



Department of Energy

Washington, DC 20585

JUL 13 1999

Mr. William M. Pardue, Chair
Oak Ridge Reservation Environmental Management
Site Specific Advisory Board
P.O. Box 2001
Mail Stop EW-91
Oak Ridge, Tennessee 37831

Dear Mr. Pardue:

Thank you for your comments on the Draft Department of Energy Order and Manual on Radioactive Waste Management, DOE O 435.1 and DOE M 435.1-1. The Department requested comments on this directive in an August 6, 1998, Notice of Availability (63 FR 42012). We received approximately 250 comments from 18 different entities. All public comments received on the Draft are available in the DOE Public Reading Rooms and at the Center for Environmental Management Information (1-800-736-3282). All comments were considered in finalizing the document. The directive was approved July 9, 1999, and is available at web address: <http://www.explorer.doe.gov:1776/htmls/directives/html>.

Enclosed is a summary of the most frequently received comments and the Department's responses to these comments.

Again, thank you for taking the time to review the directive. If you have any questions about the final document, please contact Martin Letourneau of my staff at 301-903-7656.

Sincerely,

Mark W. Frei
Acting Deputy Assistant Secretary
for Waste Management
Environmental Management

Enclosure



Summary of Public Comments on DOE Order 435.1, Radioactive Waste Management

On August 6, 1998, DOE published a Notice of Availability (NOA) of the draft Department of Energy Order and Manual on Radioactive Waste Management (DOE O 435.1 and DOE M 435.1-1) (63 FR 42012). The NOA solicited comments on the draft Order and Manual and set a deadline of September 8, 1998, for the submission of comments. Copies of all public comments received by DOE on the draft are available for viewing at the Center for Environmental Management Information (1-800-736-3282) and in the DOE Public Reading Rooms. Overall, approximately 250 comments were received from eighteen different entities, including:

- States
- Indian Nations
- Citizens Groups
- DOE Site-Specific Citizen Advisory Boards
- National Laboratories
- Private Individuals and Corporations
- Government Agencies

The focus of the comments ranged from general Order and Manual process issues to specific technical issues. The most frequently received comments and the Department's responses are summarized below. For each subject, changes that have been made to the Order and Manual are explained.

- **Public Review of the Implementation Guide** - Numerous commenters stated that the Implementation Guide for the Order and Manual should have been made available to the public at the same time for review and comment. The Implementation Guide (DOE G 435.1-1) is designed to discuss, in a non-prescriptive manner, acceptable methods for meeting the requirements of the Order. DOE did not issue the Guide at the same time it made the Order and Manual documents available because it had not finished the Guide at that time. DOE is now issuing the Guide with the final Order and Manual. Copies of the Guide are available through the Department's directives system web page (<http://www.explorer.doe.gov:1776/htmls/directives.html>). DOE plans to update and revise the Guide based on any feedback from DOE and its contractors through DOE's internal directives system as the requirements are implemented. The Department will also consider any comments received from the public on DOE G 435.1-1 when it makes future revisions to the Guide.
- **Compliance with the National Environmental Policy Act (NEPA)** - Several commenters suggested that some of the definitions and requirements being proposed in DOE O 435.1 and DOE M 435.1-1 represented proposals that should be the subject of an environmental assessment or environmental impact statement under NEPA. In particular, commenters cited: changes in the definitions of high-level waste, transuranic waste, and low-level waste, which they perceived to be substantive; the "waste incidental to reprocessing" determination process; high-level waste facility closure requirements; inclusion of accelerator produced waste as low-level waste; and exclusion of spent nuclear

fuel from the requirements of the Order and Manual. As discussed below, the Department believes that these definitions and requirements as set forth in the Order and Manual are consistent with the definitions and requirements of the new Order's predecessor, DOE 5820.2A, policy decisions and directives previously issued by the Department (including actions taken to respond to recommendations of the Defense Nuclear Facilities Safety Board), or current practices. Thus, DOE O 435.1 and DOE M 435.1-1 represent an updated codification of current DOE waste management practices, but do not impose any new substantive requirements.

