

RECOMMENDATIONS FOR SITING, DEVELOPMENT, AND OPERATION OF A REGIONAL LOW-LEVEL RADIOACTIVE WASTE DISPOSAL FACILITY IN OHIO

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ABSTRACT

In 1984, pursuant to passage of the federal Low-Level Radioactive Waste Policy Act of 1980, the Ohio General Assembly voted overwhelmingly to join the Midwest Interstate Low-Level Radioactive Waste Commission. The original members of the Midwest Compact were Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin; however, Michigan was expelled in July 1991, for failure to fulfill its obligations as host state for the first regional facility. At that time, Ohio assumed responsibility as host state and proceeded to negotiate amendments to the Compact. In September 1992, the legislative leadership requested that Governor George V. Voinovich appoint a Blue Ribbon Commission to offer recommendations on siting criteria and that the Low-Level Radioactive Waste Advisory Committee report on other aspects of facility development, operation, and long-term care. After a year of meetings, public hearings, and deliberation, the two reports were released. The reports contain detailed recommendations on a wide variety of issues, including socio-economic, hydrogeologic, and health effects criteria; the establishment of an administrative structure and process; implementation of public education and information programs; community compensation and benefits plans; and achievement of agreement state status with the NRC for purposes of licensing and regulating the Ohio facility. The recommendations will be incorporated into enabling legislation for introduction later this year.

BACKGROUND

Pursuant to the passage of the federal Low-Level Radioactive Waste Policy Act of 1980, Ohio chose to become a member of an interstate compact. In March 1984, the Ohio General Assembly voted overwhelmingly to join the Midwest Interstate Low-Level Radioactive Waste Commission and in April 1984, the bill was signed into law by former Governor Richard F. Celeste. The seven original members of the compact were Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin. Congress gave its formal consent to the Midwest Compact in December 1985.

At the outset, each state in the Midwest Compact concluded that, from an environmental standpoint, a regional facility could be located within its borders. In February 1987, the Compact Commission identified Michigan, Minnesota, Ohio, and Wisconsin as possible host states for the first low-level radioactive waste disposal facility in the region. Upon designation, a prospective host state had ninety days to withdraw from the Compact without financial penalty. None of the designated states opted to leave the Compact. In June 1987, the Midwest Compact Commission passed a resolution finalizing the host state designations, based upon a set of criteria that placed significant emphasis on projected waste generation. Michigan was chosen as the first host state on the basis of projections that it would generate the largest amount of waste. Ohio was chosen as the first alternate host state because it was projected to produce the second largest volume of waste.

The Midwest Interstate Low-Level Radioactive Waste Commission voted to revoke Michigan's membership in the Compact in July 1991, citing numerous actions indicating that Michigan did not intend to fulfill its obligations as host state. At the same meeting, Ohio became the regional host state, based upon its designation as first alternate in 1987. Although Michigan generators had been denied access to existing disposal facilities in November 1990, ten months prior to expulsion, the ban did not apply to other states in the Compact.

As host state for the Midwest Compact, Ohio is responsible for site selection, design, operation, and long-term care

of the first regional facility. The facility will operate for twenty years or until its capacity is reached, whichever occurs first. The capacity limit, to be set by the Midwest Compact Commission, will be based upon projected waste volumes.

ACTIVITIES IN OHIO

During the first year after Michigan was expelled, Ohio focused on negotiating amendments to the Midwest Compact. Representatives of the Commission met frequently with Ohio officials to draft language that would provide additional assurances to the host state, including a system of liability, funding for remediation and long-term care, and a process to ensure the availability of subsequent facilities. The Compact amendments were released for public review and comment at the annual meeting of the Commission on June 30, 1993. The comment period extended until August 30, 1993. As part of the review process, a public hearing was held in Columbus, at which over 20 persons testified. After all testimony was evaluated and a number of changes were incorporated, the Commission approved a final version of the amendments on November 29, 1993.

On September 10, 1992, Governor George V. Voinovich received a letter from the Speaker of the Ohio House of Representatives, Vern Riffe, and the President of the Ohio Senate, Stanley Aronoff, requesting the appointment of a Blue Ribbon Commission to begin the process of facility development. The Blue Ribbon Commission was charged with collecting information, conducting a series of public hearings, and providing recommendations to the Governor and the General Assembly concerning criteria and development requirements that should be considered in siting a regional low-level radioactive waste disposal facility in Ohio.

