SCOPING SUMMARY REPORT

Controlling the Disposition of Solid Materials

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U.S. Nuclear Regulatory Commission
Rockville, MD

1. INTRODUCTION

The U.S. Nuclear Regulatory Commission (NRC) staff is preparing a generic environmental impact statement (GEIS) on the proposed rulemaking on controlling the disposition of solid materials. This rulemaking concerns materials at NRC-licensed facilities that have very low amounts of, or no, radioactivity. The purpose of the rulemaking is to continue to assure the control of the disposition of solid materials in a manner that protects public health and safety and the environment while improving efficiency in regulation. This GEIS is part of the NRC staff's decision-making process.

The NRC, the U.S. Environmental Protection Agency (EPA), the U.S. Department of Energy (DOE) and the States have an interest in the proposed rulemaking and have agreed to participate as cooperating agencies. EPA sets radiation protection standards in the general environment. DOE is preparing a Programmatic EIS on alternatives for disposition of DOE scrap metals at their facilities. Also, the proposed NRC rulemaking could result in related rulemakings in the Agreement States and Suggested State Regulations; the Conference of Radiation Control Program Directors (CRCPD) and the Organization of Agreement States (OAS) have identified the State of Massachusetts as the State representative in the preparation of the GEIS.

The NRC's regulations in 10 CFR Part 51 contain requirements for conducting a scoping process prior to preparation of an EIS. As part of the NRC staff's examination of its approach for control of solid materials, including the scope of an environmental impact statement, the NRC staff sought early input on the major issues associated with this effort. In June 1999, the NRC staff published an Issues Paper (64 FR 35090) for public comment that described issues and alternatives related to the release of solid materials. To provide further opportunity for public input, the NRC staff held a series of four public meetings during the fall of 1999. The NRC staff received over 800 public comment letters and emails from stakeholders representing the metals, metal scrap, and concrete industries; citizens groups; licensees and licensee organizations; landfill operators; Federal and State agencies; and Tribal governments. Comments were also received from stakeholders at the four public meetings. Comments were sharply diverse in the views expressed, and there was support and rationale provided by commenters for a range of alternatives for controlling the disposition of solid materials. On March 23, 2000, the NRC staff provided the Commission with a paper (SECY-00-0070) on the diversity of views expressed in public comments received on the Issues Paper. Attachment 2 of SECY–00–0070 provides a summary of views and comments received; summaries of the comments can also be viewed in NUREG/CR–6682, ''Summary and Categorization of Public Comments on the Control of Solid Materials'' (September 2000). SECY–00–0070 also provided the status of the staff's technical analyses being developed as support for making decisions in this area and noted the related actions of international and national organizations and agencies that could be factors in the NRC staff's decision-making.

To solicit additional input, the Commission held a public meeting on May 9, 2000, at which stakeholder groups presented their views and discussed alternatives for controlling the disposition of solid materials. On August 18, 2000, the Commission decided to defer a final decision on whether to proceed with rulemaking and directed the staff to request that the National Academies conduct a study of alternatives for controlling the disposition of solid

materials. The Commission also directed the staff to continue to develop technical information and to stay informed of international and U.S. agency activities in this area. The National Academies study of alternatives for controlling the disposition of solid materials was initiated in August 2000. As part of the study, the National Academies held three information gathering meetings in January, March, and June of 2001, at which it obtained input from various stakeholder groups similar to those that presented information to the NRC staff earlier. Based on these meetings, and on its deliberations on this topic, the National Academies submitted a report to the NRC in March 2002 ("The Disposition Dilemma - Controlling the Release of Solid Materials from Nuclear Regulatory Commission-licensed Facilities"). The report contains nine recommendations on the decision-making process, potential approaches for controlling the disposition of solid materials, and additional technical information needed. One finding of particular note in the National Academies report was that NRC's current approach for controlling the disposition of solid materials protects public health and does not need immediate revamping. However, the National Academies report also states that NRC's current approach is incomplete and inconsistent and concludes that the NRC staff should therefore conduct a process to evaluate a broad range of alternatives to provide clear risk-informed direction on controlling the disposition of solid materials. The report notes that broad stakeholder involvement and participation in the NRC staff's decision-making process on the alternatives is critical as the process moves forward. A summary of the National Academies report can be found in an NRC staff paper, SECY-02-0133, and a link to the National Academies report, itself, is contained in the Background section of the NRC's web page on Controlling the Disposition of Solid Materials (http://www.nrc.gov/materials.html; click on "Controlling the Disposition of Solid Materials" under "Key Issues").

As an additional part of its continuing efforts to solicit stakeholder involvement, the NRC staff published on February 28, 2003, a Request for Comments on the scope of a proposed rulemaking and notice of workshop in the Federal Register (68 FR 9595). In this Federal Register Notice, the NRC staff sought stakeholder participation and involvement in identifying alternatives and their environmental impacts that should be considered as part of a rulemaking and analyzed in a GEIS. The NRC staff also announced in this Federal Register Notice its intent to conduct a workshop to solicit new input with a focus on the feasibility of alternatives that would limit where solid materials could be released. The workshop was held at NRC Headquarters in Rockville, MD May 21-22, 2003. A summary of the results of this workshop is available on NRC's web page on Controlling the Disposition of Solid Materials.

Over 2,600 public comment letters and emails were received in addition to the discussion at the workshop. NUREG/CR-6682 Supplement 1 ("Summary and Categorization of Public Comments on Controlling the Disposition of Solid Materials," March 2004) summarizes the comments received as a result of the NRC staff's request for comment and the workshop discussion. Comments were received from various stakeholder groups, including environmental and citizen's groups, members of the general public, scrap and recycling companies, steel and cement manufacturers, hazardous and solid waste management facilities, the U.S. Environmental Protection Agency (EPA), U.S. Department of Energy (DOE), State agencies, Tribal Governments, scientific organizations, international organizations, and NRC licensees and licensee organizations.

The 1999 and 2003 public comments are summarized in Section 2 of this report. All comments received to date have been considered. The comments have been categorized to ease reader understanding of the issues raised.

The scoping process helped to determine the scope of the GEIS, including significant issues to be analyzed in depth. For example, in response to comments received during the scoping process, the GEIS will include an alternative where the potentially clearable material can only be disposed of in a licensed low-level waste (LLW) disposal facility. Issues outside the scope of the DGEIS have been forwarded to appropriate staff and may be discussed in other parts of the rulemaking package.

Section 3 identifies the issues the GEIS will address, and Section 4 identifies those issues that are not within the scope of the GEIS. Although issues raised during the scoping period will be considered in the preparation of the Draft GEIS, some of those issues will either be analyzed in less detail or will not be analyzed at all, depending on their relevance to the proposed action and the anticipated impacts. Issues that will be considered, but not analyzed in detail, are addressed in Section 4.

2. SCOPING COMMENT SUMMARY

2.1 INTRODUCTION

The comments were extensive and wide-ranging, focusing on specific alternatives and technical issues that should be considered as part of NRC's rulemaking process. In addition, there were numerous comments related to potential impacts on public health and safety as well as on various industries.

Some commenters indicated that there is a significant need to establish a national standard for the release of solid materials, citing a lack of consistency in criteria and problems with implementation under the current system. Others, however, believe that the current system is both protective and easily implement able. These groups cite reports by national and international standards setting bodies that indicate that health risks at dose levels being considered are negligible or trivial. Some commenters suggested that NRC adopt the American National Standards Institute (ANSI) standard N13.12-1999, Surface and Volume Radioactivity Standards for Clearance.

Many commenters stated that there should be no release of solid materials from licensed facilities even if the calculated dose or health risks are low. In particular, potential recipients of solid material, such as scrap, metals, and cement industry representatives, objected to the release of solid materials. These commenters noted that there could be significant negative economic impacts on their industries if consumers had concerns over the presence of radioactivity in products. A large number of citizen groups and members of the public also expressed concern about the health effects of the potential presence of released material in consumer products and recommended that NRC prohibit the release of this material to isolate it from the public. Some of these commenters further suggested that NRC should implement a program to identify and recover all materials previously released under the current regulation.

Commenters also described concerns with a restricted use alternative, citing possible oversight and enforce ability issues. A number of commenters discussed the possible alternative of disposal in either EPA-regulated or NRC/Agreement State-licensed disposal facilities. Most commenters believe that disposal in an NRC/Agreement State-licensed disposal facility is the most appropriate alternative.

A number of commenters provided input on the National Environmental Policy Act (NEPA) process which governs the development of the Generic Environmental Impact Statement. Still more commenters weighed in on NRC's rulemaking process.

2.2 NO ACTION/CURRENT APPROACH

Advantages of Current Approach

Protective: The current approach protects public health and safety; released materials are monitored; no one has been placed at risk from release of materials; the National Academies report concluded that it protects public health.

Current approach is useful: It has been a useful tool for 20 years; there is common understanding on how to use it; it is easier to implement than a dose-based approach because exposure pathways do not have to be calculated; the National Academies report concluded that it is workable.

Disadvantages of Current Approach

Criteria not risk-based: They are currently based on instrument detection capabilities and concentrations in effect since 1974; the NAS report notes that the criteria are not explicitly risk-based.

Not a good regulatory framework: The current approach does not provide an adequate or logical regulatory framework, and does not provide clear guidance.

Not cost-effective and a waste of resources: The current approach can cause substantial additional cost and resources, especially at decommissioning, and may cause replication of effort from previous submittals. Without clear guidance some material is currently disposed of as radioactive waste even though there is not enough radioactive material to cause an exposure. This is an inappropriate use of resources.

Implementation is inconsistent: There can be fluctuations in background, different geometries and nuclides, differences in instrumentation approaches and efficiencies, analytic techniques, and inconsistencies in use of the "non-detectable" guideline. It is slow, resource intensive, can be difficult to implement, and can cause questions. This is also noted in the NAS report.

