

ANALYSIS OF STAKEHOLDER CONCERNS FOR THE ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT PROGRAM

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ABSTRACT

The Office of Waste Management, Department of Energy (DOE) directed this study to improve understanding of the concerns of their stakeholders. The data was gathered from the open-ended comments made during the Office of Environmental Restoration and Waste Management (EM) Programmatic Environmental Impact Statement (PEIS) Scoping Meetings in 1990-1991. A content analysis process was applied to the comments to develop a list of issues and sub-issues the stakeholders want DOE to address. From these issues, a set of recommendations were made.

This paper contributes a set of stakeholder concerns grouped according to issues for the Environmental Restoration and Waste Management Program (ERWM). These stakeholder concerns can be translated into strategic issues for EM to consider in its planning efforts. The description of major issues and sub-issues helps identify the strengths and weaknesses of EM as defined by its stakeholders. Opportunities and threats for EM can also be identified through the study of these issues. Finally, a set of recommendations for DOE from these concerns is described.

INTRODUCTION

EM's strategic plan states EM will complete its mission in a "manner that provides appropriate opportunities for public involvement" and will achieve its vision through "...openness to public input, and overall accountability to the Nation for its actions" (1). This statement clearly identifies EM as a stakeholder-oriented organization that values public acceptance of its program. A stakeholder is recognized as any person, group, or organization that can place a claim on or is affected by an organization's attention, resources, or output. They are all vested interest groups (institutions and individuals) who either affect or are affected by an organization's policies and behaviors. To fully understand the strategic planning environment, the organization should develop a precise picture of the stakeholders and the potential effects they have on the organization.

The key to success in a public or nonprofit organization is the satisfaction of key stakeholders. Public organizations are usually established to serve a public need. The organization's performance is measured through its ability to satisfy this need. If an organization doesn't recognize who its stakeholders are, and how they measure the organization's performance, there is little chance of the organization knowing how to operate successfully. Over the last decade, states and public interest groups increasingly demanded, often through the courts, access to information about and regulation over an organization's activities. These demands were heightened when an organization's policies and decisions potentially affected public welfare and/or the environment. For example, government agencies often find themselves accused of breaching public trust and leaving the "world" they were assigned to service in worse shape than they found it. A responsible government agency should understand the reasoning behind such accusations and address the issues raised. An

extra effort should be taken to understand why stakeholders feel the way they do. EM recognizes the importance of improved communication with external parties to improve its decision-making process (2). The objective of this study was to develop a list of stakeholder concerns for the ERWM.

METHODOLOGY

A content analysis process was used answer the question: What do the stakeholders of DOE's EM expect EM to accomplish with the ERWM? The purpose of the study was to reveal the focus of attention (i.e., goals and definable actions or plans for achieving the goals) that EM should be pursuing as defined by the stakeholders. "Content analysis is a research methodology that utilizes a set of procedures to make valid inferences from text" (3). The idea is to classify the diverse set of words of a text into fewer content categories. This section briefly describes the content analysis methodology used to answer the above question. A more detailed description and analysis of the process can be found in Kotnour, Koball, Batrouny, Shaw, and Harvey (4).

The main source for our data was a database of *comments* from scoping meetings conducted by DOE for the Implementation Plan for the PEIS for the ERWM. The comments from the PEIS database were grouped into issues based on the issues identified in EM's and WM's strategic plans (1,5). Each comment in the PEIS database had one or more assigned issue numbers. The PEIS issue number was matched with an EM issue. This grouping resulted in fourteen issue files. Some comments were placed in multiple issue files because they had multiple PEIS issue numbers.

Through the content analysis process a hierarchy of issues, sub-issues, and themes from the comments was developed. (See Fig. 1.) A stakeholder's comment was the basic unit of text analyzed and classified. Each comment was analyzed

for the theme(s) a stakeholder wanted EM to address (i.e., goals and definable actions or plans for achieving the goals). A comment may have contained none, one, or more than one theme. All comments for a given issue were read. The comments were tagged (i.e., classifying words of the text) for each theme, if a theme existed. After all comments were read for the given issue, the themes were organized into sub-issues. The sub-issues were developed based on similar themes. The comments were reread by the same researcher and checked for correct theme and sub-issue assignment. Any changes to a theme-to-sub-issue assignment were conducted at this time. The complete text was reviewed during this step. The number of stakeholders who commented on a given sub-issue were counted. If a stakeholder made more than one comment in a sub-issue, then the stakeholder was counted only once on that given sub-issue. This count was used to determine the "significant" sub-issues of an issue. The data were summarized by producing a "paper" on each issue. Each issue paper contained a description of the issue and the sub-issues. The sub-issues were ranked by relative importance to the stakeholders based on the frequency of stakeholders commenting on the sub-issue.

