

## CURRENT ENVIRONMENTAL REGULATIONS

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### ABSTRACT

An overview of the Federal environmental statutes and implementing regulations is provided, including the National Environmental Policy Act, the Clean Air Act, the Clean Water Act, the Safe Drinking Water Act, the Resource Conservation and Recovery Act, the Comprehensive Environmental Response, Compensation, and Liability Act, the Toxic Substances Control Act, the Federal Insecticide, Fungicide, and Rodenticide Act, and the Endangered Species Act. Recent developments which may have a direct impact on waste repository siting and management activities include: final promulgation of National Emission Standards for Hazardous Air Pollutants for radionuclides, the DOE-EPA memorandum of understanding which brings mixed radioactive and chemical waste under the requirements of RCRA, and the proposed designation of additional sole source aquifers.

### INTRODUCTION

Environmental regulation in the United States has a long and diverse history. Initially, pollution control was considered to be the responsibility of the states. The original Federal laws (water pollution, 1948 and air pollution, 1955) were merely to encourage states to abate pollution. More recently, environmental regulation was shifted from the states to the Federal government because most states had been unwilling or unable to take effective action. This shift is seen through the enactment of broad environmental legislation, which sets minimum requirements for the abatement of pollution and maintenance of environmental quality. The Federal government has established comprehensive air pollution, water pollution, and waste control programs. However, the primary responsibility for implementation and enforcement of these programs still rests with the state and local governments.

A brief overview of each of the major statutes and the regulations that implement the mandated requirements is provided in the following section. The overview is followed by a discussion of recent developments in environmental regulation which may have a direct impact on radioactive waste repository siting and waste management activities.

### OVERVIEW OF ENVIRONMENTAL STATUTES

#### National Environmental Policy Act

The National Environmental Policy Act (NEPA) establishes a national policy to accomplish the following: encourage productive and enjoyable harmony between man and his environment, promote efforts that will prevent or eliminate damage to the environment and biosphere, stimulate the human health and welfare, and enrich the understanding of the ecological systems and natural resources. The Federal government, in cooperation with state and local governments and concerned public and private organizations, is given the continuing responsibility of carrying out this policy.

Under section 102, Federal agencies are required to evaluate the environmental impacts of proposed programs and projects prior to commencement of any major Federal action. The Council on Environmental

Quality has established requirements for the preparation of Environmental Impact Statements and Environmental Assessments (40 CFR 1500-1508).

#### Clean Air Act

The purpose of the Clean Air Act is to protect and enhance the quality of the nation's air resources. Air quality in nonpolluted areas must be maintained, and air quality in polluted areas must be cleaned up in accordance with a legislative schedule. The goals of the Clean Air Act are primarily carried out by setting ambient air quality standards and by regulating emissions from stationary sources and vehicles.

Sections 108 and 109 of the Act require the Environmental Protection Agency (EPA) to identify and establish safe limits of exposure for "criteria pollutants." These limits are translated into the National Ambient Air Quality Standards (NAAQS), Code of Federal Regulations (CFR), Title 40, Part 50. The primary standards are the levels adequate to protect public health, and the secondary standards are the levels adequate to protect public welfare. Standards have been set for sulfur dioxide, particulates, ozone, nitrogen oxides, and lead.

Section 107 directs the EPA to classify the air quality of the regions of the country for all the criteria pollutants in terms of attainment, nonattainment, or unclassifiable with the NAAQS. Attainment areas must maintain clean air through review of new sources under the Prevention of Significant Deterioration (PSD) regulations. A schedule must be established for nonattainment areas to achieve attainment. Air quality improvements may be achieved through various sanctions including the installation of reasonably available control technology on existing sources and implementation of the offset ruling using lowest achievable emission rates for new sources.

EPA also sets emission standards for the criteria pollutants for specific types of new sources of air pollution. These standards limit emissions by the applying the best available control technology in an effort to improve air quality as old industrial facilities are replaced by new facilities. New Source Performance Standards (NSPS) have been promulgated for

about thirty-five different types of industries (40 CFR 60).

