

## **APPENDIX A**

### **STAKEHOLDER VIEWS - EXAMPLES**

The solicitation and subsequent consideration of stakeholder views were major steps in the development of the low-level waste (LLW) Strategic Assessment. External stakeholder views and opinions were primarily obtained in the following ways: (1) from comments provided by invited speakers and other attendees at a May 2006 Advisory Committee on Nuclear Waste and Materials (ACNW&M) two-day Working Group Meeting (i.e., a “fact-finding” workshop), which was attended by representatives from industry, states and compacts, academia, other federal government agencies, environmental groups, and professional societies; (2) from responses to a Federal Register Notice (FRN) , issued on July 7, 2006 (and later modified on July 27, 2006 to extend the comment period), which asked for comments from the public on the staff’s approach toward the strategic assessment; (3) via teleconferences with certain Agreement State regulators; and (4) from comments received in a December 2006 public meeting with the Nuclear Energy Institute (NEI) and Electric Power Research Institute (EPRI). In addition, apart from the information received in the contacts described above, several national organizations have published position papers that express various concerns and opinions regarding LLW management in the U.S. Those written positions have also been taken into consideration in the development of this Strategic Assessment and are summarized below as they relate to specific issues of interest. The following discussion, in brief, provides examples of stakeholder positions on some key issues. Stakeholder comments on these and other issues are provided in full in the transcripts<sup>1</sup> of the May 2006, ACNW&M workshop and in the public responses<sup>2</sup> to the staff’s FRN.

As noted earlier in this report, the staff factored in its own experience and knowledge base and developed a list of potential activities for the LLW program after considering stakeholders’ input on their issues of concern. The activities selected, and listed in Appendix C, were based upon programmatic needs, including responsiveness to stakeholder concerns, some of which are discussed below. While all stakeholder suggestions and recommendations for NRC action were given serious consideration by the staff, those that are outside of the scope of this effort and/or outside of NRC’s regulatory responsibility, and those that require changes in legislation or regulations that are unfeasible at the present time are not incorporated in the staff’s list of proposed activities. The priority (high, medium, or low) for each activity identified in Appendix C was ultimately based upon the staff’s qualitative assessment of the task’s relative “return on investment” (ROI), (i.e., the potential benefit in terms of meeting the LLW program’s strategic objective and goals versus the resources and time required to obtain the expected benefits), as well as additional considerations such as the potential for unintended consequences.

#### **Risk-informing**

In December 2005, the ACNW&M provided a letter to the Commission that contained a preliminary list of areas where Part 61 might be more risk-informed. In keeping with that theme, the ACNW&M’s stated purpose for its May 2006 workshop was to provide a forum for the collection of information from stakeholders regarding areas where Part 61 might be better risk-

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<sup>1</sup> ADAMS Accession Number ML061530321; also at <http://www.nrc.gov/reading-rm/doc-collections/ACNW&M/tr/2006/nw052306.pdf>, and ML061530441; <http://www.nrc.gov/reading-rm/doc-collections/ACNW&M/tr/2006/nw052406.pdf>.

<sup>2</sup> ADAMS Accession Number ML 070871208.

informed, with the aim thereby of improving the overall effectiveness of the current regulatory framework for LLW disposal. It follows that much of the discussion during the workshop focused on risk-informing the regulatory approach toward LLW management and disposal. Statements on risk-informing generally involved the following four areas: (1) disposal of very low-level radioactive waste (VLLW); (2) assumptions and basis for the intruder protection requirements in 10 CFR Part 61; (3) waste classification; and (4) managing and disposing of radioactive waste in ways commensurate with its degree of hazard, not its origin. As evidenced by the discussion below, it is difficult to treat these issues separately, as in many ways they are interrelated. For example, the Part 61 waste classification system, which establishes maximum concentrations for specific radionuclides, is based on a desire to protect inadvertent intruders. The classification system is founded upon certain assumed scenarios that are described in the Draft Environmental Impact Statement for Part 61, involving resident farmers, residence excavations, and waste exhumations. Therefore, as noted by several participants at the ACNW&M workshop, attempting to develop more “risk-informed” intruder scenarios or applying scenarios differently for different types of sites; (e.g., arid versus humid sites), could have a significant effect on what types and quantities of waste can be disposed of at a particular site (leaving aside other constraints that may be imposed by state or federal regulations or statutes).