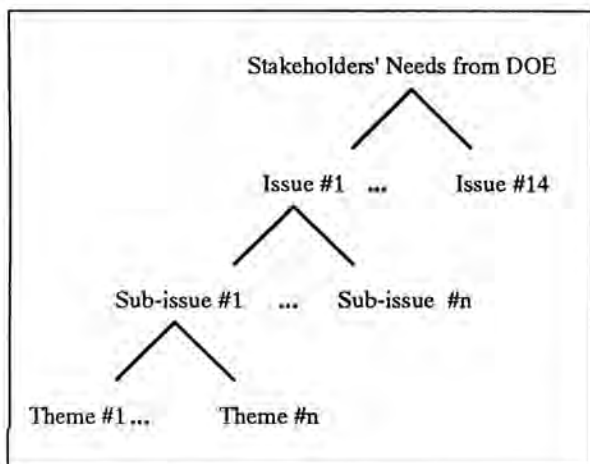


Fig. 1. Content analysis hierarchy.

RESULTS--STAKEHOLDER ISSUES

In this section the analysis results are described. These results support the findings published by DOE (6) but also extend the earlier findings by providing more than a range of comments. The comments are categorized, ranked, and related to EM's strategic plans. These results are the views and opinions of the stakeholders at the PEIS scoping meetings, that is, the results are limited to the stakeholders who commented on the PEIS. Furthermore, not all stakeholders share the same views. Table I provides a list of issues and sub-issues the stakeholders commented on. The bold titles represent the issues and their respective sub-issues are listed below the issues.

The issues provided a means of grouping the comments. Due to the paper length limits each issue cannot be discussed. However, a copy of the complete report can be obtained from Management Systems Laboratories (MSL*). In this paper,

the comments and sub-issues most common across the issues are discussed: State, Local, and Public Involvement in Decision Making and Information Sharing; Environmental, Public, and Worker Health and Safety; Technologies Used to Manage Waste; Monitoring; and Standards. The reader should remember these issues are not isolated. The waste management problem is complex with many interrelated issues and concerns.

State, Local, and Public Involvement in Decision Making and Information Sharing State, local, and public representatives want their input to be considered in decisions made at DOE on issues such as: land use, siting, transportation, and technologies used. DOE is expected to make public all past, present, and future information related to its cleanup activities. In the face of public opposition to many of DOE's activities, openness and honesty in the release of this information will do much to restore public confidence in DOE. The "legacy of secrecy" is still a major problem in the eyes of DOE's stakeholders. Also, stakeholders want independent oversight and monitoring of DOE activities supported by DOE with funding to the interested parties. Stakeholders appear to have little faith that DOE can be depended on to complete its mission in a manner acceptable to the stakeholders.

Specific actions the stakeholders want DOE to take on the issues of State, Local, and Public Involvement in Decision Making and Information Sharing include:

1. Establishing techniques to better inform and involve citizens and local and state governments in the decision-making process regarding oversight of facilities, planning, and monitoring;
2. Educating the public about the health risks of disposal at sites;
3. Holding public forums and hearings to inform the public and workers of the health risks and environmental damage;
4. Involving citizens in siting since there is concern with locating facilities close to heavily populated centers;
5. Making available to independent reviewers for analysis all DOE data regarding: violations, health studies, community and worker health records, waste release and contamination, and hazardous materials;
6. Informing and involving the public in inter-site transportation issues such as transportation routes, safety, and the presence of hazardous waste in the community where transporting waste through a state;
7. Giving all interested parties input into decisions on how clean "clean" means; and
8. Giving all interested parties a chance to express their views on appropriate technologies and the implementation of these technologies.

Environmental, Public, and Worker Health and Safety

State, local, and public representatives voiced their concern over what they see as DOE's apparent disregard for environmental, public, and worker health and safety. Health and safety at and around sites should be the primary concern.

* Requests for the final report should be sent to: Management Systems Laboratories, Virginia Polytechnic Institute and State University, 1900 Kraft Drive, Blacksburg, Virginia 24061.