In addition, in response to the comments received, DOE has added a provision to Chapter I (Section I.1.D) of the Manual clarifying that all proposed actions to implement the requirements of the Order or Manual must comply with the requirements of NEPA, DOE's NEPA Implementing Procedures, and the regulations of the Council on Environmental Quality. Nothing in the Order or Manual is meant to restrict the consideration of alternatives to proposed actions and reasonable alternatives must be considered, as appropriate.

- **The Use of Non-DOE Facilities for Waste Management** - This section was reserved pending the outcome of DOE's policy analysis on commercial disposal of low-level waste, which was in progress when the Order and Manual were made available for public comment. Some commenters provided their recommendations on the outcome of the policy analysis, while other commenters requested an opportunity to comment on the result. DOE separately requested public comments as input to the preparation of the policy analysis (63 FR 13396), and issued the final policy analysis on March 9, 1999. A notice of availability was published in the Federal Register (64 FR 12161, March 11, 1999) announcing the completion of the policy analysis and publishing the language to be incorporated in the final Manual (Section I.2.F.(4)).
- **Exemptions to Requirements** - Some commenters expressed concern that provisions for tailoring the requirements of the Order and Manual (Section I.1.E) through the "Necessary and Sufficient Closure Process" in DOE P 450.3 and DOE M 450.3-1, the "Integrated Safety Management System" in DOE P 450.5, or through exemptions in accordance with the requirements of DOE M 251.1-1A, *Directives System Manual*, were overly broad. Commenters expressed concern that the effect of such changes may be detrimental to worker and public health and safety, and protection of the environment. Under DOE's internal directives system, exemptions may be granted when a specific requirement in a DOE order or other directive is not appropriate for an individual office or facility, or when a more appropriate alternate requirement exists.

DOE notes that Field Element Managers are responsible for safely managing radioactive waste at the individual DOE sites. Application of processes under the Integrated Safety Management System or the Necessary and Sufficient Closure Process involves identifying requirements that are appropriate for the work and associated hazards. Accordingly, these structured processes identify a set of requirements that fit the work to be performed.

These processes ensure that if the requirements of DOE O 435.1 and DOE M 435.1-1 are not followed, then an appropriately tailored set of requirements for safe operation is in place. Consistent with the Department's Directives System Manual, DOE M 251.1-1A, the granting of an exemption must not compromise protection of the public, workers, or the environment. The process for granting exemptions involves preparation of an analysis which explains why the exemption is needed and how protection will be maintained. Field Element Managers or Headquarters Senior Managers are responsible for granting exemptions for those items assigned to them, and Headquarters Senior Managers have oversight for exemption decisions made by Field Element Managers. DOE believes that this system ensures that exemptions will be granted only in appropriate circumstances, and only after the protection of public and worker health and safety and the environment has been assured.

- **Order Exemption for WIPP and the Naval Nuclear Propulsion Program** - Several commenters questioned the inclusion of exemptions for the Waste Isolation Pilot Plant (WIPP) and the Naval Nuclear Propulsion Program in the Order, and suggested that these exemptions be removed.

The WIPP exemption does not allow WIPP to operate without complying with stringent requirements for protection of the public, workers, and the environment. Instead, this exemption is to avoid duplicative or overlapping requirements by according deference to external regulatory requirements (e.g., requirements of the Environmental Protection Agency and the State of New Mexico) that already apply to WIPP as a matter of law. Any requirements of the DOE Order and Manual that do not duplicate or overlap these external regulatory requirements would apply to WIPP.

In the case of the Naval Nuclear Propulsion Program, under Public Law 98-525, the Director of the Naval Nuclear Propulsion Program is assigned responsibility for "the safety of reactors and associated naval nuclear propulsion plants, and control of radioactivity associated with naval nuclear propulsion activities, including prescribing and enforcing standards and regulations for these areas as they affect the environment and the safety and health of workers, operators and the general public." As a consequence of this law, the Naval Nuclear Propulsion Program develops its own requirements for public, worker, and environmental protection. However, to the extent that the program relies on other DOE facilities for waste management services, it must certify its waste as meeting the applicable waste acceptance requirements and provide the necessary information so that the receiving facility can execute its responsibilities under the Order for safe waste management.

Accordingly, both of these exemptions were retained in the final Order (DOE O 435.1, 3.d.(1) and (4)).