The subject of risk-informing radioactive waste disposal has also been addressed in recent position papers issued by some national professional organizations. In March 2006, NAS issued one such paper<sup>3</sup> the central theme of which is that LAW should be regulated and managed according to their intrinsic hazardous properties and the associated health risk, instead of via the current regulatory structure, which is based primarily on the origin of the waste (e.g., defense, medical, nuclear industry, non-nuclear industry). A similar view was articulated by the Health Physics Society (HPS) in a revised *Position Statement*<sup>4</sup> issued in September 2005. Some speakers at the ACNW&M workshop supported the NAS/HPS position on risk-informing. One participant opined that the current (source-based) waste classification system cannot be defended on the grounds of human health protection and should be replaced with a system based on the health risks that could arise from the disposal of the wastes. Further, this participant noted that such a system would also include a general class of waste that would be exempt from regulation. However, another workshop participant, who represented a public interest organization, stated that any attempt to alter the current LLW classification system by risk-informing would be objectionable if such changes include raising the concentration limits for one or more radionuclides in the current system, as that would be viewed as a reduction in the amount of protection. This opinion was reiterated in written comments by that speaker (and others holding similar views) that were later submitted in response to the staff’s FRNs.

Even though many workshop participants who favored making LLW management and disposal more risk-informed, there was no groundswell of support for modifying 10 CFR Part 61 through rulemaking. This position was not universally held, however, as one of the respondents to the FRN suggested that Part 61 should be updated by following a risk-informed system such as

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<sup>3</sup> *Improving the Regulation and Management of Low-Activity Radioactive Waste* (National Research Council of the National Academies, March 2006).

<sup>4</sup> *Low-Level Radioactive Waste Management Needs a Complete and Coordinated Overhaul* (Health Physics Society, <http://www.hps.org>, September 2005).

that proposed (in 2002) by the National Council on Radiation and Measurements.<sup>5</sup> This respondent further stated that “. . . all limits that are promulgated should not only be risk-informed, but should also be expressed in terms of risks . . .” (rather than as dose limits). Some industry groups also advocated various Part 61 rulemakings that would have the potential effect of increasing flexibility in disposal options for certain types of LLW.

For many, the subject of risk-informing LLW disposal regulations and practices is closely tied to the current origin-based system for disposal of LAW. Accordingly, the primary recommendation of one of the respondents to the staff’s FRNs is that the regulatory agencies (viz., NRC and EPA) should implement risk-informed regulation of LAW through “integrated strategies” that would involve adoption of risk-informed approaches in incremental steps. In this respondent’s view, this approach would improve communication with affected and interested stakeholders because the current system is so “rigid and hard to understand.” As noted earlier, however, other respondents, strongly oppose risk-informing and consider it to be tantamount to “deregulation.”

The ACNW&M identified specific areas for risk-informing the regulatory framework for LLW management, but stopped short of recommending rulemaking.<sup>6</sup> A representative of an industry support group opined that 10 CFR Part 61 has significant built-in flexibility that allows the updating of dose models and concepts as well as the potential for removal of the intruder “ingestion” pathway for certain nuclides. Several commenters touched on the potential for establishing a new or modified classification system under the provisions of 10 CFR Part 61.58. The increased flexibility in disposal options inherent in this approach could, in the opinion of some, facilitate disposal availability and reduce the average cost of disposal of some types of waste.

The use of sound science and state-of-the-art methods to establish risk-informed and, where appropriate, performance-based regulations, is a strategy that NRC has committed to in its Strategic Plan.<sup>7</sup> Consequently, NRC staff activities are expected to adhere to that policy and approach. While all of the LLW program activities listed in Appendix C are expected to be risk-informed to the extent practicable, tasks that would significantly employ risk-informing are those involving rule-making and guidance development. Thus, activities related to the implementation of major revisions to 10 CFR Part 61; the development of guidance documents for implementing the LLW import/export regulations in 10 CFR Part 110 and alternative waste classification and characteristics provisions in 10 CFR Part 61.58; the updating of the Branch Technical Positions on Waste Concentration Averaging and Extended Storage of LLW; and the identification of alternatives for disposal of large quantities of depleted uranium (DU) are examples of activities that would support more risk-informed practices in LLW regulation.