Volumetric contamination not considered: Volumetric contamination is not considered; this is also noted in the NAS report.

Decision criteria needed: Materials need to be released from facilities each day (and more material will be available for release in the future because of decommissioning) and improved decision criteria are needed about what should be done with these materials.

Current standard can be redundant: It can entail redundancy of oversight between the NRC and State agencies.

Cumulative Impacts: Cumulative impacts are not considered.

General Opposition to the Current Approach

No records: There is concern that NRC allows release (and possible recycle) of solid material based on case-by-case considerations under Regulatory Guide 1.86. There is also concern that people had been exposed without their knowledge and whether there are records of material released so far. Any releases should be tracked and records kept available to the public.

Not safe: The current approach is unsafe, and unacceptable to the metals industry and the public. There are no scientific data or proof available to show that what has been released so far using Regulatory Guide 1.86 levels has not harmed the public. This approach should cease.

Warning labels: There must be warning labels at a minimum so these products could be avoided.

Outdated: Regulatory Guide 1.86 is out of date and should not be updated or used because it lacks the full force and legitimacy of a final rule done under the Administrative Procedures Act (APA).

Being misused: Regulatory Guide 1.86 was developed based on criteria for decontamination of buildings and not for releasing materials involving intimate public contact. Regulatory Guide 1.86 should not be misused to allow releases into the marketplace or converted to dose basis.

Do not use: Regulatory Guide 1.86 should be removed from licenses so that licensees cannot release radioactive wastes into garbage for landfills or the marketplace.

2.3 DOSE-BASED REGULATION ON UNRESTRICTED USE

In general, comments on the dose-based regulation on unrestricted use alternative can best be characterized by stakeholder grouping. Therefore the comments in this section are presented by stakeholder group.

2.3.1 Citizen Groups and General Public

Unrestricted Release of Contaminated Materials

General opposition: Several commenters generally indicated that they were opposed to releasing materials for unrestricted release.

Health/Risk Considerations

NRC performance goal: NRC should do its job and abide by its own performance goal of protecting public health and safety for both present and future generations by preventing exposures to unjustified practices; NRC should not shift its responsibility to reducing the burden on industry.

Precautionary principle: Based on uncertainties of risk, and unexpected outcomes, the prudent course of action would be to bar distribution of radioactive materials into the public domain.

Psychological impacts: NRC should consider impacts on citizens and their confidence; radiation in products will contribute to pessimism about our culture and economic system.

Cannot reverse releases: As more is learned about the risks of low-level radiation (e.g., bystander effect), we will not be able to reverse the effects of materials already released.

Mixing materials: Large amounts of material will be released and more highly contaminated material will be mixed with this material to ensure compliance with any established standard.

Other organisms: Release of this material will increase background levels in the environment and will be bad for the environment; additional analysis and supporting evidence regarding how other organisms are being protected is required.

No safe dose of radiation: Low levels of radiation cannot be proven as trivial, and we do not know specific health effects at low doses of radiation. Low levels of radiation can have long term health effects and can sometimes be more harmful per unit of exposure than higher levels of radiation. Every additional exposure, no matter how small, increases the chances for, and numbers of, cancer.

NRC studies biased: The studies NRC depends on are biased and not publicly acceptable (e.g., International Commission on Radiological Protection (ICRP) studies). The 2003 Recommendations of the European Commission on Radiological Risk (ECRR) address health effects of low dose radiation and document criticism of the 1988 ICRP low dose models and failures of the Hiroshima study to predict consequences of exposure; this document indicates health risks are 100 times greater than predicted by current radiation limits.

Other studies cited: Other studies of health effects of low level radiation were noted which show that there is no safe dose of radiation below which no damage results and have confirmed ways that radiation alters cells. These studies should be considered by NRC; they have been ignored to date. These studies include: (a) indications of effects from depleted uranium in weapons; (b) medical studies that show that radiation is riskier than previously assumed; (c) the book "No Immediate Danger" by Rosalie Bertell documents that there is no safe level of radiation and predicted the increase in certain health effects that we have now (and also "Uncertain Science and Failure of Trust"); (d) studies by Gofman and others conclude that all radioactive contamination is cumulative; (e) those by independent scientists, including Dr. Alice Stewart, Morgenstern, Kadheim, Bulakova, Wing, Feuerhake, Wright, Viel, and the BEIR V Committee; (f) studies of Japanese atomic survivors bear out that radioactivity released slowly over time is more dangerous than a quick high dose; (g) J. Kahn article in NY Times (6/17/03) on lung damage to Chinese workers; and (h) cancer incidence rates are rising, especially at sites with radioactive contamination.

Long-term risks: These risks are long term risks and it is not known what the risk would be to future generations, including genetic and reproductive capabilities.

Linear No Threshold (LNT) model: NRC has acknowledged the validity of the LNT model of human exposure which holds that any increase in dose, no matter how small results in an increase in risk. Therefore, the NRC's mission to ensure adequate protection of public health and safety must restrict all radioactive material from general commerce and require disposal in a licensed LLW disposal facility.

Sensitive populations: Some populations have higher sensitivities to radiation and must be protected, even if their dose is less than the critical group.

Dose from man-made nuclides: The risk from man-made nuclides is not comparable to that from naturally occurring ones because internal doses (which can occur from recycled products) can be more damaging than external ones; also, man-made nuclides bond to DNA and certain human organs in ways that naturally occurring ones, to which life on earth has adapted, do not.

Unwanted risks: The risks being considered here expose the public without their consent and are unwanted, avoidable, involuntary, and unnecessary (unlike the dose a person gets from medical treatments), even if they are small, especially since the practices are unjustified.

Cannot accurately predict doses: Computer models cannot accurately predict all doses to the public (especially when considering the different nuclide behaviors and half-lives and associated risks in the environment and in humans). Doses cannot be measured, and thus projections of reasonable/acceptable risks are meaningless. Also, doses may be higher than estimated because some mills may receive a higher amount of metal from licensees than estimated in NRC's technical analyses. There may be unexpected outcomes and untraceable impacts. RESRAD is not reliable. Not all isotopes present are considered. Validation with data from actual releases should be done. The total quantity of material to be released in commercial products is uncertain and therefore it is unclear how NRC can reasonably evaluate health impacts, including the ability to determine how much is in the environment at any time. Analyses will not be able to determine the total dose, non-fatal cancers, reduced immunities to other health problems, non-cancer health effects, cumulative effects, impacts from multiple exposures, or effects to children or adults working with the materials.

Worker risks: Releases of solid materials will expose workers at steel mills, scrap metal facilities, road construction, sewer workers, etc. to potentially significant levels of contamination; they should not be exposed to any additional risk levels. Steel workers are an unprotected workforce from this hazard and are not routinely monitored for radioactive contamination, do not receive hazardous duty pay or long term medical monitoring, and might have to choose between their job security and radiation exposure.

Risk too high: The risk of exposure to 1 mrem/yr is that 1 of every 28,600 exposed will have a fatal cancer; these risks are too high, especially when projected over the U.S. population.

Do not add to background: The fact that we receive a dose from background does not justify adding more dose even if it is less than background; no dose above background is acceptable.

Synergistic effects: We do not know, and analyses will not be able to determine, synergistic interrelationships between dose and other hazardous impacts.

Other standards: The fact that there are air and liquid emission standards does not justify allowing more releases of solids into consumer products.

Current practice is no justification for release: The fact that material is released now is not a justification for releasing more material.

Consumer Products/Isolation

Unnecessary risk: Introduction of radioactive waste materials into consumer products (in particular products in the home, in home construction or in roadways, or playgrounds) poses unnecessary risks to workers and the public and the potential for multiple exposures.

No direct benefit: There are no direct benefits from releasing materials to the public.

Consumers would be unknowing: Labels would be needed to identify products made from released material, otherwise people would be exposed without any warning; There would probably not be any labels on the consumer products so there would be no way for consumers to know what dose they are getting.

Right-to-know and choose: The individual should have the right to choose the risk to which they are exposed.

Cost-benefit and Liability Considerations

No societal benefit: It should not be assumed that operation and decommissioning of reactors are socially justified nor that the releases are therefore justified. People get no direct personal benefit from the releases.

Rule aids industry at public expense: A rule is just an economic aid to the nuclear industry. Reducing costs of compliance to licensees should not be one of NRC's major considerations on this matter. Saving licensees money on waste disposal (for a relatively small amount of material) comes at too high a price, i.e., human health and socioeconomic costs. Most Americans do not have adequate health insurance to deal with the consequences of increased unnecessary radiation exposures. Those generating material should pay for disposal of it as part of the cost of doing business; NRC should protect the public instead.

Do not transfer problem: NRC should not transfer its problem of what to do with this material by passing the problem to scrap dealers and steel manufacturers, which could put them at legal and financial risk; consumers would avoid products made from recycled metals, resulting in more resources being expended to make products with virgin uncontaminated ores.

Burden: The burden of calculating releases would be reduced if material is simply not released.

Liability: There would not be any clear liability as to who is responsible for materials released once they have gotten into the public sector.

Tracking Released Materials

Cannot measure doses: Dose-based release standards cannot be physically measured, verified, or enforced, and each consumer product cannot be monitored. Thus, releases cannot be tracked and consumers will not know their dose from recycled products. So, even though NRC says the dose limit is only 1 mrem/yr, how can this be trusted when it cannot be verified?

Public will not know dose: A person would have no way of knowing what products contain radioactive material. There should be labels on any products made so that consumers can know what dose they are getting and can control it.

Need for safeguards/no detectable radiation: NRC should not allow releases that are not tested or safeguarded and should not allow detectable materials to be released.