- **Environmental Restoration, Decommissioning and Other Cleanup Waste** - Several commenters indicated that the Department's objective for this section was unclear. As a result, this section of the Manual (Section I.2.F.(5)) has been rewritten for clarity. This provision is intended to ensure that radioactive wastes generated through the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process and other cleanup activities are managed in accordance with the requirements of the Order and Manual. The CERCLA process mandates the application of the substantive, but not the procedural, provisions of "applicable or relevant and appropriate requirements." In cases where there is construction and operation of a cell for onsite disposal of cleanup wastes, CERCLA analysis and documentation can be used to demonstrate compliance with the Order and Manual requirements for disposal activities. However, when waste is sent off site to another facility for disposal, the cleanup activity is considered a generator and must demonstrate compliance with all substantive and procedural requirements of the Order and Manual for such waste.
- **Determinations Concerning Waste Incidental to Reprocessing** - Many comments were received on the "waste incidental to reprocessing" determination process, the most common being that potentially applicable laws do not define or recognize the principle of "incidental waste," or exempt from potential Nuclear Regulatory Commission (NRC) licensing authority high-level waste that is "incidental" to DOE waste management activities. The term "incidental waste" was first used by DOE's predecessor agency, the Atomic Energy Commission (AEC). In a 1969 Notice of Proposed Rulemaking (*34 FR 8712*) for Appendix D, 10 CFR Part 50, *Policy Relating to the Siting of Commercial Fuel Reprocessing Plants and Related Waste Management Facilities*, the AEC found that certain wastes could be disposed of in a manner other than as high-level waste. The AEC stated that the term "high-level waste" did not include certain "incidental wastes" resulting from spent nuclear fuel reprocessing plant operations, including ion exchange beds, sludges, and contaminated laboratory items, clothing, tools, and equipment. Additionally, this category included radioactive hulls and other irradiated and contaminated fuel structural hardware. Although the incidental waste terminology did not appear in the Commission's final rule (*35 FR 17530-17533*), the concept of "incidental" wastes, as distinguished from high-level waste, continued to be recognized by the NRC (*55 FR 5992, 5993*) and later by DOE. The Department refers to the preceding types of incidental wastes as "citation process" wastes (DOE M 435.1-1, Section II.B.(1)).

DOE also treats as "incidental" wastes under the evaluation process (DOE M 435.1-1, Section II.B.(2)) those wastes which:

- (1) Have been processed (or will be further processed) to remove key radionuclides to the maximum extent that is technically and economically practical;

- (2) Will be incorporated in a solid physical form at a concentration that does not exceed the applicable concentration limits for Class C low-level waste as set out in 10 CFR Part 61; and
- (3) Are to be managed, pursuant to the *Atomic Energy Act*, so that safety requirements comparable to the performance objectives set out in 10 CFR Part 61 [or 40 CFR Part 191, as appropriate] are satisfied.

The Department refers to wastes determined to be incidental to reprocessing by application of these criteria as "evaluation process" wastes (DOE M 435.1-1, Section II.B.(2)). Such wastes have included large volumes of low-activity liquid wastes, separated from high-level waste streams, which have been disposed of in a grout or saltstone solid form, and tank heels which could safely remain in closed high-level waste tanks, but removal of which would have been prohibitively costly. "Evaluation process" wastes can also include wastes which meet such alternative requirements for waste classification and characteristics as the Department of Energy may authorize, pursuant to its Atomic Energy Act authority.

The Department has prepared several environmental impact statements on the management of high-level waste, which implicitly address the concept of incidental waste. These include the following:

- *Final Supplemental Environmental Impact Statement for the Defense Waste Processing Facility* [at the Savannah River Site], DOE/EIS-0082-S, 1994, which analyzes the impacts of operating a facility for separation of high-level waste into high-activity and low-activity fractions, including on-site disposal of the low-activity fraction as a low-level waste.
- *Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement*, DOE/EIS-0203-F, 1995, which considered conceptual alternatives that would produce a high-activity waste form suitable for placement in a geologic repository and a low-activity waste form that could be disposed of as a low-level waste.
- *Tank Waste Remediation System, Hanford Site, Richland, Washington, Final Environmental Impact Statement*, DOE/EIS-0189, 1996, which analyzes an alternative that results in separation of high-level wastes into low-activity and high-activity fractions, and includes two specific assumptions:
 - residual waste remaining in the tanks after removal of as much of the waste as practicable would be considered waste incidental to reprocessing and would be disposed of in-place as low-level waste; and

- low-activity wastes remaining after processing the high-level waste tank waste to remove as much of the high-level radioactivity as practicable could be considered waste incidental to reprocessing.

