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Summary and Categorization of Public Comments on the Control of Solid Materials

ICF Consulting, Inc.

U.S. Nuclear Regulatory Commission
Office of Nuclear Material Safety and Safeguards
Washington, DC 20555-0001

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Summary and Categorization of Public Comments on the Control of Solid Materials

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ABSTRACT

The Nuclear Regulatory Commission (NRC) is conducting an enhanced participatory process to evaluate alternative courses of action for control of solid materials. NRC published an Issues Paper in the Federal Register (64 FR 35090) on June 30, 1999. The purpose of the paper was to seek public input on issues associated with alternative courses of action for control of solid materials at NRC-licensed facilities that have very low amounts of, or no, radioactivity. NRC invited written comments on the paper and held a series of public meetings during the Fall of 1999 in San Francisco, CA; Atlanta, GA; Chicago, IL; and Rockville, MD. Extensive and wide-ranging comments were received at the four public meetings and in the written public comments. This report has been prepared to provide a digest of the public comments received from individuals and organizations, as well as those condensed from participants at the public workshops. Over 900 written comment letters were received on the Issues Paper in addition to those summarized from the public meeting transcripts. Most of these comments focus on the specific technical approach or criteria that should be developed. No analysis or response to comments is included in this report. The comments reflect a broad spectrum of viewpoints on the issues related to control of solid materials. This report makes the information submitted by public on the Issues Paper accessible; comments on this and other decision-making activities related to the control of solid materials will be included in the docketed record relating to this overall activity. The Issues Paper has been included as an Appendix.

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FOREWORD

The NRC is conducting an enhanced participatory process to evaluate alternative courses of action for control of solid materials with very low amounts of, or no, radioactivity at NRC-licensed facilities. NRC published an Issues Paper in the Federal Register (64 FR 35090) on June 30, 1999 to seek public input on these alternatives and invite written comments. NRC also held a series of public meetings during the Fall of 1999 in San Francisco, CA; Atlanta, GA; Chicago, IL; and Rockville, MD. The commentary on the alternatives and fundamental issues solicited from interested parties, who participated in these meetings and submitted comments directly, forms part of the official record to be addressed in decision-making for control of solid materials. The purpose of this report is to summarize these comments categorized from transcripts of the four public meetings and NRC docketed letters from individuals and organizations. This report provides a readily accessible digest of the public comments associated with the Issues Paper and with the pertinent dialog leading up to public meetings of the Commission in May 2000 on this topic. The full text of these comments can be accessed from the docket maintained by the NRC and the dedicated web site that was developed both for disseminating information and for obtaining comments on the Issues Paper (www.nrc.gov/NMSS/IMNS/controlsolids.html). Comments received with respect to this published report will also be included in the formal docket and be accessible therefrom.

This report covers letters received from April 20, 1999 to May 3, 2000. Letters received after that date will also be considered in the NRC's decision making process. The results, approaches, and methods described in this report are provided for information only. Publication of this report does not necessarily constitute NRC approval or agreement with the information contained herein.

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ABBREVIATIONS

AEA	Atomic Energy Act
ALARA	as low as reasonably achievable
ANSI	American National Standards Institute
ASTM	American Society of Testing and Materials
ASTSWMO	Association of State and Territorial Solid Waste Management Organizations
BNFL	British Nuclear Fuels Ltd.
BRC	Below Regulatory Concern
CAMU	Corrective Action Management Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO_2	Carbon dioxide
COI	conflict of interest
CRCPD	Conference of Radiation Control Program Directors
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
EU	European Union
FR	Federal Register
FRN	Federal Register Notice
IAEA	International Atomic Energy Agency
ICRP	International Commission on Radiological Protection
LLD	lower limit of detection
LLW	low-level waste
MARSSIM	Mulit-Agency Radiation Survey and Site Investigation Manual
mrem	millirem
mSv	millisievert
MSW	municipal solid waste
NCRP	National Council on Radiation Protection and Measurements
NIST	National Institute of Standards and Technology
NEPA	National Environmental Policy Act
NORM	Naturally occurring radioactive material
NO_x	nitrogen oxides
NRC	U.S. Nuclear Regulatory Commission
NUREG	Nuclear Regulatory Publication
QA/QC	Quality Assurance/Quality Control
RCA	radiologically controlled area
RCRA	Resource Conservation and Recovery Act
SAIC	Science Applications International Corporation
UMTRCA	Uranium Mill Tailings Radiation Control Act

1.0 INTRODUCTION

1.1 BACKGROUND

The NRC is conducting an enhanced participatory process to evaluate alternative courses of action for control of solid materials at NRC-licensed facilities that have very low amounts of, or no, radioactivity. As part of the NRC's examination of its approach for control of solid materials, the NRC sought early public input on the major issues associated with this effort. To aid in this process, the NRC prepared an Issues Paper that describes issues and alternatives related to release of solid materials. The purpose of the Issues Paper was to foster discussion about issues associated with alternative courses of action for control of solid materials at licensed facilities that have very low amounts of, or no, radioactivity.

This Issues Paper was published in the Federal Register (FR) on June 30, 1999. The formal closing period for public comments was extended until December 22, 1999. To the extent possible, comments received after the closing were considered as late as May 3, 2000. The Federal Register Notice (FRN) invited public comment on the Issues Paper and, to provide further opportunity for public input, the NRC held a series of public meetings during fall 1999 at the following four locations:

1) San Francisco, CA on September 15-16, 1999
2) Atlanta, GA on October 5-6, 1999
3) Rockville, MD on November 1-2, 1999
4) Chicago, IL on December 7-8, 1999

The Issues Paper described the following process alternatives:

- Continue current NRC practice of case-by-case consideration of licensee requests for release of solid material and consider updating existing guidance; or
- Conduct a rulemaking to establish criteria for control of solid materials.

The Issues Paper indicated that a rulemaking could have three technical approaches:

- Permit release of solid materials for unrestricted use if the potential dose to the public from such use is less than a specified level determined during the rulemaking process;
- Restrict release of solid materials to only certain authorized users;
- Do not permit either unrestricted or restricted release of solid material that has been in an area where radioactive material has been used or stored, and instead require all such materials to go to a licensed low-level waste (LLW) disposal facility. This approach is referred to as "prohibition."

The term "control of solid materials" is a general term that has been used in the Issues Paper and the public meetings on this subject; it should be noted that the international community uses the term "clearance" in referring to release of materials for unrestricted use.

1.2 OVERVIEW OF COMMENTS

Over 900 written comments have been received on the Issues Paper in addition to the discussion at the four public meetings. The agendas for the meetings consisted of sessions corresponding to the content of the Issues Paper. The Issues paper is included in this document as Appendix A.

Attendance at the four meetings included representatives from scrap and recycling companies; steel and cement manufacturers; sanitary waste facilities; the U.S. Environmental Protection Agency (EPA); U.S. Department of Energy (DOE); U.S. Department of State (DOS); State agencies; Tribal governments; NRC licensees and licensee organizations; and the Health Physics Society. Citizen groups had expressed opposition to this process and did

not attend the San Francisco and Atlanta meetings. However, a letter, signed by citizen groups, explaining why they did not attend, was delivered at these two meetings by a representative of the groups, with copies provided to attendees. Certain citizen groups did attend the Rockville and Chicago meetings, although others continued to not attend.

There were extensive and wide-ranging comments received in writing and provided at the four public meetings. Most of these comments focus on the specific technical approach or criteria that should be developed.

Many commenters stated that there should not be release of solid materials from licensed facilities even if the calculated dose or health risks were low. In particular, potential recipients of solid material, such as scrap, metals, and cement industry representatives, objected to release of solid materials. These commenters noted that there could be a severe economic impact on their industries if consumers refused to buy products because of concerns over the presence of radioactivity. Metal industry representatives indicated that they had installed detection systems at their facilities and might reject shipments of materials released from licensed nuclear facilities even if they meet an NRC standard. A metals industry representative suggested convening a group or panel of stakeholders to work out acceptable solutions. A large number of citizen groups and individuals also expressed concern about the health effects of the potential presence of released material in consumer products and recommended that NRC should prohibit the release of this material and isolate it from public use. Some of these commenters further suggested that material previously released from nuclear facilities be identified and recaptured.

Other commenters pointed out that there was a need for a national standard in this area because of lack of consistency in criteria and implementation. These commenters also noted that the levels discussed in the Issues Paper are in the range that scientific studies consider negligible and are a small fraction of the current NRC public health criteria in 10 CFR Part 20. With regard to an approach that would prohibit releases, nuclear industry representatives were concerned that a prohibition of this type had the potential for disrupting normal day-to-day operations and would be a significant waste of resources with no accompanying health benefit. Several commenters suggested NRC adopt the American National Standards Institute (ANSI) N13.12, Surface and Volume Radioactivity Standards for Clearance. Others suggested that a broad spectrum of materials should be included in a rulemaking to cover the day-to-day decisions on materials that move into and out of licensed facilities and have either very low amounts of, or no, radioactivity.

While the Issues Paper suggested possibly restricting release of materials to only certain authorized uses as a way to keep the material out of consumer products, most commenters thought that this approach would not work because such restrictions would be ineffective and burdensome to use. Also, it was noted that unrestricted use criteria would still be needed because restrictions would only last for the lifetime of the authorized use. The only restriction believed to be workable was to reuse or recycle the material to some other use within the nuclear industry, although some commenters suggested restricting the material to landfill sites.

The public meeting transcripts and the public comments received by the NRC staff were collected and organized into a database to facilitate NRC staff review of the public comment. This report provides a detailed summary of the public comments and meetings, as well as major trends in the comments. The report covers letters received from April 20, 1999 to May 3, 2000. A listing of commenters is found in Appendix B. The comments were organized into issues and sub-issues for each of the process alternatives, development of a technical basis, procedural issues, international issues, materials for consideration, questions about

approach, reference documents, and specific regulatory language.

Comment summaries are found in Chapters 2 through 13 and include a unique commenter number listed in parentheses. Comments categorized from transcripts of the public meetings have a comment number beginning with the following letters based on the specific meeting:

San Francisco CA:	SF
Atlanta, GA:	AT
Chicago, IL:	CH
Rockville, MD:	MD

Written comment letters have been given a commenter number corresponding to the docket number assigned to that letter. Although an individual or organization may have addressed an issue in several comment letters or in a meeting and a comment letter, the summary includes reference to that commenter only once for any given issue.

Some individuals chose to submit duplicate copies or excerpts of form letters. Only the original comment letter (i.e. the first letter received) has been included in the summary. The number of individuals submitting duplicates or excerpts of each given form letter is written next to the original comment letter number and identified by an asterisk (e.g., XXXX-X * # similar comment letters). Similar notation is used for letters received with multiple under signers (e.g., XXXX-X * # of under signers).

Readers can identify the commenter numbers applicable to an individual or organization by referencing Appendix B. Alternatively, the reader may identify the individual or organization name applicable to a comment number by referencing Appendix C. Appendix B also identifies the subsections in Chapter 2 through 13 for issues addressed by that commenter.

2.0 PROCESS ALTERNATIVES FOR CURRENT NRC PRACTICE OF CASE-BY-CASE REVIEWS

On the basic question of whether NRC should proceed with a rule, many commenters suggested that NRC take some action. Typically, such actions could only be taken after a rule is promulgated or modified. Many of these same commenters also expressed reluctance or opposition to NRC initiating a rulemaking, and would like NRC to further restrict the release of materials. A few commenters expressed clear opposition to a rule. Others either did not state an opinion or expressed mixed views.

Commenters expressed dissatisfaction with the status quo -- most said the current case-by-case approach to clearance is inadequate. Many environmentalists and private citizens dislike the current system because they do not want contaminated material to be released, while some nuclear industry representatives want a clearer and more consistent standard.

2.1 SUPPORT THE CURRENT CASE-BY-CASE DECISION PROCESS

A few commenters expressed support for the current case-by-case decision process and for the use of Regulatory Guide 1.86.

- Regulatory Guide 1.86, "Termination of Operating Licenses for Nuclear Reactors," has worked well (0070-9) (0427-5-1) (AT019-6) (CH008-11-1) (AT009-2)
- Public concern with NRC activities is currently very low (CH015-18-2) (CH020-8) (MD001-46) (MD003-9)
- Current system is adequately protective of public health and safety (0251-7) (0357-2) (CH014-16)
- Additional rulemaking will generate large quantities of materials that will need to be disposed (0251-7)
- Current process allows the public to receive a full description of all items being released (0484-6)

2.2 SUGGESTIONS FOR IMPROVING CASE-BY-CASE SYSTEM

Some commenters had specific suggestions for making improvements to the current case-by-case system.

- Produce a multi-agency guidance document based on risk/dose considerations that provides acceptable methods for decision-makers to make case-by-case determinations (0070-13)
- Specify material and release scenarios to be addressed and develop realistic guidance on codes to be used in case-by-case development or analysis (AT019-7)
- Current doses for tritium and carbon-14 in Regulatory Guide 1.86 are approximately 1,000 times too low (AT019-7)
- What problems have been encountered with the current case-by-case system? (0520-21)
- If a rule is not issued, Regulatory Guide 1.86 should be reviewed to determine if the surface contamination criteria adequately protect public health, safety, and the environment; those criteria that cannot be justified on a health and safety basis should be revised (0070-10)

2.3 OPPOSE THE CURRENT CASE-BY-CASE SYSTEM

For those commenters expressing dissatisfaction with the status quo, a number of reasons were provided.

- Generally oppose the current case-by-case system (0194-5) (0521-2) (0586-1) (0596-3* 1 similar comment letter)
- Didn't have enough information to make an informed decision regarding the case-by-case system (0520-26)
- Efforts should be redirected to re-capturing already released wastes and materials (0649S-6)

Health and Safety

- It allows too much radioactive material to be released (0002-8-4) (0044-10) (0045-4* 141 similar comment letters, additional 54 under signers) (0067-4) (0068-4) (0069-3) (0074-2) (0075-6-1) (0078-5-1) (0095-5) (AT008-22) (CH001-10-1) (CH002-5-1) (CH013-1)(CH027-7) (CH027-16-1)
- Release of any quantity is harmful to public health (0191-3)
- It is not protective of public health (0469-1) (0687-3-1) (MD008-7)

Implementation

- It can entail redundant oversight between NRC and states (SF024-3-1)
- It lacks credibility – unable to minimize the potential for problems or failure of the system (0570-8) (0070-72-1) (CH027-31-1) (MD008-30) (MD012-25-1* 1 similar comment letter) (SF001-3)
- It lacks enforceability (0649S-9) (CH027-31-1) (SF001-28)
- It is costly (0531-2) (0682-13)
- It is burdensome - lacks clarity (0057-7) (0070-9) (0531-2) (0564-1) (0740-1) (AT008-20) (AT019-6) (CH019-5-1) (MD018-20-1) (MD022-5) (MD024-1)
- It is inefficient (0070-19) (0497-3) (0531-11)

Consistency

- It lacks consistency and predictability (0070-9) (0167-5) (0422-16-1) (0469-1) (0497-3) (0531-11) (550-3) (0564-1) (0596-27* 1 similar comment letter) (0682-13) (0683-5) (0687-3-1) (AT021-3-1) (AT008-10-1) (SF001-26) (SF006-2) (CH012-45-1) (CH018-2-2) (CH019-3-1) (MD002-3) (MD018-7) (MD022-18-1) (MD024-1)
- Inconsistencies make it confusing for industry and nuclear licensees (0531-11)
- It does not provide the same level of quality as is in place for contaminated liquid and gaseous effluents (0497-3) (0531-2) (0550-3)
- Varying levels of released materials could have negative international implications (SF014-38)

Procedural

- It does not allow adequate public involvement (MD008-30)
- Agreement states should not have authority to release radioactive material into the public domain (0854-2)
- Ongoing recycling of radioactive material is in violation of National Environmental Policy Act (NEPA) and the public requirements for openness (0031-26)
- Regulatory Guide 1.86 was not intended to release radioactive materials into the marketplace (0649S-12)

3.0 PROCESS ALTERNATIVES FOR A POTENTIAL RULEMAKING

3.1 PROCESS ALTERNATIVES - GENERAL

Opinions vary widely on what type of regulation is needed. Private citizens and citizen/environmental groups commented primarily in support of prohibition while many industry and government representatives favor some type of dose-based standard.

3.1.1 Support development of a dose-based standard on release of solid materials

A number of commenters expressed support for development of a dose-based standard for various reasons.

- Generally support development of a dose-based standard (0022-2) (0030-3-1) (0038-4-1) (0042-2) (0057-4-1) (0070-8) (0127-1-1) (0139-1) (0167-1) (0212-1) (0321-5* 1 similar comment letter) (0422-3) (0427-11) (0469-5) (0489-1-1) (0493-2-1) (0497-4) (0531-1) (0549-1-1) (0550-2) (0551-2) (0564-3) (0615-2) (0623-3-1) (0638-9-1) (0639-3-1) (0643-1-1) (0644-4-1) (0681-1-1) (0682-1) (0686-9-1) (0740-2) (AT002-10-1) (AT005-16-1) (AT013-16-1) (AT016-14) (AT018-2) (AT021-2) (CH008-5) (CH011-3-1) (CH012-45-2) (CH014-10-2) (MD002-7-1) (MD015-20-1) (MD022-18-2) (MD024-15-1) (MD030-5-1) (SF001-9-1) (SF006-6-1) (SF015-3) (SF017-7-1) (SF026-4-1)

Health and Safety

- Improve public safety (0531-3) (0550-6) (0615-9) (0639-2) (0681-2) (0682-3)

Economic/Cost

- Be cost effective compared to the status quo (0057-9) (0070-8) (0497-6) (0531-13) (0659-30) (AT005-16-1) (SF001-9-1)
- Reduce unnecessary regulatory burden (0022-4) (0057-29-1) (0070-72-2) (0198-3) (0497-6) (0531-13) (0681-2) (0682-15) (MD007-11-1)
- Maximize use of resources through recycling and reuse (0422-9) (0531-8) (0682-5-1)
- Reduce costs associated with routine checking of materials for contamination if wastes are not released (0045-14* 141 similar comment letters, additional 54 under signers) (AT005-6-1)
- Increase the efficiency and effectiveness of the NRC by eliminating the need for case-by-case analyses and reviews (0070-19)

Consistency

- Provide an appropriate scientific basis for consistent regulations (0197-3) (0407-2) (0497-6) (0531-3) (0615-9) (0644-1) (0681-2) (0682-12) (0740-6) (AT008-14) (CH008-5) (MD022-2) (MD030-5-1) (SF001-9-1) (SF006-6-1)
- Provide a consistent, nationwide regulatory approach to the clearance of materials (i.e., EPA, DOE and NRC) (0030-9-1) (0070-8) (0427-11) (0469-4) (0497-6) (0531-1)
- Support international interests that require development of a national standard (0497-6) (0672-1) (AT008-35) (MD025-5-1)

Public Trust/Confidence

- Increase public confidence (0022-4) (0070-72-1) (0198-3) (0422-23-1) (0427-26) (0489-1-1) (0493-2-1) (0497-6) (0531-13) (0549-1-1) (0550-2) (0551-2) (0564-3) (0639-3-1) (0643-1-1) (0644-4-1) (0681-1-1) (0682-1) (AT002-10-1) (AT016-14) (AT019-18-1) (MD006-5-2) (MD022-18-2) (SF006-24-1)

3.1.2 Oppose development of a dose-based standard

A number of commenters indicated opposition to development of a dose-based standard for various reasons.

- Generally, oppose a dose-based standard (0045-14* 141 similar comment letters, additional 54 under signers) (0122-3) (0135-2) (0136-2) (0145-3) (0149-1-2) (0182-4) (0207-2-1) (0208-5* 1 similar comment letter) (0209-2) (0215-4) (0216-2-1) (0217-4) (0219-2) (0228-2) (0230-6) (0235-4) (0242-3) (0244-6) (0246-3) (0252-4) (0253-2) (0255-2) (0270-2* 3 similar comment letters) (0294-5* 1 similar comment letter) (0305-4) (0307-2) (0309-4) (0329-2) (0330-3) (0338-4) (0370-1) (0379-2) (0392-4) (0397-3) (0410-1-1) (0417-2-1) (0456-2) (0488-2) (0492-3) (0508-1) (0514-2) (0520-25) (0529-5-1) (0553-3-1) (0554-2) (0567-18-1* 2 under signers) (0573-1) (0579-1) (0582-1) (0592-2) (0593-3) (0594-1) (0602-4) (0629-2) (0674-2* 1 similar comment letter) (0678-1) (0685-1) (0690-1-2) (0696-3) (0697-3) (0715-3) (0860-1)

Health and Safety

- Any standard that would release contaminated materials would not protect public health and safety (0002-6-1) (0008-2) (0012-6-1) (0031-2) (0032-5-1) (0033-5-1) (0043-6-1) (0044-2) (0045-4* 141 similar comment letters, additional 54 under signers) (0104-2) (0115-2) (0118-3* 1 similar comment letter) (0119-3) (0123-3) (0125-1) (0134-2) (0154-2) (0185-3) (0189-7) (0191-4) (0193-3) (0203-3) (0214-4) (0230-3) (0231-3) (0232-4) (0254-2-1) (0257-4) (0300-6* 1 similar comment letter) (0301-3) (0328-3) (0373-5) (0383-3) (0394-2) (0425-3) (0468-1* 1 similar comment letter) (0470S-1) (0488-8) (0511-2) (0523-4) (0524-1-1) (0540-1) (0558-1) (0573-1) (0575-2) (0583-1) (0601-3) (0607-2) (0616-4) (0619-2) (0626-5) (0635-1) (0636-1) (0645-7) (0684-3) (0704-2) (0704-4) (0709-2) (0725-2) (0732-3) (0743-1) (0842-2) (0843-2) (0856-2) (AT014-28-1) (CH001-10-2) (CH002-5-2) (CH017-32-1) (CH027-16-2) (MD012-26-1* 1 similar comment letter) (SF012-12-1)
- Could overexpose people - does not calculate multiple exposures or the synergistic effects of nuclide exposure with other toxins (0028-5) (0311-3) (0468-5) (0482-1) (0507-9) (0596-24* 1 similar comment letter) (0649-3) (0706-2-2)
- Negative environmental implications (0154-2) (0193-3) (0264-4) (0399-2) (0524-1-1) (0525-2) (0540-1) (0596-7* 1 similar comment letter) (0709-2) (0631-6)
- The health implications of radiation exposure are not fully understood (0111-2) (0147-3) (0297-5)
- A dose-based standard would be against the NRC's mission to protect the public from radiation (0100-2) (0146-3) (0184-2) (0236-6) (0239-3) (0278-3* 12 under signers) (0284-5) (0401-3) (0410-3) (0488-3) (0525-2) (0573-1) (0587-3) (0596-18* 1 similar comment letter) (0619-2) (0634-4) (0647-4) (0649-3) (0667-2) (0674-4* 1 similar comment letter) (0678-4) (0713-2* 1 similar comment letter) (0720-1) (0729-2) (0732-5) (0735-1) (0750-2) (0786-2) (0810-2) (0819S-2) (0821-2) (0825-2) (0832-1) (0833-1) (0837-2) (0861-1)
- The fact that radioactivity is in nature and may have already been released in some wastes does not justify allowing more to be released (0045-13* 141 similar comment letters, additional 54 under signers)

Economic/Cost

- The public does not perceive any direct benefits from releasing materials (0023-10) (0470S-3) (0647-1) (0808-1) (CH023-61-1)
- "Generally-licensed sealed sources" entering steel recycling facilities have cost millions of dollars ($8 to 25 million) to clean up; allowing more radioactive materials to be released will only make matters worse (0045-12* 141 similar comment letters, additional 54 under signers) (0567-15-2* 2 under signers) (0660-16-2)
- Cost of analysis and regulatory approval is too great (0074-7-1) (0307-4) (0357-3) (0520-18) (0687-3-2)
- NRC has not fully explored the effects such a rule could have on the metals industry (0164-3) (0463-4) (0570-22-1) (0687-3-2) (0832-3)
- The fact that it is difficult and expensive to monitor and control radioactive waste does not justify its release (0208-4* 1 similar comment letter)

Implementation

- It is not practical (0638-4) (MD027-16) (SF012-4)
- The scrap industry does not want to process scrap metal that has been free released (0395-66-1) (0567-22-1* 2 under signers) (0570-14) (AT014-29-1) (AT025-3-2) (CH016-24-1)
- Volumetric monitoring methods are not perfected (MD027-16)

- Measuring the potential dose is complicated and there is a high potential for contaminated materials to be released without use restrictions (0251-3)
- Would complicate the release process by creating new classes of licensees (0251-14)
- Would lead to an increased quantity of products being disposed of in limited LLW landfills (0251-14)
- It would not be enforceable (0647-1)

Procedural

- NRC has not fully examined all available options (0045-16* 141 similar comment letters, additional 54 under signers) (0155-4) (0240-5) (0403-2) (0642-4) (0687-3-2) (0649-3) (0779-2* 19 similar comment letters)
- What the rule would cover has not been adequately defined (0520-20) (0530-4)
- Appears to be industry driven rather than public health driven (0051-5) (0067-2) (0115-2) (0122-3) (0123-2) (0135-2) (0145-2) (0164-3) (0189-7) (0214-4) (0219-2) (0247-4) (0263-4) (0278-3* 12 under signers) (0284-5) (0300-6* 1 similar comment letter) (0313-3) (0344-3) (0357-3) (0358-2) (0416-4) (0418-3) (0419-7) (0468-2) (0486-5) (0488-10) (0520-2) (0525-2) (0532-3) (0559-4) (0596-28* 1 similar comment letter) (0618-2) (0646-2) (0647-1) (0649-3) (0675-1-2) (0678-8) (0694-3) (0698-1) (0707-2) (0713-2* 1 similar comment letter) (0714-1) (0732-3) (0743-1) (0745-1) (0765-4* 1 similar comment letter) (0817-2) (0819S-2) (0825-2) (0829-1) (0833-3) (0834-2) (0837-3) (0841-1) (0843-2)
- Violates NEPA (0638-6)
- NRC has not adequately justified the need for a rule (0832-3)
- Production of nuclear waste should be ceased by shutting down the reactors (0421-2)

Public Trust / Confidence

- Public perception that the government and industry are contaminating the environment (0427-80) (0790-1)
- NRC has failed in the past to keep radioactive materials from being released when they should not have been (0008-2) (0031-2) (0078-5-2) (0134-3) (0504-8) (0520-18) (0596-9* 1 similar comment letter) (CH017-31-2)
- Public concern is high because DOE's history of mismanagement, the technical challenges, and the direct impact on consumer products (0044-7) (MD008-54)
- Public will perceive such a rule to be de-regulatory in nature and thus lack confidence in public health protection (0647-1) (SF012-4)
- NRC cannot be trusted to comply with the law, possess basic competence, or tell the public the truth (0031-19) (0078-5-2) (0184-4) (0307-5) (0399-2) (0409-1) (0753-2) (0765-1* 1 similar comment letter) (CH031-5-2) (MD001-18-2)
- A negative public perception associated with contaminated materials (0146-1) (0567-11* 2 under signers) (0570-12-1) (0595-6) (SF019-6)
- Rulemaking lacks integrity, the results have been prejudged, and reasonable alternatives have not been considered (0023-2) (0031-7) (0278-2* 12 under signers) (0311-3) (0343-4) (0519-11) (0520-3) (0596-16* 1 similar comment letter) (0649-2) (0794-1) (0832-4) (CH031-5-2) (MD001-10) (MD005-19-2) (MD010-1)

3.1.3 Other options supported by commenters

A few commenters suggested other options for development of the standard.

- Develop unrestricted release levels first, then pursue restricted release for materials that don't meet those levels (MD006-22-1)
- Development of dose-based guidance is not sufficient to reduce inconsistencies of current regulations (0469-2)
- Base the standard on the National Council of Radiation Protection and Measurements (NCRP) recommendations for dose limits to individual members of the public (SF001-21-1)
- Consult Congress (0832-4)

3.2 IMPORTANT COMPONENTS OF A DOSE-BASED STANDARD

Regardless of their opinion regarding whether and how NRC should proceed, many commenters identified specific components or characteristics that any dose-based standard should include or address.

Health and Safety

- Maintain public health/safety (0001-18) (0027-7) (0043-6-2) (0044-8) (0057-29-2) (0070-72-2) (0132-10) (0427-23) (0489-1-1) (0493-2-1) (0516-3) (0531-6) (0549-1-1) (0550-2) (0551-2) (0564-3) (0628-2) (0639-3-1) (0643-1-1) (0644-4-1) (0681-1-1) (0682-1) (CH023-49-1) (MD008-20-8) (MD021-16) (MD022-18-3)
- Ensure that only a predetermined amount of radiation will be released (AT008-55-2) (AT019-18-2) (MD001-32-1) (MD005-9) (MD007-11-2) (MD021-16)
- Choose dose levels based on actual health risks for specific radionuclides (AT008-49) (AT025-12-1) (CH012-38-2) (MD001-51) (MD005-7-1) (MD010-6-2)
- Maintain minimum worker protection rule (MD008-7)

Economic/Cost

- Consider whether recycled material is acceptable to manufacturers who would use the material (CH030-10)

Implementation

- Be enforceable (0007-3) (0045-7* 141 similar comment letters, additional 54 under signers) (0528-5) (0659-11-2)
- Be technically defensible (0022-12) (0044-8) (0495-4) (0530-6) (0531-5) (0644-2)
- Be measurable and verifiable (0001-22) (0030-38-1) (0045-7* 141 similar comment letters, additional 54 under signers) (0530-7) (0531-10) (0537-7-2) (0659-11-2) (0665-24-1) (0673-24-1) (0740-3-1) (MD011-1) (MD023-4) (MD030-2-3)
- Establish penalties for individuals who break the rules or controls and make them accountable for activities (0074-4) (0528-1) (AT008-48)
- Consider potential for human error in implementation (CH015-2)
- Prohibit the use of dilution of radioactivity as a means of meeting clearance levels (MD027-22-1)
- Consider the implications of orphan sources that might have lower radioactivity levels than released materials (CH016-24-2)
- Be applied uniformly to all licensees (0037-2)
- Ability to track materials after release (0528-1)
- Allow states and local governments to establish more stringent standards to limit interstate commerce (0528-5)
- Allow flexibility in certain situations when the scenario chosen for standard does not meet the actual situation for a particular release (MD030-2-3)
- Eliminate unnecessary regulatory burden on the metals industry (0531-5) (0570-11) (0643-2)
- Re-evaluate tables in 10 CFR on exempt concentrations and exempt quantities to ensure there is no confusion (0357-5)

Consistency

- Establish clear and consistent standards (0057-29-2) (0132-10) (0422-23-2) (0427-23) (0531-5) (0537-7-2) (0644-2) (0659-108-1) (0672-2) (AT005-16-2) (AT013-16-2)(AT014-14) (AT021-3-2) (CH019-3-2) (MD002-7-2) (MD012-47-2* 1 similar comment letter) (MD015-20-2) (MD021-3-1) (MD022-1-2) (MD024-15-2) (MD030-5-2) (SF001-27-1) (SF006-24-2) (SF013-8-1) (SF015-1-2) (SF017-13)
- Maintain consistency with international standards (0132-10) (0167-9-1) (0537-2-3)

Procedural

- Consider historical problems associated with releases (AT017-5) (CH017-30)
- Continue to allow 10 CFR 20.2002 alternate disposal requests for unique situations (CH014-40)

- Close any current regulatory gaps present in the case-by-case process (0001-18) (MD018-20-2)
- Include a grandfather clause for previous case-by-case clearances (0564-11) (AT024-23-1)
- Define volumetric criteria for the unrestricted release of solid materials (0070-14) (0644-2)
- Allow facilities to continue to use decay in storage as a method for releasing materials (MD011-14)
- Establish different standards for landfill disposal and recycling (0422-23-2) (0612-3-4)
- Conserve resources through recycling (0138-6)
- Build on current industry practices (0643-2)

Public Trust/Confidence

- Build public trust and confidence in the regulatory systems (0007-3) (0031-42-2) (0395-47-2) (0422-23-2) (0427-23) (0516-3) (0570-11) (AT008-3) (CH018-31-1) (CH023-16-1) (CH030-14-2) (MD001-47) (MD012-47-2* 1 similar comment letter)
- Need more public understanding (through education) and involvement (0001-13) (0001-15) (0044-8) (0057-32-1) (0274-2) (0395-41) (0427-13) (0528-5) (0530-5) (0643-2) (CH012-4) (MD006-5-1)
- Resolve perception issues related to reuse and recycling of radioactive materials (CH018-31-1) (CH023-16-1) (CH030-14-2) (MD021-8)
- Stakeholder concurrence should be required (0530-6) (0570-11) (CH023-27) (MD003-11) (SF026-48-1)
- Ensure that industry efforts to build public confidence are not undermined by NRC actions (CH030-14-1) (CH031-5-1) (MD001-38-2) (MD008-2) (MD028-3) (MD034-4-2)

3.3 QUESTIONS ABOUT GENERAL APPROACH

Many commenters raised questions that could affect their opinion regarding a rule or another approach.

Health and Safety

- Is there accurate, scientific proof that recycling contaminated materials will not adversely affect public health? (0649-3)
- Why do potentially contaminated materials exist? If areas of a facility are not supposed to be contaminated, isn't there a bigger issue here? (0520-22)
- Why has radioactive waste made its way into general commerce? (0764-1) (0768-1)

Economic/cost

- Is there such high demand for steel that this type of rule is necessary? (0331-2) (0520-19-1)
- How has NRC defined "public benefit" in relation to this rulemaking? (0482-3)
- How many case-by-case analyses is NRC performing annually and how many hours are spent doing that? (MD005-13)

Implementation

- In order to form an opinion, would like a better understanding of how the case-by-case system works (AT025-4)
- Are there presently release standards for plutonium and does NRC know how much plutonium has been released? (MD008-27)
- If the NRC reduces the number of inspectors as envisioned, won't the NRC have to change the case-by-case process? (AT024-10)
- Who will be held responsible if levels are violated? (0074-7-2)
- How will the NRC keep the public informed about what products include recycled contaminated materials and their respective levels of contamination? (0678-3)
- What unnecessary regulatory burdens currently exist? (0520-28)

Procedural

- Can NRC account for material released in the past? (MD008-11)
- Is it possible to develop a standard with a graded approach that requires more restrictive release levels for materials for which survey techniques are less certain? (AT005-8-2)
- Has NRC examined the relationship of this rule to 10 CFR Part 31.5? (MD015-6)
- What authority and responsibility in this process is retained by EPA and the Agreement States? (CH023-2-1)
- Did Tennessee have a right to allow Manufacturing Science Corporation to release volumetrically contaminated nickel? (MD008-17)
- What input has EPA had on this issue? (0387-3)
- What is the basis or reason for NRC pursuing this rulemaking? (0376-1) (0761-1)
- Why hasn't the NRC taken DOE's habitual safety and compliance problems into account? (0649-3)
- What lessons can be learned from the failure of the licensing process in the precedent setting Oak Ridge case? (0031-32)
- What will "consistency" mean for solid releases? (0649S-9)

Public Trust/Confidence

- Has there been a public outcry against reusing recycled contaminated materials? (CH020-16-1)
- How can the relative risks from recycling contaminated materials be illustrated to the public? (CH020-19-2) (MD005-10)
- Can the NRC provide additional information about uses of scrap metal with radioactive contamination? (0331-2)
- Can the NRC provide a historical perspective regarding the timing as well as the amount and types of material that have been free released on a case-by-case basis? (MD003-4)

3.4 DECISION MAKING FACTORS

Concern for public safety was the reason most commonly cited for NRC to take action. Numerous commenters thought NRC action is required to improve public safety.

Many commenters expressed a need for NRC to improve public confidence in its regulatory system. A few commenters suggested that nothing NRC could do would improve public confidence. A few commented specifically on whether a dose-based clearance standard should or could do so. Those commenters thought taking action would build confidence and others thought taking action would not.

Some commenters cited the need to reduce regulatory burden as a reason for NRC to take action. These comments came generally from the nuclear industry, utilities, and state governments, who indicated that it would result in overall improvement of the regulatory process.

Other commenters cited the need to reduce compliance costs as a reason for NRC to take action.

Health and Safety

- NRC should evaluate and minimize the radiation exposure to adults and children (0194-3) (0297-7) (0311-5)
- Simply utilizing material in a radiologically controlled area does not mean it is contaminated or hazardous to workers or the public; regulating these materials would result in needless increases in radioactive waste and impede routine facility operation (0427-34-1) (0497-18) (0613-31-2) (0659-109-1) (0673-25-1) (MD023-5-1) (SF002-8-1) (SF008-4-1) (SF023-6)

Economic/Cost

- NRC should weigh the risks related to free release with the risks of delaying the decommissioning of nuclear facilities (0613-22)

Implementation

- The proposal, as outlined in the Issues Paper, threatens the ability of licensees to be able to move materials and equipment out of radiologically controlled areas (RCAs) (NRC85-4-2)
- There is currently not enough waste disposal capacity for low level radioactive waste; restricting the release of materials would exacerbate the landfill capacity shortage (0613-19)
- Alternatives should account for surveying necessary to prove materials that have been in radioactive areas are not contaminated (SF023-7)
- Use of radioactive waste should be forbidden or at least fully disclosed until health risks are known (0846-1)
- Who will be held liable if the proposed NRC standards are violated? (0045-13-2* 141 similar comment letters, additional 54 under signers)

Procedural

- NRC should include quantitative uncertainty in its analysis (0519-9)
- Expressed dissatisfaction with NRC's proposed options because they are biased toward deregulation (MD001-2) (SF004-9)
- Inherent differences between reuse of metals and disposal of materials in landfills requires at least two standards (0612-9)
- The status quo – no unrestricted release – must be a fairly and equally considered alternative (0031-3)

Public Trust/Confidence

- Incorrect scientific theories and computer models have caused serious problems in the past; NRC should be mindful of their duty to the American public (0646-3)
- Decision has been prejudged by NRC (MD010-3)
- Public participation is critical for characterizing legitimate concerns and shifting focus from unnecessary concerns (0469-7)

4.0 TECHNICAL APPROACH - UNRESTRICTED RELEASE OF SOLID MATERIALS

4.1 UNRESTRICTED RELEASE OF SOLID MATERIALS - GENERAL

The nuclear industry, medical facilities, and utilities generally favored unrestricted release. Citizen/environmental groups were generally opposed to unrestricted release. Although the metals and cement industries did not want released materials to come to their facilities for recycle or reuse, they generally supported the concept of unrestricted release.

4.1.1 Support the unrestricted releases of materials using a dose-based standard

Commenters supporting unrestricted releases using a dose-based standard indicated a need for a release level.

- Generally support unrestricted releases using dose-based standard (0030-14-1) (0212-2-2) (531-4) (0612-6) (0665-13) (0673-9) (682-2-2) (AT008-2-1) (AT025-11-1) (CH012-45-3) (MD015-14-1)

Health and Safety

- It maximizes public safety (0057-29-3)
- Releasing low-level materials has low risks (0613-31-1) (CH020-19-1)
- There are limits as to what can be detected and is harmful - below these levels, material should be released (0407-6) (AT008-5) (SF008-4-1)

Economic/Cost

- It can result in economic benefits through cost savings (potentially releasable materials have increased value) (0057-29-3) (0070-26-1) (0406-2) (CH014-32-1) (CH019-4)
- Would result in significant societal benefits (0682-2-2)
- Use of nuclear materials in manufacturing and medicine is vital to our health and economy (0058-3)
- There is a wide range of materials that might be affected and a value in allowing reuse (CH014-66)

Implementation

- It is easier to apply than other scenarios (0070-26-1)
- It maintains consistency with current regulatory framework (0057-29-3)
- Would be relevant and appropriate to use for developing release criteria for solid material at CERCLA sites with radiological contamination that are not subject to NRC licensing (0612-12)

Procedural

- Need measurable limits for unrestricted releases (0665-7)
- Levels are predetermined and consistent with air and water release limits specified under current EPA and other regulations (0057-5) (CH012-38-1)
- Levels are determined through a robust rulemaking process (0070-26-1)
- Continue to allow case-by-case evaluation for the release of materials above the release criteria (0469-9) (AT008-37-1)
- The dose is controlled and limited to people who transport, handle, and process recycled scrap (0022-9)
- Any new regulations do not prohibit other levels of government from enacting more stringent standards (0070-4-1)

4.1.2 Oppose unrestricted release

Commenters opposed to unrestricted release stated concerns about public safety.

Health and Safety

- Concerned about the safety of radioactive material (0002-6-2) (0012-6-2) (0044-2) (0045-13-2* 141 similar comment letters, additional 54 under signers) (0495-2) (570-31-2) (AT014-28-2) (CH017-28-2) (CH027-16-3) (MD001-52-2) (MD012-47-3) (SF012-12-2)

Implementation

- It will create a large new pool of contaminated scrap steel that will "trip" alarms at steel mills that are set very close to background to detect orphan sources (0570-34-1) (CH016-22) (MD017-5-1) (MD028-15-2) (SF012-3)
- Unable to trace materials after they have been released (0045-13-2* 141 similar comment letters, additional 54 under signers)

Public Trust/Confidence

- Major questions remain that should be cleared through fact-finding regarding: Oak Ridge metal recycling that is in violation of environmental law; Tennessee's lack of authority to allow recycling of volumetrically contaminated material; government practice of keeping radioactive material releases secret from the public; NRC's contractor conflict of interest; organizations publicly releasing radioactive material are not competent to do so; failure of the DOE and recycling contractors to provide for worker safety; and NRC predecessor's sanctioned release of contaminated material without public notice (0031-63-1)
- Past government practices do not give the public confidence in NRC's ability to ensure that released materials are safe (0031-25)

4.2 SUGGESTIONS FOR CRITERIA ON INDIVIDUAL DOSE LEVEL

Some commenters expressed support for a specific dose-based level for unrestricted release. Numerous commenters backed the 0.01mSv/yr (1 mrem/yr) dose level. There was no strong preference among those commenters supporting the other specific dose-based levels, i.e., background, 0.1 mSv/yr (10 mrem/yr), and 1 mSv/yr (100 mrem/yr). There was notable support for the position that no dose level is acceptable.

4.2.1 Suggested levels

- No individual dose level is acceptable regarding the release of solid materials from licensed facilities for unrestricted use (0002-3-2) (0021-3) (0028-6) (0032-3) (0045-8* 141 similar comment letters, additional 54 under signers) (0074-3) (0095-2) (0104-3) (0115-3) (0118-2* 1 similar comment letter) (0119-2) (0122-2) (0123-4) (0126-2) (0135-1) (0146-4) (0147-1) (0148-2) (0151-2) (0156-3) (0157-3) (0160-3) (0163-2) (0164-2) (0166-3) (0168-3) (0169-3) (0182-6) (0189-3) (0190-5) (0192-4) (0195-3) (0196-2) (0200-3) (0206-3) (0213-3) (0214-3) (0215-3) (0217-3) (0218-3) (0225-2-1) (0232-3) (0235-2) (0236-5) (0244-4) (0247-2) (0256-4) (0260-4) (0263-3) (0264-3) (0281-2) (0284-3) (0290-3) (0294-4* 1 similar comment letter) (0297-4) (0299-3* 1 similar comment letter) (0310-3* 2 under signers) (0314-4) (0315-3) (0316-3* 10 similar comment letters) (0321-3* 1 similar comment letter) (0322-3) (0324-2) (0325-2) (0326-3) (0328-2) (0338-3) (0341-3-1) (0344-2) (0380-2) (0383-1) (0392-2) (0397-2) (0400-2) (0401-2) (0416-3) (0417-2-2) (0418-2) (0419-6) (0425-2) (0426-3) (0427-4) (0451-2) (0456-3-2) (0459-2-2) (0463-2) (0468-4) (0491-4) (0492-2) (0494-2) (0499-4) (0504-3) (0506-1) (0507-7) (0516-2) (0517-1) (0521-4) (0523-2) (0525-3) (0540-2) (0548-2) (0559-3) (0563-2) (0575S-1) (0583-2) (0587-2) (0593-2) (0594-2) (0595-3) (0596-20* 1 similar comment letter) (0611-4) (0616-5) (0619-3) (0626-4-1) (0633-1) (0634-2) (0638-5) (0645-4) (0647-2) (0669-2) (0674-3* 1 similar comment letter) (0675-1-1) (0676-1) (0684-2) (0694-2) (0697-2) (0704-3) (0710-2) (0713-3* 1 similar comment letter) (0714-1) (0715-2) (0720-3) (0732-4) (0737-2) (0745-2) (0747-2) (0752-2) (0754-2) (0834-2) (0841-1) (0849-2) (0852-2) (0853-2) (0859-1)

- Supports a level of 1 x 10^{-5} mSv/yr (0.001mrem/yr) (0519-2)
- Support a level of 0.01 mSv/yr (1 mrem/yr) (0030-19) (0042-3) (0132-6) (0167-10) (0469-11) (0610-2) (MD030-2-2)
- Supports a dose-limit of 0.01 mSv/yr with case-by-case determination for releases at concentrations up to 0.1 mSv/yr and for small volumes of material with a restricted use by licensee (0070-29)
- Support the ANSI N13.12 standard (0.01 mSv/yr; 1 mrem/yr) (0098-1-1) (0105-4) (0126-1-1) (0138-4) (0139-3-1) (0167-2-1) (0198-4-1) (0357-7) (0406-3) (0498-2-1) (0537-2-3) (0564-4) (0615-11-1) (0658-5-1) (0681-4-1) (0682-11-1) (MD030-2-2) (SF001-5-1) (NRC55-1) (NRC85-8-2)
- Support a level of between 0.01 mSv/yr and 0.05 mSv/yr (1 and 5 mrem/yr) (0089-3) (0497-12) (0550-5-2) (0682-9) (0740-3-2) (99-33)
- Support a level of 0.1 mSv/yr (10 mrem/yr) (0038-4-2) (0057-13) (0531-7) (0659-5) (0683-6) (MD038-1)
- Support a level of 0.25 mSv/yr (25 mrem/yr) (0564-6)
- A level below 1 mSv/yr (100 mrem/yr) is feasible even if the three major effluents (air, liquid, and solid) are summed (SF001-16-2)
- Support a level of 1 mSv/yr (100 mrem/yr) or higher (0030-10) (0057-22) (0089-2-1) (0665-14) (0673-10) (SF001-22-1)
- Support a level higher than those proposed so that reasonable survey practices can be used (0537-6)
- Set level at background (CH027-11-1)
- Set level as low as reasonably achievable (ALARA) (0518-1-2) (0520-6) (AT022-2) (SF001-24-2) (SF014-45)
- Set at the lowest level that has consensus among expert groups and agencies (0070-19)

4.2.2 Aspects of selecting acceptable levels

Where commenters specified individual protection levels, they varied from risk to concentrations to dose, and to combinations thereof.

Health and Safety

- A dose-based ANSI standard should be sufficient to protect the public and the environment without any further restrictions on the released materials (0564-7)
- Appropriate clearance levels set by rulemaking would contribute to maintaining public safety by requiring an assessment of the cumulative impacts of all materials likely to be released (0070-18)

Procedural

- Support risk-based levels (AT025-12-2) (0212-3) (0139-2)
- Support dose-based standards/criteria (0038-4-2) (0070-11) (0570-33-1) (0612-3-4) (0659-110-1) (0665-14) (0673-10) (CH11-3-2) (CH012-38-3) (NRC85-1-1) (SF009-1-2) (SF001-16-1)
- Support concentration-based values (0070-27) (0613-12) (0682-26) (CH012-38-3) (CH014-49-2) (SF005-19-2) (SF009-1-2)
- Make clear assumptions about the link between dose and concentration so the standard can be practically implemented (AT008-18)
- The level should be set so that reasonable survey practices can be used (0407-7)
- Need a contextual relationship between the limits and worker protection programs (0001-20)
- Do not set the release level at the lowest level detectable (MD011-24-2)
- The rule does not have to establish activity concentration limits even though it may be "dose-based" (0683-7)

4.2.3 Factors to consider in developing a dose level

Commenters identified a number of issues that should be factored into the development of a dose-based protection level.

Implementation

- There is not much difference between a dose level set at 0.05, 0.1, or 0.15 mSv/yr (5, 10, or 15 mrem/yr) and the levels should not necessarily be the same for all isotopes (0001-27-1)
- Dose level of 0.01 mSv/yr (1 mrem/year) is negligible (CH008-4) (MD011-1) (MD024-10-1) (SF013-12) (0613-4)
- Level will be dependent on the specific radionuclide and quantity of material (AT002-12) (CH012-38-3)
- Dose criteria significantly above the proposed range of 0.001 to 0.1 mSv/yr (0.1 to 10 mrem/yr) would result in constraints on the release of material up to forty times more restrictive than current levels and might make release totally impractical (0022-10)
- Must be able to differentiate between naturally occurring radiation and contamination (MD015-11-1) (SF001-15)
- Exposure to critical group yields a standard that is too conservative to be practically implemented (0030-7) (0615-3)
- Copper, stainless steel, and nickel smelters do not want any material with greater than background concentrations (CH027-11-1)
- The assumptions used in NUREG 1640 are too conservative and lead to a result that is impossible to implement (0682-21) (NRC85-1-1)

Consistency

- Include an evaluation of the impacts of currently exempted consumer products in setting unrestricted release levels (0070-16-1)
- The apparent dual standard for release of materials between fuel cycle facilities and materials licensees suggests that NRC is less stringent toward the nuclear industry (0395-48)
- The focus on dose does not address particular isotopes such as plutonium and transuranics (MD008-25-1)

Procedural

- Setting the dose level at twice background is not recommended because it would yield a wide range (CH012-47-1)
- ANSI standards do not produce realistic surface clearance values (0673-17)
- Must identify all potential exposure pathways to people (0649-6-1) (AT005-5-2) (CH012-38-3)
- Focus the dose on the reasonably maximally exposed individual instead of the average person in the critical group (0044-12) (MD001-31) (MD012-28) (SF019-9-2)
- Don't base a rule on collective doses because it's individuals who bear the risks (MD012-43-2* 1 similar comment letter)
- Ensure individual doses are ALARA and include the potential impact from the liquid and gaseous effluent pathways (0659-33)
- The research on the steel industry used to develop NUREG 1640 was too limited and biased the results (0395-10)
- In accordance with IAEA Safety Series 89, derived clearance values should be based on the average dose to the member of a critical group, not the maximally exposed individual (0665-16) (0673-12)
- Treat radiation the same way as any other hazard in terms of evaluating risk (SF014-23)
- Need to look at long term effects of release and recycling (MD019-3-1)
- NRC should consider:
  - -- whether the radionuclide remains in the recycled material or partitions into a byproduct of the recycling process (0044-14)
  - -- the type of radiation the radionuclide emits (0044-14)
  - -- the residence time of the radionuclide in an individual once it is ingested (0044-14)
  - -- the radionuclide's half-life (0044-14)

- Concentrations of radiation can vary along a pathway – need to take this into consideration (SF0006-12) (SF019-9-1)
- Make sure to account for cultural biases that can increase pathways of exposure for some populations as they can lead to mistakes and omissions (SF014-19-1)
- There can be variability in the dose from metal products made from the same batch of steel (SF006-12)
- Uncertainty of what is going to happen downstream as we recycle carbon steel, nickel, copper, aluminum, etc. (SF026-8)
- Consider end-use exposure, not exposure at release (AT017-13)
- Use dose assessments only if you know what the secondary uses are and how the material will be used (SF006-16)
- Consider endpoints other than just cancers and gross genetic defects, such as diseases referred to in the Biological Effects of Ionizing Radiation - V (BEIR-V) report (MD012-38* 1 similar comment letter)
- Testimony from people living in contaminated houses shows high rates of cancer, and people in authority need to evaluate this information (CH025-4).
- These substances have latent, long-term effects that are not directly traceable. How do you explain a cancer 30 or 40 years from now? (CH015-31-2)
- Dose levels should take into account worker safety, facility protection, and consumer acceptance of those levels (CH023-26-2)
- Uncertainties associated with the low doses in the population groups lend no credence to doing the collective dose evaluation. At low dose levels consider individual doses (SF001-30)

Public Trust/Confidence

- Evaluate public perception of risk in the economic impact study since public perception seems to be negative (CH018-6-1) (0660-13)
- Although a rule might be considered safe now, future improvements in understanding health risks could prove that a rule allows dangerous levels of release and should never have been passed (0075-6-2)
- Create a series of benchmarks to show the public the exposures that come from natural sources, such as foods (CH012-10)

4.2.4 Questions about individual dose level

Some commenters raised questions associated with the use of a dose-based level.

