- Commenter 38. The classification on page 38085 by point of origin is only for illustration. It's only to give the reader an idea of the types of waste which would be expected in one class or another.

- Commenter 44, 107. The commenters are correct. The term "significant gamma radiation" is imprecise and should be eliminated. As discussed under Issue D-55-10 there is no need to set concentration limits for all nuclides.

- Commenter 45:

  (a) The comment is good. Change footnote to read "Maximum concentration for Class C waste, uCi/cm^3" (or words to that effect).

(b) The suggestion is acceptable.

o Commenters 73, 101, 107:

As noted in response to Commenter 14, the bottom line for disposal and decisions about the site is the performance objectives. Decay and limits on initial concentration must be such that at the end of the institutional control period potential intruder impacts will be acceptable. See Issue C-4 for a discussion of numerical limits for the intruder. For migration, site specific determinations must be made to determine expected compliance with the environmental performance objective. The 25 mr/yr is the standard.

o Commenter 73. Commenter 73's suggestion that a complex computerized classification system that takes additional factors such as leachability and biodegradability into account might be feasible for a single waste stream where such a range of factors is known or can be determined. However, the diverse nature of low-level waste and the data available preclude such a complicated approach. Compliance would also be virtually impossible in view of the thousands of waste generators who would have to understand and use such a system.

Rule Changes: Make changes as discussed above.

ISSUE D-55-13

Issue: Stability and disposal requirements for Class A waste vs. Class B and C wastes

Commenters: Pennsylvania Dept. of Environmental Resources (16)
Dow Chemical (17)
Bechtel (44)
Arizona State Clearinghouse (47)
American Nuclear Society (87)
Washington State Department of Ecology (112)
Department of Energy (119)

Rule Citation: 61.52 and 61.55

Summary of Comments: These group of commenters in one way or another had some concerns or suggestions regarding the classification scheme that sets out additional waste stability requirements for Class B and C waste streams. (The issue of stability and the operational implementation of the classification system is also addressed under Issues D-52-1 and 2.) For example, commenter 43 was unsure whether the stability requirements for Class B waste also applied to Class C waste. Commenters 16 and 119 suggested that NRC should clarify whether the requirements in paragraph 4 - 10 of section 61.52(a) applied to all classes of waste or just Class B waste. Commenter 16 also suggested that Class A meet all the requirements of (a) except (4). Commenter 17 thought that the stability requirements should be expanded to consider operational safety. That is, additional requirements on solidification should be imposed (using best available technology) based on assuring transportation and waste handling safety.

Commenters 44, 47, and 87 were not convinced that Class A and Class B wastes needed to be distinguished. Commenters 44 and 87 both suggested that Class A and B waste be defined solely on the basis of stability rather than stability and concentration so that only Class C waste would have to be stable. There would be no requirements to stabilize Class B waste, but stable waste which just happened to arrive at the disposal facility would be disposed of in a segregated manner from unstable waste.

Commenter 47 stated "if the NRC believes that specific characteristics of each waste necessitates separate burial, this has not been adequately demonstrated, either by their own evidence or by history." Commenter 47 thought that Class A and Class B waste should be mixed together during disposal (possibly to reduce intruder impacts). Commenter 47 spoke from the viewpoint of disposal in an arid climate, and wanted to know if the physical separation between waste classes could be vertical rather than horizontal (Class C on the bottom, followed by Class B and A).

Commenter 112 questioned whether unstable (Class A) and stable waste (Class B and C) need to be segregated at disposal sites such as the Richland, Washington disposal site, which are located in arid environments (the average precipitation at Richland is about 6 inches/yr). The commenter thought that among the most important concerns at an arid site are slumping and wind erosion and that co-mingling of waste classes should be allowed in an attempt to lower the average concentration of the most hazardous waste. The commenter also thought that implementation of the regulations would require a separate disposal unit to handle only Class C waste.

Analysis of Comments: Some of the comments appear to come from a misunderstanding of the rule. The waste characteristics that each class of waste must meet and the emplacement and disposal requirements need to be more clearly stated. The comments regarding vertical segregation and potential relief from segregation requirements at arid sites may have merit, although segregation would tend to reduce the overall level of slumping at an arid site, which is a concern of Commenter 112. Such proposals would be considered under § 61.54 "Alternative requirements for design and operations."

As noted under Issue D-56-7 when addressing the hazardous, biological, etc, properties of wastes, extensive treatment of Class A waste cannot be justified at this time. Stability for all waste is the most desirable option when cost effectiveness is not considered. However, development and implementation of the technology by all licensees will require time and may never be cost effective or even reasonable for small operations. Medical research, university research, and small scale industrial research would be significantly affected. The staff is encouraging the treatment of wastes and also added a provision to the rule that if Class A waste is stable, it does not have to be segregated. Thus a specific alternative would not have to be approved under § 61.54 for stable Class A waste. Staff judges the requirements on Class B and C waste to be justified and no relaxation should be considered.

Rule Change:

1. Change Section 61.52 so that the applicability of subparagraphs 4 - 10 is clarified.

2. Regarding the stability requirements for Class B and C wastes, the rule need not be changed. Reiterate the points in section 61.55 regarding the minimum and stability requirements in the preamble to the final rule.

ISSUE D-55-14

Issue: Hold wastes for decay

Commenters: Advance Medical and Research Center, Inc. (5)
Northern Illinois University (27)
Sierra Club (37)
Ohio Environmental Protection Agency (38)
R/A Services, Inc. (57)
Texas Department of Health (117)

Rule Citation: §§61.55 and 61.56, Table 1

Summary of Commenter: The commenters were concerned that the waste classification and characteristics requirements in §§61.55 and 61.56 precluded individual licensees from holding short lived isotopes for decay to background levels and subsequent disposal in the ordinary trash. Two commenters noted that hold for decay should be used for most medical/academic wastes and one noted that materials held for decay could be retrieved for reuse.

Analysis of Comments: The comments reflect a need to clarify the purpose, scope, and applicability of the regulation. Part 61 and associated changes would not limit disposal options available to licensees except when transferring wastes containing licensed materials for disposal at a land disposal facility. Options such as on-site burial, hold-for-decay, incineration, or disposal of materials exempted from the provisions of Part 20 remain unchanged.

The Northern Illinois University expressed opposition to near-surface disposal of wastes and noted that most medical/academic wastes can be segregated and held for decay instead of disposal in near-surface facilities. Staff agrees that much of this wastes can be held and has encouraged licensees to adopt this alternative.

Rule changes: None.

ISSUE D-56-1

Issue: Use of absorbents

Commenters: Oswald Anders - 73
State of South Carolina - 79

Rule Citation: 61.56(a)(3)

Section 61.56(a)(3) allows the use of absorbents for Class A wastes provided that the absorbent is capable of absorbing twice the volume of liquid.

The State of South Carolina stated that the requirement should apply only to institutionally generated, aqueous or biological waste forms and not to organic materials.

Mr. Anders stated that absortion was an obsolete technique for immobilizing liquid wastes and was unsatisfactory. He indicated that nuclides could be easily leached from such waste forms.

The NRC staff disagrees that absorbents should only be used for aqueous wastes. There are many organic waste forms which cannot be effectively solidified and absorption is the only effective technique for immobilization. The NRC staff, however, recognizes that certain site specific conditions may restrict the disposal of absorbed organics and agrees with the State of South Carolina that such conditions need to be considered in evaluating the environmental acceptability of these wastes.

Since nuclear power plant waste generators currently solidify aqueous waste streams, Section 61.56(a)(3) is not expected to affect their operations. The NRC staff also believes that nuclear power plant waste generators would generally not use absorption since this technique would result in increased waste volumes to be shipped.

Because the use of absorbents would be only applicable to Class A wastes, pathway evaluations indicate that their use would not result in public health hazards due to leaching of radionuclides.

Because of the low activities of the Class A wastes and the current solidification of liquids at nuclear power plants, the NRC staff believes that it is unnecessary to restrict the use of absorbtion to only institutional waste generators.

Rule Change: None

ISSUE D-56-2

Issue: Chelating Agents

Commenters: Advisory Committee on Reactor Safeguards - 10
Wisconsin Electric Power - 32

Alabama Power - 33
Commonwealth Edison - 35
Union of Concerned Scientists - 36
Bechtel National - 44
Duke Power - 48
Utility Nuclear Waste Management Group - 81
American Nuclear Society - 87
Power Authority State of New York - 92
Arkansas Power & Light Co. - 94
Health Physics Society - 96
Atomic Industrial Forum - 100
Carolina Power and Light - 106
The American Society of Mechanical Engineers - 107
State of North Carolina - 109
New England Nuclear - 110
U.S. Department of Energy - 119

Rule Citation: Table 1 of Section 61.55.

Summary of Comments: The utilities, the utility groups, one professional society and DOE stated that the requirement to obtain specific approval to dispose of wastes containing greater than 0.1 percent chelating agents was too restrictive. In addition, they stated that in some cases this could result in utilities deciding against performing decontamination operations which could reduce occupational exposures. Several utilities requested that the basis of the 0.1 percent value be provided. The Union of concerned Scientists stated that disposal of wastes with chelating agents over 0.1 percent should not be permitted under any conditions. One utility stated that generic disposal requirements should be specified rather than case-by-case evaluations. The ACRS stated that the case-by-case evaluation concept was not clearly presented in the proposed rule. Several commenters also questioned packaging requirements and whether the 0.1% criterion was by weight or volume. Several recommended moving the requirements from the footnotes in Table 1.

Analysis of Comments: The proposed regulation 10 CFR 61 stated that disposal of wastes containing greater than 0.1 percent chelating agents would not be permitted without specific approval by the NRC. Since chelating agents have been shown to increase the migration of certain nuclides at certain sites, the NRC staff desired to evaluate the disposal of large quantities of wastes containing high concentrations of chelating agents on a case-by-case basis. This evaluation would consist of a review of the burial site conditions and the form of the wastes. A similar approach was used when the NRC staff reviewed the disposal of wastes which would be generated in the decontamination operations at the Dresden Unit 1 Station. In this case the NRC mandated that, in order to minimize any migration effects which might be exacerbated by chelating agents, the Dresden decontamination wastes should be disposed of at an arid disposal site. At an arid site leaching would be minimized due to the low precipitation rates.

The 0.1 percent chelating agent value is based on the amount of iron in a 55-gal drum which might normally be available to complex with unreacted chelating agents if these chelating agents leached from the waste in an uncomplexed form. If uncomplexed chelating agents complexed with iron from the waste container, it would generally be unavailable to complex with other

radionuclides in the nearby soils. Therefore, radionuclide migration would be minimized.

Because the disposal of wastes containing chelating agents is dependent on the site characteristics of the disposal facility and on the properties of the waste form, the NRC staff has modified the chelating agent disposal requirements to reflect the site specific nature of the disposal of these wastes. The Table 1 footnote that wastes containing greater than 0.1 percent chelating agents would not be permitted unless specifically approved has been replaced by more general requirements. However, in order that disposal of chelating agent wastes are considered in licensing actions, Section 61.12(f) now requires that license applications specifically address methods for handling these wastes. These methods would be developed based on the site conditions and on the allowable waste forms. The manifesting requirements (Section 20.311(b)) now require that waste generators identify wastes which contain greater 0.1 percent by weight chelating agents. This will allow disposal site operators to identify, segregate, and dispose of chelating agent wastes in accordance with individual site license conditions.

The NRC staff believes that the above changes in 10 CFR 61 will not be overly restrictive to utilities but will provide assurance that chelating agent wastes will be properly disposed of. The NRC staff believes that the wastes from decontamination processes which are currently available can be disposed in an acceptable manner. In some cases, though, these wastes may require disposal at an arid site. The NRC staff does not believe that disposal of chelating agent wastes will be or should be the limiting point for utility decisions for performing decontamination operations to reduce occupational exposures.

This modification to 10 CFR 61 would also eliminate the necessity for NRC staff to perform case-by-case evalutions. Instead, specific license conditions at each disposal site would provide the disposal requirements for chelating agent wastes. While this change does not provide detailed generic requirements for waste generators, it does provide flexibility for disposing of these wastes based on the specific disposal site characteristics and the specific waste form properties. The NRC staff believes that the revisions eliminate the confusion regarding the case-by-case evaluations as presented in the ACRS comment.

Several commenters requested specific guidance on packaging chelating agents. Since the disposal of chelating agent wastes are site dependent, there may be many acceptable options for the disposal of these wastes. The NRC staff plans to address acceptable waste form options in a branch technical psoition (BTP). This BTP would provide the basis for disposal site applicants and operators to develop disposal parameters which would provide for the proper disposal of these wastes.

Several commenters requested clarification on whether the 0.1 percent concentration value was to be determined on a percent volume or percent weight basis. One commenter suggested using a percent volume basis. The calculation to determine the 0.1 percent value was performed on a weight basis. This point is clarified in the final rule.

Two commenters stated that the chelating agent requirements should be moved from the footnote section of Table 1 and placed on the body of the rule. The revised requirements have been moved into the body of the rule.

Rule Changes:

1. Add to § 61.12: A requirement for addressing wastes containing chelating agents.

2. Add to 20.311(b) after "The solidification agent must be specified.": Wastes containing more than 0.1% by weight chelating agents must be identified and the weight of the chelating agents estimated.

ISSUE D-56-3

Issue: Definitions of pyrophoric, hazardous and explosive

Commenters: Advisory Committee on Reactor Safeguards - 10
New England Nuclear - 110

Rule Citation: 61.56(a)(4), 61.56(a)(5), 61.56(a)(6)

Analysis of Comments: The intent of Sections 61.56(a)(4), 61.56(a)(5) and 61.56(a)(6 is to provide protection to workers during waste handling and disposal operations by prohibiting wastes which are explosive, pyrophoric or generate toxic fumes.

One commenter indicated that the restrictions on wastes which are pyrophoric, explosive, or generate toxic gases may be difficult to enforce without clear definitions for these terms. Another commenter suggested new wording (add "normall") for Section 61.56(a)(5) to ensure that plastics are not excluded. Staff agrees.

Definitions of the terms, "hazardous," "pyrophoric" and "explosive" have been added to Section 61.2. The definitions for "pyrophoric" and "explosive" are consistent with those in the transportation regulations 49 CFR 171.8, 49 CFR 173.50, 49 CFR 173.115, and 49 CFR 173.150. The term, "toxic," has been deleted and "hazardous" substituted. A definition for "hazardous" has been included in Section 61.2 to reference the Environmental Protection Agency requirements in 40 CFR 261.

Rule Changes:

1. Proposed Definitions to add to § 61.2:

   Pyrophoric: A pyrophoric liquid is any liquid that ignites spontaneously in dry or moist air at or below 130°F (54.5°C). A pyrophoric solid is any solid material, other than one classed as an explosive, which, under conditions normally incident to transportation is liable to cause fires through friction, retained heat from manufacturing, or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious transportation, handling, or disposal hazard. Included in this class are spontaneously combustible and water-reactive materials.

Explosive: An explosive material is defined as any chemical compound, mixture, or device, which produces a substantial instantaneous release of gas and heat spontaneously or by contact with sparks or flame.

"Hazardous waste" means those wastes designated as hazardous by Environmental Protection Agency regulations in 40 CFR Part 261.

2. Amend § 61.56(a)(5) to read:

(5) Waste must not contain, or be normally capable of generating, quantities of toxic gases, vapors, or fumes harmful to persons transporting, transporting, handling, or disposing of the waste.

ISSUE D-56-4

Issue: Cardboard containers

Commenter: University of California, Los Angeles (8)
Sierra Club (37)
Ontario Hydro (51)
Union Oil Company of California (66)
Department of Energy (119)

Rule Citation: 61.56(a)(2)

Summary of Comments: Ontario hydro (51) questioned why wastes packaged in cardboard or fibreboard boxes are prohibited. If the waste can be segregated then these types of packaging should be acceptable.

University of California, Los Angeles thinks that prohibiting the use of cardboard or fiberboard boxes for low level radioactive waste is unnecessary. The major reason for this conclusion was that cardboard boxes could be introduced directly into an incinerator, while metal drums would have to be unpacked.

Union Oil Company of California suggested Section 61.56(a)(2) should be deleted. For certain low level waste use of cardboard or fiberboard boxes may be suitable for both shipping and disposal.

The Sierra Club supported the prohibition against packaging wastes in cardboard or fiberboard boxes.

The DOE noted that DOT regulations allow cardboard and fiberboard and DOE wastes are safely handled in such containers and suggested deleting paragraph 61.56(a)(2).

Analysis of Comments: The NRC staff after reviewing the comments regarding the prohibition or cardboard and fibreboard containers still believe that such a prohibition is needed. The DOE experience at DOE facilities has shown no difficulty for DOE wastes. However, no extensive handling or shipping are involved and greater administrative controls are possible since DOE wastes are typically buried on site and are generated by a few organizational groups operating under common guidelines. Commercial sector wastes are shipped longer distances and generated by thousands of organizations. Biodegradable packaging has merit in enhancing decomposition of unstable wastes and accelerating the

compacting process and DOE should continue the practice where experience so warrents.

Cardboard and fiberboard containers are found frequently reaching the commercial disposal sites in a ruptured condition. In addition, syringes used in research and in hospitals have sometimes penetrated containers causing injury to disposal site workers. This prohibition is consistent with current license conditions at the Hanford and Barnwell disposal sites.

The requirement to prohibit disposal of wastes in cardboard or fiberboard containers would not affect packaging prior to incineration. In this case such packaging could be desirable. See rule change 6 under Issue M-1 also.

Rule Change: None

ISSUE D-56-5

Issue: Wastes in a gaseous form

Commenters: University of North Carolina - 30
Sierra Club - 37
Los Alamos National Laboratory/Safeguards Systems Group - 43
Bechtel National - 44
Georgia Institute of Technology - 70
American Nuclear Society - 87
Atomic Industrial Forum - 100
U.S. Ecology - 101
The American Society of Mechanical Engineers - 107
New England Nuclear - 110
U.S. Department of Energy - 119

Rule Citation: § 61.56(a)(5) and (a)(7)

Analysis of Comments: The NRC staff has provided requirements for the disposal of wastes in gaseous forms in Sections 61.56(a)(5) and 61.56(a)(7). These requirements are based on license conditions currently in use and are intended to provide protection to disposal site workers and to reduce airborne releases.

Several commenters indicated that there was an inconsistency between Section 61.56(a)(5) and 61.56(a)(7). That is, Section 61.56(a)(5) specifies that wastes shall not be capable of generating hazardous gases, vapors or fumes and Section 61.56(a)(7) authorizes disposal of gases not to exceed 100 Ci per container. Several commenters requested that NRC provide the basis for the 100 Ci limit. Another commenter stated that gases should be processed into liquid or solid forms which would provide better long-term stability since it would be impossible to assure that containers would last for the 150 year stability period. Other commenters stated that wastes disposed of in a gaseous form should be limited or prohibited and that the general population off-site and downwind should be protected. Staff believes that measures to protect transporters and workers provides ample protection for off-site.

The intent of Section 61.56(a)(5) which specifies that wastes shall not be capable of generating hazardous gases, vapors, or fumes is intended to prohibit the disposal of wastes which are chemically reactive under ambient conditions

and produce hazardous gaseous reaction products. This section was not intended to prohibit the disposal of properly packaged gases such as H_3 or Kr^{85}, which occasionally require disposal. Section 61.56(a)(5) has been reworded to clarify the NRC staff's intent.

The 100 Ci limit is based on the license conditions for the disposal of gaseous wastes now in effect at the Hanford and Barnwell disposal sites. These limits have not resulted in unsafe environmental conditions at the disposal sites nor have they resulted in overly restrictive situations for waste generators.

The NRC is currently evaluating the significant generators of H_3 gas with the intent to improve packaging designs. The objective of these evaluations are to assure that package designs retain H_3 until it has decayed to insignificant levels. Since H_3 has only a 12 year half-life the package design needs only to retain the H_3 for approximately 120 years to provide a 10^3 reduction in radioactivity. The overall structural stability of the package will be oriented to providing trench stability for Class B and C wastes for a 300 year period consistent with the high integrity design concepts.

For Kr^{85} packages the release by airborne pathways of Kr^{85} is not as significant as for H_3 since Kr^{85} is an inert gas which is not concentrated in living tissue. Therefore, complete retention of Kr^{85} in a waste package over the period required for 10 half-lives of decay is not essential. The NRC staff believes that by limiting the curie content in the waste packages designed for long term stability that public health and safety can be protected.

If, in the future, large quantities of Kr^{85} are contemplated for disposal, the NRC staff will reevaluate the requirements for the disposal of Kr^{85} gas in order to assure that disposal is consistent with the disposal site performance objectives.

The American Society of Mechanical Engineers suggested modifying 61.56(a)(7) to make it less absolute. The Society recommended inserting "significantly" before "exceed one atmosphere at 20°C." The requirement of 61.56(a)(7) is consistent with the current license conditions at Barnwell and Hanford. The NRC staff believes that use of the term "significantly" will only increase the difficulties in enforcing this requirement.

The DOE commented that the maximum concentration for Kr-85 in a Class B waste would be 44 Ci/m^3 or 440 Ci/m^3 if contained in a metal. These are the same concentrations as for Cs-137. The DOE commented that this would eliminate disposal in dry wells of Kr-85 immobilized by zeolite encapsulation by deposition on metals. The NRC staff disagrees that 10 CFR 61 elminates this disposal. The regulation 10 CFR 61 applies to near surface burial facilities and requirements for other alternative methods for disposal of low-level wastes would be considered in separate rulemaking actions. At this time the health and safety impacts of the disposal of immobilized Kr-85 in dry wells could be considered.

Rule Change: Change 1 atmosphere to 1.5 atmospheres at 20°C.

ISSUE D-56-6

Issue: Packaging standards

Commenter: Department of the Environment, London (19)
Union Oil Company of California (66)
Stock Equipment Company (67)
General Electric (89)
Stone and Webster Engineering Corporation (95)
The American Society of Mechanical Engineers (107 and 113)
New England Nuclear (110)
The U.S. Department of Energy (119)

Rule Citation: Section 61.56(a)(1), (a)(7)

Summary of Comments: Paragraph 61.56(a)(1) requires that the waste packages presented for disposal comply with NRC and DOT transportation regulations. This implies that the disposed package could be a Type A, or Type B Package including all related shielding and other transportation-related requirements. Two commenters (95,113) stated it is unlikely that this is NRC's intent but the wording of the paragraph can be interpreted in this manner. They suggest NRC should clarify and reword this requirement.

Two commenters (19 and 119) commented that Section 61.56 is not explicit with respect to disposal of packaging materials. In particular it is not clear whether wastes should be packaged for disposal (thus prohibiting the use of returnable shielded packages) or whether they only need to be packaged for transport and handling prior to disposal.

Stock Equipment Company (67) suggested that all waste containers be constructed of materials that will not support combustion.

Union Oil (66), GE (89), and the ASME (107) suggested that disposal of bulk or unpackaged wastes be permitted.

New England Nuclear (110) suggested that the activity limits on containers implied in § 61.56(a)(1) and specified in (a)(7) are overly restrictive.

Analysis of Comments: The issue of waste packaging requirements as stated in Section 61.56(a)(1) is confusing to the waste generator, carrier, and receivers. NRC staff has, therefore, deleted this section because there is no need to restate in 10 CFR 61 that the waste packages shipped for disposal must comply with NRC and DOT transportation regulations. The Commission did not intend that returnable or reusable shielding must be disposed of.

Stock Equipment Company (67) referenced a recent NRC guidance document, "Radiological Safety/Guidance for On Site Contigency Storage Capacity" which requires that low level dry waste storage be in containers that do not support combustion. The Company suggests that the requirement be applied all wastes that are transported and disposed of. The hazard of fires during handling and transportation is included in the determination of the LSA, Type A, and Type B quantity limits. Since waste packages will meet the NRC and DOT transportation requirements, NRC staff believes it is unnecessary to further restrict packaging materials.

Under the rule disposal of bulk or unpackaged waste is allowed provided that the requirements for waste classification and waste characteristics are met. The staff agrees that disposal of bulk wastes may be the most efficient use of space or easiest way to minimize void spaces under certain circumstances and that certain types of wastes may be shipped in bulk under DOT regulations. The requirement for packaged wastes has been deleted.

New England Nuclear expressed the view that the container activity limits in § 61.56(a)(1) and (7) are excessively conservative. Paragraph (a)(1) imposes DOT activity limits on containers by implication. Paragraph 61.56(a)(7) has explicit activity limits on gaseous shipments. NEN raised the point that wastes processed on site after transit and before disposal should be allowed to exceed DOT limits. The staff agrees with this position. The staff intended that Table 1 set limits on allowable disposal concentrations, not quantity restrictions for transportation. The gaseous limits are addressed under issue D-56-5.

Rule Change: Delete § 61.56(a)(1).

ISSUE D-56-7

Issue: Hazardous, biological, pathogenic and infectious waste treatment

Commenters: University of Texas Medical Branch (75)
University of Texas System Cancer Center (105)

Rule Citation: 61.56(a)(8); 61.56(b)

Summary of Comments: The Medical Branch objected to treatment of all biological specimens under 61.56(a)(8) and noted that if liquid scintillation fluids are not allowed, Agreement State licensees in particular, will have a problem. The Cancer Center suggested that liquid scintillation fluids be specifically referenced and clearly exempted from stability requirements in 61.56(b)

Analysis of Comments: The NRC staff agree that treatment (e.g., incineration of liquid scintillation wastes as recommended in NUREG-0656) of wastes is the most desirable option in many instances. However, development and implementation of the technology by all licensees will require time and may never be cost effective or even reasonable for small operations. Medical research, university research, and small scale industrial research would be significantly affected. The staff cannot justify this burden at this time but is encouraging the adoption of alternative volume reduction treatments. Absorbed liquid scintillation wastes are acceptable under § 61.56 and are not routinely subject to the stability requirements since activity levels fall in Class A.

The requirement in § 61.56(a)(8) specifies that biological, pathogenic, or infectious waste material be treated to reduce the non-radiologic hazards of these wastes to the extent practicable. The intent was not to require incineration or similiar treatment of all biological materials. The requirement in (a)(8) is intended as an objective. Specific license conditions or site specific administrative procedures would be expected to address this issue in more detail. For example, the license issued by the State of Washington for the Richland site requires absorbents, lime, and double containment for animal carcasses. Such packaging would be a means of complying with (a)(8). The rule also permits the disposal of absorbed liquid scintillation fluids as Class A wastes. All licensees, however, are encouraged to develop alternative methods of managing

these wastes. The Commission's volume reduction policy statement dated October 16, 1981 also encourages all waste generators to reduce waste volumes to the extent practicable.

Rule Changes: None.

ISSUE D-56-8

Issue: Waste stability requirements

Commenters:
University of California at Los Angeles - 8
Advisory Committee on Reactor Safeguards - 10
DOW Chemical - 17
Department of the Environment, London - 19
Sargent and Lundy - 24
University of North Carolina - 30
Alabama Power - 33
Law Engineering Testing Co. - 34
Sierra Club - 37
Duke University - 48
Stock Equipment - 67
Argonne National Laboratory - 68
Oswald U. Anders - 73
Birmingham Audubon Society - 80
Utility Nuclear Waste Management Group - 81
Middle South Services - 84
Northeast Utilities - 85
American Nuclear Society - 87
Health Physics Society - 96
Atomic Industrial Forum - 100
U.S. Ecology - 101
American Institute of Chemical Engineers - 102
Conference of Radiation Control Program Directors - 103
American Society of Mechanical Engineers - 107
New England Nuclear - 110
Tennessee Valley Authority - 116
U.S. Department of Energy - 119

Rule Citation: 61.56(b); 61.7(b)(2)

Analysis of Comments: The concept of waste stability is intended to provide long term assurance that the disposal units will maintain their integrity without substantial and expensive remedial maintenance efforts. A stable disposal unit will also minimize the infiltration of water which could enhance migration of radionuclides.

Several commenters indicated that the meaning of stability was unclear and requested further specific guidance. One commenter indicated that structural rather than chemical stability was intended.

In order to clarify the term "stability" a definition has been added in Section 61.2. The NRC staff is also preparing a Branch Technical Position (BTP) on waste form which will provide acceptable test methods and criteria to be used to qualify stabile waste forms.

One commenter asked if trash would require stabilization. Trash, which generally has low specific activities, would normally be a Class A waste. However, some trash wastes may have activities which exceed the Class A limits. These wastes would be required to be stabilized or packaged in a container providing stability if the potential for degradation exists.

One commenter stated that if the disposal facility was sited properly waste stability would not be required. The AICE expressed the view that site maintenance for 100 years would take care of subsidence and waste stability was not justified. Anders objected to depending on steel drum waste packages for stability and believed that waste form and efficient backfilling were the key factors.

Siting requirements for a disposal facility are extremely important in assuring that radionuclide migration pathways are minimized. However, even at a well selected site, waste degradation can cause subsidence which could result in expensive remedial action programs. Such expensive maintenance could rapidly deplete perpetual care funds established for remedial care, monitoring and site surveillance. Therefore, trench stability is an important factor to be considered in addition to site suitability.

Two commenters supported the concept of waste stability.

The 150 year stability time period was chosen based on the sum of the site operating period, post closure observation period and the institutional control period. It was intended that wastes remain recognizable and stable over this period.

One commenter suggested that the 150 year stability requirement was overly restrictive since void spaces between waste packages would be filled. This commenter stated that voids were the cause of subsidence and suggested that the elimination of voids would eliminate subsidence. The commenter also stated additional processing would be required to meet this requirement resulting in increased waste volumes. Two other commenters stated that waste dispersion must be prevented and that this was only slightly affected by slumping or deformation.

Two commenters including TVA stated that the stability requirement should only be for 100 years. TVA based the comment on 100 years of institutional control and the decay during that time. One commenters asked what the basis of the 150 year stability requirement since some nuclides would not decay during that period. Another commenter stated that Class A wastes should also have a stability requirement since cesium (Cs-137) and strontium (Sr-90) would also be present in these wastes.

One commenter stated that steel drums can not be expected to last beyond 30 to 60 years. The commenter stated that there was no basis for assuming that steel will not corrode in 150 years. Another commenter stated that high integrity containers have not been tested for 150 years.

The NRC staff has reviewed the 150 year stability requirement with respect to the scenarios used to calculate the waste classification values. The scenario used to calculate the Class A interface assumes that after the 100 year institutional control period (approximately 150 years since the facility began

operation), the wastes are unrecognizable. The intruder, therefore, fails to recognize that he is performing construction, agricultural, or residential activities on a waste disposal site.

For Class B wastes, it is assumed that after institutional control is lost, an inadvertent intruder begins construction activities. However, due to the stability requirement, the waste is recognizable. The intruder realizes that he has begun construction in an area where previous disposal activities have taken place and he abandons his effort. The Class B concentrations are based on the intruder receiving 500 mrem in the course of discovering the disposal site.

The Class C intruder scenario assumes that the intruder barrier is effective for 500 years. At 500 years all waste is unrecognizable and the intruder performs the same activities as in the Class A waste scenarios. The difference here, of course, is that the waste has undergone 400 additional years of decay.

Looking at the above scenarios, the stable waste forms should be distinctly recognizable at 150 years for those wastes emplaced when the facility opens. It will not be necessary for the carbon steel drums to remain. For solidified wastes, though, the monolith should still remain intact. At 300 years the wastes should continue to maintain its gross physical properties and also retain a measure of its identity. High integrity containers are designed with a lifetime goal of 300 years. This lifetime also assures that a 10 half-life decay period will be applied for CS-137 and Sr-90 (30 year half-life nuclides) which are removed primarily in ion-exchange resins. Ion-exchange resins are a primary waste stream disposed of in high integrity containers.

Following the 300 year lifetime, waste degradation is expected to gradually occur. Based on the ancient cement structures, it is expected that cement products can exceed this lifetime. High density, high molecular weight polyethylene (used in the current high integrity containers) and polymer solification agents are also expected to exceed this lifetime, based on their chemical resistance, radiation stability and biodegradation properties.

The NRC staff has modified the waste stability period from 150 to 300 years to be consistent with the Class B and C waste classification scenarios.

The presence of Cs-137 and Sr-90 has been considered in the development of the Class A limits for the waste classification system. The fact that Cs-137 and Sr-90 do not decay as fast as the shorter half-live nuclides, such as Co-60, is the reason why the Class A limits for these two nuclides are lower.

The assertion that eliminating voids will provide stability is not complete since chemical, radiologic, and biodegradation will also lead to trench subsidence. It is expected that if currently used solidification agents, cement, vinyl ester styrene, and asphalt, are used with a good process control program that the necessary stability will be achieved. Therefore, volume increases are not expected over current waste generation.

The scenarios used in the waste classification system show that waste stability for Class B and C wastes is the most important factor. A stable waste implies a non-dispersive waste. Therefore, the comments that dispersion is more important than slumping and deformation is only partially correct. Stability

will minimize the site maintenance requirements during the institutional control period and the resultant burdens on the perpuetal care funds set up for remedial activities.

Three commenters stated that there was a need to specify tests and criteria to demonstrate the stability requirement.

The NRC staff is preparing a Branch Technical Position on Waste Form which will provide acceptable tests and criteria to demonstrate waste stability.

One commenter asked if wastes would be allowed to degrade if a solidification binder which did not degrade was used.

Wastes within a binder may degrade so long as the gross physical properties of the monolith are not impaired.

Rule Changes:

1. Delete 150 years from 61.56(b).

2. Add a 300 year objective for Class B and C wastes to the "Concepts" section.

ISSUE D-56-9

Issue: Five percent deformation limit

Commenters:
Alabama Power - 33
Union Carbide - 39
Bechtel National - 44
Utility Nuclear Waste Management Group - 81
Werner and Pfleiderer - 82, 124
General Electric - 89
Power Authority of the State of New York - 92
Stone and Webster - 95
Atomic Industrial Forum - 100
U.S. Ecology - 101
Carolina Power and Light - 106
American Society of Mechanical Engineers - 107, 113
State of North Carolina - 109
New England Nuclear - 110
U.S. Department of Energy (119)

Rule Citation: 61.56(b)(1)

Analysis of Comments: The requirement that a stable waste form maintain its physical dimensions within five percent was intended to ensure that degradation of waste containers and waste forms would not lead to severe trench subsidence. The five percent value was selected as a conservative deformation level which would be expected to produce only minor subsidence effects. These minor subsidence effects could be easily resolved by an inexpensive post closure maintenance program at the burial site.

Commenters indicated that the five percent deformation was overly restrictive and impossible to achieve due to the impracticality of filling containers to

95 percent capacity. In order to prevent spills, container filling operations are routinely terminated prior to reaching 95 percent capacity.

Commenters also noted that asphalt and polymetric solidification agents would be incapable of meeting this requirement because of their viscoelastic creep properties. Under static burial site load conditions, asphalt and polymetric material will flow or creep over time periods on the order of years until internal pressures are equalized. Werner and Pfleiderer suggested alternate wording on stability and thermoplastics.

Commenters indicated that the five percent limit would force waste generators into using high integrity containers. Use of high integrity containers would be required because normal containers could not be filled to 95 percent capacity and plastic solidification materials would be unacceptable due to creep.

One commenter indicated that the five percent tolerance limit should be restudied with careful consideration given to the added expenses that would be entailed.

One commenter asked for a clarification on what was actually meant by the term "within 5 percent."

Union Carbide suggested that the 5% apply to volume rather than dimension "since a 5% deflection in the diameter of a drum is inconsequential."

The NRC staff believes that trench subsidence needs to be carefully controlled in order to minimize water infiltration and major remedial care operations. In order to achieve this objective in a pragmatic way, the NRC staff has chosen to delete the prescriptive requirement for a five percent dimensional limit. The requirement that wastes remain structurally stable, however, remains in place. In order to provide guidance to waste generators on acceptable waste forms the NRC staff is preparing a Branch Technical Position (BTP) which defines acceptable test methods and criteria oriented to ensuring structural stability.

In addition to the BTP, 10 CFR 61 Section 61.52(a)(4) and 61.52(a)(5) requires that wastes be emplaced to maintain package integrity and that void spaces be filled to reduce subsidence. The filling of void spaces will minimize the creep effects in asphalt or polymeric solidified products since lateral stability will be provided by the fill material. If there are no voids, there will be no space for viscoelastic wastes to flow into.

The commenters' concerns regarding the void spaces inherent in waste containers, are addressed under that specific issue.

Rule Change: Delete 5% limit from § 61.56(b)(1).

ISSUE D-56-10

Issue: Void spaces in waste containers

Commenters: Sargent and Lundy - 24
Bechtel National - 44
American Nuclear Society - 87
General Electric - 89

Health Physics Society - 96
American Society of Mechanical Engineers - 107

Rule Citation: 61.56(b)(3)

Analysis of Comments: The proposed regulation specifies that void spaces within containers must be reduced to the extent practicable. The intent of this requirement is to minimize subsidence effects following the degradation of the container or waste product. In some cases waste containers are filled to 50 to 75 percent of the container volume. Our objective is to fill containers to 85 to 95 percent of container volume when it is practicable to do so. Components such as pumps or valves will have large internal void spaces which can not easily be eliminated. These components, however, would not be expected to undergo substantial degradation over short periods of time and will not present severe trench subsidence problems.

Several commenters requested specific criteria on how this requirement would be met and if filler materials were needed. Two commenters suggested deleting the requirement since economics would drive waste generators to package the maximum volume of waste into a container.

Because wastes can be of a very variable nature it is not possible or even desirable to include specific criteria for minimizing voids in a regulation. Where it is possible NRC suggests filling voids with other waste materials. The NRC staff will work with waste generators to suggest acceptable means for eliminating voids. The NRC staff agrees that economics should force waste generators to maximize the amounts of wastes packaged in a container, but also believes that the requirement should remain as an incentive for those waste generators who have yet to establish effective volume reduction programs to minimize volumes of waste shipped for disposal.

Rule Changes: None

ISSUE D-56-11

Issue: Compressive load requirement

Commenters:
Alabama Power - 33
Union Carbide - 39
Stock Equipment - 67
General Electric - 89
Power Authority of the State of New York - 92
Atomic Industrial Forum - 100
U.S. Ecology - 101
Carolina Power and Light - 106
American Society of Mechanical Engineers - 107
North Carolina Radiation Protection Commission - 109
U.S. Department of Energy - 119

Rule Citation: 61.56(b)(1)

Analysis of Comments: The 50 psi compressive load requirement is intended to assure that wastes requiring stability will not be crushed when subjected to the load of waste packages or overburden placed above them. The 50 psi value

is based on conservatively assuming maximum burial depths at the Hanford, WA site (up to 45 feet) and waste or overburden density of 150 lb/ft^3. Testing performed on acceptable solidified waste specimens indicate that the 50 psi compressive strength should be easily obtained.

Three commenters indicated that the 50 psi requirement was very rigorous and suggested deleting the requirement. Two of these commenters suggested editorial changes to incorporate their concerns.

Six commenters including Union Carbide and DOE suggested that the 50 psi load requirement be deleted and replaced by a general requirement to reflect actual disposal site conditions and operations.

One commenter suggested restudying this requirement on a cost/benefit basis to determine if it was necessary.

One commenter stated that some waste forms and containers would be unable to meet the 50 psi criterion. Union Carbide stated that few, if any, existing waste containers can meet the stability requirements in the rule.

The NRC staff has deleted the prescriptive requirement in 10 CFR 61 for a minimum compressive strength of 50 psi for Class B and C wastes. This 50 psi specification, however, will remain in the Branch Technical Position on waste form for solidified products as suggested guidance. NRC staff believes that the 50 psi compressive strength should be easily obtained for cement, asphalt, and vinyl ester styrene solidified products.

Section 61.56(b)(1) is now consistent with the recommended revision proposed by the two commenters cited earlier.

Rule Changes: Delete prescriptive 50 psi limit from § 61.56(b)(1).

ISSUE D-56-12

Issue: High Integrity Container (HIC)

Commenters:
Dow Chemical (17)
Union Carbide (39)
Arkansas Power and Light Company (52)
Stock Equipment Company (67)
Argonne National Laboratory (68)
Werner and Pfleiderer Corporation (82)
Northeast Utilities (85)
State of California (93)
Health Physics Society (96)

Rule Citation: § 61.56(b), (1) Disposal container

Summary of Comments: Several commenters asked for more clear design criteria on HIC.

One laboratory (68) commented that NRC's definition in the EIS is only a subjective term. The commenter also asked if NRC will provide a quantitative definition of "HIC" or will this be left to State authorities or the private sector.

One Commenter (82) requested the Commission to reexamine the design criteria for HIC for highly dispersible forms.

The State of California (93) suggested that HIC's should be used for both high and low concentration wastes to prevent the release of radionuclides into ground water.

One comment from a Utility (85) stated the need to clarify whether the HIC alone will meet the stability requirements for Class C wastes (i.e., 500 year stability requirement).

One industrial firm (67) stated that the HIC is subject to differing guidance as to whether it should provide 150 or 300 year service and what the transportation application might require or whether the life requirement can be credibly proven.

Dow Chemical (17) stated that Section 61.56 fails to reflect the concepts of ALARA and best available technology (including whether the HIC has been tested to show that they can be expected to provide stability in the disposal environment for at least 150 years).

The Health Physics Society noted that the implied requirement for this new type of container could impact larger entities such as power plants and radiopharmaceutical companies.

In Section 61.56(b)(1), it states that "structural stability can be provided by... placing the waste in a disposal container or structure that provides stability after disposal." Arkansas Power and Light Company correctly interpreted this to mean that the use of High Integrity Containers would be an acceptable method of providing structural stability. Union Carbide expressed the view that few if any, existing containers can meet the requirement and the option to rely on long term care should be retained.

Analysis of Comments: NRC staff is preparing a Branch Technical Position (BTP) on waste form. This BTP provides HIC design criteria and is the basis for how the staff would evaluate the acceptability of HIC designs.

The HIC design goal is to provide integrity over the 300 year lifetime. It will withstand various conditions such as corrosion, compaction load, thermal load, radiation, biodegradation, etc. for 300 years. If a proposed HIC container meets all the requirements of HIC design goals, it would provide an acceptable method for demonstrating structural stability. The 300 year design goal is now consistent with 10 CFR 61 scenarios. See Issue D-56-8.

Argonne National Laboratory's concern about the definition of a HIC is clarified by this design criteria in the BTP.

The State of California suggested that HIC should be used for all low waste. Basically, a HIC is designed for Class B and C wastes which require stability. Less hazardous Class A wastes are not required to be disposed of in HIC, but could be to help provide greater overall site stability.

The NRC staff believes that the use of HIC's is consistent with the concept of ALARA and the use of the best available technology. Occupational exposures in

using HIC's are expected to be similar to or less than waste solidification either with mobile or installed systems. For those utilities without the capability to effectively solidify resins, the use of the HIC could be economically advantageous since expensive equipment retrofits would be necessary to provide resin solidification capability.

While there has been no specific testing of HIC's for a 150 year period, there is substantial test data for HIC materials regarding chemical resistance, biodegradability, radiation resistance, and mechanical properties. The NRC staff belives that these data can be conservatively extrapolated to the 300 year design goal to provide assurance that the HIC will properly function over the long-term. Likewise, the NRC believes that test data can also be extrapolated to assure that solidified products can remain structurally stable over the long-term.

The use of HIC's is also consistent with the requirements for transportation provided in 10 CFR 71 and 49 CRF 171-179. HIC's currently approved for use by the State of South Carolina for shipments to the Barnwell site are fabricated from high-density, high-molecular weight polyethylene. Other containers fabricated of high-density, high-molecular weight polyethylene are commonly in use for transporting hazardous chemicals. These polyethylene containers meet the applicable transportation requirements for transporting hazardous chemicals. Likewise, the use of polyethylene containers is not in violation of transportation regulations for radioactive materials.

The NRC staff and the State of South Carolina are evaluating the use of HIC's for highly despersive waste forms such as incinerator ash. This evaluation is addressing the impacts of HIC handling accidents on worker safety. Solidification of highly despersive wastes will be required where occupational exposures from such accidents are unacceptable.

The stability requirements for Class B and C wastes are identical. Therefore, it is unnecessary for HIC's to be designed to remain completely intact for 500 years. The 300 year design goal is discussed in more detail under Issue D-56-8.

Rule Change: None

ISSUE D-56-13

Issue: Free standing liquids

Commenters: Dow Chemical Company - 17
Sargent and Lundy - 24
Stock Equipment - 67
State of South Carolina - 79
American Nuclear Society - 87
American Society of Mechanical Egineers - 107
New England Nuclear - 110

Rule Citation: 61.56(b)(2)

The proposed rule stated that liquid wastes or wastes containing liquids must be converted into a form which contains as little free standing non-corrosive liquid as is reasonably achievable, but in no case more than 1 percent of the waste volume.

Stock equipment commented that all classes of wastes should exclude free liquids. The State of South Carolina recommended implementing the free liquid requirements in their license conditions that is, 0.5 percent non-corrosive liquids in regular waste containers and 1 percent in high integrity containers.

Section 61.56 has been modified to incorporate as a minimum requirement that solidified wastes must have less than 0.5 percent of the waste volume as free liquids. This allowable free liquid volume is to account for potential condensation of water vapor sealed in the containers. The NRC staff believes that this requirement can be easily met using the solidifcation agents currently in use.

For dewatered products, such as resins, it is very difficult to assure that such products would meet a 0.5 percent free liquid requirement following transport to a burial site. Therefore, for dewatered products 1 percent free liquids will be allowed to account for settling during the transport period.

A requirement to dewater to less than 1 percent free liquids would only increase worker exposures without providing commensurate assurance that the more restrictive free liquid requirement is being met.

Sargent and Lundy, ANS, and ASME suggested deleting the requirement for non-corrosive free liquids or explaining whether the intent was to minimize either non-corrosive or radioactive liquids. New England Nuclear suggested defining non-corrosive liquids using the same terms as used in the DEIS.

The intent of the non-corrosive liquid requirement was to minimize both corrosive and radioactive liquids. Past experience has shown that corrosive liquids can result in container failure. These container failures result in higher worker exposures from repackaging wastes and cleaning spills. The waste form Branch Technical Position defines non-corrosive liquids as liquids having a pH between 4 and 11. Liquids outside of this pH range are corrosive to carbon steel, the most common material used in waste containers.

Sargent and Lundy, ANS, and ASME asked if there was an intent to limit "clean" liquids in the wastes.

The free liquid requirement applies to all liquids, corrosive and non-corrosive, radioactive and non-radioactive. This requirement follows from our intent to minimize the quantity of liquids which are in or percolate through the burial trench.

Rule Changes:

1. Modify § 61.56(b)(2) to apply the 1% criterion to wastes in a disposal container designed to assure stability and 0.5% for waste processed to a stable form.

ISSUE D-56-14

Issue: Consistency with other NRC regulations and guides

commenters: Stock Equipment - 67
American Society of Mechanical Engineers - 113

Rule Citation: § 61.56

Both Stock Equipment and ASME commented on the apparent inconsistencies between the proposed 10 CFR 61 and the Effluent Treatment Systems Branch (ETSB) Technical Position 11-3.

The November 1975 version of ETSB 11-3 specified that all wet wastes from Nuclear Power Plants should be solidified. At this time the concept of using a high integrity container for dewatered products had not been developed. ETSB 11-3 was revised in July 1981. This document still requires solidification of evaporator and reverse osmosis (RO) concentrates, but allows the option of either dewatering or solidifying resins and filter sludges. In addition, ETSB 11-3 states that specific burial site requirements may dictate the type of container to be used for these dewatered products.

The revisions to ETSB 11-3 are consistent with the proposed 10 CFR 61 in that: (1) evaporator bottoms and RO concentrates would require solidification in order to meet the free liquid requirements and (2) resins and sludges can be either solidified or dewatered dependent on the type of container used.

Stock Equipment also questioned the consistency with 10 CFR 50, Appendix I and 10 CFR 61. Appendix I to 10 CFR 50 addresses the design objectives and conditions for implementing the ALARA criterion for power plant effluents. Again, the NRC staff believes that Appendix I and 10 CFR 61 are consistent. The waste form requirements of 10 CFR 61 can be met by the use of processing equipment which will maintain effluent releases ALARA. As an example, the high integrity container concept is expected to meet or exceed the Appendix I ALARA objectives at the power plant. In addition, the use of the high integrity container is expected to meet or exceed similar objectives for the disposal site.

Stock also stated that 10 CFR 61 should also be consistent with NUREG-0782 (The Draft Environmental Impact Statement (DEIS) in support of 10 CFR 61), the waste form Branch Technical Position (BTP), 10 CFR 20.311, NRC Guidance for storage facilities, and leach testing standards.

First, the NRC staff beieves that the proposed 10 CFR 61 is consistent with the DEIS. Second, the waste form BTP is being revised to provide acceptable methods and criteria for meeting the waste form requirements in 10 CFR 61. Third, the NRC staff believes that the storage guidance is consistent with 10 CFR 61 but also recognizes that possibly more restrictive packaging measures may be needed to assure the long-term integrity of containers in a storage environment over those measures needed for disposal. Last, leach tests standards and criteria will be incorporated into the waste form BTP.

Rule Change: None

ISSUE D-56-15

Issue: Radiolytic decomposition of waste form

Commenter: Los Alamos National Laboratory/
Safeguard Group (43)

Rule Citation: 61.2

The commenter indicated that the Class C intruder waste class would include some high specific activity wastes generated in the Three Mile Island Unit 2 (TMI-2) cleanup. The commenter had reservations that such wastes should be allowed for near-surface disposal.

The waste classification system is based on the pathway studies discussed in the DEIS which supports 10 CFR 61 (NUREG-0782). The allowable nuclide concentrations are based on those pathway studies.

Some of the high specific activity wastes generated in the TMI-2 cleanup are unacceptable for near surface disposal because their activities exceed the Class C limits or because of radiolytic decomposition of the waste materials. The Department of Energy has agreed to accept these problem wastes for research and development and disposal purposes.

Based on the NRC staff experience with TMI-2 wastes, wastes which undergo substantial radiolytic decomposition should be prohibited from disposal at near-surface facilities. A Branch Technical position on waste form is being developed which includes provisions to test waste forms to ensure that stability will be maintained in a radiation environment.

Rule Change: None

ISSUE D-56-16

Issue: Establishment of technical criteria and standards

Commenters: Dow Chemical - 17, 83
Stock Equipment - 67
Health Physics Society - 96
The American Society of Mechanical Engineers - 113

Rule Citation: 61.56

Summary of Comments: Two commenters stated the need for technical standards and criteria for waste form and requested that these standards and criteria be prepared immediately. The ASME suggested that more comprehensive standards be added to Part 61 to address factor such as leachability. One of the commenters also requested that enforcement programs must also be established to ensure compliance.

The Health Physics Society suggested that it would be useful to have a separate rulemaking action on the waste stability requirements.

Analysis of Comments: The NRC staff agrees that there is a need for additional technical standards, criteria and guidance on waste form. In order to meet this need, the NRC staff is preparing a Branch Technical Position (BTP) on Waste Form which would provide acceptable test methods and criteria to demonstrate waste stability.

The NRC staff, however, is not contemplating a separate rulemaking action in this area and cannot justify additional standards fo Part 61. Since there are

many different waste forms which require disposal, the NRC staff believes that a BTP is the best approach to providing guidance while still allowing flexibility to deal with unique or differing waste forms.

Rule Change: None

ISSUE D-56-17

Issue: Enforceability of and compliance with restrictions on waste form

commenters: ACRS (10)
State of California (93)
Health Physics Society (96)

Rule Citation: § 61.56

Summary of Comments: The ACRS expressed general concern about the enforceability and implications of all the requirements in § 61.56. The State of California expressed concern about the lack of a requirement to confirm compliance with the waste form provisions. The HP Society comments reflected uncertainty about generator and disposal facility operator roles and responsibilities for waste form and packaging.

Analysis of Comments: The minimum requirements for waste characteristics outlined in 61.56(a) are a mixture of prescriptive requirements and more general objectives. The requirement banning cardboard packaging for example is a straightforward requirement that requires no interpretation and can readily be confirmed. Other requirements such as reducing the hazard of biological material to the extent practicable is more of an objective or statement of policy.

The primary reliance for assuring waste characteristics is the generator's quality control program required by proposed § 20.311. The program is inspectable at the waste generator's facility and includes a certification that wastes meet the requirements for acceptance at the disposal facility. Disposal facility operators will also conduct package inspections to monitor shippers.

Rule Changes: None

ISSUE D-56-18

Issue: Proposed container design

Commenter: Robert Reynek - 2

Rule Citation: NA

Mr. Reynek proposed a design for a waste container and has suggested testing it. While this comment does not directly apply to the proposed 10 CFR 61 regulation, the proposed design could have merit if further developed. The NRC, however, has no legislative responsibility for development of the nuclear industry. The Atomic Energy Act has given this function to the Department of Energy.

ISSUE D-56-19

Issue: Polymetric Solidification Agents

Commenter: Oswald U. Anders - 73

Rule Citation: 61.56

Summary of Comment: Anders recommended requiring solidification of all wastes in plastic polymers and banning urea formaldehyde and absorbents.

Analysis of Comments: Anders points out that virtually all waste can be immobilized in plastic matrices. Aqueous waste can be directly incorporated. Granular solids can also be directly incorporated. He recommends that all wastes be so solidified to reduce leaching and deter intruders.

Adaption of Dr. Anders' recommendation would have the most impact on Class A waste shippers. The stability requirements of 61.56(b) would accomplish his goals for Class B and C wastes. Thousands of small users generate Class A wastes and typically will not have treatment or solidification facilities.

Our pathway evaluations indicate that the use of polymetric binders are unnecessary for Class A wastes. Likewise, absorbents are also adequate for Class A wastes. For Class B and C wastes the NRC staff believes that cement as well as asphalt and other polymetric materials are capable of meeting the stability requirements in 10 CFR 61. Therefore, in order to allow waste generators the flexibility to select the optimum solidification system for their needs, the NRC staff has not specified the use of individual solidification agents.

Urea formaldehyde is currently no longer used as a solidification agent and is no longer acceptable for disposal at the three commercial disposal sites.

Rule Change: None

ISSUE D-56-20

Issue: Solidification of Ion-Exchange Media and Wet Solids

Commenters: Catherine Quigg - 13
Dow Chemical - 17
Stock Equipment - 67
Argonne National Laboratory - 120

Rule Citation: 61.56(b)(1)

Summary of Comments: Dow Chemical stated that the disposal of ion exchange media by dewatering is not within the concepts of ALARA and the use of the best available technology. This comment would apply to Class A ion exchange media and Class B and C media which are disposed of using high integrity containers. Stock Equipment also supported this concern.

Catherine Quigg suggested that resins should be solidified.

In addition, Mrs. Quigg suggested that ion-exchange resins should not be allowed to be disposed of as low-level wastes since resins can contain high specific activities and contain nuclides like Cs-137 which have half-lives of 30 years. Mrs. Quigg also suggested incinerating or vitrifying ion exchange media. Note that Argonne National Laboratory (120) clarified a quote Mrs. Quigg attributed to the commenter.

Analysis of Comments: The pathway evaluations include in the source term resins which have been disposed of in a dewatered form. These evalutions consider the dispersive nature and degradation of ion exchange resins. The results indicate that the disposal of ion exchange resins in a solidified or dewatered form is acceptable within the requirements of the waste classification system. Of course, highly loaded organic resins which are subject to substantial radiolytic degradation would be unacceptable for disposal. The resin degradation problem is being addressed in the NRC staff's Branch Technical Position on Waste Form.

The NRC staff believes that for Class B and C wastes, which require stability, that the high integrity container is an acceptable option for providing stability. Since the high integrity container filling operations at the waste generator's site would generally be less complex than solidification, it would be expected that overall occupational exposures (including maintenance of equipment) would be less than or the same as those solidification operations. This statement would generally apply to solidification using either mobile or installed solidification systems. Therefore, NRC staff believes that the ALARA concept is fulfilled by the use of high integrity containers. Additional discussions on high integrity containers are provided in Issue D-56-12.

The waste classification system in 10 CFR 61 determines the allowable concentrations for Cs-137 and for other long-lived nuclides important for disposal. These levels have been determined based on the pathway scenarios discussed in the DEIS which supports 10 CFR 61, NUREG-0782. These pathways include as a source term ion exchange resins.

The incineration of organic resins and the vitrification of inorganic zeolites are options which could be used to process ion exchange media. The incinerations of organic resins is being studied by the DOE and the commercial firms which market incinerators. The DOE is also studying the vitrification of zeolite ion exchange media both as a method for processing DOE generated zeolites and for the zeolite wastes generated in the submerged demineralizer system at Three Mile Island.

Rule Change: None

ISSUE D-56-21

Issue: Characteristics of volume reduced wastes

Commenter: Advisory Committee on Reactor Safeguards (10)

Rule Citation: General

Summary of Comment: ACRS pointed out that in the proposed rule, attention should be directed to techniques both for reducing the volumes of wastes

generated and for assuring that the waste that are produced are in, or can be converted to, a form amenable to safe disposal.

Analysis of Comment: NRC is developing a comprehensive data base regarding the acceptability for disposal of waste products from volume reduction techniques. Several research and technical assistance projects are being performed to determine the mechanical properties, leach resistance, radiation stability, and biodegradability of products from current radwaste systems and from advanced volume reduction techniques for low-level waste.

ISSUE D-57-1

Issue: Labeling

Commenters: Los Alamos National Laboratory (43)
Arizona State Clearinghouse (47)
American Nuclear Society (87)
Arkansas Power and Light Company (94)
Health Physics Society (96)
The American Society of Mechanical Engineers (107)
Department of Energy (119)

Rule Citation: §61.57

Summary of Comments: The commenters suggested using color coding, different wording to indicate class of wastes, consistency with DOT labeling, minimum standards, and clarification of responsibilities. One commentor questioned whether standard labels will be required. One commenter supported the need and one made a general suggestion that more detail be included.

Analysis of Comments: Los Alamos National Laboratory suggested using color coded labels in § 61.57. The staff considered using color coding for indicating Class A, Class B, or Class C wastes to provide easier identification by operating personnel. The drawbacks are the existing color code labeling requirements under DOT regulations and NRC regulations in 10 CFR Part 20 and the large number of potential generators and service and supply companies potentailly affected. The staff did not want to compromise DOT color codes and the dependence on them in transit. Site operators may develop site specific administrative requirements on package design, weight, labeling, etc. to facilitate handling and emplacement eventhough the rule doesn't have a specific requirement. Thus color codes may be used but are not required. The Los Alamos suggestion was not adopted.

The Arizona comment addressed the need for and potential confusion from the use of "segregated," "stable" and "intruder" in § 61.57 and suggested use of the general term "waste" instead. The suggestion was adopted.

Arkansas Power and Light Company made a general comment that "Differences between DOT and NRC regulations regarding to labeling need to be resolved prior to implementaticn to avoid confusion." No specific problems were identified by the commenter. The DOT and NRC labeling requirements are related to different activities: handling and disposal. The DOT rules treat all radioactive materials the same and do not distinguish between materials to be used and waste. Differences in labeling for the subset waste minimize the size of the affected population and minimize the number of affected radioactive shipments. The distinctive labeling is needed for ease of proper emplacement at the sites and staff believed it should be retained and apply only to shipments to disposal sites. No change to the requirements in the rule was adopted. The DOE also recommended compatibility with DOT requirements.

The Health Physics Society questioned whether NRC plans to require standard labels, warning signs, or other markings to supplement or replace current DOT labels. The commenter agreed that clear classification marking would help site operators. As noted earlier, no standard labels are intended and the labeling is supplementary to DOT. The DOT labels would still be the prime indicator for handling in transit or storage. The classification labeling would not come into play until emplacement. The classification labeling is not necessarily related to occupational hazard. For example large shipments of beta emitting istopes could be Class C but not a significant external exposure hazard.

The American Society of Mechanical Engineers suggested that § 61.57 "labeling requirements should be expanded, clarified, and made more specific." The class labeling is to provide additional assurances. The Class of each package must also be shown in the manifest accompanying the shipment. Flexibility to use printed labels or stencils, choice of colors, etc. to label the package with the words "Class A waste" etc. seems the minimum burden and commensurate with the role played only in emplacement for disposal.

The Department of Energy suggested clarifying responsibility for sorting and labeling wastes and correctly noted that the shipper is responsible. The roles of the generator, collector, processor, and facility operator are complex and are addressed individually in § 20.311 of 10 CFR Part 20 and the discussion of issues related to this section. A cross reference to labeling requirements in § 61.57 was added to § 20.311.

Rule Changes:

1. Amend § 61.57 to read:

   Each package of waste must be clearly labeled to identify waste class in accordance with § 61.55 and bear the words Class A waste, Class B waste, or Class C waste.

2. Amend § 20.311(d)(2), (f)(4) to read: Label each package of waste to identify whether it is Class A, B, or C in accordance with §§ 61.55 and 61.57 of Part 61 of this chapter.

ISSUE D-59-1

Issue: State responsibility after license transfer

Commenters: Pennsylvania Department of Environmental Resources (16)
Ohio EPA (38)
Ontario Hydro (51)

Rule Citation: Supplementary Information; also related to § 61.30, 61.31, 61.62 and 61.63.

Summary of Comments: Pennsylvania recommended the option be available to States to turn ownership and responsibility for long-term custody over to the Federal government. The Ohio EPA identified the lack of a clear statement of State responsibility after license transfer. Ontario Hydro questioned state liability for health problems arising from the site after the active institutional control.

Analysis of Comments: The Pennsylvania recommendation that States have the option to turn over responsibility for long-term custody of low-level waste sites to the Federal government if they meet satisfactory criteria reflects the approach in place for mill tailings sites. After stabilization, mill tailings sites are turned from the private sector to the State, if the State wishes, or to the Federal government if the States declines. This process for mill tailings is provided for the Uranium Mill Tailings Radiation Control Act of 1978. No such authority exists for low-level wastes so no change to the rule was made to provide this option.

The Ohio EPA and Ontario Hydro concern is directed at the land owner State responsibility beginning with transfer of the license under § 61.30. Under the licensing scheme in the proposed rule, the State would be responsible for the site and disposed waste. Institutional care would be carried out under license for some prescribed period, up to 100 years. If a commercial or private sector developer and operational licensee was involved, the developer/operator's responsibilities would normally end at transfer. Thus, the state becomes the responsible party upon receipt of the transferred license. Although it is impossible to have absolute guarantees against problems arising after site closure, the requirements of Part 61 are aimed at minimizing the potential for problems to the maximum extent practicable. It behooves the state, as land owner, to maintain awareness of the operations and conditions at the facility, either through some independent oversight as landlord, or by participating with NRC in the review of the initial application as provided in Subpart F of Part 61. If the State was developer, operator, and land owner, the State would be responsible for the site and wastes at all times. The issue of liabilities is further addressed under issue E-1 on financial assurances.

Rule Change: None

ISSUE D-59-2

Issue: 100-year limit on the institutional control period; permitted activities during the control period

Commenters:
Marvin Lewis (3)
Environmental Law Project (9)
Pennsylvania, Department of Environmental Resources (16)
Commonwealth Edison (35)
Bechtel National, Inc. (44)
Duke Power Company (48)
Argonne National Laboratory (68)
Oswald U. Anders (73)
Birmingham Audubon Society (80)
Utility Nuclear Waste Management Group (81)
Northeast Utilities (85)
American Nuclear Society (87)
Amy Hubbard (90)
Atomic Industrial Forum (100)
Conference of Radiation Control Program Directors (103)
The American Society of Mechanical Engineers (107), (113)
New England Nuclear Corporation (110)
U.S. Department of Energy (119)
U.S. Environmental Protection Agency (122)

Rule Citation: § 61.7 Concepts and § 61.59 Institutional Requirements

Summary of Comments: The Conference of Radiation Control Program Directors, Inc. concurred with and supported defining a period of time for institutional control and relating the classification and disposal of waste to this time frame. The Environmental Protection Agency supported use of a 100-year time frame for institutional controls. Marvin Lewis inquired as to the minimum time that institutional control could be a surety. The Environmental Law Project philosophically questioned the continued production of wastes that will remain hazardous longer than the assumed period of government control.

The Birmingham Audubon Society commented similarly, stating that if the 100-year limit was retained, waste remaining dangerous for longer periods should be disposed of elsewhere, where controls can be maintained for as long as the waste remains dangerous. Amy Hubbard offered a similar comment stating that radioactive wastes remain dangerous for centuries and their safe disposal is dependent upon a stable social and financial structure for at least 500 years which cannot be predicted, much less ensured. Commonwealth Edison expressed the view that 100 years was too long and difficult for a licensee to meet. Bechtel National commented that if a government institution would be available to maintain land ownership and records as discussed in the statement of consideration, then that same institution could maintain a fence for more than 100 years. This would reduce concern about the potential exposure to intruders. The same comment was made by the American Nuclear Society.

The Utility Nuclear Waste Management Group recommended that § 61.59 make it clear that during the period of institutional control the land could be used for other purposes not inconsistent with public health and safety and which would not disturb the integrity of the site. The Atomic Industrial Forum, American Society of Mechanical Engineers and Duke Power commented similarily noting that limited use of the land may be desirable in the future and the

government land owner should have flexibility to institute suitable control options and site access depending on the particular conditions existing at the site. Oswald Anders also commented on that issue noting that a proper use of inactive disposal site could be a golf course. The New England Nuclear Corporation also suggested changing the words "keep people off the site" to "control access to the site" to allow maintenance, surveillance and other appropriate activities. Pennsylvania recommended more specificity on allowable site uses.

Northeast Utilities commented that the institutional control period shall be extended for as long as the governing body exists. Doing so would extend the surveillance period and protect against site intrusion until the governing body determines the site could be reopened to the public. The Atomic Industrial Forum commented that consensus of opinion indicate that the institutional control period may reasonably range from 100 to 300 years and 300 years should be selected in the equations NRC used to determine prescriptive requirements. New England Nuclear also offered the same comment. The U.S. Department of Energy stated that the duration of institutional control significantly affects the cost of waste disposal. Raising the period from 100 to 300 years would increase the Class A limit for several radionuclides. They suggested that the NRC reexamine the basis for limiting institutional controls to 100 years noted that such controls have existed in this country more than 100 years.

Analysis of Comments: Four main points are raised in the comments and each of the points is discussed further below:

1. Everyone expressed support in one way or another for defining a time frame for institutional control related either to the hazard duration of the waste, cost or assurance of continued government stability.

2. The disposal of waste remaining potentially hazardous after the end of the assumed institutional control period should be disposed of by other methods providing greater controls.

3. Although one commenter strongly supported the 100-year time frame, about half suggested raising the limit; most suggested from 100 to 300 years.

4. Part 61 should allow the government landowner flexibility in controlling site access during the institutional control period to ensure all activities are properly carried out and to allow for productive uses of the land which would not affect site integrity.

1 and 2: The approach NRC has followed in defining requirements for safe disposal of LLW is to establish controls for each of the principal components of a "disposal system" -- the waste form and package, site characteristics, facility design and engineering, and institutional controls. The comments supported continued use of institutional controls and defining a finite time frame for assumed reliance on such controls. Complete reliance is not placed on any one component part (e.g., waste form) but each acts with the others to collectively ensure safe disposal over the long term. Thus, Part 61 does not assume total and complete reliance on institutional controls to prevent disturbance of the waste. Rather Part 61 assumes reliance on active institutional controls for a limited time frame (100 years) after which the waste form, site characteristics, facility design and operation and "passive" institutional controls, such as records and continued government land ownership collectively continue to provide

the necessary controls. The classification system proposed in Part 61 requires that wastes which will still present a significant potential hazard if disturbed at the end of this 100 year institutional control period must be placed into a stable form or container such that they will be recognizable as waste and less dispersable. Part 61 also requires that wastes which continue to present significant potential hazard at the end of 100 years must be disposed of with further additional controls (e.g., deeper burial) which will further limit the potential of their being disturbed. Thus, Part 61 does provide greater controls for disposal of waste which would continue to present a potential hazard after the end of the assumed 100-year institutional control period.

3: A remaining and basic question is how long reliance should be assumed for active institutional controls. Based on work performed by EPA; public comments on a preliminary draft of Part 61 and an advance notice of proposed rulemaking; and 4 regional workshops, a consensus of public opinion was developed which supported use of a time period of 100 years. Based on the analyses in the EIS, NRC found no overly compelling reason to select one particular institutional control period over another and the limit of 100 years for assumed reliance was based primarily on public opinion. Use of a longer institutional control period would allow higher concentrations of some radionuclides to be disposed of as Class A waste. Using a longer period would, however, increase the costs for long term surveillance and monitoring of the site. In addition, the assumed length of institutional controls and the dose limit used to control exposures to an inadvertent intruder are directly related. Thus, increasing the length of the institutional control period has to be examined in the context of comments that the dose limit established for protection of the inadvertent intruder should also be raised. (See comments on § 61.42.) Based on consideration and balancing of these two aspects NRC has decided not to increase the assumed period of 100 years upon which reliance can be placed on institutional controls. Rather, NRC has reevaluated the calculations that establish the waste classification concentration limits to eliminate unnecessarily conservative assumptions with the result that the analysis is more realistic and the limits for several important nuclides have been raised. With this action, the NRC believes that most of the concerns of those who encouraged higher exposure limits, less emphasis on protection of intruders and use of a longer institutional control period will have been met. (See comments on § 61.42 under Issue C-4 for further details and discussion.)

4: As stated in the EIS, NRC intended and would allow flexibility in control of site access including productive uses of the land provided it did not result in disturbance of the waste or affect long term site performance.

Rule Change: Based on the staff's analysis of comments, the institutional requirements in § 61.59 have not been changed. Section 61.7(b)(4), "Concepts," however, has been modified to allow flexibility in controlling site access including productive uses of the land during the active institutional control period. It reads as follows:

> (4) Institutional control of access to the site is required for up to 100 years. This permits the disposal of Class A and Class B waste without special provisions for intrusion protection, since these classes of waste contain types and quantities of radioisotopes that will decay during the 100-year period and will present an

acceptable hazard to an intruder. The government landowner administering the active institutional control program has flexibility in controlling site access which may include allowing productive uses of the land provided the integrity and long-term performance of the site are not affected.

ISSUE D-59-3

Issue: Land ownership-miscellaneous

Commenter: Ontario Hydro (51)
Union Oil Company of California (66)
Georgia Institute of Technology (70)
Louise Gorenflo (71)
Birmingham Audubon Society (80)
U.S. Department of Energy (119)

Rule Citation: V D of the Supplementary Information, § 61.59

Summary of Comments: Two commenters expressed support of the assurances provided by government ownership and two questioned the need. One questioned NRC authority to regulate federal ownership. One was concerned about the applicant's rights and others questioned whether tribal ownership is permitted.

Analysis of Comments: Ontario Hydro acknowledged that government ownership of land for disposal sites is "certainly an easy way of guaranteeing proper safe use of the land." The commenter also questioned whether NRC could regulate a site if the Federal government owns the land based on the commenter's understanding that one department of the Federal government could not regulate another. The NRC does have the authority to regulate most Federal agencies and routinely issues licenses to VA hospitals, the Departments of the Army, Navy, and Air Force, the EPA, etc. The NRC does not have the authority to regulate Department of Energy (DOE) low-level waste activities. If the DOE will be the custodial agency and provide institutional control, no NRC license would be involved for the institutional control period. Institutional control by other agencies would be licensable. A private sector developer/operator of a site located on land administered by DOE would be licensable. The U.S. Ecology site at Hanford, Washington illustrates. The land is leased by the Federal government to the State and subleased to the operator. The operator is licensed by the State (Washington is an Agreement State) and the NRC.

Gorenflo suggested that quasi-public corporations develop all new sites and assume long term care responsibilities instead of burdening resource limited states. As discussed under Issue E-1, Part 61 provides financial assurances and upfront financial planning to alleviate the resource burden of institutional control. The staff views State or Federal ownership to be a necessary safeguard. The State could fulfill its responsibilities in many ways including a State authority or quasi-public corporation, but the responsibility should be with the more certain established government.

The Birmingham Audubon Society indicated strong support for State or Federal ownership. The staff agrees that this practice should be continued.

The Union Oil Company of California suggested adding provisions to § 61.59 that ownership revert to the applicant if the site is not used for disposal. The Company cited several examples of occurrences that might prompt a change in plans such as adverse public opinion or economics. The Company also felt that the applicant should have the right of first refusal when a site used for disposal is determined safe for other uses. These issues were not addressed in the rule primarily because of the variety of circumstances and roles that may exist in the development of new sites. New sites may be proposed on land already owned by the State or Federal government. These issues may be part of the terms negotiated with the governments. The land value may be one incentive for accepting the institutional committment and responsibility. The rule as proposed does not preclude the return to the applicant. The staff did not adopt the suggestion in order to keep the proposed level of flexibility.

Rule Change: None

ISSUE E-1

Issue: Subpart E - Financial Assurances

Commenters:
Marvin Lewis (3)
Environmental Law Project (9)
The Surety Association of America (20)
Joseph H. White (21)
Commonwealth Edison (35)
Ohio EPA (38)
Chem-Nuclear Systems, Inc. (41)
Ontario Hydro (51)
National Association of Insurance Brokers, Inc. (54)
Union Oil Company (66)
Birmingham Audubon Society (80)
Utility Nuclear Waste Management Group (81)
Northeast Utilities (85)
State of California (93)
Don't Waste Washington Legal Defense Foundation (97)
State of New York (99)
U.S. Ecology (101)
Conference of Radiation Control Program Directors (103)
Kerr-McGee, Inc. (115)
Tennessee Valley Authority (116)
U.S. Environmental Protection Agency (122)
General Research Corporation (123)

Rule Citation: Subpart E - Financial Assurances

Summary of Comments: Approximately two dozen commenters responded to the proposed financial assurance requirements for closure and post-closure care. In general, the commenters expressed support for the rule's establishment of financial assurances for closure and for long term care of a LLW disposal site. Commenters mentioned that the existing history of LLW disposal sites revealed a strong need to require licensees to demonstrate evidence of financial responsibility so that the public health and safety were protected and also so that potential liabilities do not rest with state taxpayers. Several commenters felt that the financial requirements should provide more detail.

One of the major points raised by a variety of commenters including the State of New York was that the proposed regulation failed to address financial responsibility for unanticipated contingencies at a LLW disposal site. One group expressed concern that the regulations set the stage for a "tax-payer funded bailout" of poorly-run disposal sites. They felt the industry should bear these costs, and that the regulations should be written to make this explicit. Another commenter noted that the experience of the State of Kentucky with Maxey Flats emphasized the importance of making contingency funds available in the event that serious problems occur. They felt this issue should be addressed in the rulemaking. One State further noted that the rule failed to mention who would be financially responsible if problems occur at the site that cost more than were budgeted on an assumption of normal operation. These

questions covered a variety of different scenarios (i.e., Acts of God, licensee negligance etc.).

With regard to contingencies, one commenter also asked who would assume responsibility for a site and its accompanying waste when it was closed prematurely by NRC, due to rule violation.

Several commenters felt that the rule could resolve the issue of contingencies by requiring insurance coverage, or specific language that licensees would be required to indemnify well users in case of migration.

A variety of comments were received concerning the short term financial assurances required for closure and decommissioning. Several commenters supported the rule's use of a variety of different options for closure, noting that flexibility was crucial if the proposed rule was to function in a reasonable manner.

Other commenters expressed support for the rule's provision requiring that the amount of surety liability change with changes in cost estimates. One commenter also was concerned that the financial surety arrangements increase in value over time to compensate for the effects of inflation.

Commenters expressed support for the variety of alternatives allowed to demonstrate short term financial responsibility. However, several commenters mentioned that no commercial market exists to provide surety bonds of the type required in the rule.

Commenters were also divided about whether the Commission should allow self-insurance as a financial assurance for closure. Several commenters felt that self-insurance would not satisfy the surety requirements, and they recommended that licensees should be required to place specific funds in escrow to cover costs of decontamination, closure and stabilization. Another commenter suggested that self-insurance be based on an annual submittal of financial reports, i.e., a financial test.

Commenters also expressed support for the need to have a long-term care fund established at the time a license is issued. Some commenters wanted the rule to explicitly require the licensee to set aside funds for long term care. (However, the Commission currently lacks the authority to require a licensee to establish a fund to provide for long term care of the site after the license is terminated.) With regard to this lack of authority, one person suggested that the Commission ask Congress for authority to require financial assurances for licensees for the active institutional control period.

Two commenters addressed the "Superfund" law. White questioned the intent of the statement in the preamble to the rule that some of the requirements in the superfund legislation may be duplicative. EPA addressed this issue, identified releases from Part 61 facilities not in compliance with the license as reportable to EPA and indicated that EPA and NRC should work together to minimize duplicative reporting requirements.

Analysis of Comments: Several commenters expressed support for the financial requirements in the rule. The Don't Waste Washington Legal Defense Foundation stated that such strong assurances are necessary to "discharge our responsibility

to future generations, and to assure that the public will not bear costs which should be borne by the users of the facility. The State of California also supported the need for financial requirements, noting that "such strong assurances are necessary to discharge our responsibility to future generations, and to assure that the public will not bear costs which should be borne by the users of the facility."

Chem-Nuclear, Inc. expressed support for the rule's requirement that an applicant assure funding for site closure and post-closure. They felt this should minimize the potential for operator default or abandonment.

Kerr-McGee disputed the Commission's authority to require financial assurances for closure and for long term care. They asserted that the only authority possessed by NRC to require financial assurances stems from the Uranium Mill Tailings Radiation Control Act of 1978. The Commission staff believes the better legal view to be that Section 161 of the Atomic Energy Act, gives the Commission the authority to promulgate whatever regulations may be necessary and desirable to promote the common defense and security or to protect health or to minimize danger to life or property. If short term financial assurances or other forms of financial sureties are necessary and desirable to achieve the goal of safe closure of a radioactive waste burial site, then such requirements are authorized by the Atomic energy Act of 1954, as amended.

Other commenters also expressed concern that the regulations should be more detailed. The State of California noted that the financial arrangements did not appear to be sufficiently comprehensive, and an individual felt that this section of the rule lacked sufficient detail. U.S. Ecology recommended that definitive criteria be set for financial assurances in order to ascertain whether or not underwriters will accept the risk and default provisions set forth in the regulations. The Commission staff has prepared a draft Technical Position on the Funding Arrangements for Closure and for Long Term Care of a LLW Disposal Site that provides more definitive criteria for evaluating all financial assurances, including surety bonds. The draft has been circulated for review, and the Surety trade association will be asked to provide comments.

Commonwealth Edison and other commenters also wanted more detail in the rules, noting that it contained no details with respect to the amount of financial assurance that each disposal site licensee is required to obtain. The staff considered this regulatory approach to be ill-advised for two reasons. First, the amount of funds necessary for closure and for long-term care is site specific, and will vary depending on the particular site conditions at the time of closure. Therefore, a specific dollar amount in the rule would not be applicable to all site conditions. Second, a rule with specific dollar amounts would become outdated with changes in inflation. Instead, specific cost estimates for closure will be determined in the licensee's Closure and Stabilization Plan.

One of the major points raised by a variety of commenters was that the proposed regulation failed to address financial responsibility for unanticipated contingencies at a LLW disposal site. The Environmental Law Institute expressed concern that the regulations set the stage for a "tax-payer funded bailout" of poorly-run disposal sites. They felt the industry should bear these costs, and that the regulations should be written to make sure this is done. Another commenter noted that the experience of the State of Kentucky with Maxey Flats

emphasized the importance of making contingency funds available in the event that serious problems occur. They felt this issue should be addressed in the rulemaking. The State of California further noted that the rule failed to mention who would be financially responsible if problems occur at the site that cost more than were budgeted on an assumption of normal operation. The State of California was also concerned that State taxpayers rather than waste generators would eventually pay the excessive costs of site maintenance and repair.

These questions cover such a variety of different scenarios (i.e., Acts of God, licensee negligance, etc.) that it is not possible to specifically respond to all of the potential contingencies. However, a general response to the overall issue of responsibility for contingencies at a low-level waste disposal site is possible. These comments cover two different time periods--the post-closure period, when the original license is still responsible at the site, and the institutional control period, when the license has been transferred to the landowner of the site for a period of up to one hundred years. In the case of the post-closure care period, the licensee would be responsible for all activities at the site found necessary by the Commission to protect the public health and safety. Financial responsibility for activities during the institutional control period are a matter to be worked out between the site owner (i.e., the State or Federal Government) and the licensee in their lease or other legally binding arrangement, and it is possible that if the site owner were a state, they would work out an arrangement whereby the site operator would collect a surcharge from waste generators for the institutional control period. The rights and responsibilities of the state and the licensee would be determined at such a time.

With regard to contingencies, the Ohio EPA and Ontario Hydro asked who would assume responsibility for a site and its accompanying waste when it was closed prematurely by NRC, due to rule violation, or when the licensee defaults. Responsibility for a site closed prematurelay by the NRC would depend on the situation. Site closure would be a last resort of the Commission, since the agency has other authorities besides closure, such as civil penalties, to require licensee compliance. However, in the event that it would become necessary to close the site for health and safety reasons, the proposed rule provides that the licensee continues to be responsible until the license is terminated. In the event that the licensee's financial condition deteriorated so that he was unable to maintain the site to protectthe health and safety, then the Commission would probably require the site owner (either the state or federal government) to assume responsibility at the site. However, regardless of who assumed responsibility of a prematurely closed site, the rules require that a licensee have available at all times during the site life, sufficient financial gurantees to ensure that sufficient funds are available for site closure and decommissioning. These funds would be available to properly maintain the site if the original licensee were unable to do so.

Several commenters felt that the rule could resolve the issue of contingencies by requiring insurance coverage, or specific language that licensees would be required to indemnify well users in case of migration. The staff agrees that there is a need for licensees to provide financial responsibility for liability coverage for off-site bodily injury and property damage and thinks the public health and safety and the environment would be protected from unanticipated contingencies by such coverage, as well as assisting the State in establishing

disposal sites. Four existing LLW disposal facilities currently carry this type of liability coverage, and several other State and Federal agencies, including EPA have imposed similar requirements for hazardous and radioactive waste facilities in order to protect the public health and safety and the environment. However, at the present time, the Commission's only statutory framework for establishing such a requirement is Section 170 of the Atomic Energy Act, also known as the "Price-Anderson" Act. This type of coverage is designed to cover "catastrophic events" primarily for nuclear reactor licensees, and this coverage would be in excess of the risk at a low-level waste facility. Therefore, a third party liability requirement is not established in this regulation. The Commission should strongly encourage licensees to continue to carry third party liability insurance coverage through the conventional insurance market.

The State of New York was also concerned that the post-closure maintenance, leachate collection and treatment, cover repair and other likely costs will be underestimated by applicants and accepted by both site owners and the USNRC due to the pressing need for waste disposal site availability. The staff thinks the license review process will provide a basis for all concerned parties to review the licensee's estimates of costs for closure and post-closure care. All parties would have the opportunity to express their view on the adequacy of the licensee's estimates of costs required for closure and post-closure care.

The Conference of Radiation Control Program Directors also recommended that the Commission consider guidelines on methods for determining financial needs for long-term care. General Research Corporation also felt that the contents of the agreements were unclear and that the criteria to be used in evaluating these agreements were not indicated. The Staff has prepared a draft Branch Technical Position on Funding Alternatives for Closure, Postclosure, and Long Term Care that provides guidance on various alternatives States might wish to consider in developing financial arrangements for long term care. Additionally, the draft Environmental Impact Statement (NUREG-0782) accompanying the proposed rulemaking discusses possible financial arrangements for long-term care.

Several commenters expressed opinions on the types of short term financial assurances allowed by the rule. In general, the National Association of Insurance Brokers felt that flexibility was crucial if the proposed rule was to function in a reasonable manner. The proposed rule does allow several types of short term financial assurances; additionally licensees may proposed other financial assurances for closure to the Commission for review.

Other commenters expressed support for the rule's provision that the amount of surety liability should change with changes in cost estimates. The State of California was concerned that the financial surety arrangements increase in value over time to compensate for the effects of inflation. The Don't Waste Washington Legal Defense Foundation noted that Subpart E should be amended to state more clearly that the Commission will review the applicant/licensee's financial assurances periodically, and that the burden of proving adequate financial qualification is on the applicant/licensee. As proposed, the rule would allow the Commission to periodicaly assess the amount of funds collected for both closure and post-closure care of the site. If necessary, the staff could require the financial assurances to be increased to account for inflation and unforeseen problems and costs. The State of California also was concerned

that the short term financial arrangments were not instruments that increase in value over time to compensate for the effects of inflation. As proposed, the rules would allow the Commission to periodically assess the amount of funds collected for both closure and post-closure care of the site. If necessary, the staff could require the financial assurance to be increased to account for inflation and unforeseen problems and costs.

Northeast Utilities suggested that the "pay as you go" funding arrangements for closure should be permitted, instead of surety bonding for an entire site. However, the staff considers that this method of funding does not provide an adequate degree of coverage in the event of premature site closure.

Several commenters mentioned that no commercial market exists to provide surety bonds of the type required in the rule. In developing the rule, the Commission staff is aware that surety bonds of the type proposed in the rule may currently be unavailable. However, the staff included this alternative in the rule in the event that this type of coverage becomes available in the insurance market at a later time.

One commenter noted that insurance could be a viable short term financial assurance against premature site closure. Although not specifically mentioned, the proposed regulations do not exclude the use of insurance for providing financial assurances for closure. If this type of coverage becomes available at a later date, the staff will consider this type of funding assurance if a licensee proposes its use.

Commenters also were divided about whether the Commission should allow self-insurance as a financial assurance for closure. The State of California and The Don't Waste Washington Legal Foundation felt that self-insurance would not satisfy the surety requirements, and the Birmingham Audubon Society also recommended that licensees should be required to place specific funds in escrow to cover costs of decontamination, closure and stabilization. However, Union Oil felt that self-insurance based on an annual submittal of financial reports, i.e., a financial test should be permitted.

Kerr-McGee also felt that prohibiting self-insurance was arbitrary and unsupported. The staff rejected the use of stand alone "self-insurance" based on the staff's lack of confidence in this method to provide adequate assurances. Further, State officials have informally expresed the need to have tangible funds available from the licensee for site closure, so the State as landowner would not be left financially responsible. While not specifically allowing its use on a generic basis in the rule, the staff will evaluate the use of financial tests proposed by licensees on a case by case basis.

Commenters also expressed support for the need to have a long-term care fund established at the time a license is issued. Commenters suggested that licensees should be required to place in escrow funds necessary to cover costs of institutional safeguards for the duration of those safeguards. One suggested that monies should be collected from a tax or fee structure imposed on the licensee that was similar to the cubic meter surcharge imposed on waste disposed of at the site.

The State of California also suggested that a sinking fund would be a preferable vehicle for funding for the institutional control period. The Tennessee

Valley Authority felt that it would be preferable to have the licensee turn over the site and any required money at the time the license is transferred to the Government. The Commission currently lacks the authority to require a licensee to establish a fund to provide for long term care of the site after the license is terminated. Instead, the Commission can only require a licensee to provide evidence of entering into a lease or other binding arrangement with the site-owner indicating that the two parties have established financial responsibility for long term care between themselves. The proposed regulations do not therefore require a licensee to establish or tie up funds for the long term care period, so the licensee is not required to turn over any required money at the time of the license transfer.

With regard to this lack of authority, the State of California suggested that the Commission ask Congress for authority to require financial assurances for licensees for the active institutional control period. The Commission has raised this issue before Congress several times; for example, see the testimony of Joseph Hendrie before the House Committee on Science and Technology, November 7, 1979; and Statement of John Ahearne, before the House Subcommittee on Energy and Power, July 25, 1980. Additionally, NRC staff provided comments on November 6, 1981 to Congressman Udall's Committee on Interior and Insular Affairs supporting the provision in H.R. 3809 that provided the Commission with this type of enabling authority.

The General Research Corporation outlined several areas where more prescriptive requirements and clarification should be considered. While many of the observations and comments have merit, they represent a level of detail the staff prefers to relegate to Branch Technical Positions and eventually regulatory guides.

With respect to the superfund issue, the EPA comment is self-explanatory and states:

> NRC solicited comments on possible duplicative requirements for effluent releases and broker activities under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). This "Superfund" law exempts from notification "any release of source, special nuclear, or byproduct material... in compliance with a legally enforceable license, permit, regulation, or order issued pursuant to the Atomic Energy Act of 1954" (CERCLA Section 101(10)(K)). Radioactive releases from nuclear waste disposal facilities which are not in compliance with an NRC license, permit, regulation, or order fall within the reporting requirements of CERLA. Furthermore, as part of the notification regulations under CERCLA, EPA is planning to develop a notification scheme for releases of radioactive materials not licensed under the Atomic Energy Act of 1954 or the Uranium Mill Tailings Radiation Control Act of 1978. EPA wishes to minimize duplicative reporting requirements for releases reported to other agencies. EPA intends to work with NRC to minimize duplicative reporting requirements to the extent possible.

NRC staff agree that duplication should be minimized and will work with EPA to eliminate potential overlapping regulatory requirements.

Rule Changes:

1. Amend § 61.62(e) to read:

   (e) The term of the surety mechanism must be open ended unless it can be demonstrated that another arrangement would provide an equivalent level of assurance. This assurance could be provided with a surety mechanism which is written for a specified period of time (e.g., five years) yet which must be automatically renewed unless the party who issues the surety notifies the Commission, the beneficiary (site owner) and the principal (the licensee) not less than 90 days prior to the renewal date of its intention not to renew. In such a situation the licensee must submit a replacement surety within 30 day after notification of cancellation. If the licensee fails to provide a replacement surety acceptable to the Commission, the Commission will collect on the original surety.

ISSUE E-2

Issue: Optional financial report

Commenters: State of New Mexico (4)
U.S. Department of Energy (119)

Rule Citation: § 61.80(g)

Comment: Delete words "if any".

Analysis of Comment: The commenters suggested that licensees should be required to furnish an annual financial report. Deleting the "if any" flexibility would require the licensee to generate a new report even if such reports were normally generated every two years or were delayed, for example. The optional filing was provided to minimize the burden on the licensee. Section 61.62(c) requires the Commission to review the adequacy of surety mechanism for closure funding annually. Information on financial status will be important to this review and the Commission agrees with the commenters concerns. Section 61.80(g) was modified to require a annual certified financial statement and permit the annual report to meet the requirement. All companies must evaluate finances at least annually for tax purposes so the change should not be a burden.

Rule Change: Amend 61.80(g) to read: Each licensee authorized to dispose of radioactive waste received from other persons shall file a copy of its financial report or a certified financial statement annually with the Commission in order to update the information base for determining financial qualifications.

ISSUE F-1

Issue: State and tribal participation

Commenters: State of New Mexico (4) & (45)
Chem-Nuclear System Inc. (41)
American College of Nuclear Physician (53)
Department of Planning and Economic Development Hawaii (65)
Georgia Institute of Technology (70)
Yakima Indian Nation (74)
Georgia Yuan (77)
Birmingham Audubon Society (80)
Utility Nuclear Waste Management Group (81)
State of California (93)
Don't Waste Washington Legal Defense Foundation (97)
U.S. Department of the Interior (114)
Department of Energy (119)

Rule Citations: Subpart F - Participation by State Governments and Indian Tribes (§§ 61.70 - 61.73)

Summary of Comments:

Five commenters recommended replacing "may" with "shall" in § 61.71 so that the function is an obligation. Two commenters were concerned with relying on Federal Register notices to inform States and tribes. Two commenters requested clarification of Agreement States' role in § 61.70. Three commenters were concerned with limiting participation to those truly involved or affected. One commenter noted that the rule gives ample opportunity for expression of State concerns and three commenters believed additional provisions should be made. One commenter suggested reconsidering the notice of intent. Two felt a better public participation program is needed. One suggested a requirement to comply with state laws. One suggested additional uses of "shall." One suggested Burau of Indian Affairs involvement.

Analysis of comments:

The commenters are correct that making Commission staff available is an optional function in § 61.71 as proposed. Staff was concerned about possible budget restraints, especially on travel funds, when making the function optional. Changing to "shall" obligates only staff time not travel so the suggested change was adopted.

The reference to notice in the Federal Register in § 61.72(a) was used to establish a date to begin counting the 120 days. It was not meant to be the requirement for notification. Notification of States and tribes is covered by proposed revised § 2.101(b). Direct notification is required.

Agreement State participation under Subpart F is not specifically addressed. Since Commission licensing would be in non-Agreement States, the most likely affected States are non-Agreement. However, location near a State border or

other circumstances might lead to participation by more than one state. Thus, no restrictions based on Agreement status was intended and the language in the rule does not impose any restrictions.

The concern that participation be limited to those truely involved was considered by the staff in developing the decision criteria in §61.73 and true involvement will be considered in the review of proposals.

Georgia Institute of Technology comments focused on the apparent potential for conflict between State, Federal, and tribal laws and questioned which would prevail or is a case-by-case determination required. Overlaping authorities and multiple permitting and licensing are an everyday fact of life. The potential exists for conflict but the constantly changing nature of the requirements and the variety of requirements and authorities preclude any generic statement on this issue. The commenter also questioned the meaning of "relevant tribal law" in § 61.72. Such questions are resolved on a case-by-case basis. No change to the rule was adopted.

Georgia Yuan addressed State and Tribal participation as part of the overall political context and noted that the traditional licensing process that uses formal hearings to resolve issues important to the public and local governments is not a satisfactory solution to gaining public acceptance of sites. She outlined the following weaknesses in the procedures for State and Tribal participation proposed in Subpart F: lack of decision making power, lack of guarenteed influence over decisions, lack of standards for approving participation, and no guarenteed pre-application involvement. She suggested reconsidering the requirement for a notice of intent 3-6 months prior to submitting an application and requiring documentation of early public input and participation.

Yuan addressed, in very general terms, the construction of a successful public participation program. The following goals were suggested:

1. identification of public opposition or support and its causes;

2 identification of local or State preferences for locations within the State or region for radioactive waste disposal;

3. identification of preferences for State or Federal ownership after disposal operations have ceased; and

4. identification of the need to compensate the local population for increased risks resulting from waste disposal.

She encouraged educational opportunities and local citizen involvement not just States and Tribes. She identified NRC use of public opinion and input as a key issue. Her bottom line was "The Commission must seek a more interactive relationship with a broad spectrum of the public before it can begin to define the public interest and rely on it in its licensing decisions."

Yuan's dissatisfaction with the hearing process and public input into regulatory decisions is a generic one - not limited to LLW disposal. Waste disposal is noted as an area of particular concern to the public. While the Commission acknowledges the concerns and problems and that informed public input is particularly important in LLW disposal, it does not believe that the Part 61

rulemaking in the proper forum for resolving this generic problem. The EIS scoping process will be used to address many of Yuan's concerns. State compacting and landlord activities afford additional potential avenues of expression since States will face the same criticisms and must address public input into their decisions. The LLW Policy Act is particularly important in this reguard and will establish the siting arena where early input is so very important.

The State of California expressed general concern about the "tenor" of Subpart F. The State recommended that the Subpart be completely revised to reduce the adversary tenor and facilitate collegially between the Federal government and the States. The State also believed that the 120 day time limit may be too short for States. Staff disagrees based on State and compact responsibilities under the Low Level Radioactive Waste Policy Act of 1980. Replacing "may" with "shall" in § 61.71 was specifically recommended and was adopted as noted earlier. No specific suggestions for addressing the "tenor" were offered. Funding of participation by local governments was suggested as one step in providing a means for local governments to have a voice in whether and how a disposal site is established in their locale. As noted in Issue F-2, the Commission cannot fund intervenors and cannot commit to funding in a rule. Funding must be congressionally approved through the budget process. One State agency stressed the importance of § 61.72 and State participation in the decision process.

The Don't Waste Washington Legal Defense Foundation "believes that the states have and will continue to assert strong leadership roles in management of radioactive waste." The foundation expressed the view that State concurrence should be required for all licensing actions (i.e., issuance, amendment, renewal, termination). Editorial changes to reflect state concurrence and the compliance with state laws that are consistent with the requirements of the Commission were suggested. Changing "may" to "shall" and similarly stronger statements were suggested for §§ 61.7(c)(1), 61.71, and 61.73. The changes to require state concurrence and Commission findings on compliance with state laws were not adopted.

The Commission agrees that state leadership is essential and that the LLW Policy Act is a key factor. The Commission expects to work closely with the States and does not believe that Part 61 should be amended to reflect Policy Act responsibilities or to put the agency in the position of enforcing State laws or determining compliance with State laws. The Policy Act should give the States adequate voice without explicit concurrence provision in the rule. The suggested uses of shall were adopted or clarifying language adopted.

The U.S. Department of the Interior suggested coordination and participation by the Bureau of Indian Affairs (BIA) when sites are to be located on Indian reservations. Area BIA directors and the BIA Office of Trust Responsibilities should be specifically involved. The Department's comments were based on potential sites being located on Indian reservation. Such location is not provided for in the rule. Only State or Federal ownership is allowed. The Federal ownership was not intended to include Indian reservation where the trust responsibilities would come into play. Tribal land ownership and custodial responsibilities was an alternative considered but not adopted. The Department's comment is a good one for assuring involvement of key people to deal with concerns of affected tribes. Disposal sites might be located or lands where residual tribal rights exist or where transportation access involves the reservation. Being host to the site is not a prerequisite for participation

under Subpart F. Reference to BIA was added to the list of people to notify when an application is tendered in 2.101(b) to foster early BIA involvement.

Rule Changes:

1. §61.71 State and Tribal government consultation.

   Upon request of a State or tribal governing body, the Director shall make available Commission staff to discuss with representatives of the State or tribal governing body information submitted by the applicant, applicable Commission regulations, licensing procedures, potential schedules, and the type and scope of State activities in the license review permitted by law.

2. Change last sentence of 61.71 to read: In addition, staff shall be made...

3. Change 61.73(a) to read: "...the Director shall arrange..."

4. Add to 2.101(b)(1)(i): "The Commission will also inform the U.S. Bureau of Indian Affiars when tribes are notified."

ISSUE F-2

Issue: Local government government role and rights

Commenters: Township of Lower Alloways Creek, New Jersey (88)
State of California (93)

Rule Citations: §§ 2.101(b)(1)(i), 61.59, 61.50-73, 61.80

Summary of Comments: The township raised the following issues: advance notice to local governments that an application will be filed, include nearby nuclear activities in the site EIS, the need for additional assurances to local government on landlord performance, receipt of disposal records during operations, involvement in closure amendments, compensation for property devaluation, and annual public seminars. California raised the issue of funding local participation.

Analysis of Comments: Early working drafts of proposed Part 61 included a provision for applicants to file a notice of intent to file an application 3 months before filing. Local officials would have been notified of the applicant's intent. The requirement was not included in proposed Part 61 because it added an administrative burden on the applicant, early state input would probably be involved without it because of LLW Policy Act activities, and a tendering step or other means could accomplish the objective of early notice. Section 2.101(b) requires notification of local officials at the tendered step but the officials will likely be involved much sooner. States and tribes may submit proposals for participation under Subpart F of Part 61. The State and tribal plans for local participation is a required item in proposals. Local governments should be involved in the State efforts at an early stage in the Policy Act compact activities and the applicant should also work closely with local officials to identify key concerns and reflect those concerns in the environmental report and application. The notice of intent concept was not adopted in the final

rule since staff believes ample opportunity exists for local officials to be heard and, if not, case-by-case considerations are possible. Local officials can also pass ordinances requiring notification separate from Part 61 if local ordinances and zoning activities do not already provide an opportunity for input.

The township's suggestion that the environmental impact statement (EIS) for a specific site should include consideration of the impacts of other nuclear activities in the area was noted by staff. However, Part 61 does not address the required content of an EIS so no rule change is involved.

The township expressed the view that local governments need additional assurances that the State or federal government will fulfill obligations as landlord and long term care custodian for site security and environmental monitoring. The commenter suggested that the State or Federal government enter into a contract with the local community for corrective measures in the event of contamination problems and post bonds. It is beyond the Commission's authority to require such contracts and bonds so the suggestion was not adopted.

The township also suggested approval rights for local governments for long term care funding arrangements. The Commission can certainly consider local views in its review but cannot delegate its decision responsibilities. In some cases, there may be no local community or government and each long term funding arrangement may be unique. For these reasons, no provision for local government approval was added to § 61.63 which addresses financial assurances for institutional or long term care.

On the issue of providing disposal records to local officials during operations, the township expressed scepticism about making arrangements with the State and believes records would reduce public concern. Under proposed 61.80(e), records are to be transferred at license termination to local officials, among others. Thus under the proposed rules, local officials might not receive disposal records until after a hundred years of custodial care. The disposal facility operator is required to keep and report data on disposed wastes all during operation. Annual reports on disposal are required by § 61.80(h). All local officials may not want the burden of receiving, filing, and storing shipping records. Therefore, since the annual reports are on file with the NRC, local officials who wish may request copies of the annual reports.

The township wanted assurances that local officials would be notified of applications for closure and that hearings would be offered. Section 61.25 specifically provides for 30 days notice of hearings for closure amendments. Proposed § 2.104(e) requires notice to local officials for Part 61 licenses but not amendments. A requirement to notice State and local officials was added to § 61.25 in response to the commenter's concerns.

The township's suggestion that compensation for loss of property values or tax bases be provided is beyond the Commission's authority and could not be adopted.

The Township's suggestion that disposal facility operators hold annual educational seminars is a good one for operators to foster good neighbor relationships. Staff has reservations about mandatory seminars since there may be no local community or no interest by the local community and public relations efforts are normally beyond Commission requirements. Chem-Nuclear System, Inc.

conducts orientation tours and works closely with local officials in Barnwell, S.C. No State or Federal prodding was necessary to foster this relationship - it is good business practice.

The State of California points out that NRC retains sole authority to issue the license for a Part 61 facility and references state and tribal participation in § 61.70-61.73. The state expressed the view that local jurisdictions should have a voice in the decisions and that the Commission should consider funding such participation. The reference to local jurisdiction is not clear and is probably to State and tribal jurisdictions when considered in context. At any rate, the Commission lacks authority to fund intervenors in cases whether local, State, or Tribal. The participation provisions in Subpart F assisting the Commission in its reviews may or may not involve funding. The Commission cannot commit to funding in a rulemaking.

Rule Change: Add to § 61.25 "The Commission shall provide a copy of the notice of opportunity for hearings in paragraph (a)(1) of this section to State and local officials or tribal governing body specified in § 2.104(e) of Part 2 of this chapter."

ISSUE G-1

Issue: Subpart G records, reports, tests, and inspections

Commenters: Exxon Nuclear Company (15)
Joseph H. White III (21)
American Nuclear Society (87)
State of California (93)
Atomic Industrial Forum (100)
Conference of Radiation Control Program Directors, Inc. (103)
Caroline Power and Light Company (106)
American Society of Mechanical Engineers (107)
New England Nuclear (110)
U.S. DOE (119)
U.S. EPA (122)

Rule Citations: §§ 61.80, 61.82

Summary of Comments: One commenter suggested that any release to unrestricted areas be immediately reported to and investigated by NRC. One suggested duplicate sets of records. One emphasized use of existing forms and documents. One suggested a resident NRC inspector and two, state participation in inspections. One suggested specifying record recipient and one suggested a requirement to maintain records during institutional control and require the operator to transfer records to the landlord at license transfer. Several suggested that § 61.82(a) be modified to clearly preclude inspection of wastes after disposal.

Analysis of Comments: Mr. White addressed paragraph (h) of § 61.80 which requires annual reports by each Part 61 licensee. He suggested that any release to unrestricted areas be immediately reported to and investigated by NRC. The listed required contents include in (2)(i), "specification of the quantity of each of the principal radionuclides released to unrestricted areas in liquid and in airborne effluents during the preceding year." The intent was to require licensees to report releases made pursuant to § 20.106 of Part 20 and any specific requirements in the license. The report would be of a summary nature and the reporting requirement would not relieve the licensee from reporting incidents as required by 20.403, excessive levels as required by 20.405, or exceeding action levels in operating procedures.

As a practical matter, only minimal effluent releases are expected from disposal facility operation. (Effluents are releases from stacks, pipes, filter exhausts etc.) The exhaust from the ventilation system of a storage building is one example. A second is slightly contaminated precipitation which collects in operational trenches and might be pumped out and released. Action levels for these effluents will be established in the licensee's operating procedures. The action levels and releases are subject to ALARA evaluation also. It is unrealistic to assume that these releases will be zero. They may not be at detectable levels but they will not be zero. The commenter's suggestion is not realistic and would place an undue hardship on both the licensee and the NRC and was not adopted.

The State of California expressed support of NRC opportunity for inspection as provided for in proposed § 61.82. The State also requested an explicit provision "that host states enjoy a similar right." The host State will most likely be landowner and long-term custodian to provide institutional control. Both of these functions provide a means for assuring State inspection rights separate from any explicit provision in the rule. The lease can address the issue. The agreement to assume responsibility for institutional control can also address the issue. An additional mechanism is licensing NARM (naturally occurring and accelerator-produced materials) by the host States. The Commission lacks authority to license these materials and if the State has a licensing program for the materials, it can issue a license for disposal of these materials. Its licensing program should include inspection rights. For the improbable case of Federal landownership and operation, the issue can be addressed on a case-by-case basis through memoranda of understanding between the parties. Since options exist for the States, no change to the rule was adopted.

The Conference of Radiation Control Program Directors suggested a requirement for maintenance of a duplicate set of vital records in § 61.80. The duplicate set should be at an alternate location in case of fire or other loss of the primary records. While the Commission shares the Conference's concern that records are important to both the operator and the custodian, for evaluating monitoring data, closure, remedial actions, etc, it feels that a requirement for duplicating all records and storing them elsewhere is not warrented. No such requirement exists for other records in any of the Commission's regulations at this time.

Carolina Power and Light Company encouraged the use of existing forms and documents where possible to minimize the administrative burden. Such use is certainly the Commission's intent in § 61.80 and in the proposed new manifest system in § 20.311. The commenter did not suggest any changes to the rule or mention any specific requirements. Staff agrees with the thrust of the comment.

New England Nuclear recommended two additional safeguards concerning inspections. One was to assign a full-time NRC inspector to each site during the operational phase. A second was to encourage active monitoring and review of site records by State authorities. Section 61.82 allows Commission inspection but does not require it or require it at any frequency. The staff agrees that inspection is an important safeguard. The Commission participated in the full-time inspector program the States of S.C., Washington, and Nevada instituted in 1979 when lack of compliance with DOT shipping requirements was found to be significant. In effect, the inspectors were an independent quality control program on incoming shipments. Such independent quality control on incoming shipments and on all aspects of site operation may not be necessary at all times. Flexibility to adjust priorities should be maintained. The requirement for licensees to bear the expense of inspections under 10 CFR Part 170 is also a factor. The need for thorough inspections and careful quality controls by the licensee and confirmation by NRC are acknowledged but no committment on inspection policy was added to the rule.

The second New England Nuclear recommendation to encourage active monitoring and review of site records by state authorities is a good one. It can be accomplished through memoranda of understanding with States or technical assistance arrangements. If the State is landowner, access to and monitoring

records will probably be a part of that responsibility. Such monitoring and review can be one condition of the certification to assume institutional control. No change to the rule is necessary to implement this suggestion. The Departmentof Energy (DOE) suggested specifying to whom the records will be transferred in § 61.80(b). The suggestion was adopted.

The U.S. EPA suggested that in view the importance on the nature of the hazard of disposed waste that a requirement be added to the rule to require transfer of such records at license transfer to the site owner. The rule has two requirements that address this point: (1) § 61.30(a)(3) on license transfer requires transfer of "necessary records for care: and (2) § 61.80 requires maintenance maintenance of all records unless disposition is authorized and transfer of records on disposed waste to a variety of officials after institutional control as part of license termination. These provisions collectively provide the "positive" requirement suggested by EPA and no further change is needed.

The staff agrees with the commenters who were concerned that the wording in § 61.82(a) implied that wastes would be inspected after disposal and the rule was modified to clarify that such is not the intent.

Rule Changes:

1. Add to 61.80(b) after transferred: "to the officials specified in paragraph (e) of this section."

2. Insert "not yet disposed of" after "inspect radioactive waste" in 61.82(a).

ISSUE Part 2 - 1

Issue: Part 2 - General

Commenters: Exxon Nuclear Company, Inc. (15)
Chem-Nuclear Systems, Inc. (41)
Stone and Webster Engineering Corporation (95)
Atomic Industrial Forum, Inc. (100)

Rule Citations: §§ 2.103, 2.101(b)

Summary of Comments: The three issues raised were the applicability of revised § 2.103 to Part 61 licensees, notification of chief executives for alternative sites, and preparation of value impact statements.

Analysis of Comments: Exxon Nuclear Company and the Atomic Industrial Forum questioned whether revised § 2.103(a) applied to disposal facilities licensed pursuant to Part 61 and recommended wording be included in the paragraph similar to that in revised § 2.104(e). Paragraph 2.103(a) deals with two issues. One is the authority to act on applications and issue the license. The first sentence provides this authority and applies to all licenses under any part of 10 CFR including Part 61 when effective. The second issue and sentence deals with who to notify of the action of issuing a license. The current version of 2.103(a) lists facilities, commercial disposal of wastes from other persons, and high-level waste repositories as categories of licensees requiring notification of State, Indian Tribe, and local officials. The proposed revision was to delete the reference to commercial disposal. The commenter is correct that the notification provision does not apply to Part 61 licensees. The requirement to notify officials of license issuance was moved to the proposed new paragraph 2.106(d). Section 2.106 is entitled Notice of issuance so the move was logical editorially. The proposed 2.106(d) also requires notice for major amendments and is therefore more comprehensive than the present requirement in § 2.103. Proposed 2.106(d) also reflects 2.104(e) wording as suggested by the the commenter. No change to the proposed rule is required. A cross reference was added to § 2.103 to clarify the matter.

Chem-Nuclear Systems, Inc. questioned whether the requirement in proposed § 2.101(b) to notify the chief executivies of locations for alternative sites is consistent with the requirements of Part 51 and proposed Part 61. Specifically, the commenter questions whether specific alternatives sites must be identified in the application. If specific sites do not have to be identified, Part 2 should be amended to delete the requirement to notify the officials. The staff's views on alternative sites are articulated in the draft branch technical position in the site selection discussion on pages 9 and 10 of NUREG-0902. The position states that to meet NEPA, there should be comparison between the preferred site and two or three viable alternative sites. It also indicates that the major portion of detailed site characterization efforts are expected to be performed at the preferred site. Thus alternatives will probably be identified and the notification requirement was retained.

Stone and Webster Engineering Corporation referenced proposed § 2.764(e) which would require Commission approval before the Director of NMSS could issue a license or amendments pursuant to Part 61 and indicated that issuance of the license or amendments should be justified by preparation of value/impact statements. The comment is basically a procedural one indicating a specific method of documenting Commission evaluation. Under the existing provisions of 10 CFR Part 51 and under proposed editorial changes to Part 51, preparation of an environmental impact statement is required for the initial license. (See 10 CFR 51.5(a)(6).) A value/impact statement would duplicate this effort already required in the process. Further, major amendments that involve "actions which may significantly affect the health and safety of the public" would involve environmental appraisals (EA) and probably supplements to the initial EIS or a new EIS because of the "significant affect." Amendments are actions where preparation of EISs is optional (See 51.5(b)(4)(iii)). The EIS, EIS supplement, or EA would include economics - evaluation of costs and benefits - which is the point of the value/impact statement - and would be more comprehensive in scope. The Commission can request supplemental evaluation on a case-by-case basis without imposing another administrative burden on all licensing actions. Thus the commenter's suggestion was not reflected in the final rule.

Rule Changes:

1. Add to § 2.103(a) Note: For notice of issuance requirements for licenses issues pursuant to Part 61 of this chapter, see paragraph 2.106(d) of this part."

ISSUE Part 2-2

Issue: Issuing licenses

Commenters: Isham, Lincoln and Beale for Commonwealth Edison (18)
State of California (93)

Rule Citation: §§ 2.764, 61.3, and 61.7

Summary of Comments: One commenter suggested the option of immediately issuing licenses when the hearing board directs and one expressed reservations about not waiting for all appeals to be resolved.

Analysis of Comments: Isham, Lincoln, and Beale noted the need for "prompt establishment of a Midwest low level waste facility" and expressed concern that proposed language and discussion did not clearly provide the authority to issue a license while administrative and judicial appeals are resolved. The commenter expressed the view that the rule should allow licenses to be effective upon final review by the Commissioners, at the latest.

The existing provisions of § 2.764 do not apply to materials licensees such as disposal facility licensees, since mandatory hearings, construction permits, and operating licenses are not involved. The proposed change to 2.764 to address Part 61 licensing actions reflects Commissioners' desire to review all significant Part 61 licensing actions prior to issuance. The proposed change to § 2.764 has been moved to form a new § 2.765 to avoid amending provisions not applying to materials licensees.

The Commission agrees with the commenter that the option to issue the license without waiting for resolution of all appeals should exist. No changes to the rule or related amendments are necessary to assure this option, however. The Commission doesn't have to wait for court appeals under existing or amended rules. Who issues the license does not affect this option.

The State of California was concerned that the proposed modifications to § 2.764(a)(b) and (e) would render state's appeals ineffectual and cited the State's experience in Commission reactor licensing cases. The Commission's intent is to weigh the issues and decide whether the license should be immediately effective or not. The option to act before resolution of all appeals does not mean that valid concerns would be ignored or that action will be taken before resolution of appeals.

Rule Change:

Move the proposed change to § 2.764 to form a new §2.765.

ISSUE M-1

Issue: General comments on § 20.311

Commenters: The Procter and Gamble Company (6)
University of California, LA (8)
United Technologies/Packard (25)
Howard University (49)
Union Oil Company of California (66)
Georgia Institute of Technology (70)
University of Texas Medical Branch (75)
General Electric (89)
Stone and Webster Engineering Corp. (95)
Health Physics Society (96)
Atomic Industrial Forum, Inc. (100)
U.S. Ecology (101)
The American Society of Mechanical Engineers (107) & (113)
New England Nuclear (110)
Tennessee Valley Authority (116)
Texas Department of Health (117)
U.S. Environmental Protection Agency (122)

Rule Citation: §20.311

Summary of Comments: Two commenters addressed chemical form. One addressed exempting Class A wastes. One requested clarification of most of the information requirements in § 20.311(b). One commenter suggested adding dates activities are specified and two suggested adding radiation levels. Two suggested reducing the 60 day disposal facility report period. One requested clarification of Class A waste form requirements. One addressed duplication of manifest transfer requirements when waste collectors are involved. Two were concerned about delays until forwarded copies are received. The Health Physics Society raised several points for clarification. Two encouraged compatibility with existing systems. One commenter addressed the required number of copies and two addressed the inspectability of the system. One suggested relief from classification as A, B or C when transferring to processors. One addressed the logistics of prior notification. Two suggested placing the system in 10 CFR Part 71.

Analysis of Comments: The Proctor and Gamble Company comments were primarily focused on exempting Class A wastes from most of the manifest requirements as discussed and rejected under Issue 1-4. Specifically, the Company recommended that 20.311(e)(8), (f)(1), (h)(1), and (h)(2) apply only to Class B and C wastes. The Company also recommended inserting "general" before "chemical form" in 20.311(b) which lists required information in manifests to provide additional relief and flexibility. The University of California was also concerned about chemical form and recommended a 500 gram cutoff for specifying chemical form as discussed and rejected under Issue M-4. Some relief was provided by inserting "principal" without quantifying what "principal" means.

United Technologies/Packard suggested that the meaning of the information requirements in § 20.311(b) be clarified (i.e., person generating the waste, type of waste, waste volume and mass, radionuclide identity and concentration, and total activity). The definition from the Environmental Protection Agency's rules in 40 CFR 260.10(a)(26) was suggested for guidance to clarify that the individual who generated the waste was not intended. The use of person was in the same sense as defined in § 61.2 and is the licensee. The purpose of identifying the generator was twofold: 1) to provide a source of information about the waste if questions or problem arise and 2) to enable development of a representative data base showing factors such as actual generators, type of licensee, and state where generated rather than data skewed by large volumes from brokers or waste collectors. Packard suggested "physical description" instead of "type of waste" to clarify intent. This suggestion was adopted. Packard questioned whether drum size (e.g., 55 gallons) was adequate specification of volume. Drum size is acceptable. Disposal charges are usually based on volume and no burden is involved in specifying volume. Packard indicated that the weight of the drum or package might be difficult to determine without large scales. Weight would likely be estimated for handling or freight charges but staff agrees that it might be difficult and that the information is not essential so mass was deleted. The difficulties in specifying radionuclide identity, concentration, and total activity are addressed elsewhere.

Howard University suggested that the specification of activity be as of the generation date. Such specification would be useful for evaluating radioactive decay of short-lived nuclides during storage at the site of generation, and during collection and transport to the disposal site. The suggestion was not adopted. The decay before shipment should be taken into account by the generator preparing the manifest. Howard also recommended reducing the 60 day time period in 20.311(g)(5) for reports by disposal facility generators when shipments do not arrive within 60 days after advance manifests are received. This suggestion was not adopted since the facility operator reports are a backup system for checking to see that shippers, i.e., waste generators or waste collectors have conducted required investigations. Shippers must investigate within 20 days. Georgia Institute of Technology made a similar point.

Union Oil Company suggested that § 20.311(d) be clarified to indicate which sections of § 61.56 are applicable to Class A wastes. Section 61.56 is being restructured to clarify which requirements are applicable to which class of waste alleviating the need to clarify § 20.311(d).