As these examples and the preceding discussion illustrate, the concept of incidental waste is well established in DOE's waste management planning and practice, and the inclusion of this concept in the Order and Manual does not reflect any change in policy. The Department believes that these are circumstances in which it is appropriate to solidify separated streams derived from high-level waste for disposal as low-level waste or transuranic waste, and to leave residual waste in high-level waste tanks after removing as much of the waste as practicable. In making such decisions, DOE generally has consulted with the NRC, as evidenced by previous actions at the Savannah River Site, the Hanford Site, and the West Valley Demonstration Project site.

- **Mixed High-Level Waste** - Several commenters questioned whether a reference in the draft Manual to Resource Conservation and Recovery Act (RCRA) waste codes was intended to limit the applicable waste codes for mixed high-level waste to corrosivity and toxicity by metals (D004 - D011). Commenters also questioned whether high-level waste was required to comply with the Toxic Substances Control Act (TSCA). DOE believed that the draft Manual's citation of vitrification as the standard treatment (best demonstrated available technology or BDAT) for high-level waste exhibiting the "D Characteristics" of corrosivity and toxicity for metals was simply a reiteration of a portion of EPA's land disposal restriction (LDR) regulations in 40 CFR 268.42. In response to comments, this section of the Manual (Section II.C.(1)) has been revised. The discussion of waste codes has been removed to avoid unnecessary confusion. However, the RCRA LDR BDAT for high-level waste is vitrification, and that designation is limited to wastes exhibiting only the characteristics of corrosivity and toxicity for metals. High-level wastes exhibiting the other hazardous characteristics in 40 CFR Part 261, Subpart C (ignitability and reactivity), or containing listed waste, may be treated by alternate methods.

Regarding compliance with TSCA, the Manual (Section II.C.(2)) has been revised to include a requirement that high-level waste containing polychlorinated biphenyls (PCBs), or other regulated toxic components, must be managed in accordance with TSCA. The Destruction and Removal Efficiencies (DREs) Table from the EPA Handbook, "Vitrification Technologies for Treatment of Hazardous and Radioactive Waste" (EPA/625/R-92-002), dated May 1992, finds that the combination of the vitrification process and off-gas removal is capable of eliminating the organic constituents, including TSCA-regulated organics, in a high-level waste stream. Therefore, vitrification is expected to meet the treatment requirements for PCBs and other TSCA-regulated toxic components, for those high-level waste streams that are determined to contain these components.

- **High-Level Waste Facility Closure** - Many commenters indicated that the requirements for closure of high-level waste facilities were confusing. In response, this section (DOE M

435.1-1, Section II.U.) has been revised to state more clearly the requirements for closing deactivated high-level waste facilities. The revised section requires closure of high-level waste facilities to be performed in accordance with CERCLA, DOE's deactivation and decommissioning requirements (DOE O 430.1A), or a closure plan that delineates, for example, the performance objectives that are to be applied to such facilities based on the low-level waste or transuranic waste chapters of DOE M 435.1-1. This section also addresses the need to comply with RCRA requirements if the residual waste in the closed facility is a mixed waste.