### **Closure of Barnwell LLW Facility to Out-of-Compact Waste**

The projected closing in June 2008, of the LLW disposal facility at Barnwell, South Carolina, to out-of-Atlantic Compact waste generators has been an issue of concern to several stakeholders and, not surprisingly, was a major subject of discussion at the ACNW&M workshop as well as in

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<sup>5</sup> *Risk-Based Classification of Radioactive and Hazardous Chemical Wastes, NCRP Report No. 139, December 31, 2002.*

<sup>6</sup> *Letter, Michael Ryan, Chairman, ACNW&M, to Dale Klein, Chairman, NRC, August 16, 2006.*

<sup>7</sup> *U.S. Nuclear Regulatory Commission, FY 2004-2009 Strategic Plan, NUREG-1614, Vol. E, August 2004.*

the responses to the staff's FRN. Closure of the Barnwell facility to out-of-Compact waste could require waste generators in 36 states (encompassing over 80 percent of the nation's nuclear power reactors) to store their Class B and C LLW.

At the ACNW&M workshop the nuclear utilities generally noted that the potential closure of the Barnwell facility would not present any significant problems in the short term, as they already either had in place or were making provisions to ensure that there would be adequate long-term storage capability on their reactor sites. In contrast, the closure of Barnwell was seen to be a potentially significant problem for universities and hospitals who have limited, if any, ability to store their Class B & C LLW. For some non-reactor licensees, the cost and liability issues associated with extended storage of LLW was seen to be a major problem that has rather broad, and possibly severe, societal implications in that it is reportedly already curtailing medical research. One respondent to the staff's FRN observed that many small generators faced with the need to store LLW are poorly located and equipped to deal with such storage and would require specific assistance.

In the view of some respondents to the FRN, LLW disposal problems that might occur with the closing of Barnwell could be alleviated by making DOE facilities available to waste generators that have no other viable disposal option or by expanding other options such as the use of Resource Conservation and Recovery Act (RCRA) sites. One state representative, however, expressing concerns about the economic viability of LLW disposal sites, noted that a sufficient and consistent volume of waste is required to accommodate the cost of developing and operating the sites. Accordingly, that representative cautioned the NRC to ensure that its policies and actions do not interfere with the commerce of waste disposal and contended that the development of alternative disposal options, particularly for low-activity waste (LAW) or very low-level waste (VLLW), reduces the available volume of LLW disposed of at conventional facilities and further hampers the economic viability of existing and proposed LLW disposal sites.

The staff considers the potential closure of the Barnwell site to out-of-Compact waste to be a particularly significant issue, as discussed in Section 4.3.1 (System Vulnerabilities/Challenges), and in Appendix B. The staff has ranked the on-going review and update of guidance on extended storage of LLW as a high priority task, in large part due to the potential closure of the Barnwell facility.

### **Disposal Options for Low Activity/Very Low Level Radioactive Waste**

Another issue that is of concern to many stakeholders involves the disposal of LAW, or VLLW. In the view of most speakers at the ACNW&M workshop, the costs and limited disposal options for disposal of such wastes are not commensurate with the associated level of risk. Some participants expressed a desire for more risk-informed ways to dispose of such wastes (for example at RCRA/municipal sites). Others noted that, while many such wastes could be disposed under the provisions of 10 CFR 20.2002, NRC's process for authorizing disposals under this provision was inconsistent and needed to be clarified, simplified and made more transparent by the development of new regulatory guidance. The disposal of certain LLW under the provisions of 10 CFR 20.2002 was generally opposed by most of the respondents to the NRC's FRN who are members or supporters of public interest groups.

One speaker at the ACNW&M workshop suggested that it might be advisable to establish a clearance level below which LAW could be disposed in non-Part 61 (e.g., RCRA/municipal land-fill) sites without regulatory control or oversight. In a similar vein, a nuclear consultant, stating that “Part 61 over regulates the risk” for VLLW proposed the adoption of a 100 millirem (mrem) intruder dose limit during the post-closure period for a LLW disposal facility, along with a 25 mrem limit following the post-closure period (i.e., after 100 years). Whereas some state representatives pointed out that their states allowed certain LLW to be disposed at RCRA sites, a current LLW disposal site operator cautioned that in some areas local opposition to such disposal is very strong. A representative of a public interest group voiced opposition to what she stated would be viewed as a potential reduction in, or relaxation of, protections against exposure to radiation, if more VLLW is disposed in non-10 CFR Part 61 sites. A member of an environmental group spoke out against the creation of a lower-than-Class-A level of LLW and advocated a halt to the generation of all radioactive waste, along with a phasing out of nuclear reactors as soon as possible.