The University of Texas Medical Branch expressed the view that paragraphs 20.311(d)(1) and (2) duplicate the requirements of (e)(3) and (4). Paragraphs (d)(1) and (2) deal with generators preparing and labeling the wastes and (e)(3) and (4) deal with collectors forwording and including manifests. The commenter appears to be objecting to filling out a manifest when the collector is going to fill one out for sending the waste to the disposal site - a duplication of effort. The uncertainty about roles when the collector picks up the shipments at the site of generation also appears to be part of the issue. The commenter is correct that some duplication of effort is involved. However, the duplication serves at least two purposes: (1) emphasizing the waste generator's responsibilities for providing correct information on waste content and (2) documenting the responsibility through the certification required. Thus, the requirement was retained.

General Electric and the American Society of Mechanical Engineers expressed similar views on the need to forward a copy of the manifest. The commenters were concerned that shipments must be delayed until the advance copies are received. Such receipt was not intended. The intent was to ship and independently forward a copy at the same time. The wording in 20.311(d)(5) to forward "at the time of shipment" was intended to make this point. When a shipment is picked up f.o.b. the generator's facility, the manifest can be transferred at that time. In addition, the society recommended adding the "radiation level" to the manifest.

Stone and Webster Engineering Corporation also suggested that radiation levels be included in the required content of manifests in § 20.311(b). The DOT regulations have specific requirements for radiation levels and transport indices in shipping papers and labeling. No exemption from these requirements is given by the rule and in view of the complexity and potential for modification of the DOT regulations, the requirements were not repeated and the suggestion was not adopted.

The Health Physics Society expressed concern about the long term generator liability implied by the certifications concerning waste characteristics in 20.311(c) as required of generators in (d)(1) and waste processors in (f)(3). This issue is discussed under § 61.56 of the rule and issue M-2 on quality assurance. The society also raised several questions about the discussion of the system in the Supplementary Information. The intent and implications of the reference to improving the credibility of decisionmakers was one question. The improved data base will be helpful to licensing agencies, State and compact groups, and disposed facility operators in that actual data on shipments will be available not gestimates or extrapolation from surveys. The staff cannot quantify the incremental cost of manifest system or the value of more informed decision. Incremental costs of the system are small since existing practices cover most of the requirements. The system does require generators to comply with slightly modified DOT requirements as observed by the Society. The rule was changed to emphasize that one set of papers may be used for NRC and DOT requirements in response. The society's question about the meaning of inspectable is addressed in the following discussion of New England Nuclear's comments.

The Atomic Industrial Forum urged that manifest requirements be compatible with existing requirements to minimize duplication. The U.S. EPA noted that the NRC manifest system and EPA hazardous waste manifest system as a minimum must be compatible and encouraged future coordination. Staff concurs.

Minor conforming changes to the information required on the NRC manifest in § 20.311(b) were made to reflect the joint EPA/DOT proposed Uniform Hazardous Waste Manifest (47 FR 9336, March 4, 1982). For example, use of the transporter's EPA hazardous waste identification number was added as an option. Use of a single form and/or use of this joint standard form was highlighted in the Supplementary Information position of the final rule and the rule itself.

U.S. Ecology observed that the requirements of § 20.311 can apparently be met with 3 copies of the manifest but that 5 copes have proven useful in everyday practice. Staff preferred to let the parties involved determine the number of copies needed for other purposes and did not specify numbers of copies.

New England Nuclear recommended that a procedure be developed to integrate enforcement agencies into the control or supervision of the manifest system. A requirement for the site operator to return a receipted copy of the manifest to the generator and to require the generator to maintain files of shipment manifests and backrouted receipts was suggested as a possible procedure. Inspectors could review the files during routine inspections of the generators. The Commission agrees that such a procedure has merit and that the proposed language did not indicate how to generate inspectable records. The intent in the proposed rule was to rely on existing requirements in Parts 30, 40, and 70 (see §§ 30.51(c), 40.61(c)(3) and 70.51(b)(5)) for maintaining records of transfer of materials. These requirements could be met by keeping copies of the manifests. However, retained copies, receipted copies or documentation of receipt by telephone acknowledgement would not be required. The commenter rightly points out that the proposed system does not guarantee inspectable records at the generator's facility and should since the generator has prime responsibility and the rule was changed accordingly. The system does provide an inspectable cross check by having the disposal facility operator report when a shipment has not arrived within 60 days after the advance manifest was received. The Commission can thus compare reported investigation to lists from facility operators and investigate any discrepancies. To guarantee inspectable records at the generator's facility § 20.311(d)(7), (3)(5) and (f)(8) were changed to require the manifest or equivalent documentation such as a computor printout containing the same information and a binding acknowledgement as a specific way to meet existing recordkeeping requirements. Thus the new language would require maintenance of records for the same time periods but would exclude recordkeeping options such as log entries only.

Parts 50, 60 and 72 contain no specific provisions on maintaining records of transfers of materials. Each is noted below:

Part 50 - No specific transfer or records of transfer requirements. All transfers done under Part 30, 40, or 70 possession licenses.

Part 60 - No specific transfer or records of transfer requirements. Only licensee will be DOE should be little or no waste to a Part 61 facility.

Part 72 - No specific transfer or records of transfer requirements except safeguards reports in 72.54 for spent fuel. Will be less than 10 licensees. Should only be a small amount of wastes from water treatment systems that would ever be consigned to a Part 61 facility.

The Texas Department of Health expressed the view that generators shipping to intermediate processors should not have to package and classify wates as Class A, B, or C. The concern was the unnecessary expense of Class B or C packaging. Staff agrees and Class B and C packaging requirements were not intended to apply to transfers to intermediate processors where the waste was to be treated or repackaged. The wording was revised to clarify this point.

The Tennessee Valley Authority noted that copies of the manifest forwarded at the time of shipment to the intended receipient (as required of 20.311(d)(5) for example) by mail would probably not reach the recepient before the waste shipment. It would not be prior notice. The commenter's observation is true, but the purpose of forwarding a copy was to provide a means of cross checking

on shipments. The disposal facility operator is required to check the independently forwarded copies against shipments received and report any mismatches. Prior notification was not the prime purpose. Any State or facility operator requirements for prior notification are in addition to the manifest system. However, the manifest can be used for prior notice if desired. The Authority also suggested use of DOT forms and placing the requirements in 10 CFR Parts 61 or 71 not Part 20. The manifest includes additional information not included in DOT papers so this suggestion was not adopted. The manifest should suffice as DOT papers so only one set is required and no duplication should result. The requirement was placed in Part 20 with other waste disposal requirements since it applies to all licensees transferring wastes and Part 61 applies only to disposal facility licensees and not in Part 71 since Part 71 deals with packaging requirements that apply to all radioactive shipments not just waste shipments. The Health Physics Society also suggested considering adding the requirement to Part 71.

Rule Changes:

1. Change "type of waste" to "physical description of waste" in § 20.311(b), add "principal" before "chemical form", and delete "mass".

2. Add to 20.311(b): "The manifest required by this paragraph may be the shipping papers used to meet Department of Transportation regulations, or requirements of the receiver, provided all the required information is included."

3. Amend 20.311 (d)(7) to read:

   (7) Retain a copy of the manifest and documentation of acknowledgment of receipt as the record of transfer of licensed materials as required by Parts 30, 40, and 70 of this chapter.

4. Amend 20.311(e)(5) to read:

   (5) Retain a copy of the manifest and documentation of acknowledgment of receipt as the record of transfer of licensed material as required by Parts 30, 40, and 70 of this chapter.

5. Amend 20.311(f)(8) to read:

   (5) Retain copies of original and new manifests and documentation of acknowledgment of receipt as the record of transfer of licensed materials as required by Parts 30, 40, and 70 of this chapter.

6. Amend § 20.311(d) to read: Any generating licensee who transfers radioactive waste to a land disposal facility or a licensed waste collector shall comply with the requirements of subparagraphs (1) through (8). Any generating licensee who transfers waste to a licensed waste processor who treats or repackages waste shall comply with the requirements of subparagraph (4) through (8).

ISSUE M-2

Issue: The quality assurance requirements in §20.311

Commenters:
The Proctor and Gamble Company (6)
Exxon Nuclear Company (15)
Dow Chemical (17)
United Technologies/Packard (25)
NASA, JFK Space Center (26)
Los Alamos National Laboratory (43)
Georgia Institute of Technology (70)
University of Texas Medical Branch (75)
Northeast Utilities (85)
Health Physics Society (96)
Atomic Industrial Forum (100)
The University of Texas System Cancer Center (105)
The American Society of Mechanical Engineers (113)

Rule Citation: § 26.311(d)(3), (f)(5)

Summary of Comments: One commenter recommended exemption of certain low concentration wastes from the quality assurance (QA) requirements. One commenter suggested that the requirement be clarified to allow minimal programs for licensees handling minimal amounts of wastes. The resource burden on small operations for Q/A was noted by three commenters. Five commenters also suggested more specificity on requirements. Two commenters suggested the use of "quality control" instead of "quality assurance." One was concerned about management's personal involvement. One was concerned about a separate program being required. One suggested shifting part of the burden on waste form quality control to suppliers.

Analysis of Comments: The proposed requirement for a quality assurance program to assure compliance with §§ 61.55 and 61.56 was intentionally stated in general terms in recognition of the broad spectrum of waste generators who would have to comply. Flexibility to tailor the program to types and amounts of waste was intended. Since it is important that all wastes be properly classified, no exemptions for wastes were provided. The quality assurance program applies only to wastes being transferred for dispoal at a land disposal facility. Wastes being disposed of by other methods or without regard to its radioactive content (e.g., under the provisions of § 20.306) are not covered.

The references to resource burdens were very general and few in number considering the number of licensees potentially affected and to whom copies of the rule were sent. More specific guidance on what should be included in the program is planned for the regulatory guide on waste classification. In view of the diverse waste generator population and range of programs expected, guidance documents would seem more appropriate than prescriptive requirements in the regulation.

The suggested word change from "quality assurance" to "quality control" was based on the accepted use of the terms in Appendix B of 10 CFR Part 50. In the introduction to Appendix B, quality assurance includes the concept of performing satisfactorily in servce while quality control is described as controlling the quality to predetermined requirements. The generator was not

expected to evaluate disposal site performance. The waste characteristics and classification requirements are the predetermined requirements. Therefore the suggestion was adopted.

The Proctor and Gamble Company recommended modifying § 20.311(d) to replace "the program must include management audits" with "audit results must be reported to management." The proposed change would change the requirement so that management would not have to personally conduct the audits. The Commission's concern is to make sure the audits are reviewed and corrective measures taken when necessary not just reported and filed. Therefore, wording to address this concern has been added to require management to evaluate audits, but not necessarily conduct them.

Exxon Nuclear Company, Inc. was concerned that the language in § 20.311(d)(3) and (f)(5) implied that a separate quality assurance program he instituted. A separate program was not intended.

The Georgia Institute of Technology suggested that a provision be added for certain blanket authorization based on supplier information on waste form. The Institute suggested that such blanket authorization would help shift part of the burden for compliance with § 61.56 on waste form to suppliers. The staff agrees with the concept that suppliers can develop generic information on products and plans to review topical reports on waste forms and containers. However, how such products and packaging is used influences the validity of product evaluations. The generator will still need to be sure proper procedures are followed and that his waste falls within the range of parameters evaluated for the product. Data supplied by supplier and evaluated by the Commission can be included as a key part of the generator's program but cannot be substituted for it. Thus, the suggestion was not adopted.

Rule Changes:

1. Change "quality assurance" to "quality control" in 20.311(D)(3) and (f)(5).

2. For 20.311(d)(3) insert evaluation after management in "the program must include management audits."

ISSUE M-3

Issue: Burden on small entities
(See Issue D-55-11 on cost of classification, and Issue M-4 on manifest a burden also.)

Commenters: Wisconsin Electric (32)
Health Physics Society (96)

Rule Citation: General

Summary of Comment: Wisconsin Electric Power Company expressed the view that the rule would greatly increase disposal costs for small entities without commensurate health and safety benefits. The Health Physics Society noted that the rule will impact small entities but much of the impact will be positive.

Analysis of Comments: The basis for the Wisconsin Electric comment appears to be the perceived costs of the manifest tracking system (Issue M-4) and increased costs to site operators that will be passed on to the small entity. The commenter also appeared to base his concerns on a misunderstanding about the scope and applicability of the rule based on a reference to "currently permitted to dispose of radioactive wastes into sanitary sewage systems." The proposed rule does not negate such existing options as discussed under Issue A-1.

Wisconsin Electric is not a small entity and the comment was not based on costs to the commenter. No specific data or cost estimates are offered.

No rule changes were proposed based on the comments.

ISSUE M-4

Issue: Manifest system a burden

Commenters:
The Procter and Gamble Company (6)
University of California, LA (8)
D. M. Mathews (23)
United Technologies/Packard (25)
Nuclear Diagnostic Laboratories Inc. (29) & (108)
Wisconsin Electric (32)
Union Carbide Corporation (39)
American College of Nuclear Physicians (53)
Department of the Army (63)
Georgia Institute of Technology (70)
Health Physics Society (96)
Conference of Radiation Control Program Directors (103)
University of Texas System Cancer Center (105)

Rule Citation: § 20.311

Summary of Comments: Two commenters were concerned about specifying chemical form. Four commenters objected to shipper responsibility for tracking shipments. Three commenters indicated that the system is a paperwork burden and three a general burden. Three supported the system and one indicated no problems in complying. Two objected to forwarding a copy of the manifest and one was concerned about the implications of generator certifications.

Analysis of Comments: Procter and Gamble expressed the view that the manifest system is an unjustified burden for Class A wastes. Procter and Gamble noted the difficulty in specifying chemical form and the industrial security risk for pharmaceutical firms. The University of California, LA noted the large variety and possible unknown species of chemical forms from research and hospital wastes and recommended a 500 gram lower cutoff. Only chemical forms exceeding the value would have to be specifed. The staff considered exempting Class A waste and the de minimus chemical content concept. The rule as proposed required indication of chemical form " as completely as practicable." It did not have an absolute requirement. Thus, the problems with unknown or hundreds of trace chemical forms would be covered as not practicable. Staff was not able to support an across the board de minimus quantity of 500 grams for specifying chemical form as either adequate or too high. Such a requirement is very prescriptive and would impose a potential or implied compliance

burden to quantitatively demonstrate analysis of every component greater than the 500 grams. Class A wastes probably represent more than half the volume of waste currently being shipped. Information on such a large portion of the waste is needed to complete the picture. Class A wastes also probably represent the greatest hazard from non-radiological properties so detailed information is useful for managing accidents or incidents in handling the waste. Thus exemption from chemical form specification was not adopted but some relief was provided as noted in Issue M-1. In addition, a significant percentage of wastes are Class A wastes which the staff believes should not be precluded from tracking and reporting on lost shipments.

Objections to the waste generator being responsible for tracking waste shipments were raised by D. M. Mathews, the American College of Nuclear Physicians, and the University of Texas System Cancer Center. Mathews expressed the view that the waste generator would be unfairly penalized for the truckers' or site operators' mistakes by having to conduct an investigation and file a report on missing shipments. The Nuclear Physicians and Cancer Center objected to not being able to transfer responsibility for wastes to brokers or licensed waste collectors and thus transfer the burden of accounting for shipments. Wisconsin Electric expressed similiar views on carrier reponsibility. The Commission's intent in drafting § 20.311 was to allow the waste collector to acknowledge receipt of the waste to the generator and assume responsibility for tracking the wastes. Clarifying language is added to § 20.311(d)(8) to emphasize investigation only if acknowledgement of recept is not received. The generator is responsible for the information provided about the waste and cannot be relieved of this responsibility.

Nuclear Diagnostic Laboratories (a waste collector), Wisconsin Electric and United Technlogies/Packard were concerned about the paperwork burden. Nuclear Diagnostics' major concern stems from the requirement in § 20.311(e)(2) for making copies of the individual manifests prepared by waste generators part of the new manifest the collector must prepare. Consolidated shipments may include wastes from a hundred or more waste generators so that the papers could be a physical burden. The company indicates that an information retrieval system is in place and requests relief from the requirement of physically incuding generator manifests with the new manifest. The Commission agrees that such relief is warrented and such relief was added to § 20.311(e)(2). Nuclear Diagnostics was also concerned about the apparently needless requirement to forward a copy of the manifest (per § 20.311(d)(5)) to the waste collector who picks up the waste at the generator's facility. Tranfer of a copy with the shipment should be adequate. The Commission agrees and provided an exemption in § 20.311(d)(5) for direct transfers to collectors. However, the generator is still responsible for accounting for all waste transferred and making sure that all waste are acknowledged (e.g., per 20.311(d)(7)(8)). The University of Texas System Cancer Center expressed similiar views.

Wisconsin Electric's concerns about paperwork associated with the manifest system were expressed on behalf of "small entity" licensees. No analyses or data were included in support of the claimed burden. United Technologies/Packard and Georgia Institute of Technology concerns were a general caution.

The Proctor and Gamble Company and University of Texas System Cancer Center expressed the view that the manifest system is a general burden. Proctor and Gamble suggested exempting Class A wastes as discussed above. The Cancer

Center's concerns were primarily concerned with the collector or contractor/ generator roles. Proposed changes to 20.311(d)(5) and (8) provide some clarification and relief for collectors of prepackaged wastes. However, the generator is responsible for contracted services and no relief from certifications by the generator was given. The generator can certify based on employee (authorized user) or contractor information but the responsiblity remains with the licensee who packages the waste. If the waste collector repackages or treats the waste, 20.311(f) applies and the waste is the processor's responsibility and the Cancer Center's comments do not apply.

Union Carbide Corporation, the Health Physics Society, and the Conference of Radiation Control Program Directors gave general support to the system. Union Carbide noted that documentation has already become a significant part of the cost of waste disposal. The Health Physics Society noted that the required information and processing is good business as well as good health physics. The Society recommended that the system should be consistent with requirements for shipment of other radioactive shipments and hazardous materials in general. To make the system generic to all radioactive shipments, amendment of Part 71 was recommended. This suggestion to modify Part 71 was not adopted for two reasons. One, the information requested in § 20.311 includes information needed for disposal only. Second, the user of radioactive materials is likely to track shipments he needs without regulatory prodding. Wastes are by definition, materials of no further value to the user and incintive to track shipments was needed. The Commission agrees that consistency with other record systems and requirements is desirable. The Conference stated, "We strongly support the proposed amended requirements to Part 20 for the certification and use of shipping manifests to track waste shipments."

The Department of the Army indicated that current practices cover most of the requirements in the manifest system and that the additional information requirements will be added to documents and forms when required. No problems or burdens were indicated.

In summary, only seven commenters voiced problem or burden or a result of the manifest system and four objected to shippers tracking the shipments. These few comments must be viewed in the context of the 20,000 licensees (both NRC and Agreement State) who were notified of the proposed rule in a mailing that focused their attention on the system and provided a copy of the Federal Register notice with the specific requirements.

Rule Changes:

1. Add to § 20.311(d)(8) a reference to acknowledgement of receipt.

2. Add to § 20.311(e)(2): The waste collector may prepare a new manifest without attaching the generator manifests, provided the new manifest contains for each package the information specified in paragraph (b) of this section.

3. Add to 20.311(d)(5): or deliver to a collector at the time the waste is collected, obtaining acknowledgement of receipt in the form of a signed copy of the manifest from the collector.

ISSUE GEN-1

Issue: Absoluteness of Criteria

Commenters:
State of New Mexico (4)
Exxon Nuclear Company, Inc. (15)
Department of the Environment, London (19)
Bechtel National, Inc. (44)
Duke Power Company (48)
Paul F. Hadala and Don C. Banks (76)
Birmingham Audubon Society (80)
Utility Nuclear Waste Management Group (81)
Middle South Services, Inc. (84)
Northeast Utilities (85)
American Nuclear Society (87)
Atomic Industrial Forum (100)
U.S. Ecology (101)
The American Society of Mechanical Engineers (107)(113)
State of North Carolina (109)
New England Nuclear (110)
U.S. Department of the Interior (114)
Tennessee Valley Authority (116)
U.S. Department of Energy (119)

Rule Citations: Various - see summary.

Summary of Comments: Most of the commenters were expressing concern with the use of absolute terms in the rule such as "eliminate" and "prevent." One was concerned about lack of absoluteness of "reasonable assurance." One was concerned about subjective interpretations.

The specific citations and commenters are as follows:

Citations	Part 61 Term	Suggested Replacements	Commenters
1. 61.51(a)(6)	eliminate	minimize	Dept of the Envir. London (19 Bechtel (44) Duke Power (48) Hadala and Banks (76) UWMG (81) Middle South Services (84) ANS (87) Mechanical Engineers (107) NC (109) NEN (110) Interior (114) Tennessee Valley Auth (116) DOE (119)

Citations	Part 61 Term	Suggested Replacements	Commenters
2. 61.13(d); 61.23(b),(c),(d),(e); 61.30(a)(2); 61.40; 61.51(a)(2); 61.54	resonable assurance	conclusive showing	Birmingham Audubon Society (80)
3. 61.62(a)	assurances	proof	Birmingham Audubon Society (80)
4. 61.51(a)(4)	prevent	minimize	Bechtel (44) UWMG(81) ANS (87) AIF (100) Mechanical Engineers (107) NC (109) NEN (110) Interior (114) TVA (116)
5. 61.7(b)(2)	eliminated or	delete	NE Utilities (85) AIF (100) NEN (110)
6. 61.7(b)(1)	prevention	minimize	Bechtel (44) ANS (87) AIF (100) NEN(110)
7. 61.52(a)(1)	no interaction	no significant interaction	AIF (100) Exxon (15)
8. Supplementary Information pg. 38084 col 1	eliminate	minimize	U.S. Ecology (101)
9. 61.50(a)(4)	significant	none	NC (109)
10. 61.52(a)(6)	a few percent	none	NC (109)
11. 61.52(a)(9)	adequate	approved	NC (109)
12. 61.40	reasonable assurance exists that	delete	NEN (110) NM (4)
13. 61.62(a)	eliminate	minimize	DOE (119)
14. 61.80(h)(2)	report any different	report any significantly different	Exxon (15)

Citations	Part 61 Term	Suggested Replacements	Commenters
15. 61.2 "disposal"	isolation	disposal in an approved facility	Bechtel (44) ANS (87)

Analysis of Comments:

Hadala and Banks most succinctly discussed the implications of paragraph 61.51(a)(6) which states:

(6) The disposal site must be designed to eliminate the contact of water with waste during storage, the contact of standing water with waste during disposal, and the contact of percolating or standing water with wastes after disposal.

The commenters show that a literal interpretation of this requirement would preclude ever issuing a license since infiltration can never be eliminated and all soils have some water content. "Minimize" was suggested as an alternative for eliminate. To emphasize that the goal should be a real target the words "minimize to the extent practicable" were used in the final rule.

The Birmingham Aubudon Society suggested the wording changes without comment. The concern seems to be the need for stronger findings but less than guarentees. "Reasonable assurance" is a licensing standard used throughout the agency and reflects the findings staff expects to make. The changes were not adopted. The Issue B-1 also.

The Utility Waste Management Group expressed concern that literal interpretation of 61.51(a)(4) and (6) leads to requirements that are difficult if not impossible to meet by any existing technology. Similar views were expressed for the citations shown in the chart by New Mexico, Exxon, Bechtel, Duke Power, Middle South Sources, Northeast Utilities, the Ameican Nuclear Society, the Atomic Industrial Forum, U.S. Ecology, the American Society of Mechanical Engineers, North Carolina, New England Nuclear, U.S. Department of the Interior, Tennessee Valley Authority, and the Department of Energy. Staff generally agreed with the comments on the absoluteness of the wording identified and modified the language to address the concerns. See Issue D-51-1 also.

The State of North Carolina recommended that the entire rule be carefully reviewed for the use of the terms such as significant, prevent, eliminate, few, and adequate. The State was concerned about absoluteness, subjective interpretation, and ranges of opinions.

New England Nuclear made specific recommendations noted above and a general comment that absolute statements should be replaced by "achieveable practical ones."

Rule Changes:

	Citation	Adopted change
1.	61.51(a)(6)	"minimize to the extent practicable"
2.	61.13(d); 61.23(b),(c), (d),(e); 61.30(a)(2); 61.40; 61.51(a)(2); 61.54	none
3.	61.62(a)	none
4.	61.51(a)(4)	"minimize to the extent practicable"
5.	61.7(b)(2)	deleted "eliminated or"
6.	61.52(a)(1)	reworded so "prevention" not used
7.	61.52(a)(1)	reworded so "no interaction" not used
8.	Supplementary Information	Section not included in final notice
9.	61.50(a)(4)	used "known"
10.	61.52(a)(6)	revised to reflect wording in 10 CFR 20.105 so few percent not used
11.	61.52(a)(9)	"approved" used as suggested
12.	61.40	no change adopted
13.	61.62(a)	inserted "to the extent practicable" to modify "eliminate"
14.	61.80(h)(2)	inserted "significantly" as suggested
15.	61.2	added "inhabited by man and his food chains" to emphasize isolate from man not absolutely isolate

ISSUE GEN-2

Issue: Additional regulatory guidance needed

Commenter:
Pennsylvania Department of Environmental Resources (16)
Dow Chemical (17)
Ohio EPA (38)
Chem-Nuclear Systems, Inc. (41)
Union Oil Company of California (66)
Stock Equipment Company (67)
Argonne National Laboratory (68)
University of Arizona (78)
South Carolina Department of Health and Environmental Control (79)
Northeast Utilities (85)
State of California (93)
State of New York (99)
U.S. Ecology (101)
Conference of Radiation Control Program Directors (103)
American Society of Mechanical Engineers (107), (113)
U.S. Department of the Interior (114)
U.S. Department of Energy (119)

Rule Citation: None.

Summary of Comments: These commenters made suggestions on the kinds and urgency of additional regulatory guidance that the commenters felt was needed.

Commenter 67 suggested guidance on onsite contingency storage capacity and leachability test standards and criteria. Commenters 38, 66 and 85 urged that the waste classification regulatory guidance be issued as soon as possible. Commenter 16 suggested the following list:

- o Waste stability;
- o Specific assumptions to use for determining whether the intruder scenario meets the performance objectives;
- o Guidelines and assumptions for setting maximum disposal site inventory limits consistent with the performance objectives;
- o Concentration limits for naturally occurring and other isotopes (especially Radium) not specifically addressed in Table 1;
- o Specific guidance for the information that is requested in a license application as outlined in Subpart B;
- o Definite standards for the conditions that are required to be met for post-closure license transfer and termination of the license.

Dow Chemical (17) listed properties in addition to free liquids that should be included in the NRC Branch Technical Position on waste form.

Commenter 68 throught the model which NRC would use to evaluate compliance with the groundwater migration performance objective be made available. Commenter 78 suggested interagency agreement on a glossary of terms pertaining to waste management. Commenter 79 supported and recommended development and issuance of regulatory guides which incorporate standards for waste form packaging, high integrity containers, test methods, and approval guidelines and processes. Commenter 79 offered their assistance in developing these needed guidelines. Commenter 93 suggested that guidance on the types of records, reports, tests, and inspections needed to show compliance with Subpart D should be provided. Commenter 99 suggested guidance or requirements regarding soil horizon characteristics as well as guidance for engineering features which effectively respond to leachate management, subsidence control, and aqueous and aeoline erosion.

Commenters 101 and 114 requested a statement (guidance) on what criteria should be used to define the requirement in 60.50(a) that a site should be "capable of being modeled." Commenter 107 requested criteria on developing maximum site inventories, including the isotopes, maximum permissible inventory, and inventory limiting site characteristics. DOE and ASME emphasized the need for future regulatory guides to include quality assurance. Commenter 103 suggested 16 areas where additional guidance should be developed and covered a range of topics from siting to operational health physics.

Analysis of Comments: Agreed, additional regulatory guidance in a number of areas should be made available as soon as practical. Of the above, guidance on waste classification and waste stability is probably the most important. Guidance for license applications and site closure are already being addressed. Guidance on waste classification and waste form including stability have been drafted. Technical positions on site design and operation and financial

assurances have also been drafted. A Technical position document has been published for site suitability selection, and characterization (NUREG-0902). Maximum site inventories and disposal of radium need to be considered in guidance being developed. Commenters addressed the issue of radionuclide inventories vs. concentration (Issue D-55-10), and disposal of radium (Issue D-55-4). Formal and separate guides to address these two issues are not needed. Guidance on determining whether the intruder scenario meets the performance objective is not necessary since compliance with the classification scheme provides the mechanism for meeting the objective. The other topics suggested will be considered as additional guidance is developed.

Suggested Rule Change: None.

ISSUE GEN-3

Issue: Exempt waste in storage

Commenter: Union Carbide Corporation (39)

Rule Citation: Packaging and labeling requirements

Summary of Comment: Union Carbide suggested exempting wastes in storage prior to the effective data of the regulation from the packaging and labeling requirements.

Analysis of Comment: Union Carbide described its practice of storing packaged wastes in a shielded facility for up to one year to allow decay of short-lived nuclides and reduce exposures when wastes are shipped. Such reduction of exposures is in the spirit of ALARA. The commenter suggests that if these stored wastes must be repackaged, treated, or relabeled, the exposures involved would not be in the spirit of ALARA and these stored wastes should be exempted from new requirements.

While staff agrees that Union Carbide may have a valid point, the circumstances are very individual. Case-by-case exemptions can be used to provide relief if necessary. A short term detail on implementation is inappropriate for a rule.

Union Carbides point has broader implications, that is should certain parts of the rule be implemented in phases or steps. Application to existing sites was briefly addressed in Issue A-1. For the manifest system and waste Classes to work on a national scale, the 26 Agreement States must adopt conforming rules to make them regulatory requirements. Practical implementation can be achieved for data requirements and waste Class by amendments to the three existing site licenses. The effective dates for the rule will have to be established by working closely with State officials.

Rule Changes: Effective date(s) coordinated with States.

ISSUE GEN-4

Issue: Development of new sites

Commenters: Joseph H. White III (21)
Louise Gorenflo (71)
Oswald U. Anders (73)

Rule Citation: None

Summary of Comments: Joseph H. White III questioned the number and location of new sites expected and the time-line for establishing new sites. Louise Gorenflo was concerned about the lack of requirements for socio-economic impacts of new sites in the rule. Oswald U. Anders questioned whether the requirements in the rule would eliminate private enterprise developement of new sites and Gorenflo suggested that private enterprise not be allowed to develop new sites.

Analysis of Comments: The Commission does not know or control the number or location of new sites that may be proposed. Under the Low-Level Radioactive Waste Policy Act of 1980 (PL-96-573), Congress established a national policy that States are responsible for providing disposal capacity for wastes generated in their State with certain exceptions and that low-level wastes can be most safety and efficiently managed on a regional basis. The Act authorized States to enter into regional compacts to meet this responsibility. Currently, seven compact groups are in various stages of development. The National Governor's Association identified 6 potential regional breakdowns. In the DOE congressionally mandated response to the Policy act (DOE/NE-0015), 5-7 regional disposal sites were estimated to be able to handle wastes through the year 2000. Three sites are currently operating.

Timing of any new sites is also uncertain at this time. The Policy Act provides that compacts can exclude out of compact wastes in January 1986. Staff estimates of the time to license a site is up to two years after submittal of an application. Submittal would be preceeded by 2-3 years of site selection, site evaluation, data collection, and preparation of the application.

Dr. Anders expressed the view that the financial, procedural, and institutional requirements would, as a practical matter, eliminate persons in the private sector from developing new sites. He felt that the government would have to assume responsibility by default because of the regulatory burden. The proposed rule represented an attempt to provide adequate assurances to potential landowners and custodial agencies so that they would be willing to assume the role outlined for them. It attempted to define and clarify existing understandings about roles. The commercial firms presently operating sites did not share Dr. Anders' view in their comments. No comments were received from other potential commercial operators. Eliminating commercial development was certainly not the Commission's intent.

Louise Gorenflo expressed concern over the lack of land use and socio-economic considerations in the rule. The experience of her rural county that was considered for a new LLW facility was relayed. She indicated that certain rural land uses such as tourism and second home development are not compatible with LLW siting. Land adjacent to existing nuclear facilities was suggested.

Land use and socio-economic factors are normally considered in the draft and final EISs. Since Part 61 does not address the EIS requirements but defers to 10 CFR Part 51, no changes to the rule were made based on the comment. The proposed procedures require an EIS and her concerns would be addressed as part of that effort.

Rule Changes: None.

ISSUE GEN-5

Issue: De facto disposal sites

Commenter: Alfonso Scarpa (50)

Rule Citation: None.

Summary of Comment: The commenter was concerned that nuclear facilities become de facto disposal sites.

Analysis of Comment: Mr. Scarpa expressed concern that facilities where radioactive materials are used and stored become contaminated and cannot be totally decontaminated. The technology doesn't exit. The residual activity means that these sites are in fact disposal sites. He also made the point that when activity from clean up efforts are consolidated at a disposal site you then have two sites.

Mr. Scarpa offered no solution or suggested rule changes to address his concern. Limits for residual activities in decontamination and decommissioning are the subject of a separate policy development effort and are beyond the scope of proposed Part 61. Residual levels not requiring institutional control or licensing should result from this separate effort. Consolidating wastes that require institutional control to minimize the institutional burden seems to make sense and is the thrust of Part 61.

Rule Changes: None.

ISSUE GEN-6

Issue: Need for GEIS

Commenter: Joel Jaffer (46)

Rule Citation: General

Summary of Comment: The commenter believed LLW disposal is hazardous enough to require preparation of a generic environmental impact statement (GEIS).

Analysis of Comment: A comprehensive draft impact statement (DEIS) (NUREG-0782, Volumes 1-4) was prepared in support of the proposed rule. The commenter did not indicate knowledge of or problems with this document. The draft should address the commenter's concerns that extensive analyses were part of the decision process for the rule. The DEIS is not a generic statement on low level wastes, however. It is a decision document for the rule. A final EIS for Part 61 has also been prepared.

Rule Change: None.

ISSUE GEN-7

Issue: Extend the comment period

Commenters: U.S. Environmental Protection Agency (11)
PA Department of Environmental Resources (16)
Dow Chemical (17)
Kerr-McGee Corp (22)
U.S. Department of Energy(28)
Sierra Club (37)
American Institute of Chemical Engineers (no number)
Yakima Indians (74)

Rule Citation: Expiration date for comments

Summary of Comments: Proposed Part 61 was published for comment on July 24, 1981. The comment period was set to expire October 22, 1981. The draft environmental impact statement (NUREG-0782) was not announced until October 22, 1981. Additional time to prepare comments and review the DEIS was requested. One commenter requested consideration of late comments.

Analysis of Comments: The requests for additional time were reasonable and the comment period was extended until January 14, 1982 to coincide with the 90 day comment period on the DEIS (46 FR 51776 October 22, 1981). The Yakima request to submit late comments was acknowledged by letter dated January 25, 1982. Staff indicated that Yakima comments would be considered as fully as possible and if the rule has been finalized when comments are received, they will be considered in future modifications.

ISSUE GEN-8

Issue: Data base on wastes

Commenter: Advisory Committee on Reactor Safeguards (ACRS) (10)

Rule Citation: None.

Summary of Comment: The commenter calls for compilation of detailed inventories on the quantities and specific radionuclide concentrations in the low-level radioactive wastes buried in existing disposal sites. The commenter states that although this effort may require the development of instrumentation to identify and assess radionuclide concentrations in waste packages, such data are essential if the NRC staff is to have a clear understanding of current practices. The commenter further believed that such information is essential if NRC staff are to be able to ascertain the impact of various regulatory actions , particularly the influence of the establishment of "de minimus" concentrations for selected radionuclides in specified types of wastes. Finally, the commenter felt that such information is also essential in order to assess the impact of various restrictions on the types of wastes acceptable for disposal in a given site.

Analysis of Comment: The comment is a straight forward recommendation for the NRC staff to improve their data base on waste characteristics. As noted by the commenter, NRC staff are already working to compile such an improved data base. For example, NRC staff have completed contracts to acquire propriatory disposal facility shipment manifests for the years 1978, 1979, and 1980. Shipment manifests for the years 1981 and 1982 will also be acquired. This analysis has indicated that significant percentages of low level wastes by volume and activity are not identifiable from the records as being generated by a particular waste generator. Such wastes are only identified by the shipment broker. This observation led in part to the requirement in § 20.311 that the original waste generators shipping waste to disposal facilities be specifically identified in the shipment manifests. Other analyses of 1978 and 1979 shipment manifests has led to estimates of the volume-percent distribution of gross activity concentrations in LWR process waste streams. Such estimates have been incorporated into the analysis for the Final EIS.

In addition to the above, NRC staff have ongoing a number of other contractual efforts to improve their data base on waste characteristics. These include the following efforts:

- a contract with Science Applications, Inc. to perform sampling and radiochemical analysis of LWR power plant waste;
- an ongoing contract with Brookhaven National Laboratory to analyze characteristics and potential improved packaging of some specific high activity fuel cycle and nonfuel cycle waste streams, and
- a contract with Pacific Northwest Laboratory under NRC's Office of Research to more completely characterize wastes generated from decommissioning of LWR power plants.

Further information on waste characteristics is expected to be gained as part of further analysis of specific waste streams for possible disposal by less restrictive means (i.e., "de minimis" waste streams").

In summary, although NRC staff believe that the current data base on waste characteristics is sufficient at this time to arrive at regulatory decisions regarding near-surface waste disposal, improvements to this data base are warrented. NRC staff has an ongoing program to acquire such improvements. Some of this additional data has already been used in finalization of the draft Part 61 rule. Additional data acquired will be used to determine potential additional technical requirements, develop additional regulatory guidance, and develop improved procedures to analyze waste disposal and license new and existing disposal facilities.

Suggested Rule Change: None.

ISSUE GEN-9

Issue: Hearing transcripts to incorporate for the record

Commenter: Themis Klotz (42)

Rule Citation: None.

Summary of Comment: The commenter expressed general concern about nuclear matters and requested that the record of two hearings be incorporated into the record.

Analysis of Comment: The hearings referenced by the commenter were 1) Oceanography Subcommittee, Merchant Marine and Fisheries Committee, U.S. House of Representatives, held in Faneuil Hall, Boston, Massachusetts, September 21, 1981 and 2) Falmouth, Massachusetts Board of Health, held at the Town Hall on October 15, 1981.

The Oceanography Subcommittee hearings had not been printed as of February 25, 1982. Subcommittee staff indicated on February 25, that the hearings were at the printers and should be available in about a month. The transcript is available for inspection in House Annex 2, Room 550. The hearings included past ocean disposal of radioactive wastes in Boston Harbor and beyond. Ocean disposal is beyond the scope of proposed Part 61 and permit authority lies with the Environmental Protection Agency. However, the request to place the record of the hearing into the record without comment is noted.

The Falmouth Board of Health hearings referenced did not address radioactive wastes according to Dr. Jones who was chairman of the Board when these hearing were held. The issue was related to hazardous waste and was prompted by an incident involving pesticide spraying of a highway right-of-way. The relevancy of these hearings is unclear but the commenter's request is noted.

ISSUE ED-1

Issue: Editorial Comments

Commenters:
State of Nevada (14)
Pennsylvania (16)
Dow Chemical (17)
Department of the Enviornment, London (19)
Joseph H. White III (21)
Law Engineering (34)
Union of Concerned Scientist (36)
Union Carbide (39)
Bechtel National, Inc. (44)
Arizona State Clearinghouse (47)
Union Oil Company of California (66)
Argonne National Laboratory (68)
South Dakota (69)
Georgia Institute of Technology (70)
The University of Texas Medical Branch (75)
Utility Nuclear Waste Management Group (81)
Northeast Utilities (85)
American Nuclear Society (87)
General Electric (89)
Arkansas Power and Light Company (94)
Health Physics Society (96)
Atomic Industrial Forum (100)
U.S. Ecology (101)
Conference of Radiation Control Program Directors (103)
Carolina Power and Light Company (106)
The American Society of Mechanical Engineers (107) and (113)
NC Department of Human Resources (119)
New England Nuclear (NELRAD) (110)
The American Society of Mechanical Engineers (113)
Kerr-McGee (115)
Tennessee Valley Authority (116)
Texas Department of Health (117)
Atomic Energy of Canada Limited (118)
Department of Energy (119)
U.S. Environmental Protection Agency (122)

Summary of Comments: The commenters made a variety of recommendations for clarifying language, definitions, etc. and identified typographical and numbering errors.

Analysis of Comments: The comments were each considered and adopted where consistent with the intent of the rule.

HOMESTAKE MINING COMPANY

650 CALIFORNIA STREET · 31st FLOOR

SAN FRANCISCO, CALIFORNIA 94108

CABLE: HOMESTAKE
TELEPHONE (415) 981-8150

①

DOCKET NUMBER
PROPOSED RULE PR-2, 19, 20, 21, 30, 40, 51, 61, 70, 73, 170 (46 FR 38081)

July 30, 1981

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

Attn: Docketing and Service Branch

Gentlemen:

A-1 The proposed rule published by the Nuclear Regulatory Commission in the Federal Register on July 24, 1981, adding a new Part 61 to 10 CFR, should be revised to more clearly exclude uranium mill tailings and other waste generated in the nuclear fuel cycle from the definition of "waste" found at Section 61.2.

Thank you very much.

Sincerely,

[signature]

John McMunn
Assistant Counsel

JSM:hh

DOCKETED USNRC AUG 06 1981 Office of the Sec. Docketing & Serv. Branch mdv

RECEIVED AUG 07 1981 U.S. NUCLEAR REGULATORY COMMISSION

Acknowledged by card 8/6/81 mdv

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2 46FR38081 PDR

July 30 1981

②

DOCKET NUMBER
PROPOSED RULE PR-2, 19, 20, 21, 30, 40, 51, 61, 70, 73, 170 (46 FR 38081)

Dear Sirs:

D-56-1B Just as with chemical wastes it does not work to attempt to bury radioactive wastes.

A big box made of plastic impregnated throughout with steel filings and laminated entirely with a layer of white cardboard would only have to be 1-2 ft. thick to contain and kill the radiation. It would be open at the bottom and sunk about six ft. in any soil.

The thing would have a hinged lid on the top and be baffled so drums of waste would merely roll to the bottom and it would be safe to generations.

Sounds worth testing, doesn't it.

Respectfully,

[signature]

DOCKETED USNRC AUG 13 1981 Office of the Sec. Docketing & Serv. Branch mdv

RECEIVED AUG 13 1981 U.S. NUCLEAR REGULATORY COMMISSION

8108140321 810730
PDR PR
2 46FR38081 PDR

MARVIN I LEWIS
6504 BRADFORD TER
PHILA. PA 19149
8-8-81

(3)

DOCKET NUMBER PR-2, 19, 20,
PROPOSED RULE PR 21, 30, 40, 51, 61, 70, 73, 170 (46FR38081)

SECRETARY OF THE COMMISSION
NRC
WASHINGTON, D.C. 20555

DEAR MR SECRETARY;

PLEASE ACCEPT THE FOLLOWING COMMENTS ON THE PROPOSED RULE 10 CFR 61, "LICENSING RQMTS FOR LAND DISPOSAL OF RAD WASTE."

A-1: MY FIRST COMMENT AND CONCERN CENTERS ON AN ~~error~~ OMISSION: THE PROBLEM OF PRESENT, DANGEROUS LOW LEVEL WASTES SITES ARE NOT MENTIONED IN THE PROPOSED RULE. WEST VALLEY L.L.W. SITE IS LEAKING INTO A SAND LENS AND EVENTUALLY INTO THE GREAT LAKES (WASTE PAPER, NEWSLETTER OF THE SIERRA CLUB). DOE IS CLEANING UP ABOUT 20 ABANDONED DUMP SITES.
THREE MILE ISLAND IS A 'DE FACTO' HIGH LEVEL AND LOW LEVEL WASTE SITE.
THE PROPOSED RULE IGNORES ALL PREVIOUS AND EXISTING PROBLEMS WITH EXISTING LL WASTE SITES. AT A VERY MINIMUM, THE PROPOSED RULE MUST DISCUSS WHAT MEASURES RE PROPOSED TO SOLVE THE PROBLEMS IN EXISTING LL WASTE SITES.

PAGE 10. PROTECTION OF INADVERTENT INTRUDER.

C-4:
1. 500 mrem seems a lot of exposure for making a small mistake.
2. HOW CAN 500 mrem exposure be ensured without ON-SITE SECURITY? DETAILS!

PAGE 10 PROTECTION OF THE ENVIRONMENT

C-3: THERE IS NO ABSOLUTE AMOUNT OR PERCENTAGE LEAKAGE BEYOND WHICH THE SITE WOULD BE UNSAFE. EVERY NUMBER IS AN EXPOSURE OR DILUTION, THEREFORE, THE ENTIRE CONTENTS COULD LEAK OUT SLOWLY INTO THE ENVIRONMENT WITHOUT BREAKING THE CAVEATS OF THIS PROPOSED RULE.

D-59-2: PAGE 15 "100 YEAR PERIOD OF INSTITUTIONAL CONTROL"
19 "100 YEAR — MAXIMUM"
WHAT IS minimum time that institutional control is A SURETY?

E-1: PAGE 20 "FINANCIAL SECURITY" - NOT ENOUGH DETAIL TO BE SURE OF ANYTHING.

ADD: THIS PROPOSED RULE IS WORTHLESS AND MUST BE REDONE.

8108190194 810808
PDR PR
2 46FR38081 PDR

Very truly yours,
Marvin I. Lewis

Acknowledged by card 8/19/81 mdv

BRUCE KING
GOVERNOR

STATE OF NEW MEXICO
GOVERNOR'S CABINET
SANTA FE
87503

GEORGE S. GOLDSTEIN, Ph.D.
SECRETARY FOR HEALTH & ENVIRONMENT

(4)

RECEIVED SEP 15 1981

SEP 14 1981 Office of the Secretary Docketing & Service Branch

September 11, 1981

Mr. Samuel J. Chilk
Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Docketing and Service Branch

DOCKET NUMBER PR-2, 19, 20, 21, 30, 40, 51, 61, 70, 73 + 170
PROPOSED RULE (46FR38081)

(4)

Dear Mr. Chilk:

The following are recommendations and comments from the State of New Mexico regarding the proposed rulemaking for 10 CFR 61 for land disposal of radioactive wastes which was published in the Federal Register on July 24, 1981.

	Page	Column	Line	Recommendations and Comments
C-3	38083	3	27	Recommend wording read "nearest public or private existing or future potential drinking water supply."
D-50-3	38084	1	26	Recommend deletion of present text after "Surface Water" and substitution of the following: "The potential for flooding should be low." The statement at 61.50 (a)(5) is considered adequate.
A-1	38087	3	56	The summary of the proposed rule states "it would be the Commission's intent that all future disposal would be expected to comply with the provisions of Part 61." The Commission should recognize that in Agreement States regulations must be promulgated by local authorities.
	38089	3	12	61.1(b) states '...the regulations in this part apply to all persons in the United States.' An additional clause should be added to this sentence to read '...States where the Commission retains authority.'

8109150125 810911
PDR PR
2 46FR38081 PDR

Mr. Samuel J. Chilk
September 11, 1981
Page -2-

	Page	Column	Line	Recommendations and Comments
GEN-1	38098	2	33	Recommend the word "eliminated" be replaced by "minimized." Elimination of ongoing active maintenance may be the goal but it probably will not be met. This fact is recognized in 61.63(a) by the words "any required maintenance."
F-1	38099	1	47	Recommend the word "may" be replaced by "shall." This function should be an obligation of the Director.
E-2	38100	1	15	Recommend deletion of words "if any," licensees should be required to furnish an annual financial report.

Thank you for providing the opportunity for comment on the proposed rule.

Sincerely,

George S. Goldstein, Ph.D.
Secretary

GSG/teb

ADVANCE MEDICAL & RESEARCH CENTER, INC.
1270 DORIS ROAD • PONTIAC, MICHIGAN 48057 • 313-373-9120

(5)

DOCKET NUMBER
PROPOSED RULE PR-2, 19, 20, 21, 30, 40
51, 61, 70, 73, 170
(46 FR 38081)

September 15, 1981

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

Attention: Docketing and Service Branch

To Whom It May Concern:

This letter is in regard to proposed regulation in land disposal of low level radioactive waste.

As per Section 61.54, Table I states that with any isotope with a half-life of less than 5 years, the minimum requirements for all classes of waste must be followed as per Section 61.56.

D-55-14

Most medical diagnostic laboratories perform in vitro testing in which the isotope used is of short half-life of about 60 days (I^{125}). These isotopes are packaged in kit form of about 10 uCi/100 tube kits. Instead of stating that the instructions in Section 61.56 be followed, can't there be an alternative measure? As an alternate with isotopes of short half-life, make a category whereby they are set aside and allowed to decay to the background level. The waste is then monitored with a Survey Meter and if no counts above background, then dispose of this waste with the usual solid waste.

If all solid radioactive waste is to be disposed of as per Section 61.56, there would be tremendous volume of waste that would fill the disposal site rapidly and needlessly. Much of the I^{125} isotope waste will decay after several half-lives down to acceptable level and this isotope along with Fe^{59}, Co^{57} and I131 and some other isotopes of short half-lives used in a clinical setting should be given another classification.

Sincerely,

John Pappas
Associate Director

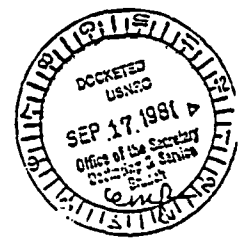
JP/dg

THE PROCTER & GAMBLE COMPANY

IVORYDALE TECHNICAL CENTER — CINCINNATI, OHIO 45217

(6) September 14, 1981

DOCKET NUMBER
PROPOSED RULE PR-2,19,20,21,30,40,51
61,70,73,170
(46 FR 38081)



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

Attention: Docketing and Service Branch

RE: PROPOSED REGULATIONS: LICENSING REQUIREMENTS FOR LAND DISPOSAL OF RADIOACTIVE WASTE

Dear Sir:

This is to provide the comments of the Procter & Gamble Company upon the proposed regulations covering specific licensing requirements for land disposal of radioactive waste published in the Federal Register on Friday, July 24, 1981, pages 38081-18104. While Procter & Gamble is not directly involved in such disposal operations, we do utilize small amounts of radioactive materials for research purposes requiring eventual disposal. The subject proposal does contain some provisions that pertain to waste generators, even those involving only small amounts of research materials. Thus, Procter & Gamble is potentially affected.

M-4 In general, we agree with the Commission's proposal and waste classification system. Our principal concern with the proposal is the manifest system. The problem is the Commission has failed to carry through its waste classification system into the manifest system. As a result, the manifest system is appropriate and useful for Class C wastes but is too burdensome and of little value for Class A wastes. Certainly the timing and reporting specifics are overkill for the small shipments of Class A wastes that commonly originate from research laboratories and medical facilities. Such overrequirements are in direct conflict with the Government's stated goal of eliminating/avoiding unnecessary regulatory burdens.

We would urge that Class A wastes be exempted completely from the manifest system of these proposed regulations or at least the overly rigid timing and reporting aspects of this manifest system. In the remainder of these comments, we address specific concerns of the proposal and provide revised wording.

Specific Comments and Recommendations

20.311(b)

M-1 The term "chemical form" is not clear. It would not always be possible or useful to specify an exact chemical species (for example with research wastes from a biological research or medical facility) or to list the many species from multiple experiments. Further, this requirement could represent a serious security problem if the exact identity of research chemicals had to be listed on a public manifest. It should be sufficient for waste disposal purposes to list the general chemical form (i.e., complex organic acid, animal carcass). We recommend the word "general" be inserted before the words "chemical form" at the end of the second sentence of this paragraph.

20.311(c)(3)

M-2 This wording is not entirely clear. It could be interpreted to require that a personal audit be conducted by management as a part of a quality assurance program to assure compliance with §§61.55 and 61.56. We believe it is intended to require (and it is certainly sufficient to require) that audits be done and results be reported to management. Our specific proposed rewording is:

> Conduct a quality assurance program to assure compliance with §§61.55 and 61.56 of this chapter; audit results must be reported to management.

20.311(e)(8), 20.311(f)(1), 20.311(h)(1), 20.311(h)(2)

M-1 There is a serious overreporting system described by these portions for Class A wastes. The difficulty is that these are written to cover more serious concerns associated with shipments of Class C wastes and yet are applied with equal rigor to Class A shipments. In particular the one week acknowledgment requirement for receiver of shipments and the requirements for the shippers to investigate and file reports on all shipments missing for 20 days is overreaction with Class A shipments. This overburden will be laid principally on research facilities, hospitals and academia.

We urge that shipments qualifying as Class A wastes be exempted from the acknowledgment, tracing and reporting timing requirements and that it simply be stated that these activities need to be done and documented. Certainly reporting to the Commission Inspection and Enforcement Regional Office should not be required, but the records should simply be maintained by the shipper and be available for the normal NRC inspection.

We recommend that the following wording be adopted:

M-1

20.311(e)(1) Acknowledge receipt of the waste from the generator; within one week for Class B and C wastes.

20.311(f)(1) Acknowledge receipt of the waste from the generator; within one week for Class B and C wastes.

20.311(h)(1) Be investigated by the shipper if the shipper has not received notification of receipt; within 20 days after transfer for Class B and C wastes.

20.311(h)(2) Be traced and for Class B and C wastes be reported. The investigation shall include tracing the shipment and for Class B and C wastes filing a report with the nearest Commission Inspection and Enforcement Regional Office listed in Appendix D of this part. Each licensee who conducts a trace investigation of a Class B or C waste shall file a written report with the nearest Commission's Regional Office within 2 weeks of the completion of this investigation.

Summary

We urge the Commission to exempt Class A wastes from the proposed manifest system or at least the timing and reporting aspects of the system so that it is more appropriate for the small risks and amounts of research wastes involved and avoids unnecessary regulatory paperwork and reporting.

Very truly yours,

Donald T. Hooker

Dr. Donald T. Hooker, Associate Director
Research & Development
Regulatory Services Division

:bal

Bethlehem Steel Corporation

BETHLEHEM, PA 18016

September 14, 1981

RECEIVED SEP 22 1981

(7)

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

DOCKET NUMBER PROPOSED RULE PR-2,19,20,21,20,40, 51, 61, 70, 73, 170 (46 FR 38081)

SEP 22 1981 Office of the Secretary Docketing & Service Branch

Attention: Docketing and Service Branch

Gentlemen:

Re: Proposed Rulemaking on Land Disposal of Low Level Radioactive Waste, 10 CFR Part 61, published in the Federal Register, Vol. 46, No. 142, Friday, July 24, 1981, pages 38081-38105

Bethlehem Steel Corporation would like clarification on certain points of the proposed rule.

D-55-7

1. Please indicate the conditions required to permit sealed sources containing relatively long lived hard gamma emitters such as cobalt 60 or cesium 137, to be classified as Class A - Segregated Waste or Class B - Stable Waste. The language in the "Supplementary Information" accompanying the proposed rulemaking seems to imply that sealed sources would have to be classified as Class C - Intruder Waste.

2. The notes below Table 1, on page 38097, appear to indicate that by enclosing a 200 millicurie, cesium 137 sealed source, having a capsule volume of 6 cm^3, in a 55 gallon drum, it is permissible to average the 200 millicuries over the 55 gallons to obtain a concentration of:

$$\frac{200{,}000 \text{ microcuries}}{200{,}000 \text{ cm}^3} = 1.0 \text{ uCi/cm}^3$$

which meets the limits for Class A - Segregated Waste; as opposed to

$$\frac{200{,}000 \text{ microcuries}}{6 \text{ cm}^3} = 33{,}333 \text{ uCi/cm}^3$$

which exceeds even the limits for Class C - Intruder Waste and would be prohibited in a low level waste disposal site. Is our interpretation of this point correct?

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PDR PR
2 46FR38081 PDR

(7)

Bethlehem Steel Corporation

D-55-7 If our interpretation as given in item (2) is correct and sealed sources can be classified as Class A or Class B, we feel that the proposed rule is reasonable. We would appreciate your comments and clarification in that regard.

Sincerely yours,

A. E. Moffitt, Jr.

A. E. Moffitt, Jr., Sc.D.
Manager of Environmental Health

cc: R.Dale Smith, Chief
Low Level Waste Licensing Branch
Division of Waste Management
U. S. Nuclear Regulatory Commission
Washington, DC 20555

UNIVERSITY OF CALIFORNIA, LOS ANGELES UCLA

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COMMUNITY SAFETY DEPARTMENT
OFFICE OF RESEARCH & OCCUPATIONAL SAFETY
LOS ANGELES, CALIFORNIA 90024

(8)

DOCKET NUMBER
PROPOSED RULE PR-2,19,20,21,30,40,51, 61,70,73,170 (46 FR 38081)

September 17, 1981

Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
Attention: Docketing and Service Branch

Dear Sirs:

Re: Proposed Rulemaking on Land Disposal of Low-Level Radioactive Waste

In general, we think that the proposed amendments to the various parts of Title 10 Code of Federal Regulations dealing with land disposal of radioactive waste are beneficial and desirable. However, we want to comment specifically on several proposed changes as follows:

M-1 M-4 Part 20.311 (b): Compliance with the requirement that the shipment manifest contain the chemical form of the waste is virtually impossible for research and hospital wastes. In some cases the chemical form may literally be unknown and in all cases the variety of chemical compounds that could be in the waste from one laboratory will be very large.

Perhaps this requirement could be rewritten to apply only to pure material present in quantities greater than a specified minimum. That is, containers of known compounds exceeding some specified quantity (say 500 gms.) would be identified, but waste contaminated with some chemical would not be identified.

D-50-5 Part 61.50 (a) (3): We appreciate the concern for avoiding areas where tectonic processes (faulting, etc.) could affect the site integrity. However, the present wording would probably make it difficult or impossible to locate a site in California, yet realistically there is no compelling scientific reason not to bury low level radioactive waste - even where some faulting has or may occur. In view of all of the other restrictions governing site selection and requirements on waste packaging, it seems highly unlikely that even major ground faulting would release radioactive material to the occupied human environment.

Secretary of the U.S. Nuclear Regulatory Commission
September 17, 1981
Page 2

D-50-5 We hope that this section can be reworded to minimize the restriction on the existence of faulting and seismic activity in the area of the disposal site.

D-56-4 Part 61.56 (2): We think that prohibiting the use of cardboard or fiberboard boxes for low level radioactive waste is unnecessary and may be short-sighted. It seems to us that one of the most promising methods for disposal of this type of waste is incineration. Cardboard boxes could be introduced directly into an incinerator, metal drums would have to be unpacked.

Perhaps this section could be modified by placing certain limits on the total quantity of activity that can be placed in a cardboard box - rather than totally prohibiting such containers.

D-56-8 Part 61.56 (b) (1): This section would also prohibit cardboard boxes and possibly some metal drums. Again for low level waste we feel that this structural stability requirement is unnecessary. The site itself, if selected according to the proposed criteria, should provide adequate containment for low level waste. Structural stability of the primary container is relatively insignificant - particularly over a time span of several hundred years.

Incidentally, incineration is again at attractive alternative as it processes the waste into a more stable form (ashes).

Thank you for your consideration of these comments.

Very Truly Yours,

Walter F. Wegst
Director
Research and Occupational Safety
Certified Health Physicist

WFW/ml

(9) PROPOSED RULE PR-2,19,20,21,30,40,51,61,70,73,170,A (46 FR 38081)

ENVIRONMENTAL LAW PROJECT
School of Law, 064-A
University of North Carolina
Chapel Hill, NC 27514

Tel: 919/962-3780, 968-9534

SEP 22 1981 Office of the Secretary Docketing & Service Branch

Comments on proposed rules for Land Disposal of Low-Level Waste, 46 F.R. 38081 (1981).

The Environmental Law Project is concerned about the proposed regulations for several reasons. These are:

(1) pre-emption of state laws, particularly with regard to siting;

(2) possibility of transfer of license with inadequate safeguards;

(3) the fact that hearings must be requested, and are otherwise not required; and

(4) the limited time that licensees are required to monitor sites after closure.

A-5 1. Pre-emption of state law: As we read the Atomic Energy Act, particularly sections 42 U.S.C.A. §2021(c) and (j), it is our understanding that the Commission still reserves the power to approve and license a disposal facility without, and even in direct contradiction of, the benefit of state law. See Pacific Legal Foundation v. State Energy Resources Conservation and Development Commission, 472 F.Supp. 191, 199 (D.C. S.Cal. 1979), which reaffirms the general pre-emptive powers of the Commission. Especially in light of P.L. 96-573, which makes it the responsibility of the states to provide disposal capacity, it is our contention that some form of final approval must be vested with a local, preferably state, government. Specific language to this effect in the regulations would resolve this latent ambiguity in favor of more responsibility for those governments which Congress intended to have primary responsibility for locating disposal sites.

B-8 2. Possibility of transfer: The license of an operating disposal site can apparently be transferred under the proposed regulations; although we would presume that the same requirements for

financial security, etc., would be necessarily met before the Commission gave its consent, it would be much more comforting to have it spelled out in black and white in the final rule. That is, that transferees will be subject to all licensing restrictions that original licensees are subject to, which must be shown prior to granting approval of the transfer. This would also be useful in generating evidence of record in case of future problems with the new operator.

B-9

3. Hearings: Hearings may be requested by interested parties subject to the procedures in 10 C.F.R. §2. 105. Our experience with this procedure, and the nature of the activity contemplated under this rule, make it imperative that public hearings be a routine part of the licensing process. The hearings should be conducted where the site is proposed, not in Washington or anywhere else that might be at the Commission's or applicant's convenience. Therefore, the rule should be amended to require public hearings, as well as the normal adversary type hearings, at or suitably near the proposed site. Applicant or the Commission would be required to publicize these hearings at least two months in advance, to give residents an opportunity to make satisfactory investigations of their own. In addition, it might also be helpful to establish public document rooms near waste facilities similar to those now required near nuclear power plants.

B-10

4. Time limitations: We think the five-year active monitoring phase required by the proposed rule §61.29 is far too short. Experience with other low-level sites has shown that migration has often gone undetected for long periods of time, and can occur in totally unexpected and unforeseen ways. In addition, past experience with licensee monitoring around power plants leads us to expect that monitoring efforts will be no more than the minimum required by the Commission, and that consequently detection of problems will be unlikely. At least ten years of some form of active monitoring seems to be required, and perhaps more using the experience gained at Maxey Flats. Some

specific provision for additional monitoring if determined necessary by geologic or other conditions would be helpful.

D-52-6

5. Other: One additional weakness we noted is that licensee does not apparently need to submit a detailed closure plan at the time of application, but that this will only be required as closure approaches. We heartily agree with the philosophy that site operation should be aimed at all times toward closure, but would like to see a stricter requirement on applicants at the time of application to have detailed closure plans, subject to amendment with Commission approval when so required by developments during operation, prepared when applying. Section §61.53(d) requires the licensee to have plans ready in case of migration: is this a realistic requirement? Since the probable problem would be groundwater contamination, we think it unlikely that licensees will be able to do anything about it. Specific language that licensees would be required to indemnify well users in case of migration would thus be preferable. Section §61.31 refers to the duty placed on licensee to perform "minor custodial activities" after closure. What about major activities? Again, specific language placing financial responsibility for these on the licensee would be useful in removing potential ambiguity. In addition, it appears that by virtue of the omission of major duties (such as cleanup) and the Commission's discretionary power to apply these rules retroactively to existing sites, the stage could possibly be set for a taxpayer-funded bailout of poorly-run existing and inoperative sites, like Maxey Flats and West Valley. We feel that the industry should bear these costs, and the regulations should be written to make sure that this is done.

E-1

D-59-2

Finally, an interesting philosophical question is raised by the statement at 46 F.R. 38085 that one hundred years is the longest that "governmental institutions should be relied on to carry out active controls." Given the problems to date of our inability to solve the high-level waste dilemma, and the fact that even the most optimistic predictions estimate that high-

D-59-2 level waste (and other low-level waste containing isotopes such as Pu-239 and U-238) can remain toxic for up to 600 years, is this not an admission that we are creating a problem for future generations that we don't think they'll be able to solve, and that we ourselves can barely handle? As a matter of philosophic good sense and good moral conduct, this statement would seem to require the cessation of any production of long-lived radioactive waste.

Comments prepared by Daniel P. Read.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

(10)

September 16, 1981

PROPOSED RULE PR-2, 10 (46 FR 38081)

Honorable Nunzio J. Palladino
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: REPORT ON PROPOSED RULE ON "LICENSING REQUIREMENTS FOR LAND DISPOSAL OF RADIOACTIVE WASTE"

Dear Dr. Palladino:

During its 257th meeting, September 10-12, 1981, the Advisory Committee on Reactor Safeguards met with the NRC Staff and representatives of the U.S. Department of Energy and the Commonwealth of Kentucky to discuss the proposed rule on "Licensing Requirements for Land Disposal of Radioactive Waste" (10 CFR 61). This was also the subject of a meeting of the ACRS Subcommittee on Waste Management held in Washington, D.C. on September 3, 1981.

1. General Comments

On the basis of this review, we offer the following general comments:

a. Adequacy of Proposed Rule

A-8 D-56-21 The proposed rule contains criteria which should assure improvement in the siting, design and operation of near-surface radioactive waste disposal facilities. Concurrent with this effort should be a continuation of work to seek better containment, stabilization, and immobilization of low-level wastes as well as completion of the establishment of criteria for deeper land burial and disposal in mined cavities. Also to be explored is the possible disposal of such wastes in the sea. In addition, the processes that result in the production of the wastes need to be addressed. Attention should be directed to techniques both for reducing the volumes of wastes generated and for assuring that the wastes that are produced are in, or can be converted to, a form amenable to safe disposal.

b. Applicability to Existing Disposal Facilities

A-1 The rule states that many of the operational characteristics requirements proposed are in effect at currently licensed low-level radioactive waste disposal facilities and that such facilities

A-1 should have no difficulty in complying with the suggested requirements. The requirements for sites where operations have been terminated because of disposal problems are not covered by the proposed rule. The NRC Staff has stated that methods for decommissioning the terminated facilities are to be enumerated in regulatory guides issued in support of the proposed rule. It should be recognized, however, that development of satisfactory guidance for such actions may be difficult. Several of these sites contain wastes that include plutonium and other long-lived radionuclides which appear to be in contact with water.

c. Types and Quantities of Wastes Subject to Disposal

GEN-B Development of the proposed rule has revealed certain deficiencies in data, particularly with respect to the compilation of detailed inventories on the quantities and specific radionuclide concentrations in the low-level radioactive wastes buried in existing disposal sites. The NRC Staff is currently compiling such data. Although this effort may require the development of instrumentation to identify and assess radionuclide concentrations in waste packages, such data are essential if the NRC Staff is to have a clear understanding of current practices and if they are to be able to ascertain the impact of various regulatory actions, particularly the influence of the establishment of "de minimus" concentrations for selected radionuclides in specified types of wastes. Such information is also essential in order to assess the impact of various restrictions on the types of wastes acceptable for disposal in a given site.

2. Specific Comments

In terms of comments on specific topics within the proposed rule, we offer the following:

a. Time Spans for Various Requirements

D-50-9 There appears to be a lack of clarity within the proposed rule relative to the time spans over which the various design requirements are to apply. It would be helpful to include a clear statement that restrictions, such as those pertaining to floods, erosion, and water drainage, are to apply through the time of site closure as well as the period of institutional control. In contrast to this, there would appear to be little necessity for specifying a need to observe long-term tectonic changes potentially affecting the site.

b. Avoidance of Soil Subsidence

D-52-2 D-56-8 The proposed rule implies that the waste form plays a major role in soil subsidence that has frequently been observed in land disposal facilities in the past. Since experience shows that subsidence results from a variety of factors, including primarily the manner in which the waste packages are placed in the ground, this portion of the proposed rule may need to be reevaluated and revised.

c. Restrictions on Types of Wastes

D-56-3 D-56-17 The proposed rule contains a number of limitations on the types of wastes that may be disposed of in a land facility. These include restrictions on pyrophorics, explosives, wastes that generate toxic gases, etc. There are also requirements on the "stability" of the wastes, without a clear definition as to what this means, and on the minimum compressive strength for the wastes, which could unduly increase the volumes to be buried. We believe that these restrictions and requirements need to be carefully assessed, both from the standpoint of their enforceability and overall implications.

d. Disposal of Chelating Agents

D-56-2 The proposed rule would not allow the disposal in surface land facilities of wastes containing greater than 0.1% chelating agents. Since such agents are present in a wide variety of radioactive wastes (for example, in decontaminating solutions), this provision could exclude many wastes from burial. In our discussions, the NRC Staff indicated that their intent is not to exclude such wastes from burial but to make the disposal of such wastes subject to their approval. The fact that consideration of the disposal of such wastes may have to be handled on a case-by-case basis needs to be emphasized.

In closing the Committee would like to note that, at the present time, there is a shortage of facilities in the U.S. for the disposal of low-level radioactive wastes. Therefore, it is important that the NRC move forward to complete the development of criteria for the establishment of such additional facilities. At the same time, as pointed out above, it is important that attention be directed to means for reducing the amounts of such wastes produced, and assuring that those that are produced are in a form compatible with disposal. It is also important to vigorously pursue alternatives to shallow land burial as a means for the disposal of such materials, particularly in view of the problems that have been encountered with land burial sites located in areas of the U.S. with high precipitation. A-8

Sincerely,

J. Carson Mark
Chairman

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

(11)

SEP 11 1981

PROPOSED RULE PR-2, et al (46 FR 38081)

Mr. R. Dale Smith
Division of Waste Management
Office of Nuclear Materials
Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Smith:

The U.S. Environmental Protection Agency (EPA) is presently reviewing proposed regulations for the Licensing Requirements for Land Disposal of Radioactive Waste. These proposed rules (10 CFR Parts 2, 19, 20, 21, 30, 40, 51, 61, 70, 73 and 170) were published for public comment on July 24, 1981, with comments due to you October 22, 1981 (46 FR 38081).

GEN-7

The Federal Register notice referenced an Environmental Impact Statement (EIS) which still has not been distributed. We have been told that this EIS will be more than 1,000 pages in length. Accordingly, we would like to request that NRC consider formally changing the due date for comments on the rule to coincide with the date that comments will be due on the draft EIS. This would allow both documents to be reviewed simultaneously.

Should you have any questions concerning our request, please contact Dr. W. Alexander Williams of my staff (755-0790). Thank you for your consideration of our request.

Sincerely yours,

DS10
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1/0

William N. Hedeman, Jr.
Director
Office of Federal Activities

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
ENVIRONMENTAL RESEARCH LABORATORIES
Boulder, Colorado 80303

September 14, 1981

(12)

PROPOSED RULE PR-2, et al (46 FR 38081)

TO: R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Division of Waste Management
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

FROM: William Takasaki, Chief
Supply Services Division

SUBJECT: Proposed Rulemaking on Land Disposal of Low-Level Radioactive Waste

Reference your letter of 7 August, 1981, subject as above.

This Agency uses several extremely low-level radioactive sources that are all self-contained sealed units. Disposal or turn-in of these units are handled through agreement with the University of Colorado located adjacent to our facilities. This Agency does not use any liquid radioisotope materials that could apply to subject rulemaking at this time.

1/0 issues

Based on the above, no comments, suggestions or recommendations are submitted relative to the proposed rulemaking.

CC: J. A. Kemper
Jack Cooper

DS10
5
1/0

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

FROM: Catherine Quigg, research director
Pollution & Environmental Problems, Inc.
P.O. Box 309, Palatine, Illinois 60067
(312/381-6695)

13

SUBJECT: PROPOSED RULEMAKING ON LAND DISPOSAL OF LOW LEVEL RADIOACTIVE WASTE: 10CFR61

DOCKET NUMBER PROPOSED RULE PR-2 et al (46 FR 38)

THE STATUS OF COMMERCIAL TRU WASTE UNDER 10CFR PART 61

The NRC, in its proposed rule 10CFR61 on land disposal of low level radioactive waste, categorizes transuranic (TRU) waste as Class 3 Intruder Waste. Class 3 waste is waste that has radioisotopic concentration that exceeds 10 nanocuries per gram (nCi/g), is not generally acceptable for near-surface disposal, and shall not be disposed of without specific Commission (NRC) approval.

D-55-3

The NRC's proposed rule (10CFR61,Section 61.58) states the NRC "may upon request or its own initiative, authorize other provisions for the classification and charateristics of waste on a specific basis, if, after evaluation, of the specific characteristics of the waste, disposal site, and method of disposal, it finds reasonable assurance of compliance with the performance objectives in Subpart C of this part." (Subpart C is a discussion of performance objectives for land disposal facilities -- criteria for siting, operation, closure and control after closures.

COMMENTARY:

The NRC has succumbed to industry pressure and has proposed a weak, ineffectual rule on TRU which will allow more than 10 nCi/g of TRU to be considered for land burial on a case by case basis.

R. Dale Smith, chief of the NRC's low level waste licensing division, told me (Sept. 15, 1981) that 10CFR61 will supercede other regulations (or lack thereof) regarding commercial disposal of TRU waste in shallow land sites.

The 10CFR61 rule is a weakening of the U.S. Department of Energy (DOE) approach to TRU and the accepted practice today of not allowing land burial of more than 10nCi/g of TRU. In 1970, in response to concerns about plutonium migration from trenches at the Idaho National Energy Laboratory (INEL), the Atomic Energy Commission (AEC) ordered defense contractors to stop disposing of TRU waste with more than 10 nCi/g in land sites. It ordered TRU waste be given retrievable, above-surface storage for 20 years. Because its standards were more rigorous than the commercial sector. The DOE defense disposal sites refused to accept TRU contaminated waste from the commercial sector.

The DOE said an alternative to land disposal would be required for defense TRU waste. The Nuclear Regulatory Commission (NRC) and its Agreement States took a more lax approach. Because of pressure from DOE (which wanted to help industry) and the nuclear industry itself, the NRC allowed commercial TRU to be buried at the Richland site until 1977.(according to NRC's Smith) when pressure from Gov. Dixie Lee Ray caused the NRC to place a TRU limit to 10 nCi/g in Nuclear Engineering Company's renewal license. The NRC's own 10CFR61 says "The last commercial site imposed the 10 nCi/g restriction in 1981 -- so there is a contradiction as far as the date of restrictions on Richland.

D-55-3

In discussions with government representatives, it is often said that there is very little commercial TRU waste now because there is no reprocessing in the United States at the present time. In fact, 10CFR61 says: "At present, wastes contraining transuranic nuclides in concentrations greater than 10 nCi/g are not being generated in significant volumes." These observations overlook the fact that major producers of TRU wastes have been private companies like Kerr-McGee, Westinghouse, General Electric, and Babcock and Wilcox in Pennsylvania. These companies were involved in plutonium fabrication and research and development on advanced plutonium fuels for breeder reactors from the 1960s through 1978. Since commercial plutonium fabrication is virtually at a standstill, companies like Kerr-McGee are trying to decommission their facilities, according to the NRC's Smith. Smith said there is an inactive plutonium facility at Erwin, Tennessee waiting to be decommissioned and decontaminated. In Smith's opinion, the NRC's 10CFR61 won't solve the problem of these companies, because he assumes the NRC will rule against burial of higher concentrations of TRU in land disposal sites. However, we have no assurance this will be the case. The NRC has bowed to industry pressure before -- and has now placed itself in a position to take a "soft" approach on a case by case basis.

It is ironic (and incredible) that the NRC is considering relaxing its standards on the land burial of TRU at the very same time the DOE is spending millions (billions?) to dig up TRU waste at its Idaho National Energy Lab.

My interpretation of 10CFR61 is backed up by projections of the 1979 Interagency Review Group (IRG) report on radioactive waste management. The IRG report (TID 28818, Appendix A) states that wastes previously considered TRU wastes may be classified as low level waste, increasing from the current 10 nCi/g to as high as 100 nCi/g -- which will substantially increase the amounts and activity of low level waste.

In a private phone conversation on August 4, 1980, J. Howard Kittle, manager of waste management program at Argonne National Laboratory, told me: "Transuranic wastes are largely alpha emitters with long half lives. This waste should be treated the same as high level waste."

COMMENTS: REGARDING TRANSURANIC WASTE RULES IN 10CFR- PART 61.

D-55-3
1. Why didn't the NRC put "less than 10nCi/g in columns 1 and 2 on page 38085. Doesn't it apply?

2. Why didn't the NRC say that TRU waste above 10 nCi/g should be given retrievable surface storage until its new regulations for intermediate waste are available? The NRC's R. Dale Smith says promulgation of these regulations is next on that agency's agenda.

D-55-5
3. 10CFR Part 61 indicates the NRC will decide TRU waste disposal on a case by case basis, giving it shallow land burial if the NRC deems the site suitable. Who in the NRC will make that decision and what are the criteria that will be used to judge whether or not a particular site is suitable?

D-55-3
4. The NRC's Smith told me high level waste will now include TRU waste down to 10 nCi/g. Isn't this misleading when a 55 gallon drum of radioactive waste containing 2-million nanocures of TRU or 70-million curies of plutonium-241 will be allowed burial in a low level waste disposal site under the proposed regulations?

5. In Section 61.55 (d), there is no definition of "near surface" -- does this mean that if the dump operator digs deep enough, then land disposal at that site will be approved?

D-55-5
6. What is the maximum limit on transuranic concentration the NRC will allow for land disposal? The rule gives no indication, other than to suggest that above 10 nCi/g, specific Commission approval will be required.

D-55-7
7. Averaging the concentration of radioisotopes over the volume of a waste container may allow heavy actual concentrations or "hot spots" of radioactive waste to be accepted for shallow land burial.

In very small type, the NRC states: "For a 55 gallon drum, multiply the (allowed) concentration by 200,000. Thus, by adding concrete, one should be able to bury just about anything -- as long as you add enough concrete. The multiplication factor of 200,000 will allow 2 million nanocuries per gram of TRU or 70 million nanocuries of plutonium-241 in a 55 gallon drum of radioactive waste.

D-55-3
8. Why 10 nCi/g? We should examine the origin of the 10 nCi/g standard for transuranics. Pro-nuclear scientists were quick to tell me at a recent EPA meeting on low-level wastes that "10nCi/g is the same as natural background -- it's like the soil outside

this building." They are wrong. According to the Atomic Energy Commission (AEC), Appendix 0511, Part 1 on radioactive waste management:

D-55-5
> "The value of 10 nCi/g is derived from the upper range of concentrations of radium-226 in the earth and is subject to modification based on long-term studies of nuclide migration in the soil."

Experience at Maxey Flats, Idaho National Energy Lab, and Oak Ridge National Lab indicate that plutonium migrates much more quickly through the soil than originally anticipated. (For details of the Maxey Flats experiences, see Science magazine, June 26, 1981, "Characterization of Plutonium in Maxey Flats"). One would expect, based on these experiences, to see the concentration of transurnics allowed shallow land burial regulated downward.

THE STATUS OF SPENT RESINS UNDER 10CFR61

Ion-exchange resins are used to take radioactivity out of primary cooling water; they act like a filter. Spent resins look like little beads of plastic. They are considered low level waste even though they are highly radioactive and contain isotopes with long half-lives like cesium-137.

Under 10CFR61, spent resins will continue to be allowed shallow land burial. J. Howard Kittle, an expert in nuclear waste managment at Argonne National Laboratory, told me in a phone conversation (August 4, 1980) that: "It (spent resin) is really in a different category and should be containerized. There is no way to reduce resin volume." Kittle said the NRC requires immobilization of spent resins now or the use of high integrity containers. "But no one knows what a high integrity container is," he said, "and that is why utilities still immobilize their spent resins." D-56-20

Kittle said: "I strongly favor the consideration of spent resins and cladding hulls as intermediate wastes. Spent resins require remote handling and clad hulls have to be handled remotely."

Unfortunately, under 10CFR61, spent resins are allowed shallow land burial. This is what industry wants. At a meeting of the American Nuclear Society at Northwestern University, Evanston, Illinois on April 25, 1981, John S. Richmond of Wisconsin Public Service Corporation said: "Spent resins should be solidified as polymer or with cement instead of shipped as liquid. It's ok to give them shallow land burial.

But other experts, in addition to Dr. Kittle, disagree. In a private communication with John Peel of the DOE's office of waste isolation in July 1980, he said: "Our focus is on improved shallow land burial. We should quit burying organic chemicals and ion-exchange chemicals. Peel said, "Spent resins should be solidified. You can burn resins in an incinerator or glass smelter at low temperatures. There are two types of resins; you can burn organic resins and melt zeolites."

According to the NRC's R. Dale Smith, (phone conversation Sept. 15, 1981): "What we did in 10CFR-PART61 was to establish performance objectives...allowable exposure. Then we back-calculated to the kinds and amounts of spent resins and other waste that could give that kind of exposure." Smith said, "Under these calculations, most spent resins would fit into the categories of waste that could be given shallow land burial."

Smith went on to say that for spent resins above that limit and inorganic materials, the type of disposal had not been determined -- other than the fact that "it should not be shallow land burial." Smith acknowledged the need for a definition and disposition of intermediate waste, saying "that is next on our agenda."

COMMENTARY ON SPENT RESINS

In my opinion, the NRC has made a serious tactical error in not releasing intermediate waste regulations at the same time as low level waste rules. If my reading of 10CFR61 is correct, the NRC has already defined TRU waste and spent resins as low level waste. The agency will have a difficult, if not impossible, task of redefining these wastes as "intermediate wastes" in the future.

The allowed exposure to low level radioactive waste is set by the NRC at 500 millirem per year per exposed individual in 10CFR61. The discussion (page 38084, Fed. Register, Sept. 24, 1981) in the proposed rule indicates: "Any waste with concentrations of these isotopes that would cause an exposure greater than 500 millirem must be protected from intrusion by deeper burial or some other barrier." C-4

How did the NRC arrive at 500 millirem which is the equivalent of about ten chest x-rays or 20 dental x-rays as a safe dose. Does the NRC take into consideration the greater health risk to children, pregnant women or the fetus, or ill, elderly people from such a dose? There is no basis given for the NRC's projection that only one, or at the most, a few persons would be exposed to the 500 millirem dose. How can the NRC predict how many people might be farming or digging in a certain plot of land somewhere in the United States over the next 200 or 300 years?

And, why doesn't the NRC wait for the Environmental Protection Agency (EPA), which has environmental standards-setting authority, to set its limits for radioactive releases to the environment from disposal facilities? Why is the NRC, in effect, pre-empting the EPA's authority by "anticipating" the EPA standards for radioactive releases from nuclear dumpsites? C-2 C-3

PLUTONIUM IN LOW LEVEL WASTE TO ESCALATE

The NRC has separated out from the 10 nCi/g restriction the transuranic element plutonium-241, and allowed it a far greater concentration than was previously permitted in low level waste. On page 38097 of its new regulations, the NRC proposes a concentration of 350 nCi/g of plutonium-241 be allowed land burial as Class C Intruder waste. D-55-3

To explain, the NRC states "this concentration of short-lived beta-emitting isotope decays to 10 nCi/g concentration of americium-241, a longer-lived alpha emitter." The NRC goes on to say that "At present, wastes containing transuranic nuclides in concentration greater than 10 nCi/g are not being generated in significant quantities."

Let us examine these two statements. First of all, plutonium-241 is not short-lived as the NRC states. It has a half-life of 13.2 years, which means it will be toxic in the environment for 132 to 164 years. This is not a short time. As the NRC says, plutonium-241 decays to americium-241. Americium-241 has a half-life of 458, which means it is toxic from 4,580 to 9,460 years. Although plutonium-241 is a

beta-emitter, its decay products americium-241 and neptunium-237 (half-life 214 million years) are alpha emitters.

The health risk from alpha radiation comes from its internal penetrating power; it has weak external (beta) penetrating power. If alpha particles are inhaled or ingested, all of their energy strikes a few cells, increasing the likelihood of cell mutation or cell death. Plutonium-241 and americium-241 emit alpha particles with strong energies and have high linear energy transfer (LET); that is they transfer greater energy in a shorter distance. A publication of the Scientists Institute for Public Information, Radioactive Contamination by V. Brodine, 1975, states that "Observations of radiation effects at the cellular level have shown that high LET radiation cannot be repaired." D-55-3

Americium-241 is known to move through the food chain. It should also be noted that any transuranics that are given land disposal can, through various natural mechanisms (erosion, intrusion, wind storms), become airborne.

Jeffrey King, MD, researcher in pulmonary physiology at the Harvard School of Public Health, says that americium-241 is in a class with the most radioactive elements and is far more toxic than the most toxic carcinogen. King says, "The special toxicity to the lungs from americium (or plutonium) is a result of the powerful short range, effect of alpha particles on the sensitive bronchial epithelium."

Dr. Karl Z. Morgan, considered the father of health physics in the United States and the former director of health physics at Oak Ridge National Laboratory, says his calculations indicate that when americium and radium-226 may become deposited in the body, "americium-241 is about 16 times more hazardous than radium-226."

After an investigation into the incidence of cancer from plutonium soil contamination downwide from the Rocky Flats plant, Dr. Carl Johnson of the University of Colorado School of Medicine in Denver, concluded: "The consistency of the increase in incidence of all cancer and of certain categories of cancer with increasing concentrations of Pu in soil supports the hypothesis that exposure of the general public to low concentrations of Pu in the environment may have an effect on cancer incidence."

Now comes the NRC with 10CFR61 proposing not only that we give concentraions of transuranics over 10 nCi/g land burial, on a case by case basis -- but that we also allow 35 times more plutonium-241 than any other transuranic nuclide. Could it be that the NRC and the nuclear industry know, as we know, that plutonium -241 is the most common transuranic produced by commercial nuclear power plants? According to a recent study by the Electric Power Research Institute (EPRI-NP-1052, April 1979), plutonium-241 constitutes 81 percent of the calculated yearly transuranic nuclide production of a 1000 megawatt nuclear power plant.

The volume and curie amounts of plutonium-241 that will be allowed land burial under 10CFR61 is staggering, when one considers the NRC's allowance that "concentrations may be averaged over the volume of the package. For a 55 gallon drum multiply the concentration units by 200,000 to determine allowable total activity, we are told. D-55-3

For plutonium-241, we multiplied 350 nCi/g by 200,000 for a total NRC allowed 70 million nanocuries per 55 gallon drum of plutonium-241 waste.

It defies reason to understand such regulations by an agency mandated to protect the health and safety of the American public.

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Enclosures for the record:

1. Letter dated April 30, 1979 from Jeffrey M. King, M.D., to Joseph Strasburg, New York City Council, Legal Division.

2. Statement of Karl Z. Morgan, July 28, 1978, regarding americium-241 and radium-226.

3. Report by Carl J. Johnson, M.D., to 5th International Congress of the International Radiation Protection Association, Jerusalem, Israel, March 9-14, 1980.

4. "Calculated Yearly Nuclide Production From a 1000 Mwe Plant", Table 2.4 from "Activity Levels of Transuranic Nuclides in Low Level Solid Wastes from U.S. Power Reactors," prepared by Science Applications, Inc, MD., for Electric Power Research Institute, Palo Alto, CA., August 1980.

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STATE OF NEVADA
DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH
BUREAU OF CONSUMER HEALTH PROTECTION SERVICES

505 EAST KING STREET
CARSON CITY, NEVADA 89710
TELEPHONE: (702) 885-4750

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September 24, 1981

(14)

COMMENT NUMBER PR-2 et al
PROPOSED RULE (46 FR 38081)

R. Dale Smith, Chief
Low-Level Waste Licensing Branch
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Dale:

In answer to your request, we have enclosed comments on the proposed 10CFR61.

Sincerely,

John

Donn Vaden
Supervisor
Radiological Health Section

JV/jc

Enc.

cc: G. Wayne Kerr (w/enclosures)

STATE OF NEVADA
DEPARTMENT OF HUMAN RESOURCES
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COMMENTS ON PROPOSED 10CFR61

It appears to be logical to categorize radioactive waste to promote stability of the surface of the site and to protect possible users of the land in the distant future.

To put such a system of classification of radioactive waste into effect, however, takes more than just promulgating a regulation. It will require the cooperation of the packager, the site operator, the regulatory agency and an institution that will monitor the site for up to 100 years.

D-55-8 The history and record of the packaging of radioactive waste by generators has not indicated a durable capability to package the waste in conformance with DOT regulations. Further, the types of isotopes and their quantities in the packages of waste are at best educated guesses. In view of this situation, it does not seem likely that the waste generators will be able to properly classify their waste according to the proposed regulation, or for that matter even label it correctly.

D-55-11 The site operator will have to accept the radioactive waste as classified by the generator because he cannot open the packages for inspection. The Class A waste would be placed in a designated trench. The site operator would assess potential active maintenance costs for this type of trench and add a per unit volume charge to the shippers of Class A waste. For simplicity, the site operator would consider all other waste received as intruder waste. This waste would be buried in a different trench under 17 feet of dirt. The additional cost for this type of burial would be passed on again to the generators of the waste. All of the additional bookkeeping required will complicate waste disposal operations and the new methods of disposal will greatly increase costs of waste disposal. In addition, the regulatory agency would need to monitor the charges collected by the site operator for active maintenance because, if that money was not all used during the five years after site closure, it should be turned over to the institution that will have custody of the site for long term care and maintenance.

The regulatory agency governing the site would either require waste packages not labeled with a waste classification to be opened by the site operator at his expense, or have the waste returned to the generator at his expense.

The regulatory agencies governing the generators will have to increase their inspections of the actual radioactive waste packaging operations to determine that the waste packaged does meet the requirements for the different classifications. It is doubtful that regulatory agencies can do more inspection in this area than they are now doing because of budget limitations.

D-55-11 The proposed regulation states that Class B wastes must be stabilized. This will require considerable quality control on the part of the generator in his packaging operations to eliminate voids and to assure solidification. In the case of resins solidified with cement, for example, if this is not done properly, the matrix will eventually crack and the resins could flow under pressure. This means that dependence may have to be placed on the container for prevention of deformation, an additional expense.

D-52-2 Section 61.29 of the proposed regulation states that site operator must actively maintain the site for five years after site closure. The cost of this operation for a new site could be estimated by the site operator and passed on to the waste generators. In the case of existing sites, particularly in arid climates, it is not expected that trench caps of trenches containing segregated waste would crack or collapse for many years, perhaps 50-100.

A-1 The statement is made in "other considerations" that the proposed regulation would apply to existing sites. In this case, the regulatory agency would require the site operator to actively maintain the site for at least five years after closure at his expense, because there would be no way the site operator could recover his costs for this operation. To apply the estimated maintenance costs to current users of the site would make burial cost prohibitive for them at that site. It is not likely that the site operator would agree to this arrangement and probably could not be forced to do so.

D-55-12 In 61.7 (b)(2) a statement is made that Class A segregated waste decays to acceptable levels during the period when the site is occupied. What are "acceptable levels"? It is assumed the acceptable levels are below those in Column 1 of Table 1. In the case of enriched or depleted uranium, however, there would be no appreciable decay during the period the site is occupied. Further, dependent on the definition of "acceptable levels", the receipt of Class A segregated waste at the site would have to be stopped at some point in time before the site is closed, if it is to decay to acceptable levels prior to site closure.

In summary, a radioactive waste classification system may be effective for new sites in the future provided an intense education and inspection program can be developed for the generators of the radioactive waste; and provided that methods can be found for solidifying wastes that need to be stabilized which will not leave residual liquid and not deteriorate in form. Existing sites will require active maintenance for a great number of years so the waste classification system is not meaningful in these cases.

ED-1 Other minor comments: Words such as "cornerstone" "adequate complement" and "unreasonable risk" should be eliminated from the regulation. Section 61.23A(5) refers to Section 61.50 which does not exist.

John Jacen, Supervisor
Radiological Health Section

September 24, 1981

EXXON NUCLEAR COMPANY, Inc.
"SEARCH AND TECHNOLOGY CENTER
George Washington Way, Richland, Washington 99352
PHONE: (509) 375-7100

October 1, 1981

15

DOCKET NUMBER
PROPOSED RULE: PR-2 et al
(46 FR 38081)

DOCKETED USNRC OCT. 5 1981 Office of the Secretary Docketing & Service Branch

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

2, 19, 20, 21, 30, 40, 51, 61, 70, 73, 170

Attn: Docketing and Service Branch

Reference: Proposed Rule, Licensing Requirements for Land Disposal of Radioactive Waste, Federal Register, Vol. 46, No. 142, pp. 38081-38105.

Gentlemen:

We have reviewed the referenced proposed rules and have a number of comments for your consideration prior to preparation of the final rule. In general, the proposed rule appears to be a reasonable blend of performance oriented objectives and technical requirements. The proposed rule should increase and promote public confidence relative to the safe disposal of low level radioactive wastes.

Specific comments with respect to the proposed rule are given below:

Paragraph Number	Comment
61.2	A better definition of disposal would be: "Confinement of the wastes with no provisions made for subsequent retrieval."
61.42(a)(1)	GEN-1 This subparagraph specifies that there be no interaction between certain disposal units and implies that an absolute condition be accomplished by separation of the disposal units. It would be more precise to state that "Wastes designated as Class A ...by placing in disposal units which have no significant interaction with disposal units containing other than Class A segregated wastes".
61.50(b)(2)(v)	The obligation in the annual report to include information relative to "any instance in which observed site characteristics were different from those described in the application for a license", should be modified to require reporting only of such site characteristics which were "significantly" different...

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AN AFFILIATE OF EXXON CORPORATION

Paragraph Number	Comment	
61.82(a)	Ambiguities in this paragraph leave open to the Commission the right to inspect waste materials which have been placed and covered within a disposal unit. Since this presumably is not the intent, the paragraph should be modified to specifically limit the inspection of radioactive wastes to materials which have not been placed within a disposal unit and covered.	G-1
2.103	It is not clear how the revised paragraph includes waste disposal facilities licensed pursuant to the proposed Part 61. Wording similar to that of the revised paragraph 2.104 (e) would appear to be appropriate to more precisely define the affected licensees.	Part 2-1
20.311(d)3 and (f)(5)	To assure compliance with regulatory requirements, while avoiding the implication that a separate QA program exists, the following alternative to paragraph 20.311 (d)(3) is proposed: "Conduct operations in a manner which assures compliance... chapter; management audits of the operations must be conducted;" similar words would be appropriate in paragraph 20.311(f)(5).	M-2

We appreciate having the opportunity to comment on the proposed rules.

Sincerely,

R. Nilson, Manager
Corporate Licensing

RN:slr

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
P.O. 2063
Harrisburg, PA 17120

October 5, 1981

(16)

DOCKET NUMBER
PROPOSED RULE PR-2 et al (46 FR 38081)

Samuel J. Chilk
Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attn: Docketing and Service Branch

Dear Mr. Chilk:

The Department has reviewed the proposed regulations covering the licensing requirements for land disposal of radioactive waste (10 CFR 61). Attached are detailed staff comments that contain the specific points the Department is concerned with.

Generally, the use of performance objectives and more general technical criteria instead of the previously suggested specific standards leads to a much more flexible and achievable regulatory system. However, in our opinion, more information is needed in the licensing process.

GEN-7 We understand that the supporting Environmental Impact Statement (EIS) referenced in the proposed regulations has not been issued. We reserve the right to provide the NRC with additional comments on these regulations after we review the EIS.

Thank you for this opportunity to review the proposed regulations.

Sincerely,

CLIFFORD L. JONES
Secretary of Environmental Resources

COMMENTS ON NRC PROPOSED REGULATIONS - 10 CFR 61
by
Department of Environmental Resources

GEN-2 The use of general performance objectives and the more general technical criteria instead of the previously suggested specific standards leads to a much more flexible and achievable regulatory system. However, to provide the more definitive information which is necessary for licensees, it is suggested that at least the following topics be addressed in the form of more detailed regulatory guidance:

1. Waste stability;
2. Specific assumptions to use for determining whether the intruder scenario meets the performance objectives;
3. Guidelines and assumptions for setting maximum disposal site inventory limits consistent with the performance objectives;
4. Concentration limits for naturally occurring and other isotopes (especially Radium) not specifically addressed in Table 1;
5. Specific guidance for the information that is requested in a license application as outlined in Subpart B. This could be in the form of standard formats and standard review plans such that the licensee would know beforehand the level of detail and, where applicable, minimum acceptable criteria to satisfy the NRC review process;
6. Definitive standards for the conditions that are required to be met for postclosure license transfer and termination of the licensee.

A-2 Because of the fact that low level waste (LLW) disposal has become a state responsibility, it would be very helpful to present Agreement States, or States which are contemplating on becoming Agreement or Limited Agreement States for the purpose of regulating a LLW site and for the NRC to formally specify which portions of Part 61 must be adopted by the State for compatibility. It is important that this be done as soon as possible so that those states which are contemplating on changing their agreement status and a possible need for specific State Legislation could include in their deliberations the impact that the mandatory adoption of these regulations would have on those decision-making processes. Part H of the Summary seems to imply that all of Part 61 will have to be complied with for compatibility.

It should be assured that these regulations will be compatible with the site selection process that may be either part of a compact arrangement or an individual State process which has been established to meet the provisions of the LLW Policy Act.

Specific Comments on Indicated Sections:

D-51 61.2 Definition of "Engineered Barrier" may be too restrictive in that this term could also be used to describe engineered barriers that limit subsurface migration or surface water intrusion.

A-1 61.7(c)(4) It is recognized that the Energy Reorganization Act precludes NRC licensing of all but those specific DOE activities listed in the Act. Possession of commercial LLW burial sites is not included as one of these specific activities, but NRC should request that Congress consider amending the law to allow licensing of this activity to insure adequate protection of public health and safety.

6-5 61.25(b) This provision would allow the opportunity for public hearing every five years during operation whether or not significant changes have occurred. Unless the prerequisites for requiring a public hearing are sufficiently stringent, such that this process is not subject to abuse, these hearings could become overly burdensome and potentially lead to unnecessary cost without a commensurate benefit to health and safety.

B-8 61.30(a) Does this paragraph preclude the site operator from retaining licensee responsibility during the institutional control period following post-closure observation and maintenance? If the site owner chooses and the site operator is agreeable, the site operator could remain as the licensee until the requirements are met to terminate the licensee without a detrimental effect on public health and safety.

C-3 61.41 It should be recognized that the limits of 40 CFR 190 are based on a cost/benefit analysis of the potential for reduction of releases from each step of the nuclear fuel cycle. These ALARA principles may also be applicable in the case of LLW disposal since engineered barriers or other disposal site design features could further reduce potential exposures in a cost effective manner.

D-50-7 61.50 Consideration should be given to including as a requirement accessibility to major transportation routes. Most assessments have shown that the largest contribution to population exposure from LLW waste management operations is due to transporting the waste from the generator to the disposal site, and therefore this factor should be assessed and minimized if possible. Minimizing the impact of this factor could also positively effect the institutional and political acceptability of a disposal site. The appropriate way to address this consideration may be to include a separate section which lists only institutional requirements such as public water supplies and population density.

D-55-13 61.52(a)(1)-(3) These subsections seem to imply that only Class B wastes need to meet the requirements of paragraph (4) through (10). Certainly Class C wastes need to meet at least the same requirements as Class B, and consideration should be given to requiring Class A to meet most of the additional requirements, except perhaps paragraph (4).

ED-1 Section 61.52 (a)(5) the term "reduce future subsidence" should be stated "control future subsidence" "Reduce" is too ambiguous.

Section 61.52 (a)(9) is not a performance specification. It should be rewritten to describe what is to be achieved.

D-53-1 Section 61.53 (a) Data covering a simple twelve-month period for seasonally variable characteristics is insufficient. Seasonal variations having an impact on future environmental monitoring would better be related to established normals, maximums and minimums as provided by appropriate agencies.

Section 61.53 (d) should include language specifying when performance specifications should be readied and to whom they should be submitted.

D-55-2 61.55 NRC should reconsider not setting generic "de minimus" levels for at least certain isotopes. The commitment to continue to set these exemptions on the basis of certain waste streams is of dubious value and is considered to be a poor excuse for failure to deal with this controversial topic. Since there already exists generic discharge limits for all isotopes if they are released in a gaseous or liquid waste stream, there is no reason that release by unrestricted solid waste disposal should be treated any differently, if the limits are properly developed. In fact, paragraph 61.7(b)(4) implies that Class A and B waste decay to "de minimus" levels after 100 years.

D-59-1 61.59(a) It should be noted that nationally recognized groups (State Planning Council and DOE National LLW Strategy Task Force), which have developed policy recommendations for LLW management, have recommended that the option should be available for States to turn over responsibility for long-term custody of LLW disposal sites to the Federal Government if they meet satisfactory decommissioning criteria. NRC should more thoroughly consider this option and make appropriate recommendations for specific Federal legislation if needed.

D-59-2 61.59(b) Consideration should be given to including requirements for, or limits upon, the use of the surface of the disposal site during the institutional control period.

B-10 It should also be made clear that active controls, especially environmental surveillance, could continue beyond the 100 year time period if the custodial agency so desires.

D-59-2 Section 64.30 deals with performance standards for avoiding environmental harm. Recognized alternative uses should be considered in the assessment of present worth because any site chosen must be restricted for a minimum of 105 years and possibly over 500 years.

DOW CHEMICAL U.S.A.

LARKIN LABORATORY
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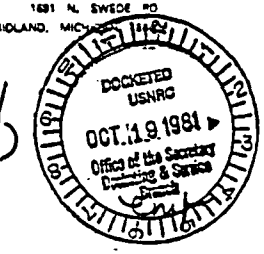
October 12, 1981

(17)

DOCKET NUMBER
PROPOSED RULE PR-2 et al (46 FR 38081)



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

Attention: Docketing and Service Branch

Subject: DOW COMMENTS, PROPOSED RULEMAKING 10 CFR 61

GEN-7 Dow comments dated September 18, 1981, on the subject rulemaking are enclosed. Commission employees have verbally informed Dow that the comment period will be extended to January 1982. No written confirmation of the extension has been noted in the Federal Register or any other official source. The Dow comments are therefore being submitted at this time to assure that they are within the official comment period. Additional comments will be submitted as necessary and as opportunities arise.

Sincerely,

J. B. Owen

J. B. Owen
Group Leader
Nuclear & Solidification Services
517-636-3388

fo

DOW CHEMICAL U.S.A.

LARKIN LABORATORY
1691 N. SWEDE RD.
MIDLAND, MICHIGAN 48640

September 18, 1981

(17)
DOCKET NUMBER
PROPOSED RULE PR-2 et al
(46 FR 38081)

DOCKETED USNRC
OCT. 19 1981
Office of the Secretary
Docketing & Service
Branch

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

Attention: Docketing and Service Branch

Subject: PROPOSED RULEMAKING 10 CFR 61

Dow Chemical U.S.A. (Dow) is licensed by the U. S. Nuclear Regulatory Commission (Commission) to possess, use, and transport certain radioactive materials. Dow is actively engaged in developing, testing, and marketing technology for cleaning equipment that is contaminated with radioactive materials. The Commission has reviewed and accepted the Dow topical report, DNS-RSS-001-P-A, which describes Dow technology for solidification of low-level radioactive wastes. Dow recognizes the need for and supports actions which result in proper disposal of radioactive wastes. For these reasons Dow welcomes the opportunity to comment on proposed rulemaking 10 CFR Part 61, Licensing Requirements for Land Disposal of Radioactive Waste, published in the Federal Register on July 24, 1981.

Specific comments are as follows.

Supplementary Information

D-56-16

1. Section II acknowledges that current regulations do not contain any standards or technical criteria for the disposal of licensed materials and that the need for standards and technical criteria is well documented. Section III acknowledges that the Commission has had a program underway for several years to develop regulations and other guidance for the management and disposal of low-level wastes and references NUREG-0782, a draft environmental impact statement, to provide guidance and support to 10 CFR 61.

Comment

D-56-16

Medical and research facilities, nuclear power plants, and other commercial activities have been generating significant amounts of low-level radioactive wastes each year since the 1950s. The first commercial site for disposal of these wastes was opened in 1962. The lack of regulatory standards and technical criteria resulted in the selection of some disposal sites and use of some disposal techniques without regard for the concept of as low as reasonably achievable (ALARA) and for which there is very little or no technical or economic justification. Some private companies, such as Dow, have developed new or improved disposal techniques which have been tested in private and national laboratories and are being used by some waste generators and service companies that support them. However, due to the lack of enforced regulatory standards and technical criteria most of the waste generators have shown significant reluctance to use the new or improved techniques. There are a few waste generators that have openly stated that they will not change or improve disposal techniques until they are required and enforced by regulation.

GEN-7

The reference to NUREG-0782 as guidance and support to 10 CFR 61 is an example of Commission actions which result in waste generators being reluctant to act without specific regulatory direction. Dow attempted to obtain NUREG-0782 and was informed that it is still being drafted and that when the draft is available there will be a 90-day comment period. The comment period for NUREG-0782 will obviously extend beyond October 22, 1981, which is the end of the comment period for 10 CFR 61. To comment on 10 CFR 61 while the guidance and support that is to be provided by NUREG-0782 is still being drafted tends to add to the waste generator's reluctance to change. In the meantime, the waste generators will continue to generate wastes and use disposal techniques which are known to compromise the ALARA concept and the goal of assuring protection of public health and safety during transport and disposal of the wastes.

D-56-16

The Commission must recognize that there is an immediate need for regulatory standards and technical criteria and not allow the development program to continue for several more years. Immediate actions should

D-56-16 be taken to establish and enforce standards and technical criteria based on the concepts of ALARA and best available technology for disposal of radioactive waste at the existing disposal sites. The Commission has used the excuse that the existing disposal sites are located in and licensed by Agreement States, therefore, the present regulatory standards and technical criteria are the responsibility of the States. This is not a valid excuse. The States have limited technical and economic resources to evaluate new or improved techniques and establish and enforce standards and technical criteria. Like the waste generators, the States are also reluctant to act without Commission guidance and assistance with these matters. The need for the Commission to provide guidance and assistance to the States has received additional emphasis by passage of the Low-Level Radioactive Waste Policy Act which authorizes the States to enter into compacts in order to establish and operate regional disposal sites. The Commission should take the lead by providing basic standards and technical criteria and strengthen the Agreement States Program with additional technical and economic assistance.

2. Section IV explains why the term "low-level radioactive waste" is not used in 10 CFR 61.

ED-1 Comment

Dow agrees that wastes should be defined in terms of radioactive and chemical properties and not in traditional terms related to their origin.

3. Section V is a discussion of Commission logic and philosophies related to the use of prescriptive requirements versus performance objectives and the minimum technical requirements related to disposal site selection, operation, and closure including waste characteristics and classification. Land ownership, institutional control, financial assurance, life cycle, and impact of other regulatory requirements and groups are also discussed.

Comment

GEN-2 Dow agrees with most of the logic and philosophy of this section. However, the present needs for regulatory standards and technical criteria can not be overlooked and require the following specific comments.

D-56-8 Subsection B

Placing reliance on stability of the disposed waste at the time the facility is closed will be possible only if stability is specified and enforced by the standards and technical criteria during the disposal operation. As pointed out in previous comments, techniques which provide stable waste forms are available today but due to the lack of regulatory standards and technical criteria they are not in general use. These techniques result in monoliths which place the radionuclides into forms which are less likely to be dispersed and less likely to be released to and transported by ground water. These monoliths are more likely to be recognized and therefore avoided or properly investigated and handled by intentional or inadvertent intruders. All of these factors are within the concept of ALARA and reduce the need to rely on the many unknowns and uncertainties associated with pathway analysis.

Subsection C

As previously stated, Dow agrees that wastes should be classified by their radioactive or chemical properties. We also agree with the intent and the five disposal site characteristics that are listed. However, without benefit of NUREG-0782 it is not possible at this time to provide specific detailed comments concerning the waste classification scheme.

ED-1 It is possible to comment that listing waste streams under Class A, B, or C appears to be an attempt to classify wastes in terms of their origin, and therefore, is in direct conflict with the intent of the classification scheme. It is acknowledged that it is implied that NUREG-0782 contains radioactive and chemical data to support this listing.

D-55-2 It is also possible and necessary to remind the Commission again that there is an immediate need for enforced regulatory standards and technical criteria based on the concepts of ALARA and best available technology. This need includes definition of a "de minimis" category for waste. Dow feels that there is sufficient information available now

D-55-2 and questions the need for the Commission to work on this definition over the next two years.

Subsection H

D-55-8 Dow agrees that many of the operational provisions and waste characteristics requirements proposed in this rulemaking are in effect at the existing disposal facilities. The point is that the waste characteristics requirements proposed in this rulemaking do not reflect the concepts of ALARA and best available technology. Just as important, maybe more, is the condition that neither the Commission or the existing disposal facilities have inspection and enforcement programs to assure that the requirements are being met. Standards and technical criteria without inspection and enforcement are useless and unnecessary.

A-1 In spite of this comment, Dow agrees that the existing operating sites should have very little or no difficulty in complying with the proper standards and technical criteria including inspection and enforcement. This must be put into effect immediately.

Part 61 - Licensing Requirements for Land Disposal of Radioactive Wastes

To comment on each Subpart and Section would in many instances be to repeat comments which have been made regarding Supplementary Information. In an effort to minimize repetition Dow has limited its comments to the following specific Sections or paragraphs.

1. Subpart A, Section 61.7 Concepts. (b)

C-5 Dow agrees that the primary safety objectives are to prevent migration of radionuclides and exposure to intruders. It is also agreed that stability is a cornerstone of the system to control migration of radionuclides and contributes to intruder protection by providing a recognizable and nondispersible waste form.

Dow has no objections to philosophies of the waste classification scheme. There is some concern that too much emphasis is being placed on pathway analysis and the ALARA concept is being overlooked. However, specific comments can not be made until NUREG-0782 is available.

2. Subpart B, Section 61.13 Technical Analyses and Subpart C, All Sections

C-5 Once again, Dow has no objections to the philosophies expressed in these Sections but emphasis on pathway analysis and specific dose values without including the ALARA concept continues to cause concern. Dow has noted that the Commission has mentioned ALARA one time (page 38084) in the Supplementary Information and not at all in Part 61. In an effort to reduce the uncertainties associated with pathway analysis, the Commission should make it very clear that the spirit of the ALARA concept applies to all standards and technical criteria.

3. Subpart D, Section 61.55 Waste Classification

Dow understands that the basis for this Section will be contained in NUREG-0782. Specific comments will therefore be made when NUREG-0782 is available. It is possible to make the following general observations.

The Commission is to be complimented for not including the listing of waste streams under Class A, B, and C that Dow objected to in the Supplementary Information.

D-55-13 Table 1 leaves the impression that the Commission is completely ignoring the needs of today and the objectives of assuring protection of the workers, the general population, and the environment during the operation of the disposal facility. For example: Class A segregated waste may be transported and disposed of with only minimum requirements on waste form and characteristics but may contain up to 140 curies of ^{60}Co in a 55-gallon drum. The minimum requirements on waste form and characteristics are set forth in Section 61.56(a) and will permit packaging wastes which are in a readily dispersible form and which contain significant volumes of liquids that will contribute to radionuclide migration by ground water. Dow understands that 140 curies of ^{60}Co in a 55-gallon drum will decay to about 0.1 millicurie after 100 years of institutional control and is therefore considered to be of little concern to the intruder. However, there is doubt that 100 years of institutional control is possible and 140 curies of ^{60}Co in a 55-gallon drum is of significant concern during the transport, disposal, and first 50 years of institutional control.

D-55-13

The point is that there are waste solidification technologies available and in use today that with very little effort and cost can place this 140 curies of ^{60}Co into a stable form. Use of these technologies will dramatically reduce the transport and disposal problems of today as well as significantly minimize the potential hazard to the intruder should the institutional control fail in less than 100 years.

The Commission should not ignore the needs of today and establish standards and technology only for the benefits and protection of intruders after 100 years of institutional control. This Section appears to be in direct conflict with the concepts of ALARA and best available technology.

4. Subpart D, Section 61.56 Waste Characteristics

D-56-20
D-56-13

Dow suggests that minimum requirements for all classes of waste should exclude the presence of liquids. Historically the Commission and the nuclear industry have used the term "no free standing water" to describe this exclusion as a desirable characteristic of the wastes. The Commission's Effluent Treatment Systems Branch (ETSB) defined free water as uncombined water not bound by the solid matrix in Branch Technical Position - ETSB 11-3 dated November 24, 1975. The Commission funded a program at Brookhaven National Laboratory (BNL) to investigate the properties of solidified radioactive wastes and containers. BNL summarized the results of their program for the period from April 1976 through September 1978 in NUREG/CR-0619 BNL-NUREG 50957. The BNL investigation confirmed much of the information that had previously been reported by Dow and others. The Central Electricity Generating Board (C.E.G.B.), in the United Kingdom, has conducted a similar investigation and confirmed much of the BNL information. At the request of the Commission, BNL also provided input relevant to the establishment of free standing water criteria revised October 15, 1979. Dow suggests that the Commission has sufficient justification to limit noncorrosive liquid in the waste, as referenced in paragraphs 61.56, (a), (3) and 61.56, (b), (2), to not exceed one-half percent (0.5%) of the waste volume or one gallon per container, whichever is less.

Dow was informed by a responsible Commission employee that one of the purposes of paragraph 61.56, (b), (2) was to provide for disposal of ion exchange media by merely dewatering to 1% of the volume of the waste.

D-56-12

Dow assumes that the wording of paragraph 61.56, (b), (1) which allows the disposal container to provide stability after disposal is also for this purpose. Dow suggests that the practice of disposing of ion exchange media by merely dewatering, to any level, is not within the concepts of ALARA and best available technology. Dow is not aware that the Commission has any information to indicate that any of the disposal containers now available, including the recently introduced high integrity containers, have been tested to show that they can be expected to provide stability in the disposal environment for at least 150 years. Dow suggests that in preparing Section 61.56 the Commission has ignored the information provided by BNL and others. Section 61.56 therefore fails to reflect the concepts of ALARA and best available technology; it is a significant change from Section 61.86 in draft 10 CFR 61 dated November 5, 1979; it is a significant, unnecessary, and unjustified relaxation of criteria now in use at two of the three operating disposal sites; and it will not achieve the objectives of the Commission as stated in the Supplementary Information, Section V Summary of Rule and 10 CFR 61, Subpart A, Section 61.7 Concepts. As written and published, this section will not alleviate the reluctance of the waste generators and the States to use new or improved techniques or provide them with a clear indication of future regulatory standards and technical criteria. This entire section should therefore be rewritten to correct these conditions.

GEN-2

Dow understands that the Commission, with assistance from BNL, is preparing a Branch Technical Position which is intended to describe a stable waste form. Dow feels the Commission now has the information necessary to accomplish this task in a timely manner. In addition to limiting noncorrosive free standing liquid to less than one-half percent (0.5%) of the waste volume or one gallon per container, whichever is less, the characteristics should define stability in specific terms such as homogeneity, leachability, compressive strength, yield strength, impact resistance, radiation resistance, thermal resistance, biological resistance, and similar properties.

5. Subpart G - Records, Reports, Tests, and Inspections

As previously stated Dow feels that regulatory standards and technical criteria without inspection and enforcement are useless and unnecessary. It is noted that the Commission intends to amend 10 CFR 20 to include a new Section 20.311, Transfer for disposal and manifests. Paragraphs 20.311, (d), (3) and 20.311, (f), (5) provide for conducting quality assurance programs to assure compliance with 10 CFR 61 Sections 61.55 and 61.56. The Commission is to be complimented for this intent and is encouraged to follow up to assure that these quality assurance programs are properly performed. Compliance can only be assured by inspection and enforcement at the waste generators site. Dow suggests that this follow up include a full scale preoperational qualification test similar to that which was conducted prior to solidification of decontamination waste from the Auxiliary Building at Three Mile Island Unit II during July 1979 or as described in Appendix 2 of ANSI/ANS-55.1-1979 with an appropriate process control program to assure that radioactive waste are solidified in the same manner to produce the same results.

M-2

In summary, Dow agrees with many of the goals, objectives, philosophies, and definitions expressed by the Commission in this rulemaking. However, the Commission has failed to recognize that there is an immediate need for regulatory standards and technical criteria for the proper disposal of wastes that are being generated and disposed today. Pathway analysis has been emphasized without inclusion of the concepts of ALARA and best available technology. This emphasis has resulted in a waste classification scheme which may limit exposure to the intruder after 100 years of institutional control but fails to consider the need to protect the workers, general population, and environment during transport and disposal operations. The Commission has sufficient technical information from BNL, Dow, and others which when considered with the experience of the nuclear industry justifies immediate action to establish and enforce regulatory standards and technical criteria which will meet the agreed to goals, objectives, philosophies and definitions.

Dow representatives are available to provide additional information, assistance, and comments necessary to assist in the timely establishment of appropriate regulatory standards and technical criteria.

Sincerely,

J. B. Owen

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Group Leader
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October 16, 1981

(18)

Secretary
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

DOCKET NUMBER
PROPOSED RULE PR-2 et al
(46 FR 38081)

Attention: Docketing and Service Branch

Commonwealth Edison Company (Commonwealth) submits these comments on the proposed rules for Licensing Requirements for Land Disposal of Radioactive Waste, published in 46 Fed. Reg. 38081. Commonwealth holds operating licenses for seven operating nuclear reactors and construction permits for six more units. Commonwealth and its customers in Northern Illinois have a substantial interest in and need for the prompt establishment of a Midwest low level waste facility. Accordingly, we have the following suggestions.

