PR-40
49 FR 46418
ABSO-2
PDR

205/RSD/85/04/17

APR 19 1985

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See Packet 2 for encl.

MEMORANDUM FOR: Richard E. Cunningham, FC
Robert L. Fonner, ELD
Sue F. Gagner, PA
Michael Lesar, DRR
Donald A. Nussbaumer, SP
R. Dale Smith, URFO
Sheldon L. Trubatch, OGC

FROM: Robert E. Browning, Director
Division of Waste Management

SUBJECT: FINAL RULEMAKING ON URANIUM MILL TAILINGS

Enclosed for your information and review is a Commission paper on a proposed final rulemaking for uranium mill tailings. The amendments to 10 CFR Part 40 are to conform to the Environmental Protection Agency's standards.

A copy of the proposed cover memorandum for Mr. Dircks is also enclosed. It shows either a concurrence or coordination role for your organization on this paper.

To concur, or if you have questions or comments, please call Kitty Dragonette (427-4300) directly. We would appreciate telephone response to expedite resolution of comments and to enable us to forward the package as soon as possible. Any substantive comments should be documented in a followup memorandum to complete the rulemaking history.

/s/ Mike Bell

Robert E. Browning, Director
Division of Waste Management

Enclosures:
1. Commission paper
2. Cover memorandum

OFC	:WMLU	:WMLU	:WM	:WM	:	:
NAME	:KDragonette/j	:LHigginbotham	:MJBell	:REBrowning	:	: :
DATE	:85/04/18	: 85/04/19	:85/04/19	:85/04/19	:	:

205

Encl. to memo to Various fm. REB 4/19/85

For: The Commissioners

From: William J. Dircks
Executive Director for Operations

Subject: FINAL RULEMAKING ON URANIUM MILL TAILINGS

Purpose: To request Commission approval to publish final amendments to 10 CFR Part 40 conforming to the Environmental Protection Agency's (EPA) final standards for uranium and thorium mill tailings.

Discussion: Final EPA standards for uranium and thorium mill tailings were published October 7, 1983 in new Subparts D and E to 40 CFR 192 (see Enclosure C). The NRC Authorization Act for FY 1983 (Public Law 97-415) requires that NRC conform its tailings regulations to these final EPA standards.

A two-step process was approved to modify the Commission's rules to fully reflect the EPA standard: (1) amendments to Appendix A of 10 CFR Part 40 published in the Federal Register for public comment (49 FR 46418, November 26, 1984) and (2) further amendments to 10 CFR Part 40 as described in the accompanying Advance Notice of Proposed Rulemaking (ANPRM) (49 FR 46425, November 26, 1984). Copies of the two notices are included as Enclosure A.

Contacts:
K. Dragonette, WM:NMSS, 427-4300
R. Fonner, ELD, 492-8692

The proposed amendments to Appendix A reflected conforming changes to existing provisions necessary to remove conflicts with the EPA standard and to incorporate the stability and radon release provisions and other provisions of the EPA standard not related to ground water. The ANPRM outlined plans for further amendments to 10 CFR Part 40 to incorporate the ground-water provisions imposed by the EPA standard and establish other requirements as necessary to satisfy the Uranium Mill Tailings Radiation Control Act of 1978, as amended, (UMTRCA) mandate for Resource Conservation and Recovery Act (RCRA)-comparable standards. Comments on the ANPRM are still under review. Comments on the ANPRM addressed many of the same general issues and raised no significant new ones. The comments on the two rulemakings, the depressed state of the industry, and the need to concentrate staff resources on implementation guidance and licensing cases have prompted staff to reconsider the nature and scope of the second rulemaking. As noted in the proposed notice in Enclosure B, a followup simple rule change to incorporate the specific ground-water protection provisions of 40 CFR 192 is one option being considered. Staff recommendations on the second step will be forwarded to the Commission as soon as the comment analysis is complete and a decision reached. Publication of the final first step rulemaking need not and should not be delayed pending a decision on the second step. Publication by the end of May would complete the first step in 6 months following publication of the proposed rule.

The comment period for the proposed rule originally expired on January 10, 1985 but was extended until February 10, 1985. Twenty-four commenters responded with 26 sets of comments. Six environmental groups, seven States, two Federal agencies, seven industry representatives, one individual, and one pro-nuclear group responded. Comments were offered on both general issues and the specific changes in the proposed rule notice. The comments and responses are summarized in the final rule notice in Enclosure B. Enclosure D is a copy of the detailed staff analysis of the comments. Enclosure D also includes copies of the comments.

The enclosed final rule notice in Enclosure B reflects and incorporates the Office of the General Counsel's (OGC)

response to the American Mining Congress (AMC) jurisdictional arguments and EPA's comments on the Commission Authority and Responsibility Statement. The OGC response is contained in SECY-85-125. The Commission's policy statement is included in the notice without change.

After consideration of the comments, staff recommends the final rule proposed for Commission approval in Enclosure B. Staff concluded that the basic two-step rulemaking approach is still feasible and advisable. The major differences between the proposed and final rules are:

(1) Addition of an insert to the Introduction requiring consideration of risks and costs in site specific licensing decisions;

(2) Addition of an insert to Criterion 5 clarifying the applicability of 40 CFR 192;

(3) Clarification of the general goal of permanent isolation of tailings in Criterion 1;

(4) Clarification in Criterion 6 that the radon flux limits are to be met for the effective design life of the reclaimed impoundment;

(5) Clarification in Criterion 8 that doses from radon emissions are to be as low as is "reasonably achievable" rather than as is "practicable"; and

(6) Addition of changes to 10 CFR 150 to clarify Agreement State options to adopt alternatives under section 274o of the AEA.

Other minor clarifying and editorial changes were also made.

Recommendations: That the Commission:

1. Approve publication of the final rule changes to 10 CFR Part 40 as set forth in the draft Federal Register Notice in Enclosure B.

2. In order to satisfy requirements of the Regulatory Flexibility Act (PL-96-354) certify that the final rule, if promulgated, will not have a significant economic impact on a substantial number of small entities. The basis for this certification is summarized in the enclosed Federal Register Notice (Enclosure B) under the Regulatory Flexibility Certification heading.

3. Note:

   a. Licensee compliance with Subparts D and E of 40 CFR 192 is an existing requirement and the proposed regulations merely incorporate specific requirements in 40 CFR 192 into NRC regulations. EPA issued a detailed Regulatory Impact Analysis in support of its standard and there is no significant additional impact arising from the proposed changes to Appendix A. Accordingly, no additional regulatory analysis has been prepared for the changes to Appendix A.

   b. EPA prepared and issued comprehensive draft and final Environmental Impact Statements in support of its standard, respecting control of radon releases, and cover longevity and stability, and the staff does not believe any additional environmental review is needed for these standards.

   c. That the Chief Counsel for Advocacy of the Small Business Administration will be informed of the certification and the reasons for it as required by the Regulatory Flexibility Act.

   d. That the Subcommittee on Nuclear Regulation of the Senate Committee on Environment and Public Works, the Subcommittee on Energy and the Environment of the House Committee on Interior and Insular Affairs, the Subcommittee on Energy and Power of the House Committee on Interstate and Foreign Commerce, and the Subcommittee on Environment, Energy and Natural Resources of the

House Committee on Government Operations will be informed by a letter similar to Enclosure F.

e. That Rep. Samuel Stratton, Chairman of the House Procurement and Military Nuclear Systems Subcommittee, will also be informed by a letter similar to Enclosure F.

f. That this final rule does not contain a new or amended information collection requirement subject to the requirements of the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.), and that existing requirements were approved by the Office of Management and Budget approval number 3150-0020.

g. That a Public Announcement such as Enclosure E will be issued on filing of the notices with the Office of the Federal Register.

h. That copies of the notice will be distributed to all Commission uranium mill licensees and copies will be provided to Agreement States for distribution to their uranium mill licensees.

William J. Dircks
Executive Director for Operations

Enclosures:
A. Federal Register Notices (2)
B. Proposed Notice of Final Rulemaking
C. EPA Standard
D. Staff Analysis of Public Comments
E. Draft Public Announcement
F. Draft Congressional Letter

WMLU	OELD	SP	FC	WM	NMSS	EDO
KDragonette LHigginbotham				REBrowning MJBell	JG Davis DMausshardt	WJDircks
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ENCLOSURE A

grain is being sacked, or while the grain is at rest in a warehouse or holding facility in accordance with the instructions.

(3) *"OUT" movements (other than export).* Each checkweighing of an "OUT" movement of nonexport sacked grain shall be based on an official weight sample obtained from the grain as the grain is being loaded in the carrier or container, or while the grain is at rest in the carrier and container, or while the grain is at rest in a warehouse or holding facility, or while the grain is being sacked in accordance with procedures prescribed in the instructions.

(4) *"LOCAL" weighing.* Each checkweighing of a "LOCAL" movement of sacked grain shall be based on an official weight sample obtained while the grain is at rest or while the grain is being transferred in accordance with procedures prescribed in the instructions.

§§ 800.100–800.103 [Removed]

6. Sections 800.100, 800.101, 800.102, and 800.103 would be removed.

(Pub. L. 94–582, 90 Stat. 2869, as amended (7 U.S.C. 71 *et seq.*))

Dated: November 8, 1984.

Kenneth A. Gilles,

Administrator.

[FR Doc. 84–30870 Filed 11–23–84; 8:45 am]

BILLING CODE 3410–EN–M

NUCLEAR REGULATORY COMMISSION

10 CFR Part 40

Uranium Mill Tailing Regulations; Conforming NRC Requirements to EPA Standards

AGENCY: Nuclear Regulatory Commission.

ACTION: Proposed rule.

SUMMARY: The Nuclear Regulatory Commission (NRC) is proposing to amend its regulations governing the disposal of uranium mill tailings. The proposed rule changes are intended to conform existing NRC regulations to the regulations published by the Environmental Protection Agency for the protection of the environment from these wastes. This action is being taken to comply with the legislative mandate set out in the Uranium Mill Tailings Radiation Control Act and the NRC Authorization Act for FY 1983.

DATE: The comment period expires on January 10, 1985. Comments received after this date will be considered if it is practical to do so but assurance of consideration may not be given except for comments received on or before this date.

ADDRESSES: Mail comments to Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Service Branch. Deliver comments to Room 1121, 1717 H Street NW, Washington, DC between 8:15 a.m. and 5:00 p.m. weekdays.

FOR FURTHER INFORMATION CONTACT: Robert Fonner, Office of the Executive Legal Director, telephone (301) 492–8692, or Kitty S. Dragonette, Division of Waste Management, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 427–4300.

SUPPLEMENTARY INFORMATION: The Nuclear Regulatory Commission (NRC or Commission) is proposing modifications to its regulations for the purpose of conforming them to generally applicable requirements recently promulgated by the Environmental Protection Agency (EPA). These new EPA requirements are contained in Subparts D and E of 40 CFR Part 192 (48 FR 45926; October 7, 1983), are applicable to the management of uranium and thorium byproduct material, and became effective for NRC and Agreement State licensees and license applicants on December 6, 1983. The action proposed herein would modify previously existing regulations of the Commission to conform them to the new EPA requirements, and would incorporate certain of the new EPA requirements into the Commission's regulations. The affected Commission regulations are contained in Appendix A to 10 CFR Part 40, which was promulgated in final form on October 3, 1980 (45 FR 65521).

The modifications to Commission regulations proposed herein will incorporate within NRC regulations some of the new EPA requirements. The action that the Commission will take with respect to the remainder of these new EPA requirements is the subject of an Advanced Notice of Proposed Rulemaking (ANPRM), which requests comment on that subject, also issued this day. These new EPA requirements were developed and issued by EPA pursuant to section 275b. of the Atomic Energy Act (42 U.S.C. 2022), as added by section 206 of Pub. L. 95–604, the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA). Under section 18(a) of Pub. L. 97–415, the Nuclear Regulatory Commission Authorization Act for fiscal years 1982 and 1983, the Commission was directed to conform its regulations to EPA's with notice and opportunity for public comment. Today's proposal addresses that responsibility.

Previous Actions

In keeping with section 18(a) of the NRC Authorization Act, the Commission suspended portions of its October 3, 1980 mill tailings regulations after notice and opportunity for public comment (48 FR 35350; August 4, 1983). As required by the Act, this suspension terminated automatically April 1, 1984. Those portions of the Commission's regulations which were suspended were those that were determined to be in conflict or inconsistent with EPA's proposed requirements. More specifically, the suspended portions were those that would require a major commitment or major action by licensees which would be unnecessary if: (1) The EPA proposed standards were promulgated in final form without modification, and (2) the Commission's regulations were modified to conform to the EPA standards. The objective of the suspension was to avoid a situation where a licensee or applicant might make a major commitment or take a major action which would be unnecessary or ill-advised after subsequent rulemaking to modify permanently the existing regulations on the basis of EPA's final standards.

The final EPA standards are very similar to those that were proposed. Nevertheless, the Commission has reconsidered the appropriateness of changes to Appendix A to 10 CFR Part 40 in light of the new EPA standards, and the need for additional supporting documentation. The changes proposed today are more modest than the previous suspension.

Scope of This Proposal

In addition to conforming its existing regulations to new EPA standards, under the provisions of the UMTRCA, the Commission has a further legislated responsibility: it must establish general requirements, for the management of byproduct material, with EPA concurrence, which are, to the maximum extent practicable, at least comparable to requirements applicable to the management of similar hazardous material regulated by the EPA under the Solid Waste Disposal Act (SWDA), as amended. The Commission deliberated as to how best to deal with these related rulemaking needs and decided on the course of action resulting in this proposal and the accompanying ANPRM. This proposal addresses all the changes to the existing Commission regulations in Appendix A to 10 CFR Part 40 that can be legally promulgated without additional supporting

documentation. Other changes to the Commission's regulations for mill tailings management resulting from the EPA standard are the subject of the accompanying ANPRM.

The content of these two rulemakings also may be characterized in terms of the need for EPA concurrence, although that was not the deciding factor. This proposal consists of modifications not requiring EPA concurrence, including conforming changes to existing NRC rules and incorporation of EPA requirements not deriving from the SWDA. Those modifications that are the subject of the ANPRM accompanying this proposal deriving from the SWDA require EPA concurrence pursuant to section 84 of the Atomic Energy Act. Modifications addressed in the ANPRM include: (1) Incorporation into NRC regulations of SWDA requirements already imposed by the EPA, (2) any further modifications to NRC regulations necessary to establish SWDA-comparable requirements as called for by the UMTRCA, and (3) any further modifications needed to address prescriptive provisions that were suspended prior to April 1, 1984 but not proposed for modification by this action. This course of action was chosen to allow the Commission to both conform its regulations to EPA's and incorporate non-SWDA provisions in a prompt and orderly manner and deal with the complex of SWDA requirements and issues in a separate, comprehensive and unified rulemaking.

Content of This Proposal

The new EPA requirements in 40 CFR Part 192, (48 FR 45926) included by reference several sections from 40 CFR Part 264, promulgated by the EPA pursuant to authority provided by the Resource Conservation and Recovery Act (RCRA), which modified the SWDA. These SWDA (or RCRA) requirements imposed under 40 CFR Part 192 are addressed in the ANPRM accompanying this proposal. The few conforming changes to NRC's existing Appendix A regulations made necessary by these newly imposed SWDA requirements are addressed in this document, as are conforming changes and other changes necessary to reflect and incorporate the non-SWDA elements of EPA's new requirements. These non-SWDA provisions include requirements to—

(1) Adhere to applicable requirements in 40 CFR Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operations" for uranium byproduct material, and essentially the same requirements for thorium byproduct material;

(2) Adhere to applicable requirements in 40 CFR Part 440, "Ore Mining and Dressing Point Source Category: Effluent Limitations Guidelines and New Source Performance Standards, Subpart C, Uranium, Radium, and Vanadium Ores Subcategory."

(3) Maintain releases of radon to the atmosphere during operations as low as is practicable;

(4) Close disposal areas so as to provide reasonable assurance of effective control for 1,000 years, to the extent reasonably achievable, and, in any case, for at least 200 years;

(5) Limit average post-closure releases of radioactive radon gas to no more than 20 picocuries per square meter per second (pCi/m^2-s); and

(6) Set limits for residual concentrations of radioactive radium left in soil, above background, in onsite areas not subject to the closure requirements for longevity and radon release control.

Proposed Modifications and Rationale

In accordance with the above, the Commission proposes the following modifications to Appendix A to 10 CFR Part 40:

1. Introduction

(a) In the second sentence of the third paragraph, change "amendability" to "amenability."

Reason: This change corrects a typographical error.

(b) Delete the fourth paragraph in its entirety.

Reason: This change deletes an information submittal requirement which was established in connection with implementation of the original Appendix A criteria. The due date originally set for submittals is past. A new due date for revised submittals is not considered necessary.

(c) Add the following paragraph at the end: "Licensees or applicants may propose alternatives to the specific requirements in this Appendix. The alternative proposals may take into account local or regional conditions, including geology, topography, hydrology, and meteorology. The Commission may find that the proposed alternatives meet the Commission's requirements if the alternatives will achieve a level of stabilization and containment of the sites concerned, and a level of protection for public health, safety, and the environment from radiological and nonradiological hazards associated with the sites, which is equivalent to, to the extent practicable, or more stringent than the level which would be achieved by the requirements of this Appendix and the standards promulgated by the Environmental Protection Agency in 40 CFR Part 192, Subparts D and E."

Reason: The flexibility to propose alternatives to the Commission's and EPA standards was included in Pub. L. 97-415 changes to the AEA. The added paragraph paraphrases the language in Section 84c. The added paragraph explicitly acknowledges the legislative intent and provides licensees and applicants the opportunity to propose alternatives as a routine licensing matter. Licensees would have to provide a site specific rationale to enable the Commission to make the required finding. This generic approach was taken instead of modifying individual criteria to provide flexibility. A generic approach avoids the chance of not identifying all areas where flexibility may be needed and preserves the existing support for Appendix A. Administratively, alternatives are easier to process under an explicit provision than exceptions to rules.

2. Criterion 1

(a) In the first paragraph delete the phrase "* * * for thousands of years * * *" and insert "* * * *."

Reason: The thousands of years language conflicts with the 40 CFR 192.32(b) standard of design of control measures to be effective for 1,000 years.

(b) In the second listed item of the first paragraph, delete the word "usable."

Reason: Both 40 CFR 264.221 and 40 CFR 264.92, which are included by reference in 40 CFR 192.32(a), require isolation of contaminants from all qualities of groundwater, not just usable groundwater sources.

3. Criterion 3

(a) Delete the modifiers "high quality" for groundwater in the second sentence of the second paragraph.

Reason: The EPA standards require protection of all qualities of groundwater, not just high quality sources.

4. Criterion 4

(a) Revise paragraph (a) by deleting "maximum possible flood" and inserting "Probable Maximum Flood."

Reason: Probable Maximum Flood reflects the appropriate hydrologic terms for a design basis and the original intent of the provision when Appendix A was promulgated.

5. Criterion 5

(a) In the first paragraph, delete the first two sentences beginning "Steps shall be taken * * *" and ending

"potential uses." and the phrase " * * * in order to accomplish this objective." in the third sentence.

Reason: The EPA groundwater protection standards referenced in 40 CFR 192.32(a) do not permit any seepage to groundwater.

(b) In the first listed item under the first paragraph beginning with "Installation of * * *" delete the words "low permeability" as a characteristic of bottom liners.

Reason: The EPA groundwater protection standard referenced in 40 CFR 192.32(a) requires a liner that prevents migration of wastes out of the impoundment into the adjacent soil and groundwater. Low permeability implies that some migration is allowed.

(c) In the second paragraph beginning "Where groundwater impacts * * *" delete the phrase "to its potential use before milling operations began to the maximum extent practicable."

Reason: The EPA standard in 40 CFR 192.33, by referencing 40 CFR 264.100, requires a corrective action program to restore groundwater to standards established under 40 CFR 264.92–264.94. This standard is essentially a nondegradation standard. Restoration of groundwater quality only to the extent necessary to restore its potential use is inconsistent with EPA standard.

(d) Delete in its entirety the third paragraph beginning "While the primary method of protecting groundwater shall be isolation * * *" and ending "* * * from current or potential uses."

Reason: The EPA standards for groundwater protection in 40 CFR 192.32(a) protect groundwater primarily on the basis of background-level concentration limits for hazardous constitutents, and not in terms of current or potential uses. The deleted sentence allowed consideration of tailings in contact with groundwater. The EPA standard permits no seepage to groundwater.

(e) In the first sentence of the fifth paragraph beginning "This information shall be gathered * * *" delete the word "usable" where it modifies "groundwater."

Reason: The EPA standard in 10 CFR 192.32(a) does not distinguish between "usable" and nonusable acquifers. The groundwater protection standard applies universally to acquifers of any quality or potential use.

6. Criterion 6

(a) Delete the first sentence in entirety, beginning with "Sufficient earth cover * * *" and ending with "* * * meter per second.", and in its place insert "In cases where waste byproduct material is to be permanently disposed, an earthen cover shall be placed over tailings or wastes at the end of milling operations and the waste disposal area shall be closed in accordance with a design [1] which shall provide reasonable assurance of control of radiological hazards to: (i) Be effective for one thousand years, to the extent reasonably achievable, and, in any case, for at least 200 years, and (ii) limit releases of radon-222 from uranium byproduct materials, and radon-220 from thorium byproduct materials, to the atmosphere so as to not exceed an average [2] release rate of 20 picocuries per square meter per second (pCi/m²s)."

Reason: The change replaces previous Commission requirements for minimum cover thickness and post-closure radon control with the EPA standards for longevity and radon control. The EPA standard in 40 CFR 192.32(b) for environmental protection after closure specifies that the control method must provide reasonable assurance that releases of radon-222 do not exceed 20 picocuries per square meter per second, rather than 2 picocuries. Under the EPA standard the thickness of cover will be a function of longevity and radon release and will be determined based on meeting the 20 value instead of 2. The three meter minimum precriptive requirement was developed to achieve a 2 picocurie emanation rate based on the assumed typical soil conditions.

(b) Add to Criterion 6 the following two footnotes which accompany the revised first sentence: footnote: (1) "The standard applies to design. Monitoring for radon after installation of an appropriately designed cover is not required." and footnote (2) "This average shall apply to the entire surface of each disposal area over periods of at least one year, but short compared to 100 years. Radon will come from both uranium byproduct materials and from covering materials. Radon emissions from covering materials should be estimated as part of developing a closure plan for each site. The standard, however, applies only to emissions from byproduct materials to the atmosphere."

Reason: This change fully incorporates the EPA radon control standard.

(c) In the fifth sentence of the first paragraph, replace "non-soiled" with "non-soil." and replace the words "to reduce tailings covers to less than three meters" with the words "as cover materials."

Reason: The first change corrects a typographical error. The second is an editorial change to be consistent with the deletion of the three meter minimum requirement as discussed in (a) above.

(d) At the end of Criterion 6, add a new paragraph to read: "The design requirements in this Criterion for longevity and control of radon releases shall apply to any portion of a licensed and/or disposal site unless such portion contains a concentration of radium in land, averaged over areas of 100 square meters, which, as a result of byproduct material does not exceed the background level by more than: (i) 5 picocuries per gram (pCi/g) of radium-226, or, in the case of thorium byproduct material, radium-228, averaged over the first 15 centimeters (cm) below the surface, and (ii) 15 pCi/g of radium-226, or, in the case of thorium byproduct material, radium-228, averaged over 15-cm thick layers more than 15 cm below the surface."

Reason: This change incorporates the EPA requirements for site cleanup outside the actual disposal area, in areas where the longevity and radon control closure standards are not applicable (see 40 CFR 192.32(b)(2) and 192.41).

7. Criterion 8

(a) At the end of the first full paragraph, add a new sentence to read "During operations and prior to closure, radiation doses from radon emissions from surface impoundments shall be kept as low as is practicable."

Reason: This change incorporates the EPA requirement imposed under 40 CFR 192.32(a)(4).

(b) Following the third full paragraph of Criterion 8, just before Criterion 8A, insert the following two new paragraphs:

"Milling operations producing or involving thorium byproduct material shall be conducted in such a manner as to provide reasonable assurance that the annual dose equivalent does not exceed 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public as a result of exposure to the planned discharge of radioactive materials, radon-220 and its daughters excepted, to the general environment."

"Uranium and thorium byproduct materials shall be managed so as to conform to the applicable provisions of Title 40 of the Code of Federal Regulations, Part 440, Ore Mining and Dressing Point Source Category: Effluent Limitations Guidelines and New Source Performance Standards, Subpart C, Uranium, Radium, and Vanadium Ores Subcategory, as codified on January 1, 1983."

Reason: These new paragraphs incorporate EPA requirements imposed

under 40 CFR 192.41(d) and 40 CFR 192.32(a)(3), respectively.

8. Criteria 2, 7, 9, 10, 11, and 12 are not affected by the new EPA standards or editorial changes and no modification is proposed for any portion of those criteria.

Commission Authority and Responsibility

Section 84c. of the Atomic Energy Act state that: A Licensee may propose alternatives to specific requirements adopted and enforced by the Commission under this act. Such alternative proposals may take into account local or regional conditions, including geology, topography, hydrology and meteorology. The Commission may treat such alternatives as satisfying Commission requirements if the Commission determines that such alternatives will achieve a level of stabilization and containment of the sites concerned, and a level of protection for public health, safety, and the environment from radiological and nonradiological hazards associated with such sites, which is equivalent to, to the extent practicable, or more stringent than the level which would be achieved by standards and requirements adopted and enforced by the Commission for the same purpose and any final standards promulgated by the Administrator of the Environmental Protection Agency in accordance with section 275.

The Commission historically has had the authority and responsibility to regulate the activities of persons licensed under the Atomic Energy Act of 1954, as amended. Consistent with that authority and in accordance with section 84c. of that Act, the Commission has the discretion to review and approve site specific alternatives to standards promulgated by the Commission and by the Administrator of the Environmental Protection Agency. In the exercise of this authority, Section 84c. does not require the Commission to obtain the concurrence of the Administrator in any site specific alternative which satisfies Commission requirements for the level of protection for public health, safety, and the environment from radiological and nonradiological hazards at uranium mill tailing sites. As an example, the Commisson need not seek concurrence of the Administrator is case-by-case determinations of alternative concentration limits and delisting of hazardous constitutents for specific sites. It should be understood that the proposed conforming regulations deal with the exercise of the Commission s responsibility and authority under the Atomic Energy Act of 1954, solely as regards uranium mill tailings sites and have no broader connotation.

The Commission believes that licensee proposals for alternatives can be an important and effective way to help deal with the problems associated with implementing the new EPA standards. The Commission expects that it may require several years to have its conforming regulations fully in place. It expects to use the flexibility provided by section 84 in the interim to consider and approve alternative proposals from licensees. Section 84c. provides NRC sufficient authority to independently approve alternatives so long as the Commission can make the required determination.

Impact of the Proposed Amendments

The Commission's action in proposing these modifications to its regulations in Appendix A to 10 CFR Part 40 is to conform them to the new EPA standards. These changes are for the purpose of avoiding conflicts and inconsistencies, and for clarifying previously existing language so as to be compatible with the new requirements. The action proposed here by the Commission is a consequence of previous actions taken by the Congress and the EPA, and is legally mandated in section 275b(3) of the Atomic Energy Act of 1954, as amended.

Commission action in this case is esentially nondiscretionary in nature, and for purposes of environmental analysis, rests upon existing environmental and other impact evaluations in the following documents: (1) "Final Environmental Impact Statement for Standards for the Control of Byproduct Materials from Uranium Ore Processing (40 CFR Part 192)," Volumes 1 and 2, EPA 520/1–83–008–1 and 2, September 1983, and (2) "Regulatory Impact Analysis of Final Environmental Standards for Uranium Mill Tailing at Active Sites," EPA 520/1–83–010, September 1983, both prepared in support of Subparts D and E of 40 CFR Paret 192, and (3) "Final Generic Environmental Impact Statement on Uranium Milling," NUREG–0706, September 1980, prepared in support of Appendix A of 10 CFR Part 40. The Commission believes that these supporting analyses for the new EPA standards and the existing Commission regulations provide a more than adequate environmental review for the standards addresed herein, and that no additional impact analysis is warranted by the conforming actions proposed herein. The EPA engaged in and completed a NEPA process with full consideration of environmental concerns, and for the purposes of this rulemaking action, can be viewed as the lead agency.

Paperwork Reduction Act Statement

This proposed rule does not contain a new or amended information collection requirement subject to the requirements of the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). Existing requirements were approved by the Office of Management and Budget approval number 3150–0020.

Regulatory Flexibility Certification

As required by the Regulatory Flexibility Act of 1980, 5 U.S.C. 605(b), the Commission certifies that this rule will not, if promulgated, have a significant economic impact upon a substantial number of small entities. Therefore, we have not performed a Regulatory Flexibility Analysis. The basis for this finding is that of the licensed uranium mills, only one qualifies as a small entity. Almost all the mills are owned by large corporations. Three of the mills are partly-owned by companies that could qualify as small businesses, according to the Small Business Administration generic small entity definition of 500 employees. However, under the Regulatory Flexibility Act, a small business is one that is independently owned and operated. Since these three mills are not independently owned they do not qualify as small entities.

List of Subjects in 10 CFR Part 40

Government contracts, Hazardous materials-transportation, Nuclear materials, Penalty, Reporting and recordkeeping requirements, Source material, and Uranium.

Under the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, 5 U.S.C. 553, and the Uranium Mill Tailings Radiation Control Act of 1978, as amended, the NRC is proposing the following amendments to 10 CFR Part 40.

PART 40—DOMESTIC LICENSING OF SOURCE MATERIAL

1. The authority citation for Part 40 is revised to read as follows:

Authority: Secs. 62, 63, 64, 65, 81, 161, 182, 183, 186, 68 Stat. 932, 933, 935, 948, 953, 954, 955, as amended, secs. 11e(2), 83, 84, Pub. L. 95–604, 92 Stat. 3033, as amended, 3039, sec. 234, 83 Stat. 444, as amended (42 U.S.C. 2014(e)(2), 2092, 2093, 2094, 2095, 2111, 2113, 2114, 2201, 2232, 2233, 2236, 2282); secs. 274, Pub. L. 86–373, 73 Stat. 688 (42 U.S.C. 2021); sec. 201, as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846). Section 275, 92 Stat. 3021, as amended by Pub. L. 97–415, 96 Stat. 2067 (42 U.S.C. 2022).