Security issues: There should not be additional releases in this time of increased security concerns; radioactive materials released from licensed facilities will make it more difficult for efforts by local, State, and Federal agencies to detect dirty bombs. Materials in the nation's scrap could affect Homeland Security technology where road monitors will be reading levels in vehicles.

Detectors are not reliable: It is not clear if detectors can reliably survey materials and protect the public - NRC will not be able to measure releases accurately or enforce criteria because field conditions do not fit computer models and monitoring low levels of radiation near background to assure compliance is difficult and uncertain; large pieces of equipment can have complicated geometries (and workers will tend to avoid these areas - uncertainties are several percent for simple geometries and will be even higher for more complex geometries); non-uniform contamination; hot spots in large piles of scrap metal can be missed; equipment can malfunction; there are problems of false negatives; and there are issues of sorting materials.

Improper releases: Improper releases and mistakes cannot be avoided, especially when there are large volumes being handled, there is a lack of resources, and there is a need to survey quickly.

Multiple exposures: A person could be exposed to many items because once the material is released it will not be controlled.

Material in environment: Released material cannot be tracked especially over long time periods which will be an environmental headache for years to come.

Penalties: There should be penalties to those releasing material in violation of any standard.

Public Confidence

NRC has a goal of increasing public confidence: NRC should abide by its own safety goal of increasing public confidence by keeping this material out of the public domain.

NRC's sincerity in protecting public health is questioned: NRC tries to downplay hazards associated with this material; people are given incorrect information about potential risks from this material. NRC says it is safe but cancers continue to occur.

Dose assessments are suspect: Computer codes, and dose and pathway models are not trusted and can be manipulated so that predicted doses meet limits; supporting analyses for this rulemaking were prepared by nuclear advocates.

Economics may influence technical accuracy: Workers at licensed facilities cannot be trusted to detect radiation in releases because of carelessness or because it may not be in the best economic interests of the licensee; this could result in substantial amounts of material being released in violation of whatever standard is set.

Past issues have contributed to mistrust: Licensees and DOE cannot be trusted because workers have been misled about radiation hazards in the past and because other rules have not always been followed, and because DOE has failed to manage material safely. Thus, it is not clear if a rule in this area would be followed. There is little public trust in DOE. NRC must consider in its rulemaking the limitations of the entities responsible for releasing materials.

Failure of orphan source program: NRC has failed on the orphan source problem and there is no reason to believe that more problems would not occur.

Unreported releases are problematic: There have been unreported releases at NRC licensed facilities and NRC must fully disclose all metals that have been released and are currently in consumer products.

2.3.2 Metals Industry

Release of Contaminated Material

Radioactively contaminated scrap metal (from impacted or restricted areas) should not be released into the stream of commerce: The metals manufacturing industry suggests that the definition of radioactive contaminated scrap metal should be that which originates in impacted or restricted areas. Scrap metal is not considered to be radioactively contaminated if it does not originate from restricted or impacted areas, was never in such areas, and can be certified as never having been exposed to radiation. Scrap metal not originating in impacted or restricted areas can be released providing that NRC requires at least one of the following safeguards: (a) where there is clear process knowledge that the scrap metal is not originating from radiological areas and the license certifies that the scrap has not been radioactively contaminated; (b) stringent radiation surveys of the scrap metal shows it does not exceed dose-based clearance standards or background radiation levels for the area from which it is released (whichever is lower), or (c) the scrap metal is manifested, labeled, and tracked.

Criteria for release should be agreed upon by stakeholders: The scrap metals industry noted that any new regulation for the release of material that is contaminated at low levels must be based on criteria acceptable to affected stakeholders. Before criteria could be established, stakeholders should review several issues, including: (a) the effect of contamination on employees and equipment; (b) the capability to detect radioactivity in material; (c) potential uses of recycled material acceptable to affected industries and the general public; and (d) the potential to assure that such material could be used only for the purposes acceptable to the affected industries and the general public. There is probably a substantial amount of material at licensed facilities that has never become contaminated with radioactive material. While this material could be recycled, all affected stakeholders would need to agree on a measurable definition and acceptable means for proving and documenting that such material did not become contaminated by radioactive material and that the material did not become mixed with contaminated material at any time prior to release.

Health and Environmental Considerations

Worker health risks: There may be health risks to workers because of radionuclides in the steel mill (including the baghouse dust), even if in small concentrations, that may build up over time; loss of control of orphan sources; and illicit trafficking of materials.

Public safety risks: Steel may be used in applications that might not be safe to the public.

Lack of environmental benefit: There would be little environmental benefit of recycling of metals from licensed facilities because the amount of such metal is small compared to the total feedstock and the impact would be less than 1 percent per year and would not affect the amount of mining conducted.

Cost-benefit Considerations

Property contamination: There will be increased risk of property contamination at metals companies, including on equipment and in byproducts, and in generation of mixed wastes.

New regulatory requirements: If the steel industry has to handle radioactive material, it may also be required to comply with more stringent regulatory requirements governing worker exposure.

Legal liabilities: This would increase metals industry liability in potential civil suits.

Large economic impacts - product de-selection: There could be a very large economic impact on steel industries because consumers (who are their customers) do not want products because of concerns, even if only perceived, over presence of radiation and will de-select products. Such impacts could include loss of revenue and jobs if customers refuse to buy products made with metals. The resulting impact on the steel industry could be as high as $600 million even if there was only a 1 percent reduction in purchases.

Lack of trust: Recycling of metal from licensed facilities undermines public trust in the safety of consumer products. Perhaps safe levels can be set, however the marketability of products will be set by public perception and it is unlikely that the public will accept products that they use each day containing what will be characterized in the media as “radioactive material.” There is a sense of risk from uncertainty and the public will feel that any risk is not worth it no matter how low a standard is set, and will not trust government to tell them what is safe.

Business disruption/orphan sources: The history of problems with loss of control of orphan sources has resulted in significant decontamination costs at steel mills; the presence of additional radioactivity would affect metals companies ability to detect and intercept orphan sealed sources.

Need to mine virgin ore: Public perception could influence industry to mine more virgin ore to vouchsafe that metals used in consumer products do not contain radioactive materials.

Shifting responsibility: The issue and problem of what to do with this material should not be shifted to the commercial metals industry but rather dealt with at the source by the generators of the material.

Small economic benefit to recycle: The amount of recycled steel from NRC-licensed facilities is so small that the economic advantage of recycling it is small and there exists an oversupply of most of these metals (ferrous metals are not likely to be affected although copper and nickel producers could be).

Acceptance Criteria

Steel mill detectors: Detectors are set at low dose rates that will alarm at levels near an NRC standard that might be promulgated (these detection systems are used because of previous problems with orphan sources). Steel and scrap yard detectors are becoming even more sensitive. The metals industry does not have the capability to distinguish the source of the alarm and hence it will reject the entire shipment.

Rejection of shipments: The steel industry would likely reject shipments of material released from NRC licensees even if the material is in compliance with an NRC standard.

Financial liabilities: The metals industry cannot take the financial liability of allowing radioactive material into their mills and exposing individuals and incurring economic loss.

2.3.3 Cement Industry

Release of Contaminated Materials

General opposition: There should be no release of materials for unrestricted uses in commerce and be recycled into concrete and other like products.

Health/Risk Considerations

Public health: Public exposure to products made with concrete is high, including use of concrete in drinking water reservoirs, tanks, and pipes, in residences, schools, and office buildings, and in driveways, sidewalks and train stations. In addition, there can be exposures to concrete masons in the concrete industry.

No benefit: Acceptance of radioactive material has no benefit to the cement and concrete industry but only possible endangerment to the industry's workers and customers.

No extra doses: Exposures from other solid materials would add to potential radioactive doses from concrete products. Preventing additional exposure to the public from man-made sources in consumer goods is in the best interest of the public and should be NRC's primary activity in carrying out its Congressional mandate to protect public health and safety.

Cost-benefit Considerations

Large economic impact - product de-selection: Any real or perceived public health risks posed by radioactive consumer goods, regardless of how slight the risk is, will not be tolerated by consumers who will be concerned about health effects despite scientific evidence. Consumers will not find the benefits of recycling by release of solid material from NRC licensees into commerce as persuasive reasons to accept the perceived additional exposures. These consumers will decide not to purchase these goods, as they will not wish to live or work in a building containing material recycled from licensees. This will translate into loss of market for the cement industry and threaten viability of the cement industry. The cement industry wants to be able to fully disclose to customers the origin and any radioactivity level and hazard from material - failure to do so will cause fiscal harm to the cement industry.

Costs for detectors: Increased potential for the release of radioactive material for reuse in the cement and concrete industry will cause them to incur significant additional expenses for surveillance for incoming radioactive material as well as management of any radioactive materials. Cement companies do not have the instruments and personnel training necessary to do these surveys and the industry would incur significant expenses for purchase of radioactivity monitoring equipment, training for personnel, facility modifications to segregate material, disposal costs for “orphan” radioactive material, liability insurance, and legal costs.

Shift of economic burden: A rulemaking will effectively shift the economic burden of disposal of the solid materials from the NRC licensees to the industries that would receive these wastes as recyclable material. This appears unfair considering that the licensees profited from the producing of these wastes.

Low economic benefit: The economic value for used concrete used as a fill material for aggregate is very low compared to virgin materials.

Public issues: NRC should practice gaining the public’s trust on issues where the potential adverse economic effects are limited to its licensees’ businesses before attempting a rulemaking that could have adverse economic effects on businesses outside of the licensees.

Potential for Rejection of Material

Need for detectors: Concrete dealers might begin to use detectors for screening because it is likely they will have similar concerns as the steel manufacturers regarding consumer unwillingness to purchase their products if there are concerns about the products containing radioactivity.

