

# EVALUATION OF THE REGULATORY COMPLIANCE IMPACT ON DOE MIXED LOW-LEVEL WASTE MANAGEMENT OPTIONS

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## ABSTRACT

IT Corporation, in support to the U.S. Department of Energy (DOE) Headquarters strategic planning, is currently evaluating various options for the "cradle-to-grave" management of DOE's mixed low-level waste. One component of this evaluation will be an analysis of the impact of various regulatory issues on the different options available to the DOE. Examples of these regulatory impacts include provisions that exclude waste management options (e.g., siting a disposal facility near a sole-source aquifer, potential increases in project cost due to permitting requirements, and schedule delays). This paper reviews and summarizes the current regulations affecting each stage of mixed low-level waste management from waste generation through disposal. Specifically, the paper summarizes the following information:

- A summary of the existing laws and orders which are likely to have the most impact on the MLLW management process.
- Historical information summary on past regulatory experience at the existing DOE site facilities.
- Identification of the proposed methodology for the evaluation of regulatory compliance impact on alternative treatment, storage, and disposal options.

## INTRODUCTION

The Mixed Low-Level Waste (MLLW) Program is a U.S. Department of Energy Headquarters (DOE-HQ) initiative designed to develop a systemwide integrated strategy for managing DOE's mixed low-level wastes. The objective of this program is to identify and implement treatment, storage, and disposal (TSD) options for MLLW. For the purposes of this DOE project, a TSD option is defined as any combination of methods used during each stage of MLLW management from waste generation to disposal (i.e., "cradle to grave"), including waste retrieval, characterization, storage, transportation, and treatment. In support of the DOE MLLW Program, a Systems Analysis Methodology is being developed to evaluate the effectiveness and feasibility of various MLLW TSD options.

The Systems Analysis will include all stages of the MLLW management process from waste generation to final disposal. The sites that are being considered as potential locations for TSD facilities in the evaluation are Savannah River Site, Idaho National Engineering Laboratory, Los Alamos National Laboratory, Oak Ridge Reservation, Rocky Flats Plant, Paducah, Fernald, Portsmouth, Nevada Test Site, and Hanford. The Systems Analysis is intended to serve as a decision-making tool by providing recommendations concerning possible optimized TSD options for the MLLW management process. The methodology will be comprised of different components that will evaluate each of 13 alternative TSD options and a Reference Case TSD option with respect to the performance of final waste forms and disposal facility technologies, life cycle cost and implementation schedules, regulatory compliance effects, and health and safety risks to workers and the public. The results of the analysis will include recommendations for alternative TSD options for the complete DOE MLLW system.

## SCOPE AND PURPOSE

One of the components of MLLW Systems Analysis that could have a major impact on the implementation of a given TSD option is the issue of regulatory compliance. Examples of regulatory impacts include potential state or local provisions that exclude the implementation of certain waste management options and prohibitive permitting costs and schedules. Therefore, an evaluation of the regulatory compliance impact on TSD options is also being performed as part of the Systems Analysis.

The following steps provided the foundation for determining the evaluation for the regulatory compliance impact:

- Review and summary of existing laws and orders
- Compilation of historical information from the DOE sites
- Identification of the proposed methodology for the evaluation of regulatory compliance impact on alternative TSD options

The first of the above items included a review and evaluation of current and proposed federal/state/local laws that were potentially applicable to the management of MLLW at each potential DOE site. The statutes that were determined to have the most relevance in terms of the management of MLLW were summarized, and the permitting/documentation requirements were identified.

The second item, compilation of historical information, was facilitated by written requests for information and telephone inquiries with the DOE MLLW sites. Information was obtained pertaining to the identification of the key regulatory drivers and the regulations that would have the most impact on TSD options, the appropriate enforcement agencies for those regulations and the overall regulatory climate at each potential DOE site.

Lastly, the proposed methodology for the evaluation of the regulatory compliance impact was defined. The

methodology is based on utilizing historical information pertaining to permitting cost and schedules for existing/planned TSD facilities. This information is currently being obtained from the DOE sites and is fundamental to the evaluation of the regulatory impact on alternative TSD options.

This paper discusses each of the above three items and their use in evaluating regulatory compliance impact on MLLW TSD options.