TABLE I
List of Issues and Sub-issues

Program Management	Legislative and Budget Support
Management	Monitoring
Standards	Long-term funding
Independent oversight of DOE	Specific projects to fund
Image	Technology
Citizen involvement	National sacrifice zones
Funding	Distribution of dollars
Release of data	
Site concerns	Site Specific Issues
Cleanup and restoration	State, local, and public involvement in decision making
Technology	DOE willingness and commitment
Culture	DOE's development of site specific programs
Characterization	Environmental, public, and worker health and safety
Contractors	Current technologies used to deal with waste
Groundwater	
Public Participation and Oversight	Technology
State, local, and public involvement in decision making	Technology development
	Current technological evaluation and requirements for the future
Public perception of DOE activities	Desired future technology characteristics
Environmental, public, and worker health and safety	Public participation in technology issues
DOE management of cleanup	
Compliance with applicable laws and agreements	Disposal
	Disposal alternatives
Occupational and Public Health	WIPP and Yucca Mountain in PEIS
Monitoring and exposure	Handling of wastes
Health and safety	WIPP and Yucca Mountain
Public information and disclosure	
Standards	Configuration
Risk	Land use
Waste Disposal	Standards
Health risk characterization	National sacrifice zones
Indian health	
Burden of contamination	Compliance
	Meeting existing regulations
Impacts-Economic and Environmental	Deregulation of waste
Contamination	Standards
Standards	Monitoring
Concern for current and future generations	
Impacts on communities and workers	Inter-site Transportation
Effect of waste management activities	Emergency response issues
Release waste management related data	Public notification and involvement
Monitoring	Amount of transportation
Waste Management	Pollution Prevention and Waste Minimization
Concerns about current technology	Minimization
DOE waste management strategies	Source reduction and prevention
Current waste situation and future impacts	Definition of minimization and prevention
State, local, and public involvement in decision making	Funding
Public and worker health and safety	Mixed waste
	Technology
	Liability
	Mitigation
	Sovereign immunity
	Compensation

DOE was described as lacking in programs that support worker safety at its sites. Private industry was described as superior in this area. Stakeholders said DOE needs to develop *such programs*. Concerns over DOE's intolerance of whistle blowing were voiced and DOE was asked to devise a program to encourage concerned workers to speak out. Health care for workers was a concern, especially since workers could not get second opinions and must use DOE-designated physicians. Also, the stakeholders want DOE to consider the cumulative effects of waste and production activities. "DOE's ability to meet health, environmental, and legal criteria cannot be evaluated adequately unless it considers the cumulative exposure resulting from all activities at a given site" (7).

Public health and safety was another concern especially for people living around nuclear facilities. Stakeholders are concerned about the extent of on-site and off-site contamination. The contamination must be known, minimized, and contained. Stakeholders are concerned about water, soil, and air contamination. Stakeholders are concerned about the long-term impacts the waste poses. Future generations should be protected from the dangers of this waste, DOE is "playing with the future of the human race" (7).

Stakeholders are concerned about the socioeconomic costs of DOE activities. They are concerned about the workers and communities of DOE sites. They support economic development of non-production activities such as using the sites and resources for waste management technology development. Also, communities want compensation for adverse impacts of DOE activities on the community. Stakeholders suggested DOE consider workers' economic state by setting up a "superfund" and retraining them.

Specific actions the stakeholders want DOE to take on the issue of Environmental, Public, and Worker Health and Safety include:

1. Minimizing the risk to workers;
2. Isolating the waste to protect health and safety;
3. Preventing accidents and having evacuation plans;
4. Complying with the worker safety laws at federal facilities the way private industry must comply;
5. Training and re-training workers in safety techniques and providing them with adequate medical care;
6. Protecting workers who report problems and preventing retaliation;
7. Independent assessment of contamination effects;
8. Disclosing accurate contamination data and assuring that existing wastes are contained properly;
9. Protecting the health and safety of current citizens and workers and minimizing the effects;
10. *Conducting independent health studies to determine the effects on the public; and*
11. Providing educational and training support to state and local governments, as well as the public, to better understand the cleanup problem and how to deal with it.