- **Defense/Non-Defense Transuranic Waste** - A number of comments were received on the requirement for defense and non-defense transuranic waste to be packaged separately. Some commenters asserted that the requirement should be made more restrictive by removing the phrase "if feasible." Others proposed that the requirement should be made less strict by noting that it should only apply "when such distinction can be made." The requirement reflects a provision in the Waste Isolation Pilot Plant Land Withdrawal Act that allows DOE to emplace only defense waste in WIPP. The definition of "atomic energy defense activity" used in the Land Withdrawal Act includes any activity performed in whole or in part in carrying out defense nuclear waste and materials byproduct management. Therefore, the requirement has been retained (DOE M 435.1-1, Section III.L.(1)(c)) as it was in the August 1998 draft.
- **Transuranic Waste Definition Exclusions** - A number of commenters questioned the meaning of, and the reason for, the exception in the definition of transuranic waste related to waste not needing the degree of isolation required by 40 CFR Part 191 (DOE M 435.1-1, Section III.A.(2)). The Department has retained the definition as it was in the draft, for the principal reason that this is the definition provided both in statute (the Waste Isolation Pilot Plant Land Withdrawal Act) and in regulation (Environmental Radiation Protection Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes, 40 CFR Part 191).
- **Low-Level Waste Definition Exclusions** - A number of commenters indicated that there was confusion over why DOE did not expressly include in the definition of low-level waste in DOE M 435.1-1, naturally occurring radioactive materials (NORM), byproduct material (as defined by section 11e.(2) of the Atomic Energy Act of 1954, as amended), and accelerator-produced waste.

The Department (DOE M 435.1-1, Section IV.B.(4)) continues the practice established in DOE 5820.2A, under which NORM waste and 11e.(2) byproduct material (tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its radioactive material content) are managed consistent with DOE 5400.5, Chapter IV, or 40 CFR Part 192, where applicable. Under these requirements, NORM and 11e.(2) byproduct material, which typically release radon, are generally disposed of at facilities specifically designed to handle wastes such as these, which have elevated radon releases. DOE believes that disposal of NORM waste and 11e.(2)

byproduct material in these facilities protects health and minimizes danger to life or property consistent with the Department's mandate under the Atomic Energy Act. This approach also has the advantage of maintaining consistency with the terminology used by NRC in its regulation of source, special nuclear, and byproduct material and with the definitions of low-level waste in the Low-Level Radioactive Waste Policy Amendments Act and in the Nuclear Waste Policy Act of 1982, as amended. DOE M 435.1-1 also continues the practice established in DOE 5820.2A, under which responsible DOE officials can exercise discretion to dispose of small quantities of NORM and 11e.(2) byproduct material at DOE low-level waste disposal facilities. In response to several comments, a definition of NORM has been added to the Manual.

Accelerator-produced material is implicitly covered by the definition of low-level waste in DOE M 435.1-1, because that definition includes all radioactive materials that are not specifically excluded (i.e., that are not high-level waste, spent nuclear fuel, transuranic waste, 11e.(2) byproduct material, or NORM). The Department, in DOE M 435.1-1 (Section IV.B.(4)), has continued the practice established in DOE 5820.2A of managing accelerator-produced material as low-level waste because this material typically contains radiation levels similar in concentration to other low-level waste.

- **Spent Nuclear Fuel** - Several commenters questioned the designation of spent fuel as "non-waste material," and the exclusion of spent fuel from the DOE O 435.1 and DOE M 435.1-1 requirements. Section 3.d(6) of DOE O 435.1 has been revised so as not to refer to spent nuclear fuel as "non-waste material," but continues to exclude spent fuel from the Order's scope.

Exclusion of spent nuclear fuel from the scope of DOE O 435.1 does not mean that DOE's spent nuclear fuel inventory is not closely regulated. Spent fuel continues to be managed in accordance with the Department's directives pertaining to nuclear safety until the time of disposal. These directives require the preparation of safety analyses and the implementation of an authorization basis for each facility managing spent nuclear fuel. These directives include DOE O 420.1, Facility Safety; DOE 5480.21, Unreviewed Safety Questions; DOE 5480.22, Technical Safety Requirements; and DOE 5480.23, Nuclear Safety Analysis Reports. In addition, each DOE site storing spent fuel has implemented site-specific requirements for managing the spent fuel based on any site-specific concerns that are present regarding protection of health, safety, and the environment.

The exemption of spent nuclear fuel from DOE O 435.1, and the continued regulation of spent nuclear fuel under the Department's other nuclear safety orders and directives, do not reflect any change in DOE's current or planned management of spent nuclear fuel, and do not represent a substantive change from the requirements of DOE 5820.2A, which also excluded spent nuclear fuel from its scope. Therefore, DOE does not believe that in this regard the revised Order represents a major federal action having significant environmental impacts under NEPA, as suggested by one commenter.