Several of the activities listed in Appendix C deal with disposal options for LAW. A high priority activity involves the development and implementation of an internal procedure and Standard Review Plan for reviewing and processing 10 CFR 20.2002 alternate disposal requests, and requests to dispose of “unimportant quantities” of source material. As indicated in Table I of this report, the staff intends to initiate work on this task during the 3<sup>rd</sup> quarter of fiscal year 2007.

Stakeholder views concerning provisions for very low level radioactive waste to exit the regulatory system, also termed “clearance,” tend to be very polarized. In policy statements issued by national organizations such as the Health Physics Society, for example, a clearance provision ranks among their highest priority actions. Those in favor of establishing an “inherently safe quantity of radioactive material,” view it as a way to ease regulatory burden and thereby reduce the cost of disposal. Some representatives of public interest groups and their supporters are on record as being strongly opposed to a clearance provision, however, because they consider it to be a generic deregulation of nuclear waste that would subject members of the public to unnecessary risk. In June 2005, the Commission decided to defer a proposed rulemaking<sup>8</sup> on controlling the disposition of solid materials because the agency was faced with several high priority tasks, because the current approach (which is to review cases on an individual basis) is fully protective of public health and safety, and because there was no longer an immediate need for the rule due to the shift in timing for reactor decommissioning. The staff has addressed this issue by identifying a task in Appendix C that would summarize current guidance associated with disposition pathways for waste with very low levels of radioactivity and clearly describe the various options for disposing of this waste.

### **Use of DOE and/or EPA Sites for Disposal of Commercial LLW**

Several participants at the ACNW&M workshop spoke to the possibility of disposal of commercial LLW at a federal (e.g., DOE) facility. A speaker from an academic institution advocated use of DOE facilities to dispose of Class B, C and greater-than-Class-C (GTCC) wastes and inquired about the possibility of using of other federal land operated either by a federal or private entity to manage LLW. In a similar vein, another speaker proposed (in the

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<sup>8</sup> *Staff Requirements Memorandum, SECY-05-0054, “Proposed Rule: Radiological Criteria for Controlling the Disposition of Solid Materials (RIN 3150-AH18), June 1, 2005.*

long-term) that Congress authorize DOE or some other federal agency to develop a disposal facility for “. . . commercial LLW on federal land, to be regulated by the NRC as a national disposal facility. This person also suggested that LLW from NRC licensees be allowed to be disposed at existing DOE sites under DOE rules on at least an interim basis, and cited a suggestion by the Health Physics Society that the DOE, as part of their Environmental Impact Statement for disposal of GTCC waste, also consider and address the disposal of Class B & Class C waste, on the grounds that a facility found safe for GTCC waste would also be adequate for Class B & C waste. Disposal of commercial LLW at sites managed by the DOE is an approach that was recommended by the American Nuclear Society, in a November 2004 *Position Statement*<sup>9</sup> on issues related to the disposal of LLW. In contrast, a representative of a state compact commission, in response to the NRC’s FRN, cautioned against allowing such an approach. The state respondent expressed the view that the rights of interstate compacts to control the flow of waste into processing or disposal facilities within their borders must be supported and upheld. A speaker at the ACNW&M workshop, representing a state and compact group, expressed the view that until the remediation efforts at federal facilities (such as those on-going at Hanford) are completed, it will be difficult to convince the public to support the development of new disposal capacity for off-site wastes at federal facilities.

Several participants at the ACNW&M workshop offered up remarks concerning the use of EPA/RCRA sites for the disposal of LAW. The Health Physics Society has supported this proposal in its revised *Position Statement*. In the view of one current site operator, RCRA sites in arid regions, which are not susceptible to the so-called “bathtub effect,” provide a very effective means of disposal that is equivalent or even superior to 10 CFR Part 61 sites for waste containment, especially for soil and debris materials. Partly in response to this, one ACNW&M member expressed an interest in exploring the feasibility of transferring the regulatory oversight of LLW disposal from NRC to EPA. Another member pointed out an objection to this suggestion that has been voiced previously by others, viz., that while EPA regulates many different things, there are benefits from NRC’s sole focus on radioactive materials. A consultant to the ACNW&M pointed out that, for EPA RCRA facilities, performance assessments are not conducted, nor are there any provisions for protection of the inadvertent intruder.