- How does a potential radiation dose an individual receives from a standard compare to the dose received from other radiation sources or from natural background levels? (CH015-11)

Implementation

- Who will be held liable if the proposed NRC standards are violated? (0045-13-2* 141 similar comment letters, additional 54 under signers)
- How will the dose level be practically measured by people releasing or accepting released material? (AT017-10) (CH023-15-3)

Procedural

- Has the Commission developed a per person rem value to be used to calculate the costs associated with reducing dose levels? (AT013-6-1)
- What is the definition of background? (MD003-13-2) (0613-28-1)
- Has NRC evaluated the effect of the build-up of radioactive metal over time in the overall metal stock? (AT025-7)
- Has anybody looked into bench marking already established practices and using that as the basis for extending rulemaking to other

recycling or other distribution of radioactive material? (CH022-4)

Public Trust/Confidence

- How can individuals measure their cumulative exposure, learn about the risks, or reject doses from released materials? (MD012-5-1* 1 similar comment letter)

4.3 PRACTICAL CONSIDERATIONS FOR UNRESTRICTED RELEASE

4.3.1 Capability of surveying materials at the different alternative dose levels being considered

Although few commenters addressed this issue, those commenters who did provided a variety of views on the types of surveying that should be required to demonstrate compliance, difficulties and limitations of surveying different types of materials at different levels, the types of surveying currently conducted at different types of facilities, and the costs associated with surveying.

4.3.1.1 General survey technology considerations

A number of commenters raised issues for consideration when developing a standard that may require use of survey technology.

Health and Safety

- A health-based standard should be developed because an instrument-based approach is not appropriate for NRC's health and safety based charter (SF014-14)
- Downstream users at landfills or steel plants are not qualified in survey techniques required to isolate and separate materials that could be potentially hazardous to employees (CH007-4)

Economic/Cost

- Non-licensees should not have to be burdened with purchasing equipment to protect themselves (0427-51)
- Obtaining the appropriate survey instrumentation will be difficult for industry (AT005-15)

Implementation

- Field instruments must be used to perform surveys near contaminated area boundaries so that contamination is not spread (NRC85-6)
- The difficulties associated with surveying to a volumetric standard are no worse than those for a surface contamination standard such as Regulatory Guide 1.86 (0070-46)
- Implementation should involve: isotope by isotope analysis, surface vs. volumetric radioactivity reductions, measurement tables, and discontinued use of Regulatory Guide 1.86 (0001-24)
- Important that instruments are available to practically implement established levels (0001-8) (0013-4) (0044-21-1) (0659-20) (AT001-9) (AT005-4) (MD015-14-2) (SF001-6-2)
- Technicians must be properly trained (AT001-5)
- The ability to determine pathways and levels of exposure is necessary (AT005-1-1)
- Must ensure that the goal of the standards is commensurate with the available survey techniques (0564-8) (MD029-12)
- Dose-based levels of mSv/yr (mrem/yr) do not account for flux, or number of gamma rays emitted (AT014-11)
- Areas or volumes for averaging need to be large enough to be practical (AT019-10)
- Dispersion of materials will cause errors in monitoring and detecting other potential radioactive substances (0150-2)

- Material released under DOE Order 5400-5 or Regulatory Guide 1.86 would set off alarms if released to steel mills for recycling (MD017-6-2)
- NRC must consider the inherent uncertainty of instrumentation and the uncertainty in surveying large pieces of equipment (MD001-25)
- DOE has spent considerable effort in ensuring an effective decontamination technology exists for the removal of nickel from a gaseous diffusion plant (CH021-27)
- NRC needs to address the gap between levels identified in the NUREG 1640 analysis and actual detector levels of downstream users (CH014-63)
- Experiences at nuclear facilities indicate materials stored in controlled areas are either non-detectable or way above the detection limit (CH022-12-2)
- As technology becomes more sensitive the perception of acceptable levels may also change (SF026-33)
- The geometry of detection systems to implement a clearance standard may impact the ability to identify orphan sources (AT008-8)
- Survey technology is continually improving (CH023-41)
- A dose level of 0.05 mSv/yr (5 mrem/yr) represents less than two percent of natural background radiation received by people in the U.S. (0682-18-1)

Consistency

- Non-detectable should be clarified to mean nothing above background can be measured – multiple definitions are confusing (AT014-13) (CH008-14) (CH018-19-2) (CH020-20) (CH022-11)
- NRC needs to establish a consistent definition on what it considers to be background; different instruments measure background very differently (0469-6) (MD003-14-2) (MD012-24* 1 similar comment letter) (CH012-8)

Public Trust/Confidence

- NRC must convince the public that radioactivity levels are measurable (AT001-4)

Socio-political

- NRC needs to recognize the impact of a regulation allowing low volumetric contamination levels on states that prohibit the disposal of any radioactive waste other than naturally occurring material or household products (00070-16-2)

4.3.1.2 Current surveying capabilities

A number of commenters provided information about the capabilities of available survey technology.

Health and Safety

- Available technology can detect radiation well below what constitutes a health risk (MD006-26-2)

Implementation

- Testing at 0.01 mSv/yr (1 mrem/yr) is difficult with current survey instruments (0044-21-1) (AT006-2-2) (AT019-5) (SF014-14)
- Testing below 0.001 mSv/yr (0.1 mrem/yr) is difficult or impossible using current survey equipment (0659-108-2)
- Testing below background is not technically feasible (CH014-18)
- Setting value below 0.01 mSv (1 mrem) would lead to difficulties and potentially increased costs (AT006-2-2) (AT024-20-2)
- University laboratories can determine the isotope, its energy, and amount down to 10-15 μCi/g (CH012-7)
- Instrumentation is commercially available that can detect low levels of radiation, perhaps as low as 100 to 1,500 times lower than the 0.01 mSv (1 mrem) level for gamma radiation (MD017-9) (MD024-8)

- For the majority of radionuclides, 0.01 mSv/yr (1 mrem/yr) is detectable with available field instruments (SF001-29) (SF005-17)
- Clearance screening levels are too low and cannot be implemented (0615-6-2)
- Many gamma-emitting radionuclides will still be detectable at the proposed limits (0395-7)
- Licensees have readily available survey capabilities to detect radioactivity at the levels established in ANSI N13.12 (0682-25)
- Current guidance has large gaps related to environmental lower limit of detection (LLD) levels for volumetric contamination (CH014-18)
- NRC needs to consider the ability of industry to physically monitor the wide range of items to be released (0030-22-1) (0406-6) (SF015-7-2)
- A wide variety of background levels has been tested and measured (CH012-8)
- Monitors can test at 3 percent above suppressed background; but more commonly look at a range of 6-8 percent above suppressed background with very low false alarm rates (CH018-30)
- A 0.01 mSv (1 mrem) clearance level for surface activity and volumetric contamination would lead to relatively few changes for industry (AT006-2-2)
- State-of-the-art portal monitors at scrap facilities can detect 14 to 21 of the radionuclides that have decent gamma emission at the NUREG 1640 level (AT014-9)
- Newer digital instruments could have algorithms programmed during the calibration process making them switchable for different materials and surface qualities (0070-46)
- Instrumentation is sophisticated enough to adapt to a new market (0070-46)
- Monitoring systems are capable of detecting heavily shielded gauging sources in demolition type scrap (0395-5)
- Monitoring systems are capable of extended unmanned operation under all weather conditions (0395-6)
- Scrap industry detectors are set for low level NORM sources as well as orphan sources (MD026-3-1)
- University labs have the ability to perform in-situ measurements of radioactivity in soil, water, or large equipment (CH012-7)
- Volumetric measures depend on a wide variety of assumptions and techniques (SF005-17)
- Technology currently exists to detect volumetric contamination well below a health risk level (MD006-29)
- Concerned that current technology is not sufficient (MD017-11)
- Current technology is not sufficient to release large equipment from radiologically controlled areas at the levels proposed (CH020-3-3) (MD017-11) (SF010-3)
- Current guidance for survey monitoring sensitivity should remain constant (0057-20)
- Monitoring for the specific types and forms of radioactivity is not always accurate (0538-2)
- A 0.01 mSv/yr (1 mrem/yr) standard can be practically implemented (AT022-3)
- Decontamination methods are not efficient or effective and increase contamination (0645-13-2)

4.3.1.3 Potential limitations of survey instruments

Commenters identified potential limitations of available survey technology that may impact development of a standard.

Implementation

- Sufficient mass is necessary to utilize monitors and detect radioactivity (AT014-10)
- Surveying does not guarantee that a material is not contaminated at extremely low levels (0045-6* 141 similar

comment letters, additional 54 under signers) (CH020-13) (MD017-12)

- Differentiation between naturally occurring radiation (background) and contamination will be necessary for an accurate measurement (0044-21-1) (AT024-8) (MD015-11-2)
- Individual contaminated items may be below release levels, but exceed levels when combined in a load and a contaminated shipment (MD015-13)
- Survey equipment at steel plants readily detects gamma emitters but ignores non-gamma emitting radioisotopes such as Carbon-14 and Iron-55 (CH014-28)
- Survey measurements for radioactive contamination are difficult and challenging for large, complicated pieces of equipment, such as those found at DOE and NRC facilities (0044-21-1)
- Large measurement errors can occur if the concentration is not uniform or if the geometry of the contaminated piece is complicated (0044-21-1)
- Many NRC licensees still rely on field instruments, such as frisker probes, that were designed to meet guidance provided by Regulatory Guide 1.86 and IEW 81-07 and cannot measure to the proposed clearance levels (0615-10) (NRC85-6)
- Typical detectors measure in mrem/hr so if the standard is set at 1 mrem/yr (0.01 mSv/yr), it won't be measurable with current instrumentation (AT016-8)
- The lower the standard, the greater the implementation problems with natural background fluctuations (AT008-16)
- Decontamination to levels well below background will affect steel mill detectors which are constantly re-evaluating background (AT027-2)

4.3.2 Survey methods to assure materials from different areas of a facility that have varying potentials for contamination meet the criteria of a dose-based standard

Commenters expressed a variety of opinions regarding the circumstances under which surveying should be required in different areas of a facility and the type of surveying that should be required in these areas.

Economic/cost

- Concerned that NRC consider the financial resources that may be required for more sensitive detectors (MD011-7-2) (MD022-12)
- Support the "green is clean" program in which workers make the initial determination on whether a material has the potential to be contaminated before it is tested, thereby reducing economic burden (CH014-35)
- Support monitoring at point of release so that the metals industry does not incur all of the costs (CH004-1) (CH014-30-2)

Implementation

- NRC should conduct case studies to relate survey methods to various scenarios (AT005-14)
- A tiered approach, such as the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), should be used (0070-47)
- Stringent monitoring and sampling protocols are needed (0570-33-2) (AT014-27)

- Detectors must be capable of detecting alpha, beta, and gamma radiation (0570-33-2)
- Supports utilizing the same detectors at licensed facility and at scrap facility receiving licensee materials to try to streamline (MD018-11)
- Survey methods should cover volumetric as well as surface contaminated materials (AT008-40)
- NRC needs to address the issue of hot-spots in materials; do not rely solely on concentration averaging (SF001-19)
- Need to standardize instrument calibration (AT001-11) (MD003-8)
- Allow process knowledge, survey history, and surface surveys to determine if a material has a radiological history (0422-10-1) (0427-34-2) (AT019-9) (CH014-17-2) (SF001-18)
- Utilize known isotopic ratios and a sum of fractions approach to derive the total amount of radiological activity associated with an item (CH014-31) (SF001-19)
- Implement technology-based requirements for sampling and monitoring locations (0570-33-2)
- Survey methods must be appropriate for the type of material being surveyed and the type of radiation expected to be present (0649S-17) (0659-62) (AT014-24) (MD007-5) (MD027-4)
- Need to address potential variations in background; background is not a single number, it varies over space and time (SF001-19) (SF026-26-2) (CH008-15)
- Steel mills need to reduce self shielding to find sources of radioactivity (SF005-11)
- Differentiate between survey for clearance and survey to ensure radioactivity is not entering a facility (SF005-12)
- Use of process knowledge and statistical sampling programs will be necessary (MD029-11)
- Direct frisking and box monitors are currently used; with this standard, use of other automated tools could be imposed (CH014-24)
- Passing on detection to the downstream user is not an option (CH007-3)
- The standard that is established will drive the measurement system to be used in survey efforts (MD029-10) (SF001-18)
- Materials should be surveyed before they are diluted (MD027-4)

4.3.3 Suggestions for incorporating criteria for release of solid material into NRC's regulations

Commenters provided a variety of suggestions for how NRC might incorporate clearance criteria in its regulations and the process by which NRC should do so.

4.3.3.1 Setting release criteria

Commenters identified numerous implementation considerations in setting the release criteria.

Implementation

- NRC should allocate up front resources to refine computer pathway models and provide them for industry and regulator use (e.g., DOE RESRAD-RECYCLE[1]) (0070-15)
- NRC should develop a regulatory guide to provide simple guidance on how to comply with the standard (different monitoring techniques and calibration methods) (0030-32-3) (0469-15) (0612-7-2) (0659-64) (0665-24-2) (0673-24-2) (AT023-4) (CH012-14) (CH030-12) (MD022-11) (MD036-4) (SF016-1) (SF017-14-2) (SF024-4)

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[1] RESRAD-RECYLE is a risk assessment model developed by Argonne National Laboratory for estimating radiation doses to various receptors resulting from the recycle and/or reuse of radioactively contaminated materials and equipment.

- NCRP should provide a handbook of acceptable methods for monitoring bulk activity (0030-32-2)
- Provide dose criteria with NRC approved models where parameters could be modified to fit real world conditions instead of a derived concentration limit (0057-23) (0682-26)
- Include a table of concentration values in different media based on specific dose objectives (0070-48) (0682-26)
- Do not use overly conservative assumptions in the selection of model input parameters (0422-13)
- Avoid simplifying assumptions not supported by scientific data (0422-13)
- Portal monitoring is not a sufficient means of establishing whether a facility can release a material under this standard (MD029-13)
- Suggest conducting a study to cross-calibrate the various instruments used to identify the true measurement differences with respect to dose (0613-6)
- NUREG guidance could be an effective mechanism in implementation if it includes concentration standards, screening limits, overall release evaluation, and demonstration of compliance with the dose standard in the rule (0683-8)
- NRC should collect information on sampling and measurement protocols from industry and education experts to use in guidance for implementation of this rule (CH007-7-2) (CH027-11-3)
- Detectors at landfills, scrap yards, and steel mills have a high sensitivity and are typically set at background; these locations are going to reject the released materials greater than background in the U.S. and Europe (0769-2) (AT014-15) (CH006-5) (MD017-5-2) (MD028-14) (SF015-8-1) (SF017-2) (SF026-2-1)
- Operators must be properly trained and have incentive to detect contamination (0649S-17)
- NRC must consider the difficulty of implementing different standards for different materials (CH019-7)
- NRC must consider different survey instruments, different levels of detection, and how to deal with multiple isotopes (0422-16-2)
- Implementing a standard will have the secondary effect of ensuring sources are not part of residual radioactive material (SF005-7)
- Guidance is needed for landfill operators on the acceptability of materials with radioactivity below the clearance level (0682-24)
- The proposed guidance challenges the ability of licensees to release material and equipment from RCAs (0615-8)
- Guidance on demonstrating compliance should be provided in a NUREG similar to DG-4006, Demonstrating Compliance with the Radiological Criteria for License Termination (0683-7)
- Control of released materials must not be limited to the facility that initially releases the material (SF027-11)
- Regulatory Guide 1.86 should be extensively revised or incorporated into a compliance demonstration NUREG (0683-7)
- Portal monitors may be needed for customs personnel (MD025-4-1)
- Detectors at steel mills already alarm for items like nickel thorium welding rods, concrete, bauxite ore, zirconium sand, phosphate, thorium, dirt, and air filters (SF026-35)
- NRC should work with the National Institute of Standards and Technology (NIST) to produce standards for evaluating detection systems (0030-31-1)

Health and Safety

- Release standards must include detailed measurement, calibration, sampling, and instrument protocols to protect the public against the inadvertent release of contaminated materials (0570-28)

Economic/Cost

- Concerned that a proposed rule will provide no recourse for injured parties and will transfer financial liabilities held by radioactive waste generators to the public (0520-3-2) (MD008-38)
- There will be an increased need for state regulatory resources to respond to detector alarms at landfills, scrap yards, and steel mills (CH006-7) (CH008-17) (SF006-19)

Consistency

- NRC must clarify what is "contaminated" and what the criteria are for identifying an area or material as such (0042-5) (0519-8)

Procedural

- The basis for release should be generic and rely on measurable quantities using normal survey equipment (0030-38-2) (0407-8) (0665-24-2) (0673-24-2) (MD023-3) (SF017-8)
- The level of control that is necessary depends on how the criteria are established (CH014-26)
- Any release standard should exclude hospitals which already have a mechanism for release (MD011-25-2) (MD027-3)
- If radioactive materials are to be recycled, they must be labeled as such (0232-5) (0250-2-2) (0252-3-2) (0418-4) (0508-2-1) (0627-1)
- Concerned that a dose-based criterion will result in cases where real risks are ignored since it requires expertise for calculation (0528-4)
- Believe free release criteria must be established before implementation issues associated with restricted release can be considered (CH014-15-1)
- NRC should look at how EPA addresses waste handing in Corrective Action Management Units (CAMUs) at sites not previously permitted (CH031-33)
- The "dose-based" release level should be stated in terms of concentration (0682-26) (SF005-19-2)
- The rule does not have to establish activity concentration limits even though it may be "dose-based" (0683-7)
- Volumetrically contaminated items from a nuclear plant are not the type of items that would be considered for release (MD007-6)
- The source material recovery industry should be exempted given the low risk posed by contaminated materials from this industry (0251-15)
- Any proposed rule should apply to all facilities regulated by the NRC or an Agreement State, including holders of Certificates of Compliance (e.g., Gaseous Diffusion Plants) (0498-3)
- Licensees dealing only with sealed sources should be exempted from any rule (0013-2)
- Need to decide which materials are eligible for recycling (SF022-2-1)
- Differentiate between materials that can and cannot be recycled (some might have to be disposed of) (MD001-44)

Public Trust/Confidence

- Concerned that a proposed rule would not provide for an informed public regarding which products are made from contaminated materials (0262-4) (0341-3-2) (0491-3)

4.3.3.2 Enforcement issues associated with release criteria

Commenters raised concerns about NRC's ability to enforce a potential clearance rule and provided suggestions to ensure proper enforcement.

Health and Safety

- NRC has a poor track record of protecting public health and safety in its regulation and monitoring of sealed sources (0520-5)

Economic/cost

- NRC must ensure adequate funds are available to monitor for compliance (0649S-18) (0678-5) (MD018-2)

Implementation

- NRC should implement mechanisms to ensure compliance and protect "whistleblowers" (0570-33-3) (CH030-12) (MD022-16-1) (SF014-30)
- Need to develop intervention criteria to ensure prompt action is taken if a level is exceeded (MD022-16-1)
- Released contaminated material should be issued a certificate so it can be traced in the event that it sets off detection monitors (SF026-42)
- Any level established will be too difficult to verify or enforce (0309-3) (0488-6) (0649S-10) (0858-2)
- Concerned that NRC will not be able to track contaminated materials after they have been released (0070-26-2) (0134-1) (0237-2) (0291-2) (0341-3-2) (0348-2) (0485-3) (0491-3) (0520-5) (0718-3) (MD012-22* 1 similar comment letter)
- Believe there is no way to adequately monitor for compliance (0343-3)
- Institutional controls cannot be trusted (CH016-13) (MD008-3-3)
- Rulemaking effort needs to include consideration of how NRC will inspect, ensure compliance, and respond to non-compliances (MD036-2)
- NRC should implement an independent oversight function to provide a Quality Assurance/Quality Control (QA/QC) mechanism (MD029-8)
- NRC must evaluate licensee monitoring, training, record keeping and QA programs relative to the release of materials (SF001-20)

Public Trust/Confidence

- Those who profit from the generation of nuclear wastes cannot be trusted to monitor their own wastes (0151-3) (0649S-17)
- NRC needs to consider that DOE cannot be trusted to follow any standard established (MD008-60-3)
- NRC cannot be trusted to protect the steel industry (MD011-21)
- There is a misconception about the level of control currently imposed on reactor licensees (MD006-25)
- Abuses of established limits can be expected given the track record of the nuclear industry (0507-8) (0520-3) (CH015-13) (MD001-33-1)
- Variation in "backgrounds" and lack of control after release lead to problems with public confidence (MD012-23-2* 1 similar comment letter)

4.3.4 Questions about enforcement

Commenters raised many questions about how NRC might enforce a potential clearance rule.

- Can the currently available detection equipment protect the public against improper releases of radioactively contaminated materials if a stringent standard is set? (0044-13)
- Would the NRC require pre-approval of procedures/models for release prior to implementation? (SF006-23) (SF017-19-1)
- Will an NRC standard include provisions for licensee evaluation procedures? (SF006-25-1)
- What controls will be established to ensure levels are not exceeded? (0311-6) (0484-2)
- Is there currently a program to help scrap yards determine what detection level they should use? (CH020-9-2)
- Will NRC inspections include review of dose modeling under this rule? (SF017-9-2)
- Has there been an established relationship between the release levels and the analytical detection capabilities of the detectors in use at steel mills? (MD028-4)
- Given current monitoring technologies, what are the possibilities for false negatives? (MD001-5)

- Is there anything in Table 1 of Regulatory Guide 1.86 under Maximum Release Levels that would not be above background levels giving consideration to all variables? (MD021-11-1)
- Is it true that Regulatory Guide 1.86 does not provide for release of volumetrically contaminated materials? (MD021-12)
- How is NRC going to maintain control over release of radioactive materials to non-licensed people? (MD008-43-1)
- Why is recycled steel from phosphate industries, copper industries, and ferrous ore industries not tripping alarms at steel mills? (MD008-43-1)
- Has NRC observed misapplication of Regulatory Guide 1.86 by licensees considering only loose contamination instead of loose and fixed contamination? (SF025-1)

Health and Safety

- Can the NRC set a standard that is both safe and for which one can reasonably survey for residual radiation? (MD001-8)
- Has NRC conducted assessments of the potential impacts of improper releases on workers or the public? (0044-21-2)

Procedural

- Is there a possibility that NRC would establish an immeasurable standard? (AT001-7)
- How would activities under a rulemaking tie into the current decommissioning requirements and the 0.25 mSv/yr (25 mrem/yr) standard? (CH010-2) (SF013-8-2)
- Where would a rule be incorporated into the regulations? (CH011-2)
- Will labeling be required? (0484-4)
- To whom will this regulation apply, if developed? (CH030-6-2)
- How frequently do licensed facilities release materials under Regulatory Guide 1.86 in accordance with their license? (MD001-12)
- Why is NRC conducting a rulemaking process to establish a standard before they examine whether it can be implemented? (AT001-8)
- What role will ALARA have in implementation of this standard? (CH016-9)
- Is NRC going to look at case-by-case release decisions from the past to determine if they meet the levels established by this rule? (AT024-9-1)

4.4 CONSIDERATION OF FEDERAL AGENCY, STATE, AND U.S. STANDARD SETTING BODY GUIDELINES IN SETTING A RELEASE LEVEL

4.4.1 Other federal agencies

Some commenters expressed a need for NRC to be consistent with DOE standards on clearance. Others said that consistency with DOE standards was not necessary. Similarly, some commenters expressed a need for NRC to be consistent with EPA standards on clearance. Most commenters did not address this issue while a few said that consistency with EPA standards was not necessary.

Economic/cost

- Different standards will result in confusion, greater resources, and greater expense to the regulated community (0070-54) (0427-65)
- Believe second round cleanups could be very expensive if EPA issues more restrictive standards than NRC (0427-59)

Implementation

- Consideration of DOE actions is important because there is a precedent for DOE materials being transferred to NRC-licensed facilities for decontamination and then release into commerce (0014-4* 1 similar comment letter) (CH021-16)
- Since DOE is likely to incorporate any NRC standard, NRC must consider experiences at DOE facilities in drafting a proposed rule (MD001-21-2) (MD008-60-2) (SF001-27-2) (SF004-2)
- DOE Title I cleanup facilities under the Uranium Mill Tailings Radiation Control Act (UMTRCA) will be affected by this rule and should be considered in this effort (MD009-4-2)

Consistency

- Concerned with consistency among federal regulators for remediation projects governed by more than a single agency; negotiation periods impact project budgets and schedules (CH010-3)
- Consistency issues should be focused primarily within the United States and among federal agencies (0070-49-1)
- Consistency with other U.S. agencies should be considered (0427-59) (0469-13)
- Adequate requirements uniformly protective of human health and the environment must include collaboration and consistency with DOE, DOD, EPA, Department of Labor, Department of State, and Department of Interior (0469-4)
- Consistency among federal agencies will help avoid repeats of the 15 versus 25 NRC/EPA war (MD005-8)
- NRC release criteria should be consistent with EPA guidance (0023-8)
- Consistency among federal agencies is necessary to avoid conflicting site closure decisions (0070-21)
- Federal agencies should adopt EPA risk ranges since EPA has final authority on site closure (0070-50)
- Federal agencies should coordinate the establishment of criteria for release through the Interagency Steering Committee on Radiation Standards (0659-68)
- Levels should be consistent with EPA drinking water standards and current airborne emission standards (0740-4)

Procedural

- Encourage NRC to get buy-in from other federal regulators (0612-3-3)
- EPA, NRC, DOE, and DOD must come to a consensus on the method of calculation and risk/dose to be attained before establishing a release level (0030-9-2) (0070-12) (MD009-5)
- Agreement among cognizant federal agencies, including EPA and DOE, regarding criteria for deregulation of slightly contaminated waste streams would enhance public credibility and minimize confusion among the regulated community (0037-4)
- Material released under this rule should be exempt from Department of Transportation rules to avoid excessive shipping paperwork associated with shipments exceeding 0.002 μCi/g (0038-5)
- NRC, EPA, and DOE should work together to prevent future releases and correct past releases (0045-13-2* 141 similar comment letters, additional 54 under signers)
- Support of any regulation is conditional upon federal agency consensus (0070-3-2)
- EPA has already taken a stand against this process of setting release standards (CH017-25-1)
- NRC must work with EPA since materials released under this rule may still be subject to solid waste regulations (CH026-3)
- Drafting of an NRC rule should include review of EPA and DOE guidelines and justification of any differences (MD001-28-2)
- NRC should consider the EPA release standard for soil at uranium recovery

facilities in setting a release level (MD009-2)

- NRC and EPA must agree on release of mixed waste materials (0665-10) (SF013-4)
- Concerned that NRC not let pressure from DOE, utilities, and nuclear industry influence decision making (0182-9)
- DOE has released materials into the public realm that should not have been and does not set an example that NRC should follow (0520-24-1)
- EPA has responsibility to set radiation standards (0596-25* 1 similar comment letter)
- NRC and EPA need to work together to resolve any differences between them on the acceptable dose standard (0682-16)

Public trust/confidence

- Inconsistent clearance standards among U.S. regulators will result in loss of public confidence in the government (0659-76)

4.4.2 State regulation

Commenters expressed a desire for consistent application of a standard between states and compatibility of a standard with agreement state programs

Consistency

- There should be strict compatibility due to probable interstate commerce issues (0497-20) (AT009-5) (CH010-3)
- NRC has not adequately addressed the compatibility with agreement states regulating a large volume of solid materials (0613-24)
- Compatibility must be considered when establishing a release level (SF006-25-2)
- Clearance levels should have the same category as the concentrations in 10 CFR Part 20, Appendix B (0070-55)
- NRC should apply compatibility category "C" to any rule on release of solid materials[2] (0427-66)
- NRC should ensure that a dose limit is consistent between states (0357-8-1) (0469-13)
- NRC should ensure compatibility with and consistent application between states, considering state and local laws that may prohibit the program (0274-3)

Procedural

- NRC should work closely with agreement states to ensure already well functioning state regulatory processes are not impeded (0037-3) (0070-49-1) (0274-4-1) (0497-20) (0612-3-3) (AT009-5)
- Concerned with impacts on MSW landfill management and call for consultation with agreement state and local officials (0071-4) (0682-23)
- Agreement states would like to maintain the flexibility and opportunity to be more restrictive if needed (AT009-5) (AT023-2)
- A national policy is needed for NORM recycling that is currently governed on a state-by-state basis (MD015-20-3)
- NRC should consider state guidance in addition to Regulatory Guide 1.86 in developing rule (0070-50)
- NRC should work with the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) since materials released under the rule may still be subject to state solid waste regulation (CH026-3)
- Believe states should provide concurrence with an NRC established release level (0659-78) (SF006-7) (SF024-3-2)
- NRC should require agreement states to implement rule as written (0682-28)

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[2] See NRC Management Directive 5.9, "Adequacy and Compatibility of Agreement State Programs." Handbook 5.9, and OSP Internal Procedure B.7 for further information on compatibility categories.

- Concerned that states may have to respond to increased false alarms at scrap metal or landfill detectors (MD018-1)
- Failure of states to incorporate the requirements in any final rule could result in conflicts with interstate transportation and commerce (0659-78)

4.4.3 U.S. standard setting bodies

Commenters pointed to U.S. standard setting bodies as both resources and organizations to be consistent with in developing a standard.

Implementation

- NRC should work with NIST to produce standard materials with known radionuclide concentrations for testing and approval of monitoring processes (0030-31-2)

Consistency

- Consistency with U.S. standard setting bodies and industry standards should be a goal of the rulemaking process (0057-25-1)

Procedural

- Utilize ANSI and the American Society of Testing and Materials (ASTM) resources (clearinghouses, peer review, data bases for industrial standards) in promulgating a rule (0070-25)
- Although NCRP criteria are unacceptable for clearance, NCRP has considerable technical material that might contribute to the technical basis for this rule (0070-51)
- NCRP's trivial dose seems to fit NRC's mission (0427-61)

4.4.4 Questions about current guidelines

Commenters raised questions about current NRC guidelines and those of other agencies.

Implementation

- Would EPA's 40 CFR 190 limits for the nuclear fuel cycle apply to any NRC solid waste clearance regulation for the nuclear power industry? (0057-25-1)

Consistency

- Is NRC involved in efforts to harmonize standards with EPA and DOE? (MD001-11)

Procedural

- What authority in this process is retained by EPA? (CH023-2-2)
- How will a rule affect states that have been making release decisions? (CH010-3) (CH014-3) (CH023-4)
- Why is NRC proceeding with a process that EPA has previously abandoned? (AT017-2) (CH017-4)
- What are the standards specified in DOE 5400.5, Radiation Protection of the Public and the Environment? (CH012-16)
- Is NRC currently considering ANSI N13.12 in development of this rule? (CH011-12-2)
- Do Regulatory Guide 1.86 releases require notification other than to the NRC? (AT017-17)

Socio-political

- How are states currently implementing legislation that prohibits radioactive materials from disposal in landfills and how will such legislation impact this rule? (SF014-4-1)

4.5 NRC'S ADOPTION OF OTHER STANDARDS

Many commenters encouraged NRC to consider the standards that have been or are being developed by other organizations. ANSI Standard N13.12 was frequently cited as such a standard.

4.5.1 Generally support the adoption of other standards

Commenters expressed support for the adoption of other standards to obtain a consensus.

Consistency

- Believe a consensus on what is radioactive must be defined by a competent authority such as the NCRP, International Commission on Radiological Protection (ICRP) or Conference on Radiation Control Program Directors (CRCPD) (0001-21) (SF001-21-2)
- Believe that differences in the proposed rule and recommendations from NCRP should be identified and justified (0659-70)

Procedural

- Support the adoption of the standards of others assuming peer review and public acceptance (0070-53-1)
- Support the concept of restricted release being considered by the NCRP's Standard Committee 87-4 (0395-53)
- NRC should rely on the recommendations and standards under development by recognized national and international experts (0659-74)

4.5.2 Specifically support adoption or consideration of the ANSI N13.12 standard

- Support adoption of ANSI N13.12 (0029-2-2) (0030-33) (0098-1-2) (0105-3) (0127-1-3) (0167-2-2) (0198-4-2) (0212-4) (0357-8-2) (0406-4) (0407-11-2) (0427-62) (0497-19) (0498-2-2) (0550-9-1) (0615-7-3) (0658-5-2) (0659-9) (0681-4-2) (0682-11-3) (MD002-6-1) (MD024-7) (MD030-3) (NRC55-1-2) (NRC85-3-2) (SF001-2)

Health and Safety

- ANSI N13.12 provides a strong, defensible technical basis that provides an adequate margin of safety to workers and the public (0098-1-2) (0127-1-3) (0139-3-3) (0615-11-3) (0682-11-3) (NRC55-1-2) (NRC85-3-2) (SF009-3)

Economic/cost

- Adoption of ANSI N13.12 would reduce costs associated with developing a numerical standard (SF001-17-1)

Consistency

- ANSI N13.12 is consistent with international standards that govern release of solid materials (0089-2-2) (0098-1-2) (0127-1-3) (0139-3-3) (0167-2-2) (0615-11-3) (0659-9) (NRC55-1-2) (NRC85-3-2)
- ANSI N13.12 ensures public safety using the standard of "Negligible Individual Dose" (0406-4)
- Because standard is endorsed by the Health Physics Society and is consistent with IAEA (0550-9-1)

Procedural

- Because this is a consensus standard with representation and/or consultation from DOE, NRC, EPA, licensees, and the public (0029-2-2) (0098-1-2) (0105-3) (0127-1-3) (0212-4) (0659-9) (NRC55-1-2)

- The standard allows for clearance on a case-by-case basis at higher dose levels when justified (SF001-25-1) (SF009-3)
- If recycling is not approved in rulemaking, the content of NUREG 1640 should be set aside in favor of ANSI N13.12 use for all materials disposed (0497-19)
- NRC is bound by statute to use technical standards found in ANSI N13.12; no inconsistency with federal law has been established as required by the National Technology Transfer Act of 1995 (0167-2-2) (0498-2-2) (0550-9-1)

4.5.3 Generally oppose adoption of standards of others

The few commenters expressing opposition to adopting standards of others, indicated that it was important for NRC to conduct its own analysis.

Health and Safety

- IAEA standard considers calculation of doses to maximally exposed individual rather than the average dose to a critical group (0665-17-1)

Procedural

- NRC should not simply adopt a previously established standard, but should conduct careful evaluation and review of all input parameters to alternative models (0665-17-1) (0673-18)

Public Trust/Confidence

- NRC must conduct their own analyses in order to build public trust (0427-64)

4.5.4 Expressed specific concern with limitations of ANSI N13.12 standard relative to solid material release

Health and Safety

- ANSI standard is not based on demonstration of a significant risk to public health and safety as is required for a regulatory limit (0613-23)
- The surface screening values listed in the ANSI standard rely on a poor assumption for power plant equipment (0665-17-1)

Implementation

- ANSI N13.12 may be difficult to fully implement because it does not address issues such as NORM, radioactive materials in or on persons, release of licensed or regulated sites or facilities for unrestricted use, radioactive materials on or in food stuffs, release of land or soil intended for agricultural purposes, materials related to national security and process gases or liquids (0212-4) (SF001-25-1)

Consistency

- Encourage NRC to clarify differences in an ANSI standard versus an NRC standard (SF017-6)

4.6 CONSIDERATION OF EXISTING STANDARDS IN SETTING A RELEASE LEVEL

The few commenters who addressed this issue generally raised concern about the potential confusion caused by inconsistent standards or a change in the status quo.

4.6.1 Generally support consistency with existing standards

- Concerned about the impacts of adopting a new NRC rule on the license termination rule criteria for soil (CH011-10) (MD033-1)
- NRC should be consistent with guideline levels it has established in the past, including the public dose limit and dose criterion for release of decommissioned structures and land (0570-27)
- Proposed rulemaking dose criteria should be consistent with the current standards for release of materials in liquid and gaseous effluents in 10 CFR 20 and 10 CFR 50, Appendix I (0659-79)
- Nuclear hazards should not be regulated differently than chemical hazards in terms of risk of cancer incidence (0001-16)

4.6.2 Specifically support maintaining the use of Regulatory Guide 1.86

- Support maintaining use of Regulatory Guide 1.86 (AT005-7) (AT016-11) (AT019-17)
- Regulatory Guide 1.86 is understood and well standardized (AT019-17)
- Regulatory Guide 1.86 has been protective of public health and safety (AT019-17)

4.6.3 Oppose consistency with certain existing standards

- The existing 0.25 mSv/yr (25 mrem/yr) standards should not be used because they were established for different purposes (0070-56)
- NRC standards in 10 CFR 20.1301 and Subpart E of Part 20 should not be considered in release of solid materials for unrestricted use because exposure to released material is involuntary; exposure at decommissioned structures and lands is voluntary (0427-68)

5.0 TECHNICAL APPROACH - RESTRICT USE OF SOLID MATERIALS TO ONLY CERTAIN AUTHORIZED USES

Commenters expressed a variety of views and posed many questions about how material uses would be restricted. Many commenters noted that it would be difficult to control uses once material has been released from licensed facilities.

5.1 GENERAL COMMENTS ON RESTRICTED RELEASE

Only a few commenters favored restricted release above other options, though additional commenters thought that it might be an alternative for materials that don't ultimately meet unrestricted release criteria.

5.1.1 Support restricted release

Commenters expressed support of restricted release for specific scenarios.

- Generally support restricted release (0089-1) (0395-59) (0427-32) (0490-2) (CH023-60-3) (SF020-6-2)
- For specific use materials (e.g., construction) - not household or consumer products (0201-2)
- For disposal only - not recycled into other products (0682-19)
- Rule should address both restricted and unrestricted use (0427-70) (0469-10) (0682-29-2) (CH008-6) (CH010-8-1) (CH016-10) (CH023-60-1) (MD003-29-1) (MD017-10) (MD022-7) (SF023-9-1)

Implementation

- Materials with readings above background need to be better segregated from materials at background (MD017-10)
- Remelt scrap oil well pipe to be returned to the oil fields; dispose of byproducts in LLW facility (0395-60)

Procedural

- Although restricted release would require tracking and control mechanisms that would increase regulatory resources needed to implement a rule, it should be considered on a case-by-case basis (0469-10) (MD022-7)
- Need to establish continued control mechanisms so materials are not unintentionally released after one or two recycling cycles (CH016-10) (0683-10)
- Ultimately there has to be a point where there is no longer control of the material (0030-34-1)
- Controls should be implemented to increase mixing, reduce exposure times, and control the end product so materials are within an acceptable standard (0665-21)
- NRC will only be able to attract public participation by incorporating discussion of release values with restricted use (AT017-27-2)
- Creating higher release values for restricted uses should not be done in place of unrestricted release criteria (0537-3)
- It would result in a conservation of disposal space and recovery of usable materials that would otherwise be disposed (0665-20) (0673-20) (CH011-9)
- Makes sense to recycle contaminated materials into a use where they will get re-contaminated as opposed to contaminating new materials (SF023-3)

Public Trust/Confidence

- The public would be more likely to accept restricted release over unrestricted because of the relative certainty it would provide (AT017-27-1)

5.1.2 Oppose restricted release

Commenters thought that implementation of a restricted release standard would be too problematic or uneconomical.

- Generally oppose restricted release (0357-10) (0497-21) (0507-12) (0564-7) (0596-31* 1 similar comment letter) (AT008-42-2) (AT018-3-1) (AT019-16-1) (AT027-7-2) (CH006-3-3) (CH012-9) (MD001-15-1)

Health and Safety

- Downstream uses are uncertain (0070-57) (0459-2-3) (0498-5) (0596-31* 1 similar comment letter) (AT019-16-1) (MD001-15-1)

Economic/Cost

- Restricted use would entail undue administrative burden not justified by level of public risk (0057-10-1) (0659-112-1) (0683-10)
- Increases regulatory burdens (higher monitoring and enforcement costs, etc.) (0057-14-1) (0683-9) (CH009-7-1)
- Dedicated facilities would not be able to compete economically (AT019-16-2)

Implementation

- Restricted use is too difficult to track and enforce (0070-57) (0459-2-3) (0498-5) (0596-31* 1 similar comment letter) (AT019-16-1) (MD001-15-1)
- Even processes that melt scrap down to dedicated products yield scrap that would need to be tracked (AT027-7-2)
- Will create havoc with radiation detectors at metal facilities and mills (0570-34-2)
- Currently restricted use options exist that do not involve disposal; however establishing clearance levels is the first priority (AT008-42-4)

Consistency

- Requiring a license for reuse of restricted materials would be inconsistent with releases of metals under the guidance of Regulatory Guide 1.86 (0498-7)

Procedural

- Unrestricted criteria need to be established before restricted option can be considered (0038-6) (0497-21) (0659-24) (CH012-9)
- Restricted use would effectively create new licensed materials (CH011-6)
- Would create a new class of licensees (0251-5) (0683-9)

Public Trust and Confidence

- Institutional controls cannot be trusted to limit uses (0026-15) (CH006-3-3) (CH016-14)

Socio-political

- Intermediate control of materials (as in restricted release) will frustrate states when such materials cross borders and become subject to varying degrees of oversight (0357-10)
- Allowing radioactive metals in consumer products could lead other countries to reject all metal products produced in the U.S., which could lead to severe economic consequences (0507-12)

5.1.3 Need more information

Some commenters felt the restricted release scenario warranted further investigation.

- The option of restricted release should be kept open pending further

investigation into other options regarding unrestricted release (AT016-10) (AT024-14) (MD015-7)

- Perhaps a joint effort by the NRC, DOE, and EPA could result in the development of a new industry dedicated to the recycling of contaminated metals, making restricted release possible (0395-61)
- May be uneconomical, needs further economic evaluation (SF001-32-1)
- May be uneconomical to have a dedicated steel mill for radioactive metal because the public won't accept steel that is mixed with contaminated steel (0395-65-1)
- Innovative restricted use scenarios exist, particularly in the European Community (AT008-42-2)

5.1.4 Questions about restricted release

Commenters raised a variety of questions about a restricted release option.

Implementation

- Is restricted use economically feasible? (0659-112-1) (AT018-3-1) (AT019-16-1)
- Is control of future use feasible? (MD008-43-2) (MD028-13)
- Would restricted use apply to imports and possibly result in an increase in those imports? (AT002-7-2)
- Would restricted use result in greater numbers and types of orphan materials (materials released to limited use which become unaccounted for over time?) (AT002-7-2)
- How will restricted release be implemented with regard to types of material uses, specific radionuclides, specific materials? (MD001-14-1)
- Do options exist for safe re-use based on type or composition of the materials? (SF012-2)
- Have restricted versus non-restricted scenarios been adequately defined, especially in terms of nuclear medicine? (SF008-4-3)

Procedural

- Has NRC considered any types of dedicated facilities as an alternative to release of contaminated material? (MD028-6)
- Have restricted use discussions considered concentration or accumulation of radionuclides after re-melting? (AT017-24-2)
- Restricted release of materials that stay within the licensed arena appears to be the same as NRC's current practices; consequently, is there a need for an additional rulemaking? (CH022-6)

5.2 TYPES OF RESTRICTED USES TO CONSIDER

Commenters expressed a variety of views regarding the basis of restricting releases, the types of uses that should be allowed, the mechanisms for controlling uses, and the feasibility of limiting uses once materials have been released.

5.2.1 Use should be licensed or restricted to government facilities such as DOE where it may get re-contaminated

- Support restricting release to licensed or government facilities (0070-57) (0567-6* 2 under signers) (0570-33) (0600-1) (0660-06) (0683-10) (0687-9) (0769-1) (CH003-3-1) (CH010-8-2) (CH014-59) (MD003-29-2) (MD018-8) (MD028-13) (SF013-3-2) (SF015-2) (SF020-6-1) (SF023-9-2)

5.2.2 Restrict to disposal of materials in a solid waste landfill

- Generally support restricting releases to solid waste landfills (0057-30-2) (0395-54-1) (0497-21) (0567-6* 2 under signers) (0570-24) (0660-23-1) (0682-29-2) (0687-9) (0769-1)
- Other uses of materials appear too burdensome from a compliance and enforcement standpoint (0057-26-2)
- The exposure pathway would be easier to evaluate for landfill disposal than recycling (SF024-1)
- Release to municipal landfills would limit public exposure, further protect public health and safety, and preserve existing LLW disposal capacity (0057-26-2)
- Materials should not be restricted to landfill disposal unless there is a health and safety basis for excluding all other release options (0659-113-1)

5.2.3 Other suggestions for restricted use

Besides restricting release to licensed facilities and solid waste landfills, commenters provided a number of additional suggested uses and considerations.

- Use of contaminated materials as a road base (0030-34-2)
- Use of metal-containing equipment or products that are to be used for their original purpose if they meet NRC's dose-based standards (0567-6* 2 under signers) (0660-23-1)
- Materials like scaffolding, tools, welding equipment, and computers that have reuse value should be released if clean (MD006-38)
- Use in non-primary consumer products, like I-beams, LLW disposal containers, cardboard in commercial packaging, and electric wire (0427-71)
- Construction materials for the nuclear industry, such as shielding blocks for reactors or containers for storage and disposal (0070-60)

Health and Safety

- Restricted release of materials for fill at industrial sites where it will have a limited effect on the environment and where land will only be reclaimed for industrial use (0030-16-1)
- Release levels should be established on the basis of safety, regardless of use (0498-5)
- Scenarios for dose assessment should include the eventual loss of controls over these materials released for restricted use (0070-65)

Implementation

- Recycling of contaminated materials will generate additional radioactive material (e.g., dust) (SF027-2-2)
- Storage of materials released for restricted use should be allowed until a market for re-use develops (SF014-17-1)

Procedural

- Release levels should be determined based on specific material use scenarios (AT017-27-3)
- Contaminated materials must be restricted to uses that preclude them from being scrapped, melted, or recycled into consumer products (0567-5-4* 2 under signers) (0660-5-4) (0683-10)
- Markets for restricted use materials need to be identified and analyzed (SF027-12-1) (0659-90)
- Materials should be allowed to be reused in original form, but not recycled into other products (CH014-21)
- Use should be allowed without subsequent re-release (CH016-11-2)

- Restricted release should be allowed for materials with levels of contamination above free-release criteria (0427-70)

Public Trust/Confidence

- If restricted use is allowed on a case-by-case basis, public involvement could vary with the size of the project (0070-64)
- If restricted use is allowed at an NRC licensed facility, the public can participate through the licensing process (0659-89)
- Individuals should be able to reject exposure, even if these doses are small (MD012-15-1* 1 similar comment letter)

5.3 CONTROLS TO ASSURE THAT RESTRICTED USE MATERIAL WOULD NOT BE RELEASED FOR UNRESTRICTED USE

Commenters suggested diverse control mechanisms and strategies for dealing with restricted use materials. These ranged from prohibition to disincentives to punitive sanctions.

5.3.1 Specific control mechanisms

Commenters identified specific control strategies to be implemented by NRC.

- Labeling and/or tracking of items made of recycled materials from nuclear facilities (0031-14) (0036-5) (0567-5-3* 2 under signers) (0570-33) (0660-5-3) (SF019-10)
- Facility releasing material must certify material has not been radioactively contaminated (0570-33)
- Penalties must be imposed on those who break rules in order to ensure public confidence in regulator (0469-6) (AT008-47)
- Entities involved must be required to have impeccable track record (0031-63-2)
- Restricted use materials should not be permitted to be re-released after initial reuse (CH016-11-3)
- Either NRC or Agreement States should grant a license for restricted use materials or grant a variance or exemption (0070-61) (0427-72)
- Interventional strategies and reporting mechanisms must be established for entities exceeding clearance standard (MD022-16-2)
- Control may be adequate in case of a dedicated facility where transfer would take place from one licensee to another (MD022-6)
- No-fault provision may be required for businesses, industries, and public adversely affected by exceedences or some form of financial assurance, such as a sinking fund (0469-6) (MD022-16-2) (SF001-11)
- Restricting use to licensed facilities would be only adequate form of control (CH008-10-2)

5.3.2 Implementir controls may be challenging

- Believe implementing controls may be difficult (AT008-15) (AT011-3-2) (AT019-15) (CH006-3-1) (CH-008-8-1) (SF001-11) (SF026-44)
- May be hard to identify which licensee a material came from because free release material may be in current recycle streams (AT008-15) (SF026-46)
- History indicates considerable problems tracking radiography sources, radiator sources, radium needles, etc. (AT019-15)

- Institutional controls are not likely to be adequate (0373-4) (CH006-3-1) (CH008-8-1)
- Questions feasibility of controlling material that does not come from a licensed facility (AT011-9)

5.3.3 Important considerations in the development of use restrictions

Commenters have identified several issues to factor into the development of restricted use scenarios.

- Any regulation would have to anticipate materials being recycled in foreign countries where controls are virtually absent (AT011-3-2)
- Need commitment of regulatory authority that restrictions will be enforced (SF001-11)
- NRC should consider what would happen if a licensed facility accepted material above the unrestricted release levels and processed it into a product, which after initial use would meet the unrestricted criteria (0659-85)
- Generators should not be held accountable or liable for subsequent use or processing (0498-06)
- The U.S. Customs Service should reject international shipments of metal products with radioactive concentrations above background levels because these materials could not feasiblely be subjected to use restrictions (0567-17* 2 under signers)

5.4 RESTRICTED USE TIME FRAMES AND RADIO-NUCLIDES TO CONSIDER AS CANDIDATES FOR RESTRICTED USE

Some commenters noted that materials should be allowed to be released once they have reached some level of decay.

Health and Safety

- Long half-lives of the radionuclides that will be going into commercial products will lead to a gradual increase in the amount of radiation to which people are exposed (MD001-7-2)
- Long term decay of radioactive materials in consumer products has not been addressed (CH023-10-2)

Economic/Cost

- Costs of monitoring and tracking materials for 10-20 half-lives of all isotopes should be incorporated into implementation costs (0649S-15)

Procedural

- Materials with half lives of less than 100 years might be acceptable for fill at industrial sites (0030-17)
- Restricted use under the authority of a license until the radioactivity has decayed, such as after ten half-lives or when a certain clearance activity is reached (0070-62)
- For short and medium half-life isotopes, material should be restricted for approximately ten half-lives. For example, 50 years for cobalt-60 and 50-60 years for cesium-137. At the end of the initial use, the concentration should not increase radiation exposure to the public by more than 0.01 mSv (1 mrem) above background concentrations (0427-73)
- After a suitable period, the material should be released for unrestricted use (0427-73)

5.5 NRC INVOLVEMENT IN CONTINUED REGULATION OR TRACKING OF RESTRICTED USE MATERIALS

The few commenters who addressed this issue generally agreed that NRC must be involved with tracking and/or monitoring compliance with restricted releases.

