

## SITE DEVELOPMENT IN THE CENTRAL MIDWEST COMPACT REGION

Terry R. Lash, Director  
Illinois Department of Nuclear Safety  
1035 Outer Park Drive  
Springfield, IL 62704

### ABSTRACT

Illinois and Kentucky, the two members of the Central Midwest Interstate Low-Level Radioactive Waste Compact, are well along in fulfilling their responsibility to provide new low-level radioactive waste (LLW) disposal capacity, which has been delegated to states and regions by federal law. The host state for facilities under the compact will be Illinois, and thus the focus of this paper is on Illinois' siting process. Illinois has both the statutory authority for LLW management and a cabinet-level agency, the Illinois Department of Nuclear Safety (IDNS), which has the responsibility for implementing the state management act.

Based on activities to date, the Central Midwest Region expects to meet the milestones established by the federal Low-Level Radioactive Waste Policy Amendments Act of 1985. Illinois, however, cannot take further progress toward managing and disposing of our LLW for granted. IDNS and the Central Midwest Compact Commission (CMCC) must continue vigorously to press ahead to assure timely development of new disposal capacity.

This paper provides background information on (1) the laws under which new facilities will be established in the Central Midwest Region, (2) the activities of IDNS and CMCC, and (3) planned activities by both IDNS and the CMCC.

### INTRODUCTION AND BACKGROUND

#### LLW Generation in the Central Midwest Region

Illinois is a major producer of LLW because it has more operating nuclear power plants than any other state in the nation. Nine reactors are currently operating and four more are under construction. In addition, nuclear fuel cycle generators in Illinois include a uranium processing facility operated by the Allied-Signal Corporation near Metropolis and a spent fuel storage facility operated by General Electric Company near Morris. Based on a comprehensive survey of Illinois' generators, over 90% of the volume and more than 99.7% of the activity of Illinois' LLW in 1984 was shipped by nuclear fuel cycle facilities.

Other producers of LLW in Illinois include the usual mix of industries, hospitals, and research facilities. Federal activities in Illinois also generate LLW that are handled by commercial disposal facilities. In 1984, 338 cubic feet of LLW were shipped to commercial disposal sites from Illinois' Veterans' Administration hospitals and 98 cubic feet of LLW from U.S. Department of Agriculture facilities. Under the 1985 Amendments Act, these wastes will become the responsibility of Illinois. In 1984, the total volume of LLW shipped from Illinois for disposal was about 214,000 cubic feet, containing approximately 48,000 curies. The

complete details of the survey are presented in the references.<sup>1</sup>

By contrast, Kentucky has no operating nuclear power plants and none are under construction or planned. Kentucky generates less than 1% of the LLW from the two-state region. That percentage is expected to decline as the four reactors under construction in Illinois become operational.

#### Statutory Framework for LLW Management and Disposal

Illinois' use of nuclear power has not gone unnoticed by the state government. After the Three Mile Island accident in 1979, the state began looking at ways of improving nuclear safety in Illinois. A major step was the creation by Governor James R. Thompson of a cabinet-level agency, IDNS, charged with the responsibility of protecting Illinois' citizens and the environment from hazards associated with radiation and radioactive materials. The General Assembly enacted the enabling legislation creating the agency in the fall of 1980. Illinois became the first state to have a cabinet-level agency devoted solely to nuclear safety.

IDNS is divided into three programmatic areas: Nuclear Facility Safety, Radiation Safety, and Environmental Safety. The responsibilities of the three offices are listed in Table I.