Potential Use of Fly Ash

Use of fly ash: The Issues Paper noted that the dose from use of recycled coal ash in concrete block as permitted by EPA can be about 3 percent of natural background (about 10 mrem/yr)). One reason fly ash is used in concrete is that in 1983 the EPA issued guidelines requiring purchase of cement containing fly ash in both government and the private sector. The guidelines were a response to a directive from Congress to provide some relief to companies that generate fly ash in coal generated electricity with regard to disposal of this high volume,

low-hazard waste. Indicating at this time that EPA has set a precedent such that the radioactivity levels in fly ash are appropriate seems egregious. It may be that, if the government had made a greater effort on public participation on this issue originally, the public's sensitivity to unnecessary radiation exposure might have prevented this use of fly ash.

2.3.4 Licensees, including Universities, Medical facilities, Fuel Cycle Facilities, and Nuclear Power Plants

Safe Criteria Can and Should be Set

There is a need for a clear dose-based standard: A dose-based standard is needed for the unrestricted re-use or disposal of solid material. This standard should clearly define a dose level (1 mrem/yr) at which protection of public health and safety is assured without the need for continued regulatory oversight.

No unrestricted release for direct recycling: No generic permission for unrestricted release of licensed solid radioactive material for the purpose of direct recycling should be allowed.

A regulatory framework is needed for recycling: A regulatory framework for case-by-case consideration of proposals for recycling of materials so as to consider specific details involved and allow request for public notice (i.e., for general uses or for conditional or restricted uses) should be implemented.

Guidance is needed: Regulatory guidance should be developed to describe acceptable methods for demonstrating with reasonable assurance that materials released for reuse or disposal are actually directed to those purposes and not diverted to recycling.

Specific criteria should be established: Criteria for unrestricted release of solid materials, based on a dose/risk standard that is inherently safe and cost-effective (like 1 mrem/yr), should be developed.

Adopt the ANSI N13.12 standard: NRC should adopt ANSI N13.12, which ensures the public will not receive doses in excess of 1 mrem/yr and does not impose unnecessary regulatory burdens.

There is a need for flexibility in the standard: Flexibility for special circumstances currently in 10 CFR 20.2002 should be preserved.

Health/Risk/Environmental Considerations

Risks are trivial: Safe criteria can be set. The doses and risks being considered are very low and scientific bodies such as the National Council on Radiation Protection and Measurements (NCRP) (see NCRP Report No. 116), the ICRP, and EPA indicate that levels around 1 mrem/yr are negligible or trivial in risk considerations; the NAS recommendations provided similar information.

Risks may be nonexistent: There is considerable scientific uncertainty as to whether any risks exist at all at these levels; there may be no risk at these levels. Diagnostic medical procedures

give patients between 500 to 1000 mrem without adverse effects; therapeutic procedures give a dose of 10,000 mrem or more without adverse effects. Health effects below 10 mrem are either too small to be observed or are non-existent.

Small fraction of background: The doses being considered would be a small fraction of background variations and would be well below doses received in routine activities of life; everyday sources of radiation (such as environmental radiation, home building materials, travel in airplanes, certain foods) contain radiation levels at or above these levels but do not have a social mandate that they be regulated.

Suggested standards are a fraction of other standards: The levels suggested are a fraction of other similar standards including EPA's 4 mrem/yr in drinking water; 10 mrem in air; and CERCLA cleanup standards. In addition, NRC currently has standards of 100 mrem/yr as a public protection value, 25 mrem/yr for decommissioning and 5 mrem/yr in airborne effluents.

Offsets other impacts: There is an environmental impact of having to replace the material which is thrown away at a LLW site, instead of reusing it in some way.

Cost-benefit Considerations

Cost of LLW disposal is significant and unjustified: Disposing of very low activity material with low potential risk in LLW burial grounds is very costly and imposes unnecessary financial burden on businesses and the economy. The cost impact of having to send very low activity waste to LLW can have a severe economic impact on small businesses, universities, and medical facilities and hospitals that handle and use radioactive materials. Health care will be negatively affected by a rule that is unreasonably stringent.

Waste of resources: Disposing of very low activity in LLW sites poses unnecessary burden on precious natural resources (land at an LLW site) which could be used for more beneficial purposes.

Societal benefits: There is a benefit that society has realized from productive use of these materials in medicine, research, product development, and power production. Release of low activity materials is part of that cost-balancing equation. There is a societal benefit in reusing the material.

International issues: There will be a large negative economic impact on U.S. trade with other countries if the international community establishes criteria and the U.S. does not have a standard or has a much more stringent standard.

Reduction of burden: The regulatory burden of the current system would be reduced because a simple standard could be established, compliance could be easily verifiable, and there would be fewer requests for approval of alternative criteria for disposal.

Public Confidence

Clear standard would boost public confidence: A standard would increase public confidence because there would be clear safety criteria.

Suggested Approaches for Unrestricted Use

Base on steel mill detectors: Materials for release should be sent through portals having the same detection levels as steel mills.

Record-keeping: There should be complete and careful record-keeping of releases so that the end user knows the identity of the material. Other comments noted that there is not a need to document every item that enters and exits a restricted or radiation controlled area, and if an item is surveyed to well-defined standards then there is not a benefit to document every release.

Inventory criteria: Generators should maintain disposition inventories and verify compliance with the yearly limit prior to disposition.

ANSI N13.12: Criteria should be set based on ANSI N13.12 which is a national consensus standard addressing the safe release of solid materials. According to the National Technology Transfer Act, NRC is required to use such a technical standard unless it is inconsistent with applicable law or otherwise impractical. Also, the screening levels in ANSI N13.12 should be used.

Criteria that is 'safe', 'clean', 'non-rad': Criteria should be set at, and define, a level at which the material is no longer considered to be radioactive and/or can be defined to be "clean" and should indicate unequivocally that the standard is safe.

Dose criteria: Suggestions include: (1) 1 mrem/yr consistent with NCRP; (2) 1-10 mrem/yr; (3) between 1 and 5 mrem/yr consistent with Appendix I to 10 CFR Part 50, 10 CFR Part 20, and 40 CFR 190; (4) 1 mrem/yr and a second level of 10 mrem/yr to allow storage of materials with dose of 10 mrem/yr or less for onsite storage; (5) consistent with EPA drinking water standards and current airborne effluents; and (6) 10 mrem/yr consistent with statistical variation of background in U.S.

Implementation of standard: Several issues were discussed: (1) the ability to implement the standard should be considered. The standard must be low enough to protect the public yet not so low as to be unworkable with common field instruments or such that survey costs could be significant; e.g., need to consider if there are hand held instruments that can measure at these levels. It must be clear to the public that whatever standards are developed can be measured so that materials can be controlled to the standard; (2) levels in the range of 1-10 mrem/yr are practical; (3) criteria below 1 mrem/yr may cause detection problems; (4) should address survey procedures; (5) there is a need to consider ability to measure specific nuclides, e.g., natural uranium; (6) the rule should allow process knowledge in evaluating materials in a survey; and (7) for fuel cycle facilities, the standard must consider variability between natural background and how it affects the nuclides they handle.

International compatibility: Criteria should be consistent with international standards.

Site-specific criteria should be established: Site-specific criteria should be able to be set based on release scenarios.

Concentration levels: Criteria should be based on concentration levels that are reasonable and tied to a dose level.

Clear, practical criteria are important: Criteria should be practical and clear and the theoretical risk should be balanced by observed risk.

Use of dose to average member of the critical group: Criteria should be based on an average member of the critical group and not on a maximally exposed individual.

2.3.5 Health Physics Society and Individuals

Rule should be dose-based and establish a brightline: A rule should be developed containing a dose-based criteria for unrestricted use of materials that are inherently safe and thus warrant no further control for radioactivity. Rules governing release of solid material should establish a bright line that distinguishes between what is and what is not radioactive from the standpoint of requiring regulatory control.

Adopt ANSI N13.12: The use of the dose limits and derived screening criteria of ANSI N13.12 are appropriate: ANSI N13.12 (1) is based on sound science, provides a risk basis, and is protective of public health; (2) contains criteria for release of volumetrically and surgically contaminated materials; (3) is a voluntary consensus standard which the National Technology Transfer and Advancement Act of 1995 requires Federal agencies to use unless inconsistent with applicable law or otherwise impractical; (4) considers detection capability; and (5) allows for clearance on a case-by-case basis.

Establish instrument performance standards: Instrument performance standards should be established that readily demonstrate the safety of associated NRC rules on release of solid material.

Health/Risk Considerations

Negligible risk: ANSI N13.12 is consistent with the NCRP and with international scientific organizations which recognize 1 mrem/yr as a negligible individual dose.

Background levels: Man-made radioactive material should be considered in comparison with natural background, and material should not be considered radioactive it if does not contribute significantly to the radiation exposure we already receive from background (levels being considered are only 0.3 percent of background);

Background variation: People are exposed to wide variations in background each day from place to place with no discernible effect on health. It is illogical to say any amount of radiation is unacceptable because we live in a sea of radiation.

Small fraction of limits: Even if a person receives multiple exposures, they will total only a small fraction of 10 CFR Part 20 limits.

Cost-benefit Considerations

Waste of resources: Trying to achieve a zero risk is a waste of finite financial resources which should not be spent on trivial risks when there are other real risks that need addressing.

Societal benefits: Nuclear power stations provide safe clean energy and uses of radioactive material in medicine and research is vital to the U.S. economy and public health, and disposition of the materials used is part of that consideration.

Tracking Released Materials

Criteria must be measurable: Values must be detectable and measurable to allow compliance.

2.3.6 States, State Organizations, State Employees

Suggested Standards

Dose-based limits are appropriate: A regulation limiting unrestricted releases to a dose-based level that is protective of public health and safety is appropriate.

Adopt ANSI N13.12: NRC should adopt the procedures and standards of ANSI N13.12. NRC should develop and implement guidance that endorses ANSI N13.12 in implementing a rule.