Nominations for the Commission were solicited from a wide variety of organizations and individuals familiar with this issue. Over thirty potential panelists were then interviewed by the directors of the Ohio Department of Health and Ohio EPA and the assistant director of the Ohio Department of Natural Resources. The directors presented Governor Voinovich with recommendations for appointment, and on

October 30, 1992, the Governor appointed thirteen individuals to serve on the Blue Ribbon Commission. These individuals were chosen from a variety of technical and scientific fields, environmental and public interest groups, local government organizations, and generators of low-level radioactive waste.

The legislative leadership also requested that the existing Low-Level Radioactive Waste Advisory Committee develop recommendations for the Governor and the General Assembly on other issues related to facility development. These issues included an administrative structure and process, disposal technology and design criteria, community compensation and benefits, licensure, facility operations, closure, and long-term care. The Advisory Committee was established at the time Ohio joined the Midwest Compact, and is composed of members appointed by the Speaker of the House and the President of the Senate; designees of the Department of Health, Ohio EPA, and the Department of Natural Resources; and two gubernatorial appointees representing an environmental organization and a generator of low-level radioactive waste. It is chaired by Ohio's representative to the Midwest Compact Commission. Members of the Advisory Committee joined the Blue Ribbon Commission for meetings, workshops, and public hearings.

The first meeting of the Blue Ribbon Commission was held in Columbus on November 16, 1992. The Commission decided that it would proceed with the directive from the Governor and legislative leadership by soliciting presentations on the subject of low-level radioactive waste. Recognized authorities were invited to address the Commission, with the public afforded opportunities to speak out in a series of hearings to be held throughout the state.

The Commission met again in December 1992 and January 1993, receiving information about low-level radioactive waste issues from invited representatives of the Nuclear Regulatory Commission, the Midwest Compact, Ohio state agencies and departments, other states and compacts, utility companies, waste generators, citizen groups, environmental groups, and medical and legal authorities. These presentations provided Commission members with an important foundation upon which to solicit and receive testimony from the citizens of Ohio.

Twelve public hearings were conducted in a variety of locations around the state from January through April of 1993. The Commission sought to encourage participation from individuals from diverse geographic, economic, and social circumstances. Hearings were held in the major urban centers of Columbus, Cincinnati, Dayton, Canton, Toledo, and Cleveland. They were also conducted in or near the smaller communities of Portsmouth, Mansfield, Lima, and Athens, and in the towns of Port Clinton and Mentor, located near the state's two nuclear power plants. All of the hearings were transcribed, and transcripts of the hearings were distributed to the State Library of Ohio and to libraries serving the twelve communities that hosted public hearings.

In the course of the public comment period, the Commission heard over 40 hours of testimony from more than 250 witnesses and received over 100 communications by mail from individuals, groups, and local government bodies. Substantial written testimony and supporting documents were received and entered into the record. Organizations throughout Ohio prepared, adopted, and presented formal positions on the subject of low-level radioactive waste. These groups included: the American Nuclear Society, the Council for Responsible Waste Solutions, the Ohio Environmental Council, the Ohio

Greens Party, Greenpeace, the League of Women Voters of Ohio, the Ohio Chapter of the Sierra Club, and the Society of Nuclear Medicine. Various elected state and local officials also appeared and voiced their opinions. A complete list of all individuals who testified or submitted testimony was included as an appendix to the Blue Ribbon Commission report.

During the summer months, the Commission and the Committee divided into subcommittees to draft specific portions of the reports. Both panels met on several occasions to deliberate various issues brought to them by the subcommittees and both arrived at their conclusions through a consensus-building process.

THE REPORTS

On September 2, 1993, the Blue Ribbon Commission and the Ohio Low-Level Radioactive Waste Advisory Committee presented their reports to Governor George V. Voinovich, Senate President Stanley Aronoff, and House Speaker Vern Riffe.

The Blue Ribbon Commission prefaced its recommendations with a set of assumptions and general recommendations. It was noted that the Commission believed the assumptions were necessary elements of siting and operating a facility in Ohio and, in themselves, could be considered criteria.

The assumptions referred to:

- use of 10CFR61 as minimum siting criteria, along with Ohio solid waste facility siting criteria;
- selection of an above-ground, engineered design;
- adoption of a fixed capacity limit for the facility;
- active maintenance of the site for 500 years;
- application of state-of-the-art monitoring techniques;
- assurance of Ohio's ability to enforce state-specific siting criteria; and
- development of adequate geologic and hydrogeologic databases.