TABLE I

Responsibilities of IDNS's  
Programmatic Offices

<u>Programmatic Offices</u>	<u>Responsibilities</u>
Environmental Safety	Protecting of the public from radioactive contamination and radiation in the environment from nuclear power plants and other sources: <ul style="list-style-type: none"> <li>o implementing state law on LLW management;</li> <li>o escorting and inspecting all shipments of spent nuclear fuel in Illinois;</li> <li>o overseeing decontamination activities in the event of improper use of radioactive materials;</li> <li>o operating a radiochemistry laboratory to measure radioactivity in environmental samples;</li> <li>o enforcing federal clean air regulations as they relate to radioactive materials;</li> <li>o assessing the potential danger of radon build-up in Illinois' homes;</li> <li>o monitoring levels of radium in drinking water.</li> </ul>
Nuclear Facility Safety	Monitoring Illinois' nuclear power plants and other nuclear facilities and areas surrounding them to ensure safe operation and direct emergency response operations: <ul style="list-style-type: none"> <li>o installing remote monitoring systems at all nuclear power plants including both in-stack monitors, and air and water radiation monitors around the reactor sites;</li> <li>o monitoring key plant systems status signals from reactor control rooms via computer;</li> <li>o developing, participating in and directing the technical aspects of Illinois' emergency response programs in case of an accident at a reactor or related facility.</li> </ul>
Radiation Safety	Directing regulatory programs associated with radiation facilities (medical, industrial and research): <ul style="list-style-type: none"> <li>o registering and assuring the inspection of all X-ray systems in Illinois;</li> <li>o accrediting all radiologic technologists in Illinois;</li> <li>o licensing and inspecting possessors of radioactive material not regulated by the federal government;</li> <li>o operating a radiation instrument calibration center with standards traceable to the National Bureau of Standards to assure the accuracy of radiation survey instruments used in inspections.</li> </ul>

The 1980 federal Low-Level Radioactive Waste Policy Act encourages states to enter into interstate compacts for the purpose of establishing new LLW disposal facilities. The incentive for forming interstate compacts is the provision which allows regions to exclude from their disposal facilities all LLW originating in states outside of their regions. The process of alignment among states began in early 1981 and the groupings were based primarily on geographic proximity.

Both Illinois and Kentucky initially took part in the discussions with the states which today form the Midwest Compact. In 1983, the Midwest Compact had been passed by several state legislatures and was introduced in the Illinois General Assembly along with a companion bill which addressed LLW management in Illinois. The original Midwest Compact was not passed by the Illinois General Assembly that session because of Illinois' wish to change critical provisions dealing with rotation of host state responsibility and shared liability. The

companion legislation, the 1983 Illinois Low-Level Radioactive Waste Management Act, however, was signed into law in December, 1983.

This Act specifies a process by which LLW generated in Illinois is managed and covers requirements for treatment, storage, disposal and transportation of LLW. IDNS is responsible for registration of generators; collection of annual reports from LLW generators; development of an Interim LLW Management Plan<sup>2</sup> covering the period after January 1, 1986; promulgation of waste treatment standards; collection of LLW fees; establishment of funds for LLW facility development and post-closure care and compensation; regulation of waste transportation; promulgation of requirements for waste facility operators; attainment of Agreement State Status with the U.S. Nuclear Regulatory Commission (NRC); and promulgation of rules governing the siting, licensing, and operation of LLW facilities. Table II outlines the major provisions of the Management Act and summarizes activity to date and near-term plans for implementation.

TABLE II

Summary of Major Provisions  
of the 1983 Illinois Low-Level  
Radioactive Waste Management Act, as Amended

<u>Section #</u>	<u>Title</u>	<u>Comments</u>
4	Generator Registration	Requires all generators to register with IDNS and to file an annual report. Registration was started in 1984, and the first annual survey was issued in 1986.