Designation as clean is appropriate: Below a certain level of radioactivity, in a manner similar to DOT, it should be considered that the material is no longer radioactive; levels should be designated as clean and safe for unrestricted use.

Free release is appropriate in non-impacted areas: If a facility can demonstrate that an area was not impacted, free release should be allowed.

Concentration and volumetric limits should be adopted: A value of 1 mrem/yr was suggested as a dose criteria; specific concentration values should be included for solids similar to 10 CFR Part 20 for liquids and gases. There should also be volumetric limits.

There is a need for case-by-case determinations: There should also be case-by-case determinations for concentrations greater than the table values for small volumes with restricted uses by the licensee or other unique cases such that the dose is less than 10 mrem/yr.

Adopt a dose-based standard for soils: A standard should be in terms of dose for free release of soils.

Concerns with Landfills

Similar to background: Levels being considered are near background which we are routinely exposed to.

Risk is trivial: Studies of dose do not confirm that any risks exist.

Cost-benefit Considerations

LLW disposal creates an unreasonable burden: The impact of having to dispose of all solid materials as LLW, even if they are at very low levels, would be prohibitive.

LLW disposal is a waste of funds: Many licensees are government facilities; spending money on needless disposal will waste money and delay needed cleanups or waste money that could be used for other programs.

Societal benefit: All people have benefitted from programs at licensed facilities that generate the solid materials.

Consumer reaction: The impact of consumers de-selecting products is overstated because consumers will not be aware of levels.

Overall impacts: The amount of contaminated metal to be recovered is very small compared to the overall volume of available clean scrap metal. The economic benefits to a few large licensees in salvaging a relatively small amount of material may not be justified in terms of societal or socioeconomic costs.

2.4 DOSE-BASED REGULATION ON CONDITIONAL USE

Advantages of Restricted Use

Limited exposures: Restricting use to only certain non-licensed uses would result in the material not ending up in consumer uses and would provide a risk-basis for any conditional uses.

Feasibility of Restricted Use

Too many possible uses: Developing a generic radiation criterion may be problematic due to the broad nature of potential conditional uses; conditional use is not covered in ANSI N13.12 because conditional use possibilities are unlimited; conditional uses should be defined for specific cases.

May not be acceptable to public: The public will not accept contaminated scrap metal in products in commerce, regardless of what products they are.

Hard to enforce: The process of making sure materials went to prescribed use would be difficult to enforce and it is not clear that institutional controls would work to limit where the material goes; scrap generated during operations generally goes to a variety of products and end users.

Burden on NRC and industry: The conditional control process would be complicated and a burden on NRC and the nuclear industry; such a process might only work if some entity (like

DOE or NRC) took licensing responsibility to assure that the material is processed as required and is not used for a prohibited purpose.

Burden on States: There could be additional burden on State and local regulatory authorities. There would be a need for a system of tracing and accountability. This could be very expensive and could create a new class of licensee that would have to be inspected. There could also be issues that arise when such materials cross State lines.

Not economically viable: This approach may not be economically viable because the limited quantities involved from licensed facilities would not be sufficient for a mill to run economically.

Dependence on market forces: Market forces should determine if restricted use is practical.

International commerce: Unlike some other countries (France did establish restrictions on use), in the U.S. the destination of material cannot be stipulated unless it is designated as a form of hazardous or radioactive waste.

Health and Safety Considerations

Risks to workers: Restricted use in certain ways (e.g., industrial products, construction fill, roads, bridges, airplanes, sewer lines, girders) is unacceptable because it would still result in doses to workers (who usually do not come in contact with radiation hazards) and the public; also impacts on these people would be too hard to predict.

Responsibility for restrictions: It is not clear who would have responsibility for restrictions, (i.e., be legally tasked with, be able to take on the expense or liability of enforcing conditions. It is not clear how entities would be selected and/or notified of their responsibilities.

Trust issues: Recent history shows that there should not be a presumption of honesty in the industry with regard to restricting the materials' use.

Restricting use to licensees: Even restricting material to licensed use would require close monitoring and tracking to assure it does not get released which would be expensive. Also, even within the nuclear industry there could be concerns about additional worker exposure.

Unauthorized Materials might be released: There is no assurance that material would be limited to its authorized use immediately upon release or for decades afterward, and would need to be tracked for years. Material is recycled many times over and would eventually be released for unrestricted use after restrictions end before all radionuclides decay. There would be no mechanism to track the end uses of recycled materials to guarantee that they do not get into consumer products and no way for people to know what dose they were getting.

Dose-based Criteria for Unrestricted Use Needed

Unrestricted use criteria needed: Even with restrictions on use, there would still need to be an unrestricted use criteria defined for when the authorized use ended because restricted use is really a delayed release of solid materials for unrestricted use and the material will eventually be released after the restrictions end.

Just set unrestricted criteria: NRC should just pursue a solution for an unrestricted use criteria. It is premature and too difficult to try to also pursue a restricted use approach at the same time.

More useful standard: Setting an unrestricted use standard would provide a more universal standard with regard to applicability and is the more conservative approach. Although release limits would be lower for unrestricted use, such limits would be more useful and simple to apply under an assumption that the material might wind up at any destination and would not rely on future controls.

Define where control ends: Points in the process would need to be defined to indicate where authorized use would begin and licensed control would end.

Suggested Approaches for Restricted Use

Set a regulatory process: A rule should lay out a regulatory framework and process for restricted or conditional use similar to the 10 CFR 20.2002 process so that conditional use situations can be characterized and dealt with on a case-by-case basis rather than in a generic standard. Such a process would require a reasonable demonstration that impacts of unrestricted recycling on the metals industry would be avoided. Such a rule could be written to "not exclude" conditional use and not define conditional uses in detail but require a thorough review and approval process, including an IS, if necessary. This approach would be a more effective way of fostering public confidence.

Permit conditional recycling: Recycling should be expressly permitted as a conditional use for material that goes to scrap steel businesses or into consumer products.

Only allow in licensed use or at DOE: Material should be conditionally recycled only to another licensed use or within the DOE (e.g., waste containers, shielding blocks, etc). This may be the only acceptable approach. It was suggested that such a scheme can already exist under NRC's regulations and it is not necessary for NRC to conduct a rulemaking. However, a comment noted that there is too much material potentially available for release for it all to be used as shield blocks at DOE facilities.

Dedicated facility: A dedicated facility could be used to melt and handle these materials as a licensed NRC facility. Metals would be refined and melted and also cleaned up by a regulated facility. In this type of scenario, the dedicated melted products could be regulated.

Other considerations: In setting restrictions, there is a need to consider such aspects as the type of material, and the type and nature of authorized uses.

Tracking Released Materials

System of controls for tracking materials: It is not clear that the necessary controls can be put into place to monitor and track material released from licensed facilities, and, therefore, it cannot be assured that the steel industry will not be burdened with material with higher levels of contamination.

Must be practical: Criteria must be practical to use. Any criteria should indicate how MARSSIM would be applied. Licensees' monitoring capabilities will need to be evaluated and upgraded for demonstrating compliance with dose-based criteria in a rule and guidance.

Put concentrations in guide: A standard should not reference activity-concentration limits. These should be in guidance similar to the license termination rule.

Reporting: There must be reporting requirements and a strategy to stop release of material if levels exceed limits.

Liability insurance: There must be liability insurance for businesses and the public if they are affected economically or socially.

2.5 DISPOSAL IN AN EPA-REGULATED LANDFILL

Rationale for Disposal in Regulated Landfills

Currently protective: Conditional and other case-by-case releases of radioactive materials, after surveys, to landfills have already taken place under 20.2002; this process has worked well to protect the public, environment, and solid waste facilities.

NORM allowed: RCRA (Resource Conservation and Recovery Act) Subtitle D facilities are currently used for management of NORM.

RCRA Subtitle C disposal is safe: Disposal in a RCRA Subtitle C facility is safe, viable, and effective in controlling where material goes. RCRA Subtitle C facilities are highly regulated and have appropriate performance assessment, radiation safety programs, and environmental monitoring. Doses would be less than public exposure requirements and much less than background. Existing processes permit NORM to be sent to RCRA Subtitle C facilities (which contributes larger, yet acceptably safe radiation levels). RCRA Subtitle C facilities can be evaluated generically. RCRA Subtitle C has proper treatment, storage, and disposal requirements and subjects its permitees to stringent controls to ensure that hazardous materials are not released to the environment (EPA's RCRA Sect. 3004(a), 40 CFR Parts 264 and 265). These facilities would protect public health and safety and be appropriate for scrap metal. Controls include leachate control, storm water control, prohibition on liquids, collapse prevention, security, inspections, training, quality assurance, closure and post-closure, financial assurance, and deed restrictions.

RCRA Subtitle D disposal is safe: Disposal in RCRA D disposal facilities can also be sufficient to isolate scrap metal from the public and provide protection of public health and safety (EPA's RCRA Sect 4001, 40 CFR 258). RCRA D disposal facilities are subject to some but not all of the same requirements as RCRA C facilities, including leachate control, run-off control, groundwater, security, inspection, training, cover material, location, records, closure and post-closure, and financial assurance.

State issues: A dose-based standard for disposal at landfills should be permitted as long as it is not prohibited by applicable State, local, or Federal agency requirements.

Landfill disposal is cost effective: The NAS report noted that disposal of this material in landfills would be cost-effective.

Standards exist: Dose-based standards already exist for this disposal method.

Limits exposure: Release to RCRA Subtitle D landfills would limit public exposure, further protect public health and safety and be cost-effective. RCRA sites are suitable because site characteristics and engineered features at these sites will assure protection of public health and safety.

Scenarios can be modeled: Landfill scenarios can be modeled because they are comparatively limited and have been modeled for concrete. DOE has already performed analysis of disposal of low concentrations of nuclides in RCRA Subtitle C and D facilities.