Under section 112, EPA regulates the emission of hazardous air pollutants--pollutants that may reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible or incapacitating reversible illness. The National Emission Standards for Hazardous Air Pollutants (NESHAPS) prescribe emission limits for specific types of facilities rather than specifying ambient levels. Emission standards have been set for asbestos, beryllium, mercury, vinyl chloride, arsenic, benzene, and radionuclides (40 CFR 61).

The EPA has established a framework for the States to implement the Clean Air Act requirements through the development of State Implementation Plans (SIPS). The SIPS, when approved by EPA, are enforceable both as a matter of state and Federal law. Federal facilities must comply with all Federal, state, interstate, and local requirements regarding the control and abatement of air pollution notwithstanding any immunity under any law. This applies to any requirement whether substantive or procedural. Exemption may only be granted by the President.

#### Clean Water Act

The objective of the Federal Water Pollution Control Act as amended by the Clean Water Act (CWA) is to restore and maintain the quality of the nation's waters, including both navigable waters and groundwaters. The amended Act reflects the abandonment of regulation of in-stream water quality in favor of a regulatory strategy predicated upon the availability of cleanup technology. Existing industrial dischargers are required to install, on a scheduled basis, best practicable control technology, followed by best available control technology. New industrial sources are required to meet new source technology standards representing the current state-of-the-art. Municipal dischargers are required to have secondary sewage treatment. The Act also regulates the discharge of dredge and fill material (40 CFR 230), oil (40 CFR 110-114), and hazardous substances (40 CFR 116-117).

The Clean Water Act is implemented primarily by regulating discharge sources through the National Pollutant Discharge Elimination System (NPDES) permit program (40 CFR 122). Discharge without an NPDES permit or in violation of the terms of the permit is not legal. The permits specify: the interim and final effluent limitations; a compliance schedule to achieve final effluent limitations; monitoring and reporting requirements; and standard requirements governing by-passes, emergency power supplies, and analytical methods. The EPA has established industrial discharge limits for direct discharge and has specified pretreatment methods for discharge into municipal treatment plants. These limits are in the form of effluent guidelines and standards for specific industrial categories (40 CFR 425-469).

Federal regulations pursuant to the CWA are primarily directed toward regulation of navigable waters, but states are given the right and encouraged to adopt regulations to protect groundwaters. Federal facilities are required to comply with all Federal, state, interstate, and local requirements; administrative authority; and sanctions respecting the control and abatement of water pollution

(notwithstanding any immunity of such agencies under any law or rule of law).

#### Safe Drinking Water Act

The Public Health Service Act as amended by the Safe Drinking Water Act (SDWA) provides for the regulation of public drinking water systems and protection of underground sources of drinking water. The EPA must set regulations and minimum requirements for the states to use when establishing state water quality programs for public drinking water systems and underground injection control.

The EPA established National Interim Primary Drinking Water Standards (40 CFR 141) pursuant to section 1412 for protection of public health from drinking water sources. The drinking water standards establish maximum contaminant levels for arsenic, barium, cadmium, chromium, lead, mercury, nitrate, selenium, silver, fluoride, specified organic compounds, radionuclides, microbiological contaminants, and turbidity. The EPA also established National Secondary Drinking Water Regulations (40 CFR 143) to control contaminants that affect the aesthetic quality of drinking water. Secondary standards set maximum contaminant levels for chloride, color, copper, corrosivity, foaming agents, iron, manganese, odor, pH, sulfate, total dissolved solids, and zinc. The secondary standards are not federally enforceable but are intended as guidelines for the states.

Potential underground sources of drinking water are protected through the control of injections into usable aquifers. The EPA has established criteria for legal injection (40 CFR 146) and authorizes injection through a permitting process (40 CFR 122).

The EPA also requires review of federally assisted projects that are to be constructed in areas that may potentially affect aquifers designated as sole source aquifers. A sole source aquifer is one that is the sole or principal source of drinking water for a specified area.