Economic/Cost

- Receiving facilities will not bear costs of assuring that recycled material has been controlled and is not contaminated (SF026-38) (SF027-9-2)
- The cost of tracking products over long periods of time will involve significant program development costs (SF027-8-2)

Implementation

- Abuses of restrictions should be anticipated given the track record of the nuclear industry (0026-9)
- Items will not be controlled beyond useful life of first recycle product (AT002-7-3) (AT014-17) (SF001-12) (SF026-6-1)
- Material released to the public sphere should be subject to both tracking and recall at every stage of the recycling process (0031-16)
- Material should be labeled and tracked through into landfill or dedicated processing and recycling facility, and any products from that recycling facility should also be tracked (0567-7* 2 under signers) (0660-7)

Procedural

- Restricted use, even through the government, should be regulated through an appropriate license issued by NRC or an Agreement State (0070-63)
- NRC is the most appropriate organization to oversee restricted uses (CH009-7-3)
- Regulation and/or tracking is needed for the first use (0427-74)
- NRC should have jurisdiction in developing and enforcing standards to control release (AT011-3-2)

5.6 DOSE CRITERIA FOR RESTRICTED USE MATERIALS

A few commenters expressed support for the same dose level that they supported for unrestricted release.

Procedural

- The dose standard should remain the same as for unrestricted use, with material use dictating active pathways in the dose assessment (0070-66)
- The same approach used in Subpart E would be appropriate and the same dose criteria as unrestricted use should be used (0659-91)
- Should use the 0.01 mSv/yr (1 mrem/yr) dose, as in NCRP's trivial risk standard (0427-78)
- How will NRC determine subsequent dose levels and acceptable uses as the radioactive decay progresses during several recycling cycles? (MD012-10* 1 similar comment letter)

5.7 PROBLEMS ASSOCIATED WITH RESTRICTING MATERIALS TO LANDFILL DISPOSAL

Some commenters cited concerns about segregating radiological and non-radiological waste, laws or regulations that govern solid wastes landfills, or technical aspects of solid waste landfill design.

Implementation

- Segregation of released material from natural material is difficult when material goes to a landfill (SF014-5-2)

- Contaminated concrete may get recycled for use as aggregate by landfill (SF006-10)
- Minimizing the volume of LLW should be an overriding consideration (CH014-51-2) (MD015-9-3)

Procedural

- A waste acceptance method and risk assessment method should be formalized for both unrestricted use and release for disposal (0070-58)
- Local constraints such as state law or land use permits may conflict with landfill disposal (0070-67) (0071-3) (0427-80) (0659-92) (SF011-4-1)
- Not all industrial solid waste facilities meet the 40 CFR 258 standards and use of the term sanitary waste landfill is misleading because it implies domestic sewage (0070-67)
- Hazardous and municipal waste landfills have not been designed or sited with the expectation that they would accept radioactive waste (0686-2)

6.0 TECHNICAL APPROACH - PROHIBITION OF RELEASE OF MATERIAL FROM RADIOACTIVE AREAS

Under this approach, NRC would not permit either unrestricted or restricted release of solid material that has been in an area where radioactive material has been used or stored (all such materials in the facility would be required to go to a licensed LLW disposal facility).

6.1 SUPPORT PROHIBITION OF BOTH RESTRICTED AND UNRESTRICTED RELEASE

Prohibition of releases garnered notable support, primarily from citizen/ environmental groups and private citizens. Moreover, many supporters of prohibition also called for a recall of previously released materials.

- Against releasing and/or recycling any contaminated materials (0008-3) (0010-1) (0016-2) (0017-2) (0023-3) (0025-2) (0026-3) (0031-53) (0032-5-3) (0045-2* 141 similar comment letters, additional 54 under signers) (0046S-1) (0052-2) (0064-2) (0065-2) (0067-3) (0075-4) (0078-2) (0082-2) (0099-3) (0118-1-1* 1 similar comment letter) (0119-1) (0120-1) (0123-2) (0125-2) (0126-1) (146-2) (0148-3) (0149-1-1) (0150-1) (0151-1) (0152-1) (0153-1) (0159-4) (0168-2) (0169-2) (0173-2) (0176-2) (0180-2) (0182-2) (0184-2) (0185-2) (0189-5) (0190-2) (0193-2) (0194-4) (0199-2) (0207-2) (0215-2) (0220-2) (0222-4) (0227-2) (0229-2) (0230-2) (0232-2) (0233-1) (0235-3) (0237-4) (0238-2) (0239-2) (0240-2) (0242-2) (0246-2) (0248-2) (0250-2-1) (0256-3) (0257-1) (0258-2) (0261-2) (0262-2) (0266-2-1) (0269-5* 1 similar comment letter) (0270-3* 3 similar comment letters) (0276-1) (0278-4* 12 under signers) (0281-4) (0283-2) (0284-4) (0287-2) (0290-2) (0292-2) (0294-2* 1 similar comment letter) (0299-2* 1 similar comment letter) (0300-2* 1 similar comment letter) (0303-2) (0308-2) (0309-2) (0310-2* 2 under signers) (0312-2) (0314-5) (0315-2) (0321-4* 1 similar comment letter) (0322-2) (0326-4) (0328-1) (0330-2) (0333-2) (0335-2) (0336-2) (0337-2) (0338-2) (0340-2) (0341-2) (0342-2) (0343-2) (0344-1) (0346-2) (0348-1) (0349-1) (0353-1) (0356-1) (0363-1) (0364-1) (0365-2) (0366-2) (0371-1) (0372-1) (0373-2) (0375-1) (0377-1) (0379-1) (0380-1) (0381-1) (0383-2) (0384-1) (0385-1) (0368-1) (0387-2) (0388-1) (0392-1) (0397-1) (0399-1) (0400-1) (0401-1) (0402-1) (0405-1) (0408-1) (0410-1-2) (0416-1) (0423-2) (0424-1) (0427-3) (0428-2) (0430-2) (0432-2) (0433-2) (0434-2) (0436-2) (0437-2) (0438-1) (0440-1-1) (0441-1) (0443-1* 4 similar comment letters) (0444-1) (0448-1) (0451-3) (0452-1) (0454-1) (0457-1) (0458-1) (0459-1) (0465-2) (0466-2) (0475-1) (0477-1) (0481-1) (0483-1) (0485-1) (0491-1) (0494-2) (0496-1) (0499-3) (0502-2) (0504-1) (0506-2) (0508-4) (0513-1) (0514-1) (0515-1) (0516-1) (0517-3) (0518-1-1) (0520-4) (0521-1) (0523-1) (0524-1-2) (0525-1) (0527-2-1) (0529-5-2) (0536-1) (0542-1) (0543-1) (0544-1) (0545-1) (0548-3) (0550-10-2) (0552-1) (0553-1) (0556-1) (0559-1) (0563-1) (0565-1) (0571-1) (0573-2) (0574-1) (0576-1) (0577-2) (0579-2) (0587-1) (0588-1) (0591-1) (0592-1) (0593-1) (0596-2* 1 similar comment letter) (0601-2) (0604-2) (0608-2) (0609-2) (0616-2) (0617-2) (0620-2) (0621-2) (0623-2) (0626-3) (0632-2) (0634-1) (0638-2) (0640-1) (0641-1) (0645-1) (0646-1) (0649-1) (0651-1) (0652-1) (0653-1) (0654-1) (0656-1) (0662-4) (0666-1) (0667-1) (0669-1) (0671-1) (0674-1* 1 similar comment letter) (0675-2) (0676-2) (0678-2) (0680-1) (0682-20) (0684-1) (0687-1-1) (0690-1-1) (0694-1) (0697-1) (0700-1) (0706-4) (0707-1) (0710S-3) (0714-1) (0715-1) (0720-2) (0725-1) (0729-1) (0735-2) (0747-1) (0753-1) (0767-1) (0768S-1) (0771-1* 8 similar comment letters, additional 3 under signers) (0779-1* 19 similar comment letters) (0780-1) (0781-1) (0786-1) (0790-1) (0794-1) (0802-1) (0813-1) (0814-2) (0817-1) (0819-1) (0825-1) (0830-1) (0834-1) (0837-1) (0838-1) (0840-1) (0841-1) (0843-1) (0847-1) (0849-1) (0850-1) (0851-1) (0852-1) (0855-1) (0857-3) (0858-1) (0859-2) (0861-2) (CH027-16-4) (CH029-2) (CH033-5) (MD003-5-1)
- Against releasing and/or recycling any contaminated materials for use in/as consumer goods (0002-2) (0004-2) (005-2) (0006-2) (0009-2) (0011-2) (0012-4) (00018-3) (0019-2) (0020-2) (0021-2) (0024-2) (0026-13) (0031-15) (0033-5-3) (0034-2) (0035-2) (0043-4) (0045-5* 141 similar comment letters additional 54 under signers) (0051-2) (0059-2-1) (0066-3) (0069-2) (0073-1) (0076-2) (0084-2) (0085-2) (0093-3) (0099-2) (0103-2) (0112-1) (0116-1) (0117-1) (0122-1) (0124-1) (0135-1) (0136-1) (0137-1) (0141-1) (0142-1) (0145-1) (0147-2) (0148-1) (0154-1) (0155-2) (0156-2) (0157-2) (0158-2) (0159-2) (0160-2) (0161-2) (0163-3) (0164-1) (0166-2) (0175-2) (0177S-1) (0182-5) (0188-2) (0191-2) (0192-2) (0194-2) (0200-2) (0202-2) (0203-2) (0205-2) (0206-2) (0208-2* 1 similar comment letter) (0213-2) (0214-2) (0216-2-2) (0217-2) (0218-2) (0221-2) (0225-2) (0231-2-1) (0236-2) (0244-2)

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- Against any release that has the potential to expose large groups of individuals to radiological contamination (0030-12-1)
- Against releasing any radioactive contaminated material that poses unacceptable risks to public health (0032-5-3) (0033-5-3) (0316-4* 10 similar comment letters) (CH025-2) (MD012-37* 1 similar comment letter) (MD035-3)
- Existence of background radiation or radiation for medical uses does not justify releasing quantities of LLW (0230-5) (0453-4) (MD021-6)

6.2 OPPOSE PROHIBITION OF RELEASE

Opponents of prohibition cautioned that it would cause problems with operations without accompanying health benefits.

- It discourages innovation and research into decontamination technologies and biomedical techniques (AT008-34) (SF016-4)
- It wastes resources (0659-109-1)
- It depletes limited LLW disposal space unnecessarily (0057-15) (SF016-3-1)
- It would lead to higher LLW storage/disposal costs and higher costs for basic goods produced through nuclear technologies (0613-31-2) (0659-109-1) (SF016-3-1)
- It increases regulatory burden (0057-15) (0665-18) (0673-25-2)
- It leads to inconsistencies and conflicts with international standards (0495-15)
- There is no definitive public health or safety basis for prohibition (0497-15) (0550-10-2)
- Prohibiting release of all solid materials that have been in an area where radioactive material has been used or stored would increase radioactive waste quantities and significantly impede routine facility operation (0497-17)

6.3 PROHIBIT RELEASES AND RECALL PREVIOUSLY RELEASED MATERIALS

Although it was not explicitly identified as an option in the issues paper, numerous private citizens and citizen/environmental groups suggested that NRC prohibit release of contaminated materials and recapture contaminated materials that have been released in the past.

6.3.1 Support prohibition of all releases and recall previously released materials

- Support prohibition and recall (0023-4) (0043-3) (0045-4* 141 similar comment letters, additional 54 under signers) (0068-2) (0081-2) (0092-2) (0107-1) (0152-3) (0155-5) (0163s-1) (0184-8) (0240-4) (0254-2-2) (0269-8-1* 1 similar comment letter) (0275-2* 1 similar comment letter) (0322-4) (0324-3) (0360-1) (0362-2* 11 under signers) (0398-1) (0456-1) (0463-3) (0464-1) (0467-4) (0471-1) (0474-2) (0479-1) (0482-2) (0486-1) (0514-3) (0516-4)

(0519-6) (0521-6) (0523-5) (0526-1) (0534-2) (0573-5) (0578-1) (0581-1) (0583-3) (0584-1) (0585-1) (0594-3) (0596-4* 1 similar comment letter) (0603-2) (0605-2) (0606-2) (0630-2) (0638-3) (0645-18) (0649-7) (0650-1) (0652-1) (0688-1) (0689-1) (0698-1) (0709-3) (0711-1) (0713-6* 1 similar comment letter) (0737-3) (0739-1) (0746-1) (0748-1) (0749-1) (0750-1) (0754-1) (0785-1* 3 similar comment letters) (0794-3) (0826-2) (0858-3) (MD012-3* 1 similar comment letter)

6.3.2 Oppose prohibition and recall

- There is no evidence that released materials have caused problems (MD005-15)
- It would be infeasible and excessively costly to recall previously released materials (MD007-7) (SF014-33)

7.0 OTHER TECHNICAL APPROACHES SUGGESTED

Commenters identified a variety of other regulatory alternatives ranging from minor modifications to the status quo to developing new license categories and making fundamental changes to the nuclear industry.

- Establish separate dose limits for materials recycled into commerce and materials sent directly to Subtitle C or D landfills (AT028-3)
- Include technology based limits in addition to dose based limits (0519-7)
- Apply Regulatory Guide 1.86 throughout the industry as an alternative to developing dose-based standards (0564-5)
- Revise Regulatory Guide 1.86 by adding criteria for volumetrically contaminated media (0427-5-2)
- Prepare generic pathway analyses based on current landfill designs so non-reusable materials (e.g., concrete, trash) can be disposed of in landfills as opposed to treated (0498-4)
- Develop a "capture" license issued to scrap recyclers and steel mills; if incoming material triggers the portal alarms, material would be captured by the license and should be disposed of in compliance with NRC regulations; if it does not trigger the portal alarms, it could be reused/recycled in compliance with NRC regulations; this would eliminate the need to "send back" shipments of contaminated materials (0039-3)
- Use the decommissioning rule and license termination process to control release decisions (AT023-3-1)
- Industries should apply for a 10 CFR 20.2002 exemption or state equivalent for material known to be slightly contaminated (SF016-5)
- Use general licenses that are industry and material specific (SF017-10)
- Only allow licensed facilities to recycle and reuse released materials (CH022-8)
- Would require the establishment of a new class of licensees (0683-9)
- Allow recycling within an industry (i.e., don't release for general use) (CH003-32)
- Focus on eliminating radioactive waste as opposed to recycling it (0003-2) (00173) (0093-4) (0228-3) (0322-5) (0432-3) (CH002-2)
- Include a system of registration, tracking, and accountability (0683-9) (0687-10)
- Use contaminated materials to contain radioactive waste (0184-6)
- Negate the radiation through fusion (0190-3)
- Evaluate the current level of radioactivity the public is subject to prior to developing regulations to release additional radioactive materials (0041-3)
- Allow intermediate facilities to dispose of contaminated material that is not appropriate for a local landfill as an alternative to disposal at a licensed LLW facility (MD002-5)

8.0 ISSUES WITH DEVELOPMENT OF NRC'S TECHNICAL BASIS

8.1 TECHNICAL BASIS CONTRACTOR CONFLICT OF INTEREST (COI) ISSUES

SAIC was the technical basis contractor developing the cost, inventory and analytical information that the NRC would use to evaluate alternatives for the control of radioactive solid materials.

- SAIC has a COI because it is a teaming partner with BNFL in an Oak Ridge contract (0040-5) (0045-17* 141 similar comment letters, additional 54 under signers) (0525-5) (0596-12* 1 similar comment letter) (0649-2) (0854-5)
- SAIC handles regulatory compliance for businesses that have a direct interest in the deregulation of radioactive materials (0832-6)
- NRC needs to resolve questions concerning the credibility of work performed for NRC (0045-17* 141 similar comment letters, additional 54 under signers) (0832-7) (CH015-8) (MD001-47)
- NRC need to resolve conflict of interest issues (0300-5* 1 similar comment letter) (0313-3) (0525-5) (0596-12* 1 similar comment letter) (0649-2) (CH015-8) (MD001-28)
- NRC should establish a technical basis while avoiding conflict of interest issues (MD008-7)
- It is not appropriate for NRC to have SAIC preparing the regulatory options and issues paper (0854–5) (CH015-8)
- NRC should disregard all of the analysis completed by SAIC and withdraw NUREG 1640 (0596-12* 1 similar comment letter) (0649-2) (0854-5)

8.2 ENVIRONMENTAL ANALYSES AND/OR RADIOLOGICAL ASSESSMENT

8.2.1 Environmental impacts

Commenters identified many different types of impacts, and offered views regarding how to balance different kinds of impacts.

8.2.1.1 NRC should balance environmental impacts by:

A number of commenters provided suggestions for including environmental impacts when considering control of solid material alternatives.

Health and Safety

- Avoiding the risks and dangers to the public from releasing radioactive materials into commerce (0161-3) (0244-3-1) (0247-5) (0257-2) (0258-4-1) (0262-3) (0307-3) (0314-2) (0323-3) (0337-3) (0419-3) (0448-2) (0467-2) (0480-2) (0481-2-1) (0502-1) (0631-3)
- Recognizing that medical research facilities provide many benefits to society through the use of nuclear medicine and imposing additional disposal requirements could increase the costs of that research (0497-2) (SF008-2)

Procedural

- Adopting an overall operating philosophy that less man-made pollution is better (0023-9)
- Setting dose levels appropriately in relation to radiation levels for everyday materials (MD006-12-2) (MD012-6* 1 similar comment letter) (MD039-1) (SF017-11)
- Considering the impact of continued mining versus reuse of present materials (including energy use) (CH012-46-1) (CH021-35-1) (MD039-1)
- Setting an appropriate standard to increase recycling and decrease new mining (0022-5)
- Considering increased health impacts from increased handling of materials (MD011-15-2)
- Accounting for difficulty associated with disposing of both current and future radioactive wastes (MD012-18* 1 similar comment)

- Using risk analysis as much as possible (0057-16)
- Emphasizing protection of public health, waste minimization, and conservation of natural resources over economic concerns (0070-33) (0507-13) (MD010-6-3)
- Balancing solid release limits with air and liquid effluent release limits (SF017-11)
- Considering limited financial resources which should not be spent on reducing unrealistic fears of anything nuclear when there are real risks to people that go unaddressed (0406-5-2)
- Judging the benefits in terms of the benefits of recycling other non-radioactive materials because there is essentially no risk in releasing such other materials (CH028-2-1)
- Involving many existing groups in the rulemaking process before writing a proposed rule in order to highlight possible environmental impacts (CH012-3-1)
- Considering how other studies have been undertaken, such as studies to develop soil concentration guidelines (CH011-11)
- Looking into differentiating between the nuclear industry and general trade, as the European Community has done (CH011-14)
- Going beyond dose limits to look at justification for actions in terms of net benefit, application of risk and dose criteria to provide protection, and optimizing the parameters of a collective dose (SF013-9-2)
- Finding a way to determine potential doses when product end use is unknown (0520-6)
- Attempting to determine cumulative effects from recycling, the long term costs to public health, safety and psychological security, or the monitoring of releases or effects of releases (0642-2)

8.2.1.2 Types of environmental impacts to consider

Some commenters identified the specific environmental impacts that NRC needs to consider.

Procedural

- Impacts from reactor derived radionuclides (0023-9)
- Actual risk values and not perceived risks (0210-5)
- Groundwater contamination and impacts to biological resources (SF020-4-1)
- Long term health impacts (CH015-31-1)
- Worker health impacts (CH015-35-1)
- All identified impacts, both radiological and non-radiological (0057-16)
- Improper releases that are above the release limits (MD001-33-2) (SF027-7)
- Exposure to radiation from slag which is then made into building block used in areas where people spend a lot of time (MD018-16)
- Non-fatal non-cancer effects of exposures (MD012-12* 1 similar comment letter)
- General health and environmental impacts (MD014-3-1)
- Additional cancer deaths (0269-4* 1 similar comment letter)
- Environmental benefits realized from nuclear power industry due to lower toxic emissions (NO_X, CO_2) and other chemical compounds when compared to other energy sources (0497-2)

8.2.1.3 Questions about approach for considering impacts

Commenters raised questions about certain environmental impacts and the methods for evaluating them.

Procedural

- What benefits and impacts actually can be assessed? (SF020-8-1)
- Are collective dose calculations accurate for large populations receiving a small dose? (MD007-9)
- Which is the more dangerous and more likely to cause health problems, mining and refining new metal or recycling slightly radioactive metal? (MD039-1)
- How will the ALARA principle be applied for the release of materials? (MD001-35)

8.2.2 Exposure scenarios to consider for materials released for unrestricted use

Many commenters identified specific exposure scenarios. Others expressed concern about the combined effects of multiple sources of radiation and the potential build-up of radiation in materials and products. While few people commented specifically on the exposure pathway analysis in NUREG 1640, several made general comments about that document.

8.2.2.1 Pathways of exposure to people

A number of commenters discussed pathways of exposure that should be considered and methods of analyzing these pathways.

Health and Safety

- Airborne alpha and beta emitting radionuclides from recycled materials might be ingested and cause health problems (0645-24) (CH001-10-3)
- Plutonium and strontium partition to slag which is used as a soil conditioner in agriculture; this creates an efficient pathway to internal human exposure from these isotopes (0645-14)
- The contribution of radioactivity in metal from recycling will be negligible compared to the contribution from atmospheric weapons testing (0564-10)
- Radiation damages the genetic material in reproductive cells, results in mutations transferred across generations, and destroys the immune system (0028-5)

Procedural

- Pathways associated with contaminated equipment (AT005-6-3)
- For most individuals, pathways for exposure are minimal (AT008-41)
- The NRC should not use collective dose calculations based on trivial exposures to large populations (0659-111-1)
- Pathway analyses are solid and conservatively based, meaning that for most people outside the critical group, the dose is zero (CH019-2)
- Pathways associated with furnaces used in the scrap metal industry (AT027-5) (0395-13)
- Look at all pathways to develop a total effective dose equivalent (SF001-24-1)
- Pathways associated with various jobs at scrap metal processing facilities such as torching, shearing, shredding, baling, sweat furnaces, and maintenance (SF026-9)
- Estimate exposures from multiple pathways for members of the public over time (i.e. cumulative dose) (0044-12) (0071-7) (0484-3) (0312-3) (0469-3) (0596-10-1* 1 similar comment letter) (0713-5* 1 similar comment letter) (MD006-7-2)
- Address the multi-step process where a broker or other processor sorts and conditions material prior to final release (0070-18)
- Evaluate pathway linkages that could cause contaminants to concentrate such as in baghouse dust or soil (AT008-17) (AT025-9) (MD022-15)
- Pathways associated with consumer products, such as braces, silverware, and pots and pans; and especially those that may contain long lived isotopes (0041-4) (0417-2-1) (0451-1) (0481-2-2) (0520-15) (0553-2) (CH023-5)

- Exposure of workers in non-licensed industries such as steel mill workers (0488-5) (0640-2) (0645-9) (MD008-21-1)
- Exposure due to the release of nickel (MD028-19)
- Pathways associated with workers who will process the materials at recycling facilities including doses received off the job (0031-42-1) (0530-8) (0596-13* 1 similar comment letter)
- Use the pathways in RESRAD-RECYCLE 3.0 which include consumer products, scrap inventory, scrap delivery, ingot delivery, product distribution, public products, reuse products, scrap melting, fabrication, and controlled products (0070-32)
- Pathways associated with workers at electric arc furnace facilities because they use almost 100 percent recycled materials and produce 50 percent of U.S steel (SF026-9)
- Concerned about use of recycled metals for food packaging and, that for some applications, substitute material may be difficult to find (SF012-9-1)
- How would landfills and the people that work on and live around landfills be affected if the materials are not recycled? (AT024-16)
- Concerned about how NRC will estimate total exposure to the public given the complexities surrounding the long half lives of some radionuclides (0044-11)
- When analyzing pathways, make the assumptions of the models known, and highlight the differences with DOE or other agencies (MD001-28-1)
- Focus pathway analyses on specific waste streams, and on uses within those streams, such as reuse or recycling (MD033-2-2)
- Be specific in addressing material types and their management with exposure pathway modeling specific to individual radionuclides with typical industry processes (0469-12)
- Many pathway analyses have flawed assumptions in the exposure times and dilution factors, resulting in unrealistic exposure scenarios (0673-15)
- Radionuclide concentrations of recovered metal have a large degree of uncertainty (0469-6)
- Analyze exposures to other forms of life besides people (0596-13* 1 similar comment letter)
- Analyze a scenario where a child's favorite toy is made with recycled radioactive material and the child carries it all day and also sleeps with it all night (0189-4) (0410-2)
- Evaluate hazardous and non-hazardous landfills separately because of the different liner requirements; also evaluate the leachate and effect on landfill workers (CH026-9-1)
- Compute risks for all released materials from all sites and all routes of human exposure combined; the analysis should consider all physical and biological exposure pathways (0519-3)
- Analyze exposure from recycled radioactive soil (0564-9) (MD027-19-1) (MD038-3)
- Analyze non-fatal, non-cancer low-dose effects as well as cancer effects, especially to the most vulnerable sectors of the population, such as unborn children, young children, pregnant women, and those with impaired health (0596-13* 1 similar comment letter) (0713-4* 1 similar comment letter)
- The analysis should be based on the Petkau Effect methodology and not the BEIR-V methodology (0645-5)
- Analyze the synergistic effects of radiation exposure with other toxins (0468-3) (0706-2-1)
- Evaluate exposure to families that live near steel mills and that grow produce for home use (0645-23)
- Exposure from drinking water contaminated by airborne emissions from steel mills should be evaluated (0645-10)
- Cancer risks allowed should be consistent with requirements for hazardous waste (0519-1)
- NRC should reduce the permissible dose levels to take into account more sensitive populations and up-to-date

research confirming low-dose effects that are not incorporated into existing standards (0596-15* 1 similar comment letter)
- Mass of slag produced per mass of scrap is not well documented or available from industry (0469-6)
- Pathways of exposure will be both process and isotopic specific (0070-32)

Public Trust/Confidence

- The effects of recycling on public health are too complex to analyze in sufficient detail and computer models are not reliable in predicting future doses (0147-4) (0152-4) (0346-4) (0595-4)
- The additional cancer death rate of one per 285 people exposed is unacceptable, and NRC's statements that the exposure from recycling would be small is not credible in light of recent revelations at Paducah (0278-6* 12 under signers)

8.2.2.2 Specific exposure scenarios

Some commenters identified specific exposure scenarios that would be relevant to an unrestricted release option.

Procedural

- Trucker driving scrap steel to a facility compared with truck drivers hauling bricks or drywall (AT008-41)
- Accidental release of material above clearance levels (AT017-32-1)
- Specific furnace types - electric arc furnace, basic oxygen furnace, cupolas, induction furnaces - taking into consideration product differences and management differences that affect partitioning of isotopes and exposures to workers (0395-28) (AT014-21) (AT027-11)
- Cleaning baghouse ducts (SF026-21)
- Scrap from multiple release points may be concentrated at one recycler (AT009-4)
- Elevated doses realized by combining individually released sources into one big source through melting (AT017-20)
- Unloading of lead and copper scrap metal by hand (CH018-32-1)
- Handling and reuse or disposal of baghouse dust and slag (0395-15) (CH023-7)
- NUREG 1640 scenarios are too limited (SF015-6)
- Evaluate inhalation and ingestion pathways for truck drivers who often remain in their cabs during loading when resuspension of radioactive dust might occur (0395-30)
- Evaluate a sailor with a bunk adjacent to contaminated bulkhead (0395-33)
- Disposal scenarios (e.g., on-site and off-site landfills, on and off-site land farming, incineration, etc.) should be considered (0659-36)
- Exposure of workers at mini-mills may be disproportionately high because recycled material might not be mixed with any clean material (0044-11)

8.2.2.3 Questions about exposure pathways

A few commenters raised questions about the pathways of exposure that NRC considers in releases of radioactive material.

Procedural

- What population is most critically exposed and what are the radionuclides of greatest concern? (AT017-21)
- How much dispersion is being found in the results for the critical group and is there a limit to the acceptable amount of dispersion? (AT023-1)
- What are the potential exposure pathways expected to be and how likely is the public to be exposed? (SF003-4)
- How certain is NRC about the partitioning of isotopes when metal is melted? (AT017-26)

- How does NRC know all of the isotopes present that are being released? (0649S-1)
- How will NRC evaluate the human health impacts of a standard? (0044-11)
- Since approximately 33 percent of slag goes to uses such as soil conditioning and ice control, could this result in localized contributions to exposure pathways that underestimate the dose to critical groups if pathway models are used with individual inputs? (0469-6)

8.2.2.4 Clarification of possible exposure pathways in NUREG 1640

Commenters identified exposure pathway considerations relevant to the NUREG 1640 analysis.

Procedural

- Scrap from the demolition of large nuclear facilities will be sorted and processed on site and shipped directly to a steel plant, bypassing the use of scrap dealers or processors (0395-16)
- Electric arc furnaces do not inherently produce higher strength steel than basic oxygen furnaces and the distribution from each to consumers takes about the same length of time as was erroneously stated in Section 4.2.3 of NUREG 1640 (0395-18)
- Facilities using electric arc furnaces typically perform finishing operations, which are not reflected in NUREG 1640 (0395-24)
- The analysis in NUREG 1640 contains contradictions and unrealistic assumptions (0645-11)
- Assumptions regarding radionuclide concentrations in scrap metal are based on limited information and are subject to uncertainty; estimates of risk could change significantly due to only small changes in concentrations (0469-6)

8.2.3 Radiological and non-radiological impacts to consider

Commenters identified many types of other environmental impacts that should be evaluated and often added their views about the extent of these impacts or raised questions about NRC's ability to adequately assess them.

8.2.3.1 Types of impacts NRC should evaluate

Health and Safety

- The NRC must consider the accumulation of radioactive materials on equipment and in metals industry by-product and waste streams, and exposure of workers and members of the public to this contamination (0570-20) (0649S-14)

Economic/Cost

- The analysis of any rulemaking should establish that the benefits outweigh the related impacts associated with implementing the rule (0659-38)
- The analysis must show a net benefit to justify a rulemaking (0659-111-2)

Procedural

- Impacts associated with the complete life cycle of potentially clearable materials of the proposed standard (0027-4)
- Air quality impacts during the recycling process (SF015-4)
- Impact from foreign materials is greater than release of metals domestically (0530-8) (CH009-2-1)
- Any potential environmental impact must be considered all the way down to the consumer level (0596-30* 1 similar comment letter) (CH027-12)
- Risk is negligible at the low dose rates so the benefits are the same as for recycling any other metal (CH028-2-2)

- Need to look at the timing and frequency of releases to evaluate potential impacts (0530-8) (MD026-1-2)
- Determining the aggregate extra radiation dose delivered to the public, including future generations, is critical and yet impossible to estimate accurately (0732-1)
- Evaluate the effects on children with depressed immune systems (0602-3)
- Evaluate the energy saved from recycling steel (0687-2)

8.2.3.2 NRC should consider the following documents, studies, and/or findings

- The Nuclear Energy Institute's technical review team findings identify questionable input parameters and application methods used in NUREG 1640; industry data could improve parameter accuracy in NUREG 1640 (0022-12-2)
- The National Research Council's 1996 study of the decommissioning of DOE's three gaseous diffusion plants includes several important recommendations pertaining to the recycling of scrap metal (0044-9)
- The Michigan State University sampling and measurement protocols (CH007-7-1)
- The 1997 EPA study, located on the EPA website, which looked at exposure to the general public and workers beyond the licensed area, such as people in scrap yards and steel mills (MD014-5-2)
- The ANSI Committee's report, N13.12, which focuses on clearance (MD024-9)
- The CRCPD's 1994 findings concerning DOE mismanagement of radioactive materials (0044-18)
- Other EPA, NRC, and DOE documents (unidentified) available in the literature and to the public, including an EPA document addressing NRC-licensed commercial nuclear power plants and DOE facilities (MD014-8) (MD029-17-1)

8.2.3.3 Several documents, studies, and/or findings are inadequate

- The draft NUREG and ANSI documents have not been adequately scrutinized (0038-7)
- The Draft Regulatory Guide DG 4006, Demonstrating Compliance with Radiological Criteria for License Termination, allows for the inadequate evaluation of doses from solid material releases (0041-2)

8.2.3.4 Question about what impacts should be considered

- How do these materials enter ecosystems and our bodies and cause negative impacts? (SF014-22)

8.2.4 Potential exposures to multiple sources of material released for unrestricted use

Some commenters thought the potential for exposure to multiple sources was a concern. Whereas others believed that the doses from other sources were small enough to mitigate this concern.

Health and Safety

- Multiple exposure pathways by which one individual or group may be exposed to many different sources would have a significant health impact; NUREG 1640 addresses this exposure; the totality of doses and their health impacts should be considered (0026-8) (0427-39) (0659-110-3) (0842-1) (MD001-29-1) (MD012-29* 1 similar comment letter)
- Because of exposure to multiple sources there is a high probability that the proposed doses will be exceeded (0184-3) (0222-3) (0459-5) (0523-3) (0858-2)
- Treat radiation the same way as any other hazard in terms of evaluating risk (SF014-23)
- The amount, type and effect of multiple exposures, including

synergistic effects, to all members of the population, the gene pool, the environment and other species, workers, and other progeny need to be evaluated (0649S-20)

Implementation

- Make clear assumptions about the link between dose and concentration so the standard can be practically implemented (AT008-18)
- Set an appropriate standard to increase recycling and decrease new mining (0022-5)

Procedural

- A 0.01 mSv/yr (1 mrem/yr) standard is sufficiently conservative to protect public health even without knowing the cumulative effects (0070-36-1) (0659-42)
- The risk from 0.01 mSv (1 mrem) of exposure is independent of exposure from any other source (MD011-11)
- People are more exposed to concrete than to other materials, so cumulative effect associated with concrete may be higher than for other materials (CH031-13)
- Need to ensure that all cleared material does not go to one recycler and may have to incorporate some "averaging" of contamination across recyclers in any rule (0030-26)

8.2.5 Societal impacts

Commenters raised concern about potential fear and adverse public reaction to the clearance of contaminated material; issues specific to sensitive populations were also noted (e.g., Native Americans).

8.2.5.1 Public reaction to potential rule

Health and Safety

- The actual effect of this proposal cannot be measured because cancer origins are not traceable (0481-3)
- Any real or perceived health risks will not be tolerated by the public (0469-6) (0470S-2)

Public Trust/Confidence

- Recycled material may end up in food packaging that does not have other packaging alternatives, and the public may not want to buy those products (SF012-9-2) (SF014-21)
- Public perception is a real concern; people think there is already enough pollution without additional releases (0252-3-1) (0427-41) (AT024-17-2)
- Irrational fear should not be considered a negative societal impact in decision making (0057-32-2) (0210-3)
- Public perception and possible rejection of recycled materials may negatively impact the recycling industry (0070-37) (AT017-6) (SF008-5)
- Public trust is low as a result of recently publicized health concerns at nuclear facilities (0469-6)
- The public is skeptical that this initiative is just another way to promote the "below regulatory concern" (BRC) policy that was struck down by Congress (0395-63) (0634-1)
- Public will have legitimate concerns about risk that should be addressed through education (0070-38)

8.2.5.2 Examining societal benefits of a proposed rulemaking

Economic/Cost

- It is not possible to assess the benefit or loss of cultural resources; Tribal people are not in the majority and it's difficult to retain control of our resources (SF020-8-2)
- The costs and environmental impacts of tracking and recapturing already released wastes need to be considered as well as opportunities for mistakes and fraud (0519-5-2)

Public Trust/Confidence

- How can you tell people new exposures would be safe when Native Americans have been disproportionately affected in the past? (SF020-3) (MD016-3-2)
- Need to carefully present information about analytical scenarios that consider sensitive populations and projects to avoid being misinterpreted (AT012-2)

8.3 IMPACTS UPON INDUSTRIES THAT HAVE SPECIAL CONCERNS ABOUT THE PRESENCE OF RADIOACTIVITY IN MATERIALS

Commenters expressed specific concern for potential impacts of a rule on the steel and other metals industries, and the nuclear medicine industry. Many commenters from the steel and metals industries expressed concern about receiving contaminated materials because their facilities may experience costly shut-downs or rejected loads or the public might reject their product.

Representatives of nuclear medicine expressed concern that controls on contaminated material could increase costs and thereby decrease access to nuclear medicine.

8.3.1 Recycled materials effect on metal prices

Economic/Cost

- Total volume of solid waste is too large for recycling of contaminated materials to have an impact (AT010-1-1) (AT011-8-1) (AT027-9-2) (SF012-8)
- Nickel and copper prices could be affected due to increased competition (AT011-8-1) (AT027-10-2)
- If releases of nickel and copper are spread out over 30 years the impact would be minimized; if not, the market would be affected (AT027-9-2)
- People may choose virgin metal over recycled materials to be safe, which would increase mining (0026-10)
- Releasing materials could affect the marketability of recycled products and metal products generally (MD034-3)
- Pre-Fermian materials are already at a premium for certain applications; recyclers will take advantage of this market niche (0070-39)
- Quantity of potentially released materials is low enough that there will not be any environmental benefits from not having to mine more metal (AT027-8)

Implementation

- The nuclear power industry has strict controls on surveying and releasing metals; the steel industry surveys incoming loads for orphan sources not because of material released from the nuclear power industry (CH014-30-3)

8.3.2 Issues affecting the feasibility of recycling

Health and Safety

- The recycling industry fears both the health and financial risks associated with recycling radioactive materials; health risks are the more significant concern as there have been several incidents where workers have been exposed to high and lethal levels of radiation from orphan sources (0530-1)

Economic/Cost

- Evaluate whether the release of slightly contaminated metal would actually increase the demand for virgin metal (MD018-3)

- The only group that is in favor of recycling radioactive metal is the nuclear industry; the public, recyclers, scrap dealers, steel mills, and users of metal products are all against recycling (0529-4-1)
- If customers de-select recycled steel there could be significant economic impacts in the form of reduced revenue, workforce reductions, and loss of revenue in industries that supply material, equipment, and services to the steel recycling industry (0687-4-1)
- Acceptance of radioactive material has no benefit to cement and concrete industry (0470S-5)
- Metals or other materials cleared at low dose rates would have minimal detrimental effects on operations in the metals industry (0070-44-2)

Implementation

- The steel industry requires the use of highly sensitive detectors to protect itself from heavy shielded orphan sources buried deep in scrap loads (0395-4)
- The released materials might set off alarms at steel mills, which has a real impact on their operations because these loads are typically rejected and at a minimum increase the operating costs on recyclers and steel mills (0395-11) (0530-8) (0567-15-1* 2 under signers) (0570-18) (0660-8) (0687-6) (SF026-27)
- Higher levels of radioactivity in baghouse dust or slag could significantly increase the management costs for these byproducts because they would have to be disposed in a LLW landfill (0530-8) (0567-15-1* 2 under signers) (0645-12)
- How will a rule affect uranium recovery operations? (0613-8)

Procedural

- NRC has not sufficiently explored the economic impact on metals industries from the free release of radioactive scrap; this economic impact could be large (0530-8) (0570-5-1) (0687-1-2)
- Steel is not inherently radioactive; it is very difficult to find any radioactivity at all in basic steel, so recycling is still a viable option (CH018-16-2)
- Decontaminating metal creates more waste not less (0645-13-1)

Public Trust/Confidence

- Currently recycling is perceived as a social good; the free release of radioactively contaminated metal would tarnish this image and could actually stimulate additional demand for mined virgin ores as metals manufacturers demand radiation free metal (0507-10) (0570-16-1) (0645-7) (0660-2) (0687-2)

8.3.3 Effect of consumer choice on the steel industry's decisions to accept released materials

Economic/Cost

- People will deselect contaminated steel, which will have a devastating impact on the steel industry (0567-13* 2 under signers) (0645-6) (0660-14) (MD017-14)

Implementation

- If NRC establishes a safe consistent standard, then there will not be a stigma (MD006-6)
- Metal producers already receive contaminated sources and have developed a zero tolerance policy to build public confidence; they will not accept metals that the public perceives to be unsafe (0269-7* 1 similar comment letter) (0283-4) (0427-43) (0642-5) (MD034-4-1)
- Steel company customers are already requesting that their steel is certified radioactive free and will require the steel companies to provide laboratory analysis of each batch if NRC passes a rule to allow the release of

contaminated materials for unrestricted recycling (0395-43-1)

Procedural

- There are two types of impact: real, such as setting off alarms at a landfill, and perceived, which might stigmatize an industry. Avoid or mitigate the real impacts in any proposed rule (CH014-7)
- Recycled steel already has radioactive material in it, so what is the appropriate level of radioactive material to keep the industry from becoming stigmatized? NRC should accept what stakeholders are comfortable with (AT008-4) (CH023-24-2)

Public Trust/Confidence

- Steel and other metals manufacturers are concerned with the perceived or real contamination of their products or wastes as a result of a rulemaking that might result from this decision-making process (0244-3-2) (0258-4-2) (0395-45) (0567-2* 2 under signers) (0683-4) (AT026-1) (CH016-8) (CH023-16-2) (MD006-6)
- The public's perception will determine the marketability of recycled metal products, not any objective evaluations of risk (0567-12* 2 under signers) (0570-12-2) (0660-2)
- Implementing a rule for restricted release would not compound problems that already exist (0070-40)
- Obtaining public acceptance is the best way to reduce the economic risks associated with released materials (0070-44-1)

8.3.4 Responsibility for problems if they arise

Implementation

- What is the contamination level when a material is released? If millirems increase during the process, the recycling industry gets blamed while the people who originally released it are no longer responsible (AT017-14)
- Guarantee that if a steel mill does a controlled melt with no other materials, and the released materials contaminate the mill, then the federal agencies involved will be responsible for the decontamination, lost business, and lost production (SF026-47)
- If a material sets off an alarm, it will go back; the plant is not going to try to find out what it was (CH018-28-1)

8.3.5 Potential Impacts on the biomedical and research industries

Implementation

- How can the biomedical industry address storage and LLW disposal? (MD002-2) (SF022-5)
- Do not burden the biomedical industry with control of solid materials at extremely low levels of radiation. 0.01 or 0.1 mSv (1 or 10 mrem) does not have an effect; 100 mSv (100,000 mrem) is a better starting point (MD011-3)
- Regulations should not hamper the industry's ability to function. Highly restrictive releases might force us into keeping large volumes of materials that enter our research areas but are not contaminated (MD023-5-2)

8.3.6 Changing current detection levels

Consistency

- Consider more than just state requirements. Local constraints also get imposed (SF011-4-2)

Procedural

- Is there a way to equate the dose of a released material to what the material would read going through a detector? (CH023-15-1) (CH030-3-2)

8.4 ECONOMIC CONSIDERATIONS

(See section 8.3 for related issues)

Among those who expressed an opinion about the likely overall economic impacts of unrestricted release, many predicted that proceeding with a rule would decrease costs. Most of the comments predicting higher costs came from the metals industry. Many commenters provided their perspective on the potential costs and benefits of different provisions of different alternatives.

8.4.1 Incorporating economic factors into decision-making process

Commenters raised a wide variety of issues regarding the economic issues related to this action. These issues include the nature and magnitude of general economic impacts and impacts on specific industries or types of facilities, specific compliance cost factors, and the economic decisions that affect recycling.

8.4.1.1 General considerations

- A safe, practical standard would save NRC resources, as compliance would be easily verifiable (0659-30)
- The cost of developing the rule could be substantially reduced by building on the extensive technical basis that already exists in the international community (ICRP, IAEA and CEC) as well as nationally (NCRP, EPA, and DOE) (0659-30)
- NRC must set a level that is reasonable considering varying measurement capabilities. Continually requiring laboratory measurements would be impractical and costly (AT005-6-1)
- Endorsing the ANSI standard would be cost effective and result in future cost savings (SF001-9-1) (0659-30)
- A reasonable and predicable standard will result in significant reductions in the compliance costs associated with unnecessary and/or inefficient regulatory burdens (0561-16)
- A reasonable standard can lower future costs of disposal of materials as nuclear plants are decommissioned (0057-9) (0531-17)
- A reasonable and predictable standard will result in a significant reduction in the compliance costs associated with unnecessary and/or inefficient regulatory burdens (0531-16)
- Requiring materials that pose a low risk of either human or environmental damage to remain at nuclear facilities wastes societal resources. Adoption of a reasonable dose-based standard for releasing solid materials will allow the reuse of materials, or permit disposal at industrial landfills (0531-16)
- Economic factors should take a back seat to public health and safety in the regulations (0019-3) (0023-5) (0257-3) (0312-4-2) (0314-3) (0419-2) (0485-2) (0504-4) (0553-3-2) (0623-3-2) (0645-15) (AT008-39)
- There is no significant advantage to the nuclear industry to recycle scrap steel as opposed to disposing of it in an industrial landfill or other adequate facility (CH014-64-1)
- Consider the potential for increased health care costs (0192-5) (0517-2)
- Each dollar spent on excessive regulation has a mortality figure attached (0210-4)
- Do not pass the burden of ultimate disposal to local municipalities – rather require companies to pay (0026-7) (0251-9) (0528-3-1)
- Include the substantial effort and time required to obtain case by case
- approval of the release of materials (AT024-23-2)
- Any rulemaking must be cost effective (AT005-3)
- Ensure a regulation will be economically viable given the quantity of material reused or recycled (AT013-1-2)
- Because we do not know what future costs will be, any economic analysis will be speculative (AT008-39)

- Evaluate the cost to small versus large facilities to comply with the current and proposed regulations (0030-13-3)
- Financial impacts should be compared against the societal good that would otherwise be possible if funds were not expended on the insignificant risk resulting from this rulemaking (0057-17)
- Economic liability should not be shifted from generators to recycling industries and the public (0045-9* 141 similar comment letters, additional 54 under signers)
- Streamlining the release of radioactive materials and eliminating the need for case-by-case determinations could reduce the regulatory burden on licensees (0682-6)
- Prohibition would be cost-saving to NRC as no more case-by-case releases would need to be considered (0649S-7)
- Costs of enforcement should be borne by generators (0649S-18)
- Although licensees already have survey equipment and procedures in place, a new rule at a minimum would require changes in the procedures and at worst would require new survey equipment (AT024-20-1)
- The establishment of international standards that do not include the U.S. could put U.S. companies at a competitive disadvantage (0682-7-1)
- Evaluate environmental justice issues (0645-3)
- It is inappropriate for regulators to establish what the industry or market will or will not do (AT008-38-1)
- Research facilities and medical licensees have very low level waste. If the definition of what can be cleared is set too low these facilities will have large volumes of low level waste that they don't have now, which would have an enormous economic impact (MD011-5)
- Need to consider external costs to those outside nuclear industry (MD031-1)
- Setting the free release level too low will create additional quantities of wastes and problems with disposing of that waste will impede the decommissioning of licensed sites (0613-21)
- Any economic impacts resulting from a rule will be minor due to the relatively low volumes of material that will be reused or recycled (AT010-1-2)
- If all the non-contaminated or background level materials from DOE or other sources are removed from the cost-benefit analysis, the remaining volume may be small enough that it can be put in a landfill more cost effectively than recycling it (MD017-18-2)
- Consider the cost to a downstream user when an upstream facility makes mistakes (AT017-31-2)
- Health impacts should be emphasized more than economic impacts, although economic impacts cannot be ignored. Environmental impacts should take a much higher priority (0070-31) (0469-14) (0506-3) (0545-2) (0552-2) (0626-4-2) (0638-9-2) (0645-2) (0754-4)
- Even the tiniest risk is not worth the large profit that will be made through free releasing material (0075-3) (0445-2)
- Unless materials may be released from decommissioned nuclear plants, disposal-related costs would be prohibitive (0407-10)
- Use the impact of radiation on post-WWII materials as a gauge for impacts associated with this rule (AT005-10)
- NRC should look at costs from a dollar/person rem value (AT013-6-2)
- There are no societal risks associated with low level exposure. Therefore, materials should realize the same benefits from recycling as other, similar materials that are recycled (CH028-2-3)
- The economic impacts to the metal working industries and the health impacts to their workers should be evaluated (0031-18-1)
- The health care costs for people who get the incremental cancers (~$200 billion) far outweigh any benefits of recycling (0382-1) (0495-3)

- Ensure mechanisms are in place to guard against individuals dumping materials to avoid regulation (i.e., negative environmental impact) (AT022-6-2)
- Universities reduce their use of nuclides because of concern about regulation and not personal safety. Radioactive materials are critical to the study of molecular processes (0030-29-1)
- Base the release level on the level of protection, not on the economic benefits realized (MD005-7-2)
- NRC is required to ensure that all recycling is in compliance with ALARA and to conduct an analysis in conformance with the ALARA principle as part of any rulemaking (0044-17)
- Need to demonstrate benefits of reuse and recycling to the public, since the public won't believe there is no risk (CH023-23)

8.4.1.2 Factors affecting non-licensed industries

- The recycling industry fears both the health and financial risks associated with recycling radioactive materials; health risks are the more significant concern as there have been several incidents where workers have been exposed to high and lethal levels of radiation from orphan sources (0530-1)
- For the restricted use alternative there are likely to be significant costs to state and local governments to implement the regulation (CH009-7-2)
- The costs of screening metal for radioactivity are shifted from licensees to scrap metal brokers and processors (0687-7)
- Scrap industry detectors are set not only for orphan sources but also for very low level NORM sources (MD026-3-2)
- The economic risk of released materials being rejected at recycling facilities is minor because the metals industry already monitors to protect itself from large scale contamination (0070-44-2)
- Differentiate economic impacts associated with melting a radioactive source versus implementing a standard (SF005-10)
- Include the economic costs to industries that are not regulated by NRC but that will be impacted by a free release rule (CH018-5)
- Consider the benefits of research using radioactive materials to develop new drugs (CH012-11-2)
- Consider the economic and employment benefits of research using radioactive materials (CH014-14-3)
- Consider the economics of affected industries, such as potential job loss, in the cost benefit equation (CH016-5)
- Consider the costs to another industry of having to receive this material in the economic analysis (CH031-2-2)
- The economic impacts of the public deselecting recycled radioactive steel could be significant even at low percentages because of the huge revenues of the steel industry (~$40 billion per year) (CH016-6-3) (CH027-3) (CH031-4-2)
- Consider economic impacts beyond just licensees in evaluating the costs and benefits (MD037-2)
- Increased potential for radioactive material in cement and concrete will cause these industries to incur significant additional expense for surveillance (0470S-5)
- Poll recyclers to see if they are willing to accept unrestricted materials and face the risk of steel mills finding hot spots and not accepting the recycled metals (MD026-4-1)
- Poll scrap dealers to see if they are willing to accept the risk of released materials setting off alarms and having to tell consumers that because it has already been free released, the material is okay (MD026-4-1)
- The small amount of material that would be available each year for recycling would not affect the metals market or recyclers (MD014-9)

- The metals industries and their customers derive no economic benefit from recycling radioactive scrap (0529-4-2) (0570-19)
- Who will benefit from the recycling of radioactive metal besides the nuclear industry? (0507-4) (CH030-7-2)
- Virgin aggregate is worth around $8/ton, the value of used concrete as aggregate would be significantly less and thus the economics of recycling concrete are dubious (CH031-14)
- EPA issued guidance adopting a 1 mSv (100 mrem) standard that the oil, phosphate, and ore processing industries said would cost billions to implement. NRC's rule could have an indirect but significant fallout on NORM industries (SF005-16)
- If materials set off alarms, facilities will not want it and the material will have negative value because someone will have to pay to remove it. Abandoned materials will also add costs (0660-3) (MD017-17-1)
- Include the substantial cost of an accidental melt of radioactive material at a steel mill (AT017-31-2)
- The released materials might set off alarms at steel mills, which has a real impact on their operations because these loads are typically rejected and they require intervention by a state or Federal agency (0395-50) (0567-3* 2 under signers) (0570-7)

8.4.1.3 Recycling considerations

- There are no economic incentives to recycle steel (AT008-2-2)
- The only reason recycling is an option is because it costs less than disposing material into a low level radiation waste landfill (0529-4-2) (AT019-14)
- Currently there is no market for recycled radioactive materials (0050-19-2) (0520-8) (SF014-17-2)
- Although the scrap value for concrete is low, it is still economically feasible to recycle contaminated concrete because the alternative, disposal, is such a high cost (CH021-23)
- There is no viable recycling market for concrete that is not supported by government grants (CH024-3-1)
- The primary economic gain from recycling is avoiding disposal costs. Given this, there is little difference between standards to restrict releases, including disposal, and permitting unrestricted recycling of such materials (0044–15)
- The new standards must be easy to implement in the field (0537-7-1)
- Compare the environmental benefit of reducing the amount of virgin ore required with recycling (0682-22)
- Products made with recycled radioactive materials should be labeled as such to allow consumers the choice to buy or not to buy these products (0085-3) (0508-2-2) (0627-1)
- What are the benefits of recycling radioactive materials? (0189-6)
- The radioactive material recycling proposal shifts costs and responsibilities of routine monitoring and emergency response from NRC to state and local governments and agencies (0528-2)
- Economic impact on nickel and copper markets would be devastating if materials are released in large quantities over short periods of time (AT027-9-1)
- Recycling slightly radioactive scrap will have little or no effect on mining because mined ore is used in blast furnaces to produce iron for blast oven furnaces, which use only small amounts of scrap especially when compared to electric arc furnace facilities (0395-56) (AT011-10)
- If the volume of contaminated metal that could be recycled is small compared to the total volume recycled, does that trivialize the economic argument for recycling this material? (SF023-2-1)

8.4.2 Major economic costs associated with release of solid materials into commerce

Those commenters who addressed this issue identified several types of costs that NRC should consider.