An important recommendation of the Commission involved the delineation of the disposal site. The site itself was defined as the area used for disposal and a surrounding buffer zone. Further, the Commission recommended the establishment of an additional, uninhabited area surrounding the site. This area would be called the Ecological Monitoring Zone (EMZ). The primary purpose of the EMZ would be to provide an opportunity for comprehensive monitoring around the site. The size and shape of the EMZ would be based upon the unique features of the chosen site and would be designed to provide a logical unit of space. The Commission envisioned the EMZ containing a variety of wildlife habitats and experimental areas, such as a biological research station to which citizens and community groups would have access. The state of Ohio would oversee all activities within EMZ. The EMZ would not be required to meet siting criteria developed for the disposal area.

Recommended siting criteria were divided into three sections -- 1) Socio-Economic, 2) Health Effects, and 3) Hydrogeology.

The Socio-Economic criteria recommended that:

- the facility not be sited within the boundaries of legally dedicated lands such as federal or state parks, recreation areas, wilderness areas, wildlife refuges, nature preserves, or wild and scenic rivers;

- the site not adversely affect the habitat of federal or state designated endangered or threatened species;
- the site not be located within the Lake Erie coastal boundary area;
- the site avoid areas designated as archaeological or historic landmarks;
- the site avoid areas with economically significant natural resources; and
- the siting process give preference to areas with minimal transportation risks.

The Health Effects criteria recommended that:

- a pre-operational environmental monitoring program be established;
- concentrations of radioactive materials released to the general environment not exceed levels established in 10CFR61.41, and any releases of radioactivity be kept As Low As Reasonably Achievable (ALARA);
- monitoring for concentrations of primary radionuclides be undertaken during and following operation of the facility;
- existing health databases be used to assess potential health effects, with the host community having the option of participating in epidemiological health studies.

The Hydrogeologic criteria recommended that:

- the site be capable of being characterized, modeled, analyzed, and monitored;
- the site not be located within the 100 year floodplain, with the facility engineered to lie outside the 500 year floodplain;
- the site contain no wetlands or lakes;
- the site not be located over a sole-source aquifer or within a wellhead protection area;
- areas of seismic risk be avoided;
- the site provide sufficient depth to the water table;
- the soil conditions at the site be suitable for construction of an above-ground facility;
- the site avoid areas of probable subsidence or frequent landslides;
- the site not be located above a bedrock formation likely to cause karst features to develop;
- upstream drainage areas be minimized; and
- the hydrogeologic unit used for disposal not discharge within the site boundaries.

Finally, the Commission report included eight additional items for consideration. Although these issues were not explicitly within the charge put forth for the Commission, members unanimously agreed to present them as part of the report, to ensure that the Governor and the legislative leaders were fully aware of their concerns.

The items addressed were:

- criteria application: that the statewide screening process be compatible with established siting criteria.
- facility design: that the preferred design not include earth-mounding of the concrete structure.

- retrievability of waste: that the facility design incorporate elements that would allow for the removal of waste for purposes of remediation.
- waste classification: that consideration be given to separation of long-lived radionuclides in a manner that provides for greater isolation, and to a requirement for solidification of liquid waste.
- waste minimization: that source reduction and waste minimization efforts be undertaken by all generators.
- cost recovery: that total capital and operating costs of the facility be fully recovered from the users.
- community incentives: that the state not provide lump sum payments to any community in exchange for hosting the facility, but instead provide reimbursement for demonstrable impacts.
- education programs: that continuous, honest, and open public information and education programs be integral parts of the facility development process.

The Ohio Low-Level Radioactive Waste Advisory Committee began its report by providing recommendations on the structure and process to be established for the management of low-level radioactive waste. Specifically, they recommended that a new state entity -- the Ohio Low-Level Radioactive Waste Facility Development Authority -- be created to oversee the development, siting, operation, and long-term care of the disposal facility. The creation of an independent agency would minimize any role conflicts between developmental activities and future regulatory responsibilities that would be undertaken by Ohio under the US NRC agreement state program. The Authority would be directed by a nine member board. Appointments to the board would be equally divided among the Governor, the Speaker of the Ohio House of Representatives, and the President of the Ohio Senate. Board members would represent scientific and technical fields, as well as environmental, public interest, and generator groups, similar to the composition of the Blue Ribbon Commission. After a site was selected, two individuals representing the host community would join the Board.

It was recommended that the board of the Authority have a broad range of powers and duties. These duties would include:

- rule promulgation;
- contract approval;
- delineation of the screening process;
- site selection;
- the ability to acquire land;
- establishment and collection of fees;
- negotiation of compensation and benefit packages; and
- designation of institutional and long-term care programs.