Section 40.7 also issued under Pub. L. 95-601, sec. 10.92 Stat. 2951 (42 U.S.C. 5851). Section 40.31(g) also issued under sec. 122, 68 Stat. 939 (42 U.S.C. 2152). Section 40.46 also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Section 40.71 also issued under sec. 187, 68 Stat. 955 (42 U.S.C. 2237).

For the purposes of sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273); §§ 40.3, 40.25(d)(1)-(3), 40.35(a)-(d), 40.41 (b) and (c), 40.46, 40.51 (a) and (c), and 40.63 are issued under sec. 161b, 68 Stat. 948, as amended, (42 U.S.C. 2201(b)); and §§ 40.25 (c) and (d) (3) and (4), 40.28(c)(2), 40.35(e), 40.42, 40.61, 40.62, 40.64 and 40.65 are issued under sec. 161o, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

Appendix A—[Amended]

2. Appendix A to Part 40 is revised to read as follows:

Appendix A to Part 40—Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material From Ores Processed Primarily for Their Source Material Content

Introduction

Every applicant for a license to possess and use source material in conjunction with uranium or thorium milling, or byproduct material at sites formerly associated with such milling, is required by the provisions of § 40.31(h) to include in a license application proposed specifications relating to milling operations and the disposition of tailings or wastes resulting from such milling activities. This appendix establishes technical, financial, ownership, and long-term site surveillance criteria relating to the siting, operation, decontamination, decommissioning, and reclamation of mills and tailings or waste systems and sites at which such mills and systems are located. As used in this appendix, the term "as low as is reasonably achievable" has the same meaning as in § 20.1(c) of 10 CFR Part 20 of this chapter.

In many cases, flexibility is provided in the criteria to allow achieving an optimum tailings disposal program on a site-specific basis. However, in such cases the objectives, technical alternatives and concerns which must be taken into account in developing a tailings program are identified. As provided by the provisions of § 40.31(h) applications for licenses must clearly demonstrate how the criteria have been addressed.

The specifications shall be developed considering the expected full capacity of tailings or waste systems and the lifetime of mill operations. Where later expansions of systems or operations may be likely (for example, where large quantities of ore now marginally uneconomical may be stockpiled), the amendability of the disposal system to accommodate increased capacities without degradation in long-term stability and other performance factors shall be evaluated.

Licensees or applicants may propose alternatives to the specific requirements in this Appendix. The alternative proposals may take into account local or regional conditions, including geology, topography, hydrology, and meteorology. The Commission may find that the proposed alternatives meet the Commission's requirements if the alternatives will achieve a level of stabilization and containment of the sites concerned, and a level of protection for public health, safety, and the environment from radiological and nonradiological hazards associated with the sites, which is equivalent to, to the extent practicable, or more stringent than the level which would be achieved by the requirements of this Appendix and the standards promulgated by the Environmental Protection Agency in 40 CFR Part 192, Subparts D and E.

I. Technical Criteria

Criterion 1—In selecting among alternative tailings disposal sites or judging the adequacy of existing tailings sites, the following site features, which will determine the extent to which a program meets the broad objective of isolating the tailings and associated contaminants from man and the environment for 1,000 years, thereafter, without ongoing active maintenance shall be considered:

- Remoteness from populated areas;
- Hydrologic and other natural conditions as they contribute to continued immobilization and isolation of contaminants from groundwater sources; and
- Potential for minimizing erosion, disturbance, and dispersion by natural forces over the long term.

The site selection process shall be an optimization to the maximum extent reasonably achievable in terms of these features.

In the selection of disposal sites, primary emphasis shall be given to isolation of tailings or wastes, a matter having long-term impacts, as opposed to consideration only of short-term convenience or benefits, such as minimization of transportation or land acquisition costs. While isolation of tailings will be a function of both site and engineering design, overriding consideration shall be given to siting features given the long-term nature of the tailings hazards.

Tailings shall be disposed of in a manner that no active maintenance is required to preserve conditions of the site.

Criterion 2—To avoid proliferation of small waste disposal sites and thereby reduce perpetual surveillance obligations, byproduct material from in situ extraction operations, such as residues from solution evaporation or contaminated control processes, and wastes from small remote above ground extraction operations shall be disposed of at existing large mill tailings disposal sites; unless, considering the nature of the wastes, such as their volume and specific activity, and the costs and environmental impacts of transporting the wastes to a large disposal site, such offsite disposal is demonstrated to be impracticable or the advantages of onsite burial clearly outweigh the benefits of reducing the perpetual surveillance obligations.

Criterion 3—The "prime option" for disposal of tailings is placement below grade, either in mines or specially excavated pits (that is, where the need for any specially constructed retention structure is eliminated).

The evaluation of alternative sites and disposal methods performed by mill operators in support of their proposed tailings disposal program (provided in applicants' environmental reports) shall reflect serious consideration of this disposal mode. In some instances, below grade disposal may not be the most environmentally sound approach, such as might be the case if a groundwater formation is relatively close to the surface or not very well isolated by overlying soils and rock. Also, geologic and topographic conditions might make full below grade burial impracticable: for example, bedrock may be sufficiently near the surface that blasting would be required to excavate a disposal pit at excessive cost, and more suitable alternative sites are not available. Where full below grade burial is not practicable, the size of retention structures, and size and steepness of slopes of associated exposed embankments shall be minimized by excavation to the maximum extent reasonably achievable or appropriate given the geologic and hydrologic conditions at a site. In these cases, it must be demonstrated that an above grade disposal program will provide reasonably equivalent isolation of the tailings from natural erosional forces.

Criterion 4—The following site and design criteria shall be adhered to whether tailings or wastes are disposed of above or below grade.

(a) Upstream rainfall catchment areas must be minimized to decrease erosion potential and the size of the Probable Maximum Flood which could erode or wash out sections of the tailings disposal area.

(b) Topographic features should provide good wind protection.

(c) Embankment and cover slopes shall be relatively flat after final stabilization to minimize erosion potential and to provide conservative factors of safety assuring long-term stability. The broad objective should be to contour final slopes to grades which are as close as possible to those which would be provided if tailings were disposed of below grade: this could, for example, lead to slopes about 10 horizontal to 1 vertical (10h:1v) or less steep. In general, slopes should not be steeper than about 5h:1v. Where steeper slopes are proposed, reasons why a slope less steep than 5h:1v would be impracticable should be provided, and compensating factors and conditions which make such slopes acceptable should be identified.

(d) A full self-sustaining vegetative cover shall be established or rock cover employed to reduce wind and water erosion to negligible levels.

Where a full vegetative cover is not likely to be self-sustaining due to climatic or other conditions, such as in semi-arid and arid regions, rock cover shall be employed on slopes of the impoundment system. The NRC will consider relaxing this requirement for extremely gentle slopes such as those which they may exist on the top of the pile.

The following factors shall be considered in establishing the final rock cover design to avoid displacement of rock particles by

human and animal traffic or by natural process, and to preclude undercutting and piping:

- Shape, size, composition, and gradation of rock particles (excepting bedding material average particles size shall be at least cobble size or greater);
- Rock cover thickness and zoning of particles by size; and
- Steepness of underlying slopes.

Individual rock fragments shall be dense, sound, and resistant to abrasion, and shall be free from cracks, seams, and other defects that would tend to unduly increase their destruction by water and frost actions. Weak, friable, or laminated aggregate shall not be used.

Rock covering of slopes may not be required where top covers are very thick (on the order of 10m or greater); impoundment slopes are very gentle (on the order of 10 h:1v or less); bulk cover materials have inherently favorable erosion resistance characteristics; and, there is negligible drainage catchment area upstream of the pile and good wind protection as described in points (a) and (b) of this Criterion.

Furthermore, all impoundment surfaces shall be contoured to avoid areas of concentrated surface runoff or abrupt or sharp changes in slope gradient. In addition to rock cover on slopes, areas toward which surface runoff might be directed shall be well protected with substantial rock cover (rip rap). In addition to providing for stability of the impoundment system itself, overall stability, erosion potential, and geomorphology of surrounding terrain shall be evaluated to assure that there are not ongoing or potential processes, such as gully erosion, which would lead to impoundment instability.

(e) The impoundment shall not be located near a capable fault that could cause a maximum credible earthquake larger than that which the impoundment could reasonably be expected to withstand. As used in this criterion, the term "capable fault" has the same meaning as defined in section III(g) of Appendix A of 10 CFR 100. The term "maximum credible earthquake" means tha earthquake which cause the maximum vibratory ground motion based upon an evaluation of earthquake potential considering the regional and local geology and seismology and specific characteristics of local subsurface material.

(f) The impoundment, where feasible, should be designed to incorporate features which will promote deposition. For example, design features which promote deposition of sediment suspended in any runoff which flows into the impoundment area might be utilized; the object of such a design feature would be to enhance the thickness of cover over time.

Criterion 5—The following shall be considered:

- Installation of bottom liners (Where synthetic liners are used, a leakage detection system shall be installed immediately below the liner to ensure major failures are detected if they occur. This is in addition to the groundwater monitoring program conducted as provided in Criterion 7. Where clay liners are proposed or relatively thin, in-situ clay soils are to be relied upon for seepage control, tests shall be conducted with representative tailings solutions and clay materials to confirm that no significant deterioration of permeability or stability properties will occur with continous exposure of clay to tailings solutions. Tests shall be run for a sufficient period of time to reveal any effects if they are going to occur (in some cases deterioration has been observed to occur rather rapidly after about nine months of exposure));
- Mill process designs which provide the maximum practicable recycle of solutions and conservation of water to reduce the net input of liquid to the tailings impoundment.
- Dewatering of tailings by process devices and/or in-situ drainage systems (At new sites, tailings shall be dewatered by a drainage system installed at the bottom of the impoundment to lower the phreatic surface and reduce the driving head for seepage, unless tests show tailings are not amenable to such a system. Where in-situ dewatering is to be conducted, the impoundment bottom shall be graded to assure that the drains are at a low point. The drains shall be protected by suitable filer materials to assure that drains remain free running. The drainage system shall also be adequately sized to assure good drainage).
- Neutralization to promote immobilization of toxic substances.

Where groundwater impacts are occurring at an existing site due to seepage, action shall be taken to alleviate conditions that lead to excessive seepage impacts and restore groundwater quality. The specific seepage control and groundwater protection method, or combination of methods, to be used must be worked out on a site-specific basis. Technical specifications shall be prepared to control installation of seepage control systems. A quality assurance, testing, and inspection program, which includes supervision by a qualified engineer or scientist, shall be established to assure the specifications are met.

In support of a tailings disposal system proposal, the applicant/operator shall supply information concerning the following:

- The chemical and radioactive characteristics of the waste solutions.
- The characteristics of the underlying soil and geologic formations particularly as they will control transport of contaminants and solutions. This shall include detailed information concerning extent, thickness, uniformity, shape, and orientation of underlying strata. Hydraulic gradients and conductivities of the various formations shall be determined.

This information shall be gathered from borings and field survey methods taken within the proposed impoundment area and in surrounding areas where contaminants might migrate to groundwater. The information gathered on boreholes shall include both geologic and geophysical logs in sufficient number and degree of sophistication to allow determining significant discontinuities, fractures, and channeled deposits of high hydraulic conductivity. If field survey methods are used, they should be in addition to and calibrated with borehole logging. Hydrologic parameters such as permeability shall not be determined on the basis of laboratory analysis of samples alone; a sufficient amount of field testing (e.g., pump tests) shall be conducted to assure actual field properties are adequately understood. Testing shall be conducted to allow estimating chemi-sorption attenuation properties of underlying soil and rock.

- Location, extent, quality, capacity and current uses of any groundwater at and near the site.

Furthermore, steps shall be taken during stockpiling of ore to minimize penetration of radionuclides into underlying soils; suitable methods include lining and/or compaction of ore storage areas.

Criterion 6—In cases where waste byproduct material is to be permanently disposed an earthen cover shall be placed over tailings or wastes at the end of milling operations and, the waste disposal area shall be closed in accordance with a design[1] which shall provide reasonable assurance of control of radiological hazards to: (i) Be effective for 1,000 years, to the extent reasonably achievable, and, in any case, for at least 200 years, and (ii) limit releases of radon-222 from uranium byproduct materials, and radon-220 from thorium byproduct materials, to the atmosphere so as to not exceed an average[2] release rate of 20 picocuries per square meter per second (pCi/m^{2}s). In computing required tailings cover thicknesses, moisture in soils in excess of amounts found normally in similar soils in similar circumstances shall not be considered. Direct gamma exposure from the tailings or wastes should be reduced to background levels. The effects of any thin synthetic layer shall not be taken into account in determining the calculated radon exhalation level. If non-soil materials are proposed as cover materials, it must be demonstrated that such materials will not crack or degrade by differential settlement, weathering, or other mechanism, over long-term time intervals.

Near surface cover materials (i.e., within the top three meters) shall not include waste or rock that contains elevated levels of radium; soils used for near surface cover must be essentially the same, as far as radioactivity is concerned, as that of surrounding surface soils. This is to ensure that surface radon exhalation is not significantly above background because of the cover material itself.

The design requirements in this criterion for longevity and control of radon releases shall apply to any portion of a licensed and/or disposal site unless such portion contains a concentration of radium in land, averaged

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[1] The standard applies to design. Monitoring for radon after installation of an appropriately designed cover is not required.

[2] This average shall apply to the entire surface of each disposal area over periods of at least 1 year, but short compared to 100 years. Radon will come from both uranium byproduct materials and from covering materials. Radon emissions from covering materials should be estimated as part of developing a closure plan for each site. The standard, however, applies only to emissions from uranium byproduct materials to the atmosphere.

over areas of 100 square meters, which, as a result of byproduct material does not exceed the background level by more than: (i) 5 picocuries per gram (pCi/g) of radium-226, or, in the case of thorium byproduct material, radium-228, averaged over the first 15 centimeters (cm) below the surface, and (ii) 15 pCi/g of radium-226, or, in the case of thorium byproduct material, radium-228, averaged over 15-cm thick layers more than 15 cm below the surface.

Criterion 7—At least one full year prior to any major site construction, a preoperational monitoring program shall be conducted to provide complete baseline data on a milling site and its environs. Throughout the construction and operating phases of the mill, an operational monitoring program shall be conducted to measure or evaluate compliance with applicable standards and regulations; to evaluate performance of control systems and procedures; to evaluate environmental impacts of operation; and to detect potential long-term effects.

Criterion 8—Milling operations shall be conducted so that all airborne effluent releases are reduced to levels as low as is reasonably achievable. The primary means of accomplishing this shall be by means of emission controls. Institutional controls, such as extending the site boundary and exclusion area, may be employed to ensure that offsite exposure limits are met, but only after all practicable measures have been taken to control emissions at the source. Notwithstanding the existence of individual dose standards, strict control of emissions is necessary to assure that population exposures are reduced to the maximum extent reasonably achievable and to avoid site contamination. The greatest potential sources of offsite radiation exposure (aside from radon exposure) are dusting from dry surfaces of the tailing disposal area not covered by tailings solution and emissions from yellowcake drying and packaging operations. During operations and prior to closure, radiation doses from radon emissions from surface impoundments of uranium or thorium byproduct materials shall be kept as low as is practicable.

Checks shall be made and logged hourly of all parameters (e.g., differential pressures and scrubber water flow rates) which determine the efficiency of yellowcake stack emission control equipment operation. It shall be determined whether or not conditions are within a range prescribed to ensure that the equipment is operating consistently near peak efficiency; corrective action shall be taken when performance is outside of prescribed ranges. Effluent control devices shall be operative at all times during drying and packaging operations and whenever air is exhausting from the yellowcake stack. Drying and packaging operations shall terminate when controls are inoperative. When checks indicate the equipment is not operating within the range prescribed for peak efficiency, actions shall be taken to restore parameters to the prescribed range. When this cannot be done without shutdown and repairs, drying and packaging operations shall cease as soon as practicable. Operations may not be re-started after cessation due to off-normal performance until needed corrective actions have been identified and implemented. All such cessations, corrective actions, and re-starts shall be reported to the appropriate NRC regional office as indicated in Criterion 8A, in writing, within 10 days of the subsequent restart.

To control dusting from tailings, that portion not covered by standing liquids shall be wetted or chemically stablized to prevent or minimize blowing and dusting to the maximum extent reasonably achievable. This requirement may be relaxed if tailings are effectively sheltered from wind, such as may be the case where they are disposed of below grade and the tailings surface is not exposed to wind. Consideration shall be given in planning tailings disposal programs to methods which would allow phased covering and reclamation of tailings impoundments since this will help in controlling particulate and radon emissions during operation. To control dusting from diffuse sources, such as tailings and ore pads where automatic controls do not apply, operators shall develop written operating procedures specifying the methods of control which will be utilized.

Milling operations producing or involving thorium byproduct material shall be conducted in such a manner as to provide reasonable assurance that the annual dose equivalent does not exceed 25 millirems to the whole body, 75 millirems to the thyriod, and 25 millirems to any other organ of any member of the public as a result of exposures to the planned discharge of radioactive materials, radon-220 and its daughters excepted, to the general environment.

Uranium and thorium byproduct materials shall be managed so as to conform to the applicable provisions of Title 40 of the Code of Federal Regulations, Part 440, "Ore Mining and Dressing Point Source Category: Effluent Limitations Guidelines and New Source Performance Standards, Subpart C, Uranium, Radium, and Vanadium Ores Subcategory," as codified on January 1, 1983.

Criteria 8A—Daily inspections of tailings or waste retention systems shall be conducted by a qualified engineer or scientist and documented. The appropriate NRC regional office as indicated in Appendix D of 10 CFR Part 20, or the Director, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555, shall be immediately notified of any failure in a tailings or waste retention system which results in a release of tailings or waste into unrestricted areas, and/or of any unusual conditions (conditions not contemplated in the design of the retention system) which if not corrected could indicate the potential or lead to failure of the system and result in a release of tailings or waste into unrestricted areas.

II. Financial Criteria

Criterion 9—Financial surety arrangements shall be established by each mill operator prior to the commencement of operations to assure that sufficient funds will be available to carry out the decontamination and decommissioning of the mill and site and for the reclamation of any tailings or waste disposal areas. The amount of funds to be ensured by such surety arrangements shall be based on Commission-approved cost estimates in a Commission-approved plan for: (1) Decontamination and decommissioning of mill buildings and the milling site to levels which would allow unrestricted use of these areas upon decommissioning, and (2) the reclamation of tailings and/or waste disposal areas in accordance with technical criteria delineated in Section I of this Appendix. The licensee shall submit this plan in conjunction with an environmental report that addresses the expected environmental impacts of the milling operation, decommissioning and tailings reclamation, and evaluates alternatives for mitigating these impacts. The surety shall also cove. the payment of the charge for long-term surveillance and control required by Criterion 10. In establishing specific surety arrangements, the licensee's cost estimates shall take into account total costs that would be incurred if an independent contractor were hired to perform the decommissioning and reclamation work. In order to avoid unnecessary duplication and expense, the Commission may accept financial sureties that have been consolidated with financial or surety arrangements established to meet requirements of other Federal or state agencies and/or local governing bodies for such decommissioning, decontamination, reclamation, and long-term site surveillance and control, provided such arrangements are considered adequate to satisfy these requirements and that the portion of the surety which covers the decommissioning and reclamation of the mill, mill tailings site and associated areas, and the long-term funding charge is clearly identified and committed for use in accomplishing these activities. The licensee's surety mechanism will be reviewed annually by the Commission to assure that sufficient funds would be available for completion of the reclamation plan if the work had to be performed by an independent contractor. The amount of surety liability should be adjusted to recognize any increases or decreases resulting from inflation, changes in engineering plans, activities performed, and any other conditions affecting costs. Regardless of whether reclamation is phased through the life of the operation or takes place at the end of operations, an appropriate portion of surety liability shall be retained until final compliance with the reclamation plan is determined. This will yield a surety that is at least sufficient at all times to cover the costs of decommissioning and reclamation of the areas that are expected to be disturbed before the next license renewal. 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 instrument which is written for a specified period of time (e.g., 5 years) yet which must be automatically renewed unless the surety notifies the beneficiary (the Commission or the State regulatory agency) and the principal (the licensee) some reasonable time (e.g., 90 days) prior to the renewal date of their intention not to renew. In such a situation the surety

requirement still exists and the licensee would be required to submit an acceptable replacement surety within a brief period of time to allow at least 60 days for the regulatory agency to collect.

Proof of forfeiture must not be necessary to collect the surety so that in the event that the licensee could not provide an acceptable replacement surety within the required time, the surety shall be automatically collected prior to its expiration. The conditions described above would have to be clearly stated on any surety instrument which is not open-ended, and must be agreed to by all parties. Financial surety arrangements generally acceptable to the Commission are:

(a) Surety bonds;

(b) Cash deposits;

(c) Certificates of deposit;

(d) Deposits of government securities;

(e) Irrevocable letters or lines of credit; and

(f) Combinations of the above or such other types of arrangements as may be approved by the Commission. However, self insurance, or any arrangement which essentially constitutes self insurance (e.g., a contract with a state or Federal agency), will not satisfy the surety requirement since this provides no additional assurance other than that which already exists through license requirements.

Criterion 10—A minimum charge of $250,000 (1978 dollars) to cover the costs of long-term surveillance shall be paid by each mill operator to the general treasury of the United States or to an appropriate State agency prior to the termination of a uranium or thorium mill license.

If site surveillance or control requirements at a particular site are determined, on the basis of a site-specific evaluation, to be significantly greater than those specified in Criterion 12 (e.g., if fencing is determined to be necessary), variance in funding requirements may be specified by the Commission. In any case, the total charge to cover the costs of long-term surveillance shall be such that, with an assumed 1 percent annual real interest rate, the collected funds will yield interest in an amount sufficient to cover the annual costs of site surveillance. The total charge will be adjusted annually prior to actual payment to recognize inflation. The inflation rate to be used is that indicated by the change in the Consumer Price Index published by the U.S. Department of Labor, Bureau of Labor Statistics.

III. Site and Byproduct Material Ownership

Criterion 11—

A. These criteria relating to ownership of tailings and their disposal sites become effective on November 8, 1981, and apply to all licenses terminated, issued, or renewed after that date.

B. Any uranium or thorium milling license or tailings license shall contain such terms and conditions as the Commission determines necessary to assure that prior to termination of the license, the licensee will comply with ownership requirements of this criterion for sites used for tailings disposal.

C. Title to the byproduct material licensed under this Part and land, including any interests therein (other than land owned by the United States or by a State) which is used for the disposal of any such byproduct material, or is essential to ensure the long term stability of such disposal site, shall be transferred to the United States or the State in which such land is located, at the option of such State. In view of the fact that physical isolation must be the primary means of long-term control, and Government land ownership is a desirable supplementary measure, ownership of certain severable subsurface interests (for example, mineral rights) may be determined to be unnecessary to protect the public health and safety and the environment. In any case, however, the applicant/operator must demonstrate a serious effort to obtain such subsurface rights, and must, in the event that certain rights cannot be obtained, provide notification in local public land records of the fact that the land is being used for the disposal of radioactive material and is subject to either an NRC general or specific license prohibiting the disruption and disturbance of the tailings. In some rare cases, such as may occur with deep burial where no ongoing site surveillance will be required, surface land ownership transfer requirements may be waived. For licenses issued before November 8, 1981, the Commission may take into account the status of the ownership of such land, and interests therein, and the ability of a licensee to transfer title and custody thereof to the United States or a State.

D. If the Commission subsequent to title transfer determines that use of the surface or subsurface estates, or both, of the land transferred to the United States or to a State will not endanger the public health, safety, welfare, or environment, the Commission may permit the use of the surface or subsurface estates, or both, of such land in a manner consistent with the provisions provided in these criteria. If the Commission permits such use of such land, it will provide the person who transferred such land with the right of first refusal with respect to such use of such land.

E. Material and land transferred to the United States or a State in accordance with this Criterion shall be transferred without cost to the United States or a State other than administrative and legal costs incurred in carrying out such transfer.

F. The provisions of this Part respecting transfer of title and custody to land and tailings and wastes shall not apply in the case of lands held in trust by the United States for any Indian tribe or lands owned by such Indian tribe subject to a restriction against alienation imposed by the United States. In the case of such lands which are used for the disposal of byproduct material, as defined in this Part, the licensee shall enter into arrangements with the Commission as may be appropriate to assure the long-term surveillance of such lands by the United States.

IV. Long-Term Site Surveillance

Criterion 12—The final disposition of tailings or wastes at milling sites should be such that ongoing active maintenance is not necessary to preserve isolation. As a minimum, annual site inspections shall be conducted by the government agency retaining ultimate custody of the site where tailings, or wastes are stored to confirm the integrity of the stabilized tailings or waste systems and to determine the need, if any, for maintenance and/or monitoring. Results of the inspection shall be reported to the Commission within 60 days following each inspection. The Commission may require more frequent site inspections if, on the basis of a site-specific evaluation, such a need appears necessary due to the features of a particular tailings or waste disposal system.

Dated at Washington, DC, this 20th day of November 1984.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,

Secretary of the Commission.

[FR Doc. 84-30946 Filed 11-23-84; 8:45 am]

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10 CFR Part 40

Uranium Mill Tailings Regulations; Ground Water Protection and Other Issues

AGENCY: Nuclear Regulatory Commission.

ACTION: Advanced notice of proposed rulemaking.

SUMMARY: The Nuclear Regulatory Commission (NRC) is considering further amendments to its uranium mill tailings regulations. The future rulemaking proceeding for which this notice is issued is primarily intended to incorporate ground water protection provisions and other requirements established by the Environmental Protection Agency for similar hazardous wastes into NRC regulations. This action is necessary to make NRC requirements similar to EPA standards as required by provisions of the Uranium Mill Tailings Radiation Control Act.

DATE: The comment period expires January 25, 1985. Comments received after this date will be considered if it is practical to do so but assurance of consideration may not be given except as to comments received on or before this date.

ADDRESSES: Mail comments to Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Service Branch, or deliver comments to Room 1121, 1717 H Street NW, Washington, DC between 8:15 a.m. and 5:00 p.m. weekdays.

FOR FURTHER INFORMATION CONTACT: Robert Fonner, Office of Executive Legal Director, telephone (301) 492-8692, or Kitty S. Dragonette, Division of Waste Management, U.S. Nuclear Regulatory

Commission, Washington, DC 20555, telephone (301) 427–4300.

SUPPLEMENTARY INFORMATION: The Nuclear Regulatory Commission has today proposed modifications to its existing mill tailings regulations in Appendix A to 10 CFR Part 40 for the purpose of conforming them to generally applicable standards promulgated by the Environmental Protection Agency (EPA) on September 30, 1983 (see 48 FR 45926; October 7, 1983). This advance notice of proposed rulemaking (ANPRM) announces that the Commission is considering proposing further modifications to its regulations in 10 CFR Part 40, to satisfy certain provisions of the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), and requests public comments on pertinent issues and questions.

On October 7, 1983, the EPA published generally applicable standards for the management of uranium and thorium byproduct material. The standards were developed by the EPA in a manner to satisfy the provisions of section 275 of the Atomic Energy Act, as amended, that for nonradiological hazards, the standards "* * * shall provide for the protection of human health and the environment consistent with the standards required under Subtitle C of the Solid Waste Disposal Act, as amended, which are applicable to such hazards." To achieve this goal the EPA included within its requirements published October 7, 1983, selected provisions from its regulations issued under the Solid Waste Disposal Act (SWDA) by cross referencing the SWDA provisions. These specific provisions are now in effect and the NRC is considering undertaking a rulemaking which would clarify its regulations by including within them those SWDA requirements selected by the EPA for application to uranium and thorium mill tailings.

The rulemaking under consideration would also be intended to satisfy a requirement placed upon the NRC under section 84 of the Atomic Energy Act of 1954, as amended, to "* * * insure that the management of any byproduct material * * * is carried out in such manner as conforms to general requirements established by the Commission, with the concurrence of the (EPA) Administrator, which are, to the maximum extent practicable, at least comparable to requirements applicable to the possession, transfer, and disposal of similar hazardous material regulated by the Administrator under the Solid Waste Disposal Act, as amended." The rulemaking under consideration, which is the primary subject of this ANPRM, would then incorporate within NRC regulations elements of EPA's SWDA requirements already imposed by EPA, and establish any further requirements necessary for the NRC to have SWDA-comparable standards, as called for by Section 84 of the Atomic Energy Act of 1954, as amended.

The Commission considered further revisions to Appendix A to conform it to the physical stability aspects of the EPA standard, but did not propose them. The EPA standard requires that the final cover design provide reasonable assurance of effective control "for one thousand years, to the extent reasonably achievable, and in any case, for at least 200 years." The EPA's numerical longevity standard takes a different approach to stability than do the NRC requirements. In Appendix A, the NRC established numerous prescriptive requirements for specific design features in order to assure stability without active maintenance for an indefinite period of time following closure. The EPA rule sets a performance standard for a limited time period. In addition, the preamble to the EPA standard and the supporting environmental evaluation indicate that the EPA consciously considered the acceptability of relying on active maintenance to provide stability following closure, and did not prohibit it. Rather, the EPA standard requires that, for nonradiological hazards the need for active maintenance only be minimized. NRC's Appendix A flatly prohibits any planned reliance on active maintenance.

The Commission requests comments on whether it should delete or modify additional provisions of Appendix A including prescriptive requirements for specific design features which may not be necessary to meet the EPA standard. The prescriptive requirements in question include those for minimizing upstream drainage area, siting where there is good wind protection, relatively flat slopes, mandatory vegetative or rock cover, cobble size rock, high quality rock cover, and rock armoring. The Commission also considered deleting the prohibition on reliance on active maintenance, modifying Criterion 3 mandating below grade disposal as the prime option, and deleting the requirement for background radium concentrations in cover materials. Relief from these retained provisions is available through case-by-case proposals by licensees as noted in proposed additions to the introduction of Appendix A of 10 CFR 40. The Commission seeks comment on whether this is sufficient flexibility in view of the Commission's intent to consider alternative proposals as routine licensing actions.