- Administrative costs of materials management could be excessive if a practical standard is not established (0027-5)
- The cost of future liabilities is a decision drivers supporting a standard (0027-6) (0568-2)
- Decontamination and surveying to prove material is below the limits (0427-46) (AT005-6-2) (AT008-31)
- Nuclear power generation costs will increase if more material is sent to low level waste burial (AT013-4)
- Impacts on utility rates (AT013-4)
- Potential costs associated with mistakes (shutting down mills, loss of wages, clean-up) (0530-2) (SF006-15)
- Costs of material leaving through the license termination process (AT023-3-2)
- Development of a new standard and conversely cost savings from adopting ANSI N13.12 (or other) standard (SF001-17-2)
- Obtaining and maintaining public confidence (SF003-06)
- Increased monitoring costs (SF003-06)
- Increased sampling costs (SF003-06)
- Additional worker protection costs (0507-11) (SF003-06)
- Additional public relations costs (SF003-06)
- Sending back materials that exceed the standard (0427-46) (SF006-20)
- Opportunity cost of not cleaning up facilities to reuse and recycle materials (SF014-18)
- Modification of machinery to accommodate radioactive materials (SF026-29)
- Tracking use and location of recycled and reused materials (SF027-8-1)
- Costs of developing new LLW facilities if recycling is not allowed (0497-13)
- Replacement costs for LLW disposal sites when existing disposal capacity is exhausted (AT007-1)
- Storage costs for waste when existing disposal capacity is exhausted and before new capacity is built (SF016-3-2)
- Cost of disposal at a low-level radioactive landfill is extremely expensive relative to other options (e.g., disposal in Subtitle C or D landfill, recycling) (AT019-2) (SF007-4) (SF023-3)
- Cost of licensing a facility for disposal, including Environmental Impact Statement (SF004-7-2)
- Costs of convening and running a commission or committee to analyze alternatives to disposal (SF007-4)
- Operational costs for running a low-level facility (SF004-7-2)
- Additional public relations costs (SF007-4) (SF023-5)
- Economic impacts of removing land from productive use because it is needed for landfill space (CH021-35-2)
- Costs of monitoring, including purchase, calibration, and worker training. The costs of managing solid waste that sets off detector alarms,and the cost of monitoring and managing landfill leachate that may contain radionuclides (0070-43) (0427-47) (0520-7)
- Costs of dealing with legal and political issues (SF023-5)
- Disposal benefits operator of disposal operations because it increases the value (SF023-5)
- Costs of "Not in my backyard" issues of state regulated landfill authorities (0469-6)

8.4.3 Economic risks associated with release of solid materials for unrestricted use

Those commenters who addressed this issue focused generally on the potential for various groups to reject materials that contain radiologically contaminated materials.

- Customers may stop accepting metal with radioactive content above background from the metal industry (0567-10* 2 under signers) (0660-10) (0687-4-2) (CH027-11-2)
- Scrap metal at levels equivalent to a few mrem/yr should not cause false alarms above current alarms due to NORM (0659-56)
- The realization that certain consumer goods have a higher potential to contain radioactivity will translate into a loss of market for the affected industries (0470S-4)
- Licensees will maximize amount of material released without decontaminating it and will attempt to minimize survey costs. These tendencies will require significant enforcement efforts to ensure that licensees are complying with therelease limits (0044-16)
- The public selecting not to use material because of a perceived concern about radiation exposures (CH016-6-2) (CH017-10-2)
- International trade partners might reject anything that was produced with recycled contaminated metal (0026-12)

8.5 POTENTIAL FOR BUILDUP OF RADIOACTIVITY IN COMMERCE OVER TIME

- Buildup is not likely because the levels that could be introduced are so small and over time naturally decrease (0030-30)
- Buildup of radioactivity in commerce must be analyzed and if it is determined to be significant the materials should be restricted to solid waste landfills (0057-19-1) (0659-58)
- Buildup of short half-life radionuclides will not occur (0070-45-1)

8.6 QUESTIONS REGARDING ECONOMIC IMPACTS

Some commenters raised questions pertaining to the economic impacts of proceeding with a rule on control of solid materials.

- Does the relatively small quantity of low level radiological waste to be recycled mean that one cannot make a strong economic or environmental argument that these materials should be recycled? (SF023-2-2)
- How much is society willing to pay to prevent 0.01 mSv (1 mrem) of additional exposure? (AT013-3-1)

9.0 OTHER PROCEDURAL COMMENTS

Many commenters addressed both the specific public participation process that NRC has implemented in addition to the more general issue of public awareness and participation regarding the clearance of materials.

9.1 NRC SHOULD EXTEND THE PUBLIC COMMENT PERIOD

A number of commenters indicated that the public comment period was too short or should be extended.

- Until September 2000 (0045-3* 141 similar comment letters, additional 54 under signers) (0046-2) (0051-4) (0052-3) (0074-6) (0155-3) (0240-3) (0244-5) (0258-3) (0266-2-2) (0269-6* 1 similar comment letter) (0511-3) (0538-4) (0547-2) (0590-3) (0595-1-2) (0624-3) (0625-4) (0631-5) (0638-7) (0642-8) (0648-2) (0664-37) (0801-3)
- For an additional 8 months (0092-3) (0120-3) (0184-7) (0240-8) (0275-3* 1 similar comment letter) (0303-3) (0322-7) (0360-2) (0398-2) (0482-4) (0519-14) (0606-3) (0779-4* 19 similar comment letters) (0807-1) (NRC74-4)
- For an additional 6 months (0302-3) (0514-5) (0619-6)
- For an unspecified time period (0045-18-2* 141 similar comment letters, additional 54 under signers) (0107-2) (0120-2-2) (0152-2) (0227-3) (0230-8) (0237-3) (0262-6-2) (0307-6) (0311-7) (0372-2) (0384-2) (0386-2) (0392-3) (0394-3) (0400-5) (0403-5) (0421-3) (0435-2) (0452-2) (0453-5) (0477-2) (0487-2) (0499-2) (0501-1-1) (0504-2) (0524-2) (0525-6) (0576-2) (0596-10-2* 1 similar comment letter) (0604-3) (0613-9) (0621-3) (0626-2) (0635-2) (0669-3) (0692-2) (0696-2) (0743-2) (0857-1) (NRC74-2)
- By at least two years (0059-2-2) (0441-2) (0451-4) (0542-2)
- By at least one year (0078-4) (0300-3* 1 similar comment letter) (0346-3) (0390-2) (0596-6* 1 similar comment letter)
- By an additional 180 days (0596-1* 1 similar comment letter)
- Since the date for the Chicago meeting was pushed back (AT017-3)
- The comment period was too short (0294-3* 1 similar comment letter) (0305-3) (0437-2) (0438-2) (0491-2) (0706-3)
- Because the public has not been made sufficiently aware of the possible rulemaking (0397-4) (0400-3) (0587-4) (0616-3)
- Because the public needs more time to form an opinion (0484-1)

9.2 NRC SHOULD EXPAND AND/OR IMPROVE PUBLIC PARTICIPATION AND AWARENESS

Some commenters expressed concern that the public was not provided adequate information to fully participate in the decision-making process.

- The public has not been well informed (0001-12) (0438-2) (0621-3) (0807-1)
- Media involvement has not been sufficient (0370-2) (0390-2) (0504-2) (0518-2) (0519-14) (0604-3) (0662-7)
- NRC did not competently notify all major stakeholder groups (0270-4* 3 similar comment letters) (0565-2) (0645-19) (CH003-1)
- NRC did not inform the public in a timely manner (MD012-32* 1 similar comment letter)
- NRC did not inform the public about all meetings regarding developing standards for release of materials (0649S-4)
- The public would not have known about the potential rulemaking were it not for Nukewatch and Progressive Foundation (0255-5)
- The length of the public comment period was confusing (CH029-4)
- Public opinion is not really being considered (0044-10) (0303-3) (0453-5) (0454-2) (0508-3) (CH017-16) (MD004-9* 9 under signers)
- Public perception is very real and needs to be given greater, serious consideration in the process (AT024-19) (AT025-8) (CH023-49-2)
- NRC has done poorly in disclosing information (e.g., the draft options papers, regulatory issues papers,

comment/response documents) to the public for review, which is its obligation (CH015-20) (CH017-2)

- Members of the public have little chance to actively participate at the meetings (CH020-5)
- The process, including the initial choosing of alternatives, needs to be revised (MD001-42-1)
- Efforts towards educating the public have been insufficient (0030-27) (0484-5) (AT022-6-3) (AT024-7) (CH003-1) (MD021-4)
- Simple techniques to better educate the public, like convening small focus groups and giving tours of facilities, can be informative and yield important results for the process (AT008-45)
- The issues are complex and difficult to communicate to the public (SF002-2) so be sure to use non-technical language (SF020-2)
- The material describing the proposed rulemaking is incomprehensible to the general public (CH017-6)
- Communication needs to be improved; for example, technical information needs to be more clearly explained and the issues should be discussed using simple language and everyday examples to create a frame of reference for the public (AT017-28-2) (CH011-13-2) (CH012-6-1) (SF022-2-1)
- Does the public understand that we import materials derived from recycled radioactive scrap metal on a daily basis? (AT003-1-2)
- NRC needs to clearly demonstrate that any determination they make will be safe (AT008-52-2) (MD015-2-2)
- The potential rulemaking is too theoretical or hypothetical (CH017-20)
- Narrow the focus of the debate to avoid talking about materials not covered in the potential rulemaking (MD001-48) (SF022-2-1)
- NRC's support of DOE's Oak Ridge metals recycling project undermines the credibility of NRC's commitment to the public participation process (0044-10)

9.3 PUBLIC PARTICIPATION HAS BEEN ADEQUATE

Some commenters expressed support for the enhanced participatory process that NRC adopted for this decision-making effort.

- The enhanced participatory process is appropriate and has been well proven through other initiatives (0022-3)
- Hundreds of environmental groups have commented on the proposal, and newspaper articles and television specials have discussed the issues (AT017-8)
- The process has been well proven through the successful, "Radiological Criteria for License Termination" rulemaking process (0022-3)
- NRC's public participation efforts, in general, have been adequate (0256-2) (0644-3)
- Early public involvement will add credibility to the process (AT017-11) (AT020-2)
- The workshop process is helpful (0612-1)
- The workshops have a good cross-section of the public (MD023-7)
- In the U.S., consideration of public perception is a luxury (AT008-21-2)
- NRC should not delay the potential rulemaking process because of negative perceptions or scare tactics by special interest groups (0058-2)
- Public participation has been low, but the NRC is not at fault (AT022-4-1)

9.4 NRC COULD IMPROVE UNDERSTANDING AND INVOLVEMENT IN THE DECISION-MAKING PROCESS

A number of commenters provided specific suggestions on ways that NRC could increase understanding and involvement of the public in the decision-making process.

- By advertising on TV and radio (SF014-3)
- Getting involved in general education programs to discuss radioactivity (SF007-3)
- Allowing comments to be submitted by email (CH013-3-2) (MD012-34* 1 similar comment letter)
- Setting up internet chat rooms for public comment on various issues (MD005-18) (MD015-10)
- Inviting rulemakers and stakeholders to steel mills and other affected areas to see operations (MD017-22-2)
- Explaining the issues to workers and others directly involved with potentially radioactive material (CH017-19)
- Being aware that some stakeholders (such as state governments) face multiple issues and plan ways to address issues from more than one side (MD018-19)
- Publishing a schedule for release of documents and publicize them well; give people adequate time to comment and make adjustments based on these comments (0519-4)
- Creating a task force that represents stakeholders and would seek input from government, industry, and the public with the goal of forming a consensus on release criteria (0530-9-2)
- Making NRC staff more available to those stakeholders outside the nuclear industry (0071-8) (MD001-40)
- Conducting an independent analysis of the DOE report (MD001-40)
- Performing a market or demand survey to determine the demand for the released material (CH030-11-1) (CH031-23-2)
- Avoiding terms like "recycling radioactive material" (CH023-48)
- Presenting information as simply as possible (0001-12) (0071-8)
- Seeking consistency (MD007-3)
- Selling risk/dose bases to the public creatively (0001-27-2)
- Coordinating with the European community, which is entering a similar process (AT003-1-2)
- Having meetings in communities (0027-10) (SF003-2), preferably on evenings or weekends (SF010-2)
- Using small groups to work towards consensus (MD001-40) (MD005-14) (MD006-49) (MD011-28) (MD018-9) (MD024-13) (MD025-3) (MD028-30)
- Publishing meeting agendas ahead of time so no new information is presented at meetings (MD015-19)

9.5 NRC NEEDS TO BUILD TRUST WITHIN THE PUBLIC

Some commenters identified lack of public trust as an factor affecting public participation.

- The process is illegitimate and some environmental groups refuse to participate (0278-2* 12 under signers) (SF018-2)
- Public relationships and past experiences with NRC and DOE have not been good (MD001-9-2)
- Trust must increase for a potential rule to be successful (0027-10) (AT016-7) (MD027-10)
- NRC's past mistakes make it difficult to gain trust (0023-2) (0031-33) (SF019-7)
- Need more interaction with the public and answers to questions the public raises (MD008-46) (MD032-27)
- Consensus among the public should be reached before proceeding (CH023-17) (MD001-39)

9.6 SUGGESTIONS FOR GAINING PUBLIC TRUST

Commenters provided further suggestions for means of improving public trust to facilitate the decision-making process.

- Follow through in the rulemaking process and remember the process is as important as the rule itself (MD027-10)
- Provide strong, consistent advocacy (0659-6)
- Help the public go through a learning process (MD021-17-2)
- Disclose more information (0031-23) (0424-2)
- Use independent contractors, disclose what they are doing, and allow the public access to meetings with them (0031-5) (MD001-18-1)
- Open meetings about contaminated soil and other topics to the public (MD012-27* 1 similar comment letter)
- Disclose the compliance history of public and private enterprises (0031-17)
- Address concern, confusion, and fear by the public (0031-27)
- Do not ignore public input (0023-2)
- Have more public discussion (0030-27)
- Make it easier to get a public hearing (0023-2)
- Have debates in non-NRC context (MD027-11)

9.7 ADDITIONAL STAKE-HOLDERS FROM THE FOLLOWING GROUPS SHOULD BE INCLUDED IN THE DEBATE

A few commenters identified specific parties that should be included in the enhanced participatory process.

- Physicians and others from the medical field (MD011-4)
- People involved in decommissioning projects (SF013-2)
- Native Americans, including tribal liaisons (MD016-1) (SF020-12)
- Everyone, because no one can speak for anyone else (MD012-19* 1 similar comment letter)
- The nuclear industry (0001-9)
- Affected industries, such as scrap recycle, steel, related manufacturing and products (0001-9)
- The environmental community (0001-9) (CH012-3-2)
- Public citizens (0001-9)
- Managers of solid waste landfills (CH024-1)
- The asphalt industry (CH031-40)

9.8 QUESTIONS ABOUT THE PUBLIC PARTICIPATION PROCESS

- Will NRC announce other meetings? (MD012-17* 1 similar comment letter)
- Would a proposed rulemaking go through a similar enhanced participation process? (SF017-5)
- Is there a website which tracks commenters' complaints, either on the internet or by phone or letter? (0025-3)

10.0 COMMENTS RELATED TO INTERNATIONAL ISSUES

Some commenters indicated that NRC should make a potential standard consistent with international standards on clearance. Others said that consistency with international standards could be problematic.

10.1 SUPPORT CONSISTENCY DUE TO IMPACTS ON FINANCIAL MARKETS AND TRADE

A number of commenters were supportive of consistency with international standards in order to avoid trade impacts.

- International consistency in setting and implementing standards is an important consideration because of import/export activities and economic disparities in commerce (0022-11) (0057-24) (0070-28-2) (0422-15) (0427-57) (0531-18) (0612-10) (0673-14) (0682-11-2)
- Compatibility with international standards will ensure that American firms are not placed at a competitive disadvantage in the global market (0022-6) (0407-11-1) (0422-11) (0531-15) (0682-7-2) (0740-5)
- Clearance standards must be harmonized with international standards to avoid adverse impacts on world trade (0659-66) (SF001-7) (SF026-2-2)
- NRC should be cognizant of standards set by IAEA that may impact the nickel and copper markets in the U.S. (AT011-8-3)

10.2 COORDINATION AND/OR CONSISTENCY WITH INTERNATIONAL BODIES ON DECISION-MAKING CRITERIA

Among the commenters who addressed this issue, some indicated consistency with international bodies was important, and others believed NRC should take a leadership role, ranging from consistency to independence.

- Considering release activities of other countries and the IAEA, NRC should take leadership role in establishing a technically sound and scientifically based standard that incorporates existing research (0531-18) (0659-8) (MD003-6) (MD030-2-1)
- Support coordination and harmonization with international agencies (0469-13)
- NRC should take lead in preventing contamination of international marketplace and not be pressured by radioactive release decisions of other countries (0045-13-3* 141 similar comment letters, additional 54 under signers) (0230-4) (0269-8-2* 1 similar comment letter) (0403-3) (0520-23) (0538-5) (0596-23* 1 similar comment letter) (0623-3-3) (0649S-19) (0652-1) (0678-6) (0698-1) (0711-1) (0746-1) (0748-1) (0754-1) (0756-1) (0764-2) (0767-1) (0770-1) (0777-1) (0787-1) (0804-1) (0824-1) (0826-2) (0585-3)
- The fact that other countries have adopted clearance criteria before the U.S. has jeopardized the credibility of the United States radiation protection framework (0132-9) (0167-8)
- NRC must coordinate efforts with international community to assure U.S. interests are considered in establishment of 'international guidelines' by the European Union (AT002-2)
- Similar to steel industry concerns with regard to NRC standards, international stakeholders have expressed concerns that the European Commission release values are not acceptable to industry (MD021-5) (SF026-25-2)
- Drafting a potential NRC rule should include review of international guidelines and justification of any differences (0659-66) (MD001-28-2)
- Although desirable, consistency with international standards should not be

the deciding factor in setting release standards (0570-30)

- If a risk-based standard adopted by the NRC on the basis of sound science differs with standards considered by the IAEA and the European Commission, the U.S. government should compel those bodies to adjust their releases accordingly (0570-30)
- Coordination with IAEA and international community will require consideration of member states that may have technical and economic disparities (AT002-3) (AT008-21-1) (MD025-2)
- Consistency with international community will require establishing a reasonable concentration limit within the range found by international experts (CH014-5)
- Adoption of criteria in ANSI N13.12 will ensure consistency with acceptable levels recommended by the IAEA and accepted by the international community (0167-6) (0537-2-1) (0550-9-2) (0615-7-2)
- NRC must ensure consistency with dose pathway models used internationally in addition to a dose standard (0682-27)

10.3 CONCERNS WITH IMPORTATION OF RADIOACTIVELY CONTAMINATED PRODUCTS

Some commenters expressed concern that a potential rule would allow for the importation of radioactively contaminated products.

- Concerned about the potential for material coming into the U.S. where radiation sources or other material has been melted or used in consumer products (SF019-1-2)
- The U.S. Customs Service should reject shipments of metal or metal products registering above normal background levels considering illicit trafficking of radioactive sources across borders in recent years (0570-30) (0660-18)
- NRC must consider safety of materials being purchased from overseas and have a basis for confidence that there is no additional threat from imports (MD025-2)

10.4 QUESTIONS ABOUT INTERNATIONAL CONSIDERATIONS

A few commenters raised questions about how international factors should be considered.

- How does the U.S steel industry deal with imports that may have a higher radioactivity than U S. steel? (SF013-10)
- What are the standards that have been set by IAEA, European Union, and individual countries and are they legally binding as are NRC standards? (CH016-2) (MD003-12)
- How will the U.S. address importation of products recycled from radioactive scrap metal if NRC establishes standards more rigorous than those set by foreign countries? (AT001-12)

10.5 POTENTIAL IMPACTS IF NRC STANDARDS DIFFER FROM STANDARDS SET BY INTERNATIONAL STANDARD-SETTING BODIES

- Discussions at an international symposium on radiological clearance indicated trade impacts associated with inconsistent clearance standards could approach $6 billion dollars per year (0659-76)

11.0 MATERIALS TO BE ADDRESSED IN THE CONTROL OF SOLID MATERIALS

11.1 CONSIDERATION OF ALL MATERIALS

With respect to the specific types of materials that should be included in a potential rule (if pursued), commenters expressed support for steel, copper, aluminum, concrete, and soil. Other commenters opposed the inclusion of each of these types of materials, except copper.

11.1.1 Support proceeding with a rulemaking that covers all materials

Some commenters support proceeding with a rule covering all materials.

- Generally support proceeding with a rule that covers all materials (0001-25) (0057-27) (0407-5) (0659-95) (0665-9) (0673-6) (0682-8) (AT024-24-1)
- Support proceeding with a rule that covers all materials, as long as the quantity is so small that the dose is trivial and the matrix is unimportant (0357-12)
- Support proceeding with a rule that covers all materials, with the possible exception of steel and other metals (0550-7) (MD017-19)
- Support proceeding with a rule that covers all solid materials, plus non-effluent liquids and aggregate solids (e.g., soils and sludge) (0395-67-1) (0497-22) (0531-12)

11.1.2 Oppose proceeding with a rulemaking that covers all materials

Some commenters expressed skepticism that one rule could adequately address all materials.

- One standard or set of concentrations may not fit all materials (0427-82) (0683-11) (MD003-25) (MD017-8) (SF009-2) (SF012-7)
- Consideration of certain materials (especially non-steel) requires additional technical analysis and consequently more time to prepare a potential rule (AT008-51) (MD027-19-2)
- The uranium recovery industry should not be included (0251-10) (0613-11)
- What is the viability of proceeding with one concentration for multiple materials? (SF009-2)
- It is unreasonable to expect that a new rule can be developed that could immediately address all potential applications (0683-11)
- An across-the-board rule may increase regulatory problems and undermine safe implementation of a standard (0044-14)

11.1.3 Need more information

Some commenters indicated further information and discussion was necessary to consider the types of materials to include.

Implementation

- Information concerning the segregation of materials coming from radioactive and non-radioactive areas prior to release is needed for materials leaving NRC-licensed facilities; uncontaminated materials (e.g., file cabinets, fencing) should be segregated from radioactively contaminated metals (MD028-9) (MD029-4)

Procedural

- NRC should clarify the breadth of the statement in the issues paper that "the

proposal will be comprehensive for materials and equipment" (CH020-3-1)

- NRC should elaborate on how it intends to consider source materials contaminated onto steel or other materials (the issues paper reports that unimportant quantities of source material are outside the scope of this effort) (SF017-4)
- If lead, nickel, and steel were considered under separate rules, would anything be different? (CH014-55)
- NRC should foster additional discussion regarding what materials are covered (MD005-2)

11.2 ANY POTENTIAL RULE SHOULD INCLUDE CERTAIN MATERIALS SO THAT PROCESS CAN BE COMPLETED IN A TIMELY MANNER

Commenters addressed the issue of proceeding with only certain materials in order to allow a rulemaking process to proceed.

11.2.1 Supports proceeding with a rulemaking process for certain materials

Some commenters support proceeding with a rulemaking process and identifying materials that should be considered.

- Materials for which a technical basis is currently available (0070-68-2)
- Materials with the greatest potential for environmental benefit (0070-70)
- Materials that are most commonly released (0070-24)
- Aluminum (0042-7-1)
- Concrete (0042-7-1) (0070-68-2) (0422-25-1) (0497-23) (0673-22) (CH012-46-2) (MD006-52-1) (SF013-13-1); there is an enormous volume of concrete at nuclear facilities, but contamination is generally limited to the outer 1-2 millimeters of the surface and this can be cleaned and the remaining concrete used for numerous other purposes (CH014-68-2)
- Copper (0042-7-1) (CH012-20); while some copper-based components of engines, electronics, etc. are very unlikely to be contaminated, others may have some surface contamination, but at a level that can be cleaned and made safe (CH014-32-2)
- Soil (0022-7) (0030-35) (0042-7-1) (0070-68-2) (0422-24-1) (0497-23) (0665-9) (0673-6) (CH012-48-1)
- Steel (0042-7-1)

11.2.2 Cautionary notes

A few commenters expressed concern in proceeding with a rulemaking process that includes only certain materials.

Economic/Cost

- The economic value from recycling concrete is limited and the transportation costs are high (CH014-37) (CH024-3-2)
- Steel is used in huge amounts, however, the economic value of recycling it is not significant (CH014-64-2)

Implementation

- NRC must consider the difficulty of implementing different standards for different materials (CH019-7)
- Generation of aluminum waste is not an issue for most academic and medical institutions (CH012-15)
- The metallurgy and partitioning of radionuclides that might be present on aluminum scrap should be closely scrutinized (CH018-8)
- Analyses examining the potential dose pathways and radiological and non-radiological impacts of aluminum are needed (CH014-25)
- Industry will only consider re-use of copper and steel if they are clean (CH027-11-4)
- The greater processing requirements for materials like copper and steel

need to be evaluated in this decision-making process (CH023-55-2)

- Any potential rule should attempt to address as many materials as possible, but in terms of soil, NRC must consider how to handle its soil criteria (10 CFR 40) and overlapping EPA regulations pertaining to 10 CFR 40, "11e(2) by-product material at uranium recovery facilities" (0613-10) (0659-97-1)
- Materials like soil will lead to dilution problems (MD027-22-2)

Procedural

- Steel recycling should be deferred until the international standard is developed (0659-95)
- If NRC proceeds with a rulemaking, there is a base of information for concrete, steel, copper, and aluminum, but not soil, sewage sludge, nickel, or titanium (MD018-18)

Public Trust/Confidence

- The potential rulemaking process needs to include careful consideration of the public's perceived risks (0044-14) (0427-83) (CH018-31-2) (CH023-61-2)

Socio-political

- Some regulators have little faith in institutional controls with regard to restricted use (CH006-3-2) (CH008-8-2)

11.2.3 Requests for further information

Some commenters raised questions or indicated that further information is needed in order to consider whether a rulemaking process should proceed for certain materials.

Procedural

- Information on the recycling of aluminum from DOE facilities (CH023-30), as well as its overall national prevalence, is needed (CH014-17-1)
- Information is needed about whether the discussion of copper includes copper alloying metals such as brass and bronze (MD028-18)
- What is the potential for concrete to be demolished or partially recycled, and what is the potential for contamination and decontamination? (CH023-47-2)
- Is NRC going to promote meaningful discussion of materials other than steel in the proposed rulemaking? (AT024-24-2) (AT025-2-2) (MD006-51-2)
- Additional scientific information is available for many other materials, not just the ones that were the focus of NRC's draft document (NUREG 1640) (MD029-17-2)

11.3 IMPACTS OF PROCEEDING WITH A RULEMAKING NOW FOR ONLY CERTAIN MATERIALS

A few commenters addressed potential impacts of proceeding with a rulemaking for only certain materials.

11.3.1 Future requests for other materials

- Attempting to separate the issue into more than one rulemaking would tie up NRC for decades and waste tax money (0395-67-2)
- Other materials (e.g., sludge, slag, asbestos) would be perceived as having a greater potential for contaminating the environment (0427-84)

11.3.2 Impacts are uncertain

- Wants to know if NRC's application of a rule would be tailored to various releases, radionuclides and materials, and if so, what kind of factors is NRC considering? (MD001-14-2)
- Concerned that there are different levels of uncertainty in the data or risk assessments for certain radionuclides, and that this uncertainty will be

appropriately incorporated into the regulatory considerations (MD001-15-2)

11.4 ADDITIONAL ANALYSES FOR OTHER MATERIALS POTENTIALLY AVAILABLE FOR RELEASE

Commenters addressed the need for conducting additional analyses for materials with the potential to be released.

11.4.1 Support performing additional analyses

- Additional analyses of disposal methods for ingot nickel from contaminated scrap are needed (0031-30-1)
- NRC should develop activity values for metals based on direct disposal or reuse scenarios (0659-99)
- Studies should focus on the effects of prolonged exposure to low levels of radioactivity (0007-2)

11.4.2 Oppose performing additional analyses

- Additional analyses are irrelevant if NRC does not first give greater consideration to the public's perceived risks (0427-85)

11.5 ADDITIONAL MATERIALS TO CONSIDER AS CANDIDATES FOR CONTROL IN A POTENTIAL RULEMAKING

Commenters identified a variety of specific materials or items that should be considered for control in a potential rulemaking process.

11.5.1 Other metals for recycling

- Lead (CH012-5) (CH014-56) (CH022-13) (CH023-52-1)
- Nickel (0070-69-2) (0422-24-2) (CH014-60) (CH021-24) (CH023-42-2)
- Non-ferrous metals (CH023-42-2)
- Mixed scrap metals (MD006-52-2)
- Titanium (MD015-18)

11.5.2 Other items or materials to be considered for release

- Activation products (CH012-5)
- Aerosol and spray paint cans (0659-101) (0673-26-2)
- Asphalt (0673-26-2) (MD006-54-2)
- Batteries (0673-26-2)
- Boroscopes (0673-26-2)
- Boxes, drums, and containers (CH014-46)
- Building materials (0422-24-2)
- Charcoal oil (0673-26-2)
- Chemical reagents (0673-26-2)
- Clothing, including gloves and shoes (0027-2) (0497-23) (0673-26-2) (CH012-40) (SF007-2)
- Complex mixtures of materials (CH014-2-2)
- Consumables (0027-2)
- Demolition wastes (particularly hydrogen fluoride from 700,000 tons of DOE UF6) (0070-68-3) (CH026-7)
- Dried solids (e.g., collected from oil interceptors and holding ponds) (0042-7-2) (0422-25-2) (CH014-41)
- Equipment (0027-2)
- Fluorine (MD015-18)
- Fly ash and other incinerator ash (CH008-19) (CH012-46-3) (MD006-10)
- Furniture (0422-24-2)
- Grease dunnage (0673-26-2)
- Industrial wastes (MD006-54-2)
- Institutional trash (0659-101)
- Mixed waste (0030-36-2) (CH012-5) (SF007-2)

- Non-recycled metals in general (SF013-13-2)
- Nylon slings (0673-26-2)
- Paints and solvents (0673-26-2)
- Medical patient waste (MD018-4)
- Research materials/laboratory wastes (CH012-48-2) (CH014-46) (CH023-38) (MD011-15-1) (SF007-2)
- Plastic or resins (0497-23) (0673-26-2) (MD006-10)
- Roof gravel (0497-23) (MD006-52-2)
- Sanitary wastes and associated equipment (e.g., plumbing snakes) (0070-69-2) (0673-26-2)
- Slag (MD001-34)
- Slightly contaminated fuels (SF006-5)
- Sewage sludge (0042-7-2) (0070-68-3) (0422-25-2) (0497-23) (0673-26-2) (CH014-67-2) (CH019-9-2) (MD011-15-1) (MD018-4)
- Exotic materials such as titanium (MD015-18)
- Tools (0027-2)
- Vehicles (0027-2)
- Welding rods and equipment (0659-101) (0673-26-2)
- Wood (0070-68-3) (0497-23)

11.5.3 Materials or objects for reuse include

- Chains, ropes, hoses, and tubing (0673-26-2)
- Compressed gas cylinders (0659-101)
- Extension cords (0673-26-2)
- Fire extinguishers (0659-101)
- Glass (0497-23)
- Office electronics and materials (e.g., computers, cell phones, radios, smoke detectors, notebooks) (0659-101) (0673-26-2)
- Paper (0497-23) (0659-101) (CH012-40)
- Scaffolding (CH014-46)
- Tools and related equipment (0027-2) (0422-24-2) (0497-23) (0613-11) (0673-26-2) (AT005-2)
- Vehicles (0027-2)

11.5.4 Materials involving special circumstances should be considered

- Materials from certain facilities (such as medical facilities, universities, high tech areas, and biotech industries) should be covered along with nuclear facilities (MD011-22) (SF007-5)
- Materials stored for long periods of time in indoor areas with ongoing operations and workers (CH023-53-1)
- Items that are a complex mixture of materials; by controlling the most harmful material in the mixed waste, less harmful materials would necessarily be covered (0030-36-2) (CH014-2-1) (SF001-4)
- Some highly contaminated materials may be appropriate for rulemaking given decontamination capabilities (AT008-11) (SF005-4)
- Volumetrically contaminated materials should be given special consideration (0030-13-1) (0613-11) (MD006-10)
- The potential rule should cover the release of materials for unrestricted use including disposal in an industrial landfill (where the risk of exposure to the food chain is low) (0030-15)

11.5.5 Materials that specifically should not be released

- Plutonium, transuranics, and other radioactive isotopes that do not occur in nature (0031-59-2)
- Materials that would create large numbers of exposed individuals (0030-12-2)

11.5.6 Concerns regarding consideration of other materials

- Releasing materials like sewage sludge will lead to dilution problems (MD027-22-3)
- "Background" is not adequately defined in the context of the release of solids (0613-28-2)
- Has NRC considered specialty products like calcium fluoride? (AT022-5)
- Separate meetings should be held to discuss various materials that may be affected by a potential rule (SF026-34)

11.6 HANDLING REQUESTS FOR RELEASE OF MATERIALS NOT INCLUDED IN A POTENTIAL RULEMAKING

- Standards for the release of other materials should be based on the standards developed for the materials covered in the potential rulemaking, provided they are dose-based, safe, and practical to implement; until then, current practices should remain in place for these additional materials (0659-103)
- The release of material should be done under the existing guidelines; if dose objectives are established during the development of the subsequent rulemaking(s), then this information should be used in conjunction with the current guidelines (0427-87)

11.7 ASSOCIATED COSTS, EFFECTIVE SURVEY METHODS, AND DOSE IMPACTS OF THE ALTERNATIVES

- Survey methods and types of monitoring instrumentation should not vary significantly from material to material (0659-105)
- In terms of contaminated concrete, the outer surface is cleaned and the rest is either left standing, demolished and buried onsite, or cleaned and released (CH014-68-1)

11.8 EXTENDING A POTENTIAL NRC RULEMAKING TO COVER MATERIALS RELEASED FROM NUCLEAR FACILITIES OPERATED BY DOE

A few commenters addressed the issues relating to how a potential NRC rulemaking could or should affect nuclear facilities operated by DOE.

11.8.1 Support extending a potential rulemaking to cover DOE facilities

- DOE will likely attempt to be consistent with whatever NRC proposes, for example, by incorporating the proposed NRC standards into its 5400.5 Order (0044-19) (0070-71) (0427-89) (0567-5-2* 2 under signers) (0660-5-2) (CH015-12) (CH021-4) (MD027-15)
- The shipping of some materials involves title transfers between NRC and DOE (CH021-13-2)
- A potential clearance rule will affect DOE at Title I cleanup facilities under UMTRCA (MD009-4-1)

11.8.2 Oppose extending a potential rulemaking to cover DOE facilities

- The current state of compliance, regulation, oversight, etc. regarding waste disposal by DOE is inadequate (0520-24-2); additional regulations could create even more uncertainty and confusion (CH017-32-3)

11.8.3 Uncertain whether a potential rule should consider DOE and DOD facilities

- How would a potential NRC rulemaking affect material released by DOE or DOD? (CH023-3)
- The issue should be ultimately resolved by NRC's Office of General Counsel (0659-106)

12.0 QUESTIONS ABOUT TECHNICAL APPROACHES

Commenters asked several general questions about how different control alternatives would be developed, implemented, or enforced.

- How will NRC keep track of contaminated materials that have been released? (AT002-7-1)
- Does the restricted use option refer to developing free release criteria and a restricted use option for materials above a certain level, or to applying a restricted use process to all materials? (AT013-1-1)
- How will the NRC convince state or local governments or the environmental community to accept the idea of restricted release? (0395-65-2)
- Does the NRC have the authority to implement a rule prohibiting restricted and unrestricted release? (SF002-8-2)
- How will the NRC take non-deregulatory options into account? (MD001-3-2)
- What are the areas and criteria for determining if a "source area" is acceptable? (0422-20)

13.0 PROPOSED REGULATORY LANGUAGE

Although no specific regulatory language has been proposed, some commenters provided suggestions about specific wording that should or should not be used if the NRC decides to initiate a rulemaking.

- "Dilution" should be clearly defined (CH026-10)
- Changing the definitions of "solid waste" and "by-product material" is unacceptable and would create significant legal ramifications (0613-26)

GLOSSARY

Activity. Measure of the intensity of radioactive material. Activity is usually designated in terms of the number of transformations or disintegrations that occur over a period of time.

Agreement States. States having signed agreements with the NRC enabling them to regulate source, byproduct, and small quantities of special nuclear material within their boundaries.

ANSI N13.12 (Surface and Volume Radioactivity Standards for Clearance, ANSI/HPS N13.12). A consensus standard on clearance or release of materials from radiological controls.

As Low As Reasonably Achievable (ALARA). A radiation protection principle applied to radiation exposures, with costs and benefits taken into account.

Atomic Energy Act (AEA). The Act (1954) that placed production and control of nuclear materials within a civilian agency, originally the Atomic Energy Commission.

Background Radiation. Radiation arising from natural radioactive material always present in the environment, including solar and cosmic radiation and radioactive elements in the upper atmosphere, the ground, building materials, and the human body.

Byproduct Material. Any radioactive material (except special nuclear material) yielded in, or made radioactive by, exposure to the radiation incident to the process of producing or utilizing special nuclear material; and the tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes.

Below Regulatory Concern (BRC). A level of radioactivity in waste, which is considered to be safe for human exposure and, therefore, does not require monitoring and control.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Federal statute (also known as Superfund), enacted in 1980 and re-authorized in 1986, that provides the statutory authority for cleanup of hazardous substances that could endanger public health, welfare, or the environment.

Decommissioning. The process of removing a facility from operation, followed by decontamination, entombment, dismantlement, or conversion to another use.

Decontamination. The removal of unwanted material (typically radioactive material) from facilities, soils, or equipment by washing, chemical action, mechanical cleaning, or other techniques.

Disposal. Waste emplacement designed to ensure isolation of waste from the biosphere, with no intention of retrieval for the foreseeable future, and requiring deliberate action to regain access to the waste.

DOE Orders. Internal requirements that establish DOE policy and procedures for compliance with applicable laws and regulations.

Environmental Justice. The fair distribution of environmental risks across socioeconomic and racial groups.

Half-life. Time required for a radioactive substance to lose 50 percent of its activity by decay.

Incinerator. An enclosed device that uses controlled flame combustion and does not

meet the criteria for classification as a boiler, industrial furnace, sludge dryer, or carbon regeneration unit.

Landfill. A disposal unit where non-liquid hazardous waste is placed in or on the land.

Low-Level Waste (LLW). Radioactive waste not classified as high-level waste, transuranic waste, spent nuclear fuel, or byproduct material.

Mixed Waste. Radioactive waste that is also a hazardous waste under RCRA.

Municipal Solid Waste (MSW). Durable goods, nondurable goods, containers and packaging, food wastes, yard trimmings, and miscellaneous organic wastes from residential commercial, and industrial non-process sources.

National Environmental Policy Act (NEPA). The Act (1969) that established the requirement for conducting environmental reviews of Federal actions that have the potential for significant impact on the human environment.

Naturally Occurring Radioactive Material (NORM). Radioactive materials not covered under the Atomic Energy Act that are naturally occurring.

NO_x. Oxides of Nitrogen NO_2, NO_3, etc.

Radiation. Particles or waves from atomic or nuclear processes (or from certain machines).

Radioactivity. The spontaneous emission of radiation from the nucleus of an atom. Radioisotopes of elements lose particles and energy through this process of radioactive decay.

Radioisotope. An unstable isotope of an element that will eventually undergo radioactive decay.

Recycling. The separation and collection of wastes, their subsequent transformation or re-manufacture into usable or marketable products or materials.

Rem (roentgen equivalent man). Unit used in radiation protection to measure the amount of damage to human tissue from a dose of ionizing radiation.

Regulatory Guide 1.86 (Termination of Operating Licenses For Nuclear Reactors). Guide describing methods and procedures considered acceptable for the termination of operating licenses for nuclear reactors.

Resource Conservation and Recovery Act (RCRA). The act (1976) that amended the Solid Waste Disposal Act of 1965 to address the huge volumes of municipal and industrial solid waste generated nationwide.

Sievert (Sv). Unit of radiation dosage equal to 100 rems

Source Material. Uranium or thorium or any combination of uranium and thorium in any physical or chemical form; or ores containing by weight, one twentieth of one percent (0.05), or more, of uranium, thorium or any combination of uranium and thorium.

Special Nuclear Material. Plutonium, uranium-233, uranium enriched in the isotope 233 or in the isotope 235, and any other material the NRC, pursuant to the provisions of section 51 of the Atomic Energy Act, determines to be special nuclear material; or any material artificially enriched by any of the foregoing.

Uranium Mill Tailings Radiation Control Act (UMTRCA). The act (1978) authorizing the Secretary of Energy to undertake remedial action at "inactive" uranium milling

sites and at vicinity properties contaminated with residual radioactive material generated at the site.

APPENDIX A

THE ISSUES PAPER

NUCLEAR REGULATORY COMMISSION

10 CFR Part 20

Release of Solid Materials at Licensed Facilities: Issues Paper, Scoping Process for Environmental Issues, and Notice of Public Meetings

AGENCY: Nuclear Regulatory Commission.

ACTION: Request for comment on issues paper and scoping process, and notice of plans for public meetings.

SUMMARY: The Nuclear Regulatory Commission (NRC) is considering a rulemaking that would set specific requirements on releases of solid materials in order to establish a regulatory framework more consistent with existing NRC requirements on air and liquid releases. The NRC is seeking early public input on the major issues associated with such a rulemaking, including conducting a scoping process related to the scope of environmental impacts. To aid in that process, the NRC is requesting comments on the issues discussed in this notice. NRC also intends to conduct four public meetings beginning in August of this year. This document provides background and topics of discussion for those meetings.

DATES: Submit comments by November 15, 1999. Comments received after this date will be considered if it is practicable to do so, but the Commission is able to assure consideration only for comments received on or before this date.

In addition to providing opportunity for written (and electronic) comments, public meetings on the issues paper and scoping process will be held as follows:

August 4-5, 1999--Chicago, Illinois, 8:30 am-5 pm, Hyatt Regency McCormick Place, 2233 South Martin Luther King Dr, Chicago, Illinois
September 15-16, 1999--San Francisco, California, 8:30 am-5 pm Radisson Miyako Hotel, 1625 Post Street, San Francisco, California

October 5-6, 1999--Atlanta, Georgia, 8:30 am-5 pm, Crown Plaza Atlanta Powers Ferry, 6345 Power Ferry Road NW, Atlanta, Georgia

November 1-2, 1999--Rockville, Maryland, 8:30 am-5 pm NRC Auditorium, 15545 Rockville Pike, Rockville, Maryland

ADDRESSES: Submit comments to: Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Attention: Rulemaking and Adjudications staff.

Deliver comments to 11555 Rockville Pike, Rockville, Maryland, between 7.30 am and 4:15 pm on Federal workdays.

You may also provide comments via the NRC's interactive rulemaking website through the NRC home page (http://www.nrc.gov). This site provides the capability to upload comments as files (any format), if your web browser supports that function. For information about the

interactive rulemaking website, contact Ms. Carol Gallagher, (301) 415-5905 (e-mail: CAG@nrc.gov).

Copies of any comments received may be examined at the NRC Public Document Room, 2120 L Street NW (Lower Level), Washington, DC.

FOR FURTHER INFORMATION CONTACT: Frank Cardile, telephone: (301) 415-6185; e-mail: fpc@nrc.gov, Office of Nuclear Material Safety and Safeguards, USNRC, Washington DC 20555-0001. Specific comments on the public meeting process should be directed to Chip Cameron; e-mail fxc@nrc.gov, telephone: (301) 415-1642; Office of the General Counsel, US NRC, Washington DC 20555-0001.

SUPPLEMENTARY INFORMATION:

I. Background

Unlike for air and liquid releases, the Commission currently has no specific regulatory requirements regarding release of solid materials. Even though the NRC does not have requirements in this area, it still receives requests from licensees for release of solid materials which it must evaluate on a case-by-case basis using existing guidance or case-specific criteria. Solid materials include metals, concrete, soils, equipment, furniture, etc., present at licensed nuclear facilities. To provide consistency in its regulatory framework for releases of all materials, the Commission is considering a rulemaking that would set specific requirements for release of solid materials.

The NRC is supplementing its standard rulemaking process by conducting enhanced public participatory activities including facilitated public meetings, before the start of any formal rulemaking process, to solicit early and active public input on major issues associated with release of solid materials. The NRC will also utilize its website to disseminate information and solicit input.

As a first step, the NRC has prepared an issues paper that describes issues and alternatives related to release of solid materials. The intent of this paper is to foster discussion about these issues and alternatives before a rulemaking to set standards would begin. The content of the issues paper is contained in Section III. It is noted in Section III that NRC would evaluate environmental impacts of alternative courses of action in an EIS in any rulemaking conducted. To assist in that process, this notice is also announcing a process for developing the scope of an EIS, i.e., a "scoping process." Specific discussion of the scoping process is contained in Section IV of this notice. The principal issues discussed in the issues paper and in regard to the scoping process are the same and the Commission believes that it is beneficial to seek comment and hold discussions on both at the same time to best utilize and coordinate available expertise and input. The discussions presented in Sections III and IV provide background and topics of discussion that will be the subject of the public meetings.

II. Request for Written and Electronic Comments and Plans for Public Meetings

The NRC is soliciting comments on the items presented in the issues paper in Section III and the scoping process in Section IV. Comments may be submitted either in writing or electronically as indicated under the ADDRESSES heading. In addition to providing an opportunity for written comments, the NRC is holding facilitated public meetings at four different geographical locations on the issues discussed in Sections III and IV between August and

November 1999 (see the DATES heading of this notice for the dates and locations of these meetings). The written public comment period will extend until after the last public meeting is held.

Based on the comments received both in written and electronic form, and at the public meetings, the Commission will decide whether to proceed with development of a proposed rule or take some other regulatory action. If the Commission decides to proceed further with a proposed rulemaking, any proposed rules will be published in the Federal Register for public review and comment.

III. Issues Paper on Release of Solid Materials at Licensed Facilities

Introduction

To provide consistency in its regulatory framework for releases of materials, the Commission is considering a rulemaking that would set specific requirements for release of solid materials. This section describes issues and alternatives related to the release of solid materials and is intended to foster discussion about these issues and alternatives before a rulemaking would begin.

Section A of this section describes some general considerations related to rulemaking, potential Commission actions, and the enhanced participatory process. Section B of this section discusses the major issues that would be associated with a rulemaking and also discusses various alternatives for proceeding.

A. Background

A.1 Current NRC Policies

A.1.1 Inconsistency of NRC regulations covering releases from licensed facilities

The NRC has the statutory responsibility for the protection of health and safety related to the use of source, byproduct, and special nuclear material under the Atomic Energy Act. A principal method of meeting this responsibility is through the body of regulations codified in Title 10, Chapter I, of the Code of Federal Regulations (10 CFR, Chapter I). The regulations in 10 CFR, Chapter I, have been developed using a rulemaking process that provides the opportunity for public review and comment under the Administrative Procedure Act and includes the analysis of costs and benefits and environmental impacts, and considers factors related to paperwork reduction. Agreement States administer equivalent programs applying equivalent regulations.

The Commission's regulations that set standards for protection of the public against radiation appear in 10 CFR Part 20. These regulations limit the radiation exposure (or "dose") that a member of the public can receive from the operation and decommissioning of an NRC-licensed activity, and also require that doses received are "as low as is reasonably achievable (ALARA)." The NRC has used the criteria on public dose limits and ALARA requirements in Part 20 (Sections 20.1301 and 20.1101, respectively) to establish limits in Table 2 of Appendix B of Part 20 on the amount of radioactivity in gaseous and liquid releases that may be released from a nuclear facility to the environment.

However, unlike the regulations applicable to gaseous and liquid releases from a licensed nuclear facility, there are no current specific criteria in Part 20 governing releases of solid materials by licensees, although there are some regulations[3] that cover the release of certain materials. Therefore, if a licensee requests approval of release of solid material, the NRC must consider the request on a case-by-case basis using existing regulatory guidance, license conditions, NRC Branch Technical Positions, etc.

The Commission recently amended its regulations in Part 20 (Subpart E) to establish criteria for unrestricted use of facility structures and lands at a decommissioned site (July 21, 1997; 62 FR 39058). Subpart E of Part 20 is focused on protection of persons entering and using decommissioned structures and lands at a site after a nuclear facility terminates its NRC license, but does not otherwise address release of solid material.