Part 2-2

The proposed additions to 10 C.F.R. Part 61 will unnecessarily prolong the time required to obtain final approval of a license to build a disposal facility for low level radioactive waste, by delaying effectiveness of a license until all administrative and judicial appeals have been exhausted. Commonwealth urges that proposed 10 C.F.R. §§61.3 and 61.7 be revised to allow licenses to become effective immediately when granted by the Atomic Safety and Licensing Board (ASLB) or, at the latest, upon final review by the NRC.

Present regulations, 10 C.F.R. §2.764 allow construction authorizations and operating licenses to become effective immediately upon issuance by the ASLB. This "immediate effectiveness" rule fully protects the public health and safety without costly and unnecessary administrative delays. As the rule now stands, construction and operation of the facility is conditioned upon approval by the ASLB, the administrative body most qualified to judge the compliance of the proposed facility with federal laws; moreover, a procedure is available for delaying construction and operation even after ASLB approval, if good cause is shown why the approval should not become immediately effective.

Part 2-2

Proposed 10 C.F.R. §§61.3 and 61.7 will delay effectiveness of a license until review by both the Licensing Appeal Board and the Commission itself, and, as implied in the Supplementary Information preceding the proposed rule, 46 Fed. Reg. 38087, appeals through all levels of the federal judicial system. This could cause a delay of several years between initial approval of the license and the beginning of construction of the facility. The small and speculative benefit to public health and safety which may accrue from this delay is not nearly commensurate with the added cost to the applicant, its customers and the public at large who benefit from llw generating activities and who urgently need the prompt establishment of new regional llw facilities. At a minimum, the rule should be revised explicitly to exclude the possibility raised by the Supplementary Information, that effectiveness will be delayed until all federal judicial appeals have been exhausted. The judiciary brings no additional technical expertise to review of a nuclear waste disposal license, and judicial review will shed no critical new light on a proposed facility which has been reviewed by, and has the approval of, all reviewing bodies within the NRC. Delay of construction until the end of judicial appeals will add greatly to time and expense, with no concomitant benefit to the public health and safety license.

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(19)

-2 att
(46 FR 38081)

The Secretary
Nuclear Regulatory Commission
Washington DC 20553
USA

13 October 1981

Dear Sir

PROPOSED RULES: 10 CFR 60 and 10 CFR 2, 19, 20, 21, 30, 40, 51, 61, 70, 73 and 170

I respond to the Nuclear Regulatory Commission's invitation to comment on the above proposals on behalf of the regulatory departments in the United Kingdom with responsibilities for radioactive waste management. They are the Department of the Environment, the Ministry of Agriculture, Fisheries and Food, the Nuclear Installations Inspectorate and the Scottish and Welsh Offices. I also annex comments received from other UK organisations.

The proposals made are most interesting, demonstrating the absolute standards approach rather than the case-by-case regulation commonly adopted in the United Kingdom. Document 10 CFR 61 illustrates the setting of overall performance objectives whilst allowing some flexibility in designing and operating each individual repository, whereas document 10 CFR 60 appears to set acceptance criteria not always justified by technical evidence. This could, in our view, lead to unduly restrictive or lax standards when research results permit a more rigorous analysis to be undertaken.

A-8

The United Kingdom regulates the whole system of disposal of low level radioactive wastes. We deal with disposals on individual sites and on the basis of individual waste types, matching waste to local conditions either in shallow land-burial sites or by disposal to the marine environment. Our practice recognises that wastes will eventually leach from a disposal site and we aim to ensure that adequate dilution and dispersion takes place to protect critical groups from unacceptable doses.

We also recognise the merit of developing a range of repositories offering levels of isolation appropriate to the nature of the waste utilising, for instance, existing cavities or purpose-built repositories at intermediate depths.

In the case of high-level, heat-generating wastes, the United Kingdom is not committed to the use of the geological route for disposal. Research is taking place into various options (disposal to various types of geological formation, disposal on or under the ocean bed, very long-term storage at or near the surface). The first step however will be to vitrify such wastes, and it is then likely that the vitrified wastes will be stored, using existing technology, for a period of 50 years or even longer, in order to facilitate supervision and secure a substantial reduction in heat output. The best solution can then be chosen on the basis of full and detailed information about the alternatives. We believe that such storage is a realistic and acceptable proposition, and it has gained a considerable measure of public acceptance in the United Kingdom. Because of this, we do not see a need in our own case for the particular concept of 'retrievability' which is incorporated in your proposals: we shall not undertake disposal until we are satisfied that the repository in question will be safe.

In regard to problems of human intrusion into a repository, our view is that institutional controls are required only over that period during which the hazard is primarily due to the fission products. Similarly, our existing control over potential repository sites does not take into consideration present-day population distribution, since we cannot predict population changes in the future.

In taking account of the many technical factors to be considered in a choice between the several options for creating a repository for heat-emitting wastes, we have adopted a systems study approach in order to bring together the many areas of research and operation. As a result we would not wish to set down specific criteria or defined levels for all variables, because these levels will differ from site to site. We think it advisable for any regulatory procedure to make allowance for natural variation.

Comment has been invited on a number of specific issues and those on which we can comment are dealt with in the paragraphs above. Those remaining relate to matters of national concern and do not call for any comment from the UK. There are, however, two matters which should be considered as needing clarification:

(a) the ALAPA principle, mentioned as a footnote on p.35289, might perhaps be explained more fully in relation to the approach adopted by the ICRP; in particular the need to take social and economic factors into account;

(b) on the same page, in column 2 / A 7 it is not made clear whether "one part in 100,000" refers to the activity in the year in question or to that which was originally emplaced. This seems to be a critical matter which must be unambiguous.

The detailed comments received from the National Radiological Protection Board, the United Kingdom Atomic Energy Authority, and the Natural Environment Research Council's Institute of Geological Sciences are annexed. I must stress that the views expressed are those of the organisation submitting them.

Yours sincerely

P S YEATES

COMMENTS ON NRC PROPOSED RULES

by

National Radiological Protection Board.

10 CFR Part 60 Disposal of High-Level Radioactive Waste in Geological Repositories.

1. General Comments

1.1 The rule has been developed in the absence of radiological protection criteria (environmental standards), for disposal of high-level wastes; the proposed technical criteria are, therefore, arbitrary. This approach to setting technical criteria is incorrect in principle. It leads to criteria which are inflexible because, since they have no clear basis, there can be no basis for changing them. In addition the approach is very likely to lead to criteria which are too restrictive, thus causing more expenditure on high-level waste disposal than is warranted by radiological protection considerations.

1.2 The rule does not define in any detail the means by which compliance with performance objectives is to be demonstrated. As a consequence the proposed performance objectives have little meaning and it is very difficult to decide whether they are appropriate or achievable.

1.3 One of the main purposes of the rule is to reduce uncertainties in predicting the performance of geologic disposal systems. While this is a reasonable objective it is over-emphasised. This leads to technical criteria which may be too restrictive, particularly for TRU wastes. It also down-grades the "geologic barrier" to an extent which is incompatible with the reasons for selecting the geologic disposal option.

1.4 For the reasons outlined above, the proposed rule is unsatisfactory and should not be adopted in its present form. It would be preferable to leave the rule in "proposed" form until the EPA standards have been published and until there is sufficient information available to derive technical criteria from these standards. The rule should then be revised.

2. Specific Points

2.1 Retrievability - The retrievability requirement (p. 35282 and Section 60.111 P. 35289) is poorly defined. It is not clear whether retrieval is regarded as an extreme measure and the intention is only to ensure that wastes can be located and could be retrieved at great cost, or whether a repository should be designed and operated so that retrieval would be relatively simple.

2.2 Human Intrusion - It is reasonable to distinguish between deliberate intrusion and inadvertent intrusion, and to ignore the former possibility when setting criteria. However, the probability and consequences of inadvertent intrusion should be considered when setting technical criteria such as the minimum disposal depth, and in specifying site selection and marking requirements. The statement (p. 35283, column 2, para. 2) that it "does no use to argue" over measures designed to prevent intrusion or to "speculate" on intrusion scenarios is inconsistent with the discussion which precedes it. Such arguments and speculations should play a part in deciding whether a respository is acceptable.

2.3 Alternative Approaches (to prescribing criteria) - The "alternative approaches" (p.35283), column 3, para. 2) considered by NRC should not be considered as alternatives, they represent stages in developing criteria and performance objectives for geologic disposal. In order to develop a consistent set of criteria it is necessary to set a "single overall performance standard", to derive "minimum performance standards for each of the major elements" from this overall standard via safety assessments and then to derive detailed numerical and engineering criteria from these performance standards for the system elements. In choosing "Alternative 2" NRC are acting prematurely and limiting the designers' flexibility to an unreasonable extent (see also general comments).

2.4 Interdependency of Site and Design - The NRC view that site and design are so interdependent that it is artificial and misleading to separate siting and design requirements (p. 35284, column 1, para. 3) is very realistic. Separation of the two types of requirement would inevitably lead to inconsistencies and difficulties in meeting criteria.

2.5 Siting Requirements (population density) - The decision not to include any siting requirements which deal directly with population density or proximity to population centres (p. 35284, column 3, para. 4) is both practical and realistic. Given the long time periods of concern in geologic disposal it would be impossible to ensure that any such requirements were met.

2.6 Definitions of "Disposal" and "Isolation" - Taken together the definitions of disposal and isolation (Section 60.2, P. 35285-5) are consistent with UK concepts and include recognition that isolation implies control of releases to the environment, rather than zero release.

2.7 Probabilistic Aspects of Assessments - In the description of the contents of assessments (Section 60.21 (ii), p. 35287) there is no mention of evaluating the probabilities that various events and processes will occur. The implication is that NRC have not reached a decision on the extent to which probabilities should be included in assessments, in spite of the indications that EPA standards will require a probabilistic approach. This section of the rule (and other related sections) require revision to clarify the NRC position on probabilistic assessment methodologies.

2.8 "Reasonable Assurance" - The requirement for reasonable assurance (Section 60) 101 (a) (2), P. 35288) that performance objectives and criteria will be met does not provide sufficient guidance for applicants. Since the performance objectives and criteria in the proposed rule are arbitrary (see general comments) it is obviously difficult to define clearly how compliance is to be demonstrated. However "reasonable assurance" could be statistically defined, taking into account the increase in the uncertainty of predictions with time.

2.9 ALARA - NRC specifically seeks comments on whether an ALARA principle should be applied to the performance objectives for containment and control of releases (Section 60.111, p. 35289). It is difficult to see the logic in applying ALARA to particular parts of the disposal system while omitting it when specifying criteria for other parts. The ALARA principle should be a major feature of the overall performance objective for the whole disposal system. The principle should then be applied both in decisions on whether the whole system is acceptable and in setting performance objectives for system elements. In the latter case it will be necessary to show that performance objectives are not over-restrictive, in the sense that they entail more financial expense than is warranted by the reduction in total risk. It seems likely to us that application of ALARA to containment

criteria would show than containment for 10^3 years is not a reasonable requirement for either HLW or TRU wastes.

2.10 Favourable and Potentially Adverse Conditions - This approach (Section 60.122 and 60. 123, P. 35290-1) to specifying geologic criteria is a very reasonable and practical one. It allows considerable flexibility in selecting sites, making allowance for the wide variations in geologic environments. The inclusion of a minimum disposal depth of 300m as a favourable condition, rather than a strict criteria, is a particularly good feature of the approach.

2.11 Backfill Functions - The proposed rule requires that the backfill shall serve a number of functions (Section 60.132 (i), (3), (ii), P. 35293), without specifying the degree of effectiveness required. It seems unlikely that any backfill material could perform all of these functions effectively. The objective should be to choose a material with the optimum combination of properties.

10 CFR Part 61, Licensing Requirements for Land Disposal of Radioactive Waste

General Comments

C-1

1.1 The rule appears to be satisfactory when viewed in the context of the current US waste management situation. The approach of specifying overall performance objectives (radiological protection standards) and perscriptive requirements is sound. It leads to criteria which are consistent and soundly based, while providing considerable flexibility for selecting the design features and operating procedures leading to an optimum disposal system for particular waste types and sites.

1.2 The emphasis on the longer term aspects of near-surface disposal (site closure, institutional controls etc.) is entirely appropriate. These aspects have not received sufficient attention in the past.

2. Specific Points

C-4

2.1 Performance Objectives - The radiological protection standards specified in the rule (p. 38083 and Sections 61.41, 61.42) appear to be reasonable. The approach of setting an individual dose limit for inadvertent intrusion and separate limits for groundwater releases is consistent with the proposed UK approach to radiological protection standards for disposal options and with ICRP principles. However, it is not clear whether the 500 mrem y^{-1} limit in the intrusion case is entirely consistent with ICRP dose limits because the rule only states that the limit is for whole body dose, not whether it is in terms of effective dose. This point should be clarified.

C-3

The dose limits for groundwater releases are consistent with current US practice and, when combined with the requirement that EPA Drinking Water Standards should not be exceeded, should ensure the doses are as low as reasonably achievable.

2.2 Minimum Technical Requirements

D-50-2

2.2.1 Groundwater - The requirements related to access of groundwater to the waste (p.38084 and Sections 61.7, 61.50, 61.51) seem unduly restrictive and somewhat inconsistent with the performance objectives. There should be no requirements to prevent water access, minimise water access or show that diffusion is the predominant radionuclide transport mechanism. It is only necessary to ensure that releases via groundwater will not result in a failure to meet the performance objectives.

D-55-3

2.2.2. Waste Classification - The classification of wastes into 3 categories, the basis for this classification and the associated conditioning and disposal requirements may well be appropriate for US wastes. However, the limit of 10 nCi g^{-1} (Section 61.55) on alpha-emitting transuranic radionuclides could be too restrictive for Class C wastes. In addition it is not clear whether this limit applies to Class A and Class B wastes as well; if it does the reasons for choosing the same limit for all wastes should be explained.

D-56-6

2.2.3 Packaging - The requirement that all waste must be packaged to transport standards (Section 61.56 (a) (i), p. 38097) is not explicit. In particular it is not clear whether wastes should be packaged for disposal (thus prohibiting the use of reusable shielded packages) or whether they only need to be packaged for transport and handling prior to disposal.

D-56-B 2.2.4 Stability - The intention to provide stability for at least 150 years (Section 61.56) does not appear to be consistent with either the maximum institutional control period (100 years) or the requirement that natural or engineered barriers should provide protection against human intrusion for at least 500 years.

Inconsistencies between 10 CFR Part 60 and 10 CFR Part 61

There are a number of important inconsistencies between Part 60 and Part 61. The overall effect of these inconsistencies is to support our view that Part 60 has a less satisfactory basis than Part 61.

C-1

1. Approach to setting Criteria and Performance Objectives - In Part 61 overall performance objectives (radiation protection standards) and prescriptive requirements are specified. This approach leads to a rule which is generally satisfactory and which has a clear basis in radiological protection as well as practical engineering and administrative procedures. In contrast, Part 60 contains a number of arbitrary requirements, has no clear basis in radiological protection and may therefore be to a large extent unworkable. The major inconsistency between the two rules is likely to create unnecessary difficulties in implementing HLW disposal since it will reinforce the views of those who claim that disposal of this waste cannot be carried out in an acceptable manner.

2. Protection of Individuals and Populations - In Part 61 both individuals and populations are considered when setting radiological protection criteria; limitation of doses to individuals in the event of human intrusion plays a major part in specifying prescriptive requirements. As noted above, radiological protection principles and criteria have played a minor role in developing Part 60. However, this rule does not contain references to the EPA standards for HLW disposal and the indications are that these standards will deal only with health effects in populations. It, therefore, appears that NRC are proposing to use radically different radiological protection criteria for HLW and LLW disposal. This is not only inherently inconsistent, it is also inconsistent with accepted radiological protection principles.

3. Human Intrusion - The human intrusion question is discussed in Part 60 but largely dismissed as a factor in disposal decisions. In Part 61 many of the performance objectives and technical requirements are aimed at protection of the inadvertent intruder. While intrusion is clearly more probable at near-surface disposal facilities and should, therefore, receive more attention in this case, it is inconsistent to dismiss it when specifying requirements for deeper disposal.

4. Institutional Controls - Part 61 does not permit reliance on institutional controls for more than 100 years and aims to minimise the burden of surveillance on future generations. Part 60 requries that a geologic repository should remain open for 110 years. The reasons for these apparently differing views of the extent to which waste management responsibilities should be passed on to future generations are not clear.

5. Financial Assurances - The financial responsibility for site closure and observation is treated in detail in Part 61. In part 60, where the timescales are longer and the need to establish responsibilities is greater, this question is not addressed; it is implicitly assumed that funds will be available.

C-5

6. ALARA - The ALARA principle is implicit throughout Part 61 since NRC has analysed the cost and benefits of a range of performance objectives and prescriptive requirements. In Part 61 there is no evidence that this principle has been applied and its application appears only to have been considered in specifying containment and release rate objectives.

D-55-3

7. Intermediate Level Wastes - The net effect of the two rules is to require that wastes with less than 10 nCi g^{-1} alpha emitting transuranic radionuclides should be disposed of by near-surface burial and that wastes above this limit (TRU wates) should be treated to produce a highly leach resistant waste form and placed in deep geologic repositories. Although there is a provision in Part 61 for dealing with more active wastes on a case-by-case basis, it is evident that this provision is not intended to cover TRU wastes. Part 60 requires that TRU wastes should be managed and disposed of in essentially the same way as HLW. The two rules, therefore, preclude the option of disposing of TRU wastes at intermediate depth without highly sophisticated and expensive conditioning. This may be unimportant in the current US situation where the rate of generation of TRU wastes is low. It would not seem to be a reasonable requirement for the UK where there are already large volumes of intermediate level ("TRU") wastes in store with more being produced and may lead to problems in the future in the US. The two rules do not provide an approach to the disposal of all the categories of intermediate level wastes which is consistent with the ALARA principle.

National Radiological Protection Board,
Chilton, Didcot, Oxon, OX11 0RQ.

30th September, 1981.

COMMENTS ON N.R.C. PROPOSED RULES

BY

UNITED KINGDOM ATOMIC ENERGY AUTHORITY

10 CFR Part 60, Disposal of High-Level Radioactive Wastes in Geologic Repositories

General

We feel that too many firm numbers are being laid down without sufficient experimental and theoretical justification. Particularly if disposal will not take place for many years it is better to set overall dose limits to define the required performance of the multiple barrier. It is then up to designers to optimise the individual elements in the system as models and experimental data are improved over the years. The proposed rule would freeze options too soon. Most of the numbers quoted are probably reasonable but at this stage they should be examples not rules.

We believe that over-emphasis on designing for retrievability could distort the design of a repository. For heat-emitting waste it is better, therefore, to aim for a period of retrievable storage followed by disposal with no intention of retrieval. After this, retrieval is always possible as a last resort but it should never be necessary and should not be allowed to distort the design. This problem might be eased by having separate rules for spent fuel and other high-level waste since waste should be eventually disposed of but fuel is a resource which may need to be retrieved.

In a number of cases the definitions quoted differ in detail from those published in the IAEA Nuclear Waste Management Glossary (Draft, April 1981). It would be advantageous if the internationally agreed definitions could be used wherever possible.

Detailed References to the Text

Page 35281, column 3, para. 2	We are doubtful about specifying 1000 year transit time.
Page 35282, column 1, para. 1	10,000 years is a speculative number and nothing is gained by stating it.
Page 35282, bottom of column 2	If waste is to be disposed of on an experimental basis it is reasonable to insist on retrievability in the early stages. We do not, however, believe that 110 year retrievability should be a condition for all future repositories. We favour the alternative of storing the solidified waste for many years and then disposing of it with no intention of retrieval.
Page 35282, column 3	Human intrusion, we believe that a discretion should be made between new
	have value as a resource.
Page 35283, column 3	Of the 3 "alternatives" at this stage we strongly favour 1, the setting of a single overall performance standard. It should then be possible to move to 2, setting of minimum performance standards for major elements as more experience and evidence becomes available.
Page 35284, column 1	Overall Description, we have grave doubts about the specification of 300 metres minimum depth which may be totally inappropriate at a specific site.
Page 35284, column 3, last para.	We agree that there is no point in invoking a population criterion.
Page 35285, column 3	Definitions, we would like to see many of these altered to conform to the IAEA glossary.
Page 35286, column 1	"HWL" is a printing error.
Page 35289	Performance Objectives. This is the most critical section and we would question the justification for most of the numbers quoted e.g.:

- retrievability 50 years after emplacement is complete.
- 1,000 years containment by the waste package.
- 1 in 100,000 annual release of any radionuclide. Also this definition is not totally clear, is it 1 in 100,000 of the amount of the radionuclide present after 1000 years or 1 in 100,000 in any year of that which is present at the start of that year.

Page 35290	Favourable Conditions. (f) (4) We are doubtful about specifying this number at this stage since its significance is very dependent on (g) regarding radionuclide transport. (i) as above we are concerned that 300 metres may be inappropriate at some sites.
Page 35290	Potentially Adverse Conditions. (b) the need to "investigate" 2 kilometres around and 500 metres below the limits of the repository could be

10 CFR Part 61, Licensing Requirements for Land Disposal of Radioactive Waste

General

Our main comment is just to note that the definition of Low-Level Waste is not consistent with the IAEA definition and that similarly the categories A,B and C and the limits quoted in Table 1 reflect U.S.A. national practice which differs in detail from that in many other countries including the U.K.

Detailed Reference to the Text

Pages 38089/38090	Definitions, we suggest that wherever possible these should be in line with the IAEA glossary.
Page 38097	We doubt the justification for requirin stability for 150 years.

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NUCLEAR REGULATORY COMMISSION

10 CFR PARTS 60 AND 61

COMMENTS

by the

INSTITUTE OF GEOLOGICAL SCIENCES

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OCTOBER 1981

Comments on Nuclear Regulatory Commission Document - 10 CFR Part 60 by the Institute of Geological Sciences

General Comments

The major features of the proposed rule are considered under six subheads:

(1) Overall description

(2) Performance objectives

(3) Siting requirements

(4) Design and construction

(5) Waste package

(6) Performance confirmation.

There is a geological component embodied in all of these subheads but before considering the detail it is pertinent to discuss two general points. The first relates to Section 60.2 Definitions (pp 35295-6). Definitions are given for "Geologic repository", "Geologic repository operations area", "Geological setting" or "site" and the "Disturbed zone" but these are amplified in later sections of the report e.g. the "disturbed zone" is rather tightly defined on p.35290 (column 3). These subdivisions of the geological environment lead to possible differentiation between the criteria necessary to define the characteristics of the "near" and "far" fields. As they stand the definitions are ambiguous, particularly in relation to the "Geological setting" or "site" which emerges as an amorphous concept of unknown dimensions and characteristics.

The second general point leads directly from the ambiguity in the definitions and relates to consequential inconsistencies and variability in the degree of qualitative versus quantitative components in the technical criteria. From the geological viewpoint this can be seen, for example, in pages 35290 and 35291, Sections 60.122 and 60.123 in which the favourable and potentially adverse conditions of the geological setting are considered. Other examples are referred to below in relation to specific points. Some inconsistencies highlight admirably these aspects of the siting of a HLRW repository about which there are insufficient technical data. It can be argued that these sections of the document illustrate the strength of the case for delaying the proposed rules until more technical data are available. The deficiency of data and the problem of the proof of the adequacy of a repository into the future is recognised throughout the text, for example at p.35288 Section 60.101 paragraph 2. Statements of this nature are entirely valid and seem to negate the technical content of associated criteria.

Specific Comments

Reference to geological criteria occur throughout the text but they are covered in some detail on p.35289 Section 60.112, p.35290 Section 60.122 and pp.35290-1 Section 60.123 in which the required characteristics of the geological setting are considered and the potentially favourable and adverse conditions are outlined. The generalised characteristics of Section 60.112 (mandatory) are amplified in Section 60.122 which is proceeded by the statement that ..... "a geological setting shall exhibit an appropriate combination of these (favourable) conditions so that, together with the engineered system, the favourable conditions present are sufficient to provide reasonable assurance that such performance objectives will be met". There is no indication of what combination of conditions would be regarded as appropriate and some of the associated statements are so generalised as to cause difficulties in interpretation of their meaning. Most of the criteria are interactive, although this is not emphasised in the text, and many of the specific conditions are the products of a number of interactive factors.

Section 60.112

Para. (a). Some quantitative statement of stability would be desirable if these mandatory characteristics are seen as significant but a stable geological setting has proved difficult to define in a generic sense. It will normally require definition in a regional rather than a global sense.

Paras. (a) and (b). "The start of the Quaternary" was probably chosen as a relatively arbitrary, but convenient time base (dated at about 2 million years ago in the United Kingdom, which was sufficiently far back in the geological record to provide a relevant time-base. However, there is little scientific basis for choosing that time period, rather than any other specified period.

Para. (b). In the land masses of the northern hemisphere there have been a series of glaciations during the Quaternary and it is totally unrealistic to speak of hydrogeologic and geomorphic stability since the start of the Quaternary.

Para. (c). The 1000 year time period appears to be related to assessments of the life-span of the engineered barriers. The pre-waste emplacement rates of groundwater movement, rather than travel times over an arbitrary period of time, are relevant as the base-line from which migration times can be judged. Any final nuclide migration models (of the types outlined in Section 60.21, p.35287 and to be included in the Safety Analysis Report) will attempt to simulate the repository and its geological setting as an entity. Accordingly, it is the groundwater travel times resulting from any perturbations caused by the repository and its waste which should be definitive. There is an inconsistency with respect to groundwater travel times between Section 60.112 para. (c) where the phrase ..... "at least 1000 years" is used, and Section 60.122 para. (f) (4) where the term ..... "substantially exceed 1000 years" appears.

Section 60.122

Paras. (a) to (e). The phrase "nature and rates of processes" will prove difficult to define and quantify when applied to some of the processes referred to. The distinction made between the terms "tectonic processes" and "structural processes" in paras. (a) and (b) is fine. In most situations the two terms would be regarded as synonomous and the reason for the distinction is not clear.

Para. (f) (1). The term ..... "low groundwater content" is ambiguous and without a rigorous definition as to its precise meaning this condition could preclude the inclusion of many argillaceous formations and crystalline rocks which current research indicates could be satisfactory as hosts.

Para. (j) This "catch-all" condition illustrates the generalised nature of conditions (a) to (i) and emphasises the problems of drafting criteria to cover all of the interactive factors in advance of completion of the necessary research. This point is well recognised in the text (p.35284 3rd column) ..... "The impact of these characteristics on overall performance would be site specific. Thus, the Commission has judged that these should not be made absolute requirements. Presence of all the favourable characteristics does not lead to the conclusion that the site is suitable to host a repository. Neither is the presumption of unsuitability because of the presence of an unfavourable characteristic incontrovertible". This valid concept should not be negated by earlier statements in the rules which are based on generalised concepts.

Para. (a) (5). The recognition of the timing of movements on fault planes is technically extremely difficult and in many situations it would be impossible to ascertain whether or not a fault had been active since the start of the Quaternary.

Para. (b) (1) and (2).. In the cases of argillaceous and crystalline host-rocks the evidence available from opencast and sub-surface mines as well as from prior drilling, may be advantageous in that they increase the amount and reliability of information and may in no way detract from the suitability of the site. This may not be so for evaporites, but the wording should reflect the distinction. In addition the rules may well have implications on the use of existing cavities for the storage of waste.

Para. (b) (5).. Nearly all rocks have, at some time or another, suffered dissolution - it is the degree and the nature of the processes involved which are important. Most rocks are soluble under specified conditions.

Para. (b) (6).. Does this condition refer to only one fault - it is the nature of the fault which is important, not the mere fact that it exists. In some circumstances the identification of faulting in the disturbed zone may be regarded as advantageous in that the location(s) of the potential for future movement is known.

Para. (b) (8).. Uplift and subsidence following isostatic readjustment after the last Ice Age is ubiquitous in the glaciated areas and is common in much of the rest of the world for various reasons. It is the degree, rate and causes of structural deformation which are important.

Para. (b) (10). No such correlations should be accepted as definitive as far as areas remote from plate boundaries are concerned.

Para. (b) (13). It is difficult to envisage that there are not zones within any potential host-rock in which there are not reducing conditions. Excavation and entry of air into the disturbed zone will change the conditions, at least in the near-field, and any such clause will need to recognise this.

Further geological aspects or the technical criteria, especially those concerned with geomechanical, geochemical and the nature and design of backfilling materials are contained in Sections 60.132, 60.133, 60.134 and 60.135 (pp 35293-35295). These are concerned with the design and construction requirements of the repository and include some very definitive statements, such as the requirements of the backfill placed in a facility. It can be argued that it is neither proven, nor generally accepted, that such requirements are necessary and that, accordingly, these statements are premature.

Section 60.21

The contents of the Safety Analysis Report which is required to accompany the application for the siting of a repository provide a valuable resumé of the types of information necessary to describe and assess the suitability of a site for the burial of HLRW but again this emphasizes the need for completion of the research before comprehensive mandatory rules are issued.

Conclusion

In its present generalised form the 'Proposed rule' highlights the areas in which more technical data are required and illustrates the difficulty (and danger) of framing comprehensive technical criteria which define safe limits for complex, interactive parameters. That there will be a need for technical criteria to be defined at sometime in the future cannot be argued, but current research programmes are providing data relevant to the definition of such criteria and the publication of a definitive rule for universal application should await the completion of many, if not all, of those studies. In the meantime individual applications for site licences should be dealt with on a site-specific basis to ensure that performance objectives can be met.

Comments on Nuclear Regulatory Commission 10 CFR Part 61 by the Institute of Geological Sciences

The report is very generalised in respect to the geological guidelines for site selection and is not dissimilar to the hydrogeological guidelines issued in the United Kingdom for disposal of controlled wastes. (The licensing of waste disposal sites, Department of the Environment, Waste Management Paper No 4, HMSO, London). The concept of minimising water access into the waste by choosing an appropriate site or by site engineering is stressed, along with the need to assess the potential for flooding, erosion or seismic/tectonic/volcanic events.

The following paragraphs consider geological/hydrogeological aspects of site selection, and are discussed in turn.

Para. 61.2. The definition of "engineered barrier" is novel and usage of such terms ought to be compatible with document 10 CFR Part 60.

Para. 61.12. ED-1 This identifies the broad subject areas which need to be considered during site selection and includes "geologic, technical hydrologic, meteorologic, climatologic and biotic features of the disposal site and vicinity". The term "technical hydrologic" is taken to mean both hydrologic and hydrogeologic but a precise definition of the meaning is required.

Para. 61.13. B-2 This basically states that groundwater is probably the most significant pathway for radioactive transport back to the surface and man, and requires particular study. Although groundwater transport is very significant, recent sensitivity analyses suggest that other pathways such as human intrusion, erosion and vegetation uptake may be more significant (Faulth and Wilhite, 1980, Prediction of radionuclide migration from Savannah River Plant's buried waste. Trans Am. Nucl. Soc. Vol. 34, p.119).

D-50-2

Para. 61.50. This paragraph outlines criteria for use in site selection, covering the practicability of characterisation, modelling and monitoring; mineral reserves; drainage and flooding; erosion/stability; seismicity/tectonics/vulcanism; and hydrogeology. In particular (a) (8), states that "any groundwater discharge to the surface within the disposal site must not originate within the hydrogeologic unit used for disposal". In some circumstances this may be unnecessarily restrictive and may not be required to meet the performance objectives outlined earlier in the document.

GEN-1

Para. 61.51. Point (a) (6) states that the "site must be designed to eliminate .... contact of percolating or standing water with wastes after disposal". Again this could prove unnecessarily restrictive in many circumstances and for some wastes.

The Surety Association of America

100 WOOD AVE. S., ISELIN, NEW JERSEY 08830 (201) 494-7600

LLOYD PROVOST
General Manager

Surety Department
QUENTIN W. LERCH
Secretary

Fidelity Department
FRANCIS X. LeMUNYON
Secretary

ROBIN V. WELCY
Assistant Secretary-Attorney

Actuarial Department
ROBERT G. HEPBURN, JR.
Assistant Secretary

GASTON SACCOCCIO
Statistician

Membership Services
ALICE TIERNEY
Assistant Secretary

October 9, 1981

20

LICENSING REQUIREMENT FOR LAND DISPOSAL OF RADIOACTIVE WASTE

DOCKET NUMBER PR-2 et al
PROPOSED RULE (46 FR 38081)

Secretary of the Commission
U. S. Nuclear Regulatory Commission
Washington, D. C. 20550

Attention: Docketing and Service Branch

Dear Sir:

This Association is a trade association of more than 500 companies writing surety bonds throughout the United States.

E-1

We have reviewed the Notice of Proposed Rule which appeared in the Federal Register of July 24, 1981 concerning the licensing requirements for land disposal of radioactive waste. The proposed Rule requires the licensee to provide assurances that sufficient funds will be available to carry out disposal site closure and stabilization. One proposed method to provide such assurance would be through the use of corporate surety bonds.

By their very nature these bonds would be of very long term duration and would be subject to periodic increases as the cost of future closure rises. In addition we understand the bonds will be required in substantial amounts. All of these factors lead us to suggest that we do not believe such surety bonds would be available except for the largest, most financially responsible firms in the country, if at all.

Under these circumstances the alternative methods proposed in the Rule would appear to be more feasible.

Somewhat similar bonds have been proposed by the Nuclear Regulatory Commission to provide assurances for the decontamination of uranium mill tailings. To our knowledge no market has developed for those bonds and you might want to check with the people within the Commission who are handling that requirement to ascertain their experiences with surety bonds.

If we can provide any additional information, please do not hesitate to contact us.

Very truly yours,

Lloyd Provost

8110210272 811009
PDR PR
2 46FR38081 PDR

LP:VE

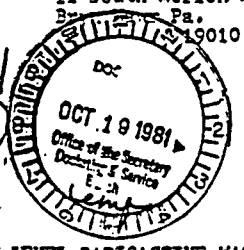
August 26, 1981

PRIORITY MATERIAL
PLEASE ANSWER IN TEN BUSINESS DAYS

(21)

Joseph H. White III
11 South Merion Ave.
Bryn Mawr, Pa.
19010

DOCKET NUMBER PROPOSED RULE PR-2 et al (46 FR 38081)



R.Dale Smith, Chief
Low-Level Waste Licensing Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards,
U.S. NRC
Washington D.C.
20555

Re: PROPOSED RULEMAKING ON LAND DISPOSAL OF LOW-LEVEL RADIOACTIVE WASTE
COMMENTS AND QUESTIONS, BOTH GENERAL AND SPECFIC

Dear Mr. Smith,

GENERAL COMMENTS:

GEN-4 pg. 38087,sectionH.other considerations: "Many of the operational provisions... are in effect at existing disposal facilities..."
1) What are the location of sites within the region (Bryn Mawr Pa.). where I live? Please put an asterisk beside those in Pennsylvania.
2) What state agencies are responsible for the sites in the region where I live? List agency with corresponding site.
3) Which, if any, of the above mentioned sites now meet NRC criteria?

What are the maxium number of sites proposed:
1) Nationally
2) In the region where I live.

Has a time-line for the creation of "new sites" been considered by NRC yet? If yes, please forward it.

On page 38088, a Memorandum of Understanding between NRC and DOT is mentioned. Please forward a copy.

C-3 What amount of "migration off disposal site" is acceptable by NRC?

E-1 When a site is closed prematurely by NRC, due to rule violation, who assumes responsibility for the site and waste already disposed?

On pg. 38088, you state "superfund registration may be duplicative"
1) What are you talking about?

Specfic comments on PART 61: Licensing Requirements for Land Disposal of Radioactive Waste

ED-1 1) 61.2 "Active maintenance does not include...replacement of monitoring equipment...minor repair of disposal unit covers..." What are these called or refered to as? Passive maintenance?

ED-1 2) 61.7 pg. 38091 (A-2) last sentance first full paragraph: What, specfically, are the mitigative measures refered to?

D-52-1 3) 61.7 pg. 38091 B-2 last sentance first column: How will the units be seperated?

D-51-4 4) 61.7 pg. 38091 B-5 : Besides depth, specifically what barriers will be used to seperate Class C from other wastes?

E-1 5) 61.25 pg. 38094 : Again, who is responsible for on-site wastes if a license is revoked?

C-6 6) 61.44 pg. 38095: What is to be done if stability is not met?

D-52-5 7) 61.52 pg. 38096 (A-6):What percent is a few percent?

D-52-3 8) 61.52 pg. 38096 (A-8): 100 Feet is too small a buffer zone.

D-53-1 9) 61.53 pg. 38096 (A): Pre-operational monitoring programs should also include the local population density of the area, and the historic and predicted future movements of the population in the area. Land use of the area, e.g. industrial, farming, residential, must also be addressed.

ED-1 10) 61.56 pg. 38097, (A-8): What do you mean by "maxium extent practicable"?

11) 61.56 pg. 38097, (A-8): The words, "Potential Hazard" are GARBAGE. Something is either a hazard, or it is not.

12) 61.56 pg. 38098 (B-3): What is ment by practiable? Please send the definition according to NRC jargon.

13) 61.61 pg. 38098 third sentance: please give an example of reasonable assurance.

G-1 14) 61.80 pg. 38100 (h-2-i): Any release to unrestricted areas , must be reported immediatly to NRC; likewise NRC must investigate any release to unrestricted areas immediatly.

This closes my comments and questions at this time. I would again like to stress the necessity of receiving these documents with haste.

Sincerly yours,

Joseph H.White III

2, 19, 20, 21, 30, 40, 51, 61, 70, 73, 1

KERR-McGEE CORPORATION

KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

ENVIRONMENT AND HEALTH MANAGEMENT DIVISION

DOCKET NUMBER
PROPOSED RULE PR-2 et al (46 FR 38081)

(22)

August 31, 1981

Mr. R. Dale Smith
Chief, Low-Level Waste Licensing Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Smith:

GEN-7 A check with NRC publications concerning our July request for a copy of Draft Environmental Impact Statement (DEIS) NUREG-0782 has determined that it will not be available for another one or two months which puts receipt possibly into late October.

The potentially late availability of this document makes informed comment on proposed Rule 10 CFR Part 61 concerning shallow land disposal of low-level nuclear waste by the established October 22, 1981 comment date difficult at best. As noted in the Background section of proposed 10 CFR Part 61, NUREG-0782 provides guidance and support for the rule development and is, therefore, an integral part for consideration.

Because of the importance of the background document to 10 CFR Part 61, Kerr-McGee requests an extension of the proposed rule October 22, 1981 comment date to include an adequate review period of NUREG-0782.

Sincerely,

W.J. Shelly

W.J. Shelly, Vice-President
Nuclear Regulation and Control

WJS/emn

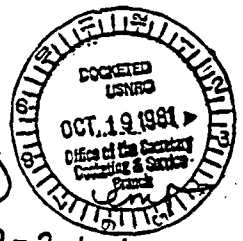
bcc John Stauber

DS10
1/0

8110210233 811019
PDR PR
2 46FR38081 PDR

D. M. Mathews
4200 Glenmere
No. Little Rock,
Arkansas 72116

Sept. 15, 1981



(23)

DOCKET NUMBER
PROPOSED RULE PR-2 et al (46 FR 38081)

Secretary of the Comission,
U. S. Nuclear Regulatory Commisssion
Washington, D. C. 20555

Attn: Docketing and Service Branch
Re: Federal Register/Vol. 46, No. 142/Friday, July 24, 1981,
Proposed Rules.

Dear Sir:

I have just finished reading the above listed proposed rules and am submitting the following comments with regard to some serious defeciences in the manuscript.

M-4 I failed to see the logic of 20.311(h). In this section the shipper of a package is penalized because of someone else's mistakes. In the event that a trucker loses the package or in the event that the receiver fails to notify the shipper, then it is (according to paragraph h) the obligation of the shipper to conduct an investigation and file a written report with the commission regional office.

While I agree that shipments of any type must reach their destination I fail to see any logic of picking a whipping boy to penalize for anything that goes wrong. The NRC, the Department of Transportation and any other agency of the government that is involved should do do their job properly and refrain from needlessly penalizing users of radioactive materials. My

D-55-1 final comments are in relation to section 61.5 and 61.56. I have been completely unable to establish any line of reasoning for the numbers listed in Table 1 and consequently with the class A, class B, class C, ratings

D-55-1

associated with these numbers. To merely list a sample of the confusion that I encounter, the ncrp total body burden for iodine 129 is 200 microcuries and the corresponding total body burden for strontium 90 is 20 microcuries. Both these concentrations refer to soluble materials and the values listed in Table 1, column 1 shows an allowable concentration of iodine only 1/50 of the allowable concentration of strontium 90 while the body burden for iodine is 10 times higher than that for strontium 90. In the event that these numbers are somehow related to a classification of hazard or danger, then a statement explaining how they are chosen would be very beneficial.

Moreover, there is no indication of any value being considered for the numbers in Table 1 with regard to the chemical composition of the radio isotope under consideration. It is my contention for example that iodine 129 in the form of lead iodide which has a very low solubility would be of less hazard than iodine in the form of potassium iodide which has a rather high solubility.

Although the number in the Table are definitely not arbitrary, a much better grouping of numbers could be obtained for such an all inclusive use as radioactive waste disposal. It is my hope that these numbers will be reconsidered and these two sections revised before forcing these items on every user of radioactivity in the United States.

Very truly yours,

D. M. Mathews

D. M. Mathews, Ph.D.

cc: R. Dale Smith
cc: Senator David Pryor
cc: Representative Ed Bethune

SARGENT & LUNDY
ENGINEERS
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603
(312) 269-2000

24

DOCKET NUMBER
PROPOSED RULE PR-2 et al
(46 FR 38081)

October 2, 1981

Secretary of the Commission
Docketing and Service Section
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

DOCKET NUMBER
PROPOSED RULE PR - Misc. Notice (Regulatory Guide)

Dear Sir:

Enclosed are our comments on Regulatory Guide 10CFR61, "Land Disposal of Radioactive Waste."

We appreciate having been given the opportunity to comment.

Yours very truly,

J. L. Loomis

J. L. Loomis, Head
Nuclear Safeguards & Licensing Division

JSL:DMS:sp
Enclosure
Copies
R. F. Janecek (1/1)
G. P. Wagner (1/1)
NSLD File 1B-4(1/1)

1891
1981

10CFR61 - "LAND DISPOSAL OF RADIOACTIVE WASTE"
COMMENTS ON PROPOSED RULEMAKING

Section 61.55 - Table 1

D-55-1
D-55-11

The waste classifications scheme presented here with the associated concentration limits presented in Table 1 would have a substantial impact on the nuclear power industry's waste disposal costs and hence, upon the cost of nuclear generated power.

The concentrations given in this Table are much more limiting than necessary. In the study prepared for the USNRC by Ford, Bacon, & Davis Utah, Inc. "A Radioactive Waste Disposal Classification System," NUREG/CR1005, conservative radioactivity limits for various waste classes were established through detailed hazards analysis. The limits recommended in NUREG/CR1005 should be incorporated into 10CFR61 in place of the arbitrary values in Table 1.

Section 61.56 Paragraph (b) (1)

D-56-8

"Stability for 150 Years" needs to be modified to indicate what forms of proof are acceptable. Some metal, wooden, and concrete structures can be shown to have maintained their "stability" for 150 years past. Very few of these are applicable to waste packaging. There is no way that deformation alone of the waste form can be a hazard to the public. The key requirement is to keep the waste from being dispersed, which is little affected by "slumping" or a "5%" deformation.

Section 61.56 Paragraph (b) (2)

D-56-13

"Non-corrosive liquid" should perhaps be changed to "liquid." If the intent of this article is to minimize corrosivity it should say so instead of setting arbitrary limits. Is the radioactivity in the liquid of any concern? Is there intent to limit the amount of "clean" water in the container?

Section 61.56 Paragraph (b) (3)

D-56-10

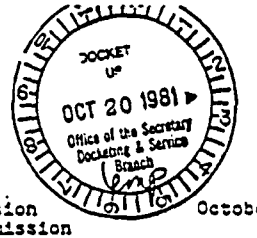
Does this mean that filler material must be added to packages containing irregularly shaped solid objects? Or is it the intent of this article that all such objects should somehow be chopped, melted, or otherwise compacted? What forms are acceptable, i.e., ash, pellets, compressed trash?

In general, the intent of these two articles is not clear and their applicability to wastes such as dewatered spent resins and incinerator ash or pelletized dryer or incinerator product needs clarification.

UNITED TECHNOLOGIES PACKARD

2200 Warrenville Road
Downers Grove, Illinois 60515
(312) 969 6000
Telex: 270-061
TWX: 910/695 3220

Packard Instrument Company



JAG 81-10-6

October 15,1981

The Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

(25)

SUBJECT: Proposed Amendments Regarding Licensing Requirements for Land Disposal of Radioactive Waste

DOCKET NUMBER PROPOSED RULE PR-2 etal (46 FR 38081)

Gentlemen:

Packard Instrument Company, Inc., is pleased to submit comments on the proposed amendments to Title 10CFR as printed in the Federal Register, Vol. 46, pages 38081-38105. Our comments shall be limited to the proposed sections which affect shippers of radioactive wastes.

Our general reaction to the proposal is favorable, in that we do not disagree with the Commission's intent. However, we do have some specific observations which we hope will be helpful.

D-55-2

In the preamble (p. 38085) the Commission refers to the new §20.306 as an example of the recognition of the need for "de minimis" classification of radioactive wastes. We agree with the need but hope that future efforts at "de minimis" classification will be more successful. In §20.306 the Commission redefines the term radioactivity to mean (a) in excess of 0.05 microcuries... of hydrogen-3 or carbon-14, per gram of medium, used for liquid scintillation counting or (b) in excess of 0.05 microcuries of hydrogen-3 or carbon-14, per gram of animal tissue averaged over the weight of the entire animal. This appears to be a welcome relaxation of regulations. However, the Department of Transportation defines radioactive material as material with a specific activity greater than 0.002 microcuries per gram of material [49CFR §173.389(e)]. Since the DOT regulations require use of a radioactive hazard label, the relaxed requirements of §20.306 are null and void for any wastes which must be transported from the generator's site. We are concerned that new approaches to "de minimis" classification should avoid ambiguity and should be applicable as intended.

D-55-12 We suggest that §61.55, Waste classification, needs some clarification. First, is it intended that the section mandate segregation of radioactive waste by radionuclide? This is an inference which some readers have drawn from Table.1. Segregation by radionuclide is highly impracticable and is impossible in wastes from multiple label experiments. Perhaps an expansion of, and repositioning of the footnote to Table 1 which refers to mixtures could clarify what appears to be an ambiguity.

D-55-6 We also have some concerns about the estimation of specific activity. The solid radioactive waste which we generate is a potpourri of various elements such as paper, glass, rubber or plastic gloves, plastic tubes and caps, resins etc. This mixture is not amenable to analysis, therefore any statement of activity can only be a rough estimate, and the combining of ratios of mixed radionuclides will certainly increase the uncertainty. Is it intended that accurate concentration data is mandated by §61.55?

D-55-2 In the case of liquid scintillation wastes, the estimation of total activity could be a horrendous bookkeeping task. Perhaps a "de minimis" classification promulgated by both the Commission and DOT would eliminate the need to consider liquid scintillation wastes as radioactive waste.

M-4 We are further concerned with §20.311, "Transfer for disposal and manifests." It may be important to establish a manifest tracking system but one must be careful not to develop a system wherein the paperwork burden exceeds the benefit of tracking a shipment.

M-1 Several questions arise related to the requirements of §20.311 (b), such as,

1. person generating the waste
2. type of waste
3. waste volume and mass
4. radionuclide identity and concentration
5. total activity

What is meant by "the person generating the waste?" Do you refer to separate individuals? I suggest that an appropriate definition is available from the Environmental Protection Agency in 40CFR §260.10.(a)(26)

> "'Generator' means any person, by site, whose act or process produces hazardous waste..."

The phrase "by site" clearly removes the possibility that individuals would be considered to be generators.

M-1 What is meant by type of waste? Is this referring to chemical form , or a physical description such as paper, glass, plastic? I believe the desired information should be stated more clearly.

The waste volume may not be difficult to indicate if the drum size is acceptable, e.g. 55 gallons. The requirement for mass seems unnecessary and may not be readily supplied by generators who do not possess a large scale.

The requirement for radionuclide identity, concentration and total activity evokes the same kind of comments as were offered relative to §61.55. The identity of the radionuclides can be readily listed, assuming that mixtures of nuclides are acceptable. However, how do we measure the concentration and total activity of paper wipes, empty containers of glass or plastic, or contaminated protective devices such as gloves?

M-2 Finally §20.311 (c)(3) mandates the establishment of a quality assurance program to assure compliance with §§61.55 and 61.56. It is our belief that such a program would not be necessary at many generator sites where the low level radioactive wastes would be generated.

This leads me back to the "de minimus" classification concept mentioned in the preamble. It appears to me that the Commission could relieve generators of radioactive waste from unnecessary paperwork by identifying a concentration of activity which would be exempted from the requirements of §§61.55, 61.56, 61.57 and 20.311. However, such an exemption must be made with the concurrence of the Department of Transportation so that transportation could be made to ordinary land-fills.

It is hoped that the observations offered in this letter will assist you in the development of a practical system of licensing requirements.

Sincerely

James A. Gibbs

James A. Gibbs
Regulatory Affairs Manager

jag/ddo

National Aeronautics and
Space Administration

John F. Kennedy Space Center
Kennedy Space Center, Florida 32899

NASA

(26)

DOCKET NUMBER
PROPOSED RULE PR-2 et al
(46 FR 38081)

OCT 15 1981

DOCKETED
USNRC
OCT 20 1981
Office of the Secretary
Docketing & Service
Branch

Reply to Attn of MD-ESB-A

Mr. R. Dale Smith
Chief, Low-Level Waste Licensing Branch
Division of Waste Management
United States
Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Smith:

M-2 The Biomedical office has reviewed the subject proposed rulemaking and concurs with those portions applicable to "generating" and "waste collecting" licensees. We are, however, concerned that requirements to "conduct quality assurance programs" (reference page 38102, Sections 20.311(D))(3) and (E)(5)) beyond standard management/administrative audits could be overly burdensome to many licensees that handle only minimal amounts of low-level wastes. It is suggested that those sections specify that minimally acceptable quality assurance programs in such instances may be comprised solely of management/administrative audits.

Paul Buchanan, M.D.
Director, Biomedical Office

cc:
MD-ESB-A/G. M. Marmaro

Northern Illinois University
DeKalb, Illinois 60115

Department of Biological Sciences
815 753 1753
815 753 0433

17 October 1981

DOCKETED
USNRC

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OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

(27)

DOCKET NUMBER
PROPOSED RULE PR-2 et al
(46 FR 38081)

Secretary of the Commission
Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Madam or Sir

This will serve as Comment on the "Proposed Rulemaking on Land-Disposal of Low-Level Radioactive Waste" (10CFR61).

A-8 Despite the laudatory effort to improve containment, stabilization and immobilization of low-level radioactive waste in shallow land burial, neither experience nor current studies provide assurance of an effective sequestering of toxic chemical or radioactive waste for the necessary number of years.

The mechanism for migration of radioactive materials off dump site remains poorly understood. After only four years in one trench at Sheffield, Illinois, tritium migrated 150 feet. Jess Cleveland and Terry Rees, U. S. Geological Survey (Science 212, 1506, 1981), reported in their characterization of plutonium migration in the Maxey Flats leachates, that organic matter produces stable, mobile complexes of plutonium. Radionuclides have migrated at five of the six commercial sites in this country - sometimes after less than a decade. It is essential for the NRC to dismiss land burial as an effective means of disposal, and develop criteria for the disposal of low-level radioactive waste in deep mined cavities in areas of low precipitation.

D-55-14 Although medical/university radioactive waste represents about 25 percent by volume of solid waste, it contains less than 1 percent of the radioactivity

Northern Illinois University

D-55-14 disposed annually of which 98.7 percent has half-lives of 60 days or less. Medical/university waste must be segregated at the source, stored for a matter of months, and disposed as normal trash.

In summary, the problems associated with the land burial of radioactive waste make it imperative to vigorously develop alternatives to this unacceptable means of disposal.

Sincerely,

Bruce W. von Zellen

Bruce W. von Zellen
Professor

Department of Energy
Washington, D.C. 20545

OCT 14 1981

DOCKETING & SERVICE
'81 OCT 22 P4:59
OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

28

Mr. J. B. Martin
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

DOCKET NUMBER
PROPOSED RULE PR-2 et al
(46 FR 38081)

Dear Mr. Martin:

The Department of Energy has partially completed a review of the proposed regulation 10 CFR 61 concerning the near-surface disposal of nuclear waste. Some comments were provided Kitty Dragonette at the Low-Level Waste Management Program Review Committee meeting in September.

GEN-7 Our review indicates that Table 1, The Disposal Concentration Limits By Nuclide, may need further work in that the limits provided may inadvertently eliminate volume reduction. This could occur if the limiting nuclide is carbon-14 or nickel-63 in controlling the disposal category. In order to constructively comment, it is necessary to review and assess the scenarios and methodology used to develop Table 1. This information is not currently available being contained within the Environmental Impact Statement.

Therefore, I request an extension of the time limit for comment on 10 CFR 61. It would seem appropriate that the comment period be extended to 120 days from the issuing of the draft Environmental Impact Statement.

Sincerely,

for Sheldon Meyers

Sheldon Meyers
Acting Deputy Assistant Secretary
for Nuclear Waste Management
and Fuel Cycle Programs
Office of Nuclear Energy

Nuclear Diagnostic Laboratories, Inc.

Serving Laboratories, Hospitals & Industry

Post Office Box 791
Peekskill, New York 10566
914-737-7330

October 19, 1981

(29)

DOCKET NUMBER PR-2 at al
PROPOSED RULE (46 FR 38081)

Secretary of the Commission
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Docketing & Services Branch

Gentlemen:

We have comments concerning two of the proposed changes to Part 20, as published in Federal Register, Volume 46, No. 142, Licensing Requirements for Land Disposal of Radioactive Waste.

As a licensed Radioactive Waste Disposal Service (collector), we are very much concerned with the increased paperwork requirements contained in the new manifest requirements of 10 CFR 20.311. We feel there should be some allowance made for our type of operation in the final rule.

There are two provisions which appear unnecessarily burdensome for a service company such as ourselves. These are:

M-1 (A) 10 CFR 20.311 (d)(5): This requires the generator to forward to us a copy of the manifest for the waste pick up that we have just made. All of our pick ups are made in our own vehicles by NDL employees. In all cases the vehicle returns to our licensed storage location. This requirement necessitates an additional page for an already multipage form, the only purpose of which is to notify us of something we already know; namely, that we received waste from a particular generator.

Our suggestion is that the requirement in (d)(5) be waived when the person making the pick up is the same as the intended recipient. The provisions of (e)(1) would still apply.

M-4 (B) 10 CFR 20.311 (e)(2): Because the waste received from one generator (due to varying burial site requirements), may be destined to be shipped to any of the three authorized sites; and because any one trailerload of waste originating at our facility may conceivably contain waste from as many as one hundred and sixty customers; it will be extremely burdensome, if not physically impractical, to include copies of originating generator manifests along with the new manifest which will be prepared by NDL. In the first case the generator manifests will contain information not applicable to the shipment in question (e.g. containers destined for a different site or some of the containers listed on one manifest not getting on one particular shipment). In the second case the paperwork for one burial site shipment could include as many as one hundred and sixty pieces of paper in addition to the paperwork prepared for a particular shipment by NDL.

While admitting that the 160-figure is a little extreme (a worst-case scenario), in practice there probably would be fifty to sixty originating generator manifests, many of which would contain nonpertinent information.

Our suggestion is that the requirement in (e)(2) be dropped, provided that copies of originating generator manifests be retained on file and all required information be included on the manifest prepared by the disposal service (collector) for shipment for burial.

If you have any questions on the comments and/or suggestions above, please contact me.

Very truly yours,

Alan Jones
General Manager

AJ:sg

DOCKETED
USNRC

'81 OCT 22 P5:23

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

THE UNIVERSITY OF NORTH CAROLINA
AT
CHAPEL HILL

University
Health and Safety Office

October 20, 1981

The University of North Carolina at Chapel Hill
Health and Safety Office
B-5 Venable Hall 045 A
Chapel Hill, North Carolina 27514

(30)

DOCKET NUMBER
PROPOSED RULE PR-2 et al
(46 FR 38081)

Office of the Commission
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
Attention:
Docketing and Service Branch

Dear Sirs:

In general the proposed rulemaking on land disposal of low-level radioactive waste, Part 61, appears to represent a foundation for improvements in this critically important area.

A few comments are offered concerning:

D-52-2 1. 61.52(a), (4) and (5)

It does not seem likely that the wording as given will make any great strides in reducing overburden subsidence, unless mechanical compaction is carried out. 61.56 (a), for example, apparently will allow the use of wooden containers.

D-56-5 2. 61.56(a), (5) and (7)

These rules appear to be contradictory concerning gases. Radioactive waste gases in conventional cylinders probably should not be buried.

D-56-8 3. 61.56(b)

Low-level waste stability, or lack of it, has been an important characteristic in problems at waste sites. The wording of this rule seems to be remarkably vague and may invite problems.

The proposed rule has gone a long way in improving existing standards for the land disposal approach for these wastes. It is important that a vigorous and competent regulatory overview also be maintained.

D-55-2 It is encouraging to read that continuing studies of "de minimis" waste classification will be made. Expanded use of incineration, compaction and segregation as volume reduction tools should, of course, also continue to be encouraged.

Sincerely,

Bobby M. Wilson
Radiation Safety Officer

P.O. BOX 529100 MIAMI, FL 33152

DOCKETED
USNRC
emp
OCT 23

FPL
FLORIDA POWER & LIGHT COMPANY

October 20, 1981
L-81-455

(31)

DOCKET NUMBER
PROPOSED RULE PR-2 et al
(46 FR 38081)

Mr. Samuel J. Chilk
Secretary of the Commission
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Docketing and Service Branch

Dear Mr. Chilk:

Re: Proposed Rule, 10CFR61
Federal Register Vol. 46, No. 42, Friday, July 24, 1981

Florida Power & Light Company's comments to Proposed Rule, 10CFR61 are attached for your consideration.

Very truly yours,

R. E. Uhrig
Vice President
Advanced Systems & Technology

REU/AJG/cab

Attachment

PEOPLE... SERVING PEOPLE

D-55-6

Table 1 of the proposed rule 10CFR61, section 6.55 provides a specific list of radioactive isotopes and their concentration limits for each of three classifications of radioactive wastes. Proposed 10CFR20.311 (b) provides that "The total quantity of noted isotopes identified in Table 1, Part 61 of this chapter must be shown.", implying that a specific assay must be performed for each radioactive waste shipment. We do not believe this to be a practical requirement nor a technical necessity, particularly for nuclear plant wastes. Except as discussed below, we don't believe the issue is whether or not the concentration limits are reasonable, rather we believe it is an issue over the practicality of demonstrating compliance for non-gamma emitting isotopes. Any provisions which would require radioactive waste generators to do a complete assay on each radioactive waste shipment, in accordance with Table 1 of 10CFR61 and 10CFR20.311, will as a minimum be likely to result in significant increases in personnel radiation exposure. Increased radiation exposure would result because of requirements to collect more and larger samples and because of the increase in sample handling times in order to accommodate more sophisticated analytical techniques. In addition, the transportation of radioactive waste shipments would be impacted due to having transportation casks tied up longer while awaiting completion of an assay prior to shipment; similarly the urgency for temporary on-site radioactive waste storage would be increased.

D-55-3

In the summary of the proposed rule, that portion of section V, part C, dealing with waste characteristics and classifications, indicates that the maximum concentration for most alpha emitting transuranic nuclides has been calculated to be in the range of 10 nCi/g. Further, it is stated that the calculations were conservatively based with no credit for dilution. A higher concentration limit could have been adopted but was not, since the current concentration limit of 10 nCi/g was in the spirit of ALARA and has been demonstrated achievable. We are not certain we can agree with these assessments by the NRC. First, it is not clear if the transuranic isotope concentration limit is a cumulative limit for all transuranic isotopes (except Pu-241) or if it is based upon a concentration per transuranic isotope.

D-55-3

Second, the assay of solid low level waste for alpha emitting transuranic isotopes involves sophisticated analytical techniques. Some studies have in fact indicated that the concentrations of transuranic isotopes in most waste streams is low. Guidance has even been offered for assaying transuranic isotopes using indirect measuring techniques. However, while we consider these studies to be extremely valuable as an indication that transuranic isotope concentrations in reactor plant radioactive waste streams are low, we are not certain that the conclusions are sufficiently absolute. We would urge the Commission to perform an in depth evaluation of transuranic isotopes in reactor plant radioactive waste streams prior to adopting the 10 nCi/g concentration limit, and to evaluate the practicality of techniques for demonstrating compliance. We have seen studies which suggest that the concentration limit for transuranic isotopes could be as much as fifty times higher.

Wisconsin Electric POWER COMPANY
231 W. MICHIGAN, P.O. BOX 2046, MILWAUKEE, WI 53201

October 21, 1981

Mr. Samuel J. Chilk
Secretary of the Commission
U. S. NUCLEAR REGULATORY COMMISSION
Washington, D. C. 20555

Attention: Docketing and Service Branch

Dear Mr. Chilk:

PROPOSED RULEMAKING ON LAND DISPOSAL
OF LOW-LEVEL RADIOACTIVE WASTE

We have reviewed the proposed rulemaking on land disposal of low-level radioactive waste which was published in The Federal Register on July 24, 1981 and have the following comments.

Although the major impact of the proposed regulation will fall upon disposal site operators, the additional costs resulting from the additional requirements undoubtedly will be passed on to waste generators. These additional costs to the site operator include new administrative and operational costs, and the provision of financial surety.

M-4 One of the new requirements which would apply to waste generators and shippers directly concerns a new manifest system which would require waste shippers to provide more information in shipping papers and to investigate missing shipments. Existing Department of Transportation regulations pertaining to shipping papers and reporting requirements are adequate. Furthermore, it is more appropriately the carrier's responsibility to investigate shipments.

D-55-1, D-56-2, D-55-3 Another new requirement to be placed on the generator/shipper concerns waste categorization through the use of Table 1 of Section 61.55. There are several difficulties with this table: a) it is incomplete, i.e., there are many nuclides which are not included or provided for; b) the 0.1% limit for chelating agents is unnecessary and is unclear as to whether this is percentage by weight or volume; c) the limits on concentration are too restrictive, especially the 10 nCi/g limit for transuranics, and the technical justification for these limits has not been demonstrated. We note in particular that the 10 nCi/g limit,

D-55-3 although historically implemented on an arbitrary basis, continues to be promulgated without justification. A new limit should be derived, based on technically sound and justifiable analysis.

M-4 On Page 38088 of The Federal Register, the NRC certifies that the proposed rule will not, if promulgated, have a substantial economic impact upon a substantial number of small entities. We do not agree with this judgment in view of the additional paperwork involved with the Manifest Tracking System and the increase in burial fees which would result when the burial site operators pass on their additional costs. The economic impact will be felt by all of the approximately 9000 licensees, and it will be felt most strongly by the "small entity" licensees who comprise all but a few hundred of the total number of licensees. In the summary, the NRC acknowledges that the economic costs of the proposed rules to "small entities" have not been quantified, and the burden to prove otherwise is placed on these small entities. Many of the small entities are physicians, medical clinics, and hospitals who are currently permitted to dispose of radioactive wastes into sanitary sewage systems. The proposed rule would greatly increase their disposal difficulties with no benefit to the public health and safety.

M-3 The new regulations are inappropriate, unnecessary, and provide no benefits for the additional costs that will be incurred.

Very truly yours,

C. W. Fay, Director
Nuclear Power Department

Mailing Address
Alabama Power Company
600 North 18th Street
Post Office Box 2641
Birmingham, Alabama 35291
Telephone 205 783-6081

F. L. Clayton, Jr.
Senior Vice President
Flintridge Building

Alabama Power

DOCKETED
'81 OCT 23 P1:23
OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

October 13, 1981

Docket Nos. 50-348
50-364

(33)
DOCKET NUMBER
PROPOSED RULE PR-2 & 61
(46 FR 38081)

Mr. Samuel J. Chilk
Secretary of the Commission
U. S. Nuclear Regulatory Commission
1717 H Street, N.W.
Washington, D.C. 20555

Dear Mr. Chilk:

Re.: Joseph M. Farley Nuclear Plant - Units 1 and 2
Comments on Proposed 10 CFR Part 61
"Licensing Requirements for Land Disposal of Radioactive Wastes"

In response to the Federal Register Notice dated July 24, 1981, we would like to offer some comments concerning the NRC proposed rule 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Wastes." Although the proposed rule is directed at licensing low-level radioactive waste burial grounds, certain parts of the rule will directly impact the packaging and processing of low-level radioactive waste at Farley Nuclear Plant. Our comments address the packaging and processing concerns raised by the proposed rule.

D-55-2

"de minimis" Classification of Wastes

On page 38085 of the Federal Register Notice containing proposed 10 CFR Part 61 (Vol. 46, No. 142 dated July 24, 1981), it is stated that Part 61 will not establish a generic "de minimis" category for waste (i.e., wastes that would be exempt from Part 61). Recently the NRC set "de minimis" limits for tritium and carbon-14 in liquid scintillation and animal carcass waste (10 CFR Part 20). The new limits on tritium and carbon-14 allowed a significant reduction in the volume of low-level radioactive waste being shipped from hospitals and research facilities. Since a large fraction of the currently shipped low-level wastes from power reactors are not hazardous to the health and safety of the public due to their very low levels of contamination, it would be very beneficial for "de minimis" limits to be specified in 10 CFR Part 61. Such limits could significantly reduce the volume of low-level radioactive wastes being shipped to burial sites and thus reduce the need for new sites. Therefore, the NRC should speed up its current schedule (i.e., two years plus) to establish "de minimis" limits for radionuclides and incorporate those limits into 10 CFR Part 61.

D-52-1

Section 61.55 Waste Classification

The waste classification system should not prevent shipment of mixed classes of wastes on one truck. As it is now written, 10 CFR Part 61 only states that Class A wastes will be segregated at the disposal site and nothing is said about Class B and Class C wastes. It appears that mixed shipments are allowed but it is not explicitly stated. An example of the problem caused if mixed shipments are not allowed is the following. Some waste containers are designated Class B and require a shipping cask. Since a shipping cask holds many waste containers, several Class A containers are used as fillers to help assure the safe transportation of all the containers. If the containers are not segregated at the disposal site, then all of them would be disposed of in a Class B burial trench. This would result in unnecessary costs to the shipper and misrepresent the actual volume of Class B wastes being disposed of. Therefore, 10 CFR Part 61 should clearly stated that all waste containers will be segregated at the disposal site or that they will not be segregated, whichever is true.

D-55-3

Section 61.55(d) states that waste which has a radioisotope concentration in excess of Column 3 in Table 1 is not generally acceptable for disposal without specific Commission approval. The value given in Column 3 for alpha-emitting transuranic radionuclides is 10 nCi/g. This value is based on current DOE requirements which were derived from conservative calculations. However, to our knowledge, it has not been demonstrated that the detectable limit for alpha-emitting transuranic radionuclides is down to less than 100 nCi/g. Therefore, a 10 nCi/g limit is not measurable and thus not enforceable.

D-56-2

Another concern with Table 1 is a footnote which states, "Wastes containing chelating agents in concentrations greater than 0.1% are not permitted except as specifically approved by the Commission." Since cleaning fluids, decontamination cleaning compounds, etc. contain chelating agents, the 0.1% restriction would require a multitude of specific approval requests for Commission review. It would be much better to establish a waste characteristic requirement in Section 61.56 for chelating agents such that these wastes could be handled routinely. Since decontamination activities will become more and more common as nuclear power plants age, the chelating agent disposal issue should be addressed generically in 10 CFR Part 61 rather than on a case-by-case basis.

D-56-11

Section 61.56 Waste Characteristics

Some of the requirements in this section appear overly restrictive and could lead to significant increases in the waste volume. In particular, section 61.56(b)(1) requires that the waste form be able to withstand a compressive load of 50 psi while maintaining

D-56-9 / D-56-8

physical dimensions within 5% in the presence of moisture, microbial activity, and with internal factors such as radiation effects and chemical changes. Since this requirement is part of section 61.56 which concerns stability of the waste for at least 150 years, it is implicitly assumed that the compressive load/dimensional integrity requirement must be met for at least 150 years. The basis given for this requirement is to prevent slumping, collapse, or other failure which could lead to water infiltration.

Subsidence (i.e., slumping, collapse, etc.) is caused by void spaces in a burial site. Section 61.52(a)(5) addresses the void concern by requiring that the void spaces between waste packages be filled with earth or other material. Therefore, the compressive load/dimensional integrity requirement is overly restrictive and could significantly add to the volume of low-level radioactive waste by requiring additional processing of the waste to meet this requirement.

If you have any questions concerning these comments, please advise.

Yours very truly,

F. L. Clayton, Jr.

FLCJr/GGY/de

cc: Mr. R. A. Thomas
Mr. G. F. Trowbridge
Mr. J. P. O'Reilly
Mr. E. A. Reeves
Mr. W. H. Bradford

LAW ENGINEERING TESTING COMPANY
2749 DELK ROAD, S.E.
MARIETTA, GEORGIA 30067
(404) 952-9005

34

October 20, 1981

PROPOSED RULE PR-2 etal (46 FR 38081)

DOCKETED
USNRC

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

81 OCT 23 P1:23

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

Attention: Docketing and Service Branch

Subject: Comments on 10CFR, Part 61, as Published in the Federal Register, July 24, 1981

The follcwing comments address limited sections of 10CFR Part 61, as solicited in the Nuclear Regulatory Commission letter, dated August 4, 1981, Subject: Proposed Rulemaking on Land Disposal of Low-Level Radioactive Waste.

(1) ITEM: TYPOGRAPHICAL ERRORS

ED-1

SUMMARY - V. C., last three words in Column 1, page 38085 - through "te" exclusion, should read, through "the" exclusion

61.53(d) "incidate", should read "indicate"

D-52-3

(2) ITEM: See Section 61.52 (a) (8), in regards to the 100ft. buffer zone.

COMMENT: the requirement for a 100ft. buffer zone may be better served from a performance objective approach. What is the purpose of the 100ft. buffer, to prevent intrusion, off-site contamination, or both? If intrusion is the criterion, the 100ft. buffer is probably sufficient; if off-site contamination is the criterion, then the buffer width should be performance based (e.g.,a function of transmissivity, waste classification, Rd, distance, time, etc.). If both intrusion and off-site contamination are the concerns of 61.52 (a)(8), then 100ft. should be defined as the minimum distance and, if necessary, an addative factor superimposed to accomodate the performance objectives.

(3) ITEM: See Section 61.56(a), in regards to stipulating minimum requirements for all classes of waste.

ED-1 COMMENT: the next section 61.56(b), does not specify if any, or all classes of waste must meet the stability requirements.

(4) ITEM: See Section 61.56(b), 2nd sentence, in regards to the need for assurance that the waste will not degrade.

D-56-8 COMMENT: the waste will degrade. The intent of the sentence would be better served without requiring natural processes not to degrade an environmentally unstable material. One can require the waste binder or container to last 150 years, but not the waste itself. The waste should be allowed to degrade, the binder and/or containers could be required to withstand disintegration, thus avoiding soil collapse and subsequent infiltration.

Law Engineering Testing Company appreciates this opportunity to comment on this important document. We look forward to the publication of 10CFR Part 61.

Sincerely,

LAW ENGINEERING TESTING COMPANY

Louis S. Karably, P.E., P.G.
Manager,
Radwaste Isolation Program

LSK/mgd

cc: F. J. Steinbrenner

Commonwealth Edison
One First National Plaza Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

DOCKETED
USNRC

'81 OCT 26 P2:55

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

emp

October 22, 1981

35

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

DOCKET NUMBER
PROPOSED RULE PR-2 et al (46 FR 38081)

Attention: Docketing and Service Branch

Subject: Proposed Rulemaking on Land Disposal of Low-Level Radioactive Waste (46 FR 38081 July 24, 1981)

Dear Sir:

Commonwealth Edison has reviewed the subject rulemaking and offers the attached comments. We appreciate having been given the opportunity to comment.

Sincerely,

L. O. DelGeorge
Director Nuclear Licensing

Comments - Commonwealth Edison
Proposed Rulemaking On Land Disposal Of
Low-Level Radioactive Waste (46 FR 38081 July 24, 1981)

DEVELOPMENT OF PERFORMANCE OBJECTIVES - PROTECTION OF THE INADVERTENT INTRUDER

C-4 This section lacks adequate provision for the protection of the general public from potential releases to the environment.

For example, while terrorists cannot be accurately described as "inadvertent" intruders, we believe there should be a plan to safeguard a site from terrorists. While security staffs at nuclear power plants have grown in proportion to the threat of potential covert actions of terrorists and extremist groups, there is no reference to security or anti-terrorist possibilities at the proposed land disposal sites. This could be due to the belief that site disposal security is not necessary, when, in fact, disposal sites are more susceptible to covert acts than nuclear power sites. This is true because the nuclear waste materials are already packed in containers in preparation for transport.

SUBPART A

61.7-b.4 INSTITUTIONAL CONTROL

A period of 100 years is too long to be meaningful. As a requirement, it would be impossible to meet unless the licensee could provide some kind of assurance of institutional control for 100 years. If left in the regulation, it could become a stumbling block to the licensing of low-level waste sites.

D-59-2 COBALT 60, the material expected to be present in any quantity, has a half life of 5.3 years. 100 years, as well as the 500-year passive control, therefore appears arbitrary. It is technically incorrect to assume that carbon steel containers, which are bio-degradable over the long term, will resist degradation for the 100 year period. The proposed changes to 10 CFR 61 imply a potential change in the container industry from carbon steel to nonbio-degradable materials such as high density polyethylene. This change would be financially prohibitive.

SUBPART B - GENERAL PROVISIONS
61.13 TECHNICAL ANALYSIS

C-1 A systems approach should be used in the regulation of low-level waste burial sites. This means that criteria for compliance at the site bouncary should be established and arbitrary intermediate levels of radioactivity on packages, leach rates, etc. should not be part of the regulations.

61.55 WASTE CLASSIFICATION

D-55-4 There are several radium 226 sources used at Commonwealth Edison Fossil Stations for flow rate determinance. Radium 226 is not specified in Table 1.

D-56-2 Chelating agents are not permitted in concentrations above 0.1% without NRC approval. This is overrestrictive, and may needlessly impact chemical cleaning operations planned for Dresden Unit 1. Additional comments regarding this impact may be submitted after further study.

SUBPART E 61.62 FINANCIAL ASSURANCES

E-1 This section contains no details with respect to the amount of financial assurance that each disposal site licensee will be required to obtain. Commonwealth Edison's concern is that prohibitive amounts will force present licensees out of business and result in a lack of low-level waste disposal sites.

2710N

Union of
CONCERNED
SCIENTISTS

DOCKETED
USNRC

'81 OCT 26 P2:53

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

October 21, 1981

(36)

Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
Attention: Docketing and Service Branch

DOCKET NUMBER
PROPOSED RULE PR-2nd ed
(46 FR 38081)

Dear People,

re: Proposed Amendments (published 21st July 1981)
to the Commission's rules regarding Licensing
Requirements for Land Disposal of Radioactive Waste

The attachment contains comments on the proposed amendments.

Thank you for your attention.

Sincerely,

G.R. Thompson

Gordon Thompson, Ph.D.
Staff Scientist

Attachment

1384 Massachusetts Avenue • Cambridge Massachusetts 02238 • Telephone (617) 547-5552
1725 I Street N.W. • Suite 601 • Washington D.C. 20006 • Telephone (202) 296-4420

DOCKETED
USNRC

'81 OCT 26 P2:53

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

Comments on

Proposed amendments (published 21st July 1981)

to the NRC's rules regarding licensing

requirements for land disposal of radioactive waste

by

Gordon Thompson
Staff Scientist
Union of Concerned Scientists
1384 Massachusetts Avenue
Cambridge, Massachusetts 02238

October 1981

1. General Comments

The proposed amendments in many respects provide an appropriate regulatory framework for near-surface disposal. In certain respects, the amendments are imprecise or inadequate as outlined in the following specific comments.

2. Specific Comments

Part 61

A-1 61.1 Purpose and Scope

The amendments should be confined to near-surface disposal until requirements for other methods are formulated.

61.7 Concepts

D-55-10 This section proposes ((b) (2)) a maximum site inventory for certain isotopes. Criteria for determining this inventory should be specified in these amendments. Furthermore, a maximum site inventory should be determined for every isotope

C-4 This section proposes ((b)(3)-(5)) provisions to guard against inadvertent intrusion. The nature of this intrusion should be specified in these amendments.

D-55-10 Adoption of a maximum site inventory for all isotopes would provide some protection in the event of inadvertent intrusion of a severity greater than that specified or in the event of other circumstances which might lead to unanticipated releases of radioactivity.

D-51-2 No provision is made in this section, or elsewhere in these amendments, for warning signs designed for a life equal to the 500-year design life of the intruder barriers. Such provision should be made.

D-53-1 61.13 Technical Analyses

Analyses of release pathways should be prepared in such a manner that they may be validated by data acquired from subsequent monitoring. Monitoring should be conducted with this end in view. Validation should be required at set periods.

C-3 61.41 Protection of the general population from releases of radioactivity

This Section states that ground water at the nearest public drinking water supply must meet National Primary Drinking Water standards. That provision should be extended to all actual or potential water supplies outside the site boundary.

61.42 Protection of individuals from inadvertent intrusion

This section should be expanded to include individuals and populations.

The amendments should specify maximum individual doses and maximum population doses, in the event of the specified intrusion or of more severe intrusions (see our comments on 61.7).

D-52-5 61.52 Land disposal facility operation and disposal site closure

At (a)(6) in this section, it is stated that gamma radiation must be within a few percent above background. This requirement should be replaced with a more precise requirement.

D-51-2 At (a)(7), it is stated that three permanent survey marker control points must be established on the site. In addition to that requirement, there should be a requirement for warning signs with a 500-year design life (see our comments on 61.7).

D-53-1

61.53 Environmental monitoring

At (a), it is required that certain data must cover at least a twelve month period. This period is much too short for the appropriate collection of many kinds of environmental data.

This section should specify the relation of monitoring to validation of analyses (see our comments on 61.13).

ED-1
D-55-10

61.55 Waste classification

A maximum site inventory should be determined for every isotope (see our comments on 61.7).

In Table 1, the concept "theoretical maximum specific activity" is used. A definition of this concept should be included in these amendments.

Table 1 should be extended so as to stipulate maximum concentrations for every isotope which may be included in radioactive waste. The suggested procedure for comparison of the isotope with Sr-90, Cs-137 or U-235 is imprecise.

D-56-2

61.56 Waste characteristics

This section should state that waste containing chelating agents in concentrations greater than 0.1% are not permitted (as is now stated in the footnotes to Table 1).

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DOCKET NUMBER
PROPOSED RULE PR-2 et al
(46 FR 38081)

3164 Main Street | Buffalo, New York 14214 (716) 832-9100

October 23, 1981

Dear Sir,

Herewith find enclosed our comments on Licensing Requirements for Land Disposal of Radioactive Waste.

GEN-7

These comments are being submitted on October 23, one day after the close of the comment period October 22. I hope that they still will be taken into consideration and would appreciate confirmation of this fact from you.

Thank you for your interest and consideration.

Sincerely yours,

Mina Hamilton
Director
Sierra Club Radioactive Waste Campaign

sierra club
radioactive waste
campaign

3164 Main Street Buffalo, New York 14214 (716) 832-9100

COMMENTS ON PART 61 "LICENSING REQUIREMENTS FOR LAND DISPOSAL OF RADIOACTIVE WASTE." Submitted by Mina Hamilton, Director, Sierra Club Radioactive Waste Campaign

37 D-56-8

PR-2 et al (46FR38

61.52 Facility Operation

D-52-2

4) No matter how "orderly" the emplacement package integrity cannot be maintained during emplacement and disposal -- steel drums and wooden crates all degrade at different times. Even if identical steel packaging were utilized degradation of the steel will occur at different rates according to type of manufacture and contents. Slumping and shifting of packages is inevitable with the consequent slumpage and caving in of trench caps.

5) Future subsidence cannot be significantly reduced by filling void spaces at emplacement or time of dumping. The rotting, corroding and deteriorating of different package materials (steel, wood) will inevitably produce voids subsequently resulting in slumpage problems.

61.56 Waste characteristics

D-56-8

8(b) "The requirements ... are intended to provide waste stability for 150 years." The assumption that waste will not degrade or slump for over 1½ centuries is based on nothing more than wishful thinking. Steel drums will corrode and rust out in 30 to 60 years. Steel drums exhumed at the Idaho dump site (INEX) were all seriously degraded after 13 years. The assumption that steel will not corrode has no basis in experience.

It is unclear as to how the goal of stability for 150 years was arrived at. Much of the material to be dumped is contaminated with cesium and strontium which will require stability for at least 300 years. (This is presuming the industry rule of thumb of multiplying ½ x 10.) If prior to this time, trench collapse, slumpage and erosion, or other events

sierra club
radioactive waste
campaign

D-56-8

provided an access route for water into the trenches, these hazardous isotopes could migrate off site. In the case of cesium we are particularly concerned because of its water solubility.

D-56-4

(2) It is highly commendable that the NRC has finally banned use of extremely temporary cardboard and fiberboard for packaging of materials that will be hazardous for hundreds of years.

D-56-5

(5) Should be expanded to include persons living downwind of the site. Although persons "transporting, handling or disposing of the waste" can be protected from gases or fumes by protective clothing and masks, citizens living or working in the vicinity need a more specific guarantee regarding harmful airborne contaminents such as radon gas or tritiated methane.

61.52 Near-surface disposal facility operation and disposal site closure.

D-52-2

(a)(2) Apparently, the requirements for stability for Class B wastes will not apply to Class A waste. Given the presence of such isotopes as cesium and strontium in Class A waste, we find the lack of such requirements as inconsistent with the over-all goal of protection of public health and safety.

(4)(5) There is no basis in experience for assumption that "orderly" or neat stacking has any effect on long-term package or trench integrity. The action of neat stacking is correlated to the expected lifetime of wood or steel. No matter how perfectly steel drums are stacked, they will eventually corrode. If provisions 61.52 (a)(4)(5) or 61.51 had a basis in reality, the trenches at West Valley would be stabile. But within 2 years of closing over 126,000 gallons of water had accumulated in one trench at West Valley. The origin of this water is unknown.

SUBPART C - PERFORMANCE OBJECTIVES

C-6

61.44 The goal of long-term stability and avoidance of continued, active maintenance at the site is central to Part 61 of CFR 10. The goal is, of course, enthusiastically shared by environmentalists, industry and government. But there is no basis in experience with burial sites located in regions of moderate to high rainfall that indicates this goal can be achieved by the means outlined in Part 61. Unless the recommended measures have been demonstrated to work at an already existing facility, then the measures are examples of wishful thinking and not concrete tactics whose implementation will result in the desired goal. To establish regulations on the basis of a hoped-for future dream and not on the basis of actual experience is a dangerous process that may lull the unwary into a false sense of security.

The goal of stability supposedly will be achieved through specific site design features. For example, in 61.51(a)(4) "Covers must be designed to prevent water infiltration." Thus far, over 12 years of experimentation with increasing the size of covers from 4' to 8', with using impermeable clay as the material, with planting of special grasses at the West Valley dump site has not prevented water infiltration. Water infiltration continues to be a problem at the closed-down Sheffield, Illinois, Maxey Flats, Ky sites and the still operating Barnwell, S. C. facilities. All operating commercial dump sites except the Nevada site (a region of limited rainfall) have water infiltration problems. Twenty years of experimentation and we seem to be no closer to prevention of water infiltration through the covers. Perhaps concrete covers would work but this approach has not been demonstrated to work. An obvious problem with

concrete would be the difficulty of maintaining the cover in place as trench contents degrade, shift and slump downwards leaving a void for the cover to collapse into. The only way to keep such a cover in place would be to have concrete walls sunk into the ground to hold the roof up. In addition, the lifetime of this concrete would not reach the goal of 150 years.

C-6

There is an apparent misunderstanding in Part 61 regarding the simpler inevitable mechanism of slumpage of trench contents. Without this understanding--that slumpage leads to cover indentations, cracks and collapse--then it is possible to make the mistake that cover "design" can solve the problem. Likewise there is a fundamental misunderstanding that slumpage can be avoided by techniques of placing materials into the trench or by packaging of materials. Slumpage is intrinsic to placing materials that degrade (steel) in a matter of decades into a hole for 150 years.

See page 2,1.

Unless the relationships are clearly seen between gradual deterioration of packaging, slumpage, trench cover collapse and water infiltration, no meaningful design criteria can be established.

SUBPART D - TECHNICAL REQUIREMENTS FOR LAND DISPOSAL FACILITIES

D-50-3

61.50 Includes a number of laudatory goals. We are disturbed however by 61.50 (a)(5) which does not absolutely exclude areas of frequent ponding and flooding, only stating the area should be "generally free" of such characteristics and which states that burial in up to a 100-year floodplain is excluded. Since the design goal is stability for 150 years, obviously

D-50-3 an area of more frequent floods should be excluded. We have major problems with the 150 year design concept (see below) and think burial should be excluded in a 500 year floodplain.

D-50-2 61.50 (a)(7) should specify the depth to the watertable which is acceptable. "Sufficient depth" to the watertable is so imprecise as to be useless. There should be no exceptions to the specified depth regardless of rates of diffusion.

D-55-1 61.55. The concept of segregating different wastes in order to better protect the public health and safety is an excellent one. However, the method of classification proposed will not lead to better protection of the public. The method of classification should not be based simply on number of curies of material per gram. The classification should be based on the half-life of the material. To mix together cesium and strontium contaminated wastes with ½ of 30 years and a necessary period of 300 years isolation from the biosphere, with isotopes such as technicium 99m and Iodine 131 with ½ respectively of 6 hours and 9 days and a sequestering period of perhaps 3 months is totally irrational. But is it possible to separate these wastes?

D-55-2 D-55-14 The easy to implement mechanism would be to separate these wastes at the point of origin. In particular, this is feasible at medical hospitals and research institutions.

If wastes of under ½ of 180 days were segregated, 75% of hospital wastes would fall into this category and could be stored at a warehouse on or near the hospital complex, until safe levels had been reached; then 75% of the volume of medical wastes going to radioactive dump sites could be eliminated and sent to a

D-55-2 D-55-14 Regular municipal landfill if there is certainty that full decay has occured. This would significantly reduce low level dump site volume requirements (currently 25% of total low level waste volume is provided by medical wastes) and involve a more rational segregation.

D-55-8 If anything the proposed system is going to increase volume requirements because the temptation of waste generators will be to package their waste so as to fit into the category of Class A and thereby avoid more stringent (and more expensive) burial site characteristics of Class B waste.

(38)

PROPOSED RULE PR-2 et al (46 FR 38081)

DOCKETED USNRC

'81 OCT 26 P2:54

OFFICE OF SECRETARY DOCKETING & SERVICE BRANCH

Re: F.R./46, # 142/Friday, July 24, 1981/Proposed Rules

Secretary of the Commission
Nuclear Regulatory Commission
Washington, D.C. 20555

October 20, 1981

Dear Sir:

The Ohio Environmental Protection Agency has been designated by Governor Rhodes as lead agency for comment upon Federal actions affecting the environment. We have read the above referenced document, solicited comments from other state agencies and have the following comments to offer.

The Nuclear Regulatory Commission is to be commended for bringing out the proposed rules. We are particularly pleased with the proposed waste classification system since this will allow the states to implement an action plan for low-level waste. We are also supportive of the de minimus standard. (D-55-2)

There are no time limits for the licensing procedure described on page 38067. On page 38100 it says that a completeness review "Generally . . .will be made within thirty (30) days." Beyond that no time limits are given. We believe that the Commission should be held to an expeditious licensing schedule and that it should be set forth in the rules. (B-3)

We are still not satisfied with the 10 nCi/gm. value set for TRU waste. Our principal objection is that it gives rise to a great deal of suspected TRU waste. Recent work with the neutron dieaway method at LASL has shown that over 90% of the waste stored as TRU was not so contaminated at all. Although this is not very important to this rule making, it is still a sore point in the total nuclear waste picture. We also object to the logic employed by the Commission namely that since 10 nCi/gm. is achievable, it should be continued. The consequence, namely that a great deal of suspect waste is stored and even buried, is ignored. (D-55-3)

A regulatory guide is mentioned on page 38068, first column. We urge that this guide be issued as soon as possible. (GEN-2)

In the definitions on page 38090, "engineered barrier" is too rigidly defined. An engineered barrier, in our understanding, can protect waste against migration and leaching as well as against intrusion. Examples might be ultra secure containers, plastic liners or clay linings added to a natural deposit. (D-51-4)

On page 38096 we suggest adding a requirement that the disposal site be accessible to transportation facilities. (D-50-7)

Some of the options considered at one time or another by some of the States are either prohibited or made economically unattractive by the present rules. For example paragraph 61.51(a)(7) states, "The disposal site shall be used exclusively for the disposal of radioactive wastes." Since the requirements for some hazardous (expecially toxic) waste disposal are very similar to those for low-level radwaste, the possibility of a dual purpose site has been considered. This would save time, effort, money, and space. We can see why the Commission would be less than enthusiastic about mixing explosives or corrosives with low-level radwaste, but we suggest amending the rules so that low-level radwaste and certain classes of toxic waste can be buried on the same site. (D-50-4)

Also, the present rules are designed to assure containment of Class C waste. We suggest that the Commission consider a set of far less stringent rules for a facility designed to contain Class A or A and B wastes only. If such sites could be constructed easily and cheaply they could take care of more than half of the low-level waste now being generated. They should not require such stringent engineering or monitoring; indeed they would be little more than leach-proof secure landfills similar to sites presently in use under 10 CFR Part 20. (D-51-3)

We still don't understand some of the numbers in Table 1. For depleted uranium contaminated waste to have the activity in the table, it would have to be about 10% uranium (if it had the density of uranium metal). Depleted uranium should be classed as a heavy metal poison, not a radiation hazard. Similarly Iodine 129, as formed (which means diluted with reactor produced stable Iodine) is of such low specific activity it is less of a radiation hazard than natural potassium or rubidium. We don't see why these materials should be controlled by the NRC at all. (D-55-1)

There is also opportunity for confusion concerning the waste classification system since Table I on page 38097 classifies waste by isotope whereas the classification on page 38085 is by point of origin. We would also question why some of these reactor wastes (trash for example) could not be disposed of directly under the new de minimus standards. (D-55-2, D-55-12)

On page 38082 other methods of disposal are mentioned, and they are certainly to be encouraged. While we appreciate the Commission's reasons for concentrating on land disposal, we would like to see alternative approaches, especially on-site decay addressed. (D-55-14)

One serious lack which we noticed is ruling on the State responsibility after the licensee turns the site over to the state. We are also apprehensive of problems the State may face if a contractor defaults on his responsibilities. (D-59-1, E-1)

We thank you for the opportunity to comment on these new rules. We hope these comments have been helpful.

Sincerely,

Wayne S. Nichols
Director OhioEPA

WSN:mkm

State of Ohio Environmental Protection Agency
Box 1049, 361 E. Broad St., Columbus, Ohio 43216 • (614) 466-8565

James A. Rhodes, Governor
Wayne S. Nichols, Director

UNION CARBIDE CORPORATION
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TELEPHONE: 914-351-2131

October 21, 1981

(39)

DOCKET NUMBER
PROPOSED RULE PR-2 et al
(46 FR 38081)

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

Attn: Docketing & Service Branch

Gentlemen:

The following comments are submitted for your consideration to revise the proposed rulemaking regarding the Licensing Requirements for Land Disposal of Radioactive Waste as published in the Federal Register on July 24, 1981.

B-3 Timing

The Low Level Radioactive Waste Policy Act sets a definite time when regional compacts must be established. This time table in turn places requirements on the individual regional burial sites to make application to the NRC for approval. The Commission should commit to a timing for response to an application in their regulations such that the applicant has some degree of assurance that the statutory deadline can be met.

D-55-2 Deminimus Levels

The treatment of low level radioactive waste problems is incomplete without addressing deminimus levels of waste. Part 61 should address this issue.

GEN-3 Decay In Storage

It is increasingly common for nuclear facilities to package radioactive waste and then store this packaged waste for a considerable period of time prior to shipment to the burial grounds. At our site we are just completing a shielded waste storage area which will allow storage of fully packaged 55 gallon drums of waste for up to one year prior to shipment. In the spirit of the ALARA concept we believe that any new packaging or labeling requirements resulting from this proposed rule exempt materials packaged prior to the effective date of the regulation so they may be disposed of properly.

Summary of Rule

B-5 Para V.G

Any license issued by the commission should be for a period of time essentially equal to the expected life of the burial site. An inference is made in the statement of consideration to a five year license term. This is inconsistent with the nature of the facility and invites public hearings and intervention with each license renewal stage.

Para V.H

D-55-11 The cost impact of the proposed regulation is not addressed quantitatively. Waste disposal is now a significant (greater than 10%) portion of our operating cost. Disposal costs over the past two years have increased at a far greater rate than all other cost elements. We anticipate that the enactment of these regulations will cause a continuation of this trend. This issue is particularly important to waste generators who must compete in world markets with competitors who are not subject to the same criteria. It is an obligation of the Commission to determine the potential cost impact on waste disposal sites and on waste generators.

M-4 Manifest System - 20.311(b) and (c)

The manifest system, when established, should be universal and acceptable to all disposal facilities, generators and regulatory authorities. Documentation of radioactive wastes has become a significant part of the cost of waste disposal.

C-4 Intruder Protection - 61.42

Even after the institutional surveillance period has expired, there should remain in effect reasonable assurance that intruder protection is in place. This protection could be provided by such basic means as posting of property, restrictions recorded on deeds, etc. Because of the residual protection remaining after the institutional surveillance period, it is overly conservative to treat the intruder with the same level of protection as a member of the general public is assured; i.e., no more than 500 mR per year. A more rational basis would be a number at least 10 times greater, that corresponding to the limiting safe occupational exposure of 5,000 mR per year.

ED-1 Site Design - 61.51(a)(7)

The wording seems too specific. We recommend; "THE DISPOSAL SITE SHALL BE USED EXCLUSIVELY FOR THE DISPOSAL OF WASTES CONTAINING RADIOACTIVE MATERIAL".

Site Closure - 61.52(a)(6)

D-52-5 Following our comment on Section 61.42, we recommend the following wording; "WASTE MUST BE PLACED AND COVERED IN A MANNER THAT LIMITS THE GAMMA RADIATION AT THE SURFACE OF THE COVER TO THE LIMITS IN 10 CFR PART 20".

Limit For Transuranics - 61.55 Table 1, Col. 3

D-55-3 This is an appropriate time to address the issue and establish a technically based limit for transuranic wastes. By failing to generate a reasonable technical basis, the regulation makes a de facto endorsement of the existing limit. The justification for not addressing the issue is stated as "the lower value of 10 nCi per gram has been demonstrated as an achievable concentration to control the disposal of transuranic nuclides". This statement is not true because there have been occasions when wastes could not meet this limit and therefore are not acceptable to commerical burial sites. We believe that a more rational limit is in order.

Site Criteria - 61.56(b)1

D-56-11 The performance criteria for compaction is a function of site conditions and trench depth. We propose site specific limits for compressive strength based on local soil conditions.

D-52-1 The proposed regulation would have Class A waste segregated from Class B. It should be recognized that Class A material would form a good shielding buffer from the Class B material which would generally be a more radioactive waste form. By segregating the Class B material, burial trenches may be filled with dirt simply to provide shielding whereas the Class A material could have been used for that shielding and resulted in better land use.

D-56-9 The proposed regulation requires a structural stability of Class B containers to maintain the physical dimension of a waste package within 5%. This should more appropriately be 5% of the volume, since a 5% deflection in the diameter of a drum is inconsequential.

D-56-12 Presently, there are few, if any, waste containers that will qualify as a stable container under the proposed rule. Until such a container has been proven we believe that the regulation should offer the alternative of perpetual care to correct the effects of settling or other manifestations of instability.

D-55-8 In general conclusion we observe that the current trend of radioactive waste disposal is to reduce volume by compacting or condensing to higher concentrations. This trend is occasioned by regulatory quotas and economic necessities. It is apparent that this trend will continue as evidenced by the emergence of incineration of low level combustibles. The development of other technologies may follow. Considering this trend we can forsee the possibility of a large part of all low level waste approaching the Class B & C categories. This becomes even more likely if local authorities decide to scale down the Federal limits. Therefore, any sound basis to relax these criterior should be advanced.

Thank you for your consideration.

Very truly yours,

James J. McGovern
Business Manager
Radiochemicals

JJMcG:js

PATHFINDER

Pathfinder Mines Corporation
550 California Street
San Francisco, California 94104
(415) 981-4150
Telex 34-0422

October 22, 1981

(40)

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

DOCKET NUMBER
PROPOSED RULE PR-2 etc
(46 FR 3808

Attention: Docketing and Service Branch

Dear Sir:

Pathfinder Mines Corporation submits the following comments in response to the "License Requirements for Land Disposal of Radioactive Waste" proposed on July 24, 1981 (46 Fed. Reg. 38081). Pathfinder operates two uranium mills in the Shirley Basin and Gas Hills regions of Wyoming. We appreciate this opportunity to participate in the rulemaking process.

It is our understanding that the proposed regulations, if adopted, would establish licensing procedures, performance objectives and technical criteria for land disposal of low-level radioactive waste. Our comments relate to the potential application of the proposed regulations to uranium milling activities. Clarification is needed regarding the proposed rule's applicability to the disposal of uranium mill tailings or wastes (byproduct material) or contaminated process equipment in another mill operator's tailings disposal facility already licensed under 10 CFR 40. An example of such an activity would be the disposal of wastes or contaminated process equipment from a small mill or an in situ mining facility operating under an NRC source material license. NRC regulations encourage these facilities to dispose of their wastes at existing mill tailings disposal sites (10 CFR 40 - Appendix A, Criterion 2).

A-1

Although the proposed rulemaking is intended to regulate "the disposal for others of radioactive wastes containing byproduct, source and special nuclear material" (Sec. 61.1a), it does "not apply to the disposal of ... byproduct material" (Sec. 61.1b). It is not clear, however, that the disposal "for others" of mill tailings and contaminated process equipment by a licensed source and byproduct material facility is exempt from the rule.

We believe that any final low-level waste disposal regulations should specifically and unequivocally exclude such activities. The wastes or contaminated equipment from uranium recovery facilities operating under separate source material licenses are compatible for combined disposal and will not increase the risk to public health or the environment. Furthermore, we believe that combined disposal of uranium processing waste and equipment is adequately regulated under 10 CFR 40.

A-1

In summary, to avoid misinterpretation and duplication of regulatory effort, the proposed regulations should be revised to more clearly state the exemption of wastes and contaminated equipment from uranium recovery facilities, whether the waste is disposed of at the generating facility or at another facility licensed to dispose of byproduct material.

We will be glad to answer any questions concerning our comments.

Sincerely,

PATHFINDER MINES CORPORATION

Lea W. Sandman

Lea W. Sandman
Senior Environmental Engineer

cc: E. L. Nugent
M. I. Ritchie
J. E. Russell

CHEM–NUCLEAR SYSTEMS INC.
P.O. Box 1866 • Bellevue, Washington 98009 • (206) 527-0711

DOCKETED USNRC

'81 OCT 26 P2:54

OFFICE OF SECRETARY DOCKETING & SERVICE BRANCH

October 19, 1981

(41)

DOCKET NUMBER PROPOSED RULE PR - Amdt al (46 FR 39031)

Mr. R. Dale Smith, Chief
Low-Level Waste Branch
U. S. Nuclear Regulatory Commission
Mailstop 56
Washington, D. C. 20555

Dear Mr. Smith:

We have reviewed the Commission's proposed rule concerning land disposal of radioactive waste. This rule, 10CFR Part 61, was published in the Federal Register on July 24, 1981. The regulation is well written and understandable and we wish to commend the NRC staff for their accommodation of many of our earlier comments. For the most part, we feel, on the basis of our interpretation of Part 61, that the proposed requirements are sound, reasonable and achievable. Early availability of the NRC's Branch Technical Positions and Regulatory Guides is encouraged for the purpose of facilitatin the implementation of the new regulations (e.g., guides on determining waste form performance required in Section 61.56). GEN-2

We do have a few comments which are offered below:

1. The proposed regulation continues to refer to identification of alternative sites. As outlined in a meeting with you in May, we are proposing a four step siting process: (a) identification of a region of interest, (b) elimination of areas with largely unsuitable conditions, (c) identification of possibly suitable areas (vs. specific sites), and (d) selection of a specific site within one of the areas for detailed characterization. At that time, you indicated that such a process would probably meet the requirements of NEPA and certainly appeared compatible with the Commission's proposed amendment to 10CFR Part 51, eliminating the requirements to provide alternative site data in environmental reports. While Section 61.14(b) of the proposed regulation was amended to eliminate the requirement for State certification of ownership of alternative sites, Section 2.101(b) still proposes to notify the chief executives of locations for alternative sites. This implies that the NRC still expects that specific alternative sites will be identified in the application. Part 2-1

2. The summary of the proposed regulation indicates a post-closure observation period of about five (5) years, but implies it could be shorter if the licensee demonstrates that the site has reached a stable condition. However, Section 61.7(c)(3) and 61.29 state that this period must be for a minimum of five (5) years. While we do not dispute the need for, or value of, a post-closure period, a clear position on the time frame is necessary for an operator to set aside funds to cover those activities. B-7

3. Section 61.7(b)(5) offers an engineered barrier alternative to deeper burial for Class C waste. This is a commendable approach that should enable interstate compacts to provide a self-contained low-level waste management system. D-51-4

4. We support the requirement in Section 61.15 that an applicant prove financial qualifications to conduct all licensed activities and assure funding for site closure and post-closure. This should minimize the potential for operator default or abandonment. E-1

5. The summary notes that the Commission is considering seeking authority to require the assumption of financial responsibility for activities occurring after the license has been transferred (last paragraph on page 21 of section F, "Financial Responsibility"). It is not clear whether this paragraph refers to the original licensee or the custodial licensee.

6. Section 61.23(g) requires assurance of institutional care as a condition for license issuance. Does this mean that license applications must be accompanied by a plan from the custodial agency? If so, what amount of detail is required, and how can agency compliance with the plan be guaranteed? Future site development will be severely impacted if each license application must include details such as those mentioned in §661.59 along with assurances for agency compliance. B-8

7. Section 61.30 states that after the post-closure period, the license will be transferred to the government custodial agency when that agency is prepared to assume responsibility. This implies that the agency could delay on its earlier commitments by imposing more stringent requirements than originally agreed to. This could change the ability of the licentee to effect proper closure due to changes beyond the financial requirements initially established.

Mr. R. Dale Smith
October 19, 1981
Page 3

D-51-1

8. Section 61.51(a)(4) requires that trench covers be designed to prevent water infiltration. While it is certainly desirable to minimize water infiltration, it is almost impossible to completely prevent any infiltration. This same comment also applies to 61.51(b)(6), which requires elimination of contact with the waste by water.

F-1

9. Section 61.72. What criteria are to be used to determine whether a State or tribe is potentially affected by a proposed site? It is certainly reasonable to encourage review of a license application by the State or tribe on whose lands a proposed site is located. Extension of review participation beyond this could enable a neighbor or more distant State through which waste will be transported not only to intervene but to review and express approval/disapproval for a site. This could create a tremendous administrative burden and cost increases for both the NRC and the applicant.

Thank you for the opportunity to comment on both draft and final versions of the proposed rule. We are looking forward to the release of the final regulation and will do our utmost to see that it properly implemented.

Sincerely,

CHEM-NUCLEAR SYSTEMS, INC.

Bruce W. Johnson

Bruce W. Johnson
Chairman and President

BWJ:LXP:slj

GEN-9

DOCKETED
USNRC

(42)

'81 OCT 26 P2:54

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

DOCKET NUMBER
PROPOSED RULE PR-2e+(al)
(46 FR 38081)

14 Jacques Loeb Road
Woods Hole, Ma 02543
October 18, 1981

Secretary
Low-Level Waste Licensing Branch
Division of Waste Management
Nuclear Regulatory Commission
Washington DC 20555

Attention: Docketing and Service Branch

Re: 7/24/81 FR Notice Proposed Rules

Dear Sir:

Thank you for sending me a copy, without my having to request it. It arrived while I was preparing to leave Illinois for Woods Hole. I read it carefully nonetheless there. I find my reaction and response can vary according to whether I am here or there. I expected to reply quickly but alas! the heat of the subject in the mainpiece has preoccupied me (eg Faneuil Hall, 9/21/81, Oceanography Sub-committee, Merchant Marine and Fisheries Committee, US House of Representatives).

One-liners satisfy some but irritate others (eg Philip Handler, while President of the National Academy of Sciences, spoke frankly of his detestation (cont'd next page)

-2

of bumper stickers). But alas! sometimes time crunches allow no more. Thus, I remarked to Rep. Norman E D'Amours (NH), who chaired the above-mentioned hearing, that I read the proposed rule-making and that it reads like a Harvard sophomore class exercise. I could as easily have said Dartmouth, or most any other institution that arrogates powers in a manner and to an extent that has created lethal absurdities on a monumental scale.

I underscored large parts of pp 38081-6 on my copy. Since I am leaving here tomorrow to return to Illinois, I am not going to spend time commenting in specific detail. I do not object to an exercise in ideal schemes for use as a way to measure deviation from ideal (of the ideal gas laws. It will have to suffice for me to call your attention to the reverse side of the paper I have (cont'd next page)

-3-

chosen for this communication: A nation that even before its founding developed on commerces and industries destructive to human health and well-being, particularly tobacco (e.g. Jamestown, et seq.), and continues to do so in the name of a spurious and specious vision of "public safety" and "prevention of juvenile delinquency" will self destruct by continuing to build on sleight-of-the-hand-holding-the-pen. (It is no accident that in anticipation of setting down some comments to you I checked out of the Falmouth Public Library then-Prof. now-Sen. Hayakawa's book on semantics Language in Thought and Action.) By grossly, or even anxiously, committing to paper the term "DISPOSAL", or in the case of the Mass. Legislature, "SAFE DISPOSAL", one does not

(Continued next page)

-4-

create the reality nor the possibility. I am not telling you something you don't know. Perhaps you'll reply, "We must start somewhere." The starts were all made long ago, the many caveats unheeded. It is not true that "not enough was known" or "people didn't know". Nobel prizes still aren't given for putting on the brakes. Quite the contrary.

The atrocious marketing of radioactive smoke detectors (note no mention overleaf that they are radioactive) does more than put egg on the NRC's collective face. It puts me in mind of a threat ascribed to the late revolutionary Che Guevara. He supposedly said, circa 1968, "We'll get you in your homes." He needn't have troubled himself. The US Govt which promotes the manifest application of the valid economic principle of enlightened self-interest

(Continued next page)

-5-

is rapidly making it most (and increasingly master) whether we have technologies or don't, whether we are a democracy or aren't, etc. (On the way out we are likely to pass through a stage akin to the anarchy in the Japan colonies described by Michener in his novel Hawaii).

Don't even ask whether it's too late for humans to survive man-made follies. Shut it all down — it will all self-destruct anyway from inherent flaws. Create no more nuclear materials, with all attendant rationalizations, not for pharmaceuticals, not for industrial testing, not for "basic science", not for "law enforcement", certainly not for weaponry. Shelter and food will follow more readily, and human misery will diminish enormously. Humanity is willing to accept loss-taking now. "Hunger-striking" is a way of life, as is the

(Continued next page)

-6-

unabashed embracing of spirituality. Twenty years ago I called the stumbomb the Great Equalizer. Now we've progressed to the Ultimate Pacifier.

This kind of essay may be neither what you want nor expect. Too bad — it's what you get. The style of my limited appearance statements should lead you to expect it. After all, I don't view the world through 3 fingers of Scotch, nor do I stooge for any commercial interests, nor am I on an ego trip that could have me send it to Perspectives in Biology and Medicine.

I wish formally to ask that you place, without further comment from me at this time, into the record in lieu of or as further comment by me the records of the hearing in Boston 9/21/81, referred to above, concerning plant dumping of radwastes in Boston

(Continued next page)

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Energy Division
Safeguards Systems Group Q-4

October 15, 1981
IN REPLY REFER TO: DSE-4/81-584
MAIL STOP 541
TELEPHONE (505) 667-7777
(505) 843-7777

'81 OCT 26 P2:43

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

(43)

DOCKET NUMBER PR-2 et al
PROPOSED RULE (46 FR 38081)

R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Division of Waste Management
Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Smith:

Thank you for arranging to send me a copy of the proposed rule-making on land disposal of low-level radioactive waste (10CFR Part 61) and for the opportunity to provide these comments. The following comments are made with the hope that they will help in further sharpening the scope of your rule-making process.

D-55-5
D-56-15

(1) I have reservations about the open-ended definition of wastes that might be included in land disposal. Under the present definition (see Section IV under Supplementary Information), high-specific activity wastes, such as those produced presently during the cleanup operations at TMI-2, will qualify for land disposal as "Class C Intruder Waste." A better restriction on the kind of wastes that will qualify for land disposal seems appropriate.

(2) The classification of wastes (Part 61.55) as "Class C Intruder Waste" is too vague and it lends itself to convenient interpretations. Some limits could be established in terms of specific activity to restrict the use of this term. The waste form criteria and packaging requirements also must be rigourous to this class of waste compared to classes A and B as defined in your proposal.

D-56-5

(3) Waste characteristics (Part 61.56), I feel, have several inconsistencies. It is the stated objective of the requirements to provide stability for the waste for a period of at least 150 years. Then, under item #7, Subsection (a), you have detailed

-7-

Harbor and beyond, and also the record of the hearing by the Falmouth (Mass) Board of Health last Thursday, October 15th, in the "Civil Defense" Room of Town Hall (02540). The latter hearing was taped. These hearing records will put flesh onto the skeleton that your proposed rules represent. Don't be too startled if the flesh is too gangreous to handle bare-handed.

If first-strike doesn't intervene, I may have some Illinois-oriented comments in a bit.

Semper —
Dennis Klotz

B-249

D-56-5 the requirements for gaseous forms of wastes. These two do not appear consistent to me. Presently, there are technologies available to readily convert radioactive nuclides of halogens, ^{3}H, ^{14}C, etc., into more manageable waste forms. The state-of-the-art in the management of radioactive noble gases dictates dilution and dispension as the safest method. The implied suggestion in this document to contain and bury up to 100 Ci of gaseous form of radioactivity in a container at a land-burial site and expecting stability for at least 150 years is baffling.

D-57-1 (4) Under "labelling" (Part 61.52), it would be desirable to include color coding to identify the three classes of wastes.

M-2 (5) Under Part 20 ("Standards ....."), there is a requirement to conduct quality assurance and compliance verification. To have this system work properly, a variety of procedures have to be established and approved by the licensing authority. I am not sure whether small waste generators such as medical facilities, small industrial operations, etc., can invest resources to comply with this requirement.

C-7 (6) Under Subpart C (61.40 to 61.44), it would be desirable to add a performance objective for the site to minimize intrusion by animals such as rodents, deer, etc., which have the potential for transporting the radionuclides to the food chain. Parenthetically, I must add there are recognized studies done at Los Alamos showing the potential for a simple rodent to create havoc at a low-level waste-disposal site.

C-1 I think your approach to rule-making, stating performance objectives (rather than detailed criteria), is commendable, recognizing the numerous forms of low-level radioactive wastes. This is also the reason why I think the definition of Class C wastes needs to be more restrictive. Please note that while preparing these comments, I did not have the benefit of your rule-making document (NUREG-0782). If I can elaborate on any of these comments, please let me hear from you again.

Sincerely yours,

K. K. S. Pillay

KSP:ke

cy: CRMO, MS 150 (2)
file

Bechtel National, Inc.
Engineers — Constructors
Fifty Beale Street
San Francisco, California
Mail Address: P O Box 3965, San Francisco, CA 94119

October 21, 1981

(44)

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

DOCKET NUMBER PROPOSED RULE PR-2 etal (46 FR 38081)

Attention: Docketing and Service Branch

Subject: Proposed Rule for Licensing Requirements for Land Disposal of Radioactive Waste

Gentlemen:

We appreciate the opportunity to provide comments on the proposed rule for Licensing Requirements for Land Disposal of Radioactive Waste. We feel that the proposed rule is an important step towards satisfying the need for additional low level waste disposal capacity.

In general we concur with the content of the regulations as written. However, there are several areas which we feel should be clarified to avoid potential problems during implementation. Detailed comments from our review of the proposed regulation based on our engineering and construction experience are attached.

If you have any questions please feel free to contact me directly.

Sincerely,

Ashton J. O'Donnell
Vice President

RJT:sms

Attach.

COMMENTS ON 10CFR61
LICENSING REQUIREMENTS FOR LAND DISPOSAL

COMMENTS ON THE SUPPLEMENTARY INFORMATION

The following comments refer to the issues raised in the discussion section which precedes the regulation. The roman numeral and letter following the comment number refer to the section to which the comment applies.

D-55-1 & D-55-13

1) V C A classification system for low level waste is proposed containing four classes. Specific activity limits define each class. While the desire to provide a level of protection commensurate with the activity level is recognized, it is not clear why class A and B wastes need be distinguished. The basis is apparently that "it is obvious that if these (unstable trash-type wastes) were disposed of with higher activity waste, their deterioration could lead to failure of the (burial) system and permit water to penetrate the disposal site and cause problems with higher activity wastes." If this is demonstrably so, would not it be better to define classes A and B solely on the basis of stability rather than on stability and activity concentration? Thus, all waste up to the class B activity limit would be separated by whether it was solidified or unsolidified.

D-55-2

2) V C It is stated that the Commission recognizes the need for a "de minimis" classification of wastes, that this "should be determined on a specific waste basis," and "Part 61 will not establish a generic 'de minimis' category for waste." The "de minimis" levels need to be established as soon as possible to prevent disposal of large volumes of materials which, in hindsight, would have met such criteria and could have been disposed of by other means. This need is especially critical in view of the limited capacity of the existing disposal sites.

D-59-2

3) V E The discussion states that active institutional controls such as periodic surveillance and controlled access cannot be relied on for more than 100 years. The implication is that governmental institutions would be aware of the necessity to maintain the site. However, in the following paragraph, credit is taken for passive controls. It seems that if a government institution is available to maintain land ownership and records, that same institution could maintain a fence. This would reduce the concern about the potential exposure to intruders.

COMMENTS ON THE REGULATION

The following comments address specific concerns raised by the regulation. The number following the comment number refers to the section of the regulation to which the comment is addressed.

A-1

4) 61.1 Purpose and Scope

The purpose and scope states that these regulations establish requirements upon which the commission issues licenses "for the disposal for others of radioactive wastes." While 10CFR Part 20 covers the disposal of waste by an individual licensee, the quantities are limited to very low levels. The purpose and scope should be rephrased to allow an individual licensee to operate a burial site. The words "for others" and the last sentence in 61.1(a) should be deleted.

5) 61.2 Definitions

ED-1

a) A "near-surface disposal facility is defined to be within the upper 15-20 meters of the earth's surface'." Is this definition intended to limit the maximum depth of a trench? If not the definition should be rephrased to clearly indicate that 15-20 meters is an approximate range.

b) The term "stability" should be defined since it is the basis for the seperation of class A and B waste.

GEN-1

c) The use of the word "isolation" in the definition of "disposal" implies a degree of absoluteness generally not attainable and its use in this context implies that the disposal facility is not part of the biosphere. The definition should read "'Disposal' means the placement of radioactive waste in an approved disposal facility."

ED-1

6) 61.7(a)(1) This clearly limits the depth of individual disposal units or trenches to 20 meters. No justification for the limit has been offered by NRC. At some locations it may be appropriate and economical for individual trenches to exceed 20 meters in depth. The statement should be revised accordingly.

GEN-1

7) 61.7(b)(1) The safety objectives should be rephrased to read "minimized the migration by any route including surface, groundwater discharge, erosion or wind erosion, and minimize the exposure to inadvertent intruders."

D-55-10

8) 61.7(b)(2) According to this paragraph a maximum disposal site inventory will be established for certain isotopes based on the characteristics of the disposal site. However, no criteria on which to base maximum site inventories is provided. The criteria for setting maximum inventories should be provided since this will limit the capacity of the site. The criteria should take into account the site conditions and locations. Also the criteria should reflect the fact that if a site is properly selected, a single large site may be more desirable than a series of smaller sites.

ED-1

9) 61.1(c)(3) As indicated in paragraph 61.52(a)(9) closure and stabilization measures must be carried out as each disposal unit is filled. Paragraph 61.7(c)(3) states that the site is in the closure phase when closure and stabilization activities are being carried out. In order to clarify the intent of this paragraph, the work "final" should be inserted between the fifth and sixth words so that it reads, "during the period when the final site...."

D-50-9

10) 61.12(d) Among the specific technical information that must be included in the license application is: "(d) a description of the design basis natural events or phenomena and their relationship to the principal design criteria." These events require further definition. The definition should include not only the types of events but also the time frame over which they must be considered.