I. Background on the Ground Water Issue

The SWDA requirements imposed by the EPA in its rule published October 7, 1983 (48 FR 45926) were described by the EPA in that Notice as follows: "Consistent with the standards EPA issued under the SWDA for hazardous wastes (47 FR 32274–32388, July 26, 1982) the standard for tailings piles has two parts: (1) A 'primary' standard that requires use of a liner designed to prevent migration of hazardous substances out of the impoundment, and (2) a 'secondary' ground water protection standard requiring, in effect, that any hazardous constituents that leak from the waste not be allowed to degrade ground water. The primary standard applies to new portions of new or existing waste depositories. The secondary standard applies to new and existing portions, the point of compliance being at the edge of the waste impoundment. The specific hazardous substances and concentrations (i.e., background levels) that define noncompliance with the secondary standard at each site will be established for uranium mill tailings by NRC and Agreement States. The SWDA rules, however, permit alternate concentration limits to be established when they will not pose "* * *a substantial present or potential hazard to human health or the environment" as long as the alternate concentration limit is not exceeded. The rule also allow (sic) 'hazardous constituents' to be exempted from coverage by the permit based on the same criterion. EPA determines the alternate concentration standard or exemption under the SWDA; EPA's concurrence would be required under the proposed standards for tailings."

The EPA went on to further describe the primary standard, primarily consisting of the liner design requirements, and clarify the secondary standard, by saying:

"The primary standard, 40 CFR 264.221, can usually be satisfied only by using liner materials (such as plastics) that can retain all wastes. Exemptions permitting use of other liner materials (such as clay) that may release water or small quantities of other substances or, in some cases, permitting no liner may be granted only if migration of hazardous constituents into the ground water or surface water would be prevented indefinitely * * *."

"Under these standards, all new waste storage areas (whether new

waste facilities or expansions of existing piles) are subject to the primary standard—the liner requirement. If new wastes are added to an existing pile, however, the pile must comply with the secondary standard—the hazardous constituent concentration standards for health and environmental protection. Whether for a new or existing pile, if the secondary standards are found not to be satisfied and subsequent corrective actions fail to achieve compliance in a reasonable time, the operator must cease depositing waste on that pile."

Also in its October 7, 1983 Notice, the EPA stated that "EPA's responsibilities to establish standards under section 206 of UMTRCA are carried out through adoption of all or part of the following sections of the SWDA regulations:

i. Subpart F:

40 CFR 264.92 Ground water protection standard
40 CFR 264.93 Hazardous constituents
40 CFR 264.94 Concentration limits
(These three sections are modified and adopted as § 192.32(a)(2))
40 CFR 264.100 Corrective action program
(This section is modified and adopted as § 192.33)

ii. Subpart G:

40 CFR 264.111 Closure performance standard
(This section is adopted as part of § 192.32(b)(1))

iii. Subpart K:

40 CFR 264.221 Design and operating requirements for surface impoundments
(This section is modified and adopted as § 192.32(a)(1))"

"NRC's responsibilities under UMTRCA are to implement EPA's standard and to '* * *insure that the management of any byproduct material * * * is carried out in such a manner as * * * conforms to general requirements established by the Commission, with the concurrence of the Administrator, which are, to the maximum extent practicable, at least comparable to requirements applicable to the possession, transfer, and disposal of similar hazardous material regulated by the Administrator under the SWDA, as amended.' EPA will insure that NRC's regulations satisfy these admonitions through its concurrence role. Relevant SWDA regulations are those embedded in Subparts A (except Section 264.3), B, C, D, E, F, G, H, and K. Examples of areas which NRC must address in discharging these responsibilities involve functions under the six sections listed immediately above which are incorporated into these EPA standards, and the following sections of the SWDA regulations:

i. Subpart F:

40 CFR 264.91 Required programs
40 CFR 264.95 Point of compliance
40 CFR 264.96 Compliance period
40 CFR 264.97 General ground water monitoring requirements
40 CFR 264.98 Detection monitoring program
40 CFR 264.99 Compliance monitoring program

ii. Subpart G:

40 CFR 264.117 Post-closure care and use of property

iii. Subpart K:

40 CFR 264.226 Monitoring and inspection (of impoundment liners), as applicable
40 CFR 264.228 Closure and postclosure care, as applicable."

The above quotations from the EPA's October 7, 1983 Notice serve to clarify the substance of EPA's standards, the respective agency responsibilities under the UMTRCA, and the nature and scope of the rulemaking the NRC is herein considering undertaking. The NRC has reviewed the language quoted and, with the exception of the jurisdictional concerns discussed in the following section, believes it to be factually correct and a fair representation of the issues addressed.

II. Commission Authority and Responsibility

Section 84c. of the Atomic Energy Act states that: A Licensee may propose alternatives to specific requirements adopted and enforced by the Commission under this act. Such alternative proposals may take into account local or regional conditions, including geology, topography, hydrology and meteorology. The Commission may treat such alternatives as satisfying Commission requirements if the Commission determines that such alternatives will achieve a level of stabilization and containment of the sites concerned, and a level of protection for public health, safety, and the environment from radiological and nonradiological hazards associated with such sites, which is equivalent to, to the extent practicable, or more stringent than the level which would be achieved by standards and requirements adopted and enforced by the Commission for the same purpose and any final standards promulgated by the Administrator of the Environmental Protection Agency in accordance with section 275.

The Commission historically has had the authority and responsibility to regulate the activities of persons licensed under the Atomic Energy Act of 1954, as amended. Consistent with that authority and in accordance with section 84c. of that Act, the Commission has the discretion to review and approve site specific alternatives to standards promulgated by the Commission and by the Administrator of the Environmental Protection Agency. In the exercise of this authority, section 84c. does not require the Commission to obtain the concurrence of the Administrator in any site specific alternative which satisfies Commission requirements for the level of protection for public health, safety, and the environment from radiological and nonradiological hazards at uranium mill tailings sites. As an example, the Commission need not seek concurrence of the Administrator in case-by-case determinations of alternative concentration limits and delisting of hazardous constituents for specific sites. It should be understood that the proposed conforming regulations deal with the exercise of the Commission's responsibility and authority under the Atomic Energy Act of 1954, solely as regards uranium mill tailings sites and have no broader connotation.

The Commission believes that licensee proposals for alternatives can be an important and effective way to help deal with the problems associated with implementing the new EPA standards. The Commission expects that it may require several years to have its conforming regulations fully in place. It expects to use the flexibility provided by section 84 in the interim to consider and approve alternative proposals from licensees. Section 84c. provides NRC sufficient authority to independently approve alternatives so long as the Commission can make the required determination.

III. Issues for Public Comments

The NRC requests public comment on the general question of how best to proceed to fulfill its responsibilities under the Atomic Energy Act, with respect to establishing SWDA-comparable requirements for the management of mill tailings, to the maximum extent practicable. In this context, comments are requested on choices and decisions the NRC must make concerning issues and actions that are within its discretion. Comments on the basic value, validity, lawfulness, or appropriateness of the EPA's SWDA regulations, the SWDA, or the UMTRCA are not requested.

A. Tentative NRC Approach for Ground Water Protection

The NRC has developed a tentative approach to place SWDA-comparable requirements in its regulations, based on planning and development efforts conducted to date. This approach is tentative, and is made a part of this public announcement so efforts spent in providing public comment might be better guided. It involves the development of additions to NRC regulations (either a block insert at the end of 10 CFR Part 40 or perhaps by creation of a new Part 41) which would contain the entire set of SWDA-comparable requirements.

The additions would be organized in terms of design, operating, closure, and post-closure requirements, and would to the fullest extent feasible, be a complete statement of the requirements without reference to EPA requirements in Title 40 of the Code of Federal Regulations. In this way, the requirements could be stated in a self-contained, unified manner in one place. Coverage would include at least the SWDA requirements already imposed by EPA (40 CFR 264.92–94, 264.100, 264.111, and 264.221), and appropriate portions of the SWDA requirements mentioned by the EPA explicitly as "examples of areas which NRC must address" (these include 40 CFR 264.95–99, 264.117, 264.228, and 264.228).

The rulemaking being considered for proposal by the NRC may include most of Subpart F (40 CFR 264.90–100), due to the close relationship and interdependency of the separate provisions, and because all but 40 CFR 264.90, "Applicability," is either imposed or mentioned as an example by the EPA.

The remainder of the EPA's SWDA regulations, including Subpart A (except § 264.3), B, C, D, E, F, G, H, and K would be reviewed in developing a proposal to determine which of those requirements would need to be incorporated in NRC regulations to establish NRC requirements which are to the maximum extent practicable, at least comparable to the EPA's SWDA requirements for similar hazardous material.

In developing this proposal the NRC would distinguish between substantive requirements and EPA's procedural permitting requirements because it does not believe the UMTRCA mandate requires the NRC to adopt any portion of the procedural permitting aspects of EPA's regulations. The NRC's established procedures for licensing, inspection, and enforcement would be used with respect to implementation.

B. Issues and Questions

The NRC seeks public input with respect to all aspects of the question of how best to fulfill its responsibilities under section 275 and 84 of the Atomic Energy Act of 1954, as amended, for protection of ground water. The NRC also seeks public comment with respect to the following issues and questions (In providing public comment, commenters are requested to provide the basis in fact for any opinions offered or assertions made):

(1) Should the SWDA-comparable requirements to be placed in NRC regulations be explicitly restated to precisely duplicate EPA's language, or should substantive requirements be paraphrased?

(2) Should all of Subpart F be included? What should not be included?

(3) What should be included in a listing of hazardous constituents for mill tailings to replace the 375-item long list in Appendix VIII to 40 CFR Part 261 referenced in 40 CFR 264.93? Should constituents not usually present or not present above trace levels be included? What criteria should be applied to decide what constituents should be included?

(4) The NRC must establish SWDA-comparable requirements to the maximum extent practicable. In this context, what is practicable given current practice and the current state of technology?

(5) Should NRC retain the basic sequence embodied in Subpart F where licensees who detect ground water contamination progress through a graduated scale of action, from detection monitoring, through compliance monitoring, and on to corrective action, with significant time delays allowed between steps while plans and programs are being developed, reviewed, and implemented? Would it be advisable, practicable or appropriate to require, for example, that all NRC licensees have approved compliance monitoring programs that are automatically activated and implemented when needed?

(6) Should the basic SWDA scheme for the timing and duration of a "compliance" period, a "closure" period, and a "post-closure care" period be maintained? What modifications, deletions, additions should be made?

(7) To what extent, how, and under what conditions should leak detection systems under single-liner impoundments be allowed to fulfill the requirements for a detection monitoring program that otherwise requires a monitoring well in the uppermost aquifer?

(8) How detailed should NRC's regulations be, and what should and should not be required in areas such as well construction, sampling and sample analysis, determinations of annual average and seasonal background concentrations, minimum detection levels, statistical treatment of data and determinations of statistically significant differences, recordkeeping and reporting, quality assurance, etc.?

(9) To what extent must the NRC provide supporting environmental impact analyses considering the nature of the requirements under consideration, some of which have already been imposed by EPA and are effective? If supporting environmental evaluations are needed for SWDA-comparable rule changes except for the requirements already imposed by the EPA, should the NRC continue to proceed with only a single rulemaking to establish a complete set of SWDA-comparable requirements?

(10) Is the flexibility cited in the proposed addition to the Introduction of Appendix A 10 CFR Part 40 sufficient or should the NRC develop and support additional modifications to conform to the physical stability aspects of the EPA standard?

List of Subjects in 10 CFR Part 40

Government contracts, Hazardous material—transportation, Nuclear materials, Penalty, Reporting and recordkeeping requirements, Source material, and Uranium.

Dated at Washington, DC, this 20th day of November 1984.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,

Secretary of the Commission.

[FR Doc. 84-30967, Filed 11-23-84; 8:45 am]

BILLING CODE 7590-01-M

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10 CFR Parts 50 and 55

Operator's Licenses and Conforming Amendment

AGENCY: Nuclear Regulatory Commission.

ACTION: Proposed rule.

SUMMARY: The Nuclear Regulatory Commission is proposing to amend its regulations to (1) clarify the regulations for the issuance of licenses to operators and senior operators; (2) revise the requirements and scope of written examinations and operating tests for operators and senior operators, including a requirement for a simulation facility; (3) codify procedures for the administration of requalification examinations; and (4) describe the form

ENCLOSURE B

NUCLEAR REGULATORY COMMISSION

10 CFR PARTS 40 and 150

Uranium Mill Tailing Regulations: Conforming NRC Requirements to EPA Standards

AGENCY: Nuclear Regulatory Commission.

ACTION: Final rule.

SUMMARY: The Nuclear Regulatory Commission (NRC) is issuing amendments to its regulations governing the disposal of uranium mill tailings. The rule changes conform existing NRC regulations to the regulations published by the Environmental Protection Agency for the protection of the environment from these wastes. This action is being taken to comply with the legislative mandate set out in the Uranium Mill Tailings Radiation Control Act (UMTRCA) and the NRC Authorization Act for FY 1983.

DATE: These changes become effective (30 days after publication).

ADDRESSES: Comments received on the proposed rule may be examined at the Commission's Public Docket Room, 1717 H Street NW, Washington, DC between 8:15 a.m. and 5:00 p.m. weekdays.

FOR FURTHER INFORMATION CONTACT: Robert Fonner, Office of the Executive Legal Director, telephone (301) 492-8692, or Kitty S. Dragonette, Division of Waste Management, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301)427-4300.

SUPPLEMENTARY INFORMATION:

Introduction and Background

The Nuclear Regulatory Commission (NRC) is issuing modifications to its regulations for the purpose of conforming them to generally applicable requirements promulgated by the Environmental Protection Agency (EPA). These EPA requirements are contained in Subparts D and E of 40 CFR Part 192 (48 FR 45926; October 7, 1983), are applicable to the management of uranium and thorium byproduct material, and became effective for NRC and Agreement State licensees and license applicants on December 6, 1983. This action modifies previously existing regulations of the Commission to conform them to the EPA requirements, and incorporates certain of the EPA requirements into the Commission's regulations. The affected Commission regulations are contained in Appendix A to 10 CFR Part 40, which was promulgated in final form on October 3, 1980 (45 FR 65521). Proposed changes were published on November 26, 1984 (49 FR 46418). The comment period originally expired on January 10, 1985 but was extended until February 10, 1985 (50 FR 2293, January 16, 1985).

The modifications to Commission regulations issued herein incorporate within NRC regulations some of the new EPA requirements. The action that the Commission will take with respect to the remainder of these new EPA requirements was the subject of an Advanced Notice of Proposed Rulemaking (ANPRM) which requested comment on that subject (49 FR 46425, November 26, 1984). Under Section 18(a) of Pub. L. 97-415, the Nuclear Regulatory Commission Authorization Act for fiscal years 1982 and 1983, the Commission was directed to conform its regulations to EPA's with notice and opportunity for public comment.

Overview of Comments on Proposed Rule Changes

Twenty-four commenters responded with 26 sets of comments. Six environmental groups, seven states, two Federal agencies, seven industry representatives, one pro-energy (pro-nuclear) group and one individual responded.

Comments were offered on both general issues and the specific changes in the proposed rule notice and reflected diverse views. A staff analysis of all the comments received is available in the NRC's Public Document Room (PDR). The following discussion summarizes and responds to all comments of major or generic significance and to all comments that prompted additional rule changes.

Commission Authority and Responsibility Statement

The notice included a statement on "Commission Authority and Responsibility." The statement summarized the Commission's policy on the exercise of its responsibility and authority for mill tailings, including the authority to approve site specific alternatives proposed by licensees under section 84c of the Atomic Energy Act (AEA).

Commenters were divided on this issue. The environmental groups and EPA disagreed with the statement. Industry advocated an alternate approach. In industry's view, reliance on the basic requirements of UMTRCA with respect to the jurisdiction of the agencies would be a stronger legal position and eliminate the need to rely on Section 84c. One State supported the statement and the need for NRC and Agreement States to review and approve site specific alternatives to standards without EPA concurrence.

EPA disagreed with NRC's interpretation of section 84c. EPA stated "Section 84c does not confer on NRC authority to approve or employ alternative standards or to substitute its judgment for EPA's regarding the level of protection necessary to protect public health and the environment. Rather it authorizes NRC to approve or employ licensee-proposed alternatives to NRC's own general implementing requirements . . ." Further, EPA argued that its standard that requires EPA approval of site specific alternative concentration limits is within its authority, not NRC's under section 84c. In EPA's view, NRC must also establish specific requirements before it can consider alternatives to them. The environmental groups were in basic agreement with EPA.

Response: The Commission conducted an independent review of UMTRCA and the legislative history surrounding this issue.

The Commission reaffirmed that it is authorized under section 84c of the AEA to grant exemptions from EPA's standards without obtaining EPA's concurrence. The basis for this conclusion covers four points. First is the belief that "specific Commission requirements" can be deemed adopted without a rulemaking proceeding. Section 84a(2) requires the Commission to ensure that tailings are managed in conformance with EPA's standards. Section 84a(2) creates a statutory obligation by the Commission to enforce EPA's standards independent of whether the Commission adopts regulations which would clarify how the Commission would enforce those standards.

Second, section 84c explicitly states that the NRC may approve alternatives which, to the extent practicable, would achieve safety levels equivalent to those which would be achieved by compliance with NRC's requirements and EPA's standards. Thus, the NRC is authorized to approve an alternative which does not provide the same level of protection of

public health, safety and the environment which would be achieved if EPA's standards were complied with fully. Third, UMTRCA does not use the phrase "implementing requirements." Section 84c refers to only "specific requirements adopted and enforced by the Commission." This phrase is clearly intended to include all requirements adopted by the Commission to regulate mill tailings. The source of the adopted requirements is immaterial to the statutory scheme and may include EPA's detailed standards. Finally, EPA's comment does not effectively respond to the Commission's argument that EPA site specific concurrence in exemptions contradicts the prohibition on EPA's issuance of a permit in section 275b.(2) of the AEA.

Comments questioning NRC's motives or intent are offset by the findings required of the Commission in section 84c in order to exercise the flexibility to approve alternatives. Assertion of legal right does not equate to an intent to abuse a right. The AMC jurisdiction issue is addressed in the following section.

The Statement is repeated in this notice without change to reaffirm the Commission's position.

Procedural and Jurisdictional Issues

The American Mining Congress (AMC) presented extensive legal arguments on the EPA/NRC jurisdictional issue. The AMC comments focused on the following legal points: (1) Since its ratification of Reorganization Plan No. 3 of 1970, consistent Congressional policy has been to limit EPA standard setting authority for NRC licensed facilities to "generally applicable standards," meaning standards that are applicable outside site boundaries and that impose no site specific design, engineering or management

requirements; (2) Congress, in UMTRCA, adopted the division of jurisdiction between EPA and NRC first established in the 1970 Reorganization Plan; and (3) EPA's standards are not "generally applicable standards" and are therefore beyond the jurisdiction of EPA. Consequently, the EPA standards are a "mere nullity" of no legal force or effect and NRC is not legally bound to conform to the standards.

Response: As noted earlier, the Commission conducted an independent review of UMTRCA and its legislative history. The Commission concluded that EPA generally acted within its jurisdiction and found the AMC arguments flawed. The following points summarize the Commission's findings:

1. Before UMTRCA, EPA, not NRC, had primary authority over both the radiological and non-radiological impacts from uranium mill tailings;

2. During Congressional deliberations over UMTRCA, NRC attempted to reduce substantially EPA's authority over radiological hazards of mill tailings by limiting it to EPA's "traditional" authority under Reorganization Plan No. 3, i.e., authority to promulgate only generally applicable, non-site specific radiological standards, applicable only outside the boundaries of the tailings sites;

3. EPA opposed the NRC's attempt to transfer to itself EPA's authority to regulate mill tailings. EPA's efforts were partially successful and resulted in a Congressional compromise which precluded EPA from promulgating site specific standards but which did not restrict EPA to standards applicable only outside site boundaries. EPA was also given concurrence authority over NRC regulations for controlling non-radiological hazards.

4. Except for one instance, EPA acted within its jurisdiction under UMTRCA in setting environmental standards for managing radioactive emissions and hazardous chemical wastes from uranium mill tailings; and

5. EPA exceeded its jurisdiction by stating that its concurrence would be required before the NRC could grant site specific case-by-case exemptions from NRC regulations for implementing EPA's standards. The Commission believes that such a concurrence role by EPA also contradicts the 1983 amendment to UMTRCA which added section 84c to the AEA.

Environmental groups and EPA commented on the legality of not meeting the six-month Congressional mandate to conform by April 1, 1984 and conforming in two steps. Commenters asserted that NRC's action is illegal, that it does not meet the explicit intent of UMTRCA, and that NRC should conform to the ground-water standards in 40 CFR 192 immediately. Concern that a four-year rulemaking on ground water delays compliance with EPA's ground-water requirements was expressed. Commenters objected to NRC's position that conforming to EPA's ground-water standards should be combined with developing a rule that fully meets the mandate in Section 84a(3) to have general requirements that are comparable to EPA's requirements for similar materials regulated under the Solid Waste Disposal Act. EPA argued that the EPA standards in 40 CFR 192 already meet this requirement to be comparable.

Response: The decisions regarding whether and how NRC should conform to the EPA standards involved complex legal, jurisdictional, and policy issues. The Commission carefully considered the implications of several alternatives and its authority and responsibilities before deciding on the course of action evidenced by the notices of proposed rulemaking and ANPRM. Further, Congress did not impose any penalty if NRC failed to meet the 6 months as it did with the loss of authority if EPA failed to meet its October 1, 1983 date.

No health and safety or environmental impacts have resulted or will result from delay since the Commission believes that NRC and the States are required to implement and enforce the EPA standards under section 275d of the AEA in the interim until final conforming regulations are in place. NRC has so informed its licensees and Agreement States and is implementing the standard.

The scope and timing of the second-step rulemaking is still under consideration. Comments on the ANPRM are being analyzed. A simple rule change to incorporate the specific ground-water protection provisions of 40 CFR 192 is one option being considered.

One environmental group and industry urged that NRC delay conforming action until the legal challenges to the EPA standard in the Tenth Circuit are settled.

Response: Since timetables for court action are highly uncertain and because the EPA standards are being implemented and enforced, the Commission sees no reason to delay conformance by rule. Obviously, if court action sets aside all or part of NRC's or EPA's rules, additional rule changes will be required.

Scope of Rulemaking

Commenters offered a wide range of views on the scope of the rulemaking. NRC was urged to undertake independent new rulemaking. An environmental group advocated complete revision of 10 CFR Part 40, Appendix A, as issued in October, 1980 to provide more protection from radon. Industry argued that NRC must undertake a completely new independent rulemaking to replace both the EPA and NRC rules. Industry asserted that EPA's standards are not adequately supported by analysis relating costs

and risks and are outside EPA's jurisdiction and that NRC has provided no analysis establishing that Appendix A of Part 40 requirements are reasonably related in terms of cost, risks, and benefits. A key point in industry arguments was the 1983 Pub.L. 97-415 addition to section 84a(1) of the AEA requiring the Commission to insure that the management of byproduct material takes " . . . into account the risk to the public health, safety, and the environment, with due consideration of the economic costs and such other factors as the Commission determines to be appropriate." The industry arguments imply that this addition mandates a total reconsideration and revision of NRC rules. Industry also noted the depressed economic state of the industry and early stabilization plans that have resulted since the 1980 rule.

Response: EPA developed and issued the standards in 40 CFR 192 under the mandate in 275b(1) of the AEA. EPA's mandate included, "In establishing such standards, the Administrator shall consider the risk to the public health, safety, and the environment, the environmental and economic costs of applying such standards, and such other factors as the Administrator determines to be appropriate." NRC is conducting the present action under the mandate in section 275f(3) of the AEA. EPA was explicitly charged to consider risk and economic costs. No mention of an independent risk/economic cost finding is explicitly required of NRC in conforming. EPA has the lead responsibility and the Commission believes it must assume that EPA met the mandate.

The Commission views the mandate in 84a(1) as applying to all aspects of its uranium recovery program. The Commission believes that it can fulfill this mandate without further rulemaking. However, section 84a(1) should be emphasized in Appendix A to make it clear that the NRC will in

fact consider risks and economic costs and site specific needs in general. The insert to the Introduction paraphrasing section 84a(1) will explicitly emphasize this point.

The Commission also believes that implementation of "practicable" should be consistent with the intent of section 84a(1) and current as low as reasonably achievable (ALARA) Commission policy in 10 CFR 20. This point is clarified by paraphrasing 10 CFR 20.1(c) in an addition to the Introduction.

Industry comments on the depressed state of the industry are valid and licensees are faced with early reclamation. However, the Commission believes that this situation only emphasizes the site specific decisions needed and does not support the need for generic rulemaking.

All categories of commenters advocated specific suggestions to expand the scope of the proposed rulemaking. Commenters generally fell into three categories - those advocating: (1) additional changes needed to conform to the EPA standards, (2) additional changes that would make 10 CFR Part 40 more explicit or more protective of public health, safety, and environment but that are not directly related to conforming to the EPA standards, and (3) additional changes that would make Part 40 less restrictive or conform to the collective intent of Congress expressed in various legislation and hearing records rather than the EPA standards. Comments in the first category were considered within the scope of this rulemaking. Comments in the latter two categories will be considered along with comments received on the accompanying ANPRM.

One commenter suggested that the Commission require that design calculations for covers incorporate a design margin to explicitly account for changes in moisture content and porosity, external erosional forces,

and internal chemical reactions in order to meet the reasonable assurance provision of the EPA radon and longevity standard over the long term.

Response: The factors identified are important to consider in evaluating expected cover performance. However, such factors are very site specific and represent a level of detail that NRC normally relegates to guidance or procedural documents. The design margin recommended is essentially applied in the staff's use of conservative material parameters in the site specific evaluation of the design of soil and rock covers.

NRC was urged to add an active monitoring program for tailings stability to the Commission's rules.

Response: Criterion 12 of the Commission's rules has a minimum requirement for annual inspections by the custodial government agency to confirm the integrity of stabilization and the need for any maintenance.

Industry recommended a number of changes based on the Commission's earlier suspension action. The recommended changes and rationale for action were essentially the same as presented in the suspension notices. Examples include deletion of below grade or equivalent as the prime option in Criterion 3 and deletion of radium content restrictions on cover materials in Criterion 6.

Response: The intent of this action is nondiscretionary conforming changes to eliminate conflicts and inconsistencies, add imposed standards or Congressional direction, or make minor editorial or clarifying changes. Industry comments were mainly statements or claims based on "may not be required" and would require extensive new rulemaking and are thus considered outside the scope of the present action.

Comments on 40 CFR 192

Virtually all categories of commenters offered comments on the validity and merits of the EPA standard. The majority reflected dissatisfaction.

Response: As noted in the accompanying ANPRM (49 FR 46427), the Commission must focus on choices and decisions it must make on actions within its discretion. Until or unless court action sets aside the EPA standards, they are binding on NRC and Agreement State licensees. NRC licensees are faced with two sets of effective regulations that contain conflicting or inconsistent requirements. Under law, NRC must implement and enforce both.

As implied by the Commission Authority and Responsibility statement, the only provision of the EPA standard the Commission does not plan to implement and enforce is the provision in 40 CFR 192.32(a)(2)(iv) requiring EPA concurrence on site specific decisions. The Commission believes that removing conflicts and inconsistencies in the two sets of regulations and using site specific alternative authority to deal with occasional site specific problems represent the best regulatory approach.

Thus, comments on the lawfulness, merits, and value of the EPA standards were considered outside the scope of this action and were not a factor in developing this final rule.

Other

One State questioned how the process of dealing with alternatives using the type of flexibility afforded by Section 84c of the AEA would work in Agreement States.

Response: Section 19 of Pub.L 97-415, the NRC Authorization Act for fiscal years 1982 and 1983, added the following option to Section 274o of the AEA for Agreement States: " . . . the State may adopt alternatives (including, where appropriate, site-specific alternatives) to the requirements adopted and enforced by the Commission for the same purpose if, after notice and opportunity for public hearing, the Commission determines that such alternatives will achieve a level of stabilization and containment of the sites concerned, and a level of protection for public health, safety and the environment from radiological and non-radiological hazards associated with such sites, which is equivalent to, to the extent practicable, or more stringent than the level which would be achieved by standards and requirements adopted and enforced by the Commission for the same purpose and any final standards promulgated by the Administrator of the Environmental Protection Agency in accordance with section 275. Such alternative State requirements may take into account local or regional conditions, including geology, topography, hydrology and meteorology."

The Commission must determine that alternative standards adopted by the State achieve the required levels of protection. Further the Commission must notice the alternatives and provide an opportunity to request public hearing. This additional flexibility to adopt generic or site specific standards is available to the State regardless of the status of the State's regulations.

The comment does point out that 10 CFR 150.31 should be amended to add the option quoted above. Including the language in Part 150 is not legally required for the State to exercise the option, but addition would clarify the situation.

No comments were received on the Regulatory Flexibility Certification or Paperwork Reduction Act Statement in the notice. No specific comments were received on the NEPA discussion under Impact of the Amendments.

COMMENTS ON SPECIFIC PROPOSED MODIFICATIONS TO APPENDIX A 10 CFR 40

The proposed rule notice listed the specific modifications and rationale for each change. The list chronologically followed 10 CFR 40, Appendix A. In the following analysis, each of the modifications are summarized and addressed. The numbering system from the proposed notice is provided.

Introduction

Modification 1.(a): Typographical error and no comments were received.

Modification 1.(b): This proposed change deleted an outdated information submittal requirement associated with the 1980 publication of Appendix A.

One commenter expressed concern that the deletion would mean that detailed information on licensees' programs showing how they meet the criteria in Appendix A would not be required.

Response: Licensee compliance with Appendix A and the EPA standards is being handled and documented in the routine course of licensing and enforcement activities. A specific or separate submittal is not needed and would represent an unwarranted burden on licensees.