A.1.2 Solid materials potentially available for release

Solid materials include metals, building concrete, onsite soils, equipment, furniture, etc., that are present at, and/or used in, licensed nuclear facilities during routine operations. Most of this material will have no radioactive contamination, although some materials can have radioactive contamination either on their surfaces or distributed within their volumes. Contamination can be distributed in the volume of materials because: (1) they are relatively porous (e.g., soil) allowing contamination to spread into the material; (2) they become radioactive through activation; or (3) a recycling process (e.g., metal melting) can cause contamination that was previously on the surface of a piece of equipment to become distributed throughout its volume. The amount of contamination that a material has, if any, depends largely on the type of licensee involved and its location in the facility:

(a) For most NRC licensees, solid materials have no contamination because these licensees use sealed sources in which the radioactive material is encapsulated. These include small research and development facilities and industrial use of various devices including gauges, measuring devices, and radiography.

(b) For other licensees (which includes nuclear reactors, manufacturing facilities, larger educational or health care facilities including laboratories, etc.), material generally falls into one of three groups based on its location or use in the facility:

(1) Clean or unaffected areas of a facility--The solid material in these areas would likely have no radioactive contamination resulting from licensed activities. These areas could include hospital waiting rooms, university office space in a laboratory, or metal ventilation ducts in the control room of a reactor facility.

(2) Areas where licensed radioactive material is used or stored--The material in these areas can become contaminated although the levels may likely be very low, or it may have none, because of contamination control procedures required at facilities licensed by the NRC. This could include material in certain laboratory areas in a university or hospital, or in certain buildings of a reactor facility.

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[3] For example, 10 CFR 20.2005, 35.92, and 36.57(e). In addition 10 CFR 40.51 and 40.13 contain transfer or unimportant quantities provisions, respectively, which are the subject of a separate Commission-directed initiative on Part 40 and are outside the scope of this effort.

(3) Material used for radioactive service in the facility, or located in contaminated areas or in areas where activation can occur--These materials generally have levels of contamination that would not allow them to be candidates for release unless they are decontaminated.

A.1.3 Current NRC case-by case review of licensee requests for release of solid material

Even though the NRC does not currently have specific criteria in Part 20 covering release of solid materials, licensees have made, and will likely continue to make, requests for release of solid material when it becomes obsolete or defective or when their facility is decommissioned. For material from clean or unaffected areas, knowledge of site radiological history is an important factor in determining whether the material is contaminated. The NRC evaluates requests for release on a case-by-case basis using either the table of surface contamination criteria in Regulatory Guide 1.86, "Termination of Operating Licenses for Nuclear Reactors," or other case-specific criteria for compliance with Part 20 requirements.

(a) Regulatory Guide 1.86. This guide, which was developed by the Atomic Energy Commission in 1974, provides a table of Acceptable Surface Contamination Levels for various radionuclides, including natural and enriched uranium, transuranics, and fission products. These surface contamination levels are stated in terms of measurable radioactivity levels (observed disintegrations per minute per 100 square centimeters of surface area), the values of which were based principally on the detection capabilities of readily available instrumentation at the time the guide was developed. The surface contamination levels were not based on the potential dose to an individual that may result from coming in contact with the released materials although such exposure is estimated to be low. Regulatory Guide 1.86 does not contain dose criteria. For some situations, the NRC will incorporate the values in the table in Regulatory Guide 1.86 into the license conditions of a facility.

(b) Allowance of release if there are no detectable levels of radioactive contamination from licensed activities above background in the material. Regulatory Guide 1.86 only addresses materials having surface contamination; it does not cover volumetric contamination. For some situations, the NRC allows release of volumetrically contaminated solid material if survey instrumentation does not detect radioactivity levels above background. This does not mean that the material is released without any radioactive contamination present on or in it; instead, it means that the material may be released with very low amounts of contamination that is not detectable with appropriate survey instruments. This method provides inconsistent and generally unsatisfactory licensing guidance because different survey instruments have different levels of detection. This can lead to disagreements and confusion over permissible levels of release and nonuniform levels of protection.

(c) Use of 10 CFR 20.2002. Licensees may request specific approval to dispose of materials containing low levels of licensed material in other than a licensed low-level waste disposal site in accordance with requirements in 10 CFR 20.2002. Section 20.2002 requires licensees to describe the material to be released and evaluate the doses that would result. Use of this approach requires case-specific NRC review and evaluation of the situation, which in the past has been used to authorize various releases of contaminated material.

A.2 NRC Actions To Address Inconsistency in Release Standards by Considering Rulemaking on Release of Solid Materials

A.2.1 Commission direction to consider rulemaking

Based on the issues and concerns described in Section A.1, the Commission, on June 30, 1998, directed the staff to consider rulemaking to establish a dose-based standard for release of solid materials so that licensee considerations and NRC review of the disposition of slightly contaminated solid materials are conducted in a consistent manner that protects public health and safety. The Commission also directed the NRC staff to include an opportunity for enhanced public participation, including use of NRC's Internet home page to solicit comments. This issues paper is the first step in soliciting views on major issues in this area.

A.2.2 Potential Alternative Courses of Action

Before conducting a rulemaking, the NRC generally considers alternative courses of action. Two broad alternatives that the NRC could consider are not doing a rulemaking (i.e., continue with the current practice of case-by case reviews) or developing a rulemaking for release of solid materials. If the NRC decided to proceed with rulemaking, it could:

(1) Permit release of solid materials for unrestricted use if the potential doses to the public from unrestricted use of the material were less than a specified level determined during the rulemaking process. Unrestricted use could result in recycle or reuse of the material in consumer products or industrial products, or disposal of the material as waste in landfills. Release of solid materials for unrestricted use is also referred to as "clearance," but for the purposes of this issues paper, the term "release for unrestricted use" is generally used.

(2) Restrict release of solid materials to only certain authorized uses. For example, future use of the material could be restricted to only certain industrial uses where the potential for public exposure is small.

(3) Do not permit either unrestricted or restricted release of solid material that has been in an area where radioactive material has been used or stored, and instead require all such materials to go to a licensed low-level waste (LLW) disposal facility.

In evaluating these alternatives, the NRC would consider potential human health and environmental impacts and economic aspects associated with each alternative.

A.3 Current Policies of International Agencies, Other Federal Agencies, State Governments and Other Standards Setting Bodies Regarding Releases of Solid Materials

In considering rulemaking alternatives, the NRC would consider policies and precedents set by other nations and international agencies, by other Federal agencies, by States, and by other standards setting bodies.

International Efforts. There is considerable effort by other nations and by international agencies, such as the International Atomic Energy Agency (IAEA), to set standards in this area. Consistency with standards set by other nations and international agencies is important because materials can be both imported and exported between the U.S. and other countries and differing standards could create confusion and economic disparities in commerce. The generally accepted term in the international community for release of materials for unrestricted use is "clearance."

Individual countries, including Germany, France, Finland, Sweden, Taiwan, and the United Kingdom, have developed national guidance for clearance of materials. The standards in these guidance documents correspond fairly well. Two major international radiation

protection organizations, the IAEA and the Commission of European Communities (CEC) have developed draft standards containing clearance levels for individual radionuclides. The NRC, the Environmental Protection Agency (EPA), and the Department of Energy (DOE) generally provide input and review on behalf of the U.S. in development of IAEA and CEC standards. Both sets of standards are based on a 0.01 millisievert (mSv) per year (1 millirem (mrem) per year) annual dose which is broadly accepted as a trivial dose. Documents published by IAEA that document the development of their draft standards include Safety Series 89, "Principles for the Exemption of Radiation Sources and Practices from Regulatory Control," (1998), and IAEA-TECDOC-855, "Clearance Levels for Radionuclides in Solid Materials (Interim Report)."

One intended application of IAEA's proposed clearance levels is related to international trade, for example the import and export of scrap metals.

U.S. Environmental Protection Agency. The EPA, although not a regulator of licensees, is responsible for setting generally applicable environmental standards for radioactive materials under the Atomic Energy Act. The NRC, in regulating its licensees, implements environmental standards that EPA promulgates in the area of radiation protection. In the absence of EPA standards in a particular area, for example in the area of release of solid materials, the NRC has the authority to set radiation protection standards for its licensees. This can cause potential problems with the finality of NRC licensing decisions if EPA later issues standards in a particular area that are different from regulations that NRC has previously issued. Thus, it is important for the NRC to involve EPA closely in developing its standards.

In addition, as noted later in Section B (Issue No.2, under "Factors in decision making"), the EPA has completed studies on environmental impacts of clearance of materials. The NRC and EPA have, and plan to continue to have, coordinated efforts in this area to ensure that effective and consistent release standards are established, while minimizing duplication of effort. In particular, the NRC and EPA, along with other Federal agencies, work together on the Interagency Steering Committee on Radiation Standards to coordinate their efforts on issues associated with establishing criteria for radiation protection. Accordingly, the EPA will not only be an important participant in the NRC rulemaking public meetings, but the NRC also plans to consult extensively with EPA throughout the rulemaking process and has invited EPA to be a member of the NRC working group.

In setting generally applicable environmental standards, EPA sets standards for a wide range of materials, including some which contain naturally occurring radioactive materials that have been enhanced as a result of man-made processes. A material that has been made exempt from regulation (see 40 CFR 261.4(b)(4)) is the ash from burning coal in power plants that has concentrated levels of radioactive materials (e.g., uranium, radium, thorium). Under this exemption, coal ash is allowed to be used in building materials; the radioactive material in the coal ash can result in small radiation doses to the general public as a result of its use. The dose level from use of exempted coal ash could be viewed as a precedent or benchmark for possible NRC release levels.

EPA is currently active in the development of screening guidelines for import into the U.S. of materials cleared in other countries. EPA has been working with the NRC and other Federal and international agencies. The importing of contaminated materials cleared by other countries into the U.S., which does not have in place generally applicable standards for this purpose, raises questions about the regulatory status of these materials after they enter the U.S.

U.S. Department of Energy. The DOE operates a number of nuclear facilities. Although generally not licensed by the NRC, the DOE faces issues concerning the disposition of materials from its facilities similar to those faced by NRC licensees.

In response to these needs, DOE has developed criteria for release of solid materials. These criteria generally endorse the numerical criteria of Regulatory Guide 1.86. The DOE criteria are contained in DOE Order 5400.5, Radiation Protection of the Public and the Environment, dated February 8, 1990 (and revised in 1993) and in the Draft Handbook for Controlling Release for Reuse or Recycle of Non-Real Property Containing Residual Radioactive Material (June 1997).

If the NRC issues a regulation containing criteria for release of solid materials, decisions would have to be made by DOE as to whether DOE would in the interest of consistency adopt the standards in the NRC regulation, or if DOE decides to release solid materials would NRC be required to authorize distribution of that material.

State governments. States face the same issues and needs that the NRC does and must also consider issues associated with release of naturally-occurring and accelerator produced materials (NARM). The Conference of Radiation Control Program Directors (CRCPD), an organization of state radiation agencies that develops suggested regulations, has established a committee to look into issues associated with release of solid materials.

Thirty States have entered into agreements with the NRC to assume regulatory authority over byproduct, source, and small quantities of special nuclear material. These "Agreement States" generally use NRC guidance such as that contained in Regulatory Guide 1.86 or similar guidance, in their regulatory programs.

In a related matter, Section 2901(a) of the Energy Policy Act of 1992 (Section 276(a) of the Atomic Energy Act) grants State governments (Agreement and non-Agreement States alike) the authority to regulate the disposal of low-level radioactive waste if the NRC exempts such waste after the enactment of Act. Several States and locales have, both prior to and subsequent to, passage of the Act established prohibitions against the disposal of radioactive material in landfills. The implications of Sec. 276(a) on NRC's potential alternative courses of action noted in Section A.2 above are unclear and may depend on the ultimate nature of any rulemaking that NRC undertakes.

Other standards setting bodies. Various other organizations are involved in setting standards which can impact decisions related to alternative courses of action for release of solid materials.

One of those organizations is the National Council on Radiation Protection and Measurements (NCRP). The NCRP is a nonprofit corporation chartered by the U.S. Congress to review current significant studies made by other health research bodies, to develop and disseminate information and recommendations about protection against radiation, and to cooperate with national and international organizations with regard to these recommendations. The NCRP has made recommendations in its report NCRP No. 116 regarding acceptable levels of radiation exposure to the public, including levels considered to present trivial health risk.

In addition, various industry groups (e.g., the American National Standards Institute (ANSI)) set standards regarding a variety of areas including equipment design and operation, facility maintenance, and contamination levels in radioactive effluents. NRC must be cognizant

of activities in these areas because Public Law 104-113 (passed by Congress in 1995) requires Federal agencies to use technical standards that are developed or adopted by voluntary consensus standards bodies unless the use of such a standard is inconsistent with applicable law or otherwise impractical.

A.4 Previous Commission Efforts to Address Release of Solid Materials

The Commission previously sought to address considerations related to release of solid materials as a part of its issuance of a Below Regulatory Concern (BRC) Policy Statement on July 3, 1990 (55 FR 27522). BRC was an approach proposed by NRC to address a Congressional directive in the Low-Level Radioactive Waste Policy Amendments Act of 1985. The BRC Policy was a general statement of Commission policy and was intended to provide a broad decision framework for formulating rules or making licensing decisions to exempt from regulatory control certain practices involving small quantities of radioactive material. The BRC Policy was envisioned to have applicability in NRC rulemaking and guidance in four principal areas, one of which was setting a standard for release of solid materials for recycle. The Commission decided that a more extensive public involvement process in establishing these areas would be beneficial and hence instituted a moratorium on the BRC Policy in July 1991. Subsequently, in October 1992, the U.S. Congress enacted the Energy Policy Act of 1992 which revoked the BRC Policy Statement.

The NRC's current efforts differ from those associated with the BRC Policy in several ways. Unlike the broad policy-setting approach of the BRC policy, the NRC's current effort is focused on considering establishment of specific requirements for release of solid materials, which protect public health and safety, consistent with the existing framework of requirements in Part 20 for gaseous and liquid releases. As discussed in Section A.2, this would include a full assessment of potential scenarios and pathways for radiation exposure and an evaluation of the environmental impacts and cost-benefit basis of alternative approaches. In addition, the NRC would enhance participation in the rulemaking process through public meetings for interested parties. Any decisions made regarding release of solid materials at this time would be made through rulemaking and not through a policy statement.

A.5 Potential NRC Actions, Enhanced Public Participation and Public Meetings, and Preparation of Issues Paper

Generally, NRC's procedure in rulemaking is the NRC staff development of a proposed rule, Commission consideration, publication of the proposed rule for public comment, consideration of the comments by the NRC staff, preparation of a final rule, Commission review and approval, and publication of the final rule. As directed by the Commission, the NRC staff plans to enhance public participation in this process by conducting public meetings before any rulemaking would begin. The public meetings are planned to elicit informed discussions of options and approaches and the rationale for them. Although these public meetings are not designed to seek "consensus" in the sense that there is agreement on the issues, the public meetings are to be conducted at a very early stage of rulemaking to involve interested parties and the public with the following objectives: (a) to ensure that the relevant issues have been identified; (b) to exchange information on these issues; (c) to identify underlying concerns and areas of disagreement, and (d) where possible, approaches for resolution. The NRC staff also plans to enhance participation by providing website access to this issues paper and the ability to submit comments on the issues paper by e-mail.

If, following this early exchange of ideas (including comments from the public meetings and comments filed by other means such as Internet responses and written comments), the Commission decides to proceed with rulemaking, other rulemaking documents will be prepared. Specifically, the NRC will evaluate the implications of a rule with regard to the National Environmental Policy Act (NEPA). NRC will conduct these evaluations as specified in 10 CFR Part 51, which contains requirements on preparing environmental analyses, including the content of an environmental statement and the public process involved in developing the scope of an environmental statement. In addition, the NRC will prepare a Regulatory Analysis to evaluate costs versus benefits of a rule consistent with Executive Order 12291 and the Commission's regulatory analysis guidelines in NUREG/BR-0058. The NRC will also publish guidance to provide licensees with information on how to demonstrate compliance with the regulation. These documents would be made available on NRC's website.

B. Issues for Discussion

The Commission believes that the issues and alternatives discussed below provide a broad look at matters related to the consistency of its regulations on standards for release of solid materials from nuclear facilities. Therefore, the Commission is soliciting comments and information on these issues before proceeding. These issues, and other relevant and substantial issues identified by interested parties, will serve as the basis of discussion at the public meetings. The discussions at the public meetings will be used by the NRC staff in deciding upon an appropriate course of action.

Issue No. 1--Should the NRC Address Inconsistency in its Release Standards by Considering Rulemaking on Release of Solid Materials?

As discussed in Section A.1.1, NRC generally uses the public dose limits and ALARA requirements in Part 20 to establish limits on releases from nuclear facilities during routine operations and decommissioning. Currently, Part 20 contains specific criteria on the amount of radioactivity in gaseous and liquid releases that may be released from a nuclear facility to the environment. NRC also has requirements in Subpart E of Part 20 on unrestricted use of decommissioned lands and structures. However, NRC currently has no specific requirement in its regulations on limits for release of solid materials.

Alternatives

The NRC has the following two broad options related to the issue of inconsistency of its regulations on release standards and licensee requests for release of solid materials: (1) continue the current practice of handling of licensee requests for release of solid materials on a case-by-case basis; or (2) include requirements in Part 20, as part of a consistent regulatory framework for evaluating releases of all materials, that would allow it to make decisions on licensee requests for release of solid materials that are protective of public health and safety.

(1) No NRC Rulemaking: Continue Current Practice of Handling Licensee Requests for Release on a Case-by-Case Basis

Under this option, no NRC rule would be prepared. Licensees will still continue to make requests for release of solid materials. As discussed in Section A.1.3, in order to comply with the requirements of Part 20, NRC evaluates licensee requests on a case-by case basis using regulatory guidance, branch positions, license conditions, etc. One basis for review has been NRC staff guidance in Regulatory Guide 1.86, which was originally published in June 1974 by

the Atomic Energy Commission (AEC). Regulatory Guide 1.86 contains a table of acceptable total and removable surface levels for various radionuclides, including natural and enriched uranium, transuranics, and fission products, which are stated in terms of measurable radioactivity levels, but does not contain specific dose criteria. Regulatory Guide 1.86 has been used to evaluate unrestricted release of solid materials whose surfaces are slightly radioactive; it does not cover material with volumetric contamination. In addition to Regulatory Guide 1.86, Section A.1.3 notes that NRC also uses other case-specific criteria, such as the detection capability of instrumentation, and certain specific rule sections, in its evaluation of requests for release of solid materials.

(2) Develop a Proposed Rule

In this option, the NRC would proceed with rulemaking to supplement its gaseous and liquid release standards in Part 20 by developing dose-based regulations limiting releases of solid material to provide a consistent regulatory framework protective of public health and safety. This would involve conducting a rulemaking under the Administrative Procedure Act, and developing, as regulatory bases, an environmental analysis under NEPA and an analysis of costs and benefits in a Regulatory Analysis. Based on Commission direction discussed in Section A.2.3, a rulemaking would use an enhanced participatory process involving early public input and website access to rulemaking documents.

Specific Items for Discussion

Should the NRC continue with the current practice of making decisions on a case-by-case basis, or should it proceed to develop a proposed rule that would establish generic criteria for release of solid materials? What are the considerations that should go into making this a decision?

(1) Does the current system of NRC case-by-case decisions on release of solid materials, using existing guidance, provide an adequate regulatory framework? Can volumetric contamination in small amounts be released in a manner similar to that done for small amounts of surface contamination on materials that have been released to unrestricted areas under the criteria in Regulatory Guide 1.86? If a rule is not issued, should Regulatory Guide 1.86 be updated with a set of dose-based values?

(2) Should the NRC develop dose-based regulations on release of solid material? Would a rule allow the NRC to better address volumetric contamination in solid materials in an explicit and consistent regulatory manner that meets both licensee needs and public concerns? Would a rule also meet additional specific regulatory needs such as the specific types of material to be covered, restricted vs. unrestricted use, etc?

(3) To what extent would such a rule contribute to maintaining public safety, enhancing the effectiveness and efficiency of the NRC, building public confidence, and reducing unnecessary regulatory burden?

(4) Would issuance of an NRC rule on release of solid material definitively resolve licensee questions regarding finality of NRC release decisions if EPA, which has authority to set generally applicable environmental standards in this area, promulgates a rule at a later date?

(5) Substantial NRC resources would be needed to conduct the complex safety, environmental, and regulatory analyses required to support a rulemaking. Without a regulation,

the NRC will have to review the anticipated increase in requests for release of solid materials on a case-by-case basis which could mean less efficient and less consistent reviews. Would potential savings in resources by having a regulation in place offset the resources spent on rulemaking?

Issue No. 2--If NRC Decides to Develop a Proposed Rule, What are the Principal Alternatives for Rulemaking that Should be Considered, and What Factors Should be Used in Making Decisions Between Alternatives?

If the answer to Issue No.1 is to conduct a rulemaking to include requirements in Part 20 on release of solid material, a rulemaking (including the development of technical basis information, evaluation of environmental impacts and cost-benefit analyses, and the public review and comment process) would be conducted to evaluate potential rulemaking alternatives.

Rulemaking Alternatives

Potential alternatives for rulemaking in this area are:

(1) Permit release of materials for unrestricted use if the potential dose to the public from the material are less than a specified level determined during the rulemaking process--In this alternative, a licensee could release for unrestricted use ("clearance") material that meets the permissible level in the standards. Potential alternative dose levels resulting from unrestricted use of the material could include doses of 0.1 mSv/yr (10 mrem/yr), 0.01 mSv/yr (1 mrem/yr), 0.001 mSv/yr (0.1 mrem/yr) above background, as well as no dose above background. To provide some perspective on these levels: (a) the dose from natural background to people in the U.S. can vary widely based on the area of the country where people live, lifestyle, and other factors, and averages about 3 mSv/yr (300 mrem/yr) but may vary from 1 to 10 mSv/yr (100 to 1,000 mrem/yr); (b) NRC's public dose limit is 1 mSv/yr (100 mrem/yr), (c) the dose from use of recycled coal ash in concrete block as permitted by EPA can be about 3 percent of natural background (about 0.1 mSv/yr (10 mrem/yr)), (d) a person receives 0.1 mSv (10 mrem) on a round-trip coast-to-coast flight, and (e) 0.01 mSv/yr (1 mrem/yr) is a level which the National Council of Radiation Protection and Measurements (NCRP) considers a trivial risk. In addition, a 0.01 mSv/yr (1 mrem/yr) value is also the level being considered for release for unrestricted use (or "clearance") in the European community.

(2) Restrict release of solid materials to only certain authorized uses (see more detail in Issue No. 3).

(3) Do not permit either unrestricted or restricted release of solid material that has been in an area where radioactive material has been used or stored--In this alternative, all such materials in the facility would be required to go to a licensed LLW disposal facility.

(4) Other alternative(s)--Other appropriate alternatives may be determined during the rulemaking process.

(5) Other decision making factors, (i.e., non-dose based criteria).

Factors in Decision making

Principal factors in making decisions regarding the alternatives include human health and environmental impacts, cost-benefit considerations, impacts on other industries, resource conservation, the capability to survey the material to assure that it meets permissible levels, existing international, national, and State standards, and other factors raised during the rulemaking process.

Human health and environmental impacts: In assessing potential rulemaking alternatives, NRC would consider a broad range of possible impacts, both radiological and non-radiological. These could include evaluation of radiation dose to individuals from release of solid materials, assessment of collective doses to different population groups from the release, transportation, processing and disposal impacts, impacts on biota, land use impacts, impacts on radiation sensitive industries, and societal impacts. Some of these impacts may be competing . For example, a lower dose criterion would result in less material available for release (and instead sent to a LLW disposal site) which, in turn, would lower the radiation dose impact to the public from exposure to that material. However, the lower dose criterion could cause an increase in other impacts, for example those impacts associated with mining, fabrication, and transport of fresh metal to replace that sent to a LLW disposal site. Because these impacts would take place over different time periods and expose different populations, a precise comparison is difficult. Nevertheless, the decision making process could consider these impacts separately and also consider the net collective impact for these disparate factors.

NRC recently published a draft report for comment on radiological assessments for clearance of equipment and materials from nuclear facilities, NUREG-1640 (2 volumes). The report provides dose factors for both surficial and volumetric radioactivity and compares them with results from Regulatory Guide 1.86 and from EPA values, European Community recommended clearance levels and IAEA draft clearance levels.

Most of the aforementioned policies, guidelines, recommendations and standards are dose based and thus are intended to be protective of public health and safety. In addition to protection of public health and safety, the U.S. Atomic Energy Act, as amended, also charges the NRC with protection of property. Some industries may be adversely affected by materials that are cleared based upon dose based standards because of sensitivity to radiation effects from the cleared material e.g., the film and electronic industries and the metal recycling industry which performs radiation monitoring of metal scrap to detect and protect itself from radioactive sources accidentally mixed with scrap.

As a first step in assessment of impacts, the NRC has issued a draft report for comment that provides a technical basis for determining potential doses to individuals from a wide range of potential scenarios by which members of the public could come in contact with material that had been released for unrestricted use (or "cleared") from licensees ("Radiological Assessment for Clearance of Equipment and Material from Nuclear Facilities," NUREG-1640, February 1999). The report contains an analysis of material flow models based on an evaluation of the recycle/reuse industry in the U.S. and of potential scenarios by which a member of the public could reasonably expect to be exposed. Solid materials that are candidates for release that are evaluated in the report include iron/steel, copper, aluminum, and concrete. The EPA has issued a report similar to NUREG-1640 which is accessible on EPA's website at http://www.epa.gov/radiation/cleanmetals/publications.htm. While some of the analysis and approaches in the EPA report are different from NRC's report, the overall results from the EPA and the NRC reports are similar.

Cost-benefit considerations: Executive Order 12291 contains provisions that require Federal agencies, in their rulemakings, to consider cost-benefit evaluations of alternative

courses of action. Consistent with Executive Order 12291, NRC has established guidelines for preparing regulatory analyses of alternative courses of action in support of its rulemaking decisions (NUREG/BR-0058). Benefits would generally derive from the net reduction in environmental impacts discussed above. Costs which could be included in a regulatory analysis could include: (1) the costs of alternative courses of action including surveys at licensed facilities, as well as surveys at non-licensed facilities that may use or receive released solid materials, to verify that permissible release levels have been met; (2) the potential for having to respond to contamination alarms at facilities handling released material; (3) economic impact on recycle/scrap/manufacturing processes; (4) replacement metal production; and (5) alternative options for disposing of the material.

Implementation considerations: A potential concern with implementation of a proposed rule is the capability to measure radioactive contamination corresponding to the very low alternative dose levels discussed above. The ability to measure radioactivity depends on both the amount and type of radioactive material. In particular, a rulemaking alternative that would require survey instrumentation to verify that there is no dose above natural background could be extremely difficult, if not impossible, to implement because of the variation in natural background and the limited capability of field survey instruments to detect such low levels.

Other international, national, and State standards: In considering rulemaking alternatives, the NRC would also consider requirements, guidelines, policies and precedents set by international agencies, other Federal agencies, or States. Consistency with standards set by other countries and international agencies is important because materials can be both imported and exported between the U.S. and other countries and differing standards could create confusion and economic disparities in commerce.

Items for Discussion

(A) Human Health and Environmental Impacts

(1) What individual dose level is acceptable regarding release of solid materials from licensed facilities for unrestricted use? Should release of solid materials for unrestricted use be permitted at a dose level (for example, 0.1, 0.01, or 0.001 mSv/yr [10, 1.0, or 0.1 mrem/yr], or no dose, above background (or other dose)) which is established in rulemaking based on a balancing of risks from various alternatives? Or, should release of solid materials not be permitted if they are potentially contaminated from the use of licensed radioactive material?

(2) How should environmental impacts be balanced and what types of impacts should be considered in decision making?

(i) In considering radiological impacts from materials released for unrestricted use in the public sector, what pathways of exposure to people, such as those already considered in NUREG-1640, should be considered? As noted above, NUREG-1640 contains a technical basis for determining potential doses to individuals from a wide range of potential scenarios by which members of the public could come in contact with material that had been released for unrestricted use. The report contains an analysis of material flow models based on an evaluation of the recycle/reuse industry in the U.S. and of potential scenarios by which a member of the public could reasonably be exposed.

(ii) In considering other environmental impacts, what impacts, both radiological and non-radiological, should be considered? Such impacts could include mining of new metals to

replace metals that could be potentially released but which are sent to a LLW disposal site, production of metal products, transportation of materials, etc.

(iii) How should net environmental impacts from all the radiological and non-radiological impacts be balanced?

(3) What is the potential for exposures to multiple sources of material released for unrestricted use, and what are ways in which persons could be exposed to multiple sources? How should potential for exposure to multiple sources be considered in setting an acceptable dose level? To what extent is there a potential that a single scrap facility would handle inputs of released solid materials from several different licensed facilities?

(4) What societal impacts should be considered and how should they be factored into the environmental evaluation? For example, material released for unrestricted use from nuclear facilities could result in concern, confusion, or fear if the public either does not clearly understand that the risk is small or does not accept the risk.

(5) How should the impacts upon industries that have special concerns about the presence of radioactivity in materials, e.g., film, electronic, and metal recycling, be considered and factored into decision making?

(B) Cost-benefit Considerations

(1) As noted above, Executive Order 12291 requires Federal Agencies to consider cost-benefit in its consideration of rulemaking alternatives. NRC uses NUREG/BR-0058 as its guideline in analysis of the cost-benefit of regulatory alternatives. In using NUREG/BR-0058:

(i) How should economic factors be incorporated into rulemaking decisions, including costs of survey methods and appropriate instruments to measure very low levels of volumetrically contaminated material, economic risks associated with release of solid materials, costs of decontamination, ALARA issues, etc.

(ii) How should economic impacts be balanced against net environmental impacts?

(2) What are the major economic costs associated with release of solid materials into commerce?

(3) What are the major economic costs associated with landfill disposal of material released for unrestricted use? Would problems be encountered in this material going to a landfill?

(4) What economic risks are associated with release of solid materials for unrestricted use? For example, what are the risks (and associated costs) that materials released from a nuclear facility could be rejected at a melter or scrap yard based on a radiation survey at that point? What means could minimize such economic risks?

(5) What is the potential for buildup of radioactivity in commerce as a result of continued release of solid material for unrestricted use over time? How should such a buildup be estimated? What is the potential that this buildup could contribute significantly to either the net environmental impact, to economic impacts on general commerce, or to public concern?

(C) Implementation Considerations

(1) What is the capability of surveying materials (both for surface and volumetric contamination) at the different alternative dose levels being considered, and what effect would that have on setting a standard? Are these survey capabilities readily available to licensees? Should there also be provisions for survey capability at receiving facilities and what should be the nature of those provisions? What economic impact would the use of different or advanced survey techniques have on the facilities releasing the material and the facilities accepting the material for reuse or recycle? How can surveys be designed to prevent releasing material in excess of permissible levels? Over what volume or mass of material should surveys be performed in assessing compliance with release levels? Should materials of varying concentration levels be combined, and, if so, how?

(2) What different survey methods should be used for assuring that materials from different areas of a facility, and having different potential for contamination, meet the criteria of a dose-based standard? For example, should the survey of solid materials from areas known to be free of contamination rely upon knowledge of facility radiological history and knowledge of plant processes, and, if so, how?

(3) How should criteria for release of solid material be incorporated into NRC's regulations, i.e., should they be expressed as a dose criteria and/or be expressed as concentration values in different media based on specified dose objectives and standard models for exposure?

(D) Other considerations including international, national, and State guidelines

(1) With regard to international, national, and State standards:

(a) How should guidelines on unrestricted release, or "clearance," set by international standards-setting bodies such as the IAEA and International Commission on Radiological Protection (ICRP), as well as those set by other countries, be considered in setting a level for release of material from NRC-licensed facilities in the U.S.? How should efforts by the EPA to set import screening guidelines be considered?

(b) How should guidelines of other U.S. agencies, e.g., DOE and EPA, be considered? To what degree should standards set by NRC be consistent with other EPA standards, such as those for recycled coal ash (see Section A.2.2.3)? With regard to issues of finality of NRC licensing decisions, what potential problems could occur if EPA later issues standards for release of solid materials different from an NRC regulation?

(c) How should recommendations made by U.S. standards setting bodies, such as the NCRP, be considered?

(d) How should standards set by U.S. industry groups, such as the American National Standards Institute (ANSI), be considered? Are industry standards currently available, or anticipated during the time frame for this rulemaking, that could be adopted in lieu of or in addition to NRC requirements on release of solid materials?

(e) Should NRC simply adopt the standards in 1(a), 1(b), or 1(c), and their associated health risk level, rather than conduct analyses of its own?

(f) What are the economic and other impacts of having NRC standards different from standards that may be set by international agencies, EPA, or other national bodies?

(g) What compatibility categories, as described in NRC's "Policy Statement on Adequacy and Compatibility of Agreement State Programs," published September 3, 1997 (62 FR 46517), and in NRC's Management Directive 5.9, "Adequacy and Compatibility of Agreement State Programs," should be assigned to any rule on release of solid materials? Compatibility refers to the extent to which Agreement State radiation control programs are consistent with NRC's program for the regulation of Atomic Energy Act radioactive materials to ensure that an adequate and coherent nationwide effort is collectively established for regulation of such materials.

(2) Should existing NRC standards, including the public dose limit of 1 mSv/yr (100 mrem/yr) in 10 CFR 20.1301, and Subpart E of Part 20 which contains a dose criterion of 0.25 mSv/yr (25 mrem/yr) for release of decommissioned structures and lands, be considered in setting allowable doses for release of solid material for unrestricted use? A consideration in this question is that there are different circumstances between Subpart E and the issues being discussed in this paper. For example, Subpart E limits the dose from the single release of structures and land at a site to 0.25 mSv/yr (25 mrem/yr). In contrast, unrestricted release of the materials considered in this issues paper could involve periodic releases over the facility lifetime at a dose level to be set in the rulemaking.

Issue No. 3--If NRC Decides to Develop a Proposed Rule Containing Criteria for Release of Solid Materials. Could Some Form of Restrictions on Future Use of Solid Materials be Considered as an Alternative?

As discussed in Section A.2.2, release of solid materials for unrestricted use would allow them to be recycled or reused in consumer products or industrial products, or be disposed of in solid waste landfills. A potential alternative could involve limiting release of solid materials by restricting their future use to some authorized use.

Alternatives

Potential alternatives for restricted use of solid materials could include:

(1) Restrict the first use of solid material to certain authorized uses

In this alternative, the release of radioactive material would be restricted to certain authorized uses to ensure that it is processed into one or more specific products. For example, material could be recycled for use in an industrial product such as steel beams that would be designated for use in a foundation or structural support for a bridge or monument. Because of uncertainties related to controlling potential uses of the material after it leaves a licensee's facility, it may be necessary to require that processing of the material for the first use be done under a specific license issued by the NRC. This alternative might be beneficial for materials contaminated by nuclides having short to moderate half-lives, allowing substantial reduction in contamination due to radioactive decay within the lifetime of the structure in which it is placed. This alternative would probably not be applicable for all materials (e.g., wood products and some metals such as copper). End user certification could be difficult to enforce.

(2) Restrict release of solid material to permitted disposal

This alternative would restrict the release of slightly contaminated solid material from nuclear facilities to disposal at municipal solid waste landfills. Solid material with higher levels of radioactive contamination would continue to be handled as radioactive waste and be disposed of at licensed facilities. Municipal solid waste landfills are issued permits by State regulatory authorities in accordance with 40 CFR 258, "Criteria for Municipal Solid Waste Landfills" as well as other State and local regulations. The rationale for this alternative is that exposure pathways at landfills can be fairly well defined and quantified, and that many of the pathways of potential exposure associated with the recycling of metal into consumer products or industrial products would not be present. Additional restrictions could involve disposal at industrial solid waste facilities rather than at sanitary waste landfills.

Issues associated with this alternative include the fact that additional NRC and/or EPA rulemaking may be required to implement this alternative. For example, the definitions of solid waste and/or byproduct material (or associated regulations) might need to be revisited to allow disposal at solid waste landfills of material having residual radioactivity. Several State and local governments currently have prohibitions against the disposal of radioactive material in landfills which would make this alternative less feasible. An additional issue is the possibility that material could be sent to a landfill under a use restriction, but it could be removed from the landfill and sold as scrap or reused.

Items for Discussion

(1) Should the NRC consider restrictions on future use of solid materials as an alternative to unrestricted use (similar to the license termination rule)?

(2) If so, what types of restricted uses should be considered?

(3) What types of controls could restrict use to assure that the material would not be released for unrestricted use? Would these controls be reasonable? Would it be necessary to license processing of the material for the first use in order to assure protection of public health and safety? For example, if iron/steel were to be restricted to use in bridge support, should the company processing the steel into bridge supports be licensed by the NRC? Or could sufficient restrictions be placed on the processing company to assure that the steel went where it was supposed to without the company having an NRC license?

(4) How long would the use be restricted? What radionuclides, and associated time periods for radioactive decay, would be reasonable to consider as candidates for restricted use? What would happen to the material when it reached the end of its useful restricted life?

(5) If restrictions were placed on future use of materials, would the NRC need to be involved in continued regulation or tracking of the material? Would States need to be involved? Or could a mechanism for institutional control, similar to that used in the license termination rule be used to assure the continued restricted use of materials? Note that Subpart E of 10 CFR Part 20 (Section 20.1403) contains requirements regarding acceptable dose levels for restricted use, allowable institutional controls and financial arrangements, etc.

(6) What type of public involvement should there be in decisions concerning restricted use of materials? Should it be similar to the method used in the license termination rule where licensees are required to seek advice from affected parties when proposing a site for restricted use? Note that Subpart E of 10 CFR Part 20 (Section 20.1403) also contains requirements for licensees to seek advice on from affected parties and also the methods to be used in obtaining

that advice. A potential problem in establishing a public involvement process for restricted use of materials is that (unlike license termination of buildings or a site where affected parties in a community can be fairly readily identified for a restricted site in a community) material leaving the site could be sent for restricted use in different areas and uses. Can a meaningful public involvement process be developed for setting restrictions on future material use in specific licensing cases?

(7) How should considerations and predictions of future public uses of materials and the restrictions on those materials be developed to provide credible approaches for restricted use?

(8) What dose should be permitted for material released for restricted use? Should the same alternative dose levels as for unrestricted use (see Issue No.2) also be considered for restricted use, or should some other value, either higher or lower, be considered? By way of comparison, the allowable dose in Subpart E of Part 20 for restricted use of released lands and structures is the same as for unrestricted use, provided the controls remain effective.

(9) What specific problems are associated with restricting materials to landfill disposal?

Issue No. 4--If NRC Decides to Develop a Proposed Rule, What Materials Should be Covered?

A rule developed by the NRC could cover selected materials (for example, certain metals such as iron and steel) or could be a broad rule encompassing all materials. Any alternatives chosen for consideration would be dependent on information available on the various materials. Currently, the NRC has developed the following technical background information:

(1) An analysis of individual doses resulting from unrestricted release of steel, aluminum, copper, and concrete (draft NUREG-1640, February 1999) has recently been completed. These materials were analyzed because they were considered to represent those most likely to become available and also to represent most of the volume of slightly contaminated material available for release from NRC-licensed facilities into the public sector, other than soil.

(2) Discussions with licensees have indicated that there are large quantities of soil with very low amounts of radioactive contamination that are available for release. Although NUREG-1640 does not include specific analyses for soil, work done previously for the license termination rule provides baseline technical information on individual dose factors and environmental analysis for soil which could be adapted for use for this application. This previous work includes NUREG-1496, "Generic Environmental Impact Statement on Radiological Criteria for License Termination," NUREG/CR-5512, "Residual Radioactive Contamination from Decommissioning," and NUREG-1549, "Decision Methods for Dose Assessment to Comply with Radiological Criteria for License Termination."

(3) The NRC does not have similar analyses completed for other slightly contaminated materials potentially available for release.

Alternatives

Alternative rule approaches could be that the rule would apply to--

(1) only a select group of solid materials, including certain metals (steel, aluminum, copper) as well as concrete and soil.

(2) a wider group of materials to also include other materials under license including sludge, sewage, wood, glass, and others.

(3) a select group of materials (Alternative 1) and conduct rulemaking on other materials in Alternative 2 at a later time.

Specific Items for Discussion

(1) Should the NRC proceed with a rulemaking covering all materials, with the option of conducting further rulemaking at a later time for certain materials if the impact to all affected parties, including the regulators, is too great or the analysis too complicated or time consuming?

(i) Is it appropriate to proceed with certain materials, including steel, aluminum, copper, concrete, and soil, so that rulemaking can be done in a timely manner using the information developed for these materials in NUREG-1640, and associated analyses as described above, as input to the environmental analyses and regulatory analyses? Would experience gained with the rule on steel, aluminum, copper, concrete, and soil be useful in evaluating requirements for release of other materials later?

(ii) Would issuing a rule now for only certain materials noted in Alternative No.1 limit NRC's capability to deal effectively with requests for release that could be made in the future for other materials? Other similar materials, such as sludges, slag, asbestos, etc., could also potentially be the subject of requests for release. To help answer that question, how many and what types of materials are licensees actually requesting release for today or are anticipated over the next decade?

(iii) Should the NRC perform additional analyses at this time of individual doses resulting from other materials potentially available for release to support rulemaking decisions for these materials even if it impacts the schedule for rulemaking for release of steel, aluminum, copper, and concrete?

(2) What other materials would be the candidates for rulemaking? Do analyses for these materials currently exist or are they under development?

(3) If the NRC proceeds with rulemaking limited to certain materials indicated in Alternative 1, how should it handle requests for release of other materials, i.e., should it proceed with a subsequent rulemaking for other materials, and, if so, how and when should it proceed with this later rulemaking? Should the additional materials be released under existing guidelines until the subsequent rule is developed, or should the release of these materials be postponed until a rulemaking is conducted? If the rulemaking establishes dose objectives for release and implements those objectives through tables of values for specific materials, should the dose objective also be used to guide case-specific release of other materials through licensing actions or exemptions?

(4) What would be the associated costs effective survey methods, and dose impacts of the alternatives?

(5) Should the NRC rulemaking be extended to cover materials that may be released from nuclear facilities operated by the DOE?

IV. Scoping Process for Environmental Impact Statement

As discussed in Section III.A.5 and III.B of this notice, if the Commission decides to proceed with a rulemaking, it will have to consider the effect of its actions on the environment in accordance with the National Environmental Policy Act (NEPA). Section 102(1) of NEPA requires that the policies, regulations, and public laws of the United States be interpreted and administered in accordance with the policies set forth in NEPA. It is the intent of NEPA to have Federal agencies incorporate consideration of environmental issues into their decision making processes.

NRC regulations implementing NEPA are contained in 10 CFR Part 51. To fulfill its responsibilities under NEPA, the NRC would prepare an environmental impact statement (EIS) by analyzing alternative courses of action and the impacts and costs associated with those alternatives. In keeping with the requirements of 10 CFR Part 51, an EIS would analyze alternatives for establishing requirements for release of solid materials. All reasonable alternatives associated with the proposed action would be analyzed to determine their impacts and costs.

The Commission's regulations in 10 CFR 51.26 contain requirements for conducting a scoping process before preparing an EIS, including preparation of a notice of intent in the Federal Register regarding the EIS and indication that the scoping process may include holding a scoping meeting. Requirements are contained in 10 CFR 51.27 regarding the content of the notice of intent, in particular that it should describe the proposed action and describe possible alternatives to the extent that information is available. In addition, the notice of intent is to describe the proposed scoping process, including the role of participants, whether written comments will be accepted, and whether a public scoping meeting will be held.

Participants in this scoping process on the environmental impacts of release of solid materials from licensed facilities may attend any of the four public meetings indicated under the DATES heading of this notice and provide oral comments on the proposed action and possible alternatives The Commission will also accept written (and electronic) comments on the proposed action and alternatives from the public, as well as from meeting participants, as indicated under the DATES and ADDRESSES heading of this notice.

According to 10 CFR 51.29, the scoping process is to address the following topics:

(1) Define the proposed action. The NRC is considering codifying radiological criteria for release of solid materials from licensed facilities. Detailed information on the proposed action is described in Section III.A.2 and III.A.5 of this notice.

(2) Determine EIS scope and significant issues to be analyzed in-depth. The NRC is considering analyzing the impacts and costs associated with alternative regulatory approaches to establish radiological criteria for release of solid materials from licensed facilities. Information regarding: (a) types, and contamination levels, of solid materials present in licensed facilities potentially available for release is contained in Section III.A.1.2 and Section III.B (Issue No. 4) of this notice; (b) pathways of exposure to solid materials released from licensed facilities is contained in Section III.B (Issue No. 2) of this notice and discussed in detail in the draft NUREG-1640 and in NUREG-1496 as referenced in Section III.B; (c) regulatory alternatives and method of approach for analysis of the alternatives is contained in Section III.A.2.2 and III.B (Issue No. 2) of this notice. Principal factors in making decisions regarding the alternatives are indicated in Section III.B (Issues No. 2, 3, and 4) of this notice.

(3) Identify and eliminate from detailed study issues which are not significant or which are peripheral or which have been covered by prior environmental review. The NRC has not yet eliminated any non-significant issues. However, the NRC is considering elimination of the following issues from the scope because they have been analyzed in previous EIS's (NUREG-0586 and NUREG-1496) and included in earlier rulemakings (53 FR 24018, June 28, 1988, and 63 FR 84088, July 21, 1997): (i) planning necessary to conduct decommissioning operations in a safe manner; (ii) assurance that sufficient funds are available to pay for decommissioning; (iii) the time period in which decommissioning should be completed; (iv) radiological criteria for decommissioning of lands and structures; and (v) the fact that consideration is not given to an alternative in which a licensee would abandon material or equipment without some treatment or licensed disposal.

Analysis of the scope of environmental impacts for this effort would be principally intended to provide input to decision making for establishing overall criteria for release of solid materials, and would not involve analysis of site-specific issues which may arise in the licensing process at specific facilities. The extent to which the environmental analysis may be applicable to a site specific NEPA process would be described in a draft EIS and draft rulemaking.

(4) Identify any environmental assessments or environmental impact statements which are being or which will be prepared that are related but are not part of the scope of the EIS under consideration.

None are being prepared.

(5) Identify other environmental review or consultation requirements related to the proposed action. The NRC has contracted with ICF to provide technical assistance in the environmental analyses. The NRC is also placing contracts to obtain specific technical assistance regarding exposure pathways, collective doses, costs, and the capability of radiation survey instruments to practically and accurately detect radioactive contamination at levels near background.

(6) Indicate the relationship between the timing of the preparation of environmental analysis and the Commission's tentative planning and decision making schedule. The schedule for issuance of an EIS has not been developed. The NRC staff will provide to the Commission, early in the year 2000, a report on the results of the public meetings and other public comments on the issues paper and the scoping process and include a schedule for any further rulemaking in this area, including the schedule for preparation of an associated draft EIS.

(7) Describe the means by which an EIS would be prepared. If the NRC proceeds with rulemaking in this area, it would prepare a draft EIS in accordance with its regulations in 10 CFR Part 51. Specifically, in accord with 10 CFR Part 51.71, a draft EIS would be prepared using the considerations of the scoping process and would include a preliminary analysis that considers and balances the environmental and other effects of the proposed action and the alternatives available for reducing or avoiding adverse environmental and other effects, as well as the environmental, economic, technical and other benefits of the proposed action.

In accordance with 10 CFR 51.29, at the conclusion of the scoping process, a concise summary of the determinations and conclusions reached, including the significant issues identified, will be prepared and a copy sent to each participant in the scoping process.

Dated at Rockville, Maryland, this 22nd day of June 1999.

For the Nuclear Regulatory Commission.
William D. Travers,
Executive Director for Operations.