Technologies Used to Manage Waste

Current technologies are considered primitive and are viewed as insufficient to deal with wastes. DOE's lack of adequate technology and ability to handle the cleanup has

been called the "dark ages of waste treatment" (7). Stakeholders feel DOE underestimates the seriousness of the problem. "DOE must commit to shifting its research efforts, focus, and resources towards developing new cleanup and waste technologies" (7). Treatment, storage, disposal, and minimization technology development is essential for the cleanup and waste management efforts at DOE. Major issues related to technology involve DOE's ability to characterize its waste and measure the extent of contamination, and to develop the appropriate technologies to deal with this waste.

Specific actions the stakeholders want DOE to take on the issue of Technologies Used to Manage Waste include:

1. Not using incineration and shallow land burial for treatment and disposal;
2. Developing a comprehensive understanding of the current levels of contamination and needed technologies as the first step in developing the appropriate solutions;
3. Setting priorities for which waste types and sites need to be cleaned up;
4. Developing a master technology plan that will lay out cleanup requirements, how to develop required technologies, and a timetable for development (Immediate investigation of the viability of waste repositories and development of alternative plans if the repositories are not viable is needed.);
5. Developing interim technologies intended to contain and stabilize the waste while searching for long-term solutions;
6. Using on-site treatment whenever possible since transportation still has risks associated with it;
7. Developing new, less-expensive technologies and researching solutions for cleanup;
8. Considering interim technologies to contain the waste while permanent disposal of the waste is the ultimate goal;
9. Seeking innovative and radical technologies, but taking caution to ensure environmental and public safety is the top priority;
10. Taking a scientifically credible approach in which technology research and development is shared among sites and private industry;
11. Obtaining through Congress sufficient funding to ensure the proper development and testing of technologies;
12. Considering environmental laws so the technology complies with all federal, state, and local laws;
13. Making future technologies more flexible and transferable than current ones; and
14. Testing and demonstrating future technologies without any harm to the environment and human life.

Monitoring

Stakeholders have concerns over who monitors DOE and problems the Environmental Protection Agency (EPA) may have enforcing regulations with DOE. Stakeholders believe they can improve DOE programs and can better protect humans and the environment through public monitoring of DOE to make sure DOE has public safety as its first priority.

Stakeholders believe restoration, monitoring, and evaluation of contamination and oversight of cleanup activities may be handled best by an agency independent of DOE. Current monitoring and evaluation lack elements necessary for accurate monitoring and are inadequate to achieve as low as reasonably achievable (ALARA) standards. Stakeholders ask: What are the inspection and monitoring practices?

Specific actions the stakeholders want DOE to take on the issue of Monitoring include:

1. Funding long-term, independent monitoring of health, air, water, and soil contamination, and of regulatory compliance (DOE should not be allowed to be self-enforcing.);
2. Funding state and local assessments of waste activities;
3. Sponsoring independently conducted dose studies and research into health studies of effects of long-term exposure;
4. Putting the EPA in charge of the cleanup (Cleanup priorities should be set by EPA and the states.);
5. Establishing public health safeguards to monitor risk of low-level radiation to fetuses and children near the sites and looking at the effects of radioactive materials on reproduction;
6. Reevaluating the effects of radiation;
7. Considering the cumulative impact from exposure from all activities to meet health, environmental, and legal criteria;
8. Opposing "below regulatory concern" (BRC) as jeopardizing public health and safety;
9. Developing and using data bases for long-term monitoring of the risk from past and future nuclear operations and the effects of exposure on humans, animals, and the environment;
10. Funding independent, comprehensive dose/epidemiological studies and analysis conducted on-site and off-site to measure the health effects of exposure and contamination; and
11. Setting up reviews by an independent agency/scientists at each facility to test if populations have been exposed.

There is concern that DOE has rejected ALARA levels and over the accuracy of dose/level exposure information. Stakeholders want DOE to adopt a zero-release goal. There must be explicit and low limits on ionizing radiation dosage to exposed persons at all times and from all operations.

Standards

The stakeholders' main concern with standards is for drinking water. Citizens are concerned about the sources of their water being contaminated. Stakeholders want standards defining "how clean is clean." More specifically, they want health-based standards that adhere to federal, state, and local laws. Also, they said states should have input and regulatory authority in developing these standards. Stakeholders believe there are no comprehensive cleanup standards, and what exists is inadequate and results in unnecessary exposure. Stakeholders ask: How do policies and standards of DOE conform to federal, state, and local regulations and laws?

Stakeholders want standards and regulations established by entities external to DOE.