Modification 1.(c): This change would add a paraphrase of the provisions of section 84c of the AEA. The language provides applicants and

licensees the opportunity to propose alternatives to the specific requirements of Appendix A.

Comments on the addition of the flexibility provisions of section 84c to the Introduction generally did not take issue with the addition itself since it paraphrased the law. States and environmental groups expressed concerns about implementation. Some of the industry commenters favored extensive supplemental rulemaking to reduce the burden on licensees to develop alternatives.

Response: The Commission agrees that additional guidance on how to implement the section 84c flexibility may be needed. Generic guidance is difficult to prepare absent experience with specific proposals. NRC has used this flexibility only once. In addition, detailed implementation guidance is normally not included in the Commission's rules. It is developed in more flexible guidance documents.

Criterion 1

Modification 2.(a): This change would delete the "thousands of years" and add the 1,000-year time frame in the EPA design standard. Editorial errors confused the specifics of this modification. The first paragraph of proposed modified Criterion 1 should have read: "In selecting among alternative tailings disposal sites or judging the adequacy of existing tailings sites, the following site features which will determine the extent to which a program meets the broad objective of isolating the tailings and associated contaminants from man and the environment during operations and for 1,000 years thereafter, without ongoing active maintenance, shall be considered."

Comments on proposed changes to Criterion 1 on the time frame for protection reflected confusion on goals or objectives versus requirements and disagreement on what the times and reliance on active maintenance should be. State and environmental comments urged times greater than the 1,000-year EPA design standard on cover longevity and no reliance on maintenance. Industry favored a 200-year goal and reliance on maintenance.

Response: Comments highlighted an important reason for the reactions to the existing language and the proposed change. The first paragraph of Criterion 1 is a statement of a very general goal or objective, not a specific standard or requirement. The proposed change and associated editorial errors compounded the problem. It was intended to prevent misunderstandings due to the reference to thousands of years, not to repeat the specific design standard being added to Criterion 6.

Comments advocating a 200-year goal are directed at the EPA design standard and how it will be implemented in site specific actions. The Commission disagrees with any position that would put the goal for protecting man and the environment from tailings at 200 years. The EPA primary design stand is 1,000 years. Further, as a general goal, permanent isolation with no planned reliance on active maintenance is consistent with the findings in the GEIS, the EPA standard and the Congressional intent in section 161x(2) of the AEA that states: " . . . the need for long term maintenance and monitoring . . . will be minimized and, to the maximum extent practicable, eliminated." Since Congress did not flatly prohibit maintenance, NRC may consider it, but the preference for no maintenance is clear.

The first paragraph of Criterion 1 is being clarified to emphasize the goal versus standard concept and to delete any specific time frame.

"Shall" is being changed to "should" in the fourth paragraph of Criterion 1 to further emphasize the goal concept.

Modification 2.(b): This change would delete the ground-water modifier "usable" to be consistent with the primary thrust of the EPA standard to protect all ground water.

State and environmental commenters supported this change and industry opposed it for reasons discussed under Criterion 5 modifications.

Response: The general thrust of the EPA standard is to protect all ground water. The proposed change was not intended to set aside the site specific option to pursue alternate concentration limits which may be based in part on the existing and potential use of the ground water. The existing language in Criterion 1 referring to " . . . isolation of contaminants from usable groundwater sources" conflicts with the EPA standard.

Criterion 3

Modification 3.(a): This change would delete the ground-water modifiers "high quality" to be consistent with the primary thrust of the EPA standard.

No new issues were raised on this change.

Criterion 4

Modification 4.(a): This change would delete "maximum possible flood" and insert "Probable Maximum Flood" (PMF).

Comments on the proposed change in Criterion 4 to replace "maximum possible flood" with "Probable Maximum Flood" reflected divergent views on the appropriate design flood to be used in analysis. Environmental

commenters favored maximum conservatism and industry advocated less conservative assumptions than either the existing or proposed language.

Response: The intent of paragraph(a) in Criterion 4 is to require that siting of tailings disposal areas minimize the upstream catchment area to reduce the potential for erosion regardless of the magnitude of the design flood. The modifiers "maximum possible" and "probable maximum" are both inappropriate since this criterion is not intended to discuss design flood requirements. In order to emphasize the primary purpose of the requirement, the Commission is replacing "probable maximum flood" with "floods."

Criterion 5

Proposed changes to Criteria 1, 3, and 5 were all intended to reflect that the EPA standard starts from a premise that no seepage from new or expanded impoundments or degradation of ground water are allowed and that all ground water is to be protected regardless of quality or use category. Industry strongly opposed protecting non-usable ground water, recommended deferring all ground-water changes, and argued that the EPA ground-water standards are invalid because they fail the Congressional test of comparability to standards for wastes of similar hazard (e.g., mining wastes). EPA made a general comment that more distinction between existing and new sites is needed.

Response: The comments clearly reflect confusion about the status of the EPA ground-water protection standards, the status of 10 CFR 40 Appendix A requirements, and the basis for proposing the few changes

related to ground-water protection in advance of more comprehensive rulemaking on ground water. As discussed under the general issues, the EPA standards have been applicable in regulation since December 6, 1983. NRC rulemaking is not required to impose the EPA standards. The proposed changes to Appendix A, and Criterion 5 in particular, were not intended to fully conform to or to modify the EPA standard in any way.

The EPA comment that the distinction between new and existing sites was not reflected was based on the brief rationale for the proposed change rather than the changes themselves. The rationale did not address the complex site specific options provided under the EPA standard (i.e., the use of site specific alternate concentration limits as the secondary standard). Criterion 5, as modified in this rulemaking does not impact the existing/new site provisions and site specific provisions of 40 CFR 192 and no additional changes are warranted on this basis.

Specific clarification of the dual regulatory situation on ground water is needed and an insert at the beginning of Criterion 5 is being added. A minor change to provide a subject for the list of considerations in Criterion 5 is also being made for clarity.

Modification 5.(a): This change would delete language implying that seepage to ground water is acceptable if it does not change the use category.

No new issues were raised on this change.

Modification 5.(b): This change would delete language referring to bottom liners of "low permeability."

Commenters generally raised issues similar to those raised elsewhere on ground water. One commenter opposed this modification on technical grounds and pointed out that no material is totally impermeable and that

state-of-the-art liners have permeability ratings on the order of 10^{-12} m/sec.

Response: The observation that in an absolute and theoretical sense even synthetic liners are impermeable, is correct. Commission concern is that most people reading the reference to "low permeability" will not consider the absolute or theoretical concept and that most readers would consider clay as low permeability and synthetic materials as impermeable. Deletion of "low permeability" leaves the issue of what type of liners are acceptable to the more specific EPA standards.

Modification 5.(c): This change would delete a reference to potential use category as a standard.

Commenters questioned implementation aspects. One commenter stated that deletion would leave the issue of degree of ground-water restoration open and another that deletion allows NRC to be more restrictive in degree of restoration than the EPA standard.

Response: Deletion of the requirement to restore to ground water "to its potential use before milling operations began to the maximum extent practicable," does leave the degree of restoration open. The degree of restoration will be determined on a site specific basis in accordance with the EPA ground-water protection standards.

Modification 5.(d): This change would delete references to use category and tailings in contact with ground water.

No significant new issues were raised in comments on this proposed change.

Modification 5.(e): The ground-water modifier "usable" would be deleted.

No significant new issues were raised in comments on this proposed change.

Criterion 6

Modification 6.(a): This change would delete the two picocuries per square meter per second radon flux and minimum 3-meter cover thickness provisions and insert EPA's radon flux and longevity and stabilization standard.

Commenters objected to incorporation of the EPA longevity and radon design standards into Criterion 6. Many of the arguments were directed against the EPA standard as being too lax to adequately protect health and the environment or more stringent than warranted by the risks.

Response: Comments directed at the validity and merits of the EPA standard were considered outside the scope of this action as noted earlier.

Several commenters urged NRC to keep its more restrictive radon limit and 3-meter minimum cover. commenters urging NRC to keep its more restrictive radon limit argued that the 2 picocurie flux is ALARA, is easily met based on the Department of Energy's (DOE) Title I research experience and is cost effective. Comments urging that the 3-meter requirement be retained based their position primarily on the protection 3 meters of earth affords against erosion and intrusion.

Response: The new issue raised on the radon limit is the reference to Title I research. The DOE Title I research experience compared costs for different types of cover strategies; however these studies didn't perform analyses which would result in conclusions on the warranted levels of radon releases from covered tailings. To truly investigate whether the meeting of the 2 pCi/m^2s flux criterion is ALARA would

require a cost-benefit analysis, which EPA did in promulgating its standard.

Although laboratory and field experience by both DOE and NRC confirm that the 2 pCi/m²s criterion can be met, it is difficult to prove that it can be significantly maintained over the long-term due to weathering, settlement and other defect generating mechanisms. Moreover, the proximity of the 2 pCi/m²s flux to the natural radon flux from background sources introduces much uncertainty. The uncertainty is addressed in the design standard by the "reasonable assurance" implementation criterion, whereby NRC utilizes reasonably conservative parameter values in predicting the long-term radon flux. The resulting flux levels are usually much less than a factor of 10 above the 2 pCi/m²s flux criterion. Thus no rulechange is needed to assure conservatism.

As noted in the rationale for the proposed change, the specific thickness of 3 meters was derived from radon flux considerations. These considerations were based on meeting the 2 picocurie or twice-background performance criteria and are clearly inconsistent with the 20 picocurie value. Effective alternatives to total reliance on soil thickness are feasible and may make more environmental and economic sense. Well designed rock covers on the tops and side slopes of reclaimed tailings can provide sufficient erosion and intruder protection so that a soil cover of less than 3 meters has been found acceptable.

One State objected to including the 200-year minimum longevity requirement based on the small incremental costs and practicality of meeting the longer (1,000-year) time and the longevity of the hazards from tailings.

Response: The 200-year minimum longevity requirement provides relief in those unique reclamation situations where the 1,000-year criterion can be shown to be too much of a cost hardship to satisfy. The Commission views the EPA longevity standard to be 1,000 years unless site specific circumstances preclude meeting 1,000 years.

One State objected to NRC's proposed use of design standards and suggested that NRC rules explicitly require proof that the design has been met by the reclamation actions.

Response: The EPA longevity and radon standard is written as a design standard. Requirements to confirm adequacy of design during and after construction have merit but will be very site and design specific. Normal inspection and envorcement activities would include quality control and compliance with designs approved and specified in license conditions. If unique site circumstances warrant, a requirement to confirm design parameters after the fact is not precluded.

Three commenters offered clarifying suggestions. They included clarifying the reference to "permanent disposal," defining the term "disposal area," and addressing how the longevity design standard will be implemented. One commenter also suggested that the standard be clarified to make it clear, that to the extent practicable, the cover would still meet the 20 picocurie flux limit at the end of the 1,000-year design period.

Response: The Commission is implementing the suggestion to clarify "permanent disposal" but believes that "disposal area" is adequately addressed in the context of the proposed changes. The suggestion to address implementation would result in a level of detail in the rule normally relegated to NRC guidance documents.

The Commission agrees that the EPA standard is not completely clear that the flux limit is to be met throughout the effective design life to the extent practicable and is clarifying this point.

Industry opposed including any EPA standards for thorium byproduct material or that at least explicit flexibility for site specific decisions should be included. Industry also suggested a 50-year stabilization time period for thorium byproduct materials.

Response: The comments opposing incorporation of the EPA standards for thorium byproduct material are generally expressing dissatisfaction with the EPA standard itself. The thorium standards proposed for insertion are already in effect on NRC and State licensees and are nondiscretionary. The EPA standard in 40 CFR 192.42 provides for substitute generic provisions to those in Subpart E, but with EPA concurrence. NRC has the authority to consider and approve site specific alternatives if the finding in section 84c can be made.

Modification 6.(b): This change would add the two radon flux modifying footnotes from the EPA standard that specify that no monitoring is required, averaging is allowed, and cover materials do not have to be considered in meeting the flux limit.

Several State and environmental commenters objected to the incorporation of the EPA footnote qualifying the longevity and radon standard as a design standard not requiring confirmatory monitoring. Averaging provisions and disregard of the radon from cover materials in the footnotes were also of concern.

Response: The footnotes quoted from the EPA standards in 40 CFR 192 are necessary to define how EPA intended the longevity and radon standards to be used. The footnotes set the conditions which EPA supported as a

reasonable balance of cost and benefit that would be achievable with present state of the art. The practical problems which led EPA to issue a design standard and NRC experience in radon attenuation measurements and calculations convince the Commission that flux monitoring should not be mandated. Measurement of flux levels in the field is difficult and subject to wide variations due to factors such as sensitivity to measurement methods, meteorological variations, nonhomogeneity of the tailings piles, and disturbance of the radon releases by the monitoring process. NRC's current method for providing reasonable assurance that the EPA flux standard will be met focuses on the selection and application of parameters and calculational methodology for radon barrier design. NRC expects to review quality assurance records during construction to assure that the approved design is implemented in the field. The Commission notes that Agreement States can adopt more restrictive standards than EPA or NRC and may mandate monitoring if desired.

NRC experience also supports the need for averaging over the impoundment. The tailings are not homogeneous. As a practical matter, radon transport offsite results in mixing before the public is exposed so that doses are reflected by average values. Details on calculation methods are more appropriate in guidance documents that can be tailored to site specific conditions and track state-of-the-art experience.

Concern about high radium content of cover materials is addressed in the second paragraph of the proposed modified Criterion 6. The second paragraph contains the requirements on low radium content that were already in Appendix A. The footnote only clarifies that the EPA standard applies to the tailings flux through the cover and that radon from cover materials

are not to be included in demonstrating compliance with the 20 picocurie flux.

Modification 6.(c): This change would correct a typographical error and delete the 3-meter requirement.

No new issues were raised on this change.

Modification 6.(d): This change would add the threshold radium levels for applicability of the inserted EPA standard on longevity and control of radon releases.

One State expressed the view that the provision allowing averaging of radium content over 100 square meters allows highly contaminated small areas to be ignored and is therefore insufficiently protective. Other comments were based on the validity and merits of the EPA standards, particularly the thorium standards.

Response: The language proposed for insertion is needed to reflect the conditions under which EPA intended the longevity and radon standard to apply. The modification as proposed would allow NRC to be more restrictive if warranted by site specific conditions. NRC may require some degree of control for areas contaminated above background but below the threshold levels. No rule change is needed to maintain this option on a site specific basis.

Criterion 8

Modification 7.(a): The change would add the EPA standard language on the as low as practicable goals for radon releases during operations.

Commenters questioned implementation aspects of the Criterion 8 change. One commenter argued for the current terminology reflected in

10 CFR Part 20 for keeping releases as low as reasonably achievable (ALARA) as the true EPA intent.

Response: The Commission agrees that EPA's intent was to impose the ALARA principal and that ALARA is more consistent with Commission radiation protection policies as reflected in 10 CFR Part 20. The actual language in a standard has higher legal force than the preamble stating intent, but in this case since numerical values or other specific provisions are not involved, the Commission has more flexibility in conforming.

Modification 7.(b): These changes would add language from the EPA standard imposing 40 CFR 190 equivalent limits for thorium byproduct materials and compliance with 40 CFR Part 440, Subpart C.

One environmental commenter objected to the "reasonable assurance" language. Industry repeated objections to all the thorium standards. Industry recommended that waiver provisions from a recent EPA rulemaking under the Clean Air Act (50 FR 5190, February 6, 1985) be incorporated into the thorium dose limits. Industry also opposed adding the language requiring compliance with 40 CFR Part 440, Subpart C stating that these regulations are invalid since EPA lacks authority to regulate byproduct material under the Clean Water Act.

Response: The proposed text was quoted verbatim from the EPA standard in 40 CFR 192. No deletions or modifications of existing NRC rules are involved.

The proposed change incorporates for clarity standards that are already binding on NRC licensees and eliminates the need to refer to 40 CFR 192 for any requirements other than ground-water protection. The waiver

provisions suggested may have merit in considering site specific situations but are outside the scope of this rulemaking. The Commission sees no merit in arguments that 40 CFR 440, Subpart C, is invalid.

Modification 8: Criteria 2, 7, 9, 10, 11, and 12 are not affected by proposed changes.

Changes to these criteria recommended by commenters are outside the scope of this rulemaking.

Modifications

In accordance with the above, the Commission is issuing the following modifications to Appendix A to 10 CFR Part 40:

1. Introduction.

(a) In the second sentence of the third paragraph, change "amendability" to "amenability."

(b) Delete the fourth paragraph in its entirety.

(c) Add the following two paragraphs at the end: "Licensees or applicants may propose alternatives to the specific requirements in this Appendix. The alternative proposals may take into account local or regional conditions, including geology, topography, hydrology, and meteorology. The Commission may find that the proposed alternatives meet the Commission's requirements if the alternatives will achieve a level of stabilization and containment of the sites concerned, and a level of protection for public health, safety, and the environment from radiological and nonradiological hazards associated with the sites, which is equivalent to, to the extent practicable, or more stringent than the level which would be achieved by the requirements of this Appendix and the standards promulgated by the Environmental Protection Agency in 40 CFR 192, Subparts D and E."

All site specific licensing decisions based on the criteria in this Appendix or alternatives proposed by licensees or applicants will take into account the risk to the public health and safety and the environment with due consideration to the economic costs involved and any other factors the Commission determines to be appropriate. In implementing this Appendix, the Commission will consider "practicable" and "reasonably achievable" as equivalent terms. Decisions involving these terms will take into account the state of technology, and the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to the utilization of atomic energy in the public interest.

2. Criterion 1.

(a) Revise the first paragraph to read:

"The general goal or broad objective in siting and design decisions is permanent isolation of tailings and associated contaminants by minimizing disturbance and dispersion by natural forces, and to do so without ongoing maintenance. For practical reasons, specific siting decisions and design standards shall involve finite times (e.g., the longevity design standard in Criterion 6). The following site features which will contribute to such a goal or objective shall be considered in selecting among alternative tailings disposal sites or judging the adequacy of existing tailings sites:"

(b) In the fourth paragraph delete the word "shall" and insert "should".

(c) In the second listed item of the first paragraph, delete the word "usable".

3. Criterion 3.

(a) Delete the modifers "high quality" for groundwater in the second sentence of the second paragraph.

4. Criterion 4.

(a) Revise paragraph (a) by deleting "maximum possible flood" and inserting "floods".

5. Criterion 5.

(a) Add the following paragraph at the beginning:

"Licensees and applicants are cautioned that the ground-water provisions of 40 CFR 192, Subparts D and E, are binding. The thrust of the EPA standards in 40 CFR 192 is nondegradation of all groundwater. The primary ground-water standard in 40 CFR 192.32(a)(1), which applies to new or expanded impoundments, does not include consideration of existing or future groundwater quality. The secondary standard in 40 CFR 192.32(a)(2) applies to management of all byproduct material including existing and new or expanded impoundments. In the secondary standard, several groundwater quality criteria are considered, especially in site specific decisions on applications for alternate concentration limits. Criterion 5 supplements and does not conflict with or modify provisions of 40 CFR 192. Until or unless the Commission undertakes additional rulemaking as described in the advance notice of proposed rulemaking published in the Federal Register on November 26, 1984 (49 FR 46423), licensees and applicants must refer to both 10 CFR Part 40 and 40 CFR Part 192 for the complete set of applicable ground-water protection requirements."

(b) Delete in its entirely the first paragraph beginning "Steps shall be taken..." and ending "...this objective." and insert the following: "In developing and conducting groundwater protection programs, applicants and licensees shall consider the following: ".

(c) In the first listed item under the first paragraph beginning with "Installation of..." delete the words "low permeability" as a characteristic of bottom liners.

(d) In the second paragraph beginning "Where groundwater impacts..." delete the phrase "to its potential use before milling operations began to the maximum extent practicable."

(e) Delete in its entirety the third paragraph beginning "While the primary method of protecting ground water shall be isolation..." and ending "...from current or potential uses."

(f) In the first sentence of the fifth paragraph beginning "This information shall be gathered..." delete the word "usable" where it modifies "groundwater."

6. Criterion 6.

(a) Delete the first sentence in entirety, beginning with "Sufficient earth cover..." and ending with "...meter per second.", and in its place insert "In disposing of waste byproduct material, licensees shall place an earthen cover over tailings or wastes at the end of milling operations and the waste disposal area shall be closed in accordance with a design[1] which shall provide reasonable assurance of control of radiological hazards to (i) be effective for one thousand years, to the extent reasonably achievable, and, in any case, for at least 200 years, and (ii) limit releases of radon-222 from uranium byproduct materials, and radon-220 from thorium byproduct materials, to the atmosphere so as to

not exceed an average[2] release rate of 20 picocuries per square meter per second (pCi/m^2s) to the extent practicable throughout the effective design life determined pursuant to (i) above."

(b) Add to Criterion 6 the following two footnotes which accompany the revised first sentence: footnote (1) "The standard applies to design. Monitoring for radon after installation of an appropriately designed cover is not required," and footnote (2) "This average shall apply to the entire surface of each disposal area over periods of at least one year, but short compared to 100 years. Radon will come from both uranium byproduct materials and from covering materials. Radon emissions from covering materials should be estimated as part of developing a closure plan for each site. The standard, however, applies only to emissions from byproduct materials to the atmosphere."

(c) In the fifth sentence of the first paragraph, replace "non-soiled" with "non-soil," and replace the words "to reduce tailings covers to less than three meters" with the words "as cover materials."

(d) At the end of Criterion 6, add a new paragraph to read: "The design requirements in this Criterion for longevity and control of radon releases shall apply to any portion of a licensed and/or disposal site unless such portion contains a concentration of radium in land, averaged over areas of 100 square meters, which, as a result of byproduct material does not exceed the background level by more than: (i) 5 picocuries per gram (pCi/g) of radium-226, or, in the case of thorium byproduct material, radium-228, averaged over the first 15 centimeters (cm) below the surface, and (ii) 15 pCi/g of radium-226, or, in the case of thorium byproduct material, radium-228, averaged over 15-cm thick layers more than 15 cm below the surface."

7. Criterion 8.

(a) At the end of the first full paragraph, add a new sentence to read "During operations and prior to closure, radiation doses from radon emissions from surface impoundments shall be kept as low as is reasonably achievable."

(b) Following the third full paragraph of Criterion 8, just before Criterion 8A, insert the following two new paragraphs:

"Milling operations producing or involving thorium byproduct material shall be conducted in such a manner as to provide reasonable assurance that the annual dose equivalent does not exceed 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public as a result of exposures to the planned discharge of radioactive materials, radon-220 and its daughters excepted, to the general environment."

"Uranium and thorium byproduct materials shall be managed so as to conform to the applicable provisions of Title 40 of the Code of Federal Regulations, Part 440, Ore Mining and Dressing Point Source Category: Effluent Limitations Guidelines and New Source Performance Standards, Subpart C, Uranium, Radium, and Vanadium Ores Subcategory, as codified on January 1, 1983."

8. Criteria 2, 7, 9, 10, 11, and 12 are not affected by this action.

The Commission is also issuing the following change to 10 CFR Part 150:

9. At the end of § 150.31, a new paragraph (d) is added to read: "In adopting requirements pursuant to paragraph (b)(2) of this section, the State may adopt alternatives (including, where appropriate, site-specific

alternatives) to the requirements adopted and enforced by the Commission for the same purpose if, after notice and opportunity for public hearing, the Commission determines that such alternatives will achieve a level of stabilization and containment of the sites concerned, and a level of protection for public health, safety and the environment from radiological and nonradiological hazards associated with such sites, which is equivalent to, to the extent practicable, or more stringent than the level which would be achieved by standards and requirements adopted and enforced by the Commission for the same purpose and any final standards promulgated by the Administrator of the Environmental Protection Agency in accordance with section 275. Such alternative State requirements may take into account local or regional conditions, including geology, topography, hydrology and meteorology."

Commission Authority and Responsibility

Section 84c. of the Atomic Energy Act states that:

> A Licensee may propose alternatives to specific requirements adopted and enforced by the Commission under this act. Such alternative proposals may take into account local or regional conditions, including geology, topography, hydrology and meteorology. The Commission may treat such alternatives as satisfying Commission requirements if the Commission determines that such alternatives will achieve a level of stabilization and containment of the sites concerned, and a level of protection for public health, safety, and the environment

from radiological and nonradiological hazards associated with such sites, which is equivalent to, to the extent practicable, or more stringent than the level which would be achieved by standards and requirements adopted and enforced by the Commission for the same purpose and any final standards promulgated by the Administrator of the Environmental Protection Agency in accordance with Section 275.

The Commission historically has had the authority and responsibility to regulate the activities of persons licensed under the Atomic Energy Act of 1954, as amended. Consistent with that authority and in accordance with Section 84c. of that Act, the Commission has the discretion to review and approve site specific alternatives to standards promulgated by the Commission and by the Administrator of the Environmental Protection Agency. In the exercise of this authority, Section 84c. does not require the Commission to obtain the concurrence of the Administrator in any site specific alternative which satisfies Commission requirements for the level of protection for public health, safety, and the environment from radiological and nonradiological hazards at uranium mill tailings sites. As an example, the Commission need not seek concurrence of the Administrator in case-by-case determinations of alternative concentration limits and delisting of hazardous constituents for specific sites. It should be understood that the proposed conforming regulations deal with the exercise of the Commission's responsibility and authority under the Atomic Energy Act of 1954, solely as regards uranium mill tailings sites and have no broader connotation.

The Commission believes that licensee proposals for alternatives

can be an important and effective way to help deal with the problems associated with implementing the new EPA standards. The Commission expects that it may require several years to have its conforming regulations fully in place. It expects to use the flexibility provided by Section 84 in the interim to consider and approve alternative proposals from licensees. Section 84c. provides NRC sufficient authority to independently approve alternatives so long as the Commission can make the required determination.

Impact of the Amendments

The Commission's action in issuing these modifications to its regulations in Appendix A to 10 CFR Part 40 is to conform them to the new EPA standards. These changes are for the purpose of avoiding conflicts and inconsistencies, and for clarifying previously existing language so as to be compatible with the new requirements. The action taken here by the Commission is a consequence of previous actions taken by the Congress and the EPA, and is legally mandated in Section 275b(3) of the Atomic Energy Act of 1954, as amended.

Commission action in this case is essentially nondiscretionary in nature, and for purposes of environmental analysis, rests upon existing environmental and other impact evaluations in the follow' documents: (1) "Final Environmental Impact Statement for Standards for the Control of Byproduct Materials from Uranium Ore Processing (40 CFR Part 192)," Volumes 1 and 2, EPA 520/1-83-008-1 and 2, September 1983, and (2) "Regulatory Impact Analysis of Final Environmental Standards for Uranium Mill Tailings at Active Sites," EPA 520/1-83-010, September 1983, both prepared in support of Subparts D and E of 40 CFR Part 192, and (3) "Final Generic

Environmental Impact Statement on Uranium Milling," NUREG-0706, September 1980, prepared in support of Appendix A of 10 CFR Part 40. The Commission believes that these supporting analyses for the EPA standards and the existing Commission regulations provide a more than adequate environmental review for the standards addressed herein, and that no additional impact analysis is warranted by the conforming actions issued herein. The EPA engaged in and completed a NEPA process with full consideration of environmental concerns, and for the purposes of this rulemaking action, can be viewed as the lead agency.

PAPERWORK REDUCTION ACT STATEMENT

This rule does not contain a new or amended information collection requirement subject to the requirements of the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). Existing requirements were approved by the Office of Management and Budget approval number 3150-0020.

REGULATORY FLEXIBILITY CERTIFICATION

As required by the Regulatory Flexibility Act of 1980, 5 U.S.C. 605(b), the Commission certifies that this rule will not have a significant economic impact upon a substantial number of small entities. Therefore, we have not performed a Regulatory Flexibility Analysis. The basis for this finding is that of the licensed uranium mills, only one qualifies as a small entity. Almost all the mills are owned by large corporations. Three of the mills are partly-owned by companies that could qualify as small businesses, according to the Small Business Administration generic

small entity definition of 500 employees. However, under the Regulatory Flexibility Act, a small business is one tnat is independently owned and operated. Since these three mills are not independently owned they do not qualify as small entities.

LIST OF SUBJECTS IN 10 CFR PART 40

Government contracts, Hazardous materials-transportation, Nuclear materials, Penalty, Reporting and recordkeeping requirements, Source ma erial, and Uranium.

LIST OF SUBJECTS IN 10 CFR PART 150

Hazardous materials-transportation, Intergrovernmental relations, Nuclear materials, Penalty, Reporting and recordkeeping requirements, Security measures, Source material, and Special nuclear material.

Under the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, 5 U.S.C. 553, and the Uranium Mill Tailings Radiation Control Act of 1978, as amended, the NRC is issuing the following amendments to 10 CFR Parts 40 and 150.

PART 40 DOMESTIC LICENSING OF SOURCE MATERIAL

1. The authority citation for Part 40 is revised to read as follows:

AUTHORITY: Secs. 62, 63, 64, 65, 81, 161, 182, 183, 186, 68 Stat. 932, 933, 935, 948, 953, 954, 955, as amended, secs. 11e(2), 83, 84,

Pub. L. 95-604, 92 Stat. 3033, as amended, 3039, sec. 234, 83 Stat. 444, as amended (42 U.S.C. 2014(e)(2), 2092, 2093, 2094, 2095, 2111, 2113, 2114, 2201, 2232, 2233, 2236, 2282); secs. 274, Pub. L. 86-373, 73 Stat. 688 (42 U.S.C. 2021); secs. 201, as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846). Section 275, 92 Stat. 3021, as amended by Pub. L. 97-415, 96 Stat. 2067 (42 U.S.C. 2022).

Section 40.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 (42 U.S.C. 5851). Section 40.31(g) also issued under sec. 122, 68 Stat. 939 (42 U.S.C. 2152). Section 40.46 also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Section 40.71 also issued under sec. 187, 68 Stat. 955 (42 U.S.C. 2237).