APPENDIX B

CROSS REFERENCE OF COMMENTERS BY COMMENTER NAME

Commenter	Commenter Number	Sections
20/20 VISION Georgia	AT004c	Under signer of AT004
A First Amendment Center	0278m	Under signer of 0278a
Abbott, Joseph & Alice	0195	4.2.1
ACURI Association, Inc.	0422	2.3, 3.1.1, 3.2, 4.3.2, 4.3.3.1, 10.1, 11.2.1, 11.5.1, 11.5.2, 11.5.3, 12.0
Adams, Samuel	0345	Letter not relevant; mistakenly docketed
Adamson, Thomas Andrew	0331	3.3
Ainslie, Scott	0284	3.1.2, 4.2.1, 6.1
Air, Water, Earth, Org.	0278h, AT004bh	Under signer of 0278a; under signer of AT004
AK Steel Corporation	CH027	2.3, 3.1.2, 4.1.2, 4.2.1, 4.2.3, 4.3.3.1, 6.1, 8.2.3.1, 8.4.1.2, 8.4.3, 11.2.2
Alliance for Nuclear Accountability	0280j, CH005c, MD004f	Under signer of 0280a; under signer of CH005; under signer of MD004
Alliant Utilities (IES Utilities)	0038	3.1.1, 4.2.1, 4.2.2, 4.4.1, 5.1.2, 8.2.3.4
Allied Signal, Inc.	AT024	3.2, 3.3, 4.3.1.2, 4.3.1.3, 4.3.4, 5.1.3, 8.2.2.1, 8.2.5.1, 8.4.1.1, 9.2, 11.1.1, 11.2.3
Allied Technological Group, Inc.	AT019	2.1, 2.2, 2.3, 3.1.1, 3.2, 4.3.1.1, 4.3.1.2, 4.3.2, 4.6.2, 5.1.2, 5.1.4, 5.3.2, 8.4.1.3, 8.4.2
Allison, Melody	0826	6.3.1, 10.2
Almgren, Anna-Maria	0162	Similar to 0045
Alvafull (e-mail alias - name not provided)	0006	6.1
Amarello, Joseph	0058	4.1.1, 9.3
Ameren EU	0057	2.3, 3.1.1, 3.2, 4.1.1, 4.2.1, 4.3.1.2, 4.3.3.1, 4.4.4, 5.1.2, 5.2.2, 6.2, 8.2.1.1, 8.2.1.2, 8.2.5.1, 8.4.1.1, 8.5, 10.1, 11.1.1
American Environmental Health Studies Project	AT004h, CH017	3.1.2, 3.2, 4.1.2, 4.4.1, 4.4.4, 8.4.3, 9.2, 9.4, 11.8.2; and under signer of AT004*
American Iron and Steel Institute (AISI)	0660, AT014, CH007, CH016, CH018, MD034, MD037	3.1.2, 3.2, 4.1.2, 4.2.3, 4.3.1.1, 4.3.1.2, 4.3.1.3, 4.3.2, 4.3.3.1, 4.3.3.2, 4.3.4, 5.2.1, 5.2.2, 5.2.3, 5.3.1, 5.5, 8.2.2.2, 8.2.3.3, 8.3.1, 8.3.2, 8.3.3, 8.3.4, 8.4.1.2, 8.4.3, 10.3, 10.411.2.2, 11.8.1
American Iron and Steel Institute (AISI) and Bethlehem Steel	MD003	2.1, 3.2, 3.3, 4.2.4, 4.3.1.1, 4.3.2, 5.1.1, 5.2.1, 6.1, 10.2, 10.4, 11.1.2
American Iron and Steel Institute (AISI) and LTV Steel Company	AT025, SF012	3.1.2, 3.2, 3.3, 4.1.1, 4.1.2, 4.2.2, 4.2.4, 5.1.4, 8.2.2.1, 8.2.5.1, 8.3.1, 9.2, 11.1.2, 11.2.3
American Nuclear Society and Sargent and Lundy Consumers Energy	CH011, SF013	3.1.1, 3.2, 4.2.2, 4.2.3, 4.3.4, 4.4.1, 4.4.4, 4.6.1, 5.1.3, 5.2.1, 8.2.1.1, 9.2, 9.7, 10.4, 11.2.1, 11.5.2
Americans for a Safe Future	AT004bc	Under signer of AT004
Andersen, Curt	0025	6.1, 9.8
Anderson, Jean K.	0671	6.1
Andrews, John P.	0030	3.1.1, 3.2, 4.1.1, 4.2.1, 4.2.3, 4.3.1.2, 4.3.3.1, 4.4.1, 4.4.3, 4.5.2, 5.1.1, 5.2.3, 5.4, 6.1, 8.2.4, 8.4.1.1, 8.5, 9.2, 9.6, 11.2.1, 11.5.2, 11.5.4, 11.5.5
Andrys, Rob	0610	4.2.1

Commenter	Commenter Number	Sections
Angelino, Salvatore J.	0077	Similar to 0045
Arizona Public Service Company (APS)	0673	3.2, 3.4, 4.1.1, 4.2.1, 4.2.2, 4.2.3, 4.3.3.1, 4.5.3, 6.2, 8.2.2.1, 10.1, 11.1.1, 11.2.1, 11.5.2, 11.5.3
Arizona Safe Energy Coalition	AT004bi	Under signer of AT004
Arizona Toxics Information	AT004z	Under signer of AT004
Arkansas Department of Health	0274	3.2, 4.4.2
Arnold, Bruce	0338	3.1.2, 4.2.1, 6.1
Arrington, Martha L.	0408	6.1
Asaokai	0421	3.1.2, 6.1, 9.1
Ashley, Joanne	0617	6.1
Ashmore, Marjorie C.	0452	6.1, 9.1
Association of Radioactive Metal Recyclers	0001, AT016, MD019	3.1.1, 3.2, 4.2.2, 4.2.3, 4.3.1.1, 4.3.1.3, 4.5.1, 4.6.1, 4.6.2, 5.1.3, 9.2, 9.4, 9.5, 9.7, 11.1.1
Association of State and Territorial Solid Waste Management Officials	0070, MD005	2.1, 2.2, 2.3, 3.1.1, 3.1.2, 3.2, 3.3, 4.1 1, 4.2.1, 4.2.2, 4.2.3, 4.3.1.1, 4.3.1.2, 4.3.2, 4.3.3.1, 4.3.3.2, 4.4.1, 4.4.2, 4.4.3, 4.5.1, 4.6.3, 5.1.2, 5.2.1, 5.2.3, 5.3.1, 5.4, 5.5, 5.6, 5.7, 6.3.2, 8.2.1.1, 8.2.2.1, 8.2.4, 8.2.5.1, 8.3.1, 8.3.2, 8.3.3, 8.4.1.1, 8.4.1.2, 8.4.2, 8.5, 9.4, 10.1, 11.1.3, 11.2.1, 11.5.1, 11.5.2, 11.8.1
Atlanta Women's Action for New Directions (WAND)	AT004d	Under signer of AT004
Atlas, Elise	0364	6.1
Aton, David R.	0443	6.1
Austin, Donald and Lehman, Joanne	0536	6.1
Austin, Roberta J.	0438	6.1, 9.1, 9.2
Avery, W. H.	0636	3.1.2
AWARE	CH005m	Under signer of CH005
Aylward, Patricia	0157	4.2.1, 6.1
Babelay, Susan	0706	3.1.2, 6.1, 8.2.2.1, 9.1
Baghosian, Rose	0362a	6.3.1
Bailine, Barbara	0453	6.1, 9.1, 9.2
Baiman, Rhon	0314	4.2.1, 6.1, 8.2.1.1, 8.4.1.1
Baiman, Sydney	0360	6.3.1, 9.1
Baker, Lisa	0295	Similar to 0294
Baker, Sheila	0657	Similar to 0045
Balch, Jeff	CH002	2.3, 3.1.2, 6 1, 7.0
Bambenek, Joel	0227	6.1, 9.1
Bard College	0691	Similar to 0045
Barger, Bobby	0555	6.1
Barnes, Kathryn A.	0436	6.1
Barr, Michael M.	0380	4.2.1, 6.1
Barri, Jaynie	0317	Similar to 0316
Bauer, Debowden	0072	Similar to 0045
Bay Area Nuclear Waste Coalition	0278e	Under signer of 278a

Commenter	Commenter Number	Sections
Baylies, Susan	0269	6.1, 6.3.1, 8.2.1.2, 8.3.3, 9.1, 10.2
Bell, Glenn	0078, 0079, 0082	2.3, 3.1.2, 6.1, 9.1; 0079 is similar to 0045
Belyeu, Danny & Marcia	0402	6.1
Benner, Robert L.	0651	6.1
Berelli, Victorio	0390	6.1, 9.1, 9.2
Berg, Erik	0828	Similar to 0779
Berger, Bradford W.	0462	6.1
Bernardo, Jennifer	0758	Similar to 0045
Bertell, Rosalie	0602	3.1.2, 6.1, 8.2.3.1
Betts, Peter	0202	6.1
Bialas, Michel E.	0206	4.2.1, 6.1
Black, Douglas B.	0466	6.1
Blair, David	0676	4.2.1, 6.1
Block, Jon	0379	3.1.2, 6.1
Block, Samuel A.	0203	3.1.2, 6.1
Blockney-O'Brien, Pamela	0028	3.1.2, 4.2.1, 8.2.2.1
Bloustine, Karen	AT004dq	Under signer of AT004
Blue Island Greens	CH029	6.1, 9.2
Blue Ridge Environmental Defense League	AT004cc	Under signer of AT004
Bluesky, Willa	0253	3.1.2, 6.1
Boardman, Nancy	0736	Similar to 0045
Boksa, Leonard	0695	6.1
Bollinger, Dave	0047	Similar to 0045
BOND	CH005j	Under signer of CH005
Boniface, George	0454	6.1, 9.2
Boniface, Kathryn & Bill	0433	6.1
Bonnarens, Corlita	0730	Similar to 0045
Booth, Don	0417	3.1.2, 4.2.1, 6.1, 8.2.2.1
Borden, Kelly	0366	6.1
Botwinick, Joan	0541	6.1
Boyens, Marguerite	0330	3.1.2, 6.1
Boyers, Richard	0179	Similar to 0045
Bradley, Matthew	0803	Similar to 0045
Bradt, Samuel	0791	Similar to 0779
Brant, Alan E.	0229	6.1
Breilid, Erik	0787	6.1, 10.2
Brenneman, Mary	0708	6.1
Brison, Allan P.	0200	4.2.1, 6.1
Brister, Bob	0286	Similar to 0045
Brody, Lise	0689, 0824	6.3.1, 10.2
Bronstein, Linda	0754	4.2.1, 6.3.1, 8.4.1.1, 10.2
Brooks, Cuyler W.	0376	3.3
Brown, Dottie	0292	6.1
Brown, Gidion	0171	Similar to 0045

Commenter	Commenter Number	Sections
Brown, Linda L.	0329	3.1.2
Brown, Myrna	0214	3.1.2, 4.2.1, 6.1
Browne, Linda	0160	4.2.1, 6.1
Bruck, Debby	0404	6.1
Bubala, Lou	0722	Similar to 0045
Buck, Paul	0293, 0554	3.1.2, 6.1
Bugg, Ann	0125	3.1.2, 6.1
Burke, Delia	0806	Similar to 0779
Burlant, Mae D.	0242	3.1.2, 6.1
Busby, Laurie	0220	6.1
Bushnell, Bill	0087	Similar to 0045
Bushnell, Martha	0859	4.2.1, 6.1
Butler, John	0419	3.1.2, 4.2.1, 8.2.1.1, 8.4.1.1
California Communities Against Toxics	AT004bu	Under signer of AT004
California State Department of Health Services	SF006	2.3, 3.1.1, 3.2, 4.2.3, 4.3.3.1, 4.3.4, 4.4.2, 5.7, 8.4.2, 11.5.2
Callner, Amy	0594	3.1.2, 4.2.1, 6.3.1
Camara, Tom	0091, 0630	6.3.1; 0091 is similar to 0045
Campaign for a Prosperous Georgia	0638	3.1.1, 3.1.2, 4.2.1, 6.1, 6.3.1, 8.4.1.1, 9.1
Campbell, Scott	0060	Similar to 0045
Cann, Roald	0495	3.2, 4.1.2, 6.2, 8.4.1.1
Cannon, John and Jeanne	0543	6.1
Caraway, Ben	0382	8.4.1.1
Carina, Rebecca	0270	3.1 2, 6.1, 9.2
Carolina Peace Resource Center	AT004m	Under signer of AT004
Carosi, Mary Dolores	0298	6.1
Carr Goldman, Patricia	0392	3.1.2, 4.2.1, 6.1, 9.1
Casten, Liane	0516	3.2, 4.2.1, 6.1, 6.3.1
Castor, James P.	0553	3.1.2, 6.1, 8.2.2.1, 8.4.1.1
Catholic Worker Organization of Ithaca, New York	AT004ax	Under signer of AT004
Cattail Music	0856	3.1.2
Center for Biological Monitoring	AT004cf	Under signer of AT004
Center for Energy Research	0278k, AT004au	Under signer of 0278a; under signer of AT004
Center for Safe Energy	0585	6.3.1, 10.2
Center for Safe Energy, Earth Island Institute	AT004cy	Under signer of AT004
Central New York - Citizens Awareness Network	AT004bd	Under signer of AT004
Central Pennsylvania Citizens for Survival	AT004w, CH005q	Under signer of AT004; under signer of CH005
Chachula, Julian & Denise	0394	3.1.2, 6.1, 9.1
Chang, Helen F.	0094	Similar to 0045

Commenter	Commenter Number	Sections
Chang, Joey	0409	Similar to 0045
Chappell, David W.	AT004du	Under signer of AT004
Charman, Karen	AT004ds	Under signer of AT004
Chemical Nuclear Systems	AT010	8.3.1, 8.4.1.1
Chenengo North Energy Awareness Group, NY	AT004bf	Under signer of AT004
Cherokee and Opinny Tribes	CH013	2.3, 9.4
Chicago Student Environmental Alliance	CH005ab	Under signer of CH005
Children of Chernobyl Relief Fund	AT004cv	Under signer of AT004
Chitwood, Joanna	0389	6.1
Christie, Jean	0819, 0819S	3.1.2, 6.1
Christopherson, Jeff	0518	4.2.1, 6.1, 9.2
Chrisulls, Marika	0751	Similar to 0045
Cicirelli, Anna	0831	6.1
Cilley, Jacqueline	0048	Similar to 0045
Citizens Action Coalition of Indiana	0724, AT004ap, CH005t, CH032	0724 is similar to 0045; under signer of AT004; under signer of CH005
Citizens Action for Safe Energy	AT004ch	Under signer of AT004
Citizens Awareness Network	0482, CH005y, AT004ag	3.1.2, 3.3, 6.3.1, 9.1; under signer of CH005; under signer of AT004
Citizens for a Healthy Planet	CH005i	Under signer of CH005
Citizens for Alternatives to Chemical Contamination, Citizens for a Healthy Planet	AT004bo	Under signer of AT004
Citizens Protecting Ohio (C-PRO)	AT004by	Under signer of AT004
Citizens Regulatory Commission	0420	6.1
Citizens Resistance at Fermi 2	CH005w	Under signer of CH005
City of Davis, California	0857	6.1, 9.1
Clark, Donna	0584	6.3.1
Clark, Patrick	0165	Letter not relevant; mistakenly docketed
Clarke, William H.B.	0354	6.1
Clean Water Action	0280e, MD004h	Under signer of 280a; under signer of MD004
Coalition for a Healthy Environment	AT004g	Under signer of AT004
Coalition for a Nuclear Free Great Lakes	CH005v	Under signer of CH005
Coalition for a Safe Environment	CH005k	Under signer of CH005
Coble, Joan	0313	3.1.2, 6.1, 8.1
Cockerill, Amy	AT004dk	Under signer of AT004
Coen, Virginia	0225	4.2.1, 6.1
Cogelia, Nicholas and Mary	0563	4.2.1 6.1
Cohen, Bobbie	0822	6.1

Commenter	Commenter Number	Sections
Cole, Muriel F.	0218	4.2.1, 6.1
Collier Dennis, Virginia	0640	6.1, 8.2.2.1
Collins, Jana	0542	6.1, 9.1
Collins, Rita	0190	4.2.1, 6.1, 7.0
Comerford, Sherma	0735	Similar to 0045
Commercial Metals Steel Group - SMI Texas	MD017	4.1.2, 4.3.1.1, 4.3.1.2, 4.3.1.3, 4.3.3.1, 5.1.1, 8.3.3, 8.4.1.1, 8.4.1.2, 9.4, 11.1.1, 11.1.2
Committee for Nuclear Responsibility	0278j, 0732	3.1.2, 4.2.1, 8.2.3.1; under signer of 0278a
Committee on New Priorities	CH005z	Under signer of CH005
Committee to Bridge the Gap	0278a, 0488, SF018	3.1.2, 4.3.3.2, 6.1, 8.2.2.1, 9.5
Commonwealth Edison	0682, CH019	2.3, 3.1.1, 3.2, 4.1.1, 4.2.1, 4.2.2, 4.2.3, 4.3.1.1, 4.3.1.2, 4.3.3.1, 4.4.1, 4.4.2, 4.5.2, 5.1.1, 5.2.2, 6.1, 8.2.2.1, 8.4.1.1, 8.4.1.3, 10.1, 10.2, 11.1.1, 11.2.2, 11.5.2
Community Organizing Center, Columbus, OH	AT004aL	Under signer of AT004
Conference of Radiation Control Program Directors' E-23 Committee (CRCPD)	0469	2.3, 3.1.1, 3.1.3, 3.4, 4.1.1, 4.2.1, 4.3.1.1, 4.3.3.1, 4.4.1, 4.4.2, 5.1.1, 5.3.1, 8.2.2, 8.2.2.1, 8.2.2.3, 8.2.2.4, 8.2.5.1, 8.4.1.1, 8.4.2, 10.2
Conneally, Rae E.	0418	3.1.2, 4.2.1, 4.3.3.1
Connecticut Opposed to Waste	AT004x	Under signer of AT004
Connelly McDonald, Mary	0310b	Under signer of 310a
Conservation Council of North Carolina	0322, AT004n	4.2.1, 6.1, 6.3.1, 7.0, 9.1; under signer of AT004
Cornett Environmental Consulting	0519	3.1.2, 3.4, 4.2.1, 4.3.3.1, 6.3.1, 7.0, 8.2.2.1, 8.2.5.2, 9.1, 9.2, 9.4
Costin, Carolyn	0674	3.1.2, 4.2.1, 6.1
Cox, Cynthia	0174	Similar to 0045
Crandall, Van	0472	Similar to 0468
Crawford, Dave	0600	5.2.1
Crouch, Brandon	0572	Similar to 0045
Cumbow, Kay	0609	6.1
CURE Communities United for Responsible Energy	0642	3.1.2, 6.1, 8.2.1.1, 8.3.3, 9.1
Cutchis, Mildred Farr	0350	Similar to 0045
D'Alessandro, Dmitri	0049	Similar to 0045
Daly, Tina	0324	4.2.1, 6.3.1
Daniel, Caitlin & Bruce	0637	Similar to 0045
David J. Joseph Company	AT027, MD026, SF026	3.1.1, 3.2, 4.2.3, 4.3.1.2, 4.3.1.1, 4.3.1.3, 4.3.2, 4.3.3.1, 4.3.3.2, 5.1.2, 5.3.2, 5.5, 8.2.2.1, 8.2.2.2, 8.2.3.1, 8.3.2, 8.3.4, 8.4.1.2, 8.4.1.3, 8.4.2, 10.1, 10.2, 11.5.6
Davidson & Associates, L.L.C.	0167	2.3, 3.1.1, 3.2, 4.2.1, 4.5.2, 10.2
Davidson, Anne & Norm	0813	6.1
Davis, Jay	0748	6.3.1, 10.2

Commenter	Commenter Number	Sections
Davis, Sue Ellen	0666	6.1
Dawson, Richard	AT004dt	Under signer of AT004
Deakins, Michael & Terry	0310c	Under signer of 310a
DeBolt, Bob	0745	3.1.2, 4.2.1, 6.1
Delsener, Ron	0114	Similar to 0045
Delves, Donald	0839	Similar to 0779
DeMare, Joseph	0527	6.1
DenHartog, Jerry	0715	3.1.2, 4.2.1, 6.1
Denney, Becky	0398	6.3.1, 9.1
Denny, Dallas	0388	6.1
DeStefano, Linda	0742	Similar to 0713
Detroit Edison - Fermi 2 Nuclear Power Plant	0643, CH022	3.1.1, 3.2, 4.2.4, 4.3.1.1, 5.1.4, 7.0, 11.5.1
DeWitt, Dawn	0809	Similar to 0785
DeWitt, Shirley	0788	Similar to 0785
DeWitt, Toni and Bob Heim	0789	Similar to 0785
Diamond, Joel and Doris	0009	6.1
Diaz, Milvio	0126	4.2.1, 6.1
Dickey, Patrice	0337	6.1, 8.2.1.1
Diez, Maite	0011	6.1
District 66: Scottsdale, GA	AT004b	Under signer of AT004
Ditta, Madeline B.	0211	Similar to 0045
Divincenzo, Christina	0266	6.1, 9.1
Donaldson, Grace M.	0232	3.1.2, 4.2.1, 4.3.3.1, 6.1
Donn, Marjory M.	0723	Similar to 0045
Don't Waste Arizona, Inc.	AT004bg	Under signer of AT004
Don't Waste Connecticut	0626	3.1.2, 4.2.1, 6.1, 8.4.1.1, 9.1
Don't Waste Michigan	AT004aa, CH005u	Under signer of AT004; under signer of CH005
Don't Waste Ohio	CH005n	Under signer of CH005
Don't Waste Oregon	AT004bs	Under signer of AT004
Dorman, Dorotheya	0760	Similar to 0045
Dougherty, Helen P.	0308	6.1
Doyle, Dorothy	0566	Similar to 0045
Drew, Bruce and Maggie	0020	6.1
Dubovsky, Becky	0005	6.1
Duce, Stephen W.	0089	4.2.1, 4.5.2, 5.1.1
Duke Power	0681	3.1.1, 3.2, 4.2.1, 4.5.2
Dunford, Gary H.	0383	3.1.2, 4.2.1, 6.1
Dunlop, Heather	0204a	Similar to 0045
Dunn, Christopher	0801	6.1, 9.1
Durham, Juanita S.	0457	6.1
Dushkind, Winnie	0746	6.1, 6.3.1, 10.2
Dutton, Margaret	0533	6.1
Dwyer, Patricia	0342	6.1
Dye, Cameron	0014	4.4.1

Commenter	Commenter Number	Sections
Earth Challenge	0224, AT004f	0224 is similar to 0045; under signer of AT004
Earth Cycles, LTD.	AT004bk	Under signer of AT004
Earth Day Coalition	0514, AT004bm	3.1.2, 6.1, 6.3.1, 9.1; under signer of AT004
Earthwise Co.	AT004ar	Under signer of AT004
ECO	AT004q	Under signer of AT004
EcoBridge	AT004an	Under signer of AT004
Edblom, Greg	0021	4.2.1, 6.1
Edmiston, V. Lynne	0352	6.1
Edwards, Alyce F.	0635	3.1.2, 6.1, 9.1
e-ESL/ Maple School, San Francisco, CA	AT004bb	Under signer of AT004
Ehrlich, Etta B.	0846	3.4
Eielson, Olivia	0189	3.1.2, 4.2.1, 6.1, 8.2.2.1, 8.4.1.3
Eldon, Jim	0662	6.1, 9.2
Ellis, Susan	0446	6.1
Emmons, Jeanine	0237	4.3.3.2, 6.1, 9.1
Entergy Services, Inc.	0550, AT007, SF010	2.3, 3.1.1, 3.2, 4.2.1, 4.3.1.2, 4.5.2, 6.1, 6.2, 8.4.2, 9.4, 10.2, 11.1.1
Envirocare of Utah	0686, SF004	3.1.1, 3.4, 4.4.1, 5.7, 8.4.2
Environmental Advocates	0109, AT004bp	0109 is similar to 0045; under signer of AT004
Environmental and Peace Education Center	0475	6.1
Environmental and Public Interest Communities	0279	Letter included in summary as AT004; same letter read at Atlanta public meeting with the same signatures
Environmental Coalition on Nuclear Power	0596, AT004t, CH005p, MD013	2.3, 3.1.2, 4.2.1, 4.4.1, 5.1.2, 6.1, 6.3.1, 8.1, 8.2.2.1, 8.2.3.1, 9.1, 10.2; under signer of AT004; under signer of CH005; MD013 is similar to MD012
Environmental Response Network	AT004bq	Under signer of AT004
Epstein, Rachel	0265	6.1
Espy, David	0097	Similar to 0045
Evans, Hazel	0587	3.1.2, 4.2.1, 6.1, 9.1
Evans, Kathleen	0288	6.1
Fanucchi, Victor	0753	3.1.2, 6.1
Faso, Charles	0845	Similar to 0779
Fasten, Susan	0223	Similar to 0045
Ferguson, Jerry	0556	6.1
Ferguson, Tom	0092, 0334	6.1, 6.3.1, 9.1
Feuer, Al	0568	6.1, 8.4.2
Fieldseth, Henry	0601	3.1.2, 6.1
Fiels, Craig O.	0622	6.1
Finkelstein, Sharna	0318	Similar to 0316
Finken, Mary L.	0123	3.1.2, 4.2.1, 6.1
First Energy	CH020	2.1, 3.3, 4.1.1, 4.3.1.1, 4.3.1.2, 4.3.1.3, 4.3.4, 9.2, 11.1.3

Commenter	Commenter Number	Sections
FirstEnergy Nuclear Operating Company (FENOC)	0615	3.1.1, 4.2.1, 4.2.3, 4.3.1.2, 4.3.1.3, 4.3.3.1, 4.5.2, 10.2
Fisher, Cordelia	0244	3.1.2, 4.2.1, 6.1, 8.2.1.1, 8.3.3, 9.1
Fishman, Ralph	0627	4.3.3.1, 8.4.1.3
Fitzgerald, R. James	0841	3.1.2, 4.2.1, 6.1
Fix, Jack J.	0105	4.2.1, 4.5.2
Florsheim, Nancy & Thomas	0222	6.1, 8.2.4
Flynn, Joan	0096	Similar to 0045
Fogel, Jerise	0678	3.1.2, 3.3, 4.3.3.2, 6.1, 10.2
Fontenot, David	0526	6.3.1
Food not Bombs	AT004e	Under signer of AT004
For A Clean Tonawanda Site, Inc. (FACTS)	AT004ai	Under signer of AT004
Forman, Joshua	0820	Similar to 0045
Forrest, Lynn	0850	6.1
Forrester, Scott	0603	6.3.1
Forsmark, Megan	0416	3.1.2, 4.2.1, 6.1
Foster, John R.	0431	Similar to 0045
Frankel, Helene	0646	3.1.2, 3.4, 6.1
Frazier, Louise	0534	6.1, 6.3.1
Freed, H.	0024	6.1
Friends of the Coast - Opposing Nuclear Pollution	0023, AT004cg	3.1.2, 4.4.1, 6.1, 6.3.1, 8.2.1.1, 8.2.1.2, 8.4.1.1, 9.5, 9.6; under signer of AT004
Friends of the Earth	0280g, 0280h, AT004cz, CH005a, MD004d	0280g is under signer of 0280a; 0280h is under signer of 0280a; under signer of AT004; under signer of CH005; under signer of MD004
Frost, Anthony & Linda	0432	6.1, 7.0
Frost, Matthew	0664	6.1, 9.1
Frostholm, Donna	0697	3.1.2, 4.2.1, 6.1
Fuchs, Jay	0522	6.1
Fuller, Ernest	MD031	8.4.1.1
Fuller, Victoria B.	0796	Similar to 0779
Fuss, LeRoy	0477	6.1, 9.1
Gallagher, Jesse	0147	3.1.2, 4.2.1, 6.1, 8.2.2.1
Gallati, M. P.	0290	4.2.1, 6.1
Gamson, Mary E.	0712	6.1
Gannis, Steve	0634	3.1.2, 4.2.1, 6.1, 8.2.5.1
Gardner, Joy	0275	6.3.1, 9.1
GE Stockholders' Alliance	AT004cs	Under signer of AT004
Gearhart, Frank	0428	6.1
Geary, Barbara	0821	3.1.2, 6.1
Geary, Richard C.	0471	6.3.1
General Atomics	SF024	2.3, 4.3.3.1, 4.4.2, 5.2.2
George Washington University	MD011	3.2, 4.2.2, 4.2.3, 4.3.2, 4.3.3.1, 4.3.3.2, 8.2.1.1, 8.2.4, 8.3.5, 8.4.1.1, 9.4, 9.7, 11.5.2, 11.5.4

Commenter	Commenter Number	Sections
Georgia Department of Natural Resources, Radioactive Materials Program	0427, AT009	2.1, 3.1.1, 3.1.2, 3.2, 3.4, 4.2.1, 4.3.1.1, 4.3.2, 4.4.1, 4.4.2, 4.4.3, 4.5.2, 4.5.3, 4.6.3, 5.1.1, 5.2.3, 5.3.1, 5.4, 5.5, 5.6, 5.7, 6.1, 7.0, 8.2.2.2, 8.2.4, 8.2.5.1, 8.3.3, 8.4.2, 10.1, 11.1.2, 11.2.2, 11.3.1, 11.4.2, 11.6, 11.8.1
Georgians Against Nuclear Energy	AT004*	6.1
Gerdeman, Graham	0491, AT004do	4.2.1, 4.3.3.1, 4 3.3.2, 6.1, 9.1; under signer of AT004
Gerdeman, Gregory	0504	3.1.2, 4.2.1, 6.1, 8.4.1.1, 9.1, 9.2
Giese, Mark	0163, 0163S	4.2.1, 6.1, 6.3.1
Giovanella, Alice	0164	3.1.2, 4.2.1, 6.1
Glad, Gertrude	0539	6.1
Gladstone, Samuel	0209	3.1.2
Global Resource Action Center for the Environment (GRACE)	AT004cp	Under signer of AT004
Goettlich, Paul	0500	Similar to 0045
Golan, Fred	0300	3.1.2, 6.1, 8.1, 9.1
Gold, David and Judy	0169	4.2.1, 6.1
Goldberg, Alex	0439	Similar to 0270
Goletz Heckman, Joyce	0034	6.1
Gondeck, Fred	0703	Similar to 0045
Gonick, Wendy and DiPerna, Jeff	0836	6.1
Goodman, Sidney J.	0012, 0720, 0818	3.1.2, 4.1.2, 4.2.1, 6.1
Gordesky, Ben	0007	3.2, 11.4.1
Gordon, Joshua	0026, 0507	3.1.2, 4.2.1, 4.3.3.2, 5.1.2, 5.5, 6.1, 8.2.1.1, 8.2.4, 8.3.1, 8.3.2, 8.4.1.1, 8.4.1.2, 8.4.2, 8.4.3
Gose, Margaret B.	0451	4.2.1, 6.1, 8.2.2.1, 9.1
Grage Haug, Jody	0747	4.2.1, 6.1
Grand, Freya	0255	3.1.2, 6.1, 9.2
Grandmothers for Peace International	0278g, AT004cx	Under signer of 0278a; under signer of AT004
Grandparents of East Harris County Texas	AT004bx	Under signer of AT004
Grass Roots Environmental Organization in NJ	AT004y	Under signer of AT004
Grasse, John and Julie	0847	6.1
Gray, Marjorie	0050	Similar to 0045
Green Delaware	0429	Similar to 0045
Green Party of Ohio	AT004av	Under signer of AT004
Green, Jeffrey S.	0051	3.1.2, 6.1, 9.1
Greenberg, Alan	0763	Similar to 0045
Greenpeace	0280c, AT004cu, MD004e	Under signer of 280a; under signer of AT004; under signer of MD004

Commenter	Commenter Number	Sections
Gremada, Harry	0795b	Under signer of 795a
Griffin, Jo Ann	0764	3.3, 6.1, 10.2
Griffin, Malcolm B.	0770	6.1, 10.2
Griffith, Gray	0378	Similar to 0045
Griffith, Jonathan	0461	Similar to 0045
Griggs, Linda	0502	6.1, 8.2.1.1
Grimm, Carl	0226	Similar to 0045
Grimm, Sarah	0186	Similar to 0045
Grimmenga, Gale	0800	Similar to 0779
Groot, Henriette	0161	6.1, 8.2.1.1
Groundwork for a Just World	0670	Similar to 0045
Grover, Ravi	0680	6.1
GTS Duratek	SF015	3.1.1, 3.2, 4.3.1.2, 4.3.3.1, 5.2.1, 8.2.2.2, 8.2.3.1
Gunter, Keith	0607	3.1.2, 6.1
Gura, Nicholas	0116	6.1
Gyr, Marian	0552	6.1, 8.4.1.1
Haley, Robert and Gaigoul, Rachel	0106	Similar to 0045
Hall, Kev	AT004df	Under signer of AT004
Hall, Mitch and Red, Beverly	0247	3.1.2, 4.2.1, 6.1, 8.2.1.1
Hallvik, Eva	0110	Similar to 0045
Hallvik, Eva and Eisenberg, Beverly	0478	Similar to 0045
Halpern, Dick	0611	4.2.1
Hamrick, John	0039	7
Haney, Philip	0579	3.1.2, 6.1
Hanford Watch	AT004ao	Under signer of AT004
Hanks, John	0076	6.1
Hannah, Stein	0191	2.3, 3.1 2, 6.1
Hannum, Hildegard	0710, 0710S	4.2.1, 6.1
Hanrahan Clare, and Petrie, Noel	0511	3.1.2, 6.1, 9.1,
Hansen, Susan	0145	3.1.2, 6.1
Hara, Frank	0795d	Under signer of 795a
Harper, Grant	0056	Similar to 0045
Hart, Bruce	0629	3.1.2
Hassett, Lynn	0304	6.1
Hassett, Rob	0381	6.1
Hatz, Diane	0130	Similar to 0045
Hauser, Lenore	0737	4.2.1, 6.1, 6.3.1
Hay, Carol & Lewis	0465	6.1
Hazard, Susan L.	0842	3.1.2, 8.2.4
Head, Lewis & Lois	0175	6.1
Healing Global Wounds	AT004v	Under signer of AT004
Health and Energy Institute	0463	3.1.2, 4.2.1, 6.3.1

Commenter	Commenter Number	Sections
Health Physics Society	SF001, MD024	2.3, 3.1.1, 3.1.4, 3.2, 4.2.1, 4.2.2, 4.2.3, 4.3.1.1, 4.3.1.2, 4.3.2, 4.3.3.2, 4.4.1, 4.5.1, 4.5.2, 4.5.4, 5.1.3, 5.3.1, 5.3.2, 5.3.3., 5.5, 8.2.2.1, 8.2.3.3, 8.4.1.1, 8.4.2, 9.4, 10.1, 11.5.4
Heartland Operation to Protect the Environment	AT004ce	Under signer of AT004
Heath, Averil	0694	3.1.2, 4.2.1, 6.1
Heinrich, Barbara	0604	6.1, 9.1, 9.2
Help the Environment	CH005L	Under signer of CH005
Henley, Lois B.	0797	Similar to 0779
Herbein James, Elizabeth	0371	6.1
Herold, Donna Lee	0297	3.1.2, 3.4, 4.2.1, 6.1
Hester, Al	0336	6.1
Heymann, Ralph	0268	6.1
Hickey, Danny	0481	6.1, 8.2.1.1, 8.2.2.1, 8.2.5.1
Higgins, Shawn W.	0734	Similar to 0045
Higgins, Winsome	0219	3.1.2
Hilliard, Brian	0545	6.1, 8.4.1.1
Hills, Thomas	0100	3.1.2
Hirt, Alice & Bill	0521	2.3, 4.2.1, 6.1, 6.3.1
Hoag, Charlene	0046, 0046S	6.1, 9.1
Hogan, Judy	0276, 0285	6.1
Holbein, Lynn	0231	3.1.2, 6.1
Holcombe, Scotti J.	0391	6.1
Hollums, Edna	0576	6.1, 9.1
Holober, Helen	0243	Similar to 0045
Home of Peace and Justice	CH005ac	Under signer of CH005
Hoodwin, Marcia	0535	Similar to 0316
Hopkins, Walter S.	0201	5.1.1
Hoy, Annie	0614	Similar to 0045
Hudspeth Directive for Conservation, TX	AT004bj	Under signer of AT004
Huff, John	0399	3.1.2, 6.1
Huff, Mary	0343	3.1.2, 4.3.3.2, 6.1
Hughes, Mrs.	0768, 0768S	3.3, 6.1
Hughes, Randi	0168	4.2.1, 6.1
Hull, Elizabeth	0505	Similar to 0045
Humphrey, Vivian	0825	3.1.2, 6.1
Hunton, Bobby	0487	6.1, 9.1
Hutson, Harold & Virginia	0575, 0575S	3.1.2, 4.2.1, 6.1
Hyper PR	AT004bw	Under signer of AT004
Ikenberry, Tracy	0212	3.1.1, 4.1.1, 4.2.2, 4.5.2, 4.5.4
Illinois Department of Nuclear Safety	0683, CH008	2.1, 2.3, 3.1.1, 4.2.1, 4.2.2, 4.2.3, 4.3.1.1, 4.3.2, 4.3.3.1, 5.1.1, 5.2.3, 5.3.1, 5.3.2, 7.0, 8.3.3, 11.1.2, 11.2.2, 11.5.2
Illinois Environmental Protection Agency	CH024	8.4.1.3, 9.7, 11.2.2

Commenter	Commenter Number	Sections
Illinois Public Research Interest Group	CH005h	Under signer of CH005
INCO United States, Inc.	0567c	Under signer of 567a
Inner Ear	AT004cd	Under signer of AT004
Institute for Energy and Environmental Research	0033	3.1.2, 6.1
Institute of Scrap Recycling Industries (ISRI)	0530, AT017, CH023, MD021	3.1.2, 3.2, 3.3, 4.2.3, 4.2.4, 4.3.1.1, 4.3.4, 4.4.4, 5.1.1, 5.1.4, 5.2.3, 5.4, 6.1, 8.2.2.1, 8.2.2.2, 8.2.2.3, 8.2.3.1, 8.2.5.1, 8.3.2, 8.3.3, 8.3.4, 8.3.6, 8.4.1, 8.4.2, 8.4.1.1, 8.4.1.2, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 10.2, 11.2.2, 11.2.3, 11.5.1, 11.5.2, 11.5.4, 11.8.3
Interfaith Council for Peace & Justice Disarmament Working Group	0234	Similar to 0208
Irvine, Emma	0355	Similar to 0045
Isler, Naomi B.	0192	4.2.1, 6.1, 8.4.1.1
Jabs, Sharon	0781	6.1
Jacobs, Andrew	0241	Similar to 0045
Jacobs, D. J.	0668	Similar to 0045
Jacobs, Peggy	0259	Similar to 0045
Jene, Bill	0440	6.1
Jennings, Stephanie	0081	6.3.1
Jike, Thomas M.	0246, 0756	3.1.2, 6.1, 10.2
Johnson, Nancy	0685	3.1.2
Johnson, Richard	0358	3.1.2, 6.1
Jones, Charlton H.	0385	6.1
Jones, Rebeccah	0621	6.1, 9.1, 9.2
Jones, Troy	0035	6.1
Jordan, Tracy	0062	Similar to 0045
Karpen, Leah R.	0239	3.1.2, 6.1
Kasdorf, Kim	0271	6.1
Kass, Jerome	0088	Similar to 0045
Kastanek, Dawn M.	0351	Similar to 0045
Katen, Lorraine	0135	3.1.2, 4.2.1, 6.1
Kautz, Kay	0153	6.1
Keasbey, Edie	0721	Similar to 0045
Keats, Larry	0524	3.1.2, 6.1, 9.1
Keegan, Michael J.	0620	6.1
Keenan, Barbara	0652	6.1, 6.3.1, 10.2
Keene, Emily	0749	6.3.1
Kelley, Melissa	0063	Similar to 0045
Kelly, Doe	0010	6.1
Kennedy, C.L.	0172	Similar to 0045
Kennedy, William E., Jr.	0132	3.2, 4.2.1, 10.2
Kenney, Anne	0580	Similar to 300
Ketter, Milton B.	0250	4.3.3.1, 6.1

Commenter	Commenter Number	Sections
Keyes Stark, Kimberly	0363	6.1
Kimball, David	0590	6.1, 9.1
King, Joan O.	0095, 0593	2.3, 3.1.2, 4.2.1, 6.1
King, Karen S.	0333	6.1
King, Kathleen A.	0426	4.2.1, 6.1
Kirkpatrick, Joanna	0598	Similar to 0045
Kirner, Nancy P.	0138	3.2, 4.2.1
Klein, Chris	0059	6.1, 9.1
Kluglein, June	0823	6.1
Klunk, Edward T.	0835	Similar to 0779
Kneeland, Andrew	0143	Similar to 0045
Kneeland, Craig	0150	4.3.1.1, 6.1
Kneeland, Mary Ellen	0144	Similar to 0045
Knepp, Mary Morris	0483	6.1
Knope, Muriel A.	0616	3.1.2, 4.2.1, 6.1, 9.1
Kortendick, Susan	0783	Similar to 0779
Kramer, Anna	0166	4.2.1, 6.1
Kramer, Scott	0688	6.3.1
Krawiec, Richard	0445	6.1, 8.4.1.1
KRLCP, Inc. / TuffBaggs	AT004as	Under signer of AT004
Kuhn, Mary; Malootian, Anna; Carocari, Roger and Doris	0546	6.1
L.A. West Network	0346	6.1, 8.2.2.1, 9.1
Lackey, Robert	0435	6.1
LaFleur, Sanford	0205	6.1
Lager, Patricia	0185	3.1.2, 6.1
LaMastra, Anthony	0395	3.1.2, 3.2, 4.2.3, 4.3.1.2, 4.3.1.3, 4.5.1, 5.1.1, 5.1.3, 5.2.2, 8.2.2.1, 8.2.2.2, 8.2.2.4, 8.2.5.1, 8.3.2, 8.3.3, 8.4.1.2, 8.4.1.3, 11.1.1, 11.3.1, 12.0
Lambert, Leonore S.	0650	6.3.1
Landau, Diana	0121	Similar to 0045
Lane, J. Kendra	0347	Similar to 0299
Lane, Lauren	0807	6.1, 9.1, 9.2
Langmaid, Adam	0332	Similar to 0045
Lather, Nancy	0326	4.2.1, 6.1
Latman, Jeanette	0362i	Under signer of 362a
Latner, B.	0213	4.2.1, 6.1
Laughlin, Jay	0455	Similar to 0443
LaVera, Ron	0210	8.2.1.2, 8.2.5.1, 8.4.1.1
Lawrence, Edward J.	0073	6.1
Leboit, Mollie	0238	6.1
LeBow, Daniel B.	0725	3.1.2, 6.1
Lee, Lillian	0353	6.1
Lee, Mark	0064	6.1
Leech, Betty	0193	3.1.2, 6.1
LeFort, Eileen and Paul	0814	6.1
Leib, Robert	NRC85	3.4, 4.2.1, 4.2.2, 4.2.3, 4.3.1, 4.3.1.3, 4.5.2

Commenter	Commenter Number	Sections
Leighdee, Bicknell	0705	Similar to 0045
Lemysko, Ida	0362h	Under signer of 362a
Levin, Steve	0571	6.1
Levine, Rae	0369	Similar to 0045
Lewis, Marvin	0041, AT004dg	7.0, 8.2.2.1, 8.2.3.4; under signer of AT004
Lewis, Sherie	0623	3.1.1, 6.1, 8.4.1.1, 10.2
Liddle, Jack	0359	6.1
Liebowitz, Jerome & Eleanor	0117	6.1
Lind, Catherine G.	0340	6.1
Lipman, Jane	0374	Similar to 0269
Lipman, Michael	0370	3.1.2, 9.2
Lippman, Roger	0368	Similar to 0045
Lipsman, Mark	0405	6.1
Lock, Ellen	0052	6.1, 9.1
Lombardi, Donna	0008	3.1.2, 6.1
Long Island Alliance for Peaceful Alternatives	AT004cj	Under signer of AT004
Lorenz, Nancy	0108	Similar to 0045
Los Angeles County Sanitation District	0071, SF011	4.4.2, 5.7, 8.2.2.1, 8.3.6, 9.4
Low Level Radiation Campaign	0280k, CH005d, MD004g	Under signer of 0280a; under signer of CH005; under signer of MD004
Lowman, J. K.	0311	3.1.2, 3.4, 4.3.4, 9.1
Lowry, Mike	0424	6.1, 9.6
Lugten, Peter	0327	Similar to 0045
Lum, Allen	0633	4.2.1
Lux, Jeff	MD036	4.3.3.1
Luxem, David A.	0804	6.1, 10.2
Lylan Wolff, Frances	0386	9.1
Lyle, Elizabeth	0544	6.1
MacWilliams, Beverly A.	0733	Similar to 0045
Madera County Greens, California	AT004aw	Under signer of AT004
Maine Office of Nuclear Safety	AT023	4.3.3.1, 4.4.2, 7.0, 8.2.2.3, 8.4.2
Mallinckrodt Medical, Inc	MD002, SF008	2.3, 3.1.1, 3.2, 3.4, 4.1.1, 4.5.2, 5.1.4, 7.0, 8.2.1.1, 8.2.5.1, 8.3.5
Mallow, Dawn	0236	3.1.2, 4.2.1, 6.1
Maloney, Mary Lee	0328	3.1.2, 4.2.1, 6.1
Manasota-88	0700	6.1
Maniscalco, Pete and Joyce, Stephanie	0738	Similar to 0045
Manufacturing Sciences Corporation	AT018	3.1.1, 5.1.2, 5.1.4
Marcoplos, Mark	0473	6.1
Marcus, Robert S.	0181	Similar to 0045
Marino, Dianne	0074	2.3, 3.1.2, 3.2, 3.3, 4.2.1, 9.1
Marsden, Janet	0494	4.2.1, 6.1

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Martel Baer, Leslie	0154	3.1.2, 6.1
Martin, J.	0729	3.1.2, 6.1
Martin, Jerome B.	0098	4.2.1, 4.5.2
Martin, Joseph	0299	4.2.1, 6.1
Martin, Marian	0456	3.1.2, 4.2.1, 6.3.1
Martin, William B.	0323, 0843	3.1.2, 6.1, 8.2.1.1
Martineau, Claire	0698	3.1.2, 6.3.1, 10.2
Martinson, Ernest	0016	6.1
Mason, Patricia	0393	6.1
Massachusetts Citizens for Safe Energy	0510	Similar to 0045
Massachusetts Department of Public Health	MD022	2.3, 3.1.1, 3.2, 4.3.2, 4.3.3.1, 4.3.3.2, 5.1.1, 8.2.2.1
Matthews, Jennifer	0187	Similar to 0045
Mattoon, Tom	0716	Similar to 0045
Maxwell Vassilakis, Noemie	0684	3.1.2, 4.2.1, 6.1
Mays, James S.	0837	3.1.2, 6.1
Mazzetti, Michael	0588	6.1
McAbery, John	0348	4.3.3.2, 6.1
McCambridge, Nancy	0812	Similar to 0045
McCann, Laurie	0631	3.1.2, 6.1, 8.2.1.1, 9.1
McClendon, Dennis	0080	Similar to 0045
McClure, Bonnie	0558	3.1.2
McCollom, Jerome	0802	6.1
McCormick, Bill	0858	4.3.3.2, 6.1, 6.3.1, 8.2.4
McDonald Goldwire, Billie	0310a	4.2.1, 6.1
McGann, Anna	0605	6.3.1
McGaugh, Patrick	0586	2.3
McGheehan, Carol	0794	3.1.2, 6.1, 6.3.1
McGiluny, Joan	0557	6.1
McGovern, Lucinda	0004	6.1
McKerry, Robert	0137	6.1
McKinnis, Amanda	0152	6.1, 6.3.1, 8.2.2.1, 9.1
McMahon, Mary	0248	6.1
MCS Health and Environment	CH005aa	Under signer of CH005
Meck, Dolores M.	0714	3.1.2, 4.2.1, 6.1
Medici, Robert	0102	Similar to 0045
Medsker, Alma	0207	3.1.2, 6.1
Mehr, Roslyn	0261	6.1
Merckx, Guy	0853	4.2.1, 6.1
Mertens, Mary Ellen	0772	Similar to 0771
Messler, Kristina	0158	6.1
Metals Industry Recycling Coalition (MIRC)	0570, CH004	2.3, 3.1.2, 3.2, 4.1.2, 4.2.2, 4.3.2, 4.3.3.1, 4.3.3.2, 4.6.1, 5.1.2, 5.2.1, 5.2.2, 5.3.1, 8.2.3.1, 8.3.2, 8.3.3, 8.4.1.2, 10.2, 10.3
Meyers, Dominique	0485	4.3.3.2, 6.1, 8.4.1.1

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Michigan State University	CH012	2.3, 3.1.1, 3.2, 4.1.1, 4.2.3, 4.3.1.1, 4.3.1.2, 4.3.3.1, 4.4.4, 5.1.2, 8.2.1.1, 8.4.1.2, 9.2, 9.7, 11.2.1, 11.2.2, 11.5.1, 11.5.2, 11.5.3
Mid-Island Radiation Alert	0043	3.1.2, 3.2, 6.1, 6.3.1
Millenium Service, Inc.	AT006	4.3.1.2
Miller, Carolyn A.	0619	3.1.2, 4.2.1, 6.1, 9.1
Miller, Donald	0765	3.1.2, 6.1
Miller, Greg	0423	6.1
Miller, Jackie	0459	4.2.1, 5.1.2, 6.1, 8.2.4
Miller, Rochelle	0362f	Under signer of 362a
Miller, Suzanne	0766	Similar to 0765
Millikan, Mona	0496	6.1
Mills, Lauren	0287	6.1
Moeckel, Cindy	0252	3.1.2, 4.3.3.1, 6.1, 8.2.5.1
Moffat, Lorna	0349	6.1
Moffetts, Tim	0773	Similar to 0771
Montgomery, Richard	0677	6.1
Mooney, Patty	0112	6.1
Moore, Janet	0540	3.1.2, 4.2.1
Moore, Shirley	0460	6.1
Morgan, Lorraine	0711	6.3.1, 10.2
Morris, D.	0484	2.1, 4.3.4, 8.2.2.1, 9.1, 9.2
Morris, Thaiia	0015	Similar to 0014
Morton, Henry	MD038	4.2.1, 8.2.2.1
Moscow, Barbara and Harold	0852	4.2.1, 6.1
MothersAlert	AT004ay	Under signer of AT004
Mulcahy, Colm	0450	Similar to 0443
Mullarkey, Barbara Alexander	0296	Similar to 0275
Muller, Bernice	0752	4.2.1, 6.1
Muller, Morris B.	0606	6.3.1, 9.1
Murray, Marie J.	0503	6.1
Nagy, Jennifer	AT004dp	Under signer of AT004
Nagy, Theodore & Joanne	0256	4.2.1, 6.1, 9.3
Name Not Provided	0066	6.1
Name Not Provided	0608	6.1
Name Not Provided	0628	3.2
Name Not Provided	0690	3.1.2, 6.1
Name Not Provided	0790	3.1.2, 6.1
Nashville Peace Action	AT004i	Under signer of AT004
National Association of Radiation Survivors	0278i	Under signer of 0278a
National Coalition of Organized Women	CH001	2.3, 3.1.2, 6.1, 8.2.2.1
National Congress of American Indians	SF020	2.1, 5.1.1, 5.2.1, 8.2.1.2, 8.2.1.3, 8.2.5.2, 9.2, 9.7

Commenter	Commenter Number	Sections
National Mining Association	0613	3.4, 4.1.1, 4.2.2, 4.2.3, 4.2.4, 4.3.3.1, 4.4.2, 4.5.4, 6.2, 8.3.2, 8.4.1.1, 9.1, 11.1.2, 11.2.2, 11.5.3, 11.5.4, 11.5.6, 13.0
Natural Resources Defense Council	0044, MD001	2.1, 2.3, 3.1.2, 3.2, 3.4, 4.1.2, 4.2.3, 4.3.1.1, 4.3.1.2, 4.3.1.3, 4.3.3.1, 4.3.3.2, 4.3.4, 4.4.1, 4.4.4, 5.1.2, 5.1.4, 5.4, 8.1, 8.2.1.2, 8.2.1.3, 8.2.2.1, 8.2.2.2, 8.2.2.3, 8.2.3.3, 8.2.4, 8.4.1.3, 8.4.1.1, 8.4.3, 9.2, 9.4, 9.5, 9.6, 10.2, 11.1.2, 11.2.2, 11.3.2, 11.5.2, 11.8.1, 12.0
Nelson, Michael T.	0717	Similar to 0045
Nevada Nuclear Waste Task Force	AT004ah	Under signer of AT004
New England Coalition on Nuclear Power	0529, 0596, MD012	2.3, 3.1.2, 3.2, 4.1.2, 4.2.1, 4.2.3, 4.2.4, 4.3.1.1, 4.3.3.1, 4.4.1, 5.1.2, 5.2.3, 5.6, 6.1, 6.3.1, 8.1, 8.2.1.1, 8.2.1.2, 8.2.2.1, 8.2.3.1, 8.2.4, 8.3.2, 8.4.1.2, 8.4.1.3, 9.1, 9.2, 9.4, 9.6, 9.7, 9.8, 10.2
New Jersey Department of Environmental Protection	0036, 0133, MD018	2.3, 3.2, 4.3.2, 4.3.3.2, 4.4.2, 5.2.1, 5.3.1, 8.2.1.2, 8.3.2, 9.4, 11.2.1, 11.5.2
New York Office of the Attorney General	0528	3.2, 4.3.3.1, 8.4.1.1, 8.4.1.3
New York Power Authority	0644	3.1.1, 3.2, 9.3
Newan, Rene	0811	Similar to 0045
Newsom, Claire	0508	3.1.2, 4.3.3.1, 6.1, 8.4.1.3, 9.2
Nichols, Cynthia	0019	6.1, 8.4.1.1
Nickel Development Institute	0567a	3.1.2, 5.2.1, 5.2.2, 5.2.3, 5.3.1, 5.3.3, 5.5, 8.3.2, 8.3.3, 8.4.1.2, 8.4.3, 11.8.1
Nickel Producers Environmental Research Association	0567b	Under signer of 567a
Niederhausen, Hanne	0785	6.3.1
Nix, Kemie	0400	4.2.1, 6.1, 9.1
Norris, Robert and Bockrader, Barbara	0547	6.1, 9.1
North American Water Office	0645, CH005g	3.1.2, 4.2.1, 4.3.1.2, 6.1, 6.3.1, 8.2.2.1, 8.2.2.4, 8.3.2, 8.3.3, 8.4.1.1, 9.2; under signer of CH005
North American Water Office, Minnesota	AT004aj	Under signer of AT004
North American Water Office, Oregon	AT004ak	Under signer of AT004
North Atlantic Energy Service Corporation	0551	3.1.1, 3.2
North Carolina Waste Awareness & Reduction Network (NC WARN)	0184, 0595, AT004o	3.1.2, 4.2.1, 6.1, 6.3.1, 7.0, 8.2.2.1, 8.2.4, 9.1; under signer of AT004
Northeast Utilities	CH028	8.2.1.1, 8.2.3.1, 8.4.1.1
Northern States Power Company	0639	3.1.1, 3.2
Norwood, Dennis & Delores	0448	6.1, 8.2.1.1
Nosfinger, Mary & Robert	0704	3.1.2, 4.2.1, 6.1
Not Able to Decipher Name	0319	Similar to 0316