Specific actions the stakeholders want DOE to take on the issue of Standards include:

1. Overhauling radiation protection standards to take into account new information on the hazardous effects of exposure;
2. Meeting and upholding the most stringent standards across the complex, e.g., use Occupational Safety and Health Administration to enforce worker safety compliance;
3. Giving states an input and regulatory authority in developing these standards (Public and state involvement must be allowed in setting more stringent standards than EPA or the Nuclear Regulatory Commission.);
4. Eliminating DOE's sovereign immunity;
5. Complying with Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and holding DOE to the same standards as private industry;
6. Considering the cumulative exposure of all activities from any given site (Consider a low limit on ionizing radiation. Zero emissions, or the lowest achievable emission rate should be the only acceptable standard.); and
7. Not implementing "below regulatory concern" (BRC) characterization of waste.

CONCLUSION

The major issues discussed by stakeholders at scoping meetings for the Office of Environmental Restoration and Waste Management Programmatic Environmental Impact Statement were identified. The results of this study identify for EM the important issues EM's stakeholders want addressed. To be "successful" in the eyes of their stakeholders, EM should demonstrate concern and action on these and on other issues. DOE's goals, objectives, actions, and measures should be developed in balance with stakeholder concerns and the requirements of its mission.

The analysis of these issues suggest a shared understanding of the issues facing the waste complex between DOE and its stakeholders is lacking. The public may not fully understand the complexity of the cleanup problem and its implications, while at the same time, DOE may not have a full understanding of the public's concerns. State, local, and public representatives expect a commitment from DOE to develop better programs to deal with the waste problem. DOE should report in a form the public can understand. The public questions the scientific integrity of DOE studies and claims there is too much analysis and no action being taken.

RECOMMENDATIONS

The stakeholders are asking DOE to help them understand the situation, share information with them, and to make them part of the decision-making process. The following recommendations are driven by the need for DOE to understand stakeholders' concerns and stakeholders to understand the complexity of the waste management problem:

- Establish techniques to better inform and involve citizens and local and state governments in the decision-making process regarding oversight of facilities, planning, and monitoring. For example, state and local governments, as well as the public, want educational and training support to better understand the cleanup problem and how to deal with it. The issues identified in this paper provide insight into the breadth and depth of the educational objectives and content.
- Demonstrate DOE's concern for public, worker, and environmental safety.
- Demonstrate progress on environmental restoration and waste management technology development.
- Determine and manage the risks in the complex for the general public, those living around sites, the workers, and future generations.

The recommendations in the "Keystone Report" (8) and EM Program Goals (9) begin to address the stakeholders concerns and the above recommendations for DOE.

REFERENCES

1. U. S. DEPARTMENT OF ENERGY, "Environmental Restoration and Waste Management Strategic Plan: Draft," (1992).
2. U. S. DEPARTMENT OF ENERGY, "DOE Endorses Keystone Report Recommendations (R-93-068)," (April 20, 1993).
3. R. P. WEBER, *Basic Content Analysis*, (Sage Publications 1985).
4. T. G. KOTNOUR, E. KOBALL, G. BATROUNY, M. SHAW, and T. HARVEY, "Gleaning Information from Open-Ended Data to Support Decision Making," *Proceedings of Twenty-Ninth Annual Meeting of the Institute of Management Sciences, Southeastern Chapter*, (October 7-8 1993).
5. U. S. DEPARTMENT OF ENERGY, "The Office of Waste Management Strategic Plan: Draft," (December 16, 1992).
6. U. S. DEPARTMENT OF ENERGY, "Implementation Plan for the Programmatic Environmental Impact Statement for the Department of Energy Environmental Restoration and Waste Management Program," (January 1992).
7. Stakeholder, Comment presented at the *Scoping Meetings on the Implementation Plan for the Programmatic Environmental Impact Statement for the Department of Energy Environmental Restoration and Waste Management Program*, (1990-1991).
8. U. S. ENVIRONMENTAL PROTECTION AGENCY, "Interim report of the Federal Facilities Environmental Restoration Dialogue Committee: Recommendations for Improving the Federal Facility Environmental Restoration Decision-Making Process and Setting Priorities in the Event of Funding Shortfalls," (February 1993).
9. U. S. DEPARTMENT OF ENERGY, "Environmental Management Program Goals (version 11)," (November 4, 1993).

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