### OVERVIEW OF FEDERAL REGULATIONS FOR MLLW MANAGEMENT

DOE facilities are required to manage their radioactive waste in accordance with DOE Orders, which were developed to facilitate DOE's implementation of the Atomic Energy Act (AEA) requirements. The AEA provides the DOE with the authority to manage wastes in a manner that protects health and minimizes dangers to life or property. As stated in DOE Order 5400.3, "Hazardous and Radioactive Mixed Waste Program" (1), it is DOE's policy to manage all departmental hazardous and radioactive mixed wastes according to the requirements of the AEA and Subtitle C of the Resource Conservation and Recovery Act (RCRA). The radioactive component of mixed waste is subject to the conditions of DOE Order 5820.2A, "Radioactive Waste Management" (2), which indicates that the management of DOE's radioactive wastes and wastes containing hazardous constituents will require compliance with applicable federal regulations.

Therefore, in order to evaluate the regulatory compliance impacts of a given TSD option, it is necessary to first identify the applicable regulatory drivers and required permits for that particular TSD option. The ensuing discussion presents a brief summary of the major federal statutes, regulations, Executive Orders, and DOE Orders, which are likely to be applicable for most TSD options.

#### Federal Compliance with Pollution Control Standards (Executive Order 12088)

As amended by Executive Order 12580, this Order requires federal agencies to comply with applicable administrative and procedural pollution control standards mandated by, but not limited to, the following federal laws (3):

- Toxic Substances Control Act (TSCA) (15 U.S.C. 2061 et seq.)
- Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.)
- Clean Air Act (CAA) (42 U.S.C. 7401 et seq.)
- Solid Waste Disposal Act, as amended (42 U.S.C. 6901 et seq.)

#### National Environmental Policy Act (NEPA) (42 U.S.C. 4321-4347)

The NEPA constitutes a national policy to preserve the environment, and to foster a better understanding of the ecological systems and natural resources important to the nation. Any proposed federal project that has the potential to significantly affect the quality of the human environment must undergo a review process pursuant to the NEPA to identify and evaluate possible environmental impacts. The Council on Environmental Quality issues regulations that implement NEPA. They contain provisions to ensure that federal agencies consider environmental information before making decisions on proposed actions.

#### DOE Order 5440.1D

This Order describes the roles of various DOE offices in implementing the NEPA (4). It also indicates that it is DOE's policy to comply fully with the intent of the NEPA. Therefore, all new federal TSD facilities would probably be required to undergo the NEPA review process. DOE's NEPA implementation policy requires that an Action Description Memorandum be prepared for proposed construction activities, and that the appropriate level of NEPA documentation be chosen for the project. The preparation of an Environmental Impact Statement (EIS) would most likely be recommended for any TSD unit considered for construction.

#### Clean Air Act (CAA)

The CAA mandates the prevention and control of air pollution to protect and enhance the quality of air resources of the nation. There are two national standards established by the Environmental Protection Agency (EPA) that may have an impact on the implementation of a new TSD unit. These are the National Ambient Air Quality Standards (NAAQS) and the National Emission Standards for Hazardous Pollutants (NESHAP). In addition, the CAA Amendments may either require use of maximum available control technology for regulated air emissions or a demonstration that air quality objectives can be otherwise achieved.

NAAQS are established in 40 CFR Part 50 for pollutants of nationwide concern. Standards have been promulgated for so-called "criteria pollutants". These are sulfur dioxide, carbon monoxide, photochemical oxidants, hydrocarbons, lead, particulates, and nitrogen dioxide. Attainment and maintenance of air quality are the primary responsibility of each state. State implementation plans for the CAA are required by the EPA for each state, as per 40 CFR Part 51. The standards of the NESHAP are designed to regulate pollutants that the EPA determines are particularly hazardous to health. These standards regulate both new and existing emission sources and limit the amount of emitted pollutants. If regulated hazardous pollutants are anticipated to be released, the facility will be required to submit an engineering report and obtain construction approval from the EPA or the state, if the state has been authorized by the EPA to grant such approval. The application to construct a new unit must include the location, the nature of the source, size, design and operating capacity, methods and description of emission controls, and calculation of emission rates.