Commenter	Commenter Number	Sections
Not Able to Decipher Name	0411	Similar to 0316
Not Able to Decipher Name	0412	Similar to 0316
Not Able to Decipher Name	0415	Similar to 0316
Not Able to Decipher Name	0667	3.1.2, 6.1
Nuclear Democracy Network	AT004da	Under signer of AT004
Nuclear Energy Information Service	AT004u, CH005*	Under signer of AT004; CH005 is similar to 0045
Nuclear Energy Institute	0022, 0027, 0659, AT008, CH014, MD006, SF014, SF022	2.1, 2.3, 3.1.1, 3.1.3, 3.2, 3.4, 4.1.1, 4.2.1, 4.2.2, 4.2.3, 4.3.1.1, 4.3.1.2, 4.3.1.3, 4.3.2, 4.3.3.1, 4.3.3.2, 4.4.1, 4.4.2, 4.4.4, 4.5.1, 4.5.2, 4.6.1, 5.1.2, 5.1.4, 5.2.1, 5.2.2, 5.2.3, 5.3.1, 5.3.2, 5.3.3., 5.6, 5.7, 6.2, 6.3.2, 8.2.1.1, 8.2.2.1, 8.2.2.2, 8.2.3.1, 8.2.3.2, 8.2.3.3, 8.2.4, 8.2.5.1, 8.3.1, 8.3.3, 8.3.5, 8.4.1.1, 8.4.1.2, 8.4.1.3, 8.4.2, 8.4.3, 8.5, 9.2, 9.3, 9.4, 9.5, 9.6, 10.1, 10.2, 10.5, 11.1.1, 11.1.2, 11.1.3, 11.2.1, 11.2.2, 11.2.3, 11.4.1, 11.5.1, 11.5.2, 11.5.3, 11.5.4, 11.6, 11.7, 11.8.3
Nuclear Energy Institute and Fuel Cycle Facilities Forum	MD015	3.1.1, 3.2, 3.3, 4.1.1, 4.2.3, 4.3.1.1, 4.3.1.3, 4.4.2, 5.1.3, 5.7, 9.2, 9.4, 11.5.1, 11.5.2
Nuclear Free New York	AT004ba	Under signer of AT004
Nuclear Fuel Services	AT013	3.1.1, 3.2, 4.2.4, 8.4.1.1, 8.4.2, 8.6, 12.0
Nuclear Guardianship Project	AT004dc	Under signer of AT004
Nuclear Information & Resource Service	0278d, 0280a, AT004cL, CH005ae, MD004*	9.2, Under signer of 0278a; 0280 is similar to 0045; under signer of AT004; under signer of CH005; MD004 is similar to 0045
Nuclear Information and Resource Service and Public Citizen	NRC74	9.1
Nukewatch	AT004cr, CH005s	Under signer of AT004; under signer of CH005
NY Environmental Management Commission, Erie County	0486	3.1.2, 6.3.1
O'Connell, Shaun	0263	3.1.2, 4.2.1, 6.1
O'Donnell, Alice	0648	6.1, 9.1
OECD Nuclear Energy Agency's Co-operative Programme on Decommissioning	0672	3.1.1, 3.2
Oehler, Katie	0305	3.1.2, 6.1, 9.1
Ohio Citizen Action	CH005o	Under signer of CH005
Olchoff, Lydia	0692	6.1, 9.1
Oldenkamp, Patricia	0294	3.1.2, 4.2.1, 6.1, 9.1
Oliver, Joseph William	0755	6.1
Olsen, Ken	0141	6.1
Olsen, Nora	0002	2.3, 3.1.2, 4.1.2, 4.2.1, 6.1
Oneida Nation	MD016	8.2.5.2, 9.7

Commenter	Commenter Number	Sections
Ontoveros, Cordelia	0805	Similar to 0771
Organizations United For Responsible Low-level Radioactive Waste Solutions	0531, MD023	2.3, 3.2, 3.4, 4.1.1, 4.2.1, 4.3.3.1, 8.3.5, 8.4.1.1, 9.3, 10.1, 10.2, 11.1.1
Ortman, Debbie	AT004dn	Under signer of AT004
Osborn, Nathalie	0128	Similar to 0045
Osborne, Orval	0663	Similar to 0045
Pace, Harriet	0180	6.1
Palmisano, Bill	0669	4.2.1, 6.1, 9.1
Paper Allied-Industrial, Chemical and Energy Workers International Union	0031, 0040, CH015, MD008	2.1, 2.3, 3.1.2, 3.2, 3.3, 3.4, 4.1.2, 4.2.3, 4.2.4, 4.3.3.1, 4.3.3.2, 4.3.4, 4.4.1, 5.1.4, 5.3.1, 5.5, 6.1, 8.1, 8.2.1.2, 8.2.2.1, 8.4.1.1, 9.2, 9.5, 9.6, 11.4.1, 11.5.5, 11.8.1
Pappas, Carmen	0361, 0362c	6.1; under signer of 0362a
Paquette, Mark	0053	Similar to 0045
Parks, Christine	0560	Similar to 0045
Parrish, Linda	0696	3.1.2, 6.1, 9.1
Paschal, Dan	0437	6.1, 9.1
Patterson, Jean	0769	4.3.3.1, 5.2.1, 5.2.2, 6.1
Paul, Edward	0045	3.1.1, 3.1.2, 3.2, 3.4, 4.1.2, 4.2.1, 4.2.4, 4.3.1.3, 4.4.1, 6.1, 6.3.1, 8.1, 8.4.1.1, 9.1, 10.2
Payne, Allison	0289	Similar to 0045
Peabody, Iris	0356	6.1
Peace Action	0280f, MD004i	Under signer of 0280a; under signer of MD004
Peace Action - Texas	AT004ad	Under signer of AT004
Peace Action - Wisconsin	0731	Similar to 0045
PECO Energy Company	0042, 0198	3.1.1, 4.2.1, 4.3.3.1, 4.5.2, 11.2.1, 11.5.2
Pennsylvania Environmental Network	AT004ab	Under signer of AT004
Peoples' Action for a Safe Environment (PASE)	AT004p	Under signer of AT004
Perez, Richard S.	0799	Similar to 0771
Perreault, Laura	0532	3.1.2
Perry, Rev. H. J. & Lucille	0221	6.1
Peters, Mark	0777	6.1, 10.2
Peterson, Diane J.	0573	3.1.2, 4.2.1, 6.1, 6.3.1
Petrille, Judy	0316	3.1.1, 3.2, 4.2.1, 6.1
Phillips, Joan	0146	3.1.2, 4.2.1, 6.1
Physicians for Social Responsibility	0278b, 0280i, AT004a, AT004s, AT004ct, CH005b	Under signer of 0278a; under signer of 0280a; under signer of AT004; under signer of CH005
Pinsky Blumenthal, Carol	0054	Similar to 0045
Platt, Richard	0499	4.2.1, 6.1, 9.1
Pliskin, Rob	0582	3.1.2
Podgurski, Craig	0665	3.2, 4.1.1, 4.2.1, 4.2.2, 4.2.3, 4.3.3.1, 4.4.1, 4.5.3, 4.5.4, 5.1.1, 11.1.1, 11.2.1

Commenter	Commenter Number	Sections
Pohly, Gerald A.	0709	3.1.2, 6.1, 6.3.1
Ponzi, Jean	0591	6.1
Portland Cement Association	0470, 0470S, CH031	3.1.1, 3.1.2, 4.3.3.1, 8.2.4, 8.2.5.1, 8.3.2, 8.4.1.2, 8.4.3, 9.4, 9.7
Portsmouth/Piketon Residents for Environmental Safety and Security (PRESS)	AT004L	Under signer of AT004
Poser, Lawrence	0778	Similar to 0045
PP&L, Inc.	0740	2.3, 3.1.1, 3.2, 4.2.1, 4.4.1, 10.1
Prairie Island Coalition	AT004af	Under signer of AT004
Prairie Island Indian Community, MN	SF003	8.2.2.3, 8.4.2, 9.4
Pratt, Beth A.	0103	6.1
Pressman, Joan	0377	6.1
Pritchard, Eric	0267	6.1
Project on Government Oversight	0277, 0280m, CH005f	0277 is similar to 0045; under signer of 0280a; under signer of CH005
Proposition One Committee	0597	Similar to 0045
Protect All Children's Environment	0468	3.1.2, 4.2.1, 8.2.2.1
Pryor, Kathy	0029	4.5.2
Pryor, Peggy	AT004dj	Under signer of AT004
Public Citizen	0278l, 0280b, 0854, AT004cm, MD004c, MD010	2.3, 3.1.2, 3.2, 3.4, 8.1, 8.2.1.1; under signer of 0278a; under signer of 0280a; under signer of AT004; under signer of MD004
Public Citizen's Critical Mass Energy Project & Nuclear Information and Resource Service (NIRS)	0649, 0649S	2.3, 3.1.2, 3.3, 4.2.3, 4.3.2, 4.3.3.1, 4.3.3.2, 5.4, 6.1, 6.3.1, 8.1, 8.2.2.3, 8.2.3.1, 8.2.4, 8.4.1.1, 9.2, 10.2
Quasey, Kathy	CH025	4.2.3, 6.1
Quick, Betty	0506	4.2.1, 6.1, 8.4.1.1
Quimby, Phil	0449	Similar to 0443
Radant, Jeff	0693	Similar to 0674
Raderman, Yvette	0119	3.1.2, 4.2.1, 6.1
Radiation and Public Health Project	AT004cq	Under signer of AT004
Radioactive Evaluation and Action Project Great Lakes	0589, AT004be	0589 is similar to 0045; under signer of AT004
Ralner, C.	0320	Similar to 0316
Ramirez, Gilma F.	0264	3.1.2, 4.2.1, 6.1
Ramos, Eileen	0173	6.1
Ramsey, Don	0458	6.1
Rappaport, Gail	0309	3.1.2, 4.3.3.2, 6.1
Raymond, Jessica	0156	4.2.1, 6.1
Redwood Alliance	AT004am	Under signer of AT004
Reeve, Sysyn	0170	Similar to 0045
Regis, Mark	0757	6.1
Reidy, Steve	0339	6.1

Commenter	Commenter Number	Sections
Reseau Sortir du Nucleaire	AT004de	Under signer of AT004
Residents Organized for Lewiston-Porter's Environment (ROLE) and For A Clean Tonawanda Site (F.A.C.T.S.)	0476	Similar to 0045
Rhoda, Katherine	0574	6.1
Rhodes, Robert	0065	6.1
Rich and Celeste	0855	6.1
Richardson, Barbara S.	AT004dm	Under signer of AT004
Ridley, Eleanor	0291	4.3.3.2
Riggs, Don	0215	3.1.2, 4.2.1, 6.1
Riley, Elizabeth	0849	4.2.1, 6.1
Rinehart, Larry D.	0099	4.2.1, 6.1
Ring, Joseph P.	0658	4.2.1, 4.5.2
Ringer, Judy	0260	4.2.1, 6.1
Ripper, M.	0653	6.1
Rizzo, Fred	0245	Similar to 0045
Robbins, Justine	0302	6.1, 9.1
Roberts, Sandra L.	0258	6.1, 8.2.1.1, 8.3.3, 9.1
Roberts, Steven K.	0444	6.1
Robinson, Zachary	0655	Similar to 0045
Robison, David	0055	Similar to 0045
Rock, Judy	0120	6.1, 9.1
Rocky Mountain Peace and Justice Center	0578	6.3.1
Rogers, Marliss A.	0767	6.1, 10.2
Roiger, Mary	0235	3.1.2, 4.2.1, 6.1
Romine, Joe	0107	6.3.1, 9.1
Rose, Lidian A.	0829	3.1.2, 6.1
Rosenberg, Dan	0111	3.1.2
Rubinstein, Aldine	0216	3.1.2, 6.1
Rubinstein, Joseph and Bette	0830	6.1
Rudolph, Janet	0183	Similar to 0045
Ruggles, A'me	0140	Similar to 0045
Ruopp, Kathleen	0848	Similar to 0779
Rusk, Carolyn	0851	6.1
Russell, Michael J.	0406	4.1.1, 4.2.1, 4.3.1.2, 4.5.2, 8.2.1.1
Rusten, June A.	0208	3.1.2, 6.1
Ruther, Martin	0124	6.1
Sabbadini, Gail	0093	6.1, 7.0
Sabbeth, Shirley	0834, 0834S	3.1.2, 4.2.1, 6.1
Sacramento Municipal Utility District	0537	3.2, 4.2.1, 5.1.1, 8.4.1.3, 10.2
Sacramento Municipal Utility District - Rancho Seco Nuclear Power Plant	0407	3.1.1, 4.1.1, 4.2.2, 4.3.3.1, 4.5.2, 8.4.1.1, 10.1, 11.1.1
Sadur, Shirley	0362g	Under signer of 362a

Commenter	Commenter Number	Sections
Safe Energy Communication Council	0155, 0280d, AT004co, MD004b	3.1.2, 6.1, 6.3.1, 9.1; under signer of 0280a; under signer of AT004; under signer of MD004
Safe Legacy	0177, 0177S	6.1
Safeguard Our State Committee, Arizona	AT004at	Under signer of AT004
Saltzman, Dale	0817	3.1.2, 6.1
Samet, Shelley	0838	6.1
San Francisco General Hospital and Radiology University of California	SF023	3.4, 5.1.1, 5.2.1, 8.4.1.3, 8.4.2, 8.6
San Luis Obispo Mothers for Peace	AT004ac	Under signer of AT004
San Onofre Nuclear Generating Station	SF002	3.4, 9.2, 12.0
Santura, Hau	0795c	Under signer of 795a
Sartor, Jason	0727	Similar to 0045
Savage, J. A.	0228, AT004dh	3.1.2, 7.0; under signer of AT004
Save Ward Valley, California	AT004az	Under signer of AT004
Sawyer, Margaret	0194	2.3, 3.4, 6.1
Sayles, Richard	0512	Similar to 0045
Scafidi, Frances	0410	3.1.2, 6.1, 8.2.2.1
Schattauer, Paul C.	0792	Similar to 0779
Schenfelt, Jessica	0003, 0827	6.1, 7.0
Schlosberg, Alice	0362e	Under signer of 362a
Schmidt, James	0139	3.1.1, 4.2.1, 4.2.2, 4.5.2
Schmidt, Nancy	0344	3.1.2, 4.2.1, 6.1
Schmiff, Juliana	0592	3.1.2, 6.1
Schmitt, Edward G.	0387	3.3, 6.1
Schmitz, Gladys et al.	0230	3.1.2, 6.1, 9.1, 10.2
Schosser, Claire L.	0240	3.1.2, 6.1, 6.3.1, 9.1
Schraufnagel, John V.	0017	6.1, 7.0
Schut, Dini	0315, 0315S	4.2.1, 6.1
Schwartzman, Henry	0675	3.1.2, 4.2.1, 6.1
Scott, Lyn D.	0373	3.1.2, 5.3.2, 6.1
Sea Coast Anti-Pollution League	0559	3.1.2, 4.2.1, 6.1
See, Gretchen M.	0067	2.3, 3.1.2, 6.1
Seitzer, Bruce	0719	Similar to 0045
Selchie, Moreva	0367	Similar to 0045
Seri, David	0115	3.1.2, 4.2.1
Serious Texans Against Nuclear Dumpling (STAND)	0520	2.2, 2.3, 3.1.2, 3.3, 4.2.1, 4.3.3.1, 4.3.3.2, 4.4.1, 6.1, 8.2.1.1, 8.2.2.1, 8.4.1.3, 8.4.2, 10.2, 11.8.2
Seron, Ori	0129	Similar to 0045
Shackett, Edward	0084	6.1
Shah, Shruti	0372	6.1, 9.1
Shannon, Joellen	0515	6.1

Commenter	Commenter Number	Sections
Shapiro, Arthur	0362k	Under signer of 362a
Shapiro, Bernard	0362j	Under signer of 362a
Shapiro, Milton	0069	2.3, 6.1
Sharis, Anita	0401	3.1.2, 4.2.1, 6.1
Shatwell, Scot	0113	Similar to 0045
Shaw, Sally	0647	3.1.2, 4.2.1
Shedd, Andrew	0061	Similar to 0045
Shields, Maria C.	0771	6.1
Shillinglaw, Fawn	0182	3.1.2, 4.2.1, 4.4.1, 6.1
Shively, Scott	AT004dr	Under signer of AT004
Shore, M.	0136	3.1.2, 6.1
Shunda High Network	CH005r	Under signer of CH005
Sibley, Jeffrey S.	0282	Similar to 0045
Siegal, Larry	0810	3.1.2, 6.1
Siegel, Howard	AT004di	Under signer of AT004
Siemens Power Corporation	MD030, SF009	3.1.1, 3.2, 4.2.1, 4.3.3, 4.5.2, 10.2, 11.1.2
Sierra Club	0134, 0569, 0599, 0661, MD035	3.1.2, 4.3.3.2, 6.1; 0569 is similar to 0045; 0599 is similar to 0596; 0661 is similar to 0045
Silk, David	0303	6.1, 9.1, 9.2
Silverberg, Marc B.	0335	6.1
Silvergert, Andrea	0489	Similar to 0316
Silverman, Jay	0403	3.1.2, 9.1, 10.2
Simmons, Janice	0397	3.1.2, 4.2.1, 6.1, 9.1
Simmons, Tony	0430	6.1
Simon, Laura	0479	6.3.1
Simone, Gail E.	0759	Similar to 0045
Simpson, Walter	0474	6.3.1
Sisters of St. Joseph	0538, 0561, 0562	4.3.1.2, 6.1, 8.4.1.1, 9.1, 10.2; 0561 and 0562 are similar to 0045
Siu, Marion and Ming	0861	3.1.2, 6.1
Sloane, Emily & Eugene	0325	4.2.1, 6.1
Smith, Chris	0795a	Similar to 0771
Smith, Stanislav	0779	3.1.2, 6.1, 9.1
Smylie, Richard	0321	3.1.1, 4.2.1, 6.1
Smylie, Susan	0413	Similar to 0321
Sneed Family	0441	6.1, 9.1
Sokolinsky, Myrna	0833	3.1.2
Sommers, Pola	0656	6.1
Sound & Hudson Against Atomic Development (SHAD)	AT004cb	Under signer of AT004
South Carolina Bureau of Land and Waste Management	AT020	9.3
Southern California Edison	MD007, SF016	3.1.1, 3.2, 4.3.2, 4.3.3.1, 6.2, 6.3.2, 7.0, 8.2.1.3, 8.4.2, 9.4

Commenter	Commenter Number	Sections
Southern Nuclear Operating Company	0497	2.3, 3.1.1, 3.4, 4.2.1, 4.4.2, 4.5.2, 5.1.2, 5.2.2, 6.2, 8.2.1.1, 8.2.1.2, 8.4.2, 11.1.1, 11.2.1, 11.5.2, 11.5.3
Southwest Toxic Watch	AT004ci	Under signer of AT004
Specialty Steel Industry of North America (SSINA)	MD028	3.2, 4.1.2, 4.3.3.1, 4.3.4, 5.1.4, 5.2.1, 8.2.2.1, 9.4, 11.1.3, 11.2.3
Sport, Gloria	0565	6.1, 9.2
St. John's Church	0624	6.1, 9.1
Standing for Truth About Radiation (STAR) Foundation	0131	Similar to 0045
Stark, J. M.	0414	Similar to 0316
State of Georgia	0718	Similar to 0045
State of Maine	MD032	9.5
State of Texas	CH006	4.3.3.1, 5.1.2, 5.3.2, 11.2.2
Steel Manufacturers Association (SMA)	0687	2.3, 3.1.2, 5.2.1, 5.2.2, 6.1, 7.0, 8.2.3.1, 8.3.2, 8.4.1.2, 8.4.3
Steel Manufacturers Association and AmeriSteel	AT026, CH030, SF027	3.2, 4.3.3.1, 4.3.3.1, 4.3.4, 5.2.3, 5.5, 8.2.1.2, 8.3.3, 8.3.6, 8.4.1.2, 8.4.2, 9.4
Stein, Albert	0362l	Under signer of 362a
Steppin' Out	AT004aq	Under signer of AT004
Stetson, Judith	0699	6.1
Steward, John A.	0743	3.1.2, 9.1
Stitely, Jeff	0798	Similar to 0779
Stockard, Christy	0176	6.1
Stockton Peace Action	AT004br	Under signer of AT004
Stoermer, Claire	0090	Similar to 0045
Stokes, Katherine S.	0750	3.1.2, 6.3.1
Stone, Nancy	0844	Similar to 0779
Strahan, Eric	0018, AT004dL	6.1; under signer of AT004
Stuard, Mary Jo	0204c	Under signer of 204a
Stubbs, Louise C.	0618	3.1.2
Sullivan Family	0254	3.1.2, 6.3.1
Svoboda, Terese	0744	6.1
Swartz, Daniel J.	0101	Similar to 0045
Swatland, CindyLynn	0513	6.1
Sythe, Dan	0577	6.1
Tanner, John	0490	5.1.1
Taylor, Parks	0509	Similar to 0045
Tennessee Division of Radiological Health	AT012	8.2.5.2
Tennessee Valley Authority	AT021, SF025	2.3, 3.1.1, 3.2, 4.3.4
Texas Natural Resources Conservation Commission	CH026	4.4.1, 4.4.2, 8.2.2.1, 11.5.2, 13.0
Thauh, Tawny	0776	Similar to 0771
Theiler, Krista	0480, 0786	3.1.2, 6.1, 8.2.1.1
Thompson, Dorothy	0780	6.1
Thompson, Douglas	0396	Similar to 0045

Commenter	Commenter Number	Sections
Thompson, Elizabeth M.	0283	6.1, 8.3.3
Three Mile Island Alert	AT004r	Under signer of AT004
Tippecanoe Environmental Council	AT004bz	Under signer of AT004
TN Technologies Inc.	0013	4.3.1.1, 4.3.3.1
Tobias, Riubella	0362b	Under signer of 362a
Todd, Paula	0307	3.1.2, 8.2.1.1, 9.1
Todd, Russell	0726	Similar to 0045
Toledo Coalition for Safe Energy	AT004bn	Under signer of AT004
Trakselis, John & Patricia	0782	Similar to 0779
Trapp, Rosalyn	0233	6.1
Trice, Eugene & Ruth	0149	3.1.2, 6.1
Tri-Valley Communities Against a Radioactive Environment	0278c	Under signer of 0278a
Tucker, Betty	0654	6.1
Turnbull, Douglas & Paula	0434	6.1
TXU Electric- Comanche Peak Steam Electric Station	0493	3.1.1, 3.2
U. S. Department of the Army	0612, CH010	3.2, 3.4, 4.1.1, 4.2.2, 4.3.3.1, 4.3.4, 4.4.1, 4.4.2, 4.4.4, 5.1.1, 5.2.1, 9.3, 10.1
U.S. Air Force	MD039	8.2.1.1, 8.2.1.3
U.S. Army Corps of Engineers	MD033, SF017	3.1.1, 3.2, 4.3.3.1, 4.3.4, 4.5.4, 4.6.1, 7.0, 8.2.1.1, 8.2.2.1, 9.8, 11.1.3
U.S. Department of Energy	CH021, MD029, SF005	4.2.2, 4.3.1.1, 4.3.1.2, 4.3.2, 4.3.3.1, 4.3.3.2, 4.4.1, 8.2.1.1, 8.2.3.3, 8.4.1.2, 8.4.1.3, 8.4.2, 11.1.3, 11.2.3, 11.5.1, 11.5.4, 11.8.1
U.S. Department of Energy, Oak Ridge Operations	AT001	4.3.1.1, 4.3.2, 4.3.4, 10.4
U.S. Department of State	AT002, MD025	3.1.1, 4.2.3, 4.3.3.1 5.1.4, 5.5, 9.4, 10.2, 10.3, 12.0
U.S. Environmental Protection Agency	AT003, AT011, CH009, MD014, SF019	3.1.1, 4.2.3, 5.1.2, 5.3.1, 5.3.2, 5.3.3, 5.5, 8.2.1.2, 8.2.2.3, 8.2.3.1, 8.2.3.3, 8.3.1 8.4.1.2, 8.4.1.3, 9.2, 9.4, 9.5, 10.1, 10.3
U.S. Environmental Protection Agency, Region V	CH003	5.2.1, 7.0, 9.2
Umetco Minerals Corporation	MD009	4.4.1, 11.8.1
Unidentified	NRC55	4.2.1, 4.5.2
Unidentified Speaker (s)	SF021	8.4.3
Unidentified Speaker (s)	AT028	7.0
United States Enrichment Corporation (USEC)	0498	4.2.1, 4.3.3.1, 4.5.2, 5.1.2, 5.2.3, 5.3.3, 7.0
United States Senate	0632	6.1
United States Senate Committee on Environment and Public Works	0832	3.1.2, 3.1.3, 8.1
University of California, Office of the President	SF007	8.4.2, 9.4, 11.5.2, 11.5.4

Commenter	Commenter Number	Sections
Unplug Salem Campaign	AT004bt	Under signer of AT004
Uptown Multi-Cultural Art Center, Chicago, IL	AT004bL	Under signer of AT004
Uranium Enrichment Project	0262, AT004k	4.3.3.1, 6.1, 8.2.1.1, 9.1; under signer of AT004
US Ecology	0037	3.2, 4.4.1, 4.4.2
US Public Interest Research Group	0280l, AT004cn, CH005e	Under signer of 0280a; under signer of AT004; under signer of CH005
Vaccarella, Jim	0273	Similar to 0270
Van Dame, Kathy	0625	6.1, 9.1
Van Hoy, David	0517	4.2.1, 6.1, 8.4.1.1
Vanderbilt University Press	0075	2.3, 4.2.3, 6.1, 8.4.1.1
VanMeter, Paula	0083	Similar to 0045
Vargo, George	0127	3.1.1, 4.5.2
Vaugel, Martine	0272	Similar to 0270
Vermont Public Interest Research Group	0728, AT004bv	0728 is Similar to 0045; under signer of AT004
Viereck, Jennifer	0583	3.1.2, 4.2.1, 6.3.1
Virginia Power	0549	3.1.1, 3.2
Visser, Barbara	0808	3.1.2
von Wettberg, Norman	0840	6.1
Vu, Heip Q.	0775	Similar to 0771
Wagner, Annabelle	0204b	Under signer of 204a
Wagner, Robert L.	0375	6.1
Wakefield, Sandra & Douglas	0217	3.1.2, 4.2.1, 6.1
Walker, Joseph J.	0197	Similar to 0045
Walshan, Harry P.	0257	3.1.2, 6.1, 8.2.1.1, 8.4.1.1
Warner, Harold	0122	3.1.2, 4.2.1, 6.1
Washburn, James	0384	6.1, 9.1
Washington Department of Health, Division of Radiation Protection	0357	2.1, 3.1.2, 3.2, 4.2.1, 4.4.2, 4.5.2, 5.1.2, 11.1.1
Wasserman, Marilyn & Allan	0312	6.1, 8.2.2.1, 8.4.1.1
Waste Action Project	AT004ca	Under signer of AT004
Water Information Network	AT004ae	Under signer of AT004
Watrous, Elizabeth	0085	6.1, 8.4.1.3
We The People, Inc. of Tennessee, Alliance for Public Health and Safety	AT004j	Under signer of AT004
Weiler, Christopher	0068	2.3, 6.3.1
Weinheimer, Elaine	0148	4.2.1, 6.1
Weininger	0362d	Under signer of 362a
Weiskopf, Richard W.	0713	3.1.2, 4.2.1, 6.1, 6.3.1, 8.2.2.1
Weiss, Elinor	0464	6.3.1
Weiss, Illa A.	0761	3.3
Wells, Darrell	0159	6.1
Wells, Mrs. Harold N.	0741	6.1
Wendling, Jane	0425	3.1.2, 4.2.1, 6.1

Commenter	Commenter Number	Sections
West Michigan Environmental Action Council	CH005ad	Under signer of CH005
Westbrooks, Vickie M.	0086	Similar to 0045
Western States Legal Foundation	0278f, MD027	3.1.2, 3.2, 4.3.2, 4.3.3.1, 8.2.2.1, 9.5, 9.6, 11.1.2, 11.2.2, 11.5.6, 11.8.1; under signer of 0278a
Westinghouse Electric Company	0564, AT022	2.3, 3.1.1, 3.2, 4.2.1, 4.2.2, 4.3.1.1, 4.3.1.2, 5.1.2, 7.0, 8.2.2.1, 8.4.1.1, 9.2, 9.3, 11.5.6
Westinghouse Savannah River Company	AT005	3.1.1, 3.2, 3.3, 4.2.3, 4.3.1.1, 4.3.2, 4.6.2, 8.2.2.1, 8.4.1.1, 8.4.2, 11.5.3
Wheatman, Michael P.	0774	Similar to 0771
White, Barbara	0641	6.1
White, Cindy L.	0306	6.1
White, Patricia	0196	4.2.1
Whitefield, Anne	0679	6.1
Wiederkehr, Rebecca	0249	Similar to 0045
Williams, Don	0860	3.1.2
Wilmoth, Carole	0581	6.3.1
Wilson Family	0281, 0492, 0762	3.1.2, 4.2.1, 6.1; Similar to 0118
Wilson, Roy C.	0118	3.1.2, 4.2.1, 6.1
Wilson, V.	0739	6.3.1
Wilson, Warren and Olive	0104	3.1.2, 4.2.1
Wingeier, Douglas	0301, 0548	3.1.2, 4.2.1, 6.1
Wittgenst, Kay	0204d	Under signer of 204a
Wobbe, Thomas	0501	9.1
Woldenberg, Sue	CH033	6.1
Wolf, Tami	0442	6.1
Women's Action for New Directions (WAND)	AT004ck	Under signer of AT004
Women's Energy Matters	0523	3.1.2, 4.2.1, 6.1, 6.3.1, 8.2.4
Women's Environment and Development Organization	AT004cw	Under signer of AT004
Women's International League for Peace and Freedom	0525, CH005x	3.1.2, 4.2.1, 6.1, 8.1, 9.1; under signer of CH005
Womer, Jessica	0142	6.1
Wood, Lea	0032	3.1.2, 4.2.1, 6.1
Woods, Beverly	0467	6.1, 6.3.1, 8.2.1.1
Woods, Nancy	0151	4.2.1, 6.1
Woods, Von	0341	4.2.1, 4.3.3.1, 4.3.3.2, 6.1
World Information Service on Energy - WISE International	AT004dd	Under signer of AT004
Wozniak, Brian	0701	Similar to 0045
Wozniak, C.R.	0702	Similar to 0045
Wright, Judith	0784	Similar to 0779
Wright, Marjorie J.	0793	Similar to 0779
Wright, Robert J.	0816	Similar to 0779
Wunsch, Richard	0365	6.1

Commenter	Commenter Number	Sections
Wyffels, James	0447	Similar to 0443
Wyoming Mining Association	0251	2.1, 4.3.3.1, 5.1.2, 8.4.1.1, 11.1.2
Wysocki, Jessica	0707	3.1.2, 6.1
Y2K World Atomic Safety Holiday - WASH Campaign	AT004db	Under signer of AT004
Young, Beatrice	0199	6.1
Young, Elena	0178	Similar to 0045
Zurcher, W.C. & Gloria	0188	6.1
Zwell, Michael	0815	Similar to 0779

APPENDIX C

CROSS REFERENCE OF COMMENTERS BY COMMENTER NUMBER

Commenter Number	Commenter	Organization Type
0001	Association of Radioactive Metal Recyclers	Metals Industry
0002	Olsen, Nora	Private Citizen
0003	Schenfelt, Jessica	Private Citizen
0004	McGovern, Lucinda	Private Citizen
0005	Dubovsky, Becky	Private Citizen
0006	Name not provided	Private Citizen
0007	Gordesky, Ben	Private Citizen
0008	Lombardi, Donna	Private Citizen
0009	Diamond, Joel and Doris	Private Citizen
0010	Kelly, Doe	Private Citizen
0011	Diez, Maite	Private Citizen
0012	Goodman, Sidney J.	Private Citizen
0013	TN Technologies Inc.	Manufacturing Industry
0014	Dye, Cameron	Private Citizen
0015	Morris, Thaiia	Private Citizen
0016	Martinson, Ernest	Private Citizen
0017	Schraufnagel, John V.	Private Citizen
0018	Strahan, Eric	Private Citizen
0019	Nichols, Cynthia	Private Citizen
0020	Drew, Bruce and Maggie	Private Citizen
0021	Edblom, Greg	Private Citizen
0022	Nuclear Energy Institute (NEI)	Nuclear Industry
0023	Friends of the Coast - Opposing Nuclear Pollution	Citizen/Environmental Group
0024	Freed, H.	Private Citizen
0025	Andersen, Curt	Private Citizen
0026	Gordon, Joshua	Private Citizen
0027	Nuclear Energy Institute (NEI)	Nuclear Industry
0028	Blockney-O'Brien, Pamela	Private Citizen
0029	Pryor, Kathy	Private Citizen
0030	Andrews, John P.	Private Citizen
0031	Paper Allied-Industrial, Chemical and Energy Workers International Union	Labor Union
0032	Wood, Lea	Private Citizen
0033	Institute for Energy and Environmental Research	Citizen/Environmental Group
0034	Goletz Heckman, Joyce	Private Citizen
0035	Jones, Troy	Private Citizen
0036	New Jersey Department of Environmental Protection	State Government
0037	US Ecology	Waste Disposal Industry
0038	Alliant Utilities (IES Utilities)	Utility
0039	Hamrick, John	Private Citizen
0040	Paper Allied-Industrial, Chemical and Energy Workers International Union	Labor Union
0041	Lewis, Marvin	Private Citizen
0042	PECO Nuclear	Nuclear Industry

Commenter Number	Commenter	Organization Type
0043	Mid-Island Radiation Alert	Citizen/Environmental Group
0044	Natural Resources Defense Council	Citizen/Environmental Group
0045	Paul, Edward	Private Citizen
0046	Hoag, Charlene	Private Citizen
0046S	Hoag, Charlene	Private Citizen
0047	Bollinger, Dave	Private Citizen
0048	Cilley, Jacqueline	Private Citizen
0049	D'Alessandro, Dmitri	Private Citizen
0050	Gray, Marjorie	Private Citizen
0051	Green, Jeffrey S.	Private Citizen
0052	Lock, Ellen	Private Citizen
0053	Paquette, Mark	Private Citizen
0054	Pinsky Blumenthal, Carol	Private Citizen
0055	Robison, David	Private Citizen
0056	Harper, Grant	Private Citizen
0057	Ameren EU	Nuclear Industry
0058	Amarello, Joseph	Private Citizen
0059	Klein, Chris	Private Citizen
0060	Campbell, Scott	Private Citizen
0061	Shedd, Andrew	Private Citizen
0062	Jordan, Tracy	Private Citizen
0063	Kelley, Melissa	Private Citizen
0064	Lee, Mark	Private Citizen
0065	Rhodes, Robert	Private Citizen
0066	Name not provided	Private Citizen
0067	See, Gretchen M.	Private Citizen
0068	Weiler, Christopher	Private Citizen
0069	Shapiro, Milton	Private Citizen
0070	Association of State and Territorial Solid Waste Management Officials	Professional Association
0071	Los Angeles County Sanitation District	Local Government
0072	Bauer, Debowden	Private Citizen
0073	Lawrence, Edward J.	Private Citizen
0074	Marino, Dianne	Private Citizen
0075	Vanderbilt University Press	Educational Institution
0076	Hanks, John	Private Citizen
0077	Angelino, Salvatore J.	Private Citizen
0078	Bell, Glenn	Private Citizen
0079	Bell, Glenn	Private Citizen
0080	McClendon, Dennis	Private Citizen
0081	Jennings, Stephanie	Private Citizen
0082	Bell, Glenn	Private Citizen
0083	VanMeter, Paula	Private Citizen
0084	Shackett, Edward	Private Citizen
0085	Watrous, Elizabeth	Private Citizen
0086	Westbrooks, Vickie M.	Private Citizen

Commenter Number	Commenter	Organization Type
0087	Bushnell, Bill	Private Citizen
0088	Kass, Jerome	Private Citizen
0089	Duce, Stephen W.	Private Citizen
0090	Stoermer, Claire	Private Citizen
0091	Camara, Tom	Private Citizen
0092	Ferguson, Tom	Private Citizen
0093	Sabbadini, Gail	Private Citizen
0094	Chang, Helen F.	Private Citizen
0095	King, Joan O.	Private Citizen
0096	Flynn, Joan	Private Citizen
0097	Espy, David	Private Citizen
0098	Martin, Jerome B.	Private Citizen
0099	Rinehart, Larry D.	Private Citizen
0100	Hills, Thomas	Private Citizen
0101	Swartz, Daniel J.	Private Citizen
0102	Medici, Robert	Private Citizen
0103	Pratt, Beth A.	Private Citizen
0104	Wilson, Warren and Olive	Private Citizen
0105	Fix, Jack J.	Private Citizen
0106	Haley, Robert and Gaigoul, Rachel	Private Citizen
0107	Romine, Joe	Private Citizen
0108	Lorenz, Nancy	Private Citizen
0109	Environmental Advocates	Citizen/Environmental Group
0110	Hallvik, Eva	Private Citizen
0111	Rosenberg, Dan	Private Citizen
0112	Mooney, Patty	Private Citizen
0113	Shatwell, Scot	Private Citizen
0114	Delsener, Ron	Private Citizen
0115	Seri, David	Private Citizen
0116	Gura, Nicholas	Private Citizen
0117	Liebowitz, Jerome & Eleanor	Private Citizen
0118	Wilson, Roy C.	Private Citizen
0119	Raderman, Yvette	Private Citizen
0120	Rock, Judy	Private Citizen
0121	Landau, Diana	Private Citizen
0122	Warner, Harold	Private Citizen
0123	Finken, Mary L.	Private Citizen
0124	Ruther, Martin	Private Citizen
0125	Bugg, Ann	Private Citizen
0126	Diaz, Milvio	Private Citizen
0127	Vargo, George	Private Citizen
0128	Osborn, Nathalie	Private Citizen
0129	Seron, Ori	Private Citizen
0130	Hatz, Diane	Private Citizen
0131	Standing for Truth About Radiation (STAR) Foundation	Citizen/Environmental Group

Commenter Number	Commenter	Organization Type
0132	Kennedy, William E., Jr.	Private Citizen
0133	New Jersey Department of Environmental Protection	State Government
0134	Sierra Club, Ohio Chapter Energy Committee	Citizen/Environmental Group
0135	Katen, Lorraine	Private Citizen
0136	Shore, M.	Private Citizen
0137	McKerry, Robert	Private Citizen
0138	Kirner, Nancy P.	Private Citizen
0139	Schmidt, James	Private Citizen
0140	Ruggles, A'me	Private Citizen
0141	Olsen, Ken	Private Citizen
0142	Womer, Jessica	Private Citizen
0143	Kneeland, Andrew	Private Citizen
0144	Kneeland, Mary Ellen	Private Citizen
0145	Hansen, Susan	Private Citizen
0146	Phillips, Joan	Private Citizen
0147	Gallagher, Jesse	Private Citizen
0148	Weinheimer, Elaine	Private Citizen
0149	Trice, Eugene & Ruth	Private Citizen
0150	Kneeland, Craig	Private Citizen
0151	Woods, Nancy	Private Citizen
0152	McKinnis, Amanda	Private Citizen
0153	Kautz, Kay	Private Citizen
0154	Martel Baer, Leslie	Private Citizen
0155	Safe Energy Communication Council	Citizen/Environmental Group
0156	Raymond, Jessica	Private Citizen
0157	Aylward, Patricia	Private Citizen
0158	Messler, Kristina	Private Citizen
0159	Wells, Darrell	Private Citizen
0160	Browne, Linda	Private Citizen
0161	Groot, Henriette	Private Citizen
0162	Almgren, Anna-Maria	Private Citizen
0163	Giese, Mark	Private Citizen
0163S	Giese, Mark	Private Citizen
0164	Giovanella, Alice	Private Citizen
0165	Clark, Patrick	Private Citizen
0166	Kramer, Anna	Private Citizen
0167	Davidson & Associates, L.L.C.	Private Citizen
0168	Hughes, Randi	Private Citizen
0169	Gold, David and Judy	Private Citizen
0170	Reeve, Sysyn	Private Citizen
0171	Brown, Gidion	Private Citizen
0172	Kennedy, C.L.	Private Citizen
0173	Ramos, Eileen	Private Citizen
0174	Cox, Cynthia	Private Citizen

Commenter Number	Commenter	Organization Type
0175	Head, Lewis & Lois	Private Citizen
0176	Stockard, Christy	Private Citizen
0177	Safe Legacy	Citizen/Environmental Group
0177S	Safe Legacy	Citizen/Environmental Group
0178	Young, Elena	Private Citizen
0179	Boyers, Richard	Private Citizen
0180	Pace, Harriet	Private Citizen
0181	Marcus, Robert S.	Private Citizen
0182	Shillinglaw, Fawn	Private Citizen
0183	Rudolph, Janet	Private Citizen
0184	North Carolina Waste Awareness & Reduction Network (NC WARN)	Citizen/Environmental Group
0185	Lager, Patricia	Private Citizen
0186	Grimm, Sarah	Private Citizen
0187	Matthews, Jennifer	Private Citizen
0188	Zurcher, W.C. & Gloria	Private Citizen
0189	Eielson, Olivia	Private Citizen
0190	Collins, Rita	Private Citizen
0191	Hannah, Stein	Private Citizen
0192	Isler, Naomi B.	Private Citizen
0193	Leech, Betty	Private Citizen
0194	Sawyer, Margaret	Private Citizen
0195	Abbott, Joseph & Alice	Private Citizen
0196	White, Patricia	Private Citizen
0197	Walker, Joseph J.	Private Citizen
0198	PECO Energy Company	Nuclear Industry
0199	Young, Beatrice	Private Citizen
0200	Brison, Allan P.	Private Citizen
0201	Hopkins, Walter S.	Private Citizen
0202	Betts, Peter	Private Citizen
0203	Block, Samuel A.	Private Citizen
0204a	Dunlop, Heather	Private Citizen
0204b	Wagner, Annabelle	Private Citizen
0204c	Stuard, Mary Jo	Private Citizen
0204d	Wittgenst, Kay	Private Citizen
0205	LaFleur, Sanford	Private Citizen
0206	Bialas, Michel E.	Private Citizen
0207	Medsker, Alma	Private Citizen
0208	Rusten, June A.	Private Citizen
0209	Gladstone, Samuel	Private Citizen
0210	LaVera, Ron	Private Citizen
0211	Ditta, Madeline B.	Private Citizen
0212	Ikenberry, Tracy	Private Citizen
0213	Latner, B.	Private Citizen
0214	Brown, Myrna	Private Citizen
0215	Riggs, Don	Private Citizen

Commenter Number	Commenter	Organization Type
0216	Rubinstein, Aldine	Private Citizen
0217	Wakefield, Sandra & Douglas	Private Citizen
0218	Cole, Muriel F.	Private Citizen
0219	Higgins, Winsome	Private Citizen
0220	Busby, Laurie	Private Citizen
0221	Perry, Rev. H. J. & Lucille	Private Citizen
0222	Florsheim, Nancy & Thomas	Private Citizen
0223	Fasten, Susan	Private Citizen
0224	Earth Challenge	Citizen/Environmental Group
0225	Coen, Virginia	Private Citizen
0226	Grimm, Carl	Private Citizen
0227	Bambenek, Joel	Private Citizen
0228	Savage, J. A.	Private Citizen
0229	Brant, Alan E.	Private Citizen
0230	Schmitz, Gladys et al.	Private Citizen
0231	Holbein, Lynn	Private Citizen
0232	Donaldson, Grace M.	Private Citizen
0233	Trapp, Rosalyn	Private Citizen
0234	Interfaith Council for Peace & Justice Disarmament Working Group	Citizen/Environmental Group
0235	Roiger, Mary	Private Citizen
0236	Mallow, Dawn	Private Citizen
0237	Emmons, Jeanine	Private Citizen
0238	Leboit, Mollie	Private Citizen
0239	Karpen, Leah R.	Private Citizen
0240	Schosser, Claire L.	Private Citizen
0241	Jacobs, Andrew	Private Citizen
0242	Burlant, Mae D.	Private Citizen
0243	Holober, Helen	Private Citizen
0244	Fisher, Cordelia	Private Citizen
0245	Rizzo, Fred	Private Citizen
0246	Jike, Thomas M.	Private Citizen
0247	Hall, Mitch and Red, Beverly	Private Citizen
0248	McMahon, Mary	Private Citizen
0249	Wiederkehr, Rebecca	Private Citizen
0250	Ketter, Milton B.	Private Citizen
0251	Wyoming Mining Association	Mining Industry
0252	Moeckel, Cindy	Private Citizen
0253	Bluesky, Willa	Private Citizen
0254	The Sullivan Family	Private Citizen
0255	Grand, Freya	Private Citizen
0256	Nagy, Theodore & Joanne	Private Citizen
0257	Walshan, Harry P.	Private Citizen
0258	Roberts, Sandra L.	Private Citizen
0259	Jacobs, Peggy	Private Citizen
0260	Ringer, Judy	Private Citizen

Commenter Number	Commenter	Organization Type
0261	Mehr, Roslyn	Private Citizen
0262	Uranium Enrichment Project	Citizen/Environmental Group
0263	O'Connell, Shaun	Private Citizen
0264	Ramirez, Gilma F.	Private Citizen
0265	Epstein, Rachel	Private Citizen
0266	Divincenzo, Christina	Private Citizen
0267	Pritchard, Eric	Private Citizen
0268	Heymann, Ralph	Private Citizen
0269	Baylies, Susan	Private Citizen
0270	Carina, Rebecca	Private Citizen
0271	Kasdorf, Kim	Private Citizen
0272	Vaugel, Martine	Private Citizen
0273	Vaccarella, Jim	Private Citizen
0274	Arkansas Department of Health	State Government
0275	Gardner, Joy	Private Citizen
0276	Hogan, Judy	Private Citizen
0277	Project on Government Oversight	Citizen/Environmental Group
0278a	Committee to Bridge the Gap	Citizen/Environmental Group
0278b	Physicians for Social Responsibility	Citizen/Environmental Group
0278c	Tri-Valley Communities Against a Radioactive Environment	Citizen/Environmental Group
0278d	Nuclear Information and Research Service	Citizen/Environmental Group
0278e	Bay Area Nuclear Waste Coalition	Citizen/Environmental Group
0278f	Western States Legal Foundation	Citizen/Environmental Group
0278g	Grandmothers for Peace International	Citizen/Environmental Group
0278h	Air, Water, Earth, Org.	Citizen/Environmental Group
0278i	National Association of Radiation Survivors	Citizen/Environmental Group
0278j	Committee for Nuclear Responsibility	Citizen/Environmental Group
0278k	Center for Energy Research	Citizen/Environmental Group
0278l	Public Citizen	Citizen/Environmental Group
0278m	A First Amendment Center	Citizen/Environmental Group
0279	Environmental and Public Interest Communities	Citizen/Environmental Group
0280a	Nuclear Information and Research Service	Citizen/Environmental Group
0280b	Public Citizen	Citizen/Environmental Group
0280c	Greenpeace	Citizen/Environmental Group
0280d	Safe Energy Communication Council	Citizen/Environmental Group
0280e	Clean Water Action	Citizen/Environmental Group
0280f	Peace Action	Citizen/Environmental Group
0280g	Friends of the Earth, US	Citizen/Environmental Group
0280h	Friends of the Earth, UK	Citizen/Environmental Group
0280i	Physicians for Social Responsibility	Citizen/Environmental Group
0280j	Alliance for Nuclear Accountability	Citizen/Environmental Group
0280k	Low Level Radiation Campaign, UK	Citizen/Environmental Group
0280l	US Public Interest Research Group	Citizen/Environmental Group
0280m	Project on Government Oversight	Citizen/Environmental Group

Commenter Number	Commenter	Organization Type
0281	The Wilson Family	Private Citizen
0282	Sibley, Jeffrey S.	Private Citizen
0283	Thompson, Elizabeth M.	Private Citizen
0284	Ainslie, Scott	Private Citizen
0285	Hogan, Judy	Private Citizen
0286	Brister, Bob	Private Citizen
0287	Mills, Lauren	Private Citizen
0288	Evans, Kathleen	Private Citizen
0289	Payne, Allison	Private Citizen
0290	Gallati, M. P.	Private Citizen
0291	Ridley, Eleanor	Private Citizen
0292	Brown, Dottie	Private Citizen
0293	Buck, Paul	Private Citizen
0294	Oldenkamp, Patricia	Private Citizen
0295	Baker, Lisa	Private Citizen
0296	Mullarkey, Barbara Alexander	Private Citizen
0297	Herold, Donna Lee	Private Citizen
0298	Carosi, Mary Dolores	Private Citizen
0299	Martin, Joseph	Private Citizen
0300	Golan, Fred	Private Citizen
0301	Wingeier, Douglas E.	Private Citizen
0302	Robbins, Justine	Private Citizen
0303	Silk, David	Private Citizen
0304	Hassett, Lynn	Private Citizen
0305	Oehler, Katie	Private Citizen
0306	White, Cindy L.	Private Citizen
0307	Todd, Paula	Private Citizen
0308	Dougherty, Helen P.	Private Citizen
0309	Rappaport, Gail	Private Citizen
0310a	McDonald Goldwire, Billie	Private Citizen
0310b	Connelly McDonald, Mary	Private Citizen
0310c	Deakins, Michael & Terry	Private Citizen
0311	Lowman, J. K.	Private Citizen
0312	Wasserman, Marilyn & Allan	Private Citizen
0313	Coble, Joan	Private Citizen
0314	Baiman, Rhon	Private Citizen
0315	Schut, Dini	Private Citizen
0315S	Schut, Dini	Private Citizen
0316	Petrille, Judy	Private Citizen
0317	Barri, Jaynie	Private Citizen
0318	Finkelstein, Sharna	Private Citizen
0319	Not Able to Decipher Name	Private Citizen
0320	Ralner, C.	Private Citizen
0321	Smylie, Richard	Private Citizen
0322	Conservation Council of North Carolina	Citizen/Environmental Group
0323	Martin, William B.	Private Citizen