For the purposes of sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273); §§ 40.3, 40.25(d)(1)-(3), 40.35(a)-(d), 40.41(b) and (c), 40.46, 40.51(a) and (c), and 40.63 are issued under sec. 161b, 68 Stat. 948, as amended, (42 U.S.C. 2201(b)); and §§ 40.25(c) and (d)(3) and (4), 40.26(c)(2), 40.35(e), 40.42, 40.61, 40.62, 40.64 and 40.65 are issued under sec. 161o, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

2. Appendix A to Part 40 is revised to read as follows:

Appendix A to Part 40 - Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material From Ores Processed Primarily for Their Source Material Content.

Introduction. Every applicant for a license to possess and use source material in conjunction with uranium or thorium milling, or byproduct material at sites formerly associated with such milling, is required by the provisions of § 40.31(h) to include in a license application proposed specifications relating to milling operations and the disposition

of tailings or wastes resulting from such milling activities. This appendix establishes technical, financial, ownership, and long-term site surveillance criteria relating to the siting, operation, decontamination, decommissioning, and reclamation of mills and tailings or waste systems and sites at which such mills and systems are located. As used in this appendix, the term "as low as is reasonably achievable" has the same meaning as in § 20.1(c) of 10 CFR Part 20 of this chapter.

In many cases, flexibility is provided in the criteria to allow achieving an optimum tailings disposal program on a site-specific basis. However, in such cases the objectives, technical alternatives and concerns which must be taken into account in developing a tailings program are identified. As provided by the provisions of § 40.31(h) applications for licenses must clearly demonstrate how the criteria have been addressed.

The specifications shall be developed considering the expected full capacity of tailings or waste systems and the lifetime of mill operations. Where later expansions of systems or operations may be likely (for example, where large quantities of ore now marginally uneconomical may be stockpiled), the amenability of the disposal system to accommodate increased capacities without degradation in long-term stability and other performance factors shall be evaluated.

Licensees or applicants may propose alternatives to the specific requirements in this Appendix. The alternative proposals may take into account local or regional conditions, including geology, topography, hydrology, and meterology. The Commission may find that the proposed alternatives meet the Commission's requirements if the alternatives will achieve a level of stabilization and containment of the sites concerned,

and a level of protection for public health, safety, and the environment from radiological and nonradiological hazards associated with the sites, which is equivalent to, to the extent practicable, or more stringent than the level which would be achieved by the requirements of this Appendix and the standards promulgated by the Environmental Protection Agency in 40 CFR 192, Subparts D and E.

All site specific licensing decisions based on the criteria in this Appendix or alternatives proposed by licensees or applicants will take into account the risk to the public health and safety and the environment with due consideration to the economic costs involved and any other factors the Commission determines to be appropriate. In implementing this Appendix, the Commission will consider "practicable" and "reasonably achievable" as equivalent terms. Decisions involving these terms will take into account the state of technology, and the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to the utilization of atomic energy in the public interest.

I. Technical Criteria

Criterion 1--The general goal or broad objective in siting and design decisions is permanent isolation of tailings and associated contaminants by minimizing disturbance and dispersion by natural forces, and to do so without ongoing maintenance. For practical reasons, specific siting decisions and design standards shall involve finite times (e.g., the longevity design standard in Criterion 6). The following site features which will contribute to such a goal or objective shall be considered in selecting among alternative tailings disposal sites or judging the adequacy of existing tailings sites:

- Remoteness from populated areas;
- Hydrologic and other natural conditions as they contribute to continued immobilization and isolation of contaminants from groundwater sources; and
- Potential for minimizing erosion, disturbance, and dispersion by natural forces over the long term.

The site selection process shall be an optimization to the maximum extent reasonably achievable in terms of these features.

In the selection of disposal sites, primary emphasis shall be given to isolation of tailings or wastes, a matter having long-term impacts, as opposed to consideration only of short-term convenience or benefits, such as minimization of transportation or land acquisition costs. While isolation of tailings will be a function of both site and engineering design, overriding consideration shall be given to siting features given the long-term nature of the tailings hazards.

Tailings should be disposed of in a manner that no active maintenance is required to preserve conditions of the site.

Criterion 2--To avoid proliferation of small waste disposal sites and thereby reduce perpetual surveillance obligations, byproduct material from in situ extraction operations, such as residues from solution evaporation or contaminated control processes, and wastes from small remote above ground extraction operations shall be disposed of at existing large mill tailings disposal sites; unless, considering the nature of the wastes, such as their volume and specific activity, and the costs and environmental impacts of transporting the wastes to a large disposal site, such offsite disposal is demonstrated to be impracticable or the advantages of onsite burial clearly outweigh the benefits of reducing the perpetual surveillance obligations.

Criterion 3--The "prime option" for disposal of tailings is placement below grade, either in mines or specially excavated pits (that is, where the need for any specially constructed retention structure is eliminated).

The evaluation of alternative sites and disposal methods performed by mill operators in support of their proposed tailings disposal program (provided in applicants' environmental reports) shall reflect serious consideration of this disposal mode. In some instances, below grade disposal may not be the most environmentally sound approach, such as might oe the case if a groundwater formation is relatively close to the surface or not very well isolated by overlying soils and rock. Also, geologic and topographic conditions might make full below grade burial impracticable: for example, bedrock may be sufficiently near the surface that blasting would be required to excavate a disposal pit at excessive cost, and more suitable alternative sites are not available. Where full below grade burial is not practicable, the size of retention structures, and size and steepness of slopes of associated exposed embankments shall be minimized by excavation to the maximum extent reasonably achievable or appropriate given the geologic and hydrologic conditions at a site. In these cases, it must be demonstrated that an above grade disposal program will provide reasonably equivalent isolation of the tailings from natural erosional forces.

Criterion 4--The following site and design criteria shall be adhered to whether tailings or wastes are disposed of above or below grade.

(a) Upstream rainfall catchment areas must be minimized to decrease erosion potential and the size of the flood which could erode or wash out sections of the tailings disposal area.

(b) Topographic features should provide good wind protection.

(c) Embankment and cover slopes shall be relatively flat after final stabilization to minimize erosion potential and to provide conservative factors of safety assuring long-term stability. The broad objective should be to contour final slopes to grades which are as close as possible to those which would be provided if tailings were disposed of below grade; this could, for example, lead to slopes of about 10 horizontal to 1 vertical (10h:1v) or less steep. In general, slopes should not be steeper than about 5h:1v. Where steeper slopes are proposed, reasons why a slope less steep than 5h:1v would be inpracticable should be provided, and compensating factors and conditions which make such slopes acceptable should be identified.

(d) A full self-sustaining vegetative cover shall be established or rock cover employed to reduce wind and water erosion to negligible levels.

Where a full vegetative cover is not likely to be self-sustaining due to climatic or other conditions, such as in semi-arid and arid regions, rock cover shall be employed on slopes of the impoundment system. The NRC will consider relaxing this requirement for extremely gentle slopes such as those which may exist on the top of the pile.

The following factors shall be considered in establishing the final rock cover design to avoid displacement of rock particles by human and animal traffic or by natural process, and to preclude undercutting and piping:

- shape, size, composition, and gradation of rock particles (excepting bedding material average particles size shall be at least cobble size or greater);

- rock cover thickness and zoning of particles by size; and
- steepness of underlying slopes.

Individual rock fragments shall be dense, sound, and resistant to abrasion, and shall be free from cracks, seams, and other defects that would tend to unduly increase their destruction by water and frost actions. Weak, friable, or laminated aggregate shall not be used.

Rock covering of slopes may not be required where top covers are very thick (on the order of 10m or greater); impoundment slopes are very gentle (on the order of 10 h:1v or less); bulk cover materials have inherently favorable erosion resistance characteristics; and, there is negligible drainage catchment area upstream of the pile and good wind protection as described in points (a) and (b) of this Criterion.

Furthermore, all impoundment surfaces shall be contoured to avoid areas of concentrated surface runoff or abrupt or sharp changes in slope gradient. In addition to rock cover on slopes, areas toward which surface runoff might be directed shall be well protected with substantial rock cover (rip rap). In addition to providing for stability of the impoundment system itself, overall stability, erosion potential, and geomorphology of surrounding terrain shall be evaluated to assure that there are not ongoing or potential processes, such as gully erosion, which would lead to impoundment instability.

(e) The impoundment shall not be located near a capable fault that could cause a maximum credible earthquake larger than that which the impoundment could reasonably be expected to withstand. As used in this criterion, the term "capable fault" has the same meaning as defined in § III(g) of Appendix A of 10 CFR 100. The term "maximum credible earthquake" means that earthquake which would cause the maximum vibratory

ground motion based upon an evaluation of earthquake potential considering the regional and local geology and seismology and specific characteristics of local subsurface material.

(f) The impoundment, where feasible, should be designed to incorporate features which will promote deposition. For example, design features which promote deposition of sediment suspended in any runoff which flows into the impoundment area might be utilized; the object of such a design feature would be to enhance the thickness of cover over time.

Criterion 5--Licensees and applicants are cautioned that the groundwater provisions of 40 CFR 192, Subparts D and E, are binding. The thrust of the EPA standards in 40 CFR 192 is nondegradation of all groundwater. The primary groundwater standard in 40 CFR 192.32(a)(1), which applies to new or expanded impoundments, does not include consideration of existing or future groundwater quality. The secondary standard in 40 CFR 192.32(a)(2) applies to management of all byproduct material including existing and new or expanded impoundments. In the secondary standard, several groundwater quality criteria are considered, especially in site specific decisions on applications for alternate concentration limits. Criterion 5 supplements and does not conflict with or modify provisions of 40 CFR 192. Until or unless the Commission undertakes additional rulemaking as described in the advance notice of proposed rulemaking published in the Federal Register on November 26, 1984 (49 FR 46425), licensees and applicants must refer to both 10 CFR Part 40 and 40 CFR Part 192 for the complete set of applicable ground-water protection requirements.

In developing and conducting groundwater protection programs, applications and licensees shall consider the following:

• Installation of bottom liners (Where synthetic liners are used, a leakage detection system shall be installed immediately below the liner to ensure major failures are detected if they occur. This is in addition to the groundwater monitoring program conducted as provided in Criterion 7. Where clay liners are proposed or relatively thin, in-situ clay soils are to be relied upon for seepage control, tests shall be conducted with representative tailings solutions and clay materials to confirm that no significant deterioration of permeability or stability properties will occur with continuous exposure of clay to tailings solutions. Tests shall be run for a sufficient period of time to reveal any effects if they are going to occur (in some cases deterioration has been observed to occur rather rapidly after about nine months of exposure)).

• Mill process designs which provide the maximum practicable recycle of solutions and conservation of water to reduce the net input of liquid to the tailings impoundment.

• Dewatering of tailings by process devices and/or in-situ drainage systems (At new sites, tailings shall be dewatered by a drainage system installed at the bottom of the impoundment to lower the phreatic surface and reduce the driving head for seepage, unless tests show tailings are not amenable to such a system. Where in-situ dewatering is to be conducted, the impoundment bottom shall be graded to assure that the drains are at a low point. The drains shall be protected by suitable filter materials to assure that drains remain free running. The drainage system shall also be adequately sized to assure good drainage).

• Neutralization to promote immobilization of toxic substances.

Where groundwater impacts are occurring at an existing site due to seepage, action shall be taken to alleviate conditions that lead to excessive seepage impacts and restore groundwater quality. The specific seepage control and groundwater protection method, or combination of methods, to be used must be worked out on a site-specific basis. Technical specifications shall be prepared to control installation of seepage control systems. A quality assurance, testing, and inspection program, which includes supervision by a qualified engineer or scientist, shall be established to assure the specifications are met.

In support of a tailings disposal system proposal, the applicant/operator shall supply information concerning the following:

- The chemical and radioactive characteristics of the waste solutions.

- The characteristics of the underlying soil and geologic formations particularly as they will control transport of contaminants and solutions. This shall include detailed information concerning extent, thickness, uniformity, shape, and orientation of underlying strata. Hydraulic gradients and conductivities of the various formations shall be determined.

This information shall be gathered from borings and field survey methods taken within the proposed impoundment area and in surrounding areas where contaminants might migrate to groundwater. The information gathered on boreholes shall include both geologic and geophysical logs in sufficient number and degree of sophistication to allow determining significant discontinuities, fractures, and channeled deposits of high hydraulic conductivity. If field survey methods are used, they should be in addition to and calibrated with borehole logging. Hydrologic

parameters such as permeability shall not be determined on the basis of laboratory analysis of samples alone; a sufficient amount of field testing (e.g., pump tests) shall be conducted to assure actual field properties are adequately understood. Testing shall be conducted to allow estimating chemi-sorption attenuation properties of underlying soil and rock.

• Location, extent, quality, capacity and current uses of any groundwater at and near the site.

Furthermore, steps shall be taken during stockpiling of ore to minimize penetration of radionuclides into underlying soils; suitable methods include lining and/or compaction of ore storage areas.

Criterion 6--In disposing of waste byproduct material, licensees shall place an earthen cover over tailings or wastes at the end of milling operations and, the waste disposal area shall be closed in accordance with a design[1] which shall provide reasonable assurance of control of radiological hazards to (i) be effective for 1,000 years, to the extent reasonably achievable, and, in any case, for at least 200 years, and (ii) limit releases of radon-222 from uranium byproduct materials, and radon-220 from thorium byproduct materials, to the atmosphere so as to not exceed an average[2] release rate of 20 picocuries per square meter per second (pCi/m^2s) to the extent practicable throughout the effective

[1]The standard applies to design. Monitoring for radon after installation of an appropriately designed cover is not required.

[2]This average shall apply to the entire surface of each disposal area over periods of at least 1 year, but short compared to 100 years. Radon will come from both uranium byproduct materials and from covering materials. Radon emissions from covering materials should be estimated as part of developing a closure plan for each site. The standard, however, applies only to emissions from uranium byproduct materials to the atmosphere.

design life determined pursuant to (i) above. In computing required tailings cover thicknesses, moisture in soils in excess of amounts found normally in similar soils in similar circumstances shall not be considered. Direct gamma exposure from the tailings or wastes should be reduced to background levels. The effects of any thin synthetic layer shall not be taken into account in determining the calculated radon exhalation level. If non-soil materials are proposed as cover materials, it must be demonstrated that such materials will not crack or degrade by differential settlement, weathering, or other mechanism, over long-term time intervals.

Near surface cover materials (i.e., within the top three meters) shall not include waste or rock that contains elevated levels of radium; soils used for near surface cover must be essentially the same, as far as radioactivity is concerned, as that of surrounding surface soils. This is to ensure that surface radon exhalation is not significantly above background because of the cover material itself.

The design requirements in this criterion for longevity and control of radon releases shall apply to any portion of a licensed and/or disposal site unless such portion contains a concentration of radium in land, averaged over areas of 100 square meters, which, as a result of byproduct material does not exceed the background level by more than: (i) 5 picocuries per gram (pCi/g) of radium-226, or, in the case of thorium byproduct material, radium-228, averaged over the first 15 centimeters (cm) below the surface, and (ii) 15 pCi/g of radium-226, or, in the case of thorium byproduct material, radium-228, averaged over 15-cm thick layers more than 15 cm below the surface.

Criterion 7--At least one full year prior to any major site construction, a preoperational monitoring program shall be conducted to provide

complete baseline data on a milling site and its environs. Throughout the construction and operating phases of the mill, an operational monitoring program shall be conducted to measure or evaluate compliance with applicable standards and regulations; to evaluate performance of control systems and procedures; to evaluate environmental impacts of operation; and to detect potential long-term effects.

Criterion 8--Milling operations shall be conducted so that all airborne effluent releases are reduced to levels as low as is reasonably achievable. The primary means of accomplishing this shall be by means of emission controls. Institutional controls, such as extending the site boundary and exclusion area, may be employed to ensure that offsite exposure limits are met, but only after all practicable measures have been taken to control emissions at the source. Notwithstanding the existence of individual dose standards, strict control of emissions is necessary to assure that population exposures are reduced to the maximum extent reasonably achievable and to avoid site contamination. The greatest potential sources of offsite radiation exposure (aside from radon exposure) are dusting from dry surfaces of the tailings disposal area not covered by tailings solution and emissions from yellowcake drying and packaging operations. During operations and prior to closure, radiation doses from radon emissions from surface impoundments of uranium or thorium byproduct materials shall be kept as low as is reasonably achievable.

Checks shall be made and logged hourly of all parameters (e.g., differential pressures and scrubber water flow rates) which determine the efficiency of yellowcake stack emission control equipment operation.

It shall be determined whether or not conditions are within a range prescribed to ensure that the equipment is operating consistently near peak efficiency; corrective action shall be taken when performance is outside of prescribed ranges. Effluent control devices shall be operative at all times during drying and packaging operations and whenever air is exhausting from the yellowcake stack. Drying and packaging operations shall terminate when controls are inoperative. When checks indicate the equipment is not operating within the range prescribed for peak efficiency, actions shall be taken to restore parameters to the prescribed range. When this cannot be done without shutdown and repairs, drying and packaging operations shall cease as soon as practicable. Operations may not be re-started after cessation due to off-normal performance until needed corrective actions have been identified and implemented. All such cessations, corrective actions, and re-starts shall be reported to the appropriate NRC regional office as indicated in Criterion 8A, in writing, within 10 days of the subsequent restart.

To control dusting from tailings, that portion not covered by standing liquids shall be wetted or chemically stabilized to prevent or minimize blowing and dusting to the maximum extent reasonably achievable. This requirement may be relaxed if tailings are effectively sheltered from wind, such as may be the case where they are disposed of below grade and the tailings surface is not exposed to wind. Consideration shall be given in planning tailings disposal programs to methods which would allow phased covering and reclamation of tailings impoundments since this will help in controlling particulate and radon emissions during operation. To control dusting from diffuse sources, such as tailings and ore pads where

automatic controls do not apply, operators shall develop written operating procedures specifying the methods of control which will be utilized.

Milling operations producing or involving thorium byproduct material shall be conducted in such a manner as to provide reasonable assurance that the annual dose equivalent does not exceed 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public as a result of exposures to the planned discharge of radioactive materials, radon-220 and its daughters excepted, to the general environment.

Uranium and thorium byproduct materials shall be managed so as to conform to the applicable provisions of Title 40 of the Code of Federal Regulations, Part 440, "Ore Mining and Dressing Point Source Category: Effluent Limitations Guidelines and New Source Performance Standards, Subpart C, Uranium, Radium, and Vanadium Ores Subcategory," as codified on January 1, 1983.

Criterion 8A--Daily inspections of tailings or waste retention systems shall be conducted by a qualified engineer or scientist and documented. The appropriate NRC regional office as indicated in Appendix D of 10 CFR Part 20, or the Director, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555, shall be immediately notified of any failure in a tailings or waste retention system which results in a release of tailings or waste into unrestricted areas, and/or of any unusual conditions (conditions not contemplated in the design of the retention system) which if not corrected could indicate the potential or lead to failure of the system and result in a release of tailings or waste into unrestricted areas.

II. Financial Criteria

Criterion 9--Financial surety arrangements shall be established by each mill operator prior to the commencement of operations to assure that sufficient funds will be available to carry out the decontamination and decommissioning of the mill and site and for the reclamation of any tailings or waste disposal areas. The amount of funds to be ensured by such surety arrangements shall be based on Commission-approved cost estimates in a Commission-approved plan for (1) decontamination and decommissioning of mill buildings and the milling site to levels which would allow unrestricted use of these areas upon decommissioning, and (2) the reclamation of tailings and/or waste disposal areas in accordance with technical criteria delineated in Section I of this Appendix. The licensee shall submit this plan in conjunction with an environmental report that addresses the expected environmental impacts of the milling operation, decommissioning and tailings reclamation, and evaluates alternatives for mitigating these impacts. The surety shall also cover the payment of the charge for long-term surveillance and control required by Criterion 10. In establishing specific surety arrangements, the licensee's cost estimates shall take into account total costs that would be incurred if an independent contractor were hired to perform the decommissioning and reclamation work. In order to avoid unnecessary duplication and expense, the Commission may accept financial sureties that have been consolidated with financial or surety arrangements established to meet requirements of other Federal or state agencies and/or local governing bodies for such decommissioning, decontamination, reclamation, and long-term site surveillance and control, provided such arrangements are considered adequate to satisfy these

requirements and that the portion of the surety which covers the decommissioning and reclamation of the mill, mill tailings site and associated areas, and the long-term funding charge is clearly identified and committed for use in accomplishing these activities. The licensee's surety mechanism will be reviewed annually by the Commission to assure that sufficient funds would be available for completion of the reclamation plan if the work had to be performed by an independent contractor. The amount of surety liability should be adjusted to recognize any increases or decreases resulting from inflation, changes in engineering plans, activities performed, and any other conditions affecting costs. Regardless of whether reclamation is phased through the life of the operation or takes place at the end of operations, an appropriate portion of surety liability shall be retained until final compliance with the reclamation plan is determined. This will yield a surety that is at least sufficient at all times to cover the costs of decommissioning and reclamation of the areas that are expected to be disturbed before the next license renewal. 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 instrument which is written for a specified period of time (e.g., 5 years) yet which must be automatically renewed unless the surety notifies the beneficiary (the Commission or the State regulatory agency) and the principal (the licensee) some reasonable time (e.g., 90 days) prior to the renewal date of their intention not to renew. In such a situation the surety requirement still exists and the licensee would be required to submit an acceptable replacement surety within a brief period of time to allow at least 60 days for the regulatory agency to collect.

Proof of forfeiture must not be necessary to collect the surety so that in the event that the licensee could not provide an acceptable replacement surety within the required time, the surety shall be automatically collected prior to its expiration. The conditions described above would have to be clearly stated on any surety instrument which is not open-ended, and must be agreed to by all parties. Financial surety arrangements generally acceptable to the Commission are:

(a) Surety bonds;

(b) Cash deposits;

(c) Certificates of deposit;

(d) Deposits of government securities;

(e) Irrevocable letters or lines of credit; and

(f) Combinations of the above or such other types of arrangements as may be approved by the Commission. However, self insurance, or any arrangement which essentially constitutes self insurance (e.g., a contract with a state or Federal agency), will not satisfy the surety requirement since this provides no additional assurance other than that which already exists through license requirements.

Criterion 10--A minimum charge of $250,000 (1978 dollars) to cover the costs of long-term surveillance shall be paid by each mill operator to the general treasury of the United States or to an appropriate State agency prior to the termination of a uranium or thorium mill license.

If site surveillance or control requirements at a particular site are determined, on the basis of a site-specific evaluation, to be significantly greater than those specified in Criterion 12 (e.g., if fencing is determined to be necessary), variance in funding requirements may be specified by the Commission. In any case, the total charge to cover the costs

of long-term surveillance shall be such that, with an assumed 1 percent annual real interest rate, the collected funds will yield interest in an amount sufficient to cover the annual costs of site surveillance. The total charge will be adjusted annually prior to actual payment to recognize inflation. The inflation rate to be used is that indicated by the change in the Consumer Price Index published by the U.S. Department of Labor, Bureau of Labor Statistics.

III. Site and Byproduct Material Ownership

Criterion 11--

A. These criteria relating to ownership of tailings and their disposal sites become effective on November 8, 1981, and apply to all licenses terminated, issued, or renewed after that date.

B. Any uranium or thorium milling license or tailings license shall contain such terms and conditions as the Commission determines necessary to assure that prior to termination of the license, the licensee will comply with ownership requirements of this criterion for sites used for tailings disposal.

C. Title to the byproduct material licensed under this Part and land, including any interests therein (other than land owned by the United States or by a State) which is used for the disposal of any such byproduct material, or is essential to ensure the long term stability of such disposal site, shall be transferred to the United States or the State in which such land is located, at the option of such State. In view of the fact that physical isolation must be the primary means of long-term control, and Government land ownership is a desirable supplementary measure, ownership of certain severable subsurface interests

(for example, mineral rights) may be determined to be unnecessary to protect the public health and safety and the environment. In any case, however, the applicant/operator must demonstrate a serious effort to obtain such subsurface rights, and must, in the event that certain rights cannot be obtained, provide notification in local public land records of the fact that the land is being used for the disposal of radioactive material and is subject to either an NRC general or specific license prohibiting the disruption and disturbance of the tailings. In some rare cases, such as may occur with deep burial where no ongoing site surveillance will be required, surface land ownership transfer requirements may be waived. For licenses issued before November 8, 1981, the Commission may take into account the status of the ownership of such land, and interests therein, and the ability of a licensee to transfer title and custody thereof to the United States or a State.

D. If the Commission subsequent to title transfer determines that use of the surface or subsurface estates, or both, of the land transferred to the United States or to a State will not endanger the public health, safety, welfare, or environment, the Commission may permit the use of the surface or subsurface estates, or both, of such land in a manner consistent with the provisions provided in these criteria. If the Commission permits such use of such land, it will provide the person who transferred such land with the right of first refusal with respect to such use of such land.

E. Material and land transferred to the United States or a State in accordance with this Criterion shall be transferred without cost to the United States or a State other than administrative and legal costs incurred in carrying out such transfer.

F. The provisions of this Part respecting transfer of title and custody to land and tailings and wastes shall not apply in the case of lands held in trust by the United States for any Indian tribe or lands owned by such Indian tribe subject to a restriction against alienation imposed by the United States. In the case of such lands which are used for the disposal of byproduct material, as defined in this Part, the licensee shall enter into arrangements with the Commission as may be appropriate to assure the long-term surveillance of such lands by the United States.

IV. Long-Term Site Surveillance

Criterion 12--The final disposition of tailings or wastes at milling sites should be such that ongoing active maintenance is not necessary to preserve isolation. As a minimum, annual site inspections shall be conducted by the government agency retaining ultimate custody of the site where tailings, or wastes are stored to confirm the integrity of the stabilized tailings or waste systems and to determine the need, if any, for maintenance and/or monitoring. Results of the inspection shall be reported to the Commission within 60 days following each inspection. The Commission may require more frequent site inspections if, on the basis of a site-specific evaluation, such a need appears necessary due to the features of a particular tailings or waste disposal system.

PART 150 - EXEMPTIONS AND CONTINUED REGULATORY AUTHORITY IN AGREEMENT STATES AND IN OFFSHORE WATERS UNDER SECTION 274

§ 150.31 Requirements for Agreement State regulation of byproduct material.

3. A new paragraph (d) is added to read as follows: "In adopting requirements pursuant to paragraph (b)(2) of this section, the State may adopt alternatives (including, where appropriate, site-specific alternatives) to the requirements adopted and enforced by the Commission for the same purpose if, after notice and opportunity for public hearing, the Commission determines that such alternatives will achieve a level of stabilization and containment of the sites concerned, and a level of protection for public health, safety and the environment from radiological and nonradiological hazards associated with such sites, which is equivalent to, to the extent practicable, or more stringent than the level which would be achieved by standards and requirements adopted and enforced by the Commission for the same purpose and any final standards promulgated by the Administrator of the Environmental Protection Agency in accordance with section 275. Such alternative State requirements may take into account local or regional conditions, including geology, topography, hydrology and meteorology."

Dated at Washington, DC, this ___ day of _____, 1985.

For The Nuclear Regulatory Commission.

_____

Samuel J. Chilk,
Secretary of the Commission.

ENCLOSURE C

PART 192—HEALTH AND ENVIRONMENTAL PROTECTION STANDARDS FOR URANIUM AND THORIUM MILL TAILINGS

* * * * *

Subpart D—Standards for Management of Uranium Byproduct Materials Pursuant to Section 84 of the Atomic Energy Act of 1954, as Amended

Sec.

Subpart E—Standards for Management of Thorium Byproduct Materials Pursuant to Section 84 of the Atomic Energy Act of 1954, as Amended

Authority: Sec. 275 of the Atomic Energy Act of 1954, 42 U.S.C. 2022, as added by the Uranium Mill Tailings Radiation Control Act of 1978, Pub. L. 95-604, as amended.

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Subpart D—Standards for Management of Uranium Byproduct Materials Pursuant to Section 84 of the Atomic Energy Act of 1954, as Amended

§ 192.30 Applicability.

This subpart applies to the management of uranium byproduct materials under Section 84 of the Atomic Energy Act of 1954 (henceforth designated "the Act"), as amended, during and following processing of uranium ores, and to restoration of disposal sites following any use of such sites under Section 83(b)(1)(B) of the Act.

§ 192.31 Definitions and Cross-references.

References in this subpart to other parts of the Code of Federal Regulations are to those parts as codified on January 1, 1983.

(a) Unless otherwise indicated in this subpart, all terms shall have the same meaning as in Title II of the Uranium Mill Tailings Rediation Control Act of 1978, Subparts A and B of this part, or Parts 190, 260, 261, and 264 of this chapter. For the purposes of this subpart, the terms "waste," "hazardous waste," and related terms, as used in Parts 260, 261, and 264 of this chapter shall apply to byproduct material.

(b) *Uranium byproduct material* means the tailings or wastes produced by the extraction or concentration of uranium from any ore processed primarily for its source material content. Ore bodies depleted by uranium solution extraction operations and which remain underground do not constitute "byproduct material" for the purpose of this Subpart.

(c) *Control* means any action to stabilize, inhibit future misuse of, or reduce emissions or effluents from uranium byproduct materials.

(d) *Licensed site* means the area contained within the boundary of a location under the control of persons generating or storing uranium byproduct materials under a license issued pursuant to Section 84 of the Act. For purposes of this subpart, "licensed site" is equivalent to "regulated unit" in Subpart F of Part 264 of this chapter.

(e) *Disposal site* means a site selected pursuant to Section 83 of the Act.

(f) *Disposal area* means the region within the perimeter of an impoundment or pile containing uranium by product materials to which the post-closure requirements of § 192.32(b)(1) of this subpart apply.

(g) *Regulatory agency* means the U.S. Nuclear Regulatory Commission.

(h) *Closure period* means the period of time beginning with the cessation, with respect to a waste impoundment, of uranium ore processing operations and ending with completion of requirements specified under a closure plan.

(i) *Closure plan* means the plan required under § 264.112 of this chapter.

(j) *Existing portion* means that land surface area of an existing surface impoundment on which significant quantities of uranium byproduct materials have been placed prior to promulgation of this standard.

§ 192.32 Standards.

(a) *Standards for application during processing operations and prior to the end of the closure period.* (1) Surface impoundments (except for an existing portion) subject to this subpart must be designed, constructed, and installed in such manner as to conform to the requirements of § 264.221 of this chapter.

except that at sites where the annual precipitation falling on the impoundment and any drainage area contributing surface runoff to the impoundment is less than the annual evaporation from the impoundment, the requirements of § 264.228(a)(2)(iii)(E) referenced in § 264.221 do not apply.