5	Requirements for Waste Facility Contractors	Requires IDNS to promulgate rules on selection of a contractor(s) to design, develop, and operate LLW facilities. Planned for 1986.
6	Requirements for Waste Facilities	Requires IDNS to promulgate regulations for design, construction, operation, maintenance, and monitoring of LLW facilities. Planned for 1987.
7	Requirements for Waste Treatment	Requires IDNS to promulgate LLW treatment standards. Planned for 1986.
8	Requirements for Waste Facility Licensing	Requires IDNS to license LLW facilities; Director is prohibited from issuing a license for a shallow land burial facility. Planned for 1987.
9	Requirements for Waste Transporters	Requires IDNS to issue permits to anyone transporting LLW to a facility in Illinois; also requires development of a manifest document and a tracking system. Tracking system is under development and will be fully operational before the disposal facility is completed.
10	Requirements for Waste Facility Siting	Establishes timetable and process for site selection, environmental studies and site characterization, public hearings, funds for counties to conduct siting reviews. Studies with ISGS and ISWS began in 1984 and will be completed in 1986. The siting process should be completely defined in 1987.
11	Requirements for Interim Waste Management	Requires IDNS to prepare an interim management plan to address how LLW is to be handled until Illinois' facility is operating. Draft in May, 1985; final in November, 1985. Updated as appropriate.
12	Waste Facility Siting Criteria	When siting facilities, geologic and hydrologic characteristics must be considered; facility will not be sited within 1 and 1/2 miles of any municipality without consent of municipality. Criteria should be adopted in 1987.
13	Waste Fees	Requires generators to pay fees to the state. Collection began in 1984.
14	Waste Management Funds	Fees are placed into two funds: 80% goes to facility development and 20% to closure and long-term care. Established in 1984.
15	Compensation	Requires IDNS to promulgate rules for compensating persons suffering loss by a radioactive release from a facility.
19	Agreement State Status	Authorizes the governor to enter into an agreement with the U.S. NRC for the purposes of becoming an Agreement State. Informal review by NRC staff in 1985; rules published in Illinois Register in January, 1986. Agreement State status expected in 1986.

Neither Illinois nor Kentucky could reach agreement with the states adopting the original Midwest Compact. The Central Midwest Compact was then negotiated by representatives of Illinois and Kentucky in May and June of 1984. The language was taken primarily from the Midwest Compact with certain key modifications necessary to address the earlier concerns with the original provisions and to provide for only two states. Strategically, the marriage of Illinois, a major producing state which recognized its responsibility to manage and dispose of its large volume of LLW, and Kentucky, a small generating state which did not want to host a new LLW disposal facility, made sense.

The Central Midwest Interstate Low-Level Radioactive Waste Compact was passed by the Illinois General Assembly and signed by Governor James R. Thompson in September of 1984. Kentucky Governor Martha Layne Collins enacted the compact by Executive Order at approximately the same time since Kentucky's legislature was out and would not be in session again until 1986. The Kentucky legislature passed the compact during its session earlier this

year and it was signed by Governor Collins on February 20, 1986. Along with several other compacts, the Central Midwest Compact was ratified by Congress in December, 1985.

While the compact language resembles the language of the Midwest Compact, there are notable differences. Illinois and Kentucky are the only eligible member states. A state will not host a LLW facility unless that state produces 10% of the region's LLW volume in a given year, a provision that assures that Illinois will host the region's facilities for the foreseeable future. Under the provisions of the Compact, the siting and regulation of facilities are the responsibilities of the host state. The compact prohibits the use of shallow land burial for the region's LLW disposal facility, and it encourages the use of source and volume reduction techniques in the region.

The Central Midwest Compact Commission (CMCC) has been established and it consists of two commissioners from Illinois and one from Kentucky. Once a county is designated as the site of a new

facility, a fourth, ex officio, non-voting commissioner representing the local community will be designated. The CMCC is responsible for developing the Regional Management Plan, which will address such things as the number and type of regional facilities needed; policies to promote source and volume reduction; and alternatives to shallow land burial. The CMCC also must approve the import of out-of-region LLW and the export of in-region LLW.

#### ACCOMPLISHMENTS TO DATE

##### Illinois Department of Nuclear Safety

The focus of IDNS's activities is implementing of the Illinois LLW Management Act, providing staff assistance to the CMCC, and conducting extensive public participation efforts. The Management Act, as previously described, sets out specific requirements for IDNS in terms of regulating and siting facilities. The Management Act and Illinois' Administrative Procedures Act ensure a minimum level of public scrutiny and legislative oversight; however, IDNS is committed to going well beyond those requirements. IDNS has devoted considerable effort to designing and implementing a broad public participation program.

##### Implementation of the Illinois LLW Management Act

One of the first tasks mandated by the Illinois LLW Management Act was the registration of all LLW generators, which was first accomplished in 1984.