Commenter Number	Commenter	Organization Type
0324	Daly, Tina	Private Citizen
0325	Sloane, Emily & Eugene	Private Citizen
0326	Lather, Nancy	Private Citizen
0327	Lugten, Peter	Private Citizen
0328	Maloney, Mary Lee	Private Citizen
0329	Brown, Linda L.	Private Citizen
0330	Boyens, Marguerite	Private Citizen
0331	Adamson, Thomas Andrew	Private Citizen
0332	Langmaid, Adam	Private Citizen
0333	King, Karen S.	Private Citizen
0334	Ferguson, Tom	Private Citizen
0335	Silverberg, Marc B.	Private Citizen
0336	Hester, Al	Private Citizen
0337	Dickey, Patrice	Private Citizen
0338	Arnold, Bruce	Private Citizen
0339	Reidy, Steve	Private Citizen
0340	Lind, Catherine G.	Private Citizen
0341	Woods, Von	Private Citizen
0342	Dwyer, Patricia	Private Citizen
0343	Huff, Mary	Private Citizen
0344	Schmidt, Nancy	Private Citizen
0345	Adams, Samuel	Private Citizen
0346	L.A. West Network	Citizen/Environmental Group
0347	Lane, J. Kendra	Private Citizen
0348	McAbery, John	Private Citizen
0349	Moffat, Lorna	Private Citizen
0350	Cutchis, Mildred Farr	Private Citizen
0351	Kastanek, Dawn M.	Private Citizen
0352	Edmiston, V. Lynne	Private Citizen
0353	Lee, Lillian	Private Citizen
0354	Clarke, William H.B.	Private Citizen
0355	Irvine, Emma	Private Citizen
0356	Peabody, Iris	Private Citizen
0357	Washington Department of Health, Division of Radiation Protection	State Government
0358	Johnson, Richard	Private Citizen
0359	Liddle, Jack	Private Citizen
0360	Baiman, Sydney	Private Citizen
0361	Pappas, Carmen	Private Citizen
0362a	Baghosian, Rose	Private Citizen
0362b	Tobias, Riubella	Private Citizen
0362c	Pappas, Carmen	Private Citizen
0362d	Weininger	Private Citizen
0362e	Schlosberg, Alice	Private Citizen
0362f	Miller, Rochelle	Private Citizen
0362g	Sadur, Shirley	Private Citizen

Commenter Number	Commenter	Organization Type
0362h	Lemysko, Ida	Private Citizen
0362i	Latman, Jeanette	Private Citizen
0362j	Shapiro, Bernard	Private Citizen
0362k	Shapiro, Arthur	Private Citizen
0362l	Stein, Albert	Private Citizen
0363	Keyes Stark, Kimberly	Private Citizen
0364	Atlas, Elise	Private Citizen
0365	Wunsch, Richard	Private Citizen
0366	Borden, Kelly	Private Citizen
0367	Selchie, Moreva	Private Citizen
0368	Lippman, Roger	Private Citizen
0369	Levine, Rae	Private Citizen
0370	Lipman, Michael	Private Citizen
0371	Herbein James, Elizabeth	Private Citizen
0372	Shah, Shruti	Private Citizen
0373	Scott, Lyn D.	Private Citizen
0374	Lipman, Jane	Private Citizen
0375	Wagner, Robert L.	Private Citizen
0376	Brooks, Cuyler W.	Private Citizen
0377	Pressman, Joan	Private Citizen
0378	Griffith, Gray	Private Citizen
0379	Block, Jon	Private Citizen
0380	Barr, Michael M.	Private Citizen
0381	Hassett, Rob	Private Citizen
0382	Caraway, Ben	Private Citizen
0383	Dunford, Gary H.	Private Citizen
0384	Washburn, James	Private Citizen
0385	Jones, Charlton H.	Private Citizen
0386	Lylan Wolff, Frances	Private Citizen
0387	Schmitt, Edward G.	Private Citizen
0388	Denny, Dallas	Private Citizen
0389	Chitwood, Joanna	Private Citizen
0390	Berelli, Victorio	Private Citizen
0391	Holcombe, Scotti J.	Private Citizen
0392	Carr Goldman, Patricia	Private Citizen
0393	Mason, Patricia	Private Citizen
0394	Chachula, Julian & Denise	Private Citizen
0395	LaMastra, Anthony	Private Citizen
0396	Thompson, Douglas	Private Citizen
0397	Simmons, Janice	Private Citizen
0398	Denney, Becky	Private Citizen
0399	Huff, John	Private Citizen
0400	Nix, Kemie	Private Citizen
0401	Sharis, Anita	Private Citizen
0402	Belyeu, Danny & Marcia	Private Citizen
0403	Silverman, Jay	Private Citizen

Commenter Number	Commenter	Organization Type
0404	Bruck, Debby	Private Citizen
0405	Lipsman, Mark	Private Citizen
0406	Russell, Michael J.	Private Citizen
0407	Sacramento Municipal Utility District - Rancho Seco Nuclear Power Plant	Utility
0408	Arrington, Martha L.	Private Citizen
0409	Chang, Joey	Private Citizen
0410	Scafidi, Frances	Private Citizen
0411	Not Able to Decipher Name	Private Citizen
0412	Not Able to Decipher Name	Private Citizen
0413	Smylie, Susan	Private Citizen
0414	Stark, J. M.	Private Citizen
0415	Not Able to Decipher Name	Private Citizen
0416	Forsmark, Megan	Private Citizen
0417	Booth, Don	Private Citizen
0418	Conneally, Rae E.	Private Citizen
0419	Butler, John	Private Citizen
0420	Citizens Regulatory Commission	Citizen/Environmental Group
0421	Asaokai	Private Citizen
0422	ACURI Association, Inc.	Nuclear Industry
0423	Miller, Greg	Private Citizen
0424	Lowry, Mike	Private Citizen
0425	Wendling, Jane	Private Citizen
0426	King, Kathleen A.	Private Citizen
0427	Georgia Department of Natural Resources, Radioactive Materials Program	State Government
0428	Gearhart, Frank	Private Citizen
0429	Green Delaware	Citizen/Environmental Group
0430	Simmons, Tony	Private Citizen
0431	Foster, John R.	Private Citizen
0432	Frost, Anthony & Linda	Private Citizen
0433	Boniface, Kathryn & Bill	Private Citizen
0434	Turnbull, Douglas & Paula	Private Citizen
0435	Lackey, Robert	Private Citizen
0436	Barnes, Kathryn A.	Private Citizen
0437	Paschal, Dan	Private Citizen
0438	Austin, Roberta J.	Private Citizen
0439	Goldberg, Alex	Private Citizen
0440	Jene, Bill	Private Citizen
0441	The Sneed Family	Private Citizen
0442	Wolf, Tami	Private Citizen
0443	Aton, David R.	Private Citizen
0444	Roberts, Steven K.	Private Citizen
0445	Krawiec, Richard	Private Citizen
0446	Ellis, Susan	Private Citizen
0447	Wyffels, James	Private Citizen

Commenter Number	Commenter	Organization Type
0448	Norwood, Dennis & Delores	Private Citizen
0449	Quimby, Phil	Private Citizen
0450	Mulcahy, Colm	Private Citizen
0451	Gose, Margaret B.	Private Citizen
0452	Ashmore, Marjorie C.	Private Citizen
0453	Bailine, Barbara	Private Citizen
0454	Boniface, George	Private Citizen
0455	Laughlin, Jay	Private Citizen
0456	Martin, Marian	Private Citizen
0457	Durham, Juanita S.	Private Citizen
0458	Ramsey, Don	Private Citizen
0459	Miller, Jackie	Private Citizen
0460	Moore, Shirley	Private Citizen
0461	Griffith, Jonathan	Private Citizen
0462	Berger, Bradford W.	Private Citizen
0463	Health and Energy Institute	Citizen/Environmental Group
0464	Weiss, Elinor	Private Citizen
0465	Hay, Carol & Lewis	Private Citizen
0466	Black, Douglas B.	Private Citizen
0467	Woods, Beverly	Private Citizen
0468	Protect All Children's Environment	Citizen/Environmental Group
0469	Conference of Radiation Control Program Directors' E-23 Committee (CRCPD)	Citizen/Environmental Group
0470	Portland Cement Association	Cement Industry
0470S	Portland Cement Association	Cement Industry
0471	Geary, Richard C.	Private Citizen
0472	Crandall, Van	Private Citizen
0473	Marcoplos, Mark	Private Citizen
0474	Simpson, Walter	Private Citizen
0475	Environmental and Peace Education Center	Citizen/Environmental Group
0476	Residents Organized for Lewiston-Porter's Environment (ROLE) and For A Clean Tonawanda Site (F.A.C.T.S.)	Citizen/Environmental Group
0477	Fuss, LeRoy	Private Citizen
0478	Hallvik, Eva and Eisenberg, Beverly	Private Citizen
0479	Simon, Laura	Private Citizen
0480	Theiler, Krista	Private Citizen
0481	Hickey, Danny	Private Citizen
0482	Citizens Awareness Network	Citizen/Environmental Group
0483	Knepp, Mary Morris	Private Citizen
0484	Morris, D.	Private Citizen
0485	Meyers, Dominique	Private Citizen
0486	NY Environmental Management Commission, Erie County	State Government
0487	Hunton, Bobby	Private Citizen
0488	Committee to Bridge the Gap	Citizen/Environmental Group
0489	Silvergert, Andrea	Private Citizen

Commenter Number	Commenter	Organization Type
0490	Tanner, John	Private Citizen
0491	Gerdeman, Graham	Private Citizen
0492	The Wilson Family	Private Citizen
0493	TXU Electric- Comanche Peak Steam Electric Station	Utility
0494	Marsden, Janet	Private Citizen
0495	Cann, Roald	Private Citizen
0496	Millikan, Mona	Private Citizen
0497	Southern Nuclear Operating Company	Nuclear Industry
0498	United States Enrichment Corporation (USEC)	Utility
0499	Platt, Richard	Private Citizen
0500	Goettlich, Paul	Private Citizen
0501	Wobbe, Thomas	Private Citizen
0502	Griggs, Linda	Private Citizen
0503	Murray, Marie J.	Private Citizen
0504	Gerdeman, Gregory	Private Citizen
0505	Hull, Elizabeth	Private Citizen
0506	Quick, Betty	Private Citizen
0507	Gordon, Joshua	Private Citizen
0508	Newsom, Claire	Private Citizen
0509	Taylor, Parks	Private Citizen
0510	Massachusetts Citizens for Safe Energy	Citizen/Environmental Group
0511	Hanrahan Clare, and Petrie, Noel	Private Citizen
0512	Sayles, Richard	Private Citizen
0513	Swatland, CindyLynn	Private Citizen
0514	Earth Day Coalition	Citizen/Environmental Group
0515	Shannon, Joellen	Private Citizen
0516	Casten, Liane	Private Citizen
0517	Van Hoy, David	Private Citizen
0518	Christopherson, Jeff	Private Citizen
0519	Cornett Environmental Consulting	Citizen/Environmental Group
0520	Serious Texans Against Nuclear Dumpling (STAND)	Citizen/Environmental Group
0521	Hirt, Alice & Bill	Private Citizen
0522	Fuchs, Jay	Private Citizen
0523	Women's Energy Matters	Citizen/Environmental Group
0524	Keats, Larry	Private Citizen
0525	Women's International League for Peace and Freedom	Citizen/Environmental Group
0526	Fontenot, David	Private Citizen
0527	DeMare, Joseph	Private Citizen
0528	New York Office of the Attorney General	State Government
0529	New England Coalition on Nuclear Power	Citizen/Environmental Group
0530	Institute of Scrap Recycling Industries (ISRI)	Metals Industry
0531	Organizations United For Responsible Low-level Radioactive Waste Solutions	Citizen/Environmental Group

Commenter Number	Commenter	Organization Type
0532	Perreault, Laura	Private Citizen
0533	Dutton, Margaret	Private Citizen
0534	Frazier, Louise	Private Citizen
0535	Hoodwin, Marcia	Private Citizen
0536	Austin, Donald and Lehman, Joanne	Private Citizen
0537	Sacramento Municipal Utility District	Utility
0538	Sisters of St. Joseph Carondelet	Citizen/Environmental Group
0539	Glad, Gertrude	Private Citizen
0540	Moore, Janet	Private Citizen
0541	Botwinick, Joan	Private Citizen
0542	Collins, Jana	Private Citizen
0543	Cannon, John and Jeanne	Private Citizen
0544	Lyle, Elizabeth	Private Citizen
0545	Hilliard, Brian	Private Citizen
0546	Kuhn, Mary; Malootian, Anna; Carocari, Roger and Doris	Private Citizen
0547	Norris, Robert and Bockrader, Barbara	Private Citizen
0548	Wingeier, Douglas	Private Citizen
0549	Virginia Power	Utility
0550	Entergy Operations	Nuclear Industry
0551	North Atlantic Energy Service Corporation	Utility
0552	Gyr, Marian	Private Citizen
0553	Castor, James P.	Private Citizen
0554	Buck, Paul	Private Citizen
0555	Barger, Bobby	Private Citizen
0556	Ferguson, Jerry	Private Citizen
0557	McGiluny, Joan	Private Citizen
0558	McClure, Bonnie	Private Citizen
0559	Sea Coast Anti-Pollution League	Citizen/Environmental Group
0560	Parks, Christine	Private Citizen
0561	Sisters of St. Joseph	Citizen/Environmental Group
0562	Sisters of St. Joseph	Citizen/Environmental Group
0563	Cogelia, Nicholas and Mary	Private Citizen
0564	Westinghouse Electric Company	Utility
0565	Sport, Gloria	Private Citizen
0566	Doyle, Dorothy	Private Citizen
0567a	Nickel Development Institute	Metals Industry
0567b	Nickel Producers Environmental Research Association	Metals Industry
0567c	INCO United States, Inc.	Metals Industry
0568	Feuer, Al	Private Citizen
0569	Sierra Club Atlantic Chapter	Citizen/Environmental Group
0570	Metals Industry Recycling Coalition (MIRC)	Metals Industry
0571	Levin, Steve	Private Citizen
0572	Crouch, Brandon	Private Citizen
0573	Peterson, Diane J.	Private Citizen

Commenter Number	Commenter	Organization Type
0574	Rhoda, Katherine	Private Citizen
0575	Hutson, Harold and Virginia	Private Citizen
0575S	Hutson, Harold & Virginia	Private Citizen
0576	Hollums, Edna	Private Citizen
0577	Sythe, Dan	Private Citizen
0578	Rocky Mountain Peace and Justice Center	Citizen/Environmental Group
0579	Haney, Philip	Private Citizen
0580	Kenney, Anne	Private Citizen
0581	Wilmoth, Carole	Private Citizen
0582	Pliskin, Rob	Private Citizen
0583	Viereck, Jennifer	Private Citizen
0584	Clark, Donna	Private Citizen
0585	Center for Safe Energy	Citizen/Environmental Group
0586	McGaugh, Patrick	Private Citizen
0587	Evans, Hazel	Private Citizen
0588	Mazzetti, Michael	Private Citizen
0589	Radioactive Evaluation and Action Project Great Lakes	Citizen/Environmental Group
0590	Kimball, David	Private Citizen
0591	Ponzi, Jean	Private Citizen
0592	Schmiff, Juliana	Private Citizen
0593	King, Joan O.	Private Citizen
0594	Callner, Amy	Private Citizen
0595	North Carolina Waste Awareness & Reduction Network	Citizen/Environmental Group
0596	New England Coalition on Nuclear Pollution and Environmental Coalition on Nuclear Power	Citizen/Environmental Group
0597	Proposition One Committee	Citizen/Environmental Group
0598	Kirkpatrick, Joanna	Private Citizen
0599	Sierra Club	Citizen/Environmental Group
0600	Crawford, Dave	Private Citizen
0601	Fieldseth, Henry	Private Citizen
0602	Bertell, Rosalie	Private Citizen
0603	Forrester, Scott	Private Citizen
0604	Heinrich, Barbara	Private Citizen
0605	McGann, Anna	Private Citizen
0606	Muller, Morris B.	Private Citizen
0607	Gunter, Keith	Private Citizen
0608	Name not provided	Private Citizen
0609	Cumbow, Kay	Private Citizen
0610	Andrys, Rob	Private Citizen
0611	Halpern, Dick	Private Citizen
0612	U. S. Department of the Army	Federal Government
0613	National Mining Association	Mining Industry
0614	Hoy, Annie	Private Citizen

Commenter Number	Commenter	Organization Type
0615	FirstEnergy Nuclear Operating Company (FENOC)	Nuclear Industry
0616	Knope, Muriel A.	Private Citizen
0617	Ashley, Joanne	Private Citizen
0618	Stubbs, Louise C.	Private Citizen
0619	Miller, Carolyn A.	Private Citizen
0620	Keegan, Michael J.	Private Citizen
0621	Jones, Rebeccah	Private Citizen
0622	Fiels, Craig O.	Private Citizen
0623	Lewis, Sherie	Private Citizen
0624	St. John's Church	Citizen/Environmental Group
0625	Van Dame, Kathy	Private Citizen
0626	Don't Waste Connecticut	Citizen/Environmental Group
0627	Fishman, Ralph	Private Citizen
0628	Name Not Provided	Private Citizen
0629	Hart, Bruce	Private Citizen
0630	Camara, Tom	Private Citizen
0631	McCann, Laurie	Private Citizen
0632	United States Senate	Federal Government
0633	Lum, Allen	Private Citizen
0634	Gannis, Steve	Private Citizen
0635	Edwards, Alyce F.	Private Citizen
0636	Avery, W. H.	Private Citizen
0637	Daniel, Caitlin & Bruce	Private Citizen
0638	Campaign for a Prosperous Georgia	Citizen/Environmental Group
0639	Northern States Power Company	Nuclear Industry
0640	Collier Dennis, Virginia	Private Citizen
0641	White, Barbara	Private Citizen
0642	CURE Communities United for Responsible Energy	Citizen/Environmental Group
0643	Detroit Edison	Utility
0644	New York Power Authority	Nuclear Industry
0645	North American Water Office	Citizen/Environmental Group
0646	Frankel, Helene	Private Citizen
0647	Shaw, Sally	Private Citizen
0648	O'Donnell, Alice	Private Citizen
0649	Public Citizen's Critical Mass Energy Project & Nuclear Information and Resource Service	Citizen/Environmental Group
0649S	Public Citizen's Critical Mass Energy Project & Nuclear Information and Resource Service	Citizen/Environmental Group
0650	Lambert, Leonore S.	Private Citizen
0651	Benner, Robert L.	Private Citizen
0652	Keenan, Barbara	Private Citizen
0653	Ripper, M.	Private Citizen
0654	Tucker, Betty	Private Citizen

Commenter Number	Commenter	Organization Type
0655	Robinson, Zachary	Private Citizen
0656	Sommers, Pola	Private Citizen
0657	Baker, Sheila	Private Citizen
0658	Ring, Joseph P.	Private Citizen
0659	Nuclear Energy Institute (NEI)	Nuclear Industry
0660	American Iron and Steel Institute (AISI)	Metals Industry
0661	Sierra Club Atlantic Chapter	Citizen/Environmental Group
0662	Eldon, Jim	Private Citizen
0663	Osborne, Orval	Private Citizen
0664	Frost, Matthew	Private Citizen
0665	Podgurski, Craig	Private Citizen
0666	Davis, Sue Ellen	Private Citizen
0667	Not Able to Decipher Name	Private Citizen
0668	Jacobs, D. J.	Private Citizen
0669	Palmisano, Bill	Private Citizen
0670	Groundwork for a Just World	Citizen/Environmental Group
0671	Anderson, Jean K.	Private Citizen
0672	OECD Nuclear Energy Agency's Co-operative Programme on Decommissioning	Citizen/Environmental Group
0673	Arizona Public Service Company (APS)	Nuclear Industry
0674	Costin, Carolyn	Private Citizen
0675	Schwartzman, Henry	Private Citizen
0676	Blair, David	Private Citizen
0677	Montgomery, Richard	Private Citizen
0678	Fogel, Jerise	Private Citizen
0679	Whitefield, Anne	Private Citizen
0680	Grover, Ravi	Private Citizen
0681	Duke Power	Utility
0682	Commonwealth Edison Company	Utility
0683	Illinois Department of Nuclear Safety	State Government
0684	Maxwell Vassilakis, Noemie	Private Citizen
0685	Johnson, Nancy	Private Citizen
0686	Envirocare of Utah	Citizen/Environmental Group
0687	Steel Manufacturers Association (SMA)	Metals Industry
0688	Kramer, Scott	Private Citizen
0689	Brody, Lise	Private Citizen
0690	Name Not Provided	Private Citizen
0691	Bard College	Educational Institution
0692	Olchoff, Lydia	Private Citizen
0693	Radant, Jeff	Private Citizen
0694	Heath, Averil	Private Citizen
0695	Boksa, Leonard	Private Citizen
0696	Parrish, Linda	Private Citizen
0697	Frostholm, Donna	Private Citizen
0698	Martineau, Claire	Private Citizen
0699	Stetson, Judith	Private Citizen

Commenter Number	Commenter	Organization Type
0700	Manasota-88	Citizen/Environmental Group
0701	Wozniak, Brian	Private Citizen
0702	Wozniak, C.R.	Private Citizen
0703	Gondeck, Fred	Private Citizen
0704	Nosfinger, Mary & Robert	Private Citizen
0705	Leighdee, Bicknell	Private Citizen
0706	Babelay, Susan	Private Citizen
0707	Wysocki, Jessica	Private Citizen
0708	Brenneman, Mary	Private Citizen
0709	Pohly, Gerald A.	Private Citizen
0710	Hannum, Hildegarde	Private Citizen
0710S	Hannum, Hildegard	Private Citizen
0711	Morgan, Lorraine	Private Citizen
0712	Gamson, Mary E.	Private Citizen
0713	Weiskopf, Richard W.	Private Citizen
0714	Meck, Dolores M.	Private Citizen
0715	DenHartog, Jerry	Private Citizen
0716	Mattoon, Tom	Private Citizen
0717	Nelson, Michael T.	Private Citizen
0718	State of Georgia	State Government
0719	Seitzer, Bruce	Private Citizen
0720	Goodman, Sidney J.	Private Citizen
0721	Keasbey, Edie	Private Citizen
0722	Bubala, Lou	Private Citizen
0723	Donn, Marjory M.	Private Citizen
0724	Citizens Action Coalition of Indiana	Citizen/Environmental Group
0725	LeBow, Daniel B.	Private Citizen
0726	Todd, Russell	Private Citizen
0727	Sartor, Jason	Private Citizen
0728	Vermont Public Interest Research Group	Citizen/Environmental Group
0729	Martin, J.	Private Citizen
0730	Bonnarens, Corlita	Private Citizen
0731	Peace Action - Wisconsin	Citizen/Environmental Group
0732	Committee for Nuclear Responsibility	Citizen/Environmental Group
0733	MacWilliams, Beverly A.	Private Citizen
0734	Higgins, Shawn W.	Private Citizen
0735	Comerford, Sherma	Private Citizen
0736	Boardman, Nancy	Private Citizen
0737	Hauser, Lenore	Private Citizen
0738	Maniscalco, Pete and Joyce, Stephanie	Private Citizen
0739	Wilson, V.	Private Citizen
0740	PP&L, Inc.	Nuclear Industry
0741	Wells, Mrs. Harold N.	Private Citizen
0742	DeStefano, Linda	Private Citizen
0743	Steward, John A.	Private Citizen
0744	Svoboda, Terese	Private Citizen

Commenter Number	Commenter	Organization Type
0745	DeBolt, Bob	Private Citizen
0746	Dushkind, Winnie	Private Citizen
0747	Grage Haug, Jody	Private Citizen
0748	Davis, Jay	Private Citizen
0749	Keene, Emily	Private Citizen
0750	Stokes, Katherine S.	Private Citizen
0751	Chrisulls, Marika	Private Citizen
0752	Muller, Bernice	Private Citizen
0753	Fanucchi, Victor	Private Citizen
0754	Bronstein, Linda	Private Citizen
0755	Oliver, Joseph William	Private Citizen
0756	Jike, Thomas M.	Private Citizen
0757	Regis, Mark	Private Citizen
0758	Bernardo, Jennifer	Private Citizen
0759	Simone, Gail E.	Private Citizen
0760	Dorman, Dorotheya	Private Citizen
0761	Weiss, Illa A.	Private Citizen
0762	The Wilson Family	Private Citizen
0763	Greenberg, Alan	Private Citizen
0764	Griffin, Jo Ann	Private Citizen
0765	Miller, Donald	Private Citizen
0766	Miller, Suzanne	Private Citizen
0767	Rogers, Marliss A.	Private Citizen
0768	Mrs. Hughes	Private Citizen
0768S	Mrs. Hughes	Private Citizen
0769	Patterson, Jean	Private Citizen
0770	Griffin, Malcolm B.	Private Citizen
0771	Shields, Maria C.	Private Citizen
0772	Mertens, Mary Ellen	Private Citizen
0773	Moffetts, Tim	Private Citizen
0774	Wheatman, Michael P.	Private Citizen
0775	Vu, Heip Q.	Private Citizen
0776	Thauh, Tawny	Private Citizen
0777	Peters, Mark	Private Citizen
0778	Poser, Lawrence	Private Citizen
0779	Smith, Stanislav	Private Citizen
0780	Thompson, Dorothy	Private Citizen
0781	Jabs, Sharon	Private Citizen
0782	Trakselis, John & Patricia	Private Citizen
0783	Kortendick, Susan	Private Citizen
0784	Wright, Judith	Private Citizen
0785	Niederhausen, Hanne	Private Citizen
0786	Theiler, Krista	Private Citizen
0787	Breilid, Erik	Private Citizen
0788	DeWitt, Shirley	Private Citizen
0789	DeWitt, Toni and Bob Heim	Private Citizen

Commenter Number	Commenter	Organization Type
0790	Name Not Provided	Private Citizen
0791	Bradt, Samuel	Private Citizen
0792	Schattauer, Paul C.	Private Citizen
0793	Wright, Marjorie J.	Private Citizen
0794	McGheehan, Carol	Private Citizen
0795a	Smith, Chris	Private Citizen
0795b	Gremada, Harry	Private Citizen
0795c	Santura, Hau	Private Citizen
0795d	Hara, Frank	Private Citizen
0796	Fuller, Victoria B.	Private Citizen
0797	Henley, Lois B.	Private Citizen
0798	Stitely, Jeff	Private Citizen
0799	Perez, Richard S.	Private Citizen
0800	Grimmenga, Gale	Private Citizen
0801	Dunn, Christopher	Private Citizen
0802	McCollom, Jerome	Private Citizen
0803	Bradley, Matthew	Private Citizen
0804	Luxem, David A.	Private Citizen
0805	Ontoveros, Cordelia	Private Citizen
0806	Burke, Delia	Private Citizen
0807	Lane, Lauren	Private Citizen
0808	Visser, Barbara	Private Citizen
0809	DeWitt, Dawn	Private Citizen
0810	Siegal, Larry	Private Citizen
0811	Newan, Rene	Private Citizen
0812	McCambridge, Nancy	Private Citizen
0813	Davidson, Anne & Norm	Private Citizen
0814	LeFort, Eileen and Paul	Private Citizen
0815	Zwell, Michael	Private Citizen
0816	Wright, Robert J.	Private Citizen
0817	Saltzman, Dale	Private Citizen
0818	Goodman, Sidney J.	Private Citizen
0819	Christie, Jean	Private Citizen
0819S	Christie, Jean	Private Citizen
0820	Forman, Joshua	Private Citizen
0821	Geary, Barbara	Private Citizen
0822	Cohen, Bobbie	Private Citizen
0823	Kluglein, June	Private Citizen
0824	Brody, Lise	Private Citizen
0825	Humphrey, Vivian	Private Citizen
0826	Allison, Melody	Private Citizen
0827	Schenfelt, Jessica	Private Citizen
0828	Berg, Erik	Private Citizen
0829	Rose, Lidian A.	Private Citizen
0830	Rubinstein, Joseph and Bette	Private Citizen
0831	Cicirelli, Anna	Private Citizen

Commenter Number	Commenter	Organization Type
0832	United States Senate Committee on Environment and Public Works	Federal Government
0833	Sokolinsky, Myrna	Private Citizen
0834	Sabbeth, Shirley	Private Citizen
0834S	Sabbeth, Shirley	Private Citizen
0835	Klunk, Edward T.	Private Citizen
0836	Gonick, Wendy and DiPerna, Jeff	Private Citizen
0837	Mays, James S.	Private Citizen
0838	Samet, Shelley	Private Citizen
0839	Delves, Donald	Private Citizen
0840	von Wettberg, Norman	Private Citizen
0841	Fitzgerald, R. James	Private Citizen
0842	Hazard, Susan L.	Private Citizen
0843	Martin, William B., Jr.	Private Citizen
0844	Stone, Nancy	Private Citizen
0845	Faso, Charles	Private Citizen
0846	Ehrlich, Etta B.	Private Citizen
0847	Grasse, John and Julie	Private Citizen
0848	Ruopp, Kathleen	Private Citizen
0849	Riley, Elizabeth	Private Citizen
0850	Forrest, Lynn	Private Citizen
0851	Rusk, Carolyn	Private Citizen
0852	Moscow, Barbara and Harold	Private Citizen
0853	Merckx, Guy	Private Citizen
0854	Public Citizen	Citizen/Environmental Group
0855	Rich and Celeste	Private Citizen
0856	Cattail Music	Private Citizen
0857	City of Davis, California	Local Government
0858	McCormick, Bill	Private Citizen
0859	Bushnell, Martha	Private Citizen
0860	Williams, Don	Private Citizen
0861	Siu, Marion and Ming	Private Citizen
AT001	U.S. Department of Energy, Oak Ridge Operations	Federal Government
AT002	U.S. Department of State	Federal Government
AT003	U.S. Environmental Protection Agency	Federal Government
AT004*	Georgians Against Nuclear Energy	Citizen/Environmental Group
AT004a	Physicians for Social Responsibility/ Atlanta	Citizen/Environmental Group
AT004aa	Don't Waste Michigan	Citizen/Environmental Group
AT004ab	Pennsylvania Environmental Network	Citizen/Environmental Group
AT004ac	San Luis Obispo Mothers for Peace	Citizen/Environmental Group
AT004ad	Peace Action - Texas	Citizen/Environmental Group
AT004ae	Water Information Network	Citizen/Environmental Group
AT004af	Prairie Island Coalition	Citizen/Environmental Group
AT004ag	Citizens Awareness Network	Citizen/Environmental Group
AT004ah	Nevada Nuclear Waste Task Force	Citizen/Environmental Group

Commenter Number	Commenter	Organization Type
AT004ai	For A Clean Tonawanda Site, Inc. (FACTS)	Citizen/Environmental Group
AT004aj	North American Water Office, Minnesota	Citizen/Environmental Group
AT004ak	North American Water Office, Oregon	Citizen/Environmental Group
AT004aL	Community Organizing Center, Columbus, OH	Citizen/Environmental Group
AT004am	Redwood Alliance	Citizen/Environmental Group
AT004an	EcoBridge	Citizen/Environmental Group
AT004ao	Hanford Watch	Citizen/Environmental Group
AT004ap	Citizens Action Coalition of Indiana	Citizen/Environmental Group
AT004aq	Steppin' Out	Citizen/Environmental Group
AT004ar	Earthwise Co.	Citizen/Environmental Group
AT004as	KRLCP, Inc. / TuffBaggs	Citizen/Environmental Group
AT004at	Safeguard Our State Committee, Arizona	Citizen/Environmental Group
AT004au	Center for Energy Research	Citizen/Environmental Group
AT004av	Green Party of Ohio	Citizen/Environmental Group
AT004aw	Madera County Greens, California	Citizen/Environmental Group
AT004ax	Catholic Worker Organization of Ithaca, New York	Citizen/Environmental Group
AT004ay	MothersAlert	Citizen/Environmental Group
AT004az	Save Ward Valley, California	Citizen/Environmental Group
AT004b	District 66: Scottsdale, GA	Local Government
AT004ba	Nuclear Free New York	Citizen/Environmental Group
AT004bb	e-ESL/ Maple School, San Fransisco, CA	Citizen/Environmental Group
AT004bc	Americans for a Safe Future	Citizen/Environmental Group
AT004bd	Central New York - Citizens Awareness Network	Citizen/Environmental Group
AT004be	Radiological Evaluation and Action Project - Great Lakes	Citizen/Environmental Group
AT004bf	Chenengo North Energy Awareness Group, NY	Citizen/Environmental Group
AT004bg	Don't Waste Arizona, Inc.	Citizen/Environmental Group
AT004bh	Air, Water, Earth, Org.	Citizen/Environmental Group
AT004bi	Arizona Safe Energy Coalition	Citizen/Environmental Group
AT004bj	Hudspeth Directive for Conservation, TX	Citizen/Environmental Group
AT004bk	Earth Cycles, LTD.	Citizen/Environmental Group
AT004bL	Uptown Multi-Cultural Art Center, Chicago IL	Citizen/Environmental Group
AT004bm	Earth Day Coalition	Citizen/Environmental Group
AT004bn	Toledo Coalition for Safe Energy	Citizen/Environmental Group
AT004bo	Citizens for Alternatives to Chemical Contamination, Citizens for a Healthy Planet	Citizen/Environmental Group
AT004bp	Environmental Advocates	Citizen/Environmental Group
AT004bq	Environmental Response Network	Citizen/Environmental Group
AT004br	Stockton Peace Action	Citizen/Environmental Group
AT004bs	Don't Waste Oregon	Citizen/Environmental Group
AT004bt	Unplug Salem Campaign	Citizen/Environmental Group
AT004bu	California Communities Against Toxics	Citizen/Environmental Group

Commenter Number	Commenter	Organization Type
AT004bv	Vermont Public Interest Research Group	Citizen/Environmental Group
AT004bw	Hyper PR	Citizen/Environmental Group
AT004bx	Grandparents of East Harris County Texas	Citizen/Environmental Group
AT004by	Citizens Protecting Ohio (C-PRO)	Citizen/Environmental Group
AT004bz	Tippecanoe Environmental Council	Citizen/Environmental Group
AT004c	20/20 VISION Georgia	Citizen/Environmental Group
AT004ca	Waste Action Project	Citizen/Environmental Group
AT004cb	Sound & Hudson Against Atomic Development (SHAD)	Citizen/Environmental Group
AT004cc	Blue Ridge Environmental Defense League	Citizen/Environmental Group
AT004cd	Inner Ear	Citizen/Environmental Group
AT004ce	Heartland Operation to Protect the Environment	Citizen/Environmental Group
AT004cf	Center for Biological Monitoring	Citizen/Environmental Group
AT004cg	Friends of the Coast - Opposing Nuclear Pollution	Citizen/Environmental Group
AT004ch	Citizens Action for Safe Energy	Citizen/Environmental Group
AT004ci	Southwest Toxic Watch	Citizen/Environmental Group
AT004cj	Long Island Alliance for Peaceful Alternatives	Citizen/Environmental Group
AT004ck	Women's Action for New Directions (WAND)	Citizen/Environmental Group
AT004cL	Nuclear Information and Resource Service	Citizen/Environmental Group
AT004cm	Public Citizen	Citizen/Environmental Group
AT004cn	US Public Interest Research Group	Citizen/Environmental Group
AT004co	Safe Energy Communication Council	Citizen/Environmental Group
AT004cp	Global Resource Action Center for the Environment (GRACE)	Citizen/Environmental Group
AT004cq	Radiation and Public Health Project	Citizen/Environmental Group
AT004cr	Nukewatch	Citizen/Environmental Group
AT004cs	GE Stockholders' Alliance	Citizen/Environmental Group
AT004ct	Physicians for Social Responsibility	Citizen/Environmental Group
AT004cu	Greenpeace	Citizen/Environmental Group
AT004cv	Children of Chernobyl Relief Fund	Citizen/Environmental Group
AT004cw	Women's Environment and Development Organization	Citizen/Environmental Group
AT004cx	Grandmothers for Peace International	Citizen/Environmental Group
AT004cy	Center for Safe Energy, Earth Island Institute	Citizen/Environmental Group
AT004cz	Friends of the Earth International	Citizen/Environmental Group
AT004d	Atlanta Women's Action for New Directions (WAND)	Citizen/Environmental Group
AT004da	Nuclear Democracy Network	Citizen/Environmental Group
AT004db	Y2K World Atomic Safety Holiday - WASH Campaign	Citizen/Environmental Group
AT004dc	Nuclear Guardianship Project	Citizen/Environmental Group
AT004dd	World Information Service on Energy - WISE International	Citizen/Environmental Group
AT004de	Reseau Sortir du Nucleaire	Citizen/Environmental Group

Commenter Number	Commenter	Organization Type
AT004df	Hall, Kev	Private Citizen
AT004dg	Lewis, Marvin	Private Citizen
AT004dh	Savage, J.A.	Private Citizen
AT004di	Siegel, Howard	Private Citizen
AT004dj	Pryor, Peggy	Private Citizen
AT004dk	Cockerill, Amy	Private Citizen
AT004dL	Strahan, Eric	Private Citizen
AT004dm	Richardson, Barbara S.	Private Citizen
AT004dn	Ortman, Debbie	Private Citizen
AT004do	Gerdeman, Graham	Private Citizen
AT004dp	Nagy, Jennifer	Private Citizen
AT004dq	Bloustine, Karen	Private Citizen
AT004dr	Shively, Scott	Private Citizen
AT004ds	Charman, Karen	Private Citizen
AT004dt	Dawson, Richard	Private Citizen
AT004du	Chappell, David W.	Private Citizen
AT004e	Food not Bombs	Citizen/Environmental Group
AT004f	Earth Challenge	Citizen/Environmental Group
AT004g	Coalition for a Healthy Environment	Citizen/Environmental Group
AT004h	American Environmental Health Studies Project	Citizen/Environmental Group
AT004i	Nashville Peace Action	Citizen/Environmental Group
AT004j	We The People, Inc. of Tennessee, Alliance for Public Health and Safety	Citizen/Environmental Group
AT004k	Uranium Enrichment Project, Earth Island Institute	Citizen/Environmental Group
AT004L	Portsmouth/Piketon Residents for Environmental Safety and Security (PRESS)	Citizen/Environmental Group
AT004m	Carolina Peace Resource Center	Citizen/Environmental Group
AT004n	Conservation Council of North Carolina	Citizen/Environmental Group
AT004o	North Carolina Waste Awareness and Reduction Network (NC WARN)	Citizen/Environmental Group
AT004p	Peoples' Action for a Safe Environment (PASE)	Citizen/Environmental Group
AT004q	ECO	Citizen/Environmental Group
AT004r	Three Mile Island Alert	Citizen/Environmental Group
AT004s	Physicians for Social Responsibility/ Los Angeles	Citizen/Environmental Group
AT004t	Environmental Coalition on Nuclear Power	Citizen/Environmental Group
AT004u	Nuclear Energy Information Service	Citizen/Environmental Group
AT004v	Healing Global Wounds	Citizen/Environmental Group
AT004w	Central Pennsylvania Citizens for Survival	Citizen/Environmental Group
AT004x	Connecticut Opposed to Waste	Citizen/Environmental Group
AT004y	Grass Roots Environmental Organization in NJ	Citizen/Environmental Group
AT004z	Arizona Toxics Information	Citizen/Environmental Group
AT005	Westinghouse Savannah River Company	Nuclear Industry

Commenter Number	Commenter	Organization Type
AT006	Millenium Service, Inc.	Nuclear Industry
AT007	Entergy Services, Inc.	Nuclear Industry
AT008	Nuclear Energy Institute (NEI)	Nuclear Industry
AT009	Georgia Department of Natural Resources, Radioactive Materials Program	State Government
AT010	Chemical Nuclear Systems	Nuclear Industry
AT011	U.S. Environmental Protection Agency	Federal Government
AT012	Tennessee Division of Radiological Health	State Government
AT013	Nuclear Fuel Services	Nuclear Industry
AT014	American Iron and Steel Institute (AISI)	Metals Industry
AT016	Association of Radioactive Metal Recyclers	Metals Industry
AT017	Institute of Scrap Recycling Industries (ISRI)	Metals Industry
AT018	Manufacturing Sciences Corporation	Nuclear Industry
AT019	Allied Technological Group, Inc.	Nuclear Industry
AT020	South Carolina Bureau of Land and Waste Management	State Government
AT021	Tennessee Valley Authority	Nuclear Industry
AT022	Westinghouse Electrical Corporation	Utility
AT023	Maine Office of Nuclear Safety	State Government
AT024	Allied Signal, Inc.	Nuclear Industry
AT025	American Iron and Steel Institute (AISI) and LTV Steel Company	Metals Industry
AT026	Steel Manufacturers Association and AmeriSteel	Metals Industry
AT027	David J. Joseph Company	Metals Industry
AT028	Unidentified Speaker (s)	Unidentified Speaker/Commenter
CH001	National Coalition of Organized Women	Citizen/Environmental Group
CH002	Balch, Jeff	Private Citizen
CH003	U.S. Environmental Protection Agency, Region V	Federal Government
CH004	Metals Industry Recycling Coalition (MIRC)	Metals Industry
CH005*	Nuclear Energy Information Service	Citizen/Environmental Group
CH005a	Friends of the Earth, US and UK	Citizen/Environmental Group
CH005aa	MCS Health and Environment	Citizen/Environmental Group
CH005ab	Chicago Student Environmental Alliance	Citizen/Environmental Group
CH005ac	Home of Peace and Justice	Citizen/Environmental Group
CH005ad	West Michigan Environmental Action Council	Citizen/Environmental Group
CH005ae	Nuclear Information and Research Service	Citizen/Environmental Group
CH005b	Physicians for Social Responsibility	Citizen/Environmental Group
CH005c	Alliance for Nuclear Accountability	Citizen/Environmental Group
CH005d	Low Level Radiation Campaign, UK	Citizen/Environmental Group
CH005e	US Public Interest Research Group	Citizen/Environmental Group
CH005f	Project on Government Oversight	Citizen/Environmental Group
CH005g	North American Water Office	Citizen/Environmental Group
CH005h	Illinois Public Research Interest Group	Citizen/Environmental Group
CH005i	Citizens for a Healthy Planet	Citizen/Environmental Group

Commenter Number	Commenter	Organization Type
CH005j	BOND	Citizen/Environmental Group
CH005k	Coalition for a Safe Environment	Citizen/Environmental Group
CH005L	Help the Environment	Citizen/Environmental Group
CH005m	AWARE	Citizen/Environmental Group
CH005n	Don't Waste Ohio	Citizen/Environmental Group
CH005o	Ohio Citizen Action	Citizen/Environmental Group
CH005p	Environmental Coalition on Nuclear Power	Citizen/Environmental Group
CH005q	Central Pennsylvania Citizens for Survival	Citizen/Environmental Group
CH005r	Shunda High Network	Citizen/Environmental Group
CH005s	Nuke Watch	Citizen/Environmental Group
CH005t	Citizens Action Coalition of Indiana	Citizen/Environmental Group
CH005u	Don't Waste Michigan	Citizen/Environmental Group
CH005v	Coalition for a Nuclear Free Great Lakes	Citizen/Environmental Group
CH005w	Citizens Resistance at Fermi 2	Citizen/Environmental Group
CH005x	Women's International League for Peace and Freedom	Citizen/Environmental Group
CH005y	Citizens Awareness Network	Citizen/Environmental Group
CH005z	Committee on New Priorities	Citizen/Environmental Group
CH006	State of Texas	State Government
CH007	American Iron and Steel Institute (AISI)	Metals Industry
CH008	Illinois Department of Nuclear Safety	State Government
CH009	U.S. Environmental Protection Agency	Federal Government
CH010	U.S. Army	Federal Government
CH011	American Nuclear Society and Consumers Energy	Professional Association
CH012	Michigan State University	Educational Institution
CH013	Cherokee and Opinny Tribes	Native American Organization
CH014	Nuclear Energy Institute (NEI)	Nuclear Industry
CH015	Paper Allied-Industrial, Chemical and Energy Workers International Union	Labor Union
CH016	American Iron and Steel Institute (AISI)	Metals Industry
CH017	American Environmental Health Studies Project	Citizen/Environmental Group
CH018	American Iron and Steel Institute (AISI)	Metals Industry
CH019	Commonwealth Edison	Utility
CH020	First Energy	Utility
CH021	U.S. Department of Energy	Federal Government
CH022	Detroit Edison - Fermi 2 Nuclear Power Plant	Utility
CH023	Institute of Scrap Recycling Industries (ISRI)	Metals Industry
CH024	Illinois Environmental Protection Agency	State Government
CH025	Quasey, Kathy	Private Citizen
CH026	Texas Natural Resources Conservation Commission	State Government
CH027	AK Steel Corporation	Metals Industry
CH028	Northeast Utilities	Utility
CH029	Blue Island Greens	Citizen/Environmental Group

Commenter Number	Commenter	Organization Type
CH030	Steel Manufacturers Association and AmeriSteel	Metals Industry
CH031	Portland Cement Association	Cement Industry
CH032	Citizens Action Coalition of Indiana	Citizen/Environmental Group
CH033	Woldenberg, Sue	Private Citizen
MD001	Natural Resources Defense Council	Citizen/Environmental Group
MD002	Mallinckrodt Medical, Inc.	Nuclear Medicine
MD003	American Iron and Steel Institute (AISI) and Bethlehem Steel	Metals Industry
MD004*	Nuclear Information and Resource Service	Citizen/Environmental Group
MD004b	Safe Energy Communication Counsel	Citizen/Environmental Group
MD004c	Public Citizen	Citizen/Environmental Group
MD004d	Friends of the Earth, US and UK	Citizen/Environmental Group
MD004e	Green Peace	Citizen/Environmental Group
MD004f	Alliance for Nuclear Accountability	Citizen/Environmental Group
MD004g	Low Level Radiation Campaign	Citizen/Environmental Group
MD004h	Clean Water Action	Citizen/Environmental Group
MD004i	Peace Action	Citizen/Environmental Group
MD005	Association of State and Territorial Solid Waste Management Officials	Professional Association
MD006	Nuclear Energy Institute (NEI)	Nuclear Industry
MD007	Southern California Edison	Utility
MD008	Paper Allied-Industrial, Chemical and Energy Workers International Union	Labor Union
MD009	Umetco Minerals Corporation	Nuclear Industry
MD010	Public Citizen	Citizen/Environmental Group
MD011	George Washington University	Educational Institution
MD012	New England Coalition on Nuclear Power	Citizen/Environmental Group
MD013	Environmental Coalition on Nuclear Power, Pennsylvania	Citizen/Environmental Group
MD014	U.S. Environmental Protection Agency	Federal Government
MD015	Nuclear Energy Institute and Fuel Cycle Facilities Forum	Citizen/Environmental Group
MD016	Oneida Nation	Native American Organization
MD017	Commercial Metals Steel Group - SMI Texas	Metals Industry
MD018	New Jersey Department of Environmental Protection	State Government
MD019	Association of Radioactive Metal Recyclers	Metals Industry
MD021	Institute of Scrap Recycling Industries (ISRI)	Metals Industry
MD022	Massachusetts Department of Public Health	State Government
MD023	Organizations United, Division of Nuclear Medicine	Citizen/Environmental Group
MD024	Health Physics Society and Harvard University	Professional Association
MD025	U.S. Department of State	Federal Government
MD026	David J. Joseph Company	Metals Industry
MD027	Western States Legal Foundation	Citizen/Environmental Group

Commenter Number	Commenter	Organization Type
MD028	Specialty Steel Industry of North America (SSINA)	Metals Industry
MD029	U.S. Department of Energy	Federal Government
MD030	Siemens Power Corporation	Utility
MD031	Fuller, Ernest	Private Citizen
MD032	State of Maine	State Government
MD033	U.S. Army Corps of Engineers	Federal Government
MD034	American Iron and Steel Institute (AISI)	Metals Industry
MD035	Sierra Club	Citizen/Environmental Group
MD036	Lux, Jeff	Private Citizen
MD037	American Iron and Steel Institute (AISI)	Metals Industry
MD038	Morton, Henry	Private Citizen
MD039	U.S. Air Force	Federal Government
NRC55	Unidentified	Private Citizen
NRC74	Nuclear Information and Resource Service and Public Citizen	Citizen/Environmental Group
NRC85	Leib, Robert	Private Citizen
SF001	Health Physics Society	Professional Association
SF002	San Onofre Nuclear Generating Station	Utility
SF003	Prairie Island Indian Community, MN	Native American Organization
SF004	Envirocare of Utah	Citizen/Environmental Group
SF005	U.S. Department of Energy	Federal Government
SF006	California State Department of Health Services	State Government
SF007	University of California, Office of the President	Educational Institution
SF008	Mallinckrodt Medical, Inc	Nuclear Medicine
SF009	Siemens Power Corporation	Utility
SF010	Entergy Operations, Inc.	Nuclear Industry
SF011	Los Angeles County Sanitation District	Local Government
SF012	American Iron and Steel Institute (AISI) and LTV Steel Company	Metals Industry
SF013	American Nuclear Society and Sargent and Lundy Consumers Energy	Professional Association
SF014	Nuclear Energy Institute (NEI)	Nuclear Industry
SF015	GTS Duratek	Metals Industry
SF016	Southern California Edison	Utility
SF017	U.S. Army Corps of Engineers	Federal Government
SF018	Committee to Bridge the Gap	Citizen/Environmental Group
SF019	U.S. Environmental Protection Agency	Federal Government
SF020	National Congress of American Indians	Native American Organization
SF021	Unidentified Speaker (s)	Unidentified Speaker/Commenter
SF022	Nuclear Energy Institute (NEI)	Nuclear Industry
SF023	San Francisco General Hospital and Radiology University of California	Nuclear Medicine
SF024	General Atomics	Nuclear industry
SF025	Tennessee Valley Authority	Nuclear Industry

Commenter Number	Commenter	Organization Type
SF026	David J. Joseph Company	Metals Industry
SF027	Steel Manufacturers Association and AmeriSteel	Metals Industry

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U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

10. SUPPLEMENTARY NOTES

11. ABSTRACT *(200 words or less)*

The Nuclear Regulatory Commission (NRC) is conducting an enhanced participatory public process to evaluate alternative courses of action for control of solid materials. NRC published an Issues Paper in the Federal Register (64 FR35090) on June 30, 1999. The purpose of the paper was to seek public input on issues associated with alternative courses of action for control of solid materials at NRC-licensed facilities that have very low amounts of, or no, radioactivity. NRC invited written comments on the paper and held a series of public meeting during the Fall of 1999 in San Francisco, CA; Atlanta, GA; Chicago, IL: and Rockville, MD. Extensive and wide-ranging comments were received at the four public meetings and in the written public comments. This report has been prepared to provide a digest of the public comments received from individuals and organizations, as well as those condensed from participants at the public work shops. Over 900 written comment letters were received on the Issues Paper in addition to those summarized from the public meeting transcripts. Most of these comments focus on the specific technical approach or criteria that should be developed. No analysis or response to comments is included in this report. The comments reflect a broad spectrum of viewpoints on the issues related to control of solid materials. This report makes the information submitted by the public on the Issues paper accessible, comments on this and other decision-making activities related to the control of solid materials will be included in the docketed record relating to this overall activity. The Issues paper has been included as an Appendix.

12. KEY WORDS/DESCRIPTORS *(List words or phrases that will assist researchers in locating the report.)*

Clearance, public comments, control of solid materials, recycle, reuse, exempted release, unrestricted release, restricted release

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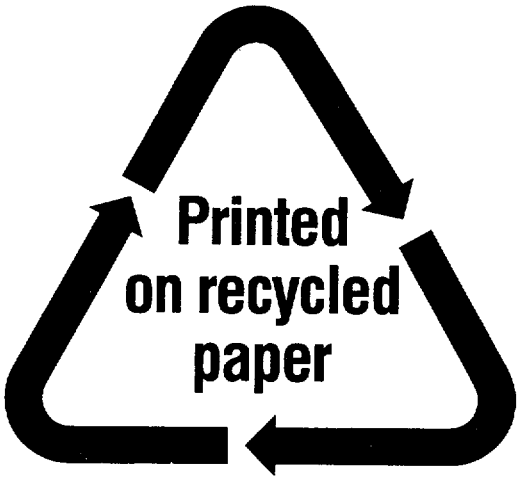

Federal Recycling Program

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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years