(2) Uranium byproduct materials shall be managed so as to conform to the ground water protection standard in § 264.92 of this chapter, except that for the purposes of this subpart:

(i) To the list of hazardous constituents referenced in § 264.93 of this chapter are added the chemical elements molybdenum and uranium.

(ii) To the concentration limits provided in Table 1 of § 264.94 of this chapter are added the radioactivity limits in Table A of this subpart.

(iii) Detection monitoring programs required under § 264.98 to establish the standards required under § 264.92 shall be completed within one (1) year of promulgation.

(iv) The regulatory agency may establish alternate concentration limits (to be satisfied at the point of compliance specified under § 264.95) under the criteria of § 264.94(b), provided that, after considering practicable corrective actions, these limits are as low as reasonably achievable, and that, in any case, the standards of § 264.94(a) are satisfied at all points at a greater distance than 500 meters from the edge of the disposal area and/or outside the site boundary, and

(v) The functions and responsibilities designated in Part 264 of this chapter as those of the "Regional Administrator" with respect to "facility permits" shall be carried out by the regulatory agency, except that exemptions of hazardous constituents under § 264.93 (b) and (c) of this chapter and alternate concentration limits established under § 264.94 (b) and (c) of this chapter (except as otherwise provided in § 192.32(a)(2)(iv)) shall not be effective until EPA has concurred therein.

(3) Uranium byproduct materials shall be managed so as to conform to the provisions of:

(a) Part 190 of this chapter, "Environmental Radiation Protection Standards for Nuclear Power Operations" and

(b) Part 440 of this chapter, "Ore Mining and Dressing Point Source Category: Effluent Limitations Guidelines and New Source Performance Standards, Subpart C, Uranium, Radium, and Vanadium Ores Subcategory."

(4) The regulatory agency, in conformity with Federal Radiation Protection Guidance (FR, May 18, 1960, pgs. 4402–3), shall make every effort to maintain radiation doses from radon emissions from surface impoundments of uranium byproduct materials as far below the Federal Radiation Protection Guides as is practicable at each licensed site.

(b) *Standards for application after the closure period.* At the end of the closure period:

(1) Disposal areas shall each comply with the closure performance standard in § 264.111 of this chapter with respect to nonradiological hazards and shall be designed [1] to provide reasonable assurance of control of radiological hazards to

(i) Be effective for one thousand years, to the extent reasonably achievable, and, in any case, for at least 200 years, and,

(ii) Limit releases of radon-222 from uranium byproduct materials to the atmosphere so as to not exceed an average [2] release rate of 20 picocuries per square meter per second (pCi/m^2s).

(2) The requirements of Section 192.32(b)(1) shall not apply to any portion of a licensed and/or disposal site which contains a concentration of radium-226 in land, averaged over areas of 100 square meters, which, as a result of uranium byproduct material, does not exceed the background level by more than:

(i) 5 picocuries per gram (pCi/g), averaged over the first 15 centimeters (cm) below the surface, and

(ii) 15 pCi/g, averaged over 15 cm thick layers more than 15 cm below the surface.

§ 192.33 Corrective Action Programs.

If the ground water standards established under provisions of Section 192.32(a)(2) are exceeded at any licensed site, a corrective action program as specified in 264.100 of this chapter shall be put into operation as soon as is practicable, and in no event later than eighteen (18) months after a finding of exceedance.

[1] The standard applies to design. Monitoring for radon-222 after installation of an appropriately designed cover is not required.

[2] This average shall apply to the entire surface of each disposal area over periods of at least one year, but short compared to 100 years. Radon will come from both uranium byproduct materials and from covering materials. Radon emissions from covering materials should be estimated as part of developing a closure plan for each site. The standard, however, applies only to emissions from uranium byproduct materials to the atmosphere.

§ 192.34 Effective date.

Subpart D shall be effective December 6, 1983.

TABLE A

	pCi/liter
Combined radium 226 and radium 228	5
Gross alpha-particle activity (excluding radon and uranium)	15

Subpart E—Standards for Management of Thorium Byproduct Materials Pursuant to Section 84 of the Atomic Energy Act of 1954, as Amended

§ 192.40 Applicability.

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§ 192.41 Provisions.

The provisions of Subpart D of this part, including §§ 192.31, 192.32, and 192.33, shall apply to thorium byproduct material and:

(a) Provisions applicable to the element uranium shall also apply to the element thorium;

(b) Provisions applicable to radon-222 shall also apply to radon-220; and

(c) Provisions applicable to radium-226 shall also apply to radium-228.

(d) Operations covered under § 192.32(a) shall be conducted in such a manner as to provide reasonable assurance that the annual dose equivalent does not exceed 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public as a result of exposures to the planned discharge of radioactive materials, radon-220 and its daughters excepted, to the general environment.

§ 192.42 Substitute provisions.

The regulatory agency may, with the concurrence of EPA, substitute for any provisions of § 192.41 of this subpart alternative provisions it deems more practical that will provide at least an equivalent level of protection for human health and the environment.

§ 192.43 Effective date.

Subpart E shall be effective December 6, 1983.

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ENCLOSURE D

(Staff Analyses of Public Notice)

(Appendices A & B not included)

URANIUM MILL TAILINGS REGULATIONS; CONFORMING NRC REQUIREMENTS TO EPA STANDARDS

STAFF ANALYSIS OF PUBLIC COMMENTS ON PROPOSED RULE CHANGES TO 10 CFR PART 40

Division of Waste
Management
NMSS
April 1985

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1. INTRODUCTION AND SUMMARY

On Monday, November 26, 1984, proposed changes to 10 CFR Part 40 were published in the Federal Register for public comment (49 FR 46418). See Appendix A. The comment period originally expired on January 10, 1985 but was extended until February 10, 1985 (50 FR 2293, January 16, 1985).

Twenty-four commenters responded with 26 sets of comments (see Section 2). Copies of the responses are included in Appendix B. Six environmental groups, seven states, two Federal agencies, seven industry representatives, one pro-energy (i.e., pro-nuclear) group and one individual responded. One environmental comment provided references only and two industry comments were endorsements of other industry comments only.

The proposed rule changes were intended to conform existing NRC regulations for uranium and thorium mill tailings to regulations published by the Environmental Protection Agency (EPA). The action was taken to comply with the legislative mandate set out in the Uranium Mill Tailings Radiation Control Act (UMTRCA) and NRC authorization Acts. The EPA standards are contained in Subparts D and E of 40 CFR Part 192 (49 FR 45926; October 7, 1983).

Comments were offered on both general issues and the specific changes in the proposed rule notice and reflected diverse views.

The general issues addressed the Commission Authority and Responsibility Statement, procedural and jurisdictional issues, the scope of the rulemaking, the validity and merits of the EPA standard, and other miscellaneous topics.

Commenters on the Commission Authority and Responsibility Statement were divided. The environmental groups (ECNP, Sierra Club, EPI, and EDF) and EPA disagreed with all or part of the statement. Industry advocated an alternate approach relying on general agency roles. One state (WA) supported the flexibility in the Statement.

Procedural and jurisdictional issues raised included industry challenging any conforming action to an EPA standard that is improper on jurisdictional grounds and delaying conforming action until the Tenth Circuit cases are settled (ECNP and AMC). The Sierra Club, EPI, and EPA challenged the legality of not meeting the six month date to conform and conforming in two steps.

Comments on the scope of the first step rulemaking included general views that NRC should undertake completely new rulemaking and a number of specific additional changes. One environmental group (ENCP) and industry (AMC and Kerr-McGee) urged NRC to undertake new rulemaking to replace both EPA and NRC rules. Additional conforming changes suggested included tailings cover specifications, reliance on active maintenance, and changes based on the earlier suspension of portions of Appendix A and initial staff recommendations to the Commission. All categories of commenters suggested additional changes to 10 CFR 40, Appendix A not related to conforming to the EPA standard.

Virtually all categories of commenters expressed dissatisfaction with the EPA standards in 40 CFR 192 as either too lax or too stringent.

A number of other miscellaneous topics were raised including Agreement State implementation of the alternatives provision which tracks the language in Section 84c of the AEA.

Comments on the addition of the flexibility provisions of Section 84c of the Atomic Energy Act (AEA) to the Introduction generally did not take issue with the addition itself since it paraphrased the law. States and environmental groups expressed concerns about implementation. Some of the industry commenters favored extensive supplemental rulemaking to reduce the burden on licensees to develop alternatives.

Comments on proposed changes to Criterion 1 on the time frame for protection reflected confusion on goals or objectives versus requirements and disagreement on what the times and reliance on active maintenance should be. State and environmental comments urged times greater than the 1,000-year EPA design standard on cover longevity and no reliance on maintenance. Industry favored a 200-year goal and reliance on maintenance.

Comments on the proposed change in Criterion 4 to replace "maximum possible flood" with "Probable Maximum Flood" reflected divergent views on the appropriate design flood to be used in analyses. Environmental commenters favored maximum conservatism and industry advocated less conservative assumptions than either the existing or proposed language.

Proposed changes to Criteria 1, 3, and 5 were all intended to reflect that the EPA standard starts from a premise that no seepage from new or expanded impoundments or degradation of groundwater are allowed and that all groundwater is to be protected regardless of quality or use category. Industry strongly opposed protecting non-usable groundwater, recommended deferring all ground-water changes, and argued that the EPA ground-water standards are invalid because they fail the Congressional test of comparability to standards for wastes of similar hazard (for example, mining wastes). EPA commented that more distinction between existing and new sites is needed.

Commenters objected to incorporation of the EPA longevity and radon design standards into Criterion 6 in general and opposed specific aspects of the proposed changes. Many of the arguments were directed against the EPA standard as being too lax to adequately protect health and the environment or more stringent than warranted by the risks. Several commenters urged NRC to keep its more restrictive radon limit and 3-meter minimum cover. Industry opposed including any EPA standards for thorium byproduct material.

Several state and environmental commenters objected to the incorporation of the EPA footnote qualifying the longevity and radon standard as a design standard not requiring confirmatory monitoring. Averaging provisions and disregard of the radon from cover materials were also of concern on Criterion 6 changes.

Commenters questioned implementation aspects of the Criterion 8 change to add the as low as practicable goals for radon releases during operations. One commenter argued for the current terminology reflected in 10 CFR Part 20 for keeping releases as low as reasonably achievable (ALARA) as the true EPA intent.

After consideration of the comments, staff concluded that the basic two-step rulemaking approach is still feasible and advisable. The major differences between the proposed rule and the final rule recommended by staff are:

(1) Addition of an insert to the Introduction requiring consideration of risks and costs in site specific licensing decisions;

(2) Addition of an insert to Criterion 5 clarifying the applicability of 40 CFR 192;

(3) Clarification of the general goal of permanent isolation of tailings in Criterion 1;

(4) Clarification in Criterion 6 that the radon flux limits are to be met for the effective design life of the reclaimed impoundment;

(5) Clarification in Criterion 8 that doses from radon emissions are to be as low as is "reasonably achievable" rather than as is "practicable"; and

(6) Addition of changes to 10 CFR 150 to clarify Agreement State options to adopt alternatives under Section 274o of the AEA.

Other minor clarifying and editorial changes are also recommended.

2. LIST OF COMMENTERS

Docket No.	Commenter	Abbreviation
1.	Ecology/Alert	None
2.	Environmental Coalition on Nuclear Power	ECNP
3.	Sierra Club	None
4.	Environmental Policy Institute	EPI
5.	Environmental Defense Fund	EDF
6.	Attorney General State of Illinois	IL
7.	Colorado Department of Health	CO
8.	Marvin Lewis	None
9.	U.S. Department of the Interior	DOI
10.	U.S. Environmental Protection Agency	EPA
11.	Texas Department of Health	TX
12.	Utah Department of Health	UT
13.	Washington Department of Social and Health Services	WA
14.	New Mexico Environmental Improvement Division	NM
15.	Environmental Defense Fund (see 5 also)	EDF
16.	Piedmont Environmental Council	PEC
17.	Western Nuclear, Inc.	WNI
18.	Kerr-McGee Corporation; Kerr-McGee Chemical Corporation and Quivira Mining Company	Kerr-McGee
19.	American Mining Congress	AMC
20.	Environmental Policy Institute (see 4 also)	EPI
21.	Homestake Mining Company	HMC
22.	Umetco Minerals Corporation	UMC
23.	Wyoming Department of Environmental Quality	WY
24.	Access to Energy	AE
25.	Dawn Mining Company	Dawn
26.	Parsons, Behle & Latimer for Rio Algom Corporation	Rio Algom

Copies of the comments received are reproduced in docket number order in Appendix B. The commenters fall into the following categories:

Environmental

Ecology/Alert

ECNP

Sierra Club

EPI

EDF

PEC

Total 6

Industrial

WNI

Kerr-McGee

AMC

HMC

UMC

Dawn

Rio Algom

Total 7

State

IL

CO

TX

UT

WA

NM

WY

Total 7

Proenergy

Access to Energy

Individuals

Marvin Lewis

Federal Agencies

DOI

EPA

Total 2

3. GENERAL ISSUES

a. Commission Authority and Responsibility Statement

The notice included a statement on "Commission Authority and Responsibility." The statement summarized the Commission's policy on the exercise of its responsibility and authority for mill tailings, including the authority to approve site specific alternatives proposed by licensees under Section 84c of the Atomic Energy Act.

Commenters were divided on this issue. The environmental groups (ECNP, Sierra Club, EPI, and EDF) and EPA disagreed with all or part of the statement. Industry (AMC and supporters) advocated an alternate approach. One State (WA) supported the statement.

ECNP strongly opposed the statement asserting that NRC is proposing to essentially deregulate mill tailings disposal on a site specific basis. The Sierra Club disagreed with the view that Section 84c gives NRC authority to approve alternatives to "any or all environmental standards" and expressed the view that Section 84c only provides for approval of alternatives to NRC rules. The Sierra Club also objected to NRC's intent to ignore the explicit concurrence provisions contained in EPA's standard. EPI disagreed with the statement and argued that Section 84c "is not a new grant of authority for the Commission to alter its health and safety or environmental protection requirements nor to alter its enforcement of the EPA standards." EPI also suggested that the policy statement inferred that EPA concurrence under Sections 84(a)(3) or 275 is precluded. In summary, EPI's view is that 84c flexibility applies only to alternate engineering and technical specifications to those in NRC rules. EPI argued that Agreement States can adopt alternate standards, not NRC, and that NRC's site specific approach is an attempt to circumvent the required finding on equivalency or more stringency in Section 84c. EDF also disagreed that Section 84c grants NRC authority to consider alternatives to the EPA standards. EDF argued that the language of the statute and the legislative history support its position. The legislative history cited included EPA's role to issue general environmental standards and NRC's role to implement them as described in Section 84(a) of the AEA.

EPA also disagreed with NRC's interpretation of Section 84c. EPA stated "Section 84c does not confer on NRC authority to approve or employ alternative standards or to substitute its judgment for EPA's regarding the level of protection necessary to protect public health and the environment. Rather it authorizes NRC to approve or employ licensee-proposed alternatives to NRC's own general implementing requirements . . ." Further, EPA argued that its standard that requires EPA approval of site specific alternative concentration limits is within its authority, not NRC's under Section 84c. In EPA's view, NRC must also establish specific requirements before it can consider alternatives to them.

WA supported the need for NRC and Agreement States to review and approve site specific alternatives to standards without EPA concurrence.

AMC and its supporters asserted that NRC is trying to avoid the jurisdictional issue by relying on Section 84c. The AMC advocated an entirely different approach as discussed in the following sections on Procedural and Jurisdictional Issues and Scope of Rulemaking. In AMC's view, reliance on the basic requirements of UMTRCA with respect to the jurisdiction of the agencies would be a stronger legal position and eliminate the need to rely on Section 84c.

Response:

A detailed legal analysis of the merits of the EPA objections to the Statement and of AMC's jurisdictional arguments is contained in SECY-85-125 dated April 10, 1985. The Commission asked the Office of the General Counsel (OGC) to prepare this information paper. The paper includes an independent review of the legislative history surrounding this issue. The response to this issue and the AMC jurisdictional arguments in the following section (b. Procedural and jurisdictional issues) are summarized from SECY-85-125.

OGC concluded that the Commission is authorized under section 84c of the AEA to grant exemptions from EPA's standards without obtaining EPA's concurrence. The basis for this conclusion covers four points. First is the belief that "specific Commission requirements" can be deemed adopted without a rulemaking proceeding. Section 84a(2) requires the Commission to ensure that

tailings are managed in conformance with EPA"s standards. Section 84a.(2) creates a statutory obligation by the Commission to enforce EPA's standards independent of whether the Commission adopts regulations which would clarify how the Commission would enforce those standards.

Second, section 84c explicitly sta es that the NRC may approve alternatives which, to the extent practicable, would achieve safety levels equivalent to those which would be achieved by compliance with NRC's requirements and EPA's standards. Thus, the NRC is authorized to approve an alternative which does not provide the same level of protection of public health, safety and the environment which would be achieved if EPA's standards

were complied with fully. Third, UMTRCA does not use the phrase "implementing requirements." Section 84c refers to only "specific requirements adopted and enforced by the Commission." This phrase is clearly intended to include all requirements adopted by the Commission to regulate mill tailings. The source of the adopted requirements is immaterial to the statutory scheme and may include EPA's detailed standards. Finally, EPA's comment does not effectively respond to the Commission's argument that EPA site specific concurrence in exemptions contradicts the prohibition on EPA's issuance of a permit in section 275b.(2) of the AEA.

Comments questioning NRC's motives or intent are offset by the findings required of the Commission in section 84c in order to exercise the flexibility to approve alternatives. Assertion of legal right does not equate to an intent to abuse a right.

As indicated in the next section, OGC believes that EPA generally has acted within its jurisdiction to set generally applicable environmental standards which include generic onsite implementation provisions. Thus the AMC view is rejected.

b. Procedural and jurisdictional issues.

Procedural and jurisdictional issues raised included challenging any conforming action to the EPA standard on jurisdictional grounds, delaying

action until court suits are settled, other references to pending proceedings, objecting to NRC failure to meet the six-month congressional timeframe for conforming, and questioning the two step process.

The AMC presented extensive legal arguments on the EPA/NRC jurisdictional issue. HMC, UMC, and Rio Algom supported the AMC comments in all respects. The AMC comments focused on the following legal points:

- Since its ratification of Reorganization Plan No. 3 of 1970, consistent Congressional policy has been to limit EPA standard setting authority for NRC licensed facilities to "generally applicable standards," meaning standards that are applicable outside site boundaries and that impose no site specific design, engineering or management requirements.

- Congress, in the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), adopted the division of jurisdiction beween EPA and NRC first established in the 1970 Reorganization Plan.

- EPA's standards are not "generally applicable standards" and are therefore beyond the jurisdiction of EPA. Consequently, the EPA standards are a "mere nullity" of no legal force or effect and NRC is not legally bound to conform to the standards.

Response:

The staff considered the AMC arguments and concluded the arguments are fundamentally AMC's brief in the Tenth Circuit suit challenging the legality of the EPA standard. NRC is not a party or participant in the Tenth Circuit proceeding. If EPA is sustained, the arguments are immaterial. If AMC is sustained, then NRC will be required to conduct additional rulemaking. Staff does not agree that the arguments are sufficient grounds for NRC not to conform absent resolution in court and has proceeded with this analysis.

As noted earlier, OGC concluded that EPA generally acted within its jurisdiction and found the AMC arguments flawed. OGC examined UMTRCA and its legislative history and summarized its findings as follows:

1. Before UMTRCA, EPA, not NRC, had primary authority over both the radiological and non-radiological impacts from uranium mill tailings;

2. During Congressional deliberations over UMTRCA, NRC attempted to reduce substantially EPA's authority over radiological hazards of mill tailings by limiting it to EPA's "traditional" authority under Reorganization Plan No. 3, i.e., authority to promulgate only generally applicable, non-site specific radiological standards, applicable only outside the boundaries of the tailings sites;

3. EPA opposed the NRC's attempt to transfer to itself EPA's authority to regulate mill tailings. EPA's efforts were partially successful and resulted in a Congressional compromise which precluded EPA from promulgating site specific standards but which did not restrict EPA to standards applicable only outside site boundaries. EPA was also given concurrence authority over NRC regulations for controlling non-radiological hazards.

4. Except for one instance, EPA acted within its jurisdiction under UMTRCA in setting environmental standards for managing radioactive emissions and hazardous chemical wastes from uranium mill tailings; and

5. EPA exceeded its jurisdiction by stating that its concurrence would be required before the NRC could grant site specific case-by-case exemptions from NRC regulations for implementing EPA's standards. We believe that such a concurrence role by EPA also contradicts the 1983 amendment to UMTRCA which added Section 84c to the Atomic Energy Act.

The Sierra Club, EPI, and EPA commented on the legality of not meeting the 6 month Congressional mandate to conform by April 1, 1984 and conforming in two steps. The Sierra Club, EPI and EPA asserted that NRC's action is illegal and does not meet the explicit intent of UMTRCA. The Sierra Club also inferred that a four year rulemaking on ground-water delays compliance with EPA's ground water

requirements. EPI argued that NRC had ample warning, time, and regulatory base to fully comply in 6 months for both groundwater and non-groundwater aspects. As a minimum, EPI argued that interim rules to conform should have been published. EPI objected to NRC's position that conforming to EPA's ground-water standards should be combined with developing a rule that fully meets the mandate in Section 84(a)(3) to have general requirements that are comparable to EPA's requirements for similar materials regulated under the Solid Waste Disposal Act. EPA argued that the EPA standards in 40 CFR 192 already meet this requirement to be comparable and even if they did not, NRC should conform tu the ground-water standards in 40 CFR 192 immediately. EPA stated that NRC should conform quickly to all of the 40 CFR 192 standards, including groundwater, in the first rulemaking. EPA argued that the same nondiscretionary approach should be used and that the second rulemaking can fulfill the requirements of Section 84(a)(3).

Response:

The decisions regarding whether and how NRC should conform to the EPA standards involved complex legal, jurisdictional, and policy issues. The Commission carefully considered the implications of several alternatives and its authority and responsibilities before deciding on the course of action evidenced by the notices of proposed rulemaking and advance notice of proposed rulemaking.

The commenters are correct that Congress intended conformance to be sufficiently straightforward to be completed in 6 months and so stated in the legislation. However, the legislation did not anticipate the complex nature of the EPA standard or the direct effectiveness on licensees beginning December 6, 1983. Congress also did not impose any penalty if NRC failed to meet the 6 months as it did with the loss of authority if EPA failed to meet its October 1, 1983 date.

No health and safety or environmental impacts have resulted or will result from delay or lack of interim rules since staff believes that NRC and the States are required to implement and enforce the EPA standards under Section 275d of the Atomic Energy Act in the interim until final conforming regulations are in

place. NRC has so informed its licensees and Agreement States and is implementing the standard.

The scope and timing of the second step rulemaking is still under consideration. Comments on the ANPRM are being analyzed. A simple rule change to incorporate the specific ground-water protection provisions of 40 CFR 192 is one option being considered. However, such a change in scope to the present action would probably require a reproposal to allow public comment and would delay removing conflicts and inconsistencies. Thus staff rejects EPA's comment. The insert developed for Criterion 5 dealing with 40 CFR 192 ground-water protection will clarify the situation in the interim.

The ECNP incorporated by reference the full records of the NRC's Consolidated Reactor Proceeding and Three Mile Island, Unit 2, Operating License Proceeding. The ECNP's focus is on radon risk issues in the proceedings. They also incorporated a number of documents related to their suit against the EPA standard. CO noted that the State is a party to litigation on the EPA standards in the U.S. Court of Appeals for the Tenth Circuit. Kerr McGee acknowledged the pending Tenth Circuit litigation against the NRC rules in one case and against the EPA standards in a second. AMC also provided documents related to the Tenth Circuit suit against the EPA standard and made frequent reference to issues in that proceeding.

Response:

Other than showing the active legal climate surrounding both NRC and EPA rules and the general dissatisfaction in many sectors, these references have no bearing on the conforming action at hand. In the absence of specific citations to matter in these voluminous referenced documents, the NRC has no obligation to comb through them for material arguably germane to this rulemaking proceeding.

The ECNP and AMC and its supporters urged that NRC delay action until the legal challenges to the EPA standard in the Tenth Circuit are settled. AE urged NRC not to conform to the EPA standard until it is revised to address "the genuine hazards posed by radon."

Response:

Since timetables for court action are highly uncertain and because the EPA standards are being implemented and enforced, staff sees no reason to delay conformance by rule. Obviously, if court action sets aside all or part of NRC's or EPA's rules, additional rule changes will be required. The Commission believes the EPA rules would have to present a clear and real threat to public health and safety for NRC to unilaterally set them aside. Environmental arguments are based on hypothetical effects and industry arguments on jurisdiction, costs, and practicality. None of the comments suggested a threat to health and safety in implementing the EPA rules or going forward with the conforming rule changes.

c. Scope of Rulemaking

Commenters offered a wide range of views on the scope of the rulemaking.

Several commenters (e.g., EPA) objected to the two step approach. Reasons cited included legal ones surrounding the Congressional mandate as discussed in the preceeding section (EPA, EPI, and the Sierra Club) and licensee/applicant confusion in the interim (NM).

ECNP, Kerr-McGee, and AMC urged NRC to undertake independent new rulemaking. ECNP advocated more restrictive rules using the EPA standard as a minimum baseline on radon control and issue regulations that "fully protect the public for the duration of these wastes". ECNP advocated complete revision of 10 CFR Part 40, Appendix A, as issued in October, 1980 to provide more protection from radon and referenced the Consolidated Radon proceedings for details on deficiencies. The AMC argued that NRC must undertake a completely new independent rulemaking to replace both the EPA and NRC rules because EPA's standards are not adequately supported by analysis relating costs and risks and are outside EPA's jurisdiction and therefore null and void and because NRC has provided no analysis establishing that Appendix A of Part 40 requirements are reasonably related in terms of cost, risks, and benefits. AMC advocated a scope and approach for the new rulemaking in which NRC would (1) focus on stabilization of tailings for a reasonable period of time instead of focusing

on radon emissions, (2) assure, after public comment, that the costs of requirements are reasonably related to risks, and (3) provide for explicit distinctions between existing and new sites and allow maximum site specific flexibility. Kerr-McGee expressed similar views on the need and basis for NRC action. A key point in the AMC and Kerr-McGee arguments against Appendix A was the 1983 Pub.L. 97-415 addition to Section 84a(1) of the AEA on risk and costs. The addition began with the word "taking" in revised Section 84 a(1):

> "a. The Commission shall insure that the management of any byproduct material, as defined in section 11e.(2), is carried out in such manner as -
>
> (1) The Commission deems appropriate to protect the public health and safety and the environment from radiological and nonradiological hazards associated with the processing and with the possession and transfer of such material taking into account the risk to the public health, safety, and the environment, with due consideration of the economic costs and such other factors as the Commission determines to be appropriate." (Emphasis supplied).

The industry arguments imply that this addition mandates a total reconsideration and revision of NRC rules. Industry also noted the depressed economic state of the industry and early stabilization plans that have resulted since the 1980 rule.

The industry arguments on site specific flexibility and existing site distinctions were based on Section 84c and legislative history.

Response:

EPA developed and issued the standards in 40 CFR 192 under the following authority and mandate in Section 275b(1) of the AEA:

> "b. (1) As soon as practicable, but not later than October 31, 1982, the Administrator shall, by rule, propose and within 11 months thereafter

promulgate in final form, standards, general application for the protection of the public health, safety, and the environment from radiological and non-radiological hazards associated with the processing and with the possession, transfer, and disposal of byproduct material, as defined in section 11e.(2) of this Act, at sites at which ores are processed primarily for their source material content or which are used for the disposal of such byproduct material.

. . .

In establishing such standards, the Administrator shall consider the risk to the public health, safety, and the environment, the environmental and economic costs of applying such standards, and such other factors as the Administrator determines to be appropriate."

NRC is conducting the present action under the mandate in Section 275f(3) of the AEA:

"(3) Not later than 6 months after the date on which the Administrator promulgates final standards pursuant to subsection b. of this section, the Commission shall, after notice and opportunity for public comment, amend the October 3 regulations, and adopt such modifications, as the Commission deems necessary to conform to such final standards of the Administrator."

Two points are clear in Section 275. One is EPA was explicitly charged to consider risk and economic costs. The second is that no mention of an independent risk/economic cost finding is explicitly required of NRC in conforming. EPA has the lead responsibility and staff believes it must assume that EPA met the mandate. Staff notes that AMC's arguments on risk are directed primarily at the EPA standard and seem to reflect its legal brief for the Tenth Circuit.

NRC's obligation to consider risk and economic costs was added to Section 84a(1) as noted earlier. Section 84a(1)requires NRC to insure that the management of the radiological and nonradiological hazards from tailings protects the public and environment. Staff views the mandate in 84a(1) to cover all aspects of implementing the EPA standard and Appendix A. The mandate should impact all site specific licensing decisions including routine actions, 84c alternative requests, and alternate concentration limit decisions. Staff

believes that it can fulfill this mandate without further rulemaking to make Appendix A either more or less restrictive. Staff also believes that the Congressional intent for site specific flexibility and distinction between existing and new sites can be met in site specific licensing decisions based on 84a(1) and Section 84c. Consequently, Section 84a(1) should also be emphasized in Appendix A to make it clear that the NRC will in fact consider risks and economic costs and site specific needs in general. An insert to the Introduction following the proposed insert on Section 84c would explicitly emphasize this point.

Other factors relating to the staff position include the general ALARA mandate applicable to all exposures and releases and industry failure to demonstrate that generic relief is appropriate or needed. Flexibility to consider site specific practical problems is the whole thrust of Section 84c. Rulemaking tailored to the problems at one or two sites is a counterproductive use of time and resources. Industry comments on the depressed state of the industry are valid and licensees are faced with early reclamation. However, staff believes that this situation only emphasizes the site specific decisions needed and does not support the need for generic rulemaking. Early reclamation will impact practicable aspects and cost considerations but on a site specific basis.