States have the primary responsibility for enforcement of drinking water regulations. Federal agencies that have jurisdiction over any Federally owned or maintained public water system or that engage in underground injection which endangers drinking water shall be subject to, and must comply with all Federal, state, and local requirements, both substantive and procedural (notwithstanding any immunity of such agencies under any law or rule of law).

#### Resource Conservation and Recovery Act

The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (RCRA) regulates the disposal of (including discharge, deposit, injection, dumping, spilling, leaking or placing) solid (including solid, liquid, semisolid or contained gaseous material) or hazardous waste (excluding source, special nuclear, or byproduct materials as defined by the Atomic Energy Act) into or onto any land or water such that it may enter the environment by emission into the air or discharge into any water (including groundwater). This Act also regulates the recycling of materials (40 CFR 244-246) and the procurement of products containing recycled materials (40 CFR 247).

The EPA has established guidelines for the thermal processing and land disposal of solid wastes

(40 CFR 240-241). These guidelines are mandatory for Federal agencies and recommended to state, interstate, regional, and local government agencies for use in their activities.

The EPA has established regulations for the management of hazardous waste. Hazardous wastes include wastes from specific and nonspecific sources that contain hazardous constituents or exhibit the characteristics of hazardous waste including ignitability, corrosivity, reactivity, or toxicity. The generation (40 CFR 262), transport (40 CFR 263), treatment, storage, and disposal (40 CFR 264) are subject to EPA permit requirements.

Enforcement of the RCRA shall be integrated with enforcement of other acts. Federal facilities must comply with all Federal, state, interstate, and local requirements, both substantive and procedural, for control and abatement of solid hazardous waste disposal. Exemptions for Federal facilities must be granted by the President and reported to Congress.

#### Comprehensive Environmental Response, Compensation, and Liability Act

Superfund is a nonregulatory piece of legislation designed to provide for liability, compensation, cleanup, and emergency response of hazardous substances released into the environment and the cleanup of inactive hazardous waste disposal sites. It provides a governmental response mechanism and tax financed fund by imposing liability on a broad range of responsible persons, including generators of hazardous waste, to reimburse the fund for governmental response costs.

The primary elements of Superfund are reporting of sites and releases, administrative cleanup and remedial action, enforcement powers to commence abatement, liability for cleanup costs and damage to natural resources, and development of a post-closure fund.

#### Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) regulates chemical substances and mixtures (excluding source material, special nuclear material, and byproduct material as defined by the Atomic Energy Act) from the time of manufacture through distribution, use, and disposal. Regulations are designed to prevent unreasonable risk of injury to health or the environment from potentially toxic substances. In addition to the general requirements on the chemical industry, the following specific substances are regulated by TSCA: polychlorinated biphenyls, fully halogenated chlorofluoroalkanes, asbestos, and materials containing tetrachlorodibenzo-p-dioxin.

The regulation of toxic substances under TSCA is coordinated with the regulation of chemicals under other Federal statutes. Primary enforcement responsibility currently lies with the Federal government.

#### Federal Insecticide, Fungicide and Rodenticide Act

The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) regulates the production, registration, application, transport, and disposal of pesticides. Pesticide use must comply with the implementing regulations. EPA has the primary

responsibility for regulation; however, states may also regulate pesticides in accordance with the Act.

#### Endangered Species Act

The purpose of the Endangered Species Act is to provide a means whereby endangered and threatened floral and faunal species, and the ecosystems upon which they depend, may be preserved. All Federal agencies are required to utilize their authorities to further the purposes of this Act. Protected species are listed in 50 CFR 17.

#### RECENT DEVELOPMENTS IN ENVIRONMENTAL REGULATION

##### Final Radionuclide Standards Under NESHAPS

Historically, airborne radionuclides were regulated under the Atomic Energy Act. However, under section 122 of the 1977 Clean Air Act Amendments, Congress directed the EPA to determine whether the emission of radionuclides could contribute to air pollution that might reasonably be expected to endanger public health. Following an initial investigation, EPA published a notice in the 27 December 1979 Federal Register listing radionuclides as hazardous air pollutants under section 112. On 16 June 1981, the Sierra Club filed suit alleging that EPA had a nondiscretionary duty to propose standards for hazardous air pollutants within 180 days after listing. The Court, finding in favor of the Sierra Club, ordered EPA to publish proposed standards and hold hearings within 180 days of the order.