B-1

11) 61.24(h) This appears to be inconsistent with 10CFR2.105 which provides the applicant an opportunity to petition for a hearing on any additional requirements or conditions. The "...or thereafter..." is particularly onerous in that it permits the staff to bypass the rules of procedures as described in Part 2 of the chapter. The Commission already has methods to require immediate action by a licensee through either an Emergency Order or a Compliance Order. This requirement should be deleted.

B-4 12) 61.25(a) This paragraph, which appears to be directed toward safety-related features at the facility, in reality prohibits any facility change without undergoing a notification and approval procedure. The first sentence should be modified to permit the normal flexibility to modify office buildings, maintenance structures, parking lots, etc. that all nuclear licensee's enjoy while holding licenses issued pursuant to this chapter.

B-7 13) 61.29 The requirement that the licensee maintain responsibility for the disposal site for a minimum of five years is an open ended requirement. A specific time period should be set. As currently stated the criteria does not provide sufficient guidance to establish adequate funding. Since wastes will not be received during this period all funding must be derived from fees charged during operation. It is necessary for planning purposes to know the time period over which the licensee will be responsible.

C-4 14) 61.42 As currently written, this requirement is too absolute. The sentence should be rephrased to read "Design, operation and closure of the land disposal facility should not result in conditions...".

D-51-1 15) 61.51(a)(3) The words "and improve" should be deleted. The siting criteria will ensure that only acceptable sites are selected. Hence, the site will meet the criteria without improvement.

GEN-1 16) 61.51(a)(4) The word "prevent" should be changed to "minimize".

17) 61.51(a)(6) There is no way to completely "eliminate contact of water with waste." However, it is possible to minimize the likelihood of water contact and provide a water collection and treatment system which can be used as water intrusion monitoring shows that it is necessary.

D-50-40 18) 61.51(7) This paragraph states that the disposal site shall be used exclusively for the disposal of radioactive waste. This seems to be unnecessarily restrictive. It should be acceptable to allow disposal of other waste types as long as there is no commingling of the waste types within a disposal facility. Once an acceptable disposal site has been found, maximum use of the site for the isolation/disposal of any environmentally dangerous materials whether they are radioactive or not should be provided.

ED-1 19) 61.52(a)(9) The requirement for "adequate" closure and stabilization measures should be defined.

D-52-1 20) 61.53(c) The last sentence should be rephrased to read "The monitoring system must be capable of providing early warning of migration of radionuclides from the disposal units before they egress the site boundary."

D-55-6 21) 61.55 An alternate method of determining the waste classification should be provided. Provisions for classification by external dose determination should be made. For cases where the types of isotopes of concern are known, this method would allow adequate classification. This alternate method would be particularly helpful for nuclear power plant trash. Generally, trash has a very low specific activity compared to the class A limits. A determination of the radionuclide identity and concentration, as required by Part 20.311, would require the purchase and use of a portable spectrum analyzer. Instead, a contact dose rate measurement of the containerized trash could be made to show that the activities were below the class A limits. Also, since a radwaste classification system is already established in 10CFR71, is it possible to tie the two systems together?

22) 61.55 Table 1

D-55-1 The logic behind the numbers selected for this table is not apparent. It would appear, for example, that carbon 14 which contains less than 0.8 microcuries per cc may be disposed of as segregated waste but that any concentration greater than 0.8, even if it is only a tiny increase, immediately requires that the disposer seek special permission from the government for disposal. The abrupt demarcation needs explaining so that the logic of it can be understood.

23) 61.55 Table 1, Footnotes

D-55-12 a) The term "significant gamma radiation" should be defined.

D-55-4 b) How is radium treated? A value should be established.

D-56-2 c) The footnotes place a restriction on wastes containing chelating agents in concentrations greater than 0.1%. Is this limit intended to be 0.1% by weight or volume?

D-56-5 24) 61.56(a)(5) The inconsistency between paragraph 61.56(a)(5) and (7) should be clarified. Wastes in gaseous form, allowed by paragraph 61.56(a)(7), could be considered the very waste disallowed by paragraph 61.56(a)(5).

D-56-9 D-56-10 25) 61.56(b)(3) This paragraph requires that "Void spaces within the waste and between the waste and its package must be reduced to the extent practicable." This requirement should be deleted as being too vague unless specific acceptance criteria can be established. For solidified liquid or slurry wastes, 10-15% freeboard in a 55 gallon drum is appropriate, but a container of dewatered resins may well contain 50% voids. If the 5% dimensional requirement is applied to the steel container instead of the solidified monolith, most packages would not meet the criteria since the packages are typically only 90% filled to minimize the potential for spills. This requirement should be modified to be consistent with standard practice.

STATE OF NEW MEXICO
GOVERNOR'S CABINET
SANTA FE
87503

BRUCE KING
GOVERNOR

GEORGE S. GOLDSTEIN, PH.D.
SECRETARY FOR HEALTH & ENVIRONMENT

DOCKETED
USNRC

'81 OCT 27 P3:03

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

October 16, 1981

(45)

DOCKET NUMBER PR-2 et al
PROPOSED RULE (46 FR 38081)

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

Attention: Docketing and Service Branch

Gentlemen:

We have reviewed the "Licensing Requirements for Land Disposal of Radioactive Waste" (10CFR 61) and offer the following comments for your consideration.

D-51-2 Page 38085, Col. 3 (Institutional Control)

Some provision should be made to require more obvious passive controls other than public records. A "permanent" type of identification monument should be constructed describing the facility and its boundaries. Unlike individual trench markers this should be of sufficient height above the ground surface that it will remain visible for many hundreds of years.

D-50-3 Page 38096, 61.50 (a)(5)

Lower flood plain frequencies of 250 to 500 years should be considered since this is the time frame required for radioactive decay to innocuous levels.

D-52-5 Page 38096, 61.52 (a)(6)

Exposure rates for gamma levels at the trench cap surfaces should be some specific value above background so that compliance may be readily determined.

D-55-12 Page 38097, Table 1, footnote 3

This footnote does not refer to any waste class but only to Class C intruder wastes. For clarity it should read: "Maximum concentration for near surface disposal."

Page 38097, Col. 3, Line 6

D-55-12 It would be more technically correct to have this sentence read: "Waste that has a radioisotope concentration that exceeds the numerical values shown in Column 3, Table 1 ...." It is implicit, by definition, that the concentration of H-3, C-14 and Co-60 cannot be in excess of their respective theoretical specific activities.

D-55-1 Page 38097, 61.55 (Waste Classification)

It is not clear from the draft whether Ra-226 will be permitted and in what concentrations.

F-1 Page 38099, 61.70 (Scope)

It is unclear what the role of an Agreement State would be in the licensing and regulation of land burial of radioactive wastes as opposed to a non-agreement State.

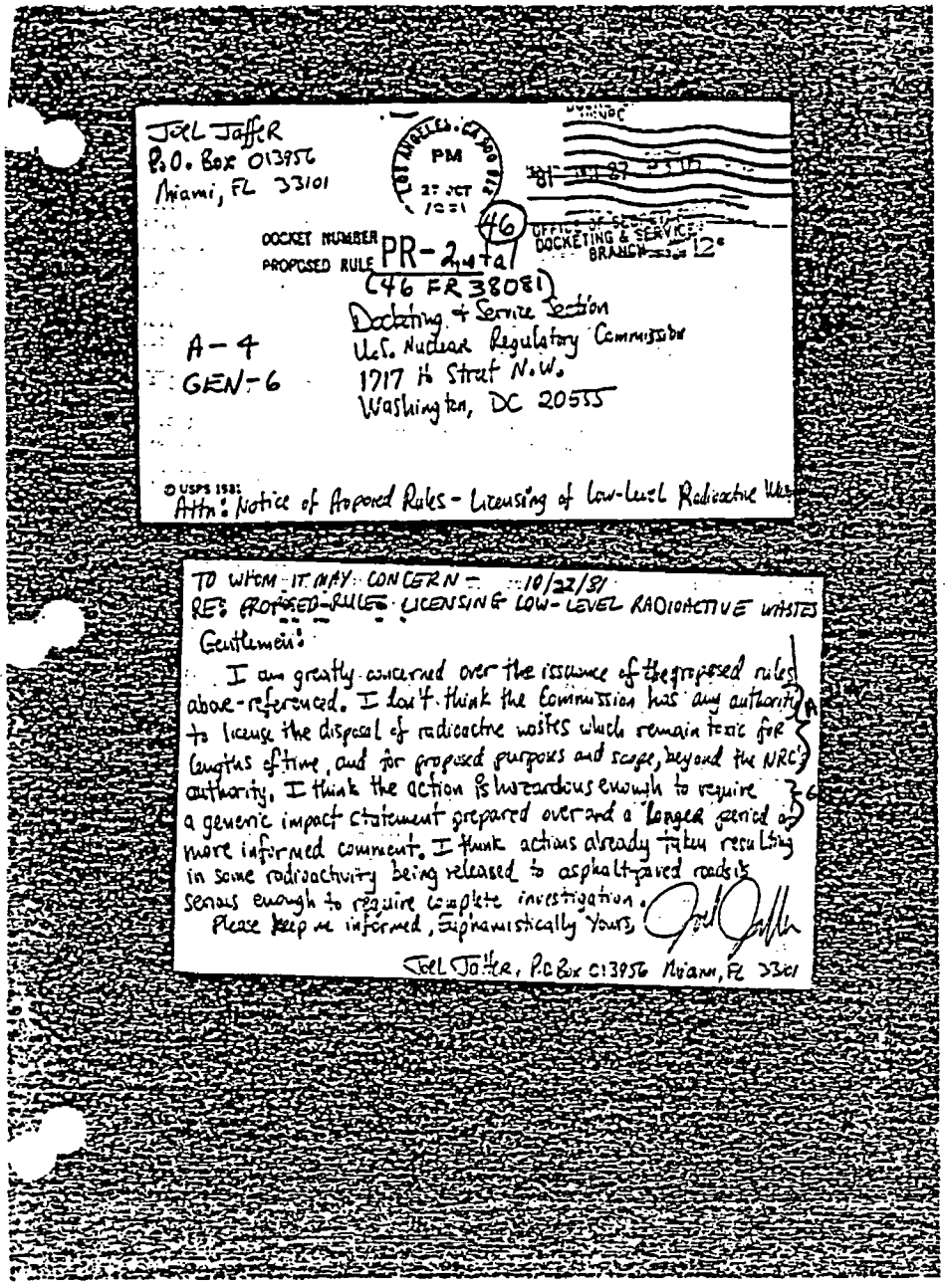
Page 38099, 61.72 (a)

Rather than relying on notification in the Federal Register, it would be more beneficial to State and tribal governments if the Director specifically inform the appropriate State and/or tribal official if a near-surface radioactive disposal facility is being proposed on lands under their jurisdiction.

Sincerely,

George S. Goldstein, Ph.D.
Secretary

GSG:teb



Joel Jaffer
P.O. Box 013956
Miami, FL 33101

OCT 21 PM 1981

DOCKET NUMBER PROPOSED RULE PR-2 et al (46 FR 38081)
(46)

OFFICE OF SECRETARY DOCKETING & SERVICE BRANCH

Docketing & Service Section
U.S. Nuclear Regulatory Commission
1717 H Street N.W.
Washington, DC 20555

A-4
GEN-6

© USPS 1981
Attn: Notice of Proposed Rules - Licensing of Low-Level Radioactive Wa

TO WHOM IT MAY CONCERN - 10/22/81
RE: PROPOSED RULES - LICENSING LOW-LEVEL RADIOACTIVE WASTES
Gentlemen:

I am greatly concerned over the issuance of the proposed rules above-referenced. I don't think the Commission has any authority to license the disposal of radioactive wastes which remain toxic for lengths of time, and for proposed purposes and scope, beyond the NRC's authority. I think the action is hazardous enough to require a generic impact statement prepared over and a longer period of more informed comment. I think actions already taken resulting in some radioactivity being released to asphalt-paved roads is serious enough to require complete investigation.

Please keep me informed, Epinamistically Yours,

Joel Jaffer

Joel Jaffer, P.O. Box 013956 Miami, FL 33101

DOCKET NUMBER PROPOSED RULE PR-2 et al (46 FR 39081) (47)
SIGNOFF

OMB Approval No. 29-R0218

FEDERAL ASSISTANCE

1. Type Of Action (Mark appropriate box)	☐ Preapplication ☐ Application ☐ Notification Of Intent (Opt.) ☐ Report Of Federal Action
2. Applicant's application	a. Number: b. Date 19 Year Month Day
3. State application identifier	a. Number: AZ: 81-60-0038 b. Date assigned 19 SEP 09 1981
Leave Blank	OCT 19 1981

4. Legal Applicant/Recipient
a. Applicant Name: U.S. Nuclear Regulatory Comm.
b. Organization Unit: Low-Level Waste Licensing Branch
c. Street/P.O. Box:
d. City: Washington
e. County:
f. State: D.C.
g. Zip Code: 20555
h. Contact Person (Name & telephone no.): R. Dale Smith, Chief

5. Federal Employer Identification No.: 0

6. Program (From Federal Catalog)
a. Number: 77.909
b. Title: Unknown U.S. Nuclear Regulatory Comm.

7. Title and description of applicant's project: Proposed Rulemaking on Land Disposal of Low-Level Radioactive Waste
This notice invites public comment on proposed amendments to the Commission's rules to provide specific requirements for licensing the land disposal of radioactive wastes.

8. Type of applicant/recipient (Specify): Federal Agency — Enter appropriate letter: K

9. Type of assistance — Enter appropriate letter(s): C

10. Area of project impact (Names of cities, counties, states, etc.): Statewide, Arizona

11. Estimated number of persons benefiting:

12. Type of application — Enter appropriate letter: A

13. Proposed Funding / 14. Congressional Districts Of:

a. Federal	$ .00	a. Applicant
b. Applicant	.00	b. Project 01, 02, 03, 04
c. State	.00	16. Project Start Date Year month day
d. Local	.00	17. Project Duration Months
e. Other	.00	18. Estimated date to be submitted to federal agency Year month date
f. Total	$ .00	

15. Type of change (For 12c or 12e) — Enter appropriate letter(s):

19. Existing federal identification number:

20. Federal agency to receive request (Name, city, state, zip code):

21. Remarks added ☐ Yes ☐ No

Section II - Certifications

22. The Applicant Certifies That
a. To the best of my knowledge and belief, data in this preapplication/application are true and correct, the document has been duly authorized by the governing body of the applicant and the applicant will comply with the attached assurances if the assistance is approved.
b. If required by OMB Circular A-95 this application was submitted, pursuant to instructions therein, to appropriate clearinghouses and the responses are attached:

	No response	Response attached
(1) Arizona State Clearinghouse	☐	☒
(2)	☐	☐
(3)	☐	☐

23. Certifying representative
a. Typed name and title:
b. Signature:
c. Date signed Year month day 19

Section III - Federal Agency Actions

24. Agency name:
25. Application received Year month day 19
26. Organizational Unit:
27. Administrative office:
28. Federal assistance identification:
29. Address:
30. Federal grant identification:

31. Action taken
☐ a. Awarded
☐ b. Rejected
☐ c. Returned for amendment
☐ d. Deferred
☐ e. Withdrawn

32. Funding
a. Federal $ .00
b. Applicant .00
c. State .00
d. Local .00
e. Other .00
f. Total $ .00

33. Action date 19
34. Starting date Year month day 19
35. Contact for additional information (Name and telephone number):
36. Ending date Year month day 19
37. Remarks added ☐ Yes ☐ No

38. Federal agency A-95 action
a. In taking above action, any comments received from clearinghouses were considered. If agency response is due under provisions of Part I, OMB Circular A-95, it has been or is being made.
b. Federal Agency A-95 Official (Name and telephone number):

424-101

Standard Form 424 Page 1 (10-75)
Prescribed by GSA, Federal Management Circular 74-7

(47)

DOCKET NUMBER
PROPOSED RULE PR 2 et al (46 FR 38081)

SEP 16 1981

DOCKETED USNRC
81 OCT 27 P3:04
OFFICE OF SECRETARY DOCKETING & SERVICE BRANCH

Charles F. Tedford, Director
AZ Radiation Regulatory Agency
325 South 52nd St., Suite 2
Tempe, Arizona 85281

Indian Affairs
Radiation Reg. Agency
Health
Land

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

SEP 1 0 1981

This project is referred to you for review and comment. Please evaluate as to the following questions. After completion, return THIS FORM AND ONE XEROX COPY to the Clearinghouse no later than 17 WORKING DAYS from the date noted above. Please contact the Clearinghouse at 255-5004 if you need further information or additional time for review.

☐ No comment on this project ☒ Proposal is supported as written ☐ Comments as indicated below

1. Is project consistent with your agency goals and objectives? ☒ Yes ☐ No ☐ Not Relative to this agency
2. Does project contribute to statewide and/or areawide goals and objectives of which you are familiar? ☒ Yes ☐ No
3. Is there overlap or duplication with other state agency or local responsibilities and/or goals and objectives? ☐ Yes ☒ No
4. Will project have an adverse effect on existing programs with your agency or within project impact area? ☒ Yes ☐ No
5. Does project violate any rules or regulations of your agency? ☐ Yes ☒ No
6. Does project adequately address the intended effects on target population? ☒ Yes ☐ No
7. Is project in accord with existing applicable laws, rules or regulations with which you are familiar? ☐ Yes ☒ No *Not completely.*

Additional Comments (Use back of sheet, if necessary):

See attached comments

Reviewer's Signature *Charles F. Tedford* Date *9/15/81*

Director - Radiation Regulatory Agency Telephone *255-4845*

MEMORANDUM

DOCKETED USNRC
81 OCT 27 P3:04
OFFICE OF SECRETARY DOCKETING & SERVICE BRANCH

TO: Charles F. Tedford

FROM: Dick Blanton RZB

DATE: September 14, 1981

SUBJECT: Proposed NRC Part 61, Rules for Land Disposal of Radioactive Wastes

I have reviewed the NRC proposed Part 61 Rules and Regulations and would like to suggest several comments for your consideration.

ED-1 1) Paragraph 61.7, "Concepts", subparagraph A, essentially defines the term "near surface disposal" of radioactive waste to be disposable in the uppermost 15-20 meters below the earth's surface. This is consistent with conditions found in many states, wherein the water table may lie at 50 meters below surface or even higher. In Arizona and other arid states, this is not necessarily true. Data collected for the hazardous waste site study in Arizona demonstrated the potential sites to have water tables at depths of 350 to 700 feet below surface level. This is not unusual. The nearest water at the Beatty, Nevada, site is in excess of 300 feet below surface. In view of this, Arizona regulations should retain flexibility to permit deeper burial, if economically advantageous. For this reason, I would like to suggest that the definition of "near surface" be extended to 50 meters beneath earth surface.

D-55-13 2) The proposed Part 61 regulations categorize radioactive wastes into three classes; A, B and C. Several of the regulations require that each class of waste be buried separately. I find two problems with this approach. First, if the NRC believes that specific characteristics of each waste necessitates separate burial, this has not been adequately demonstrated, either by their own evidence or by history. Further, there is a substantial tradition of allowing a lower level category to be upgraded into, and mixed with, a higher level category. Applied in this situation, it would seem that more evidence is necessary to demonstrate that the mixing of Class A and Class B wastes, and burying the resultant mixture as Class B wastes, is ill advised. The second point to be considered is, that although the Part 61 regulations require a physical separation of the separate classes of wastes, it is implied, but not clearly stated, that such separation must be horizontal in nature. The question thus arises, Can the burial units be stacked? That is, can one put a Class A or B waste layer at a depth of between 5 and 15 meters beneath the surface level over a previously buried Class C waste disposal layer at a greater depth? It is to be suggested that allowing such a strategy, particularly in combination with the deeper permissible burial levels as suggested above, may provide two

D-55-13

advantages. First, a more effective use of land surface area may be achieved and, secondly, by placing the Class C waste at a depth of 35-50 meters below ground surface level, covered by a 5 meter overburden layer, on top of which a layer of Class A or Class B waste is buried, will provide additional intruder protection to the Class C wastes.

B-8

3) The Part 61 regulations place obligations upon the license holder for certain activities to be conducted after the operational period, specifically, activities related to closure and post-closure monitoring activities. The NRC proposes certain regulatory efforts with respect to the financial affairs of the licensee to ensure that the obligations of closure and post-closure activities will be met. Authority to investigate and regulate the financial activities of licensees does not, in general, exist in State radiation control programs. Some undesirable experiences have resulted from this since, if a licensee fails to meet its obligations, the expenditure of public funds is necessitated to correct any and all deficiencies. Court action is the only possible method of recovering these expenses.

Since there is no profit to be gained as a result of closure and post-closure activities, it may be economically advantageous for the licensee to seek legal maneuvers, whereby its obligations may be avoided. In view of this, I recommend as an alternative that a long-term care fund be established at the time the license is issued. Monies would be paid into this fund during the operational period of the license, either from a tax or a fee structure imposed on the licensee. Obligations of the licensee would terminate with the operational license. At that time, the state, using monies contained in the long-term care fund, would take all title and responsibility to the site and ensure proper closure and post-closure activities by means of open bid contract. The former licensee would be entitled to bid on this contract, provided his performance during the operational period was acceptable. In any case, the cost of closure and post-closure monitoring activities would be paid for by the time the site had been filled.

B-11

4) In order to further ensure adequate performance of the licensee during the operational period, I would suggest a change in the orientation of the licensing; from a single license that is generally oriented towards the operation of the site, to a license which is more specifically oriented to the burial units. Under this licensing scheme, only a limited number of burial units should be permitted to be open at any given time. The licensee would not be permitted to open new units for use unless, and until, filled burial units were adequately closed and stabilized. The majority of the work of closure and stabilization should, therefore, be accomplished as an ongoing measure during the lifetime of the site.

D-57-1

5) Paragraph 61.57, "Labeling", requires that each package of waste be labeled with the words "Class A, Segregated", "Class B, Stable", or "Class C, Intruder" to identify its contents. In view of the result which labeling is intended to produce, I question whether the use of the terms "Segregated", "Stable" or "Intruder" will provide any advantage. My previous experience suggests that the use of labels specifying "Class A waste", "Class B waste", or "Class C waste" would be less confusing and more meaningful to the individuals likely to handle the packages.

CB:jr

DUKE POWER COMPANY
POWER BUILDING
422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

DOCKETED
USNRC

'81 OCT 28 P12:03

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

October 23, 1981

(48)

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

PROPOSED RULE PR-2 et al (46 FR 38081)

Subject: Licensing Requirements for
Land Disposal of Radioactive Wastes;
Duke Power Company Comments on Proposed Rule

Dear Mr. Secretary:

Duke Power Company is pleased to take this opportunity to comment on the proposed 10CFR Part 61. Further comments will be prepared when the associated Environmental Impact Statement (NUREG-0782) has been received and revieved.

The proposed rule seems to reflect Commission attention to previous comments, since this draft is much improved. However, certain parts still need clarification or revision in order to make this rule workable. Some general comments are discussed below, followed by some specific clarifications and suggested revisions.

General Comments

D-55-6 1. Classification of Wastes

Unless interpreted in more detail in the regulations, Table 1 could present severe sampling problems to the licensee, if the licensee had to demonstrate by analysis that each container of waste met the requirements of the Table. It would appear that various general types of waste could be stated in the regulation to fall within one of the three classes under normal conditions; and then only under unusual or abnormal conditions would the licensee have to analyze the waste or the precursors of the waste, or perhaps calculate by inference to determine into which higher class the waste would fall. For example, PWR ion exchange resins might be said to be Class B-Stable Waste under normal conditions of reactor operation where there is less than X% failed fuel in the reactor and where the total activity in the waste container is less than Y curies.

Acknowledged by card. 11/4/81 ecp

D-55-3 Further, in regard to the Table, we believe that the 10 nCi/g figure for the transuranic radionuclides is excessively conservative. It could easily be raised to 100 nCi/g and still be technically defensible as far as the protection of the health and safety of the public is concerned.

D-59-2 2. Institutional Control

All requirements in this proposed rule seem to imply that the disposal site following closure is to be maintained within a fenced area with extremely limited access. However, the purpose of the period of institutional control is to prevent among other things an intruder from excavating, drilling wells or performing other activities that would expose him or lead to possible increased migration of radionuclides offsite. Since the radiation levels at the surface upon closure would certainly be less than 500 mrem per year or even 25 mrem per year under certain conditions, the NRC should not preclude the site from being made into a recreational facility, for example, during this institutional control period; providing that all of the aspects of concern to prevent exposure, erosion, migration and the like are appropriately handled during this period.

D-55-2 3. De minimus

The NRC is encouraged to develop in these regulations, listings of radionuclides in concentrations and amounts that are below that of regulatory concern. Instead of handling this on an individual basis, the regulations should clearly permit, for example, 55-gallon steel drums of de minimus level radioactively contaminated compactable trash to be disposed of at a sanitary landfill, for example.

B-5 4. Requirements for a Hearing

In the supplementary information section, page 38087 of the Federal Register Notice, the NRC has listed a requirement for a public hearing and a license renewal application every five years. This requirement should be deleted since the regulatory review is continuous and the licensee is subject to regulatory control at all times. There should be no necessity to renew licenses every five years and to have a public hearing at these times. A full-term license should be issued instead. The full-term should be either the time to fill the burial facility as described in the original application or 40 years whichever is less.

Specific Comments

1. Stability (Section 61.7 and Section 61.44)

C-6 Stability as defined is applied to the waste and the disposal site. This item needs clarification to show that the more important aspect here is really the stability of the trench, not the waste.

D-55-10

2. Site Inventory Limits (Section 61.7b (465) and Section 61.55)

It is more appropriate to limit concentrations rather than quantities. The 500-year period assumed as the effective life of the intruder barriers implies protection against deliberate intrusion after that time period. Limiting concentrations initially buried should provide the protection required.

B-4

3. Changes (Section 61.25)

This section should be modified to allow the operator to make changes under certain conditions in a similar manner to that permitted by 10CFR 50.59 during the operational period of the burial facility. The requirements as listed in this section are awkward and would prevent necessary changes from being made quickly to handle a given situation. Or, as stated in Part (A) of this section, the exception categories for this specific license condition should be stated.

C-6

4. Stability of a Disposal Site (Section 61.44)

The NRC should make clear that this section applies to the period of institutional control.

D-50-3

5. Disposal Sites Suitability Requirements (Section 61.50 (6))

The meaning of the word "upstream" is not clear. It is assumed that the NRC means onsite.

D-51-1

6. Disposal Site Design (Section 61.51 (3))

The meaning of "must be designed" should be clarified. It would appear that additional requirements would be necessary only if the site was marginal.

GEN-1

(6) It would be almost impossible to design it to eliminate contact with water. The statement should read "designed to minimize" instead.

D-52-4

(7) The meaning of this item is not clear. The NRC should clarify. It is assumed that it means the site shall not be used for chemical waste disposal along with the radioactive waste, but even that needs an explanation as to limitations if for example the "chemical" waste is radioactive.

D-52-2

7. Disposal Facility Operation (Section 61.52 (4))

Strike the word "orderly" from the sentance. As it may not be cost beneficial to stack certain types of waste and yet they certainly can otherwise be loaded into the trench in a manner that maintains the package integrity.

D-52-2

(5) Change sentence to read "void spaces between waste packages must be filled with earth or other material so as to reduce future subsidence within the fill.

D-56-2

8. Waste Classification (Section 61.55) Table 1 Note 4

What is the basis for the quantity limits that enables one to make the case-by-case determination? As stated previously (item 2), it would appear that concentration limits rather than quantity limits would be appropriate to control all hazard aspects. What is the basis for the 0.1% chelating agent concentrations?

D-55-1

As stated in the general comments, our concern is with the values listed in this Table. The basis for these values should be stated.

D-56-8

Section 61.56 (b) (1) This section appears to imply that drums of compacted trash must be structurally stable for at least 150 years. This would probably require that such waste be solidified. The NRC should clarify the intent of this section.

B-10

9. Institutional Requirements (Section 61.59 (b))

This item requires an environmental monitoring program for 100 years which seems to be excessive by about 95 years. The environmental monitoring program should only continue during the five-year post closure period if environmental monitoring is intended to be a period of sampling of wells and other environmental samples for radioactivity. If environmental monitoring is deemed to be required for the period of 100 years, it should be severely limited to occasional samples of the ground water pathway.

Very truly yours,

William O. Parker, Jr.

William O. Parker, Jr.

SAG:scs

HOWARD UNIVERSITY
WASHINGTON, D.C. 20059

OFFICE OF SECURITY AND SAFETY SERVICES

21 October 1981

DOCKETED USNRC
'81 OCT 29 P4:33
OFFICE OF SECRETARY DOCKETING & SERVICE BRANCH

(49)

DOCKET NUMBER PR-2 et al
PROPOSED RULE (46 FR 38081)

Mr. R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Division of Waste Management
U.S. Nuclear Regulatory Commission
Washington, DC. 20555

Dear Mr. Smith:

This comes in response to your letter dated August 7, 1981 concerning the Proposed Rulemaking on Land Disposal of Low-Level Radioactive Waste.

M-1

Listed below are some comments that I would like for you to consider in regard to "Transfer for Disposal and Manifests":

20.311 Transfer for Disposal and Manifests

(b). Approximate date(s) of the waste generation and the length of the period of storage before pick-up should, also, be shown on the manifest. This information will give some idea of the radioactive decay which might have already taken place, and the real activity at the time of disposal. This is considered important information.

(c) (5) Sixty (60) days is considered to be too long a period for the missing radioactive material to generate concern before being considered missing. It should be reduced to thirty (30) days.

Your cooperation in this regard will be appreciated.

Sincerely yours,

Billy T. Norwood
Director

Acknowledged by card. 11/4/81 emp

Dale Smith
Chief low level Waste
Licensing Branch. My Comment

DOCKET NUMBER PR-2 et al (50)
PROPOSED RULE (46 FR 38081)

OCT 29 1981 10/20 cmt

Dear Dale Smith

An article in The Waste Paper [illegible] Vol 3 number 4 Fall 1981 - By Sierra Club chapter Radioactive Waste campaign

There's no safe place for disposal of radioactive wastes, "Local high level".

What happens when you transfer radioactive waste from a site to another you have two radioactive sites.

Once radioactive waste is stored in the earth or a building at a site. It becomes so irradiated and contaminated that there no way of cleaning it up entirely. Especially a building

GEN-5

The building becomes so contaminated that it is impossible to work in it. So it is closed down. So the property around it must also be off limits, because there radioactive waste buried there.

Best Example - West Valley N.Y.

The building became so contaminated that it was impossible to process anymore so it had to be closed down, with a burial site close by.

A-F

From what I have read and heard the radioactive material has reached the drinking water near by.

Another Example

GEN-5

When a Nuclear plant is shut down after it becomes so contaminated. What to do. Well there's talk of dismantling then bury it. Until now there's no technology how to do this. Again West Valley N.Y. Very good example.

Sincerely
Al Scoma
Ret: Pow. Plant Engineer

Alfonso Scoma
R. D. 1, Box 193-A
Preston Hollow, NY 12469

11/4/81 emp

ontario hydro

700 University Avenue, Toronto, Ontario M5G 1X6

emp

October 15, 1981

(51)

DOCKET NUMBER
PROPOSED RULE PR-2 etal.
(46 FR 38081)

Mr. R. Dale Smith, Chief
Low-level Waste Licensing Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards
US Nuclear Regulatory Commission
Washington DC 20555
United States

Dear Mr. Smith:

The following are Ontario Hydro's comments on the proposed rulemaking for 10 CFR Part 61 for "Land Disposal of Radioactive Wastes."

General Comments

C-1 1. The general philosophy of Part 61 is that "overall performance objectives are stated and the applicant has flexibility in choosing design features and operating practices to achieve these objectives...prescriptive requirements are stated as minimum criteria to afford some flexibility in meeting them." This approach is supported by Ontario Hydro rather than having specific detailed criteria and standards.

D-50-2 2. The geotechnical siting requirements are sufficiently general for inclusion into the Federal Register as rules. They reflect the US preference to found disposal facilities above the groundwater table. While this is feasible in many parts of the US, it is simply impractical in Ontario, where the groundwater table is often close to the surface. In the latter case, the NRC requires that diffusion be "conclusively shown" to be the predominant means of radionuclide movement in groundwater. (Page 38096). This means that the disposal sites will be limited to those with subsurface permeabilities of less than 10^{-6} cm/sec (i.e., till, clay shale, etc). Such geologic materials are, indeed, included in our investigation plans.

Acknowledged by card. 11/4/81 ...emp

Specific Points

C-4 1. p 38083 The proposals call for a 500 mrem/a maximum individual exposure limit for intrusion. Ontario Hydro supports this limit as only a few people could conceivably receive this dose.

D-50-1 2. p 38084 Under "complexity," the disposal site "must be capable of being investigated and analyzed." This seems vague. Will there be specific definitions derived for "complexity" or will decisions on complexity be purely subjective (i.e., will a site be ruled out simply because it is harder to analyze than other sites)?

D-55-2 3. p 38085 The rules do not attempt to establish a generic deminimus category for waste. This is unfortunate as it would undoubtedly be a greater economic advantage than case by case decisions. However, as there is not as yet a concensus on a generic deminimus level, any level chosen would be premature.

D-59-3 4. p 38085 Federal or State government ownership of land used for disposal of radioactive waste is certainly an easy way of guaranteeing proper safe use of the land. However, I am uncertain of some of the implications. At what point would the government take over control of the land? Would the government be legally responsible for maintaining active control if the licensee failed? Would the government be legally responsible for any health problems arising from the site after active controls have been removed?

D-59-1

D-59-3 In the case of federal ownership, would this not stop the Nuclear Regulatory Commission from regulating the site? I understood that one department of the federal government could not regulate another.

E-1 5. p 38087 Under disposal site closure phase, I do not understand why public hearings are held on the closure of a site after all the waste has been emplaced. The public hearings should all be done before the original license is granted. What happens to the waste if, after the site is full and ready for closure, the public reacts negatively to closing plans? This would place an unfair financial burden on the licensee.

B-12 6. p 38093 Why must the licensee sign the license under oath? I am not familiar with US legal practice.

D-56-4 { 7. p 38097 Under waste characteristics, why must wastes not be packaged in cardboard or fibreboard boxes? If the waste can be segregated then these types of packaging should be acceptable.

Yours truly,

R. G. Tulk

R.G. Tulk
Nuclear Materials Management
Department

P. J. Armstrong

P.J. Armstrong
Supervising Design Engineer
Nuclear Materials Management
Department

ARKANSAS POWER & LIGHT COMPANY
POST OFFICE BOX 551 LITTLE ROCK, ARKANSAS 72203 (501) 371-4000

October 21, 1981

2CAN108107

DOCKET NUMBER
PROPOSED RULE PR-2 et al (46 FR 38081)

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

ATTN: Docketing and Service Branch

Subject: Arkansas Nuclear One - Units 1 & 2
Docket Nos. 50-313 and 50-368
License Nos. DPR-51 and NPF-6
Comments on Proposed Rules on Licensing Requirements for Land Disposal of Radioactive Waste
(File: 3905, 2-3905)

Gentlemen:

The purpose of this letter is to submit Arkansas Power & Light Company's comments on the proposed rulemaking on land disposal of low-level radioactive waste which was published in the Federal Register on July 24, 1981.

Comment No. 1

As Mr. R. Dale Smith indicated in his August 7, 1981 transmittal letter, waste categories based on radioisotope concentration and waste characteristics are proposed, and it would be the shipper's responsibility to determine the proper category and comply with the minimum requirements of the category (Sections 61.55 and 61.56 of Part 61).

D-55-6 { Due to the heterogeneity of the isotopes present in the waste, we feel it would be highly impracticable to positively determine a given activity level as being characteristic of the presence of a respective isotope. Consequently, it would be most difficult to use Table 1 to assign a waste classification category to the waste with an acceptable degree of certainty and thus makes impracticable the proposed waste classification methodology as being a definitive approach.

Acknowledged by card 11/4/81

MEMBER MIDDLE SOUTH UTILITIES SYSTEM

Comment No. 2

D-56-12 In Section 61.56(b)(1), it states that "Structural stability can be provided by . . . placing the waste in a disposal container or structure that provides stability after disposal." We interpret this to mean that the use of High Integrity Containers would be an acceptable method of providing structural stability, for example, to PWR ion exchange resins.

Comment No. 3

We agree that the current general regulations for licensing materials do not contain any technical standards or criteria for the disposal of licensed materials, and that the need for comprehensive, national standards and technical criteria for the disposal of radioactive waste has been well established. D-55-11 However, we are concerned from a cost/benefit standpoint to our customers that adoption of the more restrictive burial site requirements may not be justified. We do not feel that the perceived safety benefits of the proposed disposal regulations are worth the added cost to our customers over and above that of the current general regulations.

Sincerely,

David C. Trimble

David C. Trimble
Manager, Licensing

DCT:DET:sl

ACNP

American College of Nuclear Physicians
Suite 700
1101 Connecticut
Avenue, N.W.
Washington, D.C.
20036
(202) 857-1135

DOCKETED USNRC

'81 OCT 30 P12:50

OFFICE OF SECRETARY DOCKETING & SERVICE BRANCH

53

DOCKET NUMBER PR-2 et al
PROPOSED RULE (46 FR 38081)

October 27, 1981

Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
Attn: Docketing and Service Branch

Dear Sir:

The American College of Nuclear Physicians is pleased to comment on proposed Rules for Licensing Requirements for Land Disposal of Radioactive Waste; Federal Register 46, #142, of 24 July 1981, pp 38081 - 38105.

The document is an important step in the process to achieve much needed facilities for disposal of radioactive waste. We appreciate the work involved and applaud the efforts of all who contributed. Our comments are primarily general, although specific comments on a few sections are included.

D-55-2 It is disappointing that "de minimus" levels are not yet included in our progress toward a rational approach to the handling of radioactive waste. Recognition of a de minimus philosophy is at least implied, which is a welcomed step. Clear delineation of de minimus standards is badly needed - this would be an appropriate document to make this advance and it is recommended that they be included in the final rule.

D-55-9 Low level radioactive waste frequently includes, as an integral part of the radioactivity, materials which must be handled as hazardous waste without respect to its radioactivity. The document, specifically section 61.5(a)(7) of the proposed rule, makes no provision for handling of waste which is both radioactive and requires special handling for other reasons. A "combined hazards" approach will ultimately be necessary and incorporation of such into this document would seem appropriate.

M-4 Responsibility for waste appears to be retained by a shipper until the shipment reaches the disposal site. When a licensee chooses to utilize a shipping agent it is not possible to satisfy these responsibilities. The licensee, especially small institutions, do not have the authority or capability to monitor or interact on training of the vehicle operator, route of transport, repackaging or movement of the shipment within the vehicle, etc. It is strongly urged that procedures be established such that a licensee can transfer custody of waste to a shipping agent and upon acceptance of the material by the shipping agent, further responsibility resides with the agent rather than the original licensee.

(more)

Acknowledged by card 11/4/81

C-3 Section 61.41 - The ground water concentration limit should be established at the boundary of the disposal site. A "nearest public drinking water supply" criterion might change after establishment of the site, causing potential danger on causing retroactive design limitations.

F-1 Section 61.70 - Participation should be limited to involved states.

Overall the document is liveable and an important step forward in providing for continued benefits derived from use of radioactivity and radioactive materials. Further improvement can be achieved by incorporation of these comments.

Sincerely,

Carol A. Lively
Executive Director

CAL/smt

THE NATIONAL ASSOCIATION OF INSURANCE BROKERS, INC.
311 FIRST ST., N.W. SUITE 700 WASHINGTON, D.C. 20001 TEL. 202/783-8880

November 5, 1981

(54)

Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

DOCKETED FOR -2 etal
PROPOSED RULE 61
(46 FR 38081)

Attention: Docketing and Service Branch

RE: Proposed rule amending 10 CFR Part 61 Subpart E - Financial Assurances, as published in the Federal Register, Volume 46, No. 142, Friday, July 24, 1981

Dear Sir:

E-1 The financial arrangements sought by the Nuclear Regulatory Commission are of surety nature and are designed to ensure that funds are available to properly close down radioactive waste disposal sites.

Several options for providing financial assurance are specifically proposed—surety bonds, cash deposits, certificates of deposit, deposits of government securities, escrow accounts, irrevocable letters or lines of credit, and trust funds. In addition, the proposed rule would provide other options by permitting "such types of arrangements as may be approved by the Commission." The National Association of Insurance Brokers believes this flexibility is crucial if the proposed rule is to function in a reasonable manner.

The NAIB represents major commercial insurance brokers in the United States. Our members develop more than half of the nation's business-related insurance coverages. The primary function and responsibility of a commercial broker is to develop insurance programs and provide related products and services to protect the assets of clients ranging from large and small businesses to public and private institutions of all kinds.

NAIB believes that the question of whether or not these financial assurance provisions are reasonable depends on their availability and cost. For instance, today there is some question whether surety bonds would, in fact, be available as the surety market is not interested in providing bonding at prices that make it an option. Also, the Commission should note that traditionally surety is available only to financially stable firms which could qualify for any of the other options, but is unavailable to those who may have a greater need of it.

11/9/81 enp

E-1

Insurance is not mentioned as an option here and, in the traditional sense, may not be appropriate because it could be argued there is no risk transfer involved when the need for closure is a certainty. However, insurance could be a viable means of financial protection against the premature closure of a waste disposal site, i.e., if a site had to be closed down before its operators had planned to do so. If, however, the closure came about "as scheduled," then insurance is not a viable solution.

Today there are no insurance products on the market which would cover the type of closure which concerns the NRC in this proposed rule. In the future, however, some form of insurance may be offered, and the NAIB feels such an option should be favorably considered by the Commission.

In summary, NAIB believes that the single most important factor in the feasibility of the financial assurance provisions of the proposed rule is that the words "such types of arrangements as may be approved by the Commission" be retained. If the Commission or staff have additional questions, the NAIB would be pleased to respond.

Sincerely,

Barbara S. Haugen
Government Affairs Officer

BSH:hch

LEGISLATIVE RESEARCH COMMISSION
State Capitol Frankfort, Kentucky 40601 502-564-8100

Joe Prather, Senate President Pro Tem
William G. Kenton, House Speaker
Chairmen

Vic Hellard, Jr.
Director

DOCKETED
USNRC

November 2, 1981

'81 NOV -6 A8:35

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

55

The Honorable Samuel J. Chilk
Secretary
Nuclear Regulatory Commission
Watonic Building
1717-H Street, N.W.
Washington, D.C. 20555

Dear Secretary Chilk:

This letter is in reference to your regulations in 10 CFR Part 61 relating to licensing requirements for land disposal of radioactive waste.

D-55-2

In 1980, the Kentucky General Assembly established a Special Advisory Committee on Nuclear Issues composed of legislators, university and industry experts, and citizens to, among other things, examine alternatives for managing Kentucky generated low level nuclear waste. During its study, it was brought to the attention of the Committee that the establishment of de minimus standards for each radioisotope in air, soil, water, and solid waste by the Nuclear Regulatory Commission and other appropriate federal agencies would be of great benefit in managing low level nuclear waste. The Committee would like to encourage the incorporation of the de minimus concept in the current revision of 10 CFR Part 61.

Sincerely yours,

Representative Pete Worthington
Chairperson, Special Advisory
Committee on Nuclear Issues

PW/chs

11/9/81 crp

WENDALL W. OGG,
PSO CRBRP, P.O. BOX U
OAK RIDGE, TN 37830

Breeder Reactor Corporation

U.S. Electric Systems Supporting The Clinch River Breeder Reactor Plant Proje[ct]

DOCKETED USNRC

'81 NOV -6 A8:36

OFFICE OF SECRETARY DOCKETING & SERVICE BRANCH

56

PR-2 et al (46 FR 38[081])

SECRETARY OF THE COMMISSION
USNRC
WASHINGTON, D. C. 20555

ATTN: DOCKETING AND SERVICE BRANCH

DEAR MADAM/SIR

I HAVE REVIEWED WITH MUCH INTEREST YOUR PROPOSED RULEMAKING 10CFR61. I FOUND NO PROBLEMS. THE DOCUMENT APPEARS TO PRESENT THE REGULATIONS WITH MUCH CLARITY.

No issues

PLEASE MAIL ME AT YOUR CONVENIENCE A COPY OF THE E.I.S.

YOURS VERY TRULY,

[signature]

11/9/81 emp

R/A SERVICES, INC.

P. O. Box 7345 * Odessa, Texas 79760 * (915) 563-4127

DOCKETED USNRC

'81 NOV -6 P2:12

OFFICE OF SECRETARY DOCKETING & SERVICE BRANCH

October 29, 1981

57

PROPOSED RULE PR-2 et al (46 FR 38081)

R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Division of Waste Management
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Smith:

We operate under Texas Radioactive Material License # 12-3010. We received the copy of the proposed rulemaking on land disposal of low level radioactive waste at a late date and as a result were unable to reply earlier.

D-55-M

The proposed regulations appear to be more than adequate to control licensees which operate disposal sites, but they are inadequate for regulating small processing operations, cutting facilities, medical research centers, and numerous other applications. The reason that I make such a statement is that no consideration appears to have been given as to what particular isotope is being disposed of. It seems a great waste to over crowd our waste sites with short half-life isotopes when they will be essentially non-radioactive waste in a short period of time.

This regulation, as we see it, will serve to drive up waste disposal costs for small operations while at the same time encourage these smaller operations to dispose of their wastes in other fashions. We would like to see a revised regulation which would determine the waste disposal criteria for radioisotopes according to specific half-life. This would appear to be a most logical solution since the fundamental principle behind radiation is the decaying of the isotope. If smaller operations are to comply, it is imperative that allowances are made for short half-lived radioisotopes.

Thank you for your considerations. Any comments pertaining to our views on this matter would be appreciated.

Sincerely,

R/A SERVICES, INC.

Delbert W. Hicks, Jr.
President

DWH/ci

CC: Texas Department of Health — Radioactive Material Specialist

11/9/81 emp

CORRECTION NOTIFICATION

To Recipients of PR-2, et al. (46 FR 38081) - Licensing Requirements for Land Disposal of Radioactive Waste

Comment Nos. 58, 59, and 60 were miscoded. These numbers will not be used again.

Docketing and Service Branch
Office of the Secretary of the Commission

11/18/81

CORRECTION NOTIFICATION

To Recipients of PR-2, et al. (46 FR 38081) - Licensing Requirements for Land Disposal of Radioactive Waste

Comment No. 61 was miscoded. This number will not be used again.

Docketing and Service Branch
Office of the Secretary of the Commission

12/3/81

DR. HARRY LAWROSKI, PE
CONSULTANT
2375 Belmont Ave.
Idaho Falls, Idaho 83401
Phone (208) 524-3237

DOCKETED
USNRC

'81 NOV 19 P3:23

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

November 13, 1981

(62)

Mr. R. Dale Smith
Branch Chief, Low-Level Waste Licensing Branch
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

RULEMAKING PROPOSED RULE PR-2 et al (46 FR 38081)

Dear Dale:

A-3

As we discussed in New Orleans, I suggest the wordings in 10 CFR Part 61 on pages 34 and 38 be changed from "Commencement of construction prior to such conclusions shall be grounds for denial to possess and use special nuclear material in such plant or facility." to "Commencement of construction prior to such conclusions shall be at the risk of the applicant and shall not be a factor in determining the acceptability of the application for license."

Since timing for opening of disposal sites may be critical, some thought should be given to limited work authorization permits. This would allow work in select areas of a potential site.

I hope these words will be helpful.

Very truly yours,

Harry

Harry Lawroski

Acknowledged by card.

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, D.C. 20310

'81 DEC -2 P4:28

24 NOV 1981

(63)

Secretary of the Commission
US Nuclear Regulatory Commission
ATTN: Docketing and Service Branch
Washington, DC., 20555

DOCKET NUMBER
PROPOSED RULE PR-2 et al
(46 FR 38081)

Dear Mr. Secretary:

This is to provide you with coordinated Army comments on your agency's proposed rulemaking action regarding land disposal of low level radioactive waste set forth in the Federal Register, Vol 46, No. 142, July 24, 1981.

The Army has reviewed subject proposed rule for impact on the current Army radioactive waste program. In particular, only Parts 20.311, 61.55, 61.56, and 61.57 will affect the Army at this time.

D-55-6 Part 61.55 classified low level radioactive waste into Class A, Class B, and Class C categories. Class B concentrations require packaging to meet the requirements of Part 61.56. Since waste shipped IAW AR 385-11 are already required by Headquarters, US Army Armament Material Readiness Command (ARRCOM), to meet these requirements, this part has no effect. However, Part 61.57 requires an additional label specifying either "Class A segregates," "Class B stable," or Class C intruder" which will require changes in existing shipping forms as outlined below.

M-4 Part 20.311 requires paperwork to accompany each shipment to supplement existing requirements for record keeping. The current waste disposal form used by the site contractors and ARRCOM already contain most of the required information. Those items not now recorded on the form, such as solidification agents, Class A, B, or C amounts, etc., will be included on ARRCOM shipping documents and forms when required. All other requirements for the generator and/or shipper (i.e., Parts 20.311(d), 20.311(e), and 20.311(f)) are being accomplished by the ARRCOM audit program and/or the ARRCOM broker, Southwest Nuclear Corp.

Sincerely,

Lewis D. Walker

Lewis D. Walker
Deputy for Environment, Safety
and Occupational Health
OASA(IL&FM)

Acknowledged by card. 12/3/81 emp

(64)

DOCKET NUMBER
PROPOSED RULE PR-2 et al
(46 FR 38081)

'81 DEC -2 A11:25

November 24, 1981

Nuclear Regulatory Commission
Washington, D.C. 20555

(81)

DOCKET NUMBER
PROPOSED RULE PR-60
(46 FR 35280)

Subject: Proposed Rulemaking on Land Disposal of Low-Level Radioactive Waste.

A-8 In my opinion nuclear wastes, both high and low level, should be permanently disposed of in underground geologic repositories. This problem should not be left for future generations to resolve.

As nuclear worker radiation doses rise, the long term implications are frightening, given the recent estimates of cancer risks associated with low-level radiation exposure. Therefore, efforts should be made to forge a new partnership among federal, state and local officials concerning all decisions of the disposal of radioactive waste.

Sincerely yours,

Julia M. Jensen

Julia M. Jensen R.N.
Route I Box 86A
Grandview, Tennessee 37337

Acknowledged by card. 12/3/81 emp

DEPARTMENT OF PLANNING
AND ECONOMIC DEVELOPMENT

GEORGE R. ARIYOSHI
HIDETO KONO
FRANK SERIVANEK

Kamamalu Building 250 South King St., Honolulu, Hawaii • Mailing Address: P. O. Box 2359, Honolulu, Hawaii 96804

'81 DEC -8 A8:08

Ref. No. 3903

November 18, 1981

65

DOCKET NUMBER PROPOSED RULE PR-2 et al (46 FR 38081)

4

DOCKET NUMBER PROPOSED RULE PR-61 (46 FR 51776)

U.S. Nuclear Regulatory Commission
Office of Nuclear Material Safety
Washington, D.C. 20555

Gentlemen:

Subject: Draft Environmental Impact Statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Wastes"

F-1 Thank you for the opportunity to review the subject draft EIS. Inasmuch as the proposed regulations provide ample opportunity for the expression of State concerns prior to the licensing of a disposal site, we feel that any Coastal Zone Management (CZM) program concerns can be addressed at that time. Moreover, should a disposal site be proposed within the CZM areas of the State, the federal consistency provisions of the National CZM Act require that the licensing be subject to State review for consistency with Hawaii's federally approved CZM program.

Sincerely,

Hideto Kono

Acknowledged by card. 12/3/81 emp

Union Oil Company of California
Union Oil Center, Box 7600, Los Angeles, California 90051
Telephone (213) 977-6810

Carleton B. Scott
Director, Environmental Sciences

RECEIVED DEC 15 1981 U.S. NUCLEAR REGULATORY COMMISSION

UNION 76

'81 DEC 14 A10:45 emp

December 2, 1981

66

Mr. Samuel J. Chilk
Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

DOCKET NUMBER PROPOSED RULE PR-2 et al (46 FR 38081)

Att: Docketing and Service Branch

Dear Sir:

Union Oil Company of California (Union) takes this opportunity to present comments on the Nuclear Regulatory Commission (NRC) proposal published in the July 24, 1981 Federal Register (46 FR 38081) to add a new 10 CFR Part 61 to provide licensing procedures, performance objectives, and technical criteria for licensing facilities for the land disposal of radioactive wastes. Set forth below is a summary of Union's nine major concerns with the NRC proposal.

A-1 1. Existing facilities holding valid licenses for the land disposal of radioactive waste should be exempt from the additional licensing requirements of the proposed regulations.

D-55-2 2. A "de minimis" classification of wastes should be established to give relief to those facilities handling material whose radiation levels are sufficiently low so as to pose no threat to health or the environment.

A-6 3. The provision that binding interpretations of regulations can be made only by the Commission or the General Counsel is overly restrictive. Negotiations with the NRC will be hampered if all other NRC agents have only apparent authority and not actual authority.

A-1 4. Provision should be made for an "interim status" which would allow present disposal operations to continue legally until such time as licensing can be considered for them.

E-1 5. Self-insurance should be permitted for those who qualify based on an annual submittal of financial reports.

Acknowledged by card. 12/15/81 emp

8112170071 811202
PDR PR
2 46FR38081 PDR

SEN-2 6. The procedures for waste classification should be clarified. The list of radioisotopes in Table I should be expanded and detailed instructions should be given for classifying material not explicitly listed.

C-3 7. The proposed exposure limit of 25 mrem/yr at the boundary is restrictive and fails to take account of background radiation. The limit should be set as an increment above background with total dose not exceeding one-third of the occupational limit.

D-56-6 8. Provision should be made to allow bulk shipment and disposal of low level waste.

A-3 9. An applicant having all the required permits to construct on a site except an NRC license for disposal of low level waste should be allowed to commence construction with the understanding that he may not be allowed to use the site for low level waste disposal until such time as appropriate approvals for such activity have been received.

Union's specific, section-by-section comments are set forth below.

A-1 Section 61.1 - Purpose and scope.

Existing facilities holding valid licenses for the disposal of radioactive wastes should be exempt from the licensing requirements proposed in Part 61. This exemption should include disposal at licensed uranium mill tailings and low level waste disposal facilities with an approved disposal plan under 10 CFR Section 20.302. Requiring a licensed facility to significantly amend its license under Part 61 or apply for a new license, only serves to discourage consolidation of wastes without any benefit to safety or the environment.

ED-1 Section 61.2 - Definitions.

A definition of naturally occuring radionuclides should be included.

A-1 Section 61.3 - Licenses required.

As proposed, Section 61.3(a) (also 61.10 and 61.23) would regulate the land disposal of any radioactive waste containing source, special nuclear, or by-product material without

A-1 establishing a "de minimis" classification of wastes. Wastes containing the most minute amounts of radioactive material would be regulated irrespective of the level of radiation. This places an undue burden on facilities handling material whose radiation levels are sufficiently low so as to pose no threat to health or the environment. A "de minimis" classification of wastes should be established which considers two factors: (1) the volume, amount, or weight of the waste and (2) the concentrations of radioactive elements in the waste.

A-3 Section 61.3(b) and Section 30.33(5)

An applicant should be allowed to commence construction at his own risk prior to a final NRC determination, provided other approvals are received. If an applicant has all required permits to construct on a site except an NRC license for disposal of LLW, he should be allowed to commence construction with the understanding that he may not be allowed to use the site for LLW disposal until such time as appropriate approvals for such activities have been received.

For example, assume that a company wishes to develop a new mine and processing plant, and the plant will produce a LLW. The company has the option to dispose of the LLW on site or ship it off-site for disposal. The mine site is found to be acceptable for a LLW disposal site. The company has other facilities that produce LLW and disposes of such material at commerical sites. The company chooses to consolidate all LLW for disposal at the new site if approval is given by NRC. The company wishes to proceed with development of the mine and other facilities (some of which will be used in processing LLW) independent of NRC approval for LLW disposal. The overall project construction should not be held up pending a Part 61 license, since if it was not approved the option exists to ship the waste to another site for disposal.

A-6 Section 61.5 - Interpretations.

Under this proposed provision a person is not entitled to rely on the representations of anyone from the Nuclear Regulating Commission (NRC) unless the interpretation is in writing from the General Counsel or is specifically authorized by the Commission. All employees of the NRC have only apparent authority and any representations which they make in negotations are not binding. This means that the only way to negotiate with the NRC will be to negotiate directly with the Commission or with the General Counsel. This appears to be unworkable.

Section 61.7 - Concepts.

Section 61.7(c). The procedures to obtain a license are both costly and lengthy. The analogous RCRA regulations provide for an "interim status" which allows existing disposal facilities to continue to operate under minimum standards until such time as licensing can be considered for them. Under the proposed NRC regulation, existing disposal operations will apparently become illegal overnight unless an "interim status" is provided or they are made exempt.

Section 61.10 - Content of application.

A-1

Under this section an application must be filed by anyone dealing with a waste containing a source material. A material is classed as a source material if it contains more than .05 weight percent of uranium, thorium, or any combination thereof. In the case of rare earths a material is a source material if it contains in excess of 0.25 weight percent uranium, thorium, or any combination of these.

The term "containing" is overly broad. The contamination with a source material could for example be one percent. This means that some waste containing source material is covered when it contains one percent of .05 weight percent. This is only .0005 weight percent. This is probably far less than the content of most naturally occurring ores. This is an extreme example of the need for a de minimis provision.

Section 61.12 - Specific technical information.

B-1

The requirement in Section 61.12(a) to provide a description of geologic and other data for the disposal site and vicinity is unduly broad in that "vicinity" is not defined. This provision may require surveys to be made on neighboring property which may or may not be accessible to the applicant's personnel. In any event the perimeter of the survey should be more precisely described.

Note that "land disposal facility" as used in Section 61.12(f) includes the buildings. If the buildings are an integral part of the disposal process the inclusion of their description is reasonable. However detailed descriptions of auxilliary buildings such as offices, cafeteria facilities, etc., should not be required.

The Section 61.12(h) requirement should be limited to an identification of "known" natural resources. The applicant should not be forced to undertake expensive resource evaluations of an exploratory nature, such as deep drilling, etc.

B-13

Section 61.20 - Filing and distribution of applications.

The applicant should be required to provide only enough copies of the application and EIS to satisfy the distribution requirement.

A-1

Section 61.23 - Standards for issuance of a license.

This section applies to a radioactive waste "containing" or "contaminated" with a source material. Regardless of the meaning "containing", "contaminant" clearly suggests the mere presence of very minor amounts of source materials, such as at the one percent level or less. This ties in with the earlier discussion (Section 61.10) that even low levels of thorium and uranium are included within the scope of these regulations.

ED-1

Section 61.28 - Content of application for closure.

An explanation should be provided to define the data that are "pertinent" to the long-term confinement of emplaced radioactive waste. The requirement as stated gives undue breadth for interpretation.

C-3

Section 61.41 - Protection of the general population from releases of radioactivity.

The proposed limit of 25 mrem/yr at disposal site boundaries is rather restrictive in view of the occupational limit of 5 rem/yr. In some locations the background radiation levels may result in exposures above this proposed limit. Either a higher limit would be preferable or one which is based on a percentage of the total background level for a year, providing this does not exceed one-third of the occupational limit. The limit might be stated as an amount or percentage above background with the increment above background being set on a case-by-case basis.

Section 61.50 - Disposal site suitability requirements for land disposal.

D-50-1

In Section 61.50(2), the criteria to determine if a site is capable of being modeled need to be established. What role will modeling play in the licensing process? What site characteristics and events will be modeled? Do NRC approved models exist?

D-50-2

The Section 61.50(4) areas to be avoided should be limited to areas having known natural resources.

D-50-3 If Section 61.50(6) is intended to provide that upstream drainage must be diverted, it should so state.

D-50-2 The term diffusion is unclear in Section 61.50(7). There are many types of diffusion, including convective, molecular, etc. The designation of the particular type of diffusion is important for an understanding and enforcement of the regulation.

The Section 61.50(8) language is unclear. Note that in other regulations "disposal unit" is defined as the actual disposal area while "disposal site" includes the disposal area plus a buffer zone. It is not clear from the language in this section of the regulations whether no groundwater shall be discharged from the disposal unit or from the disposal site.

D-53-1 Section 61.53 - Environmental monitoring.

The term "information" in Section 61.53(a) is unduly broad and is subject to interpretation.

In Section 61.53(b), the type of required monitoring should be specified explicitly. It is understandable that monitoring should be required during operations. It is not clear why monitoring is required during construction.

ED-1 Section 61.55 - Waste classification.

A detailed set of instructions describing the use and application of Table I should be provided. The instructions contained in the footnotes to Table I are incomplete, vague, confusing and difficult to apply. The list of radioisotopes explicitly listed in Table I should be expanded. In particular, thorium and the daughters of uranium and thorium should be added. A Class D should be established to cover radioisotope concentrations in excess of the values shown in Column 3. In general, the procedure for determining the class of radioisotopes and mixtures of radioisotopes not explicity listed in Table I needs clarification.

Section 61.56 - Waste characteristics.

Section 61.56(2) should be deleted. DOT and NRC transportation regulations allow certain materials to be shipped in fiberboard boxes (Type A Packaging). For certain low level

D-56-4 waste use of cardboard or fiberboard boxes may be suitable for both shipping and disposal. This determination should be made on a case-by-case basis. A section should be added to allow

D-51-4 bulk shipment and disposal of low level waste based on a case-by-case evaluation, taking into consideration such factors as the nature of the waste, method of disposal, cost/benefit analysis, safety, etc.

D-59-3 Section 61.59 - Institutional requirements.

The proposed rule requires state or federal ownership of the site before a license may be issued. Provision should be made to insure that ownership would revert to the applicant if the site is not used as a final low level waste disposal site. It is easy to foresee occurences where, even though a site is approved for low level waste disposal, the project is abandoned prior to disposal due to adverse public opinion or changes in economics or need. It is also very possible that a company may choose to remove low level waste from a disposal site and use the land for some other purpose. Further, if the NRC subsequent to title transfer determines that use of the site will not pose a radiation hazard, the applicant should receive the right of first refusal for use of the land.

E-1 Section 61.62 - Funding for disposal site closure and stabilization.

The Section 61.62(f) requirement for surety without proof of forfeiture is very unusual. Needless to say, this type of surety will be quite expensive if not prohibitive. There seems to be no justification for this provision. The surety should be available if there is a forfeiture, perhaps also in those cases where forfeiture is imminent. It should not otherwise be available.

As under the Clean Water Act, self-insurance should be permitted for those who qualify based on an annual submittal of financial reports. Financially strong companies should not be required to furnish surety bonds underwritten by surety companies that are weaker financially than they are. Furthermore, it is our understanding that the majority of surety companies will not offer bonds of the type being considered because of the long term obligation which would be involved; and the other alternatives, i.e. cash deposits, certificates of deposit, irrevocable letters of credit, etc., are quite costly.

M-1 Section 20.311 - Transfer for disposal and manifests.

The requirement of a notification of receipt by the disposal facility to the shipper (generator) might be satisfied by using a signed and dated copy of the manifest.

Section 20.311(d). The reference made to meeting the requirements of Section 61.56 should be qualified. Class A segregated waste need only comply with Section 61.56(a).

ED-1 Section 30.32 - Application for specific licenses.

On 46 FR 38103 column 3, the fourth line should read "months prior to commencement of." The word "prior" is omitted in the referenced line.

We trust that you will take our comments into consideration in promulgating this regulation. Should you have any questions concerning Union's comments, please contact Dr. Allan A. Hirata of my staff at (213) 977-6720.

Sincerely,

Carleton B. Scott

STOCK

DOCKET NUMBER PR-2,19,20,21,30 (61)
PROPOSED RULE 40,51,61,70,73,170
(46 FR 35081)

DOCKET NUMBER PR-61 (9)
PROPOSED RULE
(46 FR 51776)

December 17, 1981

'81 DEC 22 P3:44

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

Attn: Docketing and Service Branch

Re: Proposed Rule 10 CFR 61

Gentlemen:

Stock Equipment commends the Commission for the draft 10 CFR 61 as a start toward criteria for proper disposal of radioactive waste. Consistent criteria providing required safety for the general public and radiation workers will be most welcome in the industry.

The following comments are intended to assist the Commission in formulating well-defined regulations which promote reasonably achievable safety standards employing the best available technologies. They are intended to provide background and comment supporting your overall safety objectives.

D-55-B 1. Regardless of the ultimate regulation and waste form criteria, a key to any program is inspection and enforcement. A number of documents have been issued in the past, most of which have provided sound criteria to improve safety and the overall quality of waste management. Reasonable programs and definitions have previously been issued in Appendix I and ETSB 11.1, calling for permanent in-plant solidification capability, solidification of all wet solids prior to ship and process control programs to provide reasonable assurance that solidification is achieved. These documents have not been seriously implemented or enforced. (These requirements are incomplete with respect to the whole of the low level waste management issue, but could provide a sound, uniform basis from which the segments of transportation, interim storage and shallow land burial could be examined. The results of failure to enforce the presently existing criteria have been the following:

a) A significant portion of the waste processing equipment installed in nuclear power plants today cannot meet the present requirements as outlined in ETSB 11.3 and many of the waste generators, due to the uncertainty of requirements, are reluctant to improve the situation. An example of this is the recent occurence at one burial ground where inspection

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A unit of General Signal

Acknowledged by card. 12/23/81. mdv

D-56-8

was accomplished on a number of containers of solidified waste which resulted in this particular solidification agent being withdrawn from the market.

b) A number of waste generators continue to utilize portable equipment which does not meet the ALARA concept or provide consistent process control.

D-56-12

c) Burial ground states have taken the lead in developing their own, but often inconsistent, standards for disposal. These programs are reactionary in nature, in response to a wide range of ill-regulated waste management programs at generation sites which typically employ less than the best available technologies. An example of this is the recent acceptance of "high integrity containers," by some, but not all burial sites. (The high integrity container itself is subject to differing guidance as to whether it should provide 150 or 300 year service, what the transportation application might require or whether the life requirement can be credibly proven.

d) Designers of waste processing equipment, plant designers and the waste generators, if permanent installations are installed, are forced to design extreme flexibility into the capability of the equipment installed which significantly increases the price as an attempt to be sure that the equipment will, in fact, meet the changing regulatory climate over the life of the station.

e) Based upon our marketing studies it is our opinion that a high percentage of the nuclear reactors in operation and currently building will require retrofit of waste processing equipment to meet criteria in part due to the lack of consistent waste form criteria and enforcement.

D-56-14

2. The philosophy and ideas expressed in 10 CFR 61 are significant steps toward obtaining the objective of consistent safe criteria. Conversely, it is difficult to respond to the document in part due to its omissions, in part due to the uncertainties the document creates in the validity of Appendix I and ETSB 11.3 and in part due to other regulatory documents issued since Part 61 or yet to be issued. The overall waste management "puzzle," if you will, is really the sum of all the pieces, beginning with the generation of the waste and carrying through its treatment, handling and disposal. To reflect intently on one piece with incomplete knowledge of the other pieces and their interrelationships cannot result in an integrated approach, except by chance. Part 61 needs to interrelate with Appendix I and ETSB 11.3. It additionally must account for:

D-56-14
GEN-2

a) New Regulation 792
b) Draft STP - Waste Form
c) Amended 10 CFR 20 Section 20.311
d) Radiological Safety/Guidance for On Site Contingency Storage Capacity
e) Leachability Test Standards and Criteria (if any)

D-56-16

3. We strongly support the NRC in taking the lead for basic standards and technology in the protection of the public health and occupational workers during transportation and disposal. For some of the reasons listed above, it is our belief that there is an immediate need for this criteria and encourage the Commission to adopt same soon, rather than allowing additional work to progress over a number of years. We also suggest that after the standards are established, enforcement be immediately established to insure compliance. The criteria should be based upon ALARA and use the best technology available. It is our opinion that 10 CFR 61 in its present form is more concerned with the long-term migration considerations rather than protection during processing, transportation and disposal where the hazards are the greatest.

D-56-16

We do not believe that the basic standards and technical criteria should be delegated to the individual states. Most states have limited technical and economic resources to evaluate new or improved techniques and to establish and enforce standards and criteria. Some states also appear reluctant to act without guidance from the Commission.

D-55-2

4. In addition to the three general categories of waste established, it is our belief that it is in the best interest of the American public that the document also include a definition of diminimous radiation level.

D-56-8

5. We agree fully that a key to overall present and long-term safety is to place reliance on stability of disposed waste as indicated in Subsection B of Section 5. Waste form stability must be well defined, however, and enforced during the disposal operation.

Please note that polymer and cement waste forms in use today greatly exceed the proposed waste form strength criteria. Some containers and solidified waste forms in use today, conversely, will not withstand a static 50 psi load. In addition, the dynamic loads due to refilling trenches, compacting trenches and handling containers can, in some cases, exceed the strength of the containers and waste forms. D-52-11

6. Waste form and characteristic requirements as set forth in Section 61.56A will permit packaging waste which is in a readily dispersable form and which contains significant volumes of liquid that will contribute to radionuclide migration by groundwater. We suggest that 140 curies of Cobalt 60 in a 55 gallon drum is of significant concern during the transportation, disposal and first 50 years of institutional control. There are waste

Stock Equipment Company

D-56-8 solidification technologies available and in use today that can consistently place this material into a stable waste form. It is our opinion that the use of these technologies can reduce the transportation and disposal problems as well as reduce the potential hazards due to future intruders at the site.

D-56-13 7. It is our opinion that to meet the purpose of this regulation, all classes of waste should exclude the presence of liquids. The practice of disposing of ion exchange media by dewatering, for example (which contains potentially, relatively high radiation content) vs. solidification of the evaporator concentrates containing a relatively low radiation content is not logical technically or politically.

D-56-6 8. Stock suggests considering in-plant handling, transportation and disposal processes that all waste containers should be constructed of materials that will not support combustion. This term is applicable in the recently received Radiological Safety/Guidance for On Site Contingency Storage Capacity for low level dry waste storage. We concur with this application, but suggest the need is even more important when considering ion exchange resins or waste solidified in organic combustible solidification agents.

Thank you for the opportunity to comment upon this document. Stock stands ready to assist in any reasonable endeavor if you should desire it. We will also comment further regarding other phases of the program when draft documents are available.

Sincerely,

Paul C. Williams

Paul C. Williams

PCW:rr

U.S. Department of Energy

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'81 DEC 23 P3:05

December 14, 1981

DOCKET NUMBER PROPOSED RULE PR-2, 19, 20, 21, 30, 40, 51, 61, 70, 73, 170 (46 FR 35081) (63)

DOCKETING & SERVICE BRANCH

DOCKET NUMBER PROPOSED RULE PR-61 (46 FR 51776) (11)

DEC 28 1981

Mr. R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Division of Waste Management
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Smith:

Subject: Comments by Argonne National Laboratory on NRC Proposed Licensing Requirements for Land Disposal of Radioactive Waste (10 CFR 61), and Supporting Environmental Impact Statement (NUREG-0782)

Argonne National Laboratory has reviewed the Proposed Licensing Requirements for Land Disposal of Radioactive Waste (10 CFR 61) and the supporting Environmental Impact Statement (NUREG-0782). Our comments are attached.

We believe that the proposed 10 CFR 61 rule will provide a workable regulatory framework for licensing and operating new low-level radioactive disposal sites. The site requirements and criteria, operating and closure practices, and standards are conservative but in our opinion are generally practicable.

Very truly yours,

J. Howard Kittel

J. Howard Kittel, Manager
Office of Waste Management Programs

JHK:sfn
Enclosure

Acknowledged by card 5/23/81 mdv

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Comments on Proposed Licensing

Requirements for Land Disposal of Radioactive

Waste, 10 CFR Part 61, and on Supporting Draft

Environmental Impact Statement, NUREG-0782

Argonne National Laboratory

December 10, 1981

I. 10 CFR 61

A. General Comment

Our general impression of the proposed rule 10 CFR 61 is that it is a good document. It should provide a workable regulatory framework for the successful licensing - and operation - of new low-level waste disposal sites. We do not find any serious flaws. It proposes reasonable site requirements and criteria, operating and closure practices, and standards. It implicitly and explicitly states, by virtue of its performance standards, that zero release or zero migration is not expected.

B. Definitions (61.2)*

The addition of definitions and discussions of several terms which have been omitted from Section 51.2 (Definitions) might eliminate some ambiguities in interpreting the regulations. The suggested additions and the reasons for adding them are outlined below.

D-59-2 1. "Long-Term" In Supplementary Information, Section V.3, "long-term" is defined as the time after operations cease (presumably the post-closure period). It is not clear that this is the intended definition to be used in the many references to "long-term" in the regulations. If so, further subdivision of the time following cessation of operations may be appropriate because the impacts and problems for different intervals of time beyond closure are quite different. For example, the problems during the period that one can rely on "passive" institutional controls (deeds, records, etc., that allow the owner and potential user to be aware of past use) are different from the problems beyond that period, and also from the problems in the period of active institutional control. A claim [Section 61.7(b)(3)] that is reasonable for a period of the order of 1000 years is that future occupation and use of the site is unlikely; it is less reasonable for a period of the order of 10^4 years or longer. It has not been established that the allowed concentrations of very long-lived radioisotopes are low enough to permit unrestricted use of the site (which must be considered probable after all records are lost), and there is nothing in the regulations that limits the period of concern for public health and safety.

* Numbers in ( ) refer to Section Nos. in 10 CFR 61.

ED-1 2. "Disposal" The word "disposal is commonly interpreted to mean "permanent disposition of". If this is the intended definition, it should be so stated and noted that near-surface disposal is not necessarily a permanent means of disposition. Over a time period of the order of 10^5 years or longer, one cannot exclude the possibility (or even the likelihood) that the waste will be dispersed into the environment. The definition of "disposal" raises a legacy problem, and the implications of this for the hazards of waste with the limiting uranium and TRU concentrations need to be addressed, or at lease acknowledged, in the regulations.

D-56-8 3. "Stability" It is not clear whether the word "stability" is meant to be volume stability, so that the waste will not degrade, slump or collapse after burial, or also shape and physical stability, so that an intruder would clearly distinguish it from soil. If the former definition is allowed, then FUSRAP and similar waste is stable; if the latter definition is intended, it is not. If volume, shape, physical stability are required, some time limits may be needed; it might be difficult to ensure shape and physical stability for 10^4 years or longer unless rather expensive means, such as those proposed for high-level wastes, were used.

C. Protection of General Population from Releases of Radioactivity (61.41)

D-55-9 1. The performance objectives are given in terms of radiation dose. Since chemically-toxic, in addition to radiotoxic, substances may also be present in the waste, we believe that a general statement, at least, be included to the effect that releases of chemically-toxic substances shall not exceed any local or Federal standards that exist.

2. Two sets of radiation standards have been specified - one in terms of annual dose to any member of the public (25 mrem whole body and any organ except thyroid) and one in terms of drinking water concentration. The latter standard is based on 4 mrem/year for man-made radionuclides. Although it is recognized that the former is for individuals and the latter is for populations, it appears there are two different sets of standards. It is conceivable that releases to the general environment may cause exposures to as many individuals as contamination of the nearest public drinking water supply.

C-3 3. Regarding the statement "...at the nearest public drinking water supply...," this supply may not be the one most likely to be affected by the disposal site. The intent of this performance objective is certainly meant to apply to any water supply contaminated by waste migration, and this should be so stated.

4. It is possible that the last sentence in this paragraph might be misinterpreted by some to mean that the national drinking water standards are being applied to groundwater in general and not only to public drinking water supplies. We suggest that this sentence be reworded in somewhat this manner: "The waste disposal site shall not cause the National Primary Drinking Water Standards to be exceeded in any public drinking water supply." Additional clarification is needed to make the first and second sentences more compatible in terms of allowable dose, since in the first sentence drinking water could

C-3 yield a dose .. 25 mrem to the whole body and still be in compliance, while in the second sentence it would not.

GEN-2 5. The evaluation of an annual dose to the individual requires a model which allows one to calculate dose from an environmental radioactivity concentration or source term. This model can, of course, not be given in the proposed rule, but it is presumed that guidance in this area will be provided later in Regulatory Guides. The rule could give some indication as to how this performance objective is to be met.

ED-1 6. There is typographical error in the spelling of "radioactive" in the second sentence of the paragraph.

C-3 7. This Section is a general statement on standards, although not specifically directed at these. Standards are fixed absolute numbers, regardless of the uncertainties in the data on which they are based. Measurements and calculations made to assess performance against these standards are subject to uncertainties and to analytical and statistical errors. Thus, if the standard is 5 pCi/l, is a measurement of 5.1 ± 0.2 pCi/l in violation? Probably yes, but is a measurement of 4.9 ± 0.2 pCi/l in violation? Probably no, but the two measurements do not significantly differ. It would be reasonable and useful if the standards could address this problem in some way. We do not have a clear answer at this time, but it is a technical rather than a legal question, and this may make it difficult to resolve. Possibilities are (1) specify a dose standard, e.g., 25 mrem/year, and the probability of delivering that dose, (2) specify a concentration, e.g., 5 pCi/l, and the standard deviation tolerated in a measurement meant to meet this standard and the method by which it was calculated.

C-4 D. Protection of Individuals from Inadvertent Intrusion (61.42)

1. It is our belief that the inadvertent intruder scenario is given too much weight and leads to some unreasonably low concentrations in Table 1, for example, in the case of ^{94}Nb (0.002 uCi/g). This may not cause any impact on waste disposal, since ^{94}Nb is not an abundant radionuclide, but this does establish a precedent that could be unnecessarily troublesome.

2. The inadvertent intruder scenario is tenuous at best - it requires predicting some far distant future event for which the uncertainty is large - and should not be the limiting or driving force in determining the hazards.

D-50-2 E. Disposal Site Suitability Requirements for Land Disposal (61.50)

1. We believe that the intent of this requirement is that the water table shall not cyclically rise into and fall beneath the buried waste. Burial beneath the water table could be satisfactory, if diffusion is the controlling rate (as stated in this paragraph), if the travel time is very slow, if the performance objectives can still be met, and if the water table never drops below the buried waste.

D-53-1 F. Environmental Monitoring (61.53)

1. It is not clearly stated in this section that the radiological and/or nonradiological (chemical and biological) characteristics of the environment should be determined to establish baseline concentrations.

2. Should there not be a reporting requirement to demonstrate compliance with applicable standards and discuss results? This is implicitly covered in 61.80 (h) (1).

D-55-1 D-55-2 G. Waste Classifications (61.55)

1. The proposed 10 CFR 61 specifically mentions two waste categories although they are outside its intended scope. These categories are: (1) wastes with radioisotope concentrations that exceed the limits in column (3) of Table I [Part 61.55d)]; and (2) wastes that might be exempted from the regulations (Supplementary Information, last paragraph of Section V.C). On the other hand, no mention is made in the current proposed regulations of the category referred to as "low-activity bulk solid waste" although it was included in the preliminary draft of 10 CFR 61 (issued November 5, 1979). Waste from the Formerly Utilized Sites Remedial Action Program (FUSRAP) would, presumably, fall into this category. FUSRAP waste is within the scope of 10 CFR 61, but it is unclear whether this was intended or incidental. It is of considerable interest why the low-activity bulk solid waste category was eliminated and whether it may be re-introduced at some future time.

2. FUSRAP waste meets the requirements of all of the 10 CFR 61 waste classifications (except possibly with regard to dimensional stability -- see below); it is mainly soil contaminated with very long-lived radioisotopes (mostly uranium and thorium ores and processing residues) at average concentrations that are smaller than the uranium and TRU limits in Table I by a factor of 100 or more. Waste-specific requirements for Class A, B, and C wastes may not be appropriate for such wastes.

3. In raising this question regarding the fate of the low-activity bulk solid waste category, we are aware of the recent published Branch Technical Position on Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations (46 FR 52061). The question concerns the waste identified in category 5 of the position paper, i.e., waste for which long-term disposal at a site other than a licensed disposal site will not normally be a viable option.

ED-1 H. Labeling (61.57), and Tests at Land Disposal Facilities (61.31)

1. It is not clear where the primary responsibility lies for verifying the character of a waste shipment. Is it the responsibility of the generator (Section 61.57), or the site operator, or the Commission (Section 61.31)? What means will be adopted to provide quality assurance?

II. NUREG - 0782

A. Federal and State Responsibilities (1.2.3)*

be routinely measured and the concen-

1. The precise differences between the responsibilities of agreement states and those of nonagreement states with respect to the proposed rules are not clearly identified. For example, in the case of nonagreement state-owned disposal sites, is federal control considered acceptable to provide surveillance during the operational, closure, and institutional control phases?

Samples may be taken for analysis either from (a) the final waste form, or (b) the

2. If the site is owned by a state, the proposed rules should permit transfer to federal ownership subsequent to or after closure. Such action could be considered when the state is agreeable at the time the license was issued.

certain action levels, then other radio-nuclides would be measured. The action levels used may also be either based

D-55-6

B. Other Issues Regarding Classification (2.6)

upon data specific to the facility or from a set of reference action levels.

1. The EIS alludes to potential nonradiological hazards in LLW, but notes that NRC has no authority to regulate the total hazard of LLW. Nevertheless, it is desirable for the EIS on 10 CFR 61 to note that the licensing applicant must take into account possible effects from biological or chemical hazards in the LLW and from any adjacent or colocated hazardous waste disposal site.

2. A "de-minimus" classification should be provided for LLW that is near or below background levels. The need for such a classification was noted in the 1980 regional workshops held to review the draft regulation (see App. C, Section 6.1.3). Support for a "de-minimus" or comparable classification has also been expressed by several study groups, including the Low-Level Waste Strategy Task Force (Ref. 1), the Conservation Foundation (Ref. 2), and the State Planning Council on Radioactive Waste Management (Ref. 3).

sampling and more extensive analysis be set with a keen eye to practicality.

C. Reference Disposal Facility Costs (3.6.5)

1. The direct operation cost for environmental monitoring (about $25,700 per year) shown in Table 3.5 is believed to be inadequate. We estimate that the cost of only the radiochemical analyses listed in Appendix E, page E-55 is about $40,000 per year. In addition, the cost for sample collection, sample preparation, quality assurance, and other factors might increase this cost by a factor of two.

D. Alternatives to the Base Case (5.2.4)

D-56-12

1. The EIS mentions use of high-integrity containers, but defines "high-integrity" only in subjective terms. LLW shippers and site operators will need a tightening of the definition of "high-integrity" if the use of such containers is specified as meeting NRC technical criteria for disposal. Will NRC provide a quantitative definition of "high-integrity container", or will this be left to others, such as state authorities or the private sector?

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* Numbers in ( ) refer to Sections in NUREG-0782, Vol. 2, unless stated otherwise.

E. Classification of New Requirements (5.8.2)

1. Subsidence has been a problem at LLW disposal sites, particularly in humid areas. The proposed approach of requiring structural stability for higher waste classes is good. For the Barnwell site, prepared in 1980 for greater than table, from a site operational standpoint, is the decontainerized disposal of low-activity waste, briefly discussed on page 5-113. This option should be available to waste generators and site operators for low-activity waste such as building rubble, machinery and other metal, general waste, and compressible trash. Airborne activity arising from such disposal of containers can be minimized by use of dust control procedures.

D-55-6

Isotope / Average Waste Concentrations Buried at Barnwell Compared to 10 CFR 61 Table 1 Col 1

F. Potential Public Impacts from Small Spills During Normal Operation (6.2.1)

1. "Th-238" in Tables 6-3 is a typographical error.

G. Background Irradiation (Appendix E.2.2.7)

1. The pre-operational tritium concentration of 350 pCi/l is about three times greater than in the Idaho (northern INEL) area. The gross alpha and beta concentrations are reasonable.

Isotope	(uCi/g) at Barnwell	Table 1 Col 1	Allowable by 10 CFR 61
Cs-137			3.59E-1
Cs-134*	4.6E-02	4.37E+2	1.05E-4
I-131			
			2.60E-4
		4.37E+2	1.05E-4
Cr-51*	1.1E-01	4.37E+2	2.50E-4
Fe-55*	9.2E-01	4.37E+2	2.10E-3
Mn-54*	4.6E-02	4.37E+2	1.10E-4
Sr-89*			
Sr-90		2.50E+2	1.20E-3
Sr-95*	4.6E-02	4.37E+2	1.10E-4
Ce-141*	4.6E-02	4.37E+2	1.10E-4
Mn-54*			
Ru-103*			7.80E-5
Ru-106*	4.6E-03	4.37E+2	1.10E-5
Tc-99			
C-14	2.8E-03		4.00E-4

References

1. "Managing Low-Level Wastes: A Proposed Approach," Idaho, LLWMP-1 (August 1980).
2. "Toward a National Policy for Managing Low-Level Radioactive Waste," The Conservation Foundation (June 1981).
3. "Low-Level Radioactive Waste Management: An Economic Assessment," State Planning Council on Radioactive Waste Management (July 1981).

* All with half lives < 5 years

** Soil density 100-lb/ft3

shows the average concentrations of a number of isotopes which records indicate are buried at Barnwell. These concentrations are compared to the values from Col. 1, Table 1, of proposed 10 CFR Part 61. Also shown are the ratios of these average concentrations

STATE PLANNING BUREAU
State Capitol
Pierre, South Dakota 57501
605/773-3661

SOUTH DAKOTA Office of Executive Management

46 FR 51774

DOCKET NUMBER
PROPOSED RULE PR-2, 19, 20, 21, 30, 40, 51, 61, 70, 73, 170 (46 FR 38081) (69)

'81 DEC -9 P2:35

emp

December 2, 1981

(61)

Low-Level Waste Licensing Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards
Nuclear Regulatory Commission
Washington, DC 20555

DOCKET NUMBER
PROPOSED RULE PR-61
(46 FR 51774)

RE: SAI# SD811020-E15, Volumes 1-4
DRAFT EIS on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste"

Dear Sirs:

Thank you for the opportunity to review and comment on your draft environmental impact statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste."

Attached are some notations made by the South Dakota Department of Water and Natural Resources during the course of their review. You may want to take their comments into consideration when you prepare your final report.

Overall, South Dakota agencies felt your impact statement deserved recommendation for approval.

Sincerely,

Tony C. Metry
Commissioner
STATE PLANNING BUREAU

...ived by ... 12/15/81 emp

COMMENTS: 10 CFR 61 PROPOSED RULES

The South Dakota Department of Water and Natural Resource's Radiation Program has reviewed the summary volume of DEIS 10 CFR 61, and we recommend approval. The following are comments relative to minor discrepancies.

1. Volume 1, page 5, section 2.1, paragraph 3.

   The word "generated" should be replaced by "produced" because it may create confusion regarding fuel cycle power "generation", and the "generation" of LLW. Therefore, the last sentence should read: Institutional LLW production will account for about 19% of the non-fuel sources.

2. Volume 1, page 9, paragraph 3, line 12.

   "The most important . . .". The use of "geometric means" should be justified in lieu of arithmetic means.

3. Volume 1, page 19, Table S.5.

   The column heading "Costs & Impacts" should define units in column (i.e. dollars, etc.'

4. Volume 1, page 27, paragraph 2, line 8.

   The use of the term "daughters" should be replaced by "progeny" likewise throughout the proposal.

DOCKETED
'81 DEC -9 P2:35
DOCKETING & SERVICE BRANCH

The following comments pertain to Volume 1, Attachment A, Proposed Rule 10 CFR 61: Licensing Requirements for Land Disposal of Radioactive Waste.

ED-1
1. Volume 1, Attachment A, page 38082, column 1, paragraph 3, line 6.
   The word "numbr" should read "number"

2. Column 2, paragraph 1, line 11.
   "nonradio-active" should read "nonradioactive".

D-50-9
3. Volume 1, Attachment A, page 38084, Column 1, paragraph 1, item(5) "Stability - " The statement appears too generalized and vague. It should read: Stability - Stability of the disposal site over the long term (100 years) is mandatory to prevent loss of site integrity; The potential for migration and transport of wastes to offsite areas should be virtually eliminated. (As an example).

ED-1
4. Volume 1, Attachment A, page 38084, Column 2, line 24.
   The word "if" should read "it".

5. Volume 1, Attachment A, page 38085, Column 1.
   The classification scheme presented covers present waste streams but contains no provisions for future waste stream developments. If a "miscellaneous" class "C" which is characterized by activity can be included it should provide a time-buffer for future amendment needs.

Georgia Institute of Technology
A UNIT OF THE UNIVERSITY SYSTEM OF GEORGIA
SCHOOL OF NUCLEAR ENGINEERING AND HEALTH PHYSICS
ATLANTA, GEORGIA 30332

'81 DEC 14 A10:44

December 10, 1981

70

DOCKET NUMBER PROPOSED RULE PR-2, 19, 20, 21, 30, 40, 51, 61, 70, 73, 170 (46 FR 3808)

8

DOCKETED PR-61 (46 FR 51776)

The Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Docketing and Service Branch

Final Draft: 10CFR Part 61

Dear Sir:

I am enclosing herewith various comments on the draft of 10CFR61, dated June 29, 1981. I hope these comments can still be considered and incorporated before the issue of the final version of this regulation.

Yours sincerely,

Geoffrey G. Eichholz
Regents' Professor

GGE:sr

Enclosure

Received by ... 12/15/81 ... emp

COMMENTS ON FINAL DRAFT, 10CFR61

dated June 29, 1981

Geoffrey G. Eichholz
Georgia Institute of Technology

General Remarks

This proposed regulation has gone through so many drafts and public comments that it may seem invidious to introduce further criticism. For that reason in the following emphasis is given to major points of philosophy of regulation, operational criteria and anticipated problems in administering the regulations.

ED-1 It had been my impression that 10CRF61 would deal specifically with low-level waste, but that distinction does not appear in the final draft (compare 43FR49811). There clearly is a distinction in emphasis in dealing with near-surface disposal of low-specific-activity and deep disposal of high-level waste in mined cavities. Subsequent comments address themselves primarily to low-level waste. This point is, in fact, covered indirectly in §61.2, Definition of "Waste".

I do not find the argument in Section IV for dropping the LLW designation a compelling one. Somewhere else, possibly in Parts 30 or 40, provision may have to be made for performance criteria and licensing of LLW incinerators and other volume reduction schemes.

Specific Comments

C-3 1. I feel the description of performance objectives is good, and it is important to stress these over "prescriptive requirements" that necessarily reflect the current state of the art. However, the phrasing of §61.41 may be too concise to permit ready implementation. In particular, it is not clear how such annual doses will be estimated, whether they will be based on

U.S. Nuclear Regulatory Commission
Page 2
January 13, 1982

Paragraph 61.56(b),(1) waste form

In an attempt to provide numerical guidance defining waste form stability, the Commission has proposed to characterize a structurally stable waste form as one which "will maintain its physical dimensions within 5% and its form, under the expected disposal conditions of 50 psi ...". Werner & Pfleiderer Corporation finds this means of defining stability to be inappropriately restrictive. Specifically, this definition excludes many thermoplastic binders; e.g. asphalt, from conformance due to the fact that a thermoplastic monolith will gradually creep or flow under a 50 psi compressive loading. The application of this compressive strength criteria stems from the fact that compressive strength plays a significant role in soil subsidence. Experience shows that subsidence results from the degradation of waste packages and the manner in which waste packages are placed in the ground and backfilled. The Commission recognizes this in paragraphs 61.52(a),(4) and (5) in which requirements for orderly placement of the waste and backfilling to eliminate voids are established. Werner & Pfleiderer contends that with the precautions established to prevent voids in both the ground and in the waste package; i.e. Paragraphs 61.52(a),(4) and (5) and 61.56(b),(3), volumetric incompressibility of the monolith is a more appropriate measure of stability than pure compressive strength. As such, the waste form will behave in much the same manner as an incompressible component of the surrounding soil. Proper waste placement and backfilling produces an environment more akin to a hydrostatic environment in which stresses are isostatic in nature. Based on the foregoing rationale and the fact that thermoplastic binders offer significant performance improvements over more traditional binders; e.g. cement, Werner & Pfleiderer Corporation requests the Commission to reexamine the rationale supporting the currently proposed numerical guidance used to define waste form stability and adopt a stability definition which recognizes volumetric incompressibility of monolithic waste forms.

Paragraph 61.56(b),(1) establishes the use of a disposal container as a means to provide stability; i.e. confinement and isolation capability. Although no specific guidance is provided, Werner & Pfleiderer Corporation assumes that this is a tacit recognition of the ability of a high integrity container to provide isolation capability. Although this is a departure from previous Commission philosophy, Werner & Pfleiderer Corporation recognizes that a high integrity container has the potential to provide long-term confinement capability. We do, however, have some serious reservations regarding high integrity containers as they are currently used. For example, high integrity containers are structurally designed to withstand normal conditions of transportation. Statistics also show that high integrity containers are routinely subjected to transport and handling situations where accidental impact and/or crushing conditions exceed the design basis by a considerable margin. This combined with the fact that high integrity containers are predominately used to contain extremely dispersible waste forms with potentially high specific activity, pleads us to question the wisdom of the currently established design criteria. In the past, the Commission recognized that solidification of waste reduces the potential for dispersion of radioactive materials due to handling accidents. We continue to believe that solidification is an essential safeguard to dispersion of radioactive materials in light of the nonconservative design criteria imposed on high integrity containers. Werner & Pfleiderer Corporation requests the Commission to reexamine the design criteria for high integrity containers for use with highly dispersible waste forms.

U.S. Nuclear Regulatory Commission
Page 3
January 13, 1982

We appreciate being given the opportunity to provide comments on the proposed rulemaking and look forward to the Commission's consideration of the foregoing comments.

Very truly yours,

WERNER & PFLEIDERER CORPORATION

David N. Enegess,
Business Manager
Hazardous Waste Treatment Systems

DNE/WJK/gs

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actual observations or on predictive models, incorporating "realistic" [illegible] conservative assumptions.

2\. § 61.56a(2): It is not clear what constitutes capability of being [illegible] [illegible] many site can be.

3\. § 61.[illegible] criterion, e.g., [illegible] be desirable to [illegible] impermeable host medium [illegible] a well-drained [illegible]

4\. § 61.[illegible] a time scale [illegible] this paragraph mea[illegible] activity would [illegible] effect on the repository [illegible] active seismic [illegible]

5\. § 61.[illegible] particularly un[illegible] intermediate-level [illegible] higher level of [illegible] implied.

6\. Table 1 should distinguish [illegible] for H-3 and C-14 according to whether [illegible]

7\. Cobalt-60 [illegible] potential dose rates [illegible] reconsidered. On [illegible] 10 nCi/g should [illegible] Class [illegible]

8\. Some of the [illegible] in Tables 1 and 2 [illegible] justification, [illegible] implying an unrealistic accuracy of measurement. Is it meaningful to have [illegible] numbers occurring in all three columns, as for I-129, Cs-135, [illegible] when this implies that the quantity stated is both minimum and max[illegible] Class [illegible]

9\. Consideration [illegible] only, [illegible] figures.

10\. § 61.56a(7): Consideration should be given to banning the disposal [illegible] radioactive wastes containing more than a few microcuries [illegible] in gaseous form. Disposal or storage of large quantities of radioactive noble gases should be considered in another context and is probably [illegible] less desirable disposal option. Disposal of liquid waste forms by themselves [illegible] contravene the provisions of 5(1) and (2).

11\. I support the early development of an exempt or "de minimis" classification (though not that term) to avoid filling up expensive facilities with essentially nonhazardous waste. This should be done as an early date to include the provisions of § 20.306 into Part 61.

12\. § 61.57: Whose responsibility is it to provide sorting and labeling [illegible] waste packages? The main value of this would seem to lie in establishing compliance with transport requirements, Title 49 and 10CFR71, and [illegible] classifying the waste on site.

13\. § 61.55 Land Ownership: Although continuity in responsibility is clearly desirable, it is less clear why the land has to be actually publicly owned as long as some lien is maintained to provide for official access, monitoring and inspection as needed. Does this paragraph rule out privately owned lands?

14\. § 61.2, 61.59, 61.62: The term "custodial agency" must be defined.

15. State and Tribal Governments: PL96-573 and §61.70 are the first instances

DOW CHEMICAL U.S.A. ...al agencies are included in licensing activities on a par with

states. It is not clear, to what extent Federal regulations have overriding

January 12, 1982 force over state and particularly tribal law, nor what constitutes relevant

LARKIN LABORATORY

MIDLAND, MICHIGAN 48640

tribal law as quoted in §61.72. In case of conflict between [illegible] and

tribal positions does either prevail automatically or would this require

Secretary of the Commission

U.S. Nuclear Regulatory Commission

Washington, D.C. 20555

16. Manifest Tracking System: §20.311 is liable to generate mountain of paper

Attention: Docketing and Service Branch

work if not properly applied. Provision should be made for blanket

Subject: DOW COMMENTS, PROPOSED RULEMAKING 10 CFR 61

authorizations to ship low-level material of a recurring type, subject to

The subject proposed rulemaking was published in the Federal Register on ... The comment period ... will lie on

on October 22, 1981. NUREG-0732, a draft environmental ... should be subject

support to 10 CFR 61, however, NUREG-0782 had not been

published ... relevance to

are dated September 18, 1981, and were submitted to the

Commission with a cover letter dated October 12, 1981 ... sooner than after

cover letter states that additional comments will be submitted as necessary and as opportunities arise.

sixty days, see also ...

The Commission has extended the comment period for 10 CFR 61

17. to January ... Dow received NUREG-0732 on October 19,

1981, and a draft Branch Technical Position (BTP) on Waste

13. Form ... This paragraph, ... licenses,

follows:

should state the type of information required, that a limited environmental

NUREG-0782

report must be filed, or alternatively under what conditions the Commission

On pages 4, 5, 6, and 7 of the comments dated September 18,

1981, Dow stated concern that NUREG-0782 may be placing too

much emphasis on pathway analysis and overlooking the concepts of ALARA and best available technology and ignoring

the needs and objectives of assuring protection of the

workers, the general population, and the environment during

the operation of the disposal facility.

Review of NUREG-0782 has confirmed that the concern is valid

and justified.

BTP on Waste Form

Dow comments dated November 25, 1981, were submitted to

Mr. Robert E. Browning, Deputy Director Division of Waste

Management. Copies of the BTP and Dow comments are attached.

Please consider them as part of the Dow comments on 10 CFR 61.

AN OPERATING UNIT OF THE DOW CHEMICAL COMPANY

Acknowledged by card 12/18/81

Rt 6 Box 526

Crossville, TN 38555

-2-

'81 DEC 28 P2:00

January 12, 1982

December 21, 1981

Secretary of the Commission

U.S. NRC

Washington, DC 20555

Dow appreciates the opportunity to comment on 10 CFR 61.

The Commission now has sufficient technical information and experience to justify establishment and enforcement of regulatory standards and technical criteria for the proper

ATTN. Docketing and Service Branch

management of low-level wastes. Dow encourages the

Commission to take immediate actions on 10 CFR 61.

RE: 10 CFR Parts 2, 19, 20, 21, 30, 40, 51, 61, 70, 73, and 170

Licensing Requirements for Land Disposal of Radioactive Waste

R. Owen

Group Leader

Nuclear & Solidification Services

517-636-3585

The lack of coverage of socio-economic impacts of low level radioactive waste (llrw) facilities upon a community is most disappointing. Our county recently went through the experience of being considered for a llrw facility, and as a result gained a greater insight into the current practice of licensing procedures. As TN is one of the 26 agreement states, it would be responsible for regulating such a facility, but it became clear that the criteria being developed by the state with the assistance of EG&G Idaho DOE also did not include socio-economic impacts either.

Cumberland County is a rural county, so it seems it is automatically a prime candidate for a waste facility. But most of its income over the past ten years has come increasingly from tourism and second home development. Even the slightest suggestion that the county was being considered as a dump site for llrw created an unfavorable climate for potential investors to consider the county for further development.

It seems that certain land uses within a rural area are not compatible with a llrw facility. For our county's experience, it is certain that tourism and second home development are not enhanced by such a facility. I am sure that there are other land uses that conflict with siting a llrw in the vicinity: recreation, wilderness areas, prime agricultural

Acknowledged by card 12/30/81

land, mineral reserves, among others. Sensitivity to the goals of a community being considered for such a facility will go far towards finding a community willing to host such a facility.

GEN-1

On the reverse side, some current land uses seem to be more appropriate for the placement of a llrw facility: sites near or on existing nuclear facilities (nuclear plants; DOE reservations - Oak Ridge, Hanford, and Savannah River, among others.) The concentration of such multiple nuclear uses, if other technical criteria are met, certainly seem a practical way to go as the surrounding community already made an earlier commitment to a nuclear facility and might be more willing to welcome another phase of it.

The other area I would like to comment on is the long term care of facilities once they are closed. The U.S. Ecology Corp. has a rather messy history of abandoning llrw facilities in one state and opening others elsewhere. In the case of KY and Illinois, these states are left with perpetual care of dumps that are becoming each year a clearer public menace. It seems rather shortsighted for the government to allow a private company to make profits off of a inadequate operation then for the state to assume perpetual care for it once the situation becomes too hot for the company to handle.

D-59-3

I believe that such facilities should be operated by a quasi-public corporation that does not have profit making as its primary motive. Perhaps the level of competency would be higher than that experienced in the past. Perhaps not. But the issue of perpetual care would continue to be the responsibility of this public corporation rather than it being turned over to a state that is generally unable to adquately fund cleanup operations as needed.

D-59-3

I appreciate the opportunity to present these comments.

Sincerely,

Louise Gorenflo

CORRECTION NOTICE

TO: Recipients of PR-2, 19, 20, 21, 30, 40, 51, 61, 70, 73, 170 (46 FR 38081)

Comment Number 72 of the above rule has been miscoded. Please remove it from your file. Number 72 will not be used again.

Docketing and Service Branch
1/7/82

Oswald U. Anders
901 Linwood Dr.
Midland, Mich. 48640

December 30, 1981

'82 JAN -4 P5:09

(73)

Secretary of the Commission
U.S. Nuclear Regulatory Commission
attn: Docketing and Service Branch
Washington, D.C. 20555

COMMENT COUNTER PROPOSED RULE PR-2, 19, 20, 21, 30, 40, 51, 61, 70, 73, 170 (46 FR 38081)

Sir:

This letter is in reply to the notice published in the Federal Register Vol. 46 No. 142 of July 24, 1981, inviting public comment on proposed amendments to the Nuclear Regulatory Commission's rules to provide specific requirements for licensing of land disposal of radioactive wastes. I understand that the comment period has been extended to December 31, 1981 and I hasten to submit these comments with the postmark of that day.

The proposed rule making stands to become a landmark governing the disposal of low-level radioactive wastes as it, together with its detailed 4-volume Draft Environmental Impact Statement, represents the fruit of considerable and long-time effort of the Commission's staff, embodying their philosophy of government and experience with controlling the nuclear community.

As a member of that community I have personally felt the heavy hand of this control, its slow and inscrutable working, which, with all the good intentions and byzantine ritual of decision making, discourages and kills private initiative due to the mismatch of relaxation times between legalistic government action and the financial ability of the "regulated" to survive long enough to benefit from the action.

The present document substitutes recordkeeping and many layers of surveillance for technology available yet poorly understood by both regulators and the lay public. It substitutes "common sense" and proof by delay and survival for sound technical understanding and will invariably succeed to kill what it purpotes to regulate and make safe.

I shall direct my comments toward two areas: The licensing process and the Waste disposal technology, both subject of the proposed rulemaking which is with detailled emphasis overdoing the former what it lacks with respect to the latter.

GEN-4 The establishment of a disposal site and the operation of a disposal facility for low-level radioactive wastes is a serious enterprise requiring responsible people. The requirements for establishing such facilities urgently needed by the nuclear utility industry and others, as laid down by the proposed document, will de facto eliminate any private enterprise from the contention and reserve it to utility consortia and branches of the "government" which can proove financial capabilities for the long times contemplated and can afford the financing of the legal circus surely to develop upon the promulgation of the proposed document. Indeed much emphasis is placed on the establishment of this financial capability which is clearly seen as needed to keep the hordes of lawyers and "experts" in business who will migrate, like a minstral show from hearing to hearing as site after site in endless revolution attempts to attain the required 5-yearly extension of its existence permit. Personal experience regarding to these types of "public hearings" carried out presently by the Commission encourages me to nothing but scepticism, as such hearings typically drag on

B-9

Acknowledged by card. 1/5/82 mdv....

B-9

not for months but years, consult "experts" who make a carreer of it or house wives and people not at all familiar with the issues, who however qualify as concerned citizens and discuss subjects far afield.

The present document requires site [illegible] surveys that effectually drag on for at least a decade per site. The documentation for each is bound to fill more pages than NUREG 0782. De facto, this must be cleared with the "eventual owner" of the site, for unless such commitment is there ahead of time the entire preparation survey effort may be for naught. This pre-commitment is difficult to obtain as political currents may encourage the eventual "owner" to rescind its willingness to [illegible] exceed them.

[illegible] public hearings would be held [illegible] the preparation for [illegible] documentation etc. by the lawyers of the intervenors, the legal extensions granted during the "discovery phase" etc. drag out the process for months, say nothing about the [illegible]

Subsequent to the issuance of the license the disposal facility is constructed and waste receipt and disposal operations start. At intervals specified in the license, the normal term for materials licenses is currently 5 years, the licensee would be required to submit a license renewal application.... A public hearing would be offered." [illegible] would start all over again after [illegible] and closing of the facility would be discussed, and this every five years! I have a hard time seeing how the facility could make enough money, leave alone profit, to support this.

B-6

Once the licensee finds out that there is no business warranting the operation, and he applies for closing the site, he has to submit "a final closure plan for review and approval. A public hearing would be offered". I wonder whether he will still be around after this, unless the licensee is himself government. The "generator" of the waste will, of course, be required to finance the disposal [illegible] the fees he pays will have to keep [illegible] of disposal [illegible], will become so exorbitant as to greatly discourage the "generator" to send anything for disposal. He will rather store his stuff at his own site till he dies.

Anyone in any way involved in this activity, has to be prepared to face the [illegible] bureaucratic non-compliances which are associated with byzantine rules of record-keeping that no human can fulfill. Whether warranted because of public safety or not, he exposes himself to perpetual litigations about fines for non-compliance, public moral outrage at the hearings and the threat of losing permission to receive wastes for disposal - his way of staying in business. Yet at the same time he is not permitted to close the place down and [illegible]. Unless he is government he must be insane to submit to such torture without end.

Now, why does the regulatory agency find it necessary to propose these procedures? It clearly stems from lack of self-confidence of the agency relative to the technical matter, its paranoid fear of the public and inherent distrust, potentially justified, of anybody crazy enough to try to submit himself to these rules.

Now let us look at the other side of the picture. I am more qualified there as radiochemist.

D-55-12

The document states:"....remaining radioactivity is at a level that does not pose a danger to public health and safety." It deliberately avoids the cri-

D-55-12

terion in technical terms, for which the nuclear community has been waiting for more than a decade. It leaves the interpretation of this phrase forever to the lawyers [illegible] who will argue it ad infinitum during the various public hearings [illegible] enough technical data to set such [illegible] I urge the commission to adopt one such. I propose some fraction of the specific activity of some commonly mined uranium ore, or the equivalent to the highest-specific-activity topsoil accessible to the public within the continental United States, whereby the equivalency can be defined specifically for each isotope and mixture of isotopes. Such a simple definition would settle the question once and for all and put some floor under [illegible] discussions, admittedly at the expense of the legal community.

D-56-8

Radioactive waste can be made to defend itself and can be stored in such a way that the paths to the biosphere are small enough as to be of no consequence. Typically the present document places the emphasis on site and site structure. More effectively the waste form itself could be made, and should be made in a way so as to localize the radioactivity and not release it, no matter what the disposal site hydrology and disposal practice. The method cited in the document is typically the most unreliable and obsolete method of solidifying

D-56-19

liquids i.e. solidification with urea formaldehyde, a technique long recognized as unsatisfactory by the technical community. Solidification of aqueous wastes by incorporation into plastic matrixes, renders the radioactivity solid, virtually immobilized and unleachable, requiring less stringent site criteria. If formed in large enough blocks, typically up to 50 cu ft and larger, they would also discourage the inadvertent intruder, as it would require considerable effort to move or break up such waste forms. Waste treatment by volume reduction and subsequent solidification into plastic can effectively deal with liquid wastes. It can also accommodate wastes composed of pulverized or granular solids. Consideration must be given to sufficient cross linking of the plastic to give the structure sufficient rigidity and cohesive strength to counter osmotic pressure and swelling which can destroy the effectiveness of asphalts and

D-56-1

other weak matrixes. Absorbents as mentioned in 61.56(a)(3) are definitely unsatisfactory, representing obsolete technique. Leaching water will readily liberate the radioactive material from such matrixes and render them mobile.

D-56-8

The proposed rules place some weight onto the container of the waste, 61.56(b)(1). The typical container for low-level wastes are steel barrels. In the disposal site environment these containers are prone to rust, even in the desert if buried, and thus cannot really be relied on to not leak or give structural strength to the wastepile in the burial trench. Non-deformability of the waste form itself and efficient backfilling of the voids in the pile will avoid sinkhole formation causing rainwater and surface-water to be funnelled into the filled trenches.

D-55-12

I am very much in support of segregation of wastes by relative toxicity and hazard. I believe that a somewhat more sophisticated, potentially computerized, scheme, than that suggested in the document, can simplify procedures, save land and render less of it in need of perpetual care. For classification the amount per package and halflife as well as type of radiation emitted would be the important parameters. With segregation goes the requirement of stability and ageability. For solidification products the compressive strength, leachability, radiation resistance and biodegradability should be established prior to interment to provide for proper classification. Only unsuitably packaged wastes need to be placed into expensive vaults. The price would discourage the generator from sending such to the disposal facility.

C-4

I believe the document places too much consideration on the inadvertent intruder.

- 4 -

E-4 His needs are readily taken care of by placing the required cap onto the burial trench thick enough to divert surface water and remain unaffected by the freeze thaw cycle. No truly "inadvertent" intruder would burrow to more than 7 ft under the ground without considerable deliberation and knowing what he is doing. He can be sufficiently warned by a big enough monument e.g. concrete block 10 ft on edge, with inscription in deep relief announcing the inactive waste disposal site and its proper use e.g. as a golf course etc. [illegible] D-59-2

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

January 13, 1982

I hope that the above comments can still be considered for making the proposed addition to 10 CFR a workable document with which free enterprise and the nuclear establishment can live.

(84)

-2 et al

(46 FR 38081)

Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555
ATTN: Docketing and Service Branch

SUBJECT: Comments on the Proposed Rule Concerning the "Licensing Requirements for Land Disposal of Radioactive Waste"

Oswald U. Anders, Ph.D.
801 Linwood Dr.
Midland, Mich

Dear Sir:

These comments are submitted on behalf of Middle South Services, Inc. (MSS) in connection with the above subject matter. MSS is a technical services and support company for the Middle South Utilities System (MSU), which serves the electrical energy requirements of approximately 1,600,000 customers in portions of Arkansas, Louisiana, Mississippi and Missouri. The MSU System has five nuclear units and, therefore, is concerned with the development and implementation of the proposed rules.

MSS has maintained a continuing interest in the development of 10CFR61 over the last few years. The current rule, as proposed, incorporates a number of improvements over earlier drafts, and MSS wishes to commend the NRC on its continuing efforts towards further improvement. However, MSS continues to have a fundamental concern over the lack of a "de minimus" waste classification and the operability of waste separation according to the proposed Table 1. We also believe that other provisions of the proposed rule can be improved. D-55-2

Due to the unavailability of resources, we were not able to provide the detailed comments on the proposed rule that we would have liked to provide. In this regard we have participated in comments generated by the Atomic Industrial Forum and Utility Nuclear Waste Management Group and support the comments that are to be submitted by them. The following specific comments are submitted with regard to the proposed regulations.

"De Minimus" Waste Classification

D-55-2 MSS agrees with the Commission that there is a need for a "de minimus" classification of wastes that would be exempt from the 10 CFR Part 61 regulations. We believe that this is an issue of major importance, and we urge the Commission to establish this classification in as short a time frame as possible. To date, two types of wastes, Hydrogen-3 and Carbon-14, have been removed from regulation as radioactive wastes, under certain conditions, in 10 CFR 20.306. We believe that this regulation establishes a good model for the classification. It would be impractical to shorten the operating life of existing or a newly licensed site with wastes that could be disposed of at a municipal solid waste disposal facility without endangering human health or the environment.

1/22/82 emp

ESTABLISHED BY THE TREATY OF JUNE 9, 1855
CENTENNIAL JUNE 9, 1955

CONFEDERATED TRIBES AND BANDS
Yakima Indian Nation

GENERAL COUNCIL
TRIBAL COUNCIL

POST OFFICE BOX 151
TOPPENISH, WASHINGTON 98948

Secretary of the Commission
January 13, 1982
Page -2-

December 30, 1981

'82 JAN -5 P3:11

R. Dale Smith, Chief
Low Level Waste Licensing Branch
Division of Waste Management
[illegible] Nuclear Material,
Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

(74)

PR-2, 19, 20, 21 ... (46 FR 38081)

B-5 Section 61.27 of the proposed regulations discusses the application for a license renewal. In the preamble it is suggested that license renewal every five years. We believe that this requirement cannot be [illegible] pursuant to Section 61.53 (d), an environmental monitoring program must be maintained during the land disposal facility site construction and operation. Also the Draft EIS, Vol. 3, lists a number of extensive reports that must be maintained at the site, these include: (1) Personnel exposures; (2) [illegible] and disposal records; (3) [illegible] records; (4) [illegible] program; (5) Environmental monitoring data; (6) [illegible] records of site surveillance and monitoring (p. 3-35). Once a licensee has obtained his license he has demonstrated compliance with all the requirements of 10 CFR Part 61. The Commission still has authority over the licensee during operation and post-operation, and through its Inspection and Enforcement Branch is able to monitor the activities at the disposal site. Therefore, we feel that licensee renewal is unduly burdensome. [illegible]

Dear Mr. Smith:

The Yakima Indian Nation considers that no rules ... [illegible] the interest of the Yakimas ... involved until the Yakimas have in fact taken part in the rule making.

Waste Treatment

DF-52 Since the Yakimas have a Treaty with the Federal Government since 1855 and that Treaty [illegible] with inalienable Rights, we feel that the [illegible] Government [illegible] in the Federal Register [illegible] of the Yakimas themselves. [illegible] exclusively for [illegible] exclusion refers to the [illegible] interpreted as requiring [illegible] This would prevent the [illegible] at the disposal site. We [illegible] treatment.

GEN-7 The purpose of this letter therefore is to notify you that we not only request but claim the time to study and evaluate these rules so that we may present to you our own words [illegible] on the matter of these rules.

D-55-6 MSS is concerned that the proposed categorization of waste by radioisotope concentration would place an overly time-consuming and costly burden on LLRW generators. Most wastes are composed of a mixture of various isotopes at varying concentrations and it would be extremely difficult if not impossible to separate and categorize our wastes according to Table 1.

Sincerely,

Russell Jim

Russell Jim, Councilman
Yakima Indian Nation

Acknowledged by card 1/7/82 mdv

THE UNIVERSITY OF TEXAS MEDICAL BRANCH
GALVESTON, TEXAS 77550

'82 JAN -5 P3:12

December 29, 1981

Office of Environmental Health & Safety
Room 106 Basic Science Building
Area Code 713/765-4190

Low Level Waste Licensing Branch,
Division of Waste Management
Office of Nuclear Material Safety & Safeguard
U. S. Nuclear Regulatory Commission
Washington DC 20555

(75)

DOCKETED PR-2, 19, 20, 21, 30,
RULE 40, 51, 61, 70, 73, 170
(46 FR 38081)

Attention: R. Dale Smith

Gentlemen:

I understand that you are still receiving comments on the proposed Part 61 and associated amendments to other parts of the regulations. Please consider the following comments:

B-3 1. Knowing the history of licensing delays within the Nuclear Regulatory Commission and particularly those associated with major licensing actions, the regulations should require the NRC to either approve or deny license applications within a specified period of time. Applicants who have options on land or own land that could be used for other purposes may incur substantial financial losses due to unreasonable delays. Therefore, they should be compensated for those losses if the Nuclear Regulatory Commission unduly delays licensing action.

ED-1 2. Section 61.4. It would probably be more appropriate to express limits in terms of dose commitment rather than annual dose, particularly in cases where releases may be intermittent or one-time only.

D-55-1 3. Concentrations listed in Table I of Section 61.55 are unduly restrictive for beta emitters not specifically listed.

M-1 4. Section 20.311(d)(1)(2) unnecessarily duplicates the requirements of Section 20.311(e)(3) and 4. There is no need for the licensee to perform these activities if they are to be performed by the processor.

M-2 5. Section 20.311(d)(3)(e)(5) should be more specific about the items to be included in the Quality Assurance Program.

Acknowledged by card. 1/7/82 mdv

D-56-7 6. Section 61.56(a)(8) places an unnecessary and prohibitively expensive burden on licensees who use biological material, particularly medical users. Known infectious material should certainly be treated, but it is unreasonable to require treatment of all biological specimens.

7. It is not clear whether or not Section 61.56 will permit continued land disposal of liquid scintillation fluid. If not, this will present a problem to many licensees, particularly those in agreement states that still require that liquid scintillation fluid be disposed of as radioactive waste.

I hope these comments will be of benefit to you in promulgation of these regulations. In general, I feel the approach taken is reasonable and workable. Thank you for the opportunity to comment.