The Management Act also requires generators to file an annual report with IDNS that provides information about the types and quantities of LLW generated currently and in the future. Treatment methods in use or planned are also described on the form. The summary of the 1984 annual survey of generators was recently released<sup>1</sup> and the completed 1985 annual report forms are being received. IDNS expects to issue a report based on the 1985 data in July, 1986.

The need for accurate data is substantial. The data needed by states in the upcoming years in order to implement the requirements of the federal Act include such things as trends in generation rates, indications of generators with particular problems, characteristics of waste streams, and source and volume reduction techniques in use or planned. All of these pieces of information are necessary for preparing Illinois' program for the management and disposal of LLW.

Based on Illinois' experience with the annual generator survey, collection of complete and accurate information is time consuming and difficult. Table III summarizes the data that we have received. The data gained from this exercise is limited. For example, the annual surveys do not provide detailed characterizations of waste streams. Also, in many cases the responses indicated a lack of full understanding by the generators of source and volume reduction techniques; thus projections of future LLW volumes may not be accurate.

TABLE III

#### Summary of Results from the Annual Report on the Survey of LLW Generators in Illinois for 1984

1. A total of 213,636 cubic feet of LLW was shipped for disposal from Illinois in 1984, with 92% from nuclear fuel cycle activities and 71% from the Commonwealth Edison Company.
2. A total of 48,240 curies contained in LLW was shipped for disposal from Illinois in 1984 with over 99% from nuclear fuel cycle activities, almost entirely from Commonwealth Edison Company.
3. Illinois has 267 generators of LLW with 64% located in the Chicago area. 70% of the generators are hospitals.
4. Only 47 of the 267 generators shipped for disposal in 1984. Of the 47 who shipped, 25 shipped more than 100 cubic feet of LLW in 1984.
5. No Class C waste was shipped for disposal from Illinois in 1984.
6. LLW volume shipped for disposal is expected to increase slightly to over 227,000 cubic feet in 1985.
7. Despite volume reduction efforts, LLW volumes will increase after 1985 largely due to new reactors becoming operational.
8. The trend for LLW in Illinois in coming years is that LLW from fuel cycle and industrial facilities will increase in volume and LLW from medical and research institutions will decrease.

IDNS has been collecting fees from generators since early 1984 to support Illinois' LLW program. The original Act required a \$1 per cubic foot fee. The revenue from this fee was placed into two funds: 80% went to the LLW Facility Development Fund and 20% went to the LLW Facility Closure, Post-Closure Care and Compensation Fund. The Act was amended in 1985 to assess reactor operators an annual fee of \$90,000 per operating reactor, and to increase the fee to \$3 per cubic foot for all other generators. The distribution of revenues did not change.

In 1985, the Interim Management Plan required by the Act was issued. One important purpose of the Plan is to present information to assist individual generators in the development of necessary interim management practices, during the period preceding the opening of the new disposal facility. The Plan describes a series of measures which can be implemented to cope with restrictions on out-of-state disposal. The draft plan was released in May and informational hearings were held in May and June. A formal public hearing was held in July. The revised final document was released in November.

Another major undertaking required by the Management Act is achievement of Agreement State status with the U.S. Nuclear Regulatory Commission. IDNS's draft rules have received NRC's informal staff review, and they have recently been published as proposed rules in the Illinois Register. A formal hearing on them was held on February 24, 1986, in Springfield. The application, including the finally adopted rules, will be sent to the chairman of the NRC by Governor James R. Thompson in the Spring of 1986.

Work with the Illinois State Geological Survey (ISGS) and the Illinois State Water Survey (ISWS) concerning site selection criteria has also been underway as required by the Management Act. Under contract to IDNS, the Surveys have developed proposed statewide criteria based on geologic and hydrologic data and a series of maps of Illinois indicating several geological features pertinent to LLW disposal. (See Table IV for a list of those maps.) The first report was released in December, 1985. A second report has been drafted and will be published before July 1, 1986.