On 6 April 1983, EPA published in the Federal Register proposed standards for radionuclide emissions from four source categories: (1) Department of Energy (DOE) facilities; (2) NRC-licensed and non-DOE Federal facilities; (3) underground uranium mines; and (4) elemental phosphorus plants. In addition to these categories, EPA identified five other sources that emit airborne radionuclides: (1) coal-fired boilers; (2) the phosphate industry; (3) mineral-extraction industries other than phosphates; (4) uranium fuel-cycle facilities, uranium mill tailings, and high-level radioactive waste management; and (5) low-energy accelerators. No emission standards were proposed for the last five categories because EPA determined there were good reasons not to regulate these categories at the present time. The reasons EPA cited for nonregulation included: prior regulation under other statutes, low risk to public health, and insufficient data.<sup>1</sup>

A public hearing was held on 28 April 1983 in Washington, D.C. to allow public comments on the proposed standards. The comment period was held open for an additional 30 days to receive written comments. Subsequent comments requested additional time and another public hearing. The EPA responded by further extending the comment period by 45 days and holding a public hearing in Denver, Colorado on 14 June 1983.

On 17 February 1984, the Sierra Club again filed suit alleging that EPA had a nondiscretionary duty to either issue final emission standards for radionuclides, or to issue a finding that radionuclides do not constitute a hazardous air pollutant (delisting). In August 1984, the Court again granted the Sierra Club motion and ordered EPA to take final action by 23 October 1984. On 23 October 1984, EPA withdrew its proposed standards for

the first three categories on the grounds that current emission controls and operational practices provide an ample margin of safety to protect public health from the hazards associated with exposure to airborne radionuclides from these sources. EPA judged the risk too small to warrant regulation under section 112, because EPA interpreted this section not to require regulation in cases where the risks from a category of sources did not exceed a certain minimum threshold specified by EPA. EPA also concluded that the proposed standard for uranium mines did not meet the legal requirements of section 112 of the CAA, and, therefore, a final emission standard for uranium mines could not be issued at that time. EPA determined that the risks from elemental phosphorus plants were also very small, and that the costs of controls when compared to the reduction in risk were far higher than EPA had imposed in prior regulatory decisions under section 112.<sup>2</sup>

On 31 October 1984, the Court responded by issuing an order requiring the Agency to show cause why they should not be held in contempt of the Court order. Following a 21 November 1984 hearing, the Court issued a ruling on 11 December 1984 finding EPA in contempt. The Court ordered the EPA to either issue within 30 days final radionuclide emission standards for DOE facilities, NRC-licensed and non-DOE Federal facilities, and elemental phosphorus plants, and issue within 120 days final radionuclide emission standards for uranium mines, or to make a finding that radionuclides are clearly not a hazardous air pollutant.

On 21 December 1984, the EPA requested a stay of the Court order. The stay was denied. An appeal on 8 January 1985 and a further appeal to the Supreme Court were also denied. Therefore, on 6 February 1985, EPA issued final emission standards for radionuclides from DOE facilities, NRC-licensed and non-DOE Federal facilities, and elemental phosphorus plants.

The final standards limit radionuclide emissions from DOE facilities, and NRC-licensed and non-DOE Federal facilities to an amount that may cause a dose equivalent rate of 25 mrem/year to the whole body or a dose equivalent rate of 75 mrem/year to the critical organ of any member of the public. The standard excludes doses due to radon-220, radon-222, and their respective daughter products. The EPA will grant a waiver of these limits and issue an alternative standard if a facility operator can demonstrate that no member of the public will receive a continuous exposure of more than 100 mrem/year effective dose equivalent and a noncontinuous exposure of more than 500 mrem/year effective dose equivalent from all sources, excluding natural background radiation and medical procedures (40 CFR 61).