The insert recommended below paraphrases Section 84a(1) and clarifies that implementation of "practicable" will be consistent with the intent of Section 84a(1) and current Commission policy in 10 CFR 20.1(c). The second sentence paraphrases the meaning of ALARA in 10 CFR 20.1(c).

NM indicated that decisions on licensee's reclamation plans are impacted by the two-step approach since it postpones having "definitive Federal standards." Licensees don't know "to what standards the plan is required to conform."

Response:

Staff is sympathetic with the appearance of regulatory uncertainty caused by the two-step rulemaking. However, when the first step is completed, all conflicts will have been removed (e.g., 2 versus 20 picocurie flux limits) and

decisions on groundwater can be made based on the basic nondiscretionary provisions of 40 CFR 192 since it applies directly to New Mexico licensees whether or not the State has conformed to NRC's rules or the EPA standard.

TX noted that "point of compliance" was not included in the proposed changes and asked if this was intentional.

Response:

Yes. "Point of compliance" is a concept in the EPA ground-water protection standards and is therefore beyond the intended scope of this rulemaking. The insert to Criterion 5 should help clarify this point.

Commenters advocating specific suggestions to expand the scope of the proposed rulemaking generally fell into three categories-those advocating: (1) additional changes needed to conform to the EPA standards, (2) additional changes that would make 10 CFR Part 40 more explicit or more protective of public health, safety, and environment but that are not directly related to conforming to the EPA standards, and (3) additional changes that would make Part 40 less restrictive or conform to the collective intent of Congress expressed in various legislation and hearing records rather than the EPA standards. Comments in the first category will be responded to. Comments in the latter two categories will be considered along with comments received on the accompanying ANPRM. However, they will be summarized in this section. The overall flavor of the comments expressed a general dissatisfaction with both NRC's and EPA's regulations for a wide range of reasons.

EDF, EPA, and industry suggested additional changes that should be made to conform to the non-groundwater provisions of the EPA standard. EDF commented that the Commission should require that design calculations for covers incorporate a design margin to explicitly account for changes in moisture content and porosity, external erosional forces, and internal chemical reactions. Such requirements are needed to meet the reasonable assurance provision of the EPA radon and longevity standard over the long term. EDF presented technical arguments on the critical role played by cover moisture, the merits of multi-layered covers, and concern for salt migration from tailings to the cover. EPA

also suggested considering additional cover specifications but did not identify any specific topics.

Response:

Staff generally agrees that the type of factors that EDF identified are important to consider in evaluating expected cover performance. In fact, the staff uses the computer code for multi-layers referenced by EDF in its calculations. However, such factors are very site specific and represent a level of detail that NRC normally relegates to guidance or procedural documents. It is also difficult to speculate on the number and importance of all factors which might impact design at a specific site. The design margin recommended by EDF is essentially applied in the staff's use of conservative material parameters in the site specific evaluation of the design of soil and rock covers.

EDF also urged that an active monitoring program for tailings cover stability be added to the Commission's rules. The EDF recommended program would last for decades until the cover has demonstrated its stability or remedial action has been taken and the remedial action's effectiveness affirmed.

Response:

Criterion 12 of the Commission's rules has a minimum requirement for annual inspections by the custodial government agency to confirm the integrity of stabilization and the need for any maintenance. Criterion 12 also has an option for more frequent inspections. Any monitoring needed prior to transfer to the government agency can be included on a site specific basis in the reclamation plans.

Industry comments (WNI, AMC, UMC) that reliance on active maintenance should be allowed are addressed under Modification 2(a) changes to Criterion 1.

WNI and AMC recommended a number of changes based on the Commission's earlier suspension action and changes originally proposed by staff in SECY-83-523. The recommended changes and rationale for action were essentially the same as presented in the suspension notices and SECY-83-523. Little or

no new information was provided. Examples include deletion of below grade or equivalent as the prime option in Criterion 3, deletion of prescriptive requirements in Criterion 4, and deletion of radium content restrictions on cover materials in Criterion 6. Kerr-McGee also recommended deletion of the radium content requirement.

Response:

Since the additional conforming changes suggested by WNI, AMC, and Kerr-McGee suggested offered no new bases not already considered and rejected and no substantive supporting information on why they are needed on a generic basis versus site specific treatment, they are rejected for the first step rulemaking. A wider scope of changes was considered by the Commission and rejected before publication of the proposed rule, on the ground that, requirements established through extensive rulemaking cannot be set aside merely because they may not be required. The intent of this action is nondiscretionary conforming changes to eliminate conflicts and inconsistencies, add imposed standards or Congressional direction, or make minor editorial or clarifying changes. Industry comments were mainly statements or claims based on "may not be required" and would require extensive new rulemaking and are thus considered outside the scope of the present action.

A number of comments proposed specific or general changes that are not directly related to conforming to the EPA standard but would make Appendix A more explicit or protective. The following discussion summarizes these comments.

Ecology/Alert suggested using 5 ton rock slabs as cover material. EDF urged the Commission to adopt specific requirements on when final stabilization must take place, on interim stabilization for closed mills, on addition of fluids during closure, on use of dust suppressants during closure, and on phased closure during operations. EDF also advocated mandatory state-of-the-art waste treatment and operations as reflected in conceptual proposals prepared for potential development of mining and milling in Virginia. Lewis stated that numerical criteria in Criterion 5 would make the stronger groundwater protection requirement more enforceable. DOI suggested amplification of

the requirements in Criterion 12 for the custodial government agency's monitoring programs. DOI suggested adding provisions on maintaining ground-water sampling wells and on how long inspection and monitoring would continue.

WY suggested that cleanup standards for adjacent lands be developed to define when they can be released for unrestricted use. WY questioned whether the one-year baseline in Criterion 7 is adequate, suggested clarifying "unrestricted areas" in Criterion 8A, questioned the compatibility of Criterion 9 with self bonding in Wyoming, and expressed misgivings on the Criterion 11C provision on not aquiring all subsurface rights.

Industry commenters viewed the proposed conforming rulemaking as an opportunity to reiterate objections to any or all parts of Appendix A and advocate less restrictive provisions. Many issues identified in lawsuits and petitions for rulemaking were repeated. WNI and AMC proposed changes to Criterion 8 on checking parameters to control yellowcake emission to allow reliance on alarms. WNI and AMC objected to the Criterion 8A 10-day reporting requirement and "qualified engineer or scientist" inspector requirement. AMC advocated checks only when tailings are being added. Changes to Criterion 9 to reduce the licensee's liability and amount of financial assurances were also proposed by WNI. Self-insurance was advocated for Criterion 9 by AMC and WNI. WNI urged flexibility in the minimum long term care charge, no inflation adjustments, and reliance on state funds for comparable purposes in Criterion 10. AMC expressed similar views on relying on state funds. Kerr-McGee comments reflected a similar position on Criteria 8, 9, and 10. AMC argued against the 1% real interest rate in Criterion 10. AMC supporters (HMC, UMC, and Rio Algom) by reference support AMC's position in all respects.

Kerr-McGee and AMC proposed specific additional changes not related to conforming but mandated in their view by legislation enacted and other events subsequent to promulgation of Appendix A. The basis is essentially the same as noted above in the discussion under Scope of Rulemaking on their generic recommendation to undertake an independent new rulemaking. Kerr-McGee argued that Criterion 3 should be modified or deleted so that existing sites do not have to consider below grade disposal. Kerr-McGee argued that rock covering to meet the specifications in Criterion 4 is impractical in parts of the

Southwest because the rock would have to be imported and the alternative vegetative cover is also impractical. Similarly the gentle slope requirements in Criterion 4 are not practicable at all existing sites because of soil supply and land ownership and should be deleted in Kerr-McGee's view. Application of the siting criteria to existing sites must involve both short and long-term risk and cost balancing and Appendix A does not make this application clear, in fact Criterion 1 contradicts it, according to Kerr-McGee. In effect, Kerr-McGee advocates developing separate rules for mills where operations have ceased and no plans to restart are involved. These separate rules would address all aspects of Appendix A including siting. Kerr-McGee also suggested eliminating the first listed item in Criterion 5 dealing with liners since it might be read to require liners at existing sites. Kerr-McGee and AMC urged deleting the restriction on credit for thin synthetic layers to reduce radon emissions in Criterion 6.

AMC provided extensive additional suggested revisions to Appendix A. The suggested changes would revise Appendix A to follow the approach outlined for NRC to take in a new independent rulemaking as discussed above. Suggested changes included adding site specific optimization for stabilization in the Introduction, distinction between existing and new sites in Criterion 1, provision for cost/benefit judgments in Criterion 1 and planned reliance on maintenance in Criteria 1 and 12. AMC provided rewrites of Criterion 3 to reflect 200-year stabilization and Criterion 5 to reflect its views on risk, costs, site specificity, and existing vs new site distinctions. AMC suggested changes to Criterion 8 to include reliance on institutional controls and deletion of references to controlling radon during operations without regard to risk.

Dawn proposed changes to Criterion 4 dealing with the slope of embankments and covers. Dawn suggested more flexibility, a 5h:1V instead of 10h:1V design basis, and more site specific flexibility.

Recommended Rule Change:

Add the following paragraph at the end of the Introduction:

All site specific licensing decisions based on the criteria in this Appendix or alternatives proposed by licensees or applicants will take into account the risk to the public health and safety and the environment with due consideration to the economic costs involved and any other factors the Commission determines to be appropriate. In implementing this Appendix, the Commission will consider "practicable" and "reasonably achievable" as equivalent terms. Decisions involving these terms will take into account the state of technology, and the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to the utilization of atomic energy in the public interest.

d. Comments on 40 CFR 192

Commenters offered a number of comments on the validity and merits of the EPA standard. The majority reflected dissatisfaction. The dissatisfaction was reflected in general comments, references to proceedings, and in arguments on many of the general issues and specific proposed changes. Commenters represented virtually all categories of commenters.

Ecology/Alert applauded the EPA approach of protecting all qualities of groundwater from contamination. UT challenged the technical base for the radon limits for thorium byproduct material and urged NRC not to adopt them [see modification 6(d)] and EPA to change them. ECNP expressed the view that EPA failed to meet "its statutory responsibilities" in issuing 40 CFR 192. IL challenged the legality of EPA issuing a 1000-year engineering design standard.

Kerr-McGee made repeated references to its position that the EPA standards are invalid and fail to meet the risk/economic cost test. AMC's similar position was addressed in the two previous sections. AE challenged the radon hazard basis for the EPA standard as inadequate when balanced against indoor radon levels from energy conservation.

Response:

As noted in the accompanying ANPRM (49 FR 46427), the Commission must focus on choices and decisions it must make on actions within its discretion. Until or unless court action sets aside the EPA standards, they are binding on NRC and Agreement State licensees. NRC licensees are faced with two sets of effective regulations that contain conflicting or inconsistent requirements. Under law, NRC must implement and enforce both.

As implied by the Commission Authority and Responsibility statement, the only provision of the EPA standard the Commission does not plan to implement and enforce is the provision in 40 CFR 192.32(a)(2)(iv) requiring EPA concurrence on site specific decisions. The staff believes that removing conflicts and inconsistencies in the two sets of regulations and using site specific alternative authority to deal with occasional site specific problems represent the best way to deal with these conflicts and inconsistencies and meet the minimum requirements of the Congressional mandates.

In view of the above, comments on the lawfulness, merits, and value of the EPA standards were considered outside the scope of this action and were not a factor in recommending a final rule.

e. Other

Other general issues raised by the commenters included views that NRC should be more stringent than the EPA radon emission and longevity standards, Agreement State implementation, and editorial suggestions.

The ECNP urged conservative independent action by NRC to keep and expand its more stringent requirements on radon emissions and longevity. In ECNP's view, more stringent requirements would provide absolute assurance that the EPA standards would be met and provide greater public protection over longer periods of time.

Response:

The staff agrees that it must have reasonable assurance that the EPA standards will be met but does not agree that highly conservative regulations are needed to provide such assurance. Case specific reviews are the proper mechanism for such findings. For the non-groundwater provisions of the EPA standards under consideration in this action, EPA carefully and thoroughly re-examined the NRC record and considered NRC and other comments and later technical and risks information. The staff therefore has no basis to set aside the EPA conclusions on these aspects of the standard. Licensees should benefit from this re-examination.

The State Of New Mexico, an Agreement State, raised questions about Agreement State implementation. NM questioned how the process of dealing with alternatives using the type of flexibility afforded by Section 84c of the AEA would work in Agreement States. Specifically, NM asked whether NRC must concur in Agreement State decisions on proposed alternatives and whether the status of the State's adoption of regulations equivalent to or more stringent than 10 CFR Part 40 Appendix A affects the process. NM also suggested that a cross-reference to 10 CFR 150.31(b) in Appendix A might clarify Appendix A's applicability to Agreement States.

Response:

Section 19 of Pub.L. 97-415, the NRC Authorization Act for fiscal years 1982 and 1983, added the following option to Section 274o of the AEA for Agreement States:

> "In adopting requirements pursuant to paragraph (2) of this subsection with respect to sites at which ores are processed primarily for their source material content or which are used for the disposal of byproduct material as defined in section 11e.(2), the State may adopt alternatives (including, where appropriate, site-specific alternatives) to the requirements adopted and enforced by the Commission for the same purpose if, after notice and opportunity for public hearing, the Commission determines that such alternatives will achieve a level of stabilization and containment

of the sites concerned, and a level of protection for public health, safety and the environment from radiological and nonradiological hazards associated with such sites, which is equivalent to, to the extent practicable, or more stringent than the level which would be achieved by standards and requirements adopted and enforced by the Commission for the same purpose and any final standards promulgated by the Administrator of the Environmental Protection Agency in accordance with section 275. Such alternative State requirements may take into account local or regional conditions, including geology, topography, hydrology and meteorology."

The text clearly states that the Commission must determine that alternative standards adopted by the State achieve the required levels of protection. Further the Commission must notice the alternatives and provide an opportunity to request public hearing. This option is available to the State if it is regulating byproduct material without regard to the status of the State's adoption of Appendix A. It gives the state additional flexibility in adopting generic or site specific standards.

The suggestion to add a cross-reference in Appendix A is negated by the explicit provisions of 10 CFR 150.31(b) where requirements are spelled out in context. However, the comment does point out that 10 CFR 150.31 should be amended to add the option quoted above. Including the language in Part 150 is not legally required for the State to exercise the option, but addition would clarify the situation and be consistent with existing Part 150 and the proposed addition to the Introduction of Appendix A on alternatives.

Recommended Rule Change:

Add a new 10 CFR 150.31(d) to read: "In adopting requirements pursuant to paragraph (b)(2) of this section, the State may adopt alternatives (including, where appropriate, site-specific alternatives) to the requirements adopted and enforced by the Commission for the same purpose if, after notice and opportunity for public hearing, the Commission determines that such alternatives will achieve a level of stabilization and containment of the sites concerned, and a

level of protection for public health, safety and the environment from radiological and nonradiological hazards associated with such sites, which is equivalent to, to the extent practicable, or more stringent than the level which would be achieved by standards and requirements adopted and enforced by the Commission for the same purpose and any final standards promulgated by the Administrator of the Environmental Protection Agency in accordance with section 275. Such alternative State requirements may take into account local or regional conditions, including geology, topography, hydrology and meteorology."

Ecology/Alert urged NRC to use plain concise language in all its regulatory writing and provided a sample rewrite of part of Appendix A.

Response:

The Commission agrees with the thrust of this point but preferred and continues to prefer minimum word changes in the conforming process. This minimum change approach helps focus on the changes due to the EPA standard and is the simplest and most efficient.

Several commenters (EPA, WA, NM, TX) offered editorial suggestions and identified typographical and transcription errors.

Response:

Most of the State comments were straightforward and should be adopted. EPA's general editorial comment that the term "site" is not used consistently in Appendix A can be factored into subsequent rulemaking. Staff believes that no problems are presented by the use of "site" in Appenidx A that are significant enough to be addressed in this limited rulemaking.

No comments were received on the Regulatory Flexibility Certification or Paperwork Reduction Act Statement in the notice. No specific comments were received on the NEPA discussion under Impact of the Amendments. However, comments addressed under topics b., c., and d. above address the adequacy of the EPA and NRC basis for action.

4. COMMENTS ON SPECIFIC PROPOSED MODIFICATIONS TO APPENDIX A 10 CFR 40

The proposed rule notice listed the specific modifications and rationale for each change. The list chronologically followed 10 CFR 40, Appendix A. In the following analysis, each of the modifications are addressed and the numbering system from the proposed notice is provided. See the notice in Appendix A of this document for the full text of the proposed changes.

a. Introduction

Modification 1.(a): Typographical error and no comments.

Recommended Rule Change:

Change should be adopted as proposed.

Modification 1.(b): This proposed change deleted an outdated information submittal requirement associated with the 1980 publication of Appendix A.

ECNP objected to this change based on a misunderstanding. ECNP expressed concern that the deletion would mean that detailed information on licensees' programs showing how they meet the criteria in Appendix A would not be required.

Response:

Licensee compliance with Appendix A and the EPA standards is being handled and documented in the routine course of licensing and enforcement activities. A specific or separate submittal is not needed and would represent an unwarranted burden on licensees.

Recommended Rule Change:

Staff sees no reason not to delete the paragraph.

Modification 1.(c): This change would add a paraphrase of the provisions of Section 84c of the Atomic Energy Act. The language provides

applicants and licensees the opportunity to propose alternatives to the specific requirements of Appendix A.

Comments on this proposed change expressed support, opposition, and the need for clarification. ECNP expressed a generic concern over site specific licensing decisions such alternative proposals would involve. The EDF and EPI did not object to the modification itself, but took issue with the interpretation of Section 84c of the AEA that was expressed in the rationale and the Commission Authority and Responsibility statement. (See discussion under general issues.)

CO generally supported the flexibility but expressed hypothetical concern about licensee or applicant abuse. CO suggested that NRC elaborate on the issue by developing rule changes or policy on how NRC determinations on "equivalent to, to the extent practicable" will be made. CO referenced its review and position on an alternative proposal for dried tailings and liquid disposal at Spring Creek Mesa submitted by UMETCO for its Uravan facility. CO determined that the alternative design and proposed operation was not equivalent and that better design was practicable. A copy of the State's detailed licensing review for Uravan was submitted with the State's comments on the accompanying ANPRM. WA supported the flexibility. NM did not object to the flexibility but noted or questioned certain aspects. NM noted that the insert included no time frame for compliance with Appendix A requirements. NM correctly noted that only Commission approval is called for, not EPA. NM suggested adding language to clarify that it is the licensee's or applicant's responsibility to provide the basis for demonstrating the adequacy of the proposed alternative. WY objected to the flexibility afforded by the language "to the extent practicable" and recommended deleting it but supported the change otherwise.

Kerr-McGee supported this modification but indicated that it was not sufficient and more specific changes are needed. HMC supported all Kerr-McGee's comments. The AMC and its supporters supported this change but only as a first step. The AMC indicated that primary reliance on this insert would result in regulation by exception. Dawn strongly supported the modification as proposed to provide needed site specific flexibility.

Response:

Staff agrees with CO that additional guidance on how to make decisions on alternatives proposed by licensees or applicants is needed. Staff is working on guidance but efforts to date indicate that abstract generic guidance is difficult to prepare absent experience with specific proposals. NRC has used the 84c flexibility only once. The CO experience may hopefully serve as a second case. Staff is certainly in no position to propose rule changes at the present time.

While the staff agrees with NM that it is the licensee's or applicant's responsibility to provide needed information, rule change is not needed and might confuse the issue by explicit instructions here and not in other parts of Appendix A. Staff notes that Appendix A is an effective rule that is being implemented and enforced in the routine course of business. WY's recommendation to delete "to the extent practicable" would be contrary to the legislation being paraphrased which explicitly includes this provision.

Recommended Rule Change:

Add the insert as proposed.

b. Criterion 1

Modification 2.(a): This change would delete the stability design timeframe of "thousands of years" and add the 1,000-year timeframe in the EPA standard. Editorial errors confused the specifics of this modification. The first paragraph of proposed modified Criterion 1 should have read:

> "In selecting among alternative tailings disposal sites or judging the adequacy of existing tailings sites, the following site features which will determine the extent to which a program meets the broad objective of isolating the tailings and associated contaminants from man and the environment during operations and for 1,000 years thereafter, without ongoing active maintenance, shall be considered:"

The ECNP strongly opposed this modification and suggested that design periods "of at least 20,000 to 100,000 years" are needed to guarantee that the EPA standard will be met and to address the long term radon hazard. IL also strongly opposed this change based on arguments that (1) the change impacts the design goal for nonradiological hazards when the EPA standard does not apply the 1,000 year period to nonradiological hazards, (2) the EPA 1,000 year time is invalid, and (3) the hazards are so long-lived. NM objected to the deletion of "... during operations and for ..." resulting from the editorial errors. EPI opposed the change based on the longevity of hazards from tailings and on the contention that the existing language is entirely consistent with EPA intent reflected in the preamble to 40 CFR 192 and the intent of the "reasonable assurance" provision of the longevity standard. WY offered revised language to reconcile the EPA 1,000 year practical design standard with the general goal of permanent isolation and opposed any change that would reduce the design objective to less than 1,000 years.

Kerr-McGee noted the editorial problems and claimed that the change must reflect the 200 year minimum in the EPA design standard in order to fully conform. Kerr-McGee cited EPA acknowledgement that designs cannot always be proven effective for a thousand years, hence the 200-year minimum, and Kerr-McGee's assertions that costs of designing for longer than 200 years results in unjustified "tremendous cost." HMC supported all Kerr-McGee comments. The AMC also advocated inserting 200 years instead of a thousand as the maximum reasonable period that assurances can be given by engineers. AMC stated that many factors in assessing stability such as gully erosion or land use cannot be predicted with certainty beyond 200 years. If NRC adopts the 1,000 year period, AMC urged that the phrase "1,000 years, where practicable, and in any case, at least 200 years" from the EPA standard be used. UMC questioned whether cover designs with no maintenance are realistic and suggested that NRC has provided funds for some maintenance. WNI, AMC, and Kerr-McGee recommended deleting the phase "without ongoing active maintenance" based on the EPA standard not flatly prohibiting some reliance on active maintenance.

Response:

WY's comments highlighted an important reason for the reactions to the existing language and the proposed change. The first paragraph of Criterion 1 is a statement of a very general goal or objective, not a specific standard or requirement. The proposed change and associated editorial errors compounded the problem. The proposed change was not intended to set aside the EPA standard for nonradiological components in 40 CFR 264.111 referenced in 40 CFR 192. It was not intended to repeat the specific design standard being added to Criterion 6.

Staff agrees, that on a general goal basis, the existing language was not totally inconsistent with EPA's intent. However, the reference to thousands of years can and did lead to misunderstandings. Staff still believes that the language needs modification.

Comments attacking the 1,000 years and advocating 200 years are really directed more at the EPA design standard and how it will be implemented in site specific actions than at siting implications. Staff disagrees with any position that would put the goal for protecting man and the environment from tailings at 200 years. Even site specific design decisions must assure that 200 will be met but only when 1,000 years is not practicable. The primary design standard is 1,000 years. Further, as a general goal, no planned reliance on active maintenance is consistent with the findings in the GEIS, the EPA standard and the Congressional intent in Section 161x(2) of the AEA that "...the need for long term maintenance and monitoring...will be minimized and, to the maximum extent practicable, eliminated." Since Congress did not flatly prohibit maintenance, NRC may consider it, but the preference for no maintenance is clear. When clearly stated as a goal and not a requirement, the goal would not preclude relying on active maintenance if no other practicable solution exists. Keeping the goal for use in future siting and design decisions where compliance can be planned for is entirely consistent with the ALARA principle and minimizing the burden to future generations.

Staff recommends clarifying Criterion 1 using a combination of existing language and WY's suggested rewrite to show the goal versus standard point and

to delete any specific time frame. Changing "shall" to "should" in the fourth paragraph of Criterion 1 will emphasize the status as a goal and be consistent with the reference to maintenance in the first sentence of Criterion 12.

Recommended rule changes:

1. Revise the first paragraph of Criterion 1 to read:

"The general goal or broad objective in siting and design decisions is permanent isolation of tailings and associated contaminants by minimizing disturbance and dispersion by natural forces, and to do so without ongoing maintenance. For practical reasons, specific siting decisions and design standards shall involve finite times (e.g., the longevity design standard in Criterion 6). The following site features which will contribute to such a goal or objective shall be considered in selecting among alternative tailings disposal sites or judging the adequacy of existing tailings sites:"

2. Change "shall" to "should" in the fourth paragraph so that it reads: "Tailings should be disposed of a in a manner that no active maintenance is required to preserve conditions of the site."

Modification 2.(b): This change would delete the groundwater modifier "usable" to be consistent with the primary thrust of the EPA standard to protect all groundwater.

The ECNP, IL, and WY supported this change. WNI urged that "usable" be left in Appendix A and that all decisions on ground-water protection be deferred to the second rulemaking. Kerr-McGee also opposed this change. Kerr-McGee argued that it is arbitrary and capricious to protect unusable groundwater since the costs would result in no benefit. Kerr-McGee urged that as a minimum, the option for site specific decisions on ground-water protection be acknowledged. HMC supported all Kerr-McGee comments. The AMC and its supporters opposed the change for reasons discussed under Criterion 5 modifications.

Response:

The general thrust of the EPA standard is to protect all groundwater. The proposed change was intended to emphasize this thrust, not set aside the site specific option to pursue alternate concentration limits which may be based in part on the existing and potential use of the groundwater. The existing language in Criterion 1 (i.e., "...isolation of contaminants from usable groundwater sources...") sets use category as the primary goal which does conflict with the EPA standard. The proposed insert for Criterion 5 discussed under Criterion 5 should clarify this point and alleviate concerns that use category cannot be considered in decisions.

Recommended Rule Change:

Remove "usable" as proposed but add a clarifying insert to Criterion 5.

c. Criterion 3

Modification 3.(a): This change would delete the groundwater modifiers "high quality" to be consistent with the primary thrust of the EPA standard to protect all groundwater.

The ECNP, IL, and WY supported this change. Kerr McGee opposed this change to require protection of nonusable groundwater for the same arguments stated earlier. HMC supported all Kerr McGee comments. AMC and supporters opposed the change consistent with arguments elsewhere.

Response:

As noted in response to modification 2(b), the thrust of the EPA standard is to protect all groundwater and consider quality as one of many factors in site specific alternate concentration limit determinations.

Recommended Rule Change:

Remove "high quality" as proposed but add a clarifying insert to Criterion 5.

d. Criterion 4

Modification 4.(a): This change would delete "maximum possible flood" and insert "Probable Maximum Flood" (PMF).

The ECNP opposed this change and questioned the rationale given that the change represented the original intent of the provision. WNI recommended deletion of "maximum possible" with no replacement of modifiers. Kerr-McGee opposed this change and argued that neither the existing language nor the proposed change are appropriate. Kerr-McGee claimed that both are excessive and therefore, inconsistent with the 1,000-year longevity period in the EPA standard. Kerr-McGee claimed that stabilization can compensate for severe flooding. HMC supported all Kerr-McGee comments. AMC and supporters also objected to the existing modifiers and the proposed change and advocated a 200 year flood as cost effective and adequate to protect health and safety and the environment. WY supported the change as proposed.

Response:

The intent of paragraph(a) in Criterion 4 is to require that siting of tailings disposal areas minimize the upstream catchment area to reduce the potential for erosion regardless of the magnitude of the design flood. The modifiers "maximum possible" and "probable maximum" are both inappropriate since this criterion is not intended to discuss design flood requirements. In order to emphasize the primary purpose of the requirement, staff recommends replacing "probable maximum flood" with "floods." The resulting language would closely track a similar Commission siting criteria for low level waste sites in 10 CFR Part 61. (See 10 CFR 61.50(a)(6).) Comments regarding the size of the design flood are therefore moot. However staff notes that decisions on what specific design flood should be used in analysis are site specific and must be made in the context of other site and design decisions.

Recommended Rule Change:

Delete the modifiers "maximum possible" and replace "flood" with "floods."

e. Criterion 5

Several commenters offered general comments on conforming Criterion 5. NM suggested that the nondegradation language stated in the rationale be included in Criterion 5. EPA expressed the view that, as a general matter, the proposed changes do not adequately reflect the EPA standard's distinction between new and existing sites. EPA specifically mentioned that the changes do not reflect the "existing portion" concept as defined in 40 CFR 192.3(j) and used in the primary standard in 40 CFR 192.32(a)(1).

WNI expressed the view that none of the changes to Criterion 5 should be made based on Commission plans described under Scope of This Proposal in the FR notice. WNI apparently read the scope to mean that no conforming changes related to groundwater should be made. Kerr-McGee argued that all changes to Criterion 5 should be deferred to the second rulemaking and that all existing ground-water requirements in Criterion 5 should be suspended or deleted in the interim. Kerr-McGee argued that such deferral would avoid a fragmented approach and allow more benefit/risk analysis. HMC supported all Kerr-McGee comments.

The AMC expressed strong objection to incorporation of any of EPA's ground-water protection standards. The AMC basis repeated and expanded arguments that the EPA standard is invalid on jurisdictional grounds. AMC asserted that the Solid Waste Disposal Act standards incorporated by EPA into 40 CFR 192 failed the Congressional mandate to be comparable to requirements for similar hazardous materials, and provided legislative history to support the assertion. The AMC view is based on the lack of EPA standards for similar high-volume waste such as mining wastes. The AMC concludes that the EPA standards are thus inconsistent with law and NRC conformance violates Section 84(a)(3) of the AEA. AMC also offered objections to the standards based on practicality (e.g., all liners leak, so a no-seepage standard is impractical) and on no adequate cost/benefit analysis by EPA or NRC. AMC also noted that EPA comments on Appendix A when initially proposed did not challenge NRC's ground-water protection strategy.

AMC offered a complete rewrite of Criterion 5 to reflect its recommended approach to groundwater involving: (1) protection from unreasonable risks and considerion of groundwater use category, (2) distinction between existing and new sites, (3) costs commensurate with risk, and 4) site specific implementation.