Sincerely,

Leo Wade, Ph.D.
Director

LW/ar

cc: Bureau of Radiation Control
Texas Department of Health
Attn: Mr. David Lacker
1100 W. 49th St.
Austin TX 78756

Mr. Saul Harris
Nuclear Program Mgr.
Edison Electric Institute
1111 19th St. N.
Washington DC 20036

30 December 1981

'82 JAN -7 P2:14

Secretary of the Commission
US Nuclear Regulatory Commission
Washington, DC 20555

(76)

DOCKET NUMBER
PROPOSED RULE PR-2,19,20,21
30,40,51,61,70,170
(46 FR 38081)

Sir:

The following comments are made in response to the Proposed Rules describing Licensing Requirements for Land Disposal of Radioactive Waste (Ref.: Federal Register/Vol. 46/No 142/Friday, July 24, 1981, pg. 38081 ff).

GEN-1 Para 61.51(a)(6) "The disposal site must be designed to eliminate the contact of water with waste during storage, the contact of standing water with waste during disposal and the contact of percolating or standing water with wastes after disposal." Comment. The word eliminate is an absolute term and if taken literally requires that the soil around the burial pits and the backfill or cover have zero water content. Even desert soils and soils which have been heated to above the boiling point of water and then stored in the open have finite water contents. As written, this paragraph precludes any permanent contact between soil and waste because all soils contain the compound H_2O. This restriction surely is not the intention of the writers of this draft regulation. Additionally, the elimination of contact with percolating water after disposal requires a perfect hydraulic barrier between the ground surface (where it rains) and the waste. There is no such thing. Even the best built ship leaks. All soils have finite permeability so it is inevitable that there will be some contact of percolating water with waste if soils are used as the barrier. The intent should be to reduce the amount of percolation to very small levels, not to eliminate it. If Para 61.51(a)(6) remains as written, it will never be satisfied by the developer of a LLW storage facility and therefore unless this provision is modified or waived there will be no licenses granted. The term "eliminate" is not necessary for the preservation of public health and safety. "Minimize" would be an appropriate word to substitute for eliminate.

D-50-2 Para 61.51(a)(8) "Any groundwater discharge to the surface within the disposal site must not originate within the hydrogeologic unit used for disposal." Comment. If discussion on this point is correctly understood from the Site Suitability Symposium (Washington, 8-9 December 1981) and NRC Technical Position Paper on "Site Suitability and Site Characterization" undated but distributed 9 December 1981, it is the intent that no surface-water features sustained by groundwater discharge be present within the site boundaries and further, if groundwater does discharge from the receiving hydrogeologic unit beyond the site, the travel time must be so slow to allow radioactive decay to protect the individual users and general population. It is suggested that this paragraph be rephrased to be more specific.

Acknowledged by card. 1/7/82 mdv

30 December 1981

D-52-3 Para 61.52(a)(8) "A buffer zone of land must be maintained between any buried waste and disposal site boundary. The buffer zone shall extend at least 100 feet outward from the outermost waste disposal site." Comment. A buffer zone is required for safe operation however the small distance of 100 feet is questioned. Presumably, from descriptions given in other portions of the proposed rule, the disposal site will be located in a sparsely populated area so land acquisition is not a problem. Therefore, it is suggested that a buffer zone of at least 300 feet and possibly as much as 500 feet be mandated. This increased distance will be advantageous for working space and remedial activities should an accident occur and will prevent close-in development of property by adjacent property owners during periods of operation, closure, and institutional control.

Sincerely,

PAUL F. HADALA
905 Santa Rosa Drive
Vicksburg, MS 39180

DON C. BANKS
302 Enchanted Drive
Vicksburg, MS 39180

January 6, 1981

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

(77)

DOCKET NUMBER PR-2 et al
PROPOSED RULE (46 FR 38081)

Paragraph 61.7(c)(2) states:

RE: "...Periodically, the authority to conduct the above surface operations and receive waste will be subject to license renewal, at which time the operating history will be reviewed and a decision made to permit or deny continued operation..."

Dear Secretary: We understand the above requirement to mean that the disposal facility operating license must be renewed periodically, at five year intervals. This is not appropriate since the operation of the disposal facility is viewed by NRC and industry as a long-term activity. Therefore, the license should be for the operational lifetime of the facility as is the current licensing practice for operating plants. This would require a long-term commitment from the facility operator while at the same time prevent a possible periodic disruption of service.

B-5

Furthermore, periodic license renewals are unnecessary as NRC has authority to perform inspections under Paragraph 61.82 and to take appropriate action in instances of violation under Paragraph 61.24 and 61.83 of this rule, including revoking or suspending any license. (Additional comments on public hearings associated with license renewals are provided under item 5.)

Georgia Yuan

3. Transuranic Limit

Paragraph V.B. states:

"...The Commission is applying a 500 mrem/yr maximum individual exposure limit for this unusual case. (intrusion) This limit is based on ICRP recommendations for dose limits to individuals and is a level that is recognized as providing adequate protection. Since only one, or at most a few, persons would be involved, it is not necessary to consider a population dose. This limit is then used to determine the allowable concentrations of nuclides in each class of waste. (See Paragraph 61.42) ..."

D-55-3

As stated above, Paragraph 61.42 provides a 500 mrem/yr accidental instrusion dose limit for the isotopes listed in Table 1, including transuranics. Yet this stated criteria (500 mrem/yr) was apparently ignored in the development of the maximum allowable concentration for alpha-emitting transuranic isotopes for Class C waste. Rather, Paragraph V.C. states:

Acknowledged by card 1/12/82 emp

-4-

PUBLIC PARTICIPATION IN LICENSING DECISIONS -
A NECESSARY PARTNER FOR TECHNICAL SITE SUITABILITY

"...For most of the alpha emitting transuranic nuclides, the maximum allowable concentrations were calculated to be in the range of 10 nanocuries per gram currently imposed by disposal facilities. These calculations were conservatively based, in the that did not allow credit for dilution with other wastes. If this factor were changed, the values would increase somewhat. A decision was made not to recalculate in order to come up with higher values. This decision is based on two factors. First, in the spirit of the ALARA (as Low as Reasonably Achievable) concept, the lower value of 10 nCi/g has been demonstrated as an achievable concentration to the disposal of transuranic nuclides. This value has been imposed by the Department of Energy for some eleven years and by most of the commercial disposal site operators for nearly that long. The last commercial site imposed the 10 nCi/g restriction in 1981. Thus, there is no need to increase the limit from the standpoint of achievability..."

D-55-3

One of the major problems the NRC needs to address is the development of consistency throughout its regulations. There is no technical justification for arbitrarily lowering the limits on the maximum allowable concentration of Class C transuranic waste to 10 nCi/gm from that value necessary to limit intruder dose to 500 mrem/yr. Establishment of a limit simply because it is believed to be achievable does not constitute a valid or rational basis in the absence of a cost/benefit analysis.

An EPRI study described in NP-1494, "Activity Levels of Transuranic Nuclides in Low-Level Solid Wastes from U.S. Power Reactors" presents the results of isotopic analysis of various waste streams from 25 nuclear plants. Although for transuranic isotopes, the median values were within the 10 nCi/g proposed limit, there were dozens of analyses of Pu-239, Am-241, Cm-242 and Cm-244 which contained concentrations in the 10-100 nCi/g range. These results clearly show that the 10 nCi/g limit on transuranic elements is not readily achievable in all cases and could cause needless hardship and expense. The statement that ALARA, therefore, is justification for establishment of this arbitrary limit is a blatant misuse of this concept. The "Reasonably Achievable" concept within ALARA is just as important as the concept of "As low as..."

We also call your attention to the fact that the House Science Committee, during a recent mark-up session on HR 5016, voted to expand the definition of transuranic waste from 10 to 100 nCi/g.

Paragraph 61.55 - Table 1

At present the burial sites in South Carolina and Nevada will not accept any waste that has transuranics above 10 nCi/g. However, alpha-emitting transuranics that are found in nuclear power plant radioactive waste are not the isotopes of major concern. Therefore, we recommend that Columns 1 and 2 of Table 1 permit burial of alpha-emitting transuranic isotopes of up to 100 nCi/g when the isotopes have been identified and rationed to specific gamma-emitting isotopes. We also recommend that Class A and B waste limits should also be established for Pu-241.

D-55-3

[illegible] as the intruder pathway (i.e. long-term potential for hazard) is the basis for the TRU limit, Cm-242, which has a 163 day half-life should be exempted from whatever limit is ultimately established for TRU wastes.

D-55-5

Paragraph 61.55(d)

The paragraph indicates that radioactive wastes with concentrations that exceed the values shown in column 3, are not generally acceptable for near-surface disposal and shall not be disposed of without specific Commission approval [illegible] 61.55 [illegible] This requirement would clearly create problems for spent resin shipments from our nuclear facilities. [illegible] recommend that the [illegible] specify the criteria the Commission intends to use in authorizing disposal of wastes which exceed the limits for class C wastes [illegible] column 3 of Table 1.

C

D-55-2

5. De Minimus Concentrations

Paragraph V.G. states:

"...The Commission recognizes the need for a "de minimis" classification of wastes, wastes that would be exempt from Part 61 and would be considered of no regulatory concern... The Commission believes, however, as the Federal Radiation Policy Council has recommended, that such exemptions should be determined on a specific waste basis. In this regard, a recent rulemaking (46 FR 16230) established such an exemption in a new § 20.306 for certain levels of tritium and carbon-14 contained in liquid scintillation and animal carcass waste. Other wastes may also readily lend themselves to treatment in this manner. The Commission will be working over the next 2 years to define these wastes and provide for additional exemptions as appropriate. Thus, Part 61 will not establish a generic "de minimis" category for waste..."

Northeast Utilities supports the "de minimus" concept and encourages the prompt establishment of the necessary criteria. It appears to us that broader use of the "de minimus" classification would result in conservation of waste disposal site area while maintaining protection for the health and safety of the public. The AIF's National Environmental Studies Project has issued a report entitled "De Minimus Concentrations of Radionuclides in Solid Wastes" which should be reviewed by the Commission.

B-9

5. Public Hearings

Paragraph V.G. states:

"...The life of a typical facility can be broken into 5 phases: [illegible] operational, closure, [illegible] observation, and institutional control...at intervals specified in the license, (the [illegible] license [illegible] currently 5 years) the licensee would be required to submit a license renewal application (§ 61.27). At this time, the disposal site closure plan and funding requirements would be updated and financial arrangements for assurance of adequate funding reviewed. A public hearing would be offered..."

Northeast Utilities has reviewed the five phases that make up the life cycle of the disposal facility. Within these five phases there are provisions for multiple public hearings.

1. The first public hearing is provided for subsequent to docketing the license application.

2. During operation, public hearings are provided for at each of the 5 year license renewals. For a typical facility with a 25 year life, public hearings would be held at 5, 10, 15 and 20 years after initial operation.

3. A public hearing is provided for at the time of site closure, i.e., the 25th year.

4. The final hearing is provided for at the time of license transfer, i.e., about 5 years after closure or the 30th year.

Thus, for a disposal facility with a 25 year operating life, the regulations provide for a total of seven public hearings. [illegible] Northeast Utilities supports the concept of State participation, and believes that all pertinent issues should be addressed prior [illegible] obstructionist tactics some parties have utilized at public hearings and the [illegible] these have had on cost and schedule of a project.

The provision for a multitude of public hearings with their pernicious [illegible] construction, operation, closure and [illegible] that no private and [illegible] to subject themselves to this degree of regulatory [illegible]

INTRODUCTION

Licensi[illegible] for nuclear facilities are well known [illegible] for stirring [illegible] polarize public opinion. Even though the disposal of low-level radioactive waste has been practiced for nearly 20 years, it [illegible] raise[illegible] disposal [illegible] rents anxious [illegible] and from Cong[illegible] Policy Act ([illegible] on States to be "responsible" for disposing of low-level radioactive waste generated within their borders [illegible] sites couple[illegible] problem have crea[illegible] and available di[illegible]

Meeting these [illegible] clear definition [illegible] and (2) public acceptance of disposal facilities. Until these two requirements [illegible] plague radioactive [illegible] opening of [illegible] (NRC) has amended its licensing regulations for low-level radioactive waste disposal.(1) Unfortunately, these amendments neither define the characteristics of a good site nor provide mechanisms for increasing public acceptance of disposal facilities. The discussion below reviews the problems with the Commission's amendments and the consequences for radioactive waste disposal.

SITE SUITABILITY REQUIREMENTS

Among its licensing amendments, the NRC has introduced "technical requirements for site suitability", an expression implying a recipe or guide for choosing locations which will safely confine [illegible] time. Sit[illegible] suit[illegible] function, yet that [illegible] suitability so [illegible] clear. Inst[illegible] B-9, state[illegible] radioactivity to create a s[illegible] the NRC expects that site characteristics combined with engineered barriers and a c[illegible] meeting the performance objectives. This approach provides greater flexibility to the applicant in proposing a site and design for low-level radioactive waste disposal.

The utilization of both technical requirements for site suitability [illegible] performance objectives were di[illegible] ment (hereinafter [illegible] of the li[illegible]

"Perfor[illegible] in [illegible] imum [illegible] and [illegible] disposal [of low-level radioactive waste]. ...Performance objective requirements , however, require more effort and time in development as well as in licensing of specific facilities due to the large number of factors that must be considered to determine compliance. ...
It would be easy for an applicant or licensee to

> demonstrate compliance with prescriptive requirements...since engineering limits are established which can be readily measured or calculated and the specific requirements for the design and operation of a [low-level radioactive waste] disposal facility would be clearly defined and readily apparent to an applicant or licensee". (2)

Although the performance objectives achieve their goal of providing flexibility, the technical site suitability requirements are not true prescriptive requirements as defined above, and do not make demonstrating compliance "easy" as indicated in the Draft EIS. In fact the technical site suitability requirements will be just as difficult to apply as the performance objectives since in most cases the requirements rely on compliance with the performance objectives to define suitability. The Draft EIS further stated that the site suitability requirements are merely "common sense". Rather than defining suitable characteristics, the NRC plans to eliminate bad sites with the application of its technical requirements reserving judgement on what is suitable for the licensing process:

C-1

> "NRC has set out what are believed to be common sense site suitability requirements that can be consistently applied throughout the country. ...The requirements are intended to eliminate,...certain characteristics that are known to or have potential to lead to long-term problems." (2)

Thus, the NRC has not defined a suitable site but has underscored some characteristics of an unsuitable site. However, the Commission's attempt to define unsuitability is too general to be very useful in identifying sites which cannot be considered for licensing.

D-50-1

A brief review of some of the technical requirements illustrates this point. One requirement is: "The site shall be capable

of being characterized, modeled, analyzed and monitored." This requirement does not significantly narrow the spectrum of sites which the NRC could judge as suitable. Presumably, the NRC is implying that it favors sites which are geologically and hydrologically "simple" so that models can be relied upon to predict and monitor the transport of radionuclides from the site. However, this requirement places no bounds on how simple a site must be nor on how well characterized, reliably modeled, thoroughly analyzed or carefully monitored. Furthermore, this requirement merely restates the need to comply with the performance objectives since compliance with the objectives already requires utilization of predictive transport models which themselves must be derived from accurate characterization, analysis and monitoring of the site.

D-50-1

Another requirement is: "Upstream drainage areas must be minimized to decrease the amount of runoff which could erode or inundate the disposal cells." This requirement, aptly characterized as common sense, relies on the NRC interpretation of "minimize" and does not constitute a truly prescriptive requirement since no limit is set on either the size of the drainage basin or the anticipated erosion rate at the site. Until the NRC reviews a specific site the applicant does not know whether runoff has been sufficiently minimized for the purposes of obtaining a license.

D-50-3

Another requirement states that: "Areas must be avoided where tectonic processes such as faulting, folding, seismic activity, or vulcanism may occur with such frequency and extent

D-50-5

D-50-5

to significantly affect the ability of the disposal site to meet the performance objectives...or may preclude defensible modeling and prediction of long-term impacts". This requirement relies on application of the performance objectives to determine if tectonic processes at the site make the site unsuitable. Reliance on the performance objectives makes the requirement difficult to apply and redundant. The requirement only guides site selection if the NRC can describe tectonic conditions which deem the site unsuitable independent of compliance with the performance objectives. Otherwise, the NRC is only providing a glimpse at which site characteristics are important to the licensing decision.

D-50-3

Finally, the NRC requires that: "The disposal site must be generally well drained and free of areas of flooding or frequent ponding. Waste disposal shall not take place in a 100-year flood plain, coastal high-hazard area or wetland." The latter part of this requirement is prescriptive in that it states clearly a condition which is not suitable for waste disposal. However, the first part of the requirement again sets no standard for what is acceptable. The frequency of allowable ponding is not specified and well drained is not defined.

C-1

The technical requirements, including those discussed briefly above, in practice warn applicants to be wary of certain site characteristics which the Commission has highlighted but, do not provide a clear definition of suitable site characteristics. This need to maintain technical requirements which are general in nature results directly from the "systems approach" which

C-1

emphasizes the interactions and strengths of all the components in a disposal system (site, engineered barriers, waste form etc.) to contribute to the overall goal of waste disposal-confining radionuclides.(3) Site suitability defined in this context allows each site to be judged in light of the entire disposal system being proposed rather than representing an ideal site. The necessity of this approach is supported most clearly by considering its alternative. If the NRC issued technical requirements which rigidly defined an ideal site it would severely limit the possible number of acceptable sites in the country. Future sites might be concentrated by necessity in arid regions of the western U.S. Since most low-level radioactive waste is generated in the eastern half of the country, this siting pattern would result in increased transportation distances, costs and risks from accidents. In addition, as recognized in the Draft EIS, prescriptive requirements focus on components of the disposal system deemphasizing the importance of the system as a whole.

However, although more flexibility in locating sites for radioactive waste disposal is attained by emphasizing the entire disposal system and identifying only general technical requirements, other problems are created. Since site suitability for radioactive waste disposal cannot be more specifically stated using this approach, controversy over its meaning will likely surface during the licensing process. Understanding the political context in which the licensing decision will be made sheds light on this problem.

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cmp

THE POLITICAL CONTEXT

F-1

Radioactive waste disposal is a politically charged social issue. Low-level radioactive waste disposal like all nuclear issues is a problem with national and local tensions. At the national level, it is inextricably linked to the debate over nuclear power. This debate enters low-level radioactive waste decisions because 50% of all low-level radioactive waste is produced by commercial power reactors. A recent voter initiative (Initiative 383) in the State of Washington noted this fact and attempted to ban the disposal of low-level radioactive waste from nuclear power reactors while allowing the disposal of non-reactor waste. At the local level, the public is concerned about low-level radioactive waste because the major impacts from disposal activities will be born by citizens living near disposal sites. Increased traffic, potential leakage of radionuclides, the dedication of land in perpetuity, these are all consequences a local population bears. The strength of the sentiments felt by State government in dealing with these problems was seen in October, 1979, when the possible closure of all three disposal facilities was threatened by Governors of Washington, Nevada and South Carolina over inadequate packaging and transportation practices as threatening the safety of waste disposal in their States. Temporary closure of two of these disposal operations created concern that nuclear activities might have to cease until disposal capacity could be made available again. Limited storage capacity at hospitals and universities received widespread media attention. South Carolina has since halved the amount of waste it will allow buried in the State each

year and the State of Nevada [illegible] in court for the right to close down the site at Beatty, Nevada. Finally, the passage of the Low-Level Radioactive Waste Policy Act last year, focused national attention on State responsibility and rights in providing waste disposal.

The enclosed comments were prepared and reviewed by the Nuclear Society members of the Fuel Cycle and Waste Management Division.

F-1

THE PROBLEM

The NRC licensing process addresses this complex social issue by emphasizing technical requirements and providing highly formal and limited opportunities for public participation. The licensing process does not take into account heightened public awareness of the political and health questions related to radioactive waste disposal. Thus, the major problem with relying on the licensing process to apply loosely defined technical requirements in the regulations is the inevitable controversy that will result when the public challenges the acceptability of radioactive waste disposal and asserts its rights to be part of the licensing process. Interpretations of the general language used in the requirements are easily challenged, hence the determinations of site suitability based on those requirements are likewise easily challenged. Controversy will shape the debate over site suitability.

The licensing proceeding for the Diablo Canyon nuclear power plant in California serves as an example of this problem. The major technical issue is whether the plant's location 2.5 miles from a fault could cause failure of essential safety mechanisms in the reactor during a major earthquake. Experts in active faulting and seismology have argued on both sides while the Pacific Gas

and Electric Company, owner of the plant, has weathered 8 years of construction, 36 federal hearings, 4 state hearings, 3 licensing appeals and 2 Congressional inquiries.(4) Resolving the seismic issue is complicated by the incomplete development of the science and the discovery of the problem after more than 75% of the reactor had been built.(4) The late recognition of the problem and reliance on a licensing process which utilizes formal hearings to resolve controversial issues only contributed difficulties to an already intractable problem. The uncertainties in the technical data fuel the controversy and the NRC has yet to devise a way of increasing public trust in its decisions or judgement.

F-1

PUBLIC ACCEPTANCE

Lessening public opposition to agency activities is often the primary motivation for including the public in decision making. The NRC recognized the need to provide public participation opportunities in its licensing process and attempted to channel public concern into aiding the licensing decision. The licensing process has been amended to include several opportunities for formal hearings and a mechanism for States and Tribes to participate in the technical review of the site proposed for waste disposal. However, these mechanisms do not address public acceptance of waste disposal and are not adequate for conflict resolution or identification at any stage of the licensing proceeding. A brief summary of the NRC provisions for State and Tribal participation provides some insight to the weaknesses of these mechanisms.

F-1

Opportunities for State and Tribal participation begin after

submission of an application for a license. Following formal notification in the Federal Register, a State or Tribe has 120 days to submit a proposal for participation in the review of the license. The proposal must include:

* a description of how the State or Tribe wants to participate;
* a description of the material the State or Tribe wishes to submit to the NRC for inclusion in the review;
* a description of the work the State or Tribe wishes to perform for the NRC; and
* a preliminary estimate of the types and extent of the impacts the State or Tribe anticipates as a result of the waste disposal activities. (1)

F-1

This provision invites States or Tribes to assist the NRC in its licensing decision but does not give them any decision making power, nor does it guarentee them any influence over the NRC's decision. It is not clear what standard the NRC will use for granting these opportunities and it is not clear how the NRC will weigh the information gathered in this manner in the licensing decision. In addition to these disadvantages, this mechanism for participation appears particularly weak in contrast to the opportunity to participate in the Agreement State program. In this program, a qualified State can regulate radioactive waste disposal itself and discretion over the issuance of licenses is transferred from the NRC to the appropriate State agency. The possible advantages of merely assisting in an NRC decision do not clearly outweigh the option of attaining Agreement State status. Although the NRC amendment allows participatory rights to Tribes which currently can not attain Agreement State status, the type of participation proposed by the

F-1

Commission remains a weak and uncertain mechanism for influencing the decision making process.

The public participation methods proposed by the NRC reinforce the existing pattern in nuclear facility licensing, relying on formal public hearings to both gather and disseminate information and initiating formal contact with the public only after an application for a license has been made. Public hearings offer only limited one-way communication. The agency presents its proposal and receives formal testimony that tends to summarize positions rather than resolve issues.(5) This highly formal process frustrates the public which may be hearing about the proposal for the first time and does not provide the agency with the type of information it can use in making a decision. The public's comments often seem unsophisticated and ill-informed, a direct consequence of their limited opportunities to learn about and take part in planning up to the hearing stage.

A recent Congressional investigation of Federal regulations pointed out two major hinderances to effective public participation in the existing regulatory process related to the timing of public participation long after the beginning of informal discussions between the applicant and the NRC:

> " By the time notice is posted in the Federal Register, the staff of the Nuclear Regulatory Commission typically will have worked with the applicant...for a year or two on the technical details of the application.
>
> Not only does this process give the agency staff vested interest in the application as it stands, but the public is usually shut out of the early, and often determinative, stages of the process. ...
>
> By the time the public can get involved in a decision, so much money has usually been spent by the [applicant]...in planning and studying the site that it becomes uneconomical to change the course of action."(6)

F-1

The NRC amendments continue to provide too few opportunities too late for meaningful public participation. The need for public participation and the lack of public acceptance of agency decisions stem in part from lack of communication between the agency and the public:

> "Concern for participation arises almost entirely in the context of real or imagined failure of government to respond appropriately to the more competitive needs and demands of citizens, some of whom feel that the response would have been more satisfactory had their values been given an assured fair hearing." (7)

If the NRC is to encourage public participation, it must develop with the public a relationship akin to the one it has with the industry it regulates. The NRC should begin informing the public about radioactive waste disposal plans when it begins discussing those plans informally with the applicant.

The Commission should require the applicant to identify local concerns and to inform the public and its representatives in government about the type of facility which is being proposed. The NRC recognized the potential for early public participation in its regulations when it considered an option requiring a notice of intent to file an application 3 to 6 months prior to the actual filing. This requirement encourages early participation and could result in early identification and factoring in of public concerns in the applicant's proposal. The NRC rejected this option for the following reasons:

> "...(1)it added an administrative burden on the applicant; (2)from a practical standpoint, it is probably not needed to assure early state input; and (3)its purpose can be accomplished by other means." (2)

These reasons for rejection must be balanced by the benefits of

of the requirement. Although the applicant may already have reasons for seeking State input, there is little incentive to seek local or citizen input. Documentation of how the applicant sought public participation prior to submitting an application and reasons for incorporating or rejecting these concerns are important to building a credible record with the public and in gaining acceptance of the facility. The NRC should reconsider this option in a form that would go beyond public hearings and formal testimony to one which would incorporate an interactive approach for gathering and disseminating information about the proposal. F-1

Beyond the formal requirements and review of specific aspects of a license there are other considerations in increasing public participation in agency decisions. How the public contributes, who should represent the public and how the NRC plans to use the information it receives should be primary considerations in the development of a relationship with the public. Of course, it cannot be expected that increased public participation will necessarily result in easier decision making. More likely, the NRC will find itself responding to increased pressures to decide issues in a greater variety of ways while being pulled in conflicting directions by new constituencies. However, Congress recognized that relying on a more varied constituency and a larger information base can yield positive results for the agency:

> "Specifically the presentation of alternative viewpoints which is a consequence of broader participation checks possible imbalance in several ways. First, agency decision makers are provided with a greater range of alternatives and information. Second, participation promotes agency autonomy by widening the official perspective of agencies and providing an alternative basis of support." (6)

Finally, it should be emphasized that greater public participation although commonly viewed as a cause of delay in the licensing process, must be also viewed as a necessary means to seeking acceptance of waste disposal. In some cases public participation may actually speed up controversial proceedings by avoiding the lengthy alternatives of litigation and appeals: F-1

> "[In the view of the Senate Committee on Governmental Affairs], the fact that an additional party participates in an...agency proceeding does not mean that the proceeding will be delayed. ...Ultimately...the over all time elapsed may in fact be lessened, since if all relevant issues are resolved in the initial proceeding, the likelihood of a subsequent court reversal to consider relevant issues is substantially reduced and along with it the risk that the agency will simply have to go through its paces all over again." (6)

With these caveats in mind, suggestions for constructing a successful public participation program can be made. The NRC should identify its primary goals in seeking information from the public, for example:

* identification of public opposition or support and its causes;
* identification of local or State preferences for locations within the State or region for radioactive waste disposal;
* identification of preferences for State or Federal ownership after disposal operations have ceased; and
* identification of the need to compensate the local population for increased risks resulting from waste disposal.

In addition, the NRC should initiate educational opportunities for local, State or Tribal governments so that they are better equipped to understand information in the licensing process.

F-1

This information exchange will improve citizen participation by providing a clearer concept of the disposal facility and its potential problems.

Who represents the public has always been a problem in designing public participation programs. The NRC has restricted its public participation to State governments and Tribal representatives These representatives of the public contribute a limited perspective on public concerns and must themselves incorporate balancing decisions in order to fairly represent the geographic regions which define their constituencies. While State concerns may be focused more on financial problems, long-term monitoring responsibilities and ownership, the concerns of local citizens may tend to emphasize impacts on the community from construction, the influx of labor, demands on housing and social services and increased health hazards. The NRC should expect to include a variety of representatives of the public so that the perspectives and interests of those both directly and indirectly affected by radioactive waste disposal can be heard in the licensing process.

Finally, perhaps the most significant aspect of seeking public participation is how the NRC uses public opinion in formulating its licensing decisions. The history of public involvement in federal agency decision making is so infested with failure to consider public opinion that researchers have coined the term "cooptation" for the usual outcome of the heavily relied on public hearing :

> "A public hearing serves a cooptation function when the goal of the hearing is to let irate citizens and interest groups let off steam and complain about the project. The posture of the decision makers may be one of responsiveness. While it is implicit that public input will have no impact on the program or on policy, people are formally given a chance to have a say so they may not take the agency to court for failure to provide public involvement. By attending and presenting their case to an unresponsive agency, the opposition has been unwittingly coopted into serving the goals of the agency."(8)

F-1

Until the Commission is able to gain public trust in its judgement and until the public accepts radioactive waste disposal, the NRC may find it impossible to license a radioactive waste disposal site without coopting or appearing to coopt the public. The NRC is afterall a regulatory agency mandated to regulate in the public interest. Definition of the public interest requires a broad disinterested view of the public opinion and welfare. The Commission must seek a more interactive relationship with a broad spectrum of the public before it can begin to define the public interest and rely on it in its licensing decisions.

CONCLUSIONS

The NRC licensing process ensures that low-level radioactive waste disposal sites can be considered for licensing in almost any area of the country. The technical siting requirements eliminate only extreme consitions which common sense would dictate unsuitable. Yet the Commission has overlooked a key problem in its licensing process - likely public opposition to decisions which are based on technical adequacy with no meaningful opportunities for public expression of acceptance or opposition and no provisions for conflict resolution. The remedy lies in equal attention to the political and social context in which the questions of technical adequacy are answered. Public concerns over non-technical issues as well as public understanding of what site

suitability means must influence the licensing decision if low-level radioactive waste disposal is to continue.

REFERENCES

1. 46 Federal Register 38031-38105 (July 24,1981).

2. U.S. Nuclear Regulatory Commission, Draft Environmental Impact Statement on 10CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste", NUREG-0782, 3Volumes (September, 1981).

3. U.S. Department of Energy, Report to the President by the Interagency Review Group on Nuclear Waste Management, TID-29442, UC-70 (March, 1979).

4. R.J. Smith, "A Seismological Shoot-out at Diablo Canyon," Science 214, 528-529 (October,1981).

5. A.B. Bishop, M. McKee, R.D. Hansen, Public Participation in Public Policy Information: A State-of-the-Art Report, Y/OWI/SUB-77/22335 (1977).

6. U.S. Senate, Committee on Governmental Affairs, Study on Federal Regulations prepared pursuant to Senate Resolution 71, 6 Volumes (September, 1979).

7. J.A. Riedel, "Citizen Participation: Myths and Realities", Public Administration Review 32, 211-220 (May/June, 1972).

8. T.A. Heberlein, "Some Observations on Alternative Mechanisms for Public Involvement: The Hearing, Public Opinion Poll, the Workshop and the Quasi-Experiment", Natural Resources Journal 16, 197-212 (January, 1976).

THE UNIVERSITY OF ARIZONA
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COLLEGE OF ENGINEERING
DEPARTMENT OF NUCLEAR ENGINEERING

'82 JAN 11 P3:29
emp

January 7, 1982

(78)

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

DOCKET NUMBER
PROPOSED RULE PR-2 et al
(46 FR 38081

Attention: Docketing and Service Branch

Subject: Proposed Rule 10CFR61

Dear Sir:

It is my understanding that the comment period for Proposed Rule 10CFR61 has been extended until January 14, 1982. In view of that I would like to make the following general comment:

D-51-4 In addition to the Proposed Rule 10CFR61 there have been generated by other agencies of the federal government a number of documents pertaining to waste disposal. It has come to my attention and undoubtedly others that there are inconsistencies in definitions of key words in these documents. For example, in Part 61 the definition of "Engineered Barrier" is "a manmade structure or device that is intended to protect an intruder from inadvertent exposure to radiation from certain wastes." In the DOE Site Design Criteria for the Shallow Land Disposal of Solid Low-Level Radioactive Waste the term "Engineered Barrier" is defined as "an addition to the geologic environment which has been designed and emplaced to minimize or preclude radionuclide transport, or human intrusion, or to preserve the integrity of the disposal site." There are many other examples of inconsistent terms that could be cited.

GEN-2 Therefore, I strongly recommend that an interagency agreement be concluded on a glossary of terms pertaining to waste management and that the terms utilized in Proposed Rule 10CFR61 be consistent with this glossary.

Sincerely,

James G. McCray
Acting Director
Nuclear Fuel Cycle
Research Program

JGM:mg

Acknowledged by card. 1/12/82. emp

South Carolina Department of Health and Environmental Control

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'82 JAN 12 P3:25
emp

January 8, 1982

(79)

Mr. R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Division of Waste Management
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

PR-2 et al
(46 FR 38081)

Dear Dale:

We have reviewed the proposed rule, 10 CFR Part 61, Licensing Requirements for Land Disposal of Radioactive Waste and herein offer our comments and recommendations. We commend the Low-Level Waste Licensing Branch for their efforts in developing these regulations. We recognize the tremendous undertaking on your part.

As the regulatory authority in the State of South Carolina with the responsibility to adopt the regulation when issued, we support promulgation of this needed rule, and concur with the general concepts. However,

A-1 we will reserve implementation of certain aspects of the regulation which may conflict with existing regulatory requirements and criteria now in place at the Barnwell, South Carolina facility. We understand the Commission's intent that all future disposal activities at existing sites comply with Part 61; however, this will be discussed with the Commission's staff in the future.

GEN-2 Since much of the outlined regulations are general in nature, we strongly recommend the development and issuance of Regulatory Guides which will identify and explain specific requirements for licensing. In addition, we support and recommend development and issuance of Regulatory Guides which incorporate standards for waste form packaging, high integrity containers, solidification media, leachability standards, test methods, and approval guidelines and processes. We offer our assistance in developing these needed guidelines.

Our specific comments and recommendations are outlined as follows:

1. Paragraph 61.12 Specific Technical Information.

D-52-4 a. We recommend addition of a requirement for contingency plans for storage of waste in the event of an unplanned occurrence or natural phenomena which may interrupt site operations and timely disposal of the waste when received.

Acknowledged by card. 1/22/82. emp

D-55-8

b. Provisions should be required for the inspection of waste forms to insure that license requirements are being met. These provisions should require periodic inspection of waste packages, adminstrative procedures, or waste inspection and preparation procedures submitted by the waste generators utilizing the burial facility..

D-52-4

2. Paragraph 61.13 Technical Analysis .

An analysis of the impact on the immediate area at and adjacent to the burial facility from the transportation of waste should be considered. Satellite activities such as trucking terminals could have significant radiological impacts.

C-3

3. Paragraph 61.41 Protection of the General Population from Releases of Radioactivity.

It is not clear in this section if the EPA National Primary Drinking Water Standards (40 CFR Part 141) apply for a private drinking water supply such as a private well, or whether the annual whole body dose of 25mRem applies in such cases. This should be clarified.

4. Paragraph 61.50 Disposal Site Suitability Requirements for Land Disposal.

D-50-2

a. Criterion 4 regarding economically significant resources should also emphasize the necessity for considering major aquifers and ground water recharge zones as economically significant resources.

D-50-3

b. Criterion 5 addresses the possibility that a site located within the hundred year flood plain could be submerged within the time that the waste still required isolation. By ruling out sites within the hundred year flood plain, this possibility is reduced. However, there are sites within river basins which would be above the hundred year flood plain but within the area that would be flooded if the valley were impounded for irrigation, flood control, or hydroelectric power. Since suitable sites can and usually have been identified, it should not be difficult to consider this possibility.

D-50-4

c. Criterion 11 requiring that no nearby facility interfere with the environmental monitoring program should not be construed so strictly that location of burial facilities adjacent to existing Federal facilities is precluded.

D-50-8

d. A new criterion addressing the mechanical and physical properties of the site soil is needed. This should require that the soil be: (1) Strong enough to support heavy equipment (2) suitable for compaction to form trench caps (or provisions for borrow dirt or engineered caps) (3) amenable to control of surface/subsurface runoff (4) amenable to remedial measures in the event of migration, and (5) capable of characterization.

D-50-1

e. A proposed site must be amenable to modeling and sufficiently simple so that reasonable numbers of monitoring wells adequately determine flow patterns; that is, small areas of significantly increased permeability should not be present, nor should other small-scale discontinuties which require precise positioning of monitoring wells.

D-50-2

f. The preoperational ground water characterization should be comprehensive enough to determine the behavior of each zone underlying the site. For example, water levels in each saturated zone should be recorded for some minimum period long enough to determine the seasonal variations. Mass balance (e.g., perculation versus evapotranspiration) should be determined in the unsaturated zone and subsurface flow patterns and rates determined. It is particularly important to monitor this long enough to detect long-term changes such as changes in land use would cause.

5. Paragraph 61.52 Land Disposal Facility Operations and Disposal Site Closure.

D-52-1

a. Segregation of waste based on waste classification is considered a viable option to further assure that performance objectives are met in the long term, but it has certain short term drawbacks. Operationally, waste packages with low radiation levels have been used as shielding for higher radiation level packages during package placement in trenches, thus minimizing occupational exposure to workers. Waste segregation will require at least two open trenches and additional handling equipment. Radiation levels at the trench boundary will be elevated and significantly increase occupational exposure.

D-52-2

b. Subparagraph (a)(5) states that "void spaces must be filled with earth or other material to reduce future subsidence within the fill." The term "other material" should be specified.

D-52-3

c. Subparagraph (a)(6) states that radiation at the surface of the trench cover be within a few percent above natural background levels at the site. A "few percent" should be qualified.

D-52-5

d. Subparagraph (a)(9). In addition to adequate closure and stabilization measures being carried out, erosion control measures should be added.

6. Paragraph 61.56 Waste Characteristics.

D-56-1

a. Subparagraph (a)(3) should be qualified to indicate that the addition of absorbent material applies only to those institutionally generated, aqueous and biological waste forms. It should be also stipulated that organic, toxic, and reactive waste forms are prohibited from land burial unless mitigating measures are taken to stabilize the waste and make it environmentally acceptable. We will continue to reserve the right to ban certain waste forms that, in our opinion, are not environmentally acceptable at the Barnwell, South Carolina facility, irregardless of federal regulations allowing such.

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D-56-13

b. Subparagraph (b)(2) establishes a free-standing, non-corrosive liquid content of 1.0% of the volume of waste. We have of course established a more restrictive criterion of 0.5% in regular waste containers and a limit of 1% in high integrity containers. The industry has accepted and can meet these requirements which are soundly established. We feel that the more restrictive criterion should be codified in Part 61.

We appreciate this opportunity to comment on the proposed rule. We will be most receptive to meeting with you and your staff if you feel further discussion is warranted. If we can be of any assistance, please do not hesitate to contact us.

Very truly yours,

Heyward

Heyward G. Shealy, Chief
Bureau of Radiological Health

HGS:kn

cc: Mr. G. Wayne Kerr

BIRMINGHAM AUDUBON SOCIETY

POST OFFICE BOX 314 . BIRMINGHAM, ALABAMA 35201

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January 4, 1982

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(46 FR 38081)

Secretary of the Commission
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555
Attn: Docketing and Services Branch

Gentlemen/Ladies:

Attached are our comments on your July 24, 1981, proposed rule entitled, "Licensing Requirements for Land Disposal of Radioactive Waste."

While our comments address many specific points within the proposed rule, it is fair to say that as a whole the rule has serious shortcomings. Despite some strong points, the rule needs considerable revision.

Of particular concern is the last item on our comment sheet. Although your summary states that the proposed rule "does not deal with disposal by individual licensees by burial of their own wastes," clearly there should be regulations governing such activities. Perhaps this already is the case.

Mention of that one specific point is not to downplay our other concerns, but to assure you that from first to last our comments are offered with serious appreciation of how important this proposed rule is.

We are grateful for the opportunity to comment. Also, we ask to be placed on your list(s) for rulemaking notices and notices of other Commission activities of public interest.

Sincerely,

John Northrop

John Northrop
Member, Conservation Committee

Copies:
Sen. Jeremiah Denton
Sen. Howell Heflin
U. S. Rep. Albert Lee Smith
Mr. Aubrey Goodwin

Acknowledged by card. 1/22/82 emp

For the Conservation and Appreciation of Wildlife and Wilderness, Natural Resources and Natural Beauty

Birmingham Audubon
Comments on Proposed Rule:
"Licensing Requirements for Land Disposal of Radioactive Waste"

STRONG APPROVAL

A-3 1. 61.3(b)--The requirement for license before commencing construction of a land disposal facility.

D-50-6 2. 61.50(a)(3)--The requirement that a disposal site be selected so that projected population growth and future developments are not likely to affect performance objectives.

D-52-4 3. 61.51(a)(7)--The requirement that the disposal site be used exclusively for the disposal of radioactive wastes.

D-57-3 4. 61.7(c)(1)--The requirement that the State or Federal government own the proposed disposal site before the Commission issues a license.

DESIRABLE CHANGES

D-55-5 & D-59-2 1. The proposed rule endorses 100-year limits on institutional safeguards, despite allowing disposal of wastes which will remain dangerous for up to 500 years. If 100-year safeguard limits are retained, wastes remaining dangerous for longer periods should be disposed of elsewhere, where safeguards can be maintained for as long as the wastes remain dangerous.

A-1 2. The proposed rule offers provisions for disposal of wastes which may be subject to "criticality." Materials suoject to criticality should not be disposed of in sites covered by the proposed rule. Separate sites should be required, and a separate rule covering such sites should be issued.

GEN-1 3. The term "reasonable assurance" is used repeatedly throughout the proposed rule. The phrase "a conclusive showing" should be substituted in the following sections:

61.13(d)
61.23(b)(c)(d)(e)
61.30(a)(2)
61.40
61.51(a)(2)
61.54

Also, in 61.62(a), the term "assurances" should be replaced by the term "proof."

A-7 D-55-5 4. 61.7(b)(5)--There should be no exceptions to the prohibition against near-surface disposal of wastes remaining dangerous longer than 500 years.

5. 61.5--Any exemptions to these regulations should come only

A-7 after notice to the Governor and congressional delegation of the affected state and a public hearing in the state's largest city.

C-3 6. 61.41--Radiation limits are too high. Limits should be 10 millirems to the whole body, 10 millirems to the thyroid, 10 millirems to any other organ.

C-4 7. 61.42--Limit too high. Instead of 500 millirem per year, it should be no more than 10 percent of background per year.

D-52-5 8. 61.52(a)(6)--Change "within a few percent" to "within one percent."

D-52-3 9. 61.52(a)(8)--Instead of 100 feet, 100 yards.

A-7 10. 61.55(d)--There should be no exemptions in near-surface disposal prohibitions against the higher level wastes.

D-50-9 D-56-8 11. 61.56(b)--Stability should be guaranteed at the site for as long as the waste materials remain dangerous, not just for 150 years.

B-1 12. Subpart B-Licenses lacks adequate specificity. Some suggested improvements:

61.11(b)(2)--List specific qualifications for personnel.
61.12(b)--List specific minimum standards.
61.12(1)--List specific minimum measures.
61.13(b)--Give minimum standards for "adequate."

E-1 13. 61.62(b)(g)--Licensees should be required to place funds in escrow to cover costs of decontamination, closure and stabilization. In addition, Licensees should be required to place in escrow funds necessary to cover costs of institutional safeguards for the duration of those safeguards.

F-1 14. 61.71--". . . the Director must make available Commission staff . . ."

D-52-6 15. 61.28--A provision should be added allowing the Commission to require alterations to the site or the arrangement of its contents before closure, if necessary to protect public health and welfare.

A-1 16. There should be criminal penalties of up to 25 years for violating the regulations.

17. Although this proposed rule "does not deal with disposal by individual licensees by burial of their own wastes" (Summary, p. 38091), such activities should be governed by regulations as stringent as those for other disposal sites.

UNWMG

Utility Nuclear Waste Management Group
1111 19th Street, N.W. • Washington, D.C. 20036 • (202) 828-7669

82 JAN 15 P1:13
emp

January 14, 1982

(81)
-2 et al.
(46 FR 38081)

Secretary
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attn: Docketing and Service Branch

Re: Notice of Proposed Rulemaking, 10 CFR Part 61; Licensing Requirements for Land Disposal of Radioactive Waste (46 Fed. Reg. 38,081)

Dear Sir:

These comments are submitted on behalf of the Utility Nuclear Waste Management Group (UNWMG) in connection with the above-referenced matter.

The UNWMG has maintained an interest in the development of 10 CFR Part 61 for some time. In particular, the UNWMG provided, on December 22, 1978, detailed comments in response to the Commission's October 1978 Advance Notice of Proposed Rulemaking (43 Fed. Reg. 49,811). In addition, members of the Group and its consultants responded to the notice, published last year, announcing the availability of a preliminary draft regulation for public review and comment (45 Fed. Reg. 13,104).

With respect to the rule itself, the present version -- as a proposed rule -- represents a significant improvement over earlier drafts. However, as stated in our comments concerning the Draft Environmental Impact Statement on Part 61, the UNWMG seriously questions the desirability of many of the specific requirements embodied in the proposed rule. In addition, as detailed in the Attachment to this letter, certain aspects of the proposed rule are of particular concern from a practical standpoint, and will require modification to provide a fully workable basis for the land disposal of radioactive waste.

In particular, UNWMG is troubled by the fact that D-55-6 nuclide concentration limits contained in Table 1 may not

Acknowledged by card 1/22/82 emp

D-55-6 provide a practical basis for classification. To address this difficulty, UNWMG recommends the adoption of a "key isotope" approach to waste classification. Such an approach should offer a reasonable solution to the classification problem and is discussed in detail in the comments.

D-55-3 In addition, the UNWMG is of the view that the 10 nCi/g limitation on alpha-emitting transuranic nuclides not only presents difficulties from the standpoint of detectability, but is otherwise unjustified. Accordingly, the matter of establishing an alternative limit is discussed in the Attachment, and a recommended approach described.

D-50-4 Finally, in concluding this letter the UNWMG would like to make one additional observation. The current version of Part 61 appears to contain nothing that would prevent the location of a land disposal facility at a reactor site. The location of such a facility at a reactor site could have advantages in certain circumstances. Accordingly, the Commission may wish to acknowledge this fact in promulgating the final rule.

Sincerely,

R. E. L. Stanford
Program Manager

Enclosure

ATTACHMENT

Comments of the UNWMG Re Notice of Proposed Rulemaking, 10 CFR Part 61; Licensing Requirements for Land Disposal of Radioactive Waste (46 Fed. Reg. 38,081)

Comments on "Supplementary Information"

(1) -p. 38,084-85, Col. 3 & 1, respectively

D-55-3

The maximum allowable concentration of alpha-emitting transuranic nuclides, specified as 10 nanocuries per gram (10 nCi/g) in the proposed rule, should be increased by at least a factor of ten. The prescribed level of 10 nCi/g is too low to be technically justifiable and, in addition, is below the range of completely practical detection and measurement.

Calculations support a concentration value for the trench which is nearly an order of magnitude higher than the proposed limit. See, e.g., Leddicotte, G., et al., "Suggested Concentration Limits for Shallow Land Burial of Radionuclides" (prepared under the sponsorship of the Utility Waste Management Group, a predecessor of the UNWMG, and presented at the Symposium on Waste Management, Tucson, Arizona, Mar. 7, 1978). The specification of limits in terms of maximum concentrations causes difficulties. This point has been addressed by others. A maximum-to-average ratio of 10 can be postulated on the basis of

D-55-3

NUREG-0456. Conservatively, a factor of 10 for dilution due to the waste form itself, as well as burial in the trench, can be used to arrive at a more reasonable upper limit on TRU waste concentration of 100 nCi/g.*/

Even without considering dilution, however, the 10 nCi/g limitation appears to be excessively low. Earlier works (Adam, J. and Rogers, V., "A Classification System for Radioactive Waste Disposal -- What Waste Goes Where?", NUREG-0456, Jun. 1978; Rogers, V., "A Radioactive Waste Disposal Classification System," NUREG/CR-1005,

*/ Gamma spectrometry techniques can be used to identify radionuclides in a homogenous waste sample. Even the weak gammas can be monitored with appreciable resolution, thus efficiently categorizing the waste components. Most of the waste generally brought to the disposal site will have lower concentrations than the maximum limit for burial. In a survey of five major DOE sites by Healy and Rodgers (Healy, J. and Rodgers, "Limits for the Burial of the Department of Energy Transuranic Wastes," Los Alamos Scientific Laboratory, LA-UR-79-100, Jan. 1979), it is indicated that 97% of the waste disposed of at these sites is only lightly radioactive or is suspected of being radioactive because of the place at which it was generated. The authors cite a 9-month data base regarding the TRU content of trash obtained from the Plutonium Research and Development Facility at Los Alamos Scientific Laboratory. From these data they estimate that, for a limit of 10 nCi/g, a dilution factor of 20-60 could be expected for these wastes. An average dilution factor of 40 for the waste contents can be used without much argument. Combined with dilution in the trench, a total effective dilution factor of more than 100 can be assigned for the TRU waste. Conservatively, using a factor of 10 dilution, the TRU waste disposal limit can be easily raised to 100 nCi/g.

Sept. 1979) suggest that, for shallow land burial, a 10 nCi/g limitation could be raised to 100 nCi/cc or 60 nCi/g. The proposed higher limit has been criticized, however, on the grounds that it was derived on the basis of the ICRP-2 lung model; the ICRP-30 lung model is believed to be more realistic and, therefore, ensure adequate conservatism in the dose conversion factors. A comparison of the inhalation dose factors based on ICRP-2 and ICRP-30 models, however, yields some interesting results.

D-55-3

In a recent publication by Dunning and Killaugh (Dunning, D. and Killaugh, A., "A Comparison of Effective Dose Equivalents from Three Major Internal Dose Compilations," Radiation Protection Dosimetry, Vol. 1, No. 1, pp. 3-9, 1981) estimates of effective dose equivalents based on ICRP-2 and ICRP-30, by the inhalation pathway, are cited. For most transuranics the inhalation dose factors are more conservative on the basis of the old ICRP-2 model than the revised ICRP-30 lung model, with the exception of Am-241 for which the ICRP-30 dose factor is a factor of 2 higher than the corresponding ICRP-2 dose factor. For all other members of this group, the ICRP-2 numbers are consistently higher. Therefore, conclusions derived on the basis of the ICRP-2 lung model are valid for the transuranics, and the higher than 10 nCi/g limit suggested for TRU waste is justified.

In sum, UNWMG believes that the proposed limit of 10 nCi/g for TRU waste is unduly conservative and should be raised to at least 100 nCi/g; especially when potentially significant economic gains are considered.*/

D-55-3

(2)

-p. 38,085, col. 2

In its discussion of waste characteristics and classification, the Commission states that it "recognizes the need for a 'de minimus' classification of wastes, wastes that would be exempt from Part 61 and would be considered of no regulatory concern," and notes that it will be working over the next two years to further define these wastes and to provide for additional "de minimus" exceptions from Part 61 requirements.

D-55-2

UNWMG believes that the establishment of a "de minimus" category of low-level waste (LLW), whether upon a generic or a case-by-case basis, would be extremely useful and would result in considerable savings of time, money and valuable burial space at disposal sites without any corresponding increase in risk to the public health and safety.

We stand ready to offer the Commission whatever assistance we can to facilitate and expedite the

*/ Arguments to the effect that an increase in the limit would be negated by current limitations in routine measurement techniques are not correct. Few utility wastes will exceed 10 nCi/g of TRU, but proving this generically may be quite difficult. On the other hand, it can likely be shown that no utility wastes exceed 100 nCi/g. Thus, increasing the limit by a factor of even 10 will considerably expedite the qualification of utility waste streams on a generic waste source basis.

establishment of such a waste category. In this connection, we would like to call attention two reports which should aid the Commission's effort. The first is entitled 'Suggested Concentration Limits for Shallow Land Burial of Radionuclides" by G. W. Leddicotte, et al., and is cited above in connection with the discussion of limiting TRU waste concentration. The other report is AIF/NESP-016, "de minimus Concentrations of Radionuclides in Solid Wastes," which was prepared for the National Environmental Studies Project of the Atomic Industrial Forum.

D-55-2

(3)

-p. 38,087, col. 2

The suggested plan requiring that an application for renewal of a facility license be submitted at five-year intervals, and that a public hearing be offered whenever such an application is received, is unnecessarily burdensome. The rationale for limiting the life of a license to five years appears to be that "the normal term for materials licenses is currently 5 years." However, satisfaction of the regulatory requirements established by this rule would adequately demonstrate the licensee's competence, and should enable the issuance of a full-term (for the life of the facility) license.

B-5

In addition, the licensee will remain under the continuing jurisdiction of the NRC throughout both the operational and post-closure observation and maintenance

phases. Thus, the Commission will have ample opportunity for monitoring the licensee's performance and taking appropriate action -- including license revocation (see, e.g., § 61.24(b)) -- without the necessity of a formal license renewal every five years.

B-5

Comments on substantive requirements

(1)

-p. 38,090, col. 3

Denial of a license is too strong a sanction against an applicant who, perhaps through no more than inadvertence, does something at a site which is later considered to be "commencing construction," before a license has been granted. An adequate sanction would be to require that the site be restored to its "pre-construction" condition. Accordingly, the last sentence of § 61.3(b) should be eliminated.

A-3

(2)

-p. 38,091, col. 1 & 2

Section 61.7(b)(2) states that "stability" is a necessary characteristic of certain Class A segregated wastes. From the overall context of this section it is clear that the requirement refers to structural, rather than chemical, stability.*/ However, the intent of this section should be specified further to avoid any possible confusion.

D-56-8

*/ Requirements with respect to chemical stability appear elsewhere, e.g. § 61.56(a)(4).

(3) -p. 38,092, col. 3 B-2

The statement in § 61.13(a) that, "[f]or near-surface disposal, the groundwater pathway will generally be the most significant in terms of releases of radioactivity" may not be correct and -- in any event -- adds nothing substantive to the rule here. Accordingly, it should be deleted.

(4) -p. 38,093, col. 1 B-1

Section 61.13(b) provides that "[a]nalyses of the protection of individuals from inadvertent intrusion must include demonstration that the waste classification and segregation requirements will be met and that adequate barriers to inadvertent intrusion will be provided." (Emphasis added.) What is required for "demonstration," however, should be specified in terms of analysis resulting in reasonable assurance that waste classification, segregation and barrier requirements will be met.

In this general regard, the addition to Part 61 of a section similar to proposed § 60.101(a)(2) (46 Fed. Reg. 35,280, 35,288), concerning the purpose and nature of findings, would be helpful. Such a section could explain that, while requirements may be stated in unqualified terms, it is not expected that complete assurance that

B-1

they will be met can be presented. Reasonable assurance is the general standard required.

(5) -p. 38,094, col. 1

Again, the words "demonstration" and "demonstrated" are used in §§ 61.23(f), (i) and (j). The requirements for such demonstration should be specified consistent with the approach discussed in comment number (4), above.

(6) -p. 38,094, col. 3 B-4

The absolute prohibition against changing either the facility or procedures, as contained in § 61.25(a), is too restrictive. The minimum requirement providing that, in all cases, the Commission be provided with at least 60 days prior notice of any changes does not accommodate the day-to-day needs of a land burial operation.

This section should be modified to allow modification, under certain circumstances, without prior notification. In this connection, the provisions of 10 C.F.R. § 50.59, pertaining to production and utilization facilities, provide a good pattern for an approach.

(7) -p. 38,095, col. 3 D-56-8

Here, again, as in § 61.7(b)(2), the intended meaning of the term "stability" in § 61.44 (i.e., structural stability v. chemical stability) should be clarified. (See substantive comment number (2) above.) In addition, the term "long-term stability" requires additional

D-56-B / ED-1

explanation. If, as it appears, the intended reference is to the period of institutional control, this should be stated. Further, since "long-term" is used a number of times in the rule, it might be desirable to include it in the definition section.

(8) -p. 38,096, col. 1 — D-50-3

Section 61.50(a)(6) provides simply that "[u]pstream drainage areas must be minimized to decrease the amount of runoff which could erode or innundate waste disposal units." As stated, the requirement is overly vague and should be rewritten to limit "upstream drainage areas" of concern to those which contribute to general surface water runoff over the site.

(9) -p. 38,096, col. 2 — GEN-1

Sections 61.51(a)(4) and (6) require that covers be "designed to prevent water infiltration" and that the disposal site be "designed to eliminate the contact of water with waste during storage, the contact of standing water with waste during disposal, and the contact of percolating or standing water with wastes after disposal." (Emphasis added.) As now worded, these requirements would be difficult -- or, perhaps, impossible -- to meet. While contact of LLW with water can (and should) be minimized, there is currently no existing technology by which it can be proven that all contact with water has been completely eliminated. Accordingly, we suggest that this provision be modified to require designs such

GEN-1

that contact with water is minimized.

(10) -p. 38,096, col. 2 — D-50-4 + D-52-4

Section 61.51(a)(7) provides that "[t]he disposal site shall be used exclusively for the disposal of radioactive wastes." We assume that the restriction which this section imposes concerns the type of waste (i.e., radioactive waste and not hazardous chemical waste) which may be disposed of at the site. However, this provision can also be read to prohibit any activity other than waste disposal at the site. We suggest that the section be clarified so as to specifically provide that the disposal site, as defined, shall be used exclusively for the disposal of radioactive wastes; and not for non-radioactive chemical or other waste material.

(11) -p. 38,096, col. 2 — D-52-1

The meaning of § 61.52(a)(1), which requires that certain types of waste be placed in units "sufficiently separated from other units so that there is no interaction between them," should be clarified. Specifically, UNWMG suggests that the prohibition on interaction be limited to that which could reasonably be expected to lead to premature near-surface land disposal system failure.

(12) -p. 38,096, col. 3 — D-52-2

Section 61.52(a)(4) currently provides that, "Wastes must be emplaced in an orderly manner that maintains the package integrity during emplacement and disposal." The word "orderly" should be deleted from this provision. It is not essential to the meaning of the sentence and the

intent of the provision is equally clear without it. Moreover, if the word "orderly" is not deleted, greater physical contact with the packaged waste by employees might be required to arrange the containers in an "orderly" manner. Increased handling of the containers would, of course, increase radiation exposure, resulting in a risk which -- although small -- is not necessary in order to maintain package integrity.

D-52-2

(13)

-p. 38,096, col. 3

As it is currently worded, § 61.52(a)(5), which provides that "[v]oid spaces between waste packages must be filled with earth or other material to reduce future subsidence within the fill," is unnecessarily proscriptive as to the specific method to be used to minimize subsidence. It can probably be expected that reasonable efforts will be made to reduce void spaces. However, this provision should be reworded to make clear that its primary intent is to reduce future subsidence and, thus, permit greater flexibility in the procedures which may be used to achieve this goal.

(14)

-p. 38,097, col. 2 & 3

ED-1

Section 61.55 establishes three classes of radioactive waste: Class A segregated waste; Class B stable waste; and Class C intruder waste. To avoid possible confusion with Department of Transportation nomenclature, we suggest that these categories be designated Class X, Y and Z, rather than A, B, and C, respectively.

D-55-6

In addition, the nuclide concentration limits contained in Table 1 do not provide a completely practical basis for classification. Difficulties with respect to limitations on TRU waste are discussed in "supplementary information" comment (1), above. Further, in many other cases, the required measurements would be difficult and, in some instances, direct quantification may be impossible. (See, e.g., "Draft Environmental Impact Statement on 10 CFR Part 61 'Licensing Requirements for Land Disposal of Radioactive Waste'," NUREG-0782, Main Report, pp. 7-23 to -24 Sept. 1981 [hereinafter referred to as Part 61 DEIS].)

The NRC has noted that

> One solution could be to routinely measure only those radionuclides that can be reasonably and accurately measured without terribly expensive and sophisticated techniques. Concentrations of other radionuclides would be scaled to the measured radionuclides based upon existing or generator-specific data. Additional measurements would be performed to determine concentrations of other radionuclides if the measured radionuclide concentrations exceed given action levels. A more detailed set of measurements could be performed periodically (e.g., annually or semiannually) or after a significant process change to upgrade the scaling factors and the action levels.
>
> . . . Two radionuclides which are present in LWR waste streams and can be readily measured by Ge(Li) gamma spectroscopy are Co-60 and Cs-137. In

D-55-6

the procedure, these two isotopes would be routinely measured and the concentration of other radionuclides estimated based upon scaling factors developed from either data specific to the facility or from a set of reference scaling factors developed from existing data. Samples may be taken for analysis either from (a) the final waste form, or (b) the waste after any and all volume reduction but prior to solidification. If the concentrations of Co-60 or Cs-137 exceed certain action levels, then other radionuclides would be measured. The action levels used may also be either based upon data specific to the facility or from a set of reference action levels based upon existing data. If the concentrations of Co-60 and Cs-137 do not exceed the action levels, then other radionuclides would not need to be analyzed.

Part 61 DEIS, p. 7-23. We strongly support the concept of using key isotopes which can be measured externally and without opening the waste package, but caution that "action levels" which will trigger the necessity of sampling and more extensive analysis be set with a keen eye to practicality.

D-55-6

The table below is taken in part from a report on the Barnwell site prepared in 1980 for TVA. This table

Average Waste Concentrations
Buried at Barnwell Compared to Table 1 Col 1

Isotope	Average Concentration (uCi/g) at Barnwell	Proposed 10 CFR 61 Table 1 Col 1 (uCi/g)**	Ratio of Actual to Allowable by 10 CFR 61
Cs-137	2.3E-01	6.24E-1	3.69E-1
Cs-134*	4.6E-02	4.37E+2	1.05E-4
I-131*	2.0E-01	4.37E+2	4.60E-4
Co-60	1.4E-01	4.37E+2	3.20E-4
Co-58*	4.6E-02	4.37E+2	1.05E-4
Cr-51*	1.1E-01	4.37E+2	2.50E-4
Fe-55*	9.2E-01	4.37E+2	2.10E-3
Zn-65*	4.6E-02	4.37E+2	1.10E-4
Sr-89*	4.8E-02	4.37E+2	1.10E-4
Sr-90	2.3E-03	2.50E-2	1.20E-3
Zr-95*	4.6E-02	4.37E+2	1.10E-4
Ce-141*	4.6E-02	4.37E+2	1.10E-4
Mn-54*	3.4E-02	4.37E+2	7.80E-5
Ru-103*	3.4E-02	4.37E+2	7.80E-5
Ru-106*	4.6E-03	4.37E+2	1.10E-5
Tc-99	3.4E-03	1.87E-1	1.80E-2
C-14	2.3E-04	5.00E-1	4.60E-4

* All with half lives < 5 years

** Soil density 100-lb/ft^3

shows the average concentrations of a number of isotopes which records indicate are buried at Barnwell. These concentrations are compared to the values from Col. 1, Table 1, of proposed 10 CFR Part 61. Also shown are the ratios of these average concentrations

to the Part 61 concentrations. It can be seen that the only isotope which approaches a Col. 1 limit is Cs-137 (37%). The next nearest isotope is Tc-99 (2%), an isotope that is difficult to measure. No other isotope exceeds 0.25% of the Table 1 limit, and most (including Co-60) are less than 0.1%. This strongly suggests that the only key could be Cs-137. UNWMG urges that a "key isotope" approach to classification be developed, and stands ready to offer the Commission whatever assistance it can.

D-55-6

Further, one of the footnotes to Table 1 states that, "Wastes containing chelating agents in concentrations greater than 0.1% are not permitted except as specifically approved by the Commission." The basis for the 0.1% limitation, however, is unclear and may be so low as to present significant difficulties in certain cases; such as those which arise in connection with the disposal of waste resulting from reactor system decontamination projects. This limit should be either justified or increased.

D-56-2

(15) -pp. 38,097-98, col. 3 & 1, respectively

The use of the term "stability" in § 61.56(b) should be clarified by referring specifically to structural stability (see substantive comment (2), above). In addition, UNWMG is concerned that the 5% deformation limit may be too restrictive; especially when one considers that waste will be containerized to at least some extent, and will also be supported by surrounding waste and/or earth. Further, asphalt, which is generally considered a satisfactory solidification medium, may not meet the 5% limitation. If the 5% restriction would have the effect of precluding the use of asphalt as a waste form, it should be specifically excluded from the requirement.

D-56-8

D-56-9

(16) -p. 38,098, col. 1 & 2

Section 61.59(b) states that the "active institutional control program" which the landowner is to carry out must include "an environmental monitoring program at the disposal site," among other things. The rule should provide an indication as to what activities are to be included in such an "environmental monitoring program." In addition, this section should make it clear that, during the period of institutional control, the land could be used for other purposes not inconsistent with the public health and safety and would not disturb the integrity of the site.

D-59-2

(17) -p. 38,098, col. 3

E-1

Consistent with suggested changes as to the length of time for which a license may be obtained under Part 61 (see substantive comment (3), above), we suggest that the phrase "before the next license renewal" be deleted from the final sentence of § 61.62(d). This sentence would then read: "This will yield a surety that is at least sufficient at all times to cover the costs of closure of the disposal units that are expected to be used."

(18) -p. 38,099, col. 1 & 2

F-1

CNWMG assumes that the provisions of § 61.72 pertain to participation by potentially affected States and tribes, and not States and tribes in general. This limitation, however, is not completely clear. Accordingly, the section should be modified to remove any uncertainty.

Werner & Pfleiderer Corporation

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January 13, 1982

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(46 FR 38081)

Secretary of the Commission
U.S. Nuclear Regulatory Commission
1717 H Street N.W.
Washington, D.C. 20555

Attention: Docketing and Service Branch

SUBJECT: Comments to Proposed Rulemaking
Title 10, CFR, Part 61
Licensing Requirements for Land Disposal
of Radioactive Waste

Gentlemen:

The Federal Register; Volume 46, Number 142; dated July 24, 1981, invites public comment to proposed rules regarding Licensing Requirements for Land Disposal of Radioactive Waste (10CFR61). As an interested party, Werner & Pfleiderer Corporation hereby submits to the Commission detailed comments regarding the aforementioned rulemaking.

Werner & Pfleiderer is a U.S. corporation which supplies radioactive waste volume reduction and solidification systems to the North American market. Our system's Topical Report has been reviewed and accepted by the USNRC for reference in license applications for commercial nuclear power plants. To date, we have sold six such systems to domestic nuclear utilities and one to the state-owned utility of Mexico. Several other similar systems have been sold worldwide by a European affiliate. This business is the focal point of our corporate activities in the radioactive waste processing market and is the reason for our interest in the proposed rulemaking.

Werner & Pfleiderer Corporation recognizes the need for regulatory action to establish technical standards for land disposal of radioactive waste and welcomes this opportunity to participate in the regulatory process. We believe that the proposed standards established by 10CFR61 are a rational and viable means of protecting the health and safety of the public. We do, however, have the following specific comments concerning elements proposed in the regulation:

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1. Paragraph 61.56(b),(1) Waste Form

D-56-9

In an attempt to provide numerical guidance defining waste form stability, the Commission has proposed to characterize a structurally stable waste form as one which "will maintain its physical dimensions within 5% and its form, under the expected disposal conditions of 50 psi .....". Werner & Pfleiderer Corporation finds this means of defining stability to be inappropriately restrictive. Specifically, this definition excludes many thermoplastic binders; e.g. asphalt, from conformance due to the fact that a thermoplastic monolith will gradually creep or flow under a 50 psi compressive loading. The implication is that compressive strength per se plays a significant role in soil subsidence. Experience shows that subsidence results from a variety of factors, including predominately the manner in which waste packages are placed in the ground and soil backfilled. The Commission recognizes this in Paragraphs 61.52(a),(4) and (5) in which requirements for orderly placement of the waste and backfilling to eliminate voids are established. Werner & Pfleiderer contends that with the precautions established to prevent voids in both the ground and in the waste package; i.e. Paragraphs 61.52(a),(4) and (5) and 61.56(b),(3), volumetric incompressibility of the monolith is a more appropriate measure of stability than pure compressive strength. As such, the waste form will behave in much the same manner as an incompressible component of the surrounding soil. Proper waste placement and backfilling produces an environment more akin to a hydrostatic environment in which forces (pressures) are in virtual equilibrium. Based on the foregoing rationale and the fact that thermoplastic binders offer significant performance improvements over more traditional binders; e.g. cement, Werner & Pfleiderer Corporation requests the Commission to reexamine the rationale supporting the currently proposed numerical guidance used to define waste form stability and adopt a stability definition which recognizes volumetric incompressibility of monolithic waste forms.

2. Paragraph 61.56(b),(1) Disposal Container

D-56-12

Paragraph 61.56(b),(1) establishes use of a disposal container as a means to provide stability; i.e. confinement and isolation capability. Although no specific guidance is provided, Werner & Pfleiderer Corporation assumes that this is a tacit recognition of the ability of a high integrity container to provide isolation capability. Although this is a departure from previous Commission philosophy, Werner & Pfleiderer Corporation recognizes that a high integrity container has the potential to provide long-term confinement capability. We do, however, have some serious reservations regarding high integrity containers as they are currently used. For example, high integrity containers are structurally designed to withstand normal conditions of transport which specifies a maximum 4 foot drop test. High integrity containers are routinely subjected to transport and handling situations where a potential impact and/or drop accident could exceed the design basis by a considerable margin. This combined with the fact that high integrity containers are predominately used to contain extremely dispersible waste forms with potentially high

D-56-12

specific activity, leads us to question the wisdom of the currently established design criteria. In the past, the Commission recognized that solidification of waste reduces the potential for dispersion of radioactive materials due to handling accidents. We continue to believe that solidification is an essential safeguard to dispersion of radioactive materials in light of the nonconservative design criteria imposed on high integrity containers. Werner & Pfleiderer Corporation requests the Commission to reexamine the design criteria for high integrity containers for use with highly dispersible waste forms.

We appreciate being given the opportunity to provide comments on the proposed rulemaking and look forward to the Commission's consideration of the foregoing concerns.

Very truly yours,

WERNER & PFLEIDERER CORPORATION

David N. Enegess
Business Manager
Hazardous Waste Treatment Systems

DNE/WJK/gs

DOW CHEMICAL U.S.A.

January 12, 1982

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LARKIN LABORATORY
1691 N. SWEDE RD.
MIDLAND, MICHIGAN 48640

(20)

DOCKET NUMBER
PROPOSED RULE PR-61
(46 FR 51776)

DOCKET NUMBER
PROPOSED RULE PR-2 et al (83)
(46 FR 38081)

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

Attention: Docketing and Service Branch

Subject: DOW COMMENTS, PROPOSED RULEMAKING 10 CFR 61

The subject proposed rulemaking was published in the Federal Register on July 24, 1981, with the comment period to expire on October 22, 1981. NUREG-0782, a draft environmental impact statement, was referenced to provide guidance and support to 10 CFR 61, however, NUREG-0782 had not been published. Dow comments on proposed rulemaking 10 CFR 61 are dated September 18, 1981, and were submitted to the Commission with a cover letter dated October 12, 1981. The cover letter states that additional comments will be submitted as necessary and as opportunities arise.

The Commission has extended the comment period for 10 CFR 61 to January 14, 1982. Dow received NUREG-0782 on October 19, 1981, and a draft Branch Technical Position (BTP) on Waste Form dated October 30, 1981. Additional Dow comments are as follows:

NUREG-0782

C-5 On pages 4, 5, 6, and 7 of the comments dated September 18, 1981, Dow stated concern that NUREG-0782 may be placing too much emphasis on pathway analysis and overlooking the concepts of ALARA and best available technology and ignoring the needs and objectives of assuring protection of the workers, the general population, and the environment during the operation of the disposal facility.

Review of NUREG-0782 has confirmed that the concern is valid and justified.

BTP on Waste Form

Dow comments dated November 25, 1981, were submitted to Mr. Robert E. Browning, Deputy Director Division of Waste Management. Copies of the BTP and Dow comments are attached. Please consider them as part of the Dow comments on 10 CFR 61.

AN OPERATING UNIT OF THE DOW CHEMICAL COMPANY

D-56-16 Dow appreciates the opportunity to comment on 10 CFR 61. The Commission now has sufficient technical information and experience to justify establishment and enforcement of regulatory standards and technical criteria for the proper disposal of radioactive wastes. Dow encourages the Commission to take immediate actions on 10 CFR 61.

Sincerely,

J. B. Owen

J. B. Owen
Group Leader
Nuclear & Solidification Services
517-636-3388

fo

Attachment

DOW CHEMICAL U.S.A.

November 25, 1981

LARKIN LABORATORY
1691 N. SWEDE RD.
MIDLAND, MICHIGAN 48640

Mr. Robert E. Browning
Deputy Director
Division of Waste Management
Office of Nuclear Material
Safety and Safeguards
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: DRAFT BRANCH TECHNICAL POSITION ON WASTE FORM

Dear Mr. Browning:

Dow has reviewed the subject draft Branch Technical Position (BTP) dated October 30, 1981. Dow is in complete agreement that there is a need for the Nuclear Regulatory Commission (NRC) to provide guidance on acceptable forms for stabilized wastes. NRC should expedite the actions necessary to establish and enforce regulatory standards and technical criteria for proper disposal of wastes that are being generated and disposed today. Dow appreciates the opportunity to review and comment on the BTP prior to its being issued.

Specific comments are as follows:

Cover Letter

It is noted that April 1982 is the target date for completing the evaluation of the need and basis for including a minimum acceptable leach rate. Dow suggests that an additional target date of no later than July 1982 be established for including such criteria in the BTP.

A. Introduction and B. Background

These sections contain statements of philosophy, policy, or historical fact that Dow understands. Specific comments are limited to the details in the following sections.

C. Regulatory Position

1.a. Minimum compressive strength of 50 psi appears to be reasonable when the normal anticipated depth of the trench, density of wastes, density of the

fill, movement of equipment, and similar factors are considered. ASTM C39 is a technically sound and generally accepted test for determining compressive strength of concrete. However, cement waste solidification technology normally produces a product with compressive strength of a few hundred psi and occasionally a few thousand psi and Dow solidification technology produces a product with compressive strength in the range of 1,000 to 3,000 psi. Merely stating a minimum strength of 50 psi for either of these technologies could result in a unusual and therefore possibly unstable waste form.

Dow suggests that compressive strength be specified as ±10% with a minimum of 50 psi when three or more samples are tested in accordance with ASTM C39.

1.b. Exposure of the samples to a minimum of 10^8 Rads is realistic when compared to the wastes being generated and disposed today. Resistance to degradation caused by radiation effects can only be measured by determining the compressive strength before and after exposure.

Dow suggests that the BTP specify that compressive strength of three or more samples is to be determined before and after irradiation. Variation in compressive strength should not exceed ±15% with a minimum of 50 psi.

1.c. ASTM G21 and ASTM G22 are technically sound and generally accepted tests for determining growth of fungi and bacteria. By stating "no indication of culture growth should be visible" NRC has assumed that if there is no culture growth there will be no biodegradation. Dow agrees with this assumption and has no further comment.

1.d. Dow has no objections to the use of ANS 16.1 for leach testing. As previously stated, Dow suggests that NRC expedite establishing a minimum acceptable leach rate and including such criteria in the BTP.

1.e. Resistance to degradation by immersion in water can only be measured by determining the compressive strength before and after immersion.

Dow suggests that the BTP specify that compressive strength of three or more samples is to be determined before and after immersion in leachants specified in ANS 16.1. Variation in compressive strength should not exceed ±25% with a minimum of 50 psi.

1.f. Telephone discussion with Mr. Timothy C. Johnson of your office has confirmed that the reference to ASTM B353 was in error and should have been ASTM B553.

The number of temperature cycles is not defined in ASTM B553. Stating a number of cycles to represent a specific waste would obviously depend upon the geographic location of the generating and disposal sites as well as the specific storage and transport times and conditions.

As with exposure to other conditions degradation can be measured only by determining the compressive strength before and after exposure. Dow suggests that NRC select which ASTM B553 Service Condition is to be used and specify that three or more samples are to be tested before and after exposure to five temperature cycles as defined in ASTM B553 and that variations in compressive strength should not exceed ±25% with a minimum of 50 psi.

1.g. Dow agrees with the method of measuring free liquid as specified in ANS 55.1, Appendix 2.

Dow recognizes that the wording in Appendix 2, "There shall be no free liquid visible flowing or dripping from the breach," results in a problem of definition and interpretation, however, the NRC attempt to define "no free liquid" as less than one percent is excessive, unnecessary, and can possibly result in acceptance of unstable waste forms. Cement and Dow solidification technologies have demonstrated the ability to routinely produce solidified products with much less than one percent free liquid.

Dow suggests that NRC include the reference to Appendix 2 in the BTP and specify the limit on free liquid in terms of both percent and a maximum volume per container (one percent not to exceed one gallon per container is not difficult to consistently achieve with either cement or Dow technology).

1.h. Dow agrees with the philosophy expressed by this paragraph but suggests that there are methods to obtain samples of the largest anticipated full-scale waste products other than sectioning or coring.

Dow suggests that this paragraph be expanded to include obtaining representative samples by sectioning or coring after solidification or by obtaining representative samples after the addition of all solidification components but prior to solidification.

1.i. Dow agrees with this paragraph but suggests the previous wording that compressive strength be specified as ±10% with a minimum of 50 psi.

2. Dow suggests that NRC specify how radiation degradation is to be measured. The test method should specify limits on factors such as gas evolution, compressive strength of the ion exchange beads, and release of the radionuclides.

3.a. Dow agrees with the minimum design lifetime of 300 years.

3.b. Dow agrees that corrosive effects of both the waste contents and the burial ground environment should be considered. NRC should make it clear that the design must demonstrate that these effects must not shorten the minimum lifetime of 300 years.

3.c. & d. Mechanical strength to withstand a load equivalent to 35 feet of material having a density of 120 lbs/ft^3 placed directly on the top surface of the container is roughly equivalent to the minimum 50 psi compressive strength of the solidified waste form. High integrity containers containing unsolidified waste mixed with containers of waste that have been solidified with either cement or Dow solidification technologies will have less compressive strength and therefore be less stable than the surrounding wastes.

NRC should specify mechanical strength equivalent to or greater than wastes solidified with either cement or Dow technologies and the method to be used to confirm this design strength.

3.e. Dow agrees with designing mechanical strength based on creep test data. NRC should specify the method to be used to confirm this design strength.

3.f. Dow agrees that thermal loads from processing, storage, transporting, and burial should be considered. NRC should define these thermal loads and the method to be used to confirm that the high integrity container will meet or exceed them.

Fires have occurred during transportation and in burial grounds. Dow suggests that NRC specify the containers must be tested and meet the criteria of 49 CFR 173.398(a).

3.g. & h. Dow agrees that radiation stability and biodegradation properties should be considered. NRC should specify the limits and test methods for these characteristics as was discussed in paragraphs C.1.b. and C.1.c.

3.i. High integrity containers must be capable of meeting the requirements of 49 CFR 173.398(a). The free drop test in 10 CFR 71 Appendix A. is a maximum of four feet while the high integrity container may be dropped a minimum of 10 feet (assuming the truck bed is about four feet above the ground and the shipping cask is six feet tall) and possibly a maximum of about 65 feet to the bottom of the empty burial trench.

Dow suggests that NRC should specify that high integrity containers must meet the requirements of 49 CFR 173.398(a) including the 30 foot drop test.

3.j. & k. Dow agrees with these conditions.

D. Implementation

Dow agrees with the philosophy and policy of this section. As previously stated NRC should expedite issuing the BTP and immediately start and expedite actions necessary to establish and enforce regulatory standards and technical criteria for proper disposal of wastes that are being generated and disposed today.

Once again, Dow appreciates the opportunity to review and comment on the BTP. Please contact me if discussion of our comments is desired or Dow can be of further assistance.

Sincerely,

J. B. Owen

J. B. Owen
Group Leader
Nuclear & Solidification Services
517-636-3388

fo

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

January 13, 1992

emf (84)

Secretary of the Commission
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555
ATTN: Docketing and Service Branch

SUBJECT: Comments on the Proposed Rule Concerning the "Licensing Requirements for Land Disposal of Radioactive Waste"

Dear Sir:

These comments are submitted on behalf of Middle South Services, Inc. ("MSS") in connection with the above subject matter. MSS is a technical services and support company for the Middle South Utilities System ("MSU"), which serves the electrical energy requirements of approximately 1,800,000 customers in portions of Arkansas, Louisiana, Mississippi and Missouri. The MSU System has five nuclear units and, therefore, is concerned with the development and implementation of the proposed rules.

MSS has maintained a continuing interest in the development of 10CFR61 over the last few years. The current rule, as proposed, incorporates a number of improvements over earlier drafts, and MSS wishes to commend the NRC on its continuing efforts towards further improvement. However, MSS continues to have a fundamental concern over the lack of a "de minimus" waste classification and the operability of waste separation according to the proposed Table 1. We also believe that other provisions of the proposed rule can be improved.

D-55-2

Due to the unavailability of resources, we were not able to provide the detailed comments on the proposed rule that we would have liked to provide. In this regard we have participated in comments generated by the Atomic Industrial Forum and Utility Nuclear Waste Management Group and support the comments that are to be submitted by them. The following specific comments are submitted with regard to the proposed regulations.

"De Minimus" Waste Classification

D-55-2

MSS agrees with the Commission that there is a need for a "de minimus" classification of wastes that would be exempt from the 10 CFR Part 61 regulations. We believe that this is an issue of major importance, and we urge the Commission to establish this classification in as short a time frame as possible. To date, two types of wastes, Hydrogen-3 and Carbon-14, have been removed from regulation as radioactive wastes, under certain conditions, in 10 CFR 20.306. We believe that this regulation establishes a good model for the classification. It would be impractical to shorten the operating life of existing or a newly licensed site with wastes that could be disposed of at a municipal solid waste disposal facility without endangering human health or the environment.

1/22/92 emf

SERVING: MIDDLE SOUTH UTILITIES, INC. • ARKANSAS POWER & LIGHT COMPANY • LOUISIANA POWER & LIGHT COMPANY • MISSISSIPPI POWER & LIGHT COMPANY • NEW ORLEANS PUBLIC SERVICE INC.

-2 et al (46 FR 38081)

License Renewal

B-5

Section 61.27 of the proposed regulations discusses the application for a license renewal. In the preamble (46 FR 39097), it is suggested that licenses be renewed every five years. We believe that this requirement cannot be justified. According to Section 61.53 (6), an environmental monitoring program must be maintained during the land disposal facility site construction and operation. Also the Draft EIS, Volume 2, lists a number of extensive reports that must be maintained at the site, these include: (1) Personnel exposures; (2) Waste receipt and disposal records; (3) Personnel training records; (4) Records from the Quality Assurance program; (5) Environmental monitoring data; (6) Operating procedures; and (7) Records of site surveillance and monitoring (p. 3-35). Once a licensee has obtained his license he has demonstrated compliance with all the requirements in 10 CFR Part 61. The Commission retains authority over the licensee during operation and post-operation, and through its inspection and enforcement branch is able to monitor the activities at the disposal site. Therefore, a five year licensee renewal is unjustly burdensome. We recommend that full-term licenses be issued.

Waste Treatment

D-52-4

Section 61.51 (a)(7) states that, "(t)he disposal site shall be used exclusively for the disposal of radioactive wastes." Although it appears that the exclusion refers to the type of wastes (i.e., hazardous vs. radioactive), it could also be interpreted as meaning that only disposal and not treatment of waste could occur on site. This would prevent the installation of incinerators or other volume reduction equipment at the disposal site. We recommend that the regulations be changed to accomodate waste treatment.

Table 1

D-55-6

MSS is concerned that the proposed categorization of waste by radioisotope concentration would place an overly time-consuming and costly burden on LLRW generators. Most wastes are composed of a mixture of various isotopes at varying concentrations and it would be extremely difficult if not impossible to separate and categorize our wastes according to Table 1.

A-3

§61.3(b)

The requirements set forth in Section 61.3(b) are unnecessary. We are not advocating that the construction of these sites be rushed to completion without complying with all of the pertinent regulations. However, we think it should be at the discretion of the prospective licensee whether to commence construction before receipt of the final operating license. We therefore recommend that §61.3(b) be deleted in its entirety.

D-56-8

Stability

Since the stability of the wastes and waste site are very important in the classification system of these regulations, we feel that the term "stability" should be better defined. In many instances the term "structural stability" is used. Does this mean chemical structure, physical structure, or both? In the preamble (46 FR 38041, a definition for stability is given as follows:

> "It (the waste) should maintain its configuration and consistency under the conditions it was exposed to after disposal."

This is a very ambiguous definition since there are a number of conditions (physical, chemical, and biological) that the waste may be exposed to after burial.

Also, in Section 61.7(b)(2) where Class A "unstable wastes (consisting primarily of unstable, trash type wastes) are discussed, it is stated that "if mixed with higher activity waste, their deterioration could lead to failure of the system and permit water to penetrate the disposal unit..." Once again, does the term "deterioration" mean physical compaction, chemical decay, or a combination of both? We think it would be helpful if these sections were clarified.

Additional Comments

B-4

1. Section 61.25(a) does not allow any changes in the land disposal facility or procedures described in the license application without prior notification to the Commission. We believe that changes and modifications should be allowed with notification to the Commission in a timely manner.

GEN-1

2. Section 61.51(a)(6) states that "(t)he disposal site must be designed to eliminate the contact of water with waste during storage,... disposal, and ... after disposal." Unless the word "eliminate" is deleted and the word "minimize" is substituted, it would be virtually impossible to demonstrate that the design of a disposal site would meet these requirements.

Conclusion

We would once again like to commend the Commission for the work they have done thus far in striving to provide definitive regulations for low-level radioactive waste disposal facilities. Generally, we support the proposed regulations. We believe that it is very important that the Commission establish a "de minimus" classification of wastes that are exempt from 10 CFR Part 61 as soon as possible. In summary, the most significant changes we would like to see made in the proposed regulations include: full-term licenses for disposal facilities; the inclusion of waste treatment; the elimination or improvement of Table 1 which categorizes waste according to radioisotopic concentrations; and the easement of current requirements that do not allow any construction activity prior to the issuance of an operating license.

We wish to thank the Commission for the opportunity to submit these comments and we hope that they will be helpful in you further deliberations concerning the proposed regulations.

Sincerely,

Felix M. Killar
Manager, Fuel Supply

FMK:sam

cc: Dr. D. C. Gibbs
Dr. T. W. Schratz
Mr. J. D. Patterson
File: 041-01

NORTHEAST UTILITIES

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(85)

January 14, 1982

B10390

-2etal
(46 FR 30081)

(21)

-61
(46 FR 51776)

Mr. Samuel J. Chilk
Secretary of the Commission
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Attention: Docketing and Service Branch

Reference: Proposed Changes to 10 CFR Parts 2, 11, 20, 21, 30, 40, 51, 61, 70, 73 and 170, Federal Register pages 38, 081-38,105, dated July 24, 1981.

Dear Sir:

NRC Proposed Rule on Licensing Requirements for Land Disposal of Radioactive Waste

Northeast Utilities Service Company, on behalf of Northeast Nuclear Energy Company and Connecticut Yankee Atomic Power Company commends the Commission on its work to date regarding land disposal of radioactive wastes. While the Notice of Proposed Rulemaking represents a significant improvement over earlier drafts, the present version still requires additional modifications to ensure that disposal of low-level waste is accomplished in a fair and equitable manner.

Northeast Utilities' subsidiary companies, responsible for the operation of three nuclear power plants and the part owner of five others that are either operating or under construction, has a vital interest in providing for the safe and efficient disposal of nuclear waste. As such, we believe that all rules must have a sound basis and that arbitrary, capricious rules have no place in federal regulations. With these thoughts in mind, we offer our comments on the proposed rule and the accompanying "Draft Environmental Impact Statement" (NUREG-0782) for the Commission's consideration in development of the final rule for land disposal of radioactive wastes.

SPECIFIC COMMENTS

1. Waste Stability Requirement

Paragraph 61.7(b)(2):

D-56-8 As it is not possible to reduce water access to zero the phrase "eliminated or" (line 6) should be deleted. Furthermore, "stability of the waste and the disposal site" needs to be clarified as to whether stability of the disposal site refers to its operational phase or the stabilization for site closure, the latter of which, according to paragraph 61.7(c)(2), would not be required until disposal operations are about to cease. } GEN-1

1/22/82 emp

"...institutional control is relied on for periods up to 100 years to control access to the closed site. This permits the disposal of Class A segregated and Class B stable waste without special provisions for intrusion protection, since these classes of waste contain types and quantities of radioisotopes that will decay during the 100-year period to levels that do not pose a danger to public health and safety..." (emphasis added)

This paragraph appears to support the numerical values of maximum permissible concentrations listed in Table 1. However, paragraph 61.56(b) states:

D-56-8 "...The requirements in this section are intended to provide stability of the waste for at least 150 years. Stability is intended to assure that the waste does not degrade and promote slumping, collapse, or other failure of the disposal unit and thereby lead to water infiltration. Stability is also a factor in limiting exposure to an inadvertent intruder, since it provides a recognizable and nondispersible waste..."

There is no justification for providing "stability" for 150 years when the waste does not pose a danger to public health after 100 years. Therefore, we recommend that the waste stability requirement of paragraph 61.56(b) be changed from 150 to 100 years to be consistent with paragraph 61.7(b)(4).

D-56-12 Paragraph 61.7(b)(5)

This paragraph needs to clarify whether the High Integrity Container (HIC) alone will meet the stability requirments for Class C wastes. (i.e. 500 year stability requirement)

C-6 Paragraph 61.44

Burial trenches that contain only Class A waste, which according to paragraph 61.55(a) are not required to be stable, should be excluded from long-term stability requirements of paragraph 61.44.

D-50-3 Paragraph 61.50(a)(5)

The terms "coastal high-hazard area" and "wetland" should be defined.

D-52-5 Paragraph 61.52(a)(3)

The term "cover" should be clarified as to whether it includes an impervious cap.

B-9

Northeast Utilities believes that the conditions for facility construction, operation, closure and license transfer must be specified and agreed upon at the outset by the licensee. A public hearing will be held at that time, if requested, for public input to the process. Subsequent to license issuance, the NRC should monitor and inspect the activities at the facility to ensure they are in conformance with the license. Unforeseen events can be accommodated by amending the facility license. Further participation by the public is not necessary to ensure the facility is being operated properly. The prospect of repeated public hearings every five years to consider continued operation of the facility is totally unnecessary and must be eliminated from the final rule. A more appropriate and effective oversight would be provided by assigning a full time NRC inspector to a disposal site.

Additional Comments on 10CFR61

Title of Proposed Rule:

ED-1

It is essential for the public to begin to distinguish between high level nuclear wastes which will require disposal in geologic repositories and low-level waste which, under 10 CFR 61, will be permitted to be disposed of in shallow land burial sites. Furthermore, the act P.L.96-573, which gives authority to states to establish regional compacts and for which 10 CFR 61 will be a major guideline is, is titled the "Low Level Radioactive Waste Policy Act" (emphases added). Therefore, we believe that it is entirely appropriate to change the title of the proposed rule to "Licensing Requirements for Land Disposal of Low-Level Radioactive Wastes."

Paragraph 61.59(g):

D-59-2

The 100 year institutional control period should be extended for as long as the governing body exists. This would extend the surveillance period and protect against site intrusion until the governing body determines the site could be reopened to the public.

Paragraph 61.62(g):

E-1

"Pay as you go" surety requirements for closure should be permitted, as opposed to surety bonding for an entire site.

General Comment on Draft Environmental Impact Statement (NUREG-0782)

The Commission should indicate how the adequacy of quality-scaling factors (used to estimate nuclides not readily identifiable) will be determined.

GEN-2

General Comments on 10 CFR 20 Proposed Changes

Notice should be provided as to when the Regulatory Guide on classification of radioactive waste will be available. In the interim, guidance should be provided regarding classification of wastes as required by 20.311(c).

M-2

Paragraph 20.311(d)(3) and (f)(5):

The degree of implementation and criteria for the quality assurance programs, required under these paragraphs should be indicated. We would also recommend that the term, "quality assurance" be changed to "quality control" so as not to be confused with the quality assurance requirements of 10 CFR 50, Appendix B.

Should you have any questions regarding our comments, please feel free to contact us.

Very truly yours,

NORTHEAST UTILITIES SERVICE COMPANY

W. G. Counsil

W. G. Counsil
Senior Vice President

By: J. P. Cagnetta

J. P. Cagnetta
Vice President Nuclear and
Environmental Engineering

Nuclear Monitoring Systems
& Management Corporation

'82 JAN 15 P4
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January 11, 1982

(86)
---2 et al
(46 FR 38081)

Secretary of the Commission
U.S. Nuclear Regulatory Commission
1717 H Street N.W.
Washington, D.C. 20555

Dear Sir:

A-8

Enclosed is a document prepared by this company which addresses:

1) our concerns over

and

2) our recommendations for changes in

the proposed rules and regulations of the N.R.C. (F.R. Title 10, Part 61, dated July 24, 1981).

In this document, we propose a "systems" solution to the problem of "low-level" radioactive waste disposal. This "systems" solution includes:

1) a landfill in which the vast majority of "low-level" wastes would be disposed of via shallow land burial.

and

2) a monitored, retrievable storage system (such as our proposed S/M/R "Low-Level" Facility) for the small percentage of those "low-level" wastes which would not qualify for shallow land burial under the final rules and regulations of the N.R.C.

Except for the specific references to Texas, the contents apply to every state and, for this reason, we thought you might appreciate the opportunity to examine and evaluate this document from your vantage point.

Sincerely,
NUCLEAR MONITORING SYSTEMS &
MANAGEMENT CORPORATION

Louie A. Galloway, III, Ph.D., P.E.
Executive Vice President
Corporate Technology

Acknowledged by card 1/22/82 emf

4100 SW Freeway • Suite 510 • Houston Texas 77027 • 713 960-9100

AMERICAN NUCLEAR SOCIETY
FUEL CYCLE AND WASTE MANAGEMENT DIVISION

'82 JAN 15 P4:31
emf

Headquarters:
555 North Kensington Avenue
LaGrange Park, Illinois 60525 USA

January 12, 1982

(87)
---2 et al
(46 FR 38081)

Samuel J. Chilk, Secretary
United States Nuclear Regulatory Commission
Washington, DC 20555

Re: Licensing Requirements for Land Disposal
of Low-Level Radioactive Waste
46 Fed. Reg. 38081, 7/24/81

Dear Secretary Chilk:

Enclosed for your consideration in the above referenced matter is the Statement of the American Nuclear Society's Fuel Cycle and Waste Management Division regarding its comments and recommendations therein.

The Commission is to be commended for its further improvements in this area and it is our hope that full consideration will be given to these additional recommendations.

Very truly yours,

Winston W. Little, PhD
Chairman

WWL:ez
xc: C. Rickard
L. Manning Muntzing
N. Norman
L. Oyen
C. E. Anderson
O. J. DuTemple
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'82 JUN 15 A8:31

ACKNOWLEDGEMENT

The enclosed comments were prepared and reviewed by American Nuclear Society members of the Fuel Cycle and Waste Management Division.

COMMENTS OF
THE FUEL CYCLE AND WASTE MANAGEMENT DIVISION
OF THE
AMERICAN NUCLEAR SOCIETY
ON PROPOSED RULE

FOR

LICENSING REQUIREMENTS FOR LAND DISPOSAL
OF RADIOACTIVE WASTE

46 Fed. Reg. 38089 (July 24, 1981)
(to be codified at 10 C.F.R. Part 61)

JAMES R. KEELAN
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American Nuclear Society
555 North Kensington Avenue
La Grange Park, Illinois 60525
Telephone: (312) 352-6611

TABLE OF CONTENTS

I. INTRODUCTION

A. The American Nuclear Society

The American Nuclear Society, an international organization of engineers and scientists, now in its 28th year, is a nonprofit scientific, technical, and educational organization. ANS currently has an individual membership of over 13,000 and is governed by its officers and a Board of Directors elected by the individual membership.

To carry out its purposes, ANS has 17 separate technical divisions. The objective of each division is to provide means for furthering the science, engineering, and art of that branch of scientific discipline. The disciplines range from those related to nuclear power — such as nuclear fuel cycles, waste management, radiation protection and shielding, reactor safety, and reactor operations — to other disciplines, such as controlled nuclear fusion, isotopes and radiation, environmental sciences, and alternative energy technologies and systems.

B. Scope of American Nuclear Society Review

These comments are in response to NRC's proposed rule on "Licensing Requirements for Land Disposal of Radioactive Waste," 46 Fed. Reg. 38081 (July 24, 1981) (to be codified at 10 C.F.R. Part 61, Nuclear Regulatory Commission). ANS has actively followed the progress of this proposed rule with a technical support committee of interested and technically qualified members of the Fuel Cycle and Waste Management Division. Based on a technical review of the Federal Register notice by division members, there have been developed and formulated the enclosed comments on the proposed rule.

II.

COMMENTS ON
PROPOSED RULEMAKING ON LAND DISPOSAL
OF LOW-LEVEL RADIOACTIVE WASTE
10 CFR 61

Federal Register Vol. 46, No. 142, Friday, July 24, 1981 Proposal Rules

The present version of the rule, as proposed, presents a significant improvement over earlier drafts and the Commission should be commended on its work thus far. However, members of the ANS Fuel Cycle and Waste Management Division present the following comments for your consideration.

1) V. Summary of Rule

C. Minimum Technical Requirements[1]

D-55-13 (1) A classification system for low level waste is proposed containing four classes. Specific activity limits define each class. While the desire to provide a level of protection commensurate with the activity level is recognized, it is not clear why class A and B wastes need be distinguished.[2] The basis is apparently that "it is obvious that if these (unstable trash-type wastes) were disposed of with higher activity waste, their deterioration could lead to failure of the (burial) system and permit water to penetrate the disposal site and cause problems with higher activity wastes." If this is demonstrably so, would it not be better to define classes A and B solely on the basis of stability rather than on stability and activity concentration? Thus, all waste up to the class B activity limit would be separated by whether it was solidified or unsolidified.

D-55-2 (2) It is stated that the Commission recognized the need for a "de minimis" classification of wastes, that this "should be determined on a specific waste basis," and "Part 61 will not establish a generic 'de minimis' category for waste."[3] The "de minimis" levels need to be established as soon as possible to prevent disposal of large volumes of materials which, in hindsight, would have met such criteria and could have been disposed of by other means. This need is especially critical in view of the limited capacity of the existing disposal sites. The AIF report "De Minimis Concentration of Radionuclides in Solid Wastes, AIF/NESP-016," might be of some use to you.

2) V. Summary of Rule

D-59-2 E. Institutional Control[4]

The discussion states that active institutional controls such as periodic surveillance and controlled access cannot be relied on for more than 100 years.[5] The implication is that governmental institutions would be aware of the necessity to maintain the site. However, in the following paragraph, credit is taken for passive controls. It seems that if a government institution is available to maintain land ownership and records, that same institution could maintain a fence. This would reduce the concern about the potentional exposure to intruders.

1. 46 Fed. Reg. 38083, et seq.
2. § 61.55; 38084, et seq.
3. 38085
4. 38085
5. § 61.60; 38085

A-1 3) 61.1 Purpose and Scope[6]

The purpose and scope states that these regulations establish requirements upon which the commission issues licenses "for the disposal for others of radioactive wastes." While 10 CFR Part 20 covers the disposal of waste by an individual licensee, the quantities are limited to very low levels. The purpose and scope should be rephrased to allow an individual licensee to operate a burial site. The words "for others" and the last sentence in 61.1(a) should be deleted.

4) 61.2 Definitions[7]

ED-1 a) A "near-surface disposal facility"[8] is defined to be "within the upper 15-20 meters of the earth's surface." Is this definition intended to limit the maximum depth of a trench? If not, the definition should be rephrased to clearly indicate that 15-20 meters is an approximate range.

GEN-1 b) The use of the word "isolation" in the definition of "disposal"[9] implies a degree of absoluteness generally not attainable and its use in this context implies that the disposal facility is not part of the biosphere. The definition should read "Disposal means the placement of radioactive waste in an approved disposal facility."

D-56-8 c) The term "stability" should be defined since it is the basis for the separation of class A and B wastes.

5) 61.7 Concepts[10]

ED-1 a) 61.7(a)(2) This clearly limits the depth of individual disposal units or trenches to 20 meters. No justification for the limit has been offered by NRC. At some locations it may be appropriate and economical for individual trenches to exceed 20 meters in depth. The statement should be revised accordingly.

D-51-1 GEN-1 b) 61.7(b)(1) The safety objectives should be rephrased to read "minimize the migration by any route including surface, groundwater discharge, erosion or wind erosion, and minimize the exposure to inadvertent intruders."

D-55-10 c) 61.7(b)(2) According to this paragraph, a maximum disposal site inventory will be established for certain isotopes based on the characteristics of the disposal site. However, no criteria on which to base maximum site inventories is provided. The criteria for setting maximum inventories should be provided since this will limit the capacity of the site. The criteria should take into account the site conditions and locations. Also, the criteria should reflect the fact that if a site is properly selected, a single large site may be more desirable than a series of smaller sites.

6. 38089
7. 38089
8. 38090
9. 38090
10. 38090 et seq.

ED-1

d) 61.7(c)(3) As indicated in paragraph 61.52(a)(9) closure and stabilization measures must be carried out as each disposal unit is filled. Paragraph 61.7(c)(3) states that the site is in the closure phase when closure and stabilization activities are being carried out. In order to clarify the intent of this paragraph, the word "final" should be inserted between the fifth and sixth words so that it reads, "during the period when the final site...."

D-50-9

6) 61.12 Specific technical information[11]

61.12(d) Among the specific technical information that must be included in the license application is: "(d) a description of the design basis natural events or phenomena and their relationship to the principal design criteria." These events require further definition. The definition should include not only the types of events but also the time frame over which they must be considered.

B-1

7) 61.13 Technical analysis[12]

61.13 It is not apparent what is required for "demonstration" or how analysis will be accomplished. This section should be clarified. This comment also applies to Paras. 61.21(f)(1)(j). Once buried, the waste is no longer in the "possession" of the licensee.

B-4

8) 61.24 Conditions of licenses[13]

61.24(h) This appears to be inconsistent with 10 CFR 2.105 which provides the applicant an opportunity to petition for a hearing on any additional requirements or conditions. The "... or thereafter ..." is particularly onerous in that it permits the staff to bypass the rules of procedures as described in Part 2 of the chapter. The Commission already has methods to require immediate action by a licensee through either an Emergency Order or a Compliance Order. This requirement should be deleted.

9) 61.25 Changes[14]

61.25(a) This paragraph, which appears to be directed toward safety-related features at the facility, in reality prohibits any facility change without undergoing a notification and approval procedure. The first sentence should be modified to permit the normal flexibility to modify office buildings, maintenance structures, parking lots, etc. that all nuclear licensees enjoy while holding licenses issued pursuant to this chapter.

11. 38092
12. 38092, et seq.
13. 38094
14. 38096

B-7

10) 61.29 Post-closure observation and maintenance[15]

61.29 The requirement that the licensee maintain responsibility for the disposal site for a minimum of five years is an open ended requirement. A specific time period should be set. As currently stated, the criteria does not provide sufficient guidance to establish adequate funding. Since wastes will not be received during this period, all funding must be derived from fees charged during operation. It is necessary for planning purposes to know the time period over which the licensee will be responsible.

C-4

11) 61.42 Protection of individuals from inadvertent intrusion[16]

61.42 As currently written, this requirement is absolute. The sentence should be rephrased to read, "Design, operation and closure of the land disposal facility should not result in conditions...."

D-51-1

12) 61.51 Disposal site design for land disposal[17]

a) 61.51(a)(3) The words "and improve" should be deleted. The siting criteria will ensure that only acceptable sites are selected. Hence, the site will meet the criteria without improvement.

b) 61.51(a)(4) The word "prevent" should be changed to "minimize." } GEN-1

c) 61.51(a)(6) There is no way to completely "eliminate contact of water with waste." However, it is possible to minimize the likelihood of water contact and provide a water collection and treatment system which can be used as water intrusion monitoring shows that it is necessary.

D-50-4

d) 61.51(7) This paragraph states that the disposal site shall be used exclusively for the disposal of radioactive waste. This seems to be unnecessarily restrictive. It should be acceptable to allow disposal of other waste types as long as there is no comingling of the waste types within a disposal facility. Once an acceptable site has been found, maximum use of the site for the isolation/disposal of any environmentally dangerous materials whether they are radioactive or not should be provided.

ED-1

13) 61.52 Land disposal facility operation and disposal site closure[18]

61.52(a)(9) The requirement for "adequate" closure and stabilization measures should be defined.

D-53-1

14) 61.53 Environmental monitoring[19]

61.53(c) The last sentence should be rephrased to read, "The monitoring system must be capable of providing early warning of migration of radionuclides from the disposal units before they egress the site boundary."

15. 38095
16. 38095
17. 38096
18. 38096
19. 38096, et seq.

13) 61.55 Waste classification[20]

D-55-6

a) 61.55 An alternate method of determining the waste classification should be provided. Provisions for classification by external dose determination should be made. For cases where the types of isotopes of concern are known, this method would allow adequate classification. This alternate method would be particularly helpful for nuclear power plant trash. Generally, trash has a very low specific activity compared to the class A limits. A determination of the radionuclide identity and concentration, as required by Part 20.311, would require the purchase and use of a portable spectrum analyzer. Instead, a contact dose rate measurement of the containerized trash could be made to show that the activities were below the class A limits. Also, since a radwaste classification system is already established in 10 CFR 71, is it possible to tie the two systems together?

D-55-11

b) 61.55 - Table 1 The waste classifications scheme presented here with the associated concentration limits presented in Table 1 would have a substantial impact on the nuclear power industry's waste disposal costs and hence, upon the cost of nuclear generated power.

D-55-1

The concentrations given in this table are much more limiting than necessary. In the study prepared for the USNRC by Ford, Bacon & Davis Utah, Inc., "A Radioactive Waste Disposal Classification System," NUREG/CR1005, conservative radioactivity limits for various waste classes were established through detailed hazards analysis. The limits recommended in NUREG/CR1005 should be incorporated into 10 CFR 61 in place of the arbitrary values in Table 1.

The logic behind the numbers selected for this table is not apparent. It would appear, for example, that carbon 14 which contains less than 0.8 microcuries per cc may be disposed of as segregated waste but that any concentration greater than 0.8, even if it is only a tiny increase, immediately requires that the disposer seek special permission from the government for disposal. The abrupt demarcation needs explaining so that the logic of it can be understood.

D-55-2

c) De Minimis classification of wastes

61.55 Table 1 should consider a "de minimis" classification of wastes (i.e., wastes that would be considered of non-regulatory concern); we believe strongly that this should be addressed in the proposed 10 CFR 61 regulation. De minimis levels for uranium, technetium, plutonium, and neptunium should be stated. A de minimis or lower acceptable level for natural and depleted uranium should be stated; we recommend that a value of 0.035 percent natural and depleted uranium be set as a lower limit in Section 61.55, Table 1. Recent information received from Nuclear Regulatory Commission staff members reveals that proposals concerning de minimis levels for uranium are being prepared by the NRC staff that would establish multi-tiered acceptable levels for shallow-land burial of uranium wastes. One level proposed by the NRC would permit disposal of uranium

20. 38097

D-55-2

wastes in an unlicensed burial ground (i.e., sanitary type). A second proposal would permit disposal in a shallow-land licensed burial site, and a third proposed level would permit disposal in a shallow-land licensed burial site which has a covenant in the title on the property. These multi-tiered NRC proposals are consistent with our recommended levels. We recommend that de minimis levels consistent with those proposed by NRC relative to ^{99}Tc and low-enriched uranium as residual contamination in smelted alloys (Addendum to 10 CFR Parts 30, 32, 70, and 150) also be stated. In this regard, we recommend that serious consideration be given to establishment of de minimis levels of 3.5 ppm ^{235}U, 5 ppm Tc, 0.01 ppb Pu, and 1 ppb Np.

d) Alpha-emitting transuranic isotopes (Waste Classification)

D-55-3

In Section 61.55, Waste Classification, Table 1, we believe strongly that the maximum concentration for alpha-emitting transuranic isotopes should be increased from the 10 nCi/g limit presently proposed to 100 nCi/g. Part of the rationale behind the 10 nCi/g limit is stated to be that this value has been imposed by DOE; however, DOE is at the present time seriously considering revision of DOE Manual Chapter 0511 to raise this limit to 100 nCi/g dated 7/30/81. The 10 nCi/g value is also inconsistent with the value of 100 nCi/g used by the Environment Protection Agency in their proposed regulation 40 CFR Part 91 for the disposal of spent fuel, high-level, and transuranic (TRU) wastes. This regulation states that TRU wastes containing more than 100 nCi/g of alpha-emitting TRU isotopes must have the same controls as are required for high-level wastes. We recommend the same controls as are required for high-level wastes. We recommend that the 100 nCi/g limit be reflected in each of the columns 1-3 in Table 1. We also recommend that a limit of 100 pCi/cm^2 for transferable surface contamination of alpha-emitting transuranic isotopes (not natural)(or depleted uranium isotopes) be imposed, consistent with the proposed revision to DOE Manual Chapter 0511.

Additionally, the value of 10 nCi/g is based on naturally occurring radium deposits. Radium is significantly more hazardous than ^{233}U or the transuranium nuclides when dissolved in water, as the MPC's for the soluble forms of these nuclides are about 100 times (1000 times for ^{233}U) greater than that of radium. Thus, it would appear reasonable to set activity limits for alpha-emitting transuranic isotopes at 100 times greater.

The supplementary information in the NRC document also states that there is no need to increase this limit from the standpoint of achievability. Much of the waste presently stored as transuranic waste is segregated from low-level waste on the basis of waste origin since the 10 nCi/g limit is too low for accurate measurement and certification. However, segregation according to the 100 nCi/g limit could be achieved, eliminating expensive retrievable storage and deep geologic disposal of "suspect" transuranic waste.

Another concern is the footnote (#4) to Table 1 that refers to isotopes contained in metals, metal alloys, or permanently fixed on metal as contamination. The footnote, which states that "the values above may

D-55-3 be increased by a factor of ten" should be modified to include concrete and other media that exhibit low leach-rate behavior. An incentive should be provided to reduce the volume of wastes by incineration or metal smelting. These treatments may normally be avoided by waste generators since they would convert some low-level wastes into transuranic wastes. For example, a volume reduction of 30 by incineration of a waste containing 5 nCi/g would convert a low-level waste into a transuranic waste at 150 nCi/g. However, the residual ashes could be incorporated into concrete, glass, metal, etc. The leach rate of transuranic isotopes from these materials is very low (i.e., many orders of magnitude lower than the untreated waste form). Thus, a combination of leach rate and transuranic content could be used to determine the disposal options for these waste forms.

D-55-6 We are troubled with Table 1, as many of the nuclide concentrations limits may not provide a practical basis for classification. In many cases, the measurements are difficult and some are almost impossible. Perhaps the Commission would specify practical analytical methods acceptable for determining nuclide concentrations.

e) 61.55 Table 1, Footnote 4

ED-1 (1) The term "significant gamma radiation" should be defined.

D-55-4 (2) How is radium treated? A value should be established.

D-56-2 (3) The footnote places a restriction on wastes containing chelating agents in concentrations greater than 0.1%. Is this limit intended to be 0.1% by weight or volume? This limit is too low, many agents were developed to decontaminate piping and equipment to reduce radiation levels to workers. A restriction on the solidified product of 0.1% might cause potential users to forego utilization of them because of the restriction on disposal and then let radiation levels rise. One manufacturer has even developed a solidification agent for their chelating agent.

15) 61.56 Waste characteristics[21]

D-56-5 a) 61.56(a)(5)-(7) The inconsistency between paragraphs 61.56(a)(5) and (7) should be clarified. Wastes in gaseous form, allowed by paragraph 61.56(a)(7), could be considered the very waste disallowed by paragraph 61.36(a)(3).

D-56-8 b) 61.56(b)(1) "Stability for 150 years" needs to be modified to indicate what forms of proof are acceptable. Some metal, wooden, and concrete structures can be shown to have maintained their "stability" for 150 years past. Very few of these are applicable to waste packaging. There is no way that deformation alone of the

21. 38097, et seq.

D-56-8 waste form can be a hazard to the public. The key requirement is to keep the waste from being dispersed which is little affected by "slumping" or a "5%" deformation.

D-56-13 c) 61.56(b)(2) "Non-corrosive liquid" should perhaps be changed to "liquid." If the intent of this article is to minimize corrosivity it should say so instead of setting arbitrary limits. Is the radioactivity in the liquid of any concern? Is there an intent to limit the amount of "clean" water in the container?

D-56-10 d) 61.56(b)(3) This paragraph requires that "Void spaces within the waste and between the waste and its package must be reduced to the extent practicable." This requirement should be deleted as being too vague unless specific acceptance criteria can be established. For solidified liquid or slurry wastes, 10-15% freeboard in a 55 gallon drum is normally appropriate.

Does this mean that filler material must be added to packages containing irregularly shaped solid objects? Or is it the intent of this article that all such objects should somehow be chopped, melted, or otherwise compacted? What forms are acceptable, i.e., ash, pellets, compressed trash?

D-57-1 17) 61.57 Labeling[22]

61.57 The labeling requirements should be clarified and made more specific.

G-1 18) 61.82 Commission inspections of land disposal facilities[23]

61.82 Eliminate radioactive waste already disposed of and covered, from NRC inspection requirement.

D-50-4 19) General

The current version of Part 61 appears to contain nothing that would preclude the location of a land disposal facility at the site of another licensed activity. Such a location could be quite desirable since the facility has been dedicated to a nuclear application.

22. 38098
23. 38100

III. CONCLUSION

The recommendations made throughout this commentary need not be be repeated here; however, it is worthy of note that those who prepared this review are multi-disciplined professionals whose known dedication to and expertise in this field counsel an in-depth appraisal of these recommendations.

The Chairman and members of the American Nuclear Society's Fuel Cycle and Waste Management Division appreciate the opportunity to comment on the proposed rule, stand ready to assist in any further deliberations, and await the release of the final regulation.

Respectfully submitted,

JAMES R. HEELAN
American Nuclear Society
555 North Kensington Avenue
La Grange Park, Illinois 60525
Telephone: (312) 352-6611

James R. Heelan
Attorney for the American Nuclear Society

Law Offices of

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emp

IN REPLY REFER TO
_______ OFFICE
_______ FILE NO.

January 13, 1982

(88)

PR-2 et al
(46 FR 38081)
(22)
PR-61
(46 FR 51776)

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

Attention: Docketing & Service Branch

Gentlemen:

Enclosed please find an original and one copy of Comments of the Township of Lower Alloways Creek to Proposed Rule for Licensing Requirements for Land Disposal of Radioactive Waste (10 CFR Part 61).

Yours very truly,

Carl J. Valore
Special Nuclear Counsel
for the Township of Lower
Alloways Creek

CJV:lv
Enc. (2)

Acknowledged by card 1/22/82 emp

NUCLEAR REGULATORY COMMISSION
UNITED STATES OF AMERICA

2 IF

10 CFR PART 61, et al	:	COMMENTS OF THE TOWNSHIP OF LOWER ALLOWAYS CREEK TO PROPOSED RULE FOR LICENSING REQUIREMENTS FOR LAND DISPOSAL OF RADIOACTIVE WASTE

TO: Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D. C., 20555

Attention: Docketing & Service Branch

F-2

1. Background: The Township of Lower Alloways Creek (TOLAC) is a community located in Salem County, New Jersey. Within its territorial borders are Salem 1 and 2 Nuclear Generating Stations (operating licenses) and Hope Creek 1 and 2 Nuclear Generating Stations (construction licenses). Salem 1 and 2 have been permitted license amendments and/or changes to the plant design to permit increased spent fuel storage in the spent fuel pools from 284 spent fuel rods in each spent fuel pool to 1,170.

2. Site Selection and Characterization Phase:

The proposed rule and the supporting draft environmental impact statement discuss the applicants coordinating with the NRC, State and local governments as to site selection and characterization. (Draft environmental impact statement-NUREG-0782 Volume 3 E-5) (Part 2- 2.101(b)(1)(i))

The procedure as contemplated by the rule is that the applicant would establish a region of interest and then develop a most-favorite site for evaluation of information. After establishing a most-favorite site the applicant would file an application which would be announced in the Federal Register

F-2

and a hearing could potentially be held in conformity with Part 2 of the Commission regulations.

(a) The applicant should be required to notify the community wherein the site is proposed and any adjoining communities of an intent to file an application with the NRC at least sixty days prior to the filing of the application. This would enable local communities to participate in a meaningful way in the licensing process. As a practical matter local communities do not have the socio-economic-political flexibility to respond to licensing procedures as parties or intervenors unless they are given adequate lead time in reference to the proposed action.

(b) The environmental impact statement required under 10 CFR Part 61 for a waste disposal facility and the environmental report submitted by the applicant should consider the cumulative effects of putting a waste disposal facility within a 25-mile radius of an operating nuclear power plant and/or storage of spent nuclear fuel. The existence of flood plains and road networks should be carefully considered as well as the cumulative effects of the increasing radiation hazards by aggregating nuclear land uses in reasonably close proximity.

3. Institutional Control: The concept that the Federal or State land owner will carry out custodial care of the site in such activities as site security and monitoring of the environment is not entirely satisfactory.