The final standards limit the emissions from elemental phosphorus plants to a total emission of polonium-210 from calciners and nodulizing kilns of 21 Curies/year (40 CFR 61). This limit was designed to assure that emissions from future operation of phosphorus plants do not increase over present emission levels.

These final regulations are based on an EPA estimation of cancer risk from the regulated categories. EPA estimates the risk from airborne radionuclides from all DOE facilities to be about 0.07 fatal cancer cases per year, or one case every fourteen years. The EPA estimate of risk to the

public from airborne radionuclide emissions from all NRC-licensed and non-DOE Federal facilities is no more than 0.001 fatal cancer cases per year, or one case every one thousand years. EPA estimates the risk to the public from radionuclide emissions from all elemental phosphorus plants to be about 0.06 fatal cancer cases per year, or one case every seventeen years.<sup>2</sup>

The new emission regulations establish special monitoring, recordkeeping, and reporting requirements for all DOE facilities that emit quantities that may cause a dose equivalent greater than or equal to 5 mrem/year to the whole body or 15 mrem/year to a critical organ of any member of the public residing or abiding at the point of maximum annual air concentration in an unrestricted area. Recordkeeping and reporting requirements for NRC-licensed and non-DOE federal facilities have not yet been established. Owners and operators of elemental phosphorus plants must conduct emission testing according to specified methods and maintain records for inspection.

Final promulgation of air emission standards for radionuclides based on dose equivalent rates is a major step in EPA regulation of radionuclides. Transfer of this regulatory principle to other media is a definite possibility for the future.

#### DOE-EPA Memorandum on Hazardous Waste

On 22 February 1984, a Memorandum of Understanding (MOU) was signed between DOE and the EPA to delineate the areas of responsibility between DOE and EPA regarding the management of hazardous waste and radioactive mixed waste at DOE facilities operated under the Atomic Energy Act (AEA). This MOU requires all generators of hazardous wastes or radioactive mixed wastes at AEA facilities to comply with the RCRA hazardous waste requirements of 40 CFR 262 including all recordkeeping and reporting requirements. DOE transporters of hazardous wastes or radioactive mixed wastes must comply with 40 CFR 263, and DOE facilities that treat, store, or dispose of hazardous waste or radioactive mixed waste on-site must comply with the interim standards (40 CFR 265) until a permit is issued under 40 CFR 264. The MOU reverses the earlier DOE position that wastes generated at AEA facilities were not subject to regulation under the RCRA hazardous waste regulations.<sup>3</sup>

Implementation of these requirements will affect waste management operations at a number of DOE facilities, particularly those with low-level radioactive waste disposal sites. The RCRA regulations contain very specific requirements for the generation, transport, treatment, storage, and disposal of hazardous waste.

The RCRA regulations require all generators of hazardous waste (in quantities greater than 100 kg) to register with EPA and obtain an identification number. All wastes transferred from the generators location to an offsite storage, treatment, or disposal facility must be packaged, labeled, marked, and placarded in accordance with DOT requirements. Each waste shipment must be accompanied by a manifest which designates the generators name, address, telephone number, and identification number; provides a description of the waste (including proper shipping name, quantity, type and number of containers), and a certification of compliance; and designates the

transporters name and identification number, and the name, address, and identification number of the designated disposal facility and an alternate. Waste stored at the generators facility must clearly show proper identification, handling instructions, and the accumulation time. Waste generators must maintain records and submit reports.

Transporters of hazardous waste must be registered with EPA and obtain an identification number. They may only transport wastes that are accompanied by a correct manifest. Transporters must comply with all manifest requirements. In the event of discharge during transport, the transporter is responsible to see immediate remedial action is taken including notification of the proper authorities and confining the waste if necessary. Hazardous waste transporters must keep records including copies of all manifests.

The RCRA regulations establish the minimum national standards which define the acceptable requirements for management of hazardous waste by owners and operators of waste treatment, storage, and disposal facilities. All facilities must be registered with EPA and obtain an identification number. Facilities will be permitted under the final or interim status standards. Before acceptance of any waste from an outside location, the facility must notify generators in writing of their permit status. The following paragraphs summarize the minimum requirements for owners and operators of hazardous waste treatment, storage, and disposal facilities.