- Special Case Waste** - Several commenters objected to eliminating any reference in the revised Order to the term "special case waste," which had been included in DOE 5820.2A. Previously, some sites identified as "special case" waste that would otherwise meet the definition of high-level, transuranic, low-level, or mixed low-level waste, but for which there was not an identified disposition and for which special attention would be required. In general, the commenters suggested that the special case waste designation was useful in highlighting problematic waste streams, and that deletion of the term might prevent such wastes from receiving an appropriate level of attention. The General Requirements and Responsibilities section of the Manual requires that waste be managed as high-level, transuranic, low-level, or mixed low-level waste (DOE M 435.1-1, Section I.C.). For the sake of simplicity, DOE has sought to avoid the creation of additional waste categories beyond these four well-established and widely recognized waste classifications. However, in developing the Manual requirements, DOE also recognized that there are certain wastes which, regardless of category, present special problems with respect to disposal (see DOE M 435.1-1, Section I.2.F.(19)). Under the Manual, wastes identified as not having a path forward for disposal, i.e., wastes with no acceptable facility identified for their disposal, receive special attention. The Manual requires special review and approval before such wastes can be newly generated, and makes site personnel responsible for documenting the plans and schedules for resolving issues that currently preclude their disposal. In essence, these measures are similar to the steps that would have been required under DOE 5820.2A for "special case" wastes.
- Inadvertent Intruder and Groundwater Performance Objectives** - Several commenters questioned the relocation of provisions regarding analyses to protect inadvertent intruders, and provisions regarding groundwater protection, from the performance objectives section of DOE 5820.2A to the performance assessment section of DOE M 435.1-1 (Section IV.P.(2)(a), (g), and (h)). These provisions were changed from specific performance objectives in DOE 5820.2A to aspects of the performance assessment analysis in DOE M 435.1-1 to be consistent with NRC methods for low-level waste disposal and radiation protection principles articulated by the National Council on Radiation Protection and Measurements (NCRP) and the International Commission on Radiation Protection (ICRP). In accordance with these principles, it is appropriate to assign a fraction (e.g., 25 mrem) of the 100 mrem per year public dose performance measure to a particular practice (e.g., radioactive waste disposal), but it is not recommended to further fraction performance objectives to specific pathways (e.g., groundwater) or derivative activities (e.g., inadvertent intrusion). There have not been substantive changes in the requirements for these analyses from DOE 5820.2A, and the requirement has been retained as it was in the August 1998 draft.
- 1,000-Year Time of Compliance** - Several commenters questioned DOE's use of 1,000 years as the time of compliance for low-level waste disposal facility performance assessments (DOE M 435.1-1, Section IV.P.(2)). The term "time of compliance" refers only to the period of evaluation for purposes of a radiological performance assessment. Because of the uncertainty of future projections and the conservatism adopted in

developing them, DOE generally does not regard the detailed quantitative evaluation of low-level waste disposal performance beyond a 1,000-year time frame to be useful. However, some form of sensitivity analysis, including calculation of the projected size and time of peak dose, if appropriate, may provide information that contributes to the overall confidence and understanding of the performance assessment model. A sensitivity analysis of this type is required in DOE M 435.1-1 (Section IV.P.(2)(e)). It should be noted that while the time of compliance analyzed in the performance assessment is 1,000 years, the actual operation of a disposal facility must be in compliance with Departmental requirements, including the performance objectives of this Order and the requirements for protection of the public and environment in DOE 5400.5.