Protects LLW site resources: Existing LLW site capacity is limited; the ability to send material to EPA-regulated sites safely lets LLW sites appropriately handle more contaminated material.

Health and Safety Considerations

Landfills not designed for radioactivity: No radioactive materials should be allowed in landfills because landfills were never intended and not designed to receive, contain, monitor, or isolate radioactive materials. They can leak into groundwater and drinking water and contaminate soil, air, and plants for generations and cause health risks, especially in nearby towns.

Time periods for containment: Even the most technologically advanced landfills leak over time. Also, they have much shorter institutional periods thus allowing long-lived radioactivity to leak soon after required oversight is eliminated.

Concerns about RCRA Subtitle C sites: Disposal in a RCRA Subtitle C site would only subject the material to hazardous waste controls and not to controls specific to radioactive wastes which have different characteristics. Also, disposal in a RCRA Subtitle C site could result in mixing radioactive material with hazardous wastes increasing the potential migration of materials and health risks due to synergy between the materials.

Concerns about RCRA Subtitle D sites: Standards for RCRA Subtitle D facilities are inadequate to protect the public health and safety from radioactivity that is volatile or not short-lived. There are fewer controls at RCRA Subtitle D sites making leakage more likely.

Present landfill designs inadequate: EPA's present landfill requirements are inadequate; radioactivity should not be added.

Amounts of waste: There may be no limit on the amount of waste sent to a landfill; landfill managers may not even know radioactive material is being deposited there.

State issues: The current case-by-case releases to landfills may cause State or local concerns.

Feasibility, State Issues, Cost-benefit Considerations

Increased costs: A township objected to disposal in RCRA Subtitle D sites and noted that it is implementing a radiation monitoring program for incoming trash to keep out radioactive materials and their task and expense will increase if NRC allows release to landfills. This option can be very costly, and could require licensing of EPA landfills which could be more expensive than LLW disposal.

Costs of cleanup: It is not clear who would pay the costs of cleanup and health if a landfill leaked; it is likely that communities would have to pay.

A license currently being sought: Another commenter noted that WCS in Texas is currently seeking a State license for this approach.

Incineration: Issues of incineration are not discussed in NRC's documents.

11e.2 material issues: There would be regulatory issues of disposal of 11e.2 byproduct materials in landfills.

Landfill disposal would add to existing siting problems: Most landfill projects are already controversial. An NRC rule in this area, and adding radioactive waste to landfills, could have an impact by making the siting of new landfills more difficult.

State issues: Municipal solid waste landfills (RCRA Subtitle D) are regulated by federal, State, and local authorities and even if there are any federal requirements, all landfills still have to comply with State and local requirements. The degree to which States have the ability to handle or dispose of radioactive wastes varies widely and makes if difficult to categorize problems that might result from restricting materials to landfills.

State requirements: Many States have specific exclusions for all radioactive waste other than NORM or household products. California legislatures have already rejected this alternative. A rule allowing volumetric contamination in small amounts could cause problems at RCRA Subtitle D sites and with State regulators because controls are not in place at RCRA Subtitle D sites to provide assurance that contamination would not leach (therefore, release concentrations should be sufficiently low to prevent such problems, e.g., NRC has already approved exemptions and general licenses for a number of consumer products containing radioactivity - this information should be added to this evaluation). Most State agencies and local authorities have banned radioactive wastes from municipal landfills or have more stringent requirements than Subtitle D. Therefore not all municipal landfills will be able to accept cleared material. A full assessment of available permitted capacity must be made. It must always be possible for other levels of government to make independent judgement and decisions regarding more stringent standards. Nothing should be preemptive of this basic government right.

State prohibitions: Disposal of solid materials that have been released for unrestricted use should be acceptable at municipal waste landfills meeting 40 CFR Part 258, however some States and localities have prohibitions against such disposal; therefore NRC should coordinate with States before bringing waste to a facility to assure it meets acceptance criteria.

Overlapping responsibilities: There may be difficulties in overlapping responsibilities between NRC, State and local agencies with regard to impacts on landfill management.

RCRA Subtitle D sites: NRC should take care in proposing blanket approval for disposal in RCRA Subtitle D sites since not all of these sites meet 40 CFR Part 258 standards and even those that qualify to accept certain exempt materials do not have to meet any minimum standards for design or groundwater protection as in 40 CFR Part 258 although they have stringent groundwater requirements. EPA has guidelines for industrial waste management but they are not mandatory.

Potential problems: Potential problems associated with restricting materials to landfill disposal include: (1) local constraints such as State law or land use permits conflicting with landfill disposal; (2) segregation of released material from natural material is difficult when material goes to a landfill; (3) contaminated concrete may get recycled for use in aggregate by a landfill; (4) a waste acceptance method and risk assessment method should be formalized for both unrestricted use and release for disposal; and (5) minimizing the volume of low-level waste should be an overriding consideration.

Suggestions for Standards

No operational changes: No change to operations and no special features should be needed.

No changes: For a release criterion to be accepted, the level should be low enough that there will not be any special monitoring or treatment of leachate, groundwater, or landfill gases, i.e., presence of this material must not change a RCRA Subtitle D landfill into something other than a RCRA Subtitle D landfill. That is, it must be demonstrated that no adverse impacts will result by considering normal operation and closure of solid waste management facilities and by showing the regulators and operators of the facilities that these wastes will not change the operation and closure requirements of the facility. For example, considerations should include whether leachate in the leachate collection system and gas in the gas collection system, and whether groundwater, should be monitored for nuclides and whether the wastewater facility will still accept the leachate. Also a rule would have to consider landfill closure requirements and that the landfill would not be maintained beyond the normal period (for both RCRA C and D facilities).

Should be at clearance levels: Material that goes into a RCRA Subtitle D site should be at clearance levels and there should not be any extra controls required; it was noted that a release to landfills is essentially an unrestricted release. At a 1 mrem/yr level, one would not expect to affect operations of landfills. Facilities do not want to manage materials that are regulated as radioactive. A dose criterion of 1 mrem/yr is suggested. Based on this, a table of release concentrations for solids and volume limits could be adopted similar to those in 10 CFR Part 20. A 1 mrem/yr criterion would be sufficiently conservative to protect public health even if all potential exposures are not known.

Minimizing problems of diversion: The effect of diversion of material away from a landfill could be minimized by having the same 1 mrem/yr dose limit for recycle and for landfills. Material going to a RCRA Subtitle C site is manifested to make sure it goes where it should.

Consider unique aspects of facilities: NRC should consider the unique operation and closure features of landfill facilities. Due to differences in RCRA Subtitle C and D sites, different regulatory approaches for such facilities should be considered, e.g., use of RCRA Subtitle C landfills might be authorized by a generic rule after appropriate evaluation whereas use of RCRA Subtitle D should only be allowed after case-by-case evaluation of specific applications.

General license: A general license specifying the required permit requirements to be included in an existing RCRA permit is a more cost-effective and efficient solution; these requirements could be worked out in an EPA/NRC Memorandum of Understanding. NRC should not regulate these facilities.

Exemptions: It may be possible to provide exemptions or release concentrations at sufficiently low levels to prevent problems of concerns about radioactive materials in leachate, etc, by use of the approach of exemptions and general licenses in use currently for a number of consumer products.

NRC licensing: Some said NRC should license landfill disposal sites; others said NRC should not be involved.

Estimating limits: A dose-based set of limits should be derived by licensees for individual landfill characteristics (subject to approval). RESRAD and D&D pathway analyses are needed for implementation.

ANSI N13.12: A simple multiple of the ANSI unrestricted release value could be used.

International harmonization: Criteria should be consistent with international initiatives and State guidelines.

Consistency with EPA regulations: A rule should be consistent with EPA. NRC should adopt EPA risk ranges since EPA seems to have final authority for closure on most sites and 1 mrem/yr should be within what would be acceptable to EPA.

Case-by-case: Case-by-case determinations should be allowed at concentrations higher than in a table for small volumes and restricted uses at 10 mrem/yr.

Suggestions for Developing Criteria

Needed analyses: Landfills need to be part of NRC's assessment process, including analysis of operations, leachate collection, air emissions, and closure. NRC should do research to ensure landfills are acceptable for this material.

Consensus with EPA: In developing landfill criteria, NRC should consult and develop consensus with EPA in developing a suitable regulatory framework for safe disposal of solid material at RCRA sites. EPA has begun studying this option. NRC should also consult with State agencies, as appropriate.

Basis needed: It was also noted that material should not be restricted to landfill disposal unless there is a health and safety basis for not permitting unrestricted use.

Agency cooperation: NRC and licensees can work with States regarding this alternative once NRC has established safe levels for release of materials destined for disposal at landfills.

2.6 DISPOSAL IN AN NRC/AGREEMENT STATE-LICENSED LOW-LEVEL WASTE DISPOSAL SITE/PROHIBITION

Advantages of Prohibition on Releases

Prohibit any detectable material: Specifically prohibit de-regulation of any material with detectable radioactivity.

Isolate material: Only prohibition where the material is isolated from the public and sent to licensed LLW is reasonable and protective; no additional exposures are acceptable. Material should be prohibited from going to consumer products, industrial products, or landfills and incinerators, etc. In general, comments supporting prohibition also cited the reasons for opposing unrestricted use listed in Section 2.3 of this report.

Cost Savings: Prohibition of releases would represent a cost savings for NRC because dose calculations for case-by-case releases would not have to be done.

Prohibition not addressed: The prohibition alternative is not fairly addressed in the issues paper.

Disadvantages of Prohibition on Releases

Unreasonable costs: Sending very low contaminated materials to LLW disposal would have the negative impact of incurring very high costs to dispose of this material in LLW, harming society by significantly increasing the cost of goods and services provided by use of nuclear technologies, and depleting limited LLW space unnecessarily without a commensurate increase in protection of public health.