(a) The applicant and the government land owner should be required to enter into a contract with the local community that is host to the site. That contract would require the applicant and government entity to post bond in an adequate

amount for maintaining site security and monitoring the environment. In the past State regulation of sanitary landfills has not always been consistent with the safety and health of the public. Many hazardous wastes have been placed in sanitary landfills and have endangered local communities and residents. In such instances local communities and private land owners have found inadequate legal remedies and an inability to obtain immediate relief where water supply and other beneficial attributes of land ownership have been interfered with. Much of this hardship on local communities and private land owners could be eliminated if the applicant and the State or Federal government as land owner was required to enter into a contract with the local community whereby specific contractual obligations would be undertaken in the event of pollution of ground water, soil or air as a result of the operation or custodial care of the site. The form and execution of such a contract should be approved by the Nuclear Regulatory Commission and made part of the requirements of approval for a license.

F-2

(b) The local community that is host to the site should be included in approving any funding mechanisms which are created for the long-term care of the facility.

4. Record-keeping: An accurate record of any and all wastes disposed of at the site should be filed with the clerk for the local community. Such a record will promote public involvement and awareness and reduce unfounded fears and suspicions.

(a) The proposed rule apparently assumes that arrangements on record-keeping can be worked out between the State and local

community. This is unsatisfactory and may not take place. It should be the Nuclear Regulatory Commission's responsibility to provide a proposed rule that full records regarding the type of materials, their composition, and their location within the site; the volumes of material by type; the identity of the shipper and the materials shipped are all supplied to the local community as disposal is taking place.

F-2

5. Closure: It is not clear whether an application for closure is an amendment to the license which would require a hearing pursuant to Part 2 of the Rules of Practice. Any application for closure should be considered a significant amendment to the license and should be served on appropriate Federal, State and local officials and if a hearing is requested then the NRC should appoint an atomic safety and licensing board to review the amendment to the application to permit closure.

6. Local Reparations: It should be recognized that potentially hazardous uses of land are local undesirable land uses. The Nuclear Regulatory Commission should require that the applicant or State or Federal land owner or combination of the same provide economic reparation to the local community for the diminution in property value and partial loss of tax ratables in respect to property values that may be affected for a reasonable radius surrounding the site. The process could be established in the rule and if agreed to by the local community or individual property owners be in lieu of any statutory or common law remedies the local community or property owners would have predicated upon inverse condemnation.

F-2

7. Public Education: The proposed rule should require the applicant to conduct yearly public education programs on the low level radioactive waste disposal process. These programs would be designed to fully inform the public as to activities at the site and would serve as a vehicle for reducing tensions, fears and suspicions

Respectfully submitted,

CARL J. VALORE, Special
Nuclear Counsel for the
Township of Lower Alloways
Creek

January 12, 1982

GENERAL ELECTRIC

NUCLEAR ENERGY PRODUCTS DIVISION

amp

January 11, 1982

(89)
1-Detail
(46 FR 38081)
(23)
1-6L
(46 FR 51776)

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

Attention: Docketing & Service Branch

Gentlemen:

Subject: COMMENTS ON PROPOSED 10 CFR 61

In the Federal Register, Volume 46, page 38081, the NRC published proposed rule 10 CFR 61, "Licensing Requirements for Land Disposal of Radioactive Waste." On October 22, 1981, the NRC extended the comment period to January 14, 1982 (46 FR 51776). Pursuant to the invitation for public comment, General Electric Company Wilmington Manufacturing Department submits the attached comments.

The General Electric BWR fuel fabrication plant in Wilmington, N. C., is a generator of low level radioactive waste. Although GE does not operate a low level waste disposal site, the proposed rules will have an impact upon our packaging and transportation of low level radioactive waste and our interaction with other licensees disposing of low level radioactive waste.

The attached comments are submitted in a format which hopefully will be most useful to you in reviewing them. With respect to those specific items for which we developed comments, the presentation of the comments is as follows:

1) Original wording in the proposed rule.

2) Suggested modifications to the original wording.

3) Reasons for suggested changes.

General Electric appreciates the opportunity to participate in the regulatory process concerning this proposed regulation and would be pleased to discuss any questions that you or your staff may have related to our comments.

Very truly yours,

GENERAL ELECTRIC COMPANY

Charles M. Vaughan

Charles M. Vaughan, Acting Manager
Licensing & Compliance Audits
M/C J26

CMV:bmw
Attachment
NSD/SGD-L

1/22/82 amp

GENERAL ELECTRIC

Secretary of the Commission
January 11, 1982

General Electric Company
Wilmington Manufacturing Department
Wilmington, N. C.

COMMENTS ON PROPOSED 10 CFR 61

OVERALL COMMENTS

C-1 (1) The approach used by the Commission to emphasize performance specifications, supplemented only as necessary by technical specifications, is to be commended. This will assure protection of the public health and safety and at the same time capitalize on the benefits of specific site characteristics. This approach also removes the ultra-conservatism that would be necessary with generic technical specifications applicable to all conceivable locations.

D-55-1 (2) The Commission has established a manageable approach to the complex issue of waste classification and should be commended for this. The documentation of the waste categories, the specific criteria for these categories and the rationale for arriving at them, provide an excellent and workable basis for arriving at final regulations.

SPECIFIC COMMENTS

D-55-9 Page 38085 (Supplemental Information) - Waste Characteristics & Classification

We support the concept of not developing a waste classification system based on total hazard. While concerns related to both the chemical and radiological components of a waste must be evaluated to determine the proper disposal method, the establishment of a total hazard classification system would be a redundant effort. The U. S. Environmental Protection Agency already addresses chemically-related concerns through the comprehensive regulations associated with the implementation of the Resource Conservation & Recovery Act (RCRA).

D-55-9 The proposed regulations properly address necessary radiation protection considerations and provide adequate guidelines for judging proper treatment or exclusion of nuclear of waste components. This avoids the need to develop a very complex classification system that somehow interrelates radiological and nonradiological concerns on a detailed basis.

D-55-2 We also support the continuing work of the Commission to identify and define specific wastes which can be exempted from Part 61. This activity can result in conservation of the limited low level radioactive waste burial capacity and could even provide the potential for beneficial reuse of some wastes by eliminating the need to bury some exempted materials.

M-1 Page 38086 - Manifest Tracking System

The need for a manifest system to assure traceability of waste shipments from a generator through the transporter and finally to the disposal site, is recognized. We question the need for a copy of the manifest preceding the shipment for the following reasons:

1) The copy of the manifest accompanying the shipment will allow the transporter and disposal facility to verify the shipment content.

2) The expressed concern that a missing or delayed shipment would not be detected can be reconciled by other methods such as an independent transmittal of the manifest at the time of shipment or by telephone notification to the receiving facility at the time of shipment.

3) The requirement for the manifest to precede the shipment implies that the shipment should not leave until notificaton has been received by the shipper that the receiver has received said copy. This can result in a shipment sitting for an extended period while these notices go back and forth.

B-5 Page 38087 - Operational Phase

A requirement that the disposal facility license be periodically renewed for continued operation is noted in this paragraph as is a 5 year normal term for material licenses. We suggest the concept that it not be necessary to renew the license. Paragraphs 61.25 and 62.26 in the proposed regulation provide adequate assurance

B-5

that licensee-originated changes will receive review by the Commission. New-found issues of national concern that are independently identified by the Commission can be applied on a national basis to the sites as such issues are identified and are not dependent on waiting for a renewal application.

Paragraph 61.2 - Definitions

> "Near surface" disposal facility means land disposal facility in which radioactive waste is disposed or in or within the upper 15-20 meters of the earth's surface.

It is suggested that this definition be changed to read as follows:

> Near surface disposal facility" means disposal facility in which radioactive waste is disposed on in or within the upper 15-20 meters of the earth's surface or to whatever greater depth can be demonstrated as capable of meeting the required performance criteria and technical specifications.

ED-1

Rationale - The restriction in or within the upper 15-20 meters could prevent utilization of greater depths at locations where hydrogeological conditions and waste stability characteristics would allow this. The criteria of the proposed regulation are established to prevent exposure to the public by transmittal through ground water flow and to prevent exposure to the intruder. The establishment of an allowable depth should be made on a site-specific basis and with the objective that the criteria will be met. The unsubstantiated establishment of a nationwide depth limit is not in keeping with the logic used throughout the rest of the proposed regulation.

61.3(a)

> No person may receive, possess, and dispose of radioactive waste containing source, special nuclear, or byproduct material at a land disposal facility unless authorized by a license issued by the Commission pursuant to this part.

It is suggested that this paragraph be changed to read as follows:

> No person may receive, possess and dispose of radioactive waste containing source, special nuclear, or byproduct material at a land disposal facility unless authorized by a license issued by the Commission pursuant to this part or unless exemption has been granted by the Commission under Paragraph 61.6.

ED-1

Rationale - Paragraph 61.3(a) as written would prohibit transfer for land disposal of any radioactive waste to a nonlicensed person. This is overly restrictive and would force the shipment (to a licensed facility) of radioactive wastes that are not of a health or safety concern. The suggested addition to Paragraph 61.3(a) would allow determinations to be made by the Commission on a case-by-case basis where it could be demonstrated that health and safety concerns could be met by alternate disposal methods.

61.24(b)

> The licensee shall submit written statements under oath upon request of the Commission, at any time before termination of the license, to enable the Commission to determine whether or not the license should be modified, suspended or revoked.

B-12

It is suggested that this paragraph be deleted.

Rationale - The paragraph is very vague as to intent and method of implementation. It is not clear under what circumstances such an oath would be required and has a direct implication that the licensees are untrustworthy. There are certainly sufficient written transmittals required in other paragraphs of the proposed regulation to obtain necessary documentation of deliberate falsification of information.

61.25(a) - Changes

> Except as provided for in specific license conditions, the licensee shall not make changes in the land

B-4

disposal facility or procedures described in the license application. The license will include conditions restricting subsequent changes to the facility and the procedures authorized. These restrictions will fall into three categories of descending importance to public health and safety as follows: (1) those features and procedures which may not be changed without (i) 60 days prior notice to the Commission, (ii) 30 days notice of opportunity for a prior hearing, and (iii) prior Commission approval; (2) those features and procedures which may not be changed without (i) 60 days prior notice to the Commission, and (ii) prior Commission appproval; and (3) those features and procedures which may not be changed without 60 days prior notice to the Commission. Features and procedures falling in paragraph (a)(3) of this section may not be changed without prior Commission approval if the Commission, after having received the required notice, so orders.

B-4

It is suggested that this paragraph be changed to read:

> ... the required notice, so orders. Changes that do not impact public health and safety can be made immediately with subsequent notificaton to the Commission within 90 days.

Rationale - The necessity to make minor changes that do not impact on the public health and safety occurs routinely during the operation of a facility. The requirements in Paragraph 61.25(a) that no changes can be made without prior notice to the Commission, are overly restrictive.

61.56(a)(1)

> The waste must be packaged and the waste form and packaging must meet all applicable transportation requirements of the Commission set forth in 10 CFR Part 71 and of the Department of Transportation set forth in 49 CFR Parts 171-179, as applicable.

D-56-6

It is suggested that this paragraph be changed to read:

> ... and of the Department of Transportation set forth in 49 CFR Parts 171-179, as applicable. In the case of unpackaged (bulk) shipments, these must meet the requirements of 49 CFR 173.392.

Rationale - The proposed regulations should provide for the shipment of bulk (unpackaged) wastes under conditions that comply with Department of Transportation requirements for such wastes and that the wastes can meet the proposed Part 61 criteria when disposed of at the burial facility. A requirement on packaging would serve no useful purpose under these circumstances and should not be imposed.

61.56(b)(1)

> Waste must have structural stability. A structurally stable waste form will maintain its physical dimensions within 5% of its form, under the expected disposal conditions of compressive load of 50 psi, and factors such as the presence of moisture, and microbial activity, and internal factors such as radiation effects and chemical changes. Structural stability can be provided by the waste form itself, processing the waste to a stable form, or placing the waste in a disposal container or structure that provides stability after disposal.

D-56-11

GENERAL ELECTRIC

Secretary of the Commission
January 11, 1982
Page 7

D-56-11

It is suggested that this paragraph read as follows:

> Waste must have structural stability. A structurally stable waste form will maintain its general physical dimensions and form under the expected disposal conditions and factors such as the presence of moisture and microbial activity, and internal factors such as ...

Rationale - The requirement of withstanding a compressive load of 50-psi (more than 7,000 pounds per square foot) appears to be a very rigorous loading requirement and is above that available from many soils. If it is still felt that a numerical value is necessary, then consider one of these approaches:

- o Make the compressive load requirement for the waste when buried no more than that of the surrounding soils at the site under consideration.
- o Evaluate a structural approach recognizing that the waste is constrained by surrounding soil and other wastes. This could conceivably reduce the compressive load requirement by a tenfold magnitude and still have an adequate safety factor.

D-56-9

Similarly, requiring that the waste retain its form within 5% under loading is a very rigorous requirement and using the second potential approach listed above, could be eased or eliminated.

D-56-10

§61.56(b)(3)

> Void spaces within the waste and between the waste and its package must be reduced to the extent practicable.

It is suggested that this paragraph be deleted.

Rationale - This is a very subjective statement and open to varying degrees of interpretation. The goal of reducing the void spaces in a waste package is desirable and will be attained because of economic incentive independent of regulations.

:bmw

January 4, 1982

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DOCKET NUMBER PROPOSED RULE PR-2 et al (46 FR 38081)

DOCKET NUMBER PROPOSED RULE PR-61 (24) (46 FR 51776)

Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
ATTN: Docketing and Service Branch

Dear Sir/Ms.:

I would like to comment on the proposed rule, "Licensing Requirements for Land Disposal of Radioactive Waste" (46 FR 38081), and on the Draft Environmental Impact Statement, NUREG-0782, supporting that proposed rule.

In light of the troubled history of land disposal of radioactive waste, this proposed rule is an admirable attempt to regulate such facilities. The provisions which would subject these facilities to the NRC hearing process, thereby encouraging public debate, are especially commendable. However, I feel that insufficient consideration has been given to the long-term consequences of shallow land burial of radioactive wastes.

D-59-2

A realistic extrapolation of past and present societal trends would reveal some flaws in the analysis presented in NUREG-0782. Radioactive wastes remain dangerous for centuries; their safe disposal is dependent upon a stable social structure for at least 500 years. History (and current events) clearly shows that such stability cannot be predicted, much less insured. It is questionable whether the United States, as we now know it, will exist 500 years from now. The stability of the financial world is even more uncertain. The financial assurances proposed in NUREG-0782 are not depression-proof. Should this Nation be intact in the future, its economy most surely would not have remained static. The effects of war have not been considered; even a conventional war fought near a waste disposal site would release large quantities of radioactivity to the environment.

C-4

The DEIS analysis is particularly deficient in its assessment of future land use. Present trends in population growth, soil erosion, and water resources indicate that in the future land and water will be extremely precious commodities. There is already a water shortage in many parts of the country. As the population increases and more and more farmland is lost to erosion and urban growth, arable land will be in short supply. It may be that the "intruder scenarios" proposed in the DEIS will not be inadvertant, as is now assumed; the need for land and food may be so severe that the use of waste burial sites for agriculture may be permitted. This is especially likely since the site characteristics (topography, soil permeability, meteorology) most favorable for waste disposal are also the best for farming or residential purposes. The water crisis may be so serious that the use of contaminated wells will be allowed.

An example of an analysis in the DEIS that is deficient even in the context of today's society is that of exposure calculations for the intruder-agriculture scenario, Appendix G, Section

Acknowledged by card 1/22/82 emp

3.4.2. The intruder is assumed to be an individual who lives in a house on the waste burial site and consumes food grown in a garden on the site. The intruder is assumed to work at a regular job during the day and spend only about half his time at home. This scenario does not consider a more plausible family-intruder, in which the following factors would alter the risk analysis: (1) some members of the family may not work or may work in the home, thus spending much more time at the site; (2) some family members may be children or pregnant women, who are more sensitive to radiation. This analysis is inadequate for present-day society; its applicability to the future is even more uncertain. C-4

The DEIS also neglects the vulnerability of shallow land burial to acts of terrorism or sabotage.

I fear that the proposed rule, if adopted, would encourage the proliferation of waste disposal sites. This is undesirable for the reasons detailed above. Instead, the problem of radioactive waste disposal should be addressed from another perspective, that of waste reduction. Rather than continuing to produce wastes when there is no satisfactory method to dispose of them, a moratorium on waste production from those waste sources for which there exist alternative means of obtaining the same benefits is appropriate. The use of nuclear fission to generate electricity is an obvious candidate. Viable alternatives exist for the production of electricity: solar, wind, coal, magnetohydrodynamics, etc. The costs, of which waste generation is one, far outweigh the benefits of nuclear power plants. An immediate shutdown of all operating plants will decrease the volume of waste to be disposed of by about 65% (according to figures on p. D-66 of NUREG-0782). This would permit the use of existing waste facilities while alternatives can be developed for institutional and industrial uses of radioactive materials. This alternative, which was not considered in the DEIS, is clearly the most reasonable solution to the problem of radioactive waste disposal.

Sincerely,

Amy S. Hubbard
Box 5636
Cleveland, Ohio 44101

Florida Power
CORPORATION

amp

January 13, 1987
3F-0182-12
File: 3-0-3-a-10

(91)
PR-2 et al
(46 FR 38081)

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

Attn: Docketing and Service Branch

Subject: Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72
Proposed Rulemaking on Land Disposal of Low-Level Radioactive Waste

Dear Sir:

Florida Power Corporation wishes to offer the following comments regarding the proposed rulemaking on land disposal of low-level radioactive waste as published in the July 24, 1981 Federal Register. First, the requirements concerning transportation and packaging appear to have much more impact upon waste generators/shippers than upon licensed land disposal facilities. These requirements may be inappropriately placed in a regulation concerning land disposal facilities.

Second, the three class identifications specified in the proposed rule appear to require additional analysis, handling, and, therefore, increased exposure to individuals for no apparent benefit. State-of-the-art methods now available do not lend themselves to performance of the specified isotopic analysis. Aside from the methodology question, personnel resources now available are unable to support the performance of the extensive isotopic analysis specified in the proposed regulation. D-55-6

Finally, the cost/benefit aspect of classifying waste when compared to the safety aspect is not apparent. The additional risk and costs associated with additional handling and analysis must prove beneficial either in reduced risk to the public or in reduced cost of disposal in order to be a sound business practice. D-55-11

Florida Power Corporation appreciates the opportunity to provide comments regarding this proposed rule and respectfully requests that these comments be considered in the final rule.

Very truly yours,

David G. Mardis

David G. Mardis
Acting Manager
Nuclear Licensing

amp 1/22/87

General Office 3201 Thirty-fourth Street South • P.O. Box 14042, St. Petersburg, Florida 33733 • 813—866-5151

POWER AUTHORITY OF THE STATE OF NEW YORK

10 COLUMBUS CIRCLE NEW YORK, N. Y. 10019

(212) 397-6200

'82 JAN 15 P5:10

January 13, 1982
IPN-82-4
JPN-82-8

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

Attention: Docketing and Service Branch

Subject: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333
Comments on Proposed Rule - 10 CFR Part 61,
"Licensing Requirements for Land Disposal of
Radioactive Waste"

Dear Sir:

Attachment A to this letter provides the Authority's comments on proposed 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

Very truly yours,

J. P. Bayne
Senior Vice President
Nuclear Generation

cc: Resident Inspector
Indian Point Unit 3
U. S. Nuclear Regulatory Commission
P. O. Box 38
Buchanan, New York 10511

Mr. J. Linville
Resident Inspector
U. S. Nuclear Regulatory Commission
P. O. Box 136
Lycoming, New York 13093

Acknowledged by card 1/22/82 emp

ATTACHMENT A

Comments on Proposed Rule - 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

The Authority has the following specific comments on proposed 10 CFR Part 61:

'82 JAN 15 P5:10

Page/Paragraph		Comments
p. 38097 para. 61.55 (a)	D-56-2	Chelating Agents - Table 1 has a footnote eliminating wastes containing chelating agents in concentrations greater than 0.1% except as specifically approved by the Commission. This requirement eliminates most routine decontamination techniques used to reduce occupational exposure and therefore it is not in conformance with the ALARA philosophy. One disposal site already has a 1% by volume limit which is a factor of 10 greater than this regulation. If this criterion must be met, acceptable methods for packaging of these agents must be developed.
p. 38097 para. 61.55	D-55-6	Table 1 - This list of radioisotopes divides waste into three classifications. While some of the concentration limits shown are reasonable, demonstrating compliance with many of the beta emitters would be extremely difficult. Accurate analyses of isotopes such as Ni-59, Ni-63, Nb-94, Tc-99, I-129, and Cs-135 would be extremely difficult to perform for every shipment. Batch or yearly analyses such as those performed on Transuranics (TRU) by research facilities would be much easier to implement. This method is preferable because the measurement of TRU (>10 nanocuries/gm), in the presence of other interfering radionuclides, is very difficult to perform in-house. Detection is easy if TRU isotopes are the only ones present. Additionally, with the increase in the use of volume reduction techniques the concentration listed are very low and may become very cumbersome and outdated in the near future. The limits in Table 1 should be reevaluated to determine their ability to be achieved in a realistic situation and in a cost-effective manner.
	D-55-3	
	D-55-8	
p. 38098 para. 61.56 (b)(1)	D-56-9	By specifying a structurally stable waste form (<5%) the rule may be unintentionally mandating high integrity containers for all waste forms. Experience has shown that drums and liners can normally only be filled to 80% of total capacity. Further, the 50 psi criterion should be left to the specific burial site rather than it being a generic criterion.
	D-56-11	

State of California
GOVERNOR'S OFFICE
SACRAMENTO 95814

EDMUND G. BROWN JR.
GOVERNOR

916/323-6237

January 12, 1982

(93)
DOCKET NUMBER
PROPOSED RULE PR-2 etal
(46 FR 35628)
DOCKET NUMBER PR-61 (26)
PROPOSED RULE
(46 FR 51776)

R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards
U.S. Nuclear Regulatory Commission
Washington D.C. 20555

Dear Mr. Smith:

We are pleased to transmit the comments of the State of California on the Nuclear Regulatory Commission's proposed rulemaking on land disposal of low-level radioactive waste (10 CFR Part 61) and the related draft environmental impact statement (EIS). Because these two documents are closely related, this letter transmits comments on both. However, to facilitate differentiation of the issues, each will be discussed separately.

PROPOSED RULEMAKING ON LAND DISPOSAL OF LOW-LEVEL RADIOACTIVE WASTE (10 CFR Part 61)

The comments of various State agencies on the proposed rulemaking are included below. I would like to raise the following additional points.

D-52-5 1) Part 61.52(a)(6) states that the "waste must be placed and covered in a manner that limits the gamma radiation at the surface of the cover to levels that are within a few percent above the natural background levels of the site" (emphasis added). This terminology is unnecessarily vague. We recommend that the term "a few percent" be replaced with a specific number.

D-55-5 2) Part 61.55. With regard to waste classification, we share the view that segregating waste into different classes can be beneficial from the standpoints of protecting public health and maximizing disposal economies. However, the language of the rulemaking does not appear to definitively rule out the possibility of a "low-level" disposal site for transuranic-contaminated waste. Part 61.55(d) states that waste with a concentration exceeding the values shown in the accompanying table is not acceptable for near-surface disposal

D-55-5 "without specific Commission approval pursuant to Part 61.58 of this Part". Part 61.58 is one very brief paragraph which appears to permit the Commission to authorize "other provisions for the classification and characteristics of waste on a specific basis" measured against criteria and an evaluation process which are not specified in any way. It is therefore unclear to us under what conditions the Commission would exercise its authority under Part 61.58 and whether or not waivers could be granted for waste that exceeds the concentrations in Column 3 of Table 1. Our view is that transuranic-contaminated waste

D-55-3 should under no circumstances be considered low-level waste and should not be included in low-level waste disposal sites. Rather, this material should be disposed of at the specifically-designated sites operated by the federal government to receive and dispose of transuranic-contaminated waste.

A-7 3) Part 61.54, similarly, in one brief paragraph appears to permit the Commission to authorize provisions other than those set forth in detail in Parts 61.51 through 61.53 of the proposed rulemaking without any discussion of the considerations that would go into such a decision. One can only wonder why the specific elements of this rulemaking are included if the Commission is empowered at the same time to unilaterally change the requisite requirements for segregation and disposal of waste on the basis of what appears to be an arbitrary finding. This part should be clarified or deleted.

E-1 4) Part 61.62 -- Funding for disposal site closure and stabilization. The financial arrangements, while on the right track, do not appear to us to be sufficiently comprehensive. It is unclear whether the annual review by the Commission of the financial arrangements would include the requirement that the size of the post-closure funding be increased on an annual basis to account for inflation and unforeseen problems and costs. The financial surety arrangements mentioned in subparagraph (g) (surety bonds, cash deposits, certificate of deposits, etc.) are not instruments which increase in value over time to compensate for the effects of inflation. We suspect that a device such as a sinking fund would be a preferable vehicle, but this receives no mention. Additionally, there is no mention whatsoever of the funds that would be required or the source of such funds if problems should occur at the site which would require considerably greater post-closure expense than that budgeted on an assumption of normal operation. Surely the experience of the State of Kentucky with Maxey Flats testifies to the importance of making contingency funds available in the event that serious problems occur. This issue should be addressed and the rulemaking changed accordingly.

F-1 5) Subpart F -- Participation by state governments and Indian tribes. We are disturbed by the tenor of Subpart F. As drafted, it appears to set up an adversary relationship

F-1 between the states and the federal government. Rather there should be full cooperation between state government and federal agencies in all phases of low-level waste management. This rulemaking as drafted does not lay the groundwork for that cooperation. For example, the state proposal for participation required under Part 61.72(b) and (c) calls for a submission by the state of various specific items of information at a time so early in the process that all the state's concerns may not yet be apparent because of lack of information. While we understand the Commission's desire to avoid an unnecessarily protracted participation by a hostile state, nonetheless the legitimate interests of state governments should be accommodated in a more thorough and flexible manner. The regulations as drafted do not accomplish this. Note also in Part 61.71 the statement that "upon request of a state or federal government body, the director may make available Commission staff to discuss with representatives of the state..." (emphasis added). As a first step in the right direction, surely the word "may" should be replaced with "shall." This section should be completely revised to facilitate collegiality between the federal government and the states.

G-1 6) Part 61.82 -- Commission inspections of land disposal facilities. We thoroughly endorse the notion that the Commission should be afforded an opportunity at all reasonable times to inspect radioactive wastes and the premises, equipment, etc. An explicit provision should be added that host states enjoy a similar right.

Part 2-2 7) Part 2, Subpart 2.764 (a)(b)(e). The intent and consequences of these parts are unclear. They appear to authorize an initial decision by the Commission that would preclude effective appeal by either a concerned party or state. Immediate effectiveness, as it has been implemented by the Commission in reactor licensing, has had the effect of denying states effective participation, discouraging cooperative efforts between state and federal governments, and rendering state's appeals ineffectual, since a facility would commence operation before appeals had run their course. The implications of these sections should be clarified.

Below you will find additional detailed comments of various State agencies on the proposed rulemaking.

THE RESOURCES AGENCY

D-50-3 With regard to site suitability described in Section 61.50(a)(5), the criteria should be changed to require a lower risk of flooding. Currently, the section would allow waste disposal in a floodplain that is likely to be flooded less than once every 100 years. The current ratings of flood risks are crude at best. For example, in California we have had floods rated as a 100-year flood and as a 300-year flood, both within the last 25 years. This experience has led many people to suggest that our estimates of flooding potential are much too low.

Based on the California experience, we would suggest that the 100-year floodplain discussed in the regulation should be increased to at least a 300-year floodplain and, preferably, to a 500-year floodplain. Where the purpose of the disposal site is to keep the wastes isolated for a period of at least 500 years, surface flooding of that site should be avoided within our best estimates of what would be likely to happen within that 500-year period. The experience at Maxey Flats, Kentucky, should convince people that flooding of the disposal site should be avoided.

D-51-2 Third, the performance objective in Section 61.2 concerning protection of individuals from inadvertent intrusion should be strengthened. Some kind of permanent sign or warning device should be in place at the perimeter of the site. The warning sign or symbol should be designed to last 500 years and to remain effective as a communicator, even if the language spoken in the area changes within that period. An example could be a combination of the skull and crossbones and the symbol for nuclear radiation.

D-55-8 Fourth, although the regulations describe minimum requirements for waste characteristics to be accepted at a disposal site, the regulations do not appear to require some kind of checking of the condition of the materials at the site. A site could experience the problems found in the past when sealed steel drums were delivered for disposal and no one knew what the drums contained. If there is no program for checking the contents of the drum, either at the site of origin or at the disposal site, the requirements for waste characteristics may well be ignored by many of the waste generators.

OFFICE OF EMERGENCY SERVICES

Following closure, the draft assumes the State becomes the site owner (pp. 3-36 of NUREG-0782, V-2.). However, paragraph 61.59 of Part 61 states either the state or the federal government shall become the site owner. Governmental ownership is certainly desirable; however, the apparent conflict should be clarified.

F-1
F-2

Paragraphs 61.1 and 61.3 indicate that licenses will be issued by the NRC. In paragraph 61.70 through 61.73, provision is made for a state or tribal government to participate in the licensing process, yet it is quite clear the NRC retains sole authority to issue the license. This suggests that a local jurisdiction has neither a voice in determining whether or not a site is established in their locale nor the conditions under which it is established and operated. The NRC should take steps to facilitate participation by affected local governments, including consideration of funding such participation.

B-8
E-1

If the State government has little or no real control during the functional life of the site, there is some question whether it would wish to assume responsibility for the site when it was closed. This would be especially questionable if the new site owner (i.e., the State) was expected to fund the cost for maintenance and monitoring.

Although several methods are mentioned for providing funds to the institutional authority, the rule makes no provision for it. In fact, the Commission admits it has no authority to "...require land disposal facility licensees to provide financial responsibility for activities occurring after the original licensee's responsibilities have ceased and the license has been transferred to another party." We would suggest the Commission ask Congress for authority to require financial assurances for licensees for the active institutional control period.

For additional comments please see Part 7.2 below of the comments on the environmental impact statement.

DEPARTMENT OF CONSERVATION

F-1

The California Department of Conservation (CDC) has reviewed the subject document for its geotechnical and procedural aspects. We. . .feel Section 61.72 is very important, providing for State participation in the review of any license application that affects the State. These procedures are very important to assure a real opportunity for the states, and thereby any affected local government, to have an effective input in the low-level waste (LLW) disposal process and specific site decisions which inevitably will impact all "host" states.

D-50-2

However, we believe that there is a significant defect in Subpart D, Subsection 61.50, Disposal site suitability requirements for land disposal. These requirements will not provide adequate protection to usable groundwater or to the environment from radionuclides that could be transported from the site by groundwater.

None of the stipulations in the disposal site criteria refer specifically to preventing migration of radionuclides into usable groundwater. Item (7) in Subsection 61.50 states, "The disposal site must provide sufficient depth to the water table that groundwater intrusion, perennial or otherwise, into the waste, will not occur. The Commission will consider exceptions to this requirement if it can be conclusively shown that disposal site characteristics will result in diffusion being the predominant means of radionuclide movement and the rate of movement will result in the performance objectives of Subpart C of this part being met."

Our concern is that the above-quoted stipulation is concerned only with groundwater intrusion into the facility and, furthermore, would allow diffusion of radionuclides in groundwater as an acceptable concept in the disposal of waste.

What is lacking in these criteria is the fail-safe approach to planning and design. The uncertainties inherent in geologic, design, and operational factors for any LLW site cast serious doubt on the assumption that the wastes can be guaranteed to be isolated for the prescribed time. If radionuclides should prematurely escape from their confinement at the site, it would be difficult and expensive, if not impossible, to prevent their contaminating the groundwater. Therefore, CDC recommends that Item (7) in Subpart D, Section 61.50 be rewritten as follows:

Department of Conservation (continued)

D-502

The disposal site must not be located 1/ within basins containing usable groundwater or their recharge areas, or 2/ within geologic formations which will permit the diffusion of radionuclides to the environment, or their transport by groundwater to a degree exceeding the performance objectives of Subpart C.

We recognize that the adoption of this recommendation will have the effect of decreasing the number and size of the search areas which would be eligible for consideration as potential LLW sites. Nevertheless, we believe that the seriousness of the risk of any radioactive contamination of groundwater warrants this degree of effort to assure that even if radionuclides were to escape, they could not contaminate any usable aquifer.

GEN-2

The regulations also fail to specify in Subpart G, Subsection 61.81 the nature and extent of Records, Reports, Tests and Inspections which will be required to ensure compliance with Subpart D - Technical Requirements for Land Disposal Facilities. Greater specificity is necessary regarding geologic, hydrologic, and other types of surveys and/or research to determine that potential sites comply fully with the regulations.

DRAFT ENVIRONMENTAL IMPACT STATEMENT
ON 10 CFR PART 61 "LICENSING REQUIREMENTS
FOR LAND DISPOSAL OF RADIOACTIVE WASTE"

The Draft Environmental Impact Statement is an important accompanying document, without which the proposal rulemaking would be difficult to assess. Comments from several state agencies are included below. First, however, I would like to make a few additional points.

1) Part 2.3 -- Alternative Disposal Methods. The EIS discusses briefly ocean disposal of low-level wastes. Although this disposal alternative is not addressed in detail within the EIS, we want to express our opposition to the use of the oceans for disposal of low-level wastes.

2) Part 4.6.1 -- Institutional Control Requirements. We support the concept of permitting disposal of low-level wastes only on land owned by the federal government or by the states, since the need for control of near-surface disposal facilities will last, in some cases, for several hundred years.

3) Part 5.5.1.2(2) -- Site Characteristics. With regard to the location of future sites, we believe the criteria should be changed to require a lower risk of flooding. We reiterate our comment (see comments above from The Resources Agency) that the 100-year floodplain may not be conservative enough. We suggest that a 300-year floodplain or, preferably, a 500-year floodplain be required to avoid surface flooding of a site.

4) Part 5.5.1.3(2) -- Design and Operations. We share the view that prior to any license application, the applicant shall gather information concerning "the ecology, meteorology, climate, hydrology, geology, and seismicity of the site." However, we disagree with the requirement that "for those characteristics that are subject to seasonal variation, data shall cover at least one full year." We believe this should be strengthened. Any locale's susceptibility to changing environmental factors requires that an attempt be made to gather historical data so as to try to accurately reflect how a proposed site has changed over time. We suggest that this section be amended to require collection of historical data going back a reasonable period of time, to the degree such collection is feasible.

5) Part 7.2 -- Waste Classification Based Upon Consideration of a Potential Inadvertent Intruder. The discussion of financial requirements during the operation of the

postclosure period touches on most of the relevant issues. However, there is a lack of depth to the analysis, and adequate solutions are not suggested for problems that have been identified. For example, per our comments above, it is clear that a sinking fund or some similar financial assurance mechanism would be the most preferable alternative for ensuring that necessary funds will be available for the lifetime of the site (i.e., including postclosure lifetime). Steps should be taken by the Commission to seek the authority to explicitly require that a sinking fund be established. Instead, the document endorses less satisfactory alternatives while at the same time the Commission recognizes the shortcomings of this approach. Additionally, the EIS, like the draft rulemaking, fails to account for the possibility of serious problems occurring at the site. It does not make contingencies for such problems or for the costs which a state would no doubt incur if such problems occurred. This is a major failing of the document and should be rectified. Costs and cost estimates should reflect the possibility of a serious failure of the site -- a failure of greater consequence than those that have already occurred at existing sites.

6) Part 7.2.6 -- Transuranic Isotopes. We support the retention of the 10 nanocurie per gram limit for surface disposal of low-level waste. We believe that wastes that exceed this limit should not be considered low-level waste and should not be buried at commercial low-level waste disposal sites.

7) Part 8.4 -- State, Tribal, and Public Participation. We would like to reiterate our point made earlier in Part 61.71 of the proposed rulemaking that there should be full cooperation between the state and federal governments in all phases of low-level waste management. This cooperation will strengthen the working relationship between the states and the federal government and thereby facilitate the safe establishment of necessary new disposal sites.

Below you will find additional detailed comments of several state agencies on the draft Environmental Impact Statement.

Note: No page 10. Mis numbered.

STATE WATER RESOURCES CONTROL BOARD

General Comments:

1. In California, disposal to land of all but very low level radioactive wastes is prohibited by state law (California Administrative Code, Title 17, Section 30288, attached).

2. The entire document fails to emphasize the need to prevent significant movement of pollutants from the disposal site to underlying ground water. The placement of an impervious cap over the waste will not preclude gravity drainage of liquid pollutants through a pervious trench bottom. Further, if the trench walls contain pervious beds (even lenses or "stringers"), water from precipitation or other nearby sources can move laterally into the trench, leach out pollutants, and then percolate vertically to underlying ground water. These ground water pollution threats can be essentially precluded by requiring disposal trenches to have impervious bottoms and sides. An engineered impervious barrier such as a clay liner could be required for each disposal trench. Better yet, the trench site should be in an area having a substantial thickness of clay. (See Class I Disposal Site Criteria, California Administrative Code, Title 23, Section 2510.)

Specific Comments:

1. Summary, Page 11. - The abbreviations, "PWR" and "BWR" should be interpreted (re Report Page 3-10, bottom).

2. Report, Pages 10-6 and 13 et seq. - The southwest "hypothetical regional site" is described as serving the western half of the country. The "High Plains" location, however, is far from the significant concentration of nuclear generating facilities on the west coast. It would be more appropriate for the western hypothetical site to be located near the west coast facilities.

3. Proposed Rule 10 CFR Part 61:

C-7 { A. Section 61.40 sets standards to avoid excessive exposure to humans. Excessive exposure to animal life should be avoided also.

D-50-2 { B. Section 61.50 should include criteria requiring impervious material (natural or "engineered") beneath and along the sides of all disposal trenches.

Attachment

Subchapter 15. Waste Disposal to Land

Article 1. General Provisions

2500. Definition of Terms. (a) "Disposal site" means any place used for the disposal of solid or liquid wastes. It does not include any part of a sewage treatment plant or point of discharge of sewage effluent or land drainage from pipes or ditches into waters of the state.

(b) "Disposal area" is that portion of the site which has received or is receiving wastes.

(c) "Leachate" is drainage from the waste or fluid resulting from the percolation of liquid through a waste substance.

(d) "Usable" ground or surface water includes potentially usable water.

(e) "Hydraulic continuity" is a condition existing when fluid occupying an interstice of a saturated material is able to move under a head differential to adjoining interstices or surface channels containing fluid.

(f) "Capillary fringe" is the partly saturated zone immediately above the water table in which water is held by capillary forces.

(g) "Toxic" means lethal, injurious, or damaging to man or other living organisms including plants, domestic animals, fish and wildlife.

(h) "Active life" is the period of time required to achieve stabilization of decomposing waste in a site such that leachate or the rate of generation of gases is no longer a threat to water quality.

NOTE: Authority cited: Sections 1058, 13140, 14000, Water Code.

History: 1. New Subchapter 15 (§§ 2500, 2510-2513, 2520-2522, 2530-2536, 2540, 2541, 2550) filed 3-10-72; effective thirtieth day thereafter (Register 72, No. 11).

Article 2. Classification of Waste Disposal Sites

2510. Class I Disposal Sites. Class I disposal sites are those at which complete protection is provided for all time for the quality of ground and surface waters from all wastes deposited therein and against hazard to public health and wildlife resources. The following criteria must be met to qualify a site as Class I:

(a) Geological conditions are naturally capable of preventing vertical hydraulic continuity between liquids and gases emanating from the waste in the site and usable surface or groundwaters.

(b) Geological conditions are naturally capable of preventing lateral hydraulic continuity between liquids and gases emanating from wastes in the site and usable surface or groundwaters, or the disposal area has been modified to achieve such capability.

(c) Underlying geological formations which contain rock fractures or fissures of questionable permeability must be permanently sealed to provide a competent barrier to the movement of liquids or gases from the disposal site to usable waters.

(d) Inundation of disposal areas shall not occur until the site is closed in accordance with requirements of the regional board.

(e) Disposal areas shall not be subject to washout.

(f) Leachate and subsurface flow into the disposal area shall be contained within the site unless other disposition is made in accordance with requirements of the regional board.

(g) Sites shall not be located over zones of active faulting or where other forms of geological change would impair the competence of natural features or artificial barriers which prevent continuity with usable waters.

(h) Sites made suitable for use by man-made physical barriers shall not be located where improper operation or maintenance of such structures could permit the waste, leachate, or gases to contact usable ground or surface water.

(i) Sites which comply with a, b, c, e, f, g, and h but would be subject to inundation by a tide or a flood of greater than 100-year frequency may be considered by the regional board as a limited Class I disposal site.

History: 1. Amendment of subsections (a), (b) and (c) filed 12-29-72; effective thirtieth day thereafter (Register 72, No. 53).

B-345

(b) Excreta from individuals undergoing medical diagnosis or therapy with radioactive material shall be exempt from any limitations contained in this section, provided that the user provides for appropriate radiological monitoring whenever any waste line in the user's installation which may carry such excreta is opened.

30258. Disposal by Burial in Soil. (a) No user shall dispose of radioactive material by burial in soil unless:

(1) the total quantity of radioactive material buried at any one location and time does not exceed, at the time of burial, 1,000 times the amounts specified in Section 30356, Appendix B, and

(2) burial is at a minimum depth of four feet; and

(3) successive burials are separated by distances of at least six feet and not more than 12 burials are made in any year.

(b) The department will not approve any application for license to receive radioactive material from other persons for disposal on land not owned by the Federal or State Government.

30259. Treatment or Disposal by Incineration. No user shall treat or dispose of radioactive material by incineration except as specifically approved by the department pursuant to Section 30345.

NOTE: Authority cited: Sections 102, 208, 25811, Health and Safety Code.

History: 1. New section filed 7-22-71; effective thirtieth day thereafter (Register 71, No. 30).

-12-

Article 6. Records, Reports and Notifications

30293. Records. (a) Each user shall maintain accurate and complete written records, as follows:

(1) The results of each required calibration, survey and test.

(2) Each receipt, transfer, and disposal of a source of radiation.

(3) Radiation exposures of all individuals for whom personnel monitoring is required under Section 30276. Exposure records shall be kept on department Form RH-2365 or in a manner which includes all the applicable information required on said form. Each entry shall be for a period of time not exceeding one calendar quarter.

(4) Results of medical examinations and bio-assays pursuant to Section 30277.

(b) Each required record of dose received by individuals and of medical examination and bioassay shall be preserved indefinitely or until the Department authorizes their disposal. Each other required record shall be preserved for a period of three years following the date of the occurrence that is the subject of such record.

Sent by Bill Friedman, Dept. Health, 5-0931 3-2767

30360. Appendix B.

APPENDIX B

Radionuclide	Microcuries	Radionuclide	Microcuries	Radionuclide	Microcuries
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

NOTE: [illegible]

EXAMPLE: [illegible]

RESOURCES AGENCY, DEPARTMENT OF CONSERVATION

D-56-17

The California Department of Conservation, based on review by the Division of Mines and Geology, has considered the Draft Environmental Impact Statement with respect to geotechnical aspects and procedural requirements.

In the DEIS, NRC discusses the use of high-integrity disposal package containers with extended containment life (approximately 300 years) for use in the disposal of high-concentrations wastes, as a waste processing option (DEIS, Ch. 5.2.4.8, App. D.4.3). This section also discusses potential use of similar containers for lower concentration wastes, but usage of this type of containerized disposal is not required by the proposed regulations. Also, for less concentrated wastes, the proposed regulations appear to require that the disposal package containers maintain their integrity only during the operational phase of the disposal site trenches (DEIS, App. D.4.3). However, we feel that because the less concentrated wastes could still release radionuclides similar to, or even the same as, those contained in the waste packages for high-concentration wastes, container integrity is essential to preventing the release of radionuclides into groundwater (prior to adequate confined decay time) to insure that the resultant activity level is low enough to not pose a danger to public health and safety.

As discussed in the DEIS, the proposed regulations in 10 CFR Part 61 assume that in the event of early release of radionuclides from disposal containers, or from decontainerized disposal, the site design, including the geologic setting, should be capable of preventing radionuclide migration out of the disposal trenches and into the surrounding groundwater and environment. However, the proposed regulations provide no fail-safe assurance that this will be the case.

Even if the wastes were to be segregated according to the active life of the different radionuclides and disposed of in containers which could maintain their integrity for the necessary containment time of each of the different classes of radionuclides, there does not appear to be adequate provisions in the proposed regulations for enforcement of this degree of detailed inspection during waste processing. We feel that the potential for migration of radionuclides from the disposal site and subsequent contamination of groundwater in the vicinity of the disposal sites could, coupled with adequate site planning and design, be minimized by containerized disposal of wastes in containers capable of maintaining their integrity for a minimum confinement period of 100 years [10 CFR Part 61, Subpart A, 61.7 (4)]. However, due to the lack of provisions in the regulations to require containerized disposal of all wastes,

D-56-17 along with uncertainty in the capability for adequate enforcement of the regulations relative to proper packaging and disposal, we recommend that item 7 in Subpart D, Section 61.50 of [the proposed rulemaking for] 10 CFR Part 61 be rewritten as recommended above.

DEPARTMENT OF HEALTH SERVICES

We continue to be troubled by the cost issues and their presentation in this EIS draft.

First, we are discouraged to find NRC using their own regions for the waste data bases. The states have been working for more than a year now with regions and waste volume projections based on U.S. Department of Energy (USDOE) studies. Comparison, then, with the USDOE data becomes difficult or impossible. However, because we know something of USDOE's efforts, their strengths and weaknesses; there is a need for careful comparison of data and conclusions on such an important matter as this. The final EIS should facilitate those comparisons.

Secondly, costs are based on the 20-year period from 1980 to 2000. We think it important that costs be shown by year from 1986 (when exclusionary authority may be conferred by Congress) through 2000. For some regions (as defined by current state actions, or the USDOE), initial costs may verge on prohibitive. A review of USDOE data indicates that by 1986 only three regions would generate the volume of waste on which the EIS was based. One, Region 5 (USDOE), would not have the waste volume by the year 2000 (see Table I).

Given the history of some existing disposal sites, one key concern should be the assurance of adequate financial resources on the part of the applicant to construct and operate a disposal facility and to provide adequate financial provisions for site closure and long-term care.

The EIS, although it cites no specific cost figures, appears to underestimate the short- and long-term costs of operating and maintaining a low-level waste disposal site, and fails to recognize the problems small companies (as identified in the EIS) have in meeting financial requirements in operating a waste disposal site. It seems likely that few small companies can raise the necessary capital for plant development, set aside trust funds, cash deposits, purchase surety bonds against short-term financial needs and further set aside additional money for 100-year care costs within the life span of the disposal site. The most careful attention should therefore be paid to the financial resources of any applicant who seeks to develop and/or operate a new site.

The "unanticipated contingencies" not addressed by the EIS (i.e., problems occurring at a site) should, we believe, be explicitly addressed either by the NRC or the Congress. To the extent that all national sites meet or exceed a

common design and performance standard, the Congress might accept such a responsibility. That uniformity might, however, require some special handling as was done for uranium mill tailings.

To summarize, the EIS should contain a section specifically developed for informing the Congress on the impact of its impending action as authorized in PL 96-537. That section would chart waste disposal needs and costs by regions as they actually exist or are planned by the states. The conclusion of such a piece might well be that the implementation date of 1986 is too early in terms of waste volume, and unaffordable. Additionally, given the amount of time necessary to bring new sites into operation (4-7 years), the 1986 date in PL 96-537 may be premature, if safe management and disposal of these materials is to be assured.

TABLE I

Fraction of Representative Site Waste Volume by Region*

	1986	2000
Region 1	120%	230%
Region 2	46%	97%
Region 3	140%	290%
Region 4	87%	180%
Region 5	19%	40%
Region 6	52%	84%

*Reference: Low-Level Radioactive Waste Management Report, prepared by the U. S. Department of Energy, March 13, 1981.

Thank you for affording us the opportunity to comment of these documents. This is a most timely issue, and one which we are sure will benefit from the careful attention and input provided by all interested parties.

Sincerely,

Phillip A. Greenberg
Assistant to the Governor
for Energy and Environment

ARKANSAS POWER & LIGHT COMPANY
POST OFFICE BOX 551 LITTLE ROCK, ARKANSAS 72203 (501) 371-4000

January 14, 1982

94

ØCANØ18204

(46 FR 38081) 28 (46 FR 51776)

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

ATTN: Docketing and Service Branch

Subject: Arkansas Nuclear One - Units 1 & 2
Docket Nos. 50-313 and 50-368
License Nos. DPR-51 and NPF-6
Additional Comments on Proposed Rules
on Licensing Requirements for Land
Disposal of Low-Level Radioactive Waste
(File: 3905, 2-3905)

Gentlemen:

The purpose of this letter is to submit additional comments to those contained in our October 21, 1981, letter (ØCAN108107) on the Proposed Rulemaking on Land Disposal of Low-Level Radioactive Waste which was published in the Federal Register on July 24, 1981. The comment period was extended to January 14, 1982. Comments 1, 2 and 3 are contained in the October 21, 1981, letter.

D-55-3

COMMENT NO. 4 - TRANSURANICS

For most alpha-emitting transuranic (TRU) nuclides, the maximum allowable concentrations were calculated to be in the range of 10 nanocuries per gram. As was acknowledged in the proposed rule, the calculation was conservative in that it did not allow credit for dilution by other wastes. We feel that proper consideration of this factor alone could realistically increase the above allowable concentration by an order of magnitude or more. It must be recognized that the maximum allowable concentration of 10 nanocuries per gram limits the options available to the utility industry to reduce the volume of waste to be shipped by using incineration or other waste concentration technologies.

D-56-2

COMMENT NO. 5 - CHELATING AGENTS

In Table 1 of the Waste Classification Section 61.55, it states that wastes containing chelating agents in concentrations greater than 0.1% are not permitted except as specifically approved by the Commission.

Acknowledged by card 1/22/82 emp

D-56-2

Generally speaking, we feel that this limit is itself overly restrictive. Also, the rationale for whatever quantitative limit is ultimately used should not be arbitrary, i.e., it should have a specifically delineated scientific basis.

ED-1

COMMENT NO. 6 - THEORETICAL MAXIMUM SPECIFIC ACTIVITY

This term needs to be defined as to its meaning with regards to this proposed rulemaking.

D-57-1

COMMENT NO. 7 - LABELING

Differences between DOT and NRC regulations regarding to labeling need to be resolved prior to implementation to avoid confusion.

D-55-2

COMMENT NO. 8 - DE MINIMUS WASTE CLASSIFICATION

In the section "Class C - Intruder Waste", there is a discussion of a "De Minimus" classification for wastes which would be exempt from 10CFR Part 61. We understand from this section that the NRC in the next two years will work to define these wastes and "to provide for additional waste exceptions as appropriate." Arkansas Power and Light Company supports the need for a "De Minimus" concept and encourages the expeditious establishment of suitable criteria for this concept. A "De Minimus" classification would result in the conservation of valuable disposal site burial space while at the same time protecting the health and safety of the public. With this in mind, we urge the Commission to permit case by case reviews of requests for specific applications of the "De Minimus" concept during the period criteria are being developed.

D-56-2

COMMENT NO. 9 - ALARA IMPACTS

As has been previously stated, Table 1 in Section 61.55 has a footnote eliminating wastes containing chelating agents in concentrations greater than 0.1% except as specifically approved by the Commission. This requirement would eliminate most routine decontamination techniques to reduce occupational exposures and thus would adversely affect ALARA programs. Again, since at least one disposal site presently accepts wastes containing chelating agents in excess of 1% by volume, (a restriction which is a factor of 10 greater than that proposed in Part 61), it is not clear to us why this greater restriction is being proposed. Guidance on acceptable packaging and disposal techniques for these agents is needed.

COMMENT NO. 10 - NEED FOR REEVALUATION OF THE CONCENTRATION LIMITS IN TABLE 1 OF PART 61.55

D-55-6

Table 1 is a specific listing of radioisotopes with their respective concentration limits for three waste classifications. While it appears that some of the concentration limits shown are reasonable, demonstrating compliance for others would be most difficult because of problems in sampling, e.g., taking measurements with long delay periods for offsite transport which would then inevitably result in additional increases in personnel radiation exposures and increases in disposal costs.

D-55-3 D-55-6 Additionally, the actual measurement of TRU in the 10 nanocurie per gram range while in the presence of other interferring radionuclides would be very difficult with today's technology. We do recognize that detection of 10 nanocuries per gram can be readily accomplished, however, if transuranic isotopes are the only ones present. Furthermore, it should be recognized that the present policy of volume reduction does increase the concentration of radionuclides in the waste and could cause the waste to exceed the Table 1 concentration limits. For these reasons, we feel that the concentration limits in Table 1 should be reevaluated to determine their ability to be achieved in a realistic situation and in a cost effective manner. Simply put, implementable technology does not exist at this time to realistically determine the concentrations characteristic of a given isotope, especially in dry trash.

COMMENT NO. 11 - SUPPORT OF AIF COMMENTS

Arkansas Power and Light Company endorses the comments prepared by the Atomic Industrial Forum Working Group on 10CFR61, Proposed Rulemaking on Licensing Requirements for Land Disposal of Radioactive Waste and on the Environmental Impact Statement - NUREG 0782. The AIF comments are hereby incorporated into ours by reference.

Sincerely,

David C. Trimble

David C. Trimble
Manager, Licensing

OCT:DET:sl

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Secretary of the Commission
Attention Docketing and Service Branch
U. S. Nuclear Regulatory Commission
Washington, DC 20555

January 12, 1982

95
PR-2 etal
(46 FR 38081)
-61 29
(46 FR 51776)

Dear Sir:

LICENSING REQUIREMENTS FOR LAND DISPOSAL OF RADIOACTIVE WASTE, 10CFR61
46FR38081, JULY 24, 1981
46FR51776, OCTOBER 22, 1981

We are pleased to submit our comments on the subject proposed rule. We generally concur with the philosophy and recommended approach embodied in the proposed rule and believe the proposed rule to be appropriate in that it will serve to increase the consistency of practices and requirements imposed by various disposal sites.

B-5 V. Summary of Rule. On page 46FR38087, in the paragraph entitled "Operational Phase," it is stated that a license renewal application would be submitted every 5 yr after issuance of the license. We suggest that the first 5-yr interval should commence after the Commission authorizes the licensee to receive waste, since the license is issued prior to construction and the operational phase does not begin until construction is complete.

B-4 Section 61.24(z). We suggest this paragraph be replaced with the following:

> Prior to completion of the construction of the facility, the licensee will make available for Commission inspection any information necessary to assure the Commission that the facility has been constructed in accordance with the applicable requirements established in the application. At or about the time of completion of construction, the applicant will submit an attestation to the Commission that the facility meets the applicable requirements of the license.
>
> The attestation shall state the name of the applicant, the name and location of the facility, the time when the facility is expected to be ready to commence operation, and shall contain a statement that the facility meets the applicable requirements of and conforms to the application for a license for such facility.

1/22/82 emp

B-4 Within 10 days of receipt by the Commission of such attestation, notice thereof shall be published in the Federal Register. Thirty days following receipt by the Commission of such attestation, the licensee may commence waste disposal activities unless the Commission issues an order prohibiting or limiting such actions and explaining the reasons therefor.

B-4 Section 61.24(h). The Commission should not make any change to a license unless that change is first justified via the performance of a value/impact analysis.

D-56-6 Section 61.56(a)(1). This section requires that the waste package presented for disposal comply with NRC and DOT transportation regulations. This implies that the disposed package could or must be a Type A, Type B, or Large Quantity package including all related shielding and other transportation-related requirements. While it is unlikely that this is NRC's intent, the wording of the paragraph can be interpreted in this manner. NRC should clarify and reword this requirement.

D-56-9 Section 61.56(b)(1). The requirement that waste packages presented for disposal retain 95 percent dimensional stability after burial is inconsistent with the capability of most solidification processes. A solidified material can be packaged in a degradable container. Most solidification processes cannot fill a container 95 percent full. Therefore, when the container degrades, the waste form can compress to less than 95 percent of the original package volume.

The 95 percent stability requirement as written, therefore, implies or requires the use of high integrity containers for solidified materials. The option of using a high integrity container in lieu of solidification then becomes no option at all.

Part 2-1 Section 2.764(e). The initial issuance of the license and any amendments to the license should be justified via the performance of value/impact statements.

M-1 Section 20.311(b). The shipment manifest should also indicate the "radiation level" of the waste container to be buried as well as the other waste characteristics noted.

We appreciate the opportunity to assist in the development of this rule, and hope that the above comments will assist you in its finalization.

Very truly yours,

RB Bradbury

R. B. Bradbury
Chief Licensing Engineer

RB:ned

HEALTH PHYSICS SOCIETY

CHARLES B. MEINHOLD, President
Brookhaven National Laboratory
Upton, New York 11973
Telephone: (516) 282-4209

January 18, 1982

(96)

Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
Attention: Docketing and Service Branch

(46FR 38081)

(30)

Re: Licensing Requirements for Land Disposal of Radioactive Waste; Proposed Rule 10 CFR Parts 2, 19, 20, 21, 30, 40, 51, 61, 70, 73, and 170; 46 FR 38081, July 24, 1981

Gentlemen:

The Health Physics Society is a National organization of approximately 5,000 scientists and professionals engaged in the practice of radiation protection. The Society's primary objective is the development of scientific knowledge and practical means for the protection of man and his environment from the harmful effects of radiation while encouraging the optimum utilization for the benefit of mankind. It is in the sense of this objective that we offer, for your consideration and action, the following comments on the proposed rules referenced above.

These comments were developed by the Society's Committee on State and Federal Legislation and are offered on behalf of the Society by the Committee and the Society's Officers. We wish to acknowledge the cooperation of NRC's staff in providing some initial information on the proposed rules changes and the Environmental Impact Statement.

In general, we agree with the efforts by the Commission to develop the new Part 61 specifically addressing land disposal of radioactive wastes.

A common aspect of the proposed rules is the matter of how such radioactive wastes are classified (for use by shippers, i.e., waste generators; by processors, who consolidate shipments; and by the recipients, i.e., licensed land disposal facilities). The Health Physics Society members would be most affected by the proposed rules which apply primarily to generators, although we are also interested in the health physics practices expected of facility licensees to protect the employees, the "intruder," and the general public during several phases of the life cycle of the facility.

We therefore believe and recommend that NRC clearly separate the rules with which the generator must comply in separating, identifying, classifying, packaging, labeling, and shipping wastes from rules which are to be uniquely met by the licensed disposal facility. There is an obvious overlap in the system for classifying wastes as shipped and as received, to provide primarily for long-term

D-55-8 protection from the operation of the facility. But the burdens of certification of packaging, etc. which fall on the shipper (or processor) should be clearly spelled out from those which fall on the facility licensee. We have attempted to address this fundamental issue in our comments below.

Waste Classification

Under the proposed rules, wastes are to be classified as either Class A Segregated Waste; Class B Stable Waste; and Class C Intruder Waste. Implied is a classification below Class A, a de minimis category, and a classification above Class C, for wastes which have concentrations in excess of Class C. Essentially, there are these five categories that both the generator, the processor, and the facility operator need to consider.

D-55-2 The Health Physics Society applauds the effort by the NRC to develop, at least for these proposed rules, a de minimis classification that would be exempt from Part 61 (and other parts of 10 CFR that relate to low level radioactive wastes). These wastes would be considered to be a negligible hazard of no regulatory concern and could be disposed of perhaps in a sanitary landfill. We encourage the use of such exemptions such as was done in 46 FR 16230 for specified waste forms and concentrations, and recommend that an exemption (or de minimis) category be included in the Part 61 classification system.

ED-1 We are concerned that Table 1 (46 FR 38097) has too many requirements crammed in the columns and footnotes, setting forth both the classification requirements and waivers and other key provisions in one table. We urge NRC to dismantle this table and express the requirements for each classification in both tabular and narrative form, with a separate table for each class (from exemptions through above Class C). Each separate table should define a range of concentrations or quantities that fall within that classification, and include the waivers that may apply to that group.

D-56-2 Certainly, the matter of disposing of radioactive wastes containing chelating agents deserves more attention than a non-referenced footnote to the current Table 1.

ED-1 Similarly, beta-emitting nuclides with little or no gamma radiation, beta-emitting nuclides with significant gamma radiation, and alpha-emitting isotopes other than radium should have been clearly listed in the table, and not buried in a footnote. It appears that the concentration limits for such beta emitters, those not specifically listed, are unduly restrictive. Since the classification system has great impact on the shipper in the packaging and also the use of the manifest system (see below), the separate subparts of 10CF361 must be easily understood side by side. The current conglomerate shown as Table 1 cannot permit an easy understanding as currently written.

D-55-6 To properly use the classification system proposed within Table 1, and the various footnotes and waivers, the generator will be required to perform monitoring and analysis of each container during waste separation and packaging. A major sampling problem could result if the generator-licensee had to prove that each container met the classification requirements stated on the labels or in the manifest. Recognition of the limits of instrumentation would assist NRC in the final development of suitable concentrations within each classification in the recommended expansion of Table 1 and footnotes. The instruments limit the ability of generators

D-55-3 of such wastes to carry out the classification process. We understand that detection of TRU at 10 nCi/g is possible when only TRU isotopes are present. We suggest that the figure for Class C limits for TRU wastes of 10 nCi/g be increased to perhaps

D-56-3 100 nCi/g, which would still provide protection for the health and safety of workers, intruders, or the public.

Waste Characteristics (61.56)

D-56-7 Paragraph (a) states that the requirements are intended to facilitate handling "at the disposal site" and "provide protection of health and safety" presumably all the way from the generator's facilities via transportation to the disposal facility. Yet, subparagraphs (1), (2), (3), (6), and (7) emphasize packaging requirements while subparagraph (8) refers to treatment of biological, etc. wastes. Subparagraphs (4) and (5) also apply primarily to the generator of the waste, who has the most control over toxicity or explosive problems. These sections place a heavy burden on licensees disposing of radioactively-contaminated biological or infectious material, particularly medical licensees, if the infectious concentrations are not known.

D-56-8 Paragraph (b) translates these requirements (which are primarily within the control and responsibility of the generator) into requirements for handling at the site to provide stability of the waste for 150 years or more. Hence the structural stability requirement becomes the long-term responsibility of the generator,

D-56-10 as does the requirements for keeping liquids low and void spaces to a minimum. Does "practicable" in 61.56(b)(3) imply compaction or solidification? Would continued land disposal of liquid scintillation fluids be permitted?

D-56-8 We are concerned that a generator will be held responsible for certifying that his waste, at the time of shipment, has been packaged so as to meet the stability requirements (of maintaining physical dimensions within 5% and its form under 30 psi and other factors for over 150 years). A separate rulemaking on the

D-56-16 stability requirements for containers, as shipped by generators, would be useful. Perhaps these requirements could be identified clearly as shipper responsibilities and included in the revision of 10 CFR 71.

Labeling (61.57)

D-57-1 The labeling of each container is the responsibility of the waste generator and requires an understanding and use of the classification system lumped into Table 1. Does NRC intend to require standards labels, warning signs, or other markings to supplement or replace current DOT labels? A clear set of classification markings would facilitate the land disposal operations and assist radiological emergency personnel who may have to respond to accidents involving low level waste en route to disposal facilities. Generators have some correct concerns over the precision with which they are expected to analysis the nuclide content. This is virtually impossible to do in a quantitative manner so the "less than" statements are usually employed.

Protection (61.41, 61.42, 61.43)

C-7 The Society recognizes the need to assure radiation protection for employees, possible intruders, and the general public during land disposal facility operations and beyond. We recommend that each of these groups be properly protected using limits in 10 CFR 20, as currently written or as proposed, rather than proposing a system of new and unique limits related to waste disposal. The establishment of a unique system of dose limits for a separate area of the nuclear fuel cycle seems unnecessary and may imply a special need for protection in the minds of the public; thereby exacerbating an already confused public perception of radioactive waste disposal issues.

Specific Technical Information and Technical Analysis (61.12, 61.13)

B-1 We concur that applicants for a facility license should include in the standard technical specifications a radiation protection program (item k) and an environmental monitoring program (item l). Much of the future success of a national land disposal operation for radioactive waste lies in achieving proper radiation protection for employees, intruders, and the public. All would be adequately safeguarded by emphasis on thoroughly planned and implemented radiation protection and environmental control programs. Obviously, these programs require proper analysis of instrumentation readings, maintenance of disposal logs, etc. to verify meeting of applicable requirements of Parts 20 and 61. Monitoring and analytical requirements for occupational exposures should be consistent with the criteria for ALARA.

Transfer for Disposal and Manifests (20.311)

M-1 M-4 The purpose of this section is described as being designed to control transfer of waste and establish a manifest tracking system. On the face of it, the need for a manifest system follows automatically from the increased emphasis on a new classification system for waste, on new packaging and labeling requirements, and on placing responsibility for compliance with these new requirements on the waste generator.

We therefore recommend that the proposed manifest system requirements be included in revision to 10 CFR 71, Packaging of Radioactive Material for Transport ... and be applicable to the wide range of radioactive material shipments for the sake of consistency. The manifest system for radioactive wastes should be identical to the manifest system for any other radioactive material - or to any other hazardous material during transport.

There is clearly a need to establish a labeling system for packages intended for land disposal of radioactive wastes that is consistent with labels for packages containing other radioactive material - or other hazardous material. The labels and manifest information must obviously be identical and consistent with any label or manifest for any shipment of radioactive material.

With regard to the specific requirements of the proposed manifest system, we concur that, to be meaningful, there must be clear identification of each package on the package exterior and [illegible]

M-2 D-55-8 As indicated above, the entire responsibility for classification and conformance to waste characteristics falls upon the generator not just during the initial transportation but for the next 150 years (61.56(b)(1). We suggest that such a warranty be either specifically required in writing on each manifest or that a system of shared responsibility between generator and facility licensee be permitted. The generator will warranty that, to the best of his knowledge and efforts, the packages being shipped will meet the long-term, 150-year criteria at the time and place of shipment. The facility licensee will warranty to NRC or the State that, to the best of his knowledge and efforts, the packages as buried will meet the same criteria. The form of quality assurance programs by both the generator or processor to meet these criteria may need to be spelled out in more detail.

Regulatory Impact

The NRC sets forth the basis for the proposed rules and refers interested parties to NUREG-0782, the draft EIS, Volumes 1,2,3 and 4, issued September 1981. In the preparation of these comments, no detailed study of NUREG-0782 has been attempted. The following comments are based on discussions with persons who have made that effort and in response to issues raised in 46 FR 38088.

M-3 The proposed rule changes will have an impact on significant numbers of persons including organizations licensed by NRC and agreement States and users of non-licensed radioactive material who offer such material as wastes for final land disposal. Much of this impact will be positive providing clear and consistent criteria for the safe disposal of such wastes and thereby encouraging the optimum utilization of radiation for the benefit of mankind, as a result of resolving the land disposal issue. Proper standards for licensing land disposal facilities are urgently needed to permit additional sites to be developed and offered to generators.

B-9 The Health Physics Society Committee on State and Federal Legislation has not specifically addressed the process through which future land disposal facility applicants will have to go to achieve a license. We note briefly, with concern, that the opportunities for hearings, through Atomic Safety and Licensing Boards, with further appeals, etc., may result in excessive delays in achieving new sites unless issues that might be contended are limited to those identified in the proposed rule and discussed in the accompanying draft EIS, including the [illegible]

M-1 rules and the EIS would be that a major long-term public and occupational health problem is created by the operation of land disposal facilities for low level radioactive wastes. Hence, the NRC has proposed rules which, according to the Federal Register notice, are compatible with, and possibly duplicative of, existing Federal regulations, but with an increasing intensity and specificity to a perceived unique problem. Not only are rules proposed for the disposal facility, but more and different NRC rules are proposed for the packaging and labeling of each container; presumably on the argument that if each container meets the classification requirements, the sum of all containers (the disposal facility contents) will meet health and safety criteria for at least 150 years. D-56-B The scope of the new rules imply a regulatory deficiency that requires a program of 150-year stability, to be certified in advance as being able to meet health physics objectives over the future. We believe the need for land disposal facilities is imperative and that the new proposed rules should reflect a less deficient and less desparate current practice.

Sincerely yours,

Charles B. Meinhold
President

Don't Waste Washington Legal Defense Foundation
Suite 654 Colman Building
811 First Avenue
Seattle, Washington 98104

'82 JAN 19 P1:37

January 12, 1982

97
PR-2 et al
(46 FR 38081)

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

Attn: Docketing and Service Branch

Re: Proposed Rule 10 CFR Part 61, Licensing Requirements of Land Disposal of Radioactive Waste, 46 Fed. Reg. 38081 (July 24, 1981)

Dear Mr. Secretary:

This comment is submitted on behalf of the Don't Waste Washington Legal Defense Foundation.

The Don't Waste Washington Legal Defense Foundation is a Washington not-for-profit corporation concerned generally with safe radioactive waste disposal. We are committed to educating the public regarding the need for development and implementation of safe radioactive waste disposal technologies and systems, and to participating in decision-making which promotes the safe and orderly transportation and disposal of radioactive waste.

B-5 Don't Waste Washington shares the concerns of the Commission regarding the need for careful monitoring and control of radioactive waste disposal in order to protect the public health, safety, and welfare. We welcome the Commission's recognition that radioactive waste materials must be isolated and monitored for long periods of time. We therefore believe that language reflecting this recognition should be included in the final rule. For example, §61.27(a) states, in part: "Failure to renew the license in no way relieves the licensee of responsibility for carrying out site closure, postclosure observation and transfer of the license to the site owner." The principle of long term fixed responsibility embodied in this language is critical to the protection of health and to the minimization of danger to life and property required by the Atomic Energy Act.

D-55-2 Second, we agree with the proposed regulation's statement that there should be no generic "de minimis" category for waste. Third, we support the Commission's position that

E-1 adequate financial assurances are essential for all aspects of waste disposal—construction, operation, site closure, postclosure observation and maintenance, and institutional control. Such strong assurances are necessary to discharge

Acknowledged by card 1/22/82 amp

E-1 our responsibility to future generations, and to assure that the public will not bear costs which should be borne by the users of the facility. Self-insurance does not satisfy the surety requirements for the reason stated in §61.62(g). We agree that the amount of surety liability should change with changes in cost estimates. This amount should be subject to increase at the time of license renewal (if not annually), especially because the purpose of reviewing the license periodically is economic rather than technologic. Subpart E should be amended to state more clearly that the Commission will review the applicant/licensee's financial assurances periodically, and that the burden of proving adequate financial qualification is on the applicant/licensee.

C-1 We have some question about the proposed rule's justification for relying primarily on performance objectives in an area where the concern for public health and safety is so great. It is not sufficiently clear to us that the technology is not sufficiently advanced to warrant use of more prescriptive requirements than are in the proposed rule. If performance objectives are to be used, the rule should emphasize and confirm that the standards of the Atomic Energy Act are applicable, and that the burden is upon the applicant/licensee to show that it has met these standards of protecting health and minimizing danger to life and property.

We believe that §61.25 must be rewritten in such a way that the right to notice and opportunity to be heard is better protected. As this section stands now, it is not clear that the public, a state, or Indian tribe will have input into any decision on amendments in license conditions other than those specifically listed in subsection (b) This may become important where, for example, the new conditions contained in an amended or renewed license are inconsistent with those imposed by a state lessor in the lease itself.

F-1 Don't Waste Washington also wishes to comment on the issue of state authority and state participation in the procedures for license application, amendment, renewal, and termination. Don't Waste Washington believes that the states have and will continue to assert strong leadership roles in management of radioactive waste. Congress has concurred in this judgment in the Low-Level Radioactive Waste Policy Act.

At the outset, at least with respect to state ownership of the land, it appears that the state has a sufficient degree of control because it can make the initial determination whether to take ownership of the land selected by the applicant for a waste disposal site, and on what terms to

F-1 lease the facility. The state must not subsequently lose this control because of federal policies that restrict state participation during operation of the facility. We believe that, with respect to state-owned land, a license to construct and operate a waste disposal site must not be granted, amended, renewed, or terminated without the explicit concurrence of that state. The applicant/licensee must comply with all applicable state laws that are consistent with the requirements of the Commission.

We suggest the following specific changes:

SUBPART A

61.7(c)(1)	Change the word "may" to "shall" in the sentence, "The Commission's review of the application is in accordance with established administrative procedures and may involve participation by affected State governments or Indian tribes."
61.7(c)(2)	Add to the end of the first sentence an explicit statement, "including state laws and regulations that are consistent with Commission regulations."

SUBPART B

61.23	Add a subsection which says, "Where the land is owned by a state, the applicant has met the state's requirements."
61.24(a)	Add to the end of the sentence, "and, if the land is owned by a state, the state has given its concurrence."
61.24(c)	Add to the end of the sentence, "and, if the land is owned by a state, the state requirements have been met."
61.24(d)	Add to the end of the first sentence, "and if the land is owned by a state, to all state laws and regulations consistent with Commission regulations."
61.24(e)	Add to the end of the sentence, "or any state law or regulation consistent with Commission regulations, where the land is owned by a state."

F-1

61.24(h) Add after the words "additional requirements," an explicit statement, "including state requirements, where the land is owned by a state."

61.28(a) Add before the second sentence, "Where the land is owned by a state, this closure application must include a certification from the state that the applicant has complied with all state requirements."

SUBPART E

61.61 Add a sentence, "Where the land is owned by a state, this showing shall be supplemental to any assurances required by the state."

SUBPART F

F-1

The wording of this Subpart should be brought into conformity with its counterpart, Subpart C in Final Rule 10 CFR Part 60, Disposal of High-Level Radioactive Wastes in Geologic Repositories: Licensing Procedures, 46 Fed. Reg. 13971 (February 25, 1981). Primarily, the use of the word "may" must be replaced by the word "shall."

61.71 Second line--change "may" to "shall"

Fifth line from the end--change "will" to "shall"

61.73(a) Third line--change "will" to "shall"

61.73(b) Second line--change "may" to "shall"

Thank you for the opportunity to comment on the Proposed Rule 10 CFR Part 61. Don't Waste Washington appreciates the opportunity to participate in this rulemaking proceeding, and is prepared to contribute further views or any other assistance that the Commission may require. Please send us notice of any further proceedings, including further comment periods and promulgation of a final rule.

Very truly yours,

Lydia Gold by mwg

Lydia Gold

Michael W. Gendler

LG,MWG/mm

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emp

January 11, 1982

98

D-2 et al

(46 FR 38081)

Mr. Samuel J. Chilk
Secretary of the Commission
U.S. NUCLEAR REGULATORY COMMISSION
Washington, D.C. 20555

Dear Mr. Chilk:

PROPOSED RULEMAKING ON LAND DISPOSAL OF LOW-LEVEL RADIOACTIVE WASTE

Since the comment period for the proposed rulemaking on land disposal of low-level radioactive waste has been extended, we employ this opportunity to supplement our earlier comments which were contained in our letter to you of October 21, 1981.

There are two additional problems with Table 1 in 10CFR61.55.

D-55-8 / D-55-3

1. It may be necessary to dilute wastes in order to comply with the proposed concentration units. This is undesirable, and it would be contrary to NRC's policy on volume reduction as published in 46FR51100 on October 16, 1981. This problem would be most severe with transuranic waste; the 10 n Ci/g limit should be increased to a level commensurate with the actual risks.

D-55-2

2. There is no provision for the establishment of minimum concentrations of nuclides in waste below which the waste is acceptable for disposal through ordinary means such as sanitary land fills.

D-55-6

The additional radiation dose to personnel which would result from the required additional sampling and analysis of radwaste should be considered in the context of ALARA. This actual dose to personnel would be difficult to justify when compared with the small hypothetical dose calculated to result in the environs of a disposal site. In addition, there will be additional costs of labor and equipment associated with the additional sampling and analysis requirements. Certain types of analyses are difficult

1/22/82 emp

D-55-6 by nature. Nuclides which decay by beta emission and electron capture such as Nickel-59 and Iodine-129 are in this category. Time consuming chemical separations will be required as part of these analyses. This will not be cost-effective, especially for the small licensee.

Finally, we recommend the elimination of reporting requirements for nuclides which constitute insignificant fractions of radwaste packages.

Very truly yours,

C. W. Fay

Assistant Vice President

ROBERT ABRAMS
ATTORNEY GENERAL

STATE OF NEW YORK
DEPARTMENT OF LAW
ALBANY, N.Y. 12224
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PR-2 etal
(46 FR 3808)

January 14, 1982

US Nuclear Regulatory Commission
Secretary's office
Washington, D.C. 20555

To Whom It Concerns:

I have enclosed two copies of the Attorney General's Technical Comments on the proposed Part 61 regulations for management of low level radioactive waste. We appreciate the opportunity to respond to your proposals and look forward to any response from you in the future.

Sincerely yours,

Peter Skinner P.E.
Environmental Engineer

Encl.

Acknowledged by card. 1/22/82 emp

TECHNICAL COMMENTS OF THE NEW YORK STATE ATTORNEY GENERAL'S OFFICE ON THE PROPOSED 10 CFR PART 61 - LICENSING REQUIREMENTS FOR LAND DISPOSAL OF RADIOACTIVE WASTE

January 14, 1982

Introduction

The Attorney General's office has been actively involved with nuclear waste management for over a decade, participating in radioactive waste management policy making from uranium tailings to high level waste repositories. Members of and experts for the office have testified in numerous proceedings before Congress, and federal and state agencies. The office has maintained close scrutiny of the ongoing efforts to cleanup radioactive waste accumulations at West Valley, Model City, and elsewhere in the state. The office has also participated in numerous hazardous waste disposal cleanups and landfill design and siting efforts. It is on the basis of this experience we make the following comments and recommendations to the US Nuclear Regulatory Commission on their proposed regulations for 10 CFR Part 61 to better control the land disposal of radioactive waste.

D-55-8

Our comments should not be taken as an endorsement of land burial of radioactive wastes in general. Rather, we believe that source reduction, precompaction and numerous other technologies exist to reduce the need for reliance on land disposal of wastes as it is practiced today or as it will be practiced under Part 61 when promulgated. In addition, we believe the USNRC should give careful consideration to emerging techniques of waste management such as encapsulation and above ground dry storage similar to methods employed at the Idaho Engineering Laboratory to isolate transuranic wastes. These and other approaches to waste management, when fully exercised by waste generators, may significantly reduce the need for burial of waste; especially those wastes which play a large role in the deterioration of the land burial facilities.

History of Land Disposal of Waste

Land disposal of waste has been practised for millenia. Archeologists rejoice when they come upon dumps of previous societies because therein lies artifacts which greatly help to describe the way of life of earlier peoples. Artifacts of bygone societies, however, are very different from the wastes of today. Few wastes were toxic and certainly none were particularly radioactive. Performance objectives of such facilities did not reflect concern that intruders be kept out or infiltration be

limited. Earlier societies merely practised the objective of "out of sight - out of mind."

Modern day performance objectives informally evolved from this objective into an objective of waste isolation. Facility engineering changed little, but the waste spectra certainly did. Hazardous chemical wastes grew in volume, toxicity and persistence and a new group of wastes, nuclear wastes, began to appear. Although gigantic amounts of scientific effort went into creating these exotic wastes, little or no effort went into waste site suitability considerations or facility engineering. The result of this lack of vision has been such notable environmental disasters as Love Canal in New York and Montague in Michigan. Although radioactive waste dumps cannot be considered environmental disasters yet, some of them have certainly not succeeded in isolating wastes from the biosphere. The waste facilities of West Valley, Maxey Flats, Sheffield are good examples of such troubled sites.

These three sites have failed to completely isolate the waste materials dumped for a variety of reasons. Chief among them are soil cover erosion and deterioration. Once deteriorated, these covers fail to prevent infiltration of rainfall, runon and snowmelt. Infiltration, in turn, causes leachate to percolate the wastes and mobilize contaminants and generates leachate, often in millions of gallons in each disposal unit.

Since past performance objectives required sites with tight soil to preclude groundwater migration, leachate would accumulate there, only to later migrate in transmissive horizons or overflow the boundaries of the disposal units into surface drainage systems. Site operators and responsible governmental units have been forced to deal with these leachate accumulations by very expensive pumping and treatment efforts. Expensive studies have been undertaken by scientific teams after the fact determine whether the site was appropriate in the first place.

Other studies have focussed on the post-closure performance of the disposal unit itself to determine the dynamics of internal consolidation and soil cover deterioration. These studies have conclusively shown that stabilization of low level waste disposal units is a long one. Materials inside degrade, containers rust away, losing their structural strength, and consolidation goes forward inexorably to some ultimate, but unpredictable point. This inevitable process of internal consolidation leads inescapably to a loss of structural support for the soil cover, often to different degrees in different parts of the disposal

unit. This loss of support then leads to differential subsidence of the soil cover, cracks and holes in the cover and finally infiltration of water.

NUREG/CR-2101, "Evaluation of Trench Subsidence and Stabilizaton at Sheffield Low-Level Radicactive Waste Disposal Facility," discusses these phenomena in detail and concludes:

> "All trenches have a potential for some future subsidence due to piping of soil, natural soil consolidation, and waste container deterioration. The location, sizes and extent of this subsidence is quantitatively indeterminant due to the unknown void sizes and their numbers and locations within the trenches.....Increased incidences of subsidence may occur
> from 10 to 14 years after waste disposal when metal drums, cardboard, and wood containers will have experienced some deterioration."

This report and others like it for other similar facilities do not give one much confidence that the environment or the finances of site owners have been well protected by this type of waste disposal system. It is within this framework that we have considered the USNRC proposed Part 61 rules and regulations.

Subpart C...Perfomance Objectives

Subpart C is the heart of the proposed Part 61 regulations. All other subparts measure achievement in terms of the objectives listed in Subpart C. Consequently, we have considered that part of the regulations first.

C-4
C-6

From review of Subpart C, it appears that the USNRC has made an in-depth review of the problems of low level waste disposal. We are impressed with the innovative approach to disposal regulation through protection of various populations at risk; general populations, intruders, and employees. We particularly support the notion of site stability as a criterion for successful disposal. If the site is stable over long periods of time, the likelihood of excessive long term maintenance costs is significantly lower. As history has shown, site owners (States in this case) have been and probably will be saddled with unrecoverable multi-million dollar bills each decade to maintain facility integrity.

C-3

We are, however, disappointed by the limits proposed by the USNRC for the protection of the general population. Subpart C in § 61.41 proposes that the facility will be operating

satisfactorily as long as the population outside the site boundary is receiving no more than 25 mrem whole body dose, 75 mrem thyroid dose, and 25 mrem to any other organ. In addition, the groundwater at the nearest public water supply must meet the National Primary Drinking Water Standards. As long as the effluents from the facility contaminate the environment such that the groundwater does not get too contaminated and the biologic pathways to man do not transmit doses in excess of the limits above, the facility is operating or has operated in compliance with the regulations. In short, the facility can leak as long as the leaks do not contaminate the area too much.

C-3

This regulatory approach tries to provide reasonable population protection through inherently uncertain health based risk assessment. In actuality, however, use of this approach for land burial is tantamount to an admission that burial of low level radioactive wastes in the forms required and at the sites found suitable by Subpart D of the regulations cannot achieve long term isolation of radioactivity.

We believe this kind of a regulatory approach is unacceptable for protection of the general public. First, this approach relies on a conceptual framework similar to the EPA's water quality considerations for NPDES permit limitations based on a receiving water body's assimilitive capacity. Permit limitations based on assimilative capacity are very difficult to set and impossible to verify as adequate for environmental protection. Instead, notions of "best available technology," "best practicable technology," and other technology and cost based standards for permit limitations have been developed. Considering the difficulty of monitoring and determining assimilative capacity predictions unique to groundwater compared to similar efforts for surface waters, use of the concepts embodied in § 61.41 seem most ill-advised.

C-5

Permitted radioactivity releases from other nuclear facilities are not based on assimilitive capacity. Rather their limits are set by USNRC regulations which are not site specific. In addition to the maxima set forth in these regulations, the notion of "As Low As Reasonably Achievable" (ALARA) requires extra efforts by licensees to reduce releases and personnel exposure even lower where reasonable. The proposed limits under § 61.41 are not consistent with this existing defensible and workable industry guideline.

C-3

Another basic goal mandated by Congress is the notion of "zero discharge." A well known goal of the Clean Water Act of 1972 is that discharges of wastes into navigable waters be

reduced to zero by 1985. Although this goal has engendered a good deal of controversy and may not be reasonably achievable by certain industries and old manufacturing facilities, there is little disagreement that the goal itself is appropriate and generally achievable. § 61.41 flies directly in the face of such a goal. Rather than basing performance objectives on "zero discharge," this section proposes instead as much discharge as the environment can handle as long as the population does not get overdosed. C-3

The term "reasonably achievable" provides basic guidance for a variety of environmental protection regulations. Reliance on this approach for low level waste disposal seems appropriate. As other sections of our comments point out, affordable engineering systems exist today to assure that environmental releases from disposal sites can be reduced to de-minimus levels. Certainly, then, application of ALARA notions to LLW disposal is defensible from a regulatory and cost point of view. In addition, we are confident that application of ALARA concepts will easily justify the application of "zero discharge" limitations to ground and surface waters.

On the basis of the foregoing arguments, we recommend that the language of § 61.41 be amended so that "zero discharge" be the performance objective for ground and surface waters in perpetuity and that ALARA guide all site activites, including Subpart C sections 61.41 through 61.44. The proposed population doses and maximum contaminant limitations may remain as absolute maxima. Releases of radioactivity which cause such doses or maximum contaminant levels, however, should certainly not be considered satisfactory facility performance under any circumstances. As such, even the totally unacceptable performance of the West Valley, Sheffield and Maxey Flats sites would be satisfactory under at least § 61.41. C-5

Subpart D....Technical Requirements

Subpart D sets forth a number of technical requirements for land disposal facilities which will supposedly assure that Subpart C performance objectives are met by the facility. This section features numerous defensible and innovative regulatory approaches to facility integrity and safety. Some of the proposed rules, however, should be changed to assure that discharges from the site will be zero or at least as low as reasonably acheivable, performance objectives we have proposed in our comments above.

Site suitability requirements

§ 61.50 of Subpart D sets forth some basic site suitability requirements no one can argue with. Unfortunately, these requirements do not require siting the facility in a soil environment which will preclude or even reduce leachate migration. The only subsection dealing with leachate even tangentially is § 61.50(a) 7 which requires that the water table be sufficiently below the site to preclude groundwater intrusion. This section, as written, implies that if groundwater is kept out, no liquid will enter the fill and the previous impermeable soil requirements are not necessary to protect the public.

Unfortunately, groundwater has not been the only way copious quantities of leachate have been generated in past landfills. Rather, surface infiltration through subsidence cracks and holes has caused much of the leachate generation. In addition, liquids in wastes, rainwater and snowmelt entering the trenches during operations and internal decomposition add to the volume of wastewater which either accumulates or migrates from the site. Because of the high likelihood that substantial quantities of leachate will be generated by future facilities, site suitability criteria must address this issue, not avoid it. D-50-2

Some professionals have argued that a leaky site is appropriate. They point to the lack of leachate at the Barnwell facility as an example of good performance. Any liquids which enter the trenches through the subsidence and shrinkage cracks and other entry points drains right out into the porous soil of the site. Voila'....no problem. If this stratagem may ever, in fact, be effective, it is only by accident and as long as the soil beneath the facility can attenuate the radionuclides sufficiently to protect the environment. Luck or wishful thinking are not appropriate for sound management stratagems.

Under the proposed regulations, in order to assure that the soil can perform its required function in perpetuity, it must be shown to possess appropriate radionuclide attenuation characteristics such that eventual doses to humans are acceptable under § 61.41. This showing can be easily made, based on alluring scientific experiments and projections. Unfortunately, these experiments and projections are still crude indeed and their predictive value very limited. It is impossible to verify these predictions with real life conditions because these experiments and calculations must be based on leachate characteristics and waste spectra which are, at any time, nearly impossible to predict. Consequently, although such showings are easily made, their validity is doubtful indeed and would provide regulators and the public a false sense of security about the long term integrity of the facility.

D-50-2

Optimistic "scientific" showings have formed the bases for both radioactive and hazardous waste dump licenses in the past. States are now suffering the inevitable consequences of the lack of validity of these showings. Therefore, basing new licensing regulations on scientific demonstrations of questionable predictive capability is unacceptable.

We recommend, instead, that the USNRC develop site suitability requirements vis a' vis soil horizon characteristics based on the assumption that substantial quantities of leachate will enter or be generated by the waste mass at one or more times during the hazardous life of the waste. Perhaps the appropriate regulatory framework should specify porous soils. Or perhaps, tight soils with adequate leachate collection and treatment facilities are the answer. Whatever the case, failure to specify soil horizon characteristics fails to deal with the very real problems of leachate generation experienced by almost all "secure" landfills in humid climates.

GEN-2

Facility Design

D-51-1

§ 61.51 discusses minimum engineering features of a land disposal facility. This section fails as does the previous section, to squarely deal with the difficult problem of substantial leachate generation. Although subsections deal with engineering features which may reduce the likelihood of external infiltration, they certainly do not eliminate it. In some ways, this section provides little more guidance than has been applied to the closed landfills for radioactive waste which have failed to perform well. Thought should be given to specific guidance for engineering features which effectively respond to leachate management, subsidence control, and aqueous and aeolian erosion.

GEN-2

Facility Operation

D-52-1

§ 61.52 discusses general facility operational guidelines. These rules also demonstrate USNRC recognition of the problems encountered at waste sites in the past. Many of the requirements here will lead to significant improvement in environmental protection. Subsections (a) 1 , 2 and 3 preclude "interaction" of radioactive wastes of Classes A, B, and C. In so doing, USNRC seems to be making an effort to achieve a consistent level of environmental and intruder protection for different danger level wastes. The rules, however, do not define the term "interaction" and are therefore vague and difficult to enforce.

D-52-2

Environmental segregation of waste of different classes of danger does make good sense. If the segregation and the pretreatment of the wastes assure that the risk potential is equal among the classes and also an acceptable level, then the management scheme is defensible. We have problems, however, with the level of pretreatment accorded Class A waste. According to personal discussions on several occasions with USNRC staff, Class A waste comprises a whopping 60% of the volume of all low level wastes covered by the proposed Part 61 regulations. This waste will be dumped in the trenches without pretreatment for stability or leachability reduction as detailed in § 61.56. As such, Class A waste will be managed in much the same way as it has been for leachate production experience of the past will not recur in the future at Class A waste dumps.

Most of the low level wastes which are compressible and degradable fall within the limits of low activity Class A waste. These characteristics lead inexorably to collapse of the cover over the trench. Collapse of the cover (differential subsidence and holes) leads inexorably to surface water infiltration and leachate generation. These physical problems require institutional responses for engineering and construction which end up costing taxpayers millions of dollars. We have no reason to believe Class A waste will behave in any different way underground than it has in the past. Therefore, we conclude that tomorrow's Class A waste dumps licensed under 10 CFR Part 61 as proposed will suffer the same performance difficulties their predecessors have with similar financial impacts on their owners.

We must not forget, however, that the relaxed performance objectives under § 61.41 will still be met by a dump whose covers fail just as long as the population does not get overdosed and the groundwater at the nearest public well does not get too contaminated. Although these objectives may be satisfactory to the USNRC, it is unlikely that a Class A landfill whose covers admit copious quantities of water which forms a large radioactive plume will be satisfactory to local authorities or the citizenry. These governmental units and people will generate significant political pressure to close such a facility. Then as now, when half the nation's waste sites are closed due to performance difficulties, adequate space will not be available for the disposal of wastes. Such a dump crunch will be particularly troublesome when compacted facilities have moved to limit dumping by out of compact generators.

Subsidence, leachate generation, and costly repair and maintenance requirements will become important questions in

federal and state licensing proceedings. As such, they will become rallying points for those opposed to nuclear power and waste management in particular localities. They form a reasonable basis for denial of licenses and revocation of licenses once operations have commenced. They will inevitably exacerbate the same disposal availability problems from which we now suffer. Consequently, we believe that Part 61 rules should be written to preclude the recurrence of these phenomena.

Precluding subsidence and its inevitable ramifications is relatively easy and cost effective when long term maintenance and repair costs are included in the equation. Higher activity Class B and C wastes will be stabilized in such a way under § 61.56 that they will "...not degrade and promote slumping, collapse, or other failure of the disposal unit and thereby lead to water infiltration." The encapsulation matrix or container must withstand a compressive load of at least 50 psi. In this way, these Class B and C wastes will not be responsible for disposal unit cover collapse. If 40% of the nation's low level wastes can already be affordably pretreated in this fashion, then we submit that the remaining portion of the wastes should receive a similar degree of pretreatment.

D-52-2

USNRC has argued that because Class A waste decays radioactively within the period of institutional control, the inevitable subsidence and leachate phenomena associated with Class A waste dumps do not present unacceptable risks to the public. This may be true if the site successfully attenuates the plume of radioactive leachate and if the radionuclides are indeed short lived. Both assumptions are very doubtful, however, given experience at all the low level waste dumps in the U.S. to date. In any case, the bad press and public criticism such dumps will engender if and when a radioactive plume is discovered moving away from the site will undo all public relations dividends of the carefully stabilized Class B and C waste dumps.

The USNRC should recognize these very real siting and operational considerations and reconsider pretreatment for Class A waste. Although more costly in the short run, stabilization pretreatment will yield substantial benefits during and after the 100 year institutional control period, both in terms of environmental protection and in terms of public acceptability.

Environmental Monitoring

D-53-1

§ 61.53 discusses guidance for licensees concerning environmental monitoring. This subsection is very vague compared

to the level of specificity which could be justified. After only a decade of operation, the existing low level waste sites have been found to require substantial exploration for remedial purposes. USGS, USEPA, and numerous other state and federal agencies have spent millions of dollars in the last few years developing monitoring nets around these facilities and evaluating the data these nets have generated. These efforts should provide USNRC with a great deal of guidance to specify particular types of and sensitivity for monitoring nets. All the proposed regulations require now is a "... monitoring system ....capable of providing early warning of migration of radionuclides from the disposal site." This description provides no spatial or time specifications and thereby allows licensees to determine specifications which are in their best interest; namely far field and long time period monitoring systems.

D-53-1

Such insensitive monitoring systems are not in the best interests of either environmental protection or the finances of the site owner. We, therefore, recommend that the USNRC rewrite Part 61 regulations to reflect appropropriate spatial and temporal specifications. These should include several monitoring wells both upgradient and downgradient, screened at various depths in both the saturated and unsaturated zones to permit stratified sampling if desired. Such a well system should include wells below as well as beside the waste mass. Similar monitoring systems should be emplaced for gaseous emissions as well. Surface runoff and aeolian particulates should receive monitoring scrutiny as well.

Groundwater monitoring systems remain the most important part of the environmental protection scheme for the facility. Although such systems may provide effective early warning systems, engineering design requirements may be acceptable as well. One approach used in the hazardous waste landfill field is the "telltale" layer beneath the waste mass. This confined porous layer conducts early migratory liquids to a point where samples can be obtained. These samples will provide an accurate representation of the source term for environmental impact assessments. In addition, it can trigger early mitigation efforts and other institutional responses. We recommend that USNRC consider the appropriateness of "telltale" layers and rewrite § 61.51 to reflect the availability of this effective and affordable environmental protection measure.

Subpart D, Financial Assurances

E-1

§§ 61.62 and 61.63 discuss minimum financial arrangements needed to obtain low level waste licenses. These sections go

E-1 much further than earlier regulations to protect the financial interests of site owners. Although innovative and comprehensive, we remain concerned that the post-closure maintenance, leachate collection and treatment, cover repair and other likely costs will be underestimated by applicants and accepted by both site owners and the USNRC due to the pressing need for waste disposal site availability. In the long run, as today, it will be state taxpayers, rather than waste generators, who will eventually bear the excessive costs of site maintenance and repair. We recommend that the USNRC study carefully the likelihood and costs of major facility repair and maintenance generically by climatological region prior to the consideration of any application for waste site construction. Such a study will highlight the high financial risk associated with burial of wastes such as contemplated for Class A and help site owners and regulators determine adequate lease arrangements prior to the licensing proceeding.

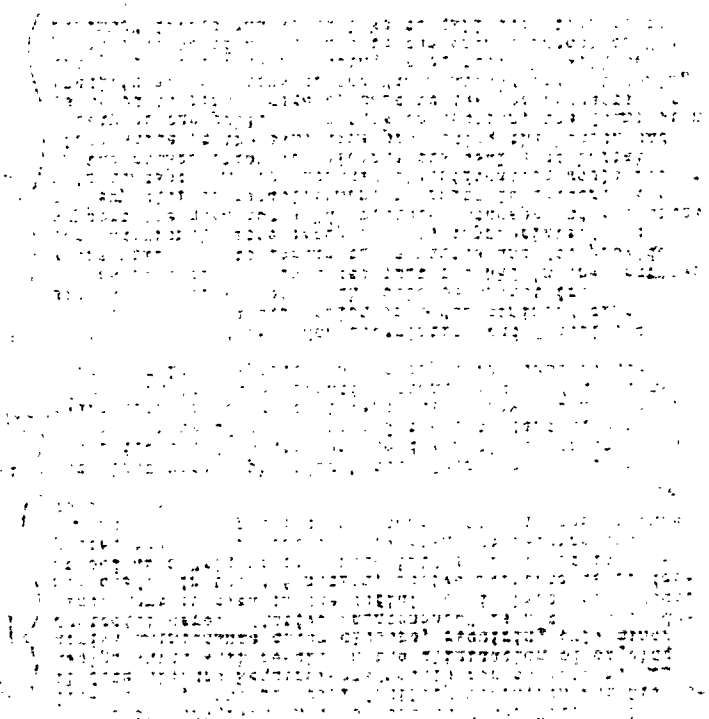
B-1 Subparts E and B both discuss various applicant qualifications necessary for granting a license. We were surprised to find no discussion of the past experience and professional qualifications of applicants. We feel applicants which have had a bad track record managing their enterprises in the past represent poor choices for new facilities. We believe, however, that problems of the past may be prologue to the future and should be an important part of the application review process.

Comment Summary

The USNRC proposed regulations for Part 61 represent a solid step in the right direction. We do feel, however, that the performance objectives and several other parts of the regulations fall short of the intention of the USNRC "...to assure the protection of the public health and safety." In order to achieve this goal, burial facility licensees must be able to conclusively prove that releases of waste will not exceed certain limits. We feel these proposed limits are far too lax and fail to recognize that burial sites fail due to waste consolidation and then generate copious quantities of contaminated leachate.

We also believe that Class A waste deserves adequate pretreatment to preclude consolidation. Such pretreatment would limit the physical, financial and public criticism ramifications associated with subsidence and leachate generation and/or accumulation. In fact, we believe that the USNRC should consider the effect of the regulations on facility siting. More stringent requirements for Class A waste pretreatment and zero discharge

will better convince the public and regional governmental units that the site will be a good neighbor.



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AIF

January 18, 1982

(100)
(46 FR 38081)
(32)
(46 FR 51776)

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

Attention: Docketing and Service Branch

Re: Notice on Proposed Rulemaking "Licensing Requirements for Land Disposal of Radioactive Waste" 10 CFR Part 61 (46 Federal Register 38081) and "Draft Environmental Impact Statement," NUREG-0782

Dear Sir:

The enclosed comments on the proposed rule and the draft EIS were prepared by two AIF subcommittees on low level radioactive waste.

The consensus of the subcommittees is that the proposed rule appears reasonable; however, some suggestions and some exceptions to the proposed rule and to the draft EIS were made and are reflected in the enclosures.

Sincerely,

John H. MacMillan
Chairman, AIF
Committee on the Nuclear Fuel Cycle

JHM:gpg
Enclosures

Acknowledged by card 1/22/82.

Comments on the Proposed NRC Rulemaking: "Licensing Requirements for Land Disposal of Radioactive Waste", 10 CFR Part 61, and on the "Draft Environmental Impact Statement", NUREG 0782
prepared by
The AIF Subcommittee on Low-Level Radioactive Waste and
the AIF Subcommittee on Solidification of Low Level Reactor Radwaste

Comments on "Supplementary Information":

p. 38084 Para V,C — ED-1

The first paragraph in this section under "Disposal Site Design, Land Disposal Facility Operation and Disposal Site Closure Requirements" calls for operations and design which will result in the elimination of ongoing active maintenance after closure, requiring only minor custodial care. "Active maintenance" is not clearly defined here or even in the definition in Para. 61.2 "Definitions". In the definition, active maintenance is described as a "significant remedial" action. It is suggested that the postclosure maintenance requirement should be site specific and incorporated in the license conditions.

p. 38084 Para V,C — D-55-12, D-56-8

The first paragraph under "Waste Characteristics and Classification" points out the desirability of the physical integrity of the waste and the site lasting until radioisotopes decay "to levels where they are no longer of concern from the migration standpoint". What standards should be applied to satisfy this requirement?

p. 38085 Para V,C — D-55-2

In the section "Waste Characteristics and Classification", there is a discussion of a "de minimus" classification for wastes which would be exempt from 10 CFR Part 61. It is noted that the NRC in the next two years will work to define these wastes and "to provide for additional waste exceptions as appropriate." We support the need for a "de minimus" concept and encourage the expeditious establishment of suitable criteria for this concept. A "de minimus" classification would result in the conservation of valuable disposal site burial space while at the same time protecting the health and safety of the public. In this connection, the Commission is urged to permit case by case reviews of requests for specific applications of the "de minimus" concept during the period criteria are being developed. We will be pleased to be of assistance in the establishment of "de minimus" levels and would like to call attention to the

D-55-2 report by the Forum's National Environmental Studies Project entitled "De Minimus Concentration of Radionuclides in Solid Wastes", AIF/NESP-016. Also, the Utility Nuclear Waste Management Group sponsored a study, "Suggested Concentration Limits for Shallow Land Burial of Radionuclides", which should be of value.

p. 38086 Para F M-1 In reference to the "Manifest Tracking System" we urge the Commission to ensure that any changes in manifest tracking systems are compatible with existing systems in order to minimize or eliminate possible duplication.

p. 38086 Para G B-3 The five phases of the life-cycle for a typical land disposal facility discussed in the proposed rule are: preoperational, operational, closure, post-closure observation, and institutional control. Some discussion is needed to indicate that several of these phases may proceed simultaneously at the same site as part of the normal disposal site operation.

There should be a sixth phase in the life cycle for a land disposal facility identified in the regulation; namely - release for uncontrolled use. This phase, which occurs after the radioactive contents of the landfill have decayed, should be stressed. It is further important to stress the need to keep toxic or mutagenic chemical forms out of landfills intended for radioactive waste. Chemical wastes are present forever and the land used must be restricted forever. Radioactivity decays away in time and land use can be recovered.

p. 38087 Para G B-5 The proposed rule requires a license renewal every five years. For a facility of this type, a five-year license renewal policy appears unreasonably short. Disposal sites should be provided with a full term license, subject to appropriate review. The fiscal basis for site operation and monitoring assumes a reasonable operating life. Licensing similar to that under 10 CFR 50 would appear to be more appropriate.

p. 38087 Para G D-59-2 The proposed rule states that the Institutional Control Board has a responsibility to "keep people off the site". This approach may be unnecessarily restrictive. Limited use of the land may be desirable in the future. A more appropriate action might be to control access to the site. The control board should have the flexibility to institute suitable control options depending on the particular condition existing at the site.

Comments on Part 61:

p. 38089 Para 61.2 See our comments on Para. V,C p. 38084 on "active maintenance".

ED-1

p. 38090 Para 61.2 In the definition of "Disposal" isolation of radioactive wastes from the biosphere should be clarified. A better definition would be: "Confinement of the wastes with no provision made for subsequent retrieval."

p. 38091 Para 61.7 (b)(1) The primary safety objectives for a near-surface disposal facility should be redefined in a manner that will (a) keep the site personnel dose as low as reasonably achievable and (b) keep the environmental impact and population dose below specified limits. In the existing statement of objectives the word "prevention" should be replaced with "minimize". To minimize migration of radionucludes is to provide a means towards achieving the primary safety objectives. "Prevention of exposure to "inadvertent intruders" is a special case of (b) above, and should be regarded as a secondary objective.

D-51-1

GEN-1

p. 38091 Para 61.7 (b)(2) In the first sentence the word "eliminated" should be modified or omitted. The requirement may not be possible.

B-1 p. 38092 Para 61.13 (b) It is not apparent what is required for "demonstration" or how analysis will be accomplished. This section should be clarified. This comment applies to Paras. 61.23(f),(i) and (j).

B-4 p. 38094 Para 61.25 The section on "changes" is too restrictive. The licensee should be allowed to make changes when deemed necessary, providing they do not decrease the level of protection to the public and provided they are brought to the attention of the Commission in a timely manner (i.e., Subpara.(d) provisions for changes similar to those in 10 CFR 70.32 (d)).

B-7 p. 38095 Para 61.29 The closure period should be included in the closure plan rather than the regulation. The required period of observation should be a function of specific site characteristics.

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p. 38095 Para 61.30 (5) B-8 — The requirement for transfer of the license to Federal or State custodial care should be part of the closure agreement and not the regulation. Transfer should be contingent upon licensee satisfaction of required conditions. Transfer "when the agency is prepared" leaves an open-ended commitment by the licensee which is not warranted.

p. 38096 Para 61.50 (a)(3) D-50-6 — Projections of population growth should be limited to useful demographics. Projection to 100 years or even 50 could be a useless exercise or worse, could rule out an acceptable site.

p. 38096 D-51-1 Para 61.51 GEN-1 (a)(4) — Replace "prevent" with "minimize".

p. 38096 GEN-2 Para 61.52 (a)(1) — Replace "no interaction" with "no significant interaction".

p. 38096 D-51-1 Para 61.51 (a)(6) — Replace "eliminate" with "minimize".

D-52-2 p. 38096 Para 61.52 (a)(4) — The word "orderly" should be deleted or explained.

D-52-5 p. 38096 Para (a) (7) — "Accurately located" depends on the state of the art. The word "accurately" should be defined or not included.

D-56-2 p. 38097 Para 61.55 (a) — Table 1 has a footnote eliminating wastes containing chelating agents in concentrations greater than 0.1% except as specifically approved by the Commission. This requirement eliminates most routine decontamination techniques to reduce occupational exposures and thus adversely affects ALARA programs. It is not clear why this restriction is being imposed. Guidance on acceptable packaging and disposal techniques for these agents is needed.

p. 38097 Para 61.55 D-55-6 — Table 1 is a specific list of radioisotopes with their respective concentration limits for three classifications of wastes, Class A segregated waste, Class B stable waste, and Class C intruder waste. While some of the concentration limits shown are reasonable, demonstrating compliance for others would be difficult (for example Ni-59 and Ni-63) because of problems in sampling and long delay periods for off-site transport which consequently result in additional increases in personnel radiation exposures. Additionally, the

D-55-3 — measurement of TRU in the 10 nanocurie/gram range in the presence of other interfering radionuclides is very difficult. Detection of 10 nanocuries/gram can be accomplished readily if TRU isotopes are the only ones present. Further, the present policy of volume

D-55-8 — reduction increases the concentration of radionuclides in the waste and in some cases may cause the waste to

D-55-1 — exceed the Table 1 concentration limits. For these reasons, the concentration limits in Table 1 should be reevaluated to determine their ability to be achieved in a realistic situation and in a cost-effective manner.

p. 38097 Para 61.56 (a)(7) D-56-5 — Change to read ..."that does not significantly exceed atmosphere at 20 degrees C". If this requirement is not modified, waste generators may be required to package gases under reduced pressure or elevated temperatures. The basis for the 100 curies should be provided.

p. 38098 Para 61.56 (b)(1) D-56-9 — By specifying a 5% limitation on the physical waste form, the proposed rule may well be unintentionally mandating a high integrity container for Class B wastes. Experience has shown that drums and liners can normally be filled to about 80% of their volume. Demonstrating compliance with a 95% criteria could be

D-56-11 — difficult. Also, the 50 psi compressive load criteria may eliminate bitumen media as a waste stabilization process. The compressive load criteria may also be more appropriately related to individual disposal site overburden characteristics rather than specified as a generic criteria.

G-1	p. 38100 Para 61.82 (a)	Eliminate radioactive waste already disposed of and covered from NRC inspection requirement.
Part 2-1	p. 38100 Para 2.103	It is not understood how this paragraph applies to 10 CFR 61.
M-2	p. 38102 Para 20.311 (d)(3) and	Regulatory requirements suggest rewording section to "conduct operations in a manner which assures compliance with Paras. 61.55 and 61.56 of this chapter." Existing wording implies that a separate quality assurance program will be used.
	(f)(5)	Same comments as suggested for 20.311(d)(3).

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USEcology

101
PR-2 et al
(46 FR 38081)

33
PR-61
(46 FR 51776)

January 13, 1982

R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Division of Waste Management
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Smith:

US Ecology has reviewed the proposed NRC rules for the land disposal of radioactive wastes (10 CFR 61) published in the Federal Register on July 24, 1981, and comment as follows:

GEN-1

Disposal Site Design, Land Disposal Facility Operation, and Disposal Site Closure Requirements. Page 38084, Col. 1.

This section as well as others in the proposed regulation refer to "eliminating the need for active maintenance after site closure." It is impossible to ensure that the need for no active maintenance can be achieved, so we would suggest that the word "minimize" be used in place of "eliminate."

2. Waste Characteristics and Classification.

D-55-12, D-56-B

a. Page 38084, Col. 2.
This section states that the stability of the waste and the disposal site should last long enough for the radioisotopes to decay to levels where they are no longer of concern from a migration standpoint. Without any reference to appropriate standards it is the regulatory agency's interpretation which must be used as a standard. References to applicable standards should be given.

D-55-3

b. Page 38084, Col. 3.
The limit of 10 nanocurie per gram for TRU waste is excessively conservative and is counter productive. Limits of this nature may dissuade waste generators from practicing volume reduction.

1/22/82 emp

D-55-2

Page 38085, Col, 2.
Decreased burial efficiencies will be experienced in burial facilities if the Commission fails in the establishment of a lower limit Class A segregated waste concentration. It is suggested that de minimus quantities be established to properly categorize those wastes that are suitable for alternate disposal methods. (e.g. sanitary landfills).

E-1

4. Financial Assurances. Page 38085, Col. 3.

The Commission indicates that certain types of surety mechanisms are acceptable. It is recommended that representatives of the commercial insurance industry be given definitive criteria against which to base any bonds in order to ascertain whether or not underwriters will accept the risk and default provisions set forth in these regulations.

M-1

4. Manifest System. Page 38086, Col. 2 and Pages 38102, 38103, Section 20.311.

The manifest tracking system provides for three (3) copies of the manifest. It has been the experience of this company that a greater number of copies is needed. A total of 5 identical manifests would provide a copy for the generator, carrier, an advanced copy to the intended recipient, one copy with the shipment and one copy as a receipt for the waste.

5. Regulatory Flexibility Act. Page 38088, Col. 1.

D-55-2

The lack of a de minimus quantity as well as any lower limits on the Class A segregated waste concentrations conflicts with the Department of Transportation Regulations governing the transport of radioactive material. 49CFR section 173.389 defines radioactive material as "any material or combination of materials which spontaneously emit ionizing radiation. Material in which the estimated specific activity is not greater than 0.002 microcuries per gram of material, and in which the radioactivity is essentially uniformly distributed is not classed as Radioactive material."

ED-1

6. 61.2 Definitions

Page 38090, Col. 1.
"Disposal" is defined as isolation of radioactive wastes from the biosphere. This is not possible as the "biosphere" can be interpreted as meaning part of the world in which life can exist. Many microorganisms will exist in and around all the waste. It is suggested that disposal be defined as isolation from the biospheres inhabited by man or his food chain.

A-6

7. 61.5 Interpretations

Page 38090, Col. 3.
By placing the responsibility for all regulatory interpretations upon the General Counsel and preventing other Commission personnel from making interpretations, the Commission could significantly disrupt operations by slowing the regulatory process. To avoid this, the regulations should establish a period, for example 10 days, within which the General Counsel must respond to requests for interpretation.

B-6

8. 61.7 (c) (2). Page 38091, Col. 3.

Since closure plans are to be submitted with the initial license application and periodically updated until final closure occurs, the licensee should not have to apply for a license amendment to close the site. The closure plan will have been periodically reviewed by the licensing agency throughout the disposal site operational phase, therefore, closure of the disposal site in accordance with the final updated and approved closure plan should be sufficient.

B-1

9. 61.11. Page 38092.

The definition of what is required for "demonstration" or how analysis will be accomplished should be provided. The comments apply to 61.2 (f) (i) (j).

ED-1

10. 61.24 Conditions of Licenses.

61.24 (f). Page 38094, Col. 2.
This section refers to possession of radioactive materials and should be clarified to indicate that buried waste is no longer in the possession of the licensee.

B-4

11. 61.25 Changes.

61.25 (a). Page 38094, Col. 3.
This section on changes is too restrictive. The licensee should be allowed to make changes when deemed necessary providing they do not decrease the level of protection to the public and provided they are brought to the attention of the Commission prior to implementation.

B-7

12. 61.29 Post-Closure Observation and Maintenance. Page 38095, Col. 1.

If the Commission or licensing agency closely monitors the closure per 61.29 and is familiar with the site, the minimum period of five years for post-closure observation and maintenance could be shortened commensurate with the condition of the disposal facility as closed. Provisions should be made for a period of less than five years if conditions warrant upon request of the licensee.

B-8

13. 61.30 Transfer of License.

61.30 (a) (5). Page 38095, Col. 2.
This section will allow the long-term custodial care agency even though prior commitments have been made to delay in accepting its responsibility. The use of the phrase "when the agency is prepared" in effect negates all prior commitments of long-term custodial care agency.

14. 61.50 Disposal Site Suitability Requirements.

D-50-1
GEN-2

61.50 (a) (2). Page 38096, Col. 1.
Modeling of any site can only be approximate. Some statement as to what criteria should be used to define "capable of being modeled" is required.

D-50-6

61.50 (a) (3). Page 38096, Col. 1.
A time frame for projecting population growth and future development is needed. Is this time frame the 100 year custodial care period or the 500 year engineered barrier life span?

D-50-3

61.50 (a) (5). Page 38096, Col. 1.
Clarification is warranted as to the requirement for well-drained and free of areas of flooding and frequent ponding. Is this a selection criteria based on "as is" conditions or "as can be engineered."

D-50-4

61.50 (a) (11). Page 38096, Col. 1.
If the environmental monitoring program is masked then it is not going to be a proper indication of the stability of the site, therefore, the use of the phrase "significantly masked" is not appropriate.

D-51-1

15. 61.51 Disposal Site Design for Land Disposal.

61.51 (a) (4). Page 38096, Col. 2.
No cover will totally prevent all water infiltration. This section should require that covers be designed to minimize water infiltration.

61.51 (a) (5). Page 38096, Col. 2.
In a humid area some minor erosion will occur. This is one of the criteria which must be taken into account when selecting and closing a disposal site. It is not possible in a humid area to ensure that erosion will not result or that active maintenance will not be necessary in the future.

16. 61.52 Land Disposal Facility Operation and Disposal Site Closure

D-52-2

61.52 (a) (4) Page 38096, Col. 2.
The word "orderly" should be deleted or defined. Orderly placement is often inconsistent with the principles of ALARA.

D-52-5

61.52 (a) (7) Page 38096, Col. 3.
The requirement to accurately locate each disposal unit is reasonable if an allowed tolerance is indicated.

D-55-2

17. Table I Page 38097.

Having no lower limit activity concentrations for Class A segregated waste conflicts with the definition of radioactive material used in 49CFR.

18. 61.56 Waste Characteristics

D-56-5

61.56 (a) (7) Page 38097, Col. 1.
49CFR allows limited quantities of radioactive gases to be packaged in greater quantities than 100 curies. This is inconsistent with the requirements of these proposed regulations.

D-56-9

61.56 (b) Page 39098, Col. 1.
By specifying a 5% limitation on the physical waste form, the proposed rule may well be unintentionally mandating a high integrity container for Class B wastes. Experience has shown that drums and liners can normally be filled to about 80% of their volume. Demonstrating compliance with a 95% criteria is unrealistic as a practicle matter. Also, the 50 psi compressive load criteria may eliminate bitume media as a waste stabilization process.

D-56-11

The compressive load criteria would be more appropriately related to individual disposal site overburden characteristics rather than specified as a generic criteria.

Draft EIS Comments

In general, the Environmental Impact Statement (EIS) states current practices and also cites alternate methods. It is unclear whether the Commission accepts either case or prefers the alternates. It is important for the Commission not to specify a method as any proposed site for disposal will be unique.

1. Page 5-106

Vibratory compactors are recommended by the EIS. Such compactors are good for granular soils but are less effective for cohesive soils. The Commission should specify a degree of compaction or required permeability rather than a method of compaction.

2. Page 3-35, Section 3.6.3.6 Security

Full time security personnel have not been used at the present commercial burial facilities. The full time security provisions such as fences, signs and periodic law enforcement visits have provided effective security and have not resulted in any security violations that would warrant the employment of full-time security personnel. The use of radio communication to contact emergency and law enforcement agencies is not warranted as the fastest and easiest method is the telephone. Many years of experience has shown that the use of telephone commucation in emergency situations has proved reliable.