TABLE IV

List of Statewide Criteria Maps

1. Aquifer Distribution Within 50 Feet of Ground Surface.
2. Major Sand and Gravel Aquifers.
3. Distribution of Major Bedrock Aquifers Within 300 Feet of Ground Surface.
4. Major Bedrock Aquifers Within 500 Feet of Ground Surface.
5. Major Bedrock Aquifers at Depths Greater than 500 Feet Below Ground Surface.
6. Surface Water Bodies and Locations of Surface Water Withdrawal.
7. Alluvial Deposits.
8. Surficial Sand and Gravel Resources.
9. Deep Resources of the Springfield (No. 5) Coal.
10. Strippable Resources of the Springfield (No. 5) Coal.
11. Deep Resources of the Herrin (No. 6) Coal.
12. Strippable Reserves of the Herrin (No. 6) Coal.
13. Inactive Faults.
14. Public Interest Areas (state reserve system units, public recreational landsites, Federal Reserve system units and special Federal Reserve system units).

During 1986, implementation of the Management Act will focus on several fronts. The International Symposium on Alternative LLW Technologies, co-sponsored by the CMCC, was held in Chicago last week. It provided information on alternatives to shallow land burial and it was an early step in examining advanced technological alternatives for treating, storing and disposing of LLW in Illinois. Throughout 1986 IDNS plans to study specific alternatives that would be suitable for Illinois. Characterization of LLW streams in Illinois is an additional project planned for 1986.

In terms of promulgation of rules under the Management Act, contractor selection criteria will be developed and the rules promulgated as required under the Act. In addition, regulations will be developed on waste treatment standards. That work will include a review of available treatment technologies and an evaluation of their possible use in Illinois.

Another project which will be started in 1986 and completed in 1987 is the development of waste facility standards. Under this project, the technical licensing requirements and regulations for

the design, construction, operation, maintenance, monitoring, decommissioning and closure of an Illinois facility will be developed.

Continuing projects in 1986 include the collection of fees and the annual survey of generators. Future work with the State Surveys will focus on criteria for evaluating proposed disposal sites and procedures for conducting studies necessary for site characterization and evaluation.

The Management Act generally describes the siting process, and the development of detailed siting procedures is expected to begin in 1986. Work planned by IDNS to further define the siting process includes a review of the existing technical literature, laws and regulations on siting similar facilities; the establishment of the initial planning, development and site selection procedures to be used by IDNS in the siting process; and a draft guidance document on requirements for environmental impact studies and site characterization.

### Public Participation

IDNS is committed to involving the public fully and meaningfully in the Department's decisionmaking. IDNS views participation as a two-way process: not only does IDNS seek to inform and educate citizens, but IDNS also seeks advice and information from citizens throughout the state on issues and decisions that IDNS must make.

A public participation workshop was held with representatives from other states, federal agencies, an environmental organization, and a university in December, 1984. The group made several recommendations to IDNS for establishing a public involvement program. One recommendation was to set up a balanced and representative state-wide advisory committee on overall LLW management policies and plans, particularly those concerning the siting process. In addition, the group recommended that IDNS solicit the views of interested groups on ways of encouraging and promoting public participation.

As a result, IDNS published a draft Public Participation Plan in May of 1985 and distributed it for comment. In addition to information on laws and regulations on LLW, the Plan suggested the formation of a citizens' advisory group, as well as technical advisory panels as necessary<sup>4</sup>.

Over the spring and summer of 1985, IDNS met with groups of interested citizens, representatives of various interest groups, LLW generators, and local officials to determine the desirability and function of a citizens' advisory group. In November, a 16-member Citizens' Advisory Group on Low-Level Radioactive Waste was appointed. Members of the Group include representatives of environmental organizations, generators (including fuel cycle activities, hospitals, industries, and universities), a geologist, a representative of the Illinois Farm Bureau, and others. The first meeting of the Citizens' Advisory Group was held in December, 1985, and the second one was held in February, 1986. The discussions have addressed such issues as source and volume reduction, interim management, and the federal LLW Policy Amendments Act of 1985. IDNS provides staff support to the group, but the facilitators are from The Conservation Foundation.