Public hearings would be required prior to specific decisions of the Authority, including selection of a contractor, approval of a disposal technology, initiation of the statewide screening process, candidate site selection, final site selection, and establishment of a public education and involvement program. The Committee recommended the establishment and funding of a local monitoring committee to provide independent oversight of the development process in the potential

host community. Among the duties of the local monitoring committee would be selection of the two citizens for appointment to the board of the Authority.

The education and public involvement section of the Committee report emphasized the need for early and continued involvement of the public in the siting process. The basic education plan would be designed to enhance the abilities of those involved in project development to communicate clearly with the public and to encourage citizens to participate in all aspects of decision-making. It was recommended that the state adopt a policy of complete openness with substantial public access to all information related to the siting process.

The Committee advised the state to employ a contractor rather than operating the facility directly. A set of criteria for selection of the developer/operator were recommended, including previous experience, technical competence, ability to meet financial assurance and liability standards, and compliance with environmental statutes. Final facility design determinations would be made after a site had been selected to maximize compatibility between the protective features of the engineered structure and the natural geological features of the site. The Committee suggested that the design allow for the waste to be recoverable and that a rigorous monitoring program of the air, vegetation, and soil be established at the site. Measurable performance criteria based upon radiation dose, as opposed to material transport, were recommended.

The Committee recommended that the host community be compensated for a variety of direct impacts. Areas eligible for compensation included:

- costs associated with the establishment of an independent monitoring capability;
- payment for any tax revenue lost due to public ownership of the land;
- funds for improving the public infrastructure, including roads and water and sewer systems;
- funds for additional staffing of local government to address an increased administrative workload;
- resources to hire and train staff and purchase equipment for an enhanced emergency response capability.

The host community would also have the option of negotiating a benefits package for items not directly related to impacts, such as enhancements to the local educational system or a commitment to train and use local labor. In addition, the Committee recommended that nearby affected communities be given the right to petition the state for compensation of direct impacts and that individual property owners whose property was devalued as a result of the location of the facility have the right to petition for compensation.

The Advisory Committee strongly urged that Ohio obtain full agreement state status with the Nuclear Regulatory Commission for licensure and subsequent regulation of the disposal facility. The Committee recommended that the Ohio Department of Health, Bureau of Radiological Health Services, be the state agency designated to implement the agreement state program. Concentration of regulatory authority at

the state level would reduce duplication of effort, promote more timely response to local concerns and changing conditions, and ensure more efficient use of resources. The facility licensing process advocated by the Committee specified that:

- the license application would be submitted to the Ohio Department of Health by the contractor;
- ODH would conduct license application review, with the opportunity to request further information;
- ODH would convene a license review board composed of an administrator and two scientific experts;
- the license review board would conduct further review of the adequacy and technical propriety of the application;
- the license review board would conduct an adjudicatory hearing upon request, with partial funding made available to qualified intervening parties;
- the license review board would issue findings and recommendations to ODH;
- ODH would issue a decision on the license;
- ODH would conduct a formal license review at five-year intervals, with the opportunity for an adjudicatory hearing;
- appeals of decisions from adjudicatory hearings would go directly to the Ohio Supreme Court.

In the final section, the Advisory Committee developed recommendations concerning operation, closure, and long-term care of the facility. The Committee recommended that the state be given the ability to establish waste acceptance criteria, design and implement a manifest system, register transporters, and conduct inspections of transport records and waste containers. Institutional control would continue for a period of at least 100 years after closure and long-term care would continue for at least an additional 400 years. The Committee believed that monitoring and maintenance of the facility should continue for as long as necessary to demonstrate that the facility is meeting and will continue to meet performance standards.

DISSEMINATION OF THE RECOMMENDATIONS

Initially, the reports were delivered to the Governor, the Speaker of the House, and the President of the Senate and distributed to all members of the Ohio General Assembly. On September 28, 1993, a legislative briefing was held to familiarize legislators and their staffs with the recommendations and to discuss the future of the project. Copies of the reports were sent to all interested parties -- including a mailing list of over 750 persons -- and to media contacts throughout the state. Since issuance of the reports, a number of organizations have requested presentations and additional information.

In order for Ohio to proceed with facility development, the General Assembly must enact enabling legislation. Selected recommendations from both reports, along with the Compact amendments, are currently being compiled into a legislative proposal for introduction in the Ohio General Assembly later this year.