Unreasonable to ignore background radiation: It is unreasonable to prohibit releases of such slight amounts because it ignores reality that radiation is a fundamental part of the world we live in, and that there are radiation levels naturally in air, water, food, earth and background which vary widely in space and time; these levels completely overshadow annual exposures being considered here.

Wasteful of resources: Prohibition would be wasteful of valuable resources.

Societal impact: Biomedical research could be curtailed or stopped if all materials (e.g., boxes for equipment unpacked within controlled areas) have to go to LLW disposal.

Material excluded: Any prohibition alternative must consider excluding items that have no history of exposure to licensed radiological operations because these should be of no concern

to NRC, e.g., fences around sites. NRC would need to consider what is the boundary between things that could be released and those that would go to LLW; e.g., would the entire restricted area be affected, including administrative offices, etc.

International issues: A standard in European countries of, for example 10 uSv/a (1mrem/yr), would mean that U.S. authorities need to consider what would happen to material imported to the U.S. under an NRC standard which prohibited release, i.e., would NRC have to license such material imported into the U.S.

Impractical: Total prohibition could be impractical because more mobile materials might be included along with fixed, discrete items.

2.7 OTHER ALTERNATIVES

Revise Part 61: The rulemaking should focus on improving storage at Part 61 LLW facilities.

Start over: None of the alternatives are any good; NRC should develop better ways to maintain control and stop development of the rulemaking.

Recapture: There should also be a full reporting on, identification of, and recapture of any material released so far. There needs to be assurance that previous situations of release where people were not informed would not happen again. Specifically there should be a report on a tracking of health effects subject to review by independent scientists and studies and such information should be provided to the public. Other commenters suggested that the recapture approach be rejected because there is no evidence that any member of the public has been placed at significant risk and that recovering all items is unreasonable. Others noted that orphan source recovery is beyond the scope of this effort.

Intermediate facility: Solid material with very low amounts of radioactivity could be sent to an intermediate disposal facility, such as the Envirocare disposal facility in Utah; or some other interim storage facility.

General license: An approach that uses general licensing could be used.

Varying standards: Different standards could be established for reuse and disposal due to inherent differences between reuse of materials and disposal in landfills. There could also be some mix of restricted and unrestricted options to give licensees flexibility. Different standards could be based on: (a) the fact that material at nuclear facilities is separated based on whether it came from restricted areas or unaffected areas; (b) there is a range of material at nuclear power plants that includes institutional trash, asphalt, concrete, roofing and scrap metals, and materials available for re-use (e.g., trucks, scaffolding, computers) that could be treated differently; (c) some material could be cleared but other material, like potentially recyclable steel, would not be released or could be restricted as to its use once released.

Pilot program: Use of a pilot program for control of different materials might be appropriate.

2.8 STATE/FEDERAL/INTERNATIONAL ISSUES

State and Federal Agency Issues

EPA landfill issues: NRC should consult with EPA and appropriate State agencies to coordinate development of a suitable regulatory framework for disposal of solid materials at RCRA sites

DOE facilities should be included in analysis: DOE facilities should be included within the scope of an NRC rulemaking because an NRC rulemaking will affect DOE facilities as DOE will likely try to be consistent with whatever NRC proposes and DOE possesses a large amount of waste material. Also, some material from DOE sites is controlled through NRC and Agreement State licensed facilities. Also, DOE noted that its goal is to maintain standards consistent with standards that apply to the commercial sector.

Compatibility issues: There should be consistency between all States to avoid difficulties with interstate commerce. Some noted that a rule must be compatible with State requirements. There was discussion of what authority Agreements States will retain and whether they could continue current practice or be more restrictive. It was noted that many States have set standards for NORM. States should not be required by the level of compatibility to approve conditional use. States should have flexibility in application so that case-by-case evaluation may still be performed by a State.

Other agencies: NRC must work with DOE, EPA, the Department of Defense (DOD), and the Department of State (DOS), to establish a uniform system of standards, to harmonize method of calculations and dose/risk standards, and to get public confidence.

EPA role: NRC has worked with EPA to develop technical bases and EPA is not developing a standard in this area because of higher priorities related to orphan sources. While some said this is EPA's responsibility and NRC should not do this effort, it was also noted that NRC is within its jurisdiction to develop standards in this area for its licensees.

Other organizations: Business and industry representatives and State regulated landfill operators must be involved.

International Issues

Harmonization is needed: Any NRC standard should be consistent with the international initiatives.

Consider international implications: The international implications of setting a standard should be considered and NRC should consult and coordinate with international agencies and organizations in its rulemaking. Currently, some members of the European Community [European Union] have established clearance criteria that allow for unrestricted use of inherently safe sources of radioactivity; such practices should be evaluated by NRC. NRC should make an effort to assure reasonable consistency between an NRC rule and international initiatives so as to avoid developing an inconsistent NRC standard that can have diverse impacts on international trade or which unnecessarily restricts trans-boundary commerce.

Availability of material: Other countries do not have the capability to replace metals as easily as the U.S. and need to develop standards in this area; the U.S. imports material derived from recycled radioactive material.

NRC leadership: With regard to international standards setting, NRC should take a leadership role in what a standard should be. Some commenters noted that this should involve taking a lead with regard to the approach suggested by the metals industry and other commenters suggested this should involve an approach of not permitting release.

Disallow international standards: NRC should not follow international standards if they permit releases.

Reject international shipments: Regardless of what other countries may do, the Customs Service should reject any shipment of metal that sets off a sensor set at background. Commenters suggested that this is needed due to the incidents of illicit tracking of radioactive sources across borders and illegal trade and is needed to better safeguard our borders.

2.9 NEPA AND PROCEDURAL ISSUES

Stakeholder Involvement

Comment period: The comment period should be extended for this environmental scoping process.

Burden on stakeholders: It is an unjustified regulatory burden on the public for them to have to prove negative health effects at low doses.

Inadequate process: The enhanced participatory process is not adequate; the Advanced Notice of Proposed Rulemaking process was skipped and there were not enough public meetings. The NRC did not seriously consider critical technical comments by one invited expert participant. The scoping process has not lived up to the NAS recommendations to include the maximum number of stakeholders nor has it seriously addressed concerns of those opposed to unrestricted use.

Lack of stakeholder involvement: The Commission said that it held several meetings in 1999-2000, however the public boycotted those meetings.

Task force: Commenters noted that NRC should form an advisory task force of stakeholders (of metals industry, licensees, and consumers, convened with NRC assistance), which would report to the NRC on matters like which industries might take which materials and possible criteria based on clarification of critical issues, review of all factors, and dialogue between stakeholders. It should be noted however that the Nuclear Energy Institute (NEI) noted that their comments were developed with assistance of an industry task force of reactor radiation safety managers and Health Physicists, were reviewed by nuclear fuel cycle and materials licensees, and NEI comments reflect insights gained from listening to other stakeholders at public workshops. Also, the Metals Industries Recycling Coalition (MIRC) noted that their comments come from an ad hoc coalition of metals industry trade associations, including

copper, brass, nickel, specialty steels, and steel manufacturers, all of whom represent major recycling industries.

Basis for decisions: NRC should not make decisions on unfounded fear. NRC should state clearly that its standard is safe and communicate clearly that NAS says the current practice is safe, so as to not undermine public confidence and possibly do economic harm to licensees.

Inadequate number of public meetings: Comments for obtaining additional public input noted that there should be regional workshops in communities, four additional meetings, meetings in each State, evening meetings, and public hearings. Additional meetings should give special attention to tribal interests, relying on State assistance for outreach, using tools like television, magazines, and including having NRC staff meetings be open to the public, chat rooms on specific topics and issues, notifying interested groups by email of meetings, and posting discussions information on the website. It was also noted that NRC should consider having public meetings that concentrate on specific issues and having small group discussions on issues with reports to larger groups. There should also be a systematic method for the public to get questions answered by NRC.

BRC Policy: The public has spoken in opposition before on the below regulatory concern (BRC) policy and on other previous efforts in the late 1970's and early 1980's. This resulted in passage of the Energy Policy Act in 1992 revoking BRC. NRC should not try again with this similar effort which will have the same result.

Individual's rights: In evaluating any alternative, the right of the individual to decide and choose, or not choose, the risk of exposure should be considered.

Stakeholder consensus: Stakeholders should be allowed to agree upon facts and parameters and acceptable methods of dealing with materials and NRC should implement such a finding.

Other rulemakings: NRC ignored public comment and did not adopt their recommendations on the decommissioning rulemaking in the early 1990s.

Need for open process: Public perception concerns can be treated by following an open public process that addresses public concerns as they are identified by developing a safe practical standard, and by defending the standard as fully protective.

State issues: The rights of State and local governments to impose stricter standards and any possible limitations thereon under the interstate commerce clause should be considered.

Conflict of Interest Issues

Contractors: Full disclosure of all contracts and contractors supporting the rulemaking is requested with respect to their histories and potential for conflict of interest (COI). This includes S. Cohen & Associates (SC&A) and other contractors doing work for NRC.

Independence of other organizations: Other scientific organizations supporting release of solid materials are not independent of NRC.

SAIC COI: SAIC did basic work for NRC in preparing NUREG-1640, but SAIC was found to have a COI; NUREG-1640 should not be used.

Form and Presentation of Material

The term “radioactive” should be used when referring to the materials being discussed; also, the amounts, long-lived nature, and hazard of the materials, and prior efforts in this area (e.g., BRC), should be more clearly stated.

Clarity of discussions: Discussions should be understandable, and make clear NRC’s role and legal authority in this area.

Clarification of impact: NRC should clarify whether what it is proposing would result in releasing more material and what would be different in society.