3. Page E-13, Section 2.1.

It appears that the Commission is basing site selection on the ability of the locations to fit their computer model. Due to projected site complexity, it is not realistic to require a location to fit present computer models.

4. Page Q-16 and 17, Section 4.1.1, Table Q-7.

The cost of building demolition ($100,000) seems high in view of the fact that the three buildings to be demolished cost only $423,850 to build (See Q-3) and about half of that would have been materials.

5. Q-16, Section 4.1.2.

Vibratory compaction equipment will be effective only in granular fill.

6. Page K-45, Section 5.1.

The last paragraph of this section factually states that this fund is inadequate to pay for long-term care of the site but does not properly state that monies were placed in the State's general fund and not earmarked for the use intended.

7. Page K-50, Section 5.5.

The statement that the fund is inadequate is not based on current facts. The surcharge has increased by 10% in 1981 and the proper investment of the funds will take care of the effects of inflation. Further increases can and are being implemented which will provide substantial funding to the State.

Sincerely,

J. S. Scoville
President

JSS:db

AIChE

NUCLEAR ENGINEERING DIVISION
AMERICAN INSTITUTE OF CHEMICAL ENGINEERS

'82 JAN 19 P3:15

January 11, 1982

(102)

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

-2 etal
(46 FR 38081)
-61 (35)
(46 FR 51776)

Attention: Docketing and Service Branch

Dear Sir:

The Nuclear Engineering Division (NED) of the American Institute of Chemical Engineers appreciates this opportunity to comment on the proposed regulation related to land disposal of radioactive waste (10 CFR Part 61) published at 46 FR 38081 on July 24, 1981.

The American Institute of Chemical Engineers is a professional organization representing over 30,000 chemical engineers, many of whom are members of the Nuclear Engineering Division. A number of these persons have had decades of experience in most (if not all) of the technologies related to land disposal of radioactive waste.

NED heartily concurs with the urgent need for regulations codifying requirements for land disposal of radioactive waste. However, we believe that Subpart D of the proposed regulations is so basically flawed that it should be deleted and the proposed regulation rewritten and republished for comment.

C-1

Generally, the regulation should present not "technical requirements" but "performance objectives." If technical requirements persist in the regulation:

- Overconservatism now embodied in the proposed technical requirements should be considerably reduced.
- Cost/benefit considerations should be based on the entire fuel cycle as now defined by the Administration and recognized by the Commissioners of the NRC.
- The definition of transuranic waste should be made realistic recognizing the entire fuel cycle with a rational application of the ALARA principle.
- Full recognition of the beneficial consequences of "layered"

disposal should be reflected.

PERFORMANCE OBJECTIVES

The primary flaw in the proposed regulation consists of the abortive attempt by the NRC to formulate generic limits for disposal. This will deprive a potential disposal facility operator of the opportunity to either:

- Take advantage of natural or engineered features of his operation to permit him to accept materials of above-normal radionuclide content and dispose of them with quite adequate protection of the public in both the short and long term, or
- Limit his receipts to less contaminated material to permit him to avoid some of the more costly proposed NRC requirements, still with adequate safety, to be able to offer a service less costly to his customers (and, therefore, the public).

C-1

An unacceptable reason given by the NRC not to adopt a performance objective appears in Section 2.2.1 of NUREG-0782 (hereinafter, the NUREG), where it is stated, "In addition, it may not be totally clear to an applicant or interested person how to design and operate a disposal facility to meet the general objectives." We submit that anyone so naive or lacking in thorough understanding of all technical aspects of waste disposal should not be involved in a responsible technical position related to a land disposal operation. The role of the regulating agency should be that of regulation, not the establishment of design bases.

We have felt repeatedly in past years that NRC regulations resembled more and more a "cook book" approach. As with other nuclear operations, waste disposal cannot be left to unqualified persons to be carried out simply by rote. It must be done under the supervision of highly qualified management.

Accordingly, there should be no reason why the NRC should not adopt only performance objectives for waste disposal rather than the limits and criteria proposed. To the contrary, it appears that the former would offer worthwhile benefits. Granted, Subpart D does allow departure from its requirements if it can be shown that there will be compliance with Subpart C; however, the very existence of the requirements of Subpart D will inevitably present a major obstacle to an applicant endeavoring to benefit from an especially good site or operational provisions.

UNDUE CONSERVATISM

D-55-1

We feel that there is gross overconservatism in the NUREG. The proposed

requirements are, to a great extent, not cost-effective and extend far beyond ALARA requirements. There are many examples of this, including:

D-55-1

- Both NUREG-0456 and NUREG/CR-1005 are frequently referenced in the NUREG. Indeed the conclusions of all three documents bear many similarities. However, in the two referenced documents no credit was taken for the waste package nor for waste stabilization or solidification. The proposed regulation carries with it requirements for all of these. That all documents are similar at the bottom line but so very different in basic premises shows the extreme conservatism in the NUREG.
- It is well known that the mixing of ^{129}I with stable (^{127}I) iodine results in directly proportionate reduction in iodine related dose to the thyroid and other organs. This is recognized in the NUREG (for example, on pages 4-16 and 5-73) but then ignored in consideration of ^{129}I limits.
- As addressed below, the only scenarios for transport of radionuclides from a disposal trench when the waste is emplaced at moderate depths (say 10 meters) below grade are the water pathways. Sections 61.51(a)(4) and (6) require that the disposal site design be such as to prevent water infiltration and to eliminate the contact of water with waste. If the proposed regulation is adopted, it seems fair to presume that a prospective disposal site operator would be required by the NRC to give reasonable proof that it is probable that these requirements can be and will be met. If so, then there exists no credible water pathway, making limits proposed quite irrational.

SOURCES OF WASTE

D-55-3

The NUREG pointedly ignores significant sources of waste. It references what is now known to be an interim federal policy against recovery of valuable, irreplaceable energy resources by reprocessing spent fuel. This is no longer the policy, as was recognized by the Commissioners in their Second Prehearing Memorandum and Order dated November 6, 1981 in the waste disposal confidence rulemaking (PR-50.51). In that document, the Commissioners stated, "On October 8, 1981, the President issued a statement outlining a policy favoring commercial reprocessing." It is well known that the operation of a reprocessing plant generates sizeable quantities of "low level" waste. One must include in such quantities the waste also discharged from the operation of the plutonium and "high level" waste solidification facilities.

Further, it is the policy of the current Administration that the nation should

D-55-3

proceed with a breeder program. This will require the processing of plutonium for fuel, generating more waste not addressed in the NUREG.

Indeed, the NRC in its proposed 10CFR Part 60 recognizes the possibility of reprocessing in the definition of "high level radioactive waste." (60.2)

The nature and quantity of reprocessing, high level waste solidification, and plutonium processing wastes mandates that they be included in consideration of land disposal regulation.

TRANSURANIC (TRU) WASTES

The definition of the waste form called "transuranic" must be redone for at least several reasons:

D-55-3

- The quantity of wastes from those portions of the entire fuel cycle ingored in the NUREG, much of which would likely be in the 10 to 100 nCi/cm^3 range, must be taken into account in assessing the cost-benefit balance on the ALARA principle. One of the more significant compcnents of these wastes is, for instance, leached fuel cladding hulls. It is likely that the transuranium content of hulls will be below 100 nCi/cm^3. To unnecessarily identify them as being excluded from land burial could result in large and wasteful expenditures of money. Other components of these wastes likely will fall in the same range.

- It appears that, in tying the 10 nCi limit to lung dose, the inhalation pathway has been used. With layered disposal (see below) this pathway for transuranics should not be applicable. The water pathway would lead to, first, only an ingestion pathway, and second, only to the requirement for an inventory limit rather than a concentration limit.

- The "fact" that the 10 nCi limit is readily complied with now loses its meaning when all real (even if not now generated) wastes are taken into account and the principle of ALARA is sincerely applied.

VALIDITY OF PROPOSED LIMITS

D-55-1

As noted above, the NUREG frequently references NUREG-0456 and NUREG-CR/1005. Both of these documents (with deep involvement of

NRC personnel) concluded:

D-55-1

- Intruder-construction and intruder-agriculture scenarios would require concentration limits to be imposed on waste to be disposed of by land burial.

- The potential for other intruders and the potential (likely or not) man-rem consequences to a few individuals lead to the conclusion that such a scenario is unimportant in the future.

- Water migration scenarios would require not concentration limits but total site inventory limits to be imposed.

- None of these scenarios is expected to take place while there is institutional control (taken in the NUREG to be 100 years).

- The "layered" mode of disposal, as described in the NUREG, obviates the need to address any intruder scenario for the higher activity wastes.

- There is no need for special packaging or stabilization of wastes to make the above conclusions valid (the referenced NUREGs assumed no such requirement).

Therefore, the limits proposed in the draft 10CFR 61.55 must be recomputed. There should be a clear recognition that waste buried at the bottom (say 10 meters deep) of an operation is only subject to site-specific inventory limits (a performance objective). Further, credit should be given for compliance with the requirements of 61.51 "disposal site design for land disposal."

D-56-8

Also, the consideration of subsidence should be redone. We can see no valid reason why, during the period of institutional control with monitoring by the NRC, any subsidence could not and would not be promptly corrected. In line with this, we believe that even without the proposed requirements to prevent or minimize subsidence, all significant subsidence could be expected to take place well before the expiration of the 100 year period (after site closure) of institutional control. Accordingly, the costly requirements proposed in Part 61 are unnecessary both during the priod of institutional control and after.

Finally, througout the NUREG, numbers on concentrations, doses, etc., are expressed to as many as three or four significant figures. Such a presentation is very misleading in that it implies that our knowledge is that precise (which it is not) or that such accuracy is needed (which it is not).

D-55-2

We do note with approval that the discussion on 46 FR 38085 indicates that

D-55-2 de minimis waste classifications will be established. Hence, potentially lower cost disposal options may develop for materials at lower concentration levels. We encourage establishment of such de minimis limits outside the scope of Part 61. This approach should allow consideration of both the form and type of waste.

In conclusion, 10CFR Part 61 should be rewritten based on simple performance objectives. Any competent applicant has available all the necessary tools (hydrological, geological, climatological, etc., data, codes, etc.) to support appropriate site-specific limits for his proposed operation. We urge that he be given the latitude to take advantage of site-specific benefits or to search for an improved site which would give him an opportunity to offer a better service at a reduced cost.

We request the opportunity to answer any negative response by the NRC to any aspect of this discussion.

Sincerely,

R. I. Newman

R.I. Newman
Chairman, Nuclear Waste Task Force
Past Chairman, Nuclear Engineering Division

CONFERENCE OF RADIATION CONTROL PROGRAM DIRECTORS, INC.
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'82 JUL 20 P1:12

(103)

January 15, 1982

DOCKET NUMBER PROPOSED RULE PR-2 et al (46 FR 38081)

(36)

DOCKET NUMBER PROPOSED RULE PR-61 (46 FR 51776)

Mr. R. Dale Smith, Chief
Low-Level Waste Licensing Branch
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Dale:

The following comments relate to the Proposed Rule for a new Part 61, and other related amendments, as published in Volume 46, No. 142 of the Federal Register, dated July 24, 1981.

The Nuclear Regulatory Commission is to be commended on this proposed regulation. This new proposed rule provides a vast improvement in guidance and requirements for the control of land disposal of radioactive waste. The existing regulation on the disposal of radioactive waste contained in Part 20 provides only a limited guidance that has resulted in problems at both NRC and state licensed burial sites.

The Conference has taken the position since the late sixties that more federal guidance and criteria is needed in the area of shallow land disposal of radioactive waste. The Conference has passed various resolutions addressing this concern. Such guidance is imperative for uniform management of the country's radioactive waste.

Many of the improvements in the proposed Part 61 are responsive to some of the recommendations made by the Conference. Proposed Part 61 also establishes, in the NRC regulatory system, many "state of the art" improvements that have been developed by the states in the operation and regulation of low-level radioactive and hazardous waste burial sites.

The Conference concurs and supports the following proposals contained in the new Proposed Part 61:

C-1 1. An improved waste classification system that divides the present all-inclusive "low-level" waste into several categories based on hazard evaluation.

D-55-3 2. Confirmation of the definition of transuranic wastes as recommended by the Conference several years ago.

C-1 3. Technical requirements for burial that become more stringent based on the increasing hazard of the radionuclide concentration in the waste.

D-56-B 4. Technical requirements on stability of waste packaging.

D-52-2 5. Technical requirements on burial site operations that minimize voids in trenches with emplaced waste.

E-1 6. Technical and financial requirements associated with the site closure phase and the post-closure observation and maintenance phase.

D-59-2 7. Defining a period of time for institutional control, and relating the classification and disposal of waste to this time frame.

C-2 C-3 8. For design purposes of new proposed sites, and until specific recommendations are forthcoming from the Environmental Protection Agency, the Conference supports the objective in Proposed Part 61 that any movement of radioactivity should not result in calculated doses in excess of 25 mrem/year to an individual at the site boundary, and support the application of the EPA drinking water standard to the nearest public drinking water supply. We also recommend the application of these dose limits as guidelines for existing sites. Of course, the application of ALARA should be applied to a near surface burial site, as with other licensees.

C-5

M-4 We strongly support the proposed amended requirements to Part 20 for the certification and use of shipping manifests to track waste shipments.

We offer the following specific comments on the proposals.

(1) 61.2 Definitions:

ED-1 a. Should include a definition for "minor custodial care."

b. "Disposal" - As stated, the temporary storage of waste could meet the definition. Disposal into land generally connotes long term or permanent removal of the waste from the biosphere. Possibly the words "long term" should be added before the word "isolation."

D-55-2 c. "Waste" - The definition should include levels of concentrations of radioactive materials specific to a particular waste stream below which regulatory control is no longer required. This position was previously

D-55-2 transmitted to the Commission in the form of Resolution III which was adopted at the thirteenth annual Conference meeting.

D-55-9 Although the definition for waste may not be the area in which the following concerns should be addressed, we strongly urge the Commission to consider the total hazard, both radiological and chemical, in the classification of acceptable waste for a radioactive burial site. Although this concern is somewhat addressed under 61.56, criteria or guidelines are needed which specifically consider the appropriateness and/or procedures of combining waste which is highly toxic, chemically, but low in radioactivity, with chemically nontoxic radioactive material.

Consideration should be given to a definition of "toxic chemical/radioactive waste" which may require different handling and burial requirements. This concern was expressed to the Commission in the form of Resolution II adopted by the Conference.

B-8 (2) 61.7 Concepts:

Under section (c)(4), "The Licensing Process," the concept of license transfer to a state or federal agency after finding of satisfactory disposal site closure is discussed. Under this concept, if transferred to a state, the NRC would be licensing a state government until institutional care is not required. This concept for a low-level waste site may need further discussion and refinement before implementation. For example, what criteria will be used to judge the adequacy of the state government licensee? If "state government" violates the conditions of the license, what enforcement actions would be taken? Additionally, why would the license be terminated if transferred to the Department of Energy, but not terminated if transferred to a state? Experience and history has shown that states have been as effective as the federal government in assuming responsibility for long-term care of existing sites. Therefore, consideration should be given to license termination after transfer to a state government.

B-1 (3) 61.12 Specific Technical Information:

Section (d) would require a description of the design basis natural events or phenomena. Requirements should be

B-1 placed on the applicant to consider the maximum creditable accident anticipated, and a description of actions that would be taken should such an event occur.

(4) 61.50 Site Characteristics:

D-50-8 Consideration should be given to a nonsuitability requirement for burial into areas high in natural radioactivity.

(5) 61.80 Records:

G-1 Consideration should be given to the requirement for the maintenance of a duplicate set of vital records at an alternate location in case of destruction by fire or other loss of primary records.

We would also like to comment on the Summary Draft E.I.S., NUREG-0782, Volume 1. We believe the Draft E.I.S. adequately supports the need for the Proposed Part 61, and identifies impacts. Our specific comments are as follows:

1. Page 15, Impact Measures:

   Another pathway which should be considered is trench overflow and/or pumping of water from trenches.

2. Page 16, Table S.4:

   Impact measures should include trench overflow or pumping of trenches, and the release of tritiated methane.

3. Page 30, 5.1.2., 4th paragraph:

   The "bathtub" problem not only "leads to costly long-term trench pumping," but may also release radioactivity in the process.

4. Page 55, Impacts on the Public:

   An additional beneficial impact with the implementation of the requirements of the Proposed Part 61 is the reduction of potentially large, long-term financial cost for taxpayers in states in which sites are located.

- GENERAL COMMENTS -

GEN-2 There is an urgent need for written criteria and/or guidelines as to what constitutes acceptability in meeting the performance

standards of the new Proposal. We recommend immediate consideration be given to the following:

GEN-2

1. Standards for acceptable solidifying agents for liquid low-level waste.
2. Acceptable testing procedures to determine if solidified liquids meet the above standard.
3. Comprehensive licensing guidelines for waste reduction methods such as incineration and compacting units.
4. Guidelines for types of acceptable or optimum geological formations for the land disposal of low-level radioactive waste.
5. Standards or criteria for the optimum design of a site, considering dry vs. humid climates.
6. Guidelines as to acceptable or optimum burial practices.
7. Guidelines relating to the minimum acceptable health physics program for a near surface burial facility.
8. Guidelines relating to the minimum acceptable nonradiological occupational protection program for a near surface burial facility.
9. Guidelines relating to the specific areas that must be considered for emergency planning for a near surface burial facility.
10. Guidelines on environmental contamination trend analysis, and recommended protective actions based on potential increasing environmental levels of specific radionuclides.
11. Standards or criteria which specifies what constitutes stabilization and a decommissioned site.
12. Guidelines which identify the minimum acceptable activities to be performed by a government agency after closure.
13. Guidelines on methods of determining financial needs for long-term care.
14. Guidelines as to the minimum acceptable environmental monitoring programs for a near surface disposal facility.
15. Guidelines on the application of ALARA for near surface facilities.
16. Guidelines on ground water modeling for near surface facilities.

Again, I would like to commend the Commission for the excellent work contained in the new Proposed Part 61. Such regulations have been needed for many years. We appreciate the opportunity to comment on this very vital need to our country.

Yours very truly,

John R. Stanton

John R. Stanton, Chairman
Conference of Radiation Control
Program Directors, Inc.

JRS/CMH/pch

cc: Board
Federal Liaisons
Executive Secretary
G. Wayne Kerr

PURDUE UNIVERSITY SCHOOL OF HEALTH SCIENCES

January 15, 1932

(104)

DOCKET NUMBER
PROPOSED RULE PR-2 et al
(46 FR 39081)

Samuel Chilk
Secretary, Nuclear Regulatory Commission
Attention: Docketing and Service Branch
Washington, DC 20555

Dear Mr. Chilk:

I am writing you as Chairman of the Program Review Committee, an independent review committee comprising representatives from industry, institutions, environmental groups, and state and federal government.

EG&G Idaho, Inc., as Manager of the Department of Energy's Low-Level Waste Management Program, has constituted this review committee. The Committee has reviewed your proposed regulation 10 CFR 61. Most of our comments have been included with the Department of Energy comments through EG&G Idaho. However, there is one matter that we consider merits special comment.

C-4

From our review and discussions with NRC, DOE, and EG&G Idaho staff, we find that the "inadvertent intruder" is the dominant or controlling feature of the regulation. The waste categories, radionuclide concentration limits, and other matters are set by the calculated dose to the inadvertent intruder. In our judgment the NRC has given too much weight to the intruder scenario in the development of the regulation. We do not feel that safety regulations for the general population should be dictated by the hypothetical number actions of a very small number of individuals.

Our judgment is that the inadvertent intruder scenario is more analogous to an accidental exposure pathway than to a chronic exposure pathway. Action to mitigate the consequences of the event and to lessen the likelihood of the event seems more appropriate than using the event as a basis for operational regulation.

We agree that the "inadvertent intruder" should and must be considered in the regulation. However, more emphasis should be placed on requirements to reduce the likelihood of intrusion. One such requirement might be to use durable monuments large enough to warn potential intruders. The proposed waste form and container requirements for structural stability may also serve to mitigate the consequences of an inadvertent intrusion.

Pharmacy Building
West Lafayette, Indiana 47907

Samuel Chilk
January 15, 1982
Page 2

C-4 The above discussion represents the general feelings and consensus of the committee. There was unanimity among the Committee members that this question and our judgments should be brought to your attention. The Program Review Committee would be happy to elaborate on these comments or answer any further questions concerning our conclusions. Please accept our compliments on your efforts and our thanks for the help and assistance received from the NRC staff, in particular, Ms. Kitty Dragonette, who was very helpful and attentive.

Sincerely,

Paul L. Ziemer

Paul L. Ziemer, Chairman
Low-Level Waste Management
Program Review Committee

PLZ:mhf

cc: Dale Smith
Division of Waste Management
U.S. Nuclear Regulatory Commission
Washington, DC 20555

THE UNIVERSITY OF TEXAS SYSTEM CANCER CENTER

M. D. Anderson Hospital and Tumor Institute
Texas Medical Center Houston, Texas 77030

Department of Physics

January 13, 1982

DOCKET NUMBER PROPOSED RULE PR-2 et al (46 FR 38081) 105

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

Attention: Docketing and Service Branch

Dear Sir:

I appreciate this opportunity to comment on Proposed Licensing Requirements for Land Disposal of Radioactive Waste. There definitely needs to be a single, coherent set of licensing requirements regarding burial sites and I am glad to see these regulations formally presented for review. I am particularly gratified to see the waste classification scheme, Part 61.55.

The University of Texas System Cancer Center generates radioactive waste in the course of medical therapy, diagnosis, and research activities and may be directly affected by parts 61.55, 61.56 and 20.311. I will confine my comments to these parts.

D-56-7

Part 61.55

The waste classification of isotopes and activities is acceptable. All radioactive waste generated here would fall under Class A segregated waste with regard to activity.

Part 61.56

My uncertainty with portions of this section is NRC interpretation in applying these requirements to medical research waste containing organic solvents such as toluene, xylene, dioxane, etc. used in liquid scintillation counting. As I understand this part, drums containing liquid scintillation vials, which in turn contain organic solvents, would be unacceptable due to parts (a) (5), (a) (6) and primarily (b) (2). It would be worthwhile for the NRC to refer specifically to liquid scintillation vial waste. Due to the low activity and small volume of solvents, I think part (a) (3) is sufficient for liquid scintillation vial waste. Complying with part (b) (2) might be practically impossible due to the usually unknown mix of solvents in scintillation cocktail.

Acknowledged by card. 1/25/82 emp

Rehabilitation Center The University Cancer Foundation The Anderson Mayfair
Extramural Programs Division: Environmental Science Park · Oncology Council · Biomedical Institutions · Collaborative Studies · Substations

Part 20.311

It seems to me that certain parts of this section put an undue burden on generators of low level medical radioactive wastes in terms of increased cost and manpower required to implement these rules. According to this section all waste generators are considered shippers and are responsible for meeting all of the implementation and record keeping requirements of this section regardless of arrangements made with other parties (i.e. collectors, reprocessors) for shipment of wastes. The minimum requirement for medical low level waste generators should be to accurately indicate radionuclide identity, activity, physical forms, and NRC waste classification for each drum or container. M-4

If other parties are willing to take responsibility for wastes leaving the generator's facility, they should be permitted to do so. Otherwise this is yet another requirement forced upon medical institutions which could better utilize their money and personnel on other more pressing safety problems.

I have the following specific comments on this section:

(b) As stated above, for medical low level radioactive waste I see no need for information provided by the generator other than radionuclide identity, activity, physical form and NRC waste classification for each container.

(c) The generator should as a minimum certify only the proper classification, description and packaging of wastes. Other parties (i.e. commercial firms) should be able to certify the remaining information if they contractually agree to this.

The generator institution should be able to allow individual authorized users of radioactive materials to certify the above information.

(d)(3) Other parties should be allowed to perform this assurance under contract. In any case the NRC should specify what a quality assurance and management audit program should entail. For Class A waste this should be minimal. M-2

(d)(4) See comments on (b) and (c).

(d)(5) This is unnecessary when another party is receiving the waste at the generator's institution. M-4

(d)(8) Generators should be exempted form this requirement when another party receives the waste at the generator's institution.

(f) The licensed waste processor should be allowed to perform duties for the generator as commented upon above. This will also eliminate unnecessary duplication of effort by the generator. M-4

(h) See (d) (8).

Sincerely,

M. E. Norton
Radiation Safety Officer

cc: Edgar Bailey,
Texas Radiation Control Bureau

MEN:eg

Carolina Power & Light Company

January 14, 1982

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

Attention Docketing and Service Branch

COMMENTS TO PROPOSED 10CFR PART 61

Dear Sir:

As requested by the notice published in the July 24, 1981 Federal Register, Carolina Power & Light Company (CP&L) hereby submits comments on the proposed 10CFR Part 61. As generators of low level waste, CP&L has concerned itself primarily with the portions of the proposed 10CFR61 which address waste classification. However, in regard to the entire regulation, we express our support for the concept of stating overall performance objectives for low level waste disposal supplemented by prescriptive design requirements only where necessary. This approach provides needed flexibility, particularly in landfill design where local conditions vary.

C-1

Comments on specific sections of 10CFR Part 61 are as follows:

Section 61.27, Application for Renewal or Closure

This paragraph discusses the license renewal requirements. On page 38087 of the preamble, NRC indicates that the renewal period will be five years. We think this is inappropriate and unnecessary. Section 61.25 Changes, already requires Commission approval before changes can be made to the site. Section 61.24(a) already provides authority to revoke modify or suspend a license. Therefore, the automatic five (5) year renewal is not needed. Also, a nuclear power plant is licensed for the life of the plant (normally 40 years). Since the degree of public risk is very low for a low level waste disposal facility, the license should be issued for the life of the facility, similar to a nuclear power plant license. In this way, a private operator of a low level waste facility can be assured that his initial investment would not be lost after five (5) years, should his license not be renewed.

B-5

Section 61.55, Waste Classification

The waste classification system as outlined in Table 1 is unworkable. The Draft Environmental Impact Statement (DEIS) Summary, pages 43 and 44, addresses the difficulty of measuring

D-55-6

Acknowledged by card 1/25/82

-2-

such isotopes and proposes the use of scaling factors based on measured levels of indicator isotopes. This wording must be included in 10CFR61 to avoid future enforcement problems. The standard error associated with this technique must also be recognized and allowed for enforcement. Language must be introduced into Part 61 recognizing that the specific activity of isotopes need not be measured directly and permitting the use of indirect methods for reasonably estimating them.

D-55-6

An attractive and reasonable alternative which would avoid these isotopic analysis problems and still accomplish the Commissions objective of having an inventory of all waste at a site at time of closure, would be to entitle each column in Table 1 as typical wastes or waste sources (similar to the list shown on page 38085 of the preamble). For enforcement purposes, a simplified indirect measurement of indicator isotopes in each package would then suffice to categorize waste packages as falling within the "typical" levels shown for each column of Table 1.

We strongly support the NRC's efforts in establishing a "de minimis" classification which would essentially be exempt from Part 61. For clarity, we would suggest a column for the "de minimis" levels be added to Table 1. We would also suggest a column be established to cover all low level wastes that exceed Class C wastes, so that it is clear what is to be done with these wastes as well.

D-55-2

In establishing a limit of 0.1% by weight for chelating agents in waste, the NRC is not taking into account the stability requirements of Class B and C wastes. We feel that applying a 0.1% chelating agent limit to these wastes will discourage the use of present and developing decontamination techniques useful in reducing occupational exposures. If the NRC believes it is necessary to establish additional protection, guidance for proper and reasonable packaging should be developed as opposed to concentration limits. General performance guidelines could achieve stated goals without requiring the extreme efforts necessary to routinely demonstrate compliance.

D-56-2

We recommend a 100 nCi/gm limit for transuranic waste. The proposed 10nCi/gm is an arbitrary level and is very conservative from a health and safety standpoint. Although 10nCi/gm is achievable during normal power plant operations, there are documented reports of levels occasionally reaching the 10-100 nCi/gm range (EPRI Project 613, August, 1980). These events were associated with unusual fuel performance. Raising the limit would accomplish two things. First, the very small amount of power plant waste falling in the 10-100 nCi/gm range

D-55-3

D-55-3 can be readily disposed of safely. Second and more importantly, all waste from operating power reactors could safely be assumed to fall below the 100 nCi/gm level, thereby achieving compliance by definition and making it unnecessary to perform direct or indirect measurements which are technically very difficult.

C-4 Table 1 is designed to provide a limit of 500 mRem/year exposure to an inadvertent intruder 100 years after closure of the site. We feel the 5 Rem/year limit currently applied to radiation workers represents an acceptably low risk and should be the standard used in this intruder scenario. The low probability of intrusion and the limited number of individuals who would ever be involved in such an event would justify calculating risk based on individual exposure and not population exposure. This change would increase allowable capacity at the disposal sites and would reduce the total number of required sites in the future.

D-55-1 The limits established in Table 1 assume an intrusion 100 years after the waste is placed. From our review, it appears that no credit has been allowed for the decay of the predominately short-lived isotopes that would occur during the operational phase. If so, higher activities could be allowed per waste class in the early years and still meet the intrusion criteria after 100 years.

G-1 Due to the expected increase in paperwork associated with 10CFR 61, we encourage that existing forms and documents be used where possible to avoid unnecessary additional administrative burden.

ED-1 A general comment concerning Table 1 is that it contains far too much information to be limited to the space given. We would suggest that narrative be provided to explain the intent of each classification and footnote.

D-55-8 Of final concern is that Table 1 and the waste classification scheme in general would appear to discourage waste volume reduction which is contrary to the NRC Policy Statement of October 16, 1981, concerning volume reduction, as well as CP&L policy of promoting total waste volume reduction. If volume reduction is to be encouraged, a waste classification system must be developed in the final 10CFR61 whereby users are rewarded in some way for using waste volume reduction techniques.

Section 61.56

D-56-11 The prescriptive requirement of 50 psi compressive load for waste form stated in 61.56 (b)(1) should be replaced by a performance objective allowing specific requirements to be developed on a site-by-site basis to avoid subsidence at that specific site configuration.

D-56-9 It is our understanding that to maintain the waste stability to within 5% would require filling the waste container to less than 95%. This is impractical from a large operations standpoint, and should be changed to a performance objective which would require filling the container as close to capacity as reasonable.

A-1 Agreement State Status

Within the proposed 10CFR61, the status of agreement states is ambiguous. There are several places in the regulations where it would be appropriate to explain how 10CFR Part 61 would apply in states with agreement status. Specific language is suggested as follows:

Section 61.1(b)

"Except in Agreement States where a compatible waste disposal program is in place or as provided in Section 61.6 'Exemptions'...."

Section 61.70

"This subpart describes mechanisms through which the Commission will implement a formal request from a non-Agreement State, an Agreement State without a compatible disposal program, or Tribal government to participate in the review...."

Draft Environmental Impact Statement (EIS)

DEIS is unreasonably voluminous based on the small degree of environmental or safety risk from low level waste. The disposal of wastes has received significant public attention recently and has become a very sensitive topic. A DEIS of this volume tends to inappropriately legitimize these overstated concerns.

Should you have questions concerning our comments, please let me know. We appreciate this opportunity to comment on the proposed regulation.

Very truly yours,

Patrick W. Howe
Vice President
Technical Services

PWH:dcj

The American Society of Mechanical Engineers

Nuclear Engineering Division
(Founded in 1954)

'82 JAN 22 P2:55

Please address reply to:

General Electric Company
175 Curtner Avenue
San Jose, CA 95125
Mail Code 772

January 21, 1982

(107)

DOCKET NUMBER
PROPOSED RULE PR-2&61
(46FR 38081)

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

Attention: Docketing & Service Branch

Subject: Transmittal of Comments to 10CFR Part 61, "Licensing Requirement for Land Disposal of Radioactive Waste"

We are pleased to take this opportunity to comment on the proposed rule, 10CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste"

The attached comments are those of the Radwaste Systems Committee (ASME), chaired by Larry Reiter.

Kenneth E. Kolb

Kenneth E. Kolb
Member, Radwaste Systems Committe of
Nuclear Engineering Division of
American Society of Mechanical Engineers

Enclosure

Acknowledged by card 1/25/82 emp

Member • American Association of Engineering Societies • Accreditation Board for Engineering and Technology

'82 JAN 22 P2:55

REVIEW COMMENTS OF PROPOSED RULEMAKING

ON LAND DISPOSAL OF LOW-LEVEL RADIOACTIVE WASTE - 10CFR61

SUBMITTED BY

CODES AND STANDARDS SUBCOMMITTEE
RADWASTE SYSTEMS COMMITTEE
NUCLEAR ENGINEERING DIVISION OF
AMERICAN SOCIETY OF MECHANICAL ENGINEERS

D-55-12

PAGE 38084 - PARA. V, C - WASTE CHARACTERISTICS AND CLASSIFICATION

"Stability should last long enough for the radioisotopes to decay to levels where they are no longer of concern from the migration standpoint."

What criteria determines the length of time migration concern?

B-5

2. PAGE 38087 - PARA. G - OPERATIONAL PHASE

"At intervals specified in the license (the normal term for materials license is currently five years) the licensee would be required to submit a license renewal application."

Suggest that the site be provided a full term license with subsequent periodic reviews not subject to public hearing. The review should ascertain that the conditions supporting the full term license have not changed significantly.

Paragraphs 61.25 and 62.26 in the proposed regulation provide adequate assurance that licensee-originated changes will receive review by the Commission. New-found issues of national concern that are independently identified by the Commission can be applied on a national basis to the sites as such issues are identified and are not dependent on waiting for a renewal application.

D-59-2

3. PAGE 38087 - PARA. G - INSTITUTIONAL CONTROL BOARD

"...surveillance to keep people off the site..."

The Institutional Control Board should have the prerogative to determine the extent of site access on a site specific basis.

M-1

4. PAGE 38086 - PARA. V, F - MANIFEST TRACKING SYSTEM

"...to provide copies of the manifest to proceed and accompany shipments..."

The need for a manifest system to assure traceability of waste shipments from a generator through the transporter and finally to the disposal site, is recognized. We question the need for a copy of the manifest preceding the shipment for the following reasons:

1) The copy of the manifest accompanying the shipment will allow the transporter and disposal facility to verify the shipment content.

2) The expressed concern that a missing or delayed shipment would not be detected can be reconciled by other methods such as an independent transmittal of the manifest at the time of shipment or by telephone notification to the receiving facility at the time of shipment.

M-1

3) The requirement for the manifest to precede the shipment implies that the shipment should not leave until notification has been received by the shipper that the receiver has received said copy. This can result in a shipment sitting at the initiating site for an extended period while these notices go back and forth.

A-1

5.. PAGE 38089 - PARA. 61.1(a) -

"...Commission issues licenses, for the disposal for others of radioactive wastes ... set forth in Part 20 of this chapter."

While 10CFR Part 20 covers the disposal of waste by an individual licensee, the quantities are limited to very low levels. The purpose and scope should be rephrased to allow an individual licensee to operate a burial site. The words "for others" and the last sentence to 61.1(a) should be deleted.

6. PAGE 38090 - PARA. 61.2 -

"Disposal" means ... facility."

Suggest: "Disposal" the placement of waste in a licensed land disposal facility for radioactive waste.

ED-1

7. PAGE 38090 - DEFINITIONS

"Near surface" disposal facility means land disposal facility in which radioactive waste is disposed of in or within the upper 15-20 meters of the earth's surface."

It is suggested that this definition be changed to read as follows:

"'Near surface disposal facility' means disposal facility in which radioactive waste is disposed of in or within the upper 15-20 meters of the earth's surface or to whatever greater depth can be demonstrated as capable of meeting the required performance criteria and technical specification."

Rationale: The restriction in or within the upper 15-20 meters could prevent utilization of greater depths at locations where hydrogeological conditions and waste stability characteristics would allow this. The criteria of the proposed regulation are established to prevent exposure to the public by transmittal through ground water flow and to prevent exposure to the intruder. The establishment of an allowable depth should be made on a site-specific basis and with the objective that the criteria will be met. The unsubstantiated establishment of a nationwide depth limit is not in keeping with the logic used throughout the rest of the proposed regulation.

8. PAGE 38090 - PARA. 61.2 -

"Earth's surface" should be defined.

This could be the final surface elevation of the disposal site as used in the site closure and stabilization plan.

9. PAGE 38090 - PARA. 61.2 -

"Stability" should be defined.

It is a basis for separation of Class A and B waste.

10. PAGE 38090 - PARA. 61.3(a) -

Change: (...issued by the Commission pursuant to this part.)

to: (...issued by the Commission pursuant to this part or unless exemption has been granted by the Commission under Paragraph 61.6.)

ED-1

Rationale: Paragraph 61.3(a) as written would prohibit transfer for land disposal of any radioactive waste to a nonlicensed person. This is overly restrictive and would force the shipment (to a licensed facility) of radioactive wastes that are not of a health or safety concern. The suggested addition to Paragraph 61.3(a) would allow determinations to be made by the Commission on a case-by-case basis where it could be demonstrated that health and safety concerns could be met by alternate disposal methods.

11. PAGE 38091 - PARA. 61.7(a)(1) -

"...uppermost 15 to 20 meters of the earth."

Suggest: Addition of sentence:

(Surface burial deeper than 20 meters may also be satisfactory.)

Rationale: Deeper surface burial may prove satisfactory relative to protection of the public and economics.

12. PAGE 38091 - PARA. 61.7(b)(1) -

"(b) Waste Classification and Near-Surface Disposal. (1) Disposal of radioactive waste in near-surface disposal facilities has two primary safety objectives: prevention of migration of radionuclides, primarily through groundwater; and prevention of exposure to inadvertent intruders."

A paragraph change to include the following is proposed:

"...has the following safety objectives:

1) Minimize migration by surface and groundwater, and wind effects.

2) Keep personnel dose ALARA.

3) Keep environmental impact within specified limits."

ED-1

13. PAGE 38091 - PARA. 61.7(b)(2) -

This paragraph states that for certain isotopes a maximum disposal site inventory will be established based on the characteristics of the disposal site.

D-55-10

Because this rule is site capacity and size limiting, criteria such as the isotopes, their maximum permissible inventory, and inventory limiting site characteristics should be established.

GEN-2

14. PAGE 38091 - PARA. 61.7(c)(3) -

Suggest that:

"During the period when the site closure..."

be changed to:

"During the period when the final site closure...".

ED-1

15. PAGE 38092 - PARA. 61.13 -

It is not apparent what is required for "demonstration" or how analysis will be accomplished. This section should be clarified. This comment also applies to Paragraph 61.2(f)(i)(j). Once buried, the waste is no longer in the "possession" of the licensee.

B-1

16. PAGE 38094 - PARA. 61.24(b) -

"The licensee shall submit written statements under oath upon request of the Commission, at any time before termination of the license, to enable the Commission to determine whether or not the license should be modified, suspended or revoked."

It is suggested that this paragraph be deleted.

Rationale: The paragraph is very vague as to intent and method of implementation. It is not clear under what circumstances such an oath would be required and has a direct implication that the licensees are untrustworthy. There are certainly sufficient written transmittals required in

B-12

B-12

other paragraphs of the proposed regulation to obtain necessary documentation of deliberate falsification of information.

17. PAGE 38094 - PARA. 61.24(h) -

B-4

It is suggested that this requirement be deleted.

Rationale: This appears to be inconsistent with 10CFR2.105 which provides the applicant an opportunity to petition for a hearing on any additional requirements or conditions. The "...or thereafter..." is particularly onerous in that it permits the staff to bypass the rules of procedures as described in Part 2 of the chapter. The Commission already has methods to require immediate action by a licensee through either an Emergency Order or a Compliance Order.

18. PAGE 38094 - PARA. 61.25(a) -

B-4

It is suggested that this paragraph be changed to read:

> "...approval; (3) those features and procedures which may not be changed without 60 days prior notice to the Commission; and (4) changes that do not impact public health and safety can be made immediately with subsequent notification of the Commission in a timely manner. Features and procecures falling in paragraph (a)(3) of this section..."

Rationale: The necessity to make minor changes that do not impact on the public health and safety occurs routinely during the operation of a facility. The requirements in Paragraph 61.25(a) that no changes can be made without 60 days prior notice to the Commission, are overly restrictive.

19. PAGE 38095 - PARA. 61.29 -

B-7

The requirement that the licensee maintain responsibility for the disposal site for a minimum of five years is an open ended requirement. A specific time period should be set. Since this period may need to be extended or possibly shortened as determined by site specifics, it should be included in the site closure plan rather than the regulation.

As currently stated the criteria does not provide sufficient guidance to establish adequate funding. Since wastes will not be received during this period all funding must be derived from fees charged during operation. It is necessary for planning purposes to know the time period over which the licensee will be responsible.

20. PAGE 38096 - PARA. 61.51(7) -

D-50-4

This paragraph states that the disposal site shall be used exclusively for the disposal of radioactive waste. This seems to be unnecessarily restrictive. It should be acceptable to allow disposal of other waste types as long as there is no commingling of the waste types within a disposal facility. Once an acceptable disposal site has been found, maximum use of the site for the isolation/disposal of any environmentally dangerous materials whether they are radioactive or not should be provided.

21. PAGE 38096 - PARA. 61.51(a)(3) -

D-51-1

Remove the words "and improve". An acceptable site must meet site criteria. Improvements, if made, need not be mandatory.

22. PAGE 38096 - PARA. 61.51(a)(4) -

Replace "prevent" with "minimize".

23. PAGE 38096 - PARA. 61.51(a)(6) -

Replace "eliminate" with "minimize".

GEN-1

24. PAGE 38096 - PARA. 61.52(a)(4) -

D-52-2

"Orderly manner" needs further explanation. For example, "orderly manner" may mean like packages together or higher dose packages at the bottom elevations.

25. PAGE 38095 - PARA. 61.55(a)(7) -

D-52-5

"Accurately located" needs further explanation. For example, the drawings or calculations are independently verified, there is a record that the survey instruments have been recently calibrated, or the surveyor is licensed in the site's state.

25. PAGE 38096 - PARA. 61.55(a)(9) -

ED-1

"Adequate" should be defined.

27. PAGE 38097 - PARA. 61.53(a) -

D-53-1

Suggest that the early warning of radionuclide migration must be given before the migration reaches site boundary.

28. PAGE 38097 - PARA. 61.55 AND TABLE 1 -

D-55-11

The waste classifications scheme presented here with the associated concentration limits presented in Table 1 would have a substantial impact on the nuclear power industry's waste disposal costs and hence, upon the cost of nuclear generated power.

D-55-1 The concentrations given in this Table are much more limiting than is necessary. In the study prepared for the USNRC by Ford, Bacon, & Davis Utah, Inc., "A Radioactive Waste Disposal Classification System," NUREG/CR1005, conservative radioactivity limits for various waste classes were established through detailed hazards analysis. The limits recommended in NUREG/CR1005 should be incorporated into 10CFR61 in place of the arbitrary values in Table 1.

D-55-6 An alternative method of determining the waste classification should be provided. Provisions for classification by external dose determination should be made. For cases where the types of isotopes of concern are known, this method would allow adequate classification. This alternate method would be particularly helpful for nuclear power plant trash. Generally, trash has a very low specific activity compared to the Class A limits. A determination of the radionuclide identity and concentration, as required by Part 20.311, would require the purchase and use of a portable spectrum analyzer. Instead, a contact dose rate measurement of the containerized trash could be made to show that the activities were below the Class A limits. Also, since a radwaste classification system is already established in 10CFR71, is it possible to tie the two systems together?

D-55-1 The logic behind the numbers selected for this table is not apparent. It would appear, for example, that carbon 14 which contains less than 0.8 microcuries per cc may be disposed of as segregated waste but that any concentration greater than 0.8, even if it is only a tiny increase, immediately requires that the disposer seek special permission from the government for disposal. The abrupt demarcation needs explaining so that the logic of it can be understood.

D-55-2 <u>De Minimis Classification of Wastes</u>

Section 61.55, Table 1, should consider a "de minimis" classification of wastes (i.e., wastes that would be considered of non-regulatory concern); we believe strongly that this should be addressed in the proposed 10CFR61 regulation. De minimis levels for uranium, technetium, plutonium, and neptunium should be stated. A de minimis or lower acceptable level for natural and depleted uranium should be stated; we recommend that a value of 0.035 percent natural and depleted uranium be set as a lower limit in Section 61.55, Table 1. Recent information received from Nuclear Regulatory Commission staff members reveals that proposals concerning de minimis levels for uranium are being prepared by the NRC staff that would establish multi-tiered acceptable levels for shallow-land burial of uranium wastes. One level proposed by the NRC would permit disposal of uranium wastes in an unlicensed burial ground (i.e., sanitary-type). A second proposal would permit disposal in a shallow-land licensed burial site, and a third proposed level would permit disposal in a shallow-land licensed burial site which has a covenant in the title on the property. These multi-tiered NRC proposals are consistent with out recommended levels. We recommend that de minimis levels consistent with those proposed by NRC relative to ^{99}Tc and low-enriched uranium as residual contamination in smelted alloys

D-55-2 (Addendum to 10CFR Parts 30, 32, 70, and 150) also be stated. In this regard, we recommend that serious consideration be given to establishment of de minimis levels of 3.5 ppm ^{233}U, 5 ppm Tc, 0.01 ppb Pu, and 1 ppb Np.

D-55-3 In Section 61.55, Waste Classification, Table 1, we believe that the maximum concentration for alpha-emitting transuranic isotopes should be increased from the 10 nCi/g limit presently proposed to 100 nCi/g. Part of the rationale behind the 10 nCi/g limit is stated to be that this value has been imposed by DOE; however, DOE is at the present time seriously considering revision of DOE Manual Chapter 0511 to raise this limit to 100 nCi/g dated 7/30/81). The 10 nCi/g value is also inconsistent with the value of 100 nCi/g used by the Environmental Protection Agency in their proposed regulation 40CFR Part 91 for the disposal of spent fuel, high-level, and transuranic (TRU) wastes. This regulation states that TRU wastes containing more than 100 nCi/g of alpha-emitting TRU isotopes must have the same controls as are required for high-level wastes. We recommend that the 100 nCi/g limit be reflected in each of the columns 1-3 in Table 1. We also recommend that a limit of 100 pCi/cm^2 for transferrable surface contamination of alpha-emitting transuranic isotopes (<u>not</u> natural or depleted uranium isotopes) be imposed, consistent with the proposed revision to DOE Manual Chapter 0511.

Additionally, the value of 10 nCi/g is based on naturally occurring radium deposits. Radium is significantly more hazardous than ^{233}U or the transuranium nuclides when dissolved in water, as the MPC's for the soluble forms of these nuclides are about 100 times (1000 times for ^{233}U) greater than that radium. Thus, it would appear reasonable to set activity limits for alpha-emitting transuranic isotopes at 100 times greater.

The supplementary information in the NRC document also states that there is no need to increase this limit from the standpoint of achievability. Much of the waste presently stored as transuranic waste is segregated from low-level waste on the basis of waste origin since the 10 nCi/g limit is too low for accurate measurement and certification. However, segregation according to the 100 nCi/g limit could be achieved, eliminating expensive retrievable storage and deep geologic disposal of "suspect" transuranic waste.

Another concern is the footnote to Table 1 that refers to isotopes contained in metals, metal alloys, or permanently fixed on metal as contamination. The footnote, which states that "the values above may be increased by a factor of ten," should be modified to include concrete and other media that exhibit low leach rate behavior. An incentive should be provided to reduce the volume of wastes by incineration or metal smelting. These treatments may normally be avoided by waste generators since they would convert some low-level wastes into transuranic wastes. For example, a volume reduction of 30 by incineration of a waste containing 5 nCi/g would convert a low-level waste into a transuranic waste at 150 nCi/g. However, the residual ashes could be incorporated into concrete, glass, metal, etc. The leach rate of transuranic isotopes from these materials

is very low (i.e., many orders of magnitude lower than the untreated waste form). Thus, a combination of leach rate and transuranic content could be used to determine the disposal options for these waste forms.

D-55-3 Many of the nuclide concentrations limits may not provide a practical basis for classification. In many cases, the measurements are difficult and some are almost impossible. Perhaps the Commission would specify practical analytical methods acceptable for determining nuclide concentration.

Table 1, Footnote 4

D-55-12 a) The term "significant gamma radiation" should be defined.

D-55-4 b) How is radium treated? A value should be established.

D-56-2 c) The footnotes place a restriction on wastes containing chelating agents in concentrations greater than 0.1%. Is this limit intended to be 0.1% by weight or volume? This limit is too low, many agents were developed to decontaminate piping and equipment to reduce radiation levels to workers. A restriction on the solidified product of 0.1% might cause utilities to not use them because of the restriction on disposal and then let radiation levels rise.

29. PAGE 38097 - PARA. 61.58(a)(1) -

D-56-6 It is suggested that this paragraph be changed to read:

"...and of the Department of Transportation set forth in 49CFR Parts 171-179, as applicable. In the case of unpackaged (bulk) shipments, these must meet the requirements of 49CFR173.392."

Rationale: The proposed regulations should provide for the shipment of bulk (unpackaged) wastes under conditions that comply with Department of Transportation requirements for such wastes and that the wastes can meet the proposed Part 61 criteria when disposed of at the burial facility. A requirement on packaging would serve no useful purpose under these circumstances and should not be imposed.

30. PAGE 38097 - PARA. 61.56(a)(7) -

D-56-5 Suggest that this paragraph be changed to read

"...that does not significantly exceed atmosphere at 20 degress C."

31. PAGE 38098 - PARA. 61.56(b) -

D-56-8 "Stability for 150 years" needs to be modified to indicate what forms of proof are acceptable. Some metal, wooden, and concrete structures

D-56-8 can be shown to have maintained their "stability" for 150 years past. Very few of these are applicable to waste packaging. There is no way that deformation alone of the waste form can be a hazard to the public. The key requirement is to keep the waste from being dispersed, which is little affected by "slumping" or a "5%" deformation.

It is suggested that Paragraph 61.56(b)(1) be changed to read as follows:

"Waste must have structural stability. A structurally stable waste form will maintain its general physical dimensions and form under the expected disposal conditions and factors such as the presence of moisture and microbial activity, and internal factors such as..."

D-56-11 Rationale: The requirement of withstanding a compressive load of 50 psi (more than 7,000 pounds per square foot) appears to be a very rigorous loading requirement and is above that available from many soils. If it is still felt that a numerical value is necessary, then consider one of these approaches:

- Make the compressive load requirement for the waste when buried no more than that of the surrounding soils at the site under consideration.
- Evaluate a structural approach recognizing that the waste is constrained by surrounding soil and other wastes. This could conceivably reduce the compressive load requirement by a tenfold magnitude and still have an adequate safety factor.

D-56-9 Similarly, requiring that the waste retain its form within 5% under loading is a very rigorous requirement and using the second potential approach listed above, could be eased or eliminated.

The 5% limitation on physical waste form is too restrictive for stable, solidified, structurally strong waste handling. If applied to the drum-container-liner outer dimensions rather than to the solidified waste itself. In this case, drums-containers-liners which are typically filled to 80% to avoid spills/splashing during the filling procedureprovide handling appurtenances and a clean surface for filling-transportation-burial actions. Once in the ground, these may be breached or oxidized in time, leaving the contained solidified and stable waste without effect on safety to the public or environs.

32. PAGE 38098 - PARA. 61.56(b)(2) -

D-56-13 "Non-corrosive liquid" should perhaps be changed to "liquid". If the intent of this article is to minimize corrosivity it should say so instead of setting arbitrary limits. Is the radioactivity in the liquid of any concern? Is there intent to limit the amount of "clean" water in the container?

33. PAGE 38098 - PARA. 61.56(b)(3) -

It is suggested that this paragraph be deleted.

D-56-10

Rationale: This is a very subjective statement and open to varying degrees of interpretation. Does this mean that filler material must be added to packages containing irregularly shaped solid objects? Or is it the intent of this article that all such objects should somehow be chopped, melted, or otherwise compacted? What forms are acceptable, i.e., ash, pellets, compressed trash? The goal of reducing the void spaces in a waste package is desirable and will be attained because of economic incentive independent of regulations.

34. PAGE 38098 - PARA. 61.57 -

D-57-1

These labeling requirements should be expanded, clarified, and made more specific.

35. PAGE 38100 - PARA. 61.82 -

G-1

Eliminate radioactive waste already disposed of and covered from NRC inspection requirement.

(108)

46 FR 3208

'82 JAN 25 P2:43

Nuclear Diagnostic Laboratories, Inc.

Serving Laboratories, Hospitals & Industry

Post Office Box 791
Peekskill, New York 10566
914-737-7330

January 19, 1982

Secretary of the Commission
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Docketing & Services Branch

Gentlemen:

This is to further comment on the proposed changes to Part 20, as published in the Federal Register, Volume 46, No. 142, Licensing Requirements for Land Disposal of Radioactive Waste.

M-4

NDL is a radioactive waste disposal service (collector). We pick up prepackaged various-sized containers from some 150 customers. When an NDL serviceman goes in to pick up waste containers from a customer, the drums are logged on an NDL Radioactive Manifest Record. The Manifest Record has spaces for twenty-five containers.

When the serviceman returns to NDL's facility, the various containers are unloaded into our storage area and separated according to the following waste categories and sizes:

5 Gallon(D) (Dry Waste)	Destined for land burial in South Carolina
5 Gallon (L) (Absorbed Waste)	Destined for land burial in Washington/Nevada
5 Gallon (S) (Scintillation Waste)	Destined for land burial in Washington/Nevada
5 Gallon (B) (Biological Waste)	Destined for land burial in South Carolina
5 Gallon (W) (Dry Waste)	Destined for land burial in Washington/Nevada

-1-

1/27/82

30 Gallon (D) (Dry Waste)	Destined for land burial in South Carolina
30 Gallon (W) (Dry Waste)	Destined for land burial in Washington/Nevada
30 Gallon (S) (Scintillation Waste)	Destined for land burial in Washington/Nevada
30 Gallon (L) (Absorbed Liquid)	Destined for land burial in Washington/Nevada
55 Gallon (D) (Dry Waste)	Destined for land burial in South Carolina
55 Gallon (W) (Dry Waste)	Destined for land burial in Washington/Nevada
55 Gallon (S) (Scintillation Waste)	Destined for land burial in Washington/Nevada
55 Gallon (L) (Absorbed Liquid)	Destined for land burial in Washington/Nevada
55 Gallon (V) (Vials non-scintillation)	Destined for land burial in Washington/Nevada
55 Gallon (R) (Biological Waste)	Destined for land burial in South Carolina
83 Gallon (R) (Biological Waste)	Destined for land burial in South Carolina

M-4

Conceivably we could make a pick up from one customer with every one of the above containers listed on one Radioactive Manifest Record. And because of the four container sizes and the three separate destinations for the different types of wastes; it is also conceivable that the above sixteen containers would be shipped in sixteen separate trailer-load shipments to the three burial sites within the course of a year.

With the above in mind one may understand that the rule, proposing to include copies of the originating generator manifests of all containers along with the new burial trailer-load shipment manifest, would be the creation of additional paperwork in the extreme; and entirely unnecessary, inasmuch as every container on a trailer-load shipment is on file at NDL.

As a concrete example, on January 8, 1992, this company shipped 1,931 five-gallon containers, one ten-gallon container, fifteen thirty-gallon containers and eight fifty-five gallon containers in one trailer-load to the Richland, Washington site. These containers represent

pick ups from a number of customers. If the proposed rule was in effect at the time this particular shipment was made, the paperwork would, to put it mildly, be indeed voluminous. As a burial site employee aptly put it "You would need a van to travel behind the shipment, just to carry the paperwork".

M-4

We cannot emphasize enough the severe burden this rule would place upon this company and others with similar operations. In addition we find this rule highly impractical and totally unnecessary inasmuch as all data can readily be obtained from the files. It is merely duplicating paperwork.

With our current practice every container is assigned a unique number and is readily identifiable. When a container is picked up, its unique number with the other necessary data is logged on our manifest. When that drum is loaded for shipment to an authorized burial site, that same information, including the unique identifying number, is transferred to the shipment manifest, while the originating customer manifest is kept on permanent file at NDL. Should someone have need of any additional information regarding a particular container (which is unlikely for the disposal manifests are quite complete), it can be readily made available.

We thank you for your consideration of the above. If you have any questions or desire clarification, please contact me or Alan Jones.

Very truly yours,

Peter J. Pastorelle
President

PJP:sg

STATE OF NORTH CAROLINA
DEPARTMENT OF HUMAN RESOURCES
The North Carolina Radiation Protection Commission

JAMES B. HUNT JR.
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'82 JAN 26 P1:31

DOCKET NUMBER 109
PROPOSED RULE PR-2 etc.
46 FR 38081

January 21, 1982

Secretary of The Commission
U.S. Nuclear Regulatory Commission
Attention: Docketing and Service Branch
Washington, D.C. 20555

Gentlemen:

The North Carolina Radiation Protection Commission is responsible for promulgating, adopting, amending and repealing statewide regulations governing the possession, use and disposal of radiation sources in North Carolina. Since North Carolina is an Agreement State of the N R C, we have a particular interest in your proposed licensing requirements for land disposal of radioactive wastes published in the Federal Register, Vol. 46, No. 142, Friday, July 24, 1981.

We are cognizant of the importance of having adequate radioactive waste disposal facilities available and of establishing, for protection of the public and the environment, adequate regulations and criteria for the siting, construction, operation and closure of such facilities. In this regard, we believe that the above referenced proposed rules include considerable and commendable improvements over earlier drafts. At the same time, I have attached for your consideration a number of comments and suggestions for change which are intended to further improve your proposed rules. It is requested that the Nuclear Regulatory Commission give these comments and suggestions favorable consideration despite this technically late submission due to recent adverse weather conditions in our area.

We appreciate having the opportunity to provide our comments on these proposed rules and would support your efforts toward their further improvement and early adoption.

Sincerely yours,

Raymond L Murray

Raymond L. Murray, Ph.D.
Chairman

Attachment

Acknowledged by card. 1/27/82

Comments on N R C Proposed 10 CFR Part 61, Licensing Requirements for Land Disposal of Radioactive Waste, as published in the Federal Register, Vol. 46, No. 142, Friday, July 24, 1981 -

1. On page 38087 in item H, Other Considerations, the Nuclear Regulatory Commission (N R C) expresses its intent for all radioactive waste disposal facilities to comply with the provisions of Part 61, even though such facilities may be licensed by one of the 26 Agreement States. This statement implies that all aspects of Part 61, both administrative and technical provisions, would have to be adopted by Agreement States.

From the perspective of N R C responsibility under the Atomic Energy Act, it does not seem either necessary or important for most administrative provisions to be uniformly adopted by each Agreement State. It is agreed that most, if not all, of the technical requirements related to protection of public health and the environment should be imposed by such states. Accordingly, it is recommended that the stated intent in item H should be elaborated more fully in order to clarify its impact upon the prerogatives which will be left to the Agreement States.

We feel that the N R C should leave as much latitude as possible to Agreement States in their implementation of programs for siting, licensing and regulating disposal facilities, consistent with N R C responsibilities under the Atomic Energy Act. In so doing, the N R C would, to some extent, allow individual Agreement State programs to minimize the rather major burdens which will be imposed upon them by Part 61.

2. It is recommended that the 12-month preoperational monitoring requirement in Part 61.53(a) be revised to require that the applicant shall have implemented such preoperational monitoring by the time a licensee application is submitted. The current language would have the effect of arbitrarily adding 12 months to the length of time required to site, build and initiate operation of a new disposal site.

Since Part 61.3(b) already prohibits construction until after license issuance and N R C review will probably take about 18 months, it seems clear that the purpose of 12-month preoperational monitoring would not be compromised by the suggested change. Considering the important January 1986 exclusionary date in the National Low Level Radioactive Waste Policy Act and the probable four to five years required for opening a new facility under the proposed Part 61, it would seem justified and prudent to shorten the process by up to 12 months through this change.

3. We endorse in principle the concept of a waste classification system as proposed by the Nuclear Regulatory Commission. This is a significant step in the right direction; however, the three-class approach in Part 61.55 does not address those important wastes lying at the two extremes of the Class A, B and C system.

First, the proposed concentration limit for Class C wastes does place "higher level" wastes in the position of not being suitable for near surface disposal. Such wastes must be addressed at the earliest possible date and not left hanging as is presently the case. Dilution or volume expansion to make wastes disposable at near surface burial sites under Part 61 appears undesirable and counterproductive, as well as inconsistent with the N R C position which favors volume reduction.

Second, the proposal does not address the admittedly difficult question of diminishingly low concentrations. Clearly there are, and should be, such low concentrations of radioactivity in some wastes that they should not be considered as radioactive for the purpose of disposal. Such wastes should not be required by regulations to consume valuable space in a near surface burial facility.

(Page 1)

D-55-2 In this regard we support the N R C's stated intention to systematically develop "de minimis" classifications for specific radionuclides and waste streams; however, this process should be accelerated as much as possible and not allowed to "bog down".

4. While we endorse the N R C policy of encouraging volume reduction, we are concerned that the proposed Part 61 does not appear to include any incentives for volume reduction. In many respects the proposed rules may provide disincentives for example:

D-55-8
- excluding wastes with higher activity than the limits for Class C from near surface burial sites, without providing a viable alternative for disposal, may encourage dilution in order to gain access to such sites;

D-55-3
- arbitrarily, limiting alpha particle emitting transuranic radionuclides to 10 nCi per gram, thereby discouraging volume reduction in order to ensure an available disposal option; and
- the added expense and complexity for disposal of wastes as Class C rather than B, or as Class B rather than A, and the lack of disposal options for higher level wastes than Class C will have the effect of discouraging volume reduction when it would raise waste from a lower to a higher class.

D-55-8

D-56-9
D-56-11 While part of this dilemma may be unavoidable, it does support the concept of carefully restudying the more expensive criteria applied to higher level wastes to make sure that they are necessary (e.g. the 5% dimensional tolerance and 50 psi compressive load requirements in Part 61.56 and the limit of 10 nCi per gram for alpha particle emitting transuranics without regard to actual environmental and health risks).

D-55-3

ED-1 5. Table 1 of proposed Part 61.55 includes a multitude of footnotes which have major impact upon interpretation of values in the table. The brevity of the footnotes and their interrelationships result in deficient clarity. Since the subjects of the footnotes are regulatory in nature and of major importance, it is recommended that they should be expanded and clarified, possibly in the form of regulatory text rather than footnotes.

With respect to these footnotes, questions remain as to

D-55-4
- specific limits for Class A, B or C Radium wastes;

D-55-6
- relationship of maximum concentration limits to averaging techniques for various containers and to routine analytical techniques for evaluating container contents;

D-56-2
- wastes containing specific chelating agents which do not promote migration through the soil; and

D-55-5
- the implication that the N R C might approve special additional limits for an individual licensee; hence raising a question with respect to justification of special treatment of one licensee over another.

D-55-6 6. The language of proposed Parts 61.55 and 61.56(a) could be construed to require elaborate and sometimes impossible assay and analysis (chemical and radiological) of every individual container of waste. Such an interpretation could make it impracticable to impossible for many generators to adequately declare their wastes for disposal at a near surface burial site.

D-55-6 It is suggested that the N R C proposal be revised to provide for detailed licensee characterization (chemical and radiological) of their radioactive waste streams and development of more practicable routine assay procedures for individual containers of waste from each waste stream.

B-5 7. The N R C's stated concept of employing a 5-year license issuance with potential requirements for public hearings on each renewal may well have the effect of discouraging private industry from risking entry into the waste disposal business. This could result in failure to establish needed new regional burial sites.

It is recommended that the N R C consider a concept of issuing long-term, life-of-site licenses and reserve subsequent public hearing for requested license amendments which would have the effect of expanding the disposal site or the license authorizations. Since the N R C already proposes to require licensees to keep their applications fully current, make various reports to the N R C and obtain prior approval in specific instances, and the N R C will have modification, revocation, suspension and civil penalty authority; the five-year expiration, public hearing and renewal process appears to serve no purpose other than to arbitrarily place the facility's license in jeopardy.

C-2 8. As referenced by the N R C on page 38083 under "Protection of the Environment," the E P A has not yet fulfilled its responsibility to prepare a standard that will set limits for releases of radioactivity to the general environment from disposal facilities. This has led the N R C to necessarily develop proposed rules based upon other existing standards in anticipation of what the E P A may eventually do.

It is unfortunate that the "cart has had to be put ahead of the horse". We would urge the E P A to assign high priority to meeting its important responsibilities in this area at the earliest possible time.

D-52-2 9. The word "orderly" in Part 61.52(a)(4) implies careful stacking in a rectangular array. Since this would probably result in higher worker radiation exposure inconsistent with ALARA principles and less efficient use of disposal units (trenches), it is suggested that the N R C consider replacing the words "an orderly" in Part 61.52(a)(4) with the word "a". It would appear that this change should not compromise this rule's intent of "maintaining package integrity during emplacement and disposal" and would reduce worker exposure, promote efficient site utilization and lower disposal cost.

GEN-1 10. We recognize the difficulty in using regulatory language which is always specific and subject to uniform literal interpretation; however, it is recommended that the proposed Part 61 be carefully reviewed giving special attention to terms such as: significant, prevent, eliminate, few and adequate. For example:
- "significant" in Part 61.50(a)(4), referring to natural resources, does not lend itself to literal interpretation and would be subject to a wider range of individual options;
- "prevent" in Part 61.51(a)(4) would appear to imply "zero" or "none" when perhaps "minimize to some low level" may be the intention;
- "eliminate" in Part 61.51(a)(6) also appears to imply "zero";
- "a few percent" in Part 61.52(a)(6) would result in a wide range of defensible individual opinions; and
- similarly, "adequate" in Part 61.52(a)(9) is not directly interpretable and would be largely a matter of opinion.

GEN-1 To the maximum extent feasible, use of such terms should be minimized. For example, in Part 61.52(a)(9) it might be more palatable to require the licensee to carry out the closure and stabilization procedures specified in his application and approved by the Nuclear Regulatory Commission. There are adequate provisions elsewhere to require revision of procedures, correction of problems, et cetera, when previously approved procedures later prove to be inadequate.

Raymond L Murray

Raymond L. Murray, Ph.D., Chairman
North Carolina Radiation Protection Commission
January 21, 1982

New England Nuclear

'82 JAN 27 P2:56

110
DOCKET NUMBER
PROPOSED RULE PR-2, et al
(46 FR 5 38081)

38
DOCKET NUMBER
PROPOSED RULE PR-61
(46 FR 51776)

January 21, 1982

R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Division of Waste Management
Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Smith:

I enclose this letter to alert you to the fact that New England Nuclear chaired the NELRAD 10 CFR 61 Subcommittee and was actively involved in the development of the detailed comments. As such New England Nuclear endorses the report and recommends due consideration be given to it.

Sincerely,

NEW ENGLAND NUCLEAR

J. C. Brantley
V.P. Administration, NENC

JCB/da

Acknowledged on 1/27/82

549 Albany Street, Boston, Massachusetts 02118 Telephone 617-482-9595 Telex 94-0996

NELRAD

'82 JAN 27 P2:5

January 21, 1982

R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Division of Waste Management
Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Smith:

I enclose comments on 10 CFR Part 61 and the accompanying Draft Environmental Impact Statement. These comments are written from the generator's perspective, compiled from safety officer input from several waste generating firms in New England.

These collective comments are a product of NELRAD activity. NELRAD is a consortium of New England firms and institutions who use radioactive materials and have a common need for a nearby low-level radioactive waste disposal facility. Our group was formally organized in 1981 to support the efforts of the six New England states in complying with the Low-Level Radioactive Waste Policy Act.

We are pleased to be a part of the process that allows review of proposed regulations. In general, we approve the intent of 10 CFR Part 61 and encourage expeditious progress.

Sincerely,

James D. Stelluto
Executive Director,
NELRAD

JDS/da

Enc.

P. O. BOX 1267 CONCORD, MA 01742-1267 Tel. (617) 371-0355

TO: NELRAD Committee
FROM: NELRAD 10 CFR 61 Subcommittee
SUBJECT: Comments on Proposed Rulemaking on Land Disposal of Low-Level Radioactive Waste.
DATE: 1/20/82

The enclosed report presents detailed comments on 10 CFR 61, the Draft Environmental Impact Statement (NUREG-0782) and the accompanying summary of the proposed rule. The detailed comments are preceded by a summary of the main points.

Members of the subcommittee which prepared this report are:

F.N. Brenneman (to Dec. 1981)	Northeast Utilities P.O. Box 270 Hartford, CT 06101
M. Galanik	77 Main St. Room 20B, 238, MIT Cambridge, MA 02139
D. Gomer	Nuclear Metals, Inc. 2229 Main St. Concord, MA 01742
L.R. Smith (Chairperson)	New England Nuclear Corp, DuPont 549 Albany St. Boston, MA 02118
J. Stelluto	NELRAD 549 Albany St. Boston, MA 02118
E. Tarnuzzer	Yankee Atomic Electric Company 1671 Worcester Rd. Framingham, MA 01702

Thanks are due to K. Bennert, J.D. Bernardy, J.C. Brantley and C.B. Killian for their helpful comments and to K. Thomas for processing this report.

L.R. Smith

L.R. Smith

SUMMARY OF COMMENTS ON THE PROPOSED RULEMAKING ON LAND DISPOSAL OF LOW-LEVEL RADIOACTIVE WASTE: PREPARED BY THE NELRAD 10 CFR 61 SUBCOMMITTEE.

10 CFR 16 Scope.

C-1 We believe that the development of performance standards in 10 CFR 61 is the best approach to establishing licensing requirements for land-disposal of low-level radioactive waste. We agree that only essential generic prescriptive requirements should be included in the regulations and all site specific requirements should be incorporated in individual facility licenses.

Site Licenses and Inspection.

The scope and sequence of activities in establishing safe operations and ensuring proper closure of a facility appear realistic. We recommend that safeguards be strengthened by:

B-5 a. granting disposal facilities a full term license with appropriate review instead of subjecting a license to the public hearing process every five years.

G-1 b. assigning a full-time NRC inspector to each LLW site during the operational phase.

c. encouraging active monitoring and review of site records by state authorities.

Probability of Inadvertent Intrusion.

C-4 The method used to establish generic prescriptive requirements to protect inadvertent intruders is appropriate for estimating the lower boundaries of concentration limits. However, these limits are unnecessarily conservative because the probability of intruders encountering radioactivity has not been factored into the calculations.

We believe that better estimates of maximum permissable concentrations can be made if the following considerations are included in the calculations:

a. The probability of inadvertent intruders encountering critical waste forms.

b. The concentration of radioactivity in waste sent to a site exhibits a log-normal distribution with an average concentration at least an order of magnitude lower than the maximum permissable concentration.

If these probability factors are included in the calculations, maximum permissable radioactivity concentrations are expected to be at least an order of magnitude higher than those presented in 10 CFR 61 and will still provide sufficient protection to the inadvertent intruder.

Site Selection and Utilization.

D-55-1 The site could be better utilized if credit was given for the decay of short lived radionuclides during the operational period.

D-50-6 It is clear that local resources and demographic developments are important considerations when selecting a suitable site. However, demographic predictions can be unreliable therefore we recommend that the NRC consider zoning requirements to restrict activities that may adversely affect the site hydrology and environment.

D-50-2 The potential impact of changes in natural radioactivity in ground water due to site excavations was not conspicuously covered in the DEIS. We recommend that these effects be considered.

Clarification of the Intent of 10 CFR 61.

ED-1 We have indicated several instances where the intent of the regulations is not clear. The following improvements are recommended:

a. replace absolute statements by achievable practical ones.

b. use units and terminology recommended by scientific standard setting organizations (eg. ICRU and ICRP).

c. clarify performance objectives by specifying internal and external dose equivalent limits to individual organs as suggested by the ICRP.

Waste Concentration.

D-55-6 Waste generators are concerned that the difficulty in accurately assaying radioactivity in individual containers will cause overly conservative values to be assigned to shipments resulting in poor utilization of the site. We recommend that the NRC consider relaxing concentration limits on individual containers and accept inventory methods designating average concentrations in waste shipments. Using inventory averaging methods would also enhance the generator's ability to determine if waste concentrations were below "de minimis" levels. The establishment of "de minimis" levels for radionuclides and waste forms should be encouraged for better site utilization.

D-55-7

D-55-2

D-56-5 The 100 Ci per container limit appears excessively conservative. We recommend that DOT limits be adopted since the most restrictive potential impact scenario appears to be individual exposure from accidential breach of containment during transportation to the site.

Use of ALARA Concept.

C-5 In several instances the ALARA concept is improperly used to justify excessive restriction. We recommend that optimum levels be defined at which an operation could be described to be ALARA. Imposing further restrictions yielding small benefits at great cost is not ALARA. For example,

D-55-3 the proposed 10 nCi/g limit for TRU contaminated waste is not ALARA

D-55-3 simply because industry has complied with this regulation. The EPA has suggested that 100 nCi/g is an appropriately conservative limit. We recommend that the EPA's suggestion be adopted unless a better limit is derived.

M-1 Manifest Tracking.

We recommend that a reasonable procedure be developed to integrate enforcement agencies into the control or supervision of the manifest tracking systems.

Conclusion.

In general, we recommend that 10 CFR 61 should not duplicate existing regulations but should reference them and be compatible with them.

Our final conclusions is that 10 CFR 61 will provide a reasonable and necessary regulatory frame-work for low-level radioactive waste disposal. We submit these comments in the hope that they shall improve both safety and cost effectiveness.

SPECIFIC COMMENTS ON THE PROPOSED RULEMAKING ON LAND DISPOSAL OF LOW-LEVEL RADIOACTIVE WASTE: PREPARED BY THE NELRAD 10 CFR 61 SUBCOMMITTEE

1. Page 38084, Col. 2.

D-55-12 This section specifies that waste stability should be sufficient to ensure that the residual radioactivity is "no longer of concern from the migration standpoint". We recommend that the quoted phrase be replaced by appropriate dose limits.

2. Page 38084, Col. 3.

D-55-3

a. The 10 nCi/g limit for transuranic waste is too conservative. The EPA suggests that 100 nCi/g is a conservative limit. Overly conservative limits may dissuade waste generators from practicing volume reduction of waste potentially contaminated with TRU.

b. Although industry has been able to comply with the 10 nCi/g limit for TRU waste we do not agree that this limit is ALARA. On page 7-13 of the DEIS and in several other instances the ALARA concept is misapplied to justify excessive restrictions. Operations should only be said to be ALARA when the cost to reduce impacts from these operations is justified by the benefits accrued and when further costs to reduce impacts are not justified. Compliance with an excessive restriction or achieving a lower level of impact are not necessarily ALARA. Reduction of environmental impacts 2-3 orders of magnitude below comparable impacts from other conventional industries is not reasonable and therefore not ALARA.

D-55-2 3. Page 38085, Col. 2.

The establishment of de minimis levels for other waste streams and radionuclides should be encouraged since this should lead to improved utilization of disposal sites.

B-5 4. Page 38087, Col. 2.

Disposal sites should be provided full term license with appropriate review. The financial planning necessary for long term site monitoring assumes a reasonable operating life. Hence the license should not be subject to the public hearing process every five years with the possibility that renewal may not occur.

D-59-2 5. Page 38087, Col. 2.

"Keep people off the site" should be replaced by "control access to the site" to allow maintenance, surveillance and other appropriate activities.

6. In the following sections the words "assurance" and "assure" should be replaced by "ensurance" and "ensure" respectively. This is to indicate that positive action should be taken to achieve an objective rather than merely persuading that an objective can be achieved.

ED-1

Page 38089, Col. 3, line 5, 61.2.
Page 38090, Col. 1, line 51, 61.2.
Page 38091, Col. 1, line 14, 61.7 (b), (3).
Page 38093, Col. 3, 61.23 (b), (c), (d).
Page 38094, Col. 1, 61.23 (e), (g).
Page 38095, Col. 1, 61.28 (b).
Page 38095, Col. 2, 61.30 (a), (2), (5).
Page 38095, Col. 3, 61.50 (a), (1).
Page 38096, Col. 2, 61.51 (a), (2).
Page 38097, Col. 2, 61.55 (b), (c), (1).
Page 38097, Col. 3, 61.56 (b).

7. Page 38090, Col. 2, line 16.
Page 38091, Col. 1, line 3, 61.7 (a), (1)

Instead of "15-20" meters a single value should be used. "15-20" may be confused as meaning burial below 15 meters and above 20 meters from the ground surface.

8. Page 38090, 61.7 (a), (1).

C-1

a. We agree that both performance objectives and prescriptive requirements are necessary. Performance objectives should be limited to occupational and environmental impact concentrations and should be specified in the regulations.

b. Generic prescriptive requirements are appropriate to limit LLW concentrations and to protect inadvertent intruders. These and prescriptive requirements which provide financial surety should also be incorporated in the regulations. In the cases where prescriptive requirements are adopted from other existing or proposed regulations these should be referenced or incorporated in 10 CFR 61.

D-55-10

c. Other prescriptive requirements which limit site inventory or which protect against excessive migration of radionuclides are site specific and should be incorporated in site licenses. 10 CFR 61 should specify that site licenses will incorporate these site specific prescriptive requirements.

9. Page 38091, Col. 1, 61.7 (b), (1).

GEN-1

a. We recommend that the primary objectives for disposal of LLW are: To isolate LLW from the biosphere in a manner that maintains:

i. personnel dose equivalent commitments ALARA;
ii. environmental impact and personnel dose equivalent commitments below specified limits.

GEN-1

b. "Prevention of migration of radionuclides" is an important strategy for achieving those primary safety objectives. "Prevention of exposure to inadvertent intruders" is a special case of (a) (ii) and should be called a secondary objective.

10. Page 38091, Col. 1, 61.7 (b), (2).

a. Omit "eliminated or" since it is not possible to reduce water access to zero.

D-56-8

b. This paragraph should be written more clearly. In particular it should be clear when "stability" refers to trench structure or the waste itself.

11. The generic term "radionuclide" should replace "isotope" and "radioistope" in the following sections:

ED-1

Page 38091, Col. 2, line 1, 61.7 (b), (2).
Page 38097, Table 1
Page 38097, Col. 2, 61.55 (a), (1).

12. Page 38091, Col. 2, 61.7 (b), (3).

Replace "would" by "could" since intruder risk has a statistical basis.

13. Page 38091, Col. 2, 61.7 (b), (4).

a. The first sentence is ambiguous. It may be rewritten thus: "Institutional control of access to the site is required for at least 100 years after closure of the burial site:

b. Page 4-49 of the DEIS indicates that consensus of opinion expects that the institutional control period may reasonably range from 100 to 300 years. Since this parameter is somewhat arbitrary it should be the last parameter selected in the equation for determining prescriptive requirements.

14. Page 38091, Col. 3, 61.7 (c), (1).

"Established administrative procedures" should be cross referenced to enable recognition of specific procedures.

15. Page 38093 Col. 1, 61.13 (b).

"Demonstration" should be replaced by "reasonable indication" since it is not possible to demonstrate the achievement of performance objectives until long after a site has been closed.

16. Page 38094, Col. 1, 61.23 (e).

Replace "should" by "to".

GEN-1

17. Page 38095, Col. 2, 61.40.

Eliminate "reasonable assurance exists that".

C-3
C-4

18. Page 38095, 61.41 and 61.42.

a. Specify whether "annual" and "year" refer to a calender or a sliding year.

b. i. "Dose" should be defined to mean "dose equivalent".
ii. It is not stated whether "dose" refers to internal, external or a summation of these commitments.
iii. We advise that the ratio of dose equivalent limits to various organs should follow ICRP recommendations.

C-4

19. Page 38095, 61.42.

a. Since the inadvertent intruder is identified as the critically exposed individual for most radionuclides, more effort should be directed into determining the probability of intruder scenarios occuring. Waste concentration limits could then be relaxed if these interaction probabilities are factored into the impact calculations.

b. We agree with the proposed dose limit provided that waste concentration limits are calculated to ensure, with reasonable probability, that the inadvertent intruder does not receive more than 500 mrem/yr.

c. Dose equivalent limits following CRP guidelines should also be specified for the inadvertent intruders' thyroid, skin, bone and other organs.

ED-1

20. Page 38095, 61.50 (a), (1).

The second sentence should be clarified. The "long-term performance objectives of Subpart C" should be specified or cross referenced individually.

D-50-6

21. Page 38096, 61.50 (a), (3), (4), (11).

If industrial or other activities which may adversely disturb the ground water should not be located near the site, consider the need to establish zoning restrictions to exclude these activities.

D-50-3

22. Page 38096, 61.50 (a), (5).

"Coastal high-hazard area or wet land" should be defined or a definition else-where in the regulations referenced.

23. Page 38096, 61.50 (a), (6).

Clarify whether "upstream drainage area" refers to onsite or other locations.

D-50-2

24. Page 38096, 61.50 (a), (7).

It is not appropriate to specify that ground water intrusion cannot contact waste. This section should be rewritten to specify the maximum permissable probability for ground water intrusion as is similarly accomplished when defining 100 year flood plains etc.

GEN-1

25. Page 38096, 61.51 (a), (4).

Replace "prevent" by "minimize".

26. Page 38096, 61.51 (a), (6).

Replace "eliminate" by "minimize".

D-52-1

27. Page 38096, 61.52 (a), (1).

This sentence requires clarification. "no interaction" should be defined since migration of released radionuclides could be considered a form of interaction.

D-52-5

28. Page 38096, 61.52 (a), (3).

It is not clear whether 5 meters refers to the distance from the top or bottom surface of the cover. Does cover include an impervious cap?

D-52-2

29. Page 38096, 61.52 (a), (4).

Remove "orderly". If it is intended that the waste should be emplaced in a specified manner the intent should be described more explicitly.

D-52-5

30. Page 38096, 61.52 (a), (6).

a. Replace "radiation .... levels" by "exposure rates" or "dose rates". Include exposure to X-rays and bremstrahlung. Consider contributions from neutrons.

b. "A few percent above... background" is too vague. Specify a limit and require adherance to the ALARA principle.

D-52-3

31. Page 38096, 61.52 (a), (8).

If concentration limits are relaxed, more emphasis should be placed on isolating critical radionuclides from ground water and preventing access to potentially contaminated ground water. The latter might be accomplished by extending the buffer zone in the direction of ground water migration.

32. Page 38096, 61.53 (a).

D-53-1

We recommend that the potential impact of technologically enhanced natural radiation due to excavation operations or changes in pH should be considered in the DEIS. Radon and ^{40}K levels in ground water may be increased due to site operations. The DEIS should show that such an impact would not be likely to violate EPA drinking water quality regulations. Then T.E.N.R. can be explicitly excluded from 10 CFR 61.

33. Page 38097, 61.53 (d).

ED-1

Place this section before (b) to indicate that it refers to all phases under the licensee's control.

34. Page 38097, Table 1.

ED-1

a. Use scientifically accepted notation or provide a definition of the convention employed (eg. tritium is properly indicated by the symbol ^{3}H).

b. Table 1 is unclear and could be improved by:

i. lining up decimal points in a column.
ii. using larger type
iii. indicating units by subheading instead of by note.

c. Table 1 should reference a list of de minimis levels for particular waste streams and other disposal methods for waste exceeding table 1 categories.

D-56-2

d. The limit on concentration for diluting agents should be specified as 0.1% of the container volume.

ED-1

e. For a 55 gallon drum the concentration limits specified in $\mu Ci/cm^3$ should be multiplied by 200,000 ml to determine the maximum permissable total activity expressed in μCi.

f. The use of scaling prefixes for units should be minimized. In particular multiple prefixes should be eliminated and in fractions a single prefix should be placed in the numerator. (eg. instead of $\mu Ci/ml$ write Ci/m^3; instead of p Ci/ml write mCi/m^3

g. As suggested on page 5-76 of the DEIS, site utilization maybe improved if site licenses specified the option to dilute ^{129}I by inoculating potentially contaminated waste with ^{127}I sufficient to reduce potential thyroid uptake and exposure by 2 to 3 orders of magnitude.

35. Page 38097, 61.55

D-55-1

a. In the DEIS the product of a large number of conservative estimates will be unreasonably conservative even if individual estimates are only mildly conservative. A better method for combining parameters is to use the best estimates of each parameter and propagate uncertainty errors to generate upper and lower confidence boundaries. A simplified version of this approach using a range of values for each parameter (eg. as used in the BEIR III report) is preferable to compounding conservative estimates. Credit should be given for improving critical waste forms to reduce plant uptake in the intruder-agriculture scenario. Studies are quoted in the DEIS which indicate that the average radioactivity concentration in waste can be expected to be from 1% to 10% of the maximum concentration. Hence concentration limits should be relaxed by at least one order of magnitude and will still provide adequate intruder protection.

D-55-10

b. If concentration limits are to be included in the regulations we encourage the development of concentration limits for other radionuclides and compounds. However a "generic nonsite-specific waste classification system" will be too conservative. Waste generators should normally only need to consider one site to dispose waste. They should normally only need to be conversant with the classification system specific to that site. A site specific waste classification system should allow optimum site utilization.

D-55-6

c. Industry will have difficulty in economically assaying waste to ensure that it complies to the conditions of a particular category.

i. This may lead to generators assigning conservative estimates to waste concentrations and consequential under utilization of a waste site.
ii. The inability of regulatory authorities to assay containers of waste renders control by assay unenforcable.
iii. The scaling factors recommended to simplify waste analysis are not applicable to industries making a wide range of custom products.

ED-1

36. Page 38097, 61.56, (a).

Clarify whose health and safety is being referred to.

D-56-5

37. Page 38097, 61.56 (a), (1), (7).

Individual container limits appear excessively conservative and should be justified in the DEIS.

i. For waste disposed as received the DOT limits should apply since airborne release and non-occupational exposure is the controlling factor.
ii. For waste processed on site the limits for individual containers should be 10 times the DOT limit since it is occupational exposure which provides the limiting scenario.

38. Page 38097, 61.56 (a), (5).

D-56-3

Add "normally" to read "waste must not contain or be normally capable of generating..." This is to ensure that plastics with high ignition points but which are capable of emiting toxic burn products are not unnecessively excluded from the waste.

39. Page 38097, 61.56 (a), (7).

a. Add "significantly" to read: "... at a pressure that does not significantly exceed one atmosphere at 20°C." If this sentence is not modified, waste generators may be constrained to packaging gases under reduced pressure or elevated temperatures.

D-56-5

b. It is not clear whether the 100 Ci limit applies only to gases. This should be clarified. 100 Ci limit per package is too restrictive for certain radioactive gases. eg. $^{14}CO_2$ and ^{3}H.

c. Although there is provision for exceptions to the proposed limits on a case by case basis, calculations should be included to show the impact expected from radioactive gas. Also the wide range in toxicity of labeled compounds should be addressed in the DEIS.

40. Page 38098, 61.56 (b), (1).

D-56-9

The intent of "within 5%" should be clarified.

41. Page 38098, 61.56 (b), (2).

D-56-13

"Non corrosive liquid" should be defined as it is in the DEIS, ie., "pH between 4 and 10 and incapable of significant galvanize and chemical reaction".

42. Page 38098, 61.58

D-55-7

a. Provision should be made to allow waste generators to categorize waste by an inventory process. The quantities of waste generated in a year or present in an individual shipment could be determined with greater accuracy than by making separate determinations for individual containers. This comment is particularly relevant to very low contamination levels and radionuclides which are restricted by the ground water migration scenario.

D-55-1

b. Scenarios assume that all waste is placed just before the site was closed. However in practice waste will accululate over a 20 to 60 year period and a considerable fraction shall have decayed before site closure. Hence a relaxation in concentration limits can be applied to short lived radionuclides received during the initial period of burial activities.

43. Page 38100, 61.82.

G-1

a. We recommend that a full-time NRC inspector or agreement state agency inspector be assigned to a LLW site during the operational phase.

b. The State authorities should be encouraged to monitor the disposal site and review site records.

44. Page 38102, 20.311

M-1

From the language in the proposed rule, it is not clear how enforcement agencies would be involved. One possible procedure would require the site operator to return a receipted copy of the manifest system to the generator vice merely notifying him of receipt. If the generator were then required to maintain a file of all shipment manifests and backrouted receipts, the enforcement agency could check for compliance at each generator's place of business. Such a system closes the loop on the process and allows one to readily check for compliance during a regular facility inspection. It has the further advantage of not burdening the enforcement agency with volumes of manifests. Additionally, generators could reserve making payment to shippers until the backroute is received. This would provide a strong economic incentive to comply with the manifest tracking system.

In any event, some reasonable procedure should be developed to integrate enforcement agencies into the control or supervision of the manifest tracking system.

Similar

COLORADO DEPARTMENT OF HEALTH

Richard D. Lamm
Governor

Frank A. Traylor, M.D.
Executive Director

January 15, 1982

(111)

PROPOSED RULE PR-2, et al
46 FR 3908

Donald Nussbaumer
Assistant Director for State
Agreement Programs
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Nussbaumer:

We have reviewed the proposed Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste". The following comments are offered:

C-3

1. The use of a uranium and thorium limit of 10pCi/l above background has not been justified, and is not related to 40CFR141, as it has not been adopted.
2. The limit of 25 millrem to the whole body to any member of the public has not been justified. This standard has been legally challenged by the uranium industry, and should not be applied here until that challenge is settled.

D-50-4

3. We agree in principal that radioactive waste should not be disposed of with other wastes. However, the exclusion in 61.51(a)(7) is too absolute, as there may be instances where an existing hazardous waste site may be best site for a radioactive waste facility.

D-55-3

4. Transuranic wastes should be limited to 10nCi/g regardless of its decay mode due to the fact that the daughters may be hazardous.

If you have any questions, do not hesitate to contact this division.

Sincerely,

Albert J. Hazle, Director
RADIATION CONTROL DIVISION

AJH/WJ/ms

cc: Bob Doda, Region IV

Acknowledged by card. 1/21

4210 EAST 11TH AVENUE DENVER,COLORADO 80220 PHONE (303) 320-8333

HN SPELLMAN
Governor

PR 61
46 FR 51776

DONALD W. MOOS
Director

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Mail Stop PV-11 • Olympia, Washington 98504 • (206) 459-6000

'82 JAN 19 P2:22

comp (112)

January 13, 1982

(34)

DOCKET NUMBER
PROPOSED RULE PR-61
(46 FR 51776)

Mr. R. Dale Smith, Chief
Low-Level Waste Licensing Branch
Division of Waste Management
Office of Nuclear Material Safety &
Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Smith:

Thank you for the opportunity to comment on the draft environmental impact statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste". As the state's coordinator for NEPA documents, we notified all state agencies of the availability of the EIS. The Department of Social and Health Services was the only agency to respond. A copy of their comments is attached.

If you have any questions, please call Ms. Nancy Kirner, Department of Social and Health Services, at (206) 753-3459 or Mr. Greg Sorlie, Department of Ecology, at (206) 459-6016.

Sincerely,

Dennis Lundblad, Supervisor
Comprehensive Management Division

DL:lc

Attachment

cc: Ms. Nancy Kirner
Mr. Greg Sorlie

JOHN SPELLMAN
Governor

STATE OF WASHINGTON
DEPARTMENT OF SOCIAL AND HEALTH SERVICES
Olympia, Washington 98504

January 13, 1982

TO: Barbara Ritchie
Department of Ecology
PV-11

FROM: Nancy P. Kirner, Supervisor
Radioactive Materials Unit
Radiation Control Section

SUBJECT: COMMENTS ON PROPOSED 10 CFR 61 ENVIRONMENTAL IMPACT STATEMENT

The environmental impact statement for 10 CFR 61, "Licensing Requirements for Land Disposal of Radioactive Waste," appears to be well written and it adequately supports appropriate regulation of a radioactive waste disposal site having more than 10 inches of rain each year. The environmental impact statement and its proposed regulation, however, fail to accurately address realistic concerns and place realistic conditions on the operation of a radioactive waste disposal site at an arid location. Among the major problems of an arid site are slumping and wind erosion. More emphasis should be placed on mitigating these two impacts, absent infiltration of ground and surface water.

D-55-13
D-52-1

While it is conceded that the stability of the waste form enhances safety, the strong reliance placed upon scenarios involving groundwater infiltration appears inappropriate for an arid site such as the low-level waste disposal site located near Richland, Washington. Without the liklihood of groundwater or surface water transport of radionuclides, segregation of class A and class B wastes seems to be unnecessary when weighed against the burden of operating separate disposal units. For the arid site, a case can even be made to allow co-mingling of waste classes in an attempt to lower the average concentration of the most hazardous wastes. The same logic can likewise be used for class C wastes at an arid site, provided class C wastes are placed at deeper depths and solidified in a relatively leach-free matrix or otherwise segregated for their hazardous lifetime. The proposed regulation and its supporting environmental impact statement do not appear, however, to make a convincing enough argument for the establishment of a third disposal unit to handle only class C

ALAN I
Secret

D-55-13
D-52-1

wastes at an arid site. Washington does not believe that the segregation of waste by classification should become a matter of compatibility.

Since the draft environmental impact statement on 10 CFR 61 was written, the state of Washington has increased its perpetual care and maintenance funding. Descriptions of Washington's funding mechanisms should be revised on pages 9-6 and K-50 to reflect these recent changes as follows:

a. The Perpetual Care and Maintenance (PC&M) Fund contribution by U S Ecology, currently at $0.275 per cubic foot, will increase to $1.75 per cubic foot. This renegotiated contribution will provide a total fund of approximately $6 million by July 1, 1985. The total accumulation will be determined by the actual volume of waste disposed.

b. In addition, US Ecology will contribute $0.25 per cubic foot of waste disposed to a newly established Contingency Closure Fund. A contribution at this rate will yield a fund of $800,000 by July 1985, assuring that the state of Washington will be able to adequately close the radioactive waste disposal operations conducted at the site if and when needed.

c. On January 15, 1982, the company will post a surety bond in the amount of $500,000 for a period of one year to protect the state if the company should leave the site without meeting closure conditions as stated in the license.

Thank you for the opportunity to incorporate our concerns.

NPK/db

The American Society of Mechanical Engineers

Nuclear Engineering Division
(Founded in 1954)

'82 FEB -1 P

M. M. Thomas
Black & Veatch
P. O. Box 8405
Kansas City, MO 64114

Subject: Proposed Rule 10 CFR 61
Supplemental Comments Prepared
by Radwaste Systems Committee

(113)

DOCKET NUMBER
PROPOSED RULE PR-2 et al
(46 FR 38081)

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

Attention: Docketing and Service Branch

Dear Sir:

The Radwaste Systems Committee of the Nuclear Engineering Division of ASME recently submitted comments on the proposed Rule 10 CFR 61. Subsequent to the preparation of that submittal, additional comments were received. We request that these additional comments to accepted by the Commission as input to their deliberations on the final rule.

Both sets of comments have been submitted to ASME for review and approval, but neither as yet represents the formal position of ASME. They do, however, represent the considered opinion of a large number of individuals intimately involved in the area of low-level radioactive waste.

Sincerely,

Michael M Thomas

Michael M. Thomas, Chairman
Codes and Standards Subcommittee
of the Radwaste Systems Committee

bg
Attachment

Acknowledged by card 2/4/82 amp

Supplemental Review Comments
of Proposed Rulemaking
on Land Disposal of Low-Level Radioactive Waste - 10 CFR 61

Submitted by

Codes and Standards Subcommittee
Radwaste Systems Committee
Nuclear Engineering Division of
American Society of Mechanical Engineers

SUPPLEMENTAL COMMENTS ON
PROPOSED AMENDENTS TO 10 CFR Parts 2, 19, 20, 21,
30, 40, 50, 51, 61, 70, 73, AND 170
LICENSING REQUIREMENTS FOR LAND DISPOSAL OF
RADIOACTIVE WASTE

General Comments

D-56-14

1. The proposed regulation is consistent with the philosophy and recommended approach for disposal of low level radioactive waste espoused by many groups and other government agencies.

   While some of the technical requirements (e.g., limits or concentrations and quantities of various isotopes) may prove to be a problem in the future, The NRC's approach is generally compatible with current utility and disposal site operating practices. The proposed regulation seems appropriate in light of some past problems with burial sites and the lack of consistent practices and requirements disposal sites.

2. How will 10 CFR 61 affect NRC Branch Technical Position 11.3 regarding mandatory solidification?

GEN-1

3. Are there acceptance criteria which verify prescribed criteria after completion of the facility?

ED-1

4. The terms "short term" and "long term" should be defined clearly when used in 10 CFR 61.

GEN-1

5. The draft 10 CFR 61 regulations require a "quality assurance" program without establishing what program to follow. There are no National standards on such a program. A "quality control" program probably is more appropriate and could be implemented at less cost.

M-2

D-55-8

6. The draft 10 CFR 61 regulations discourage volume reduction of radioactive wastes. This conflicts with a recent NRC policy statement which promotes volume reduction methods.

Specific Comments

ED-1

1. Page 38083, first paragraph, second column - The wording "coming in contact with the waste" should be changed to "becoming exposed to the wastes."

D-52-6

2. Page 38087, last paragraph, second column - The NRC should define what requirements are necessary for a period of postclosure observation and maintenance. This would preclude opening this issue up in a licensing effort and prevent the need for such a plan.

A-1

3. Page 38090, last paragraph in column 1 - This paragraph rigidly defines the "Land disposal facility" associated with the disposal of radioactive wastes "into the subsurface of the land." This should be rewritten to include aboveground, engineered structures and should be discussed in section 6.1.7(a)1 of the same chapter.

D-52-4

Continuing into the next paragraph - Reference should be made relative to the licensing of "onsite storage" facilities.

D-55-10

4. Page 38091, the first sentence, column 2 - It is not clear why for certain isotopes, a maximum disposal site inventory should be established based on the characteristics of the disposal site.

D-59-2

In the same column, the second paragraph states that "institutional control is relied on for periods up to 100 years ...." How was this amount of time arrived at?

D-52-6

5. Page 38091, first paragraph, last column - The last sentence of this paragraph refers to a "final review of licensee's site closure and stabilization plan." It is not clear if an initial review was made or when it was made. Without establishing a plan initially, how will the public ever accept that the licensee will meet the criteria. This should be discussed in detail in part (c) of this section, "The Licensing Process."

B-1

6. Page 38092, Section 61.11(c)(4), second column - This sentence is not clear as to whether the plans are relative to before, during, or after useage as a land disposal facility.

7. Page 38092, fourth paragraph, third column - The quality assurance program description requirements should be discussed in further detail. Reference should be made to where it is documented that such a statement exists.

ED-1

8. Page 38093, third paragraph, first column - What is meant by the term "mass wasting?"

C-4

9. Page 38095, Section 61.42, third column - It is not clear as to what time frame should be applied to the inadvertent intrusion necessary to evaluate the 500 mR/year.

D-55-6

10. Page 38097, Section 61.55, Table 1 - This table serves no purpose other than to possibly restrict the utilities' radwaste disposal efforts without consideration to individual waste inputs. This table should be deleted and/or revised to represent typical comprehensive radwaste inputs which possibly have some deviations from the radioisotopic concentration ranges given in Table 1.

    Other reviewers commented that most of the isotopes listed are primarily beta-emitters which would be difficult or impossible to detect with

D-55-4 equipment suitable for power plant operation. It is recommended that the final rule make explicit the rationale provided in the draft EIS, especially the provision allowing an isotopic inventory to be based on ratios from the concentrations of more easily measured isotopes.

D-55-8 11. Page 38097, Section 61.56, third column - It seems appropriate that this section should discuss the volume reduction techniques and advantageous aspects relative to land impacts.

D-56-16 This section should establish detailed waste form criteria relative to meaningful requirements, such as flammability, leachability. The waste characteristics described are too simplistic and almost apply to any waste currently being produced.

D-56-6 This section requires that the waste package presented for disposal comply with NRC and DOT transportation regulations. This implies that the disposal package could or must be a Type A, Type B, or Large Quantity package including all related shielding and other transportation related requirements. While it is unlikely that this is NRC's intent, the wording of the paragraph can be interpreted in this manner. NRC should clarify and reword the requirement.

ED-1 12. Page 38097, Section 61.56, second column - The term "Class A segregated waste" needs clarification.

D-56-9 The requirement that waste packages presented for disposal retain 95% dimensional stability after burial is inconsistent with the capability of most solidification processes. A solidified material can be packaged in a degradable container. Most solidification processes cannot fill a container 95% full. Therefore, when the container degrades, the waste form can compress to less than 95% of the original package volume.

The 95% stability requirement as written, therefore, implies or requires the use of high integrity containers for solidified materials. The option of using a high integrity container in lieu of solidification then becomes no option at all.

M-1 13. Page 38102, 10 CFR 20 paragraph 311(b) - This change to 10 CFR 20 is related to the 10 CFR 61 changes.

The shipment manifest should also indicate the "radiation level" of the waste container to be buried as well as the other waste characteristics noted.

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

'82 FEB -2 P3:18

ER 81/2260

JAN 28 1982 emp

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

(41)
DOCKET NUMBER
PROPOSED RULE PR-61
(46 FR 51776)

(114)
DOCKET NUMBER
PROPOSED RULE PR-3 et al
(46 FR 38081)

Dear Sir:

We have reviewed the proposed licensing requirements for Land Disposal of Radioactive Waste (10 CFR 61).

General Comments

C-1 In general, we are in agreement with the overall technical philosophy and strategy employed in the rule. It appears to be a major step forward in improving low-level radioactive waste management. We concur that many acceptable sites should be possible in most areas throughout the country and we agree, in general, with the flexibility and conservatism of the combined prescriptive and performance objective approach. Finally, we agree that waste classification is a cornerstone for a good waste management rule and that the classification scheme proposed is sensible and practical in terms of radionuclide content.

D-55-9 Our principal concern with the waste classification system is that it fails to address nonradioactive toxicity of the waste. We believe that any waste classification scheme should be based on total hazard. It would seem inappropriate for a particular waste to be declared as Class A radiologically when it might contain toxic metals or organic compounds with potential harmful effects several orders of magnitude greater than those of the radionuclides. Perhaps the rule should either prohibit components with greater potential toxicity than the radionuclides or provide for additional classification options based on other-than-radiological toxicity. This position would be consistent with recommendations of the Conservation Foundation Dialogue Group on Low-Level Radioactive Waste and the Department of Energy's Task Force on Radioactive Waste Management.

D-55-8 We believe that waste volume reduction is an important element in reducing overall magnitude and complexity of the problem. We therefore suggest giving it greater emphasis and perhaps offering additional incentives. We also believe that Federal/Defense generated low-level radioactive waste should come under the same earth-science guidelines and criteria.

F-1 Participation of Bureau of Indian Affairs (BIA) and the Indian Tribes

The Secretary's trust responsibilities apply to waste disposal sites that are to be located on Indian reservations. The Bureau of Indian Affairs (BIA) provides the support services necessary to carry out the Secretary's trust responsibilities. Therefore, BIA area directors or their authorized representatives should be invited to participate in the review of applications for the location of low-level radioactive waste disposal sites on Indian reservations. In addition,

... signed by cmp 2/4/82 emp

F-1 regulatory policy should also be coordinated with BIA's Office of Trust Responsibilities with respect to locating, licensing, operating and maintaining commercially operated disposal sites on Indian lands. Because of variations and changes in Indian land ownership, BIA's involvement will be essential.

Specific comments on the proposed rule and the environmental impact statement are attached separately.

We hope these comments will help you in the preparation of a final statement.

Sincerely,

Bruce Blanchard, Director
Environmental Project Review

Enclosures

PROPOSED RULE

The following more specific comments are addressed to the rule itself but would also apply to corresponding sections of the Summary and the environmental statement.

D-52-3 Section 61.2. Definitions

Buffer Zone. The buffer zone definition should include depth as well as lateral boundaries, and should be described as a three-dimensional zone. The performance standards might then apply to releases beyond the boundary of the buffer zone. Unrestricted use of land and resources beyond the buffer zone (laterally or at depth) would then be allowable during and after site operations.

61.50 Disposal Site Suitability Requirements for Land Disposal

D-50-1 GEN-2 (a)(2) We suggest being more specific in the "modeling" requirements. Do you mean physical scale model? numerical ground water/solute transport model? conceptual model? (There are many kinds of possible models.)

D-50-2 (a)(7) We endorse this option but suggest using "molecular diffusion" in place of "diffusing" and/or defining maximum hydraulic conductivity allowable such as 10^{-6} cm/sec.

61.51 Disposal Site Design for Land Disposal

GEN-1 (a)(4) It is impossible to totally "prevent" infiltration; suggest using "minimize" in place of "prevent."

(a)(6) This requirement appears inconsistent with 61.50(a)(7). The option of disposing in the saturated zone should be mentioned again.

D-52-3 61.52 Land Disposal Facility Operation and Disposal Site Closure

(a)(8) We believe the location of the buffer zone should be determined on the basis of site performance. The zone ideally would be enclosed within a three-dimensional surface surrounding and underlying the burial site. Our concept of the buffer zone is a zone that provides a controlled/restricted-access volume of earth material around and under the site, beyond which unrestricted use of land and resources, surface or subsurface, could be allowed during and after site operation. The 100 foot lateral extent listed in the rule appears somewhat arbitrary.

D-53-1 61.53 Environmental Monitoring

(a) We believe that "geochemistry" should be listed with the other subjects (ecology, meteorology, climate, hydrology, etc.). Although geochemistry is often an implied aspect of hydrology, we believe it deserves specific mention because it plays such an important part in radionuclide mobility in ground water.

6L55 Waste Classification

D-55-9 General: We believe waste should be classified according to total toxicity as described above under "General Comments."

A-8 (d) It is not clear what the disposition will be of wastes which exceed Class C concentrations. What type of disposal is envisioned by the Commission for those wastes?

6L56 Waste Characteristics

D-55-9 General: The non-radiological toxicity of the waste needs to be considered here, we believe. It is apparently ignored.

BEFORE THE NUCLEAR REGULATORY COMMISSION

Comments of Kerr-McGee Corporation Kerr-McGee Nuclear Corporation and Kerr-McGee Chemical Corporation on Proposed 10 CFR Part 61 (46 Fed. Reg. 38081 (July 24, 1981))

January, 1982

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January 18, 1982

'82 JAN 22 P4:22

Secretary of the Commission
Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Docketing and Service Branch

Re: Proposed 10 CFR Part 61

DOCKET NUMBER PROPOSED RULE PR-2etal. (46 FR 3808)

Gentlemen:

Enclosed please find Kerr-McGee's comments on the above-referenced rulemaking proceeding. It is our understanding (from a telephone call to Mr. Smith's office) that the comments will be considered timely so long as postmarked today (Monday) in view of the storm that paralyzed the D.C. area (where the comments were finalized) last week.

Very truly yours,

Charles H. Montange
Attorney for Kerr-McGee

cc: Mr. R. Dale Smith (w/encls.)

Acknowledged by card.....

KERR-McGEE CORPORATION
KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

ENVIRONMENT AND HEALTH MANAGEMENT DIVISION

January 14, 1982

DOCKET NUMBER PROPOSED RULE PR-2etal (46 FR 3808)

'82 JAN 22 P4:22

CERTIFIED MAIL, RETURN RECEIPT REQUESTED

DOCKET NUMBER PROPOSED RULE PR-61 (46 FR 9776)

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

Re: Proposed Rule 10 CFR Part 61
Licensing Requirements for Land Disposal of Radioactive Waste

Dear Sir:

The Nuclear Regulatory Commission (NRC) recently published an invitation for comments in connection with the proposed Rule 10 CFR Part 61 concerning Licensing Requirements for Shallow Land Disposal of Radioactive Waste. (See 46 Federal Register 38081, July 24, 1981.) The attached comments of Kerr-McGee are in response to that invitation.

Sincerely,

John C. Haugen
for W. J. Shelley, Vice President
Nuclear Licensing and Regulation

ba/bec
Enclosure

Comments on Proposed
10 CFR Part 61

These comments, submitted on behalf of Kerr-McGee Corporation, Kerr-McGee Nuclear Corporation, and Kerr-McGee Chemical Corporation (Kerr-McGee), are addressed the Licensing Requirements for Land Disposal of Radioactive Waste, proposed by the Nuclear Regulatory Commission (NRC) at 46 Fed. Reg. 38081 (July 24, 1981). A number of the standards proposed in 10 CFR Part 61 are premature and beyond the authority of NRC. In addition, many of the standards and other requirements are unreasonably stringent and are not supported by the rationale offered in the underlying documentation. Kerr-McGee's specific objections are detailed below.

I. The Exposure and Emission Standards Proposed for Part 61 Are Premature and Beyond the Agency's Authority to the Extent that They Are Not Already Embodied in 10 CFR Part 20

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Reorganization Plan No. 3 of 1970 by its terms transferred to the Administrator of the Environmental Protection Agency (EPA) the authority under the Atomic Energy Act to set generally applicable radiation standards.[1] Assuming arguendo the validity of the Plan,[2] the EPA Administrator, not NRC, is responsible for issuing standards relating to exposure to ionizing radiation from a low level radioactive waste disposal site during and after its operation. NRC in fact appears to admit that EPA is responsible for issuing the pertinent standards. EPA, however, has not issued standards governing waste disposal of the sort involved here. In the absence of EPA standards, NRC is limited to the existing standards found in 10 CFR Part 20.[4]

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The 10 CFR Part 20 regulations limit public exposure to 500 mrem per year, and specify stringent limits on the release of about two hundred radionuclides by air or water to unrestricted areas. A number of the standards specified in proposed Part 61, however, are not currently contained in 10 CFR Part 20. For example, proposed § 61.41 limits release of radionuclides such that no member of the public may be exposed to a dose of more than 25 mrem to the whole body, 75 mrem to the thyroid, and 25 mrem to any other organ. No such standard appears in 10 CFR Part 20 for waste disposal operations. NRC accordingly lacks authority to adopt it here. To take another example, neither the purported concentration limits for radionuclides in proposed § 61.41 nor the 10 pCi/l uranium/thorium

[1] See section 2(a)(6) of the Plan, 35 Fed. Reg. 15623, 84 Stat. 2086, 42 U.S.C. § 4231 note.

[2] Kerr-McGee has challenged, in a lawsuit currently pending in the Tenth Circuit, the validity of the plan insofar as it purports to transfer authority over radiation standards. This section of Kerr-McGee's comments apply in the event that NRC is correct and that the validity of the plan is upheld.

[3] See 46 Fed. Reg. 38083.

[4] With one exception, the Part 20 standards, insofar as they deal with exposure of the public, were issued by the Atomic Energy Commission prior to loss of standard-setting authority to EPA pursuant to Reorganization Plan No. 3. The one exception is that portion of Part 20 incorporating EPA's 10 CFR Part 190.

C-2 standard is contained in any regulation under 10 CFR Part 20. It is therefore invalid as beyond NRC's power. All portions of proposed Part 61 predicated on these invalid standards must be withdrawn pending final action by EPA on pertinent standards.

II. Various Standards and Requirements Specified in Proposed Part 61 Are Unduly Stringent and Unsupported.

A. The 25 mrem Rule Set Forth in Proposed § 61.41 Is Unsupported

C-3 Proposed § 61.41 limits release of radioactive material from a low level waste facility such that the release will "not result in an annual dose exceeding an equivalent of 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public." This proposed limit appears to be derived from EPA's 40 CFR Part 190. This derivation is incorrect for a number of reasons. First, it is incorrect for a purely legal reason: EPA specifically excluded operations at waste disposal sites from Part 190's coverage.[4] NRC may not promulgate its own standard in the absence of action by EPA.

Second, the 25 mrem standard specified in the regulation is too low. 25 mrem is a mere one-twentieth the level (500 mrem) specified in 10 CFR § 20.105 for releases to unrestricted areas.[5] There is no evidence that complicance

[4] 40 CFR § 190.02(b).

[5] See also 25 Fed. Reg. 4402 (May 18, 1960) (Radiation Protection Guidance for Federal Agencies).

C-3 with the 500 mrem standard has resulted in any untoward results. The 25 mrem restriction is demonstrably too low for another reason. Average natural background radiation (cosmic, terrestrial, and internal body radiation) varies from state to state in this country between 90 mrem and 180 mrem average exposure per year. Variation is caused primarily by different altitudes above sea level and by natural rock formations. Living near a granite rock formation, for example, may result in 25 to 100 mrem addition exposure per year. 25 mrem is thus only a small fraction of natural background exposures. 25 mrem is also only about half the exposure incurred in an ordinary chest x-ray.[7] Epidemiological evidence unanimously indicates that increased exposures discernible adverse health effects.[8] Leading

[7] See Biological Effects of Radiation, 15 Encyclopedia Britannica 382 (1979) (gives 50 mrem for chest x-ray and 100-150 mrem for natural background); Low-Level Ionizing Radiation, Hearings before the Subcommittees on Energy Research and Production and Natural Resources and Environment of the House Committee on Science and Technology, 96th Cong., 1st Sess., at 8-9 (1979).

[8] See, e.g., Hickey, et al, Low level Ionizing Radiation and Human Mortality: Multi-Regional Epidemiological Studies, 40 Health Physics 625 (1981) (Exhibit A); Frigerio, et al, The Argonne Radiological Impact Program (ARIP)-1. Carcinogenic Hazard from Low-level, Low-rate Radiation (Argonne Nat'l Lab. Report, ANL/ES-26, Part I) (1973) (Exhibit B); High Background Radiation Research Group (China), Health Survey in High Background Radiation Areas in China, 209 Science 877 (1980) (Exhibit C); Gopal-Ayengar, et al., Evaluation of the Long Term Effects of High Background Radiation in Selected Population Groups on the Kerala Coast in Peaceful Uses of Atomic Energy, Vol. II, Proc. 4th Int'l Conf. Peaceful Uses of Atomic Energy, pp. 31-51 (1971) (Exhibit D); Cullen, et al, Dosimetric And Cytogenetic Studies in Brazilian Areas of High Natural Natural Activity, 19 Health Physics 165 (1970) (Exhibit E).

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authorities believe that low level radiation is not hazardous. As Dr. Evans recently testified, "say we double the background radiation [to] us, what will that do to us? The answer is nothing . . .. [T]here are no radiobiological effects."[9]

Third, the 25 mrem restriction deviates in a significant way from that specified in EPA's 40 CFR Part 190. EPA excluded radon and its daughters from Part 190's coverage. The proposed NRC regulation does not contain a similar exclusion. It is possible that certain radioactive ore residues (e.g., some uranium or thorium wastes and some rare earth wastes) may be disposed in low level repositories covered by proposed Part 61. In order to attain a 25 mrem standard as applied to radon, it may be necessary to cover the wastes in question with many meters of earth cover. The benefits from this action are speculative and slight. Because of the importance of the issue, the purported risk from radon is discussed in detail below.

NRC has elsewhere indicated that the primary hazard posed by disposal of uranium mill wastes is emanation of radon-222, a radioactive, inert gas. NRC in the past has attempted to vindicate stringent radon controls on the basis of (1) risks to persons living at some distance from the

[9] Testimony of Dr. Robley Evans before the New Mexico EIS, reprinted in Uranium Ore Residues Hearings: Potential Hazard Disposition, Hearings before the Procurement and Military Nuclear Systems Subcomm. of the House Comm. on Armed Services, 97th Cong., 1st Sess., at 456 (1981). See also T. Luckey, Radiation Hormesis (1980).

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uranium wastes in question and (2) risks to persons living near the wastes. Neither justification has merit.

Radon-222 emanation from uranium wastes does not pose a significant risk to persons living outside the near-vicinity of the wastes in question. The amount of radon likely to result from the wastes is miniscule compared to the amount of radon released naturally from soils in the United States and from such accepted economic activities as agriculture.[10] Moreover, increased radon from uranium wastes cannot be detected more than a short distance from such wastes, even in a downwind direction.[11] The effect of the wastes is vastly overborne by natural discharges.

Stringent controls for radon emanation similarly cannot be justified on the basis of risk to nearby residents. NRC acknowledges that there are no discernible adverse health effects from exposure to radon from uranium wastes.[12] In the

[10] See, e.g., Transcript of Hearing before the New Mexico EIS at 461-62 & 470 (testimony of Dr. Evans) reprinted in Uranium Ore Residues: Potential Hazards and Disposition, Hearings before the Procurement and Military Nuclear Systems Subcomm. of the House Armed Service Comm., 97th Cong., 1st Sess. 453 (June 24 & 25, 1981).

[11] See, e.g., Shearer & Sill, Evaluation of Atmospheric Radiation in the Vicinity of Uranium Mill Tailings, 17 Health Physics 77 (1969) (Attachment E); Letter, Greenleigh (DOE) to Selander (EPA), dated July 15, 1981, at 2 (DOE comments on EPA inactive site standards) (Attachment G); Uranium Ore Residues Hearings, supra, at 457; 127 Cong. Rec. S 12984 (daily ed. Nov. 5, 1981).

[12] NRC, Generic EIS on Uranium Milling (GEIS) at A-35 ("We [NRC] know of no data or studies which indicate definitively that health effects do or do not occur at the low levels of exposure that are anticipated to result from operation of uranium mills").

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absence of data, NRC apparently assumes that some health effects may occur on the basis of the "linear non-threshold model." This model has been aptly criticized by numerous authorities. For example, the model is based on the assumption that tumor induction is a straightforward "one-hit" process in which any unit of exposure will result in some carcinogenic activity. But "the bulk of the evidence" argues against the hypothesis that neoplastic transformation is a linear function of dose.[13] Additionally, many prominent health physicists and other experts believe that the body is capable of repairing damage caused by low-level radiation.[14] Moreover, the linear non-threshold model is contrary to direct evidence that "ecologically realistic, low-level radiation is biologically stimulatory, and presumably beneficial."[15] This effect, known as "radiation hormesis," is a restatement of the Arndt-Schulz law that small doses of substances are stimulatory (i.e. beneficial) even if large doses are harmful. As one biochemist recently explained,

> "[r]adiation hormesis denies the validity of straight line extrapolation from known harmful doses to zero. The argument that low doses give harmful effects in proportion to dosage is invalid."[16]

[13] Anderson, Pathology 347 (7th ed. 1977).