#### Clean Water Act (CWA)

The objective of the CWA is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters" by prohibiting the discharge of pollutants in toxic amounts to navigable waters in the United States. The regulatory vehicle used to impose limitations on pollutant discharges is a nationwide permit program referred to as the National Pollutant Discharge Elimination System (NPDES), 40 CFR Parts 122, 123, and 124. The NPDES program imposes detailed pollution control requirements for industrial effluent and stormwater runoff discharges associated with industrial activity through permits issued by the EPA or states having an EPA-approved permit program.

#### RCRA

RCRA regulates the generation, handling, treatment, storage, and disposal of hazardous waste. The implementing

regulations are specified in 40 CFR Parts 260-270. All MLLW TSD facilities are required by these regulations to obtain a RCRA permit. There are two permit applications that pertain to a RCRA permit—the Part A permit application and the Part B permit application. The type of unit being permitted will stipulate the regulatory permit requirements that must be satisfied. For example, the regulations require significantly different information for permitting an incinerator as compared to permitting a treatment tank, storage area, or a disposal facility. Location standards for TSD facilities are regulated by the EPA under 40 CFR Part 264.18.

### **TSCA**

A TSD facility may also have to comply with the regulatory requirements of TSCA. These regulations pertain to any RCRA-permitted facility that handles hazardous wastes containing more than 50 parts per million of polychlorinated biphenyls (PCBs).

### **SUMMARY OF RESULTS FROM COMPILATION OF HISTORICAL INFORMATION**

It was determined that the documentation and permitting requirements resulting from the RCRA, the CAA, the CWA, and the NEPA would probably have the most impact on the TSD options in terms of regulatory cost and schedules. The proposed methodology for the evaluation of regulatory compliance impact on alternative TSD options, which is explained later in this paper, is based on identified permitting requirements and their effect on cost and schedules.

The information received from the DOE sites indicated that enforcement authority for the regulations, promulgated in accordance with the above-mentioned laws, had been delegated to certain states by the EPA, but that the EPA continued to maintain partial authority over some regulations in some states. The information also suggested that some states have more stringent regulations than the Federal Regulations. In addition, the majority of the DOE sites reported that the current political climate in their state was not perceived as being supportive in terms of accepting out-of-state MLLW for treatment and/or disposal. In view of this information it seems increasingly clear that in order for MLLW management progress to continue, a strong spirit of cooperation must exist among the individual states, the EPA and the DOE.

The sites indicated that all of the states being evaluated had authority over the RCRA base TSD program, but only a few sites reported that their state had complete Land Disposal Restriction (LDR) authority. Rocky Flats and Hanford reported that their respective RCRA state regulations were more stringent than the Federal Regulations. Paducah suggested that their state RCRA regulations had the potential to be more restrictive depending on the unit to be permitted. All states except Idaho, Colorado, and Nevada were reported to have NPDES permit authority. Hanford reported that the state of Washington regulations pertaining to clean air and clean water were more stringent than the EPA standards, and Savannah River Site indicated that South Carolina also had the potential to be predisposed in this direction. Rocky Flats and Paducah mentioned that their states had more restrictive clean water regulations.

Additional site information declared that Oak Ridge Reservation, Savannah River Site, Hanford, and Idaho National Engineering Laboratory have been placed on the National Priorities List (NPL) and therefore, they were required

to be cleaned-up under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The Nevada Test Site is currently being evaluated as a potential candidate for the NPL.

### **PROPOSED METHODOLOGY FOR EVALUATION OF REGULATORY COMPLIANCE IMPACT**

The regulatory compliance impact resulting from the implementation of each TSD option will be evaluated on the basis of costs and schedules for permitting activities. Each of the 13 alternative TSD options and the Reference Case TSD Option will be evaluated to determine what major permits will be required for that option. Specifically, for each DOE site included in an option as a treatment, storage, or disposal facility location, the following major regulatory requirements will be estimated:

- RCRA Part B
- Clean Water
- Clean Air
- Extent of NEPA documentation (EIS, EA, etc.)

This evaluation will identify the permit requirements expected to have the most impact in terms of permitting costs and schedule for specific units at each site for each alternative TSD option.

