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CHAPTER 5 STAFF ASSESSMENT

Based on the analyses presented in this document, it can be concluded that for all the alternatives there are no significant impacts, except for the LLW Disposal Alternative. For this alternative, there are higher estimated transportation accidents, a large impact on LLW disposal capacity, and a large cost. A summary of the environmental impacts of the alternatives is presented in Section 2.6.

The No Action Alternative (NRC’s current approach) is workable and familiar to licensees. However, there is a lack of an overall risk basis or consistent approach, the measurement bases are outdated, there is no regulation associated with the current approach, licensees have problems using the current approach when dealing with materials day-to-day, and there are expenditures of NRC staff resources on case-specific reviews.

The National Academies report indicates that NRC’s current approach for controlling the disposition of solid materials (the No Action Alternative) is “sufficiently protective of public health that it does not need immediate revamping.” However, the National Academies report also indicates that the current approach is incomplete and inconsistent and that NRC’s approach should be risk-informed. As a result, the National Academies study states that NRC should conduct a process to evaluate alternatives to provide clear risk-informed direction on controlling the disposition of solid materials. This Draft GEIS is part of that process and considers several alternatives which are risk-based rulemakings.

One of the rulemakings considered is the Unrestricted Release Alternative. This alternative would allow solid materials to be released for use in general commerce if a radiation survey verifies that radionuclide concentrations in a dose-based regulation have been met. This alternative satisfies the NRC strategic goal of ensuring protection of public health and safety and the environment. A dose limit of 1 mrem/yr was analyzed for this alternative because it is a small fraction of the public dose limit, the National Academies recommended it in their study, and it is consistent with national and international clearance guidelines. Other dose limits (0.03, 0.1 and 10 mrem/yr) were also considered as options. The lower dose limits were rejected because there are difficulties in surveying at these dose limits (Appendix K) and disposal costs would be higher. Larger amounts of material were released for the 10 mrem/yr dose limit.

Some commenters viewed the Unrestricted Release Alternative as the least expensive option, while still providing adequate protection. They found disposal of all potentially clearable solid materials in a licensed LLW disposal facility is costly to licensees without an accompanying health and safety benefit and would cause a severe economic impact for small licensees (e.g., medical facilities, universities). However, most of the public commenters were concerned that risks associated with unrestricted use of these solid materials are avoidable and involuntary, the risks of radiation are underestimated, there is a potential for exposures to multiple products, and releases would not be accurately measured and tracked. Also commenters from the steel and concrete industries, who would receive the cleared material, indicated that their potential costs could be very large because consumers could choose not to purchase items made from material recycled from licensed facilities.

1
2 To answer some of the public's concerns with unrestricted use, we also examined the EPA/State-
3 Regulated Landfill Disposal Alternative. This alternative considers release of solid materials
4 only to EPA/State-Regulated RCRA Subtitle D facilities. This approach would prevent solid
5 material from licensed facilities from entering general commerce, thus limiting the potential for
6 radiation dose to the general public. Also, limiting disposal of released solid materials to an
7 EPA/State-Regulated landfill would place a smaller economic burden on licensees than disposal
8 of all potentially clearable solid materials at a licensed LLW disposal site. (Some potentially
9 clearable solid material would still go to a LLW facility if it was above the dose limit.)
10 However, this alternative would allow higher radionuclide concentrations because a greater
11 amount of activity could be released to landfills than the amount that would be released to
12 general commerce under the Unrestricted Release Alternative.
13

14 The next alternative considered was the LLW Disposal Alternative, also referred to as
15 Prohibition. In this alternative, all potentially clearable solid material would be prohibited from
16 general commerce. The solid material would be required to be disposed of in a LLW disposal
17 site. This approach would prevent potentially clearable solid material from licensed facilities
18 from entering general commerce, thus limiting the potential for public exposure to radiation.
19 However, if all potentially clearable material (which has no, or very small amounts of,
20 radioactivity and which has some economic value) is sent to LLW disposal sites, this would be
21 costly to licensees. Furthermore, there is a large impact on LLW disposal capacity - the solid
22 materials to be generated from the existing commercial nuclear reactors would represent more
23 than the existing LLW disposal capacity.
24