As shown in Appendix C, the staff identified several activities that would involve systematic interaction and coordination with other Federal or State agencies on options for the management of LLW. Among these activities are the development of a standard review plan for reviewing and processing 10 CFR 20.2002 alternate disposal requests and requests to dispose of “unimportant quantities” of source material; coordinating with other Federal and State agencies on improving the regulation of LAW; developing licensing criteria for disposal of GTCC waste; and develop generic waste acceptance criteria for the disposal of LLW in 11e.(2) impoundments.

### **Economic Considerations**

Economic factors were a major concern to many stakeholders. In the words of one respondent to the staff’s FRN, the concern stemmed from “the lack of a competitive cost environment.” The rising costs of disposal of Class B & C LLW was the source of a recommendation from one

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<sup>9</sup> *Disposal of Low-Level Radioactive Waste - - Position Statement No. 11; American Nuclear Society; <http://www.ans.org/>. November 2004*

respondent to allow disposals of commercial LLW at DOE sites. In a similar vein, a representative of a state regulatory agency opined that the expanded use of RCRA facilities to accept slightly radioactive materials could reduce future disposal costs for such types of waste. However, another state regulatory agency representative stated that the expanded use of RCRA facilities for disposal of LAW could impact the economic viability of the operating LLW disposal facilities and/or require LLW facilities to increase the price of waste disposal to compensate for the loss in revenue. The costs of transporting LLW over long distances was an issue raised by an industry trade association, which also expressed concerns that the lack of a disposal option for Class B and C LLW would likely translate into increased costs for LLW management (including long-term storage), and could dampen future investment in the nuclear industry.

Several of the activities evaluated in Appendix C have economic implications. The development of a Standard Review Plan for reviewing and processing 10 CFR 20.2002 alternate disposal requests, for example, would be expected to result in increased efficiency in NRC reviews of these requests as well as increased clarity for licensees and other stakeholders. The development and issuance of an Information Notice on waste minimization would benefit small institutional waste generators, in particular, by providing them with additional information on how to minimize the amount of waste produced by their operations. The identification of alternatives for disposal of large quantities of depleted uranium would have a potential impact on enrichment facility licensees with regard to the future cost of operations and associated financial assurance decisions.

### **Waste Classification**

As noted in the discussion above regarding risk-informing, a number of stakeholder have made recommendations regarding the classification system established in 10 CFR Part 61. Some stakeholders advocate major changes in NRC's regulations that would result in a classification system that was better aligned with risk, rather than with the waste's origin or legislative stature. Others recommend that all radioactive wastes be reclassified according to the "length of time they pose a hazard." The latter group opposes risk-informed regulation on the grounds that the risks of ionizing radiation at low doses and the synergistic effects of hazardous waste are unknown and are being ignored. Thus, as with other issues, the subject of waste classification cuts across related issues such as risk-informed regulation, disposal options for very low activity waste, disposition of GTCC sealed sources and disposal options for large quantities of depleted uranium (DU).

The staff has identified several tasks in Appendix C that would further add transparency and flexibility to the waste classification process. Those tasks include the development of guidance document for implementing the alternate waste classification provisions of 10 CFR 61.58, updating the Branch Technical Position on Concentration Averaging, and identifying alternatives for safe disposal of large quantities of DU.

### **Unintended Consequences**

In the ACNW&M workshop discussions, several speakers advised caution in making changes to the LLW regulatory framework that could result in unintended consequences. As one speaker stated, proposals for alternative approaches should be carefully analyzed from the

perspective of all parties, as it is important to consider political realities, economic consequences and regulatory concerns. An example of the kind of issue that could cause complications that are hard to quantify involves the waste classification provisions in Part 61. Those provisions are referenced and included in other regulations as well as federal and state legislation, so any changes in the waste classification system could have a cascading effect. One of the ACNW&M workshop attendees, representing an agreement state regulatory agency that is involved in the licensing review of a LLW disposal facility, expressed the view that any federal regulatory changes that might occur during the state's licensing process could have significant, and potentially negative, effects and should therefore be avoided. In a similar vein, another state agency representative, responding to the staff's FRN, opined that NRC should focus on identifying unique and emerging waste streams rather than furthering changes in regulations.

As part of the process of identifying and ranking proposed activities (discussed in section 4.3.3), the staff took into consideration the potential unintended consequences that might ensue if the activity were carried out. For those tasks having significant potential unintended consequences, the details appear in the column labeled, "Additional Considerations" Table C-III, in Appendix C.