A list of TSD facilities compiled by EG&G has been used to identify major existing/planned treatment, storage, and disposal units at each DOE site that is being evaluated by the Systems Analysis as a potential TSD facility location. Specific TSD units have already been identified at each DOE site, and applicable information has been entered into information request tables that have been sent to each site, so that the sites may provide additional needed information. The purpose of the table is to obtain historical information from each site pertaining to identified existing/planned treatment, storage, disposal units in the following areas:

#### **For each existing/planned unit:**

- Description of the type of unit
- Volume capacity of the unit
- Information on the permit status of the unit (i.e., interim status, application pending, application not filed yet, permit not required, etc.)
- For non-permitted units, the duration of the permitting process for each permit (i.e., how long has the process been going on and how much more time is anticipated before the permit will be obtained)
- For units that have obtained permits, the duration of the permitting process for each permit (i.e., how long did it take to obtain the permit)
- Cost to obtain each permit or projected expenditure to obtain a permit
- NEPA requirements and cost

Once the permitting cost and schedule data for each type of permit at each DOE site is obtained, and the required permits for each alternative option is estimated, the regulatory compliance impact will be estimated by using a table similar to Table I. *It should be noted that the information presented in Table I is not factual; it is just an example to show how total permitting costs and schedules will be estimated for an alternative TSD option.*

**TABLE I**  
Sample Table for Estimation of Regulatory Compliance  
Impact on a TSD Option

Alternative Option 1 Site A		
Permit Required	Range of Cost (in thousands of dollars)	Estimated Time
RCRA Part B	\$2,250 - \$4,500	2 to 3 years
NESHAP	\$500 - \$750	2 years
Site B		
Permit Required	Range of Cost (in thousands of dollars)	Estimated Cost
RCRA Part B	\$1,100 - \$2,000	1.5 to 2 years
NESHAP	\$500 - \$750	1 to 3 years
Grand Total for Option 1 = \$4,350 - \$8,000 to 3 years		
As mentioned previously, the regulatory component is only one of several different components that will comprise the MLLW Systems Analysis. It is expected that all components will be incorporated into the MLLW Systems Analysis, and a final report published by DOE in early 1994.		

The evaluation scheme in Table I will be followed for each of the alternative TSD options being evaluated by the Systems Analysis.

After estimating the total permitting costs and schedules for each TSD option, the next step will depend on what type of decision methodology is selected for integrating the different components of the Systems Analysis. If the parameter used for the integration is dollars, then the total permitting costs could be used as an indication of the regulatory compliance impact for each option. However, in that case, the schedules would also need to be converted into dollar values. Instead of dollar values, an index may also be used and the permitting costs as well as schedules for each alternative

option may each be converted to a relative index by comparison with the Reference Case. The cost and schedule indices for each option may also be added by using a weighted average method to arrive at a final index for each option. A methodology for integrating the different components of the Systems Analysis is currently being developed.

In further support of the effort to estimate costs, additional information pertaining to treatment, storage, and disposal permits for commercial hazardous waste facilities is currently being researched at the state level. However, this information has not yet been thoroughly investigated, so the relevance of the data is yet to be determined.

#### FUTURE OUTLOOK

Once the permitting cost and schedule information is obtained from the DOE sites, and any additional relevant data is collected, it will be incorporated into the methodology for the evaluation of the regulatory compliance impact on alternative TSD options. The final report evaluating the regulatory compliance impact on each of the alternative TSD options is anticipated to be completed in the summer of 1993.

As mentioned previously, the regulatory component is only one of several different components that will comprise the MLLW Systems Analysis. It is expected that all components will be incorporated into the MLLW Systems Analysis, and a final report published by DOE in early 1994.

#### REFERENCES

1. U.S. DEPARTMENT OF ENERGY (DOE), "Hazardous and Radioactive Mixed Waste Program", DOE Order 5400.3, U.S. Department of Energy, Washington, D.C. (1989).
2. U.S. DEPARTMENT OF ENERGY (DOE), "Radioactive Waste Management", DOE Order 5820.2A, U.S. Department of Energy, Washington, D.C. (1988).
3. EXECUTIVE ORDER, EO-12580, "Federal Compliance with Pollution Standards", Washington, D.C. (1987).
4. U.S. DEPARTMENT OF ENERGY (DOE), "Implementation of the National Environmental Policy Act", DOE Order 5440.1D, U.S. Department of Energy, Washington, D.C. (1990).