25 After assessing the above alternatives, NRC considered the Limited Dispositions Alternative.
26 Under this alternative, potentially clearable solid material (concrete, steel and trash) could be
27 released, if it were below radionuclide concentrations associated with a dose criterion of 1
28 mrem/yr, but with only certain authorized dispositions to limit the potential for public exposures.
29 Three pre-authorized dispositions are considered in this alternative - RCRA Subtitle D landfill
30 disposal, concrete use in road beds, and the reuse of tools and equipment. Any requests to
31 release material other than the three pre-approved dispositions (for example, soils or industrial
32 uses such as metals in bridges, sewer lines, or industrial components in a factory) or at higher
33 radionuclide concentrations would require case-specific approval.
34

35 To minimize the potential impacts of the unlikely release of solid material into other products,
36 the radionuclide concentrations considered in this alternative are based on unrestricted release.
37 The IAEA radionuclide concentrations were chosen to be consistent with national and
38 international numeric guidelines. Another economic benefit is that potentially clearable solid
39 materials could be used under certain authorized conditions, rather than using the more costly
40 licensed LLW disposal facilities. As shown in Table 3-29, the collective dose for this alternative
41 is lower than for the No Action Alternative because exposures to the public are more limited. To
42 ensure that the material releases are occurring to the pre-approved dispositions, there would be
43 licensee recordkeeping and these activities would be evaluated periodically during routine staff
44 inspections at licensed facilities. Also enforcement action would be taken if necessary.
45

1 Municipal solid waste operators, EPA and the State agencies have the discretion of allowing or
2 refusing disposals in Subtitle D facilities. Even if allowed, EPA and the State agencies might
3 impose additional constraints on such disposals. Accordingly, the implementation of the rule
4 would have to consider EPA and State agency requirements as well as the concerns of the
5 landfill operators. It is envisioned that some landfill operators might not want to receive such
6 materials, but others would, considering economic factors. At this time, however, it is not
7 possible to determine readily which landfill operators and State agencies might find the NRC
8 rule an effective option.
9

10 Most landfills routinely monitor incoming waste shipments for the presence of radioactivity.
11 The radiation monitoring systems typically are installed at the scales where trucks are weighed
12 before being sent to specific waste processing areas. The alarm set-points are set at varying
13 levels, typically at a multiple of ambient background levels. If a waste shipment were to set off
14 an alarm, the shipment is typically set aside and the originator of the shipment is informed of the
15 situation. Also, landfill operators may call the State agency responsible for radiation protection
16 for guidance on how to proceed. Licensees will have to be aware of monitoring practices for
17 incoming shipments to landfills or other destinations as part of their business practices, in
18 addition to complying with the nuclide concentrations in this regulation for release of solid
19 materials from licensed control.
20

21 Recommendation 22

23 After considering the costs, benefits, and impacts of all the alternatives, the staff has
24 preliminarily concluded that the Limited Dispositions Alternative would ensure that doses are
25 maintained well below levels established to ensure protection of public health and safety and the
26 environment, has among the lowest costs, and its dose criterion is consistent with international
27 guidelines. The No Action Alternative (NRC's current approach) sufficiently protects public
28 health, but there is a need for a risk-informed regulation. Most public commenters were
29 concerned about the Unrestricted Release Alternative because of the increased potential for
30 exposures to consumer products. The EPA/State-Regulated Disposal Alternative would limit the
31 potential for radiation dose to the general public, but the radionuclide concentration limits for
32 only landfill disposal are higher than for unrestricted release. For the LLW Disposal Alternative,
33 there are higher estimated transportation accidents, a large impact on LLW disposal capacity,
34 and a large cost. Thus the Limited Dispositions Alternative is the staff's preliminary
35 recommendation.
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