A detailed physical and chemical analysis of a representative sample of each waste to be handled by the facility must be obtained. The analysis must include all the information necessary for proper handling of the waste. Owners and operators may obtain this information directly or require the analysis to be performed by the generator prior to acceptance of waste materials. Records of this analysis must be maintained by the facility.

The facility must meet specified physical design and security requirements including: security to prevent entry by unauthorized persons or animals; facility structures to maintain segregation and confinement of wastes; required equipment, communication and alarm systems; and arrangements with local authorities for emergency response measures. Facilities must be located in areas which meet the minimum seismic and flood standards. The regulations establish minimum design specifications for various types of facilities including facilities for storage of containers, waste tanks, surface impoundments, waste piles, land treatment facilities, landfills, and incinerators. Most of the facilities must include double containment (liners) and leak detection and monitoring equipment.

Facilities must be inspected on an established schedule for compliance with the terms of the facility permit. Inspections shall include the physical facilities, operations, discharges, monitoring equipment, and safety and emergency equipment. Remedial actions shall be taken as necessary to bring facility operations into compliance. A log of these inspections and the appropriate actions must be maintained.

A contingency plan for handling discharges and emergency situations must be developed and approved by

EPA. All operational personnel at the facility must receive proper training including emergency actions.

A plan for groundwater protection and monitoring will be included as part of the permit requirements. The permit will specify the hazardous constituents which will be monitored, the monitoring locations, and the limits allowed in groundwater at the point of compliance.

Owners and operators must have an established plan for closure of treatment, storage, and disposal facilities. The plan must include post-closure care and financial arrangements for post-closure liability.

#### Proposed Designation of Sole Source Aquifers

Sole source aquifers are aquifers that receive special designation for protection because they are the sole or primary source of drinking water for certain geographical areas. The EPA has received and is reviewing petitions for designation of additional sole source aquifers in the continental United States. These include the following: the New Jersey Coastal Plain; the aquifer in Vestal, New York; the aquifer in Sardinia, New York; the aquifer in Schenectady, New York, the Seven Valleys in York County, Pennsylvania; the Volusia-Floridan Aquifer in Florida; the Oakland County Aquifer in Michigan; the Delaware Basin in western Texas and eastern New Mexico; the aquifer in Baton Rouge, Louisiana; the Carrizo-Wilcox Aquifer in Bastrop County, Texas; the aquifer in De Soto Parish, Louisiana; the Snake River Plain Aquifer in eastern Idaho; the Cross Valley Aquifer in Washington; the Newberg Area Aquifer in Snohomish County, Washington; the aquifer in the Seven Lakes Area, Washington; and the aquifer in the Naco-Bisbee Area of Arizona.

Under current regulations, the designation of any of these aquifers as sole source aquifers will not preclude the siting or operation of Federal facilities or Federally-licensed facilities on lands adjacent to or overlying the protected aquifers. However, a determination by EPA that these aquifers are the sole or primary source of drinking water for a designated area will greatly influence the political situation and local policy decisions regarding facilities that may affect the water quality in these protected areas. Since the siting of radioactive waste disposal repositories is greatly influenced by political pressures and local policies, designation of a sole source aquifer in an area near a proposed waste site may greatly affect the acceptability of that site.

#### REFERENCES

1. U.S. Environmental Protection Agency, Office of Radiation Programs, Background Information Document (Integrated Risk Assessment) Final Rules for Radionuclides, EPA 520/1-84-022, October 22, 1984.
2. U.S. Environmental Protection Agency, "Final Rules, National Emission Standards for Hazardous Air Pollutants, Standards for Radionuclides, 40 CFR Part 61," Federal Register, 50(25): 5190-5200, February 6, 1985.
3. Dennison, W.J., "Overview of Current and Expected Changes in Legislation and Regulations," in Proceedings of the Fourth DOE Environmental Protection Information Meeting, December 7-9, 1982, Denver, Colorado, August 1983.