FAA approach: It may be appropriate to develop a result similar to when the Federal Aviation Administration (FAA) determines that certain standards and activities are safe.

Discussion of present situation: Discussions should make clear that the levels of radiation being discussed are small and that materials are being released every day. The benefits of nuclear technology and the fact that the U.S. imports materials derived from recycled radioactive material should be noted.

Decision-making Process

Ignoring prohibition: The NRC is ignoring written feedback received in the majority of comments demanding a complete prohibition on releasing solid materials.

Ignoring other studies: The NRC is not reviewing critically any work done by those opposing release standards or participating in developing standards that prohibit release.

Harmonization: The NRC is relying on harmonizing with standards that it itself has participated in.

Decision is predetermined: This process has a predetermined outcome and is therefore illegitimate and flawed. The government is doing what industry wants for their economic benefit; and NRC is not seriously considering the option of isolating radioactive wastes and is not evaluating it with the same rigor in its contractor studies or its NEPA analysis - thus the NEPA analysis is flawed. Options in the June 1999 Issues Paper pre-suppose that some releases, either detection-based or dose-based, will take place; and more recently the February 28, 2003 Federal Register Notice and other discussions reiterate the Commissions support for release of solid materials. Because this process is predetermined, the environmental community boycotted the Fall 1999 public meetings rather than legitimize the process. The process is predetermined because the June 30, 1998, Staff Requirements Memorandum (SRM) directs the NRC staff to promulgate a dose-based rule for clearance of material.

Additional Technical Basis Needed

Additional analyses needed: Until more analyses of technical information and more extensive research and study of effects, etc, are complete, NRC should put this process on hold and suspend releases unless there are ironclad assurances that the plan is totally safe. Otherwise, many situations have been proven to be dangerous after they were allowed or after long term exposure.

Analysis should be complete before rule is proposed: The timing of the reports on soil analyses and technical support for NEPA and cost-benefit analyses is very important and these reports should be done before the draft of any rule.

Other Issues

Allow market to work: NRC should set health-based standards and allow the market to work within the bounds of the standard.

Lawsuit: There would be a class action suit against NRC if it goes ahead with this plan.

State regulations will be enforced: Sixteen States have passed laws and regulations more restrictive than NRC's mostly with intent to continue regulatory control if NRC deregulates.

2.10 RULEMAKING PROCESS

Advantages of NRC's Rulemaking Process

Clearly defined standard needed: A dose-based standard is needed (for unrestricted use or for specific uses such as re-use or landfill disposal) that clearly defines a level: (1) at which protection of public health is assured without the need for continued regulatory oversight or licensing; or (2) that distinguishes between material considered radioactive and non-radioactive from the standpoint of regulatory control; or (3) at which any material released is clean and safe.

Risk-informed: A dose-based standard reflects risk-informed regulation and NRC's risk-informed performance philosophy and can be consistent with other dose-based standards currently used to protect the public.

Consistent and usable: A national standard is needed that provides consistency, is technically defensible and safe, can be readily implemented, and includes volumetric contamination; standards in various States are different around the country.

Public confidence: The rulemaking process would provide for public participation; it could increase public confidence in the regulatory process because the standard would be clear as to safety and would be more consistently applied.

CRCPD: The E-23 Committee recommends a rulemaking should be done to develop a dose based standard.

Cost-effective: A dose-based standard would be cost effective compared to the status quo of making case-by case determinations and would reduce unnecessary regulatory burden.

Scientific basis: A dose-based standard could provide an appropriate scientific basis for consistent regulations.

International: A dose-based standard would be supportive of international initiatives.

Disadvantages associated with rulemaking

Dose is not measurable: With a dose-based or risk-based standard, the doses and risks cannot be modeled accurately, or be measured, verified, enforced, or trusted (unlike the current approach which can be measured).

Deregulation of wastes: A rulemaking would put standards in place for release that would expand the amount of material the public is exposed to. A rule would result in deregulation and redirection of large amounts of wastes to unlicensed, unregulated destinations, these wastes would have been required under present policies to go to a regulated Part 61 LLW site.

Contamination of consumer products: A rulemaking would permit release of large amounts of waste material into consumer products; radioactivity at any level in these products is not acceptable.

No public benefit: A rule would only benefit the licensees and there would be no benefit to the general public.

Lack of trust: Past failures by NRC in keeping radioactive materials from being improperly released argue against having a release rule.

Too burdensome: The cost of analysis and regulatory approval is too great.

Not accurate: Volumetric monitoring methods are not perfected.

Case-by-case reviews: If a regulation is adopted, would this eliminate the capability to request "case-by-case" reviews?

Scope of Rulemaking

Origin of material: The Federal Register Notice notes that solid material in "restricted" or "impacted" areas are covered by requirements; however the rule should provide for control of <u>all</u> licensed and/or potentially radioactive material regardless of where it is on the site, including licensed material that may be stored in unrestricted or controlled areas.

Limit rule to volumetric contamination: NRC might consider only rulemaking for volumetric contamination.

Criteria should be market-based: NRC should set health-based standards and let the market work within the bounds of a standard.

Consistency with license termination rule: There needs to be a connection between any standard developed and the criteria of the license termination rule.

Other materials: NRC should clarify whether this rulemaking applies to liquids and sludges.

3. SCOPE OF THE DRAFT GEIS

The National Environmental Policy Act (NEPA) (Public Law 91-90, as amended), and the NRC's implementing regulations for NEPA (10 CFR Part 51) prescribe in general terms what should be included in an IS prepared by the NRC. Regulations established by the Council on Environmental Quality (40 CFR Parts 1500-1508), while not binding on the NRC, provide useful guidance.

The Draft GEIS analysis will include a consideration of the economic, technical, and other benefits and costs of the proposed action, and alternatives to the proposed action. Due consideration will be given to compliance with environmental quality standards and regulations that have been imposed by Federal, State, regional, and local agencies having responsibility for environmental protection, including any applicable zoning and land-use regulations and water pollution limitations or requirements established or imposed pursuant to the Federal Water Pollution Control Act. The environmental impact of the proposed action will be considered in the draft analysis with respect to matters covered by such standards and requirements regardless of whether a certification or license from the appropriate authority has been obtained. While satisfaction of NRC standards and criteria pertaining to radiological effects will be necessary to meet the licensing requirements of the Atomic Energy Act, the draft analysis will, for the purposes of NEPA, consider the radiological effects of the proposed action and alternatives.

The issues to be analyzed in depth in the Draft GEIS include the impacts and costs associated with rule alternatives for controlling the disposition of solid materials at licensed facilities. Information will be developed on (a) types and contamination levels of solid materials present at licensed facilities and potentially available for release; (b) pathways of exposure to, and environmental impacts of, solid materials released from licensed facilities; (c) regulatory alternatives and methods of approach for analysis of the alternatives; and (d) costs and benefits of the alternatives. The Draft GEIS will also include a detailed discussion of the need for the proposed action.

The Draft GEIS will recognize other studies related to the control of solid materials, including the National Academies report completed in March 2002. This report contains nine recommendations on the decision-making process, potential approaches for controlling the disposition of solid materials, and additional technical information needed. In addition, other scientific organizations are engaged in similar processes. Recognized radiation protection standards organizations like NCRP, ICRP, and ANSI have issued findings about possible criteria for controlling the disposition of solid materials. International agencies (such as the International Atomic Energy Agency and the European Commission) as well as other individual nations, are in the process of establishing standards for controlling the disposition of solid materials. These efforts are significant for the NRC because inconsistency in standards between the U.S. and other nations can result in confusion regarding international trade, in particular if materials released under other nations' regulations arrive as imports in the U.S.

The NRC identified reasonable alternatives to the proposed action during scoping. The DGEIS will include consideration of both radiological and nonradiological impacts associated with the proposed action and the reasonable alternatives. The DGEIS also considers necessary

monitoring, potential mitigation measures, unavoidable adverse environmental impacts, short-term uses of the environment and the maintenance and enhancement of long-term productivity, irreversible and irretrievable commitments of resources, and cumulative impacts. The following topical areas and issues will be analyzed in the Draft GEIS.

- ***Public and Occupational Health and Safety.*** The potential human health impacts of the alternatives on workers and the general public will be evaluated for normal operations (including handling, transfer, inspection activities, and end uses) and decommissioning. Potential exposures to radioactive elements and to chemicals will be considered.

- ***Transportation.*** The transportation impacts of shipping released materials under each alternative will be discussed. The impacts of transportation will be evaluated in terms of radiological exposure risk to the population during normal transportation (including handling, transfer, and inspection) and under credible accident scenarios. The non-radiological impacts of transportation will also be evaluated.

- ***Water Resources.*** The Draft GEIS will assess the potential impacts of the alternatives on surface water and groundwater resources.

- ***Air Quality.*** Potential air quality impacts of each alternative will be evaluated in the Draft GEIS. The evaluation will include potential impacts for both radiological constituents and other air pollutants.

- ***Waste Management.*** Waste management was identified as a significant issue by many commenters. The Draft GEIS will document the quantities, types, treatment, and disposal of the various released materials. The Draft GEIS will also consider the disposal capacity impacts associated with the disposal of materials at both EPA-regulated landfills and LLW disposal facilities.

- ***Cost-benefit Analysis.*** The Draft GEIS will include a cost-benefit analysis that assesses the environmental and other costs and benefits of each of the alternatives.

4. ISSUES OUTSIDE THE SCOPE OF THE DGEIS

The NRC has made a determination that some issues are associated with small or no impacts. For this reason, these issues will not be addressed in detail in the GEIS. These issues include:

- Soils
- Ecological resources
- Environmental justice
- Land use
- Visual/scenic resources
- Noise
- Historical, archaeological and cultural resources

Also, the GEIS will not address the impacts of terrorism as the staff does not consider these impacts to be reasonably foreseeable as a result of the proposed action.