WY generally supported all proposed changes to Criterion 5. WY also urged flexibility in requiring liners at all new or expanded facilities, and NRC investigation and inclusion of processes to dry tailings.

Response:

The comments clearly reflect confusion about the status of the EPA groundwater protection standards, the status of 10 CFR 40 Appendix A requirements, and the basis for proposing the few changes related to ground-water protection in advance of more comprehensive rulemaking on groundwater. As discussed under the general issues, the EPA standards have been in effect and applicable in regulation since December 6, 1983. NRC rulemaking is not required to impose the EPA standards. NRC staff believes it has no option but to conform and implement and enforce the EPA standards. Staff thus believes that both the EPA standards and Appendix A are effective on licensees.

The proposed changes to Appendix A, and Criterion 5 in particular, were all intended to reflect that the EPA standard reflects the RCRA groundwater protection strategy and starts from a premise that no seepage from the impoundments or degradation of groundwater is allowed and that all groundwater is to be protected regardless of quality or use category. The changes were intended to remove language that explicitly conflicted with this basic strategy. They were not intended to fully conform to or to modify the EPA standard in any way.

The EPA general comment that the distinction between new and existing sites was not reflected was based primarily on the brief rationale for the proposed change rather than the changes themselves. The rationale did not address the complex site specific options provided under the EPA standard (i.e., the use of site specific alternate concentration limits as the secondary standard). Staff carefully reviewed Criterion 5 as an adjunct to the EPA

standards. Staff concluded that Criterion 5, with the proposed changes, does not impact the existing/new site provisions and site specific provisions of 40 CFR 192 and that no additional changes are warranted on this basis.

The AMC proposed rewrite will be considered as part of the ANPRM analysis and scoping. The AMC approach would require intensive analysis and support and would delay conformance.

The EPA standard itself and the proposed insert to Appendix A's Introduction provide for site specific decisions on any issue. Processes to dewater tailings are already listed as a consideration in Criterion 5, so no further action is needed to address this comment of WY.

Staff concludes that specific clarification of the regulatory situation on groundwater is needed. A minor change to provide a subject for the list of considerations in Criterion 5 is also recommended for clarity.

Recommended Rule Changes:

1. Insert the following paragraph as the first paragraph of Criterion 5:

"Licensees and applicants are cautioned that the ground-water provisions of 40 CFR 192, Subparts D and E, are binding. The thrust of the EPA standards in 40 CFR 192 is nondegradation of all groundwater. The primary ground-water standard in 40 CFR 192.32(a)(1), which applies to new or expanded impoundments, does not include consideration of existing or future ground-water quality. The secondary standard in 40 CFR 192.32(a)(2) applies to management of all byproduct material including existing and new or expanded impoundments. In the secondary standard, several groundwater quality criteria are considered, especially in site specific decisions on applications for alternate concentration limits. Criterion 5 supplements and does not conflict with or modify provisions of 40 CFR 192. Until or unless the Commission undertakes additional rulemaking as described in the advance notice of proposed rulemaking published in the Federal Register on November 26, 1984 (49 FR 46425), licensees and

applicants must refer to both 10 CFR Part 40 and 40 CFR Part 192 for the complete set of applicable ground-water protection requirements."

2. Make the proposed first sentence the second paragraph of Criterion 5 and revise it to read:

"In developing and conducting groundwater protection programs, applicants and licensees shall consider the following:"

Modification 5.(a): This change would delete language implying that seepage to groundwater is acceptable if it does not change the use category.

The ECNP generally supported the change but expressed concern that this modification might preclude deep burial. ECNP also questioned how the EPA standard for perfect containment will be implemented and enforced. EPA noted that the rationale did not acknowledge that only new disposal areas must meet the no seepage requirements. EPA also suggested that a footnote referring to the potential for additional changes from the second rulemaking be added. WNI recommended that the change not be made and that all changes related to groundwater be deferred to the second rulemaking noticed in the accompanying ANPRM. WNI cited the severe impact on existing sites if no seepage and no consideration of aquifer use category are allowed. Kerr-McGee supported deletion of the first sentence based on the commenter's position that nonusable groundwater does not need protection and the sentence requires mitigation of all seepage, not just seepage that would contact usable groundwater. Consistent with this position, Kerr-McGee opposed deletion of the second sentence. Kerr-McGee outlined the benefits from disposal of tailings as backfill in the underground mines from which the ore came and expressed concern that deleting the reference to preserving ground-water use category would eliminate such a proposal. Kerr-McGee correctly notes that the primary groundwater water standard in 40 CFR 192.32(a)(1) applies to surface impoundments only and the mine backfill operation would not be subject to the primary standard. HMC supported all Kerr-McGee comments.

AMC opposed all proposed Criterion 5 modifications. Dawn opposed the change because, in its view, the change set aside the flexibility built into the

EPA groundwater standards. Dawn referenced the secondary ground-water standards referenced in 40 CFR 192 that provide for degradation of groundwater when public health and safety and the environment are not at risk. Dawn supported the need for flexibility based on practicality, remoteness of sites, and aquifer use potential.

Response:

The ECNP and industry reservations and concerns about Criterion 5 and its implementation seem to stem in part from a lack of understanding that groundwater protection requirements are defined by both Appendix A of 10 CFR 40 and the EPA standards. The proposed changes were intended only to make Appendix A stand alone only on non-groundwater matters and remove conflicts with the EPA ground-water standards. The insert outlining the dual requirements described in the general discussion on Criterion 5 should alleviate much of the concerns. It will not alleviate dissatisfaction with the EPA standard itself, however. The insert also addresses EPA's point on referencing the second step rulemaking.

The option for underground mine backfill disposal advocated by Kerr-McGee is a unique and site specific circumstance not precluded by NRC or EPA rules. Since it is not precluded, staff does not believe that specific requirements or changes are needed to be able to address this option in a site specific licensing decision.

Recommended Rule Change:

Delete the language as proposed and rely on the Criterion 5 insert.

Modification 5.(b): This change would delete language referring to bottom liners of "low permeability."

The ECNP also generally supported this change with similar reservations expressed for modification 5(a). Kerr-McGee objected to this change on the grounds that the remaining language could imply that synthetic liners must be installed under existing tailings piles. Kerr-McGee stated that such installation is not required by the EPA standard since existing portions are

exempted under 40 CFR 192.32(a)(1) and furthermore is neither cost effective nor justified. HMC supported all Kerr-McGee comments. AMC opposed all proposed Criterion 5 modifications. Dawn opposed this modification on technical grounds. Dawn pointed out that no material is totally impermeable and that state of the art liners have permeability ratings on the order of 10^{-12} m/sec.

Response:

The Kerr-McGee and Dawn comments are the only ones involving issues not addressed elsewhere. Kerr-McGee's concern that synthetic liners would be required under existing tailings impoundments does not stem from the proposed deletion of modifiers. The proposed deletion results in having to consider installation of bottom liners instead of low permeability bottom liners. Staff does not see how this modest change impacts the resolution of what type of remedial ground-water protection action may be required at existing sites.

Dawn's observation that in an absolute and theoretical sense even synthetic liners are not impermeable, is technically correct. The only way synthetic liners can meet the EPA standards in 40 CFR 192 is in consideration that the synthetic liner requirements applies only to the operation and closure phases (20-30 years), not to the long term post closure phase. Staff concern is that most people reading the reference to "low permeability" will not consider the absolute or theoretical concept. Staff believes that most readers would consider clay as low permeability and synthetic materials as impermeable. Deletion of "low permeability" leaves the issue of what type of liners are acceptable to the more specific EPA standards.

Recommended Rule Change:

Delete "low permeability" as proposed.

Modification 5.(c): This change would delete a reference to potential use category as a standard.

The ECNP supported the change but questioned implementation aspects. Kerr-McGee opposed NRC's nondegradation rationale for this change but supported

the change. Kerr-McGee claimed that restoration to use category may be unjustified and stated that the deletion would leave the issue of degree of restoration open. HMC supported all Kerr-McGee comments. AMC opposed all proposed changes to Criterion 5. Dawn opposed the change arguing that the existing language is inconsistent with considerations allowed in determining alternate concentration limits under the EPA standard and that deletion allows NRC to be more restrictive in degree of restoration than the existing rule. Dawn indicated that situations at existing facilities will require flexibility to consider groundwater quality in restoration decisions.

Response:

Staff agrees that deletion of the requirement to restore to groundwater "to its potential use before milling operations began to the maximum extent practicable" leaves the degree of restoration open. This was the intent of the proposed change. Staff also agrees that the degree may be more or less restrictive than use category preservation. The degree of restoration will be determined in a site specific basis in accordance with the EPA groundwater protection standards. The insert at the beginning of Criterion 5 should help emphasize the dual requirements.

Recommended Rule Change:

Delete the phrase as proposed.

Modification 5.(d): This change would delete references to use category and tailings in contact with groundwater.

The ECNP supported this change. EPA suggested that this language referring to protecting groundwater by isolation of tailings and tailings solutions be retained. Kerr-McGee opposed the deletion for the same reasons noted for modification 5(a). HMC supported all Kerr-McGee comments. AMC opposed all proposed changes to Criterion 5.

Response:

The only new issue in comments on this proposed change is EPA's suggestion to keep the isolation goal. The general goal of isolation is included and emphasized in the revised first paragraph of Criterion 1. (See Modification 2(a) discussion.)

Recommended Rule Change:

Delete the paragraph as proposed.

Modification 5.(e): The groundwater modifier "usable" would be deleted.

The ECNP supported this change. Kerr-McGee opposed the change and indicated that the change would impose costly monitoring or other requirements for nonusable groundwater. HMC supported all Kerr-McGee comments. AMC opposed all proposed changes to Criterion 5.

Response:

No new issues or information were identified in comments on this change. The change would result in having to characterize the whole groundwater regime at the site but does not impose any monitoring. Such characterization would be necessary to support any requests for alternatives to synthetic liners or proposals for alternate concentration limits under 40 CFR 192 groundwater requirements and is thus consistent with the EPA standard.

Recommended Rule Change:

Delete "usable" as proposed.

f. Criterion 6

Modification 6.(a): This change would delete the two picocuries per square meter per second radon flux and minimum 3 meter cover thickness provisions and insert EPA's radon flux and longevity and stabilization standard.

ECNP and AMC opposed these changes in their entirety. The ECNP strongly opposed these changes based on views that the EPA standard inadequately protects the environment. ECNP further expressed the view that even the more restrictive NRC requirements proposed for deletion may not be adequate protection. AMC opposed incorporation of the EPA standards based on jurisdictional arguments, i.e. the standards apply inside the site boundary and are therefore invalid. AMC also argued that no limit on radon emissions is warranted based on risk and therefore that any limit does not adequately balance cost and risks. The AMC repeated arguments that active maintenance should be included to allow higher radon flux values by relying on limited access to sites and that the stabilization period for uranium tailings should be 200 years, not 1,000, if included.

Response:

The basic arguments expressed by ECNP and AMC were addressed generically under general issues dealing with comments on the EPA standard itself.

Commenters also specifically opposed includng the EPA 20 picocurie flux standard. EDF, IL, and Lewis objected to deleting the Appendix A 2 picocurie flux value and adoption of the 20 value in the EPA standard as being too lax. The EDF argued that the 2 picocurie flux is ALARA, is easily met based on the Department of Energy's Title I research experience and is cost effective. WNI objected to incorporation of the 20 picocurie flux claiming that costs to comply far outweigh any benefits.

Response:

Comments objecting to the 20 picocurie flux generally used the same arguments as used against the EPA standard addressed under general issues.

The one exception is the EDF reference to Title I research. The DOE Title I research experience compared costs for different types of cover strategies; nowever these studies didn't perform analyses which would result in conclusions on the warranted levels of radon releases from covered tailings. To truly investigate whether the meeting of the 2 pCi/m^2-sec flux criterion is ALARA would require a cost-benefit analysis, which EPA did in its Final Environmental Impact Statement for Standards for the Control of Byproduct Materials from Unranium Ore Processing (40 CFR Part 192), Volumes 1 and 2, EPA 520/1-83-008-1 and 2, September, 1983 and Regulatory Impact Analysis of Final Environmental Standards for Uranium Mill Tailing at Active Sites, EPA 520/1-83-010, September, 1983. As a result of the EPA analysis, the additional deaths avoided didn't warrant the reduction of the criterion below 20 pCi/m^2-sec from a cost benefit standpoint.

It should also be noted that although laboratory and field experience by both DOE and NRC confirm that the 2 pCi/m^2-sec criterion can be met, it is difficult to prove that it can be significantly maintained over the long-term due to weathering, settlement and other defect generating mechanisms. Moreover, the proximity of the 2 pCi/m^2-sec flux to the natural radon flux from background sources allows for too much uncertainty in the predictive methodologies and ranges for parameter input values. Little relief can be obtained by actual monitoring, since, monitoring data results at these low radiation levels can be of marginal value, due to the levels of uncertainty involved. The uncertainty is addressed in the design standard by the "reasonable assurance" implementation criterion, whereby NRC utilizes reasonably conservative parameter values in predicting the long-term radon flux. The resulting flux levels are usually much less than a factor of 10 above the 2 pCi/m^2-sec flux criterion used in the past.

Three commentors argued against deleting the minimum 3 meter cover requirement. Lewis objected to deletion of "requirements for specific ground cover", i.e., the 3 meter minimum, and expressed the view that Criterion 6 "is destroyed." EPA recommended that the 3 meter minimum cover requirement be kept "to provide reasonable assurance of adequate long-term performance of the cover under erosional and other stresses." The EPI similarly objected to deletion of the 3 meter minimum cover requirement based on the protection depth

affords against erosion and intrusion. EPI also argued that "reasonable assurance" of meeting the 20 picocurie flux requires a thicker cover than one that merely meets the 20 limit.

Response:

Comments objecting to deleting the 3 meter minimum cover focused on the need for erosion and intrusion protection as adequate reason for 3 meters independent of any radon flux consideration. As noted in the rationale for the proposed change, the specific thickness of 3 meters was derived from radon flux considerations. These considerations were based on meeting the 2 picocurie or twice-background performance criteria and are clearly inconsistent with the 20 picocurie value. Staff agreed in the GEIS and agrees now that effective covers are needed for long term protection. Site specific experience and further research and analysis on long term stability (e.g., NUREG-3397, "Design Considerations for Long-Term Stabilization of Uranium Mill Tailings Impoundments") have indicated that effective alternatives to total reliance on soil thickness are feasible and may make more environmental and economic sense. Well designed rock covers on the tops and side slopes of reclaimed tailings can provide sufficient erosion protection so that a soil cover of less than 3 meters may be acceptable. Deletion of the minimum cover thickness does not relieve licensees from the requirement to provide effective covers. It provides for site specific alternative designs to accomplish the same erosion and intruder protection. While staff agrees that "reasonable assurance" requires some degree of conservatism, staff does not agree that "reasonable assurance" dictates a factor of ten conservatism, as EPI's arguments indicate.

CO objected to including the 200 year minimum longevity requirement based on the small incremental costs and practicality of meeting the longer (1,000 year) time and the longevity of the hazards from tailings. Ecology/Alert questioned the 200-year "loophole." As noted earlier, AMC advocated a 200-year standard.

Response:

The 200 year minimum longevity requirement provides relief in those unique reclamation situations where the 1,000 year criterion can be shown to be too much of a cost hardship to satisfy. Staff views the EPA longevity standard to be 1,000 years unless site specific circumstances preclude meeting 1,000 years. Staff rejects the AMC assertion that the standard is or should be 200 years with no attempt to meet 1,000 years. The language and intent of the EPA standard proposed for insertion in Criterion 6 is clear in this regard.

IL objected to NRC's proposed use of design standards and suggested that NRC rules explicitly require proof that the design has been met by the reclamation actions. In support of its position, IL cited EPA/NRC jurisdiction, disposal and engineering experience, and the long-term hazards.

Response:

The EPA longevity and radon standard is written as a design standard. Requirements to confirm adequacy of design during and after construction have merit but will be very site and design specific. Normally, key design features and quality control would be specified in site specific license conditions. Normal inspection and enforcement activities would include quality control and compliance with designs approved and specified in license conditions. The site specific conditions and levels of uncertainty in the design might result in some need to confirm design parameters after the fact but such a need should be the exception. Expressing the standard as a design standard does not preclude such site specific findings. The related issue of radon flux monitoring is discussed under the next modification (6.(b)).

Three commenters offered clarifying suggestions. EPA recommended clarifying the reference to "permanent disposal". NM recommended defining the term "disposal area". WY suggested that NRC address how it will implement and apply the longevity design standard and make findings. WY also suggested that the standard be clarified to make it clear, that to the extent practicable, the cover would still meet the 20 picocurie flux limit at the end of the 1,000 year design period.

Response:

Staff agrees with the EPA suggestion to clarify "permanent disposal" and recommends the change listed below. The "disposal area" definition is addressed indirectly in the third paragraph of the proposed Criterion 6. The third paragraph picks up the threshold activity limits that define when the longevity and radon requirements on post-closure apply. EPA defined disposal area" only in terms of the applicability of 40 CFR 192.32(b)(1). Staff sees no need for additional definition. The WY suggestion to address implementation would result in a level of detail in the rule normally relegated to NRC guidance documents. Existing guidance documents on reclamation planning and design may need some followup modification. The NRC is planning to review or has reviewed existing documents and is exploring the need for additional implementing guidance.

Staff agrees with WY that the EPA standard is not completely clear that the flux limit is to be met throughout the effective design life to the extent practicable and proposes the change listed below.

Kerr-McGee supported the change for uranium byproduct material but opposed including thorium byproduct material standards. Kerr-McGee correctly observed that its West Chicago facility is the only current thorium facility subject to the thorium standards and urged that the generic standards should not be applied or that at least explicit flexibility for site specific decisions should be included in Criterion 6. Kerr-McGee did not identify specific problems and based its arguments on inadequate analysis by EPA in issuing the standards. HMC supported all Kerr-McGee comments. The AMC objected to including thorium byproduct material provisions and suggested a 50 year stabilization time period for thorium if included. The short time period was supported by arguments on shorter lived radionuclides [in the thorium 232 chain] and reliance on institutional controls. UT's comments on the technical basis for the EPA thorium values are discussed under Modification 6(d).

Response:

The comments opposing incorporation of the EPA standards for thorium byproduct material are generally expressing dissatisfaction with the EPA standard itself. The EPA standard in 40 CFR 192.42 provides for substitute generic

provisions to those in Subpart E, but with EPA concurrence. Thus a rulemaking on different thorium standards would be totally discretionary on NRC's part and require extensive supporting analysis. The thorium standards proposed for insertion are already in effect on NRC and state licensees and are nondiscretionary. NRC repetition in 10 CFR 40 has no bearing on their status. Staff does not consider rulemaking for the one site subject to the standard for the foreseeable future to be warranted. NRC has the authority to consider and approve site specific alternatives if the finding in Section 84c can be made. Staff believes that the objective of having 10 CFR 40 be complete on all non-groundwater protection requirements justifies repetition of already binding standards. As a technical observation, staff notes that AMC arguments on shorter periods of control required do not take into account the real world mix of naturally occurring isotopes of natural thorium and the presence of uranium and its daughters in most thorium ores. The complexity of the mixtures highlights the site specific aspects and the difficulty of developing alternative generic standards.

Recommended Rule Changes:

1. In the first sentence of proposed new Criterion 6, delete the words "In cases where waste byproduct material is to be permanently disposed, an earthen cover shall be placed" and insert "In disposing of waste byproduct material, licensees shall place an earthen cover".

2. Insert at the end of the first sentence of proposed new Criterion 6 after (pCi/m^2s) the phrase "to the extent practicable throughout the effective design life determined pursuant to (i) above".

Modification 6.(b): This change would add the two radon flux modifying footnotes from the EPA standard that specify that no monitoring is required, averaging is allowed, and cover materials do not have to be considered in meeting the flux limit.

The ECNP opposed adding the EPA footnotes because the footnotes state that no monitoring of the radon flux is required and that averaging is allowed. The EDF aso argued that radon releases should be monitored for 40-50 years after

reclamation. IL, CO, NM and EPI also objected to no monitoring of flux levels. CO objected that the averaging provision is too vague. IL expressed concern that the language clarifying that cover materials not be considered in the 20 picocurie flux calculations would result in the use of high radium content soils for covers.

Kerr-McGee noted that the changes are consistent with the EPA standard but repeated the view that the EPA standard is invalid. HMC supported all Kerr-McGee comments. The AMC agreed with including footnote 1 as proposed since it clarifies that the standard is a design standard, but because of AMC's position that no limits on radon flux are warranted, footnote 2 should not be incorporated.

Response:

The footnotes quoted from the EPA standards in 40 CFR 192 are necessary to define how EPA intended the longevity and radon standards to be used. The footnotes set the conditions which EPA supported as a reasonable balance of cost and benefit that would be achievable with present state of the art.

While NRC does have the authority to require monitoring of flux levels as the comments note, the practical problems which led EPA to issue a design standard and NRC experience in radon attenuation measurements and calculations convince staff that flux monitoring should not be mandated. Measurement of flux levels in the field is difficult and subject to wide variations due to factors such as sensitivity to measurement methods, meteorological variations, non-homogeneity of the tailings piles, and disturbance of the radon releases by the monitoring process. Monitoring flux levels in controlled experimental situations can provide useful data with sufficient precision to evaluate the relative importance of design considerations such as moisture content or vegetative penetration. However, the difficulties and variations in measurements and measurement techniques convince staff that the EPA design standard should not be implemented as a performance standard. NRC's current method for providing reasonable assurance that the EPA flux standard will be met focuses on the selection and application of parameters and calculational methodology for radon barrier design. Experience and research to date have included development and validation of standardized calculation methods and determining the relative importance

of individual parameters. Some parameters affect calculated cover requirements very little from site to site. Others are very site specific and may require field and laboratory data. Parameter values must be chosen to represent the expected long-term conditions of the cover. NRC's approach is the approach EPA intended, involves conservative site specific resolution, and commits NRC and DOE or licensee resources up front to properly design the cover before the reclamation work begins. Further, NRC expects to review quality assurance records during construction to assure that the approved design is implemented in the field. In summary, staff believes that current design and review methods provide ample assurances. Staff notes that Agreement States such as CO can adopt more restrictive standards than EPA or NRC and may mandate monitoring if desired.

Staff experience also supports the need for averaging over the impoundment. The tailings are not homogeneous. Airborne transport of radon offsite results in mixing before members of the public are exposed so that doses are reflected by average values. Also, the averaging minimizes the effects of variability in the values of parameters and reduces the need to specify error ranges. Details on calculation methods are more appropriate in guidance documents that can be tailored to site specific conditions and track state of the art and experience.

IL's concern about high radium content of cover materials is addressed in the second paragraph of the proposed modified Criterion 6. The second paragraph contains the requirements on low radium content that were already in Appendix A. The footnote only clarifies that the EPA standard applies to the tailings flux through the cover and that radon from cover materials are not to be included in demonstrating compliance with the 20 picocurie flux.

Proposed Rule Change:

Add the footnotes as proposed.

Modification 6.(c): This change would correct a typographical error and delete the 3 meter requirement.

ECNP, IL, and EPI opposed deletion of the 3 meter minimum earth cover requirement as noted under Modification 6(a). Kerr-McGee and AMC and their supporters generally supported the change.

Response:

See Modification 6(a).

Proposed Rule Change:

Correct typographical error and delete 3 meter requirements as proposed.

Modification 6.(d): This change would add the threshold radium levels for applicability of the inserted EPA standard on longevity and control of radon releases.

ECNP opposed this change and advocated an absolute nondegradation standard for radon releases. CO expressed the view that since averaging over 100 square meters allows highly contaminated small areas to be ignored, it is insufficiently protective. UT offered a number of technical arguments relating to radon production on why the threshold radium 228 values for thorium byproduct material should be different from uranium values. UT suggested that the thorium limits from the EPA standard not be added to NRC rules since they are unjustifiably high.

Kerr-McGee did not specifically comment on this change but its position on Modification 6(a) and (b) would imply that no thorium provisions should be included. AMC opposed the modification based on jurisdictional arguments and the lack of technical consistency between the threshold values and the 20 picocurie flux limit. AMC stressed that the allowable radon releases from the tailings is higher than the radon releases that result from contamination at the threshold limits. AMC also argued that institutional controls had not been adequately considered by EPA in setting the limits and that the limits were not based on realistic risk assessment.

Response:

The language proposed for insertion is needed to reflect the conditions under which EPA intended the longevity and radon standard to apply. The modification as proposed would allow NRC to be more restrictive if warranted by site specific conditions. NRC may require some degree of control for areas contaminated above background but below the threshold levels. EPA acknowledged this option in its rulemaking. Such site specific decisions would be a part of the NEPA review of licensee's reclamation plans. Explicit mention of this option in Appendix A is not required to maintain the option for controls and the proposed change does not preclude additional controls. All other comments were directed at the EPA standard, not NRC options.

Recommended Rule Change:

Add the paragraph as proposed.

g. Criterion 8

Modification 7.(a): The change would add the EPA standard language on the as low as practicable goals for radon releases during operations.

The ECNP expressed reservations about implementation and enforcement of the as low as practicable goal and the lack of specific time limits for completion of stabilization and radon control after operations cease. EDF expressed more pointed concerns on time limits and proposed additional changes to address their concerns. WNI had no objection. Kerr-McGee had no objection other than general objection to the EPA standards. AMC and supporters recommended that the word "practicable" be deleted and the phrase "reasonably achievable" be inserted to more accurately reflect EPA intent. AMC cited EPA's intent as described in the preamble to final 40 CFR 192 (48 FR 45933) to implement the Federal Radiation Protection Guidance of May 13, 1960. As EPA recognized in the preamble, "this guidance is currently known as the 'as low as reasonably achievable' (ALARA) principle". AMC also noted that the language change from practicable to ALARA is reflected in Commission rules in 10 CFR 20.

Response:

As noted earlier, discretionary additional changes such as time limits, interim stabilization, and phased disposal recommended by EDF and others were considered outside the scope of this action.

Staff agrees that EPA's intent was to impose the ALARA principle and that ALARA is more consistent with Commission radiation protection policies as reflected in 10 CFR Part 20. The actual language in a standard has higher legal force than the preamble stating intent, but in this case since numerical values or other specific provisions are not involved, the Commission has more flexibility in conforming. Staff agrees that the intended general guidance is more accurately ALARA.

Recommended Rule Change:

Add the proposed modification but delete "practicable" and insert "reasonably achievable".

Modification 7.(b): These changes would add language from the EPA standard imposing 40 CFR 190 equivalent limits for thorium byproduct materials and compliance with 40 CFR Part 440, Subpart C.

The ECNP objected to the "reasonable assurance" language in the text added from the EPA standard and suggested that NRC was replacing actual standards with this insert. WNI noted no comment on this change. Kerr McGee opposed including the thorium byproduct standards for the same reasons noted and responded to under Modification 6(a). HMC supported all Kerr McGee comments. The AMC recommended that waiver provisions from a recent EPA rulemaking under the Clean Air Act (50 FR 5190, February 6, 1985) be incorporated into the thorium dose limits. The AMC also opposed adding the language requiring compliance with 40 CFR Part 440, Subpart C stating that these regulations are invalid since EPA lacks authority to regulate byproduct material under the Clean Water Act.

Response:

The proposed text was quoted verbatim from the EPA standard in 40 CFR 192. No deletions or modifications of existing NRC rules are involved. The proposed change incorporates for clarity standards that are already binding on NRC licensees for clarity and eliminates the need to refer to 40 CFR 192 for any requirements other than groundwater protection. While the waiver provision suggested by AMC may have merit in considering site specific situations, the staff does not believe that such a generic discretionary rulemaking is warranted. Staff has no basis to act on AMC arguments that 40 CFR 440, Subpart C, is invalid.

Recommended Rule Change:

Add the modification as proposed.

h. Modification 8: Criteria 2, 7, 9, 10, 11, and 12 not affected by proposed changes.

EPA noted that the second step rulemaking on groundwater and other provisions to be comparable to SWDA requirements may affect these criteria. No response to this correct observation is needed. Changes to these criteria recommended by commenters are addressed under Scope of Rulemaking as a general issue.

ENCLOSURE E

DRAFT PUBLIC ANNOUNCEMENT

(To be supplied by the Office of Public Affairs)

ENCLOSURE F

Dear Mr. Chairman:

The U.S. Nuclear Regulatory Commission (NRC) is amending the Commission's rules in 10 CFR Part 40 for licensing uranium mills and disposal of mill tailings and waste.

The NRC Authorization Act for FY 1983 (Public Law 97-415) contained a requirement that the Commission modify its mill tailings regulations to conform to final Environmental Protection Agency (EPA) standards for these materials. Final standards were signed by the Administrator September 30, 1983 and published on October 7, 1983 (48 FR 95928).

The NRC is following a two-step rulemaking process to modify its rules to make them consistent with the EPA standards and satisfy provisions of Section 205 of the Uranium Mill Tailings Radiation Control Act of 1978, as amended. Proposed changes to 10 CFR Part 40 were published in the Federal Register for public comment (49 FR 46418, November 26, 1984). The enclosed Federal Register notice reflects consideration of comments received on the proposed rule changes. The enclosed amendments to Appendix A consist of changes to the existing Commission regulations necessary to conform to the new EPA standards and to incorporate within Commission regulations those provisions of the EPA standards not related

to ground water. Minor conforming amendments to Appendix A, as necessary to remove inconsistencies with the ground-water protection provisions of EPA's new standards, are also included. An accompanying advance notice (49 FR 46425, November 26, 1984) outlined the NRC's plans for a further rulemaking to consider the incorporation within NRC regulations of the ground-water protection standards in the October 7, 1983 rules and other EPA ground-water protection requirements issued by the EPA pursuant to provisions of the Solid Waste Disposal Act, as amended.

The enclosed notice is being sent to the Office of the Federal Register for publication. A copy of a public announcement to be released by the NRC on this matter is also enclosed.

Sincerely,

John G. Davis, Director
Office of Nuclear Material Safety
and Safeguards

Enclosures:
1. FR Notice on Final Amendments
2. Public Announcement