[14] See, e.g., Robbins & Cotran, Pathologic Basis of Disease 552 (2d ed. 1979); Transcript of New Mexico EIB hearing at 495-96 (testimony of Dr. Evans); In the Matter of Duke Power Co. (Perkins Nuclear Station, Units 1, 2 and 3), 8 NRC 87, [1975-78 Transfer Binder] Nuclear Reg. Rep. (CCH) ¶ 30,312 at p. 28,669 (1978).

[15] Hickey, Letter: Cancer and Concensus, Chemical & Engineering News 65 & 75 (Sept. 14, 1981) (Attachment E).

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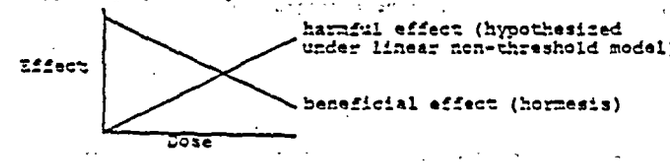
Finally, pertinent epidemiological studies are consistent with the proposition that low-level radiation is not harmful. Indeed, those studies indicate that people in high background radiation areas enjoy better health than people in low background radiation areas.[17] For example, people living on the Colorado plateau in the United States have significantly lower death rates from cancer and chronic disease that people in the

[16] T. Luckey, Radiation Hormesis 162 (CRC 1980). See also Luckey, Letter: Hormesis, Nuclear News 48 (Dec. 1981); Hickey, Letter: Hormesis, Nuclear News, at p. 54 (Dec. 1981). In any event, even if carcinogenesis is linearly related to dose, there may also be a second beneficial effect at low doses, and these benefits may outweigh the risks. Such a relationship would appear graphically as follows:



See Sagan, Some Thoughts on Dose-Response, Hormesis and All That, Nuclear News, at p. 82 (Oct. 1981).

[17] See, e.g., Hickey, et al, Low Level Ionizing Radiation and Human Mortality: Multi-Regional Epidemiological Studies, 40 Health Physics 625 (1981); Frigerio, et al, The Argonne Radiological Impact Program (AGIP)-1. Carcinogenic Hazard from Low-level, Low-rate Radiation (Argonne Nat'l Lab. Report ANL/ES-26, Part 1) (1973); High Background Radiation Research Group (China), Health Survey in High Background Radiation Areas in China, 209 Science 877 (1980); Gopal-Ayengar, et al, Evaluation of Long-Term Effects of High Background Radiation on Selected Population Groups on the Kerala Coast in Peaceful Uses of Atomic Energy, Vol. II, Proc. 4Sth Int. Conf. Peaceful Uses of Atomic Energy, pp. 31-51 (1971).

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eastern costal plains where natural ionizing radiation is much lower. Another striking example involves the people of Kerala, India.

> "The people of Kerala are reported to have the highest literary rate and the best health status in India; yet their expenditure on health care is not appreciably above average, and they have the lowest food intake and the least adequate diets of people of all states of India. A partial explanation for this paradox is that radiation from the unusually high radium and thorium in costal and river rocks exposes many residents to 10 times more terrestrial radiation than the U.S. average."[10]

NRC admits that the linear nonthreshold model may be erroneous.[11] In fact, as one statistician has charged, the purported general regulatory "acceptance" of the model is "in large part [a] misuse of statistics."[12] Exclusive or even primary reliance on the linear non-threshold model is an over-simplication and may result in an over-investment in controls to avert hypothetical risks.[13] This translates into

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[10] Luckey, Letter: Hormesis, Nuclear News 52 & 54 (Dec. 1981) (emphasis added).

[11] GEIS U-4.

[12] Hickey, supra note 15.

[13] In the words of Professor David Okrent of UCLA, "Resources for the reduction of risks to the public are not infinite. At some point, a greater improvement in health and safety is to be expected from a more stable and viable economy than from a reduction in pollution or the rate of accidents." Okrent, Comment on Societal Risk, 208 Science 372, 374 (1980). NRC should also recognize that stringent controls aimed at reducing exposure to radiation from atomic energy activities can easily have a reverse affect. For example, new and costly NRC controls will result in increased energy costs to consumers.

(footnote cont'd)

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an unwarranted burden on atomic energy activities and a waste of society's resources. NRC should re-evaluate and modulate its reliance on the linear non-threshold model for purposes of assessing the risk from exposure to low-level radiation. In particular, NRC should give greater weight to the possibility (indeed, likelihood) that the ionizing radiation, particularly from naturally occurring concentrations of radionuclides such as are involved here, is not harmful and may in fact be beneficial.

Even assuming that the linear non-threshold model is appropriate, the risk which it projects in the situations

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(footnote cont'd)

This will induce increased reliance on insulation. This means fewer air changes in residences and businesses. This in turn leads to increased exposure to naturally occuring indoor radon. EPA estimates (under the linear non-threshold model) that the risk posed by indoor radon is about 1 in 300 lifetime (approximately 1 in 21,000 per year). EPA, Draft EIS for Remedial Action Standards for Inactive Uranium Processing Sites at pp. 4-20 & 21. This means that, under government estimates, about 10,000 people perish per year from natural indoor radon exposure in this country alone. This is far more than the maximum number of deaths (6) projected by NRC from radon emanating from three times the amount of uranium mill tailings now in existance. Increased insulation, prompted by rising energy costs, already is leading to about 1,000 additional hypothetical deaths from indoor radon per year and will eventually lead to about 10,000 additional hypothetical deaths. Cohen, Health Effects of Radon from Insulation of Buildings, 39 Health Physics 937, 940 (1980). Less costly uranium fuel cycle regulatory requirements can make a major contribution in decreasing hypothetical radiation fatalities in this country because less costly regulation will result in less expensive electricity. This in turn will lead to less reliance on conservation measures which are 100 to 1000 times more hazardous radiologically speaking than radon releases from the uranium fuel cycle.

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involved here is insubstantial. NRC calculates that the maximum risk posed by radon-222 from even totally unregulated mills is 1 in 70,000,000 for three times the number of mills now in existence.[22] This maximum risk, which is only hypothesized to exist anyway, is insignificant and de minimis. NRC has admitted that even if it actually eventuates, it is "about equal" only to the risks posed by "a few puffs on a cigarette, a few sips of wine, driving the family car about 6 blocks, flying about 2 miles, canoeing for 3 seconds, or being a man aged 60 for 11 seconds."[23] Indeed, the risk perceived by NRC is far less than many risks commonly and ordinarily accepted in our society.[24]

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[22] See, e.g., GEIS at 19.

[23] 46 Fed. Reg. 15167 (March 4, 1981). See also 127 Cong. Rec. S 12984 (daily ed. Nov. 5, 1981).

[24] The following table sets forth many commonly and ordinarily accepted risks in our society.

Cause	Individual risk/year
smoker	1/300
agricultural employment	1/1,700
motor vehicle - Total (1975)	1/4,500
air pollution - sulphates	1/6,700
government employment	1/9,100
truck driving employment	1/10,000
falls	1/13,000
alcohol	1/20,000
living for one year downstream from a dam	1/20,000
motor vehicle - pedestrian (1975)	1/25,000
drowning (from recreational activities)	1/53,000
inhalation and ingestion of objects	1/71,000
home accidents (1975)	1/83,000
bicycling	1/100,000
person in room with smoker	1/100,000
one pint of milk per day (aflatoxin)	1/100,000

(footnote cont'd)

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Kerr-McGee understands that NRC staff may take the position that this de minimis risk is not dispositive because the risk to people living next to, or on top of, uranium wastes, is greater. To Kerr-McGee's knowledge, NRC has not provided a detailed quantification of this alleged risk for public review. However, the risk -- which is purely hypothetical to begin with -- cannot be large in comparison to many customarily accepted risks. This view is strongly supported by the Commission's admission that radon exposures at the edge of uranium wastes stabilized in accordance with the agency's now suspended Uranium Mill Licensing Requirements will result in exposures which are only "a small fraction of any reasonable health protection limit."[25] Moreover, purported fears for persons living atop such wastes are groundless in view of requirements such as these in proposed Part 61 and in the Uranium

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(footnote cont'd)

Cause	Individual risk/year
accidental poisoning - solids and liquids	1/170,000
electrocution	1/200,000
vaccination for small pox (per occasion)	1/330,000
air travel - one transcontinental flight/yr	1/330,000

Source: OSHA Testimony of Professor Richard Wilson (Exhibit I) reprinted in Butt, Unresolved Issues in Conflict Between Individual Freedom and Government Control of Food Safety, 33 FDC L.J. 558, 564-66 and 562 (1978).

[25] GEIS at p. 12-15 explains that "[e]xposures as close in as a fencepost near the edge of the pile would be about 1.1 x 10-4 WL above background levels. . ., which is a small fraction of any reasonable individual health protection limit (1% of the Surgeon General's guidelines)."

Mill Tailings Radiation Control Act, that ownership of the disposal site generally be transferred to the government for actual tailings.[36] Obviously, Congress presumed that the government can and will keep people from occupying the disposal area.[37]

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NRC's risk estimates under the linear non-threshold model, which already predict insubstantial hazards, are in fact excessive because the agency has relied on erroneously high risk estimators. The latest study by a panel of eminent scientists from EPA, the Department of Energy (DOE), Germany England and Canada indicates that the maximum hypothetical risk from radon-222 can be no greater than 1/3 that employed by NRC per unit exposure and may in fact be zero.[38] Moreover Professor Cohen, after analysis of risk estimates for radon-induced lung cancer employed in the BEIR-III report, concluded that the risk estimators advocated in that report overstated the risk from low-level exposure by a factor of twenty to

[36] 42 U.S.C. § 2113(b).

[37] NRC is authorized to waive government ownership requirements with respect to byproduct material as defined in section 11e.(2) pursuant to 42 U.S.C. § 2113(b). Government ownership is unnecessary for purposes of assuring that people do not intrude on properly disposed uranium and thorium wastes. Deed covenants barring such intrusion are sufficient for this purpose. NRC's Branch Technical Position, published at 46 Fed. Reg. 52601 (Oct. 23, 1981), properly recognizes this fact in adopting a policy of relying on deed covenants in options 3 and 4.

[38] Evans, et al., Estimate of Risk from Environmental Exposure to Radon-222 and its Decay Products, 390 Nature 98 (March 12, 1981) (attachment J). Significantly, DOE has expressly endorsed reliance on the study by Evans, et al., for standard-setting purposes. Uranium Ore Residues Hearings, supra, at 176.

forty.[39] To the extent that NRC purports to rely on a risk of exposure through an injestion pathway, that risk estimate is similarly excessive. Professor Evans has specifically criticized risk estimates for injestion of low-levels of radium as unduly conservative and as unsupported by the evidence.[40]

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The 25 mrem rule may also apply to thorium-bearing ores or thorium wastes. It is therefore pertinent to examine problems arising from application of the rule to such wastes. Thorium wastes do not pose a significant radon problem. The radon decay product (known as thoron) in the thorium decay chain has a much shorter half life (only 55.6 seconds) in comparison to radon-222 and accordingly cannot be expected to diffuse in significant amounts through even nominal cover. It furthermore cannot be expected to travel any significant distance off-site. Moreover, the decay products of thoron, with one exception, are short-lived in comparison to decay products of radon-222.[41] The primary hazard NRC identifies with respect to thorium is direct gamma radiation.

[39] See also Cohen, Failures and Critique of the BEIR-III Lung Cancer Risk Estimate, _____ Health Physics ___ (in publication) (attachment K).

[40] See R. Evans, et al., in Radiobiology of Plutonium (Stover & Jee, eds. 1972) at pp. 431-68 (practical threshold for humans); Raube, et al., Bone Cancer from Radium: Canine Dose Response Explains Data for Mice and Humans, 208 Science 61 (1980).

[41] The properties of the thorium decay series are described in Rundo, The Radioactive Properties and Biological Behavior of ^{232}Ra (Th X) and its Daughters, 35 Health Physics 13 (1978).

C-3

NRC's risk estimates for low-level gamma radiation are even more suspect than NRC's risk estimates for exposure to low-levels of radon-222. NRC's estimates, insofar as they exist at all, are traceable to exclusive reliance on a linear non-threshold model. All the criticisms already made with respect to the linear non-threshold model apply with equal or greater force. Indeed, the objections are even more telling, because the epidemiological studies in India, Brazil and China on high-background radiation were in thorium-rich areas. None of these epidemiological studies detected adverse effects. They are instead consistent with the view that higher exposure to natural radiation may be beneficial. Moreover, various advisory groups have acknowledged the lower likelihood of gamma radiation to result in harm. The ICRP has indicated that gamma and beta radiation (termed "low-LET") is an order of magnitude less effective in doing biological damage than high-LET radiation.[12] The BEIR-III Committee have also admitted that the linear nonthreshold model "probably leads to overestimates of the risk of most cancer . . . for exposure to low-LET radiation at low doses."[13] The BEIR-III report in fact recommends the use of a range of estimates for the risk of such radiation, and notes that the risk may be zero. NRC

[12] International Commission on Radiological Protection, Report of Committee II on Permissible Dose for Internal Radiation (1959).

[13] See National Academy of Science, The Effects on Population of Exposure to Low Levels of Ionizing Radiation 4 (1980) (BIER-III Report).

and EPA have improperly relied exclusively on a linear non-threshold model for projecting the risk from gamma radiation from thorium wastes.

In sum, the 25 mrem rule is unduly stringent as applied either to uranium or to thorium wastes. The costs for control of exposure to uranium or thorium wastes at a level of 25 mrem are totally out-of-line with the speculative benefits such control would produce. The American Mining Congress (AMC) has estimated that the cost to comply with a 25 mrem rule (excluding radon) at uranium mills would approach $1,000,000,000 (one billion) per hypothetical health effect avert. The cost per health effect would obviously be even greater if the restriction applied to radon.[14] The ratio of low-level waste repositories would not be more favorable. NRC should exclude radon and its daughters from the 25 mrem standard proposed in § 61.41.

C-3

B. The 10 pCi/l Uranium/Thorium Standard Proposed in Section 61.41 Is Unduly Stringent

NRC's justification for the 10 pCi/l uranium and thorium limitation appears to be based on a Suggested Action Guidance (EPA-SAG) entitled "Advisory Opinion for Uranium" issued in draft form on July 15, 1981. This EPA document is labeled "do not quote or cite," indicating the extremely preliminary nature of its conclusions. A critique of the EPA

[14] Uranium Ore Residues Hearings, supra, at pp. 255-88 et sec. (hereby incorporated by reference).

document is attached (Exhibit L). The critique explains the deficiencies in the rationale for the 10 pCi/l uranium limit and applies equally to that limit as proposed by NRC in § 61.41. The critique also applies to the proposed 10 pCi/l thorium limit. The subject uranium/thorium limit should be deleted.

C-3

C. The Provision Relating to Protection of Individuals from Inadvertent Intrusion Are Arbitrary and Unreasonable.

Proposed § 61.42 requires that a low-level radioactive waste facility be designed, operated, and closed such that no "individual inadvertently intruding into the disposal site and occupying the site or contacting the waste after active institutional controls over the disposal site are removed, could receive a dose to the whole body in excess of 500 millirem per year." For purposes of proposed Part 61, NRC hypothesizes active insitutional controls to last 100 years.

Kerr-McGee objects to the restriction embodied in § 61.42. The proposed regulations provide that the low level waste repository must be located "on land owned in fee by the Federal or a State government." Proposed § 61.59(a). NRC's "inadvertent intruder" hypothesis is predicated on the notion that the government will somehow fail, allowing people to occupy the site of the low-level waste repository for dwellings and agricultural purposes. NRC's assumption that the government will fail is inconsistent with the concept of a national government and the firmly established principle that the

C-4

United States is a Union of States established for perpetuity."[1] It is arbitrary and unreasonable for NRC to propose a standard based upon a notion antithetical to our Constitution. This is doubly the case since the proposed regulations authorize NRC to require a low-level waste repository licensee to provide funding for institutional controls of indefinite duration. Proposed § 61.63. Similar objections apply to NRC's argument in support of its preference against any disposal which may require long-term maintenance.

C-4

D. The Concentration Limits for Alpha-Emitting Transuranic Isotopes Specified in Column 3 of Table 1 Are Unreasonably Low.

Table I to Part 61 proposes a 10 nCi/gm limit on alpha-emitting transuranic (TRU) waste for purposes of disposal as low-level waste. The 10 nCi/gm limit for TRU waste is totally arbitrary. It was not established on the basis of health effects

D-55-3

[1] Our Constitution contains no provision for the dissolution of our government. Marbury v. Madison, 5 U.S. 1 Cranch) 137 (1803). As Chief Justice Marshall explained, "[t]he [Constitution's] principles . . . so established, are deemed fundamental. And as the authority from which they proceed is supreme, and can seldom act, they are designed to be permanent." Id. A Civil War was fought over this issue. As President Lincoln observed in his First Inaugural Address (March 4, 1861):

> "A disruption of the Federal Union heretofore only menaced, is now formidably attempted.
>
> I hold, that in contemplation of universal law, and of the Constitution, the Union of these States is perpetual. Perpetuity is implied, if not expressed, in the fundamental law of all national governments. Is is safe to assert that no government proper, ever had a provision in its organic law for its own termination." IV Collected Works of Abraham Lincoln 264 (R.P. Basler, ed., 1953).

or hazards. Instead, it was "derived from the upper range of concentrations of radium-226 in the earth and is subject to modification based on long-term studies of nuclide migration in soil." AEC Manual, Chapter 511 at p. 51 (Sept. 19, 1973). Kerr-McGee is aware of no health or safety reason for maintaining the 10 nCi/gm TRU limit. The limit may readily be raised by at least a factor of ten without posing any serious health or safety hazard under the conditions NRC applies to Class C "intruder" waste.

D-55-3

NRC's rationale for retaining the limit at 10 nCi/gm is three-fold. First, NRC asserts that past experience has indicated that the 10 nCi/gm limit is "achievable." See Draft EIS on 10 CFR Part 61 at 7-15. The notion of "achievability" as used by NRC apparently means that NRC believes that wastes can be limited for low level disposal to 10 nCi/gm. The fact that 10 nCi/gm is "achievable" in the sense that some wastes meet that limit does not mean that the standard is defensible or desirable. To the contrary, 10 nCi/gm is neither defensible nor desirable. The bulk of the TRU waste in the hands of NRC licensees exceeds 10 nCi/gm in concentration. It cannot realistically be reduced in concentration. Moreover, most of this waste results from decommissioning activities.[16] There are currently no facilities available for disposal of the TRU

[16] See generally Rockwell Int'l (Rocky Flats), Transuranic (TRU) Waste Management Program: U.S. Department of Energy Acceptance of Commercial Transuranic Waste (Feb. 1980 (revised)) (describes amount of TRU waste held by NRC-licensees).

waste in question. This essentially precludes prompt decommissioning of the NRC-licensed facilities.[17] This is contrary to the public interest in timely decommissioning and is wasteful of resources. The 10 nCi/gm standard is therefore not "achievable" if viewed in the context of the TRU-waste disposal problem.

D-55-3

Second, NRC contends that the 10 nCi/gm TRU limit is warranted by radiation dose calculations. This contention is not supported in NRC's rationale. According to the Draft EIS, the 10 nCi/gm limit was supposedly derived on the basis of an intruder/construction scenario and an intruder/agriculture scenario. Assuming arguendo that intruder hypotheses are appropriate bases for setting concentration limits,[18] neither intruder scenario envisioned by NRC warrants the 10 nCi/gm limit on TRU waste suggested in proposed 10 CFR Part 61. Under the intruder/construction scenario, NRC assumed that institutional controls would fail one-hundred years after closure of the repository and that a person would erect a dwelling atop the disposal trenches, excavating three meters down from the surface in doing so. See Draft EIS on to 10 CFR Part 61 at G-58. Under the intruder/agriculture scenario, NRC

[17] Kerr-McGee estimates that it has 10,000 to 30,000 cubic feet of TRU waste from decommissioning activities at its former small mixed oxide plant in Cimarron, Oklahoma. This waste exceeds 10 nCi/gm in TRU concentration. No commercial facility is available for disposal of this waste. Kerr-McGee cannot complete decommissioning until a repository is available for this TRU waste.

[18] Kerr-McGee objects generally to the use of intruder scenarios for setting concentration limits for the same reasons noted in Part C above.

assumed that some of the soil excavated in the intruder/construction scenario is scattered about the ground around the house and that vegetables are grown in it. See id. at G-61.

Neither of these scenarios would result in any exposure to TRU waste. Proposed section 61.52(a)(3) requires that Class C waste (which includes all TRU) be so disposed "that the top of the waste is a minimum of 5 meters below the surface of the cover." (Emphasis added.) Even if three meters of soil were excavated for a house, two meters would of soil would remain separating the basement slab from the TRU. The construction intruder accordingly cannot come into contact with the TRU. Similarly, no TRU would be brought to the surface to result in exposure in the agricultural scenario. In sum, NRC's calculations of intruder exposure to TRU are in error because the agency failed to give credit for five meters of cover."

D-55-3

The agency's intruder scenario calculations are incorrect for an additional reason. NRC calculated airborne

" The intruder scenarios envisioned by NRC are in any event unduly conservative. It is unreasonable to assume that a residence will be constructed atop a government owned repository and that people will occupy the site for a significant period of time. It is also important to note that NRC cannot alter the intruder scenarios so that exposure to TRU waste disposed in accordance with the regulations can be realistically projected. Under the proposed regulations the repository will be sited, among other things, so as to be protected from a 100 year flood and the waste will be buried. Under these circumstances, the principal means of erosion will be sheet erosion. Many thousands of years will be required to erode five meters of cover under the applicable universal soil loss equation. See Conservation Agronomy Technical Notes, Note No. 291 (June 9, 1981) (Exhibit M).

radioactive concentration for the intruder scenarios using Equation G-11, which can be represented by

$$Tsa = X/C_3 = (Tsa)_o \ (10/V) \ (S/30) \ (50/PE)^2$$

where

Tsa = ratio of airborne concentration to soil density, dimensionless.

X = average airborne concentration, Ci/m^3.

Cs = average soil concentration, Ci/m^3.

$(Tsa)_o$ = reference airborne to soil radioactive concentration ratio, dimensionless.

$= 2.53 \times 10^{-10}$

V = mean wind speed, m/sec.

= 3.61 m/sec.

10 = reference mean wind speed, m/sec.

S = Soil silt content, percent.

= 50

30 = reference soil silt content, percent.

PE = Thornwaite's precipitation - evaporation index, dimensionless.

50 = reference PE index, dimensionless.

D-55-3

Equation G-11 essentially states that the airborne radioactive concentration due to wind resuspension is inversely proportional to the mean wind speed and the square of the moisture content. However, if this were true, wind resuspension would increase as the mean wind speed decreases, which cannot be.

Wind resuspension source terms have been shown by field measurements to be proportional to the cube of the wind

D-55-3

speed above a threshold value and inversely proportional to the square of the moisture content,[**] or

$$Q \sim V^3/PE^2 \text{ where}$$

Q = wind resuspension source term, Ci/sec.

The corresponding airborne radioactive concentration can be represented by $X \sim Q/V$ indicating that the greater the wind speed the more dilution. Hence, substituting $Q \sim V^3/PE^2$ into $X \sim Q/V$, we derive $X \sim V^2/PE^2$. In sum, the term (10/V) in Equation G-11 should be inverted and then squared. If the term is merely inverted, the value for Tsa becomes 4.60×10^{-11} instead of the 3.53×10^{-10} calculated by NRC. This would result in a reduction in inhalation doses by a factor of 7.7 in the intruder scenarios.

<u>Third</u>, NRC argues that most of the economic gain from raising the 10 nCi/gm limit would be negated by measurement problems. In many instances, measurement may be expensive. However, Kerr-McGee believes that reasonably economic measurement techniques involving alpha-counting may be devised, at least for its TRU waste from decommissioning. Moreover, no commercial facility is currently available for disposal of TRU wastes contaminated in excess of 10 nCi/gm. NRC should permit its licensees the option of disposal of at least some of this higher concentration of TRU by near-surface methods since

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** P. Bagnold, The Physics of Blown Sand and Desert Dunes (1941); Momeni, et al., The Uranium Dispersion and Dosimetry (UDAD) Code (Nureg/cr-0553) (May 1979).

D-55-3

there are no alternative repositories available and since there are no health or safety reasons to retain the current stringent disposal limit.

In conclusion, NRC's rationale for maintaining the current 10 nCi/gm limit for TRU is insufficient. The agency should raise the limit by at least one order of magnitude.

E-1

F. <u>The Surety Requirements Set Forth in the Proposed Rule Are Beyond NRC's Authority and Improper</u>

Proposed § 61.62 requires financial surety for monitoring and closure requirements. The only surety authority enjoyed by NRC, beyond NRC's power to examine financial status in reviewing license applications, is with respect to uranium mills. 42 U.S.C. § 2210(x). That authority was specifically conferred by Congress in section 203 of the Uranium Mill Tailings Radiation Control Act (UMTRC Act) of 1978. That specific provision would be superfluous if, as NRC now contends, the agency all along possessed general authority to require sureties. It is elementary that a statute should not be interpreted so as to render any of its provisions a nullity. <u>See</u>, <u>e.g.</u>, <u>United States</u> v. <u>Menasche</u>, 346 U.S. 528, 538-39 (1945); <u>Abatacor, Inc.</u> v. <u>United States</u>, 571 F.2d 552, 557 (Ct. Cl. 1978); <u>Kenneth</u> v. Schmoll, 482 F.2d 90,94 (10th Cir. 1972); <u>Tabor</u> v. <u>Ulloa</u>, 323 F.2d 823, 824 (9th Cir. 1963). NRC's assertion of authority to impose a surety requirement absent express statutory authority is unlawful.

Proposed § 61.62 is arbitrary for a wholly different reason: it bars the use of self-insurance. NRC's rejection

of self-insurance alternatives is also arbitrary and unsupported. Many of the Commission's licensees are large, financially sound corporations, such as public utilities and energy companies. These licensees are at least as financially sound and stable as the bonding companies, insurance companies, and banks which would be the sources of the surety which NRC seeks to require. It is simply an unnecessary tie up of working capital and an unwarranted subsidy to the banking and insurance industries to require operators of nuclear facilities to purchase surety bonds or insurance from outside organizations. Moreover, there is no evidence that alternatives to self-insurance are available. Indeed, Kerr-McGee has determined that surety bonds are generally not available for stabilization of uranium mill tailings.[*1] E-1

NRC accepts self-insurance to fulfill financial protection requirements for operators of nuclear reactors and certain other nuclear facilities. See 10 CFR §§ 140.11, 140.12, 140.14, 140.15(b). Other agencies likewise endorse self-insurance. See, e.g., 30 CFR § 800.5, 800.12, 806.11(b), modified, 45 Fed. Reg. 52306 (Aug. 6, 1980) (Office of Surface Mining authorizing self-bonding for final reclamation); 33 CFR §§ 135.203, 205 & 213 (offshore oil); 46 CFR §§ 540.5(d), 542.8(a)(3), 543.8 & 544.8 (Trans-Alaska Pipeline); 49 CFR §§ 1043.5(a) & 1084.7 (motor carriers and freight forwarders).

[*1] See, e.g., Letter, Mr. Provost (Surety Ass'n of America) to Mr. Lingo (Kerr-McGee) (Exhibit N).

These provisions demonstrate the propriety and workability of self-insurance surety mechanisms.

Self insurance accompanied by a financial test (e.g., a demonstration of the financial well-being of the licensee on an annual basis) will satisfy any legitimate health and safety concerns while at the same time costing licensees much less. The additional expense attendant upon the financial arrangements preferred by NRC is not counterbalanced by any benefits. It is "arbitrary and capricious for the Agency to reject obviously less burdensome but equally effective controls in favor of more expensive or onerous ones." South Terminal Corp. v. EPA, 504 F.2d 646, 676 (1st Cir. 1974). NRC should at the very least permit self insurance accompanied by a financial test. E-1

III. Miscellaneous

1. Uranium and alpha-emitting radionuclides. The table limits low-level disposal of U-235 (enriched uranium) to 40 nCi/cm^3 and natural or depleted uranium to 50 nCi/cm^3. The notes to table 1 propose to restrict alpha-emitting radioisotopes other than radium to the values for U-235 (40 nCi/cm^3) for purposes of low level waste disposal. In the event that the limit for alpha-emitting transuranics is raised to 100 nCi/gm (or more) for purposes of Class C intruder waste, the limits for U-235, natural or depleted uranium, and alpha-emitting radionuclides should be raised to a similar level for Class C disposal. NRC's basic rationale for limiting disposal D-55-1

D-55-1 of uranium and alpha-emitter's is (as a general matter) no more applicable to these radionuclides than it is to alpha-emitting transuranics.

A-8 2. Land disposal other than near surface. The proposed Part 61 regulations at several points reserve subsections for requirements applicable to land disposal other than near-surface. See, e.g., proposed § 61.51(b). Kerr-McGee supports the concept of an intermediate-level waste facility permitting land disposal of higher-concentration TRU waste than is permitted at low-level waste facilities. The Company believes that NRC, EPA and the Department of Energy should promptly finalize plans and requirements for such a facility and that it should be made available for permanent disposal of TRU-waste resulting, among other things, from decommissioning activities. Such a facility would fully protect the public health and safety and be far more economic that a deep geologic repository for high level waste.[42]

ED-1 3. Proposed § 61.23(g) refers to a § 61.60. There is no § 61.60.

[42] See Winograd, Radioactive Waste Disposal in Thick Unsaturated Zones, 212 Science 1457 (1981) (Exhibit O).

TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

'82 FEB -9 P4:00

emp

February 4, 1982

(116)

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

DOCKET NUMBER
PROPOSED RULE PR-2 etal (46 FR 38081)

(43)

Attention: Docketing and Service Branch

DOCKET NUMBER
PROPOSED RULE PR-61 (46 FR 51776)

Dear Sir:

The Tennessee Valley Authority (TVA) is pleased to provide comments on the proposed amendments to 10 CFR Parts 2, 19, 20, 21, 30, 40, 50, 51, 61, 70, 73, and 170 concerning licensing requirements for land disposal of radioactive waste as noticed in the July 24, 1981 Federal Register notice (46 FR 38081-38105) and comments on NUREG-0782.

We appreciate the opportunity to comment and our specific comments are enclosed.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Regulation and Safety

Enclosure
cc (Enclosure):
Executive Secretary
Advisory Committee on Reactor Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Mr. Tom Tipton
AIF, Inc.
7101 Wisconsin Avenue
Washington, DC 20555

Acknowledged by card 2/16/82 emp

ENCLOSURE

E-1 1. Page 38086, last paragraph in column 1—This paragraph would require a licensee (disposal facility operator) to provide financial responsibility for a disposal site even after it has been turned over to a Government agency for long-term institutional care and monitoring. Since the institutional care period could last as long as 100 years, a licensee's money could be tied up for 100 years. We believe it would be preferable to have the licensee turn over the site and any required money at the time that the license is transferred to the Government.

ED-1 2. 10 CFR 61.41, first sentence—We believe the term "general environment" should be defined and suggest the definition should be similar to the same term in 40 CFR Part 190.

GEN-1 3. 10 CFR 61.51(a)(4)—We suggest changing "prevent" to "minimize" and, in 10 CFR 61.51(a)(6), changing "eliminate" to "minimize."

D-52-4 4. 10 CFR 61.51(a)(7)—We believe this item should be deleted since many activities usually take place at a disposal facility other than disposal of radioactive waste. Some facilities are used for transportation equipment storage, empty container storage, and a center for radwaste services to nuclear plants. This regulation could have a significant impact on present disposal sites and conflicts with 10 CFR 61.11(c)(4).

ED-1 5. 10 CFR 61.52(a)(4)-(10)—It appears that these regulations apply to Class A, B, and C waste. However, 10 CFR 61.52(a)(2) says that these regulations apply to Class B waste. We believe this should be clarified.

D-52-3 6. 10 CFR 61.52(a)(8)—We believe the designation of a minimum distance of 100 feet for the buffer zone does not appear to be necessary. We support the need for a buffer zone but the distance criteria should be determined by site specific and other factors of the disposal facility to meet the performance objectives of Subpart C of this part.

ED-1 7. 10 CFR 61.55, Table 1—The limits for some of the isotopes in this table are the same for all three classes of waste. We suggest the regulations should contain statements that any waste containing these isotopes in concentrations exceeding these limits cannot be disposed of at a near-surface disposal facility.

D-56-8 8. 10 CFR 61.55(b)(2) and 61.56(b)— The stability requirement of at least 150 years for Class B stable waste appears inconsistent with the institutional control period of up to 100 years (see paragraph 61.59(b), page 38097). As discussed in paragraph 61.7(b)(4), page 38091, Class B stable waste contains the ". . .types and quantities of radioisotopes that will decay during the 100-year period to levels that do not pose a danger to public health and safety." Therefore, for waste in this classification, there does not seem to be a need for stability requirements beyond 100 years.

D-56-8 Also, it is not obvious why the stability requirement for Class C intruder waste is given as at least 150 years. This waste classification specifies a maximum concentration of radionuclides so that at the end of 500 years, the remaining radioactivity is at a level that does not pose a danger to public health and safety (see paragraph 61.7(b)(5), page 38091). Therefore, for this waste in this classification, the stability requirements should be for 500 years.

M-1 9. 10 CFR 20.311(d)(5)—It appears this regulation requires that a copy of the shipping manifest be sent to the intended recipient (possibly by mail) at the time of shipment. If shipments are sent by truck it is very likely that the truck will get to the disposal facility before the advance copy of the manifest. Therefore, this method would not provide a way of providing prior notification of the intended shipment.

We believe the substance of the information required by this regulation is already required by the Department of Transportation (DOT). We suggest the procedure be revised to require only the submittal of copies of the material sent to DOT. This requirement should be placed in 10 Part CFR 61 or 10 CFR Part 71 and not 10 CFR Part 20.

10. NUREG-0782, Volume 3, Table E.2, Page E-21—We believe the concentration should be in $\mu g/m^3$ instead of mg/m^3. Also the annual average secondary standard of 60 $\mu g/m^3$ for sulfur dioxide was revoked in 1973. The current annual average primary sulfur dioxide standard is 80 $\mu g/m^3$. Also, this table includes only four of the seven pollutants for which standards have been developed. We suggest inclusion of the remaining three—carbon monoxide, ozone, and lead.

Texas Department of Health

Robert Bernstein, M.D., F.A.C.P.
Commissioner

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Robert A. MacLean, M.D.
Deputy Commissioner
Professional Services

Hermas L. Miller
Deputy Commissioner
Management and Administration

February 1, 1982

(117)
PR-2 et al
(46 FR 38081)

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

Attn: Docketing & Service Branch

Dear Sir:

We appreciate the opportunity to comment on Proposed CFR Part 61, Licensing Requirements for Land Disposal of Radioactive Waste (46 FR 38081). As an Agreement State radiation control agency, the development of these rules is important to us since in all likelihood they will be items of compatibility. It is our opinion that these rules are essential to the future of the safe handling and disposal of low-level radioactive waste.

Comments were solicited from our staff and from radioactive material licensees of our Agency. A list of the major comments received is enclosed.

Yours truly,

David K. Lacker

David K. Lacker, Chief
Bureau of Radiation Control

Enclosure

COMMENTS ON PROPOSED 10 CFR PART 61

ED-1

61.2 - Definitions

The definition of disposal indicates that the waste is isolated from the biosphere. In some areas the minimum covering of five meters of soil would not be adequate to completely isolate the waste from certain plant root systems or burrowing animals.

D-51-1

61.51 - Disposal Site Design for Land Disposal

It is recommended that preferential consideration be given to a progressive slope design for burial of radioactive waste. The reason is to prevent vertical walls which contain fractures, bedding planes and joints as avenues for exit of liquids.

D-55-14

61.55 - Waste Classification

More consideration should be given to separation by half-life prior to burial so that the material with shorter half-lives could be stored for several years and retrieved rather than this material taking up permanent space in a disposal site.

M-1

Part 20 - Manifest System

It is felt that generators shipping to intermediate processors should not have to package and classify the material as Class A, B, or C. To package Class B or C waste in packages which will last 150 years seems overly costly and unnecessary for short shipments which are to be repackaged.

Atomic Energy of Canada Limited
Research Company
Chalk River Nuclear Laboratories

L'Énergie Atomique du Canada, Limitée
Société de Recherche
Laboratoires Nucléaires de Chalk River

MEMORANDUM

Chalk River Environmental Authority FEB 16 1982 January 21

env 1

Dr Paul Lohaus
Low-Level Waste Licensing Branch
U.S. Nuclear Regulatory Commission (118)
WASHINGTON, D.C. 20555
U.S.A.

(45)

PROPOSED RULE PR-2 et al (46 FR 32081)

COMMENT NUMBER
PROPOSED RULE PR-61 (46 FR 51776)

Dear Paul:

As discussed with you by telephone (82/1/11), I would like to make further comments on the draft regulation 10 CFR 61 as given in Volume 1 of NUREG-0782.

ED-1 Section 61.56, section (a) makes it clear that the requirements in that section are minimum requirements for all three classes of waste. However section (b) does not make it clear that it only applies to Classes B and C as was the intent of the regulation. This could be corrected by adding "in Classes B and C" after "waste" in the third line of 61.56 (b).

D-55-1 Also it appears inconsistent to allow "natural specific activity" for natural or depleted uranium metal while only allowing 0.05 uCi/cm^3 for other forms of U such as UO_2, since uranium can oxidize in room temperature water to form UO_2^2. Also the product of this reaction, a flocculant uranium oxide powder, has a high surface area and is much more amenable to dispersion than UO_2 pellets.

As written, Table 1 of 10 CFR-61 allows up to 30 kg of UO_2 in a drum but excludes a single UO_2 pellet under the 0.05 uCi/cm^3 maximum concentration regulation. I understand that the intent of the regulation was not to exclude quantities of natural UO_2 and the regulation will be revised.

ED-1 I understand that the alpha emitting transuranic isotopes or Pu-241 are allowed under Columns 1 and 2 of Table 1 at the same level as under Column 3 and that the Table will be rewritten to show this.

I still don't quite understand the concentration limits stated in terms of theoretical maximum specific activity (TMSA) which is defined as the radioactivity of a nuclide per unit mass of that nuclide e.g. Ci of Co-60 per g of Co-60. The TMSA is about 1.1 x 10^6 µCi/g of Co-60. Over what volume of waste is this activity to be averaged, one cm^3?

ED-1 A last comment. Section 61.23 (g) refers to 61.60 on the last line. There is no section 61.60.

I hope these comments will be of some use to you.

Yours sincerely,

inel

MAF:sa

M.A. Feraday

Department of Energy
Washington, D.C. 20545

'82 FEB 18 AM 8:47

emp

FEB 16 1982

Mr. Samuel Chilk
Secretary, Nuclear Regulatory Commission
Attention: Docketing and Service Branch
Washington, D.C. 20555

(119)

DOCKET NUMBER PR-2 etal
PROPOSED RULE (46 FR 38081)

Dear Mr. Chilk:

The Department of Energy (DOE) is pleased to provide comments on the proposed regulation, 10 CFR 61, published July 24, 1981 (46 FR 38081). We believe that, with the modifications we propose, the rule will greatly assist the States and commercial sector in establishing additional low-level waste disposal capacity.

C-1 We support the philosophy of establishing performance objectives for a disposal facility based on public health and safety requirements. However, the proposed regulation is restrictive in some cases by setting both overall performance objectives and technical requirements, which could increase the costs and occupational health impacts without any commensurate benefits in increased safety. These items are specifically denoted in our detailed comments. Primary emphasis should be on the overall performance objectives, and the Commission should provide applicants with flexibility to propose specific subsystem performance criteria based on a systems approach which considers site characteristics, design, and operating practices.

Since we did not have sufficient time to thoroughly evaluate all the calculations in the draft Environmental Impact Statement (DEIS), nor to review the supporting Data Base (NUREG/CR-1759), our comments focus on the regulation itself.

Our specific comments on the proposed regulation are provided as Enclosure A. We are also submitting discussion papers on issues of major concern as Enclosure B. Our principal concerns are in the following areas which are discussed further in Enclosures A and B:

D-55-1 (1) Specific nuclide concentration limits.

The concentration limits for carbon-14, niobium-94, and nickel isotopes in Table 1 are unreasonably low and could control disposal options. Application of these limits will be burdensome and expensive, and will impose significant economic penalties without commensurate increases in public health or safety. These limits appear to result from unrealistically conservative scenarios. Alternative scenarios are proposed (Enclosure B).

C-4 (2) Dose limits under the intruder scenarios.

The dose rate limit for the intruder scenarios controls all disposal limits and exercises inordinate control over potential disposal site

2/22/82 emp

C-4 options. This limit is overly conservative; a more realistic assumption for the intruder might be to use criteria similar to those used by the National Council on Radiation Protection and Measurements (NCRP) (Enclosure B).

D-55-3 (3) The definition of transuranic waste.

A transuranic nuclide concentration limit should be established using pathway analyses as performed for other radionuclides. We are reassessing the 10 nCi/g limit in terms of environmental, health, and safety considerations and recent EPA and NCRP efforts (Enclosure A, 1.d).

A-8 (4) Non-near surface disposal.

The Commission's approach may require a separate facility for non-near surface disposal which may result in institutional impacts similar to those associated with a high-level waste disposal facility. The Department is evaluating other disposal alternatives for such wastes and believes it is premature to commit to such facilities (Enclosure B).

D-55-2 (5) Establishment of de minimus levels.

We encourage the Commission to continue to establish de minimus levels for various waste streams or specific radionuclides which would be exempt from 10CFR61 (Enclosure A, 1.c).

D-59-2 (6) Institutional Control.

The Department believes that the duration of institutional control period significantly affects the cost of waste disposal. The Commission's basis for limiting institutional control should be examined (Enclosure A, 1.a).

As you know, the Department's management of low level waste is exempt from this regulation; however, we are aware of the need for this rule in the commercial area and are ready to assist the Commission's staff. The revised language which we are submitting should help in preparing the final rule.

Sincerely,

F E Coffman

Franklin E. Coffman
Acting Deputy Assistant Secretary
for Nuclear Waste Management
and Fuel Cycle Programs
Office of Nuclear Energy

Enclosures

Enclosure A

COMMENTS ON PROPOSED REGULATION 10 CFR 61

1. General Comments

D-59-2

a. Institutional Control - The Department believes that the duration of institutional control significantly affects the cost of waste disposal. Disposal of Class B waste would be significantly more expensive than Class A waste. For example, raising the institutional control period from 100 to 300 years would increase the Class A limits for Co-60, Ni-63, Sr-90, Cs-137, and H-3. The increase of a factor of 100 for Sr-90 and a factor of 44 for Cs-137 are particularly significant since this would allow larger volumes of mixed fission product waste to be classified as less expensive Class A waste.

Therefore, the Commission's basis for limiting institutional control to 100 years should be reexamined. Such controls have existed in this country for more than 100 years. Loss of institutional controls would generate more serious public concerns than those presented by a low-level waste disposal site.

C-4

b. Intruder Scenario - The inadvertent intruder scenarios are similar in many respects to scenarios in Paragraph 259 of NCRP report No. 39 for accident scenarios in less urgent emergencies in that a limited number of members of the general public may become inadvertently exposed to radiation. An annual dose connotes chronic exposure and seems unwarranted and inappropriate to use for an intruder. (For additional information see the discussion paper in Enclosure B.)

D-55-2

c. De Minimus Levels - Values and/or criteria for wastes and waste streams which could be exempt from 10 CFR 61 should be defined in establishing de minimus levels. We recommend that serious consideration be given to the establishment of de minimus levels for radionuclides such as ^{235}U, ^{99}Tc, Pu, and Np in consultation with the Environmental Protection Agency.

D-55-3

d. Definition of Transuranic Waste - The transuranic nuclide concentration limit established should be consistent with health and safety limits using realistic pathway analyses as performed for other radionuclides in Table 1. The Department is reassessing the limit it established for its operations in 1970 using environmental, health, and safety considerations. The Commission should consider recent NCRP and EPA studies in recommending the establishment of higher transuranic concentration limits. Waste streams may be processed which would result in TRU or low-level waste according to the level of alpha activity, and disposed of accordingly. A concentration limit that is presently being considered by the Department is 100 nCi/g of alpha activity from radionuclides with half-lives greater than 20 years.

GEN-2

e. Quality Assurance - Future regulatory guides should address quality assurance with respect to site characterization, designs, construction, tests, measurements, etc. Practical, specific quality assurance program requirements should be created for land disposal activities.

D-55-6

f. Requirements for detailed waste data - The proposed waste classification system implies detailed radioisotopic information for all constituents of the waste. Such a requirement would be unnecessary, costly, and could lead to increased occupational exposure. The Commission's intentions regarding this area should be made clear.

D-55-8

g. Volume Reduction - Some of the radionuclide concentration limits in Table 1 may inhibit volume reduction. This could occur when a specified radionuclide reaches its limit. For example, C-14 could limit reactor waste although it is not the most prevalent or most hazardous radionuclide. The Commissioners have issued a policy statement supporting volume reduction and the regulations should be consistent.

5D-1

h. Land Ownership - The United States Government owns land. Federal agencies administer the land. The Commission should be consistent on this point throughout the regulation.

2. Summary of Rule -

ED-1

Section G. - The Commission should state whether a safety evaluation report is to be prepared by staff prior to the issuance of a license.

A-1

Section H. - The summary states "it would be the Commission's intent that all future disposal would be expected to comply with the provisions of Part 61." The NRC should recognize that in Agreement States regulations must be promulgated by state authorities.

ED-1

The summary should acknowledge that future regulatory guides will address the Commission's thinking in certain areas, e.g., site suitability.

A-1

3. Section 61.1 (b) - This section states ". . .the regulations in this part apply to all persons in the United States." An additional clause should be added to this sentence to read ". . .States where the Commission retains authority."

ED-1

4. Section 61.2 - The term "custodial agency" must be defined as it is used in Sections 61.59 and 61.62.

D-51-4

5. Section 61.2 - To differentiate between intruder barrier and engineered barrier, "Engineered barrier" should be defined as "a man-made structure or device intended for the purpose of confining the waste and limiting the migration of the waste components or to protect an inadvertent intruder from direct exposure to the waste."

ED-1

6. Section 61.6 - The title should be changed to read "Specific Exemptions."

D-55-10 Section 61.7(b)(2) - In view of our comments on Table 1, the Commission should indicate which radionuclides could serve in establishing the maximum disposal site inventory.

B-7 8. Section 61.7(c)(3) - We question the basis for applying the 5 year post-closure observation period for all cases. We suggest that in some cases a shorter period may be justified, for example, if a facility has operated for 30 years without major problems. On the other hand, a longer period may be justified when facilities have operated for shorter periods or have extenuating circumstances.

ED-1 9. Section 61.7(b)(4) - Delete line 10 and replace with "an unacceptable hazard to an intruder or to".

10. Section 61.7(b)(5) - Line 17, insert after "pose", "an unacceptable hazard to an intruder or" and delete "a danger".

B-1 11. Section 61.23(a) - This section states that the applicant should be qualified by reason of training and experience. This might tend to rule out new companies and would lead to monopolies by present companies. It is suggested that "and" be replaced with "or".

ED-1 12. Section 61.23(g) - There is no Section 61.60 as stated in this section.

13. Section 61.24(h) - It is suggested that the phrase "or thereafter" be deleted. Changes after the issuing of a license should be limited to those needed to protect health and safety or should be negotiated with the licensee.

B-5 14. Section 61.27(d) - This section discusses license renewal, although no prior section discusses license duration. The Commission should indicate the amount of time for which a license is issued.

B-8 15. Section 61.31 - The Commission should specify more clearly in the regulation the custodial agency license conditions. We assume that the license conditions will change as a result of the license transfer from the operational phase to the custodial phase.

C-3 16. Section 61.41 - The basis for the drinking water limits should be provided.

D-50-1 17. Section 61.50(a)(2) - It is not clear what constitutes a capability of being modeled, analyzed, or monitored. A more specific statement, such as "the site shall be located in areas where hydrogeologic conditions allow reliable, technically conservative performance evaluations through characterization, modeling, analyses, and monitoring. That is, the site must be able to be described using basic model assumptions, and the input parameters required for a model simulation must be measurable, attainable, and distributed in a definable manner."

D-50-3 18. Section 61.50(a)(5) - This paragraph requires the disposal site to be "generally well drained." This is difficult to quantify and is adequately covered by the remainder of the sentence. Delete "generally well drained and ..." "Coastal high-hazard area or wetland" needs to be defined. The Commission should establish procedures for an applicant to propose mitigation measures which would allow for exemptions to specific technical requirements.

19. Section 61.50(a)(6) - The term "upstream drainage area" needs to be explained.

D-50-2 20. Section 61.50(a)(7) - Sufficient depth to the water table should be more specifically defined as that depth completely above (or below) the transection zone between the saturated and unsaturated zones. The transection zone is the zone over which the water table and the capillary fringe cap fluctuate.

We believe that the intent of this requirement is that the water table shall not cyclically rise into and fall beneath the buried waste. Burial beneath the water table could be satisfactory, if diffusion is the controlling rate (as stated in this paragraph), if the travel time is very slow, if the performance objectives can still be met, and if the water table never drops below the buried waste.

D-50-5 21. Section 61.50(a)(9) - It would be sufficient to say that active seismic faults or volcanic sites are considered unsuitable. Tectonic processes such as faulting or folding occur on a time scale so much longer than the disposal site lifetime to make this paragraph meaningless. Seismic effects would have trivial impact; volcanic activity would have such overriding direct impacts as to make any effect on the disposal site inconsequential.

ED-1 22. Section 61.51(a)(1) - The term "long-term isolation" needs to be clarified. Adding "after site active operations cease" at the end of the statement would help.

D-51-1 GEN-1 23. Section 61.51(a)(6) - This section establishes technical requirements which are impossible to meet and demonstrate because all soils contain some moisture. Our understanding is that the objective of this section is to minimize contact between water and waste. The following paragraph is a suggested replacement:

> "The disposal site must be designed so that storage areas for waste are well drained and protected from the weather. Disposal areas should be designed to minimize the contact time between percolating water and waste and to eliminate standing water contact with the waste."

D-52-1 24. Section 61.52(a)(1) - This paragraph states that Class A wastes "must be segregated from other wastes by placing them in disposal units which are sufficiently separated from other units so that there is no interaction

D-52-1 between them." It is not clear what kinds of interactions (e.g. chemical, physical) are to be avoided.

D-55-13 25. Section 61.52(a)(4) - It is not clear whether paragraphs (a)(4) through (10) of this section apply only to Class B stable waste, as stated in 61.52(a)(2), or also to other classes of waste.

D-52-2 26. Section 61.52(a)(4) and (5) - It is not clear why these technical requirements, which would increase disposal costs, are needed if the overall performance objectives established elsewhere in the regulation were met.

D-52-3 27. Section 61.52(a)(6) - The phrase "a few percent" is vague. The level of gamma radiation at the surface of a trench cover should be specific. "Within a few percent" should be replaced with "no more than 10 percent" if measuring within 10 percent is feasible. An alternative approach would be to use survey meters in order to take corrective action following trench covering should the surface radiation limit exceed 1 mrem/hr, as this has been an operating practice used by the Department.

D-51-2 28. Section 61.52(a)(9) - No additional site closure requirements that would reduce the likelihood of inadvertent intrusion are discussed. Such requirements should be added. One example is requiring that permanent monuments be provided for the site.

A-7 29. Section 61.54 - It is our understanding that this section allows applicant to propose site specific requirements for waste segregation and disposal and facility design and operation. We strongly support this flexibility and recommend that the Commission stress this feature of the regulation in the future.

D-55-6 30. Section 61.55, Table 1 - This table gives specific radionuclide concentration limits for three proposed classes of waste. This table could imply that all radionuclide concentrations have to be quantitatively measured in order to classify the waste. It would be costly, by as much as a factor of two or three, and impractical to quantitatively measure the concentration of each radionuclide in each waste container. Many wastes contain a large number of radionuclides, but only a few would be significant in determining the potential hazard and, therefore, the category of the waste. The regulations should specifically state that radionuclide concentrations can be estimated by using techniques such as: consideration of external radiation levels, ratios of known radionuclide concentrations, or the source of the waste.

D-56-2 31. Section 61.55, Table 1 - A footnote states that wastes containing chelating agents in concentrations greater than 0.1 percent by volume cannot be buried without specific Commission approval. Strong decontamination solutions used in the nuclear industry can exceed this limit. Wastes containing chelating agents which are solidified with cement or

D-56-2 other acceptable media should be accepted without limit, other than radionuclide concentration, at disposal site. As a minimum, low activity Class A wastes should not have this restriction since the limits for Class A wastes are based on the intruder scenario and not on groundwater migration.

ED-1 32. Section 61.55, Table 1 - Footnote 3 does not refer to any waste class, but only Class C intruder wastes. For clarity it should read: "Maximum allowable concentration for near surface disposal."

D-55-7 33. Section 61.55, Table 1 - The concentration limits for all radionuclides except transuranic nuclides are expressed in terms of microcuries per cubic centimeter, and averaging over the volume of the package is specifically permitted. The limit for transuranic nuclides is in terms of nanocuries per gram, but the regulations do not say whether this can be averaged over the weight of the package. Averaging over the weight of the package should be permitted.

D-56-5 34. Section 61.55, Table 1 - As presently written, the maximum concentration permitted for krypton-85 in a Class B waste would be that of Cs-137, 44 Ci/m^3, or 440 Ci/m^3 if contained in metal. This eliminates disposal of immobilized krypton-85 in dry wells. Disposal of krypton-85 immobilized by zeolite encapsulation or ion implantation into a metal may be the most effective means of management. The rules should be written so as not to eliminate this mode of disposal. This may be done by categorizing the maximum specific activity (for 7% krypton-85 in stable krypton) as a Class B waste (Column 2 in Table 1). Since for the waste forms under consideration, the maximum concentration in the closed container would be less than 5×10^6 Ci/m^3, the specified contained concentration should be increased to 5×10^6 Ci/m^3.

D-55-1 35. Section 61.55 - This section establishes three categories of waste suitable for near surface disposal. Class A is the lowest radioactivity concentration category. Class B is an intermediate category with stricter packaging criteria to ensure that the package retains its shape. Class C waste is the highest concentration waste allowed and requires special measures for protection against future inadvertent intrusion in the future. Waste exceeding Class C limits is not acceptable for near surface disposal. Based upon NUREG/CR-0130, non-fuel activated components inside the reactor vessels of commercial plants would also exceed the limits for Ni-59, Ni-63, and C-14. This restriction was apparently not intended since it states on page 61.7 of the preamble that light water reactor non-fuel activated components were expected to fall into the intermediate Class B category. Since major corrosion of these materials would be required to release the radioactivity, it is recommended that such materials be accepted with a minimum increase of a factor of 1000 in the limit on nickel concentration. (For additional information see the discussion paper in Enclosure B.)

ED-1 36. Section 61.55(d) - The term "near surface disposal" is used and therefore implies a non-near surface disposal concept may be suitable for certain wastes. There is a need to define the non-near surface concept.

ED-1 37. Section 61.55(d) - It would be technically more correct to have this sentence read: "Waste that has a radioisotope concentration that exceeds the numerical values shown in Column 3, Table 1 ..." It is implicit, by definition, that the concentration of H-3, C-14, and Co-60 cannot be in excess of their respective theoretical specific activities.

D-55-1 38. Section 61.55(d) - This paragraph and the limits in Table 1 would prohibit the disposal of waste such as uranium tetrafluoride (UF_4) even though the disposal of natural or depleted uranium metal is permitted by a Table 1 footnote. In Table 1, Column 3, the radioactivity limit for natural or depleted uranium waste is 0.05 uCi/cm^3. UF_4 has properties similar to uranium metal and its radioactivity disposal limit should be increased. Otherwise packages or drums of UF_4 may not be placed in the facility unless the Commission gave specific approval. In the preamble, UF_6 process waste is listed as Class A, Segregated Waste. UF_4 is considered as a UF_6 process waste.

ED-1 39. Section 61.56(a) - The health and safety statement should be more specific by referring to the general public and/or the personnel at the disposal site to clarify the intent of the protective measures.

D-58-6 40. Section 61.56(a)(1) - The requirement should only apply to receipt of waste at the site, not to actual disposal. Shipping containers are frequently designed for reuse and can be costly. The regulation should not require the disposal of costly reusable shipping containers. Further, the regulations provide no credit for the container in terms of waste containment. It is suggested that "The waste ..." be replaced with "All waste accepted at the site."

D-56-4 41. Section 61.56(a)(2) - This section precludes the use of cardboard and fiberboard boxes presumably to protect the operational staff at the disposal facility. These containers are permitted by transportation regulations and are being used by Department facilities without difficulty. We recommend deleting this section as it is an undesirable and unnecessary generic restriction. Individual sites may still choose not to accept such containers.

D-56-11 42. Section 61.56(b)(1) - Wastes falling into the intermediate category are required to retain structural stability in the ground under a compressive load of 50 psi in order to mitigate the burial trench subsidence. Since large component packages would only be placed in a single layer in a trench, the weight on top of these packages would be due to the earth covering the package. Therefore, for large packages, the 50 psi compression requirement is unnecessary. It is recommended that the compressive load requirement be related to the depth from the earth's surface to the top of the waste and to the covering material rather than specifying a single value for all cases.

ED-1 Section 61.56 states that 150 years of structural stability is required. The Commission should clarify what structural stability pertains to; the disposal site, the waste package, or the waste form. The Department suggests that waste form rather than waste package should pertain to the structural requirement.

D-56-9 The 5 percent tolerance on physical dimension of waste packages will cause expensive high integrity containers to be used. Experience has shown that most drums are only filled to about 80 percent of their theoretical volume rather than the 95 percent required.

D-52-2 D-56-8 43. Section 61.56(b)(3) - This section states that "void spaces within the waste and between the waste and its package must be reduced to the extent practicable." This requirement is vague and should not be needed if the stability requirements of Section 61.56 are met. If interpreted literally, this regulation would require that voids in packages containing large activated components be filled in. Such an operation would increase worker radiation exposure and increase the package weight. Increased weight could have a significant impact on the ability to ship and handle these packages. It is our understanding that it is the Commission's intent that this section would require operators to compact the soil covering of waste. We believe that this is adequately treated in the definition of stability and should be deleted.

D-57-1 44. Section 61.57 - There should be clarification on the responsibility for sorting and labeling of waste packages. This would assist in establishing compliance with transport requirements, Title 49 and 10 CFR 71, and in classifying the waste on site. Presumably, the shipper is responsible for labeling the package. Since extensive labeling is required for transportation purposes, these sets of requirements should be compatible.

D-59-3 45. Section 61.59(a) - Does this paragraph rule out tribally-owned lands? This question should be clarified.

D-51-1 GEN-1 46. Section 61.62(a) - Replace the word "eliminated" with "minimized". "Elimination" of ongoing active maintenance may be the goal but it probably will not be met. This fact is recognized in 61.63(a) by the words "any required maintenance".

F-1 47. Section 61.70 - It is unclear what the role of an Agreement State would be in the licensing and regulation of land burial of radioactive wastes as opposed to a non-Agreement State. Our impression is that this section applies only to non-Agreement States.

48. Section 61.71 - It is recommended that the word "may" be replaced by "shall". This function should be an obligation of the Director.

G-1 49. Section 61.80(b) - To whom the records will be transferred should be specified.

E-2 50. Section 61.80(g) - Delete the words "if any". Licensees should be required to furnish an annual financial report.

Editorial Comments

1. The Environmental Impact Statement indicates the Department of Energy (Department) is responsible for disposal of all Federal government low-level waste. At present, only the Department waste and classified defense-related waste is accepted at the Department's facilities.

2. 61.1(b) For consistency, either delete the paragraph reference for Part 40, or add paragraph references for Parts 60 and 20.

3. 61.2 Definitions

   "Active Maintenance" by current understanding is improperly defined - what is actually defined is Remedial Action. That which is excluded is active maintenance.

   "Active Maintenance" 15th line typo "revegetation".

   "Near Surface Disposal" add "a" after means and delete "in or"

4. 61.4 4th line - change "should" to "shall"

5. 61.4 4th line from end - change "at" to "to"

6. 61.7 2nd line - delete word "intended"

7. 61.7(b)(3) 10th line - add "disposal operations cease,"

8. 61.7(b)(4) 1st line - add an "a" after "for" and make "period" singular

9. 61.7(b)(5) Next to the last line - delete "recognizable". There is no reason to believe an intruder would recognize the problem regardless of form.

10. 61.7(c)(4) 4th line - change "agency" to "government" and change "that" to "whichever". Delete next sentence. No Federal agency can own land.

11. 61.10(a) 2nd line - change "use" to "handle"

12. 61.22(b) 1st line - change "its" to "the"

13. 61.23(g) 4th line - insert "are met" after section

14. 61.24(b) 2nd line - put commas before and after "under oath"

15. 61.50(a)(4) Change "must" to "should"

16. 61.52(a)(4) Add "operations" after "disposal"

17. 61.53(d) 3rd line - typo "indicate"

18. 61.55 1st line - insert "Low-level" before "radioactive"

19. 61.55(b)(1) 3rd line - insert after Column 1 "but does not exceed the values shown in Column 2; and,"

20. 61.55(c)(1) 2nd line - insert after Column 2 "but does not exceed the values shown in Column 3;..."

21. 61.56(b)(1) 9th line - delete one "as"

22. 61.72(a) 7th line - insert "by" after "affected"

23. 61.72(c)(5) Delete "be" after "should"

24. 61.80(d) Replace "takes" with "shall take"

C-4

Enclosure B

DOSE LIMITS UNDER THE INTRUDER SCENARIO

Subject

Dose criteria for intruder scenarios.

Department of Energy Position

The design objectives for disposal sites are appropriately and properly expressed as dose criteria. However, the intruder dose limit should be similar to limits used for accidents, i.e., single event exposures to a limited segment of the public.

Discussion

The Department takes issue with the NRC's assertion that a 500 mrem/yr intruder limit does not significantly increase costs compared to a higher limit. Nearly all of the radionuclide concentration limits in Table I are set by the intruder scenario. Significant volumes of waste, particularly large metallic components from decommissioning of reactor plants, would exceed the Class C limits. Disposing of this waste by any means other than shallow land burial would greatly increase costs. Also, the intruder dose limit affects the limits for Class A wastes. Since Class B and C wastes are much more expensive to dispose of, increasing Class A limits would reduce costs. Therefore, setting an unnecessarily low intruder dose limit does significantly affect waste disposal costs.

Section 61.42 proposes a whole body annual dose of 500 mr for the inadvertent intruder and the waste classification limits of 61.55 are controlled by the doses received from this scenario. The limit in 10 CFR 20 is based on potential release pathways and not from intrusion into the waste. Based on release pathways, an individual exposure limit of 500 mr/year is reasonable and achievable, in the context of the intent of Part 20, i.e., normal operations. We believe that human intrusion is a credible event and should be carefully evaluated, but to a separate criterion.

A person who inadvertently intrudes into the waste and who has bypassed warning markers is subject to the maximum radiation level potential available at that site. In the context of this application, human intrusion is not a normal routine exposure scenario and warrants separate treatment similar to an accident situation or an unplanned release. In NCRP Report, No. 39, "Basic Radiation Protection Criteria" Paragraph 259, the limit on accidental exposures in less urgent emergencies is 25 Rem. As we have previously indicated in 10 CFR 60, we believe that warning markers can be developed which will reduce the probability of intrusion. Additionally, we are not convinced that discounting institutional controls after 100 years is a proper approach. We continue to believe that sufficient institutional memory will survive most probable events to reduce the probability of intrusion.

Based on the above, an inadvertent intruder should be allowed a higher radiation dose than the exposure limits applicable to routine operations.

NON-NEAR SURFACE DISPOSAL A-8

Subject

The need and desirability of requiring non-near surface disposal of some low-level wastes.

Department of Energy Position

An implication in 10 CFR 61 is that similar regulations governing the use of non-near surface facilities for the disposal of low-level waste will be issued. The Department does not consider that a need for such facilities has been established. Our recommendation is that the Commission only specify design objectives at this time. Design and analytical guidance may also be needed.

Discussion

As a result of the waste classification system development by the Commission (draft 10 CFR 61), quantities of low-level radioactive waste may be unacceptable in near surface disposal facilities and may require greater confinement in, presumably, non-near surface disposal facilities. Requiring non-near surface disposal will result in a variety of impacts, beyond those of low-level waste, including social, political, economic, and transportation impacts.

Several social, political, and economic impacts could arise if non-near surface disposal were to be required:

1. The volumes of waste, estimated to be up to 50,000 ft^3/year, could only justify one such expensive facility nationally. The institutional and political questions associated with establishing such a facility could be similar to those associated with a high-level waste disposal facility. Such a situation is not particularly attractive.

2. The Department is presently evaluating the need for non-near surface disposal facilities and the technology required for such a facility. Several alternatives exist for non-near surface disposal facilities and other methods for achieving greater isolation than afforded by normal near surface disposal, including providing longer lasting packages or engineered barriers. Focusing on non-near surface disposal now may prematurely foreclose other options.

3. Reprocessing of spent fuel may become more prevalent. This could create a new commercial waste stream beyond Class C wastes requiring greater isolation than near surface disposal, however, since the NRC has not considered reprocessing in this rule it appears premature for the Commission to establish a requirement for non-near surface disposal facilities.

SPECIFIC NUCLIDE CONCENTRATION LIMITS

Subject

The radionuclide concentration limits established in 10 CFR 61.

Department of Energy Position

Some of the values in the regulation seem unduly conservative, some of the nuclides seem unnecessary and inappropriate, and sufficient information is not provided for some nuclides. It is recommended that only those nuclides for which there is a demonstrated hazard protection need and for which sufficient information exists be included in the regulation. The Department recommends that the limit for carbon-14 be raised by a factor of 8, for the nickel isotopes, a factor of at least thousand, and for niobium a factor of 12.

Discussion

While it has not been possible to thoroughly review the Environmental Impact Statement (NUREG 0782) or the Data Base (NUREG/CR-1759), it appears that the NRC has used overly conservative assumptions in calculating the concentration limits. Our preliminary review of the calculation of the Commission for ^{14}C, nickel and niobium isotopes, and the analysis is included in this paper. We agree that the methods used by the NRC provide conservative bounds, but using a series of conservative assumptions greatly compounds the conservatism and may lead to the imposition of unrealistic limits.

Carbon-14 Discussion

Three principal pathways of movement of ^{14}C into vegetation should be considered:

A. Direct uptake of lower molecular weight ^{14}C species by root systems which have penetrated the burial zone.

B. Uptake of $^{14}CO_2$ as bicarbonate following dissolution of microbially-released $^{14}CO_2$ by plant foliage following diffusion from decomposing wastes.

C. Photosynthetic uptake of $^{14}CO_2$ by plant foliage following diffusion from decomposing wastes.

The rate of release and relative importance of each pathway will depend on type and depth of buried wastes; adequacy of isolation of buried zone from wetting by soil water and upward mass movement, total amount and specific activity of organic wastes, permeability of the soil, base organic content of soil, soil pH, and vegetation type.

Since most carbon in plants is absorbed from the air, we consider pathway C in lieu of pathway A as used by the Commission to be the main pathway under most conditions. The rate of transfer to vegetation can be roughly estimated as follows:

1. Calculate rate of decomposition - An approximate turnover time of 1000 years for decomposition of the approximate 4000g/m^3 of organic carbon in an eastern forest soil is a reasonable start.[1]

2. Using the release rate and diffusivity of CO_2 in soil, calculate the partial pressure of CO_2 in soil and the transfer of $^{14}CO_2$ to air from soil.[2]

3. Calculate ^{14}C uptake from soil solution by plants using concentration of $^{14}CO_2$ in soil water and rates of transpiration of water by plant leaves (any physiology text). This uptake will depend on soil temperature, Henry's constant, partial pressure of $^{14}CO_2$ in soil air, solubility of CO_2 in water, and transpiration rates in liters of H_2O/m^2. For these calculations assume that this $^{14}CO_2$ would be fixed photosynthetically in plant leaves.

4. Calculate photosynthetic uptake from air based on diffusion of $^{14}CO_2$ from the soil surface, and content of 640 micrograms of $^{12}CO_2$ per m^3 of air, an exchange rate of 1 volume per minute, and proportioned uptake of $^{14}CO_2$ with respect to $^{12}CO_2$ from this air.

Using such a procedure should yield an increase of greater than a factor of 8 in the carbon-14 concentration limit.

Nickel Isotope Discussion

As a consequence of Table 1, two land disposal waste classifications (A segregated and unacceptable) pertain to Ni-59; and three classifications (A segregated, B stable, and unacceptable) pertain to Ni-63. The tabulated waste concentrations, in uCi/cm^3, may be increased by a factor of ten for isotopes contained in metals and may be averaged over the package volume (i.e., 200,000 cm^3 for a 55 gallon drum). The tabulated nickel concentrations in subpart D of 10 CFR 61 which categorize the radioactive wastes are 2.2 μCi/cm^3 (Ni-59) and 3.5 70 μCi/cm^3 (Ni-63).

The low-level wastes anticipated for disposal during the time period 1980 to 2000 were divided into four general groups based upon common characteristics (see Table 3.1 in NUREG 0782). These groups are: (1) light-water reactor process wastes, (2) trash, (3) low specific activity wastes, and (4) wastes having unique special characteristics. By combining the isotopic concentrations (see Table 3.3 in NUREG 0782) and total projected waste volumes (see Table 3.4 in NUREG 0782), the accumulated radioactivity for land disposal will be 6,300 and 830,000 Ci for Ni-59 and Ni-63, respectively. It should be noted that 92.0 percent of the Ni-59 activity and 96.6 percent of the Ni-63 activity are

projected for the group 4 waste category which comprises only 1.6 percent of the total low-level waste volume. Despite the high nickel concentrations in group 4, all of the projected waste streams of Ni-59 would be classified as class A segregated, and only the four Ni-63 waste streams in group 4 would be restricted to a class B stable classification. It should be noted that the two streams designated as LWR nonfuel reactor components and sealed sources would require the factor of ten increase in Ni-63 concentration permitted for metals to qualify for near surface disposal. Even with recycled uranium fuels, nickel isotopes are not a problem in gaseous diffusion cascades.[3]

Although the projected nickel isotope waste streams are acceptable for land burial as defined by the concentrations in Table 1, certain nuclear reactor hardware may be classified as unacceptable. The BWR end fittings, which contain inconel expansion springs,[3] may contain up to 50 and 7,000 uCi/cm^3 of Ni-59 and Ni-63, respectively, after a burnup of 27,500 MWd/MT.[3] These values, which exceed the maximum concentrations of 22 and 700 μCi/cm^3 in Table 1, would not permit near-surface disposal of the BWR end fittings. Due to the corrosion resistance of the activated metal hardware, the BWR in Subpart C (see 61.58 in 10 CFR 61). To evaluate this possible alternative, the respective nickel isotope concentrations in the BWR end fittings are about 100 and 15 ppm (by weight) for Ni-59 and Ni-63.

A reasonable pathway analysis can be performed by starting with Reference Man.[6] The nickel content of the body is 10.0 mg with 5.3 mg distributed in the soft tissues (60,000 g) and 5.0 mg distributed in the skeleton (10,000 g). A daily nickel intake in food and fluids amounts to 0.4 mg/d, and only 0.6 ug of nickel enters the body daily by inhalation. About 98.5 percent of the nickel entering the body either goes directly to excretion or is retained with a biological half-life ranging from 0.1 to 0.2 days. The remaining nickel entering the body, 0.006 mg/d, is assumed to be uniformly distributed throughout all organs and tissues and retained with a biological half-life of 1200 days. This half-life is compatible with the fractional absorption, daily intake, and total body content of nickel (10.0 mg) given for Reference Man.

With the given information, the quantities of Ni-59 and Ni-63 can be calculated which will give an annual dose of 25 millirems to the whole body (see 61.41 in 10 CFR 61). A 25 millirem annual dose to a 10,000g skeleton containing 5 mg of nickel will require isotopic concentrations of either 5,000 ppm of Ni-59 or 2.8 ppm of Ni-63. It should be noted that the same annual whole body dose to 60,000 g of soft tissue (5.3 mg nickel) would require higher isotopic nickel concentrations. Comparing these isotopic concentrations with the BWR end fittings indicates that the potential for an overexposure due to nickel activity is difficult to conceive. Since naturally occurring nickel is widely distributed in the earth's crust with an estimated average content of 0.019 percent,[8] the radioactive nickel isotope concentrations will be diluted as migration proceeds from the burial site. Even without isotopic dilution, the Ni-63 concentration of 120 ppm would only require a decay period of 540 years to reach the 2.8 ppm level.

An intruder may receive 500 mrem/year thus increasing exposure by a factor of 20. This results in concentrations of Ni-63 of about 100 ppm for class A waste and 2500 ppm for class B and C wastes.

If all of the nickel in an intruder's body was derived from the waste, the Ni-59 and Ni-63 concentration limits resulting in an exposure of 500 mr/year could be set as follows:

	Weight percent Ni-isotope/Total Ni		
Waste Class	A	B	C
Ni-59	10	10	10
Ni-63	0.012	0.25	0.25

For decommissioning metallic wastes, core barrels, and reactor vessels, this would seem to be a preferred way to express the limits in Table 1.

Niobium Discussion

If the Department's recommendations on carbon-14 and nickel isotopes are adopted, niobium-94 would become the limiting isotope for non-fuel activated reactor components. The proposed NRC limit of 0.02 $\mu Ci/cm^3$ for Nb-94 in metal would be exceeded by many components. In a study by Battelle, the average Nb-94 concentration in the stainless steel core barrel of a reference PWR was calculated to be 0.17 $\mu Ci/cm^3$.[9] Thus, this metal would be unacceptable for burial unless it could be diluted by a factor of nine. The actual concentration of Nb-94 in activated steel is not known since the Nb-94 is masked by the much larger initial concentrations of other isotopes. It is calculated by assuming a conservatively high concentration of target Nb-93 atoms in the steel.

One way to assess the hazard to a potential intruder from the Nb-94 in waste is to assume that all of the niobium in the intruder's body comes from the waste. As in the case of the nickel isotopes, this is a conservative assumption since niobium is not concentrated by the body. Niobium is present in many common foodstuffs and the daily intake of 620 μgm is balanced by an excretion rate of 620 μgm per day.[10] 110 mg of niobium is present in the soft tissue of the body.

What would the dose to the intruder be if the niobium in his body came from the core barrel in the Battelle study? For stainless steel with a niobium content of 0.016 weight percent and 0.17 $\mu Ci/cm^3$ of Nb-94, the specific isotopic concentration of Nb-94 is 678 ppm (mg Nb-94 per Kg niobium). The limiting organs for a total body source of Nb-94 are the small and lower large intestine walls.[11] The dose to these organs if the intruder's 110 mg of niobium contained 678 ppm Nb-94 would be 3.4 rem. If 5 rem per year were the limit to the intryder, then the appropriate Nb-94 limit would be about 985 pm or 0.24 $\mu Ci/cm^3$.

Since inhalation of Nb-94 was found to be more limiting than direct exposure in the DEIS (NUREG 0782), it is useful to consider how much metal would have to be inhaled by an intruder to receive a dose of 5 rem to the lungs. Assuming the niobium corrosion products are still a trace part of the steel corrosion products, the intruder would have to inhale the corrosion products of 1073 grams of steel with a specific Nb-94 concentration of 985 ppm. It is difficult to postulate a realistic scenario where this amount of rust could be inhaled.

To further put the hazard from small amounts of Nb-94 in stainless steels in perspective, one should consider the nonradiological hazards of this material. Stainless steels contain abut 10 percent by weight of nickel. Nonradioactive nickel is known to have a severe acute systemic toxicity when inhaled and severe chronic systemic toxicity when either inhaled or ingested. Thus, nickel metal and insoluble compounds have been assigned a threshold limit value of 1 mg/m^3 in the workplace environment.[12]

Thus, one can compare the radiological and nonradiological hazard of breathing rust from activated stainless steel with 985 ppm Nb-94. If an intruder were breathing air with a Nb-94 concentration at the derived air concentration limit of 3×10^{-3} Bq/m^3, the nickel concentration in the air would be about 270 mg/m^3. The nonradiological hazard is far more limiting. Thus, since disposal of nonradioactive stainless steel is not generally considered to be hazardous, it seems reasonable to increase the limit for Nb-94 to 985 ppm Nb-94 or 0.24 $\mu Ci/cm^3$.

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US Department of Energy

ARGONNE NATIONAL LABORATORY

9700 South Cass Avenue, Argonne, Illinois 60439

Telephone 312/972-6677

February 26, 1982

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(120)

DOCKET NUMBER
PROPOSED RULE PR-2 et al
(46 FR 38081)

Mr. G. W. Roles
U.S. Nuclear Regulatory Commission
Mail Stop SS-697
Washington, D. C. 20555

Mr. Roles:

Thank you for sending me a copy of the letter from Catherine Quigg containing her comments on the proposed rule 10 CFR 61, in which Ms. Quigg quotes her understanding of statements made by me to her in a telephone discussion she stated was held on August 4, 1980. Some of the quotations attributed to me differ significantly with views I held then (and hold now). I therefore called Ms. Quigg on February 25, 1982, but we were unsuccessful in determining why her account of our discussion differs from mine.

In any case, I would wish to state my personal views on nuclear waste management directly to the NRC rather than to have them interpreted by a third party. Therefore, please note the following corrections in the quotations Ms. Quigg attributes to me in her letter containing comments to the NRC on 10 CFR 61:

D-55-3

1. Page 2, Last sentence

   Contrary to the alleged quotation, I do not necessarily believe that TRU "waste should be treated the same as high-level waste". Wastes can contain TRU concentrations above the present 10 nCi/g limit and yet not present any significant health hazard. Such waste, of course, need not be treated the same as high-level waste.

D-56-20

2. Page 4, Paragraph 2

   Contrary to the alleged quotation, "There is no way to reduce resin volume", I am well aware of incineration and other methods being investigated to reduce the volume of spent resins.

3. Page 4, Paragraph 3

D-55-3

Contrary to the alleged quotation, "I strongly favor the consideration of spent resins and cladding hulls as intermediate wastes", I do not favor consideration of an "intermediate waste" classification for these or any other nuclear wastes. I believe that any such need is provided for by the waste classification system proposed in 10 CFR 61, along with DOE's Greater Confinement Disposal Studies under their Low-Level Waste Technology Program.

I would appreciate your assistance in bringing the above corrections to the attention of any other NRC staff to whom Ms. Quigg's letter may have been distributed.

Very truly yours,

J. Howard Kittel
Manager
Office of Waste Management Programs

JHK:pf

cc: C. Quigg
R. D. Smith

U.S. Department of Energy
ARGONNE NATIONAL LABORATORY
9700 South Cass Avenue, Argonne, Illinois 60439
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March 4, 1982

46 FR 38081 (WM-4) and 46 FR 51776 (121)

DOCKET NUMBER PROPOSED RULE PR-2 et al (46 FR 38081) (50)

DOCKET NUMBER PROPOSED RULE PR-61 (46 FR 51776)

Mr. G. W. Roles
U. S. Nuclear Regulatory Commission
Mail Stop SS-197
Washington, D. C. 20555

Dear Mr. Roles:

D-53-1

Subject: Comments by Argonne National Laboratory on Environmental Monitoring Costs in Draft EIS on 10 CFR Part 61

Reference: Ltr. J. H. Kittel to R. Dale Smith, "Comments by Argonne National Laboratory on NRC Proposed Licensing Requirements for Land Disposal of Radioactive Waste (10 CFR 61), and supporting Environmental Impact Statement (NUREG 0782)" December 14, 1981.

In response to your recent telephone inquiry, attached are the environmental monitoring cost estimates developed by Argonne National Laboratory for a reference LLW disposal site. These estimates formed the basis for our comments in the reference letter that the direct operation cost for environmental monitoring shown in Table 3.6 of NUREG 0782 is believed to be inadequate.

Please let me know if further information is needed.

Very truly yours,

J. Howard Kittel, Manager
Office of Waste Management Programs

JHK:pf

cc: S. A. Mann, DOE-CH

DRAFT EIS ON 10 CFR PART 61

COMMENTS ON ENVIRONMENTAL MONITORING COSTS

The environmental monitoring costs given for the Reference Site in Table 3.6 (page 3-39) are $543,000 over 20 years, or $26,700 per year. The environmental monitoring program for the Reference Facility is discussed in Appendix E, Section 5.2.6 (pages E-55 and E-58). A preliminary estimate of the costs can be obtained from the sampling and analysis schedule in Table E-10 (page E-57) and is given in the following table. For this cost estimate, we have assumed that 1) the particulate air sample to be analyzed daily for gross beta-gamma activity is counted on-site as part of routine operations, 2) the other samples are sent to an outside commercial firm for analysis, and 3) the cost per analysis are average charges by firms performing this work, expressed in 1981 dollars.

Annual Environmental Monitoring Costs

Sample	No. of Locations	Frequency of Analysis	No. of Analysis	Cost per Analysis	Total Cost
External Gamma-TLD	50	Quarterly*	200*	$25	$ 5,000
Atmosphere - Particulate	1	Weekly	52	80 (γ-spec)	4,160
Atmosphere - Charcoal	1	Weekly	52	20 (^{131}I)	1,040
Soil and Vegetation	10	Quarterly	40	20 (β-γ)	800
				20 (α)	800
				40 (tritium)	1,600
Off-Site Wells	5	Semi-annually	10	80 (γ-spec)	800
				20 (α)	200
				40 (tritium)	400
Site Boundary Wells	10	Semi-annually	20	80 (γ-spec)	1,600
				20 (α)	400
				40 (tritium)	800
Disposal Area Wells	15	Quarterly	60	80 (γ-spec)	4,800
				20 (α)	1,200
				40 (tritium)	2,400
Trench Sumps	58	Monthly	70**	80 (γ-spec)	5,600
				20 (α)	1,400
				40 (tritium)	2,800
					$35,800

*Paragraph 5.2.6.4 (page E-58) states 12 locations are to be analyzed monthly, for a total of 296 analyses. The number in this table was taken from Table E-10

**Assuming water was present 10% of the time.

In addition to the purely analytical costs, expenses of sample collection, sample preparation, quality control, maintenance of sampling equipment, record keeping, supplies, and other expenses may increase the analytical costs by a factor of up to two. If the analyses were performed in-house by personnel who also perform other work, such as the sample collection and preparation, some cost saving would result. We believe a more realistic estimate is $60,000 per year for the total program.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

(122)

MAR 18 1982 '82 MAR 19 P2:16

PROPOSED RULE PR-2 et al (46 FR 38081)

OFFICE OF THE ADMINISTRATOR

(51)

DOCKET NUMBER PR-61
PROPOSED RULE (46 FR 51776)

Mr. Samuel Chilk
Secretary of the Commission
Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Chilk:

In accordance with Section 309 of the Clean Air Act, as amended, the U.S. Environmental Protection Agency (EPA) has reviewed the Nuclear Regulatory Commission's (NRC) proposed Licensing Requirements for Land Disposal of Radioactive Waste (46 FR 38081) and the accompanying Environmental Impact Statement (NUREG-0782).

C-1 EPA believes it is appropriate for NRC to use both performance objectives and prescriptive requirements in its proposed regulations. These proposed regulations and the supporting analyses are an important step in solving the nation's low-level radioactive waste (LLW) problems. The information

C-2 presented by NRC will be of considerable assistance to EPA in its low-level radioactive waste standards program.

A-2 EPA is concerned that the handling of low-level waste licensing in Agreement States may become inconsistent, so EPA recommends that NRC help the Agreement States adopt consistent state regulations and procedures.

E-1 NRC solicited comments on possible duplicative requirements for effluent releases and broker activities under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). This "Superfund" law exempts from notification "any release of source, special nuclear, or byproduct material ... in compliance with a legally enforceable license, permit, regulation, or order issued pursuant to the Atomic Energy Act of 1954" (CERCLA Section 101(10)(K)). Radioactive releases from nuclear waste disposal facilities which are not in compliance with an NRC license, permit, regulation, or order fall within the reporting requirements of CERCLA. Furthermore, as part of the notification regulations under CERCLA, EPA is planning to develop a notification scheme for releases of radioactive materials not licensed under the Atomic Energy Act of 1954 or the Uranium Mill Tailings Radiation Control Act of 1978. EPA wishes to minimize duplicative reporting requirements for releases reported to other agencies. EPA intends to work with NRC to minimize duplicative reporting requirements to the extent possible.

E-1

A-1 EPA has regulatory responsibility for the disposal of hazardous wastes under the Resource Conservation and Recovery Act, as amended (RCRA). RCRA, Section 1004(27), specifically exempts "source, special nuclear, or byproduct material as defined in the Atomic Energy Act of 1954, as amended." Additionally, Section 1006(a) of RCRA states that "Nothing in this Act shall be construed to apply to ... any activity or substance which is subject to the ... Atomic Energy Act of 1954 (42 U.S.C. 2011 and following) except to the extent that such application (or regulation) is not inconsistent with the requirements of such Acts." RCRA does not address the issue of hazardous chemicals mixed with radioactive materials. We believe the most positive way for NRC and EPA to establish jurisdication over these wastes is in a memorandum of understanding. Such a memorandum would enable both agencies to avoid excessive costs and duplicative licensing of wastes. Furthermore, close coordination of EPA's RCRA and NRC's nuclear waste requirements is necessary in areas such as manifest tracking systems, groundwater protection, technical requirements, and financial assurances, since some NRC licensed wastes may be disposed of in EPA permitted facilities. A memorandum of understanding could serve as a vehicle for accomplishing this.

D-55-9 Hazardous and toxic chemicals are frequently present in these nuclear wastes. EPA is particularly concerned that these hazardous and toxic non-radioactive chemicals and their health impact are not considered in this proposed rule and EIS. We consider the rule and EIS deficient in this regard. Accordingly, EPA has rated this draft EIS ER-2 (environmental reservations and additional information requested).

EPA has divided its enclosed comments into major and minor comments on both the proposed regulations (10 CFR 61) and the supporting draft Environmental Impact Statement (EIS). Should you have any questions on our comments, please call Dr. W. Alexander Williams (755-0790) of my staff.

Sincerely yours,

Paul C. Cahill

Paul C. Cahill
Director
Office of Federal Activities

Detailed Comments
of the
U.S. Environmental Protection Agency (EPA)
on the
U.S. Nuclear Regulatory Commission's
proposed licensing
Requirements for Land Disposal
of
Radioactive Waste (10 CFR 61)
and draft
Environmental Impact Statement
(NUREG-0782)

Major Comments on 10 CFR 61

C-4

1. The 500 millirem per year performance objective for an inadvertant intruder limit is not appropriate as a "regulatory limit." It is not a regulatory limit which will be monitored against for compliance. Nor is it a triggering level for an action such as an accident-related Protective Action Guide. The 500 millirem per year as applied in Part 61, is the design basis for the waste classification system. We believe that if "As Low As Reasonably Achievable" (ALARA) principles were applied, the exposure to the inadvertant intruder would be lower than 500 millirem per year. This is evident from NRC's own analyses in the regional case studies, which use realistic assumptions and the proposed prescriptive requirements.

C-3

2. Setting an individual exposure limit at the site boundary is appropriate. The 25 millirem per year is in the correct range of values if, as the NRC indicates, that range includes 1 to 25 millirem per year. We are assured by the NRC analyses and their own statements in the DEIS that they should be able to establish a regulatory limit compatible with any future EPA standard established using ALARA principles.

3. It is not appropriate to adopt the contaminant level of 4 millirem per year from the National Interim Primary Drinking Water Regulations as a performance objective for contamination of public drinking water supplies from LLW disposal. The National Interim Primary Drinking Water Regulations were established in the context of levels of contamination, which if exceeded, would require mitigating action by the water supply authority. It is also not appropriate to allow one group of radioactive materials users to contaminate a water supply to a limit which would preclude other releases from nuclear power plants, hospitals, and other users. It does not appear from the NRC analysis that the LLW disposal requirements are so sensitive to this limit that a lower value would be difficult to meet. It should also be noted that the 10 picocurie per liter value for uranium and thorium is not part of the National Interim Primary Drinking Water Regulations. EPA would not object to the use of the National Interim Primary Drinking Water Regulations for protection of groundwater. In forthcoming RCRA land disposal regulations we expect to use the drinking water regulations as one aspect of groundwater protection.

C-5

4. The NRC's intentions in applying 10 CFR 20 to the operational phase of LLW disposal is unclear. This arises out of the lack of specificity in Section 61.43 in view of the requirement of Section 61.41. This ambiguity is enhanced in the DEIS: see Vol. 1, Section 5.1.3 (page 35); Section 5.2 (bottom of page 38); Vol. 2, Section 6.3 and Section 6.4 (page 6-13); and Section 6.6 (page 6-18).

C-5 It is our understanding, after talking to NRC staff, that the offsite exposures during operation of the disposal site (approximately 20 years) should be held to the same limits as the long-term offsite exposures. To make this clear, it should be stated that Section 61.43 (use of 10 CFR 20 limits) applies to occupational exposures only. Section 61.41 should be broadened to include direct radiation exposure.

D-59-2 5. Section 61.59.b makes it clear that active institutional controls may not be relied on for more than 100 years following transfer of control of the disposal site to the owner. This is appropriate for risk assessment and as a basis for design criteria. However, the regulations should contain a positive requirement that active institutional controls should be established for this period, since this is the design basis of the facility. It is also clear from the

G-1 DEIS (Vol. II, page 4-69) that institutional maintenance of records of the nature of the hazard is desirable over a longer period of time. This should also be made a positive requirement of the license transfer to the site owner, although it is realized that it cannot be depended upon.

D-62-2 6. Class A segregated wastes will be put in separate trenches from the stable Class B wastes and will have potentially permeable trench covers. The active maintenance of such trenches can be expected to be extensive for many years. NRC should indicate how they plan to develop long-term stability of the Class A trenches. Although Class A wastes may not present a serious radiological public health hazard, they may, in the eastern United States, under certain hydrogeological conditions, cause site instability problems, pose a "public nuisance", and, more important, the non-radioactive chemical portion of Class A wastes may cause significant ground and surface water pollution just as sanitary landfills may.

A-8 7. We urge the NRC to give a high priority to fulfilling its pledge to conduct performance, safety, and cost/benefit analyses for other readily available disposal methods such as hydrofracture, deep well injection and disposal in a mined cavity. These alternatives could show lower intruder impacts. Promulgation of 10 CFR 61 should not be delayed to permit consideration of these alternatives, however.

ED-1 8. Because it is based solely on the intruder scenario, Table 1 presents some practical incongruities. For example, tritium and some of the short halflife isotopes would have heat rates that clearly would be impractical (i.e., self boiling of tritiated water and, decompostion of the solidifying medium). Also, it does not appear that some of these high specific activities exist in any actual waste stream.

D-55-9 9. Part 61 shows no consideration of hazards from other chemicals and toxic substances that may be associated with the waste. This is a particularly significant omission because some of these materials may have essentially infinite lives compared to many of the radioactive constituents. As a minimum, Part 61 regulations should indicate that these materials must be handled in a manner compatible with RCRA requirements.

M-1 10. The NRC proposes to develop a manifest tracking system which is "somewhat similar" to the EPA's hazardous waste manifest system. NRC and EPA should seriously consider coordination and possible integration of the two systems. At the least, the two systems should be compatible because of the possible future need to transfer wastes from NRC regulatory authority to EPA authority, or vice versa (i.e., slightly radioactive LLW whose primary hazard is from non-radioactive substances) and for future interaction between NRC and EPA on the ocean disposal of LLW.

Minor Comments on 10 CFR 61

D-62-5 1. (Sect. 61.52.a.6): It states that, "Waste must be placed and covered in a manner that limits the gamma radiation at the surface of the cover to levels that are a few percent above the background levels of the site." This would be difficult to enforce in its present form due to the ambiguity of "a few percent" and the variability of background levels.

ED-1 2. (Sect. 61.55, Table 1): The table should have a title and appropriate labels for the columns.

D-52-2 3. Methane, carbon dioxide, and other waste decomposition gases generated within a shallow disposal trench can build up sufficient pressures to directly affect the stability of any engineered trench covers, particularly if the trench covers are impervious and not properly vented. Gases can also be generated from the decomposition of wastes in arid disposal sites, even in the absence of significant precipitation.

Gases from sanitary landfills have travelled underground for hundreds of feet. Gases from Class A trenches, therefore, have the possibility of affecting the stability of the Class B trenches if proper precautions are not taken. Gas generation is a long continuing process which commonly extends for 50 years or more, requiring active repair and maintenance work on the trenches. Part 61 does not indicate any consideration of this phenomena.

D-50-8 4. We recommend that the following additional or similar requirement be added to Subpart D, "a disposal medium with a permeability sufficiently low to cause the accumulation of water in the trench should not be used, especially for Class B wastes, unless compensating measures are taken to prevent or reduce the leaching of radioactive materials from the waste such as (1) installing an impermeable trench cover to keep water out of the trench or (2) preparing wastes in a low-leachable form."

ED-1 5. Part 61 or its explanatory preamble should contain a clear statement that, "The intent of site selection is to insure that off-site migration or releases of radioactivity from waste disposed in a facility shall not exceed specified health and safety limits. Although it is reasonable to expect success of a properly sited facility in providing the necessary confinement, this cannot absolutely be guaranteed in advance of actual use."

Major Comments on DEIS for 10 CFR 61

1. The need for cooperation between EPA and NRC in the development of a final 10 CFR 61 is indicated by the intention of NRC to include "Specific concentration limits for the disposal of important naturally occuring and accelerator produced nuclides" in a planned regulatory guide on the classification of waste. (See page 42 of DEIS Vol. 1 and page 7-22 of Vol. 2). Natural radionuclides, particularly radium, are expected to be included in EPA regulations under the Resource Conservation and Recovery Act. Positive steps should be taken to ensure compatibility under these two jurisdictions .

2. In the preamble of the regulation (p. 38091, column 2) and in the DEIS, it is indicated that engineered barriers such as concrete covers are assumed to have an effective life of 500 years. Outside of comments received at public hearings, there is no indication of any basis for such an assumed lifetime. NRC should discuss data which confirm the lifetime of engineered barriers and criteria for approving barrier designs.

3. Monitoring at LLW disposal facilities will be an important activity and will require a regulatory guide from NRC. This should be added to NRC's commitment to prepare regulatory guides in the future. (Vol. 2, Section 2.2 p. 2-4). This guide should establish "action levels" for elevated levels of radioactive materials in the environment to indicate when increased monitoring and corrective actions should begin.

4. The NRC calls for Class B wastes to be stable for 150 years. We believe that criteria should be given that will reasonably assure a 150 year waste stability.

5. Actual experience at existing sites has shown that under certain hydrogeological conditions, such as outlined in Base Case 3, the direct overflow of contaminated water to land surface has been a very important, if not the dominant, pathway. The "direct to land surface overflow" pathway also has a very short travel path and does not give the benefits of delay for decay afforded by the longer travel paths and slower travel times of the ground-water pathway. The short- and long-term impacts of the "overflow to land surface" pathway should be evaluated and compared with the ground-water pathway for Base Case 3 and for all similar test cases.

6. (Vol. 4, Append. M, Sect. 3): The DEIS should make estimates of maximum individual and population health risks, projected over time, for each of the pathways evaluated. As a part of this evaluation, the integrated activity moving through each pathway and its resultant population dose should be presented.

7. (Vol. 2, Sect. 3.8, p. 3-48, and Append. G, p. G-98)): The doses for transportation are based on a 1972 USAEC report on the transportation of LLW from nuclear power plants. We believe that the quantities of wastes and level of radioactivity in them are considerably higher in actual experience per shipment than was predicted in the 1972 estimates. Therefore, estimated dose levels should be adjusted accordingly. Also, Table 5.5 and the discussion on p. 5-15 should be adjusted accordingly.

8. The DEIS considers the time value of money in the estimation of the postoperational (closure and institutional control) costs but does not consider the time value for the design and operational costs. The operational costs which occur in the years 1 through 20 should also be discounted. Otherwise, combining the operational and postoperational costs to represent the total disposal costs for each alternative may result in an incorrect cost ranking of alternatives.

9. The cost estimates for institutional control need to be reexamined. After the several manipulations involving constant dollars, inflation and a nominal interest rate are made. It is unclear on what basis the final institutional control costs are stated.

10. The DEIS is deficient throughout in its failure to account for and assess the potential environmental impact and health risk from the non-radioactive chemical, hazardous, and toxic materials in the LLW. The contamination of ground and surface waters and risk to inadvertant intruders could be significant from non-radioactive materials.

Minor Comments on DEIS for 10 CFR 61

1. The short-term impacts of LLW disposal have been underestimated. In the Summary, in Chapters 3 and 4 of Volume 2, and in Appendices D and G, the radionuclides considered are only those with long half-lives

or those occurring in "significant" quantities in LLW. For short-term impacts, such as radiation doses delivered during the operational phase of a waste disposal facility (including occupational, population and accident doses), the source term should include the presence of shorter-lived, gamma-emitting radionuclides.

2. The ground-water pathway is not significant for many arid zone sites. In arid regions, attention should be given to the upward translocation of radionuclides by plants and animals and by the upward "wicking" effects of the strong evaporation potential on capillary water in the soil. Transport, and possibly erosion, by wind should also be considered.

3. The EIS does not give any specific distances for separating the Class A and Class B trenches. This distance could be significant in assuring overall site stability.

4. It is difficult to follow the projections of waste volumes as given in Tables D.25-D.26, which are based on Tables D.9 and D.11-14. For example D.9 gives untreated waste volumes by "region" while Tables D.25-26 list wastes by "spectrum".

5. Carbon-14 from Light Water Reactors (LWR) would more appropriately be scaled to Co-60. In the LWR, C-14 is produced both in the fuel and coolant. Except in cases of gross fuel failure, C-14 in the fuel stays there. Consequently, C-14 that ends up in LLW originates from activation in the reactor coolant. Therefore, it would seem more approporiate to scale C-14 to an activation product such as Co-60.

6. (Vol. 2, p. 6-7, last sentence); An explanation or reference should be given for the assumed release fraction 0.1 of the radioactivity within the waste packages involved in a fire.

7. (Vol. 2, Chap. 6, Sect. 6.2): Accident probability numbers would be helpful in placing the accidents and potential consequences in perspective. Data is available to at least make reasonable probability estimates.

9. (Append. E, Sect. 2.2): Consideration No. 1 should be expanded to include "and other discontinuities in the geologic media which increase the permeability significantly." For example, sand lenses or layers and desiccation cracks, as well as other unexpected features may be encountered, in addition to those listed.

9. (Append. E., Sect. 3.2.2): Texture and mineral composition are critical parameters for radionuclide retention by a geologic medium. It would be helpful to plot the composition of the Schwinn Formation on a United States Department of Agriculture (USDA) Textural Classification Chart in addition to the descriptive terminology of sandy loam and loamy sand. The advantage of using the USDA chart is

that it shows the percent clay, silt and sand fractions of the medium which are textural parameters correlative with permeability and the sorption potential of a disposal medium.

10. (Appendix J): Insufficient data are presented to make reasonable predictions about the sorption capabilities of the geologic media. For example, only the percentage of the silt-size fraction was given when the clay-size fraction of the medium is more important in assessing its capabilities to retain radionuclides. The Eh and pH are not presented either.

11. (Appendix J, Sect. 1.1.1): In the first sentence, change "underlain" to "overlain."

12. (Append. J, Sect. 1.1.3): The factors that contribute to increased permeability should be briefly described in this section. For example, in glacial tills, this includes sand lenses and desiccation cracks.

13. (Append. J., Sect. 1.1.9, 1.2.9 and 1.3.9): In a detailed site evaluation, the following additional information is needed: texture of the medium described in percentage of sand, silt, and clay-size fractions; mineral composition and organics described quantatively for each size fraction and a weighted average for total sample; cation exchange capacity correlated to clay mineral and organics content; Eh and pH of medium; chemistry of the groundwater; and naturally occurring radionuclides in the medium.

14. Executive Order 12291 requires government agencies to use a 10 percent real discount rate in developing their regulatory impact analyses. The DEIS uses an "implied" real discount rate of approximately 1 percent in the cost analyses. We believe the use of 1 percent in the DEIS should be reconciled with the requirements of the executive order. In doing so, the DEIS should present a sensitivity analysis of alternative discount rates, possibly using 1, 5 and 10 percent.

15. (Appendix Q): The methodology for calculation of capital, operational, closure and institutional costs appears reasonable. What appears to be lacking is a consistent treatment of the date attached to each cost. For example, captial costs are presented in 1980 dollars, operational costs are provided as sums of money appropriate to the 20 year operating life of the site but no particular date is attached to this amount, and closure costs are presented as 1980 costs inflated to the end of site closure. In order to evaluate disposal costs appropriately, a consistent time treatment of money is needed.

16. The last term in the long equation for postoperational costs on p. Q-44 should be corrected.

17. In the discussion of financial arrangements, the license applicant is to prepare an estimate of the amount of money required for closure and long-term care. We urge the use of a very careful review process on these cost estimates because past experience has shown that the licensee, with one exception where the regulator took an active part, has traditionally underestimated closure and long-term costs.

18. (Appendix G, pp. G-12/13): The dilution factor Q was taken to be equal to its pumping rate in the intruder well pathway. This dilution factor should be taken as the total groundwater flow within the plume of contamination rather than the well pumping rate.

19. The methodology used to develop trench infiltration should be presented somewhere in the text or appendices. The reference cited in Appendix G on p. 68, paragraph 2, is insufficient. There is no indication that the "externally produced" value is ever allowed to vary within the analysis.

20. A clearer explanation of the basis for the indices used in calculating the interaction factors in Appendix G is needed.

21. (Append. G, p. G-68): The rate of infiltration was calculated by multiplying by the number of days for which the precipitation exceeds 0.01 in/day. This method is very simple but, in our opinion, does not meet the state of the art for estimating infiltration rates. Our technical staff is available to discuss other possible methods for calculating infiltration.

22. (Vol. 2, p. 5-22): The dose rates through the population well and surface water pathways for Case 1A (Table 5-6) is calculated to be approximately 10 times lower than for Case 1 (Table 5-3) simply due to replacing the backfill material on moderately permeable soil used in Case 1 with more permeable soil. This fact does not agree with current knowledge of the leaching process. This phenomena was explained by the waste-water contact time being longer in Case 1 than in Case 1A and a resultant higher rate of leaching. In reality, the pellicular water in the waste, which contains dissolved radionuclides, will be maintained in between the interstices of the waste all of the time. Therefore, any added percolation of gravity water will be mixed with the pellicular water during the course of percolation and will be independent of the true velocity of the water movement. Therefore, the rate of radionculide release should change very little because of changes in the permeablility of the backfill material.

23. (Vol. 1, p. 19, Table S.5): The values listed under Body & Bone need to be explained in a footnote as "the number of years at which this impact level exists."

24. At several points in the DEIS (e.g. Vol. 1, p. 23), the comment is made that "the potential hazard quickly drops to about 1000 millirem per year to bone at about 500 years following facility closure." The term "quickly" does not seem compatible with a 500 year time period.

25. (Vol. 1, p. 20): The statement, "Maximum annual thyroid doses are in the range of 850 mrem at the intruder and population wells, 270 mrem at the population well, and 12 mrem at the surface water body" is ambiguous. This leaves in doubt what the dose is at the population well.

26. (Vol. 1, p. 26, Table S.7 & Vol. 2, p. 4-41, Table 4.19): Several of these costs (those with double asterisk) are not comparable with the others because they are based only on the 10% volume of waste employing that technique. To make the costs comparable, costs for the other 90% of the wastes should be figured and a weighted average presented.

27. (Appendix N): EPA's authority under the Marine Protection, Research, and Sanctuaries Act of 1972 for ocean disposal of radioactive waste should be listed.

28. (Appendix N): EPA's proposed guidance for Occupational Exposures should be discussed. (Federal Register, Vol. 46, No. 15, Friday, January 23, 1981, page 7836).

29. (Appendix N, p. N-3): EPA's schedule for its Low-Level Waste Standard is currently under review and may be revised. We will notify NRC of any such revision.

30. (Appendix N, p. N-19): National Primary Drinking Water Regulations is incorrect, it should be Interim National Primary Drinking Water Regulations.

31. (Appendix G): Tables G-3 through G-10 are poorly titled and measurement units are not well identified.

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'82 MAR 22 P2:16

123

DOCKET NUMBER PR-2 et al
PROPOSED RULE (46 FR 38081)

March 19, 1982

comp

(F21)

DOCKET NUMBER PR-61
PROPOSED RULE (46 FR 51770)

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

Dear Sir or Madam:

The following are comments on the U.S. Nuclear Regulatory Commission's proposed licensing requirements for land disposal of radioactive waste contained in 10 CFR Part 61 and on the Draft Environmental Impact Statement NUREG-0782 prepared as a decision document for the performance objectives and technical and financial criteria set out in Part 61. We understand that the comment period officially closed on January 14, 1982, but that the Commission intends to accept comments submitted after that date and to consider them to the extent possible. Because our review of the docket indicates that very few comments were submitted on closure and post-closure care and because we consider these topics to be extremely critical aspects of the regulatory program, we are submitting the following comments. We have addressed the most major concerns expressed in the docket, and sought in addition to raise issues not addressed to date in the docket.

The International Research and Technology Operation of the General Research Corporation (formerly the International Research and Technology Corporation) has been involved since 1977 in supporting the U.S. Environmental Protection Agency in developing standards for closure and post-closure care, cost-estimation, and financial responsibility of the owners and operators of hazardous waste treatment, storage and disposal facilities. Many of the issues concerning the scope and content of Part 61 and NUREG-0782 are similar to issues addressed in the analysis of how to protect human health and the environment from hazardous waste. In particular, the long-term nature of the threat to human health and the environment posed by both hazardous and radioactive waste makes it extremely important that effective regulatory structures be developed.

The comments which follow discuss the technical and procedural requirements established by 10 CFR Part 61. Major problems associated with most of the phases in the life cycle of a typical land disposal facility for radioactive waste are identified by phase. No attempt has been made, however, to analyze issues particularly associated with the preoperational phase, such as disposal site design or the effects of different waste characteristics and classifications. Major emphasis has been placed on issues associated with the closure plan and cost estimates and the performance of the actions they require.

.....acknowledged by card. 3/25/82 emp

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Technical and Procedural Issues

a. Preoperational and Operational Phases

D-52-6

Although the closure of the disposal facility is extremely important to the overall assurance of protection of public health and safety, Part 61 may not establish sufficiently specific requirements for the closure plan, nor may it establish adequate procedures for revising the closure plan during the operational phase of the facility.

The initial closure plan must be prepared as a part of the special technical information contained in the license application. Section 61.12(b) requires that this information include a description of design features related to disposal site closure and stabilization, and Section 61.12(g) sets a broad performance requirement that closure should "eliminate the need for ongoing active maintenance" (emphasis added), which is defined in turn in Section 61.2 to mean such "significant remedial activity" as pumping or treatment of water from a disposal unit. Closure is, in general, expected to achieve a "reasonable assurance" that exposures to humans are within the limits established in specific performance objectives set in Sections 61.41 to 61.44. Two potential problems arise from these provisions as drafted, however. First, it may not be possible or desirable to eliminate the need for active maintenance, if that maintance includes such activities as leachate monitoring and pumping. In some cases, an environmentally sound plan for closure may still require periodic leachate pumping to ensure adequate protection. Since the commission anticipates that from five to fifteen years may be an appropriate post-closure observation and maintance period, a requirement that closure activities minimize to the extent possible the need for future active maintenance may be a more appropriate performance objective.

A second potential problem is due to the lack of procedural specificity in the closure plan regulations. Given that the Commission's intent is to allow a licensee to tailor his plan to meet the specific conditions of his site, it is important to indicate explicitly the procedures which must be followed and sufficient details about the contents of the plan to ensure that the requirement can be enforced. Issues that require classification include the following:

To what extent does the closure plan account for activities to be carried out during the post-closure observation and maintenance period?

- Is the plan based on the assumption that closure will occur when intended under ideal site conditions or should it account for activities that may be necessary under a worst-case scenario (or something in between)?
- What kinds of activities are expected to be accounted for in the closure plan? For example, what level of inventory if any, should be assumed?
- What kind of documentation is expected?
- Closure plans must be approved prior to closure. How long prior to closure must they be submitted? What are the provisions of this review process? Involvement of the public? What happens if the plan is not approved?

D-52-6

Detailed guidance may be sufficient to clarify certain kinds of questions, e.g., the level of documentation expected in the plan. Other issues must be clarified in the regulation, however, if the Commission is to be assured that a licensee's closure plan reflects the needs of the site and can be used as a basis for financial responsibility requirements.

The purpose of the closure plan is to ensure that adequate preparations have been made for site closure and to serve as the basis for the level of financial responsibility required to ensure that adequate funds are available for closure. Unless the closure plan adequately reflects actual site conditions these goals will not be met. Provisions in the regulations for revising the plan during the operational phase may not overcome these problems. Part 61 seems to require that closure plans be revised, if necessary, as part of the closure application procedures. Although the provisions of Section 61.25 implicitly include revisions in the closure plan, the requirement is not clear.. In addition, the requirement does not specifically state the circumstances under which the plan must be revised.

If regulations do not explicitly state when the plan must be revised, two problems could arise. First, an emergency situation could occur which did not allow for an extended period of planning before closure operations had to begin. In such a situation, the existing closure plan could be found to be seriously inadequate. Second, because the cost estimates are tied to the closure plan, infrequent revisions in the closure plan could lead to inaccurate cost estimates and inadequate financial assurance. Although the financial assurance mechanism will be revised annually, such a review can only ensure that the mechanism is adequate to pay for the activities called for by the closure plan. An inadequate plan will lead directly to inadequate assurance.

In addition to problems with the content of the closure plan, the precise relationship between the closure plan and the closure cost estimate is left uncertain. First, the activities that are intended to be included in the estimate and the assumptions to be used in estimating costs are left unclear (e.g., it is not clear if estimates are to be based on a worst-case scenario). The EPA, for example, in its cost estimating regulations requires that cost estimates be based on the costs of closure of the maximum extent of site operation. Second, if the cost estimate and financial responsibility are to include the post-closure observation period, it is essential to determine the length of that observation period. If the cost estimate is not prepared assuming the longest likely post-closure period, then insufficient funds may be available if needed. For financial planning purposes it is also necessary to know the length of the post-closure period and the extent of funds that will be required.

E-1

b. Closure Phase and Post-Closure Phase

The Part 61 regulations do not completely resolve the question of when the closure phase is terminated. Section 61.30 states that the Commission will determine that closure has been made "in conformance with the licensee's disposal site closure plan, as amended and approved as part of the license". However, Section 61.29 provides that even following "completion of closure" the licensee will be required to perform observation, monitoring, maintenance and repairs "until the site closure is complete" and the license is transferred. The Commission estimates that post-closure observational maintenance will last from five to fifteen years. Despite the separation of the closure phase from the post-closure observation and maintenance phase, therefore, it appears that in practice the two phases must be treated together. The closure plan will have to include plans for post-closure observation and maintenance, or those activities will not be properly reflected in the cost estimates and financial assurances. Such estimates will be difficult to achieve because the duration of the post-closure phase is not precisely defined.

B-8

Determination by the Commission that the required closure or post-closure activities have been completed satisfactorily and that the license may be transferred may also be difficult, in the absence of any certification procedures. Similar regulations in other related areas such as hazardous waste frequently require that the licensee obtain a certification from an engineer that activities required by the closure plan have been carried out.

A third problem associated with the closure and post-closure phases will arise if certain forms of active maintenance cannot be terminated. For example, if leachate pumping cannot be discontinued, or if such pumping can only be avoided by massive expenditures not provided

B-8 for in the financial assurance obtained by the licensee, the Commission may either be forced to undertake legal action, including bankruptcy proceedings, to obtain additional funds from the licensee, or be compelled to transfer the site. Such situations could lead to conflicts between the Commission, the states, and the licensee over transfers of responsibility.

c. Institutional Control Phase

E-1 The key issues to be resolved regarding requirements during this phase involve the scope of required activities and the allocation of responsibilities between the Commission and the Agent responsible during the institutional control period. The intent of closure is to ensure that no active maintenance is needed during the institutional control period. Section 61.63, however, stipulates that financial assurance must be available during the institutional control period to cover "any required maintenance...". It is unclear who has the responsibility of performing major maintenance activities, if necessary, and how disputes over that responsibility will be resolved.

Second, the contents of the agreements are unclear and the criteria to be used in evaluating these agreements are not indicated. It is also unclear if these leasing agreements will be reviewed during the operational phase and who will take responsibility for the institutional control period if the leasing agreement is deemed no longer adequate.

Sincerely,

Robin Rodensky Severn

Robin Rodensky Severn
Economic and Regulatory
Analysis Department
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'82 MAR 31 P2:07

March 24, 1982

(124)

Mr. Tim Johnson
U.S. Nuclear Regulatory Commission
Silver Spring, MD

DOCKET NUMBER PROPOSED RULE PR-2etal (46 FR38081)

SUBJECT: 10CFR61/Waste Form Stability

Dear Tim:

We wish to thank Paul Lohaus, Dale Smith and yourself for the time spent with us to discuss 10CFR61 and our comments concerning waste form stability. We can appreciate the difficulty you face in developing a simple yet comprehensive statement defining structural stability of buried waste forms. Per our discussion, we have given the matter some thought and have the following suggestions regarding alternative wording:

D-56-9 "A structurally stable waste form shall remain a monolithic solid without volume change under the expected disposal conditions."

Or, if there is a need to distinguish thermoplastics from other waste forms;

"Waste forms which can undergo plastic deformation under a compressive stress equivalent to the burial environment shall be required to behave as a monolithic, volumetrically incompressible component of the surrounding soil; i.e. experience no appreciable volume changes or crumbling to form a discontinuous solid."

We trust that you will find the foregoing suggestions helpful as you attempt to incorporate solicited comments into the final regulation. If we can be of any further assistance, please do not hesitate to contact us.

Very truly yours,

William J. Klein

William J. Klein
Manager, Product Development
Hazardous Waste Treatment Systems

WJK/gs

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April 5, 1982

REPLY REFER TO
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FILE NO (125)

DOCKET NUMBER
PROPOSED RULE PR-2 etal
(46 FR 38081)

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

Attention: Docketing & Service Branch

Gentlemen:

Enclosed please find supplemental comments by the Township of Lower Alloways Creek to proposed rule for licensing requirements for land disposal of radioactive waste.

Very truly yours,

CARL J. VALORE

CJV/sgp

D-55-9

B-447

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

10 CFR Part 61, et seq.	Supplemental Comments of the Township of Lower Alloways Creek to Proposed Rule for Licensing Requirements for Land Disposal of Radioactive Waste

TO: Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D.C., 20555

Attention: Docketing & Service Branch

The Township of Lower Alloways Creek hereby supplements the comments it filed on January 12, 1982 as follows:

The classification established in the DEIS, Vol. 2, part 2.4.3.1, is based principally on radiotoxicity. The Township of Lower Alloways Creek is of the opinion that the suggestion to classify on the basis of total hazard-chemical, biological and physical as well as radiological, can be implemented. Tehnical meetings between the Environmental Protection Agency and the Nuclear Regulatory Commission should be productive of a classification system for non-radiological hazards at low-level waste disposal sites. The failure of the Nuclear Regulatory Commission to address the chemical, biological and physical hazards of material to be placed at low-level waste disposal sites constitutes a regulatory gap and a minimization of the risks involved.

Respectfully submitted,

CARL J. VALORE, Special
Nuclear Counsel for the
Township of Lower Alloways Creek

April 5, 1982

NRC FORM 335 (7-77) U.S. NUCLEAR REGULATORY COMMISSION

BIBLIOGRAPHIC DATA SHEET

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16. ABSTRACT *(200 words or less)*

The three-volume final environmental impact statement (FEIS) is prepared to guide and support publication of a final regulation, 10 CFR Part 61, for the land disposal of low-level radioactive waste. The FEIS is prepared in response to public comments received on the draft environmental impact statement (DEIS) on the proposed Part 61 regulation. The DEIS was published in September 1981 as NUREG-0782. Public comments received on the proposed Part 61 regulation separate from the DEIS are also considered in the FEIS. The FEIS is not a rewritten version of the DEIS, which contains an exhaustive and detailed analysis of alternatives, but rather references the DEIS and presents the final decision bases and conclusions (costs and impacts) which are reflected in the Part 61 requirements. Four cases are specifically considered in the FEIS representing the following: past disposal practice, existing disposal practice, Part 61 requirements, and an upper bound example.

17. KEY WORDS AND DOCUMENT ANALYSIS

17a. DESCRIPTORS

low-level waste
land disposal
social commitment
groundwater migration
inadvertent intrusion
10 CFR Part 61
waste form
financial assurances
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radioactive waste
disposal technologies
cost-benefit analysis

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