IDNS has also formed a Technical Advisory Panel on LLW issues. This seven-member group, composed of scientists, political scientists and engineers, will expand the amount of technical information available to IDNS from outside sources. This group will concentrate on issues such as evaluating disposal technologies other than shallow-land burial and suggest an evaluation methodology to the Department. The Technical Advisory Panel had its first meeting in December, 1985, and is expected to meet three or four more times before submitting its report to IDNS in 1987.

Public participation includes the dissemination of information, and to that end IDNS sponsors an annual conference for Illinois' and Kentucky's LLW generators and interested members of the public. The first of these conferences was held in 1984. The intent has been to explain the national situation and the IDNS and CMCC activities to generators and concerned citizens.

The Department also maintains a Speakers Bureau, which makes IDNS staff available for presentations on a variety of issues. A periodic agency newsletter supplements our public information efforts, since it includes articles on agency programs and outside developments affecting our activities.

We have also taken the approach of giving pertinent Departmental reports and publications the widest possible distribution. This has included the Department's Interim Management Plan<sup>2</sup> and the annual report based on generators' completed survey forms<sup>1</sup>. Also, the Surveys' series of maps showing various geologic and hydrologic characteristics in Illinois that relate to siting a LLW disposal facility were given wide distribution in an attempt to increase public awareness of the site selection process.

### The Central Midwest Compact Commission

The role of the CMCC is more limited when compared to the compact commissions from other regions. Since the question of host state designation has been resolved in advance, the CMCC's major responsibilities are to approve or disapprove of LLW exports from and imports into the region, to prepare a Regional Management Plan, to encourage source and volume reduction, to promote alternatives to shallow land burial, and to determine the needed number and type of regional facilities.

The first meeting of the CMCC was held in Springfield in March, 1984. This was an organizational meeting at which the membership fees of both states were submitted and officers elected. Commissioner Clark Bullard (IL) was elected Chairman. The two other commissioners are Donald Hughes, Director of Kentucky's Department of Health Services' Radiation Control Branch and myself.

The second meeting was held in Springfield in July, 1984, and covered such topics as by-laws, budget, and consideration of the Regional Management Plan. The latest meeting was held in Louisville, KY, in January, 1986, and the main focus of the discussion was on the process for developing the Regional Management Plan.

## CONCLUSIONS

In sum, significant progress has been made in Illinois toward establishing new LLW disposal capacity. The public has been involved to a significant degree in IDNS's activities. There should be a disposal facility using an advanced disposal technology operating in Illinois by January 1, 1993.

As we get closer to this goal, there will be even more public interest in our activities. IDNS's response to this increased interest will be to enhance the opportunities available for public, particularly local communities, input in the decisionmaking process. To do anything else would only lessen the chances of making continued progress.

We have much to do in the next seven years. Establishing new disposal facilities entails many time-consuming tasks, and we will face many challenges. On occasion, the temptation may be great to feel as if 1993 will never arrive - or perhaps that it will arrive too soon.

Albert Einstein, one of the fathers of the Atomic Age, once said, "I know why there are so many people who love chopping wood. In this activity one immediately sees the results." That statement reflects some of the frustrations we experience with

low-level waste issues, as it is often years before tangible results are produced. In establishing new disposal facilities, we will have to give the public ample opportunity to help us select the trees and maybe even tell us how to swing the ax. If we do, and we maintain our sense of humor, then Illinois and Kentucky will have a safe, technologically advanced disposal facility that fulfills the requirements of federal and state laws and, more importantly, has the confidence of our citizens.

## REFERENCES

1. Illinois Department of Nuclear Safety, Annual Report on the Survey of Low-Level Radioactive Waste Generators in Illinois for 1984, March, 1986.
2. Illinois Department of Nuclear Safety, Interim Management Plan for Low-Level Radioactive Waste in Illinois, 1986-1993, November, 1985.
3. Illinois State Geological Survey and Illinois State Water Survey, Siting a Low-Level Radioactive Waste Disposal Facility in Illinois: Statewide Criteria, December 15, 1985.
4. Illinois Department of Nuclear Safety, Public Participation Plan on Low-Level Radioactive Waste Management in Illinois, November, 1985.