- **100-Meter Point of Compliance** - Several commenters questioned DOE's use of a 100-meter point of compliance for low-level waste disposal facility performance assessments (DOE M 435.1-1, Section IV.P.(2)(b)). Commenters questioned whether this requirement presumed institutional control, and whether the flexibility in DOE M 435.1-1 to vary this requirement would be used by DOE to accommodate larger quantities or concentrations of waste to be disposed of. The Department is required to control access to and monitor low-level waste disposal facilities until they can be released in accordance with DOE 5400.5, Radiation Protection of the Public and the Environment. Institutional controls or barriers are not only presumed, but are required, as necessary, to meet these requirements. However, recognizing future uncertainty, the Department prepares performance assessments to provide a reasonable expectation that low-level waste disposal facilities will be protective over the long term. In developing a performance assessment, it is necessary to establish a location at which radiological impacts will be evaluated. The location, for the purpose of the performance assessment, is routinely well within the total area expected to be controlled by DOE for the long-term radiological protection of the public. The Manual contains a requirement for evaluating the impacts to a hypothetical individual who inadvertently intrudes onsite into the disposed of waste itself. The impacts to an offsite (hypothetical) individual who does not intrude into the disposal cell are addressed by evaluating the potential all-pathways dose. The point of compliance for these hypothetical dose assessments has been defined as 100 meters from the edge of the disposal facility, or another distance if adequate justification can be provided. A different distance must be justified in terms of the long-term control of the site, not merely to accommodate a given quantity of waste for an assumed lateral subsurface transport rate. Commitments made in long-term plans for controlling access to a DOE site may be an acceptable basis for justifying a different point for assessing doses to this hypothetical receptor for evaluating performance of the disposal facility.
- **25 mrem All-Pathways Performance Objective** - One commenter expressed concern that DOE's draft Order and Manual would fail to provide for consistent and sufficient groundwater protection for all categories of radioactive waste by establishing an "all pathways" public dose limit of 25 mrem (DOE M 435.1-1, Section IV.P.(1)(a)), rather than providing for a separate limit for underground sources of drinking water. The 25 mrem per year dose limit is a health-based standard and performance objective, not a

performance objective for the protection of a resource (e.g. groundwater). This limit, which was contained in DOE 5820.2A, is 25 percent of the 100 mrem per year all pathways and all sources dose limit used by the NRC and the Department (and recommended by national and international organizations) as the primary dose limit for protection of the public. The 25 mrem per year standard is intended to provide reasonable assurance that multiple sources will not result in an exceedence of the primary dose limit, and that members of the public near the site will be adequately protected from radiation over the long-term. Combined with DOE's requirement (DOE M 435.1-1, Section I.2.F.(12)) to reduce doses to levels that are as low as is reasonably achievable (ALARA), DOE believes that the 25 mrem per year standard represents is effective radiation protection system.

The Department does not believe that it is necessary or appropriate to establish media-specific performance objectives. Such objectives tend to limit the flexibility of the control system design so that it may not be possible to provide optimum protection of the public. A separate groundwater requirement restricts risk management decisions in a manner that may not permit use of the most cost-beneficial approach to radiation protection and in some cases, may result in more overall harm than good.

That notwithstanding, the Department does provide for consideration of resource protection in its regulatory system. DOE M 435.1-1 requires the assessment of impacts on water resources so that resource protection may be adequately addressed in the ALARA assessment (Section IV.P.(2)(f) and (g)). Furthermore, as DOE O 435.1 specifies, waste management activities must comply with any applicable laws or regulations, including those related to groundwater protection. In addition, waste management activities must be implemented in conjunction with other DOE requirements. DOE 5400.5 requires that releases from DOE activities not cause drinking water limits to be exceeded. This requirement, combined with the ALARA requirements of DOE 5400.5 and the requirements for a Groundwater Protection Management Program under DOE 5400.1, helps to ensure that groundwater is adequately protected.

Finally, Section IV P.(3) of DOE M 435.1-1 requires preparation of a composite analysis for each low-level waste disposal facility which accounts for all sources of radioactive material that may be left at the DOE site which may interact with the source term of the low-level waste disposal facility. The results of the composite analysis are to be used for planning, radiation protection, and future DOE commitments to minimize the likelihood that low-level waste disposal activities will result in the need for future corrective or remedial actions.

The same commenter also questioned DOE's methodology for calculating the 25 mrem per year performance objective, noting that it differed from the method employed by NRC in 10 CFR Part 61. DOE uses total effective dose equivalent (TEDE) for all its current radiation protection orders and rules. This methodology is consistent with ICRP 26/30, NCRP, and Federal guidance. NRC's 10 CFR Part 61 was issued in 1983 and predates the

current TEDE dosimetric methodology. However, more recent NRC regulations, such as 10 CFR Part 20, Subpart E, are consistent with the approach used by DOE and contain the 25 mrem per year TEDE dose limit. DOE's requirements are consistent with and provide equivalent protection with NRC requirements, and have not been changed from the requirements currently in place under DOE 5820.2A.